



# *Model 1014A Crane*

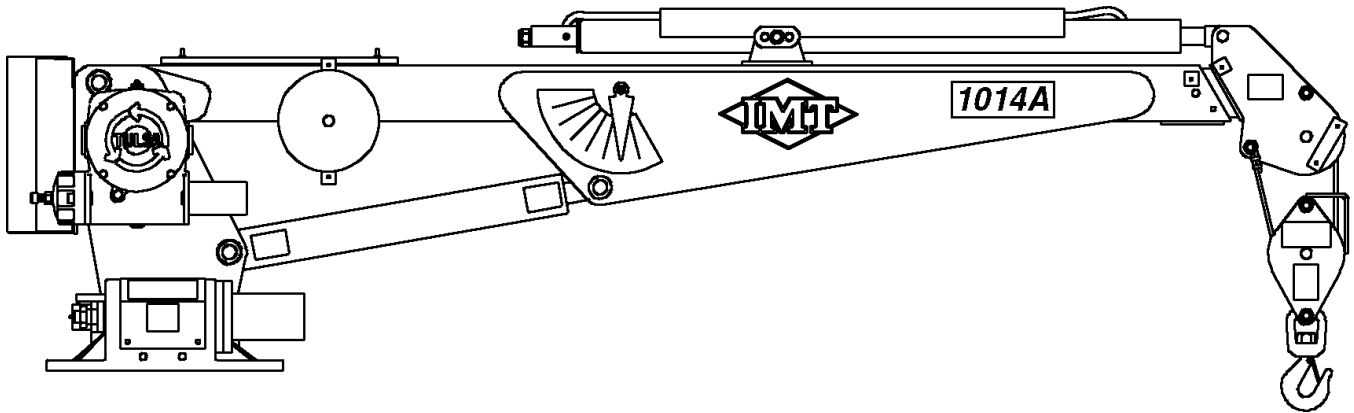
## **Volume 2 - PARTS AND SPECIFICATIONS**

**Section 1 CRANE SPECIFICATIONS**

**Section 2 CRANE REFERENCE**

**Section 3 REPLACEMENT PARTS**

**Section 4 GENERAL REFERENCE**



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MANUAL PART NUMBER 99901221

## 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 1014A CRANE SPECIFICATIONS

### GENERAL

	<u>1014A-H10 CRANE</u>	<u>1014A-HM14 CRANE</u>
<b>CRANE RATING</b>	10,500 ft-lbs (1.46 ton-meters)	10,500 ft-lbs (1.46 ton-meters)
<b>REACH</b> - from centerline of rotation	10'-0" (3.05m)	14'-0" (4.27m)
<b>HYDRAULIC EXTENSION</b>	36" (91.4cm)	36" (91.4cm)
<b>MANUAL EXTENSION</b>	---	48" (121.9cm)
<b>LIFTING HEIGHT</b> - from base of crane	11'-4" (3.45m)	15'-2" (4.62m)
<b>WEIGHT OF CRANE</b>	610 lbs (277 kg)	650 lbs (295 kg)
<b>STORAGE HEIGHT</b> - crane only	26" (66.0cm)	26" (66.0cm)
<b>MOUNTING SPACE REQUIRED</b> (crane base)	14-1/2" X 17" (36.8cm x 43.2cm)	14-1/2" X 17" (36.8cm x 43.2cm)
<b>TIE-DOWN BOLT PATTERN</b>	11-1/2" X 14-3/4" (29.2cm X 37.5cm) on center	11-1/2" X 14-3/4" (29.2cm X 37.5cm) on center
<b>HORIZONTAL CENTER OF GRAVITY</b> from centerline of rotation	15" (38.1cm)	15" (38.1cm)
<b>VERTICAL CENTER OF GRAVITY</b> from bottom of crane base	13" (33.0cm)	13" (33.0cm)
<b>OPTIMUM PUMP CAPACITY</b> (PTO)	5 U.S. GPM (18.9 liters/min)	5 U.S. GPM (18.9 liters/min)
<b>*OPTIMUM PUMP CAPACITY</b> (electric 2-stage)	1.5 & 3.5 U.S. GPM (5.7 & 13.2 liters/min)	1.5 & 3.5 U.S. GPM (5.7 & 13.2 liters/min)
<b>OIL RESERVOIR CAPACITY</b> (electric 2-stage)	5 U.S. Gallons (18.9 liters)	5 U.S. Gallons (18.9 liters)
<b>DESIGN FACTORS</b> - pins and hydraulics	4/1	4/1

\* The 2-stage pump delivers 1.5 U.S. GPM (5.7 liters/min) at low speed and 3.5 U.S. GPM (11.4 liters/min) at high speed. Normally, when operating under load, the pump will be operated as a single-stage pump. The pump will be operated as a 2-stage pump to save time during set up.

### PERFORMANCE CHARACTERISTICS

		<b>**PTO</b>	<b>***POWER UNIT</b>
<b>ROTATION:</b>	400°	35 seconds	50 seconds
<b>LOWER BOOM ELEVATION:</b>	-0° to +72°	6 seconds	9 seconds
<b>EXTENSION BOOM:</b>	36" (91.4cm)	8 seconds	12 seconds
<b>WINCH</b> -single part line		25 ft/min (7.6 m/min)	12 ft/min (3.7 m/min)
<b>WINCH</b> -two part line		12 ft/min (3.7 m/min)	6 ft/min (1.8 m/min)

\*\* All times are based on 5 GPM (18.9 liters/min) pto delivery rate.

\*\*\* All times are based on 3.5 GPM (13.2 liters/min) pump delivery rate.

### CYLINDERS

	<u>BORE</u>	<u>STROKE</u>
<b>LOWER BOOM CYLINDER</b>	2-1/2" (6.4cm)	18" (45.7cm)
<b>EXTENSION BOOM CYLINDER</b>	2" (5.1cm)	36" (91.4cm)

**POWER SOURCE**

Power is supplied to the electric motor by a solenoid connected to the 12-VDC truck battery. The chassis must be equipped with a 4000 watt Delco Freedom battery (or equivalent) connected in parallel to the chassis' standard heavy-duty battery. The chassis must also be equipped with a heavy-duty alternator (63 amp for GM vehicles and 60 amp for Ford vehicles).

**ROTATION SYSTEM**

Turntable bearing with external worm gear powered with a high-torque hydraulic motor through a self-locking worm. Total gear reduction is 63 to 1.

**CYLINDER HOLDING VALVES**

The base ends (extend sides) of the lower boom and extension cylinders are equipped with integral-mounted counter-balance valves to prevent sudden cylinder collapse in case of hose or other hydraulic failure.

The counter balance valve serves several functions. First, it is a holding valve. Secondly, it is designed to control the speed at which the lowering function operates, and allows that motion to be metered under load. Finally, it prevents the loss of an excess amount of oil in the event of a hose failure. Only the oil in the hose, at the time of the failure, will be lost.

**EXCESSIVE LOAD LIMIT SYSTEM (ELLS)**

Overloading of the crane is limited by the ELLS. This is done by disarming the crane functions which make possible the application of greater than allowable stress to the crane structure and components. Functions controlled by the ELLS are winch up, extension out and lower boom down. To relieve the situation, the operator may set the load down (winch down) or retract the extension boom (extension in).

**WINCH**

The winch is powered by a hydraulic motor through a 38:1 ratio worm-gear drive which also functions as a brake. Line speed is 25 ft/min (7.6m/min) at optimum oil flow for 1-part line and 12 ft/min (3.8m/min) for 2-part line. The winch is equipped with 65 ft (19.81m) of 7/32 (.56cm) 7 X 19 class aircraft cable having a lifting capacity of 1600 lbs (726 kg) at 2800 PSI (193 bar) for 1-part line and 3200 lbs (1452 kg) for 2-part line. A nylon sheave riding on a lubricated needle bearing is located at the tip of the extension boom. The ratio of winch drum and sheave pitch diameter to wire rope diameter is 20:1. 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 (PTO DRIVEN)**

Open-centered, full-pressure system that requires 5 GPM (18.9 liters/min) optimum oil flow at 2250 PSI (155 bar). The control valvebank is a 4-spool, stack-type, 12 VDC valvebank. The hydraulic system includes a 100-mesh suction-line strainer, a return line filter and the control valvebank. An optional hydraulic reservoir is available.

**ELECTRO-HYDRAULIC SYSTEM (2-SPEED/AUTO-SHIFT)**

Open-centered, full-pressure system that features a 2-stage hydraulic pump, with the first stage delivering 1.5 GPM (5.7 liter/min) and the second stage delivering 3.5 GPM (13.2 liters/min) at 2250 PSI (155 bar). The operation of the circuit automatically shifts from high to low speed when the crane reaches a certain pressure or load level. The control valvebank is a 4-spool, stack type, 12VDC valve system. The system includes a 5 gallon (18.9 liter) hydraulic reservoir, 100-mesh suction line strainer, a hydraulic pump driven by a totally enclosed fan cooled 12VDC motor and all necessary hoses and fittings.

**CONTROLS**

Remote control with a 25-foot (7.62m) control cable.

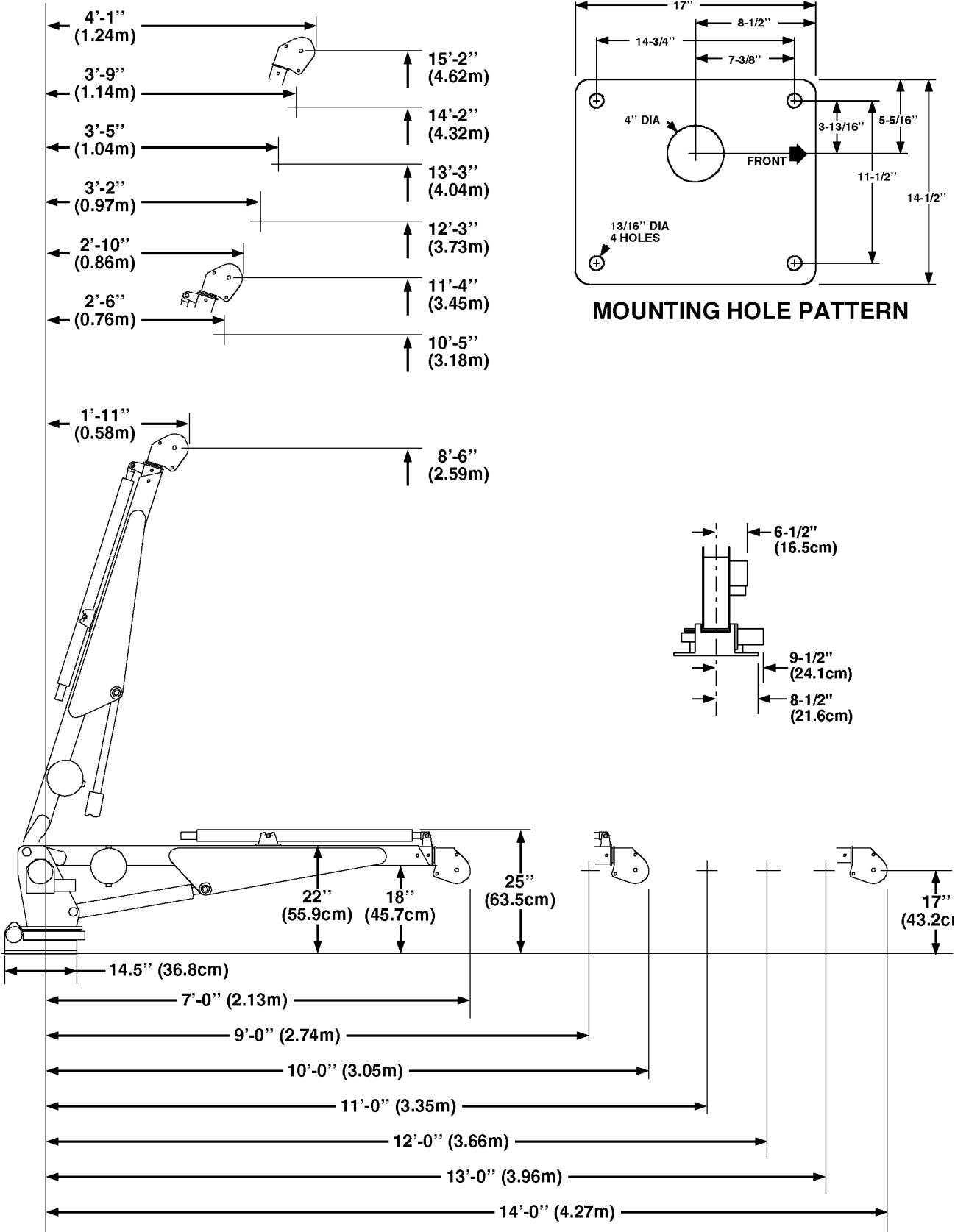
**MINIMUM CHASSIS SPECIFICATIONS**

<b>BODY STYLE</b>	Conventional Cab	Conventional Cab
<b>WHEEL BASE</b>	137" - 161"	348cm - 409cm
<b>CAB TO AXLE</b>	60" - 84"	152cm - 213cm
<b>FRAME SECTION MODULUS</b>	5.91"3	97cc
<b>*RBM</b>	212,760 in-lbs	2451 kg-meter
<b>FRONT AXLE RATING</b>	2700 lbs - 4000 lbs	1315 kg - 1814 kg
<b>REAR AXLE RATING</b>	5480 lbs - 7500 lbs	2486 kg - 3402 kg

\* Based on 36,000 PSI yield frame material (A-36).

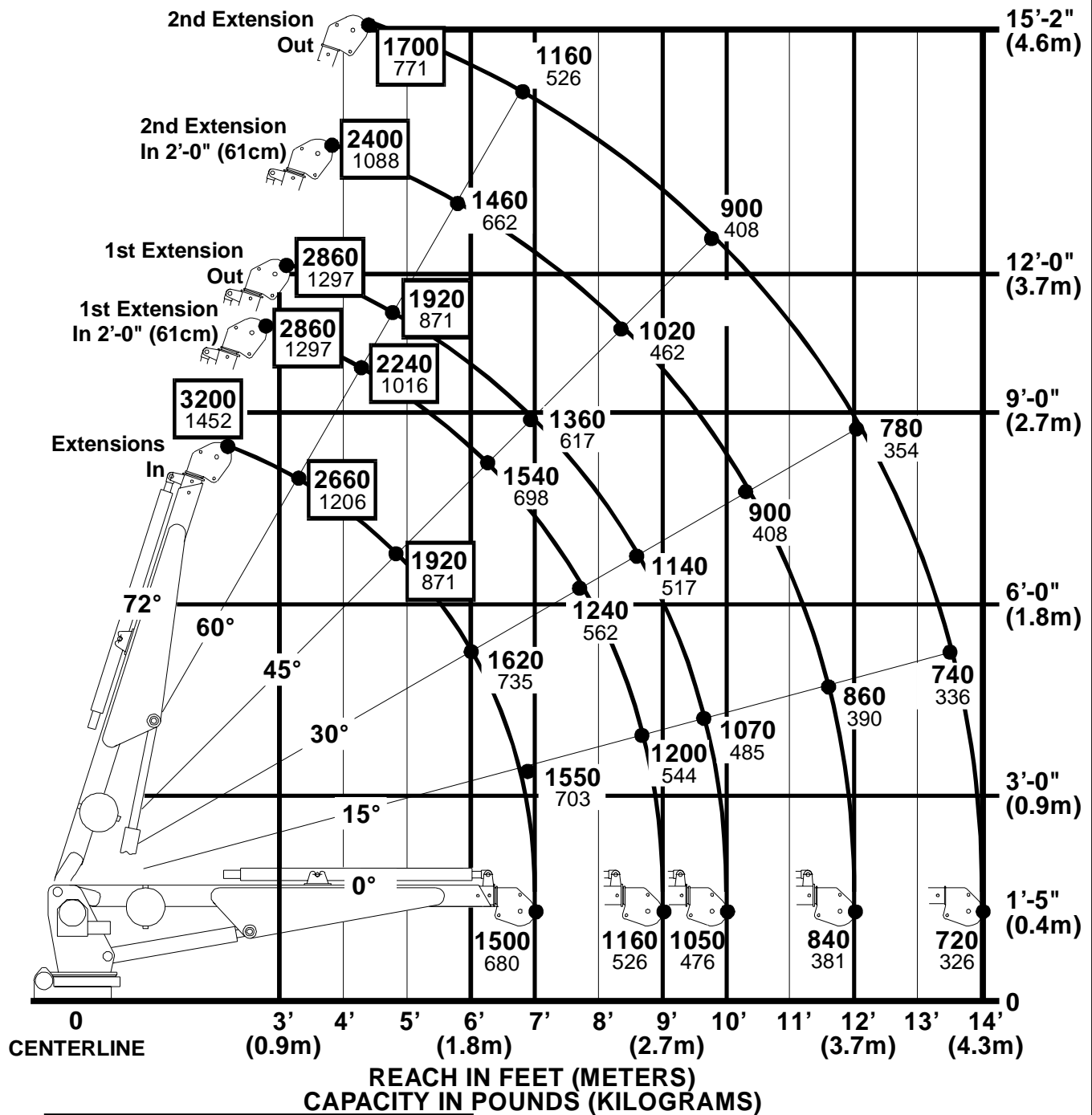
In addition to these specifications, a heavy-duty battery and alternator are required. It is recommended that the vehicle have power steering and dual rear wheels..

GEOMETRIC CONFIGURATION



## CAPACITY CHART

## 1014A CAPACITY CHART



Maximum 1-part line capacity is 1600 lbs (725 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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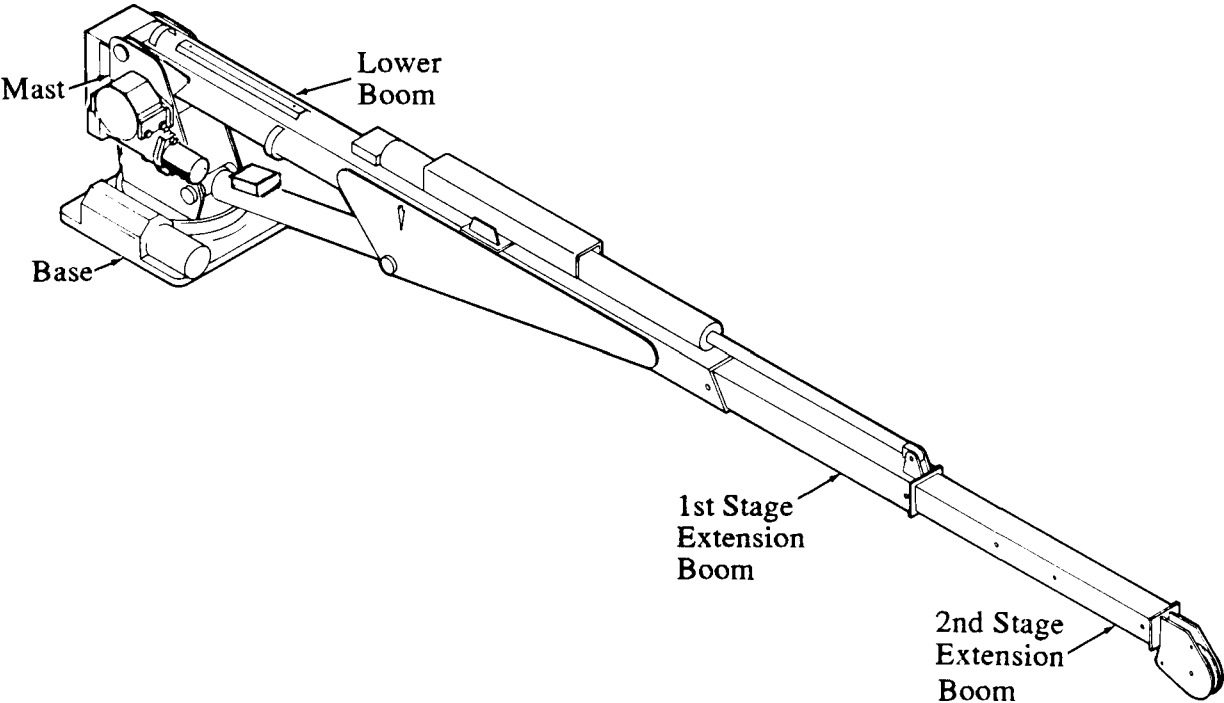
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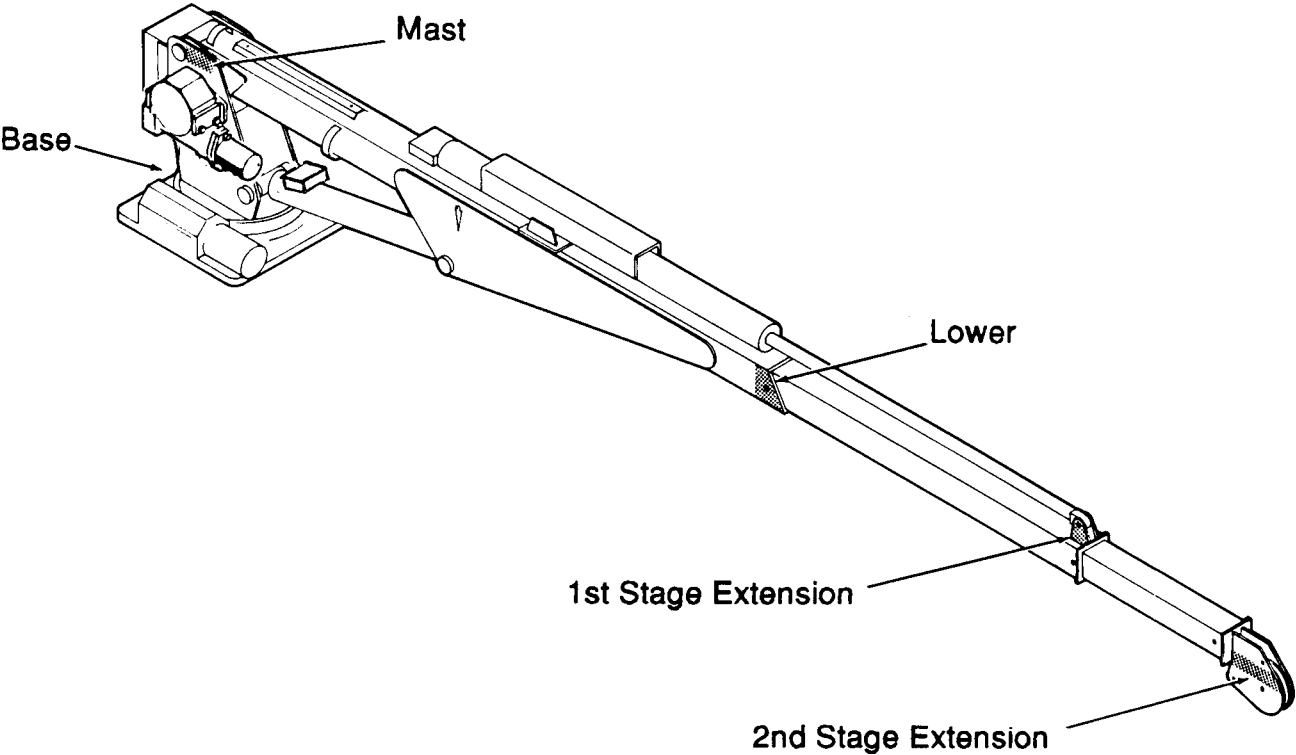
## NOTES

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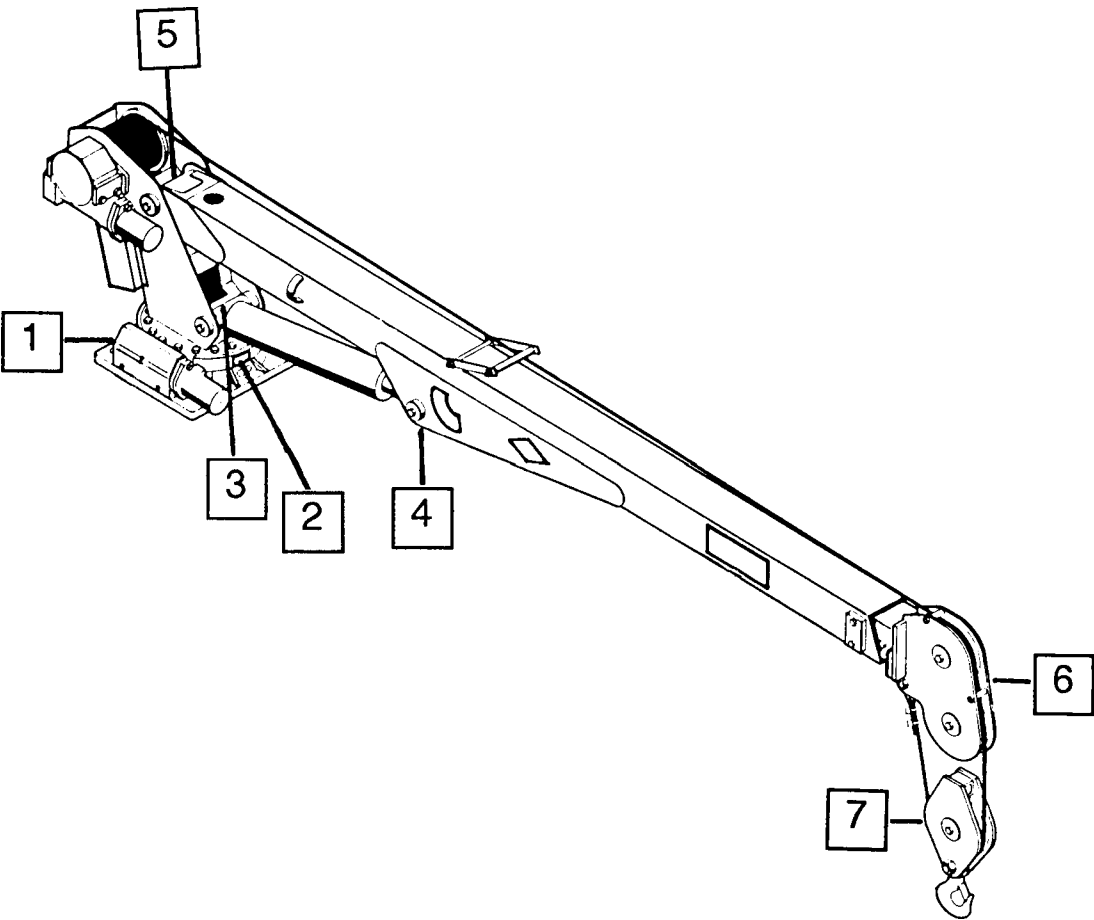
**MAJOR CRANE ASSEMBLIES**



**WELDMENT PART NUMBER LOCATIONS**



GREASE ZERK LOCATIONS AND LUBRICANT REQUIREMENTS



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

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

# RECOMMENDED SPARE PARTS LIST

## 1 Year Supply MODEL 1014A CRANE For Manual: 99901221

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
41704562.01.19990407	<b>BASE ASM</b>						
	5	60030116	THRUST BEARING	2	W		
	8	70055147	BEARING	1	W		
	9	70055148	BEARING	1	W		
	10	70056307	WORM GEAR	1	W		
	REF	89086159	MOLUB	2	P		
41714331.01.19990407	<b>WINCH/CABLE/HOOK KIT</b>						
	8	70055142	BEARING	1	W		
	10	77041291	SWITCH	1	W		
31710164.01.19990407	<b>CABLE &amp; HOOK KIT</b>						
	7	70055163	ROLLER BEARING	1	W		
	8	70580059	WIRE ROPE 7/32"X65'	1	W		
	10	71732760	SWIVEL HOOK 1-1/2 TON	1	W		
	16	70055162	INNER RACE	1	W		
51713168.01.19990407	<b>CORD REEL ASM</b>						
	4	70732193	CORD REEL	1	W		
41714699.01.19990407	<b>LOWER BOOM ASM</b>						
	3	60030097	WEAR PAD	1	W		
41715072.01.19990407	<b>LOWER BOOM ASM-W/D-RING</b>						
	15	60030097	WEAR PAD	1	W		
3B111980.01.19990407	<b>LOWER BOOM CYLINDER</b>						
	3	6H025015	HEAD	1	W		
	4	6I025087	PISTON	1	W		
	7	73540052	C'BAL VALVE	1	C		
	8	9B101214	SEAL KIT	1	W		
41714447.01.19990407	<b>EXTENSION BOOM ASM-HYD/MANUAL 14'</b>						
	5	60030061	SHEAVE W/BEARING	1	W		
41714446.01.19990407	<b>EXTENSION BOOM ASM-HYD 10'</b>						
	5	60030061	SHEAVE W/BEARING	1	W		
3B311970.01.19990407	<b>EXTENSION BOOM CYLINDER</b>						
	3	6I020075	PISTON	1	W		
	4	6H020012	HEAD	1	W		
	6	9B081012	SEAL KIT	1	W		
	16	73054304	C'BALANCE VALVE 10GPM	1	C		
73051957.01.19990414	<b>HYDRAULIC POWER UNIT</b>						
	2	73540046	RELIEF CARTRIDGE	1	W		
	4	73540048	KICK DOWN CARTRIDGE	1	W		
	8	77041570	STARTER COIL	1	W		
70733222.01.19990407	<b>VALVEBANK-PROP'L RMT CTRL</b>						
	4	70145626	COIL	1	C		
	5	70145625	RELIEF VALVE	1	C		
	6	73054624	SOLENOID VALVE	1	C		
70733225.01.19990407	<b>VALVEBANK-PWR UNIT</b>						
	5	70145625	RELIEF VALVE	1	C		
	6	73054624	SOLENOID VALVE	1	C		
70733346.01.19990407	<b>VALVEBANK-NON PROP'L</b>						
	5	70145625	RELIEF VALVE	1	C		
	6	73054624	SOLENOID VALVE	1	C		
51714700.01.19990407	<b>REMOTE HANDLE ASM-PWR UNIT</b>						
	17	77040372	TOGGLE SWITCH SPDT	4	W		
	18	77040373	TOGGLE SWITCH SPST	1	W		
	19	77040374	TOGGLE SWITCH SPDT	4	W		
	23	77041407	DIODE BOARD	1	W		
51713384.01.19990407	<b>REMOTE HANDLE ASM-PTO</b>						
	16	77040371	TOGGLE SWITCH SPST	2	W		
	17	77040372	TOGGLE SWITCH SPDT	4	W		
	18	77040373	TOGGLE SWITCH SPST	1	W		
	19	77040374	TOGGLE SWITCH SPDT	1	W		

## NOTES

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# INSTALLATION

## GENERAL INSTALLATION

This section is intended to serve as a guide in the installation of the IMT 1014A crane. Since each installation is considered unique, certain components, such as the power unit's battery cable must be cut to the proper length.

## CHASSIS INFORMATION

The crane is designed for use with an IMT body installed on a vehicle meeting the minimum chassis requirements as specified in Section 1.

If this crane is being installed on any body other than an IMT mechanic body, check with IMT to determine the suitability of that body.

### WARNING

THE USE OF THIS CRANE ON A BODY NOT CAPABLE OF HANDLING THE LOADS IMPOSED ON IT BY THE CRANE, MAY RESULT IN SERIOUS INJURY OR DEATH.

## CRANE INSTALLATION

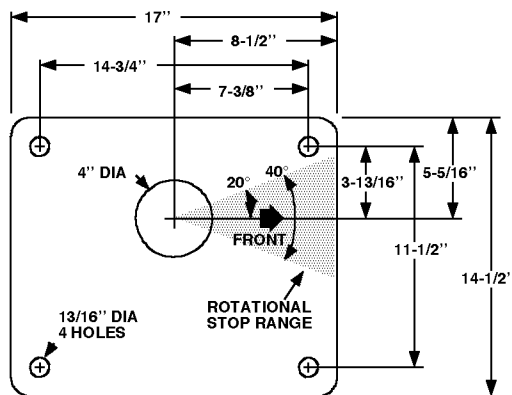
The crane requires a mounting space of at least 14-1/2" wide by 17" long. If necessary, the truck body can be reinforced to give sufficient strength to support the crane in its operating condition. Locate and drill the four 13/16" holes (see drawing below). Use a pilot drill first and then the 13/16" drill. Cut the 4" diameter hole with a saw after starting with a drill. Deburr all holes. Lift the crane into position on the body. Use a lifting device capable of supporting the crane - 650 lbs (295 kg).

Install the bolts, lockwashers, flat washers and nuts to secure the crane to the chassis (see drawing). Torque the bolts to 200 ft. lbs. (27.66 kg-m).

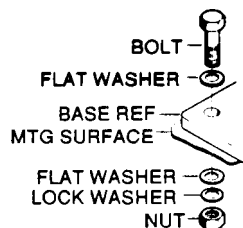
### NOTE

IN ADDITION TO THESE SPECIFICATIONS, A HEAVY-DUTY BATTERY AND ALTERNATOR ARE REQUIRED. IT IS RECOMMENDED THAT THE VEHICLE HAVE POWER STEERING AND DUAL REAR WHEELS.

IMT RECOMMENDS ADHERENCE TO THE UPPER LIMIT OF THESE SPECIFICATIONS FOR BEST SYSTEM PERFORMANCE.



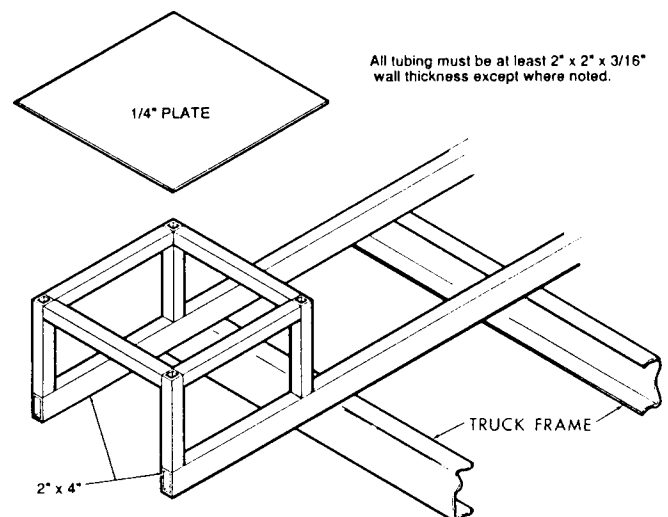
**MOUNTING HOLE LAYOUT**



## CRANE INSTALLATION

## BODY REINFORCEMENT

If, after talking with the factory, it has been determined that the body will not support the crane with the full, rated load, the body can be reinforced as shown below. Use 1/4" fillet welds and an AWS qualified welder.



## REINFORCEMENT

# 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 2250 psi at 5 gpm. If the relief valve should fail, it would likely stick open. This would prevent system pressure from developing and cause a lack of torque/force at the actuator. The relief valve can be changed easily by screwing it out and replacing with a new one.

### PROPORTIONAL VALVE

The proportional valve varies the oil flow to the individual crane functions. Doing so dictates the speed of the crane functions. As the electrical current increases to the valve, by using the trigger on the control handle, more oil is ported downstream to the crane function. If the valve coil burns out, the operator would be unable to vary the flow to the crane functions. If the valve spool becomes stuck, the operator would be unable to vary the downstream flow. If speed control is the problem, it is likely an indication of a proportional valve problem. It is necessary to verify that current is flowing to the coil correctly, and that it is not an electrical problem. The proportional valve can also be operated manually for test purposes. The valve stem can be screwed out manually to port oil downstream. Doing so will manually position the valve spool and hold it in the manually commanded position.

### DIRECTIONAL VALVES

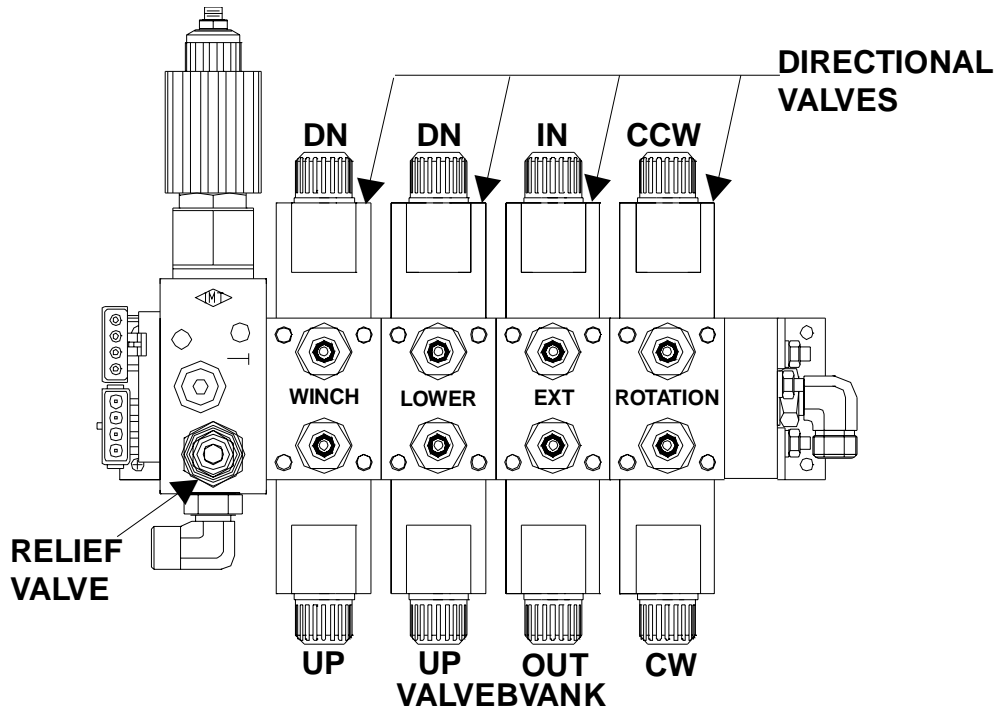
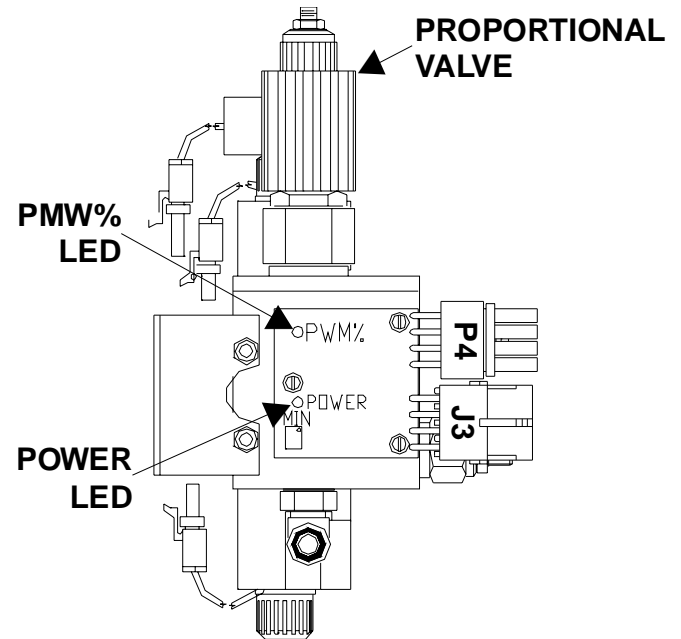
The directional valves (4) control the direction of the crane functions. When one of the solenoids is energized, it shifts the valve spool. This allows oil to flow out one of the valve ports. If a function does not work, a directional valve may be to blame. These valves have a standard manual override.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



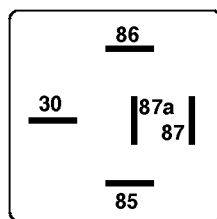
# RELAY BOARD OPERATION

## INTRODUCTION

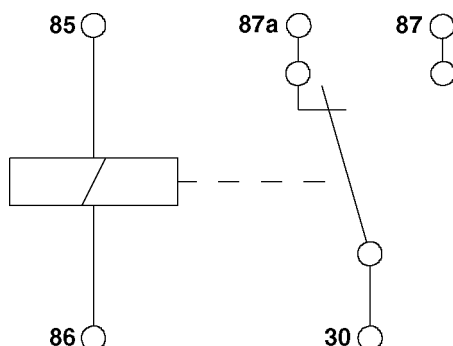
To understand how the relay board operates, it is necessary to understand how the individual relays function.

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.

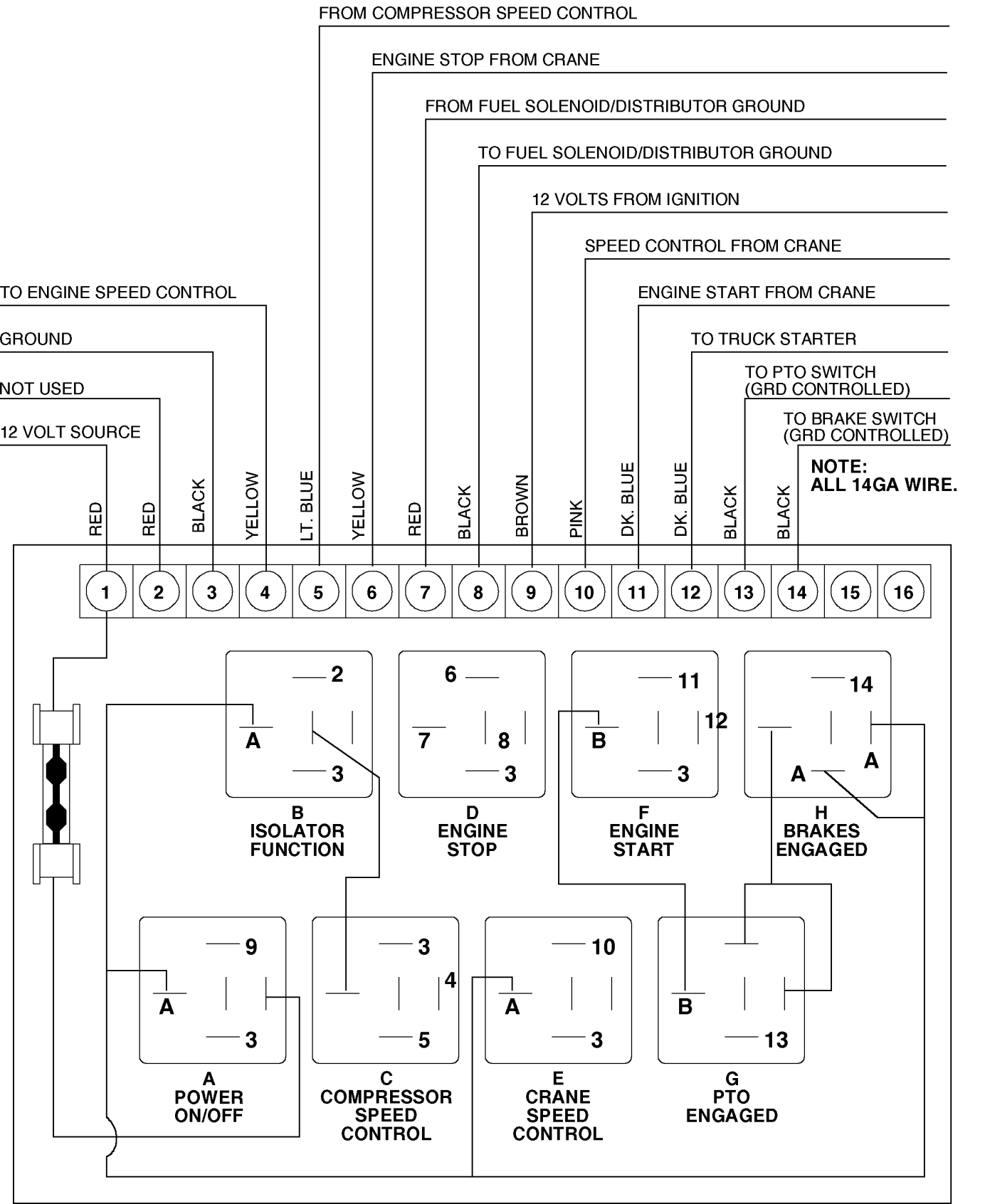
To start the vehicle, the engine start switch at the handle must be depressed. When this is accomplished, terminal 11 of the terminal block becomes “HOT”. See Figure 5.

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



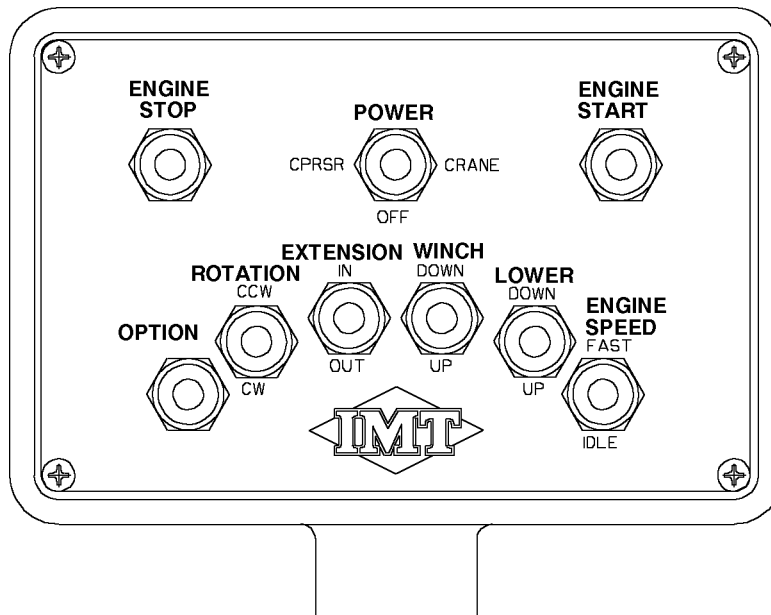
## REMOTE ENGINE SPEED (FROM CRANE)

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”

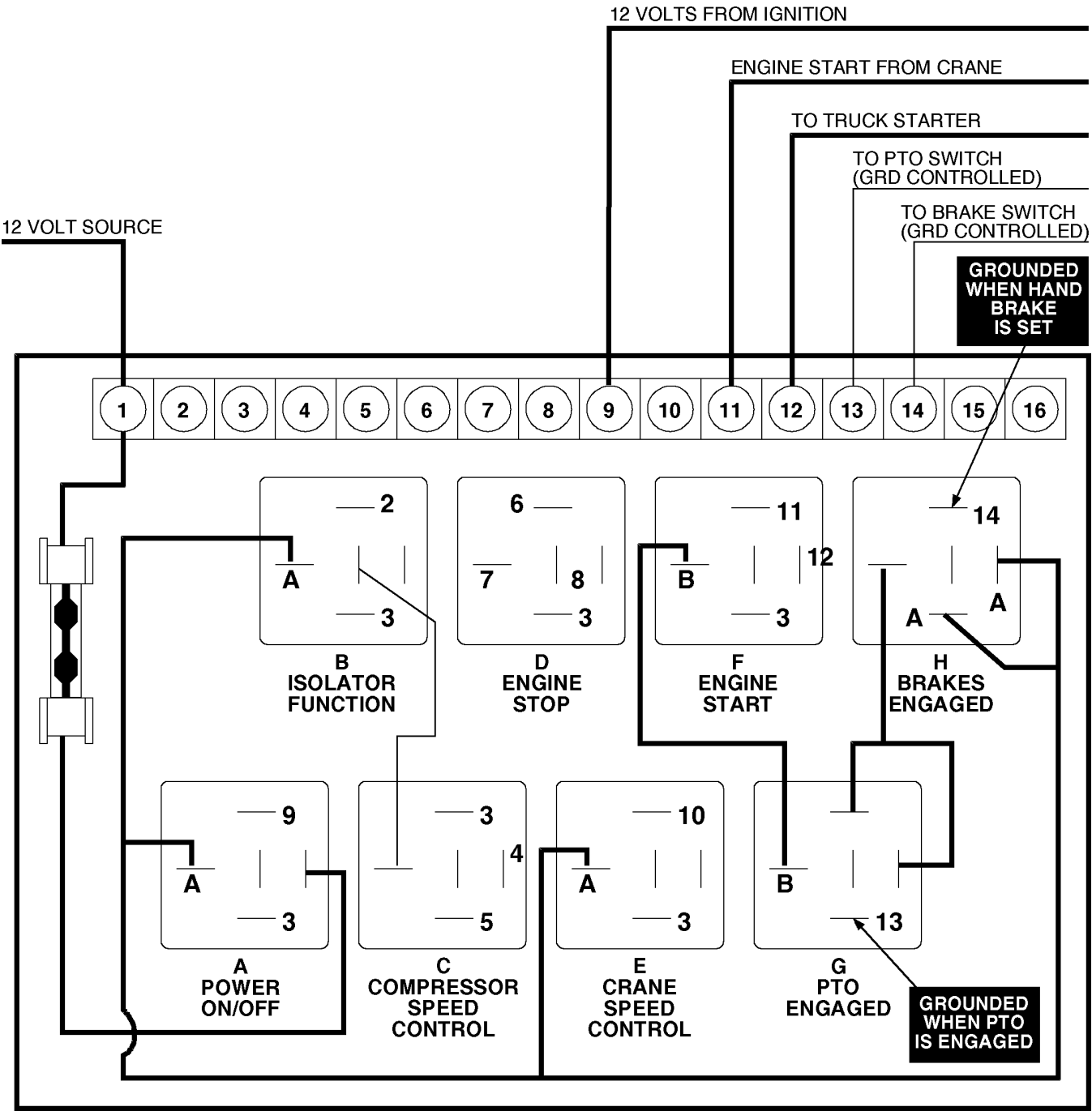
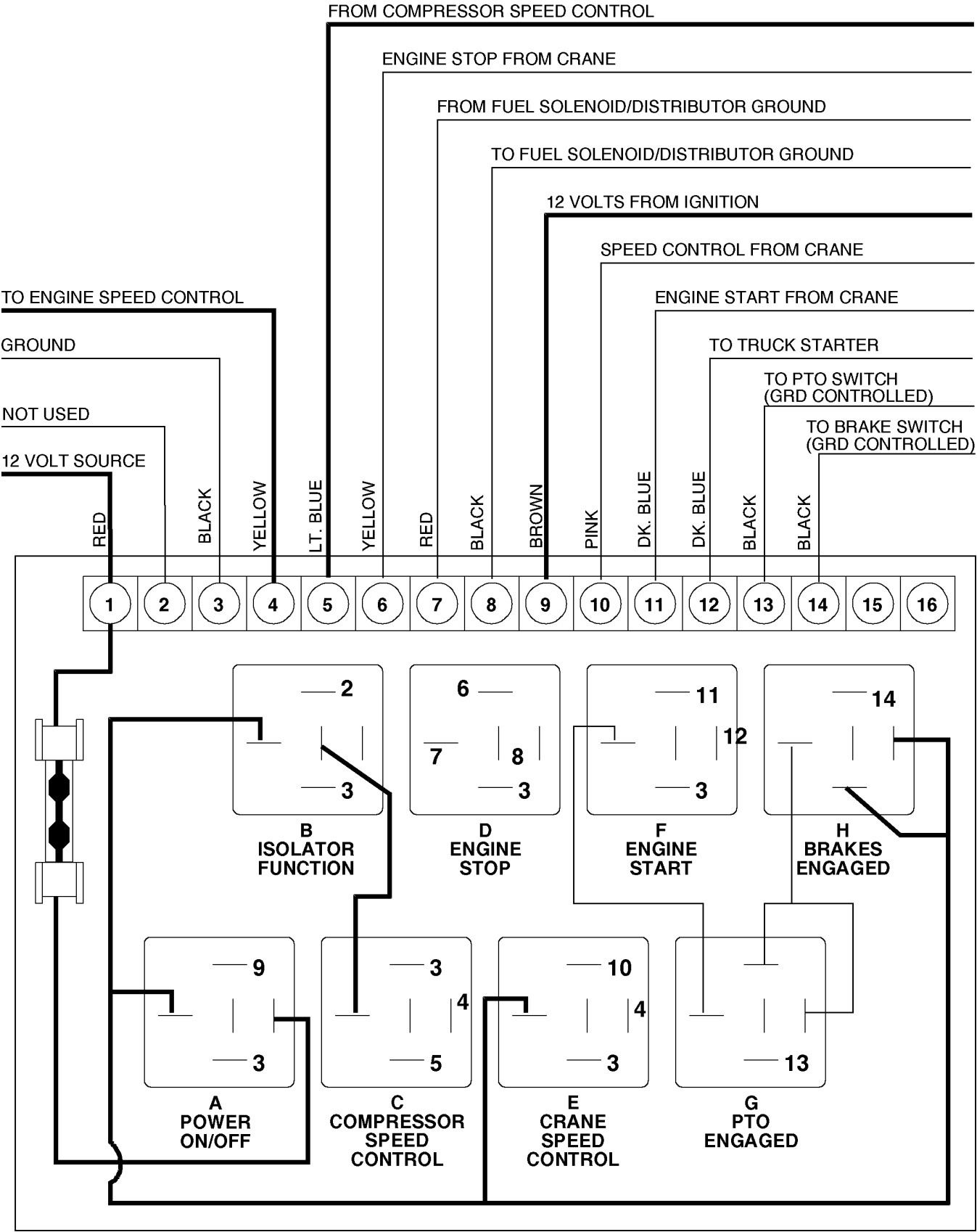


FIGURE 6. SPEED CONTROL - COMPRESSOR ONLY



## 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

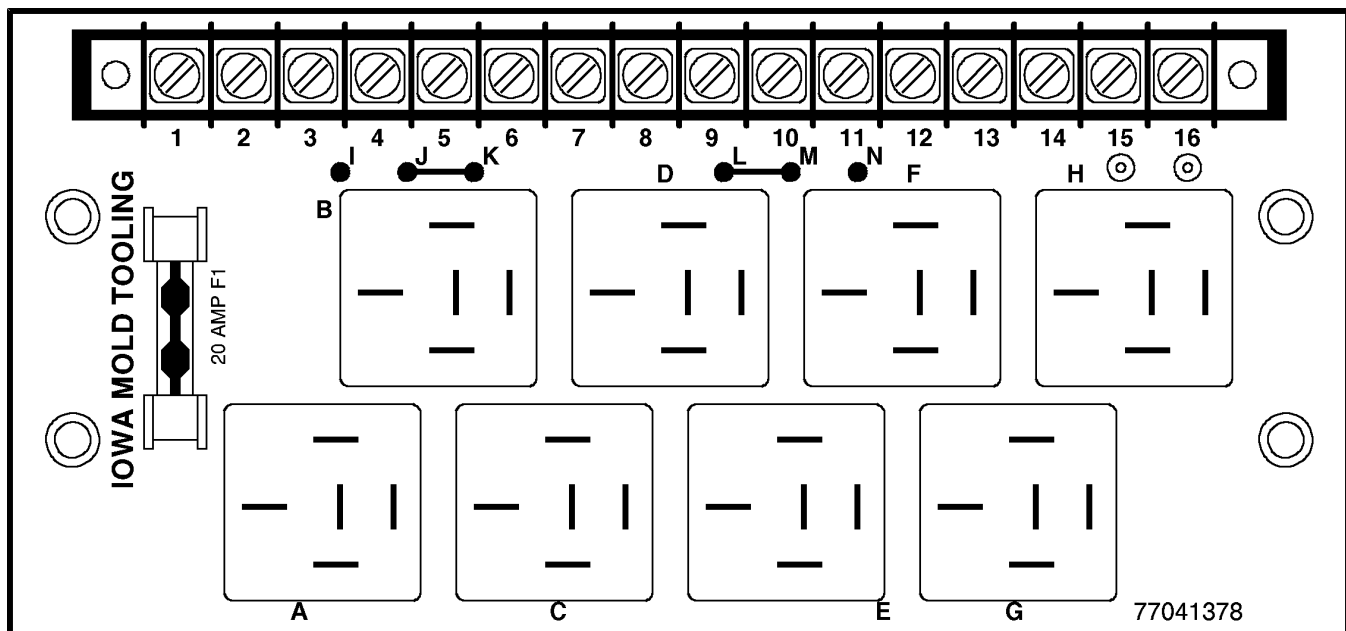
Circuits that could be ground excited are 6 - 10 & 11.  
Quick Check: (Before connecting wires to circuit board)  
Activate the engine stop switch from the crane. If terminal 6 is hot, wire per 4-1. If not, wire per 4-2.

## 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**

## NOTES

This image shows a full page of blank handwriting practice paper. It features approximately 28 evenly spaced horizontal blue lines across its entire surface. There are no margins, text, or other markings present.



## Excessive Load Limit System (ELLS) TEST PROCEDURE

This procedure is to be used for testing the Excessive Load Limit System (ELLS) used on the IMT Telescoping Crane models. Following this test procedure will ensure the system is currently operable and will not allow the crane to be excessively overloaded.

The purpose of the ELLS is to prohibit the excessive overloading of the crane. It does this by disarming the functions that make it possible for the operator to apply greater than allowable stress to the crane structure and components. The functions which are involved in the ELLS may vary for each crane model (Refer to TABLE 1 for which functions are shut down by the ELLS on each crane).

The load rating of the crane is determined by the pressure induced in the lower boom cylinder. The ELLS senses the pressure in the base end of the lower boom cylinder with a normally closed pressure switch located on the valve block on the top of the cylinder. When the pressure in the base end of the cylinder exceeds the setting of the pressure switch for that particular crane, the pressure switch opens and breaks the ground connection for the solenoids that shift the valve spool on the appropriate functions. Once the ground connection is disengaged, the solenoids that shift the valve spools for the appropriate functions can not be activated using the remote control handle. Only those functions that will not increase the load moment of the crane structure and components will be operable (i.e.- winch down, extension in, lower boom up, rotation). The operator is able to use "WINCH DOWN" to set the weight down to relieve the crane and "EXTENSION IN" to bring the load in for a shorter load radius. Either of these two functions will decrease the load moment of the crane structure and components, thus decreasing the pressure in the main cylinder.

### ITEMS REQUIRED TO TEST THE CRANE ELLS (SEE PHOTOS NEXT PAGE)

#### **PRESSURE GAGE ASSEMBLY (GAGE & PIPE-JIC ADAPTER)**

-5000 PSI LIQUID FILLED PRESSURE GAGE W/ 1/4" PIPE THRD	QTY 1
-1/4 PIPE-#6 JIC ADAPTER (ref) PARKER PART# 0203-4-6	QTY 1

#### **16" HOSE ASSEMBLY (3/8" OR 1/4" HOSE W/ #6 FEM. JIC FITTINGS & T-FITTING)**

-TEE FITTING (ref) PARKER PART# 653T-6-6	QTY 1
-#6 FJIC FITTING (ref) PARKER PART# 10643-66	QTY 2
-3/8" SAE 100R16 HOSE (ref) PARKER PART# 431-6	QTY 16"

#### **4" HOSE ASSEMBLY (3/8" OR 1/4" HOSE W/ #6 FEM. JIC FITTINGS)**

-#6 FJIC FITTING (ref) PARKER PART# 10643-66	QTY 2
-3/8" SAE 100R16 HOSE (ref) PARKER PART# 10643-66	QTY 4"

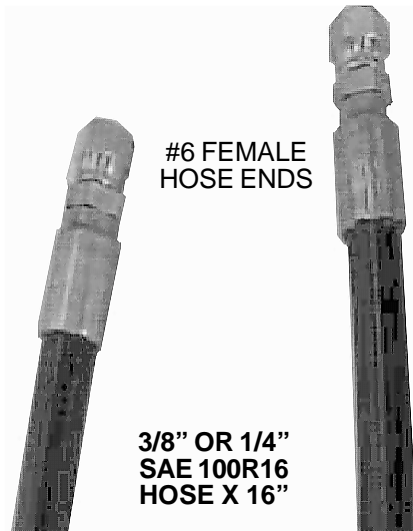
<b>#6 STR-#6 MALE JIC FITTING</b> (ref) PARKER PART# 0503-6-6	QTY 2
---	-------

#6  
MALE  
STRAIGHT  
THREAD#6  
MALE  
JIC#6  
MALE  
STRAIGHT  
THREAD#6  
MALE  
JIC

TEE

#6  
MALE  
JIC

ADAPTER

1/4"  
FEMALE  
PIPE  
THREAD5000 PSI  
LIQUID FILLED  
PRESSURE GAUGE#6 FEMALE  
HOSE ENDS3/8" OR 1/4"  
SAE 100R16  
HOSE X 16"#6 FEMALE  
HOSE END3/8" OR 1/4"  
SAE 100R16  
HOSE X 4"#6 FEMALE  
HOSE END

## TEST PROCEDURE

### A. Position Crane Boom

1. Back the truck up to an immovable object to which the crane hook can be securely fastened. The boom tip must be directly over the immovable object when the crane is rotated to the rear of the truck, with the extension extended one foot.
2. Engage the parking brake and PTO.
3. Properly position all outriggers.
4. Rotate crane so it is pointing directly off the rear of the truck. (Most stable position)
5. Extend extension boom one foot.
6. Check to assure that the boom tip is positioned directly over the immovable object to which the crane hook can be securely attached.
7. Lower the lower boom until the lower boom cylinder is fully retracted and bottoms out.
8. After the boom is bottomed out, hold the "LOWER BOOM DOWN" function for two seconds to make sure cylinder is bottomed out.
9. Disengage PTO and turn off the engine in the truck.
10. Turn the truck ignition back on after the engine is stopped. BE AWARE OF TRAPPED PRESSURE BEHIND THE PLUG IN THIS STEP!! PRESSURIZED OIL MAY CAUSE SERIOUS INJURY!!
11. Trigger the function for the main boom up and down a few times to relieve trapped pressure in cylinder.

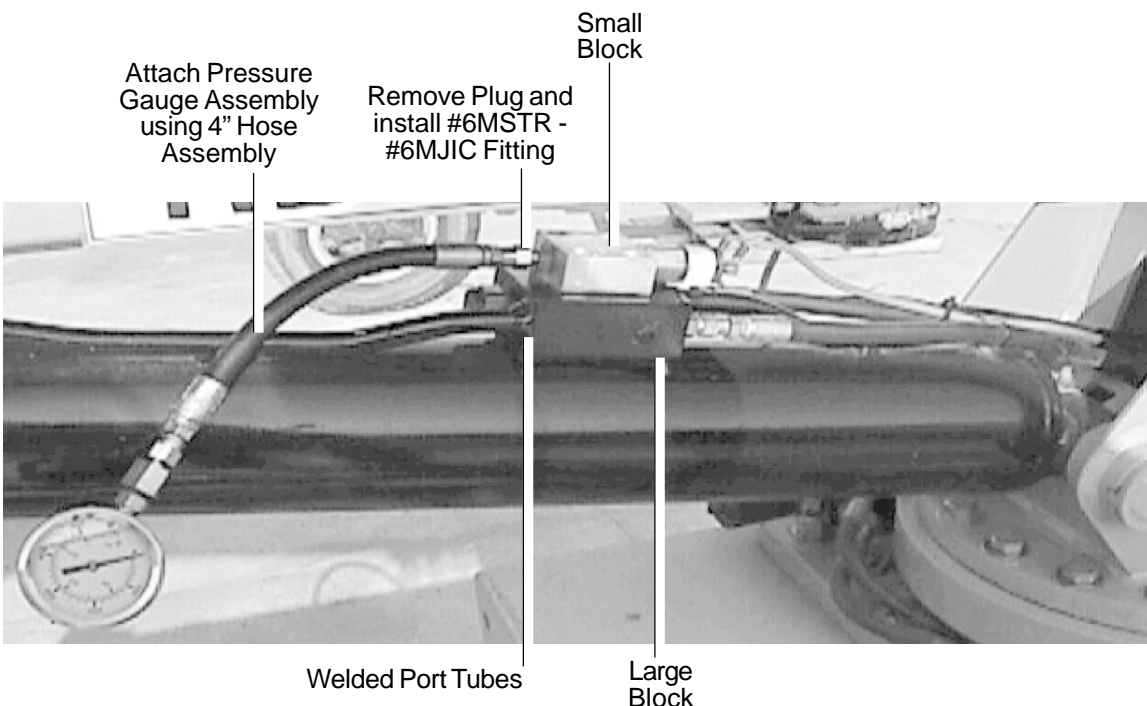
**B. Attach Pressure Gage (Procedure used depends on cylinder block used on crane.)**

-Use Procedure 1 for cranes featuring a large valve block with a smaller block attached and the port tubes welded directly to the valve block and cylinder.

-Use Procedure 2 for cranes with only one valve block and the port tubes are removable by use of fittings on the valve block and on the cylinder.

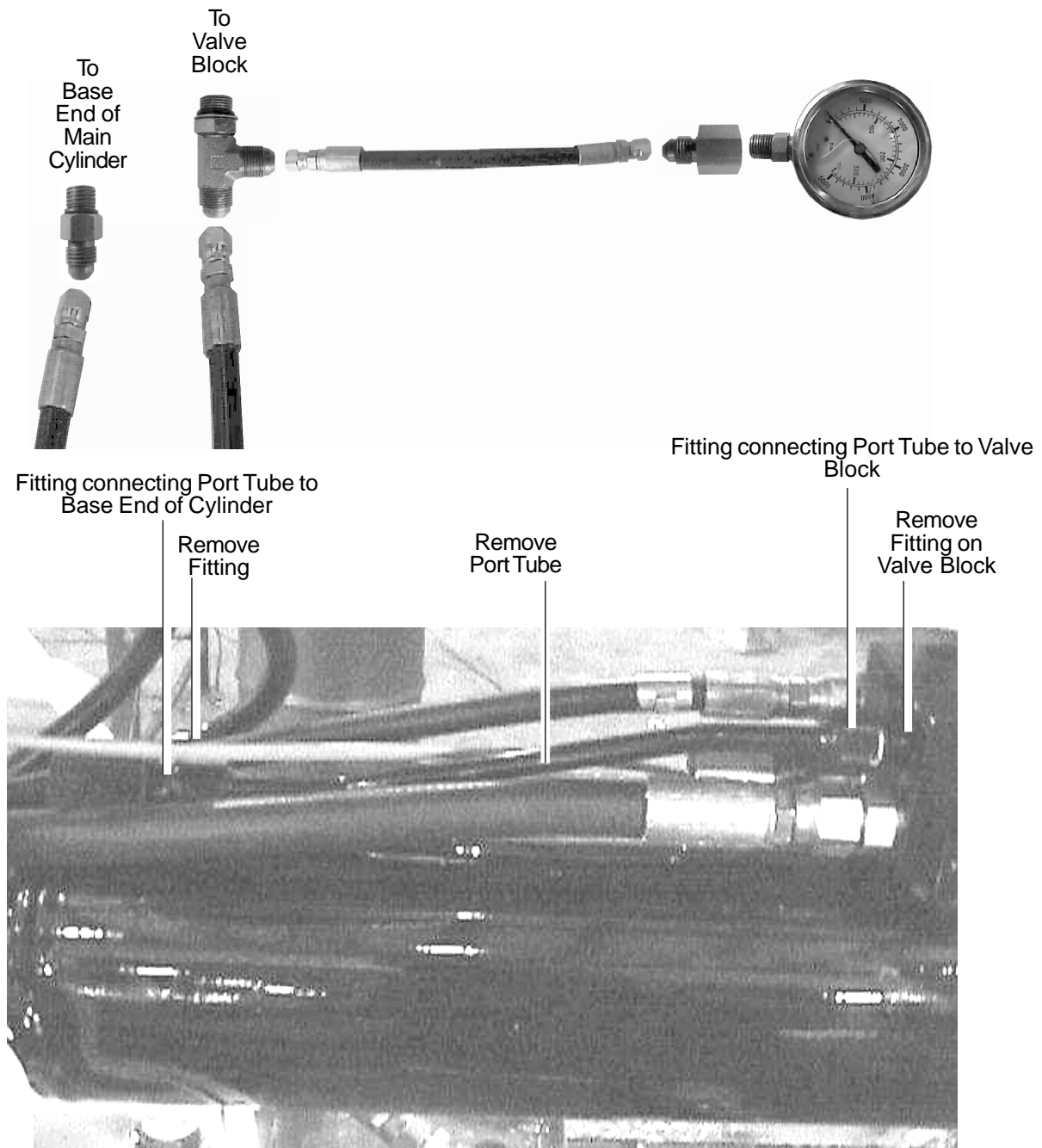
**1. Procedure 1 (Large valve block with smaller block attached – port tubes welded)**

- a. BE AWARE OF TRAPPED PRESSURE BEHIND THE PLUG IN THIS STEP!! PRESSURIZED OIL MAY CAUSE SERIOUS INJURY!! Slowly remove #6 hex plug on the end of the smaller block on the lower boom cylinder.
- b. Install #6 MJIC fitting into the port that the plug was removed from.
- c. Attach 5000 PSI liquid-filled pressure gage assembly using 4" hose assembly.
- d. Be sure to tighten all fittings securely.

**PRESSURE GAGE ASSEMBLY & 4" HOSE ASSEMBLY**

**2. Procedure 2** (Large valve block only – port tubes removable)

- a. Remove bolts that attach the valve block to the cylinder
- b. **BE AWARE OF TRAPPED PRESSURE BEHIND THE PLUG IN THIS STEP!! PRESSURIZED OIL MAY CAUSE SERIOUS INJURY!!** Turn off fitting connecting port tube to base end of cylinder (end closest to crane base).
- c. Turn off fitting connecting port tube to valve block.
- d. Carefully remove port tube that runs from the valve block on the lower boom cylinder to the base end of the lower boom cylinder, being sure not to damage fittings.
- e. Remove fitting from valve block.
- f. Install 16" hose assembly with T-fitting (refer below) between block on lower boom cylinder and base end of lower boom cylinder.
- g. Attach pressure gage assembly to T-fitting using 4" hose assembly (refer to figure below).
- h. Be sure to tighten all fittings securely.

**16" HOSE ASSEMBLY WITH T-FITTING & 4" HOSE ASSEMBLY**

**C. Test System**

1. Start truck engine.
2. Raise boom up until boom cylinder is fully extended, then lower boom until cylinder is fully retracted to remove air that may have been introduced while installing the gage.
3. Raise boom to 15 degrees above horizontal and securely fasten crane hook to immovable object using a double line attachment.
4. Use the winch up function to take slack out of cable.
5. Refer to TABLE 1 for maximum pressure at which ELLS system should shut down appropriate functions for the particular crane model being tested.
6. While monitoring the pressure gage, use the winch up function to slowly apply down force on end of boom. If the pressure on the gage exceeds the maximum pressure for that particular crane and the ELLS has not shut down the appropriate functions, the ELLS is not working. Do not go any higher.
7. If the system is operating properly, the function should stop working before the gage reaches maximum pressure.
8. While the pressure gage still reads the pressure at which the ELLS shut down the appropriate functions, test the other functions that should be shut down by the ELLS (TABLE 1).
9. If the appropriate functions are not operational, the ELLS system is working
10. If any of the functions in Table 1 are still operational, the ELLS system is not working.
11. Refer to the TROUBLE SHOOTING PROCEDURE (page 6) for instructions to determine the problem with the ELLS.

**TABLE 1**

IMT CRANE MODEL	FUNCTIONS SHUT DOWN BY ELLS			MAX. TEST GAGE PRESSURE ALLOWED
	WINCH UP	EXTENSION OUT	LOWER DOWN	
1014	X	X	X*	2600
1014A	X	X	X	3000
2015	X	X	X*	3000
2020	X	X	X	3000
3016	X	X	X	3000
3020	X	X	X	3300
3816	X	X	X	3500
5016	X	X	X	3500
5020	X	X	X	3500
6016	X	X	X	3500
6020	X	X	X	3500
7020	X	X	X	3200
7025	X	X	X	3200
315A	X	X	N/A*	3200

\* NOTE: Cranes before July 1996 do not have "LOWER BOOM DOWN" function tied into the Excessive Load Limit System.

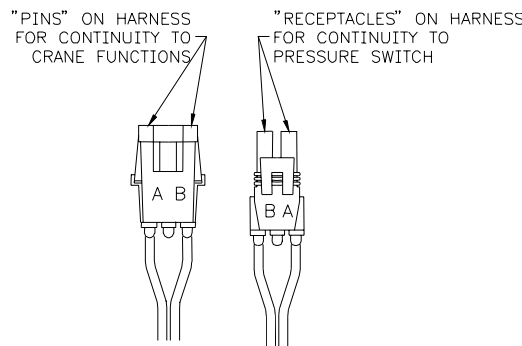
## ELLS TROUBLESHOOTING PROCEDURE

Each function (winch up, winch down, extension in, etc.) is actuated by a solenoid that shifts the valve spool to perform the particular function. The solenoids are located on the valve bank. Each solenoid has two wires protruding with a connector on the end that is plugged into a connector on the wire harness for the crane. There are two wires, one wire is black (ground) and the other wire is colored. The “ground receptacle” is the receptacle that the black wire connects to.

### A. Find which solenoid actuates which function

-When a solenoid is actuated, it becomes magnetic. By using a piece of steel to find which solenoid is magnetic, (steel ruler, paper clip, etc.) the solenoids can be matched with which function it controls. It will not be a real strong magnetic pull, but will be detectable with a small piece of metal.

1. Be sure the truck ignition is on, the parking brake is engaged, and power is “on” to the crane. The PTO does not need to be engaged.
2. Activate “LOWER UP” on the remote control handle and use the piece of steel to find which solenoid is magnetic (being actuated).
3. When the correct solenoid is found, unplug the connector protruding from the solenoid.
4. Activate “WINCH UP” on the remote control handle and use the piece of steel to find which solenoid is magnetic (being actuated).
5. When the correct solenoid is found, unplug the connector protruding from the solenoid.
6. Unplug the connector protruding from the pressure switch (Some models may have wire terminals instead of a connection. Detach the wires from the pressure switch.)



7. Using a multi-meter, check continuity (setting on multi-meter that “beeps” if two wires are connected) between the ground receptacle on the connector that plugs into the connector on the “LOWER UP” solenoid and the ground receptacle on the connector that plugs into the connector on the “WINCH UP” solenoid. They should not be continuous. If they are, the harness is the problem, which needs to be either repaired or replaced.
8. Reconnect the pressure switch.
9. Repeat steps 4-8 for each of the functions shut down by the ELLS. Instead of using “WINCH UP”, use the appropriate function and find the controlling solenoid and check for continuity with ground receptacle on the connector that plugs into the connector on the “LOWER UP” solenoid.
10. Activate “WINCH UP” on the remote control handle and use the piece of steel to find which solenoid is magnetic (being actuated).
11. When the correct solenoid is found, unplug the connector protruding from the solenoid.
12. Unplug the connector protruding from the pressure switch (Some models may have wire terminals instead of a connection. In this case, detach the wires and use the ground wire that attaches to the pressure switch for the next step.)
13. Using a multi-meter, check continuity between the ground receptacle on the connector that plugs into connector on the pressure switch and the ground receptacle on the connector that plugs into the connector on the “WINCH UP” solenoid. They should be continuous. If they are not, there is a problem with the harness, which either needs to be repaired or replaced.
14. Reconnect the pressure switch.
15. Repeat steps 10-14 for each of the functions shut down by the ELLS. Instead of using “WINCH UP”, use the appropriate function and find the corresponding solenoid. Each one should be continuous with the ground receptacle on the connector that plugs into the connector on the pressure switch.
16. If there is no problem found with the harness, the pressure switch is the problem and it will need to be replaced.



## SECTION 3. 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: 641-923-3711  
Technical Support Fax: 641-923-2424

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

**SERIAL NUMBER PLACARD**

### CYLINDER IDENTIFICATION

To insure that the proper cylinder replacement parts are received, it is necessary to specify the complete number/letter sequence for any part requested. Part numbers must be verified by checking the number stamped on the cylinder case (See figure below) against the information included in the service manual. You must include the part number stamped on the cylinder case when ordering parts.

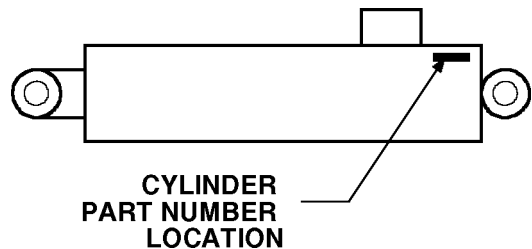
### WELDMENT IDENTIFICATION

Each of the major weldments, base, mast, lower boom, extension boom, and outriggers, have a part number stamped on them. Any time one of the weldments is to be replaced, it is necessary to specify the complete part number as stamped on that weldment. The location of the part numbers are shown Section 2.

### ORDERING REPAIR PARTS

When ordering replacement parts it is important to follow the steps as outlined below.

1. Give the model number of the unit.
2. Give the serial number of the unit.
3. Specify the complete part number. When ordering cylinder parts, or one of the main weldments, always give the stamped part number.
4. Give a complete description of the part.
5. Specify the quantity required.



**CYLINDER PART NUMBER LOCATION**

**BASE ASM (41704562)**

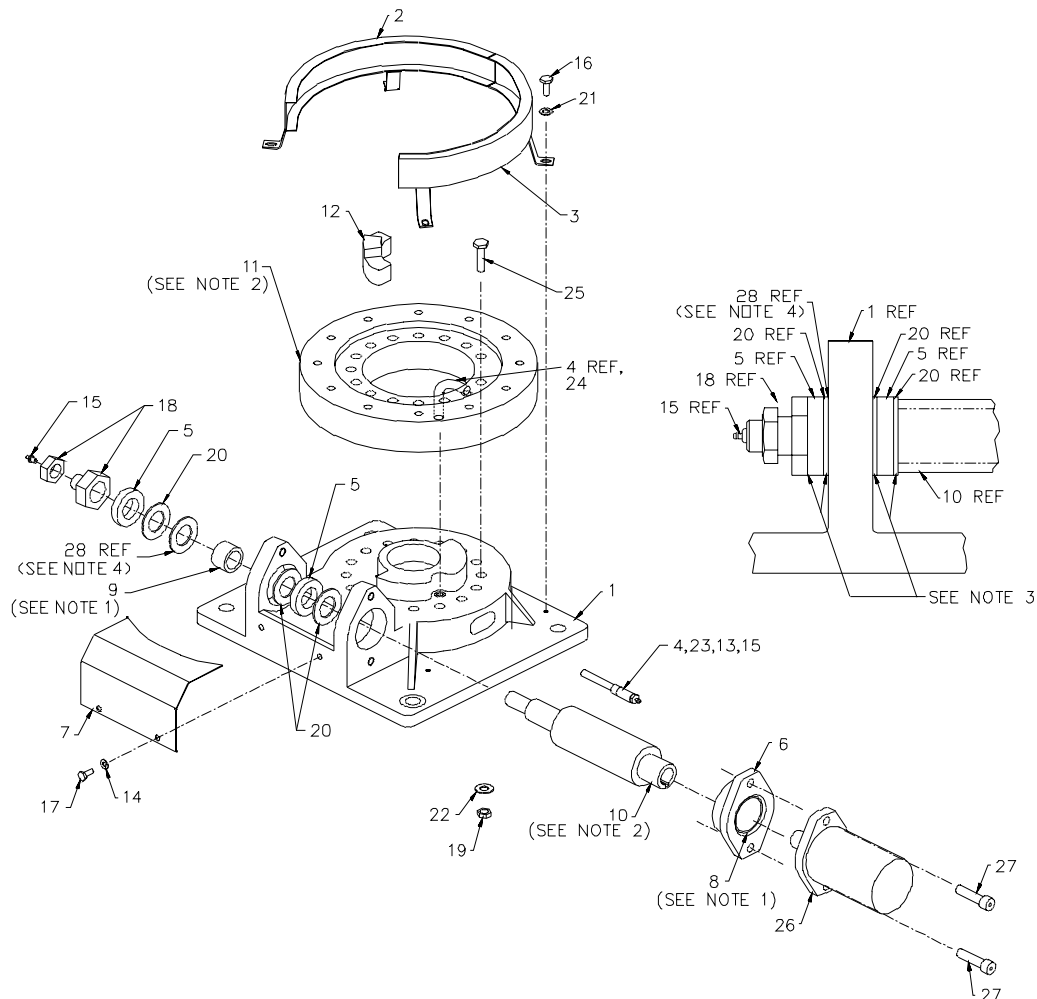
ITEM	PART NO.	DESCRIPTION	QTY
1.	51704564	BASE	1
2.	52713752	TURNTABLE GUARD-RH	1
3.	52713753	TURNTABLE GUARD-LH	1
4.	60030086	TUBING 1/4 X 6	1
5.	60030116	THRUST BEARING	2
6.	60107543	SUPPORT PLATE	1
7.	60107617	COVER	1
8.	70055147	BEARING	1
9.	70055148	BEARING	1
10.	70056307	WORM GEAR	1
11.	71056308	TURNTABLE BEARING	1
12.	71142535	SLIDE 400°	1
13.	72053301	COUPLING 1/8NPT	1
14.	72063050	WASHER 5/16 LOCK	2
15.	72053508	ZERK 1/8NPT	2
16.	72060000	CAP SCR 1/4-20X1/2 HHGR5	4
17.	72060023	CAP SCR 5/16-18X3/4 HHGR5	2
18.	72062251	NUT 7/8-9 LOCK 2-PC GR8	1
19.	72062162	NUT 9/16-12 HEX GR8	15
20.	72063161	WASHER 1-1/8 FLAT	3
21.	72063049	WASHER 1/4 LOCK	4
22.	72063117	WASHER 9/16 FLAT HARD GR8	15
23.	72531731	ADAPTER 1/8POLY-FLO 1/4	1
24.	72531746	ELBOW 1/8MPT 1/4POLYFLO 90°	1
25.	72601313	CAP SCR 9/16-12X3-1/2 HHGR8	15
26.	73051482	MOTOR	1
27.	72601486	CAP SCR 1/2-13X1-3/4 SH	2
28.	60121433	SHIM 2.25X1.81X16GA	REF

**WARNING**

ANY TIME THE GEAR-BEARING BOLTS HAVE BEEN REMOVED, THEY MUST BE REPLACED WITH NEW BOLTS OF IDENTICAL GRADE AND SIZE. FAILURE TO REPLACE GEAR-BEARING BOLTS MAY RESULT IN BOLT FAILURE DUE TO METAL FATIGUE CAUSING SERIOUS INJURY OR DEATH.

**NOTES**

1. BEARINGS MUST BE PACKED WITH GREASE AT ASSEMBLY.
2. APPLY "MOLUB-ALLOY 936" TO TURNTABLE BEARING AND WORM GEAR TEETH AT ASSEMBLY.
3. INITIAL LUBRICATION OF BOTH SIDES OF THRUST BEARING IS REQUIRED AT TIME OF INSTALLATION. SEE NOTE 4 FOR APPROVED LUBRICANTS.
4. APPROVED LUBRICANTS ARE "SLIP PLATE", "LUBRI-PLATE" OR OTHER LUBRICANTS CONTAINING GRAPHITE OR  $MSO_2$ .
5. SHIM AS REQUIRED IF NEEDED.

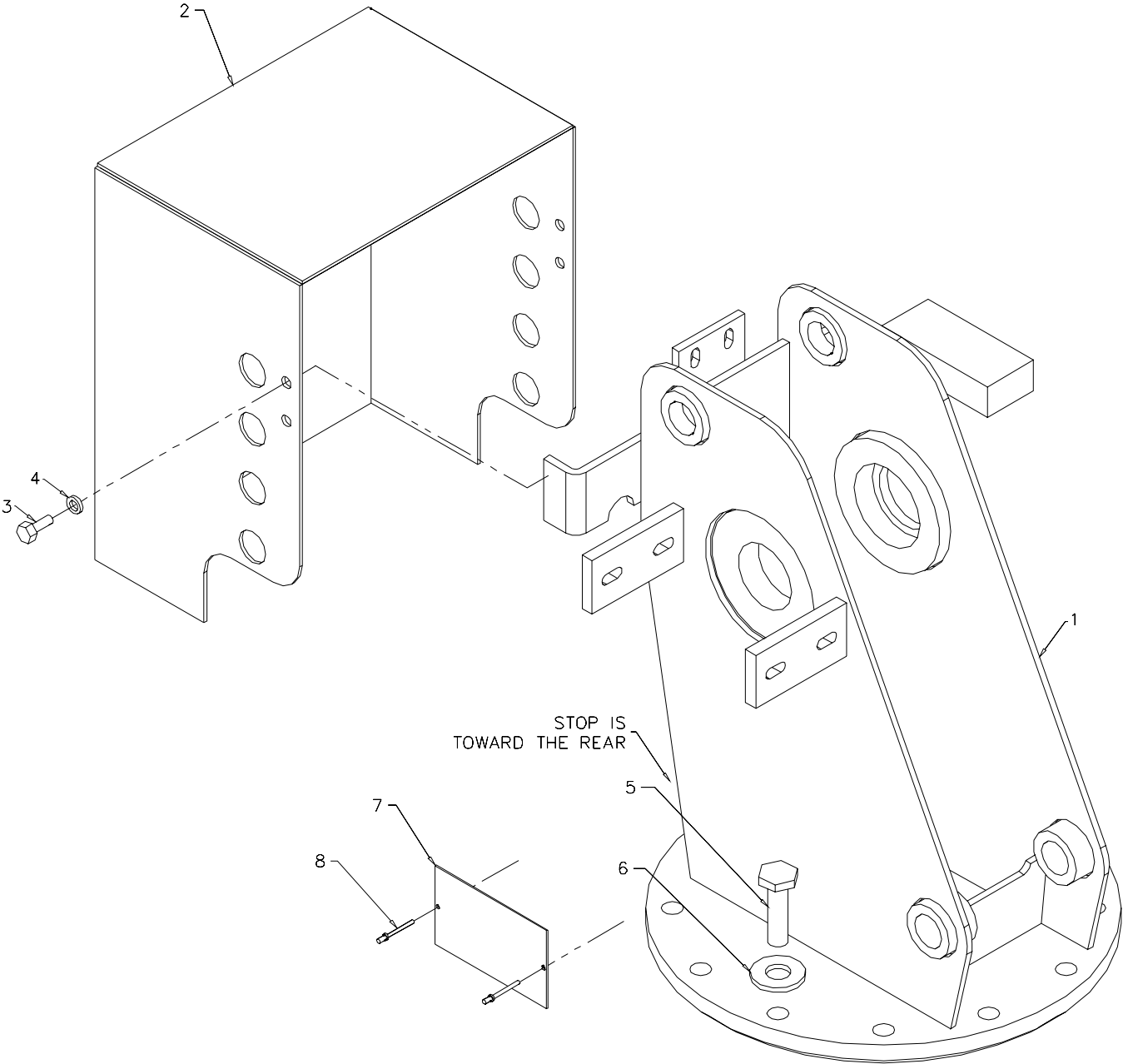


MAST ASM (41714276)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52714278	MAST	1
2.	60120189	COVER	1
3.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
4.	72063049	WASHER 1/4 LOCK	4
5.	72601144	CAP SCR 9/16-12X2 HHGR8	12
6.	72063117	WASHER 9/16 HARD FLAT	12
7.	70029119	PLACARD-SERIAL NUMBER	1
8.	72066340	POP RIVET 1/8X3/8GRIP	2

**WARNING**

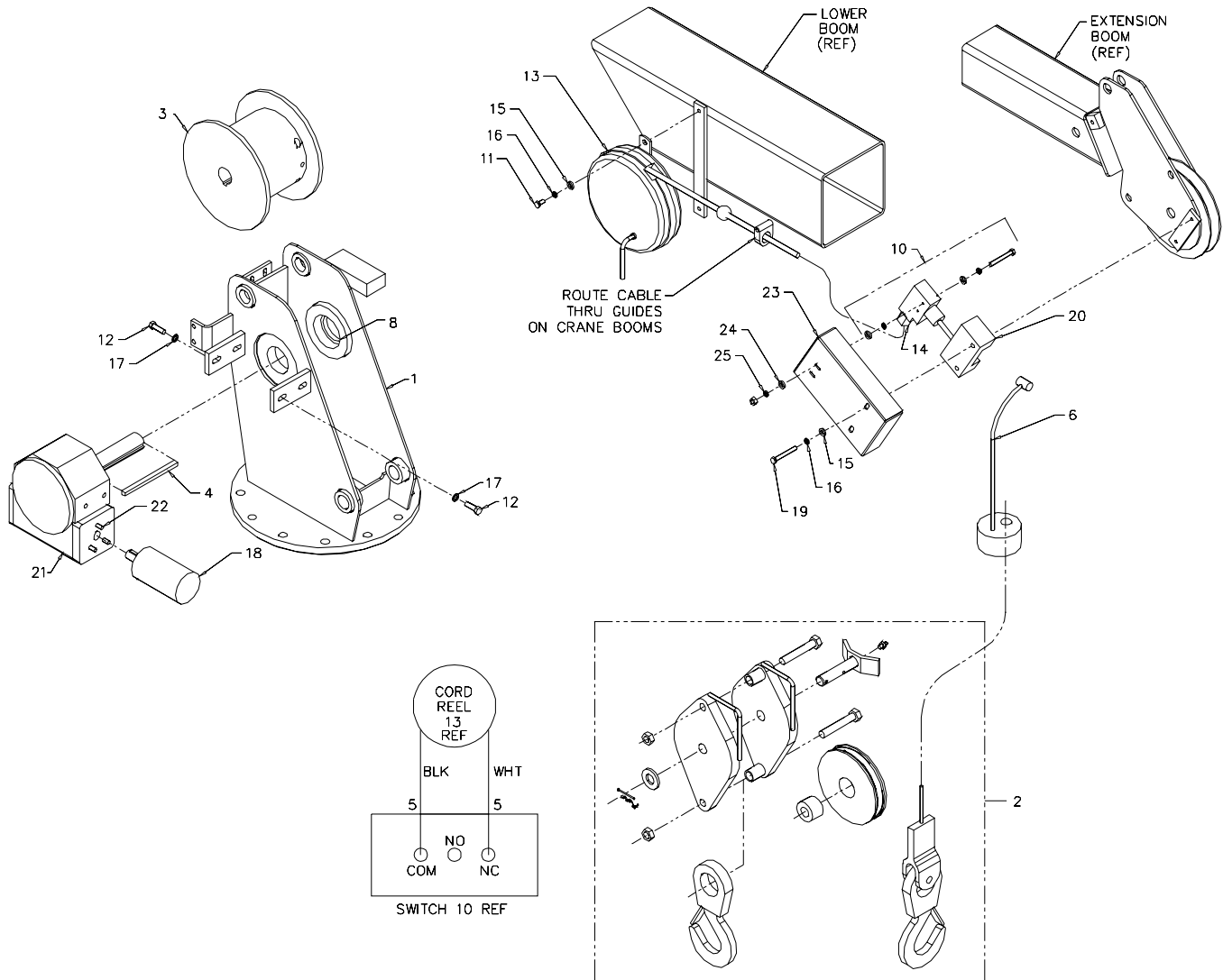
ANY TIME THE GEAR-BEARING BOLTS HAVE BEEN REMOVED, THEY MUST BE REPLACED WITH NEW BOLTS OF IDENTICAL GRADE AND SIZE. FAILURE TO REPLACE GEAR-BEARING BOLTS MAY RESULT IN BOLT FAILURE DUE TO METAL FATIGUE CAUSING SERIOUS INJURY OR DEATH.



**WINCH/CABLE/HOOK KIT (41714331)**

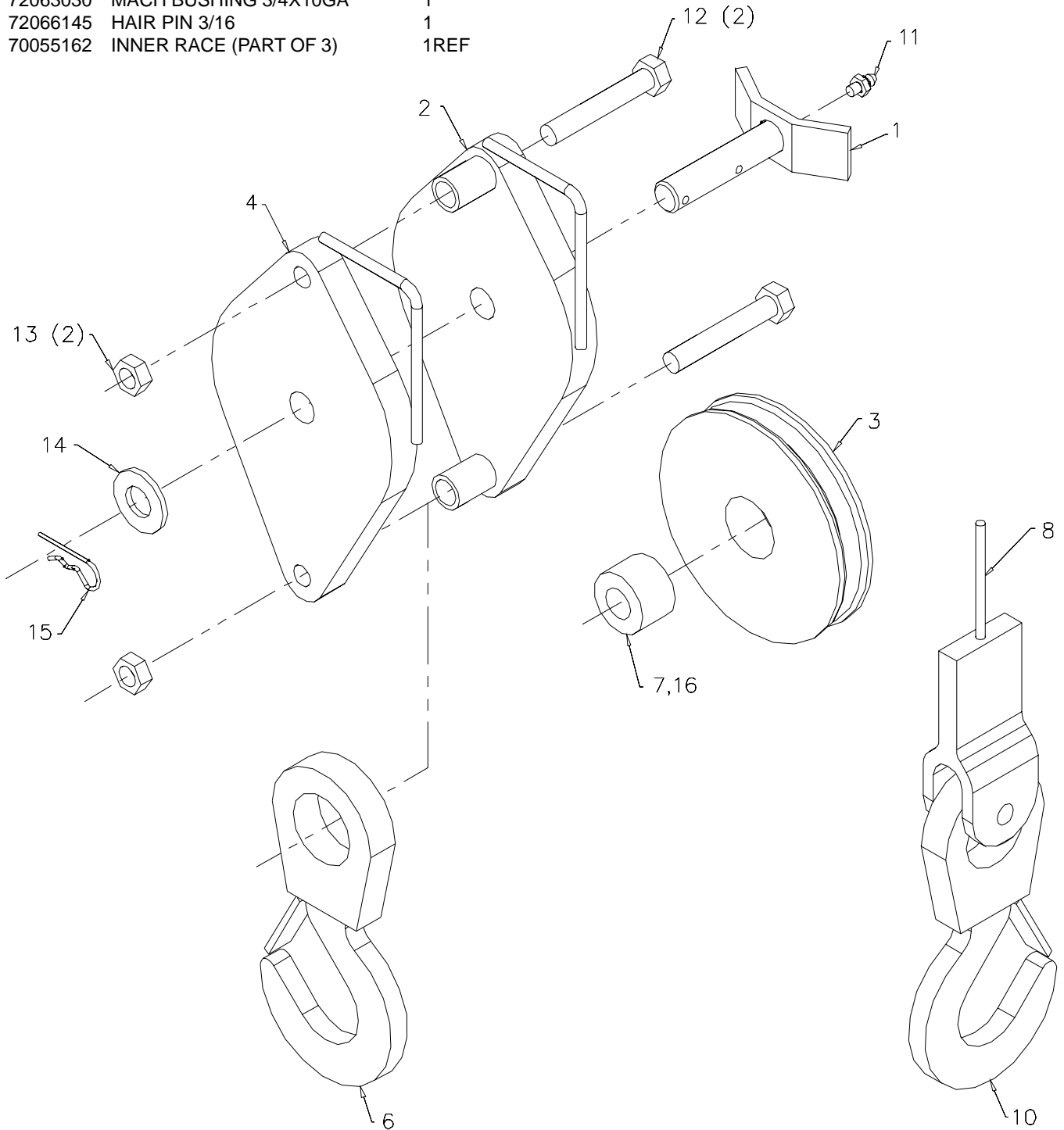
ITEM	PART NO.	DESCRIPTION	QTY
1.		MAST	1REF
2.	31710164	CABLE & HOOK KIT (SEE DWG)	1
3.	60025203	WINCH DRUM	1
4.	60107226	KEY (PART OF 21)	1REF
5.	77040051	TERMINAL #8 SPRSPD 16-14GA	2
6.	52709413	CABLE WELDMENT	1
8.	70055142	BEARING	1
10.	77041291	SWITCH	1
11.	72060001	CAP SCR 1/4-20X5/8 HHGR5	2
12.	72060025	CAP SCR 5/16-18X1 HHGR5	4
13.	51713168	CORD REEL ASM	1

14.	77044468	STRAIN RELIEF 1/2	1
15.	72063001	WASHER 1/4 WRT	4
16.	72063049	WASHER 1/4 LOCK	4
17.	72063050	WASHER 5/16 LOCK	4
18.	73051398	MOTOR	1
19.	72060008	CAP SCR 1/4-20X2 HHGR5	2
20.	60113594	COVER MTG BLOCK	1
21.	70057663	SPEED REDUCER	1
22.	72060694	CAP SCR 1/4-28X3/4 SH	3
23.	60113593	COVER	1
24.	72063098	WASHER .16 FLAT	2
24.	72063047	WASHER #10 LOCK	2



**CABLE & HOOK KIT (31710164)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52704828	PIN	1
2.	52704254	SNATCH BLOCK	1
3.	60030061	SHEAVE (INCL:7,16)	1
4.	52709411	SIDE PLATE	1
5.	72060569	SET SCR 5/16-18X3/8SH (DRUM)	1
6.	71073921	HOOK 2-TON	1
7.	70055163	ROLLER BEARING (PART OF 3)	1REF
8.	70580059	WIRE ROPE ASM 7/32" X 65'	1
10.	71732760	SWIVEL HOOK 1-1/2 TON	1
11.	72053508	ZERK 1/8NPT	1
12.	72060097	CAP SCR 1/2-13X3 HHGR5	2
13.	72062080	NUT 1/2-13 LOCK	2
14.	72063030	MACH BUSHING 3/4X10GA	1
15.	72066145	HAIR PIN 3/16	1
16.	70055162	INNER RACE (PART OF 3)	1REF

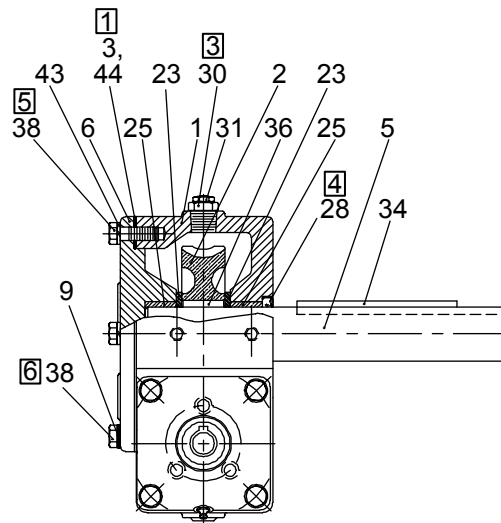
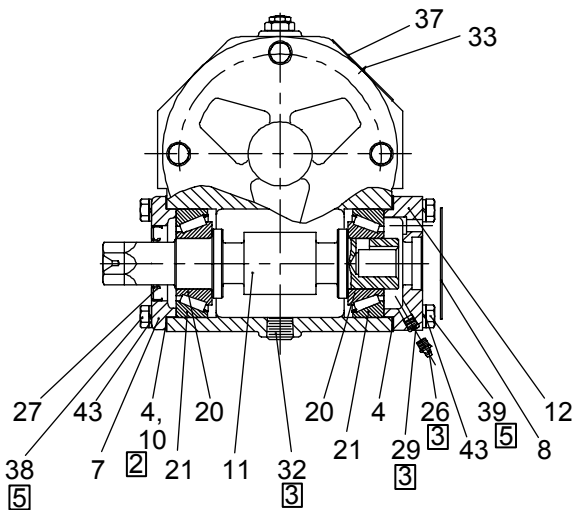


**SPEED REDUCER (70057663)**

ITEM	PART NO.	DESCRIPTION	QTY
	PART #	DESCRIPTION	QTY
1.	70143637	HOUSING	1
2.	70056425	GEAR, WORM	1
3.	76393144	GASKET, COVER (.015")	2
4.	76392896	GASKET, BRG. RET. (.015")	3
5.	70143633	SHAFT, OUTPUT	1
6.	70143636	COVER	1
7.	70145156	RETAINER, BEARING	1
		(WAS 70143634 BEFORE 11-94)	
9.	76393142	WASHER, 5/16 SEALING	2
10.	76393143	GASKET, BRG. RET. (.031")	1
11.	70056511	WORM	1
		(WAS 70056424 BEFORE 11-94)	
12.	70145157	ADAPTER, MOTOR	12
		(WAS 70143635 BEFORE 11-94)	
20.	70055192	BEARING, CONE	2

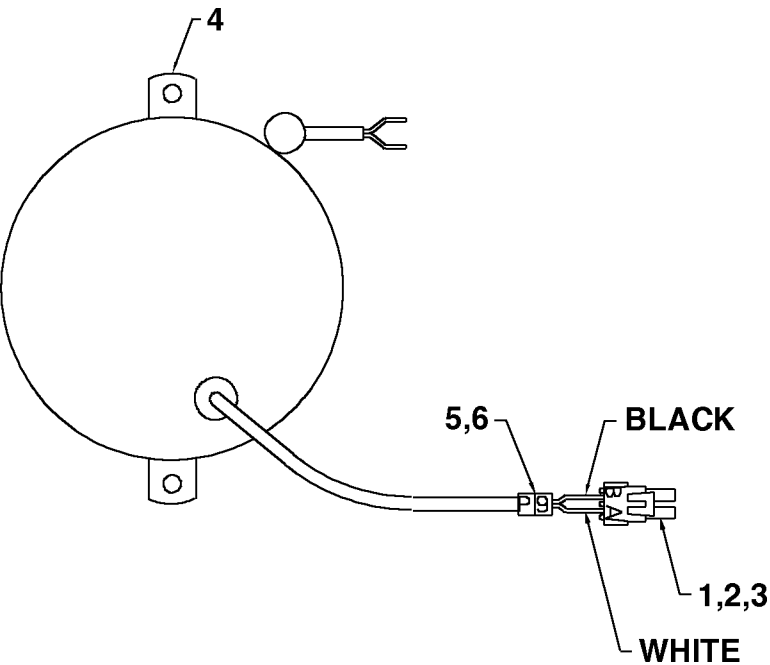
**NOTES (SEE REFERENCE NUMBER IN BOX):**

- 1) USE GASKETS TO OBTAIN .005/.015 END PLAY ON OUTPUT SHAFT.
- 2) USE GASKETS TO OBTAIN .000/.004 END PLAY ON WORM SHAFT.
- 3) INSTALL REDUCER (#30), PIPE PLUG (#32), AND SHIPPING PLUG (#29) WITH PIPE SEALANT WITH TEFLON. SHIP ZERK (#26) LOOSE.
- 4) INSTALL SEALS (#27 AND #28) WITH LOCTITE 609 ON O.D. LUBRICATE SEAL SURFACE BEFORE ASSEMBLY.
- 5) INSTALL BOLTS USING LOCTITE 242. TORQUE TO 18-21 FT-LB.
- 6) CAUTION - USED FOR OIL LEVEL. DO NOT USE LOCTITE. DO NOT OVERTIGHTEN.



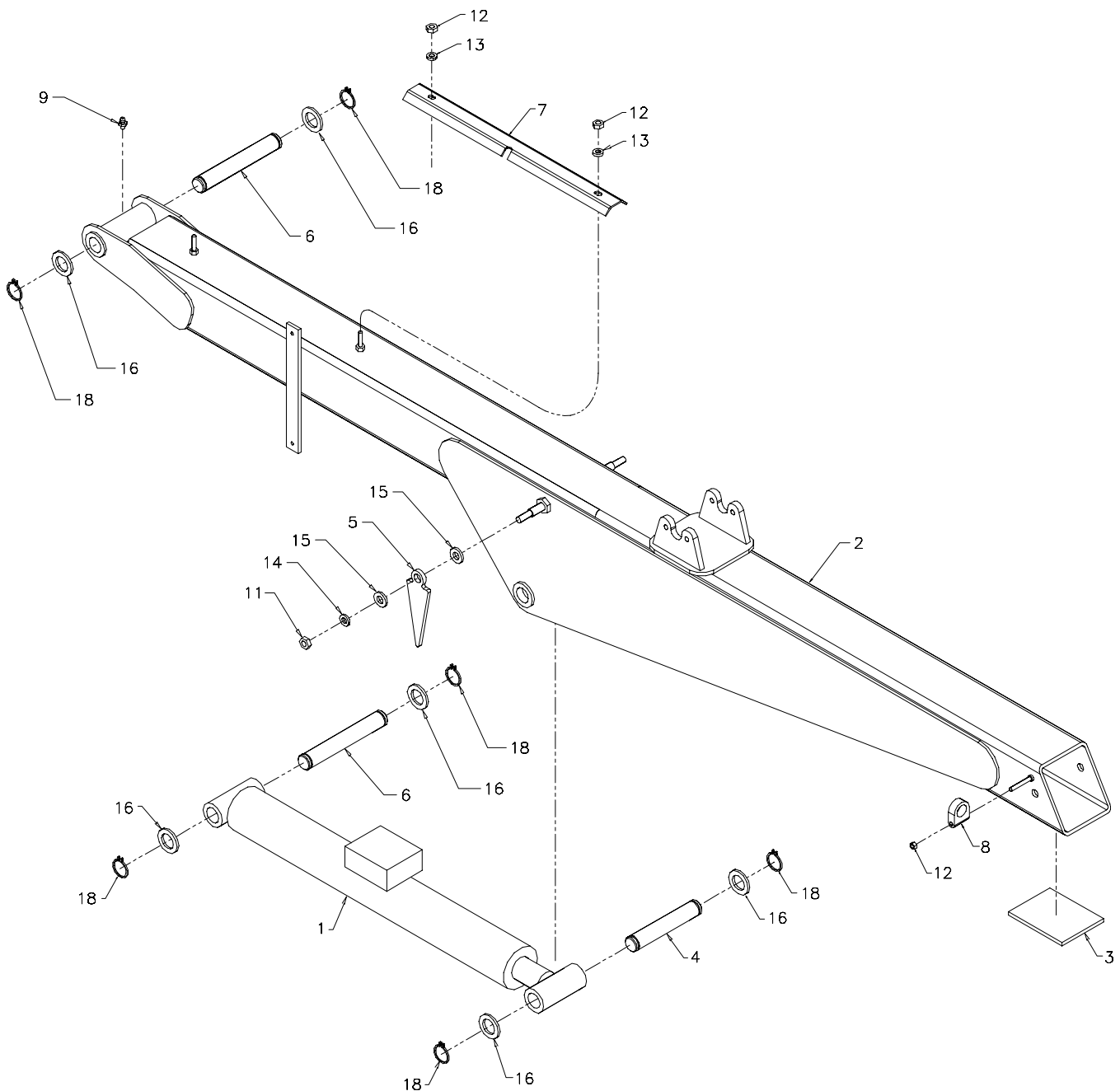
**CORD REEL ASM (51713168)**

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



**LOWER BOOM ASM (41714699)**

1.	3B111980	LOWER CYLINDER	1
2.	52704944	LOWER BOOM	1
3.	60030097	WEAR PAD	1
4.	60101906	PIN	1
5.	60105544	INDICATOR	2
6.	60106065	PIN	2
7.	60121167	HOSE GUARD	1
8.	70034381	SUPPORT	1
9.	72053508	ZERK 1/8NPT	1
11.	72062103	NUT 3/8-16 LOCK	2
12.	72062104	NUT 1/4-20 LOCK	3
13.	72063001	WASHER 1/4 WRT	2
14.	72063003	WASHER 3/8 WRT	2
15.	72063005	WASHER 1/2 WRT	4
16.	72063034	MACH BUSHING 1X10GA NR	6
18.	72066125	RETAING RING 1 EXT HD	6





**LOWER BOOM CYL (3B111980)**

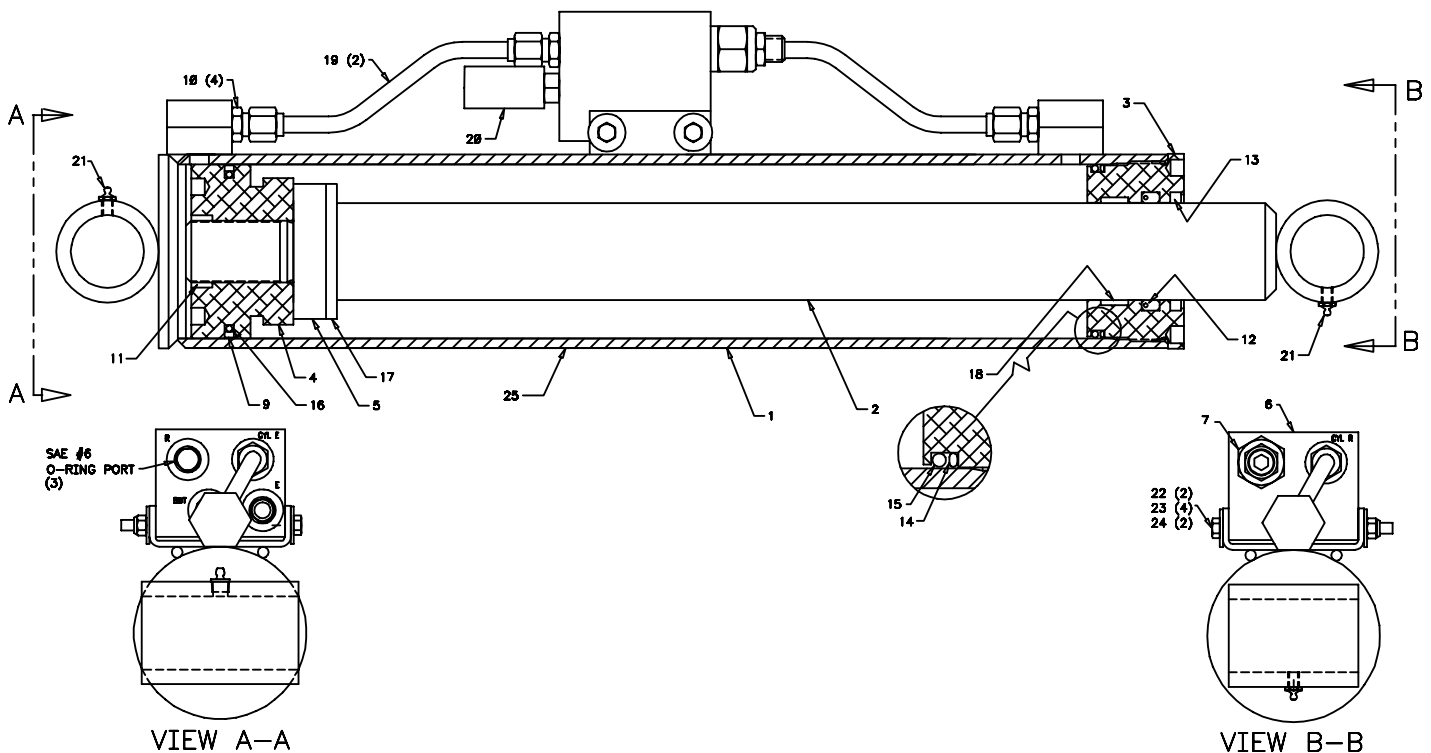
1.	4B111980	CASE ASM (INCL:21,PART OF 25)	1REF
2.	4G104820	ROD (INCL:21,PART OF 25)	1REF
3.	6H025015	HEAD (PART OF 25)	1REF
4.	6I025087	PISTON (PART OF 25)	1REF
5.	6C075015	STOP TUBE (PART OF 25)	1REF
6.	73540057	C'BAL VALVE (INCL:7&20)	1
7.	73540052	C'BAL VALVE (PART OF 6)	1REF
	73540039	C'BAL VALVE BEFORE 2-15-00	1REF
8.	9B101214	SEAL KIT (INCL:9,11-18)	1REF
9.	7T66P025	PISTON SEAL (PART OF 8)	1REF
10.	72533186	ADAPTER #6MFACE #6MSTR	4
11.	7T61N087	LOCK RING SEAL (PART OF 8)	1REF
12.	7R546015	ROD SEAL (PART OF 8)	1REF
13.	7R14P015	ROD WIPER (PART OF 8)	1REF
14.	7Q10P228	O-RING (PART OF 8)	1REF
15.	7Q072228	O-RING (PART OF 8)	1REF
16.	7Q072137	O-RING (PART OF 8)	1REF
17.	6A025015	WAFFER LOCK (PART OF 8)	1REF
18.	7T2N8015	WEAR RING (PART OF 8)	1REF
19.	70145752	TUBE ASM	2
20.	77041552	PR SWITCH (PART OF 6)	1REF
21.	72053507	ZERK 1/8NPT (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.	3B111980A	CYLINDER (INCL:1-6,8)	1

**NOTE**

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

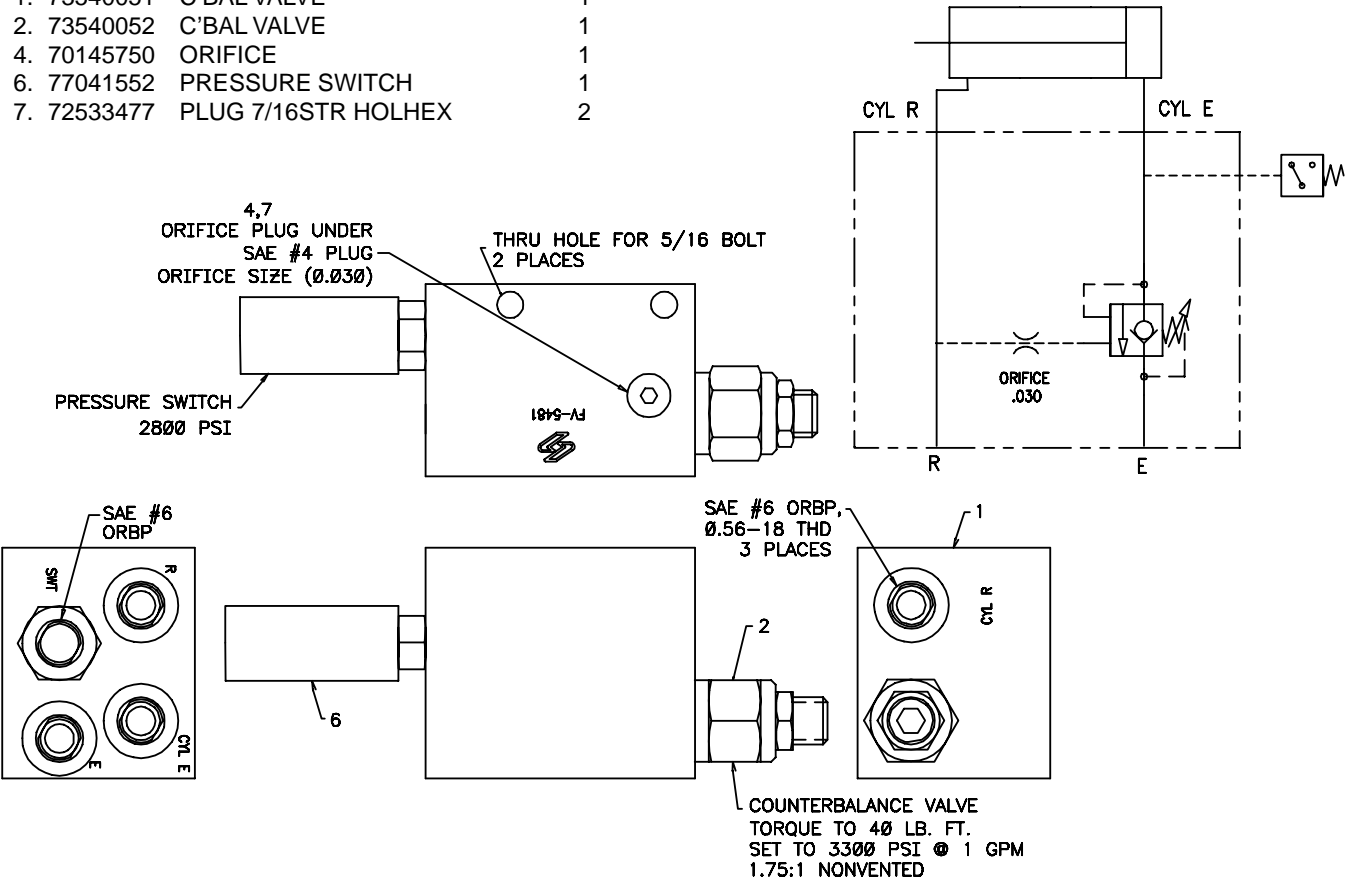
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER. KEEP AWAY FROM ALL SEALS.



COUNTERBALANCE VALVE ASM  
(73540057)

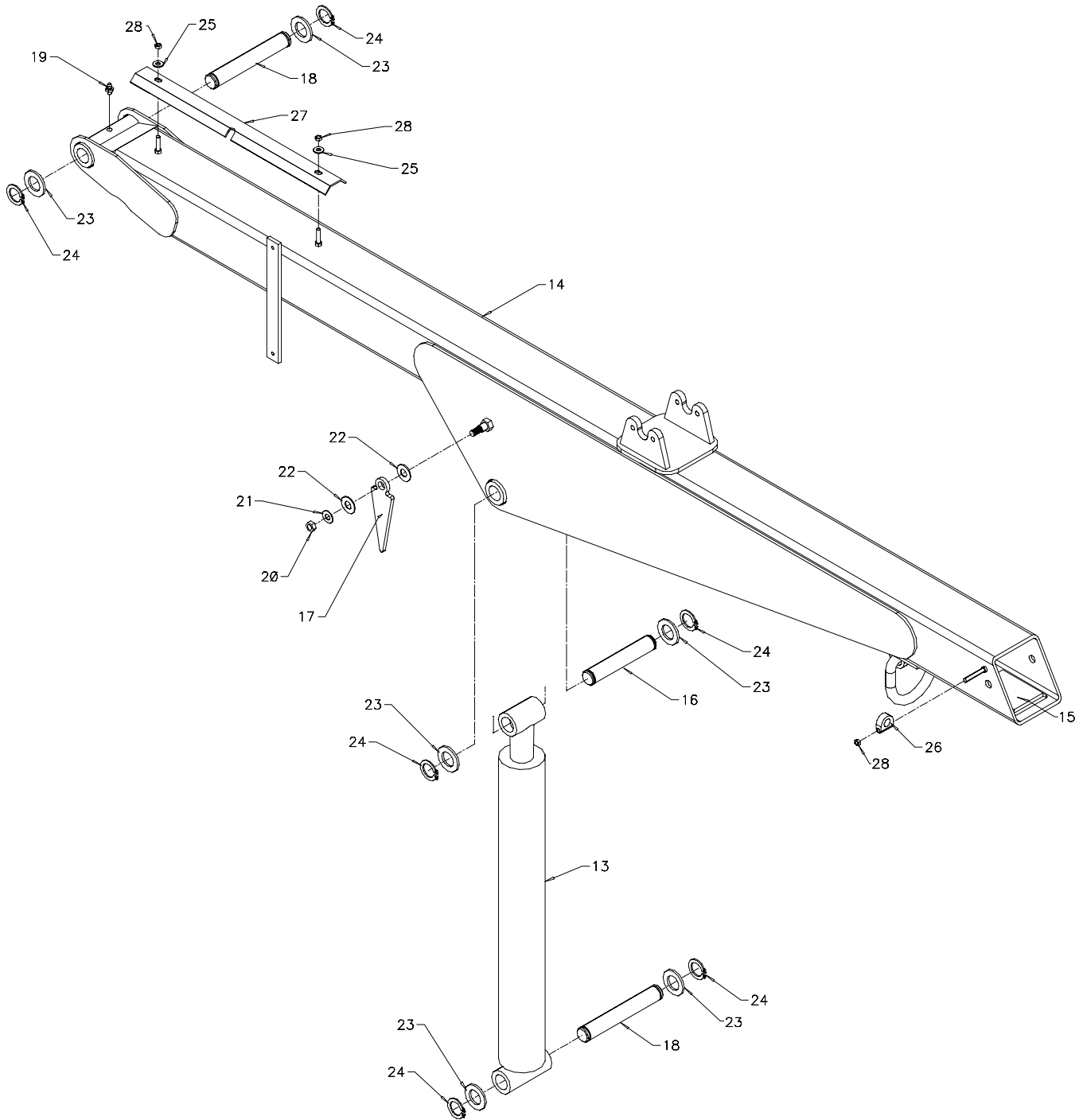
- |    |          |                     |   |
|----|----------|---------------------|---|
| 1. | 73540051 | C'BAL VALVE         | 1 |
| 2. | 73540052 | C'BAL VALVE         | 1 |
| 4. | 70145750 | ORIFICE             | 1 |
| 6. | 77041552 | PRESSURE SWITCH     | 1 |
| 7. | 72533477 | PLUG 7/16STR HOLHEX | 2 |



**LOWER BOOM ASM-W/D-RING (41715072)**

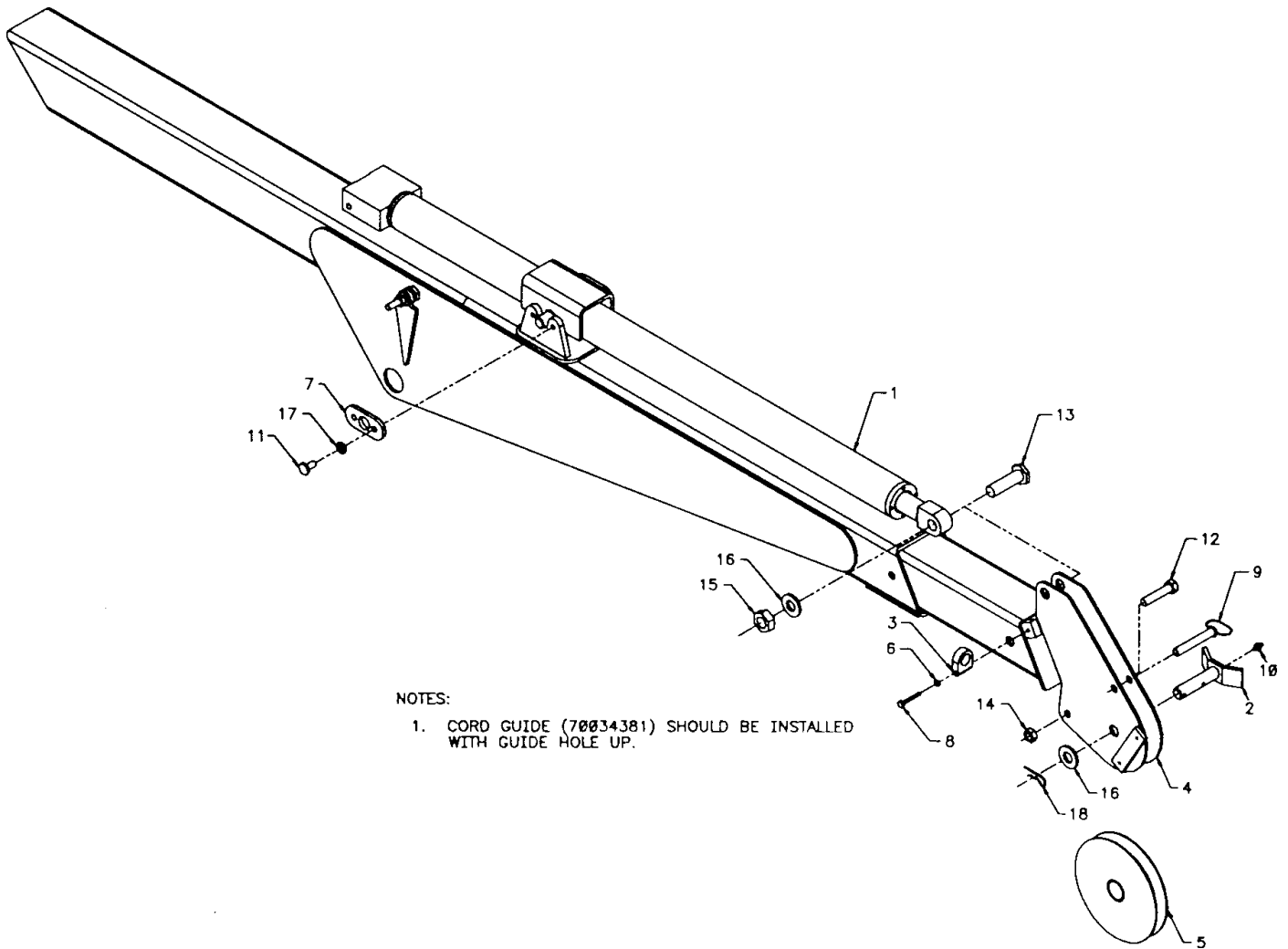
13.	3B111980	LOWER CYLINDER	1
14.	52714049	LOWER BOOM	1
15.	60030097	WEAR PAD	1
16.	60101906	PIN	1
17.	60105544	INDICATOR	2
18.	60106065	PIN	2
19.	72053508	ZERK 1/8NPT	1

20.	72062103	NUT 3/8-16 LOCK	2
21.	72063003	WASHER 3/8 WRT	2
22.	72063005	WASHER 1/2 WRT	4
23.	72063034	MACH BUSHING 1X10GA NR	6
24.	72066125	RETAING RING 1 EXT HD	6
25.	72063001	WASHER 1/4 WRT	2
26.	70034381	SUPPORT	1
27.	60121167	HOSE GUARD	1
28.	72063049	WASHER 1/4 LOCK	1



**EXT BOOM ASM-HYD 10' (41714446)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B311970	EXTENSION CYLINDER	1
2.	52704255	PIN	1
3.	70034381	SUPPORT	1
4.	52704947	EXTENSION BOOM	1
5.	60030061	SHEAVE WITH BEARING	1
6.	72063049	WASHER 1/4 LOCK	1
7.	60107922	LOCKPLATE	2
8.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	1
9.	71731462	QUICK RELEASE PIN 1/2X1-1/2	1
10.	72053508	ZERK 1/8NPT	1
11.	72060044	CAP SCR 3/8-16X3/4 HHGR5	4
12.	72601368	CAP SCR 1/2-13X2-1/4 HHGR8	1
13.	72060186	CAP SCR 3/4-10X2-1/2 HHGR5	1
14.	72062080	NUT 1/2-13 LOCK	1
15.	72062114	NUT 3/4-10 LOCK	1
16.	72063030	MACH BUSHING 3/4X10GA NR	2
17.	72063051	WASHER 3/8 LOCK	4
18.	72066145	HAIR PIN 3/16	1



**EXTENSION CYL (3B311970)**

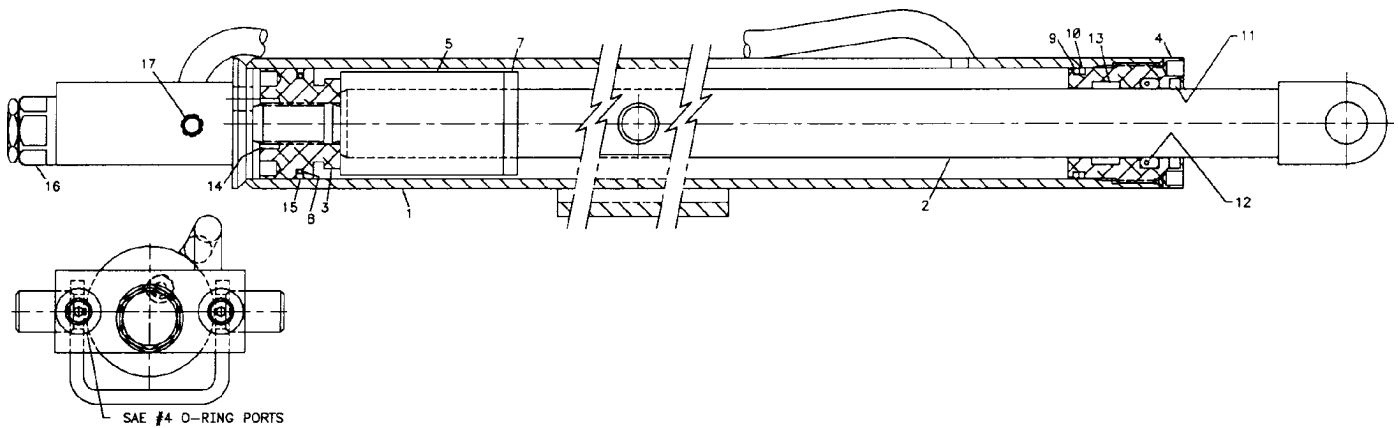
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B311970	CASE ASM (INCL:17)	1
2.	4G108830	ROD	1
3.	6I020075	PISTON	1
4.	6H020012	HEAD	1
5.	6C300012	STOP TUBE	1
6.	9B081012	SEAL KIT (INCL:7-15)	1
7.	6A025012	WAFFER LOCK (PART OF 6)	1REF
8.	7Q072129	O-RING (PART OF 6)	1REF
9.	7Q072224	O-RING (PART OF 6)	1REF
10.	7Q10P224	O-RING (PART OF 6)	1REF
11.	7R14P012	ROD WIPER (PART OF 6)	1REF
12.	7R546012	ROD SEAL (PART OF 6)	1REF
13.	7T2N8012	WEAR RING (PART OF 6)	1REF
14.	7T61N075	LOCK RING SEAL (PART OF 6)	1REF
15.	7T66P020	PISTON SEAL (PART OF 6)	1REF
16.	73054304	C'BALANCE VALVE 10GPM	1
17.	7PNPXT02	PLUG 1/8NPT (PART OF 1)	3REF

**NOTE**

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

APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON 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. KEEP AWAY FROM ALL SEALS.

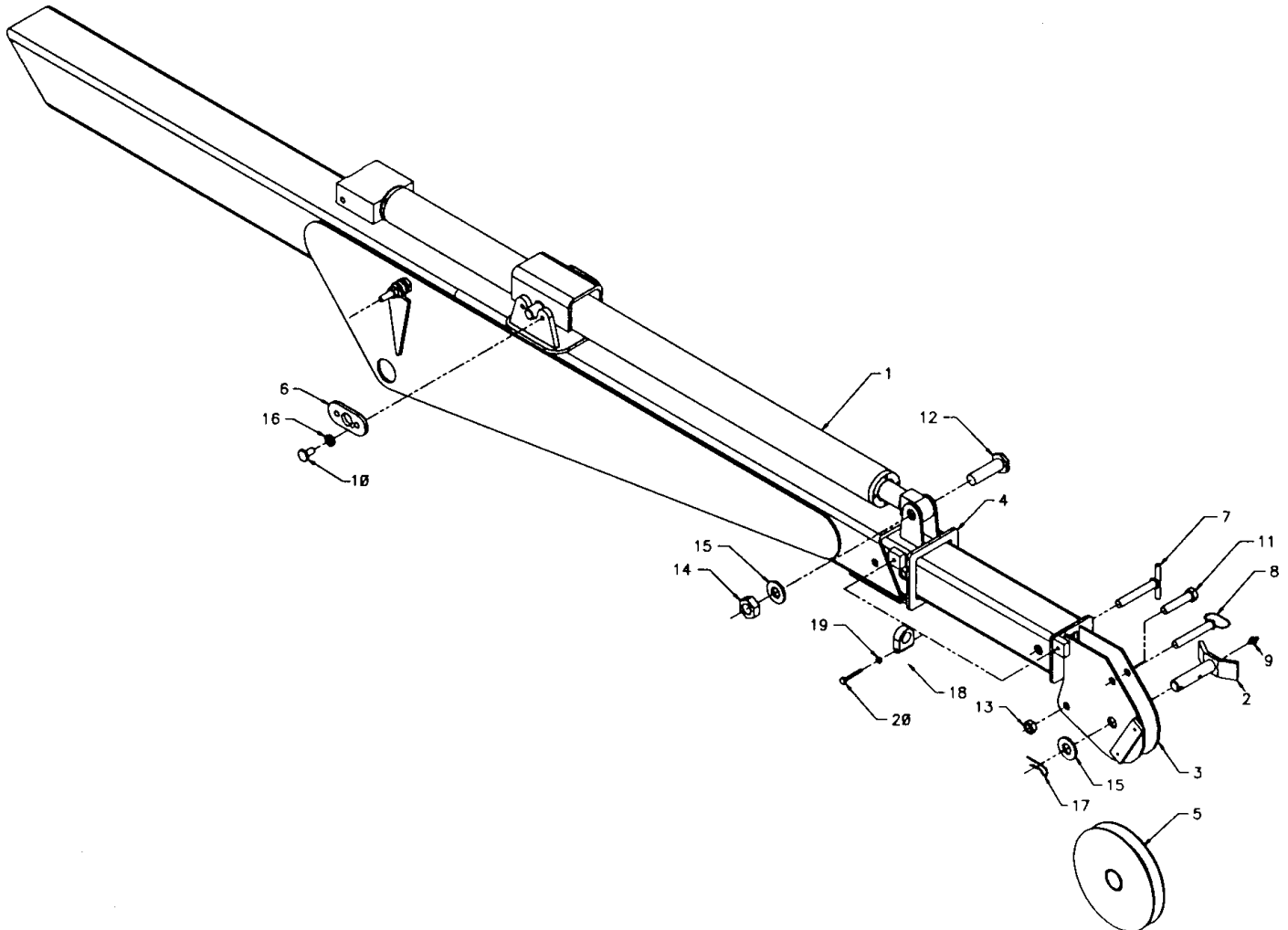


**EXT BOOM ASM-HYD 14' (41714447)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B311970	EXTENSION CYLINDER	1
2.	52704255	PIN	1
3.	52704945	2ND STG EXT BOOM	
4.	52704946	1ST STG EXT BOOM	1
5.	60030061	SHEAVE WITH BEARING	1
6.	60107922	LOCKPLATE	2
7.	71731461	PIN-QUICK RELEASE 1/2X4	1
8.	71731462	PIN-QUICK RELEASE 1/2X1-1/2	1
9.	72053508	ZERK 1/8NPT	1
10.	72060044	CAP SCR 3/8-16X3/4 HHGR5	4
11.	72601368	CAP SCR 1/2-13X2-1/4 HHGR8	1
12.	72060186	CAP SCR 3/4-10X2-1/2 HHGR5	1
13.	72062080	NUT 1/2-13 LOCK	1
14.	72062114	NUT 3/4-10 LOCK	1
15.	72063030	MACH BUSHING 3/4X10GA NR	2
16.	72063051	WASHER 3/8 LOCK	4
17.	72066145	HAIR PIN 3/16	1
18.	70034381	SUPPORT	2
19.	72063049	WASHER 1/4 LOCK	2
20.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
21.	70394443	DECAL-DGE FALLING BOOM	1

**NOTES**

1. INSTALL CORD GUIDE (70034381) WITH GUIDE HOLE UP.
2. PLACE ITEM 21 AT NEAR MANUAL BOOM EXT RETENTION MECHANISM.

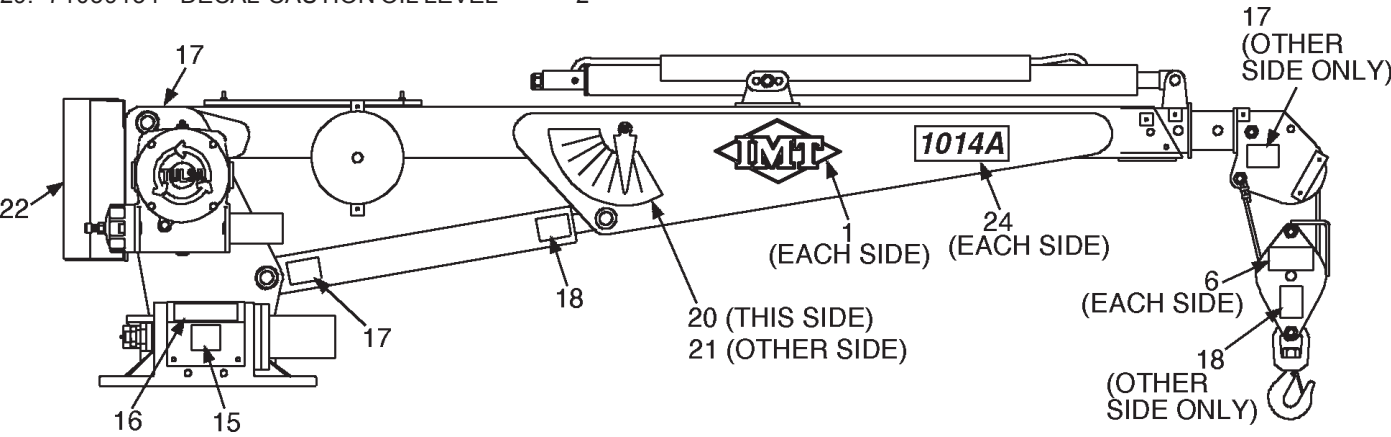


DECAL KIT-PWR UNIT (95714753)

ITEM	PART NO.	DESCRIPTION	QTY
1.	70392887	IMT DIAMOND	2
2.	70394444	DECAL-DANGER ELECTRO	1
3.	70392814	DECAL-DANGER OPERATOR	1
4.	70392815	DECAL-DANGER OPERATION	1
5.	70392861	DECAL-DANGER 2-BLOCKING	1
6.	71394083	DECAL-LOAD BLOCK RATING 2T	2
7.	70392863	DECAL-DANGER HOIST PERS	1
8.	70392864	DECAL-DGR OUTRG STD CLR	2
9.	70394445	DECAL-DANGER ELECTRO	4
10.	70392866	DECAL-DANGER OPER COND	1
11.	70392867	DECAL-DGR OUTRG MOVING	1
12.	70392868	DECAL-DANGER LOADLINE	4
13.	70392888	DECAL-DGR OPER RESTRICT	1
14.	70394446	DECAL-DANGER RC ELECTRO	1
15.	70392524	DECAL-ROTATE CRN/GREASE	1
16.	70392399	DECAL-LUBE WORM	1
17.	70391612	DECAL-GREASE WKLY LEFT	3
18.	70391613	DECAL-GREASE WKLY RIGHT	2
19.	70391598	DECAL-WARNING OUTRG	2
20.	71391522	DECAL-ANGLE CHART RH	1
21.	71391523	DECAL-ANGLE CHART LH	1
22.	70395333	CAPACITY PLACARD	2
23.	71392095	DECAL-CAUTION AMPH CONN	1
24.	70395331	DECAL-1014A IDENT	2
25.	70392213	DECAL-CAUTION WASH/WAX	2
26.	70392982	DECAL-CONTACT IMT	2
27.	70394189	DECAL-RECOMMEND HYD OIL	2
28.	70395324	DECAL-ASME/ANSI B30.5	1
29.	71039134	DECAL-CAUTION OIL LEVEL	2

DECAL PLACEMENT

2,3,4,5,7,25,10,11,13,14,22,26
At or near remote control storage point
8,19
One on each outrigger
9,12
One on each side of carrier vehicle
23
Near connector
27
At or near hydraulic reservoir
28
At or near crane serial number placard



**DECAL KIT-PTO (95714752)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	70392887	IMT DIAMOND	2
2.	70391598	DECAL-WARNING OUTRG	2
3.	70391612	DECAL-GREASE WKLY LEFT	3
4.	70391613	DECAL-GREASE WKLY RIGHT	2
5.	70395331	DECAL-1014A IDENT	2
6.	70392213	DECAL-CAUTION WASH/WAX	1
7.	70392399	DECAL-LUBE WORM	1
8.	70392524	DECAL-ROTATE CRN/GREASE	1
9.	70394444	DECAL-DANGER ELECTRO	1
10.	70392814	DECAL-DANGER OPERATOR	1
11.	70392815	DECAL-DANGER OPERATION	1
12.	70392861	DECAL-DANGER 2-BLOCKING	1
13.	70392863	DECAL-DANGER HOIST PERS	1
14.	71391522	DECAL-ANGLE CHART RH	1
15.	71391523	DECAL-ANGLE CHART LH	1
16.	70392866	DECAL-DANGER OPER COND	1
17.	70392867	DECAL-DGR OUTRG MOVING	1
18.	70392868	DECAL-DANGER LOADLINE	4
19.	70392888	DECAL-DGR OPER RESTRICT	1
20.	70394446	DECAL-DANGER RC ELECTRO	1
21.	70392864	DECAL-DGR OUTRG STD CLR	2
22.	70394445	DECAL-DANGER ELECTRO	4
23.	71392095	DECAL-CAUTION AMPH CONN	1
24.	70395333	CAPACITY PLACARD	2
25.	70392982	DECAL-CONTACT IMT	1
26.	70392891	DECAL-DANGER DRIVELINE	1
27.	71394083	DECAL-LOAD BLOCK RATING 2T 2	1
28.	71039134	DECAL-CAUTION OIL LEVEL	1
29.	70392109	DECAL-RETURN LINE	1
30.	70392108	DECAL-SUCTION LINE	1
31.	70394189	DECAL-RECOMMEND HYD OIL	1
32.	70395324	DECAL-ASME/ANSI B30.5	1

**DECAL PLACEMENT**

6,9,10,11,12,13,16,17,19,20,25,28,24

At or near remote control storage point

2,21

One on each outrigger

22,18

One on each side of carrier vehicle

23

Near connector

29

On reservoir at return line

30

On reservoir at suction line

26

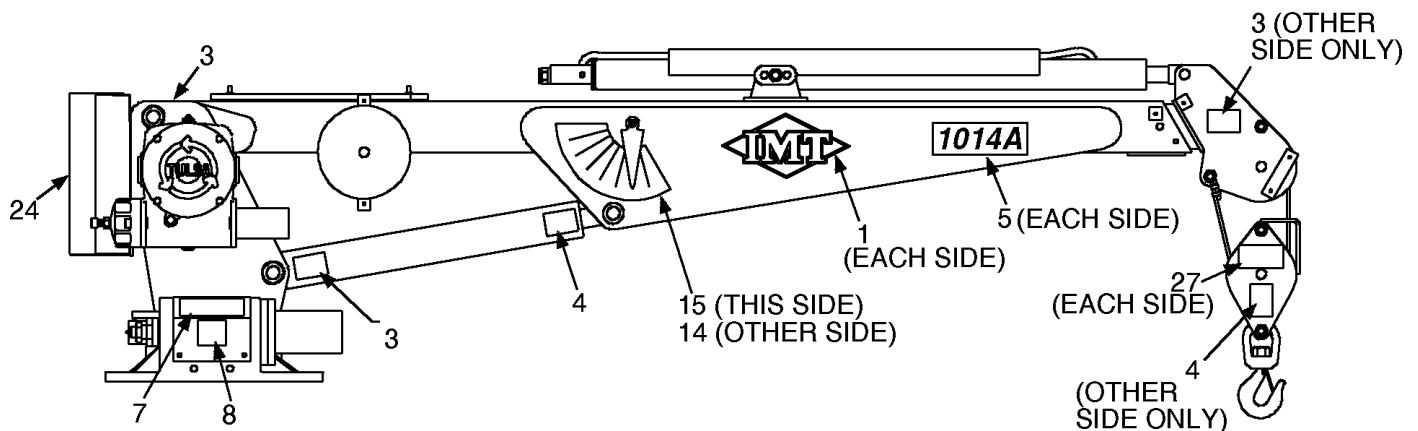
At or near driveline

31

At or near hydraulic reservoir

32

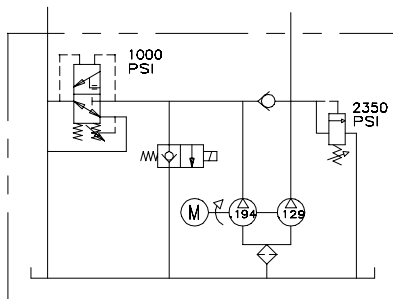
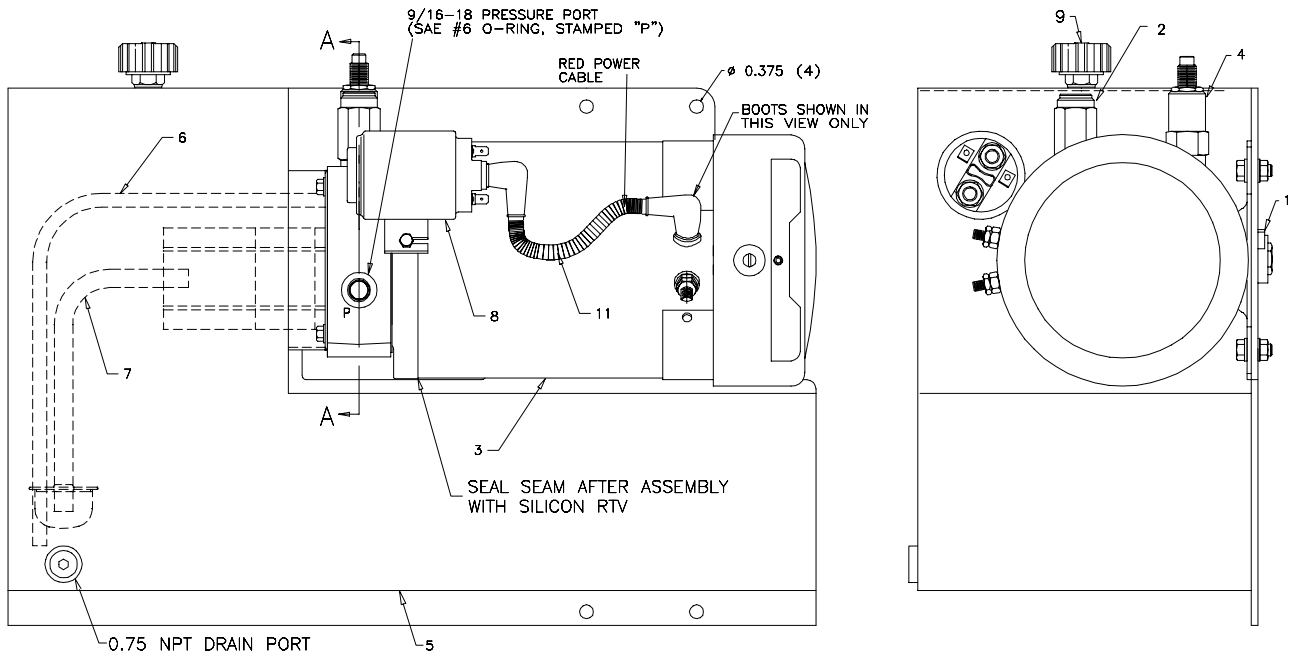
At or near crane serial number placard



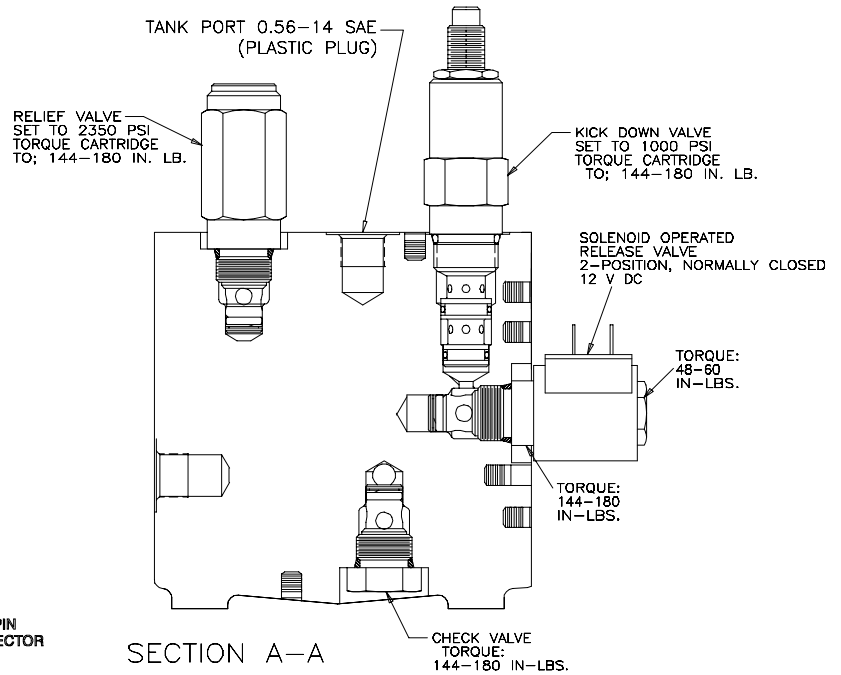


**HYD PWR UNIT-DC (73051957)**

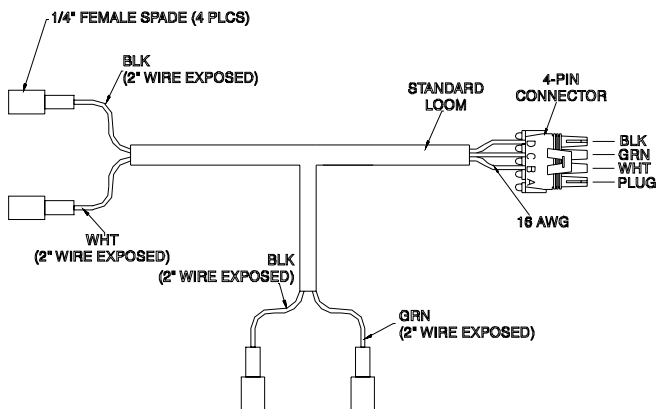
1. 73540045	DUMP VALVE	1	6. 70145919	TUBE-TANK LINE	1
2. 73540046	RELIEF CARTRIDGE	1	7. 70145920	TUBE-SUCTION	1
3. 73540047	MOTOR/VALVE/PUMP	1	8. 77041570	STARTER COIL	1
4. 73540048	KICK DOWN CARTRIDGE	1	9. 70048210	BREATHER	1
5. 70145918	RESERVOIR	1	10. 51714750	CABLE ASM (SEE DWG)	1
			11. 77044839	CABLE-STARTER COIL	1



HYDRAULIC SCHEMATIC



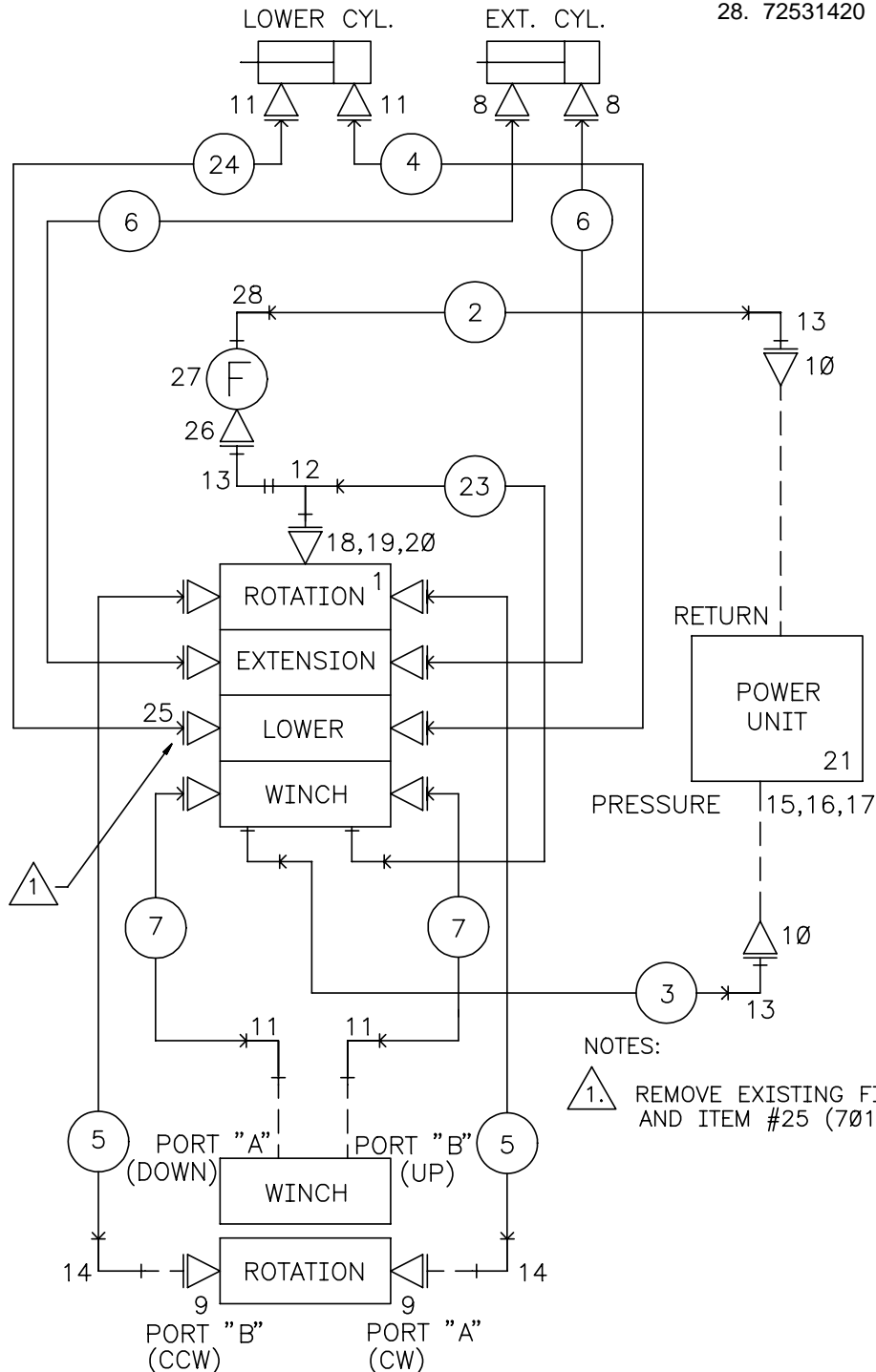
SECTION A-A

**ITEM 10. CABLE ASM (51714750)**

**HYD KIT-PWR UNIT (91715095)****REPLACED BY 91715654 EFF: 4-1-00**

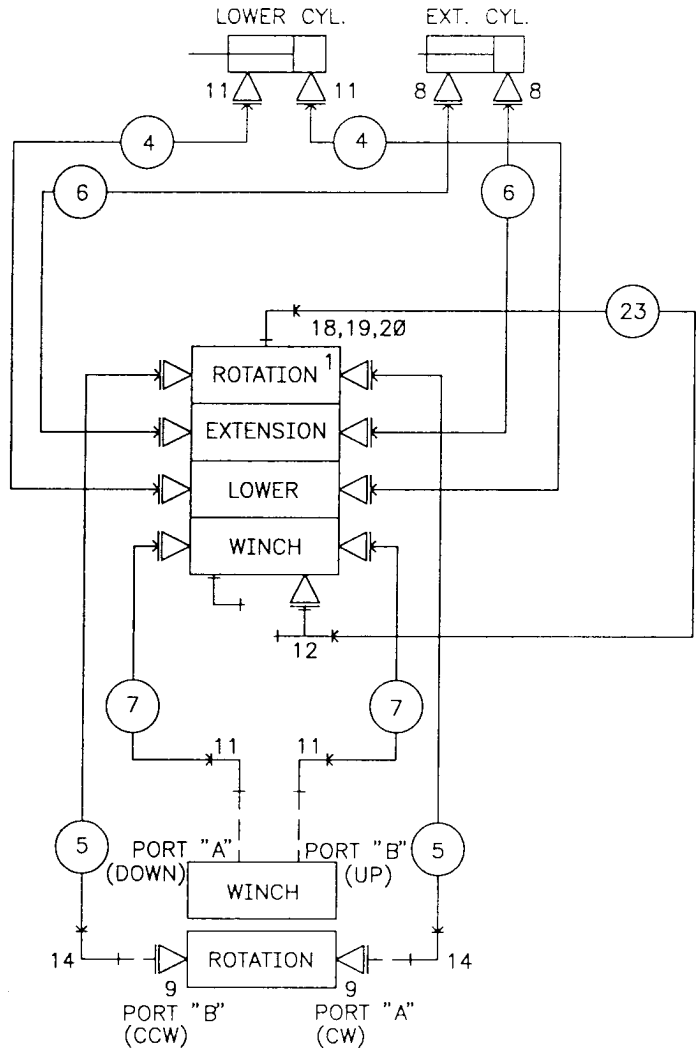
1.	70733225	VALVEBANK	1
2.	51395305	HOSE-1/2X23.5 #8#8(PART OF 22)	1REF
3.	51394945	HOSE-3/8X28 #8#8(PART OF 22)	1REF
4.	51394952	HOSE-1/4X32 #4#4(PART OF 22)	1REF
5.	51394953	HOSE-1/4X39 #4#4(PART OF 22)	2REF
6.	51394954	HOSE-1/4X57 #4#4(PART OF 22)	2REF
7.	51395226	HOSE-1/4X24 #4#4(PART OF 22)	2REF
8.	72532351	ADAPTER #4MSTR #4MJIC	2
9.	72532722	ADAPTER #10MSTR #6FSTR	2
10.	72532357	ADAPTER #6MSTR #8MJIC	2
11.	72532353	ADAPTER #6MSTR #4MJIC	4
12.	72532671	TEE #8JIC SWVL NUT BRANCH	1

13.	72532658	ELBOW #8MJIC #8FJIC	3
14.	72532985	ELBOW #6MSTR #4MJIC 45°	2
15.	72063050	WASHER 5/16 LOCK	4
16.	72063002	WASHER 5/16 WRT	4
17.	72060025	CAP SCR 5/16-18X1 HHGR5	4
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
19.	72063001	WASHER 1/4 WRT	4
20.	72062104	NUT 1/4-20 LOCK	4
21.	73051957	POWER UNIT	1
22.	51715096	HOSE KIT (INCL:2-7&23)	1
23.	51394949	HOSE-1/2X11-1/2(PART OF 22)	1REF
24.	51395534	HOSE-14X32 #4#6 (PART OF 22)	1REF
25.	70145928	FLOW LIMITER	1
26.	72533622	ADAPTER 3/8MPT #8FJIC	1
27.	73052093	RETURN FILTER 10MIC 3/4FPT	1
28.	72531420	ELBOW 3/8MPT #8MJIC	1



**HYD KIT-PROP'L PTO (91715097)****REPLACED BY 91715656 EFF: 4-1-00**

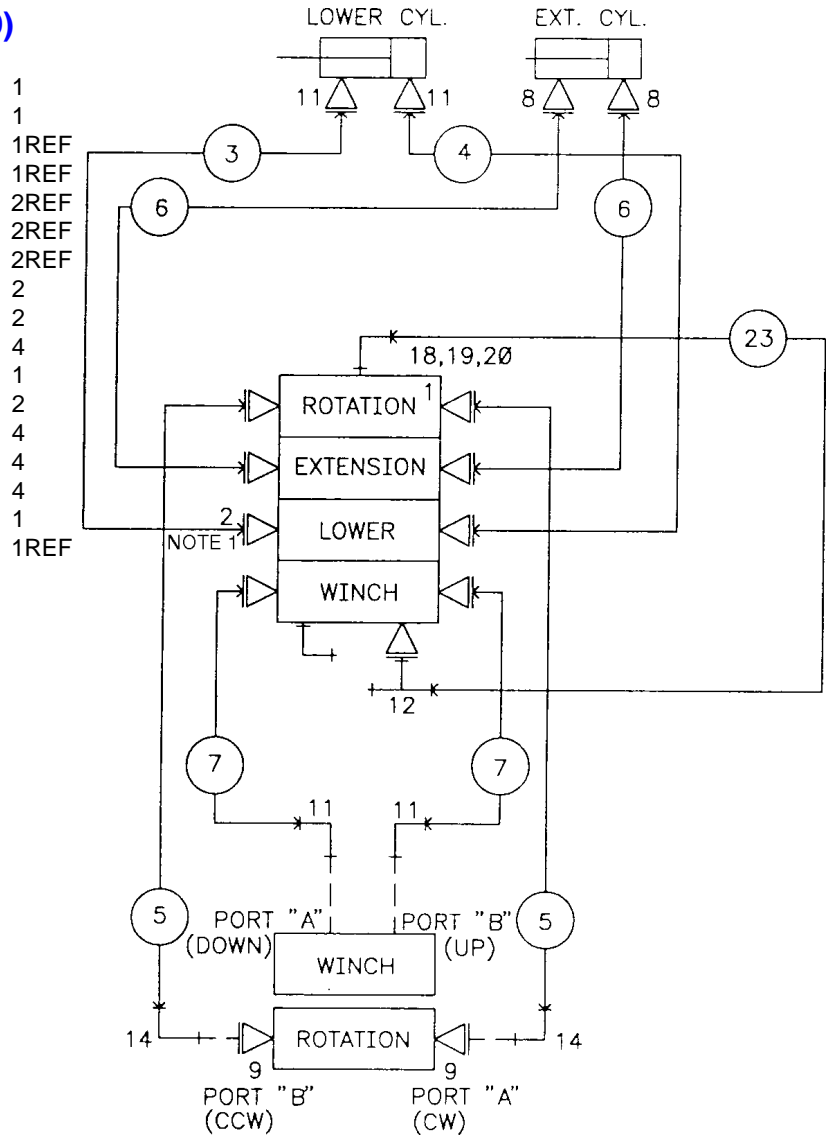
1.	70733222	VALVEBANK	1
4.	51394952	HOSE-1/4X32 #4#4(PART OF 22)	2REF
5.	51394953	HOSE-1/4X39 #4#4(PART OF 22)	2REF
6.	51394954	HOSE-1/4X57 #4#4(PART OF 22)	2REF
7.	51395226	HOSE-1/4X24 #4#4(PART OF 22)	2REF
8.	72532351	ADAPTER #4MSTR #4MJIC	2
9.	72532722	ADAPTER #10MSTR #6FSTR	2
11.	72532353	ADAPTER #6MSTR #4MJIC	4
12.	72532671	TEE #8JIC SWVL NUT BRANCH	1
14.	72532985	ELBOW #6MSTR #4MJIC 45°	2
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
19.	72063001	WASHER 1/4 WRT	4
20.	72062104	NUT 1/4-20 LOCK	4
22.	51715098	HOSE KIT (INCL:4-7&23)	1
23.	51394950	HOSE-1/2X11.5(PART OF 22)	1REF



**HYD KIT-NON-PROP'L PTO (91715099)****REPLACED BY 91715657 EFF: 4-1-00**

1.	70733346	VALVEBANK	1
2.	70145928	FLOW LIMITER	1
3.	51395534	HOSE-1/4X32 #4#6(PART OF 22)	1REF
4.	51394952	HOSE-1/4X32 #4#4(PART OF 22)	1REF
5.	51394953	HOSE-1/4X39 #4#4(PART OF 22)	2REF
6.	51394954	HOSE-1/4X57 #4#4(PART OF 22)	2REF
7.	51395226	HOSE-1/4X24 #4#4(PART OF 22)	2REF
8.	72532351	ADAPTER #4MSTR #4MJIC	2
9.	72532722	ADAPTER #10MSTR #6FSTR	2
11.	72532353	ADAPTER #6MSTR #4MJIC	4
12.	72532671	TEE #8JIC SWVL NUT BRANCH	1
14.	72532985	ELBOW #6MSTR #4MJIC 45°	2
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
19.	72063001	WASHER 1/4 WRT	4
20.	72062104	NUT 1/4-20 LOCK	4
22.	51715100	HOSE KIT (INCL:4-7&23)	1
23.	51394951	HOSE-1/2X10.5(PART OF 22)	1REF

NOTE 1: REPLACE EXISTING FITTING WITH #2 (70145928).

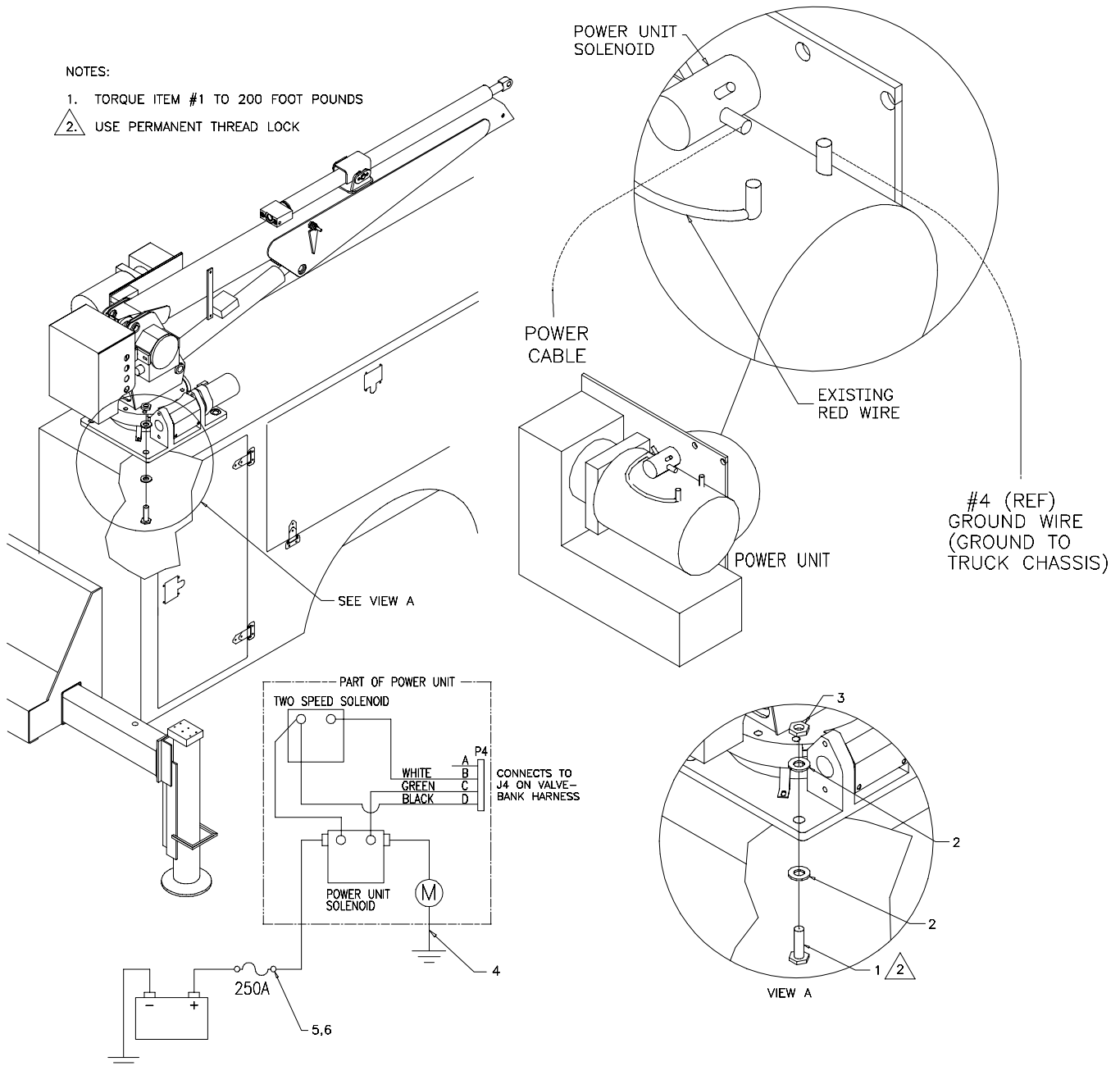


**INSTALLATION KIT-PWR UNIT (93714530)**

1.	72060186	CAP SCR 3/4-10X2-1/2 HH GR5	4
2.	72063008	WASHER 3/4	8
3.	72062140	NUT 3/4-10 HEX STL-INSERT	4
4.	51705925	CABLE ASM #1WIRE X 96	1
5.	77041592	FUSE	1
6.	77041593	FUSEHOLDER	1

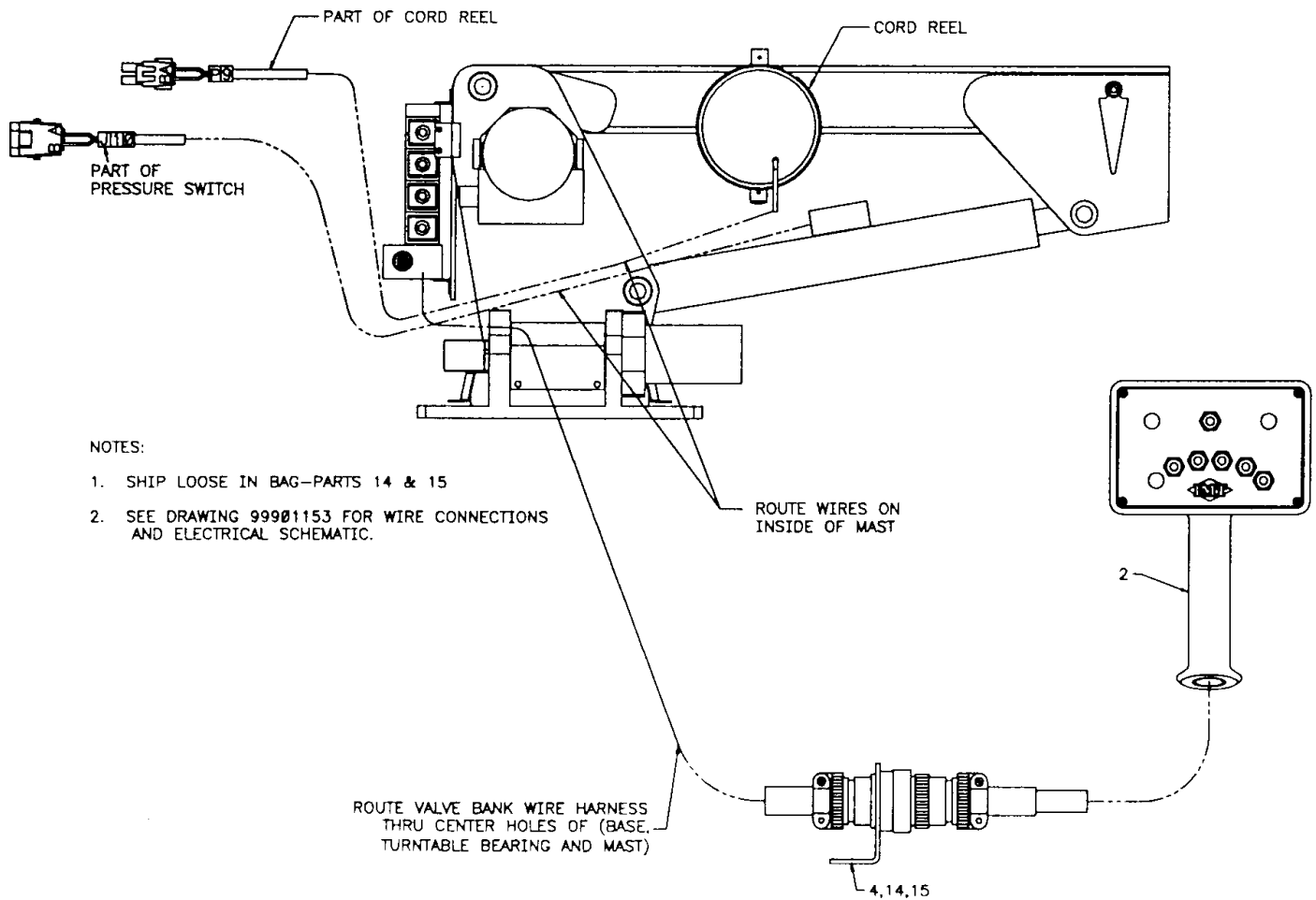
**NOTES:**

1. TORQUE ITEM #1 TO 200 FOOT POUNDS
2. USE PERMANENT THREAD LOCK



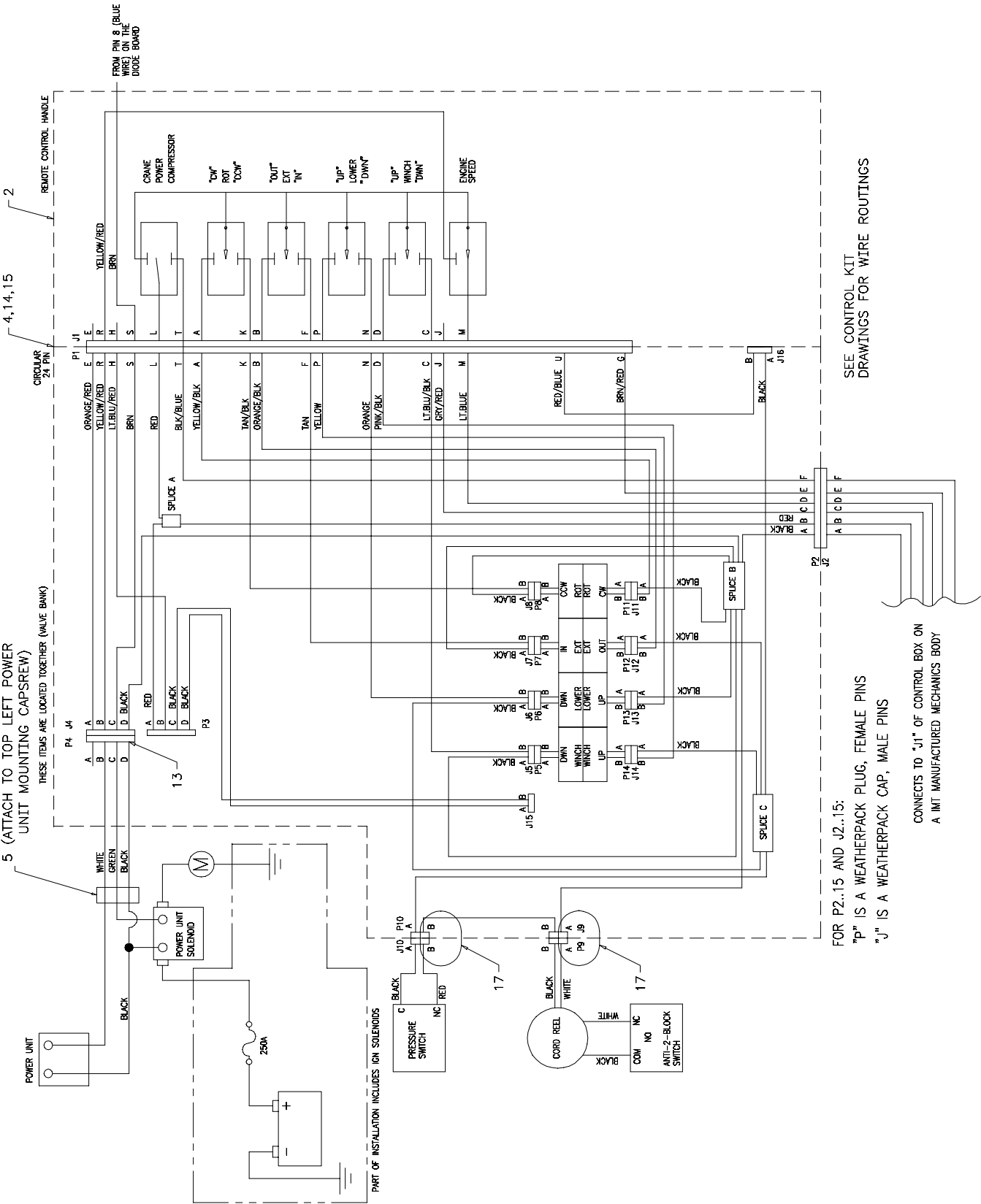
**CONTROL KIT-PWR UNIT (91714438)**

SEE 99901153 SCHEMATIC



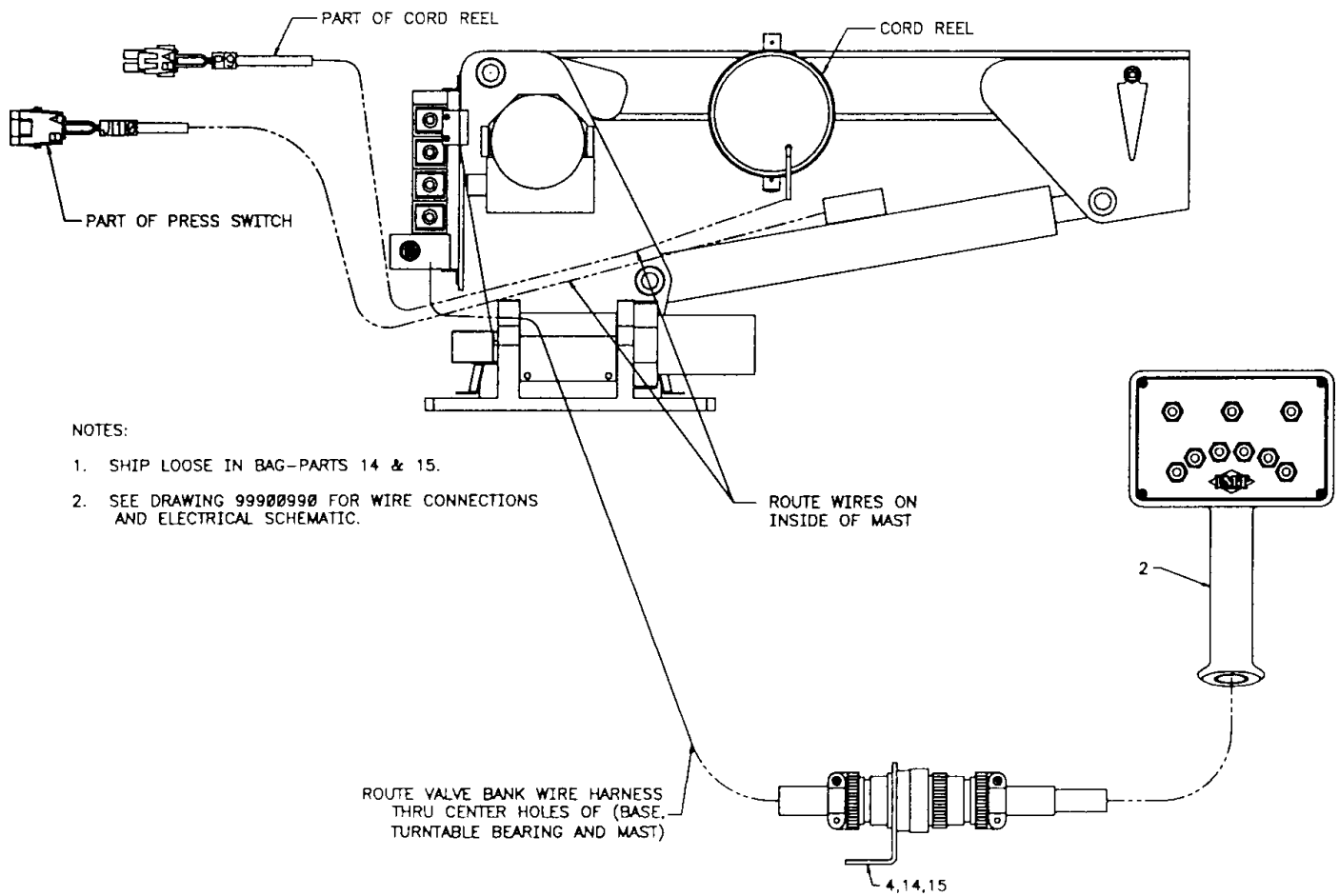
SCHEMATIC-PWR UNIT (99901153)

2.	51714700	HANDLE ASM-PWR UNIT	1
4.	60119299	MTG BRACKET	1
5.	72661312	CLAMP	1
13.	51714750	CABLE ASM (part of PWR UNIT)	1REF
14.	77044645	NUT	1
15.	77044646	WASHER-LOCK	1
17.	70034439	LOCK WIRE LEAD SEAL	2



**CONTROL KIT-PROP'L PTO (91714440)**

SEE 99900990 SCHEMATIC



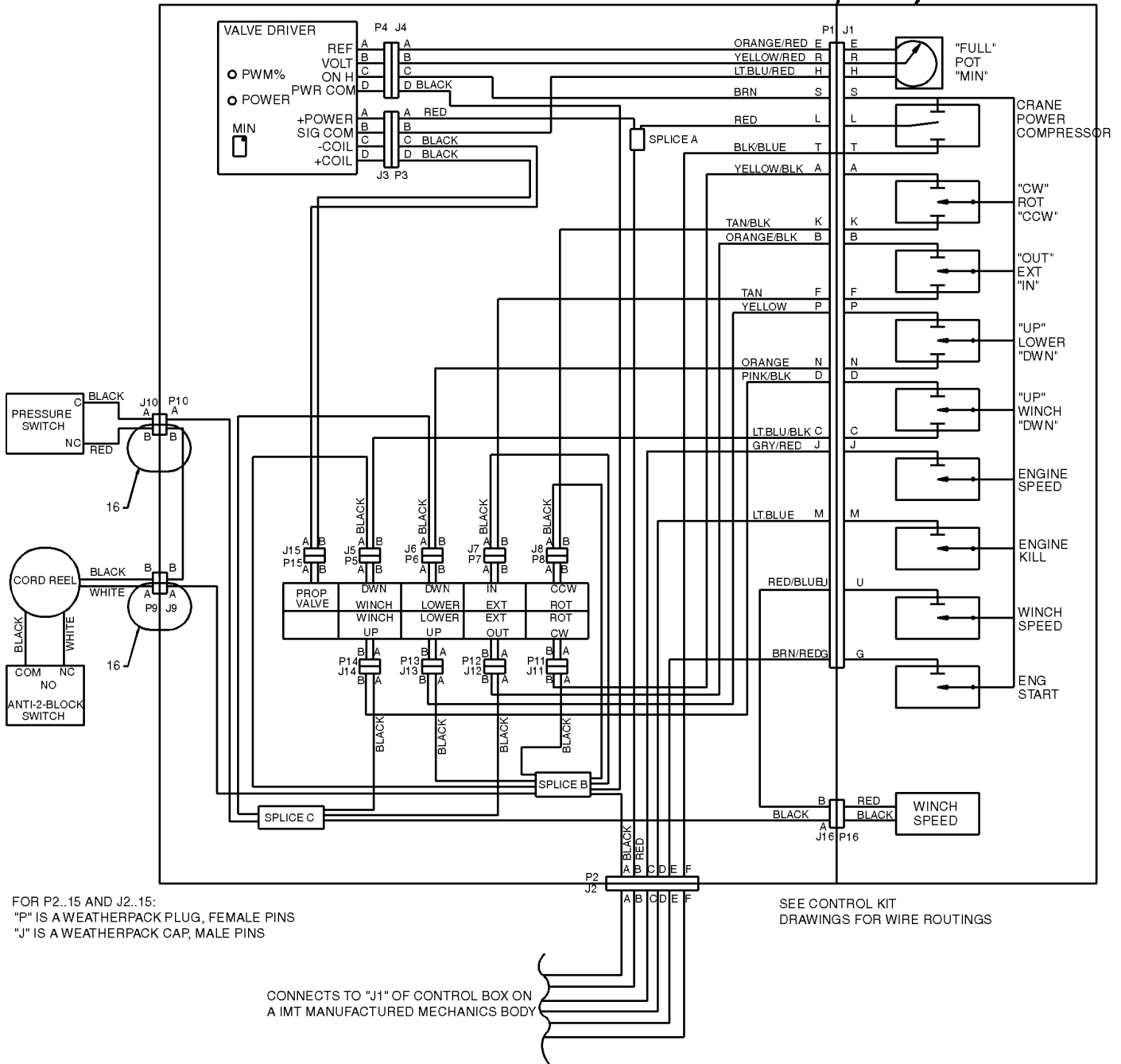


## SCHEMATIC-PROPORTIONAL RMT CTRL (99900990)

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

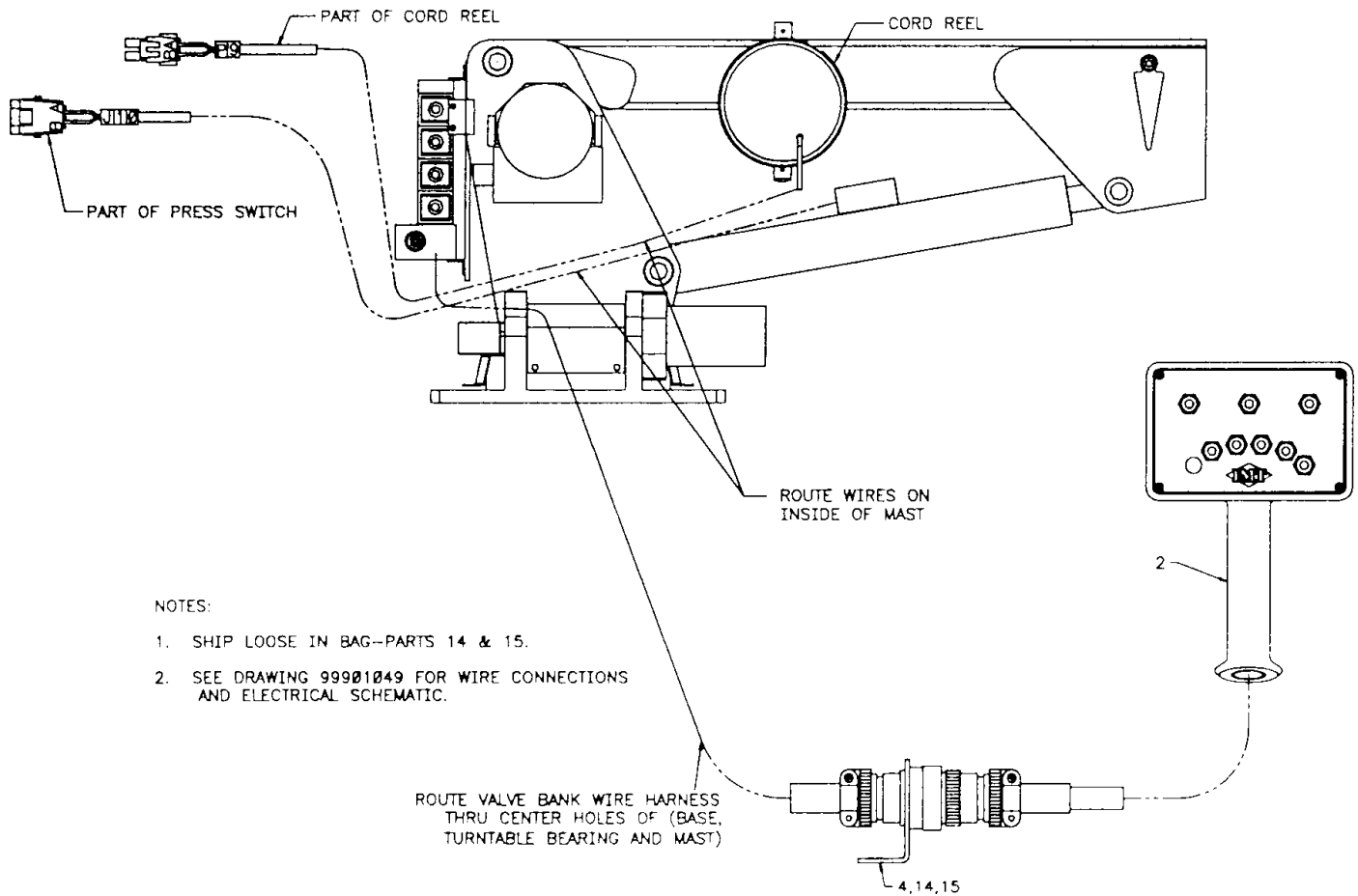
THESE ITEMS ARE LOCATED TOGETHER (VALVE BANK)

CIRCULAR 24 PIN 4,14,15 2 REMOTE CONTROL HANDLE



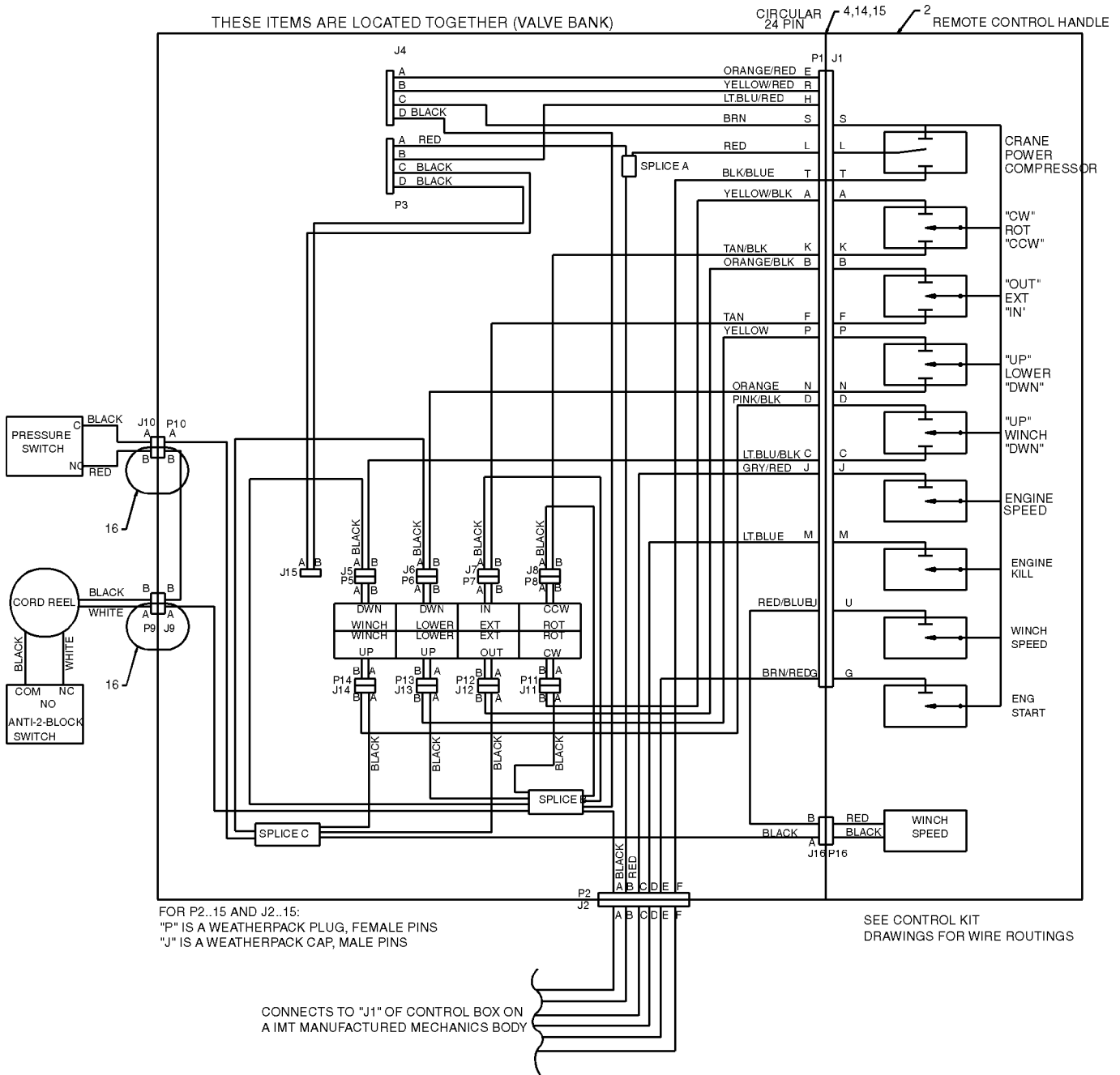
**CONTROL KIT-NON PROP'L PTO  
(91714439)**

SEE 99901049 SCHEMATIC



## SCHEMATIC-NON PROP'L RMT CTRL (99901049)

ITEM	PART NO.	DESCRIPTION	QTY
2.	51713384	HANDLE ASM ON-OFF PTO	1
4.	60119299	MTG BRACKET	1
14.	77044645	NUT	1
15.	77044646	WASHER-LOCK	1
16.	70034439	LOCK WIRE LEAD SEAL	2



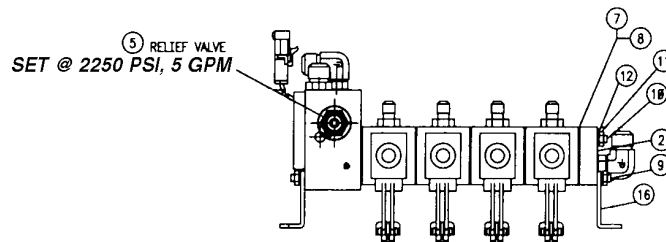
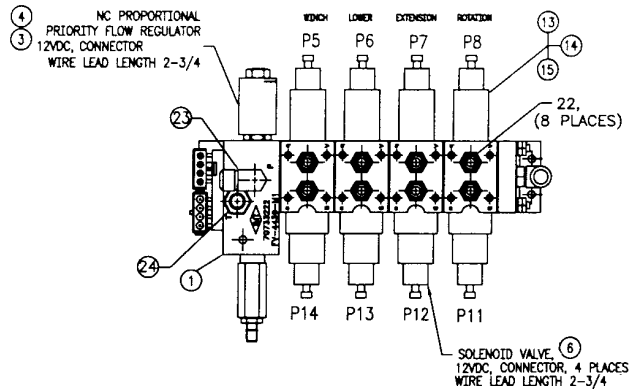
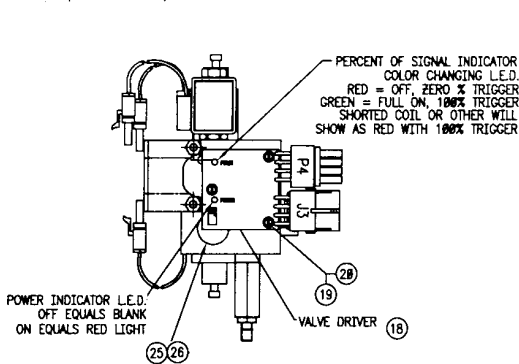
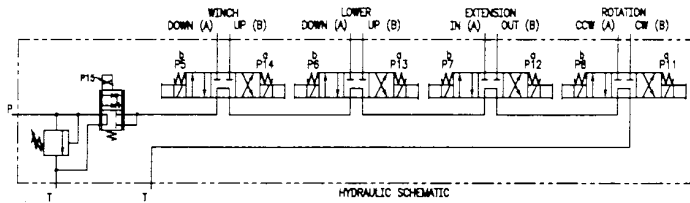
## VALVEBANK-PROP'L RMT CTRL (70733222-1)

REPLACED BY 70733399 EFF: 4-1-00

1.	70145629	INLET BODY	1
2.	70145628	OUTLET BODY	1
3.	70145627	FLOW REG	1
4.	70145626	COIL	1
5.	70145625	RELIEF VALVE (2250 PSI)	1
6.	70145624	SOLENOID VALVE	4
7.	70143337	O-RING PLATE	5
8.	70145623	O-RING	10
9.	70145622	THREADED ROD GR8	2
10.	70145621	THREADED ROD GR8	2
11.	72062000	NUT 1/4-20	6
12.	72063047	WASHER 1/4 LOCK	6

CONTINUED ON FOLLOWING PAGE

13.	77044574	CONNECTOR TOWER	9
14.	77044577	CONNECTOR TERMINAL	18
15.	77044578	CABLE SEAL	18
16.	70145738	MOUNTING FOOT	2
17.	70145620	NAME TAG	1
18.	77044826	VALVE DRIVER	1
19.	72601704	MACH SCR (USE LOCTITE 242)	3
20.	72601705	WASHER #6 FLAT	3
21.	70733066	WIRING HARNESS	1
22.	72532353	ADAPTER #6MSTR #4MJIC	8
23.	72053762	ELBOW #6MSTR #8MJIC 90°	2
24.	72532357	ADAPTER #6MSTR #8MJIC	1
25.	70145884	PLUG	1
26.	70145885	ORIFICE PLUG	1



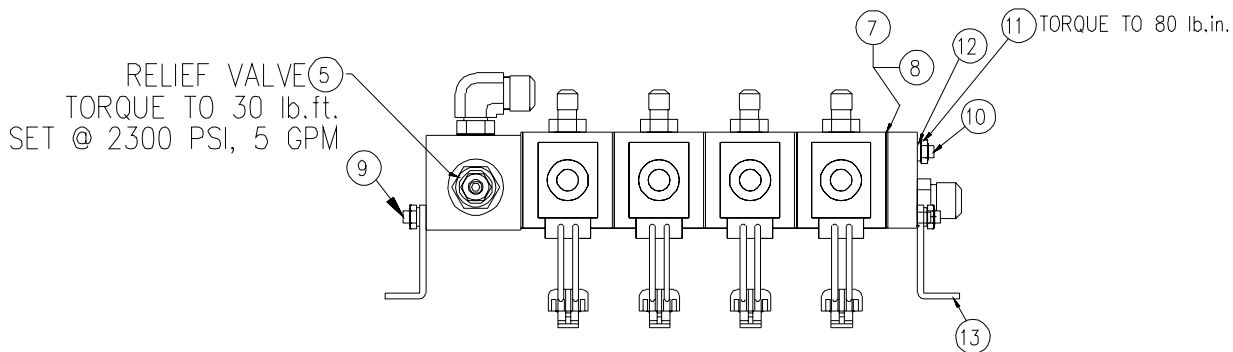
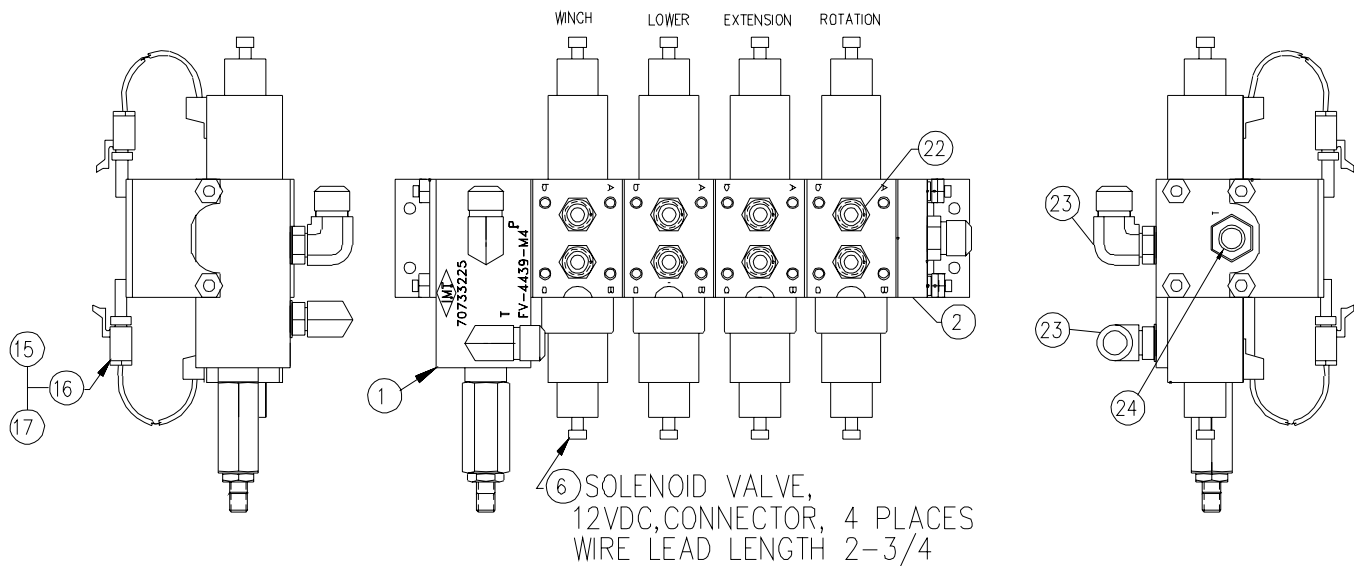
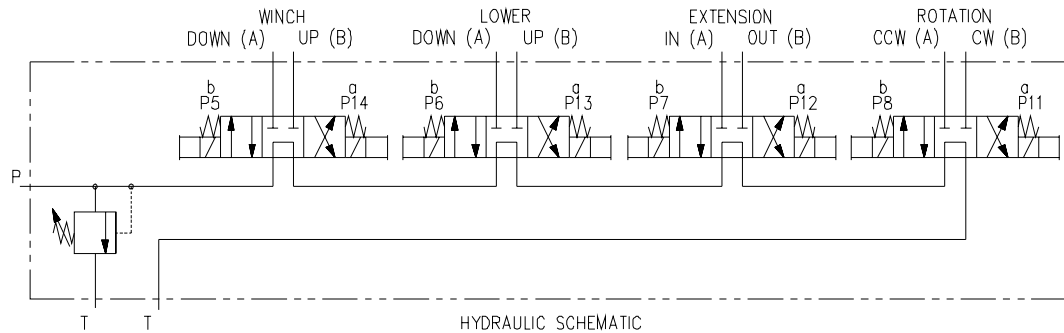


**VALVEBANK-PWR UNIT (70733225-1)**

CONTINUED ON FOLLOWING PAGE

REPLACED BY 70733398 EFF: 4-1-00

1. 70145879	INLET BODY	1	13. 70145738	MOUNTING FOOT	2
2. 70145628	OUTLET BODY	1	14. 70145620	NAME TAG	1
5. 70145625	RELIEF VALVE (2250 PSI)	1	15. 77044574	CONNECTOR TOWER	9
6. 70145624	SOLENOID VALVE	4	16. 77044577	CONNECTOR TERMINAL	16
7. 70143337	O-RING PLATE	5	17. 77044578	CABLE SEAL	16
8. 70145623	O-RING	10	20. 77044676	CABLE PLUG	6
9. 70145622	THREADED ROD GR8	2	21. 70733066	WIRING HARNESS	1
10. 70145621	THREADED ROD GR8	2	22. 72532353	ADAPTER #6MSTR #4MJIC	8
11. 72062000	NUT 1/4-20	6	23. 72053762	ELBOW #6MSTR #8MJIC 90°	2
12. 72063047	WASHER 1/4 LOCK	6	24. 72532357	ADAPTER #6MSTR #8MJIC	1




# **VALVEBANK WIRING HARNESS** **(70733225-2)**

**REPLACED BY 70733394 EFF: 4-1-00**

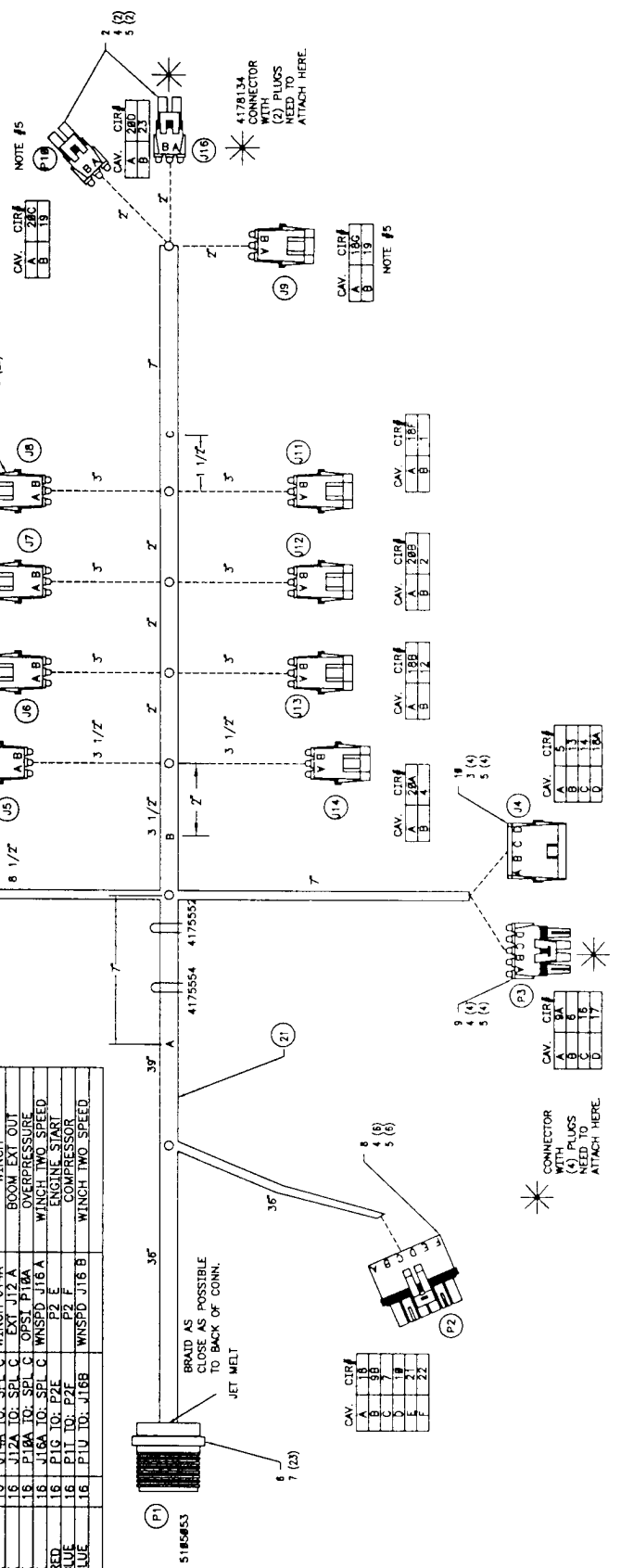
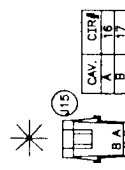
1. 77044573 SHROUD CONN 2-CONTACT
2. 77044574 TOWER CONN
3. 77044576 TERMINAL-M
4. 77044577 TERMINAL-F
5. 77044578 CABLE SEAL
6. 77044620 CONN RCPT
7. 77044580 SOCKET
8. 77044622 TOWER CONN 6-CONTACT
9. 77044623 TOWER CONN 4-CONTACT
10. 77044624 SHROUD CONN 4-CONTACT

- 10REF
- 2REF
- 24REF
- 14REF
- 38REF
- 1REF
- 23REF
- 1REF
- 1REF
- 1REF

CIR	5185853	COLOR	WIRE LEGEND	CA	WEATHER PAK	LABELING	FUNCTION
WIRE LEGEND							
CONNECTOR							
1	A	YELLOW/BLK	18	P1A TO: J11B	ROT11B	ROTATE CW	
2	B	ORANGE/BLK	18	P1B TO: J12B	EXT12B	BOOM EXT OUT	
3	C	LT BLUE/BLK	18	P1C TO: J5B	WIN J5B	WINCH DOWN	
4	D	PINK/BLK	18	P1D TO: J14B	WIN J14B	WINCH UP	
5	E	ORANGE/RED	18	P1E TO: J4A	J4A	REF	
6	H	GRAY/RED	18	P1H TO: P3B	P3B	SIGNAL COMM.	
7	J	LT BLUE/RED	18	P1J TO: P2C	P2C	SPEED RELAY	
8	K	GRAY/RED	18	P1K TO: J8B	ROT8B	ROTATE CCW	
9	L	TAN/BLK	18	P1L TO: SPL A	N/A	P1 TO SPLICE	
9A		RED	16	P2A TO: SPL A	P2A	POWER +	
9B		RED	16	P2B TO: SPL A	P2B	IGNITION SOLENOID	
10	M	LT BLUE	18	P1M TO: P2D	P2D	KILL RELAY	
11	N	ORANGE	18	P1N TO: J6B	LOWER J6B	LOWER DOWN	
12	P	YELLOW/RED	18	P1P TO: J13B	LOWER J13B	LOWER UP	
13	R	YELLOW/RED	18	P1R TO: J4B	J4B	VOLUME	
14	S	BROWN	18	P1S TO: J4C	J4C	VOLUME	
15	T	TAN	18	P1T TO: J7B	EXT J7 B	BOOM EXT IN	
16	U	BLACK	18	P3C TO: J15A	PRVLY J15 A	PROP. VALVE & COIL -	
17	V	BLACK	16	P3D TO: J15B	PRVLY J15 B	PROP. VALVE & COIL +	
18	W	BLACK	18	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 J7 A	BOOM EXT IN	
18E		BLACK	16	J8A TO: SPL B	ROT J8 A	ROTATE CCW	
18F		BLACK	16	J11A TO: SPL B	ROT J11 A	ROTATE CW	
18G		BLACK	16	J9A TO: SPL B	ATB J9 A	ANTI-TWO	
18H		BLACK	16	P10B TO: J9B	P10B & J9B	OPRES & ANTI-TWO	
18I		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 J12 A	BOOM EXT OUT	
20C		BLACK	16	P18A TO: SPL C	OPST P18A	OVERPRESSURE	
20D		BLACK	16	J16A TO: SPL C	WNSPD J16 A	WINCH TWO SPEED	
21	C	BRN/RED	16	P1G TO: P2E	P2 E	ENGINE START	
22	D	BLK/BLUE	16	P1G TO: P2F	P2 F	COMPRESSOR	
23	U	RED/BLUE	16	P1U TO: J16B	WNSPD J16 B	WINCH TWO SPEED	

1. ALL WIRE TO BE GAL.
2. DIMENSIONS SHOWN ARE TO MATING END OF CONNECTORS UNLESS OTHERWISE SPECIFIED
3. BRAND SHOULD BE WITHIN 1" TO THE BACK OF CONNECTORS WHERE BRAID IS CALLED OUT WITH
4. ORIENT CONNECTOR AS SHOWN
5. SHIP CONNECTORS P1B AND J9 CONNECTED
6. CONNECTORS WITH THE SYMBOL  ARE TO BE PERMANENTLY LABELED WITH THE LETTERS & NUMBER.
7. LABELING SHALL APPEAR ON WIRES EVERY 2"

CONNECTOR WITH (A) PLUGS NEED TO ATTACH HERE.



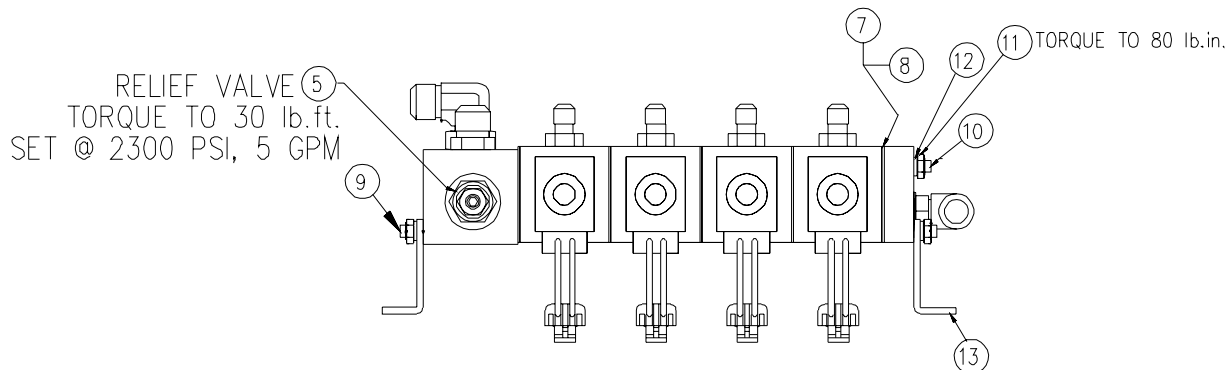
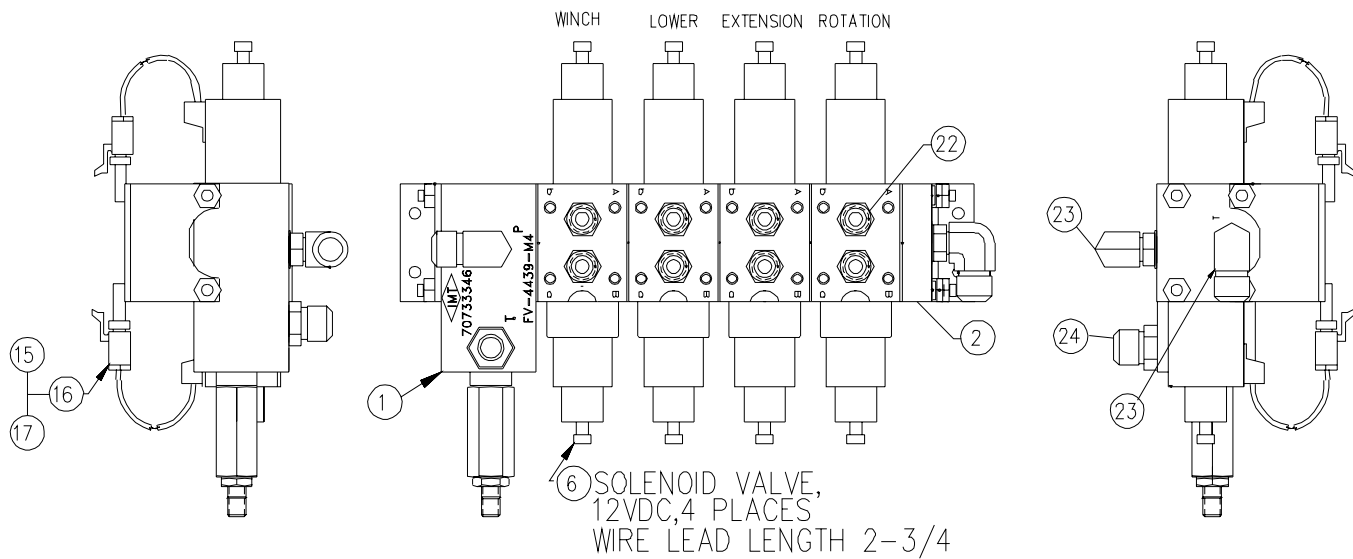
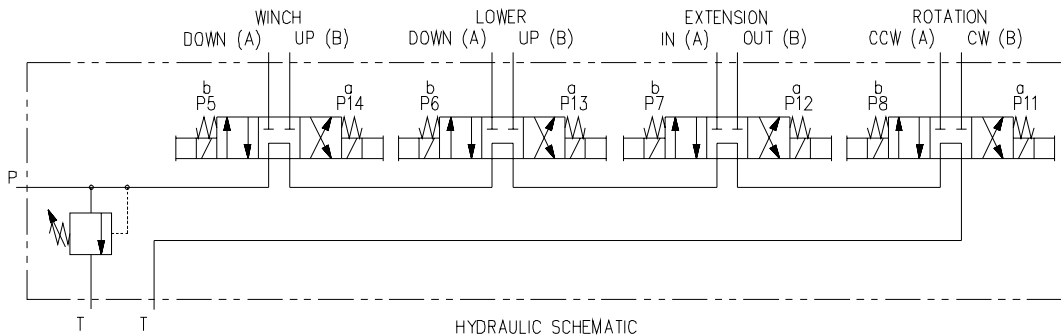
**VALVEBANK-NON PROP'L (70733346-1)**

REPLACED BY 70733400 EFF: 4-1-00

1.	70145879	INLET BODY	1
2.	70145628	OUTLET BODY	1
5.	70145625	RELIEF VALVE (2250 PSI)	1
6.	70145624	SOLENOID VALVE	4
7.	70143337	O-RING PLATE	5
8.	70145623	O-RING	10
9.	70145622	THREADED ROD GR8	2
10.	70145621	THREADED ROD GR8	2
11.	72062000	NUT 1/4-20	6
12.	72063047	WASHER 1/4 LOCK	6

CONTINUED ON FOLLOWING PAGE

13.	70145738	MOUNTING FOOT	2
14.	70145620	NAME TAG	1
15.	77044574	CONNECTOR TOWER	9
16.	77044577	CONNECTOR TERMINAL	16
17.	77044578	CABLE SEAL	16
20.	77044676	CABLE PLUG	6
21.	70733066	WIRING HARNESS	1
22.	72532353	ADAPTER #6MSTR #4MJIC	8
23.	72053762	ELBOW #6MSTR #8MJIC 90°	2
24.	72532357	ADAPTER #6MSTR #8MJIC	1



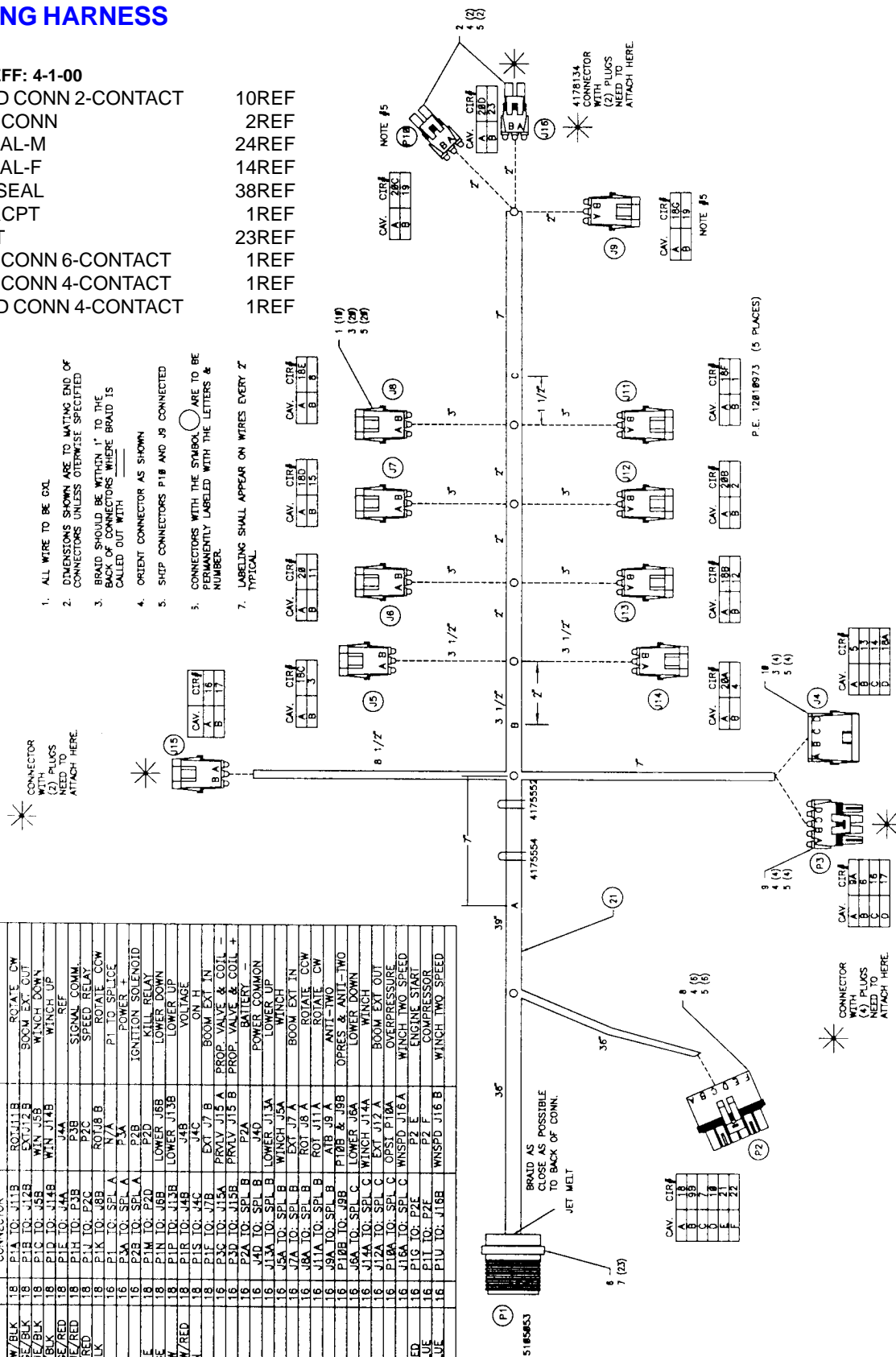
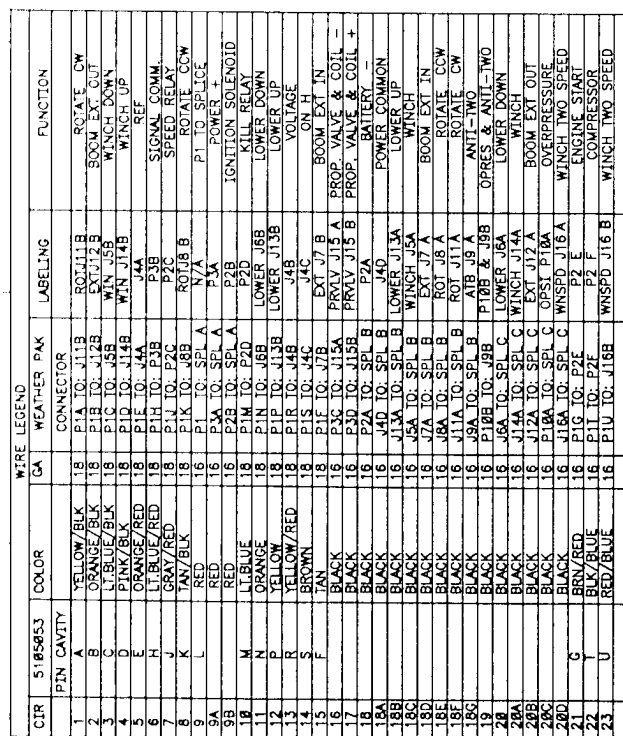


## VALVEBANK WIRING HARNESS (70733346-2)

REPLACED BY 70733394 EFF: 4-1-00

- |     |          |                       |
|-----|----------|-----------------------|
| 1.  | 77044573 | SHROUD CONN 2-CONTACT |
| 2.  | 77044574 | TOWER CONN            |
| 3.  | 77044576 | TERMINAL-M            |
| 4.  | 77044577 | TERMINAL-F            |
| 5.  | 77044578 | CABLE SEAL            |
| 6.  | 77044620 | CONN RCPT             |
| 7.  | 77044580 | SOCKET                |
| 8.  | 77044622 | TOWER CONN 6-CONTACT  |
| 9.  | 77044623 | TOWER CONN 4-CONTACT  |
| 10. | 77044624 | SHROUD CONN 4-CONTACT |

- 10REF  
2REF  
24REF  
14REF  
38REF  
1REF  
23REF  
1REF  
1REF  
1REF



P.E. 12010973 (5 PLACES)

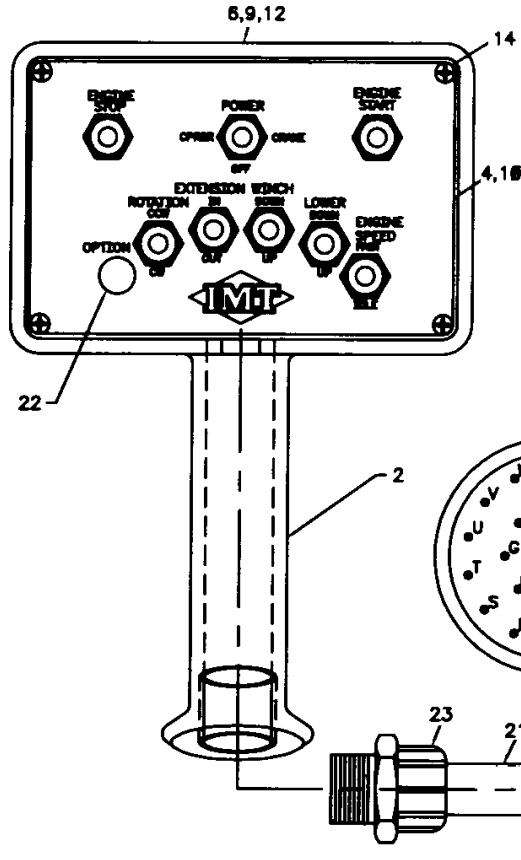
CONNECTOR  
WITH  
4) PLUGS  
NEED TO  
ATTACH HERE.



**RMT HANDLE ASM-PTO (51713384)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	89044214	WIRE 18GAX GRN STRD	1.42FT
2.	60119335	CONTROL HANDLE	1
4.	60119277	COVER	1
5.	70034306	BACK COVER	1
8.	77044621	PIN	23
9.	70394447	DECAL-DGR RC ELECTRO SM	1
10.	70394142	DECAL-CTRL	1
14.	72061009	SHT MTL SCR #6X3/4 PH	8
15.	77040051	TERM-SPRSPD #8 16-14GA	23
16.	77040371	TOGGLE SWITCH SPST	2

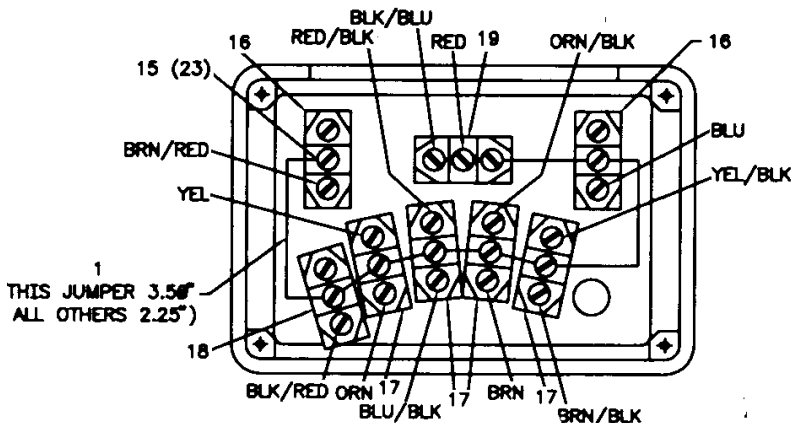
17.	77040372	TOGGLE SWITCH SPDT	4
18.	77040373	TOGGLE SWITCH SPST	1
19.	77040374	TOGGLE SWITCH SPDT	1
20.	77044579	CONNECTOR	1
21.	89044100	CABLE 18GA 24WIRE	30FT
22.	70392785	PLUG 1/2	1
23.	77044196	CONNECTOR	1
24.	70145495	HEAT SHRINK	.50FT



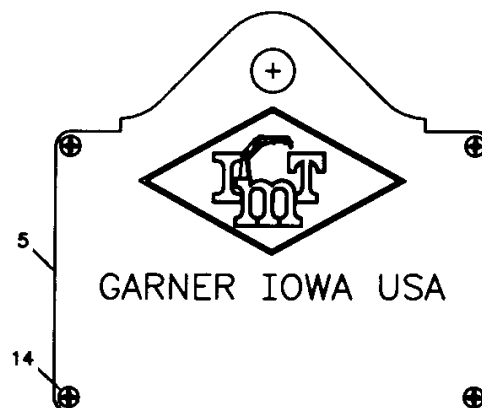
SOLID/STRIPE	FUNCTION
A YEL/BLK	ROT CW
B ORN/BLK	EXT OUT
C BLU/BLK	WIN DN
D RED/BLK	WIN UP
E ORN/RED	-
F BRN	EXT IN
G BRN/RED	ENG START
H BLU/RED	-
J BLK/RED	ENG SPD
K BRN/BLK	ROT CCW
L RED	POWER
M BLU	ENG STOP
N ORN	LWR DN
O BLK/ORN	-
P YEL	LWR UP
Q BRN/BLU	-
R YEL/RED	-
S BLK	-
T BLK/BLU	CPRSR
U RED/BLU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

**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.

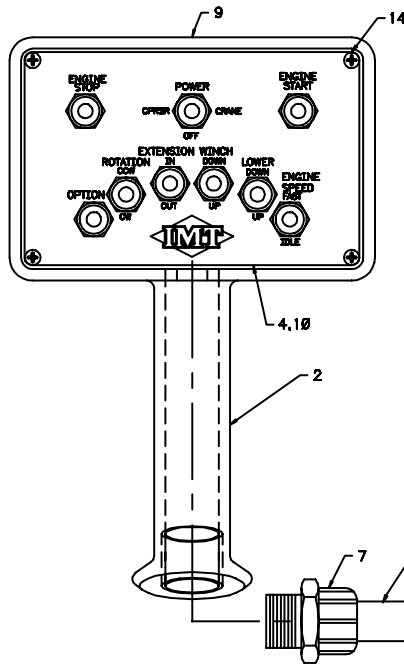
**ASSEMBLY OF SWITCHES ONTO FACE PLATE.**

- 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.



**RMT HANDLE ASM-PTO (51713182)**

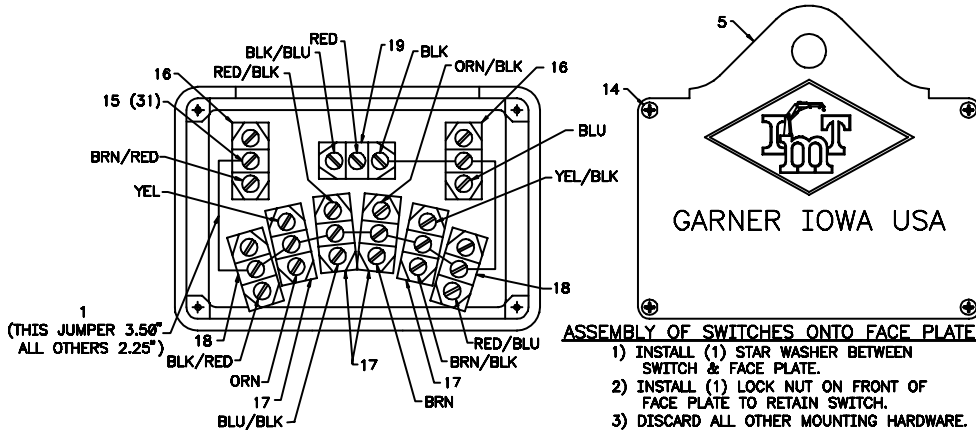
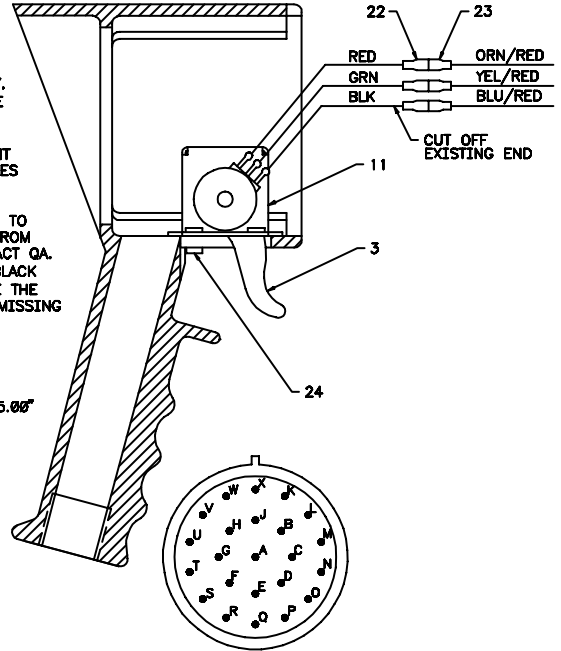
ITEM	PART NO.	DESCRIPTION	QTY				
1.	89044214	WIRE 18GAX GRN STRD	1.61FT	14.	72061009	SHT MTL SCR #6X3/4 PH	8
2.	60119335	CONTROL HANDLE	1	15.	77040051	TERM-SPRSPD #8 16-14GA	31
3.	60111141	TRIGGER (PART OF 11)	1REF	16.	77040371	TOGGLE SWITCH SPST	2
4.	60119277	COVER	1	17.	77040372	TOGGLE SWITCH SPDT	4
5.	70034306	BACK COVER	1	18.	77040373	TOGGLE SWITCH SPST	2
7.	7704196	STRAIN RELIEF 3/4	1	19.	77040374	TOGGLE SWITCH SPDT	1
8.	77044621	PIN	23	20.	77044579	CONNECTOR	1
9.	70394447	DECAL-DGR RC ELECTRO SM	1	21.	89044100	CABLE 18GA 24WIRE	30FT
10.	70394142	DECAL-CTRL	1	22.	77040147	TERM-1/4FSLPON 22-18GA	3
11.	70394183	TRIGGER ASM (INCL:3)	1	23.	77040047	TERM-1/4MSLPON 16-14GA	3
				24.	72060602	MACH SCR #6-32X3/8 RDHD	4
				25.	70145495	HEAT SHRINK	.50FT

**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:**

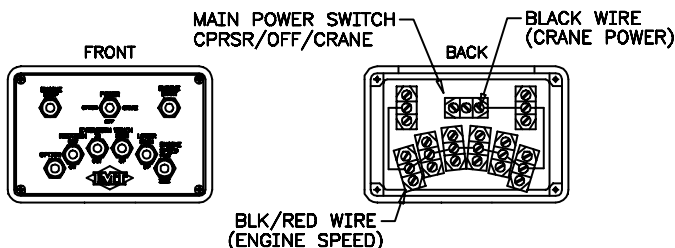
- 1) CUT WIRE CABLE OUTSIDE JACKET BACK 5.00"
- 2) SLIP ON HEAT SHRINK
- 3) MAKE WIRE CONNECTIONS
- 4) PUSH HEAT SHRINK UP AND HEAT.

**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	-

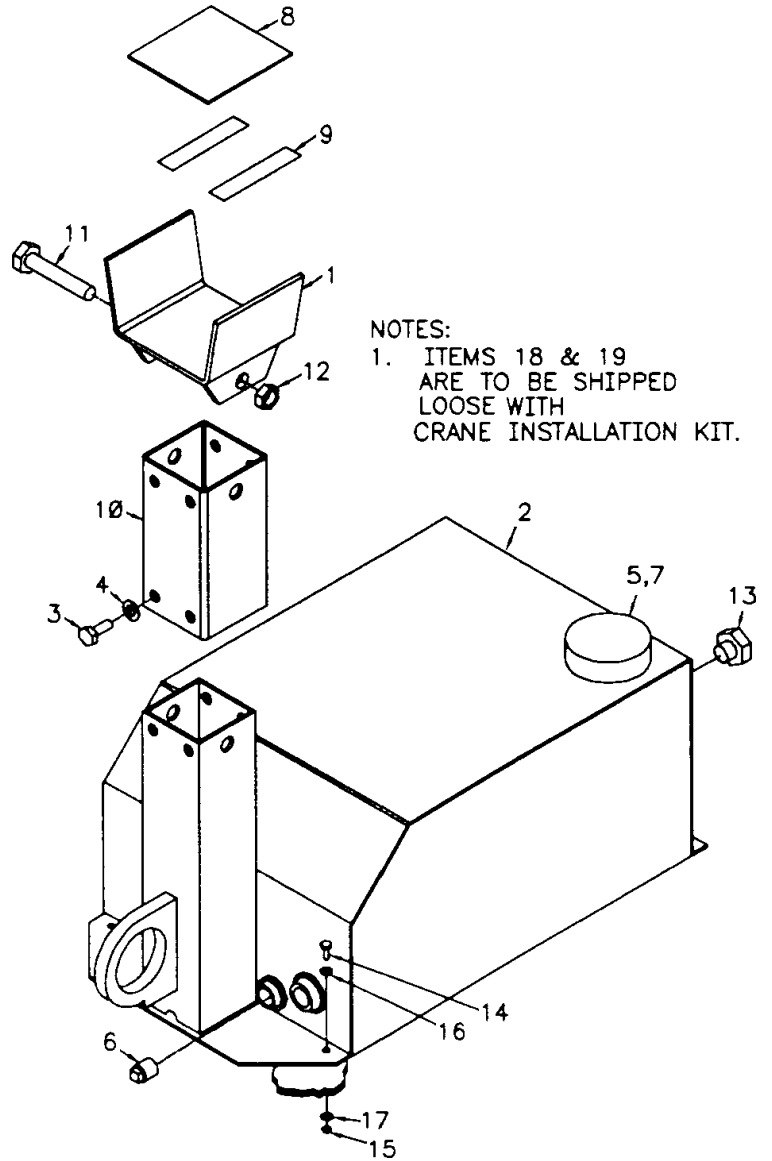
REWIRE CRANE REMOTE HANDLE TO ALLOW FOR THE OPERATION OF THE SOLENOID VALVE WHEN THE CRANE IS CHOSEN ON A TRUCK WITH AN AUTOMATIC TRANSMISSION



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).

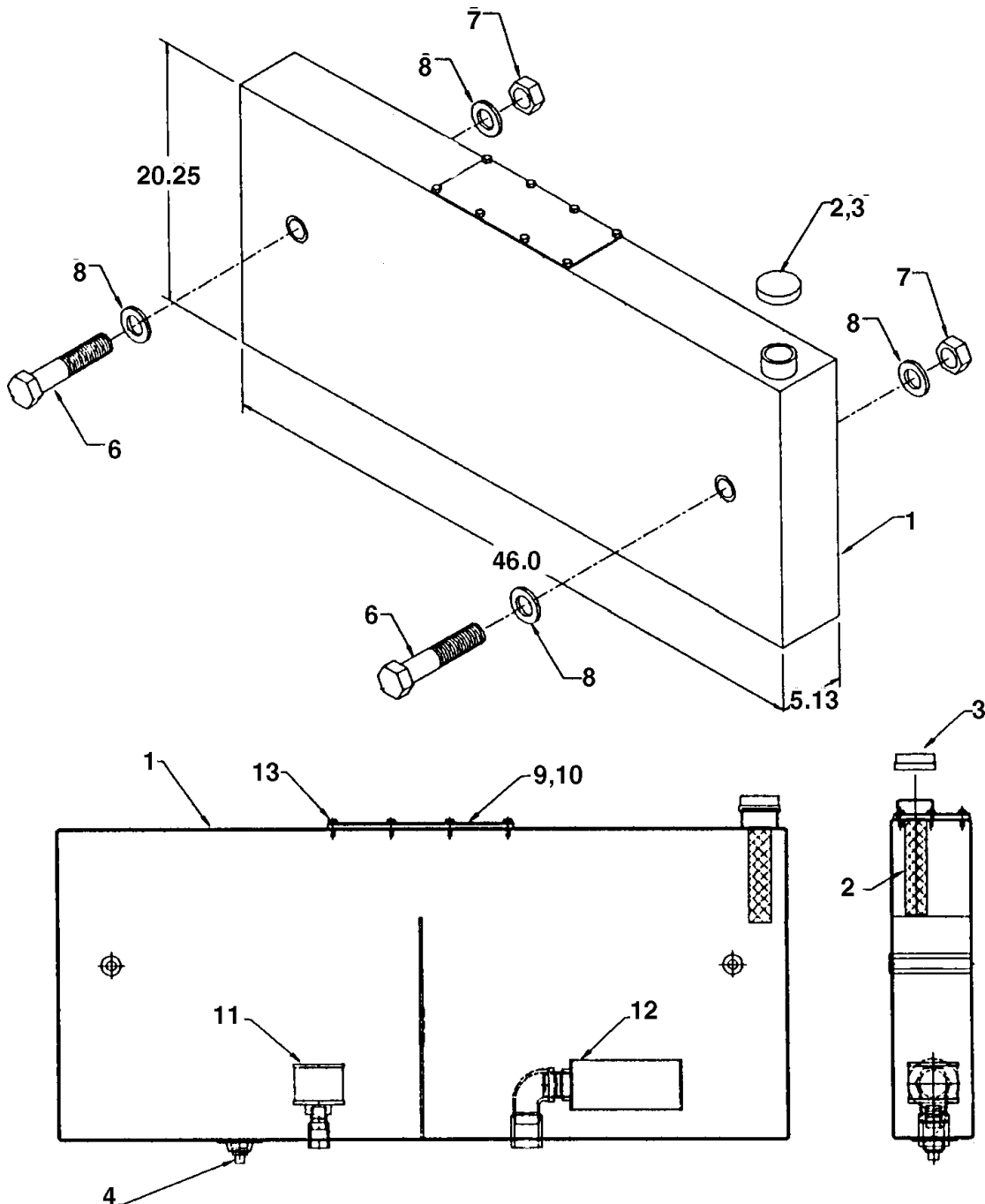
## OPTION-BOOM SUPPORT/RESERVOIR 20 GAL (51706910)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52705061	SADDLE	1
2.	52706909	RESERVOIR, 20 GAL.	1
3.	72060092	CAP SCREW, 1/2 X 1 1/4 GR5	4
4.	72063053	WASHER, LOCK, 1/2	4
5.	73014671	CAP, FILL	1
6.	73052001	PLUG, MAGNETIC, 3/4 NPT	1
7.	73141276	SCREEN, FILL NECK	1
8.	60030162	PAD, WEAR	1
9.	70086054	TAPE	12"
10.	60109252	TUBE, SADDLE	1
11.	72060195	CAP SCREW, 3/4 X 7 GR5	1
12.	72062114	NUT, SELF LOCKING, 3/4	1
13.	72532261	PLUG, SIGHT GAUGE, 3/4	1
14.	72060046	CAP SCREW, 3/8 X 1 GR5	4
15.	72062103	NUT, SELF LOCKING, 3/8	4
16.	72063003	WASHER, FLAT, 3/8	4
17.	76392821	SEAL, THREAD, 3/8	4
18.	73052012	SUCTION FILTER	1*
19.	72053211	PIPE NIPPLE	1*
20.	70394189	PLACARD-MOBIL OIL	1
* ITEMS 18 & 19 ARE SHIPPED LOOSE.			



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

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



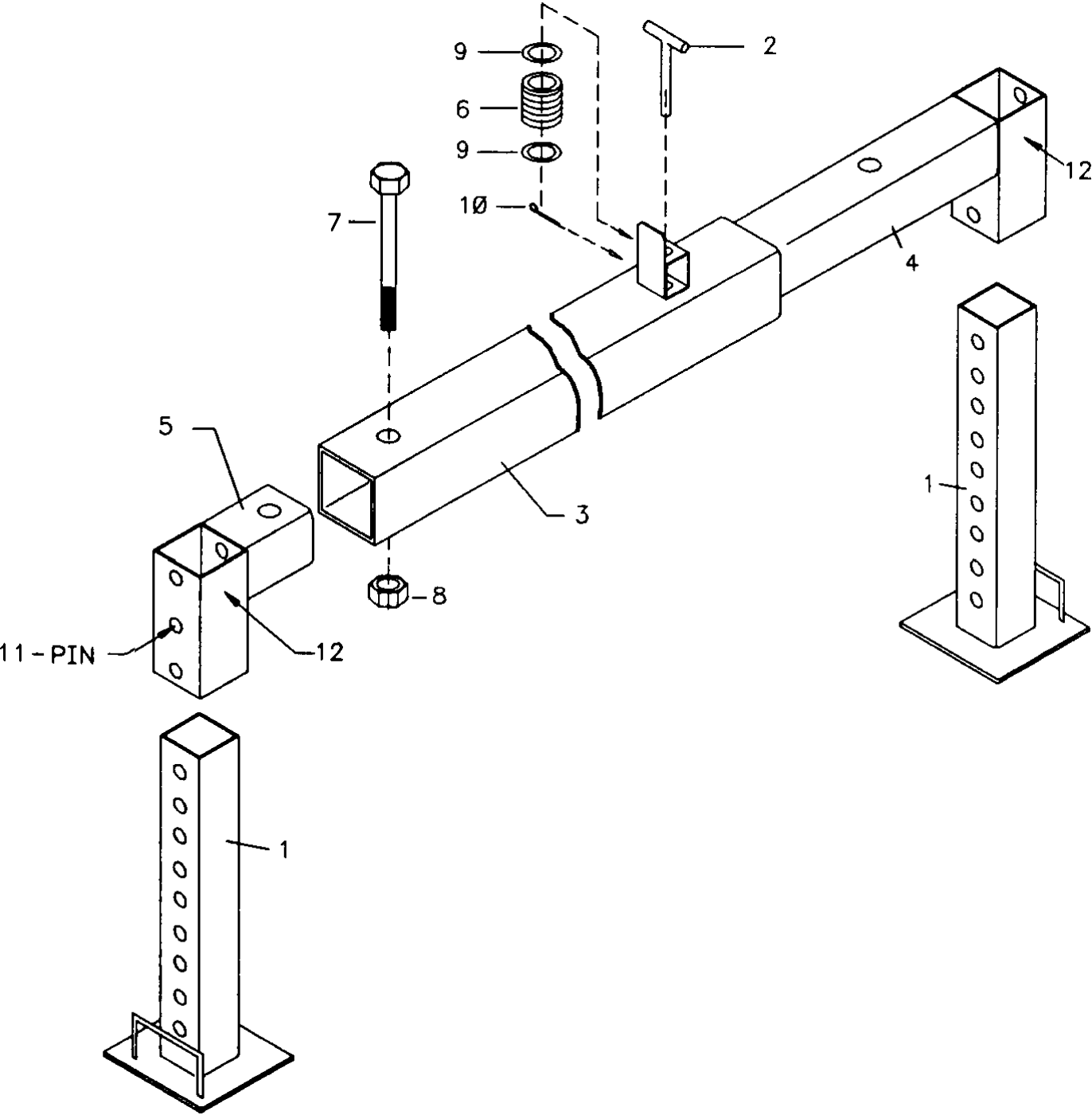
AUX OUTRIGGER-REAR-MNL OUT & DN  
(31711125)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52703353	OUTRIGGER LEG-MNL DN	2
2.	52070138	T-PIN	1
3.		OUTRIGGER HOUSING	1
4.	52712688	ARM-ADJ MNL OUT/DN	1
5.	52712689	ARM-STAT MNL OUT/DN	1
6.	60010351	SPRING	1
7.	72060104	CAP SCR 1/2-13X6-1/2 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	1
9.	72063007	WASHER 5/8 WRT	2
10.	72066185	COTTER PIN 5/32X1	1
11.	71731461	PIN-QUICK RELEASE	2
12.	70392864	DECAL-DANGER STAND CLEAR	2

INSTALLATION NOTE

OUTRIGGER HOUSING TUBE (ITEM 3) MUST BE TIED INTO THE STRUCTURAL SUPPORT OF THE CRANE.

DECAL PLACEMENT	
ITEM	LOCATION
14	ONE ON EACH OUTRIGGER



## AUX OUTRIGGER-MNL OUT/CRANK DN (31711126)

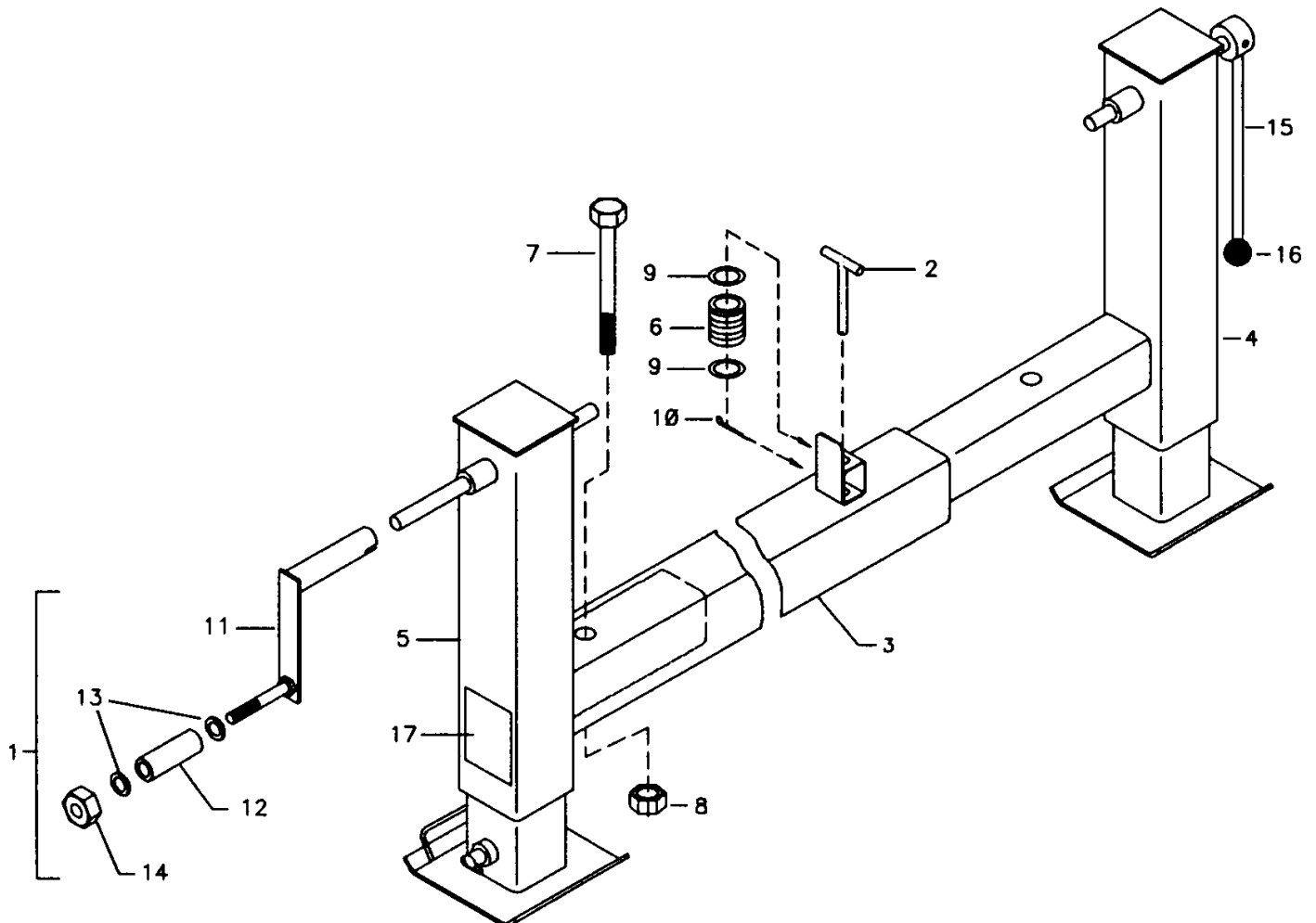
ITEM	PART NO.	DESCRIPTION	QTY
1.	51705040	CRANK ASM (INCLUDES 11-14)	1
2.	52070138	T-PIN	1
3.	52704814	HOUSING	1
4.	52712690	ARM-ADJUSTABLE	1
5.	52712691	ARM-STATIONARY	1
6.	60010351	SPRING	1
7.	72060104	CAP SCR 1/2-13X6-1/2 HHGR5	1
8.	72062080	NUT 1/2-13 HEX LOCK	1
9.	72063007	WASHER 5/8 WRT	2
10.	72066185	COTTER PIN 5/32X1	1
11.	52705039	CRANK (PART OF 1)	1REF
12.	60030099	ROLLER (PART OF 1)	1REF
13.	72063003	WASHER 3/8 WRT (PART OF 1)	2REF
14.	72062103	NUT 3/8-16 LOCK (PART OF 1)	1REF
15.	52703319	CRANK HANDLE	1
16.	71039096	CONTROL KNOB 1-1/2"	1
17.	70392864	DECAL-DANGER STAND CLEAR	2

### INSTALLATION NOTE

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

### DECAL PLACEMENT

ITEM	LOCATION
17	ONE ON EACH OUTRIGGER





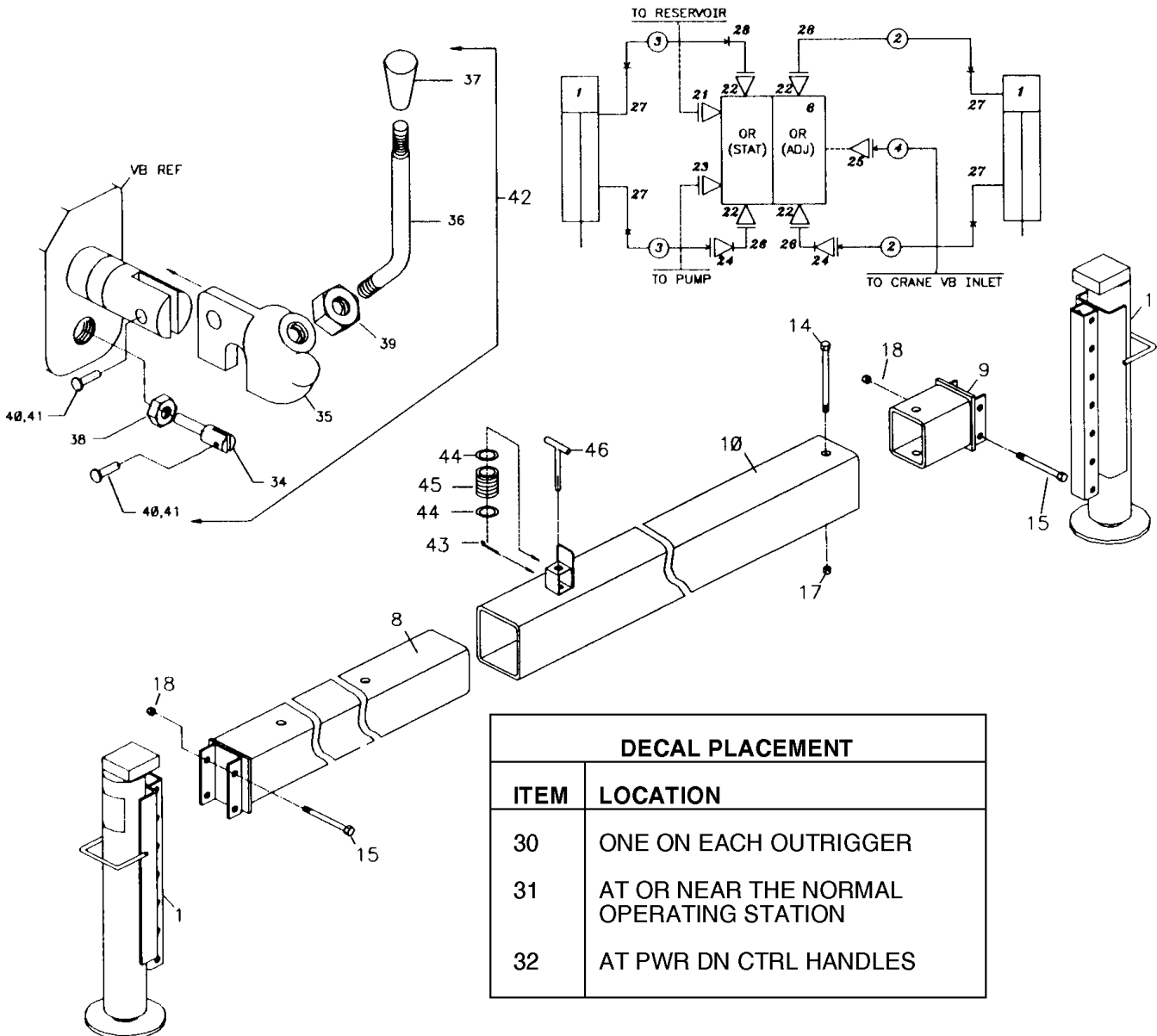
## AUX OUTRIGGER-MNL OUT/PWR DN (31711127)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B048870	POWER DOWN CYLINDER	2
2.	51705191	HOSE ASM 1/4X96 FF	2
3.	51703596	HOSE ASM 1/4X120 FF	2
4.	51703939	HOSE ASM 1/2X96 FF	1
6.	51705983	VALVEBANK 2-SECT (INCL:42)	1
8.	52711140	ARM-ADJUSTABLE	1
9.	52711139	ARM-STATIONARY	1
10.	52704814	OUTRIGGER HOUSING	1
14.	72060104	CAP SCR 1/2-13X6-1/2 HHGR5	1
15.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
17.	72062080	NUT 1/2-13 LOCK	1
18.	72062091	NUT 5/8-11 LOCK	4
21.	72532365	ADAPTER #10MSTR #12MJIC	1
22.	72532722	ADAPTER #10MSTR #6FSTR	4
23.	72532358	ADAPTER #8MSTR #8MJIC	1
24.	72532707	ADAPTER #4MJIC #6MJIC	2
25.	72053764	ELBOW #10MSTR #8MJIC 90°	1
26.	72532700	ELBOW #6MSTR #6MJIC XLG 90°	2
27.	72053758	ELBOW #4MSTR #4MJIC 90°	4

28.	72532699	ELBOW #6MSTR #4MJIC 90°	2
30.	70392864	DECAL-DGR STAND CLEAR	2
31.	70392867	DECAL-DGR OUTGR MOVING	1
32.	71392257	DECAL-CONTROL PO	1
34.	70142648	LEVER PIVOT (PART OF 42)	2REF
35.	70142650	LEVER SUPPORT (PART OF 42)	2REF
36.	70142651	LEVER-CTRL HNDL (PART 42)	2REF
37.	71392269	KNOB (PART OF 42)	2REF
38.	72062021	NUT 5/16-18 HEX (PART OF 42)	2REF
39.	72062024	NUT 1/2-13 HEX(PART OF 42)	2REF
40.	72066162	COTTER PIN (PART OF 42)	4REF
41.	72661204	CLEVIS PIN (PART OF 42)	4REF
42.	51731580	HANDLE ASM (INCL:34-41) (PART OF 5)	2REF
43.	72066185	COTTER PIN 5/32X1	1
44.	72063007	WASHER 5/8 WRT	2
45.	60010351	SPRING	1
46.	52070138	T-PIN	1

### INSTALLATION NOTE

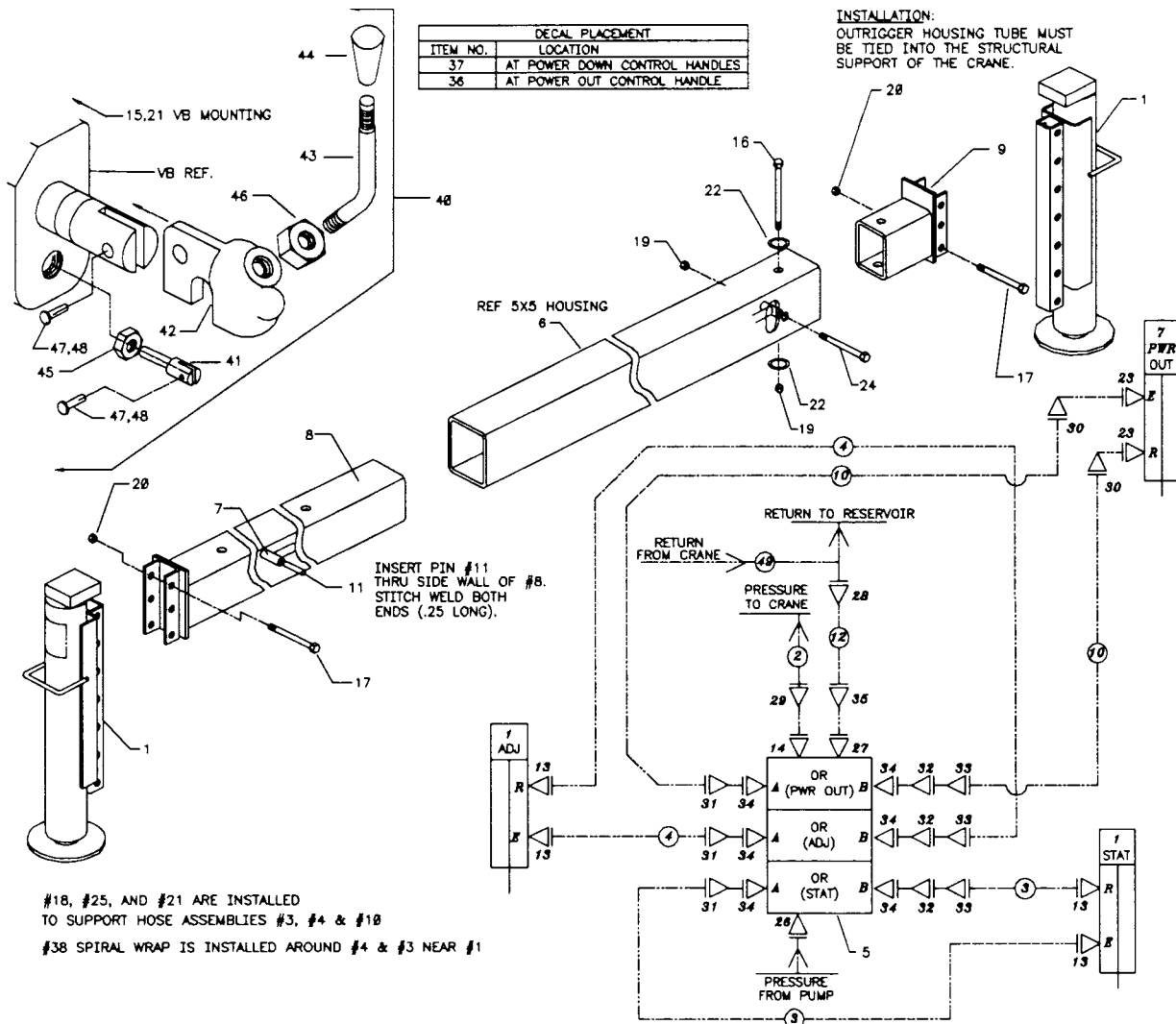
OUTRIGGER HOUSING TUBE MUST BE TIED INTO THE STRUCTURAL SUPPORT OF THE CRANE.



## AUX OUTRIGGER-PWR OUT/PWR DN 5X5 (31711128)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B048870	CYLINDER-PWR DN	2
2.	51703604	HOSE ASM 3/8X134 FF	1
3.	51705364	HOSE ASM 1/4X128 FF	2
4.	51705191	HOSE ASM 1/4X96 FF	2
5.	51705984	VALVEBANK 3-SECT (INCL:40)	1
6.	60116643	TUBE	1
7.	3B142860	CYLINDER-PWR OUT	1
8.	52711140	ARM-ADJUSTABLE	1
9.	52711139	ARM-STATIONARY	1
10.	51707597	HOSE ASM 1/4X105 FF	2
11.	60107866	PIN	1
12.	51705062	HOSE ASM 1/2X48 FF	1
13.	72053758	ELBOW #4MSTR #4MJIC 90°	4
14.	72053764	ELBOW #10MSTR #8MJIC 90°	1
15.	72060025	CAP SCR 5/16-18X1 HHGR5	4
16.	72060104	CAP SCR 1/2-13X6-1/2 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
18.	72060833	SCR 5/16-18X3/4 THRD CUTING	2
19.	72062080	NUT 1/2-13 LOCK	2
20.	72062091	NUT 5/8-11 LOCK	4
21.	72063002	WASHER 5/16 WRT	6
22.	72063005	WASHER 1/2 WRT	2
23.	72532351	ADAPTER #4MSTR #4MJIC	4

24.	72601297	CAP SCR 1/2-13X5-3/4 HHGR5	1
25.	72066582	CLAMP	2
26.	72532358	ADAPTER #8MSTR #8MJIC	1
27.	72532365	ADAPTER #10MSTR #12MJIC	1
28.	72532769	TEE 9/16JIC 3/8TUBE	1
29.	72532658	ELBOW #8MJIC #8FJIC SW	1
30.	72532690	ELBOW #4MJIC #4FJIC SW	2
31.	72532699	ELBOW #6MSTR #4MJIC 90°	3
32.	72532700	ELBOW #6MSTR #6MJIC 90°XLG	3
33.	72532707	ADAPTER #4MJIC #6FJIC	3
34.	72532722	ADAPTER #10MSTR #6FSTR	6
35.	72532696	ELBOW #12MJIC #12FJIC SW	1
36.	71392277	DECAL-PWR OUT	1
37.	76391511	DECAL-STABILIZER	1
38.	89034049	SPIRAL WRAP	6'
39.	99900644	MANUAL-OUTRIGGER	1
40.	51731580	HANDLE (INCL:41-48,PART OF 5)	2REF
41.	70142648	PIVOT-LEVER (PART OF 40)	2REF
42.	70142650	LEVER SUPPORT (PART OF 40)	2REF
43.	70142651	LEVER-CTRL (PART OF 40)	2REF
44.	71392269	KNOB (PART OF 40)	2REF
45.	72062021	NUT 5/16-18 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.	51703939	HOSE ASM 1/2X96 FF	1



**CYLINDER-PWR DN (3B288970)**

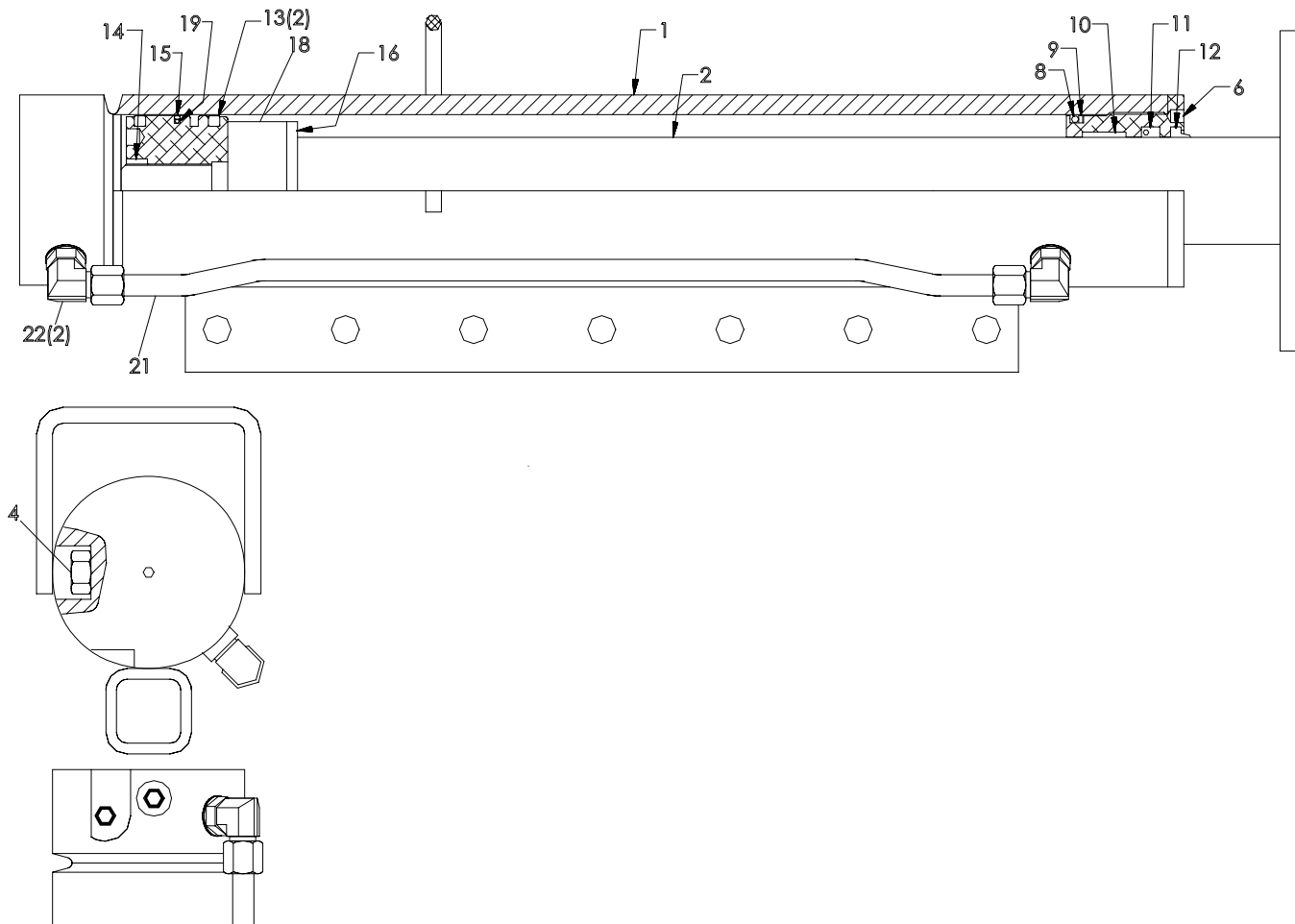
1.	4B288970	CASE ASM	1
2.	4G048870	ROD ASM	1
4.	73054681	CHECK VALVE	1
6.	6H035025	HEAD	1
7.	6I035125	PISTON	1
8.	7Q072338	O-RING (PART OF 17)	1REF
9.	7Q10P338	BACK-UP RING (PART OF 17)	1REF
10.	7T2N8027	WEAR RING (PART OF 17)	1REF
11.	7R546025	ROD SEAL (PART OF 17)	1REF
12.	7R14P025	ROD WIPER (PART OF 17)	1REF
13.	7T65I035	PISTON RING (PART OF 17)	2REF
14.	7T61N125	LOCK RING SEAL (PART OF 17)	1REF
15.	7T66P035	PISTON SEAL (PART OF 17)	1REF
16.	6A025025	WAFFER LOCK (PART OF 17)	1REF
17.	9C142020	SEAL KIT (INCL:8-16,19)	1
18.	6C015025	STOP TUBE	1
19.	7Q072151	O-RING (PART OF 17)	1REF
21.	5P288970	PORT TUBE	1
22.	72053763	ELBOW #8MSTR #8MJIC 90°	2

**NOTE**

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

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

USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER. KEEP AWAY FROM ALL SEALS.



CYLINDER-PWR OUT (3B142860)

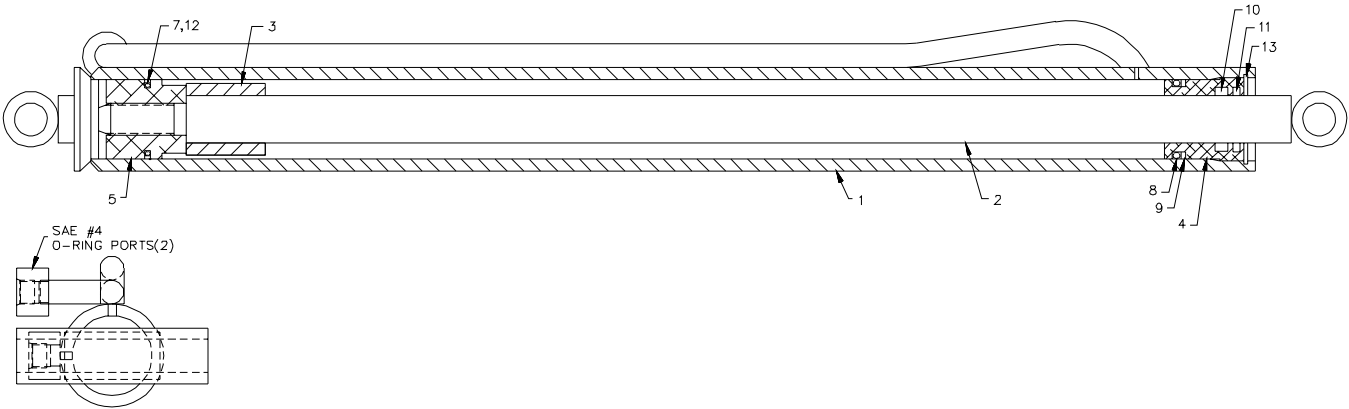
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B142860	CASE ASM	1
2.	4G142860	ROD ASM	1
3.	6C125007	STOP TUBE	1
4.	6H012007	HEAD	1
5.	6I012050	PISTON	1
6.	9B050608	SEAL KIT (INCL:7-12)	1
7.	7Q072021	O-RING (PART OF 6)	1REF
8.	7Q072214	O-RING (PART OF 6)	1REF
9.	7Q10P214	BACK-UP RING (PART OF 6)	1REF
10.	7R100750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



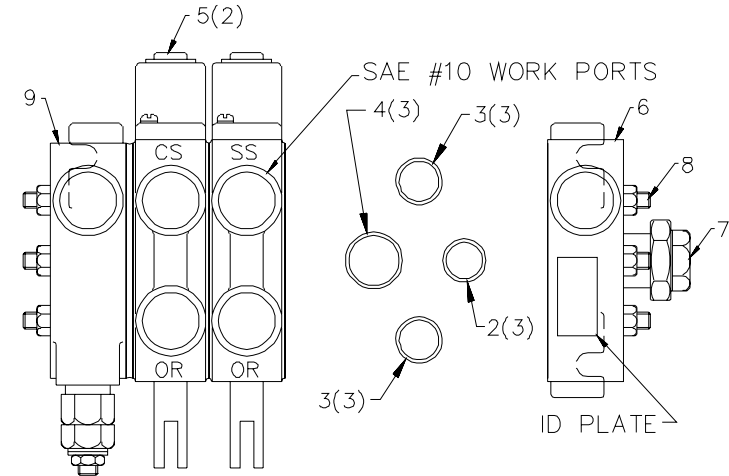
VALVEBANK ASM-2 SECTION (51705983)

EFFECTIVE PREVIOUS TO 1-1-00:

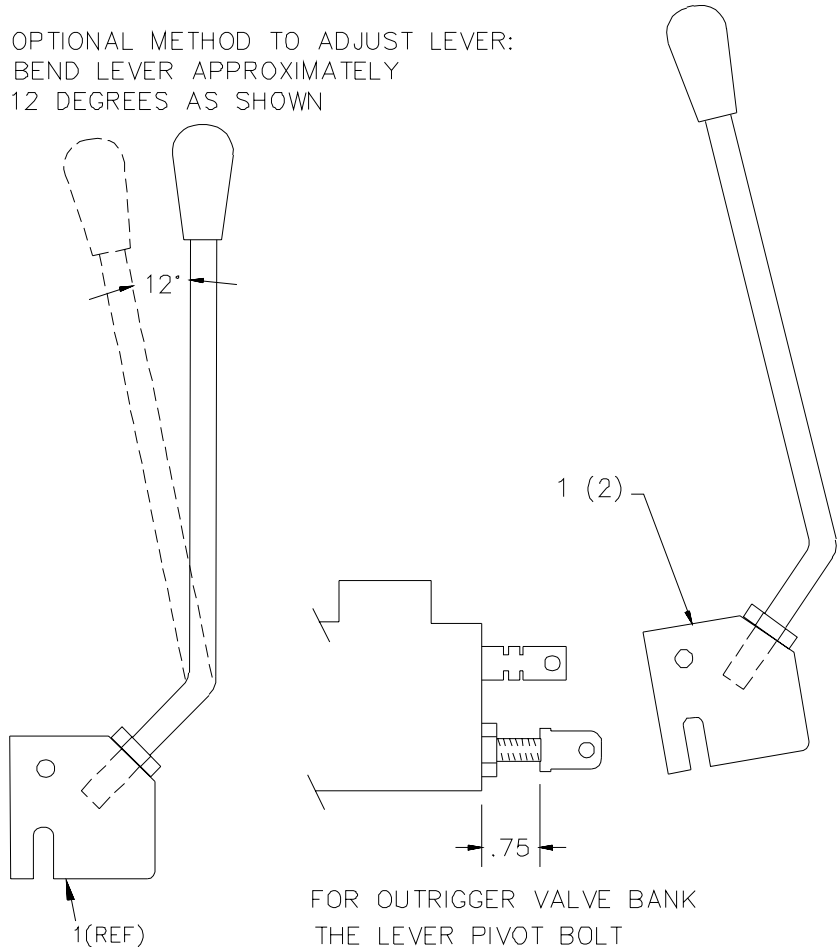
1.	51731580	LEVER ASM	2
2.	7Q072017	O-RING SM	3
3.	7Q072018	O-RING MED	6
4.	7Q072021	O-RING LG	3
5.	73054490	TANDEM VALVE SECTION	2
6.	73540010	END COVER RH	1
7.	73731763	POWER BEYOND ADAPTER	1
8.	94731590	TIE ROD KIT (2 SECT)	1
9.	73054488	END COVER-LH	1

EFFECTIVE FROM 1-1-00:

1.	73540073	LEVER ASM	2
2.	7Q072017	O-RING SM	3
3.	7Q072018	O-RING MED	6
4.	7Q072021	O-RING LG	3
5.	73540074	VALVE SECTION 4-WAY	2
6.	73540075	END COVER RH	1
7.	73540076	POWER BEYOND ADAPTER	1
8.	73540078	TIE ROD KIT (2 SECT)	1
9.	73540077	END COVER-LH	1



OPTIONAL METHOD TO ADJUST LEVER:  
BEND LEVER APPROXIMATELY  
12 DEGREES AS SHOWN



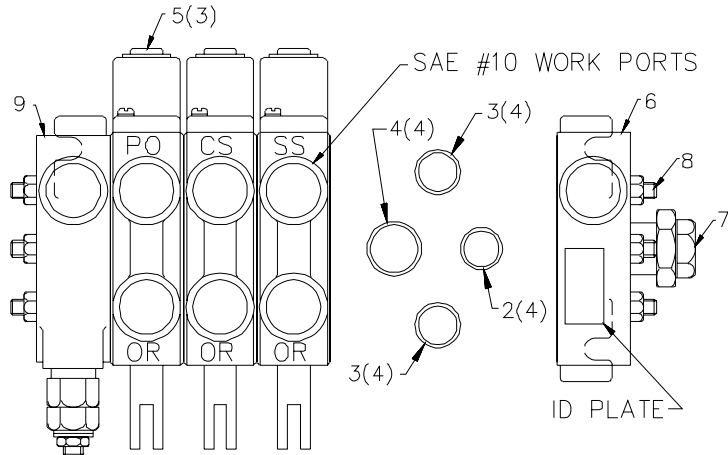
FOR OUTRIGGER VALVE BANK  
THE LEVER PIVOT BOLT  
MUST BE HELD OUT .75"  
SO HANDLE TIPS IN AS SHOWN

**VALVEBANK ASM-3 SECTION (51705984)****EFFECTIVE PREVIOUS TO 1-1-00:**

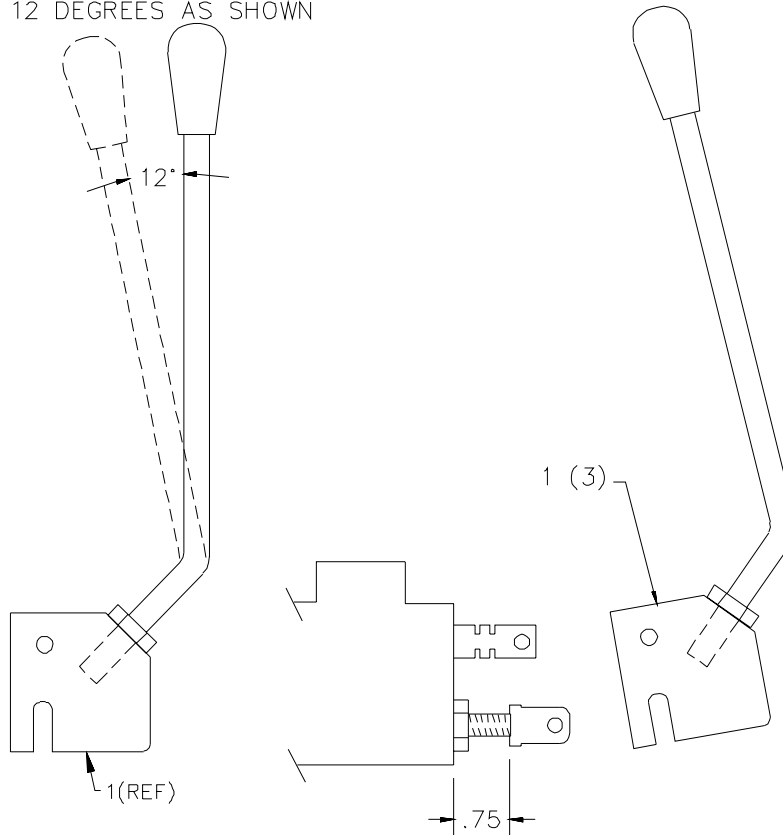
1.	51731580	HANDLE ASM (NOT SHOWN)	3
2.	7Q072017	O-RING SM	4
3.	7Q072018	O-RING MED	8
4.	7Q072021	O-RING LG	4
5.	73054490	TANDEM VALVE SECTION	3
6.	73540010	END COVER RH	1
7.	73731763	POWER BEYOND ADAPTER	1
8.	94731764	TIE ROD KIT	1
9.	73054488	END COVER LH	1

**EFFECTIVE FROM 1-1-00:**

1.	73540073	HANDLE ASM	3
2.	7Q072017	O-RING SM	4
3.	7Q072018	O-RING MED	8
4.	7Q072021	O-RING LG	4
5.	73540074	VALVE SECTION	3
6.	73540075	END COVER RH	1
7.	73540076	POWER BEYOND ADAPTER	1
8.	73540079	TIE ROD KIT	1
9.	73540077	END COVER LH	1



OPTIONAL METHOD TO ADJUST LEVER:  
BEND LEVER APPROXIMATELY  
12 DEGREES AS SHOWN

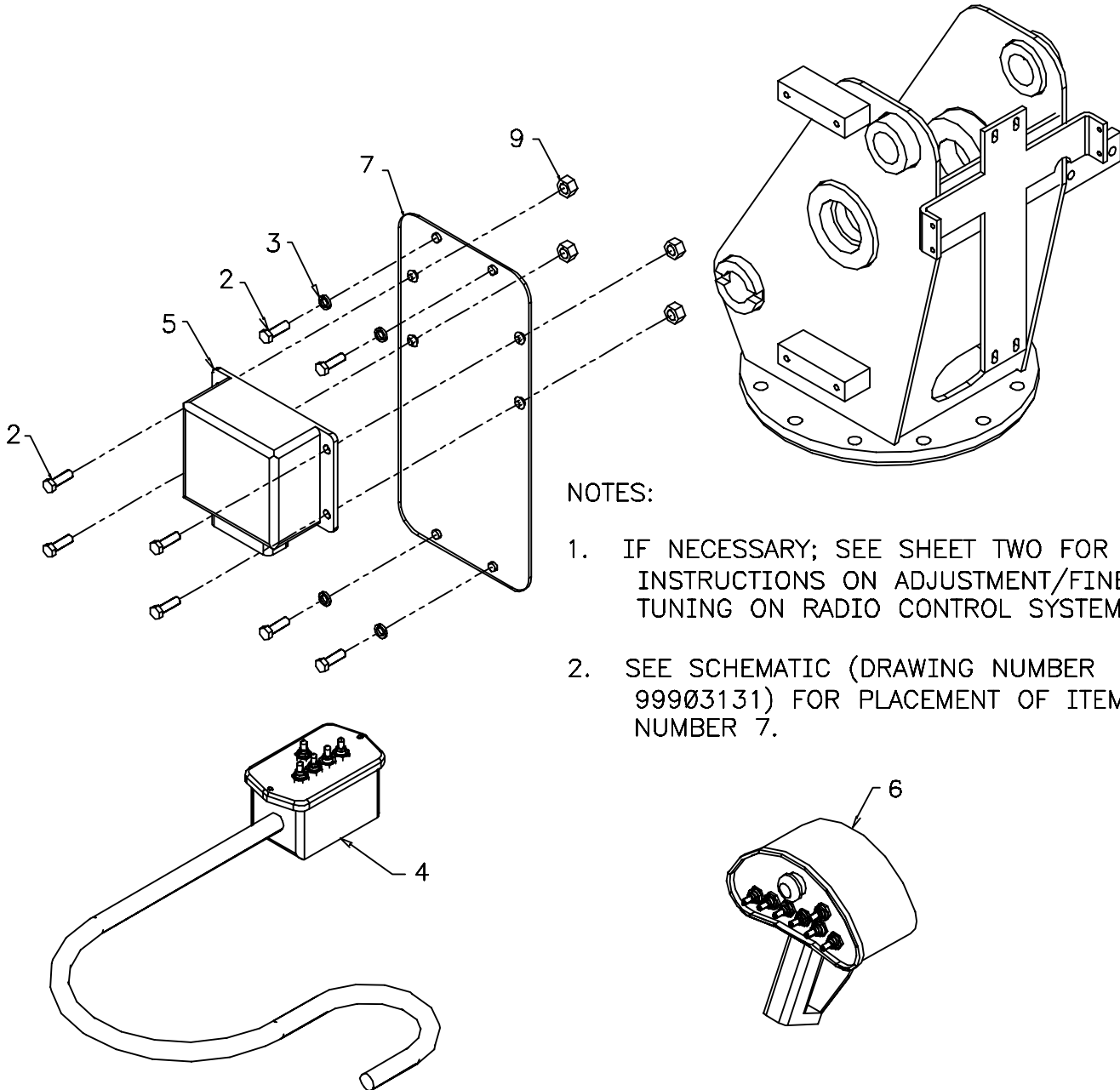


FOR OUTRIGGER VALVE BANK  
THE LEVER PIVOT BOLT  
MUST BE HELD OUT .75"  
SO HANDLE TIPS IN AS SHOWN

**CONTROL KIT-RADIO RMT (90715576-1)**

1.	70733354	RADIO RMT (INCL:5&6)	1
2.	72060025	CAP SCR 5/16-18X1 HHGR5	8
3.	72063050	WASHER 5/16 LOCK	4
4.	51715567	HANDLE ASM-RAD RMT BACKUP	1
5.	73733392	RADIO RMT-RCVR (PART OF 1)	1REF
6.	73733393	RADIO RMT-XMTR (PART OF 1)	1REF
7.	70034439	LOCK WIRE LEAD SEAL 8"	2
8.	72062109	NUT 5/16-18 LOCK	4
9.	60121960	BRACKET	1

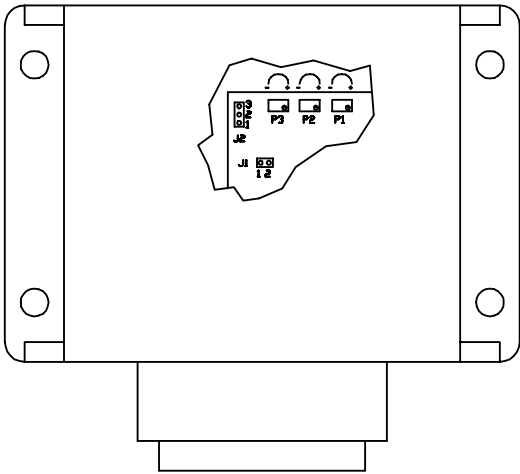
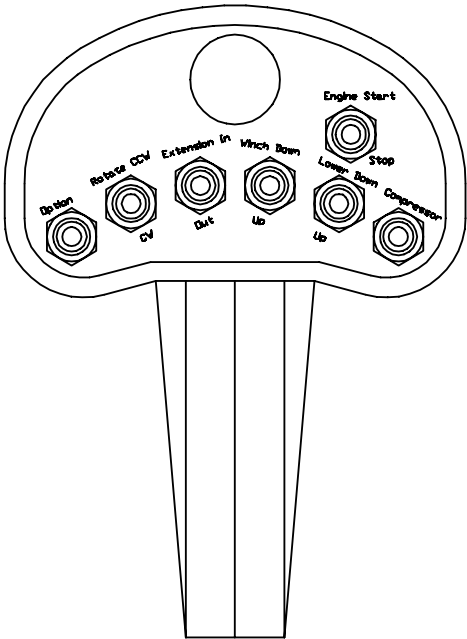
CONTINUED ON FOLLOWING PAGE

**NOTES:**

1. IF NECESSARY; SEE SHEET TWO FOR INSTRUCTIONS ON ADJUSTMENT/FINE TUNING ON RADIO CONTROL SYSTEM.
2. SEE SCHEMATIC (DRAWING NUMBER 99903131) FOR PLACEMENT OF ITEM NUMBER 7.

CONTROL KIT-RADIO RMT (90715576-2)

CONNECTOR PIN LETTER	IMT ASSIGNED FUNCTION
A1	ROT CW
A2	EXT OUT
A3	WINCH DN
A4	WINCH UP
A5	PROP VALVE +
A6	EXT IN
A7	ENGINE START
A8	RADIO GND
A9	SPEED RELAY
B1	NOT USED
B2	ROT CCW
B3	RADIO POWER
B4	KILL RELAY
B5	LOW DN
B6	NOT USED
B7	LOWER UP
B8	NOT USED
B9	NOT USED
C1	PROP VALVE -
C2	NOT USED
C3	COMPRESSOR
C4	WINCH 2 SPD
C5	NOT USED
C6	NOT USED
C7	NOT USED
C8	NOT USED
C9	NOT USED



JUMPER CONNECTIONS INSIDE RECEIVER

- J1: PULSE/DITHER FREQUENCY  
- NO JUMPER
- J2: CONTROL RANGE OF OUTPUT CURRENT (ONLY  
CURRENT-CONTROL)  
- PIN 2/3 CONNECTED: 0-2A

- P1: TRIMMING POTENTIOMETER FOR MAXIMUM VALUES. ON TRANSMITTER HANDLE, ENGAGE ROTATION CW OR CCW FUNCTION SWITCH AND PULL TRIGGER FULLY ON. CRANE MAY OR MAY NOT BEGIN TO MOVE AT THIS TIME DUE TO P1 INITIAL SETTING. TURN P1 POTENTIOMETER COUNTERCLOCKWISE UNTIL DESIRED MAXIMUM SPEED IS OBTAINED OR UNTIL SPEED NO LONGER CONTINUES TO INCREASE.
- P2: TRIMMING POTENTIOMETER FOR INITIAL VALUE ADJUSTMENT. ON TRANSMITTER, ENGAGE ROTATION CW OR CCW FUNCTION SWITCH. WITHOUT PULLING TRIGGER, ADJUST P2 COUNTERCLOCKWISE UNTIL CRANE BEGINS TO MOVE. AT THIS TIME, ADJUST P2 CLOCKWISE UNTIL NO MOVEMENT IS DETECTED. SLIGHTLY ENGAGE TRIGGER AND ADJUST P2 TO FINE TUNE.
- P3: TRIMMING POTENTIOMETER TO ADJUST DITHERAMPLITUDE: ADJUST CLOCKWISE OR COUNTERCLOCKWISE FOR SMOOTHNESS OF OPERATION.



HANDLE ASM-RADIO RMT (51715567)

1.

73733374

CABLE ASM

1
2.

77041345

SWITCH-TOGGLE SGL-THRW

1
3.

77041346

SWITCH-TOGGLE DBL-THRW

4
4.

60121724

JIC BOX

1
5.

77040186

TERMINAL 1/4FSLPON

14
6.

60045031

WIRE 4" GRN

4
7.

77044018

STRAIN RELIEF 1/2

1
8.

77044201

NUT 1/2 ELEC

1
9.

70395536

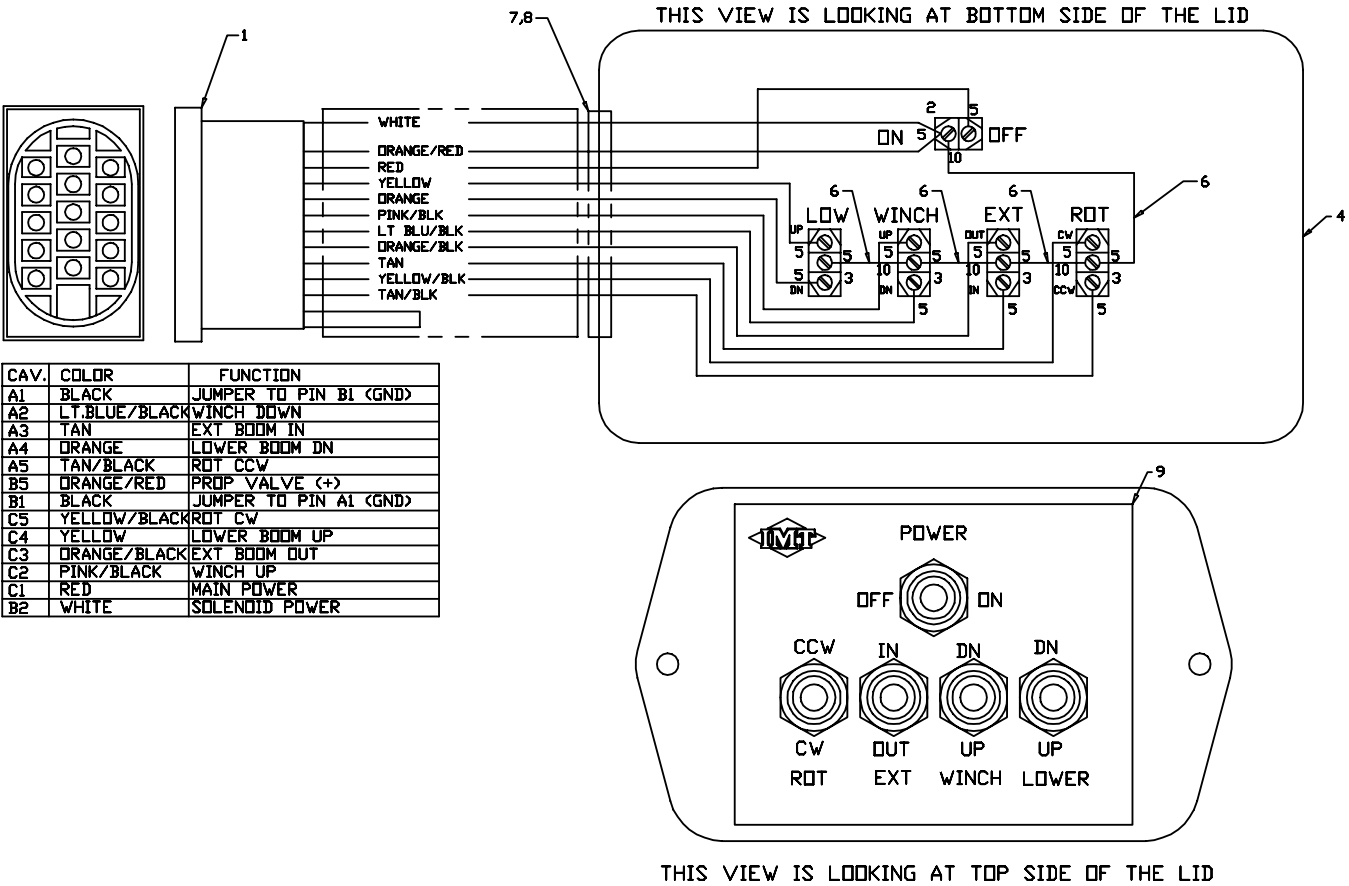
DECAL-RMT CTRL

1
10.

77040282

TERM-1/4 PIGBAC 16-14GA

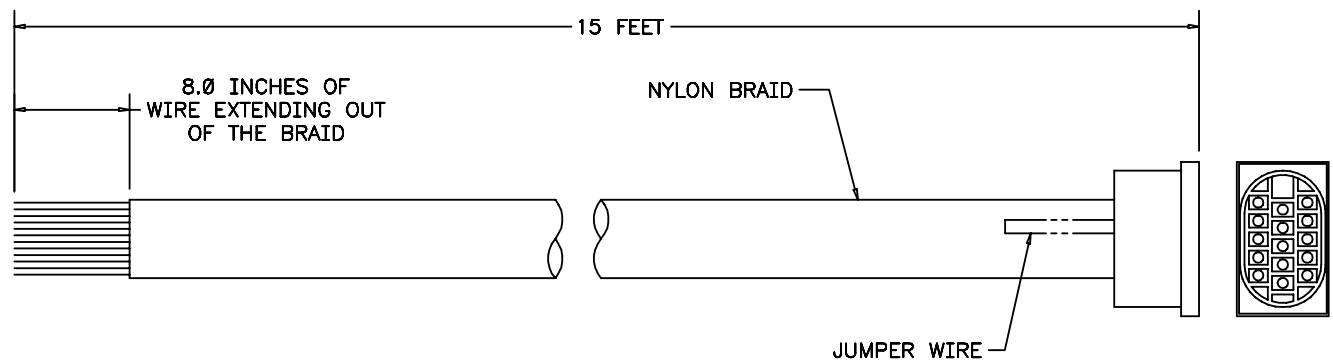
4



CABLE ASM-RADIO RMT BACKUP (73733374)

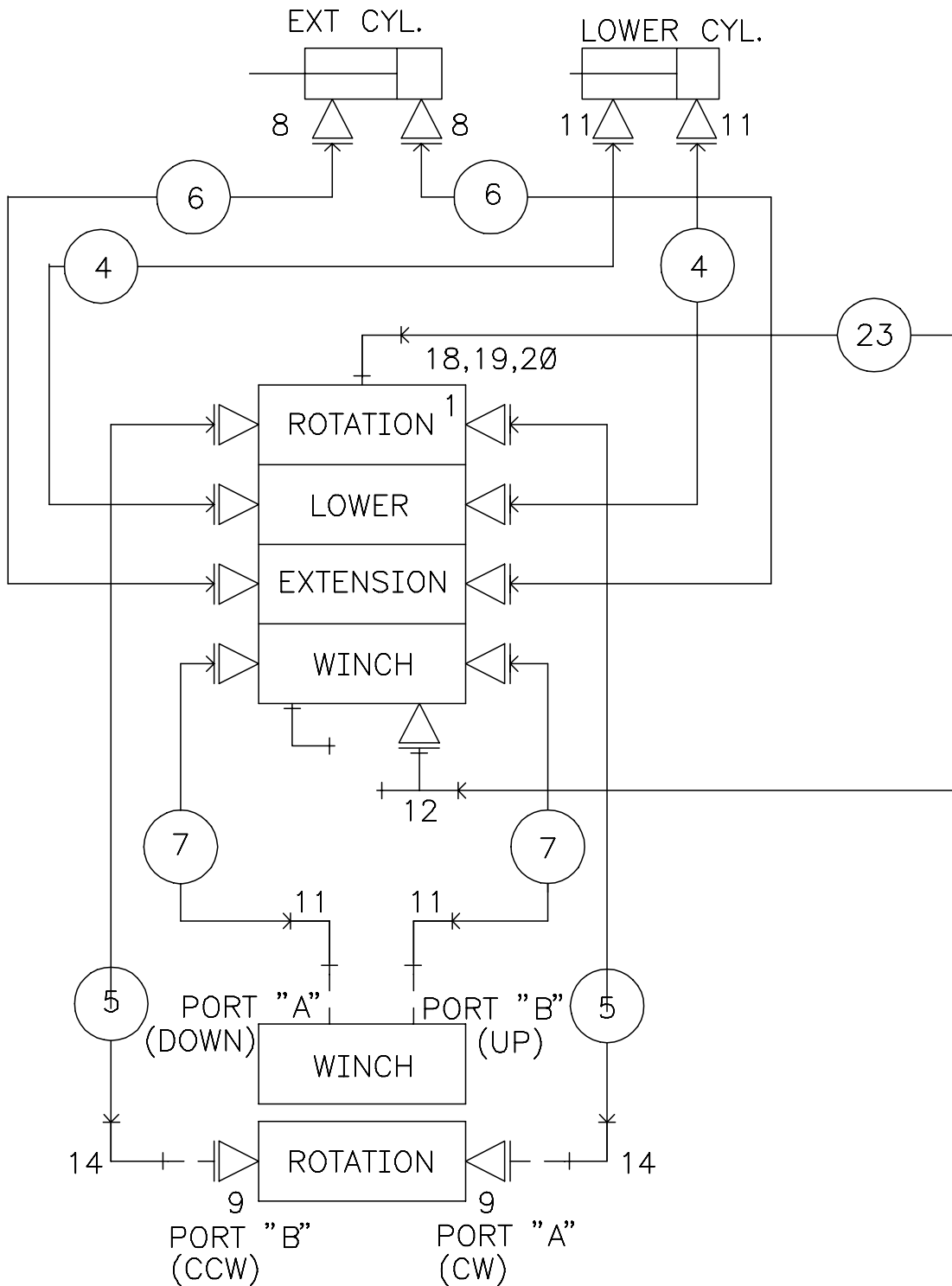
CAV.	COLOR	GA.	FUNCTION—TELESCOPIC	LABELING	FUNCTION—ARTICULATING
*A1	BLACK	20	PROP GROUND	GND	JUMPER TO PIN B1 (GND)
A2	LT BLU/BLK	20	WINCH DOWN	WIN DN	INNER BOOM DOWN
A4	ORANGE	20	LOWER DOWN	LOW DN	OUTER BOOM DOWN
A3	TAN	20	EXTENSION IN	EXT IN	ROT CCW
A5	TAN/BLK	20	ROTATE CCW	ROT CCW	EXT BOOM IN
B5	ORANGE/RED	20	PROP VALVE +	PROP VALVE +	PROP VALVE (+)
*B1	BLACK	20	PROP GROUND	GND	JUMPER TO PIN A1 (GND)
C5	YELLOW/BLK	20	ROTATE CW	ROT CW	EXT BOOM OUT
C3	ORANGE/BLK	20	EXTENSION OUT	EXT OUT	ROT CW
C4	YELLOW	20	LOWER UP	LOW UP	OUTER BOOM UP
C2	PINK/BLACK	20	WINCH UP	WIN UP	INNER BOOM UP
C1	RED	20	RADIO POWER	RAD PWR	MAIN POWER
B2	WHITE	20	SOLENOID POWER	SOL PWR	SOLENOID POWER

\* CAVITIES A1 AND B1 ARE JUMPERED.



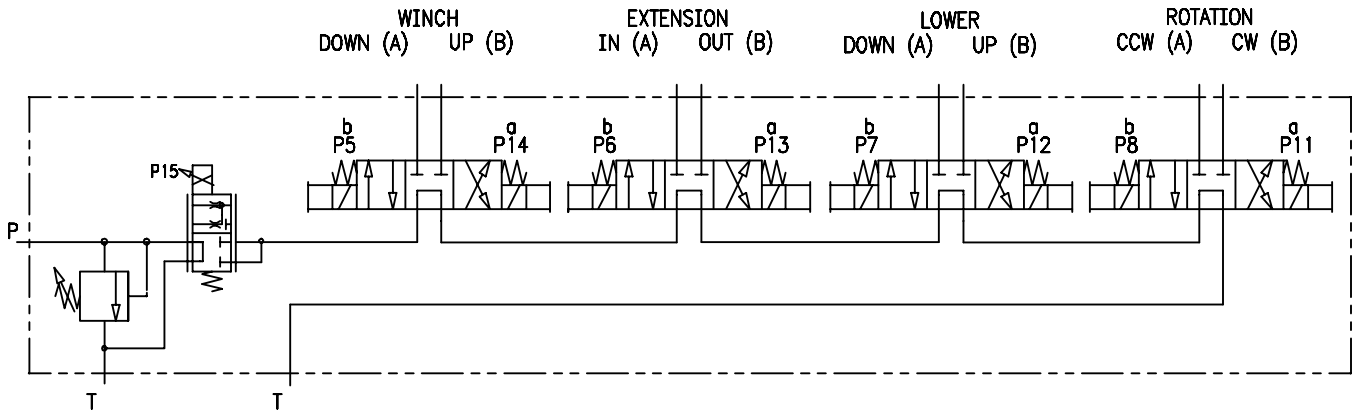
**HYD KIT-RADIO RMT (91715579)**

1.	73733382	VALVEBANK	1
4.	51393953	HOSE FJ .25X34 #4#4	2REF
5.	51394953	HOSE FJ .25X39 #4#4	2REF
6.	51395537	HOSE FJ .25X55 #4#4	2REF
7.	51395226	HOSE FJ .25X24 #4#4	2REF
8.	72532351	ADAPTER #4MSTR #4MJIC	2
9.	72532722	ADAPTER #10MSTR #6FSTR	2
11.	72532353	ADAPTER #6MSTR #4MJIC	4
12.	72532671	TEE #8JIC SWVLNUTBRANCH	1
14.	72532985	ELBOW #6MSTR #4MJIC 45°	2
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
19.	72063001	WASHER 1/4 WRT	4
20.	72062104	NUT 1/4-20 LOCK	4
22.	51715630	HOSE KIT (INCL:4-7,23)	1
23.	51394950	HOSE FI .50X11.5 #8#8	1REF

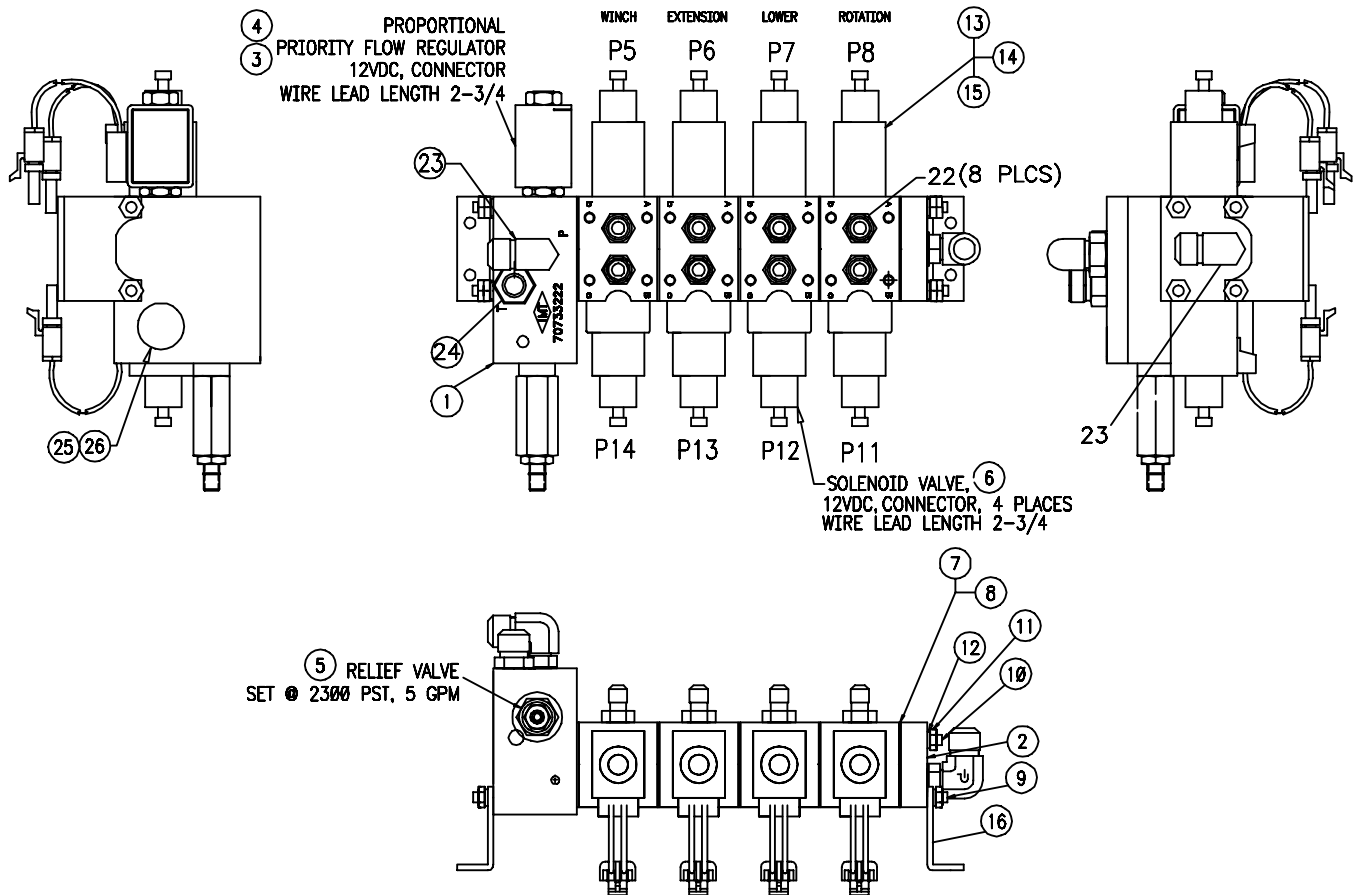


**VALVEBANK-4 SECTION (73733382)**

1. 70145629	INLET BODY	1	13. 77044574	CONNECTOR TOWER	9
2. 70145628	OUTLET BODY	1	14. 77044577	CONNECTOR TERMINAL	18
3. 70145627	PROPL FLOW REG	1	15. 77044578	CABLE SEAL	18
4. 70145626	COIL 12VDC	1	16. 70145738	MOUNTING FOOT	2
5. 70145625	RELIEF VALVE SET AT 2300PSI	1	17. 70145620	NAME TAG	1
6. 70145624	SOLENOID VALVE	4	21. 70733351	WIRING HARNESS	1
7. 70143337	O-RING PLATE	5	22. 72532353	ADAPTER #6MSTR #4MJIC	8
8. 70145623	O-RING	10	23. 72053762	ELBOW #6MSTR #8MJIC 90°	2
9. 70145622	ROD 1/4-20X11.5 GR8	2	24. 72532357	ADAPTER #6MSTR #8MJIC	1
10. 70145621	ROD 1/4-20X9.5 GR8	2	25. 70145884	PLUG HEX SOCHD	1
11. 72062000	NUT 1/4-20	6	26. 70145885	ORIFICE PLUG	1
12. 72063047	WASHER 1/4 LOCK	6			



HYDRAULIC SCHEMATIC



## CABLE ASM (70733351-1)

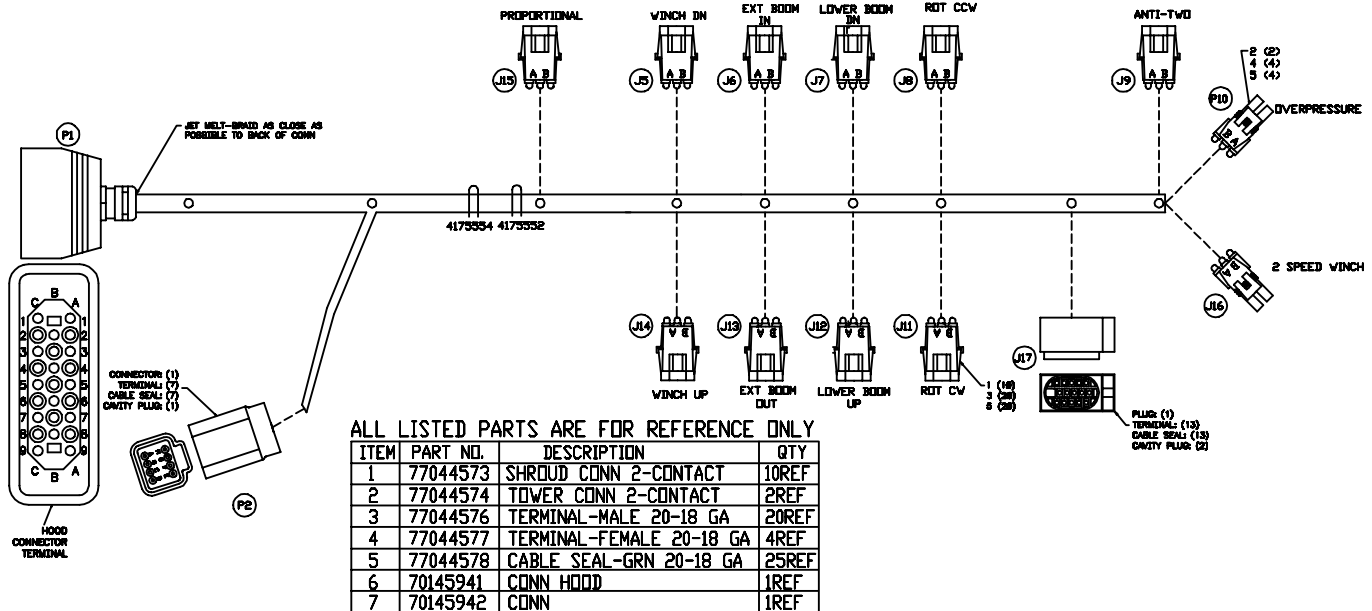
CONTINUED ON FOLLOWING PAGE

CAV.	COLOR	GA.	FUNCTION	LABELING	CONNECTIONS
PIA1	YELLOW/BLK	18	ROTATE CW	ROT CW J11B	PIA1 TO SPLC L
PIA2	ORANGE/BLK	18	BOOM EXT OUT	EXT J12B	PIA2 TO SPLC M
PIA3	LT. BLUE/BLK	18	WINCH DOWN	WIN J5B	PIA3 TO SPLC D
PIA4	PINK/BLK	18	WINCH UP	WIN J14B	PIA4 TO SPLC P
PIA5	ORANGE/RED	18	PROP +	PROP + J15B	PIA5 TO SPLC H
PIA6	TAN	18	BOOM EXT IN	EXT J7B	PIA6 TO SPLC F
PIA7	BRN/RED	16	ENGINE START	P2F	PIA7 TO P2F
PIA8	BLK	18	RADIO GROUND	GRND SPLC B	PIA8 TO SPLC B
PIA9	GRAY/RED	18	SPEED RELAY	SPD RELAY P2I	PIA9 TO SPLC D
PIB2	TAN/BLK	18	ROTATE CCW	ROT CCW J8B	PIB2 TO SPLC G
PIB3	RED	18	RADIO POWER	PWR P2B	PIB3 TO SPLC K
PIB4	LT. BLUE	18	KILL RELAY	P2B	PIB4 TO P2B
PIB5	ORANGE	18	LOWER DOWN	LOW J6B	PIB5 TO SPLC E
PIB7	YELLOW	18	LOWER UP	LOW J13B	PIB7 TO SPLC N
PIC1	YELLOW/RED	18	PROP -	PROP - J15A	PIC1 TO SPLC J
PIC2	WHITE	18	SOLENOID POWER	SOL PWR	PIC2 TO SPLC R
PIC3	BLK/BLUE	16	COMPRESSOR	P2C	PIC3 TO P2C
PIC4	RED/BLUE	16	WINCH 2 SPEED	WNSPD J16B	PIC4 TO J16B
J17A1	BLK	20	RADIO GRND	J17 GRND	J17A1 TO SPLC B
J17A2	LT. BLUE/BLK	20	WINCH DOWN	J17 WINCH DN	J17A2 TO SPLC D
J17A3	TAN	20	BOOM EXT IN	J17 EXT IN	J17A3 TO SPLC F
J17A4	ORANGE	20	LOWER DOWN	J17 LOW DN	J17A4 TO SPLC E
J17A5	TAN/BLK	20	ROTATE CCW	J17 ROT CCW	J17A5 TO SPLC G
J17B5	ORANGE/RED	20	PROP +	J17 PROP +	J17B5 TO SPLC H
J17B1	YELLOW/RED	20	PROP -	J17 PROP -	J17B1 TO SPLC J
J17C5	YELLOW/BLK	20	ROTATE CW	J17 ROT CW	J17C5 TO SPLC L
J17C3	ORANGE/BLK	20	BOOM EXT OUT	J17 EXT OUT	J17C3 TO SPLC M
J17C4	YELLOW	20	LOWER UP	J17 LOW UP	J17C4 TO SPLC N
J17C2	PINK/BLK	20	WINCH UP	J17 WINCH UP	J17C2 TO SPLC P
J17C1	RED	20	RADIO POWER	J17 RAD PWR	J17C1 TO SPLC K
J17B2	WHITE	20	SOLENOID POWER	J17 SOL PWR	J17B2 TO SPLC R

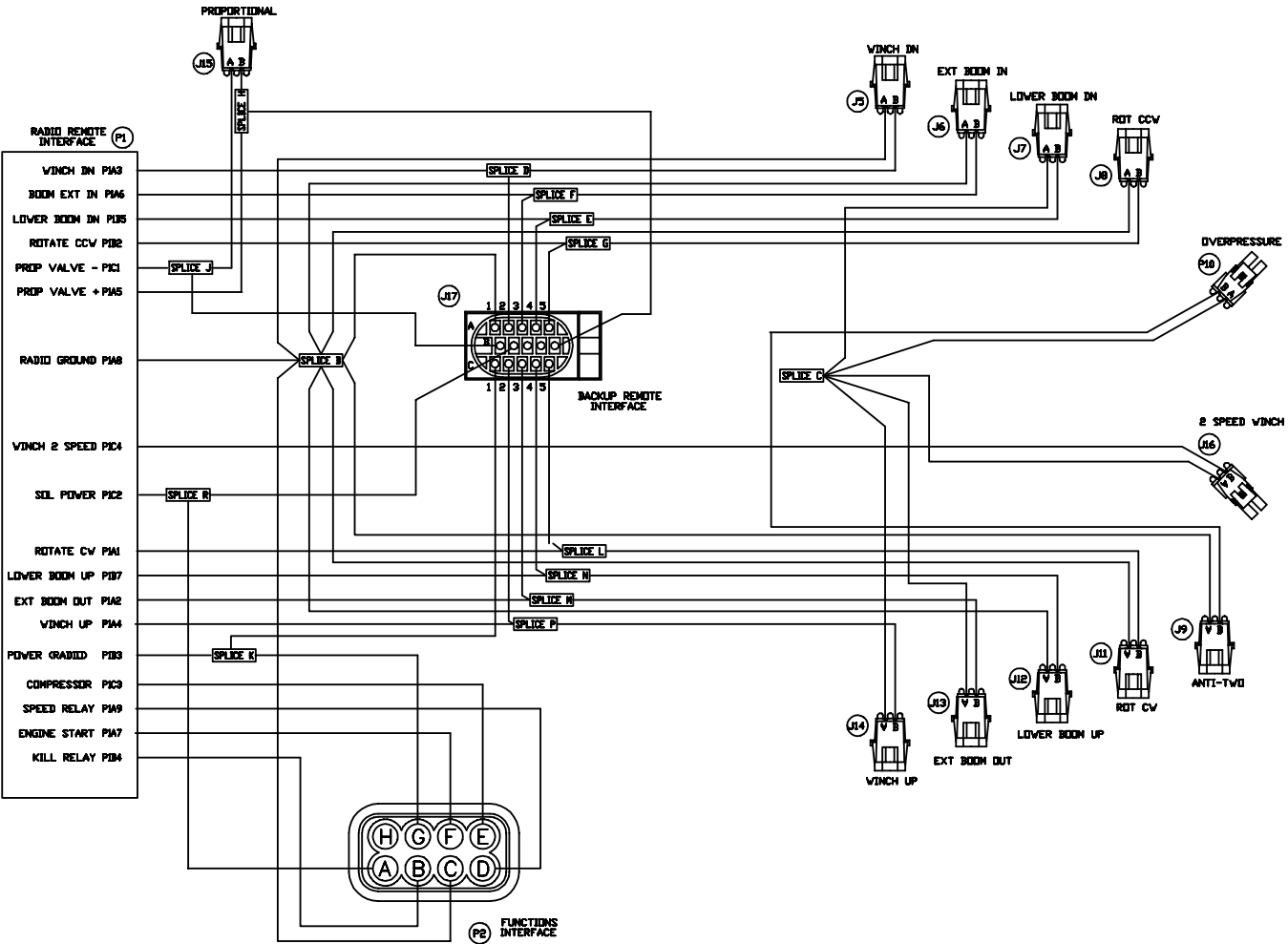
CAV.	COLOR	GA.	FUNCTION	LABELING	CONNECTIONS
J5A	BLK	16	WINCH DOWN	J5A WINCH DN	J5A TO SPLC B
J5B	LT. BLUE/BLK	18	WINCH DOWN	J5B WINCH DN	J5B TO SPLC D
J7A	BLK	16	LOWER DN	J7A LOW DN	J7A TO SPLC C
J7B	ORANGE	18	LOWER DN	J7B LOW DN	J7B TO SPLC E
J6A	BLK	16	EXT IN	J6A EXT IN	J6A TO SPLC B
J6B	TAN	18	EXT IN	J6B EXT IN	J6B TO SPLC F
J8A	BLK	16	ROTATE CCW	J8A ROT CCW	J8A TO SPLC B
J8B	TAN/BLK	18	ROTATE CCW	J8B ROT CCW	J8B TO SPLC G
J9A	BLK	16	ANTI-TWO	J9A ANTI-TWO	J9A TO SPLC B
J9B	BLK	16	OPRES/ANTI-TWO	P10 TO J9B	J9B TO P10B
P10A	BLK	16	OVER PRESSURE	P10 OPRES	P10A TO SPLC C
J11A	BLK	16	ROTATE CW	J11A ROT CW	J11A TO SPLC B
J11B	YELLOW/BLK	18	ROTATE CW	J11B ROT CW	J11B TO SPLC L
J12A	BLK	16	EXT OUT	J12A EXT OUT	J12A TO SPLC B
J12B	ORANGE/BLK	18	EXT OUT	J12B EXT OUT	J12B TO SPLC N
J13A	BLK	16	LOWER UP	J13A LOW UP	J13A TO SPLC C
J13B	YELLOW	18	LOWER UP	J13B LOW UP	J13B TO SPLC M
J14A	BLK	16	WINCH UP	J14A WINCH UP	J14A TO SPLC C
J14B	LT. BLUE/BLK	18	WINCH UP	J14B WINCH UP	J14B TO SPLC P
J15A	YELLOW/RED	18	PROP -	J15A PROP -	J15A TO SPLC J
J15B	ORANGE/RED	18	PROP +	J15B PROP +	J15B TO SPLC H
J16A	BLK	16	WINCH 2 SPEED	J16A WNSPD	J16A TO SPLC C
P2A	WHITE	18	SOLENOID POWER	SOL PWR	P2A TO SPLC R
P2C	BLK	16	RADIO GROUND	RADIO GROUND	P2C TO SPLC B
P2G	RED	18	RADIO POWER	RADIO POWER	P2G TO SPLC K

WIRE SPECIFICATIONS			
PART #	SIZE (AWG)	# OF STRANDS	INSULATION THICKNESS
GA18	18	19/28	.023 MILS-NOM.
GA16	16	19/28	.023 MILS-NOM.
GA20	20	7/28	.023 MILS-NOM.

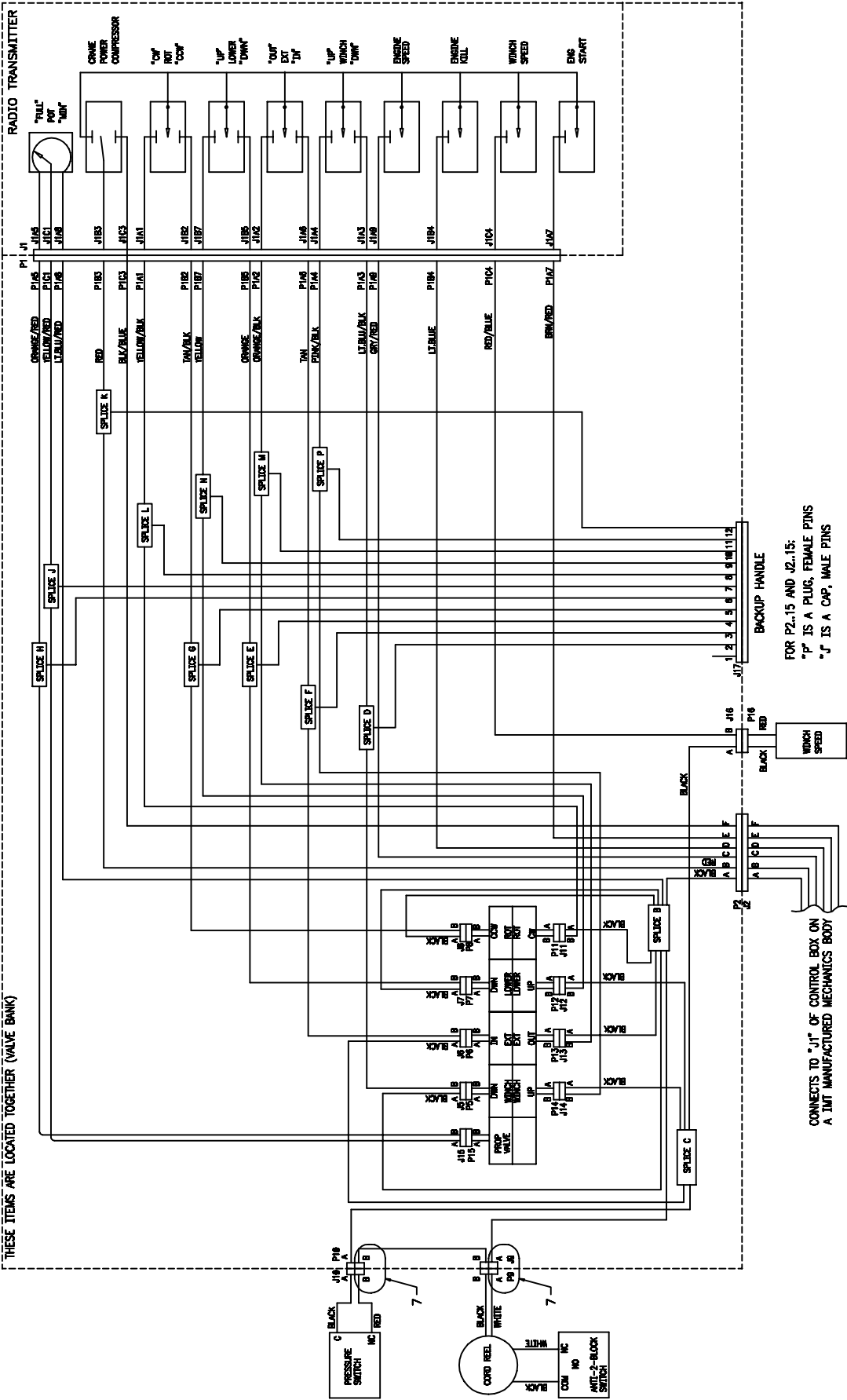
- HEAT RESISTANCE IN ACCORDANCE WITH SAE J-1126  
- TEMPERATURE RANGE: -51 C TO +125 C  
- MEETS Ford SP2C (M11-5028) & CHRYSLER (MS-9000)



CABLE ASM (70733351-2)

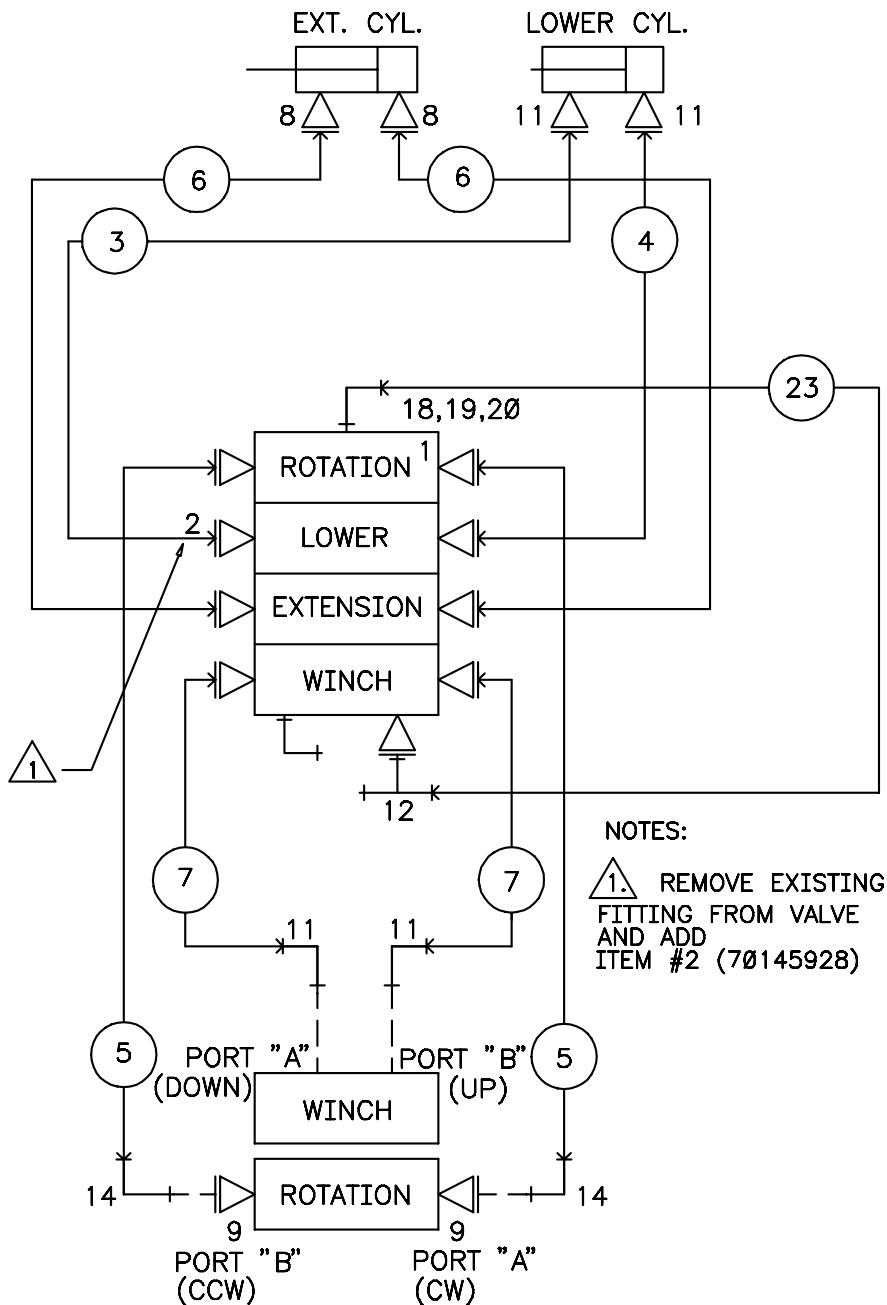


SCHEMATIC (99903131)



**HYD KIT-NON-PROP'L PTO (91715657)****REPLACES 91715099 EFF: 4-1-00**

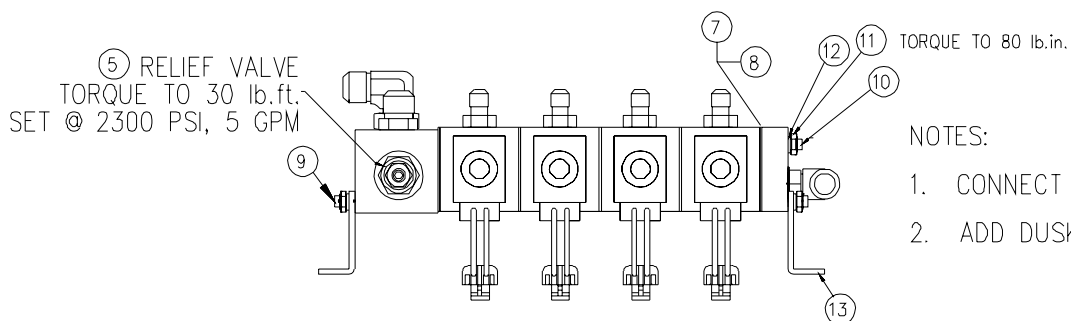
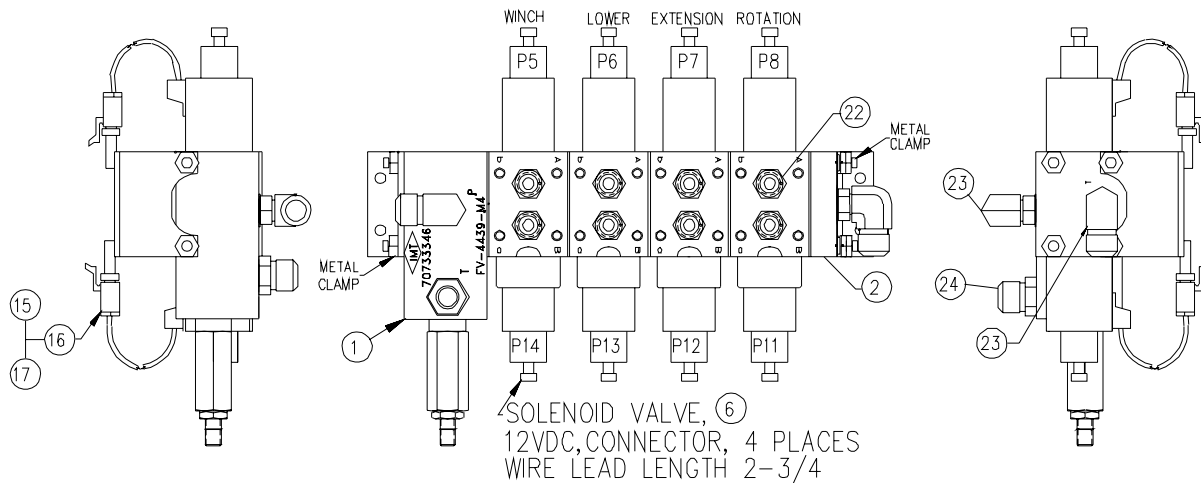
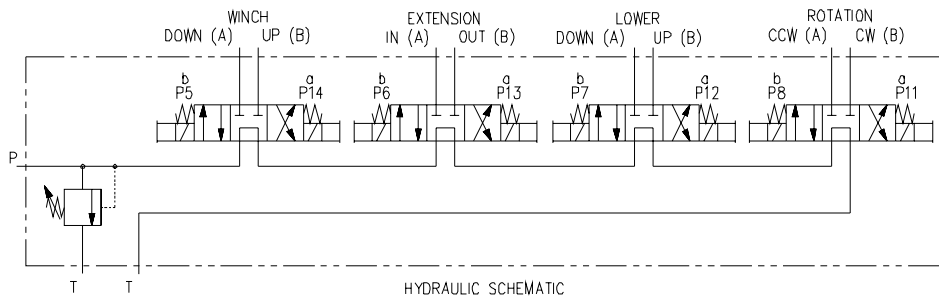
1.	70733400	VALVEBANK	1
2.	70145928	FLOW LIMITER	1
3.	51395535	HOSE-1/4X34 #4#6(PART OF 22)	1REF
4.	51393953	HOSE-1/4X34 #4#4(PART OF 22)	1REF
5.	51394953	HOSE-1/4X39 #4#4(PART OF 22)	2REF
6.	51395537	HOSE-1/4X55 #4#4(PART OF 22)	2REF
7.	51395226	HOSE-1/4X24 #4#4(PART OF 22)	2REF
8.	72532351	ADAPTER #4MSTR #4MJIC	2
9.	72532722	ADAPTER #10MSTR #6FSTR	2
11.	72532353	ADAPTER #6MSTR #4MJIC	4
12.	72532671	TEE #8JIC SWVL NUT BRANCH	1
14.	72532985	ELBOW #6MSTR #4MJIC 45°	2
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
19.	72063001	WASHER 1/4 WRT	4
20.	72062104	NUT 1/4-20 LOCK	4
22.	51715658	HOSE KIT (INCL:3-7&23)	1
23.	51394949	HOSE-1/2X11.5#8#8(PART OF 22)	1REF





**VALVEBANK-NON PROP'L (70733400)****REPLACES 70733346 EFF: 4-1-00**

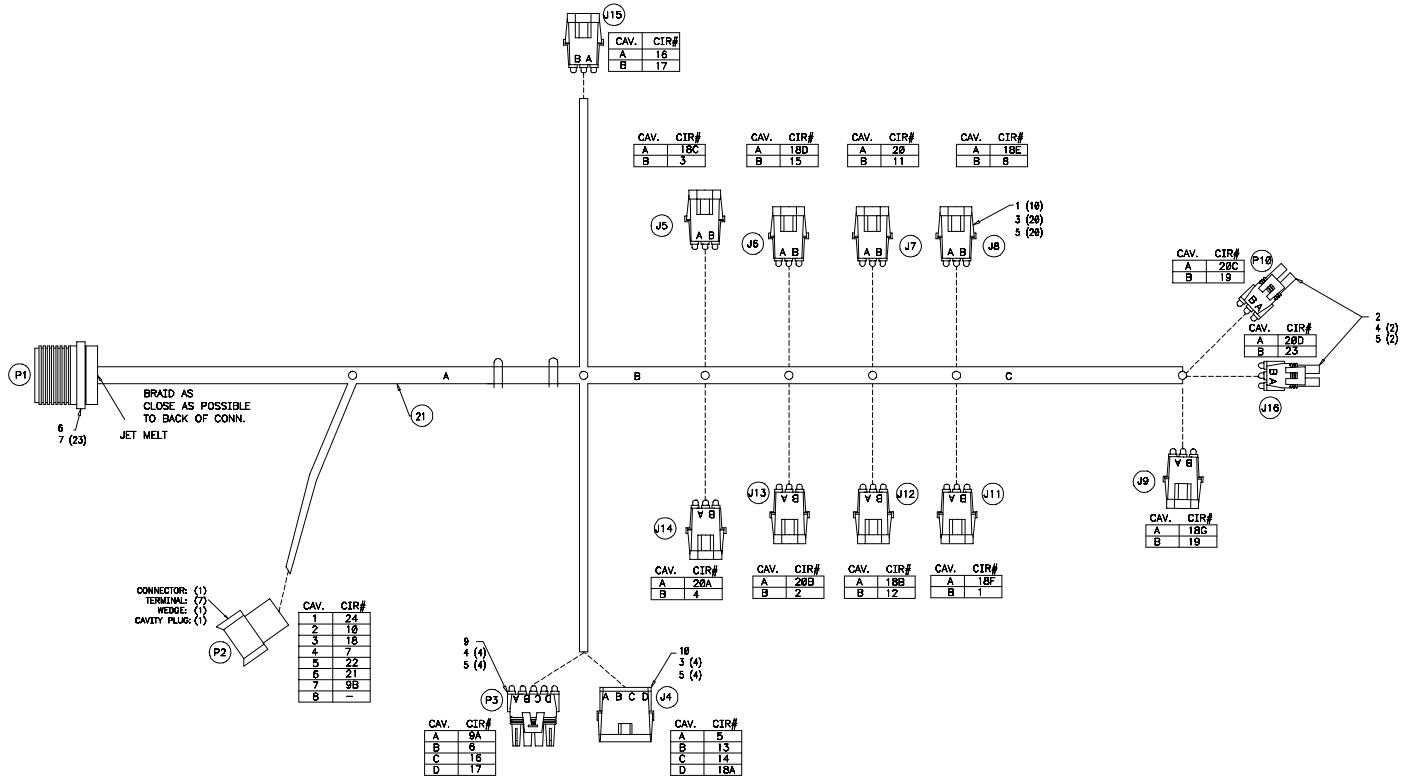
1. 70145879	INLET BODY	1	13. 70145738	MOUNTING FOOT	2
2. 70145628	OUTLET BODY	1	14. 70145620	NAME TAG	1
5. 70145625	RELIEF VALVE (2250 PSI)	1	15. 77044574	CONNECTOR TOWER	9
6. 70145624	SOLENOID VALVE	4	16. 77044577	CONNECTOR TERMINAL	16
7. 70143337	O-RING PLATE	5	17. 77044578	CABLE SEAL	16
8. 70145623	O-RING	10	20. 77044676	CABLE PLUG	6
9. 70145622	THREADED ROD GR8	2	21. 70733394	WIRING HARNESS (SEE DWG)	1
10. 70145621	THREADED ROD GR8	2	22. 72532353	ADAPTER #6MSTR #4MJIC	8
11. 72062000	NUT 1/4-20	6	23. 72053762	ELBOW #6MSTR #8MJIC 90°	2
12. 72063047	WASHER 1/4 LOCK	6	24. 72532357	ADAPTER #6MSTR #8MJIC	1



## VALVEBANK WIRING HARNESS (70733394)

REPLACES 70733346 EFF: 4-1-00

1. 77044573	SHROUD CONN 2-CONTACT	10REF
2. 77044574	TOWER CONN	2REF
3. 77044576	TERMINAL-M	24REF
4. 77044577	TERMINAL-F	8REF
5. 77044578	CABLE SEAL	32REF
6. 77044620	CONN RCPT	1REF
7. 77044580	SOCKET	23REF
9. 77044623	TOWER CONN 4-CONTACT	1REF
10. 77044624	SHROUD CONN 4-CONTACT	1REF



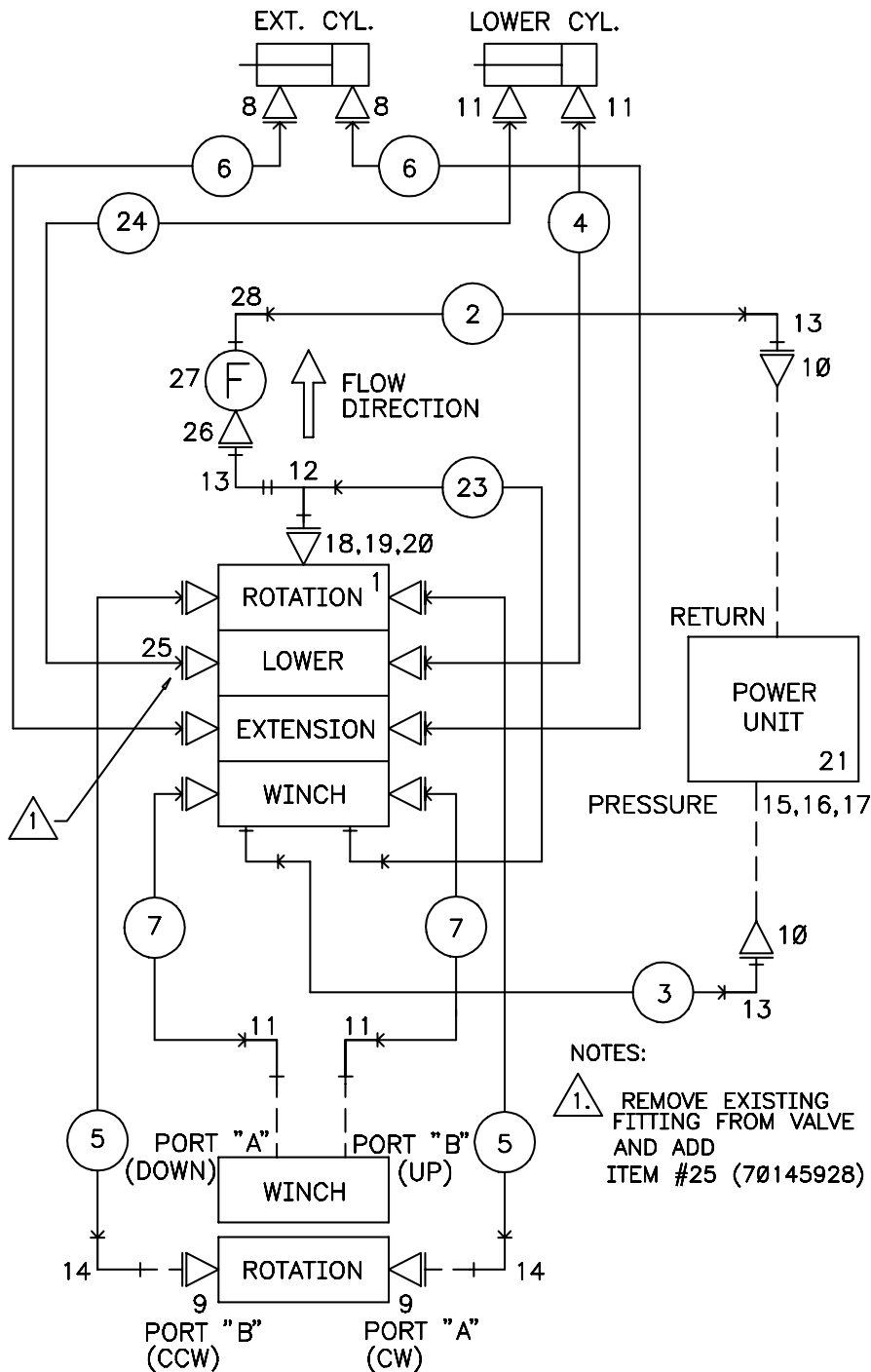
### WIRE LEGEND

CIR	5105053	COLOR	GA	WEATHER PAK	LABELING	FUNCTION
	PIN CAVITY			CONNECTOR		
1	A	WHITE	18	P1A TO: J11B	ROTJ11 B	ROTATE CW
2	B	WHITE	18	P1B TO: J13B	EXTJ13 B	BOOM EXT OUT
3	C	WHITE	18	P1C TO: J5B	WIN J5B	WINCH DOWN
4	D	WHITE	18	P1D TO: J14B	WIN J14B	WINCH UP
5	E	WHITE	18	P1E TO: J4A	J4A	REF
6	H	WHITE	18	P1H TO: P3B	P3B	SIGNAL COMM.
7	J	WHITE	18	P1J TO: P2C	P2C	SPEED RELAY
8	K	WHITE	18	P1K TO: J8B	ROTJ8 B	ROTATE CCW
9	L	WHITE	16	P1 TO: SPL A	N/A	P1 TO SPLICE
9A		WHITE	16	P3A TO: SPL A	P3A	POWER +
9B		WHITE	16	P2B TO: SPL A	P2B	IGNITION SOLENOID
10	M	WHITE	18	P1M TO: P2D	P2D	KILL RELAY
11	N	WHITE	18	P1N TO: J7B	LOWER J7B	LOWER DOWN
12	P	WHITE	18	P1P TO: J12B	LOWER J12B	LOWER UP
13	R	WHITE	18	P1R TO: J4B	J4B	VOLTAGE
14	S	WHITE	18	P1S TO: J4C	J4C	ON H
15	F	WHITE	18	P1F TO: J6B	EXT J6 B	BOOM EXT IN
16		WHITE	16	P3C TO: J15A	PRVLV J15 A	PROP. VALVE & COIL -
17		WHITE	16	P3D TO: J15B	PRVLV J15 B	PROP. VALVE & COIL +
18		WHITE	16	P2A TO: SPL B	P2A	BATTERY -
18A		WHITE	16	J4D TO: SPL B	J4D	POWER COMMON
18B		WHITE	16	J12A TO: SPL B	LOWER J12A	LOWER UP
18C		WHITE	16	J5A TO: SPL B	WINCH J5A	WINCH
18D		WHITE	16	J6A TO: SPL B	EXT J6 A	BOOM EXT IN
18E		WHITE	16	J8A TO: SPL B	ROT J8 A	ROTATE CCW
18F		WHITE	16	J11A TO: SPL B	ROT J11 A	ROTATE CW
18G		WHITE	16	J9A TO: SPL B	ATB J9 A	ANTI-TWO
19		WHITE	16	P10B TO: J9B	P10B & J9B	OPRES & ANTI-TWO
20		WHITE	16	J7A TO: SPL C	LOWER J7A	LOWER DOWN
20A		WHITE	16	J14A TO: SPL C	WINCH J14A	WINCH
20B		WHITE	16	J13A TO: SPL C	EXT J13 A	BOOM EXT OUT
20C		WHITE	16	P10A TO: SPL C	OPSI P10A	OVERPRESSURE
20D		WHITE	16	J16A TO: SPL C	WNPSD J16 A	WINCH TWO SPEED
21	G	WHITE	16	P1G TO: P2E	P2 E	ENGINE START
22	T	WHITE	16	P1T TO: P2F	P2 F	COMPRESSOR
23	U	WHITE	16	P1U TO: J16B	WNPSD J16 B	WINCH TWO SPEED
24	O	WHITE	16	P10 TO: P2A	SOL PWR	SOLENOID POWER

**HYD KIT-PWR UNIT (91715654)****REPLACES 91715095 EFF: 4-1-00**

1.	70733398	VALVEBANK	1
2.	51395305	HOSE-1/2X23.5 #8#8(PART OF 22)	1REF
3.	51394945	HOSE-3/8X28 #8#8(PART OF 22)	1REF
4.	51393953	HOSE-1/4X34 #4#4(PART OF 22)	1REF
5.	51394953	HOSE-1/4X39 #4#4(PART OF 22)	2REF
6.	51395537	HOSE-1/4X55 #4#4(PART OF 22)	2REF
7.	51395226	HOSE-1/4X24 #4#4(PART OF 22)	2REF
8.	72532351	ADAPTER #4MSTR #4MJIC	2
9.	72532722	ADAPTER #10MSTR #6FSTR	2
10.	72532357	ADAPTER #6MSTR #8MJIC	2
11.	72532353	ADAPTER #6MSTR #4MJIC	4
12.	72532671	TEE #8JIC SWVL NUT BRANCH	1
13.	72532658	ELBOW #8MJIC #8FJIC	3

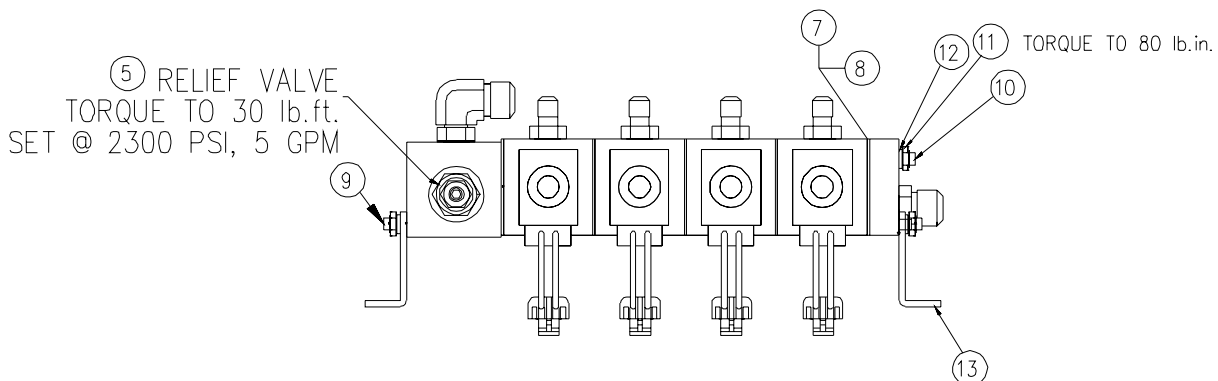
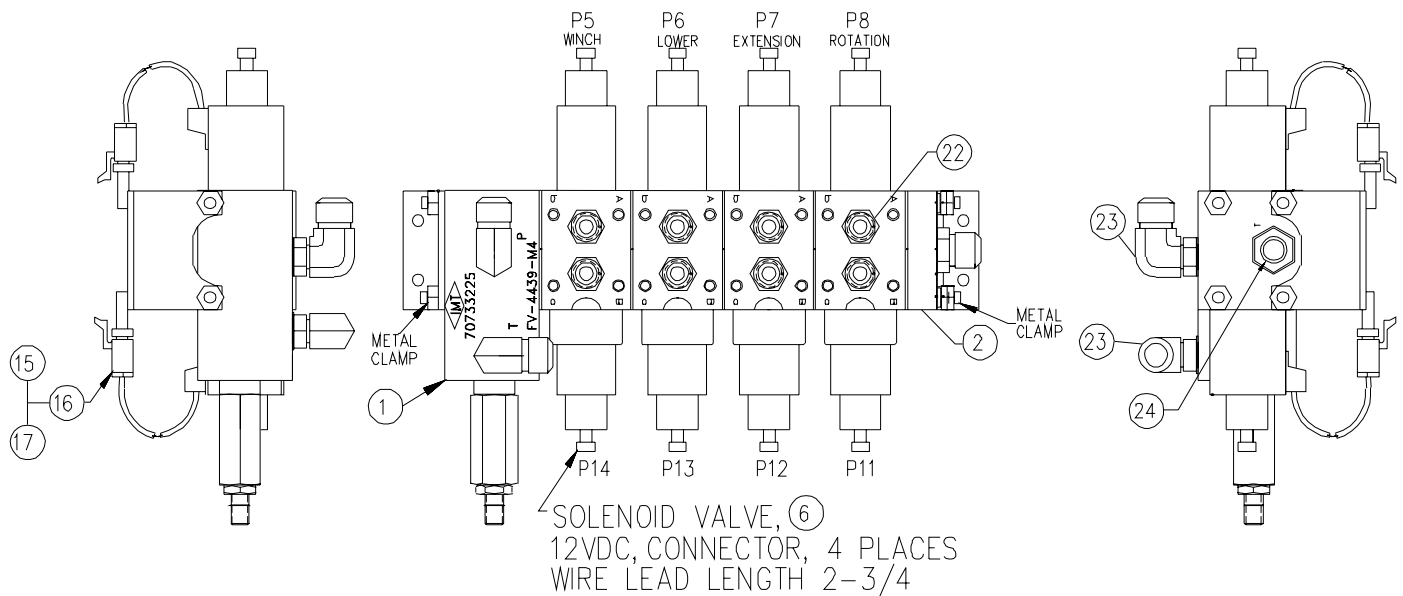
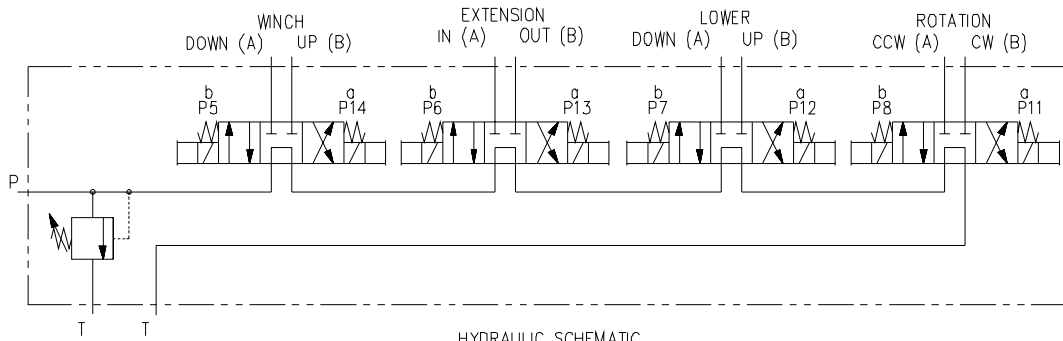
14.	72532985	ELBOW #6MSTR #4MJIC 45°	2
15.	72063050	WASHER 5/16 LOCK	4
16.	72063002	WASHER 5/16 WRT	4
17.	72060025	CAP SCR 5/16-18X1 HHGR5	4
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
19.	72063001	WASHER 1/4 WRT	4
20.	72062104	NUT 1/4-20 LOCK	4
21.	73051957	POWER UNIT	1
22.	51715655	HOSE KIT (INCL:2-7&23)	1
23.	51394949	HOSE-1/2X11-1/2(PART OF 22)	1REF
24.	51395535	HOSE-1/4X34 #4#6 (PART OF 22)	1REF
25.	70145928	FLOW LIMITER	1
26.	72533622	ADAPTER 3/8MPT #8FJIC	1
27.	73052093	RETURN FILTER 10MIC 3/4FPT	1
28.	72531420	ELBOW 3/8MPT #8MJIC	1



**VALVEBANK-PWR UNIT (70733398)**

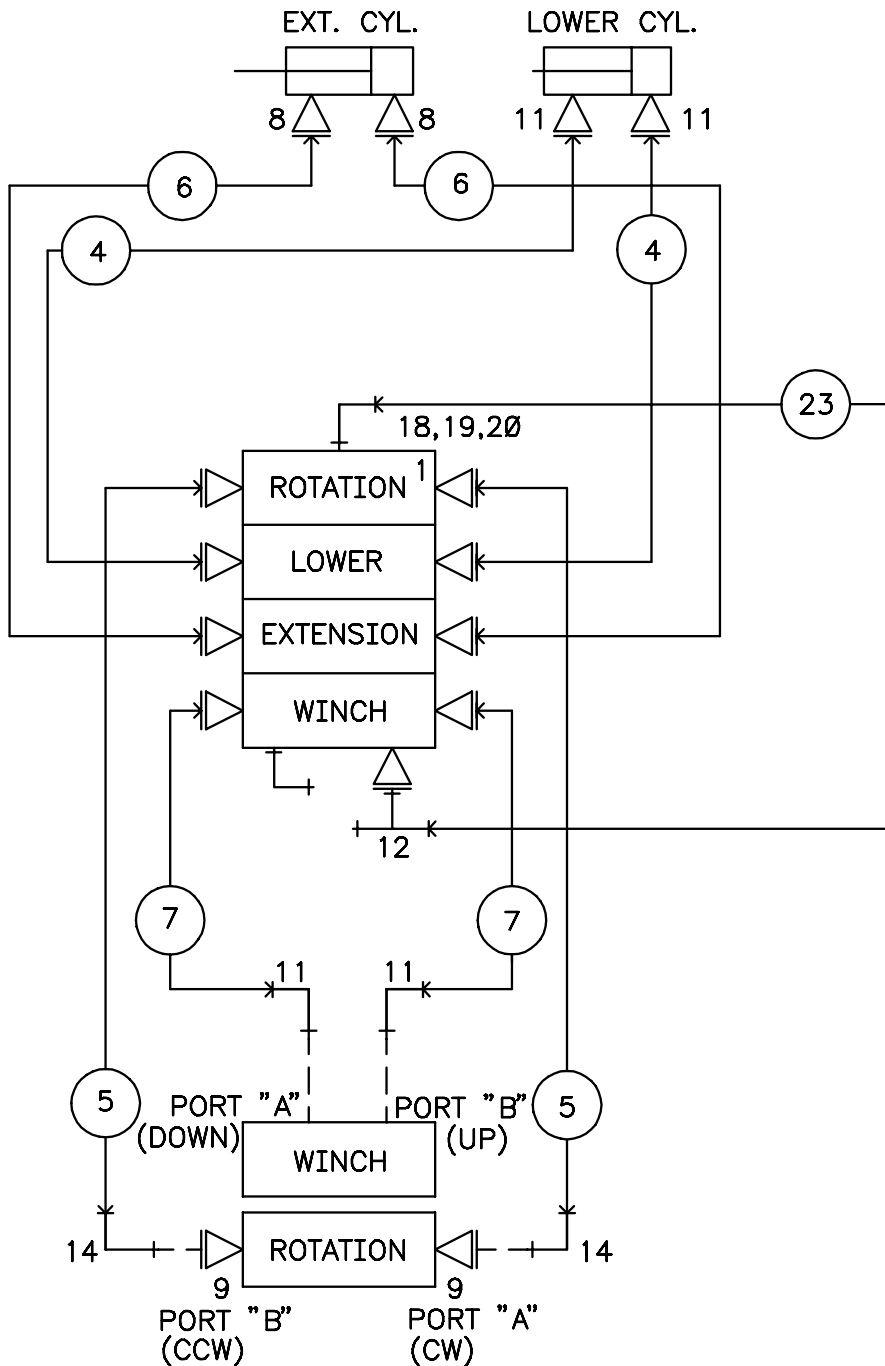
RE[PLACES 70733225 EFF: 4-1-00]

1. 70145879	INLET BODY	1	13. 70145738	MOUNTING FOOT	2
2. 70145628	OUTLET BODY	1	14. 70145620	NAME TAG	1
5. 70145625	RELIEF VALVE (2250 PSI)	1	15. 77044574	CONNECTOR TOWER	9
6. 70145624	SOLENOID VALVE	4	16. 77044577	CONNECTOR TERMINAL	16
7. 70143337	O-RING PLATE	5	17. 77044578	CABLE SEAL	16
8. 70145623	O-RING	10	18. 77044624	CONN SHROUD	1
9. 70145622	THREADED ROD GR8	2	20. 77044676	CABLE PLUG	6
10. 70145621	THREADED ROD GR8	2	21. 70733394	WIRING HARNESS (SEE DWG)	1
11. 72062000	NUT 1/4-20	6	22. 72532353	ADAPTER #6MSTR #4MJIC	8
12. 72063047	WASHER 1/4 LOCK	6	23. 72053762	ELBOW #6MSTR #8MJIC 90°	2
			24. 72532357	ADAPTER #6MSTR #8MJIC	1



**HYD KIT-PROP'L PTO (91715656)****REPLACES 91715097 EFF: 4-1-00**

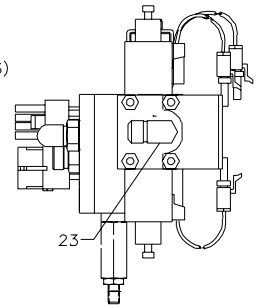
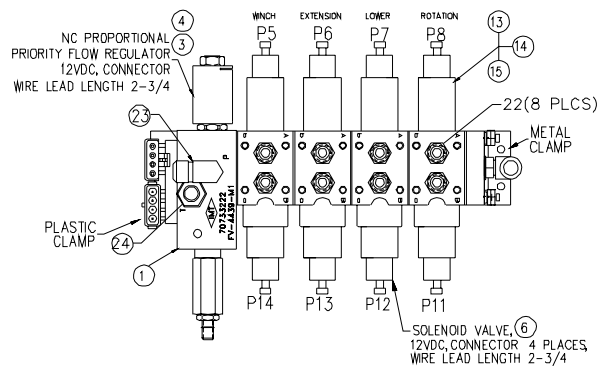
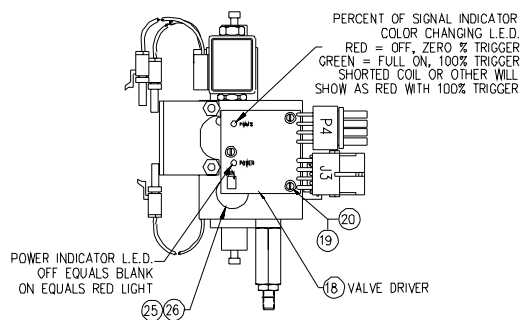
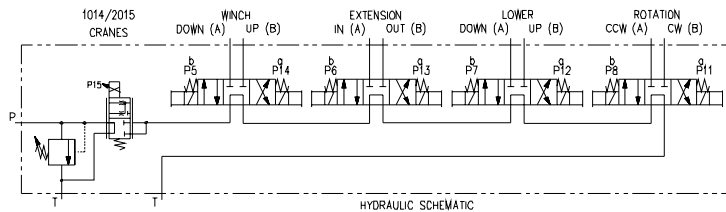
1.	70733399	VALVEBANK	1
4.	51393953	HOSE-1/4X34 #4#4(PART OF 22)	2REF
5.	51394953	HOSE-1/4X39 #4#4(PART OF 22)	2REF
6.	51395537	HOSE-1/4X55 #4#4(PART OF 22)	2REF
7.	51395226	HOSE-1/4X24 #4#4(PART OF 22)	2REF
8.	72532351	ADAPTER #4MSTR #4MJIC	2
9.	72532722	ADAPTER #10MSTR #6FSTR	2
11.	72532353	ADAPTER #6MSTR #4MJIC	4
12.	72532671	TEE #8JIC SWVL NUT BRANCH	1
14.	72532985	ELBOW #6MSTR #4MJIC 45°	2
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	4
19.	72063001	WASHER 1/4 WRT	4
20.	72062104	NUT 1/4-20 LOCK	4
22.	51715630	HOSE KIT (INCL:4-7&23)	1
23.	51394950	HOSE-1/2X11.5 #8#8(PART OF 22)	1REF



## VALVEBANK-PROP'L RMT CTRL (70733399)

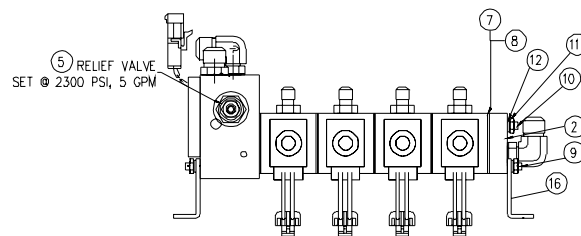
REPLACES 70733222 EFF: 4-1-00

1. 70145629	INLET BODY	1	13. 77044574	CONNECTOR TOWER	9
2. 70145628	OUTLET BODY	1	14. 77044577	CONNECTOR TERMINAL	18
3. 70145627	FLOW REG	1	15. 77044578	CABLE SEAL	18
4. 70145626	COIL	1	16. 70145738	MOUNTING FOOT	2
5. 70145625	RELIEF VALVE (2250 PSI)	1	17. 70145620	NAME TAG	1
6. 70145624	SOLENOID VALVE	4	18. 77044826	VALVE DRIVER	1
7. 70143337	O-RING PLATE	5	19. 72601704	MACH SCR (USE LOCTITE 242)	3
8. 70145623	O-RING	10	20. 72601705	WASHER #6 FLAT	3
9. 70145622	THREADED ROD GR8	2	21. 70733394	WIRING HARNESS (SEE DWG)	1
10. 70145621	THREADED ROD GR8	2	22. 72532353	ADAPTER #6MSTR #4MJIC	8
11. 72062000	NUT 1/4-20	6	23. 72053762	ELBOW #6MSTR #8MJIC 90°	2
12. 72063047	WASHER 1/4 LOCK	6	24. 72532357	ADAPTER #6MSTR #8MJIC	1
			25. 70145884	PLUG	1
			26. 70145885	ORIFICE PLUG	1



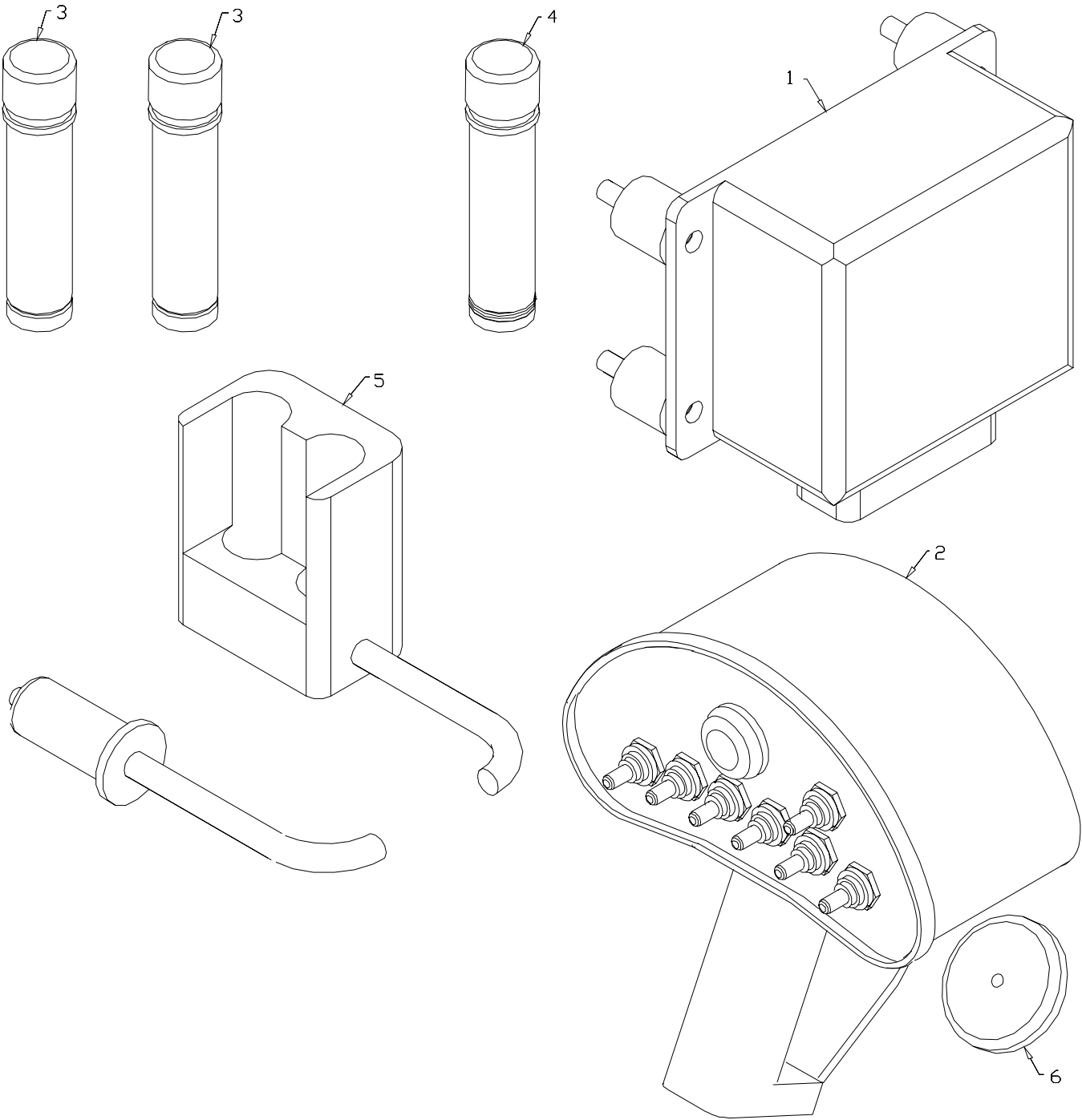
### NOTES:

1. CONNECT P10 AND J9 TOGETHER
2. ADD DUST CAP TO J16



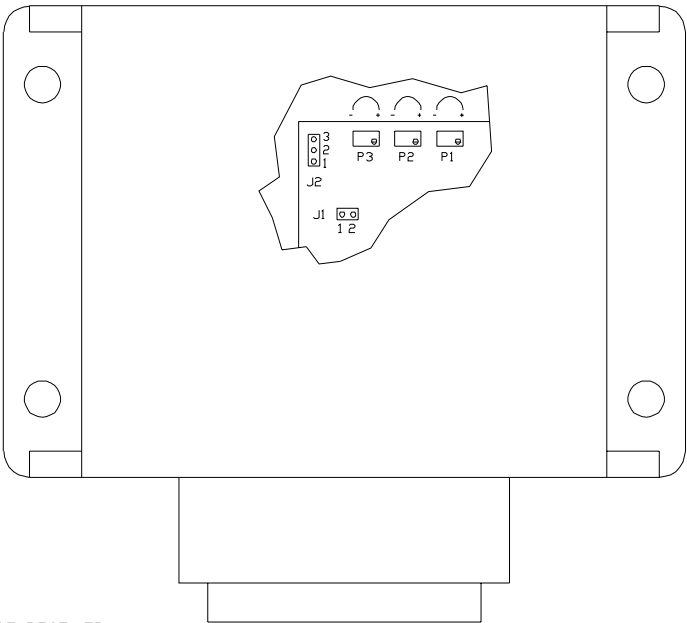
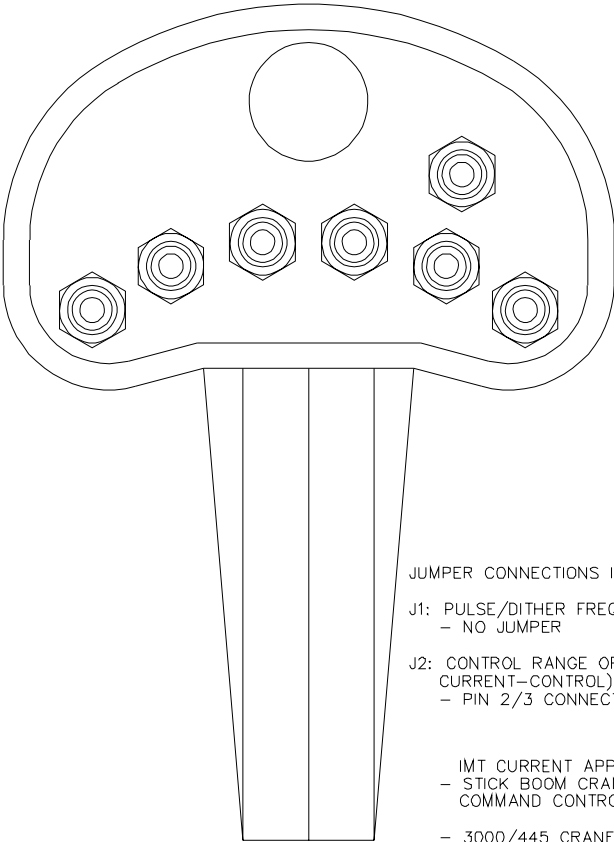
**RADIO RMT KIT (70733354-1)**

- |    |          |                 |   |
|----|----------|-----------------|---|
| 1. | 73733392 | RECEIVER        | 1 |
| 2. | 73733393 | TRANSMITTER     | 1 |
| 3. | 70146100 | BATTERY         | 2 |
| 4. | 70146101 | BATTERY HOUSING | 1 |
| 5. | 70146102 | BATTERY CHARGER | 1 |
| 6. | 70146103 | MAGNET          | 1 |



RADIO RMT KIT (70733354-2)

- ALL SWITCHES ARE MOMENTARY UNLATCHED TYPE



JUMPER CONNECTIONS INSIDE RECEIVER

- J1: PULSE/DITHER FREQUENCY  
- NO JUMPER
- J2: CONTROL RANGE OF OUTPUT CURRENT (ONLY CURRENT-CONTROL)  
- PIN 2/3 CONNECTED: 0-2A
- IMT CURRENT APPLICATIONS:  
- STICK BOOM CRANES (PIN 2/3 CONNECTED: 0-2A)  
  COMMAND CONTROL PROP VALVE (EHPFD-16-N-0-10-12DL)
- 3000/445 CRANES (PIN 2/3 CONNECTED: 0-2A)  
- STERLING PROP VALVE (JP04C-31-50-N-IMT)

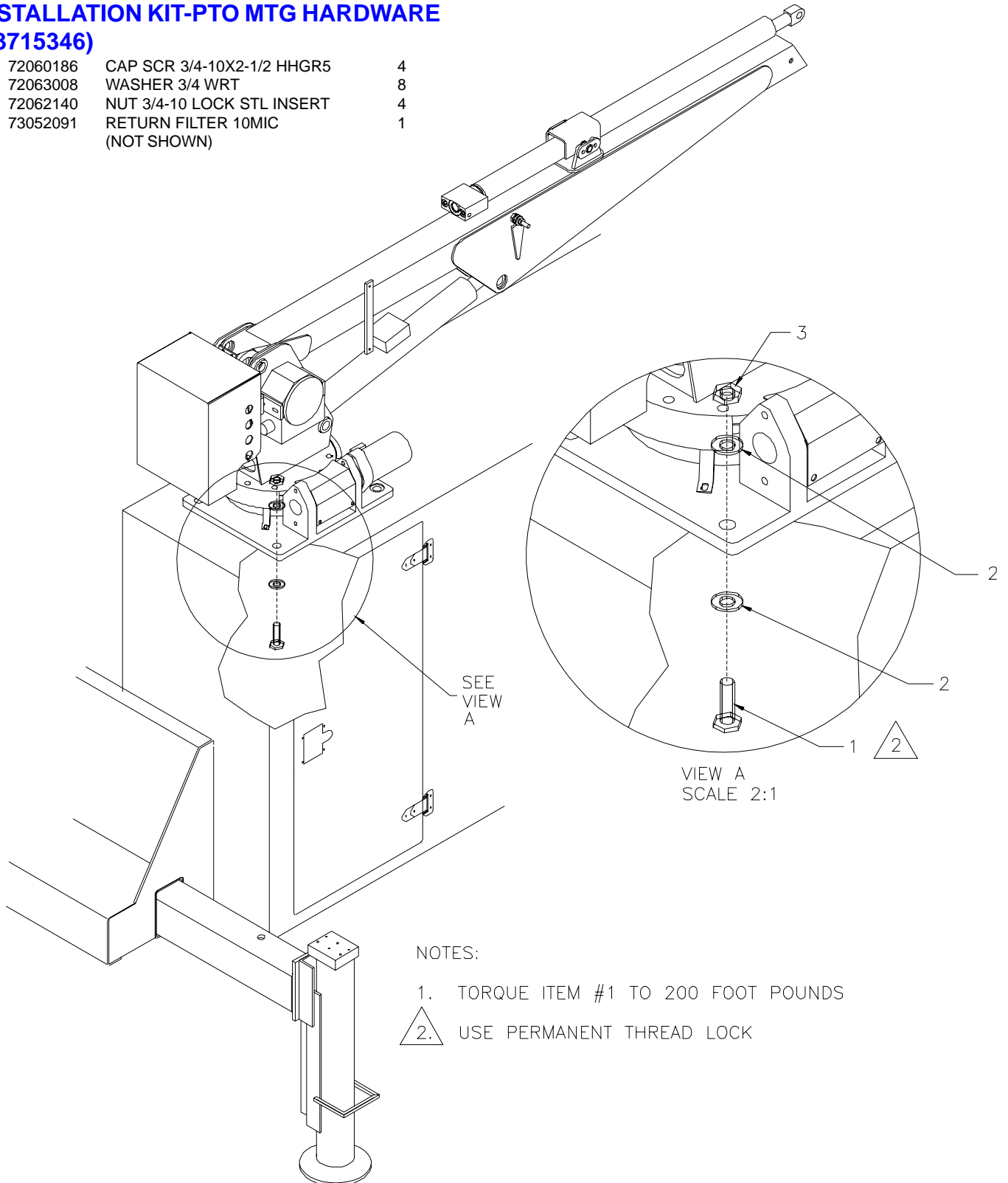
- P1: TRIMMING POTENTIOMETER FOR MAXIMUM VALUES. ON TRANSMITTER HANDLE, ENGAGE ROTATION CW OR CCW FUNCTION SWITCH AND PULL TRIGGER FULLY ON. CRANE MAY OR MAY NOT BEGIN TO MOVE AT THIS TIME DUE TO P1 INITIAL SETTING. TURN P1 POTENTIOMETER COUNTERCLOCKWISE UNTIL DESIRED MAXIMUM SPEED IS OBTAINED OR UNTIL SPEED NO LONGER CONTINUES TO INCREASE.
- P2: TRIMMING POTENTIOMETER FOR INITIAL VALUE ADJUSTMENT. ON TRANSMITTER, ENGAGE ROTATION CW OR CCW FUNCTION SWITCH. WITHOUT PULLING TRIGGER, ADJUST P2 COUNTERCLOCKWISE UNTIL CRANE BEGINS TO MOVE. AT THIS TIME, ADJUST P2 CLOCKWISE UNTIL NO MOVEMENT IS DETECTED. SLIGHTLY ENGAGE TRIGGER AND ADJUST P2 TO FINE TUNE.
- P3: TRIMMING POTENTIOMETER TO ADJUST DITHERAMPLITUDE: ADJUST CLOCKWISE OR COUNTERCLOCKWISE FOR SMOOTHNESS OF OPERATION.

CONNECTOR PIN LETTER	IMT ASSIGNED FUNCTION
A1	ROT CW
A2	EXT OUT
A3	WINCH DN
A4	WINCH UP
A5	PROP VALVE +
A6	EXT IN
A7	ENGINE START
A8	RADIO GND
A9	SPEED RELAY
B1	NOT USED
B2	ROT CCW
B3	RADIO POWER
B4	KILL RELAY
B5	LOW DN
B6	NOT USED
B7	LOWER UP
B8	NOT USED
B9	NOT USED
C1	PROP VALVE -
C2	NOT USED
C3	COMPRESSOR
C4	WINCH 2 SPD
C5	NOT USED
C6	NOT USED
C7	NOT USED
C8	NOT USED
C9	NOT USED



## INSTALLATION KIT-PTO MTG HARDWARE (93715346)

1.	72060186	CAP SCR 3/4-10X2-1/2 HHGR5	4
2.	72063008	WASHER 3/4 WRT	8
3.	72062140	NUT 3/4-10 LOCK STL INSERT	4
4.	73052091	RETURN FILTER 10MIC (NOT SHOWN)	1





SECTION 4. GENERAL REFERENCE

INSPECTION CHECKLIST ..... 3

WIRE ROPE INSPECTION ..... 7

HOOK INSPECTION ..... 7

HOLDING VALVE INSPECTION ..... 8

ANTI-TWO BLOCKING DEVICE INSPECTION ..... 8

TORQUE DATA CHART - DOMESTIC ..... 9

TORQUE DATA CHART - METRIC ..... 10

TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE ..... 11

TURNTABLE BEARING INSPECTION FOR REPLACEMENT ..... 12

LIMITED WARRANTY ..... 14

## NOTES

[illegible]

**NOTICE**

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

OWNER/COMPANY

CONTACT PERSON

CRANE MAKE &amp; MODEL

CRANE SERIAL NUMBER

UNIT I.D. NUMBER

LOCATION OF UNIT

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

REV: 6-18-99

TYPE OF INSPECTION (check one)

☐

DAILY (if deficiency found)

☐

QUARTERLY

☐

MONTHLY

☐

ANNUAL

DATE INSPECTED

HOUR METER READING (if applicable)

INSPECTED BY (print)

SIGNATURE OF INSPECTOR

**TYPE OF INSPECTION****NOTES:**

Daily and monthly inspections are to be performed by a "designated" person, who has been selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

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

One hour of normal crane operation assumes 20 complete cycles per hour. If operation exceeds 20 cycles per hour, inspection frequency should be increased accordingly.

Consult Operator / Service Manual for additional inspection items, service bulletins and other information.

Before inspecting and operating crane, crane must be set up away from power lines and leveled with outriggers fully extended.

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

**MONTHLY (M):** Monthly inspections or 100 hours of normal operation (which ever comes first) includes all daily inspections plus items designated with an **(M)**. This inspection must be recorded.

**QUARTERLY (Q):** Every three to four months or 300 hours of normal operation (which ever comes first) includes all daily and monthly inspection items plus items designated with a **(Q)**. This inspection must be recorded.

**ANNUAL (A):** Each year or 1200 hours of normal operation (which ever comes first) includes all items on this form which encompasses daily, monthly and quarterly inspections plus those items designated by **(A)**. This inspection must be recorded.

FREQUENCY	ITEM	KEY	✓ = SATISFACTORY ✗ = DEFICIENCY (must be corrected prior to operation)	R = RECOMMENDATION (should be considered for corrective action) NA= NOT APPLICABLE	STATUS ✓ ✗ R, NA
			INSPECTION DESCRIPTION		
D	1	Labels	All load charts, safety & warning labels, & control labels are present and legible.		
D	2		Check all safety devices for proper operation.		
D	3	Controls	Control mechanisms for proper operation of all functions, leaks & cracks.		
D	4	Station	Control and operator's station for dirt, contamination by lubricants, & foreign materials.		
D	5	Hyd System	Hydraulic system (hoses, tubes & fittings) for leakage & proper oil level.		
D	6	Hook	Presence & proper operation of hook safety latches.		
D	7	Rope	Proper reeving of wire rope on sheaves & winch drum.		
D	8	Pins	Proper engagement of all connecting pins & pin retaining devices.		
D	9	General	Overall observation of crane for damaged or missing parts, cracked welds & presence of safety covers.		
D	10	Operation	During operation, observe crane for abnormal performance, unusual wear (loose pins, wire rope damage, etc.). If observed, discontinue use & determine cause & severity of hazard.		
D	11	Remote Ctrls	Operate remote control devices to check for proper operation.		
D	12	Electrical	Operate all lights, alarms, etc. to check for proper operation.		
D	13	Anti 2-Blocking	Operate anti 2-blocking device to check for proper operation.		
D	14		Other		
D	15		Other		

**Inspection Checklist****CRANES****2**

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

## 3

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		
Q	70	Pumps, PTO's & Motors	Pumps, PTO's & motors for loose bolts/fasteners, leaks, noise, vibration, loss of performance, heating & excess pressure.		
	71		● Winch motor(s)		
	72		● Rotation motor(s)		
	73		● Other		
Q	74	Valves	Hydraulic valves for cracks, spool return to neutral, sticking spools, proper relief valve setting, relief valve failure.		
	75		● Main control valve		
	76		● Load holding valve(s)		
	77		● Outrigger or auxiliary control valve(s)		
	78		● Other		
	79		● Other		
Q	80	Cylinders	Hydraulic cylinders for drifting, rod seal leakage & leakage at welds. Rods for nicks, scores & dents. Case for damage. Case & rod ends for damage & abnormal wear.		
	81		● Outrigger cylinder(s)		
	82		● Inner boom cylinder(s)		
	83		● Outer boom cylinder(s)		
	84		● Extension cylinder(s)		
	85		● Rotation cylinder(s)		
	86		● Jib lift cylinder(s)		
	87		● Jib extension cylinder(s)		
	88		● Other		
Q	89	Winch	Winch, sheaves & drums for damage, abnormal wear, abrasions & other irregularities.		
Q	90	Hyd Filters	Hydraulic filters for replacement per maintenance schedule.		
A	91	Daily	All daily inspection items.		
A	92	Monthly	All monthly inspection items.		
A	93	Quarterly	All quarterly inspection items.		
A	94	Hyd Sys	Hydraulic fluid change per maintenance schedule.		
A	95	Controls	Control valve calibration for correct pressures & relief valve settings		
A	96	Valves	Safety valve calibration for correct pressures & relief valve settings.		
A	97	Valves	Valves for failure to maintain correct settings.		
A	98	Rotation Sys	Rotation drive system for proper backlash clearance & abnormal wear, deformation & cracks.		
A	99	Lubrication	Gear oil change in rotation drive system per maintenance schedule.		
A	100	Hardware	Check tightness of all fasteners and bolts.		
A	101	Wear Pads	Wear pads for excessive wear.		
A	102	Loadline	Loadline for proper attachment to drum.		

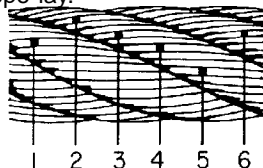




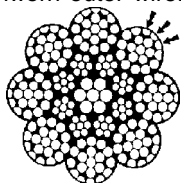
**WIRE ROPE INSPECTION**

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

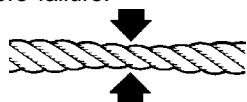
- A. Corrosion can be cause for replacement. Any development of corrosion must be noted and monitored closely.
- B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



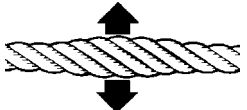
- C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



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



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



- F. When there is noticeable heat damage (discoloration) of the rope by any means.



- G. When the diameter is reduced from nominal size by 1/32" or more.



- H. If a broken wire protrudes or loops out from the core of the rope.

**HOOK INSPECTION**

Hooks having any of the listed deficiencies shall be removed from service unless a qualified person approves their continued use and initiates corrective action. Hooks approved for continued use shall be subjected to periodic inspection.

**A. DISTORTION****Bending / Twisting**

A bend or twist exceeding 10° from the plane of the unbent hook.

**Increased Throat Opening**

**HOOK WITHOUT LATCH:** An increase in throat opening exceeding 15% (Or as recommended by the manufacturer)

**HOOK WITH LATCH:** An increase of the dimension between a fully-opened latch and the tip section of the hook exceeding 8% (Or as recommended by the manufacturer)

**B. WEAR**

If wear exceeds 10% of the original sectional dimension. (Or as recommended by the manufacturer)

**C. CRACKS, NICKS, GOUGES**

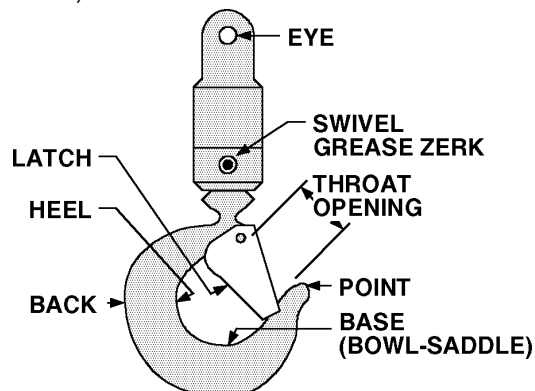
Repair of cracks, nicks, and gouges shall be carried out by a designated person by grinding longitudinally, following the contour of the hook, provided that no dimension is reduced more than 10% of its original value. (Or as recommended by the manufacturer) (A qualified person may authorize continued use if the reduced area is not critical.)

**D. LATCH****Engagement, Damage & Malfunction**

If a latch becomes inoperative because of wear or deformation, and is required for the service involved, it shall be replaced or repaired before the hook is put back into service. If the latch fails to fully close the throat opening, the hook shall be removed from service or "moused" until repairs are made.

**E. HOOK ATTACHMENTS & SECURING MEANS**

If any indication of distortion, wear, cracks, nicks or gouges are present, unless a qualified person authorizes their use. (Or as recommended by the manufacturer)



**HOLDING VALVE INSPECTION**

The cylinders are equipped with holding valves that prevent sudden movement of the cylinder rods in the event of a hydraulic hose or other hydraulic component failure. The valve is checked in the following manner:

1. With a full rated load, extend the cylinder in question and kill the engine.
2. Operate the control valve to retract the cylinder. If the cylinder "creeps", replace the holding valve. If the cylinder does not "creep", the valve is serviceable.

**ANTI-TWO BLOCKING DEVICE INSPECTION**

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

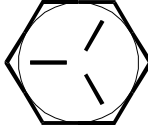

The anti two block system should be checked daily as follows:

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

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

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

**COARSE THREAD BOLTS**

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

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

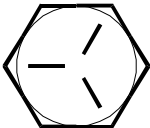

1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, colloidal copper or white lead are applied, multiply the torque values in the charts by the factor .90. The use of Loctite does not affect the torque values listed above.
5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

**WARNING**

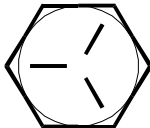
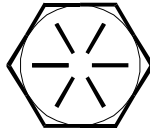
Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing.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

# TORQUE DATA CHART - DOMESTIC

## FINE THREAD BOLTS

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

## COARSE THREAD BOLTS

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

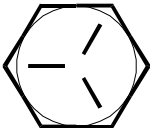

1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special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

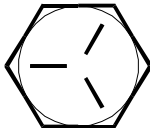
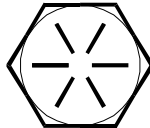
Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing.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

# TORQUE DATA CHART - 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.

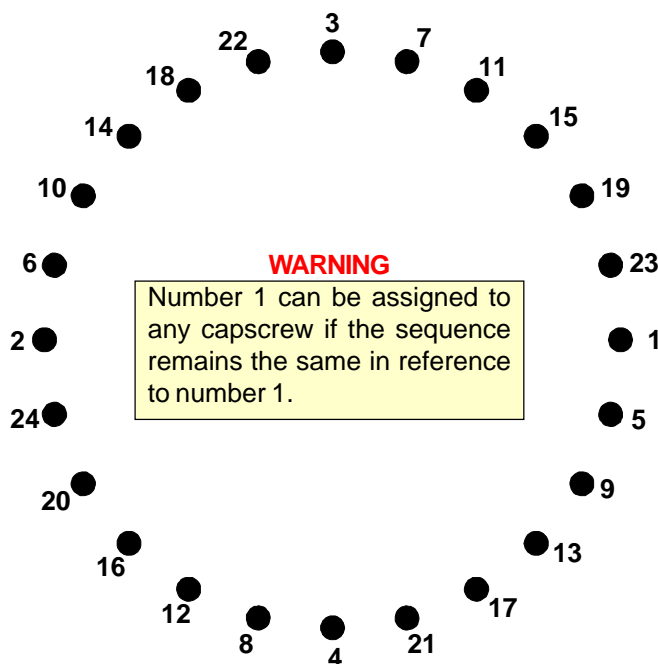
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in kilogram-meters.
4. Torque values specified are for bolts with residual oils or no special lubricants applied.  
If special lubricants 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/torqueing sequence of the turntable bearing to the crane base and crane mast. The total quantity of cap screws varies dependent on crane model.



### TIGHTENING PROCEDURE:

1. Refer to the Torque Data Chart to determine the proper torque value to apply to the size of capscrew used.
2. Follow the tightening sequence shown in the diagram. Note that the quantity of capscrews may differ from the diagram, but the sequence must follow the criss-cross pattern as shown in the diagram.
3. Torque all capscrews to approximately 40% of the specified torque value, by following the sequence.  
(EXAMPLE: .40 x 265 FT-LBS = 106 FT-LBS)  
(EXAMPLE-METRIC: .40 x 36 KG-M = 14.4 KG-M)
4. Repeat Step 3, but torqueing all capscrews to 75% of the specified torque value. Continue to follow the tightening sequence.  
(EXAMPLE: .75 x 265 FT-LBS = 199 FT-LBS)  
(EXAMPLE-METRIC: .75 x 36 KG-M = 27 KG-M)
5. Using the proper sequence, torque all capscrews to the listed torque value as determined from the Torque Data Chart.

# TURNTABLE BEARING INSPECTION FOR REPLACEMENT

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

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

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

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

## TEST PROCEDURE

### STEP 1.

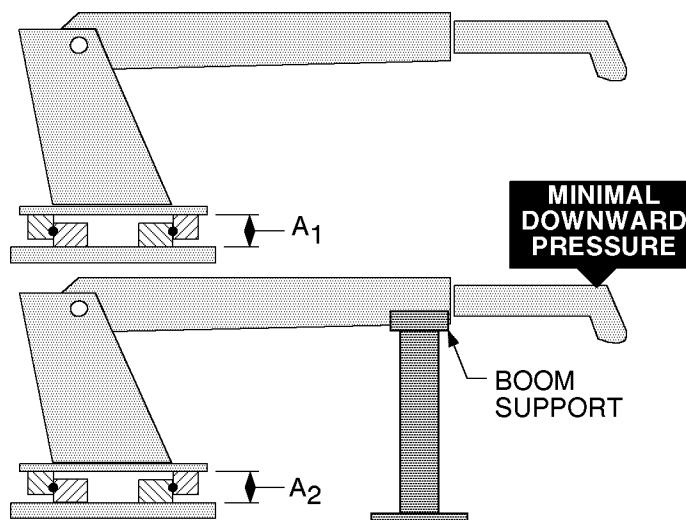
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing ( $A_1$ ), using a dial indicator for accuracy.

### STEP 2.

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

### STEP 3.

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



**COMPARISON CHART - MODEL TO MEASURED TILT DIMENSION**

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

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

MANUAL CHANGE REQUEST

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

☐

ERROR FOUND

LOCATION OF ERROR (page no.):

DESCRIPTION OF ERROR:

☐

ERROR FOUND

DESCRIPTION OF ADDITION:

REASON FOR ADDITION:

MAIL TO:  
IOWA MOLD TOOLING CO., INC.  
BOX 189  
GARNER, IA 50438-0189  
ATTN: Technical Publications

# LIMITED WARRANTY

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

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

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

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

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

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

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

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

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

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

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

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

Effective January, 1985

This parts manual is provided to the user to assist in servicing the equipment. It is the property of Iowa Mold Tooling Co., Inc. and, as such, may not be reproduced either whole or in part, whether by chemical, electrostatic, mechanical or photographic means without the expressed written permission of an officer of Iowa Mold Tooling Co., Inc. One manual is provided with each piece of new equipment and additional manuals may be obtained at a nominal price. Your distributor may have access to this manual through the IMT web site at [www.IMT.com](http://www.IMT.com).



**IOWA MOLD TOOLING CO., INC.**  
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[www.imt.com](http://www.imt.com)