



# ***Model 7020 Crane***

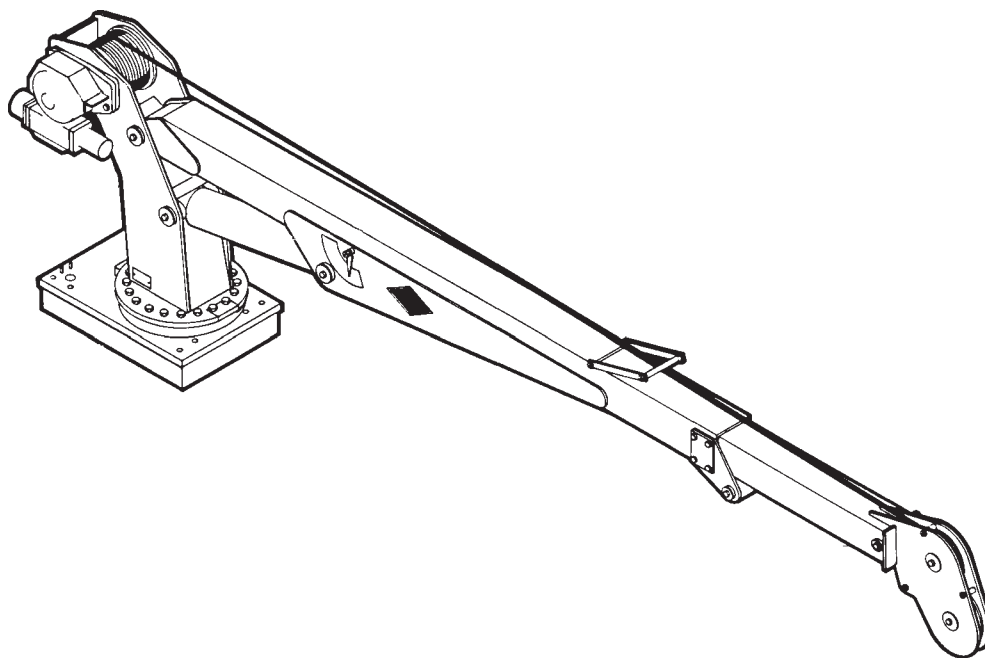
## **Volume 2 - PARTS AND SPECIFICATIONS**

**Section 1 CRANE SPECIFICATIONS**

**Section 2 CRANE REFERENCE**

**Section 3 REPLACEMENT PARTS**

**Section 4 GENERAL REFERENCE**



**IOWA MOLD TOOLING CO., INC.**

BOX 189, GARNER, IA 50438-0189

TEL: 641-923-3711

MANUAL PART NUMBER 99900196

***Manual Effective August 2004***

00007020:99900196: -----

## REVISIONS LIST

DATE	LOCATION	DESCRIPTION OF CHANGE
20040907	PARTS	ECN 9524 - UPDATED MANUAL WITH NEW REMOTE SYSTEM
20050712	3-5	ECN 9776 - REMOVED THREAD LOCK FROM GEAR BEARING BOLTS.
20050919	3-6,44	ECN 9614 - ADDED LIFT HOOK TO DRAWINGS
20071129	3-35	ADDED SPARE PARTS NOTE TO 51713182 HANDLE ASSEMBLY.
20100927	3-17,20,23,29	ECN 11134 - REPLACED VALVES & SPARE PARTS WITH CURRENT MODELS
20120419	3-36,42	ECN 11616 - UPDATED 3B166820 DRAWING, ADDED PROP REMOTE CALIBRATION

## 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.**

00007020:99900196: 20000731

## NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

SECTION 1. MODEL 7020 CRANE SPECIFICATIONS

GENERAL ..... 3

PERFORMANCE CHARACTERISTICS ..... 3

CYLINDERS ..... 4

POWER SOURCE ..... 4

ROTATION SYSTEM ..... 4

CYLINDER HOLDING VALVES ..... 4

EXCESSIVE LOAD LIMIT SYSTEM (ELLS) ..... 4

WINCH ..... 4

HYDRAULIC SYSTEM ..... 4

MINIMUM CHASSIS SPECIFICATIONS ..... 5

GEOMETRIC CONFIGURATION ..... 5

CAPACITY CHART - 7020 crane ..... 6

00007020:99900196: 19960515

1-2  
**NOTES**

## MODEL 7020 CRANE SPECIFICATIONS

### GENERAL

<b>CRANE RATING</b>	70,000 ft-lbs 9.68 ton-meters
<b>REACH</b> - from centerline of rotation	20'-4" 6.20m
<b>HYDRAULIC EXTENSION</b>	84" 213.4cm
<b>LIFTING HEIGHT</b> - from base of crane	23'-5" 7.14m
<b>WEIGHT OF CRANE</b>	2960 lbs 1343 kg
<b>OUTRIGGER SPAN</b> (required option)	11'-11" 3.63m
<b>STORAGE HEIGHT</b> - crane only	54" 137.2cm
<b>MOUNTING SPACE REQUIRED</b> (crane base)	24" x 34-1/2" 60.1cm x 87.6cm
<b>HORIZONTAL CENTER OF GRAVITY</b> - from centerline of rotation	32" 81.3cm
<b>VERTICAL CENTER OF GRAVITY</b> - from bottom of crane base	27" 64.8cm
<b>OPTIMUM PUMP CAPACITY</b>	10 U.S. Gallons/minute 37.8 liters/minute
<b>OIL RESERVOIR CAPACITY</b>	20 U.S. Gallons 75.7 liters
<b>DESIGN FACTORS</b> - pins and hydraulics	4/1

### PERFORMANCE CHARACTERISTICS

ROTATION:	450° (7.85 Rad.)	38 seconds
LOWER BOOM ELEVATION:	-10° to +80° (-0.17 Rad. to +1.40 Rad.)	16 seconds
EXTENSION CYLINDER:	84" (213.4cm)	16 seconds
HORIZONTAL OUTRIGGER EXTENSION:	23-3/4" (60.3cm)	4 seconds
VERTICAL OUTRIGGER EXTENSION:	21" (53.3cm)	6 seconds
WINCH (2-speed):		
High Speed	- 34 feet/minute (10.36 meters/minute)	
Low Speed	- 17 feet/minute (5.18 meters/minute)	

IOWA MOLD TOOLING CO., INC.  
BOX 189, GARNER, IA 50438-0189  
TEL: 641-923-3711 FAX: 641-923-2424

## CYLINDERS

	<u>BORE</u>	<u>STROKE</u>
LOWER BOOM CYLINDER	6" (15.2cm)	21-1/8" (53.7cm)
EXTENSION BOOM CYLINDER	3" (7.6cm)	84" (213.4cm)
HORIZONTAL OUTRIGGER CYLINDER	2" (5.1cm)	23-3/4" (60.3cm)
VERTICAL OUTRIGGER CYLINDER	2-1/2" (6.4cm)	21" (53.3cm)

## POWER SOURCE

Integral-mounted hydraulic pump and PTO application. Other standard power sources may be used - minimum power required is 17 horsepower based on 10 GPM at 2500 PSI (37.8 liters/min. at 172 bar).

## ROTATION SYSTEM

Turntable bearing powered by a high-torque hydraulic motor through a ring-and-pinion type spur-gear train. Total gear reduction is 50.7 to 1.

## CYLINDER HOLDING VALVES

The base end of the extension cylinder and the extend side of the lower boom cylinder are equipped with counterbalance valves to prevent sudden cylinder collapse in the event of hose breakage or other hydraulic component failure.

A 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 means of a hydraulic motor driving a 30:1 worm gear arrangement with a mechanical brake. The winch may be operated at a line speed of 34 ft/min (10.36 m/min) under no—load conditions or 17 ft/min (5.18 m/min) under load. Maximum single-line lifting capacity of the winch is 7000 lbs. (3175 kg.). The winch is equipped with 100 ft. (30.5 m) 1/2 in. (1.27 cm) 6 x 36 PRF RRL IWRC XIPS wire rope. Nylon sheaves are located at the tip of the extension boom and two-part line block. The ratio of winch drum and boom tip sheave pitch diameter to wire rope diameter is 18:1. The ratio of the two-part line sheave to wire rope diameter is 16:1. 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

The hydraulic system is an open center, full pressure system requiring maximum flow of 10 GPM (37.9 liters/min.) at 2500 psi (172 bar). It is equipped with a four section, electric remote, stack type control valve with a 30 ft. (9.14 m) control cable. The system includes a separate hydraulic oil reservoir, suction line filter, return line filter and control valve.

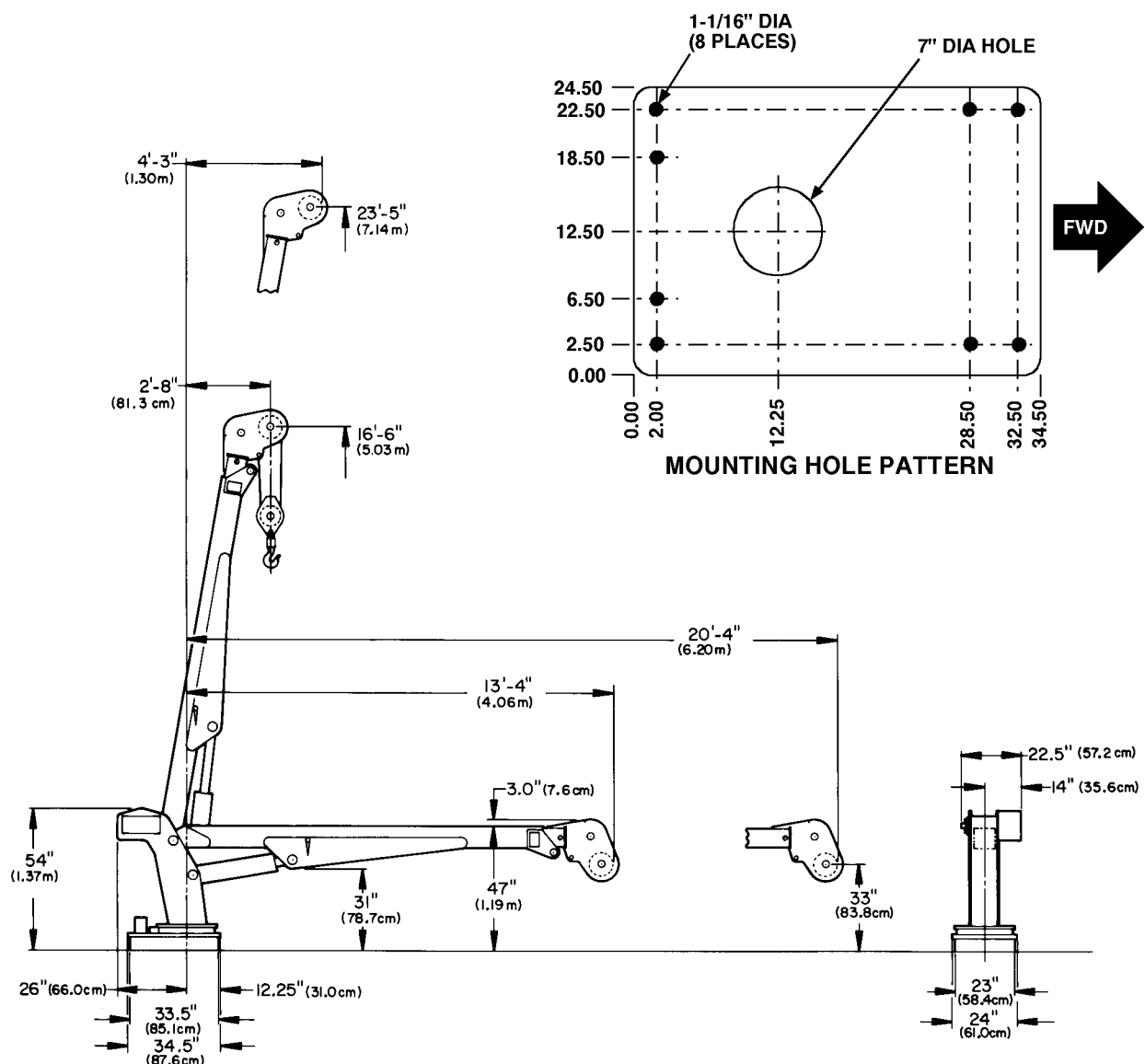


**MINIMUM CHASSIS SPECIFICATIONS**

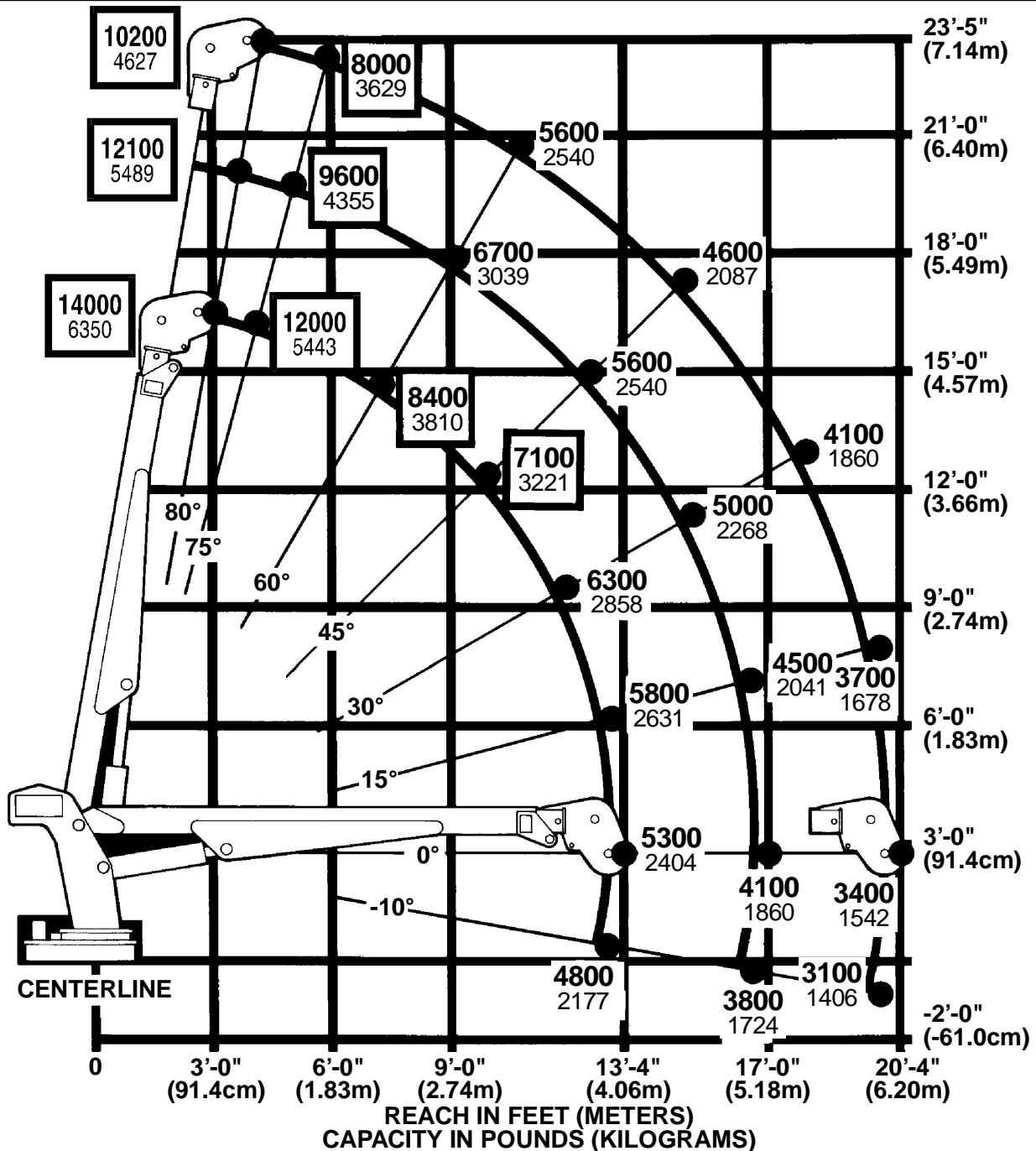
BODY STYLE	Conventional Cab	Conventional Cab
WHEEL BASE	189"	480.1cm
CAB TO AXLE	120"	304.8cm
FRAME SECTION MODULUS	19.2 cubic inches	314.7cc
RBM	900,000 in-lbs	10,373 kg-meter
FRONT AXLE RATING	9000 lbs	4082 kg
REAR AXLE RATING	21,000 lbs	9526 kg
TRANSMISSION	5 speed	5 speed

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

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

**GEOMETRIC CONFIGURATION**

# 7020 CAPACITY CHART



Maximum 1-part line capacity is 7000 lbs (3175 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.



**IOWA MOLD TOOLING CO., INC.**

BOX 189, GARNER, IA 50438-0189

TEL: 641-923-3711 FAX: 641-923-2424

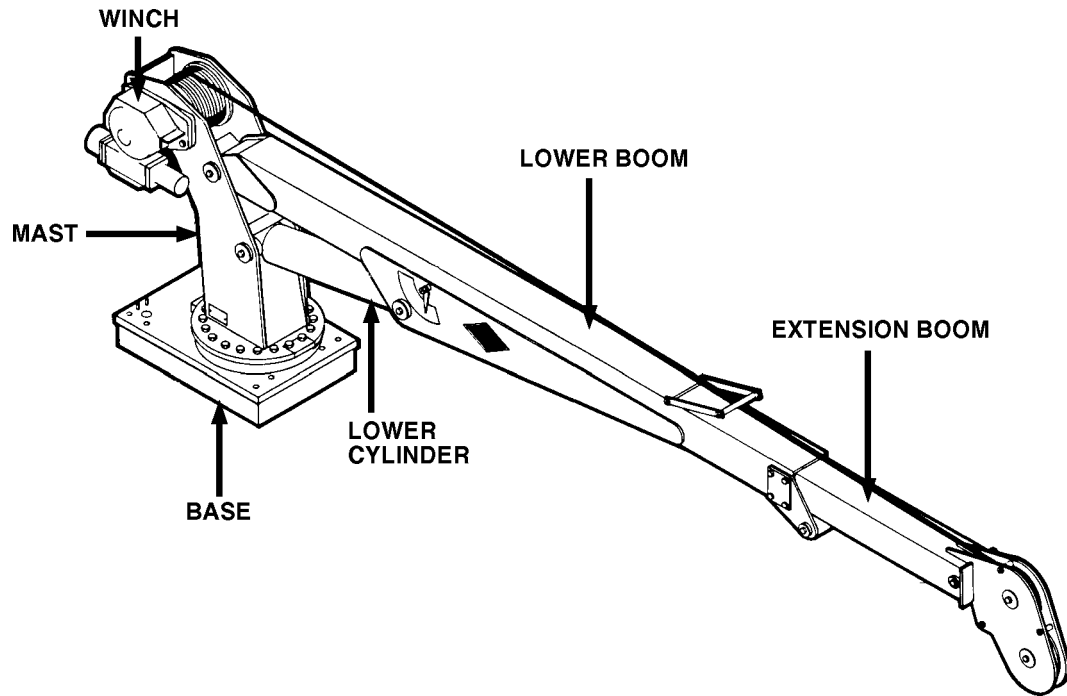
71392649

**SECTION 2. MODEL 7020 CRANE REFERENCE**

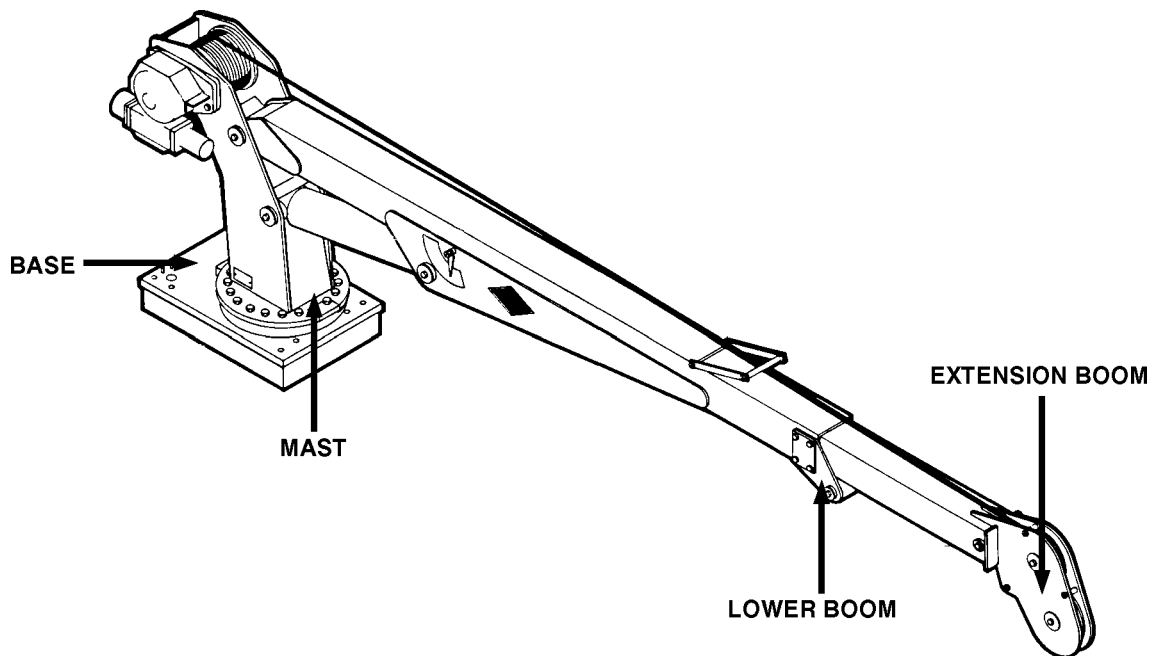
MAJOR CRANE ASSEMBLIES .....	3
WELDMENT PART NUMBER LOCATIONS .....	3
GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS .....	4
RECOMMENDED SPARE PARTS LIST .....	5
INSTALLATION .....	7
CRANE INSTALLATION .....	7
HYDRAULIC INSTALLATION .....	8
ELECTRICAL INSTALLATION .....	8
TEST .....	8
CONTROL VALVE TROUBLESHOOTING .....	9
RELAY BOARD OPERATION .....	11
WINCH TROUBLESHOOTING .....	17
ANTI TWO-BLOCKING DEVICE .....	19
Excessive Load Limit System (ELLS) TEST PROCEDURE .....	21
ELLS TROUBLESHOOTING PROCEDURE .....	26

00007020:99900196: 19960515

2-2  
**NOTES**

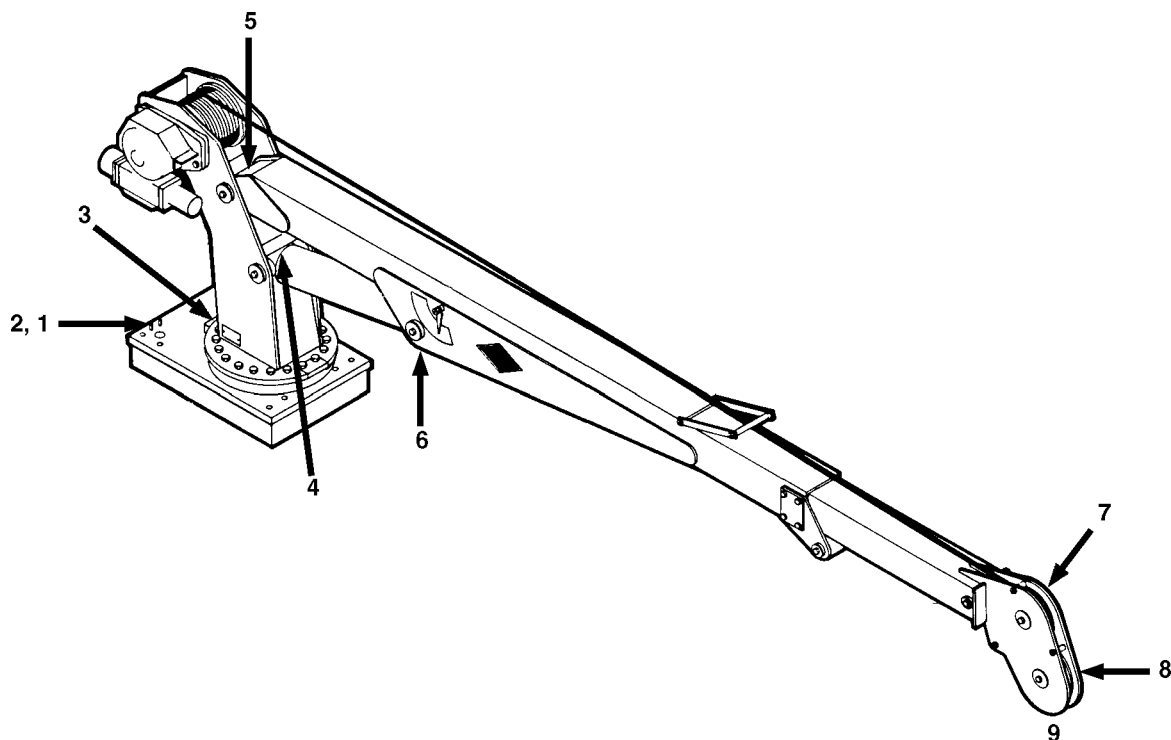


## MAJOR CRANE ASSEMBLIES



## WELDMENT PART NUMBER LOCATIONS

## GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	TURNTABLE/BEARING GREASE EXTENSION	SHELL ALVANIA 2EP  OR  SHELL RETINAX "A"	WEEKLY
2.	*ROTATE CRANE WHILE GREASING		
3.	DRIVE GEAR GREASE EXTENSION		
4.	PINION GEAR		
5.	LOWER CYLINDER BASE		
6.	MAST/LOWER BOOM HINGE PIN		
7.	LOWER CYLINDER ROD		
8.	UPPER SHEAVE PIN		
9.	LOWER SHEAVE PIN		
	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 7020 TELESCOPING CRANE  
FOR MANUAL: 99900196**

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
<b>41706634.01.19981021</b>	<b>BASE ASM</b>						
	3	60020115	BUSHING	1	W		
	4	60020116	BUSHING	1	W		
	5	60020187	BUSHING	1	W		
	6	60020188	BUSHING	1	W		
	16	71056265	PINION GEAR	1	W		
	36	73540004	HYD MOTOR	2	W		
<b>41706681.01.19960515</b>	<b>LOWER BOOM ASM</b>						
	5	7BF81520	BUSHING	4	W		
	8	60030015	WEAR PAD	2	W		
	9	60030167	WEAR PAD	1	W		
<b>3C252990.01.20000720</b>	<b>LOWER BOOM CYLINDER</b>						
	3	7BF81520	BUSHING	5	W		
	6	6H060030	HEAD	1	W		
	5	6I060200	PISTON	1	W		
	7	9C242432	SEAL KIT	1	W		
	21	73540057	CBAL VALVE	1	C		
	29	7BF82020	BUSHING	1	W		
<b>41706682.01.19960515</b>	<b>EXTENSION BOOM ASM</b>						
	4	60030076	WEAR PAD	1	W		
<b>3B341860.01.19960515</b>	<b>EXTENSION BOOM CYLINDER</b>						
	4	73054900	COUNTERBALANCE VALVE	1	C		
	5	6H030020	HEAD	1	W		
	6	6I030106	PISTON	1	W		
	7	9C121617	SEAL KIT	1	W		
	20	60030004	WEAR PAD	2	W		
<b>73054900.01.19989520</b>	<b>LOCKING/HOLDING VALVE</b>						
	2	73054999	COUNTERBALANCE VALVE	1	C		
	3	7Q072112	O-RING	3	W		
<b>31706974.01.19960515</b>	<b>WINCH/CABLE/HOOK KIT</b>						
	1	51706674	CABLE WITH SOCKET 1/2X100'	1	W		
	8	60030102	SHEAVE	2	W		
	9	60030170	SHEAVE	1	W		
	45	77041291	SWITCH	1	W		
	47	51713168	CORD REEL	1	W		
<b>73733397.01.20000720</b>	<b>PROPORTIONAL VALVEBANK</b>						
	3	73054934	PROPORTIONAL SOLENOID	1	C		
	4	73054935	RELIEF VALVE	1	W		
	5	73054936	SOLENOID VALVE	4	W		
	6	7Q072013	O-RING	10	W		
	17	77044595	VALVE DRIVER	1	C		
<b>51713182.01.19971111</b>	<b>PROPORTIONAL REMOTE HANDLE ASM (1996 &amp; NEWER)</b>						
	11	70394183	TRIGGER ASM	1	W		
	16	77040371	TOGGLE SWITCH SPST	2	W		
	17	77040372	TOGGLE SWITCH SPDT	4	W		
	18	77040373	TOGGLE SWITCH SPST	2	W		
	19	77040374	TOGGLE SWITCH SPDT	1	W		
<b>93709115.01.19980226</b>	<b>INSTALLATION KIT</b>						
		73052006	ELEMENT-RET. FILTER 10MIC	6	P		
		70048149	ELEMENT 100 MESH	6	P		
		73052014	ELEMENT 25 MIC SPIN	6	P		

00007020:99900196: 19960515

2-6  
(BLANK)



# INSTALLATION

## GENERAL

This section contains specific instructions for the installation of your crane. Prior to installing the crane and hydraulic components, make sure that the chassis is ready to receive the crane (Volume 1). Reinforce the chassis frame, as necessary, and install the PTO, hydraulic pump, filters, etc. as necessary.

Each installation may vary in components used. It is important to use hoses of proper length, pumps of correct size, and PTO's of adequate speed.

## CRANE INSTALLATION

Install the 7020 crane only on an IMT-designed and approved truck body. The body must be designed to sustain the forces imposed by the crane when lifting the full rated load. Before attempting to install the crane, first install the truck body.

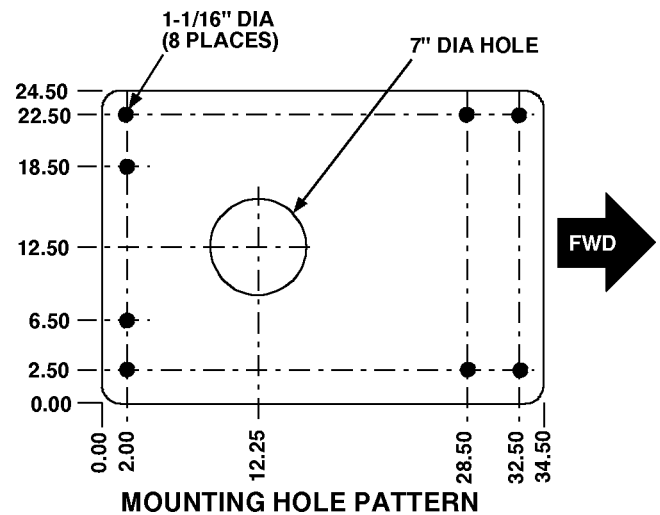
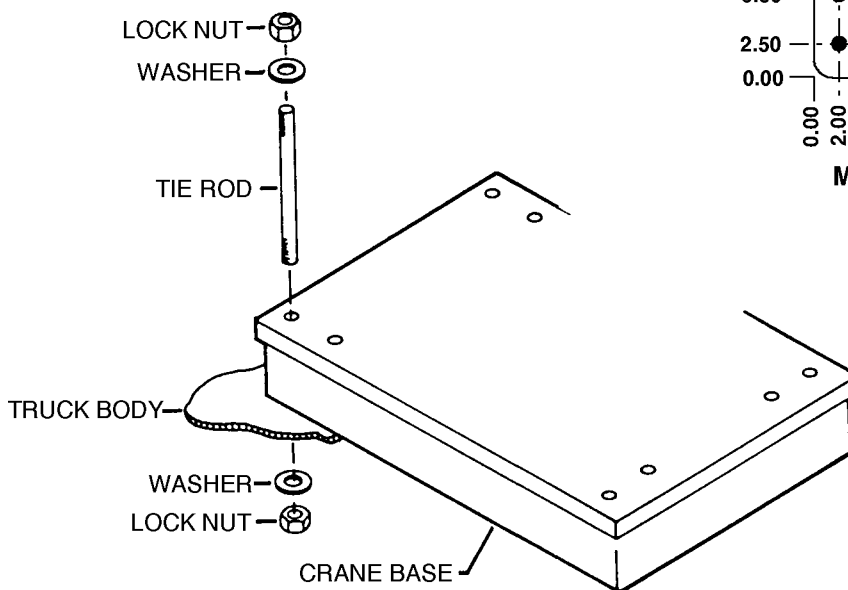
To install the crane:

1. Use a lifting device capable of lifting the weight of the crane, 2960 lbs. (1343kg.). Lift the crane and move the carrier vehicle with body installed under the crane. Lower the crane into position on the body.
2. Install the mounting tie rods, washers, and nuts to secure the crane base to the truck body. Tighten and torque to 200 ft- lbs. (28 kg-m).

## CAUTION

Do not attempt to apply the same torque to the self locking nuts and tie rods as shown in the Torque Data Chart. Do not exceed 200 ft-lbs. Exceeding the stated torque of 200 ft-lbs. (28 kg-m) may damage either the crane base or the body.

Power wrenching of the nut is not recommended until the lead thread of the nut insert is engaged by hand turning.



**CRANE INSTALLATION**

## HYDRAULIC INSTALLATION

Before beginning hydraulic installation, refer to the Installation Kit in the Parts Section for specific components and routing.

To install the crane hydraulics:

1. Install the suction filter on the carrier vehicle's frame. Install the 1-1/4" gate valve and hose on the suction filter inlet. Route the 1-1/4" ID hose between the reservoir and filter. Install the barbed nipples and hose clamps.
2. Install the 1-1/4" ID hose between the pump and the suction filter, using barbed nipples and hose clamps.
3. Install the 1/2" ID hose between the pump and the valvebank.
4. Install the 3/4" ID return hose between the return filter and the return port on the valvebank.

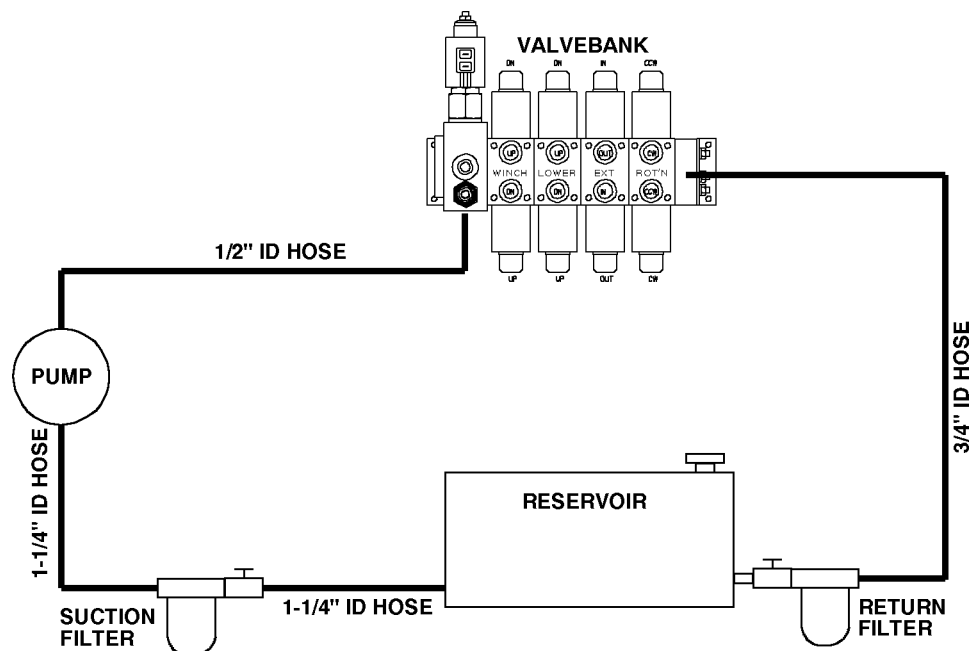
## ELECTRICAL INSTALLATION

Familiarize yourself with the information on Proportional Remote Controls contained in this manual. Install the electrical components per the diagrams shown in the Parts Section.

## TEST

Test operate the crane and controls as follows:

1. Fill the hydraulic reservoir (refer to Volume 1 for hydraulic oil specifications).
2. Check all connections for leaks.
3. Start the vehicle engine and test each crane function individually. Conduct a visual inspection to make certain that there are no leaks and that everything is operating properly.
4. Check the oil level in the reservoir and add oil if necessary.



## HYDRAULIC INSTALLATION

## **CONTROL VALVE TROUBLESHOOTING**

### **HYDRAULICS-VALVEBANK**

#### **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.

##### **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 2500 psi at 10 gpm. If the relief valve should fail, it would likely stick open. This would prevent system pressure from developing and cause a lack of torque/force at the actuator. The relief valve can be changed easily by screwing it out and replacing with a new one.

##### **PROPORTIONAL VALVE**

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

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

##### **DIRECTIONAL VALVES**

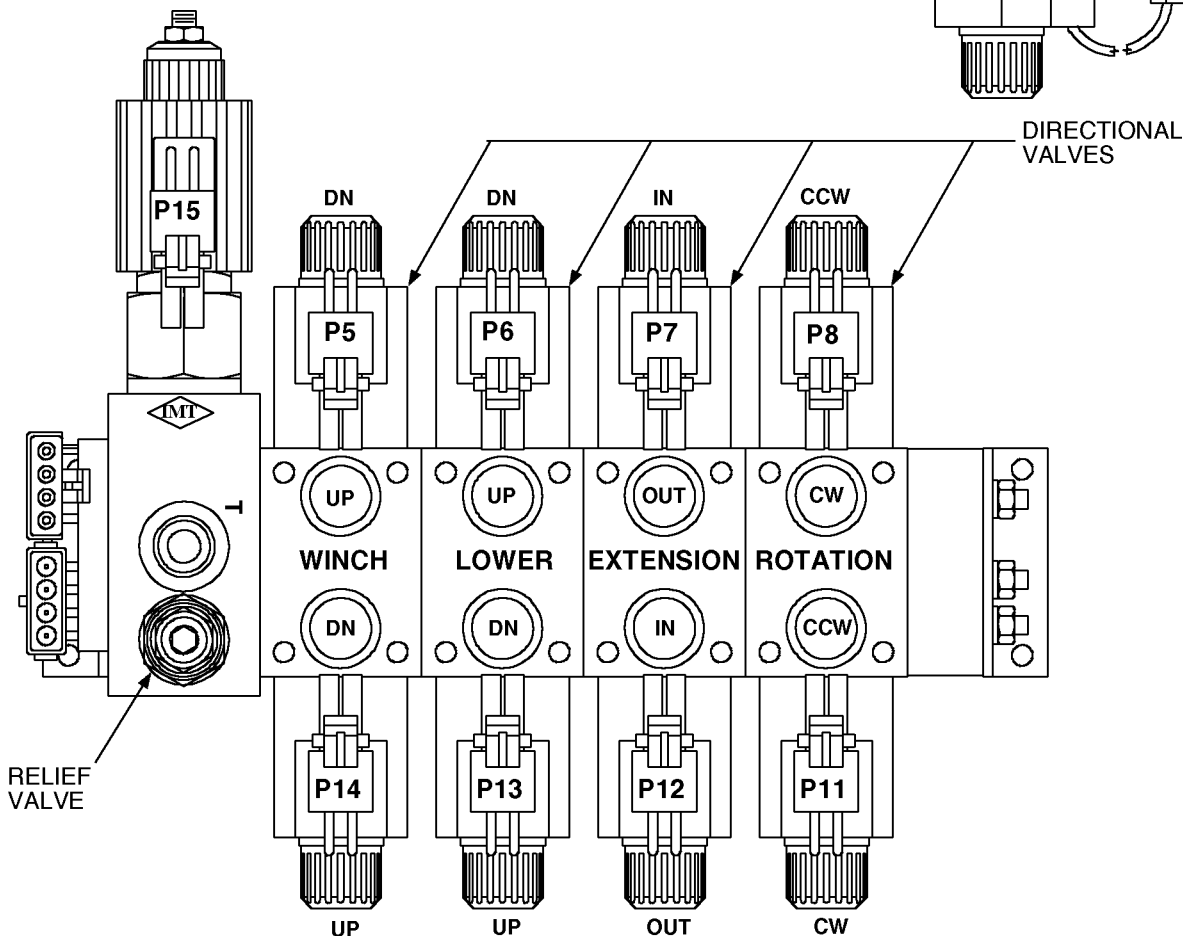
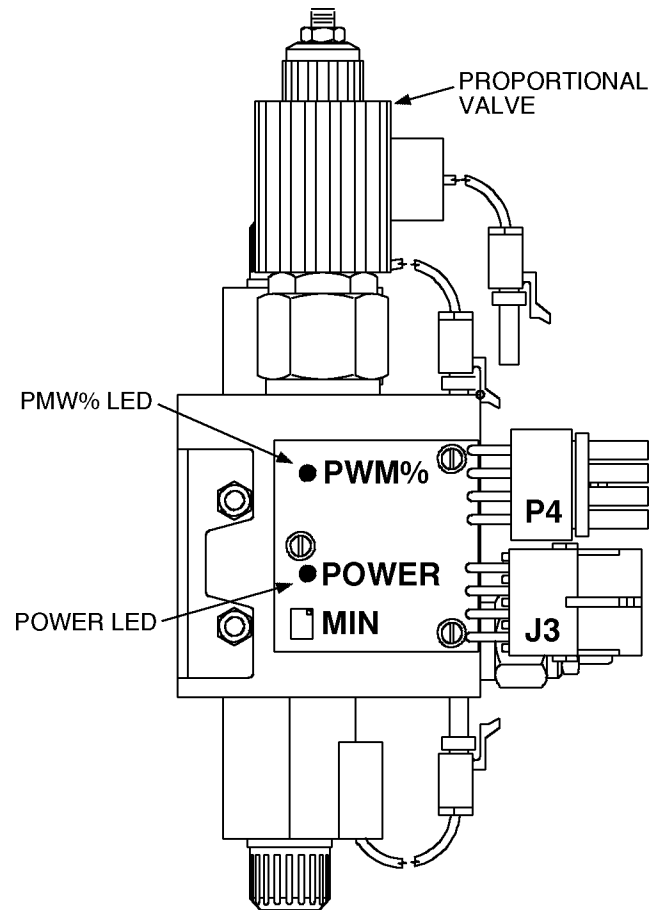
The directional valves (4) control the direction of the crane functions. When one of the solenoids is energized, it shifts the valve spool. This allows oil to flow out one of the valve ports. If a function does not work, a directional valve may be to blame.

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

**CAUTION**

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

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

**VALVEBANK**

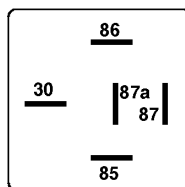
# RELAY BOARD OPERATION

## INTRODUCTION

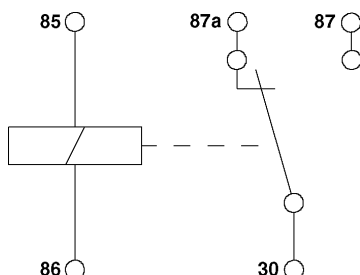
To understand how the relay board operates, it is necessary to understand how the individual relays function.

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

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



**FIGURE 1. BOTTOM VIEW OF RELAY**



**FIGURE 2. INTERNAL WIRING**

## 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.

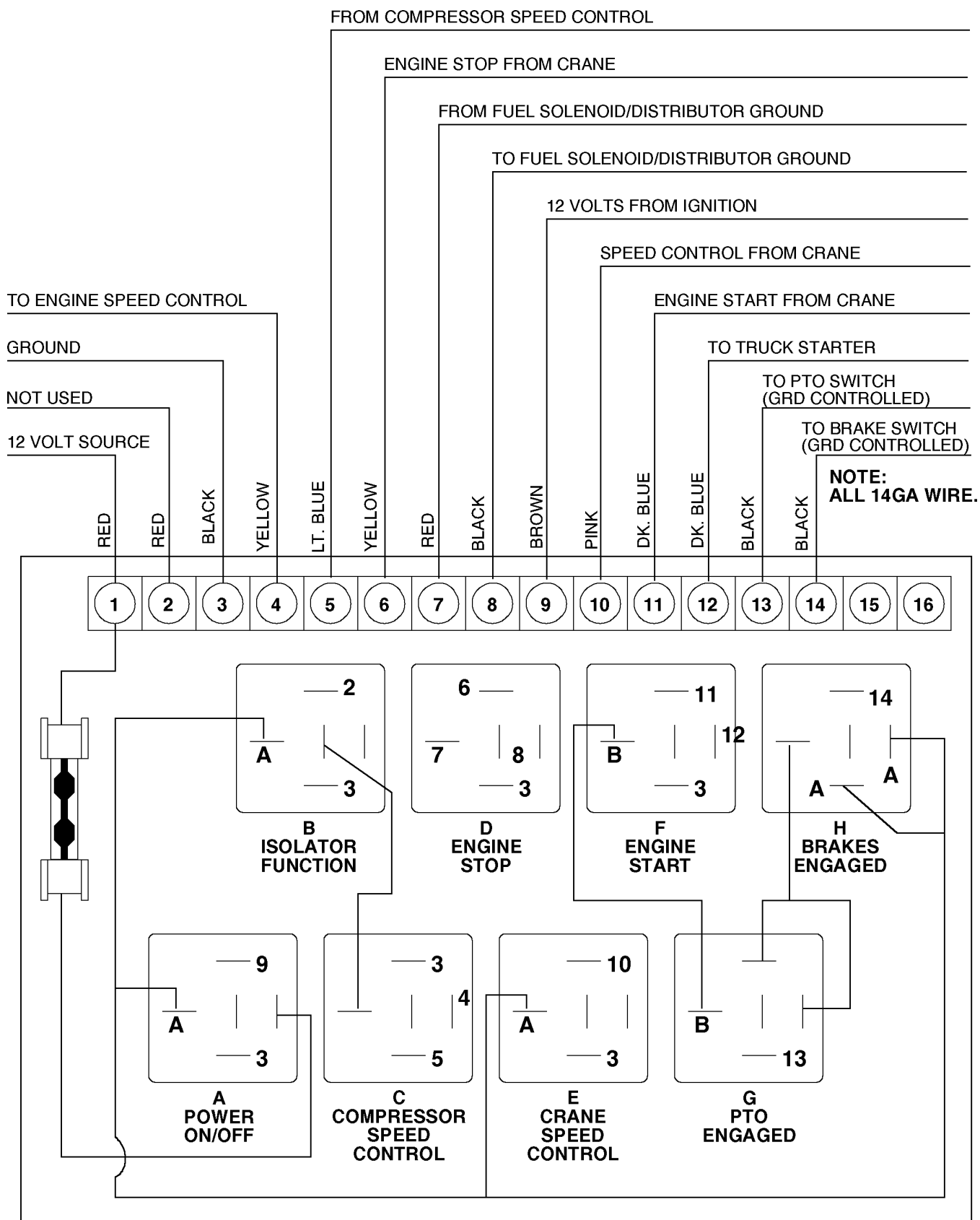


FIGURE 3. RELAY BOARD - COMPONENTS &amp; WIRING

## REMOTE ENGINE SPEED (FROM CRANE)

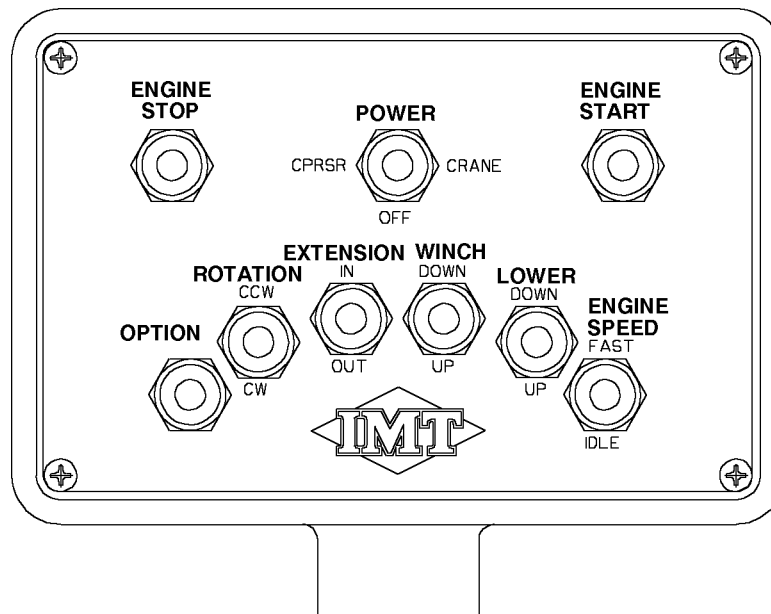
Engine speed can be controlled from the remote control handle. When the engine speed switch is activated, voltage is applied at terminal 10 of relay “E”. The coil of relay “E” is energized and current is allowed to flow to the signal input of the speed control currently installed. The speed of the engine 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.

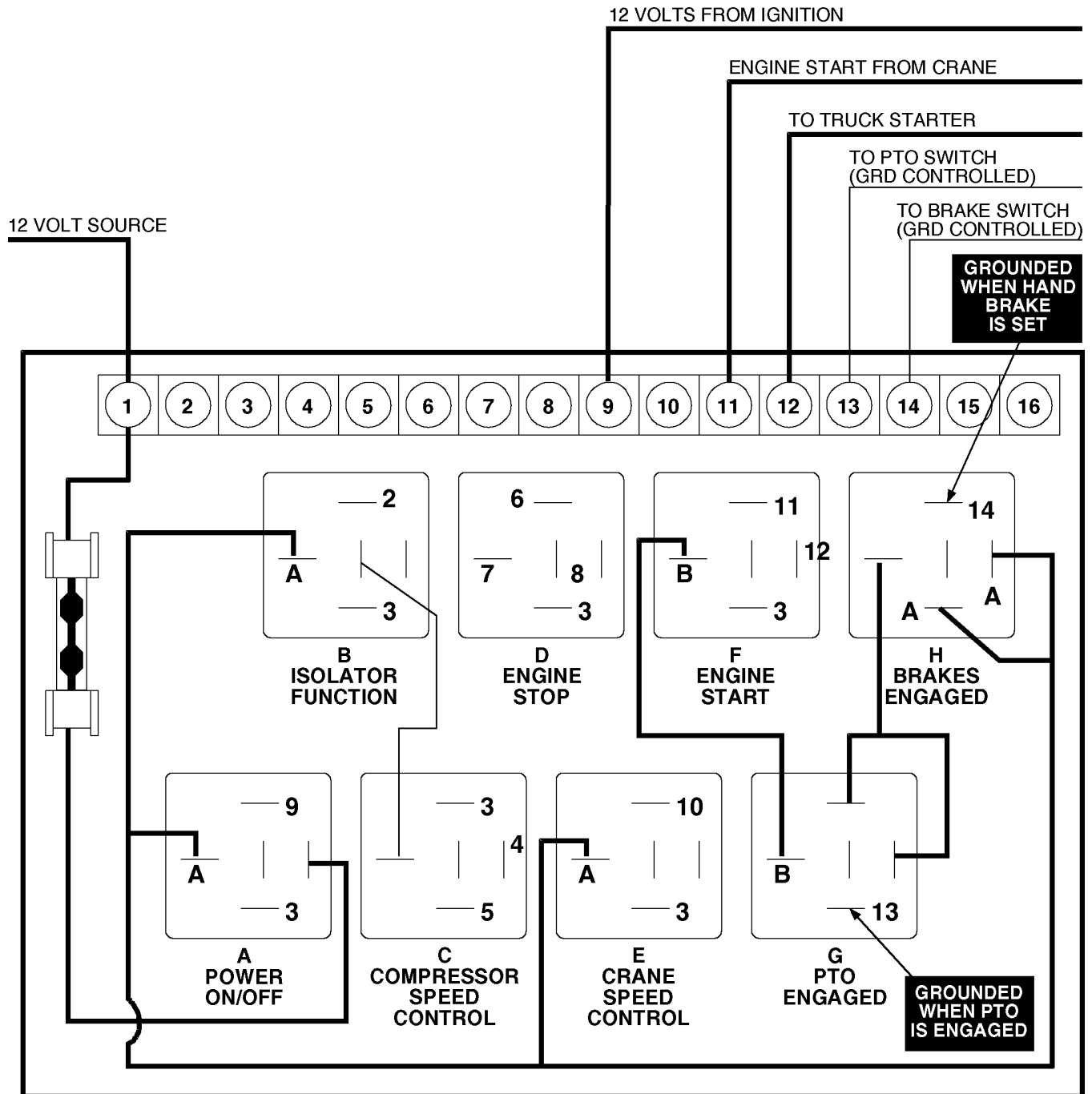
Relay “C” energizes the coil in the relay, connecting terminal 4 to terminal “C” of the relay which is “HOT” from relay “B”. Reference Figure 6 showing circuits energized (in bold) when engine speed is increased by the compressor. This will provide a “HOT” signal at terminal 4 which then provides a 12-volt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

### NOTE:

THE SWITCH MARKED “OPTION” CONTROLS TWO-SPEED WINCH FUNCTION.



**FIGURE 4. REMOTE CONTROL HANDLE**



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



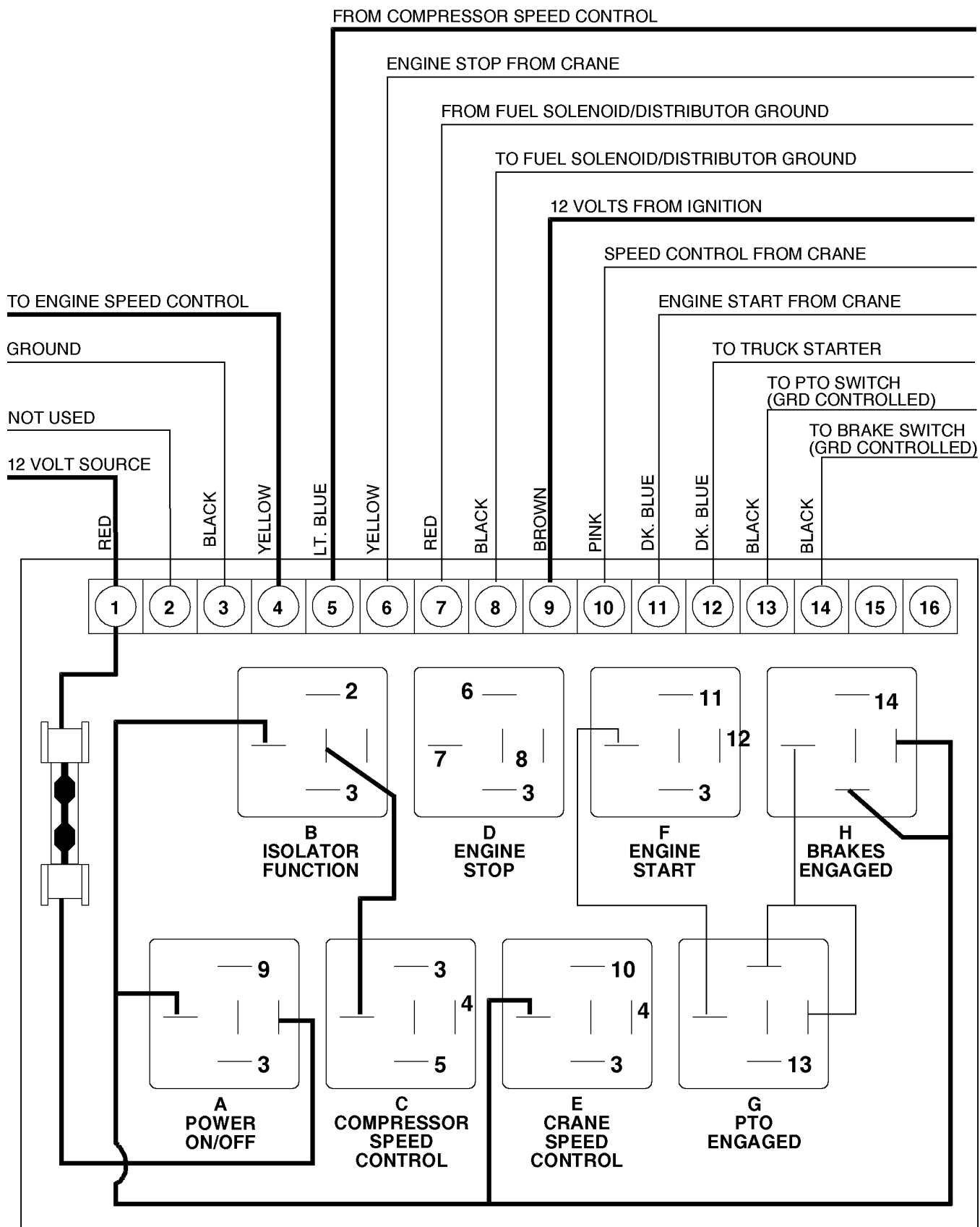


FIGURE 6. SPEED CONTROL - COMPRESSOR ONLY

**INSTALLATION**

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

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

3. Connect control wiring as indicated in Wiring Chart.

4. Jumper wires connections:

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

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

**WARNING**

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

**\* NOTES**

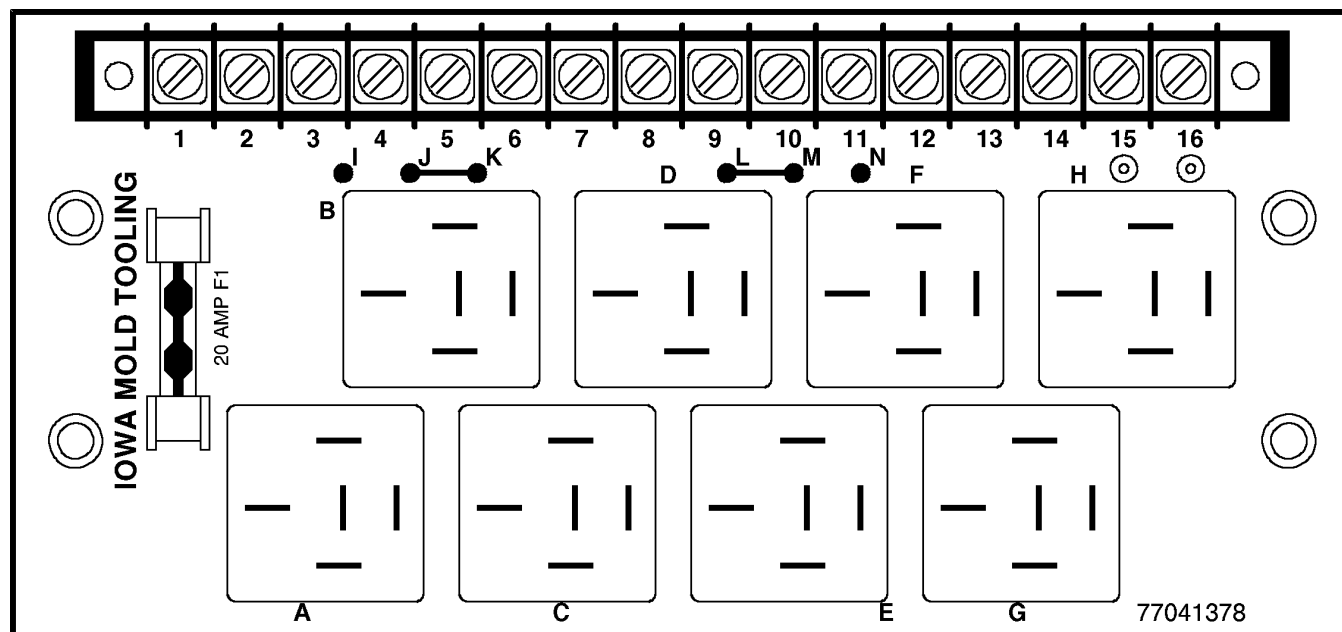
Circuits that could be ground excited are 6 - 10 & 11.  
Quick Check: (Before connecting wires to circuit board)  
Activate the engine stop switch from the crane. If terminal 6 is hot, wire per 4-1. If not, wire per 4-2.

**WIRING CHART**

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

**RELAY FUNCTION**

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



**FIGURE 7. RELAY BOARD (77041378) WIRING INSTRUCTIONS**

## WINCH TROUBLESHOOTING

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

See Section 3 for parts drawing.



## ANTI TWO-BLOCKING DEVICE

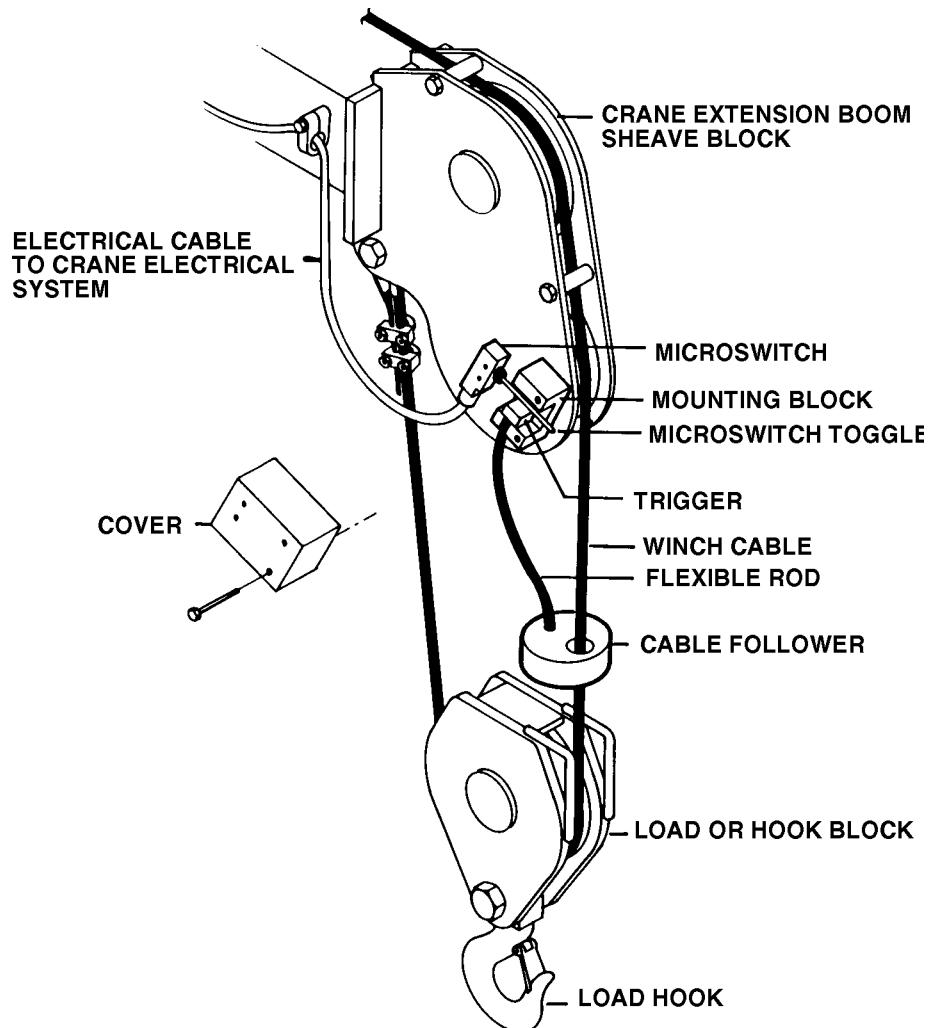
IMT telescoping cranes using a winch are equipped with an Anti Two-Blocking Device which is designed to provide a method of sensing an approaching Two-Blocking situation and prevent the crane from entering that situation. It is the operator's responsibility to avoid Two-Blocking and not to rely on this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

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

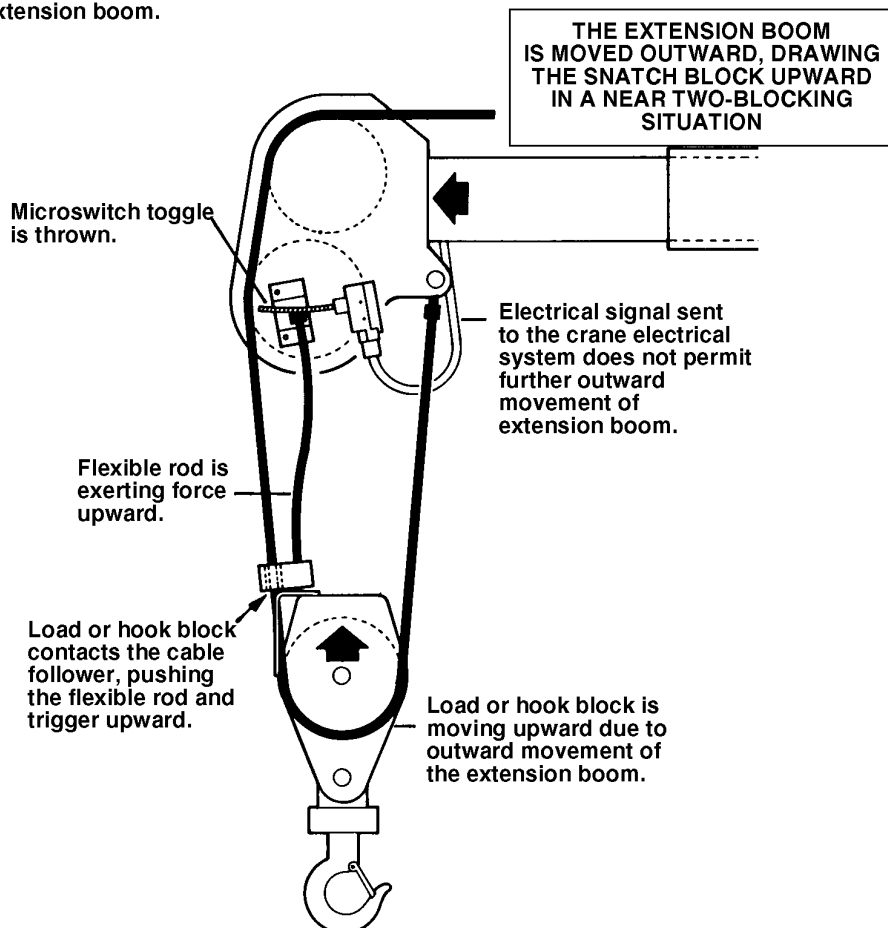
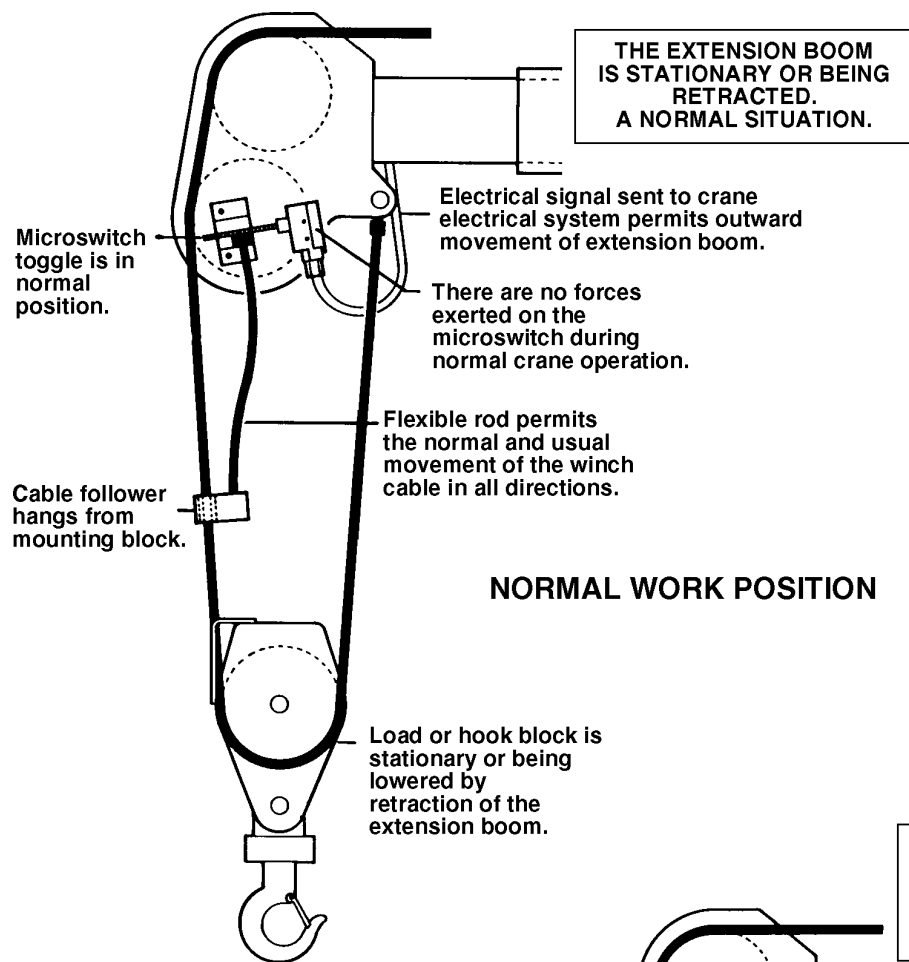
### NOTE

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

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



## ANTI TWO-BLOCKING DEVICE COMPONENTS



## 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"

#### **#6 STR-#6 MALE JIC FITTING**

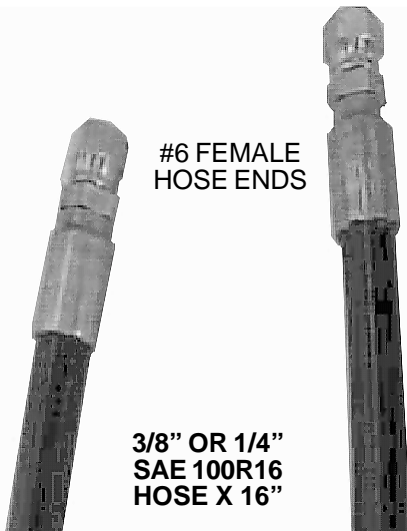
(ref) PARKER PART# 0503-6-6	QTY 2
-----------------------------	-------

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

TEE

#6  
MALE  
JIC

ADAPTER

1/4"  
FEMALE  
PIPE  
THREAD**5000 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.

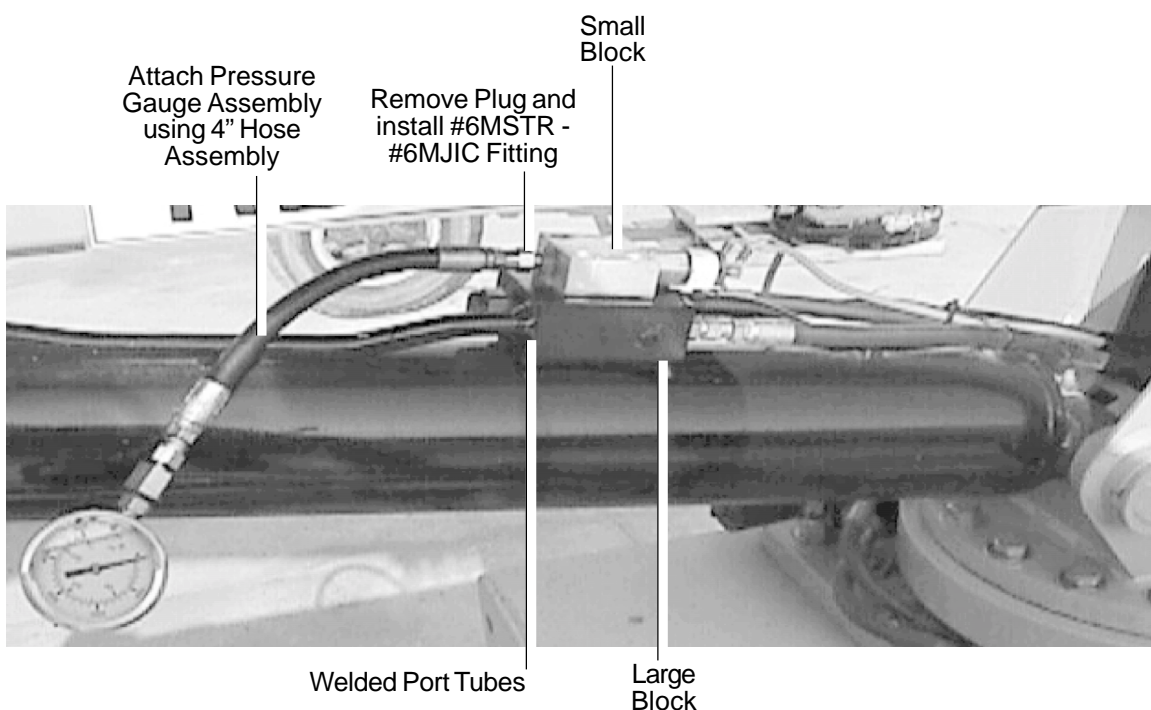


**B. Attach Pressure Gauge (Procedure used depends on cylinder block used on crane.)**

-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.

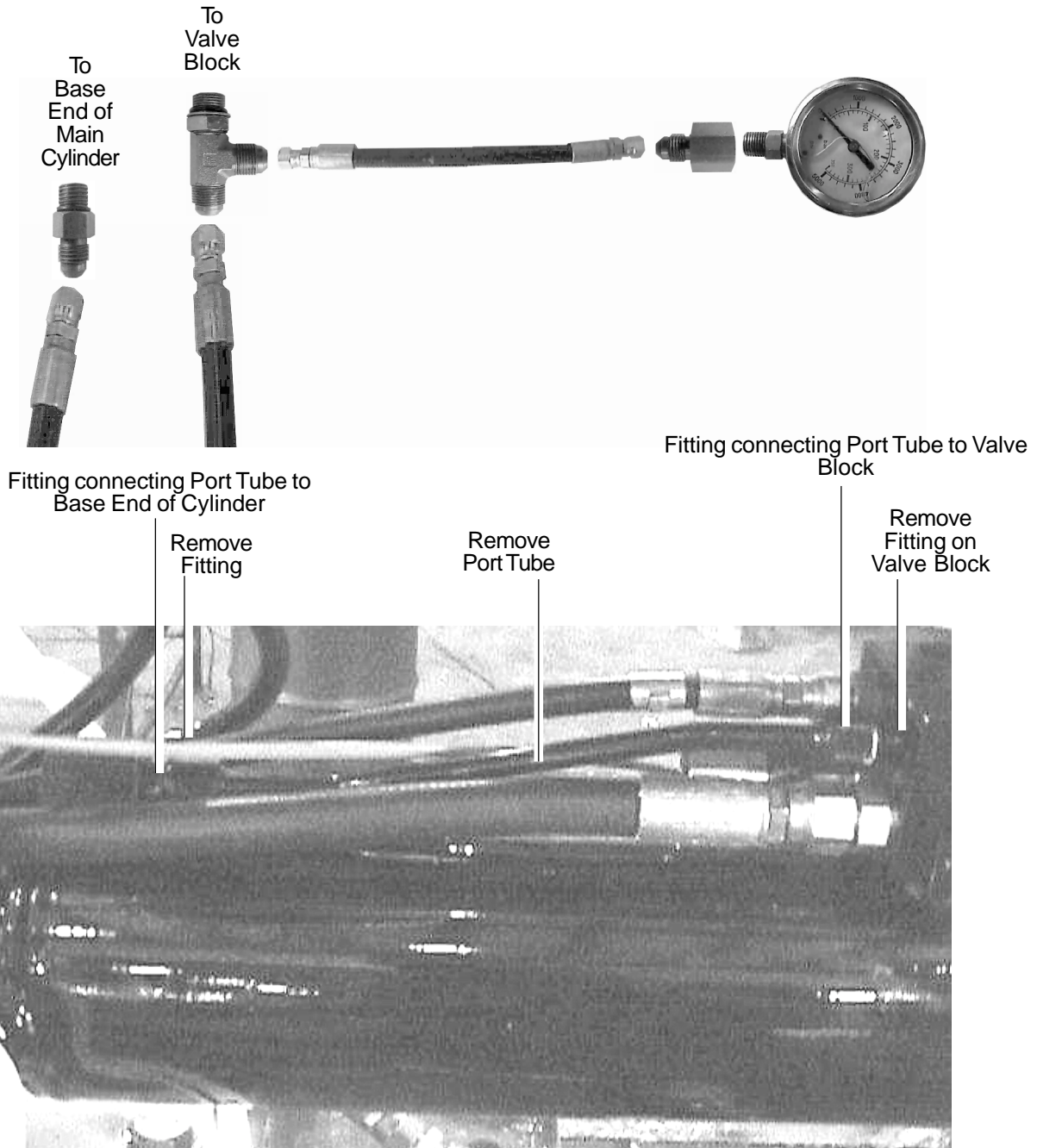
-Use Procedure 2 for cranes with only one valve block and the port tubes are removable by use of fittings on the valve block and on the cylinder.

- 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 gauge 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)

- Remove bolts that attach the valve block to the cylinder
- 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).
- Turn off fitting connecting port tube to valve block.
- 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.
- Remove fitting from valve block.
- Install 16" hose assembly with T-fitting (refer below) between block on lower boom cylinder and base end of lower boom cylinder.
- Attach pressure gage assembly to T-fitting using 4" hose assembly (refer to figure below).
- 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.

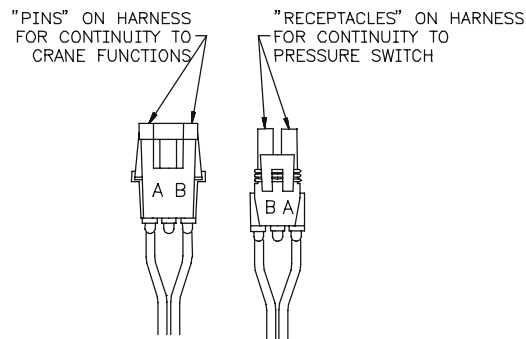
## ELLS TROUBLESHOOTING PROCEDURE

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. MODEL 7020 REPLACEMENT PARTS

PARTS INFORMATION .....	3
BASE ASM (41706634) .....	4
MAST ASM (41706646) .....	5
LOWER BOOM ASM (41706681) .....	6
LOWER BOOM CYLINDER (3C252990) .....	7
EXT BOOM ASM (41706682) .....	8
EXT BOOM CYLINDER (3B341860) .....	9
LOCKING/HOLDING VALVE (73054900) .....	10
HOLDING VALVE (73054004) .....	11
WINCH/CABLE/HOOK KIT (31706974) .....	12
WINCH (71057627) .....	13
CONTROL KIT (90709116) .....	14
CONTROL KIT-4R+ENG START (90709117) .....	15
CONTROL KIT-RADIO RMT (90718833) .....	16
HYDRAULIC KIT, FAUVER VALVEBANK .....	17
HYDRAULIC KIT (91714933-1) .....	17
HYDRAULIC KIT (91714933-2) .....	18
HYDRAULIC KIT (91714933-3) .....	19
HYD KIT-RADIO RMT (91715634-1) .....	20
HYD KIT-RADIO RMT (91715634-2) .....	21
HYD KIT-RADIO RMT (91715634-3) .....	22
VALVEBANK, RADIO REMOTE (73733932) .....	23
WIRING HARNESS, RADIO REMOTE (77441101-1) .....	24
SCHEMATIC, RADIO REMOTE (77441101-2) .....	25
CIRCUIT CHART, RADIO REMOTE (77441101-3) .....	26
WIRE ROUTING (90713191) .....	27
ELECTRICAL SCHEMATIC, PROP REMOTE CONTROL (99900855) .....	28
HYD KIT, TETHERED REMOTE (91715653-1) .....	29
HYD KIT, TETHERED REMOTE (91715653-2) .....	30
HYD KIT, TETHERED REMOTE (91715653-3) .....	31
VALVEBANK, TETHERED REMOTE (73733397) .....	32
CABLE ASM, TETHERED REMOTE (70733394-1) .....	33
CABLE ASM, TETHERED REMOTE (70733394-2) .....	34
PROP'L RMT HANDLE ASM (51713182) .....	35
TETHERED PROPORTIONAL REMOTE POTENTIOMETER ADJUSTMENT .....	36
OPTION-AUX STABILIZERS-MO/PD (31704124-1) .....	37
OPTION-AUX STABILIZERS-MO/PD (31704124-2) .....	38
OPTION-AUX STABILIZERS-PO/PD (31704123-1) .....	39
OPTION-AUX STABILIZERS-PO/PD (31704123-2) .....	40
VALVEBANK ASM-2 SECT (51703620) .....	41
VALVEBANK ASM-3 SECT (51703619) .....	42
CYLINDER - PWR DN (3B166820) .....	43
CYLINDER-PWR OUT (3B210522) .....	44
DECAL KIT (95708663) .....	45
INSTALLATION KIT-MTG HARDWARE (93715349) .....	46
INSTALLATION KIT (93709115) .....	47
CABLE ASM 14GA 6WIRE X 35' (51713199) .....	48
OPTION-BOOM SUPPORT ASM (51708366) .....	49
OPTION-RESERVOIR ASM-34 GAL (51708368) .....	50
CORD REEL ASM (51713168) .....	51
CHASSIS WIRING HARNESS (99903340) .....	52

00007020: 99900196:19981021

3-2  
**NOTES**

[illegible]

## 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  
Product 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.

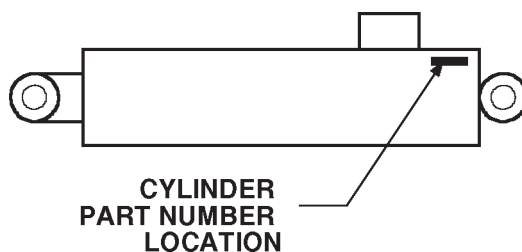
### WELDMENT IDENTIFICATION

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**



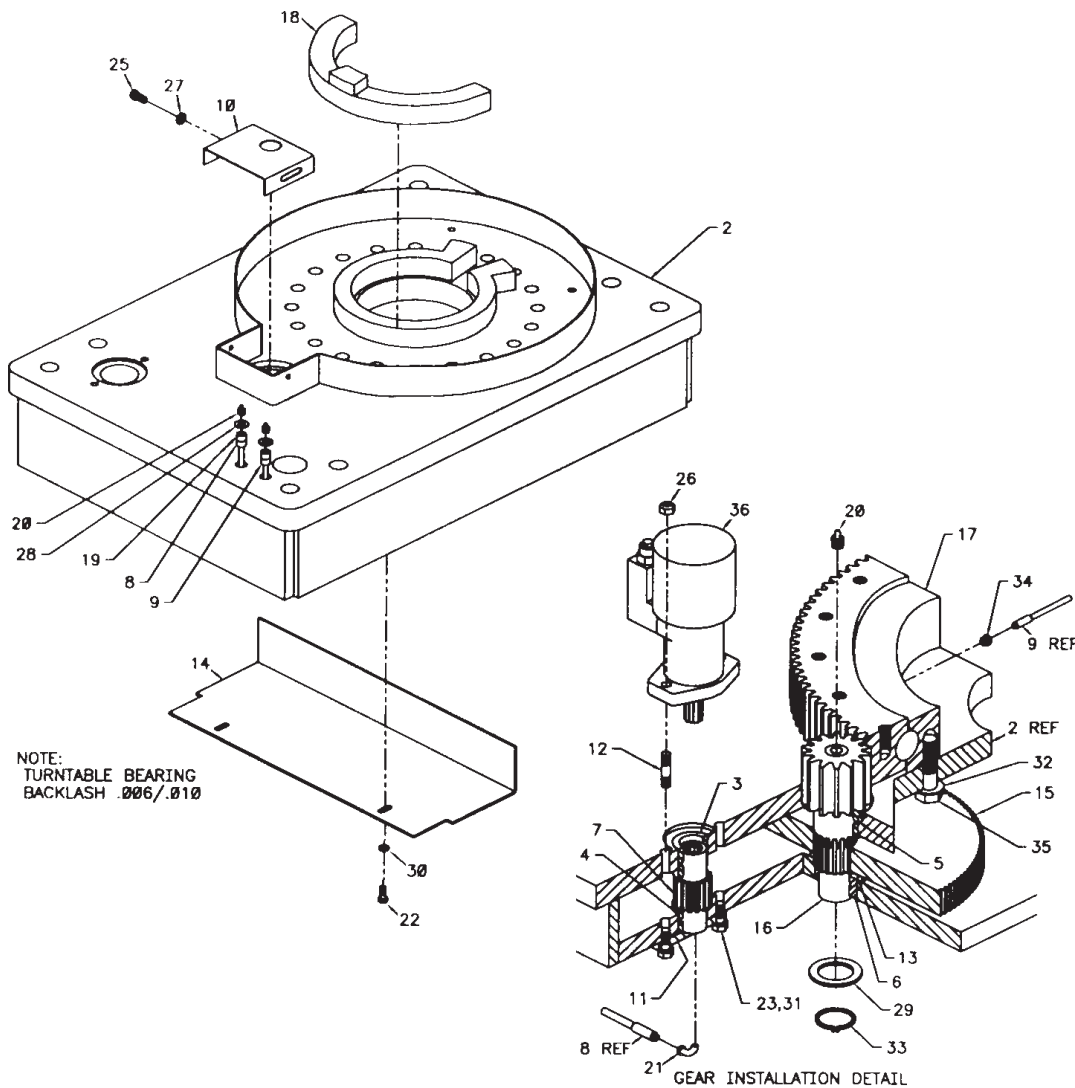
**BASE ASM (41706634)**

ITEM	PART NO.	DESCRIPTION	QTY
2.	52706637	BASE (INCL: 3-7)	1
3.	60020115	BUSHING (PART OF 2)	1REF
4.	60020116	BUSHING (PART OF 2)	1REF
5.	60020187	BUSHING (PART OF 2)	1REF
6.	60020188	BUSHING (PART OF 2)	1REF
7.	71056011	DRIVE GEAR (PART OF 2)	1REF
8.	51395124	HOSE (PART OF HOSE KIT)	1REF
9.	51395125	HOSE (PART OF HOSE KIT)	1REF
10.	60010235	PINION COVER	1
11.	60010844	GREASE PLATE	1
12.	60106032	STUD 1/2-13X2	2
13.	60106886	PINION SPACER	1
14.	60109991	GEAR GUARD	1
15.	71056072	INTERMEDIATE GEAR	1
16.	71056265	PINION GEAR	1
17.	71056361	TURNABLE BEARING	1
18.	71145016	ROTATION SLIDE 450°	1
19.	72053301	COUPLING 1/8NPT	2
20.	72053508	ZERK 1/8NPT	3
21.	72053589	STREET ELBOW 1/8NPT 90°	1
22.	72060023	CAP SCR 5/16-18X3/4 HHGR5	2
23.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	2

25.	72060833	CAP SCR 5/16-18X3/4 HHGR5	2
26.	72062080	NUT 1/2-13 LOCK	2
27.	72063002	WASHER 5/16 WRT	2
28.	72063003	WASHER 3/8 WRT	2
29.	72063039	MACH BUSHING 2X10GA	1
30.	72063050	WASHER 5/16 LOCK	2
31.	72063053	WASHER 1/2 LOCK	2
32.	72063116	WASHER 3/4 HARDENED	20
33.	72066095	RETAINING RING 2"	1
34.	72531826	REDUCER BUSHING 1/4 X 1/8	1
35.	72601295	CAP SCR 3/4-10X3-1/2 HHGR8	20
36.	73540004	HYD MOTOR (FROM 5-15-98)	1
	73051004	HYD MOTOR (TO 5-15-98)	1
	73054538	VALVE (TO 5-15-98)	2
	7Q072012	O-RING (TO 5-15-98)	2
	72060738	CAP SCR (TO 5-15-98)	4
	5V151830	MOTOR BLOCK (TO 5-15-98)	1

**WARNING**

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





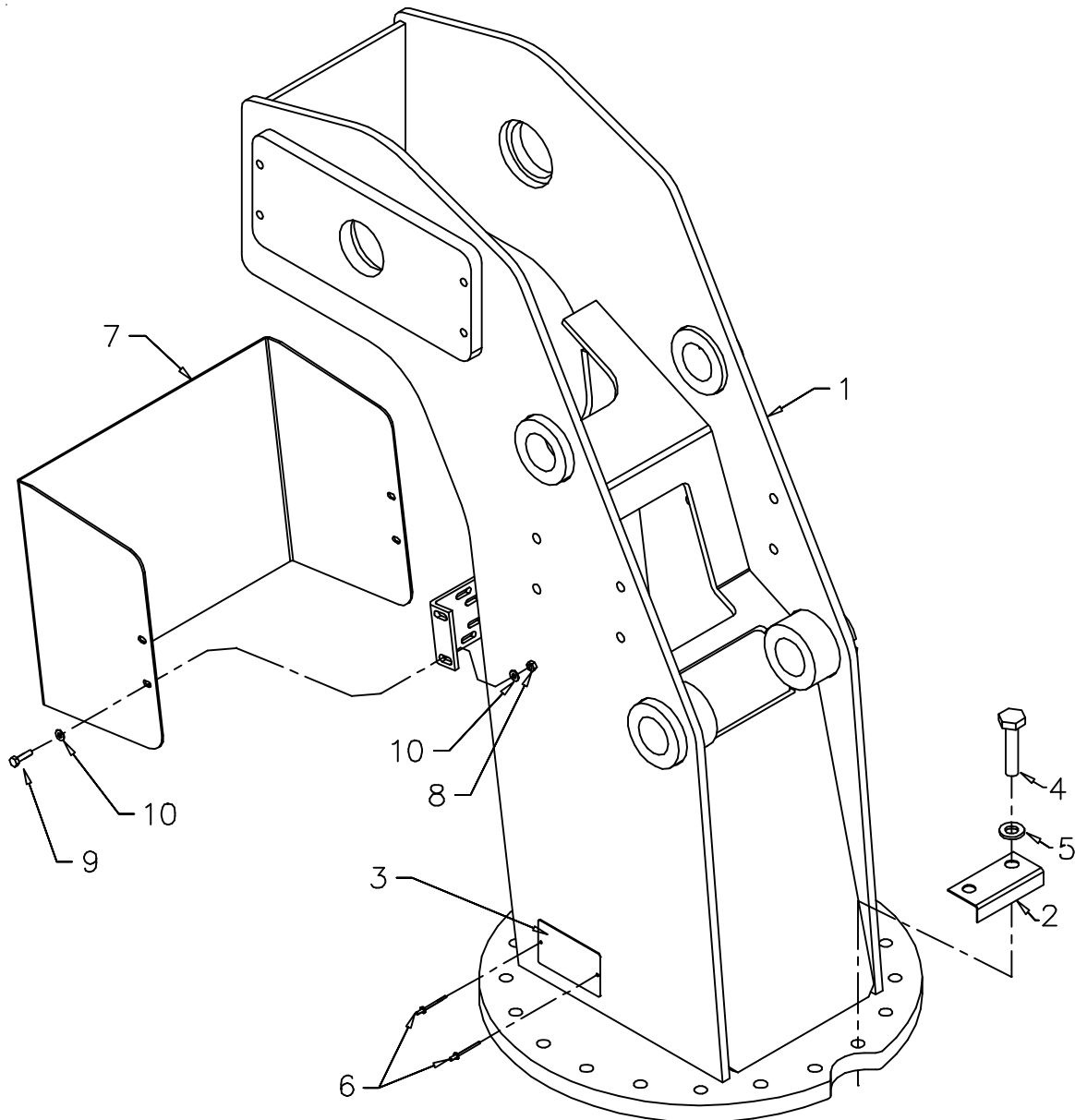
**MAST ASM (41706646)**

1.	52706647	MAST	1
2.	60110950	PINION COVER	1
3.	70029119	SERIAL NUMBER PLACARD	1
4.	72060177	CAP SCR 5/8-11X3 HHGR8	20
5.	72063119	WASHER 5/8 FLAT HRDND GR8 20	20
6.	72066340	POP RIVET 1/8	2
7.	60119127	COVER	1
8.	72062104	NUT 1/4-20 LOCK	4
9.	72060004	CAP SCR 1/4-20X1 HHGR5	4
10.	72063001	WASHER 1/4 WRT	8

**WARNING**

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

NOTE: DO NOT USE THREAD LOCK ON ITEM #4.

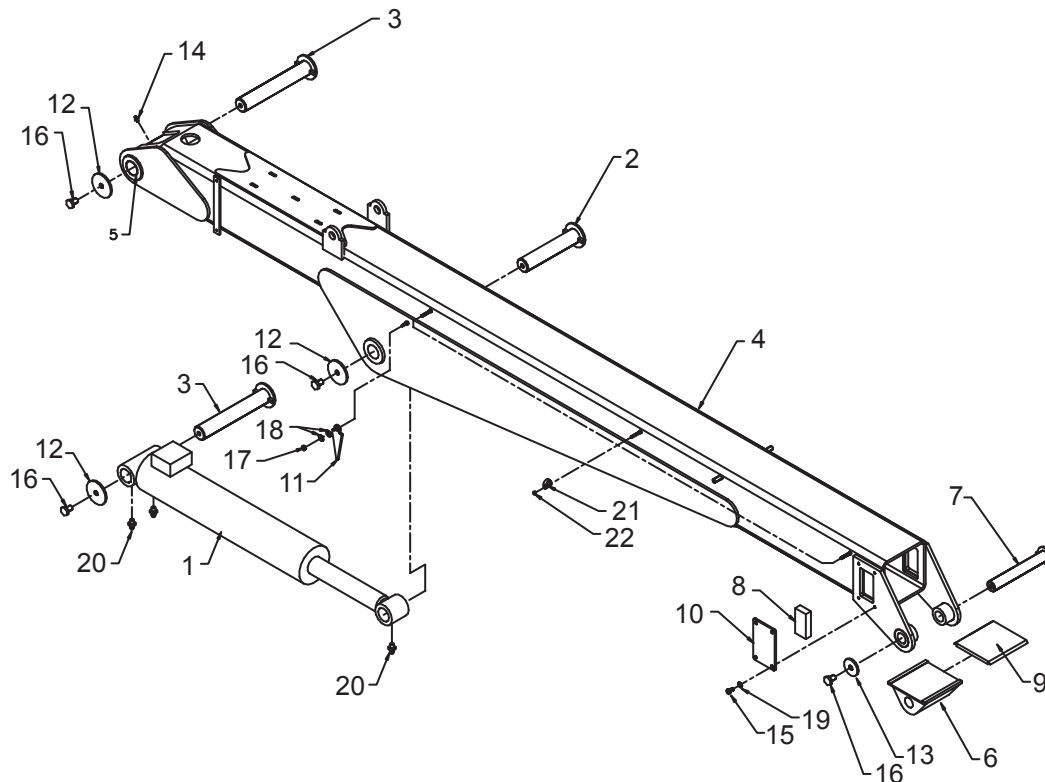


**LOWER BOOM ASM (41706681)**

1.	3C252990	CYLINDER (INCL. 20)	1
2.	52703714	PIN	1
3.	52705160	PIN	2
4.	52706683	LOWER BOOM (INCL. 5)	1
5.	7BF81520	BUSHING (PART OF 4)	4REF
6.	51707761	TRUNNION	1
7.	52706654	PIN	1
8.	60030015	WEAR PAD	2
9.	60030167	WEAR PAD	1
10.	60103463	PAD RETAINER PLATE	2
11.	60105544	ANGLE INDICATOR	2
12.	60106331	RETAINER PLATE	3
13.	60106333	RETAINER PLATE	1
14.	72053508	ZERK 1/8NPT	1
15.	72060023	CAP SCR 5/16-18X3/4 HHGR5	8
16.	72060147	CAP SCR 5/8-11X1 HHGR5	4
17.	72062103	NUT 3/8-16 LOCK	2
18.	72063003	WASHER 3/8 WRT	4
19.	72063050	WASHER 5/16 LOCK	8
20.	72053507	ZERK 1/4-28 (PART OF 1)	3REF
21.	70034381	CORD GUIDE	3
22.	72062104	NUT 1/4-20 LOCK	3

**NOTE**

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



**LOWER BOOM CYLINDER (3C252990)**

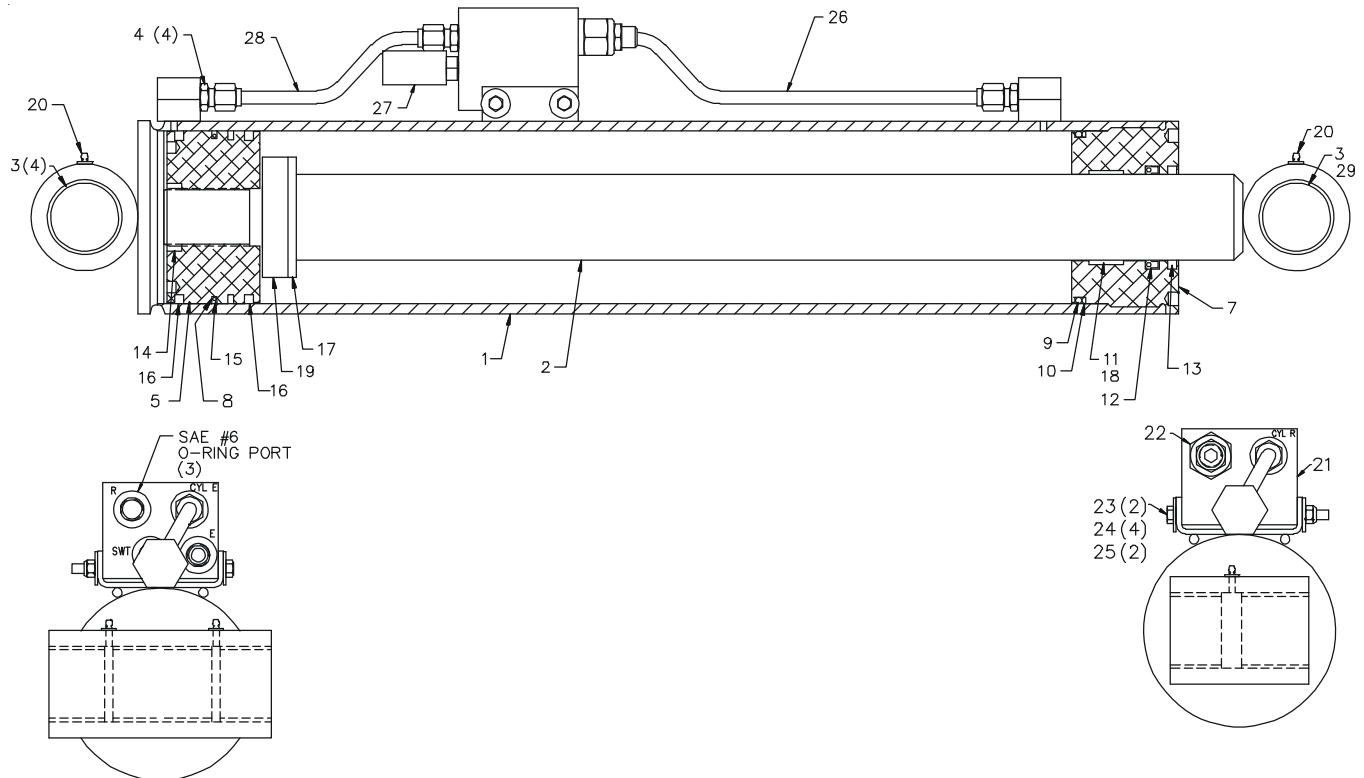
1.	4C252990	CASE (INCL:3,20)	1REF
2.	4G300860	ROD (INCL:3,20,29)	1REF
3.	7BF81520	BUSHING (PART OF 1&2)	5REF
4.	725333186	ADAPTER #6MFACE #6MSTR	4
5.	6I060200	PISTON	1REF
6.	6H060030	HEAD	1REF
7.	9C242432	SEAL KIT(INCL:9-19)	1REF
8.	7Q072253	O-RING (PART OF 8)	1REF
9.	7Q072358	O-RING (PART OF 8)	1REF
10.	7Q10P358	BACK-UP RING (PART OF 8)	1REF
11.	7T2N4032	WEAR RING (PART OF 8)	1REF
12.	7R546030	ROD SEAL (PART OF 8)	1REF
13.	7R14P030	ROD WIPER (PART OF 8)	1REF
14.	7T61N200	LOCK RING SEAL (PART OF 8)	1REF
15.	7T66P060	PISTON SEAL (PART OF 8)	1REF
16.	7T65I060	PISTON RING (PART OF 8)	1REF
17.	6A025030	WAFFER LOCK (PART OF 8)	1REF
18.	7T2N8032	WEAR RING (PART OF 8)	1REF
19.	6C075030	STOP TUBE	1REF
20.	72053507	ZERK 1/4-28 (PART OF 1&2)	3REF
21.	73540057	C'BAL VALVE (INCL:22,27)	1
22.	73540052	C'BAL VALVE (PART OF 21)	1REF
23.	72060037	CAP SCR 5/16-18X4 HHGR5	2
24.	72063002	WASHER 5/16 WRT	4
25.	72062109	NUT 5/16-18 LOCK	2
26.	70146258	TUBE ASM	1
27.	77041552	PR SWITCH (PART OF 21)	1REF
28.	70145753	TUBE ASM	1
29.	7BF82020	BUSHING (PART OF 2)	1REF
30.	3C252990A	CYLINDER	1

**NOTE**

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

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

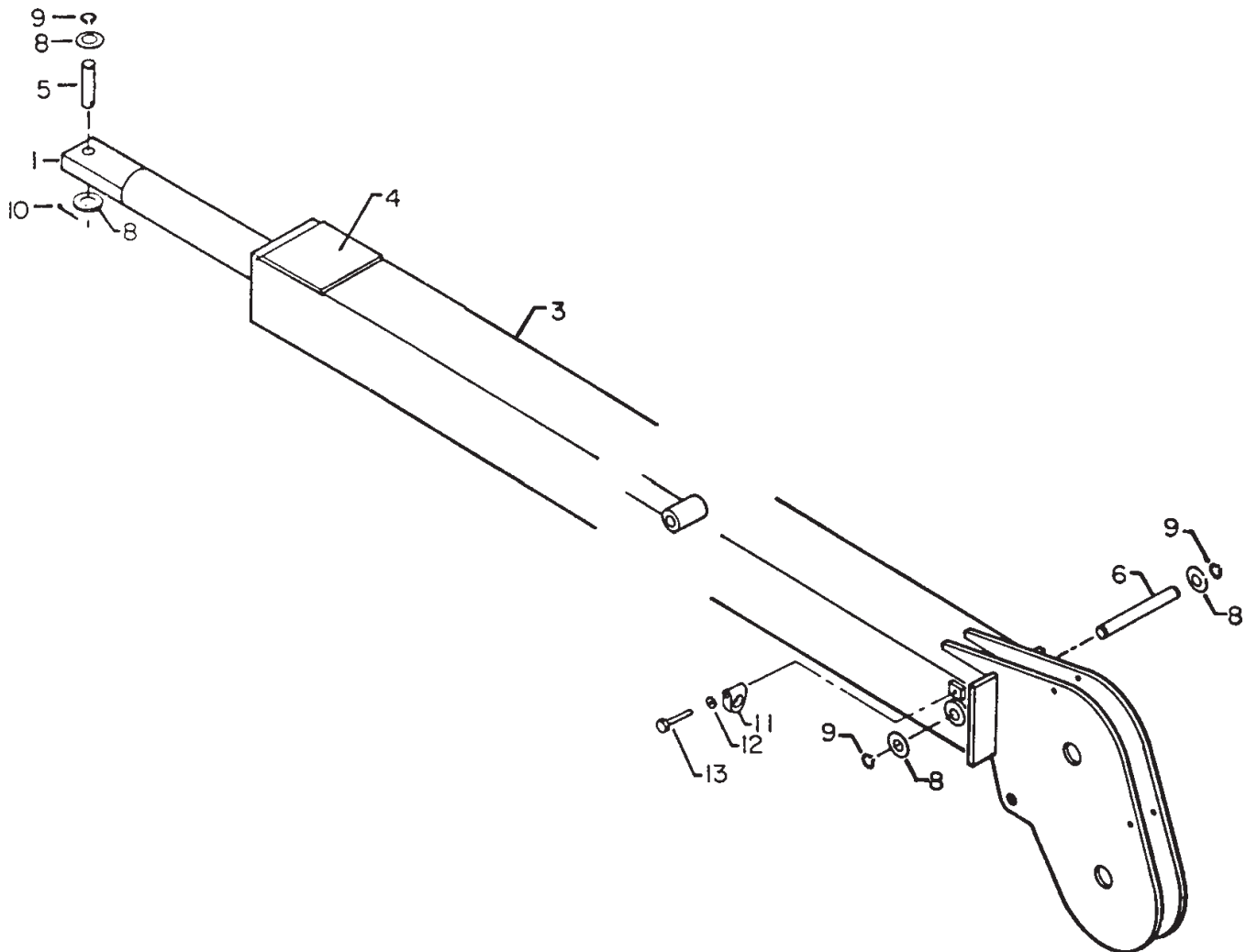
APPLY "NEVER-SEEZ" REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO CYLINDER HEAD AND CASE THREADS. KEEP AWAY FROM ALL SEALS.



## EXT BOOM ASM (41706682)

## NOTE

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B341860	EXTENSION CYLINDER	1
3.	52706684	EXTENSION BOOM	1
4.	60030076	WEAR PAD	1
5.	60101905	PIN	1
6.	60103821	PIN	1
8.	72063034	MACH BUSHING 1 X 10GA	4
9.	72066125	RETAINING RING 1" EXT	3
10.	72066145	HAIR PIN .19	1
11.	70034381	CORD GUIDE	1
12.	72063049	WASHER 1/4 LOCK	1
13.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	1



**EXT BOOM CYLINDER (3B341860)**

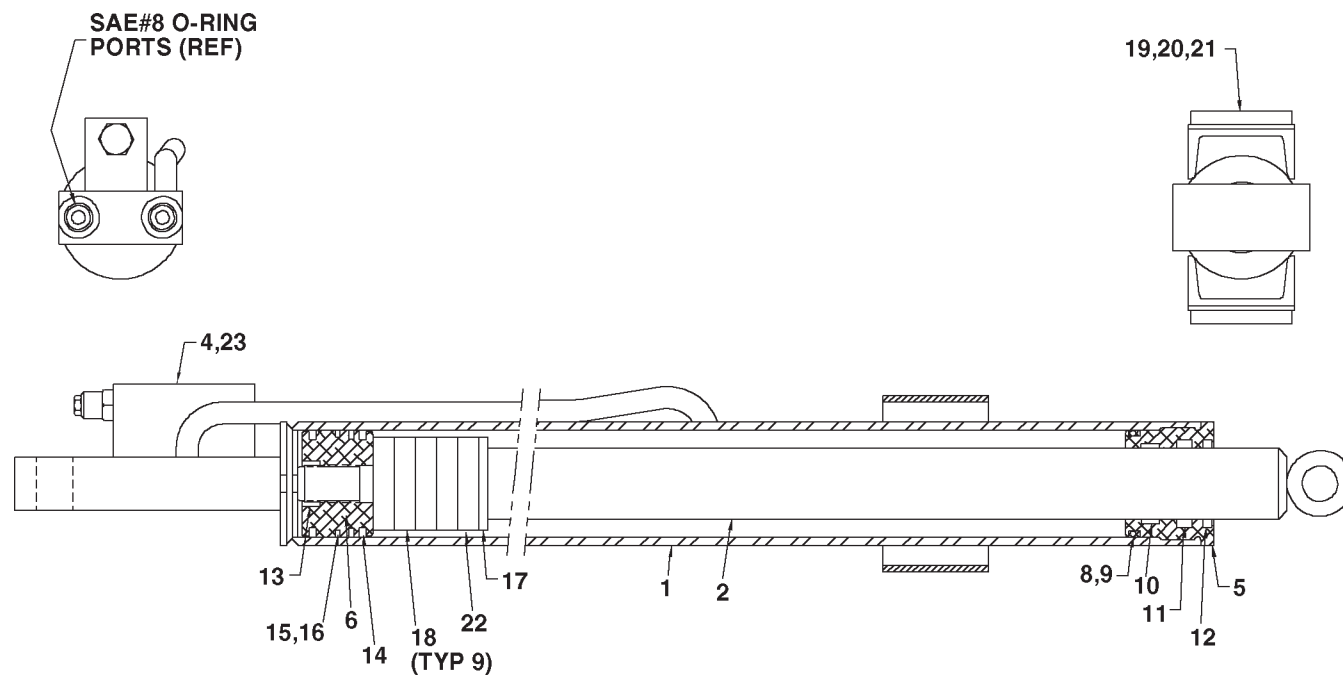
ITEM	PART NO.	DESCRIPTION	QTY
1.	2B341860	CASE	1
2.	2G341860	ROD	1
3.	7PNPXT02	PIPE PLUG 1/8NPT(PART OF 1)	2REF
4.	51713194	COUNTERBALANCE VALVE MOD 1	
	73054900	COUNTERBALANCE VALVE ASM REF	
5.	6H030020	HEAD	1
6.	6I030106	PISTON	1
7.	9C121617	SEAL KIT (INCL:8-17)	1
8.	7Q072334	O-RING (PART OF 7)	1REF
9.	7Q10P334	BACK-UP RING (PART OF 7)	1REF
10.	7T2N4022	WEAR RING-ROD (PART OF 7)	1REF
11.	7R546020	ROD SEAL (PART OF 7)	1REF
12.	7R14P020	ROD WIPER (PART OF 7)	1REF
13.	7T61N106	LOCK RING SEAL (PART OF 7)	1REF
14.	7T65I030	PISTON RING (PART OF 7)	2REF
15.	7T66P030	PISTON SEAL (PART OF 7)	1REF
16.	7Q072145	O-RING (PART OF 7)	1REF
17.	6A025020	WAFFER LOCK (PART OF 7)	1REF
18.	6C300020	STOP TUBE 3"	9
19.	60106350	SPACER	2
20.	60030004	WEAR PAD	2
21.	72060836	SCREW 1/4-20X3/4 FL HD	8
22.	6C150020	STOP TUBE 1-1/2"	1
23.	72060713	CAP SCR 1/4-20X2-1/2 SH	6

**NOTE**

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

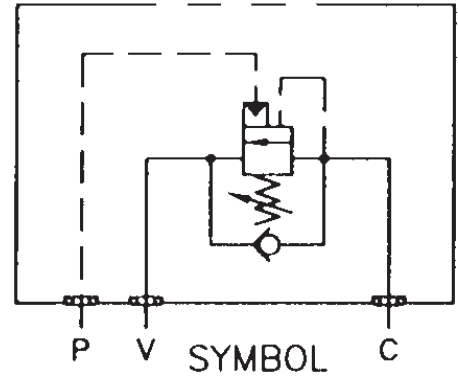
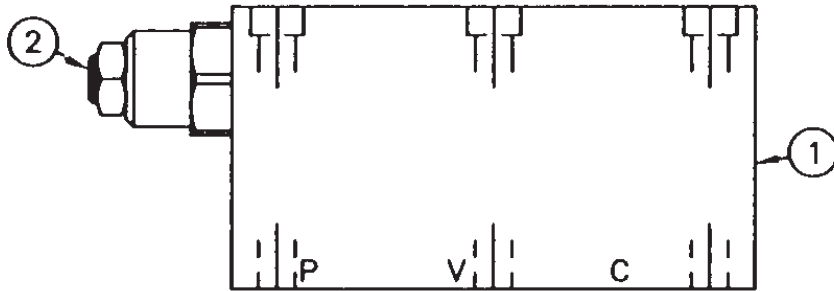
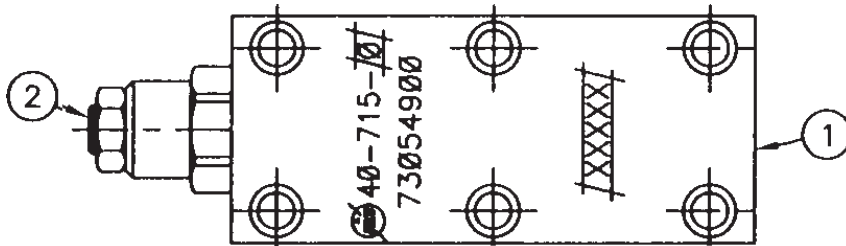
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON, HEAD GLAND, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

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

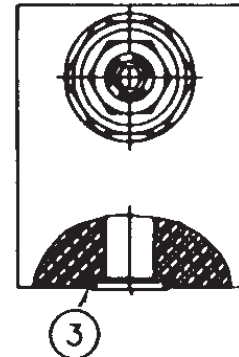
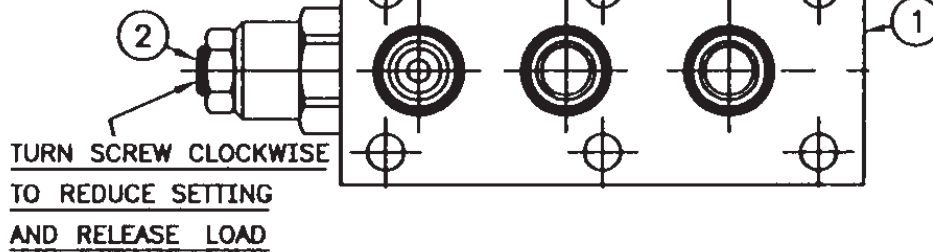


**LOCKING/HOLDING VALVE (73054900)**

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

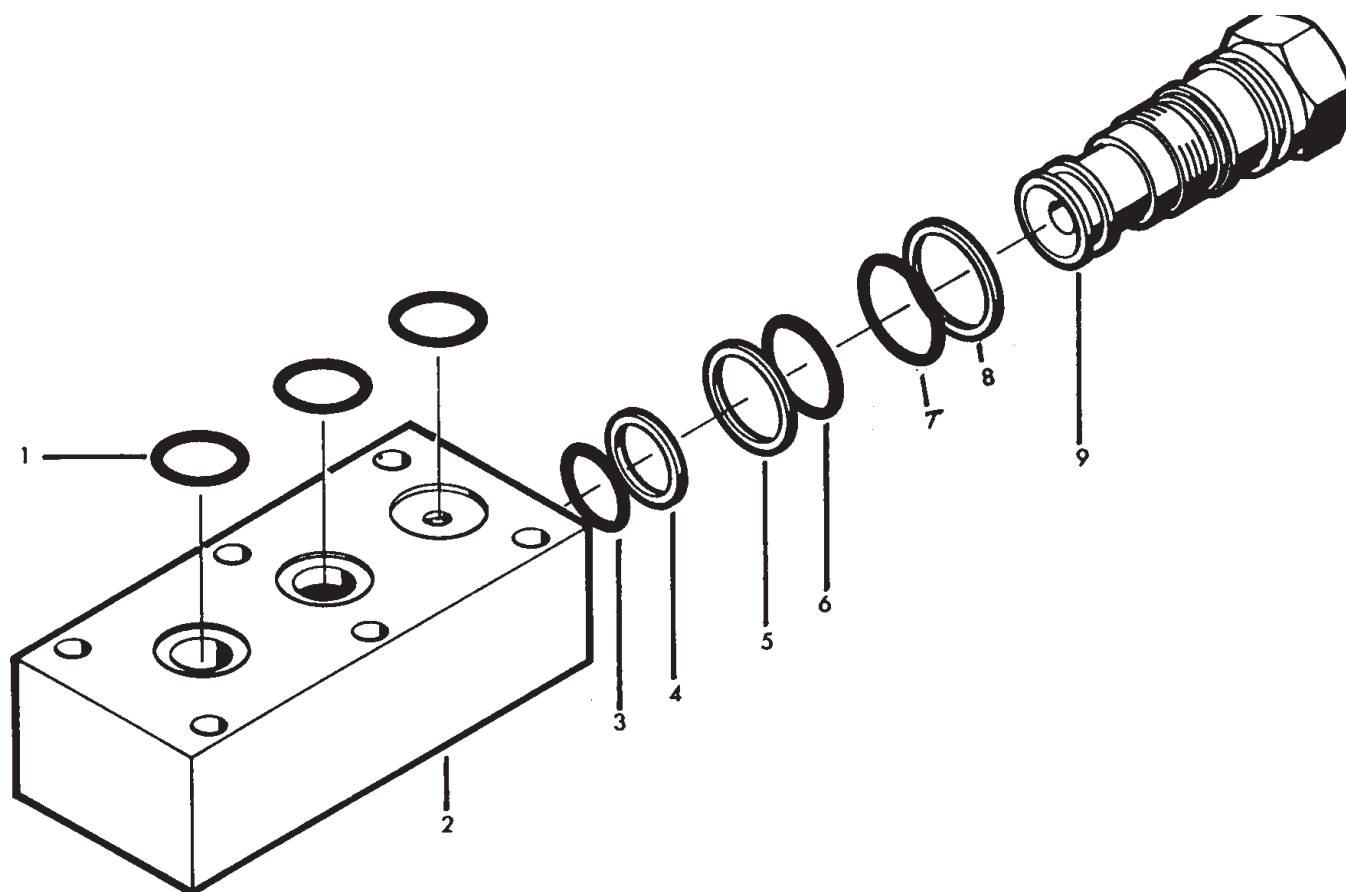


INSTALLATION TORQUE  
FOR ITEM(S) 2  
TO BE 30-35 FT.LBS.



**HOLDING VALVE (73054004)**

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



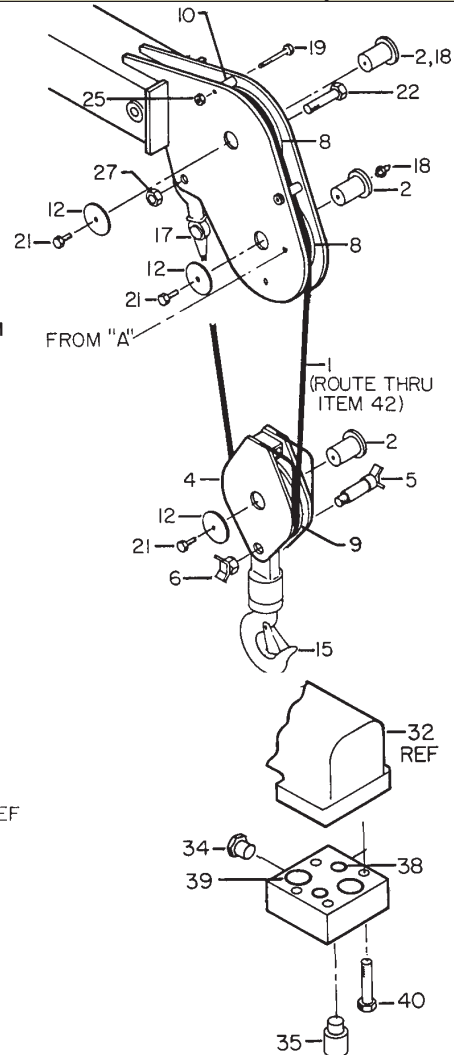
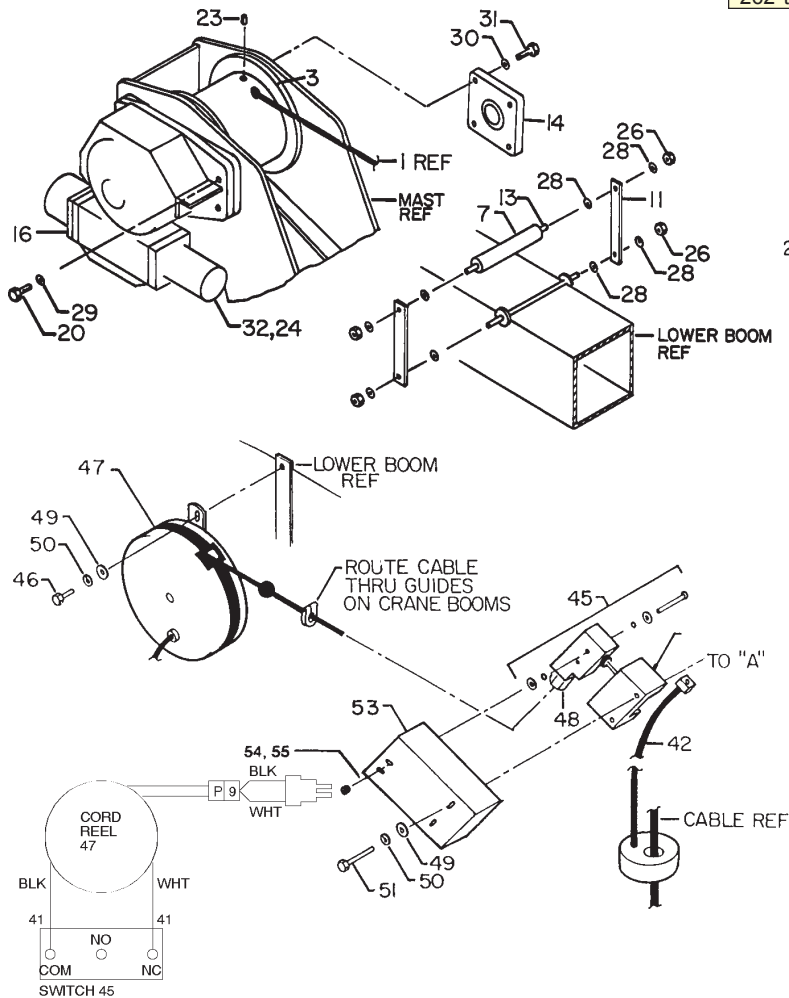
**WINCH/CABLE/HOOK KIT (31706974)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	51706674	CABLE WITH SOCKET 1/2 X 100'	1
2.	52705161	PIN	3
3.	52705163	DRUM	1
4.	52706947	SNATCH BLOCK	1
5.	52706664	PIN	1
6.	52706671	PIN RETAINER	1
7.	60030101	GUIDE ROLLER	1
8.	60030102	SHEAVE	2
9.	60030170	SHEAVE	1
10.	60102596	SPACER	2
11.	60105540	SIDE BAR	2
12.	60106331	PIN RETAINER PLATE	3
13.	60108192	GUIDE STUD	1
14.	70055117	BEARING	1
15.	70731813	HOOK 7-TON	1
	70074053	SAFETY LATCH ASM	REF
16.	71057627	WINCH	1
17.	71073035	HOOK 4.5-TON	1
	70074004	SAFETY LATCH ASM	REF
18.	72053508	ZERK 1/8NPT	3
19.	72060056	CAP SCR 3/8-16X4 HHGR5	2
20.	72060118	CAP SCR 1/2-13X2 HHGR8	4
21.	72060147	CAP SCR 5/8-11X1 HHGR5	3
22.	72060247	CAP SCR 1-8X4-1/2 HHGR5	1
23.	72060596	CAP SCR 1/2-13X3/4 SH	1
24.	72060795	CAP SCR 1/2-13X1-1/2 SH	2
25.	72062103	NUT 3/8-16 LOCK	2

26.	72062107	NUT 1/2-13 LOCK	4
27.	72062137	NUT 1-8 LOCK	1
28.	72063005	WASHER 1/2 WRT	8
29.	72063053	WASHER 1/2 LOCK	4
30.	72063055	WASHER 5/8 LOCK	4
31.	72060148	CAP SCR 5/8-11X1-1/4 HHGR5	4
32.	70731848	MOTOR (INCL:33-40)	1
34.	73054854	SHUTTLE VALVE (PART OF 32)	1REF
35.	77041466	MINI-SOLENOID (PART OF 32)	1REF
38.	7Q072015	O-RING (PART OF 32)	2REF
39.	7Q072024	O-RING (PART OF 32)	2REF
40.	72060318	CAP SCR 3/8-24X2-3/4 HH	4REF
41.	77040051	TERMINAL	2
42.	52709415	CABLE	1
43.	77040186	TERMINAL	1
44.	77040047	TERMINAL	1
45.	77041291	SWITCH	1
46.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
47.	51713168	CORD REEL	1
48.	77044468	STRAIN RELIEF	1
49.	72063001	WASHER 1/4	4
50.	72063049	WASHER 1/4 LOCK	4
51.	72060008	CAP SCR 1/4-20 X 2 HH GR5	2
52.	60113594	MOUNTING BLOCK	1
53.	60113593	SWITCH COVER	1
54.	72063098	WASHER .16 FLAT	2
55.	72063047	WASHER #10 LOCK	2

**NOTE**

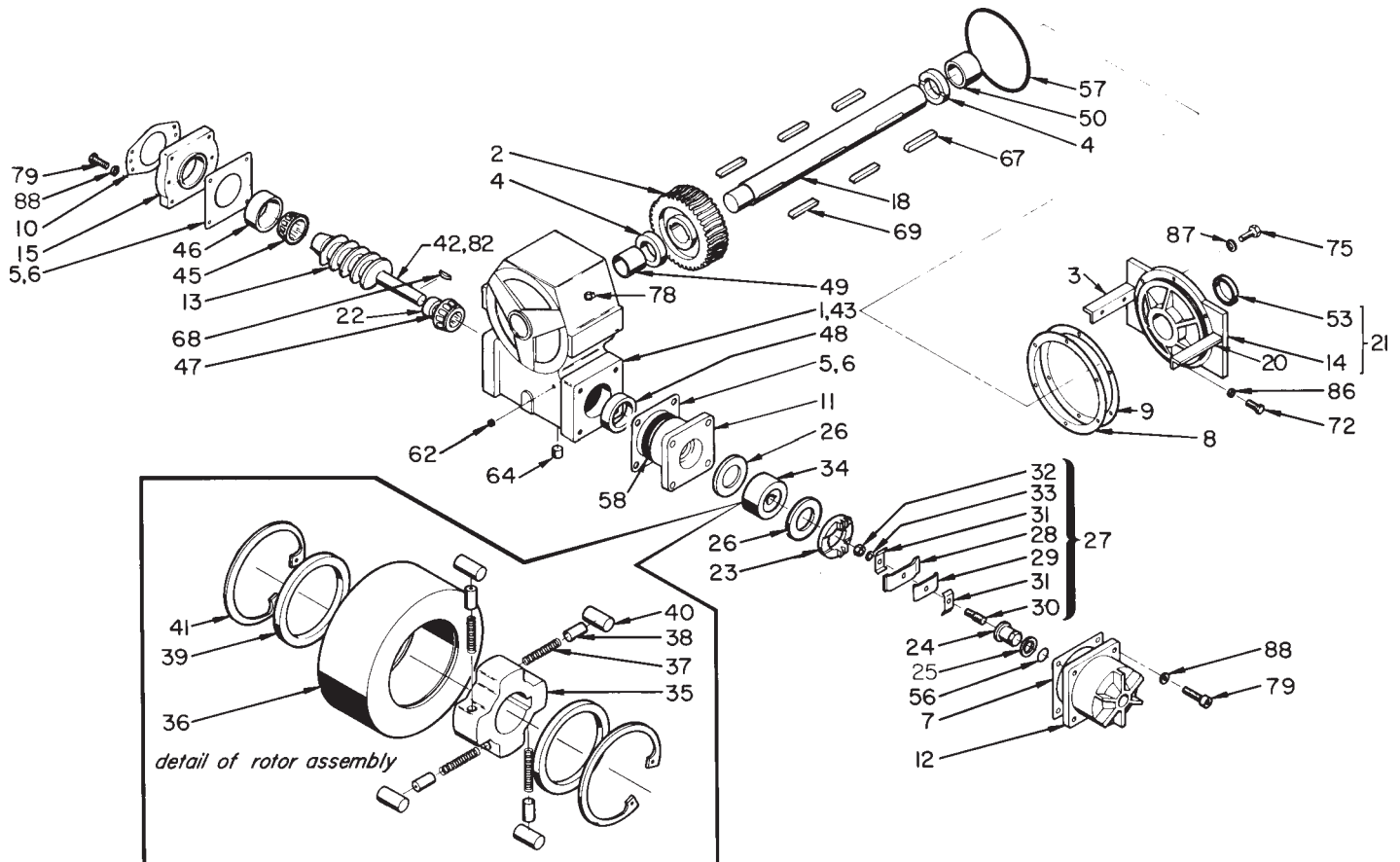
Anytime the pin retainer bolts have been removed, apply Loctite 262 to the threads before reassembly.



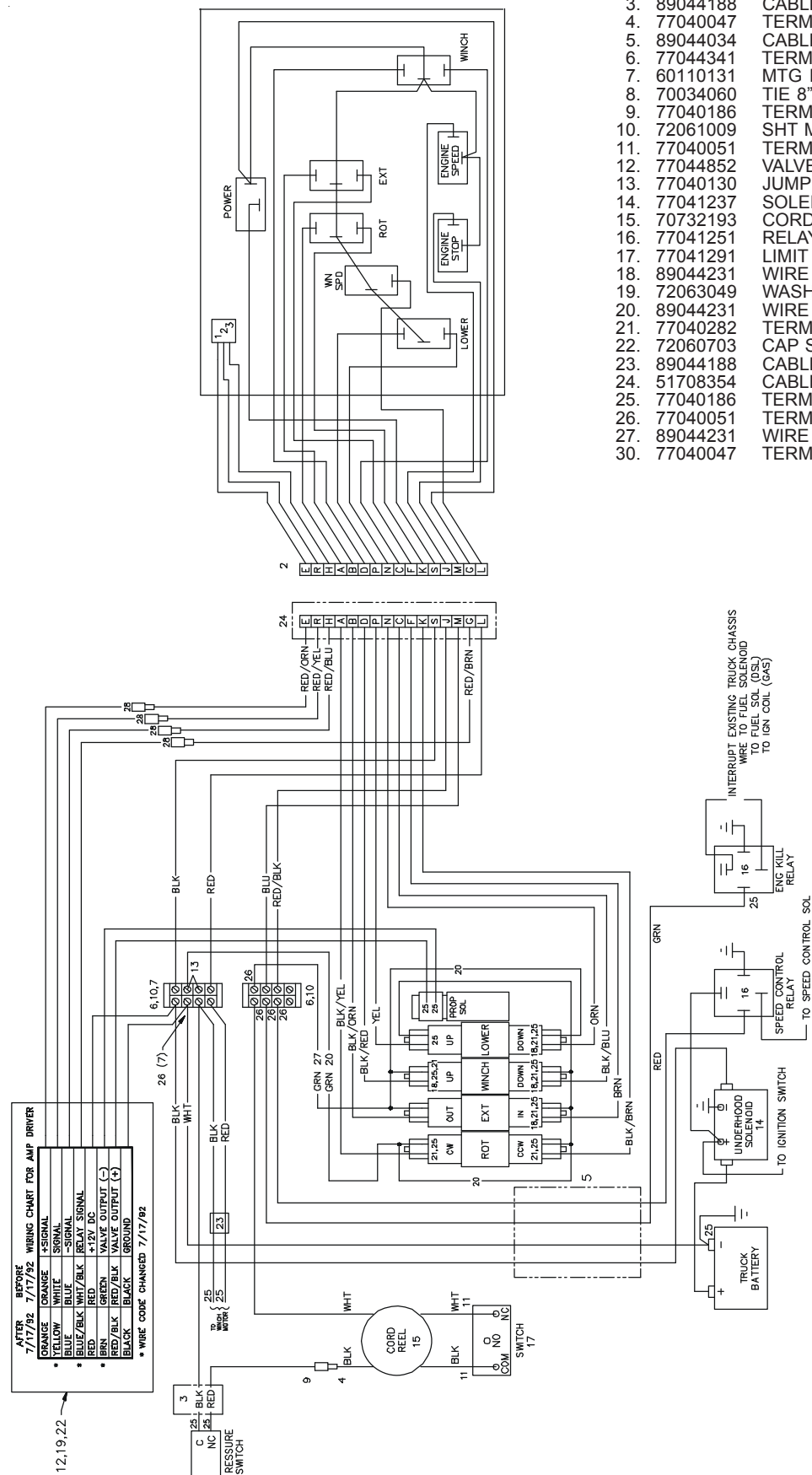


**WINCH (71057627)**

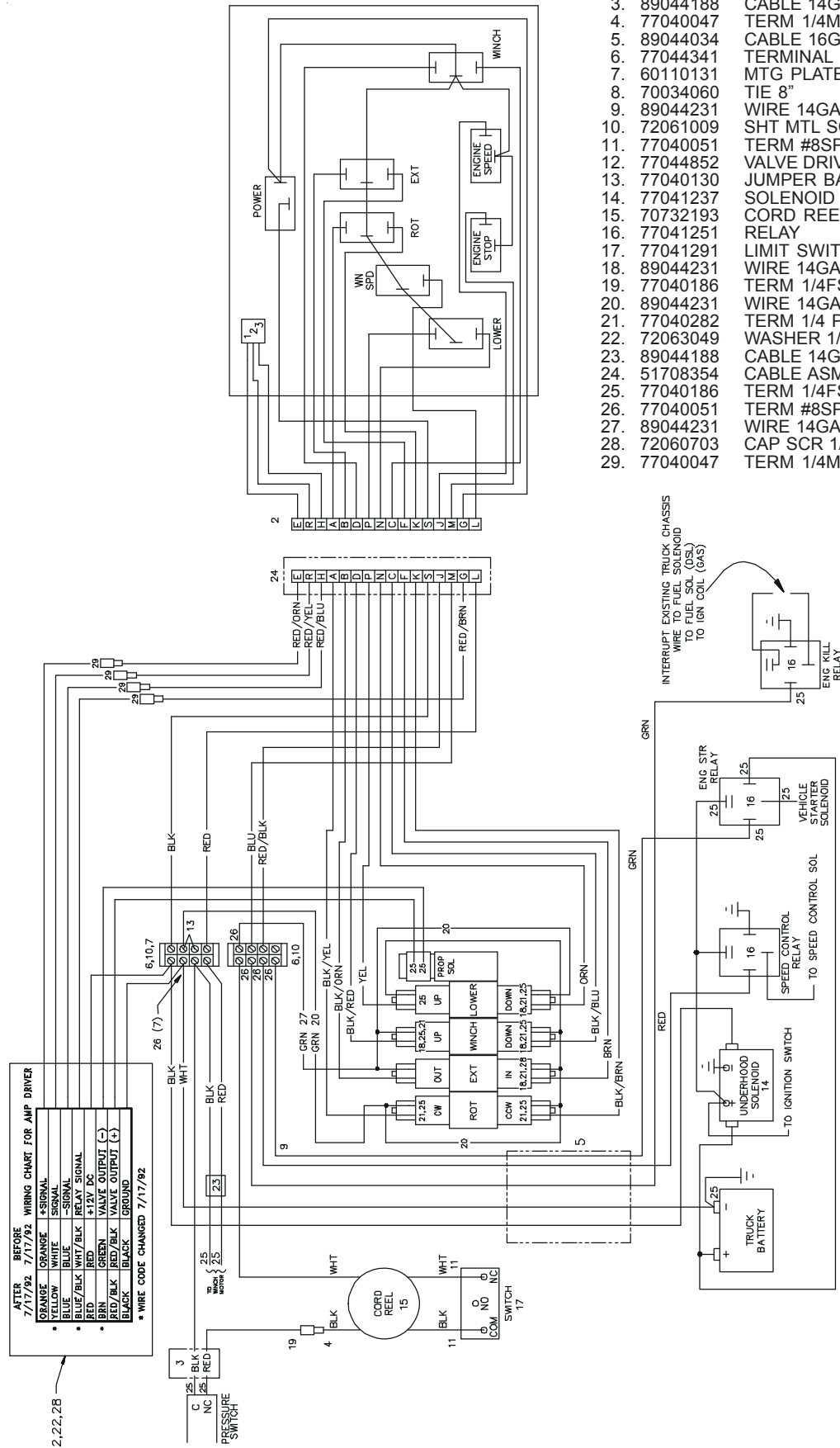
ITEM	PART NO.	DESCRIPTION	QTY				
1.	70143263	HOUSING (PART OF 43)	1REF	35.	70142235	RACE (PART OF 34)	REF
2.	70024160	GEAR-WORM	1	37.	70142237	SPRING (PART OF 34)	4REF
3.	70143262	ANGLE (PART OF 21)	1REF	38.	70142238	PLUNGER (PART OF 34)	4REF
4.	71014831	RING-THRUST	2	39.	70142239	RING-RETAINER (PART OF 34)	2REF
5.	76039276	GASKET	2	40.	70142240	ROLLER (PART OF 34)	4REF
6.	76039277	GASKET	2	41.	72066796	RING-SNAP (PART OF 34)	2REF
7.	76039294	GASKET	1	42.	71014840	WORM SHAFT	1
8.	76039275	GASKET	4	43.	71014841	HOUSING (INCL:1 & 49)	1
9.	76039274	GASKET	4	45.	70055038	CONE-BEARING	1
10.	76029295	GASKET	1	46.	70055039	CUP-BEARING	1
11.	71014828	BEARING CONTAINER	1	47.	70055036	CONE-BEARING	1
12.	71014834	HOUSING	1	48.	70055037	CUP-BEARING	1
13.	71014829	WORM	1	49.	70143258	BUSHING (PART OF 43)	1REF
14.	70143261	COVER (PART OF 21)	1	50.	70143258	BUSHING (PART OF 21)	1REF
15.	70114839	RETAINER-BEARING	1	53.	76392758	SEAL (PART OF 21)	1
18.	70143260	SHAFT-CABLE DRUM	1	56.	7Q072022	O-RING	1
20.	70143259	ANGLE (PART OF 21)	1	57.	7Q072266	O-RING	1
21.	71014832	COVER ASM(INCL:3,14,20,50,53)	1	58.	7Q072236	O-RING	1
22.	71014830	WORM SPACER	1	62.	72053244	PLUG 1/8NPT	1
23.	71014833	PLATE-PRESSURE	1	64.	72053394	PLUG 1/2NPT	1
24.	71014836	NUT-ADJUSTMENT	1	67.	70143088	KEY	4
25.	76039293	GASKET	1	68.	72661260	KEY	1
26.	76039296	DISC-FRICTION	2	69.	71014645	KEY	2
27.	71014835	SPRING (INCL. 28-33)	1	72.	72060148	CAP SCR 5/8-11 X 1-1/4 HH	4
28.	70142231	SPRING-MAIN LEAF (PART OF 27)	REF	75.	72060092	CAP SCR 1/2-13 X 1-1/4 HH	6
29.	70142232	SPRING-SECONDARY LEAF	REF	78.	72533035	PIPE PLUG 1/2NPT	1
30.	70142233	STUD	REF	79.	72060065	CAP SCR 7/16-14 X 1-3/4 HH	8
31.	70142234	CLIP	REF	82.	71014842	KEY	1
32.	72062039	NUT-JAM 1/2	REF	86.	72063055	WASHER-LOCK 5/8	4
33.	72063112	WASHER-LOCK1/2 (PART OF 27)	REF	87.	72063053	WASHER-LOCK 1/2	6
34.	71014837	ROTOR (INCL. 35-41)	1	88.	72063052	WASHER-LOCK 7/16	8
				90.	70058985	CABLE WEDGE (NOT SHOWN)	1



## CONTROL KIT (90709116)



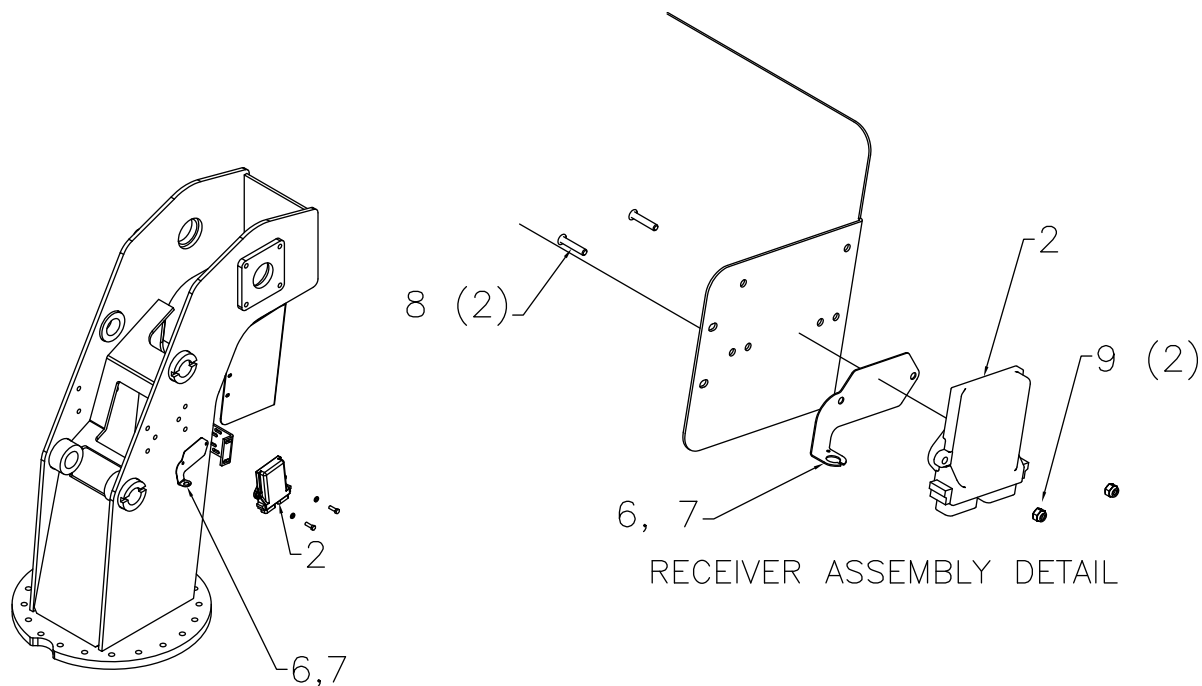
- |     |          |                            |      |
|-----|----------|----------------------------|------|
| 1.  | 51704784 | CABLE ASM #1WIRE X 6       | 1    |
| 2.  | 51713607 | KIT-FIELD CVRSN            | 1    |
| 3.  | 89044188 | CABLE 14GA X 55            | 1    |
| 4.  | 77040047 | TERMINAL .25MSLPON 16-14GA | REF  |
| 5.  | 89044034 | CABLE 16GA 4WIRE           | 420" |
| 6.  | 77044341 | TERMINAL BLOCK             | 2    |
| 7.  | 60110131 | MTG PLATE                  | 1    |
| 8.  | 70034060 | TIE 8"                     | 5    |
| 9.  | 77040186 | TERMINAL .25FSLPON 16-14GA | REF  |
| 10. | 72061009 | SHT MTL SCR #6X3/4 PH      | 4    |
| 11. | 77040051 | TERMINAL #8SPRSPD 16-14GA  | 2REF |
| 12. | 77044852 | VALVE DRIVER               | 1    |
| 13. | 77040130 | JUMPER BAR                 | 1    |
| 14. | 77041237 | SOLENOID 12V 80% 150A      | 1    |
| 15. | 70732193 | CORD REEL 30'              | REF  |
| 16. | 77041251 | RELAY                      | 2    |
| 17. | 77041291 | LIMIT SWITCH               | REF  |
| 18. | 89044231 | WIRE 14GA GRN X 3          | 4    |
| 19. | 72063049 | WASHER 1/4 LOCK            | 2    |
| 20. | 89044231 | WIRE 14GA GRN X10          | 3    |
| 21. | 77040282 | TERM 1/4 PIGBAC 16-14GA    | 6    |
| 22. | 72060703 | CAP SCR 1/4-20X1/2 SH      | 2    |
| 23. | 89044188 | CABLE 14GA X 32            | 1    |
| 24. | 51708354 | CABLE ASM 18GA 19WIRE X 72 | 1    |
| 25. | 77040186 | TERM 1/4FSLPON 16-14GA     | 16   |
| 26. | 77040051 | TERM #8SPRSPD 16-14GA      | 12   |
| 27. | 89044231 | WIRE 14GA GRN X 6          | 1    |
| 30. | 77040047 | TERM 1/4MSLPON 16-14GA     | 4    |

**CONTROL KIT-4R+ENG START (90709117)**

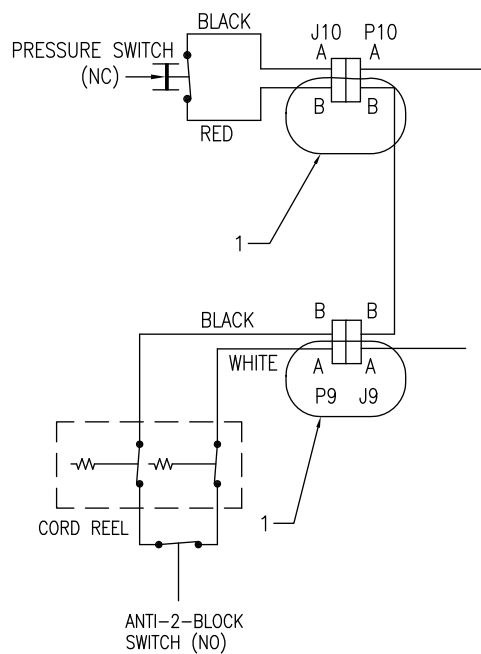
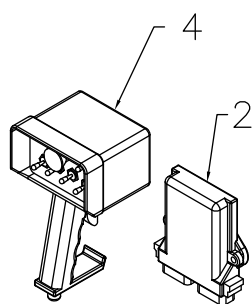
1.	51704784	CABLE ASM #1WIRE X 6	1
2.	51713607	KIT-FIELD CVRSN	1
3.	89044188	CABLE 14GA X 55	1
4.	77040047	TERM 1/4MSLPON 16-14GA	REF
5.	89044034	CABLE 16GA 4WIRE	420"
6.	77044341	TERMINAL BLOCK	2
7.	60110131	MTG PLATE	1
8.	70034060	TIE 8"	5
9.	89044231	WIRE 14GA GRN X 420	REF
10.	72061009	SHT MTL SCR #6X3/4 PH	4
11.	77040051	TERM #8SPRSPD 16-14GA	2REF
12.	77044852	VALVE DRIVER	1
13.	77040130	JUMPER BAR	1
14.	77041237	SOLENOID 12V 80% 150A	1
15.	70732193	CORD REEL	REF
16.	77041251	RELAY	2
17.	77041291	LIMIT SWITCH	REF
18.	89044231	WIRE 14GA GRN X 3	4
19.	77040186	TERM 1/4FSLPON 16-14GA	REF
20.	89044231	WIRE 14GA GRN X10	3
21.	77040282	TERM 1/4 PIGBAC 16-14GA	6
22.	72063049	WASHER 1/4 LOCK	2
23.	89044188	CABLE 14GA X 32	1
24.	51708354	CABLE ASM 18GA 19WIRE X 72	1
25.	77040186	TERM 1/4FSLPON 16-14GA	20
26.	77040051	TERM #8SPRSPD 16-14GA	13
27.	89044231	WIRE 14GA GRN X 6	1
28.	72060703	CAP SCR 1/4-20X1/2 SH	2
29.	77040047	TERM 1/4MSLPON 16-14GA	4

**CONTROL KIT-RADIO RMT (90718833)**

1.	70034439	LOCKWIRE LEAD SEAL, 8"	2
2.	70733921	RECEIVER, RADIO REMOTE	1
4.	70733883	TRANSMITTER, RADIO REMOTE	1
6.	60125959	BRACKET, TETHER CONNECTOR	1
7.	72066340	RIVET, POP, 1/8 X 3/8 GRIP	1
8.	72601846	CAP SCR-22 1/4-20X1-1/4 HH	2
9.	72062194	NUT-SS 1/4-20 NYLOC	2
10.	99903628	INSTRUCTIONS, RADIO REMOTE	1
13.	99903629	INSTALLATION DWG, RADIO REMOTE 1	



RECEIVER ASSEMBLY DETAIL

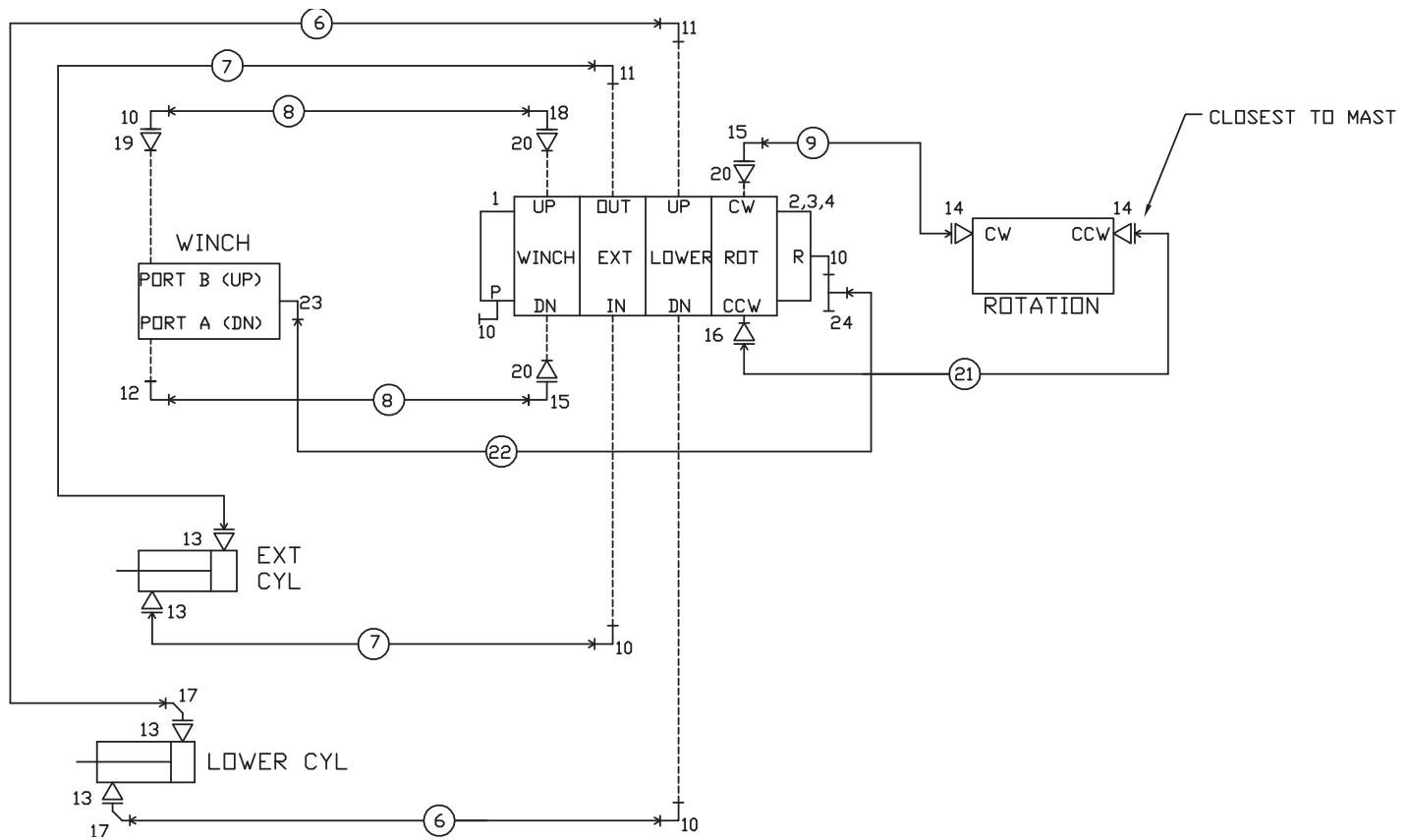


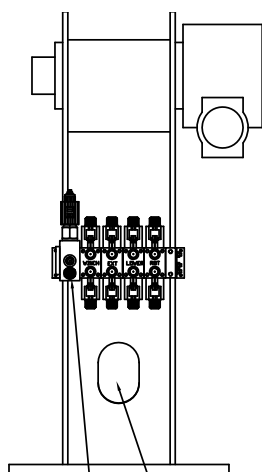
# HYDRAULIC KIT, FAUVER VALVEBANK HYDRAULIC KIT (91714933-1)

CONTINUED ON FOLLOWING PAGE

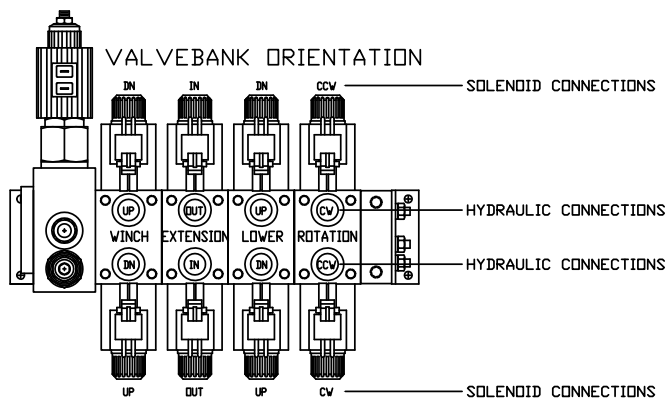
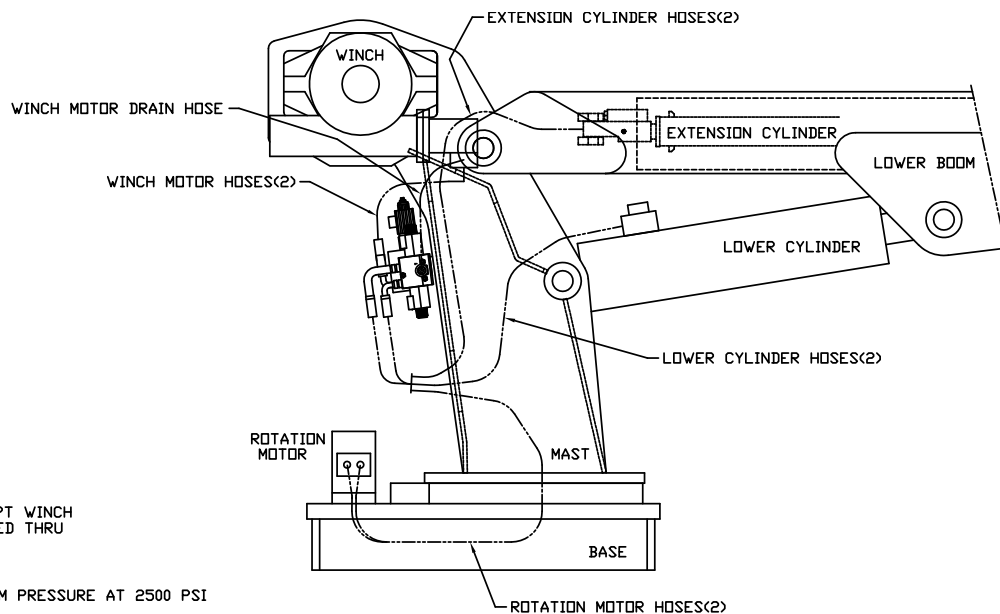
1.	73734544	VALVEBANK (WAS 73733336)	1
2.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	4
3.	72062104	NUT 1/4-20 LOCK	4
4.	72063001	WASHER 1/4 WRT	4
5.	51714928	HOSE KIT (INCL:6-9,21,22)	1
6.	61394545	HOSE-FF .38X39 #8#8	2REF*
7.	51394546	HOSE-FF .38X51 #8#8	2REF*
8.	51394050	HOSE-FF .38X28 #6#8	2REF*
9.	51394543	HOSE-FF .25X74.5 #4#6	1REF*
10.	72053763	ELBOW #8MSTR #8MJIC 90° (4REF PART OF 1)	1
11.	72532666	ELBOW #8MSTR #8MJIC 90° XLG (PART OF 1)	2REF
12.	72053764	ELBOW #10MSTR #8MJIC 90°	1
13.	72532358	ADAPTER #8MSTR #8MJIC	4
14.	72532351	ADAPTER #4MSTR #4MJIC	2

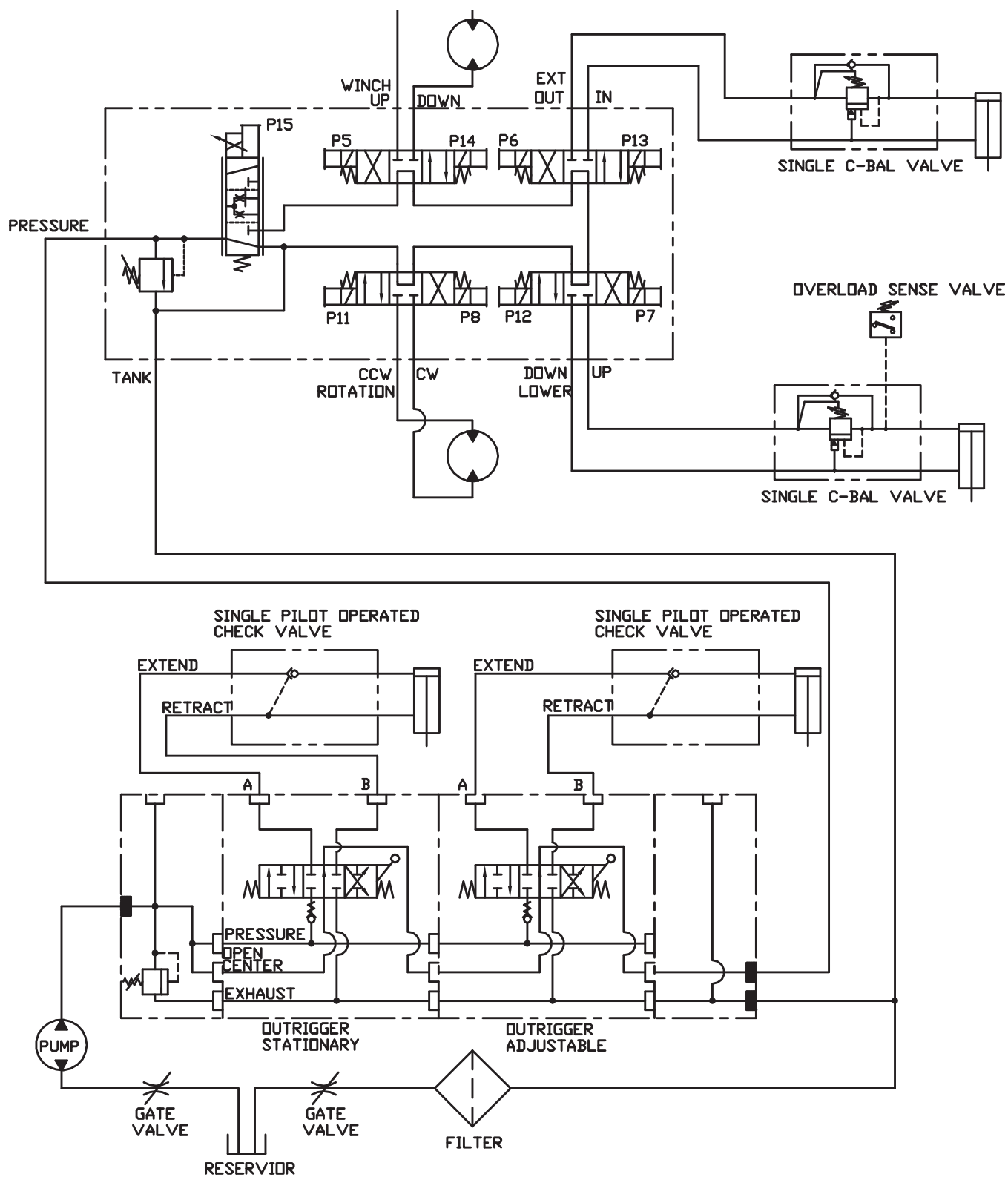
15.	72532700	ELBOW #6MSTR #6MJIC XLG (PART OF 1)	2REF
16.	72532792	ADAPTER #8MSTR #4MJIC (PART OF 1)	1REF
17.	72532670	ELBOW #8MJIC #8FJIC 45°	2
18.	72053760	ELBOW #6MSTR #6MJIC 90° (PART OF 1)	1REF
19.	72531206	ADAPTER #10MSTR #8FSTR	1
20.	72533052	ADAPTER #8MSTR #6FSTR (PART OF 1)	3REF
21.	51394542	HOSE-FJ .25X74.5 #4#4	1REF*
22.	51394548	HOSE-FF .38X17 #4#8	1REF*
23.	72053758	ELBOW #4MSTR #4MJIC 90°	1
24.	72532657	TEE #8 SWVLNUTRUN	1





—SET VALVE BANK SYSTEM PRESSURE AT 2500 PSI

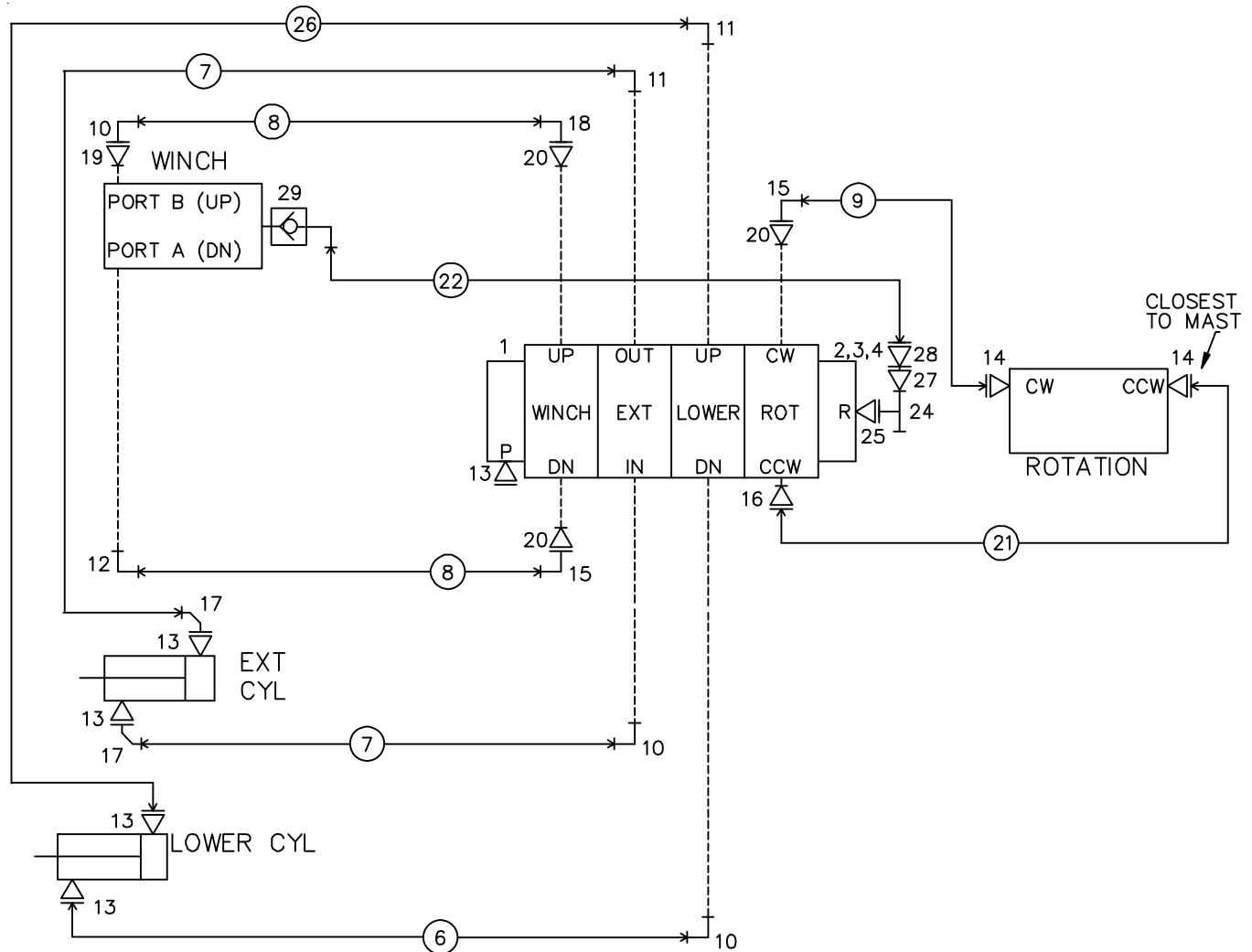




**HYD KIT-RADIO RMT (91715634-1)**

CONTINUED ON FOLLOWING PAGE

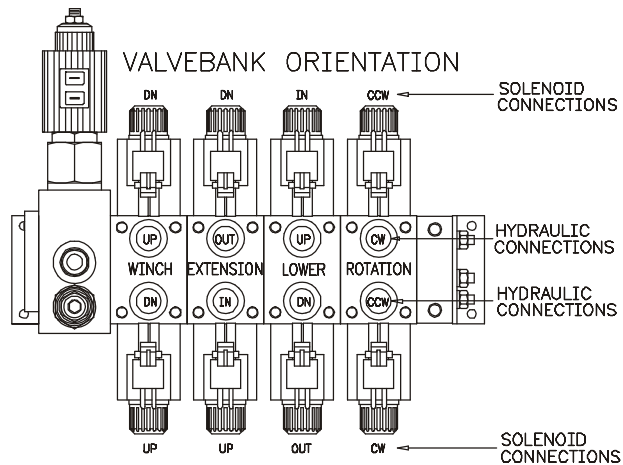
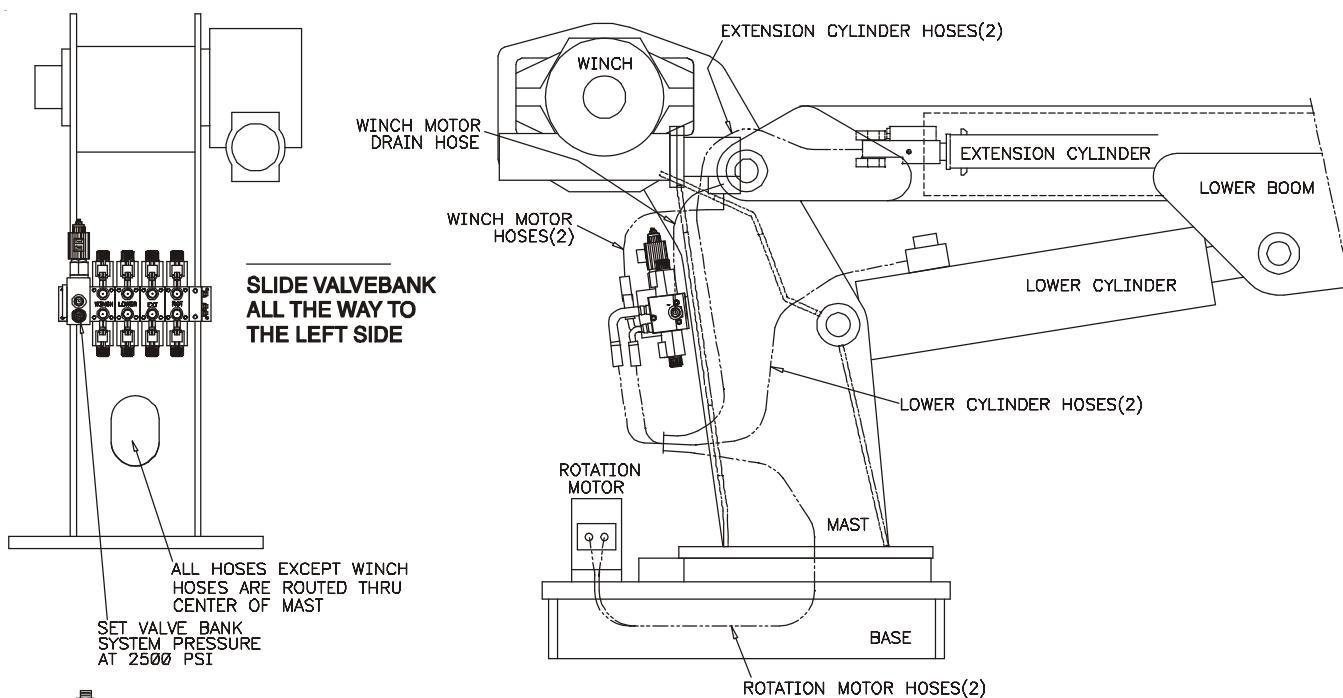
1.	73734545	VALVEBANK (WAS 73733932)	1
2.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	4
3.	72062104	NUT 1/4-20 LOCK	4
4.	72063001	WASHER 1/4 WRT	4
5.	51714928	HOSE KIT (INCL:6-9,21,22)	1
6.	51394545	HOSE ASM FF .38X39 #8#8	1REF
7.	51394546	HOSE ASM FF .38X51 #8#8	2REF
8.	51395721	HOSE ASM FF .38X28 #6#8	2REF
9.	51394543	HOSE ASM FF .25X74.5 #4#6	1REF
10.	72053763	ELBOW #8MSTR #8MJIC 90°	1,2REF
11.	72532666	ELBOW #8MSTR #8MJIC 90°	2REF
12.	72053764	ELBOW #10MSTR #8MJIC 90°	1
13.	72532358	ADAPTER #8MSTR #8MJIC	4,1REF
14.	72532351	ADAPTER #4MSTR #4MJIC	2
15.	72532700	ELBOW #6MSTR #6MJIC XLG	2REF
16.	72532792	ADAPTER #8MSTR #4MJIC	1REF
17.	72532670	ELBOW #8MJIC #8FJIC 45°	2
18.	72053760	ELBOW #6MSTR #6MJIC 90°	1REF
19.	72531206	ADAPTER #10MSTR #8FSTR	1
20.	72533052	ADAPTER #8MSTR #6FSTR	3REF
21.	51394542	HOSE ASM FJ .25X74.5 #4#4	1REF
22.	51395928	HOSE ASM FJ .25X18.5 #4#4	1REF
24.	72533115	TEE #12 SWVLNUTBRANCH	1
25.	72532364	ADAPTER #8MSTR #12MJIC	1REF
26.	51395520	HOSE FF .50X41 #8#8	1REF
27.	72532972	ADAPTER #8MJIC #12FJIC	1
28.	72532665	ADAPTER #4MJIC #8FJIC	1
29.	73054549	CHECK VALVE #4MSTR #4MJIC	1

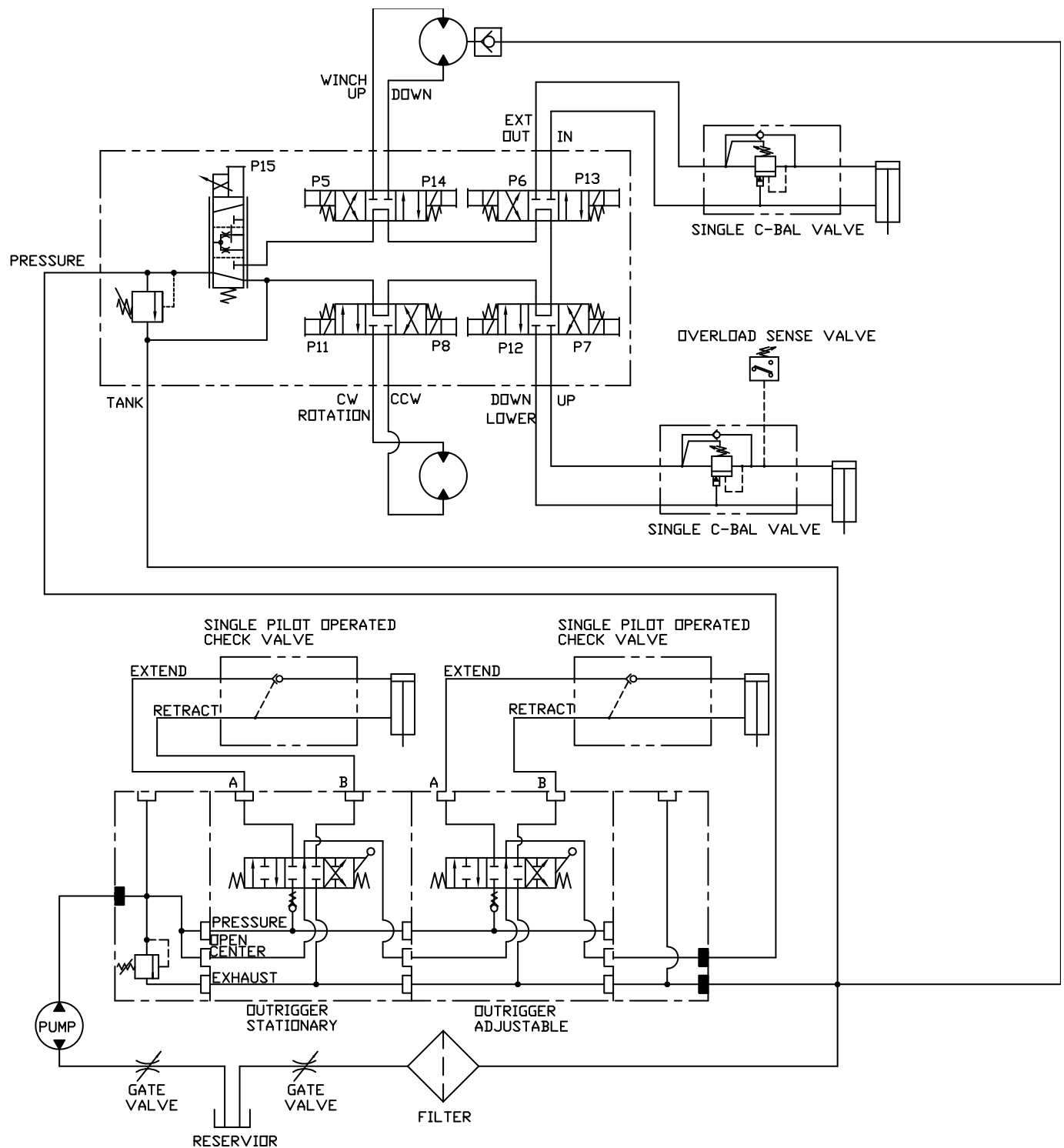




**HYD KIT-RADIO RMT (91715634-2)**

CONTINUED ON FOLLOWING PAGE

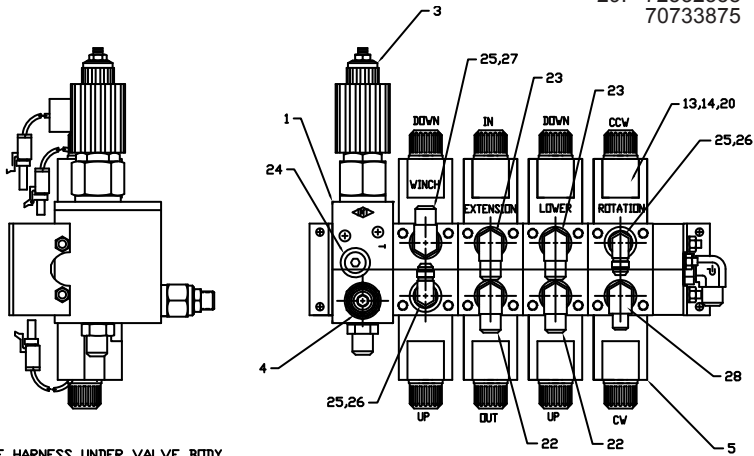


**HYD KIT-RADIO RMT (91715634-3)**

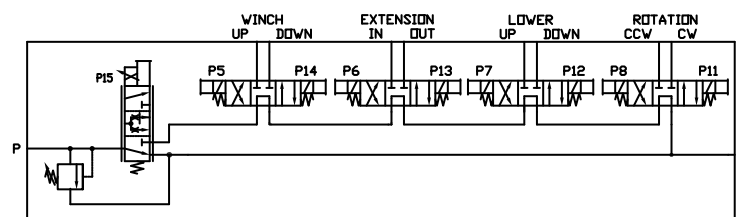
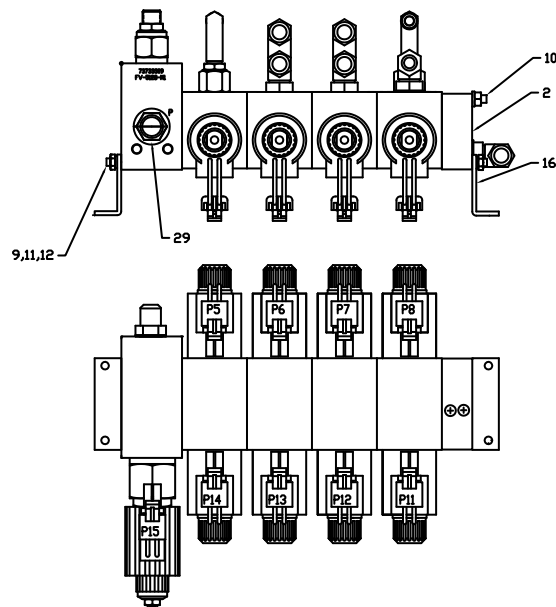
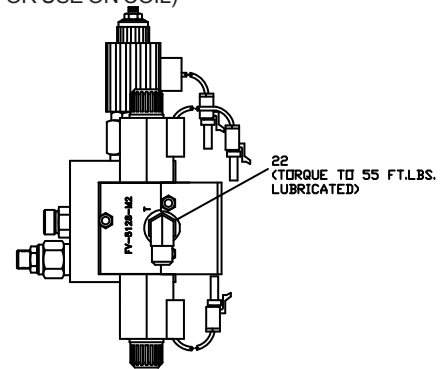
# **VALVEBANK, RADIO REMOTE** **(73733932)**

1.	73540028	BLOCK-INLET	1
2.	73540027	END CAP	1
3.	73054934	VALVE-PROPL FLOW CTRL	1
4.	73054935	VALVE-RELIEF	1
5.	91722649 OR 91722723	VALVE SECTION (WAS 73540044)	4
6.	7Q072013	O-RING	10
7.	72533477	PLUG 7/16STR HOLHEX	1
8.	70145829	EXPANDER PLUG	2
9.	60119363	ROD 1/4-20X12-1/2	2
10.	60119364	ROD 1/4-20X10-9/16	1
11.	72062000	NUT 1/4-20 HEX	5

12.	72063047	WASHER #10 LOCK	5
13.	77044574	CONNECTOR	9
14.	77044550	TERMINAL-FEM 18-20GA	18
15.	70394069	CABLE SEAL	2
16.	70145830	MTG BRACKET	2
17.	72532358	ADAPTER #8MSTR #8MJIC	1
19.	72532364	ADAPTER #8MSTR #12MJIC	1
20.	77044594	CABLE SEAL	16
21.	77441101	CABLE ASM	1
22.	72053763	ELBOW #8MSTR #8MJIC 90°	2
23.	72532666	ELBOW #8MSTR #8MJIC 90°	2
24.	72533603	PLUG 9/16STR HOLHEX	1
25.	72533052	ADAPTER #8MSTR #6FSTR	3
26.	72532700	ELBOW #6MSTR #6MJIC XLG	2
27.	72053760	ELBOW #6MSTR #6MJIC 90°	1
28.	72053671	ELBOW #8MSTR #6MJIC 90°	1
29.	72532358	ADAPTER #8MSTR #8MJIC	1
	70733875	PLASTIC NUT W/O-RING SEAL	REF
		(FOR USE ON COIL)	

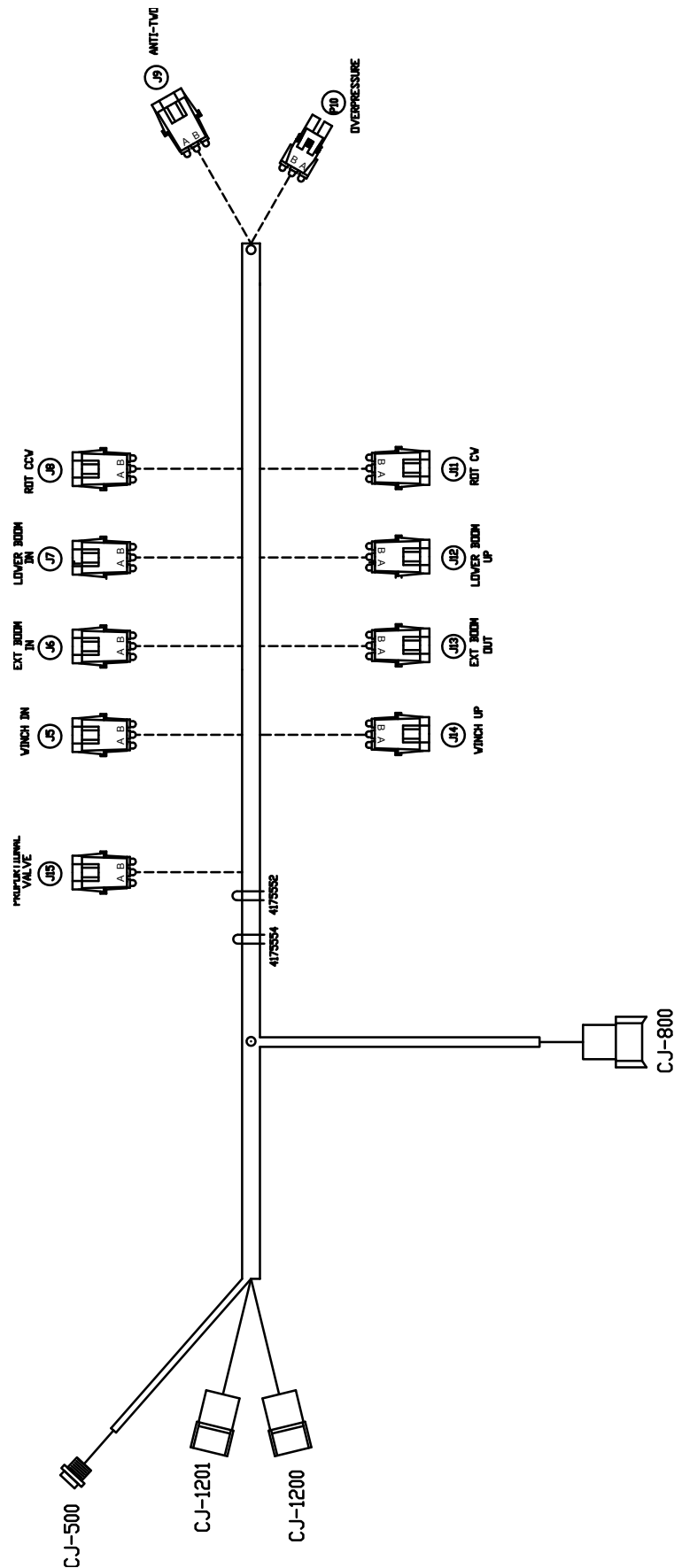


RUN WIRE HARNESS UNDER VALVE BODY

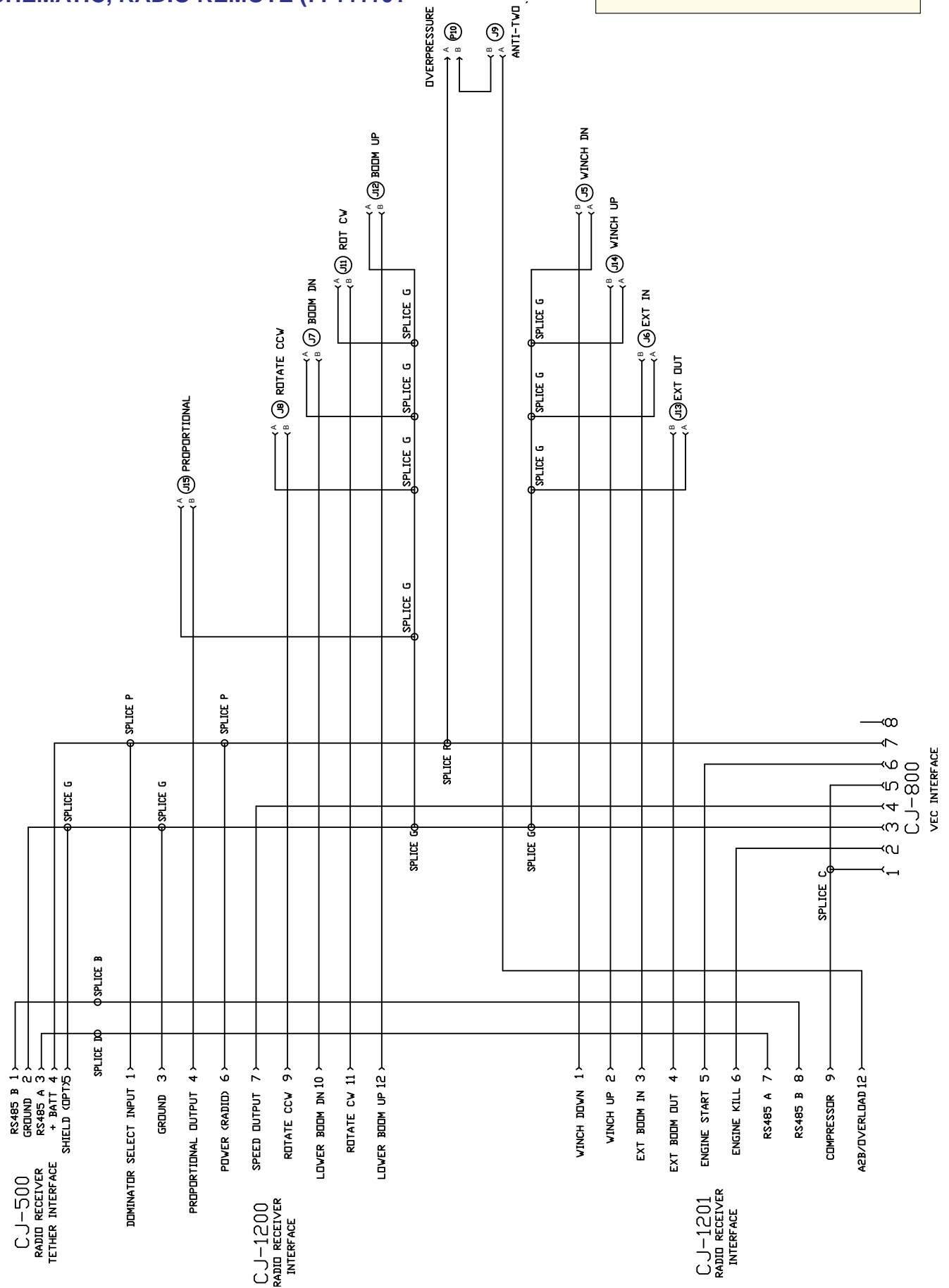


**WIRING HARNESS, RADIO REMOTE  
(77441101-1)**

CONTINUED ON FOLLOWING PAGE



**CONTINUED ON NEXT PAGE**



# CIRCUIT CHART, RADIO REMOTE (77441101-3)

PARTS LIST AND SCHEMATIC ON PREVIOUS PAGES

LOCATOR CODE: CJ-500					
BRAD/HARRIS: 8RS400A18A120					
CAP: 80012 (IE TO HARNESS)					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
1	BRWN	22	RS485 B	TO	SPL B
2	BLK	22	GROUND	TO	SPL G
3	BLUE	22	RS485 A	TO	SPL D
4	WHT	22	+ BATT	TO	SPL P
5	GREY	22	SHIELD (OPTIONAL)	TO	SPL G

LOCATOR CODE: CJ-800					
DUETSCH DT04-8PA					
TERM: 1060-16-0122 WEDGE: W8P CAVITY PLUG: 114017					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
1	WHT	16	COMP PWR	TO	SPL C
2	WHT	16	ENG KILL	TO	CJ-1201
3	WHT	16	GROUND	TO	SPL G
4	WHT	16	SPEED OUTPUT	TO	CJ-1200
5	WHT	16	COMP PWR	TO	SPL C
6	WHT	16	ENGINE START	TO	CJ-1201
7	WHT	16	POWER	TO	SPL P
8	-	-	-	TO	-

LOCATOR CODE: CJ-1200					
DEUTSCH: DTM06-12SA					
TERM: 1062-20-0122 WEDGE: WM12S CAVITY PLUG: 0413-204-2005					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
1	WHT	16	DOM SEL INPUT	TO	SPL P
2	-	-	-	TO	-
3	WHT	16	GROUND	TO	SPL G
4	WHT	16	PROP VLV PWR	TO	J15
5	-	-	-	TO	-
6	WHT	16	POWER (RADIO)	TO	SPL P
7	WHT	16	SPEED OUTPUT	TO	CJ-800
8	-	-	-	TO	-
9	WHT	16	ROTATE CCW	TO	J8
10	WHT	16	BOOM DN	TO	J7
11	WHT	16	ROTATE CW	TO	J11
12	WHT	16	BOOM UP	TO	J12

LOCATOR CODE: CJ-1201					
DEUTSCH: DTM06-12SB					
TERM: 1062-20-0122 WEDGE: WM12S CAVITY PLUG: 0413-204-2005					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
1	WHT	16	WINCH DN	TO	J5
2	WHT	16	WINCH UP	TO	J14
3	WHT	16	EXTN	TO	J6
4	WHT	16	EXT OUT	TO	J13
5	WHT	16	ENGINE START	TO	CJ-800
6	WHT	16	ENGINE KILL	TO	CJ-800
7	WHT	16	RS485 A	TO	SPL D
8	WHT	16	RS485 B	TO	SPL B
9	WHT	16	COMP PWR	TO	SPL C
10	-	-	-	TO	-
11	-	-	-	TO	-
12	WHT	16	A2B/OVERLOAD	TO	J9

LOCATOR CODE: J5					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	WINCH DN GRND	TO	SPL G
B	WHT	16	WINCH DN	TO	CJ-1201

LOCATOR CODE: J6					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	EXT INGRND	TO	SPL G
B	WHT	16	EXTN	TO	CJ-1201

LOCATOR CODE: J7					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	BOOM DN GRND	TO	SPL G
B	WHT	16	BOOM DN	TO	CJ-1200

LOCATOR CODE: J8					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	ROT CCW GRND	TO	SPL G
B	WHT	16	ROTATE CCW	TO	CJ-1200

LOCATOR CODE: J9					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	A2B/OVERLOAD	TO	CJ-1201
B	WHT	16	P10B TO J9B	TO	P10

LOCATOR CODE: P10					
PACKARD: 12015792					
TERM: 12124580 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	OVR PRESS SW	TO	SPL P
B	WHT	16	P10B TO J9B	TO	J9

LOCATOR CODE: J11					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	ROT CW GRND	TO	SPL G
B	WHT	16	ROTATE CW	TO	CJ-1200

LOCATOR CODE: J12					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	BOOM UP GRND	TO	SPL G
B	WHT	16	BOOM UP	TO	CJ-1200

LOCATOR CODE: J13					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	EX OUT GRND	TO	SPL G
B	WHT	16	EX OUT	TO	CJ-1201

LOCATOR CODE: J14					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	WINCH UP GRND	TO	SPL G
B	WHT	16	WINCH UP	TO	CJ-1201

LOCATOR CODE: J15					
PACKARD: 12010973					
TERM: 12124582 SEAL: 12015359					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
A	WHT	16	PROP VLV GRND	TO	SPL G
B	WHT	16	PROP VLV PWR	TO	CJ-1200

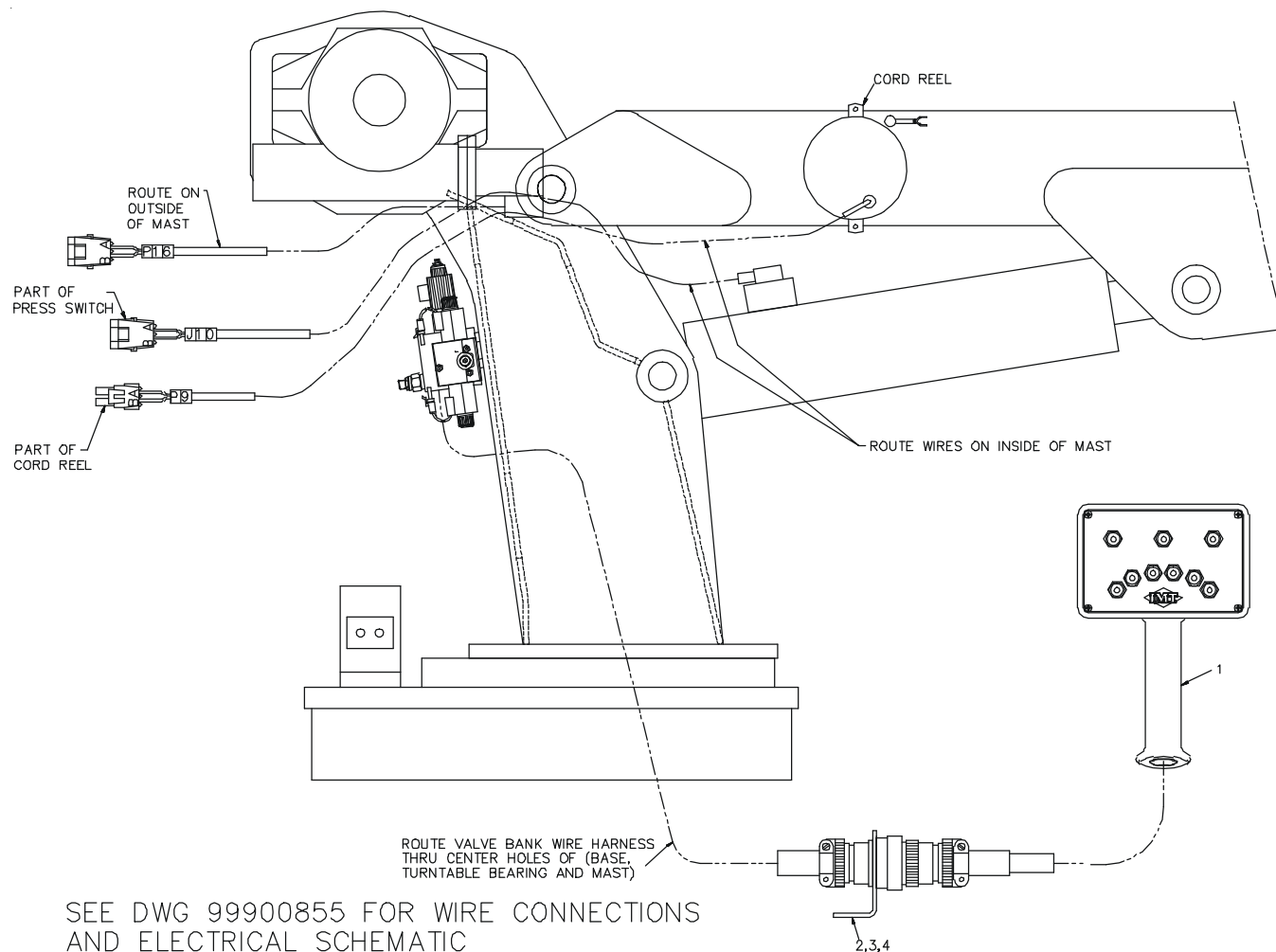
LOCATOR CODE: -					
SPlice B					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
-	BRN	22	RS485 B	TO	CJ-500
-	WHT	16	RS485 B	TO	CJ-1201

LOCATOR CODE: -					
SPlice C					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
-	WHT	16	COMP PWR	TO	CJ-1201
-	WHT	16	COMP PWR	TO	CJ-800
-	WHT	16	COMP PWR	TO	CJ-800

LOCATOR CODE: -					
SPlice D					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
-	BLUE	22	RS485 A	TO	CJ-500
-	WHT	16	RS485 A	TO	CJ-1201

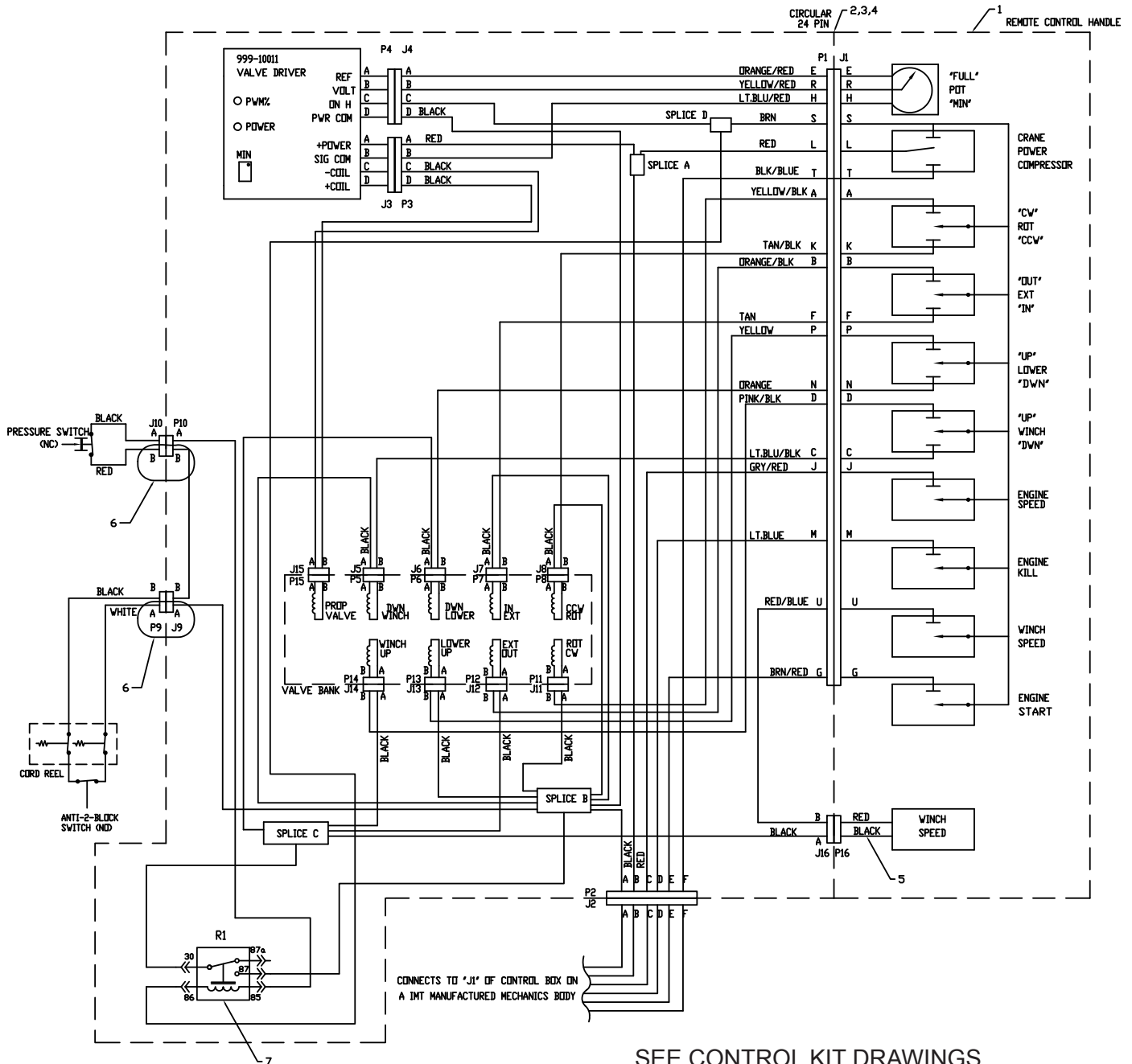
LOCATOR CODE: -					
SPlice G					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
-	WHT	16	WINCH DN GRND	TO	J5
-	WHT	16	EX IN GRND	TO	J6
-	WHT	16	BOOM DN GRND	TO	J7
-	WHT	16	ROT CCW GRND	TO	J8
-	WHT	16	ROT CW GRND	TO	J11
-	WHT	16	BOOM UP GRND	TO	J12
-	WHT	16	EX OUT GRND	TO	J13
-	WHT	16	WINCH UP GRND	TO	J14
-	WHT	16	PROP VLV GRND	TO	J15
-	WHT	16	GROUND	TO	CJ-500
-	WHT	22	SHIELD (OPTIONAL)	TO	CJ-500
-	WHT	16	GROUND	TO	CJ-800
-	WHT	16	GROUND	TO	CJ-1200

LOCATOR CODE: -					
SPlice P					
CAVITY	COLOR	GA	PRINT LABEL	TO	CON-SPLC
-	WHT	16	POWER	TO	CJ-800
-	WHT	16	POWER (RADIO)	TO	CJ-1200
-	WHT	16	DOM SEL INPUT	TO	CJ1200
-	WHT	22	+ BATT	TO	CJ-500
-	WHT	16	OVR PRESS SW	TO	P10



# ELECTRICAL SCHEMATIC, PROP REMOTE CONTROL (99900855)

1.	51713182	HANDLE ASM	1
2.	60119299	BRACKET	1
3.	77044645	NUT-DEUTSCH CONNECTOR	1
4.	77044646	LOCK WASHER -DTSCH CONN	1
5.	51713343	CABLE ASM 14GA/2 WIRE	1
6.	70034439	LOCK WIRE LEAD SEAL 8"	2
7.	77041597	HARNESS, DUAL-PRESS.	1





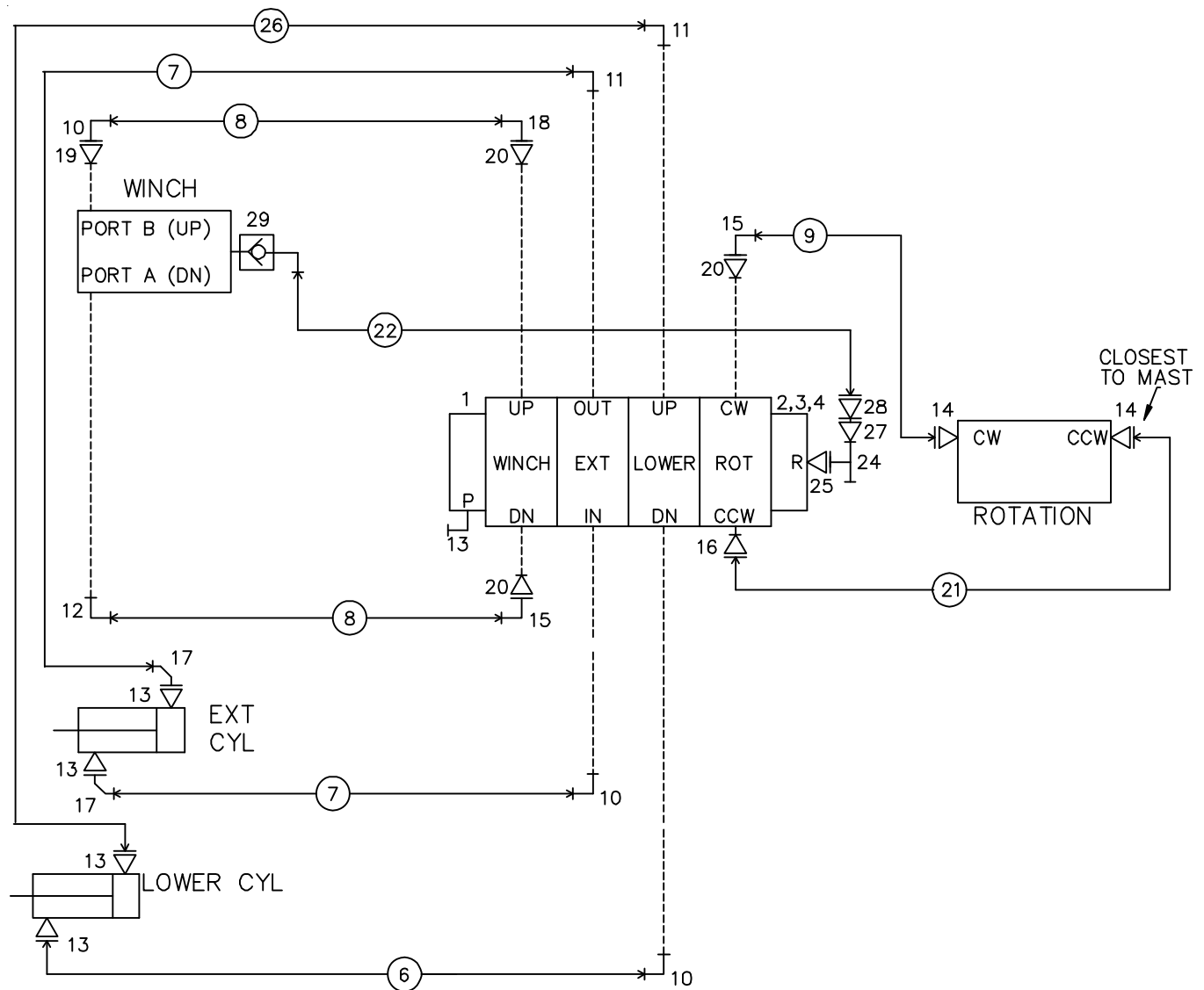
# **HYD KIT, TETHERED REMOTE (91715653-1)**

1.	73734544	VALVEBANK (WAS 73733397)	1
2.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	4
3.	72062104	NUT 1/4-20 LOCK	4
4.	72063001	WASHER 1/4 WRT	4
5.	51714928	HOSE KIT (INCL:6-9,21,22,26)	1
6.	61394545	HOSE-FF .38X39 #8#8	1REF*
7.	51394546	HOSE-FF .38X51 #8#8	2REF*
8.	51395721	HOSE-FF .38X28 #6#8	2REF*
9.	51394543	HOSE-FF .25X74.5 #4#6	1REF*
10.	72053763	ELBOW #8MSTR #8MJIC 90° (2REF PART OF 1)	1
11.	72532666	ELBOW #8MSTR #8MJIC 90° XLG (PART OF 1)	2REF
12.	72053764	ELBOW #10MSTR #8MJIC 90°	1
13.	72532358	ADAPTER #8MSTR #8MJIC (1REF PART OF 1)	4
14.	72532351	ADAPTER #4MSTR #4MJIC	2

CONTINUED ON FOLLOWING PAGE

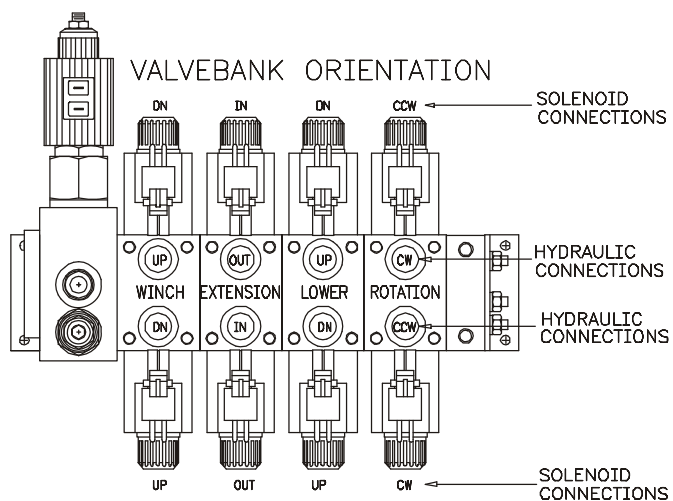
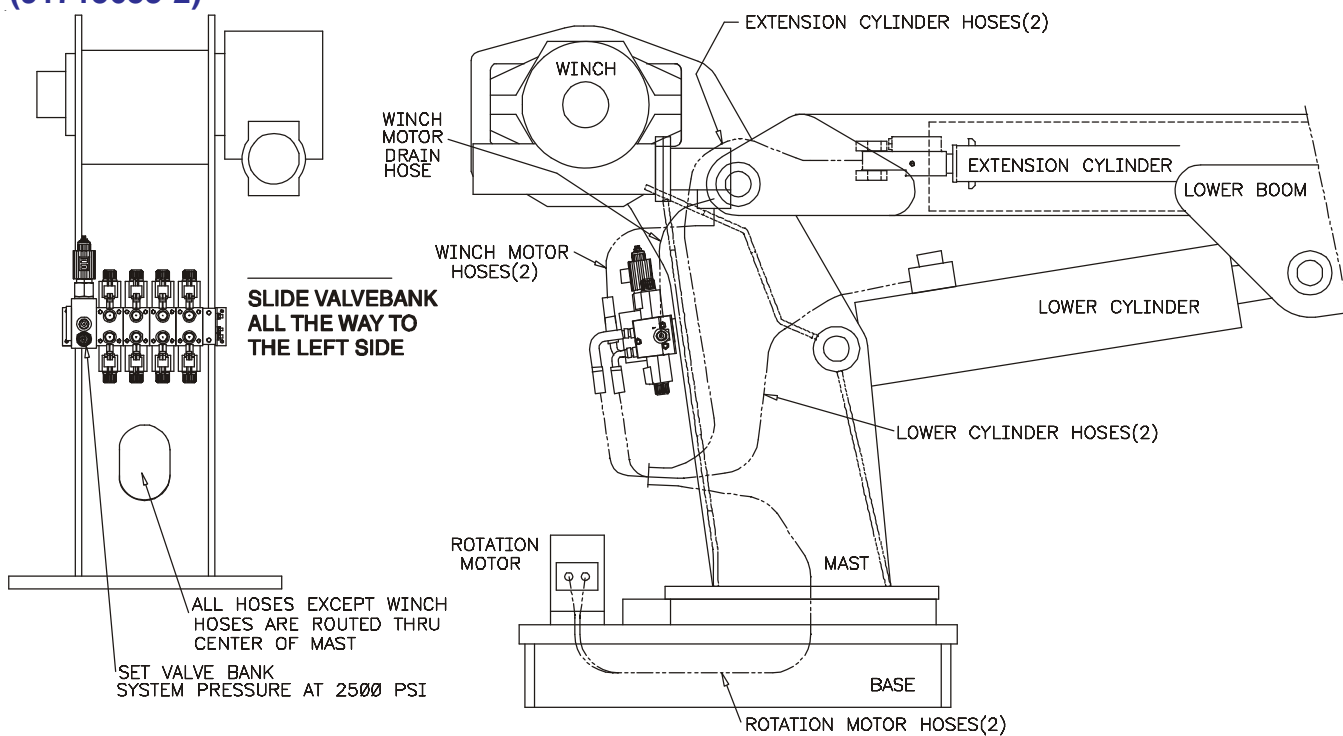
15.	72532700	ELBOW #6MSTR #6MJIC XLG (PART OF 1)	2REF
16.	72532792	ADAPTER #8MSTR #4MJIC (PART OF 1)	1REF
17.	72532670	ELBOW #8MJIC #8FJIC 45°	2
18.	72053760	ELBOW #6MSTR #6MJIC 90° (PART OF 1)	1REF
19.	72531206	ADAPTER #10MSTR #8FSTR	1
20.	72533052	ADAPTER #8MSTR #6FSTR (PART OF 1)	3REF
21.	51394542	HOSE-FJ .25X74.5 #4#4	1REF*
22.	51395928	HOSE-FJ .25X18.5 #4#4	1REF*
24.	72533115	TEE #12 SWVLNUTBRANCH	1
25.	72532364	ADAPTER #8MSTR #12MJIC	1
26.	51395520	HOSE-FF .50X41 #8#8	1REF*
27.	72532972	ADAPTER #8MJIC #12FJIC	1
28.	72532665	ADAPTER #4MJIC #8FJIC	1
29.	73054549	CHECK VALVE #4MSTR #4MJIC	1

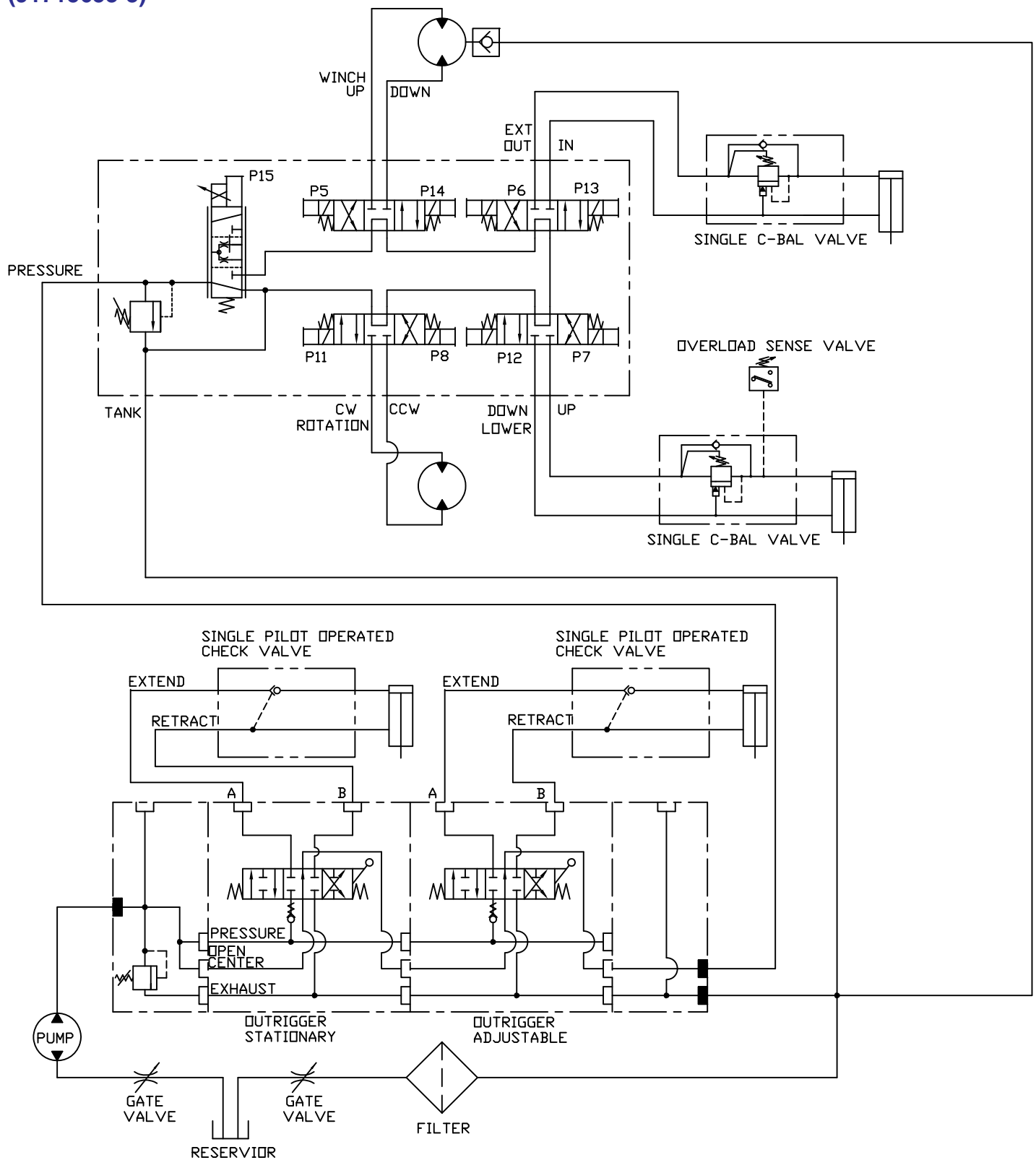
\* PART OF ITEM 5, HOSE KIT



# **HYD KIT, TETHERED REMOTE (91715653-2)**

CONTINUED ON FOLLOWING PAGE

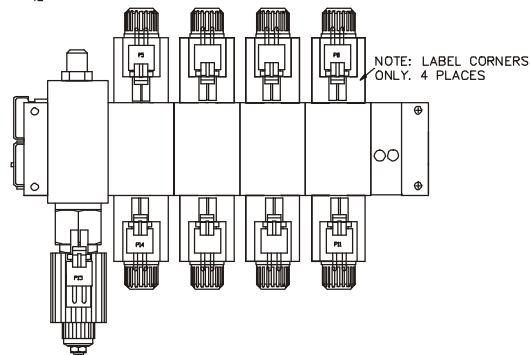
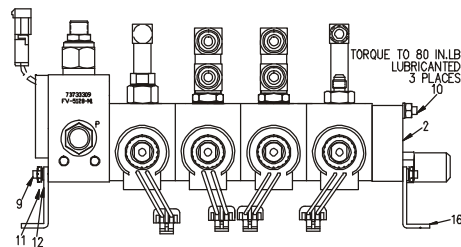
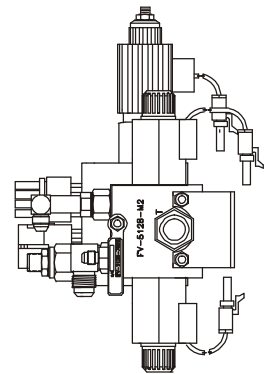
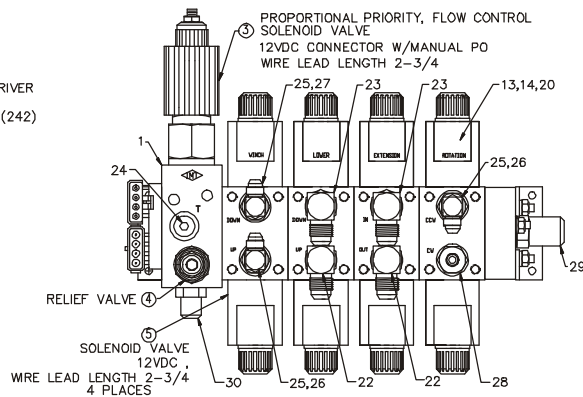
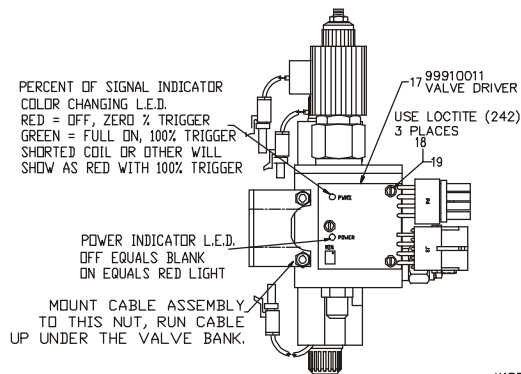
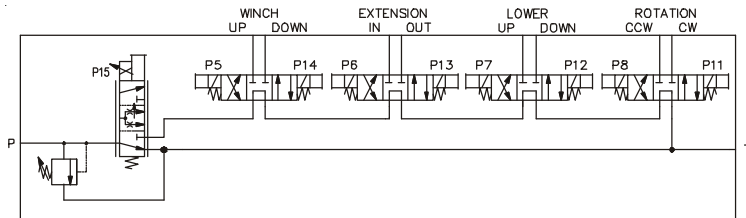


**HYD KIT, TETHERED REMOTE  
(91715653-3)**

# **VALVEBANK, TETHERED REMOTE (73733397)**

1.	73540028	INLET BLOCK	1
2.	73540027	END CAP	1
3.	73054934	VALVE-PROPL FLOW	1
	77041556	PROPL VALVE-COIL ONLY	REF
4.	73054935	RELIEF VALVE	1
5.	91722649	OR 91722723	
	91722709	VALVE SECTION (WAS 73540044)	4
		COIL-SOLENOID (WAS 77041518)	REF
6.	7Q072013	O-RING	10
7.	72533477	PLUG .44STR HOLHEX STL	1
8.	73054936	EXPANDER PLUG	4
9.	60119363	ROD-THRD 1/4-20X12.5	2
10.	60119364	ROD-THRD 1/4-20X10-9/16	1
11.	72062000	NUT 1/4-20 HEX	5
12.	72063047	WASHER #10 LOCK	5

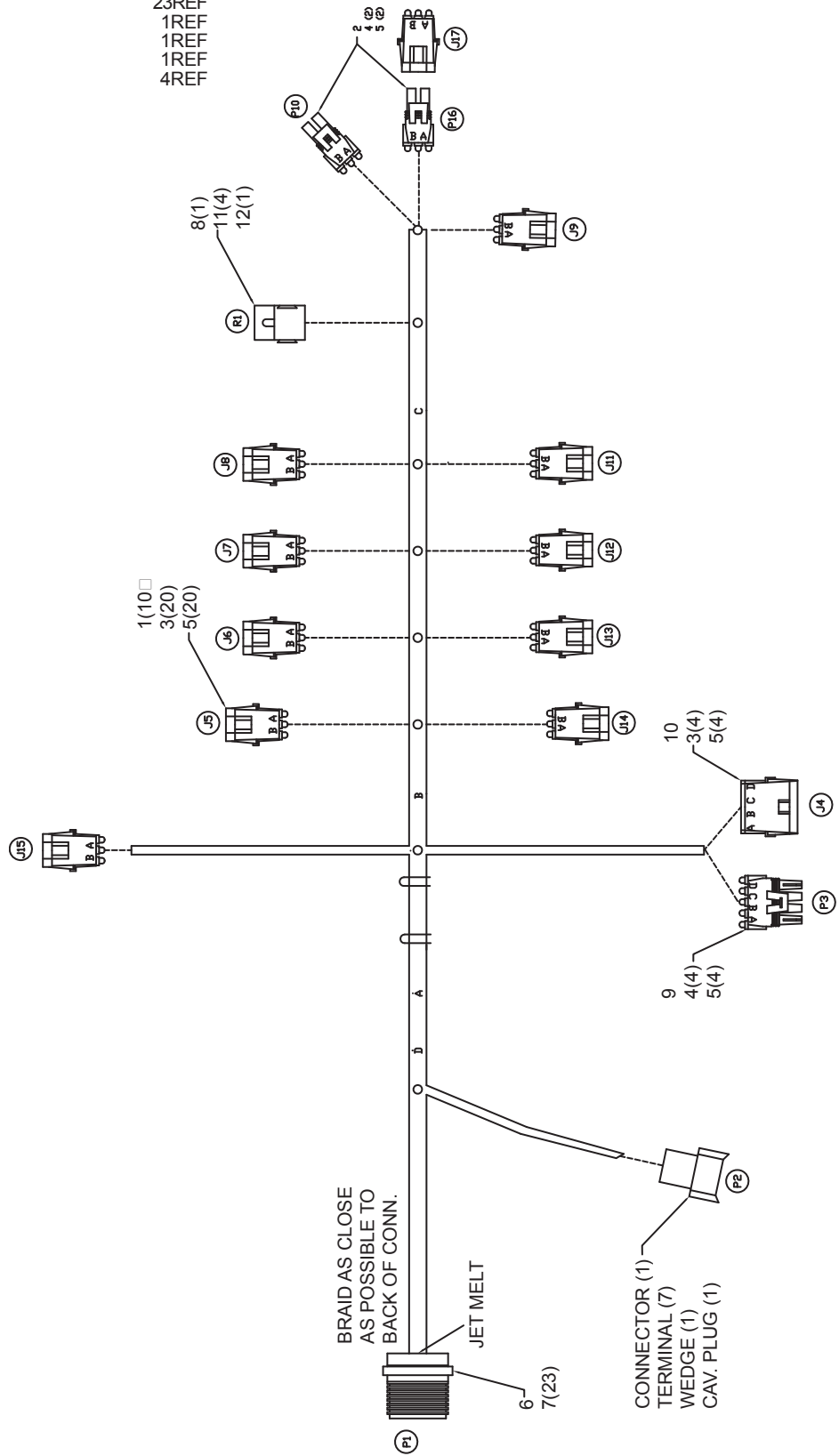
13.	77044574	CONNECTOR 2-WAY	9
14.	77044550	TERMINAL 18-20GA F	18
15.	70394069	CABLE SEAL	2
16.	70145830	MTG BRKT	2
17.	77044595	VALVE DRIVER	1
18.	72601704	MACH SCR #6-32X3/4 RDHD	3
19.	72061705	WASHER #6 WRT	3
20.	77044594	CABLE SEAL	16
21.	70733394	CABLE ASM	1
22.	72053763	ELBOW #8MSTR #8MJIC	2
23.	72532666	ELBOW #8MSTR #8MJIC 90° XLG	2
24.	72533603	PLUG 9/16STR HOLHEX STL	1
25.	72533052	ADAPTER #8MFACE #6FSTR	3
26.	72532700	ELBOW #8MSTR #6MJIC 90°	1
27.	72053760	ELBOW #6MSTR #6MJIC 90°	1
28.	72532792	ADAPTER #8MSTR #4MJIC	1
29.	72532364	ADAPTER #8MSTR #12MJIC	1
30.	72532358	ADAPTER #8MSTR #8MJIC	1



**CABLE ASM, TETHERED REMOTE (70733394-1)**

1.	77044573	SHROUD CONN 2-CONT	10REF
2.	77044574	TOWER CONN 2-CONT	2REF
3.	77044576	TERMINAL-MALE 20-18GA	24REF
4.	77044577	TERMINAL-FEMALE 20-18GA	8REF
5.	77044578	CABLE SEAL GRN 20-18GA	32REF
6.	77044620	CONN RCPT	1REF
7.	77044580	SOCKETS	23REF
8.		SOCKET, RELAY	1REF
9.	77044623	TOWER CONN	1REF
10.	77044624	SHROUD, CONN	1REF
11.		TERMINAL	4REF

CONTINUED ON NEXT PAGE



# CABLE ASM, TETHERED REMOTE (70733394-2)

LOCATOR CODE: P1						
TERM 0462-201-16141						
SEAL: -						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	18	ROT J11B	TO	J11	B
B	WHT	18	EXT J13B	TO	J13	B
C	WHT	18	WINCH J5B	TO	J5	B
D	WHT	18	WINCH J14B	TO	J14	B
E	WHT	18	J4A REF	TO	J4	A
F	WHT	18	EXT J6B	TO	J6	B
G	WHT	16	P2 6 ENG STRT	TO	P2	6
H	WHT	18	P3B SIG COMM	TO	P3	B
I	-	-	-	TO	-	-
J	WHT	18	P2 4 SPD RLA	TO	P2	4
K	WHT	18	ROT J8B	TO	J8	B
L	WHT	16	PENDANT PWR (+)	TO	SPL A	-
M	WHT	18	P2 2 KILL RLA	TO	P2	2
N	WHT	18	LOWER J7B	TO	J7	B
O	WHT	16	P1 0 SOL PWR	TO	P2	1
P	WHT	18	LOWER J12B	TO	J12	B
Q	-	-	-	TO	-	-
R	WHT	18	J4B VOLTAGE	TO	J4	B
S	WHT	18	P1S ON H	TO	SPL D	-
T	WHT	16	P2 5 COMPR	TO	P2	5
U	WHT	16	WNSPD P16B	TO	P16	B
V	-	-	-	TO	-	-
W	-	-	-	TO	-	-

LOCATOR CODE: P2						
TERM 1062-16-0122						
SEAL: WBP						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
1	WHT	16	P1 0 SOL PWR	TO	P1	0
2	WHT	18	P2 2 KILL RLA	TO	P1	M
3	WHT	16	P2 3 BAT (-)	TO	SPL B	-
4	WHT	18	P2 4 SPD RLA	TO	P1	J
5	WHT	16	P2 5 COMPR	TO	P1	T
6	WHT	16	P2 6 ENG STRT	TO	P1	G
7	WHT	16	P2 7 IGN SOL	TO	SPL A	-
8	-	-	-	TO	-	-

LOCATOR CODE: P3						
TERM 12089188						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	P3A POWER (+)	TO	SPL A	-
B	WHT	18	P3B SIG COMM	TO	P1	H
C	WHT	16	PRPVLV (-)	TO	J15	A
D	WHT	16	PRPVLV (+)	TO	J15	B

LOCATOR CODE: J4						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	18	J4A REF	TO	J1	E
B	WHT	18	J4B VOLTAGE	TO	J1	R
C	WHT	18	J4C ON H	TO	SPL D	-
D	WHT	16	J4D PWR COM	TO	SPL B	-

LOCATOR CODE: J5						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	WINCH J5A	TO	SPL B	-
B	WHT	18	WINCH J5B	TO	P1	C

LOCATOR CODE: J6						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	EXT J6A	TO	SPL B	-
B	WHT	18	EXT J6B	TO	P1	F

LOCATOR CODE: J7						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	LOWER J7A	TO	SPL C	-
B	WHT	18	LOWER J7B	TO	P1	N

LOCATOR CODE: J8						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	ROT J8A	TO	SPL B	-
B	WHT	18	ROT J8B	TO	P1	K

LOCATOR CODE: J9						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	ATB J9A	TO	SPL B	-
B	WHT	16	P10B & P9B	TO	P10	B

LOCATOR CODE: P10						
TERM 12089188						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	DPSI P10A	TO	R1	85
B	WHT	16	P10B & J9B	TO	J9	B

LOCATOR CODE: J11						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	ROT J11A	TO	SPL B	-
B	WHT	18	ROT J11B	TO	P1	A

LOCATOR CODE: J12						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	LOWER J12A	TO	SPL B	-
B	WHT	18	LOWER J12B	TO	P1	P

LOCATOR CODE: J13						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	EXT J13A	TO	SPL C	-
B	WHT	18	EXT J13B	TO	P1	B

LOCATOR CODE: J14						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	WINCH J14A	TO	SPL C	-
B	WHT	18	WINCH J14B	TO	P1	D

LOCATOR CODE: J15						
TERM 12089040						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	PRPVLV (-)	TO	P3	C
B	WHT	16	PRPVLV (+)	TO	P3	D

LOCATOR CODE: P16						
TERM 12089188						
SEAL: 12015323						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	WHT	16	WNSPD P16A	TO	SPL C	-
B	WHT	16	WNSPD P16B	TO	P1	U

LOCATOR CODE: J5						
TERM -						
PLUG 12010300						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
A	-	-	-	TO	P16	-
B	-	-	-	TO	P16	-

LOCATOR CODE: -						
TERM -						
SPICE A						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
-	WHT	16	PENDANT PWR (+)	TO	P1	L
-	WHT	16	P2 7 IGN SOL	TO	P2	7
-	WHT	16	P3A POWER (+)	TO	P3	A

LOCATOR CODE: -						
TERM -						
SPICE B						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
-	WHT	16	WINCH J5A	TO	J5	A
-	WHT	16	RELAY GND	TO	R1	87
-	WHT	16	P2 3 BAT (-)	TO	P2	3
-	WHT	16	J4D PWR COM	TO	J4	D
-	WHT	16	ROT J11A	TO	J11	A
-	WHT	16	LOWER J12A	TO	J12	A
-	WHT	16	EXT J6A	TO	J6	A
-	WHT	16	ROT J8A	TO	J8	A
-	WHT	16	ATB J9A	TO	J9	A

LOCATOR CODE: -						
TERM -						
SPICE C						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
-	WHT	16	LOWER J7A	TO	J7	A
-	WHT	16	ATB & DPRES GRD	TO	R1	30
-	WHT	16	EXT J13A	TO	J13	A
-	WHT	16	WINCH J14A	TO	J14	A
-	WHT	16	WNSPD P16A	TO	P16	A

LOCATOR CODE: -						
TERM -						
SPICE D						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
-	WHT	18	P1S ON H	TO	P1	S
-	WHT	16	RELAY PWR (+)	TO	R1	86
-	WHT	18	J4C ON H	TO	J4	C

LOCATOR CODE: R1						
TERM 12066614						
RELAY SOCKET: PACKARD 12065685, 12052834						
RELAY HELLA 87411 (SEALED)						
CAVITY	COLOR	GA.	PRINT LABEL	TO	CON-SPLC	CAVITY
30	WHT	16	ATB & DPRES GRD	TO	SPL C	-
87	WHT	16	RELAY GRD	TO	SPL B	-
87A	-	-	-	TO	-	-
86	WHT	16	RELAY PWR (+)	TO	SPL D	-
85	WHT	16	DPSI P10A	TO	P10	A

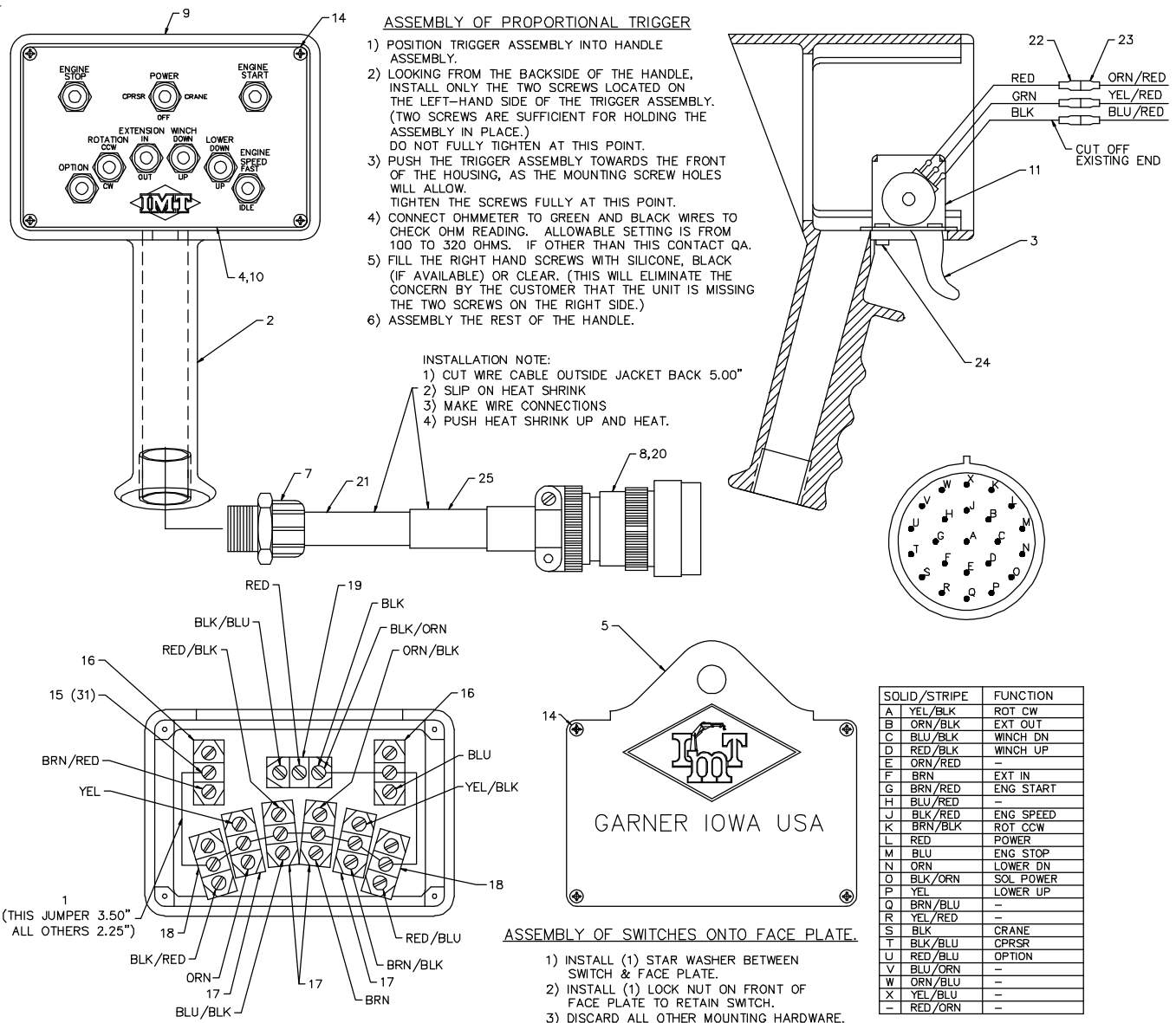
A		A		A		A	
LOCATOR CODE	CAVITY	PRINT LABEL		3000 FUNCTION			
P1	B	EXT J13B		INNER BOOM DOWN			
P1	C	WINCH J5A		EXTENSION BOOM IN			
P1	D	WINCH J14B		EXTENSION BOOM OUT			
P1	F	EXT J6B		INNER BOOM UP			
P1	N	LOWER J7B		OUTER BOOM UP			
P1	P	LOWER J12B		OUTER BOOM DOWN			
J5	A	WINCH J5B		EXTENSION BOOM IN			
J5	B	WINCH J5B		EXTENSION BOOM IN			
J6	A	EXT J6A		INNER BOOM UP			
J6	B	EXT J6B		INNER BOOM UP			
J7	A	LOWER J7A		OUTER BOOM UP			
J7	B	LOWER J7B		OUTER BOOM UP			
J12	A	LOWER J12A		OUTER BOOM DOWN			
J12	B	LOWER J12B		OUTER BOOM DOWN			
J13	A	EXT J13A		INNER BOOM DOWN			
J13	B	EXT J13B		INNER BOOM DOWN			
J14	A	WINCH J14A		EXTENSION BOOM OUT			
J14	B	WINCH J14B		EXTENSION BOOM OUT			

## PROP'L RMT HANDLE ASM (51713182)

- |     |          |                         |        |
|-----|----------|-------------------------|--------|
| 1.  | 89044214 | WIRE 18GA GRN           | 1.61FT |
| 2.  | 60119335 | CONTROL HANDLE          | 1      |
| 3.  | 60111141 | TRIGGER (PART OF 11)    | 1REF   |
| 4.  | 60119277 | COVER                   | 1      |
| 5.  | 70034306 | BACK COVER              | 1      |
| 7.  | 77044196 | STRAIN RELIEF 3/4       | 1      |
| 8.  | 77044621 | PIN                     | 23     |
| 9.  | 70394447 | DECAL-DGR RC ELECTRO SM | 1      |
| 10. | 70394142 | DECAL-CTRL              | 1      |
| 11. | 70394183 | TRIGGER ASM (INCL:3)    | 1      |

- |     |          |                            |      |
|-----|----------|----------------------------|------|
| 14. | 72061009 | SHT MTL SCR #6X3/4 PH      | 8    |
| 15. | 77040051 | TERMINAL-SPRSPD #8 16-14GA | 31   |
| 16. | 77040371 | TOGGLE SWITCH SPST         | 2    |
| 17. | 77040372 | TOGGLE SWITCH SPDT         | 4    |
| 18. | 77040373 | TOGGLE SWITCH SPST         | 2    |
| 19. | 77040374 | TOGGLE SWITCH SPDT         | 1    |
| 20. | 77044579 | CONNECTOR                  | 1    |
| 21. | 89044100 | CABLE 18GA 24WIRE          | 30FT |
| 22. | 77040147 | TERM-FSLPON1/4TAB 22-18    | 3    |
| 23. | 77040047 | TERM-MSLPON 1/4TAB 16-14   | 3    |
| 24. | 72060602 | MACH SCR #6-32X3/8 RDHD    | 4    |
| 25. | 70145495 | TUBING-HEAT SHRINK         | .5FT |

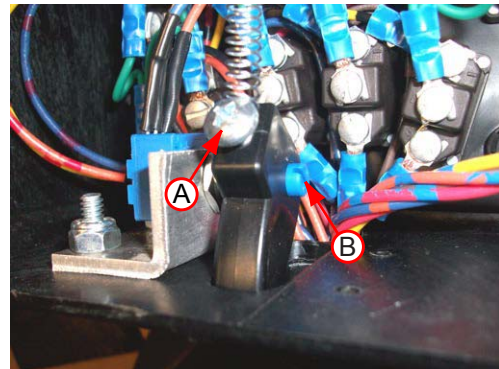
NOTE: KIT # 51717816, TETHERED CABLE - 30 FEET,  
INCLUDES ITEMS 8, 15 (QTY 24), 20, 21, AND 30.  
ORDER 51717816 TO REPLACE THE CABLE  
ASSEMBLY.



## TETHERED PROPORTIONAL REMOTE POTENTIOMETER ADJUSTMENT

**NOTES:** ONLY use this procedure to set the low-end output on the remote handle assembly if crane functions operate without pulling the proportional trigger. You may need a second operator to help with steps 4 and 5.

1. Following proper crane and stabilizer set-up, with the PTO engaged and the truck running, move the crane from the stowed position to a position off to the side of the truck. Unstow the winch cable hook and lower the winch approx (6) six feet.
2. Remove the back cover of the remote control handle.
3. Loosen screw "A" slightly. (Note: Screw style may vary).
4. While holding "WINCH DOWN" function, very slowly, rotate screw "B" clockwise until all movement has stopped.
5. Release "WINCH DOWN" function.
6. Tighten screw "A"
7. Test by operating "WINCH DOWN", "WINCH UP", "ROTATE CCW", and "ROTATE CW" without pulling the trigger. If any of these functions move, repeat steps 2 through 6.
8. Replace control back cover and properly stow the crane and stabilizers.





# **OPTION-AUX STABILIZERS-MO/PD** **(31704124-1)**

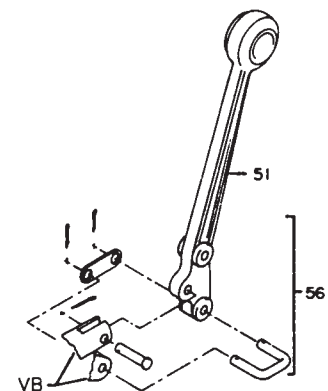
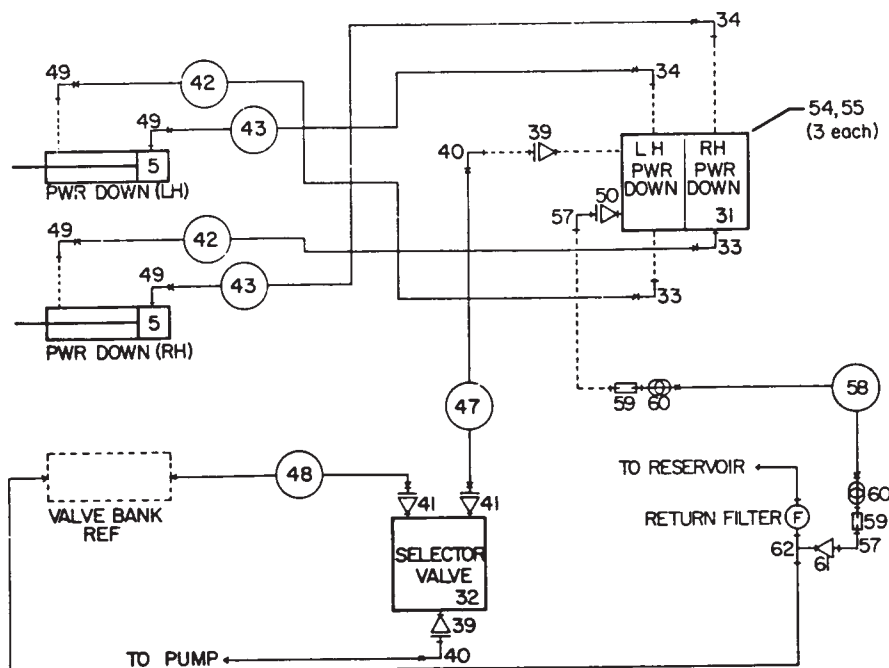
CONTINUED ON FOLLOWING PAGE

ITEM	PART NO.	DESCRIPTION	QTY
1.	52704109	HOUSING	1
2.	52701065	ARM	2
3.	52704867	SLEEVE	2
4.	52704868	LEG-STD	2
5.	3B166820	PWR DOWN CYLINDER	2
6.	52070138	T-PIN	2
7.	60010354	CLAMP PLATE	4
8.	60106716	CLAMP PLATE	4
9.	60030053	ROLLER	4
10.	60106968	PIN CYL/LEG	2
11.	60010351	SPRING	2
12.	72063007	WASHER 5/8 WRT	2
13.	60106314	PIN ARM/ROLLER	4
14.	71014053	TIE-DOWN STUD 1-8X26	8
15.	72066185	COTTER PIN .16X1	2
16.	60106718	CHAIN	2
17.	70058060	COLD SHUT LINK	2
18.	72060795	CAP SCR 1/2-13X1-1/2 SH	12
19.	72060102	CAP SCR 1/2-13X5-1/2 HHGR5	4
20.	72060053	CAP SCR 3/8-16X2-3/4 HHGR5	2
21.	70392566	DECAL-SELECTOR VALVE	1
22.	72062107	NUT 1/2-13 CTR LOCK	4
23.	72062103	NUT 3/8-16 LOCK	2
24.	72062141	NUT 1-8 LOCK	16
25.	72063066	WASHER 1" HI-STRENGTH	16
26.	72063034	MACH BUSHING 1X10GA	4
27.	72066125	RETAINING RING 1" HD	4
29.	72066178	COTTER PIN .12X1	8
31.	51703620	VALVEBANK 2-SECT	1
32.	73054420	SELECTOR VALVE	1
33.	72532666	ELBOW 3/4MSTR 3/4MJIC XL 90°	2
34.	72053763	ELBOW 3/4MSTR 3/4MJIC 90°	2
36.	71392257	DECAL-CTRL SS	1
37.	70392864	DECAL-WARNING STD CLR	3

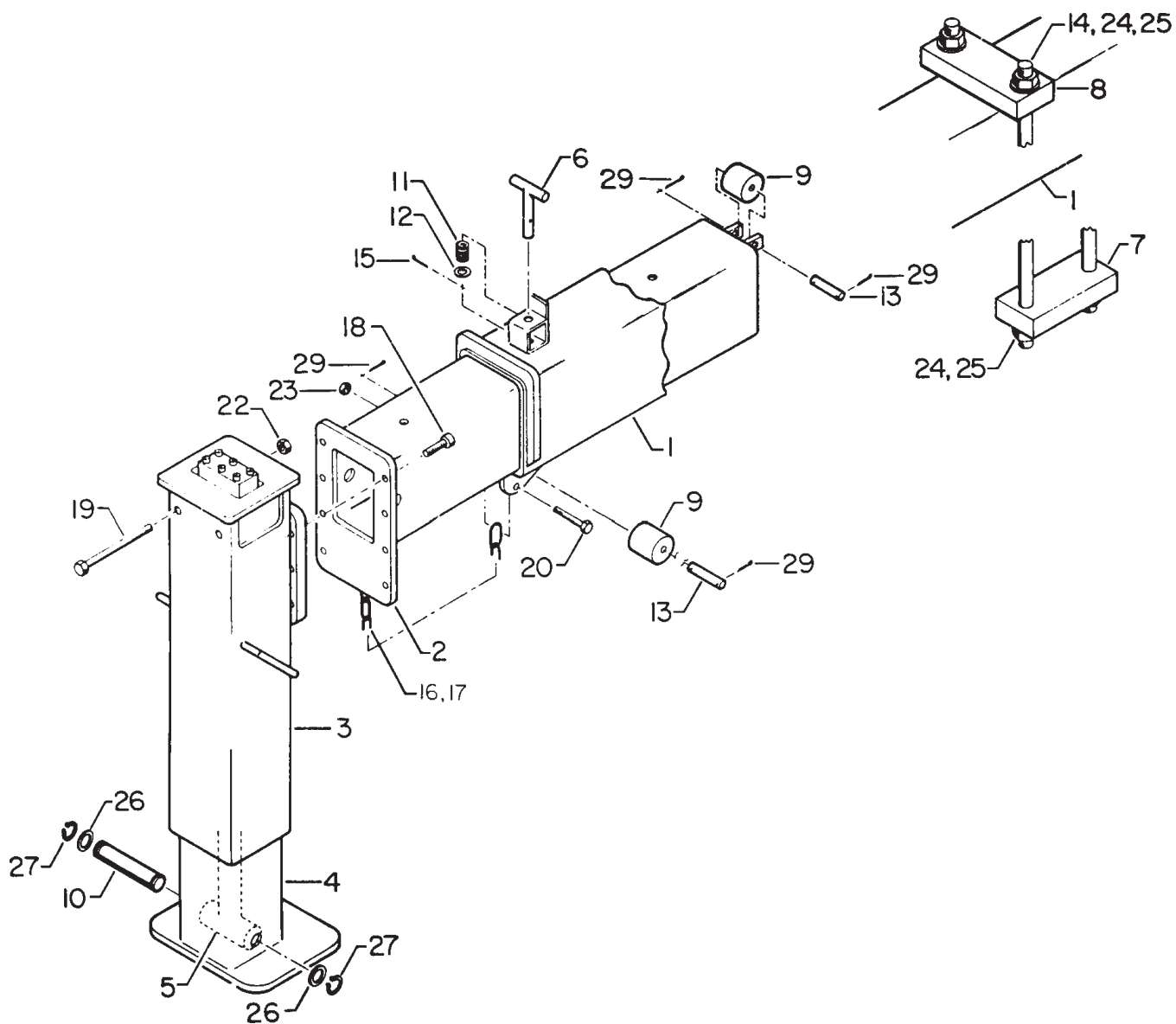
39.	72532669	ADAPTER 7/8MJIC 3/4MJIC	2
40.	72532668	ELBOW 1-1/16MSTR 7/8MJIC 90°	2
41.	72532360	ADAPTER 1-1/16MSTR 3/4MJIC	2
42.	51703032	HOSE ASM 3/8X66	2
43.	51703253	HOSE ASM 3/8X108	2
47.	51703931	HOSE ASM 1/2X312	1
48.	51703347	HOSE ASM 1/2X20	1
49.	72532779	ELBOW 9/16MSTR 3/4MJIC XLG	4
50.	72053747	ADAPTER 1-1/16MSTR 3/4FPT	1
51.	73014848	VALVE HANDLE	2
54.	72062109	NUT 5/16-18 LOCK	3
55.	72060033	CAP SCR 5/16X3 HHGR5	3
56.	94731839	LINK & PIN KIT	2
57.	72053556	STREET ELBOW 3/4NPT 90°	2
58.	60035170	HOSE 3/4X240	1
59.	72531548	BARB NIPPLE 3/4MPT 3/4BARB	2
60.	72066000	HOSE CLAMP #12	2
61.	72531836	REDUCER BUSHING 1-1/4X3/4	1
62.	72531994	STREET TEE 1-1/4NPT	1

## **DECAL PLACEMENT**

ITEM	LOCATION
37	ONE ON EACH STABILIZER, ONE AT OR NEAR THE NORMAL OPERATING STATION
36	AT PWR DOWN CTRL HANDLES
21	AT SELECTOR VALVE



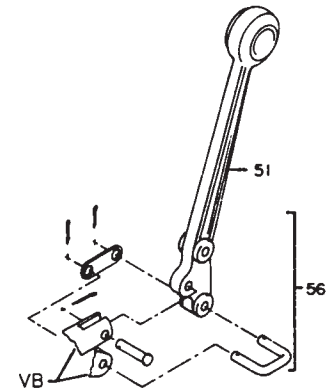
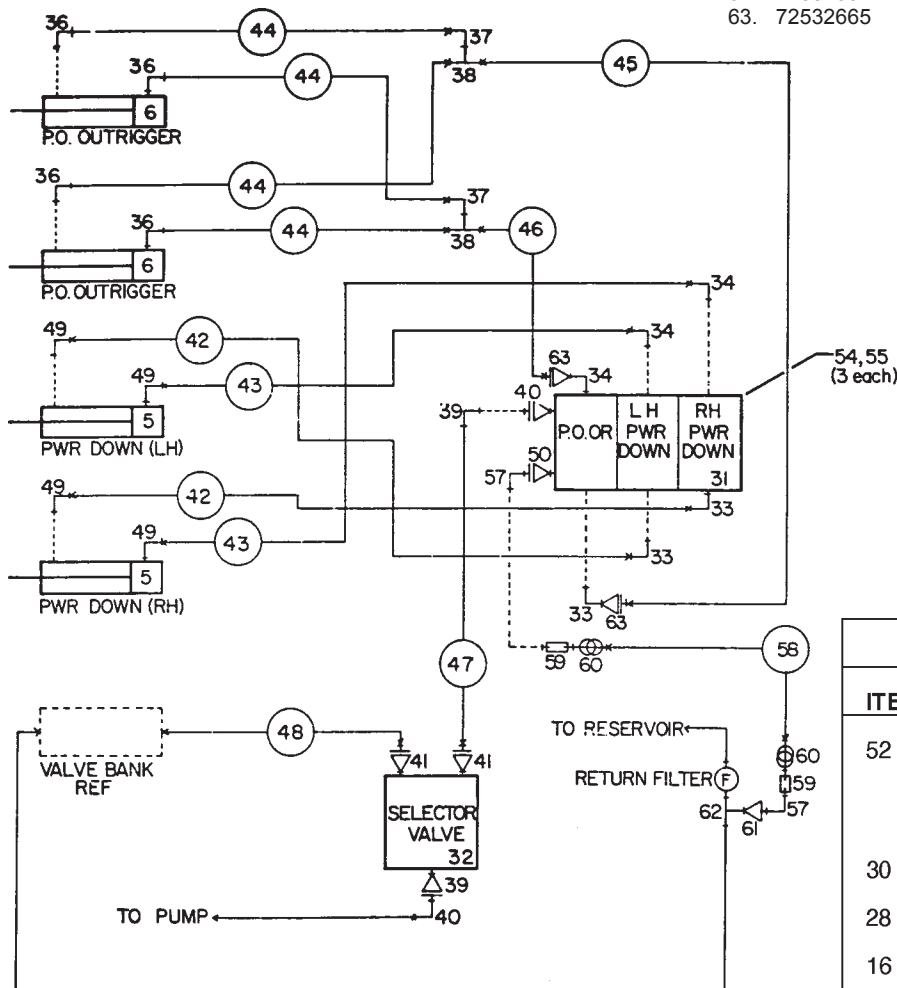
**OPTION-AUX STABILIZERS-MO/PD**  
**(31704124-2)**



# **OPTION-AUX STABILIZERS-PO/PD** **(31704123-1)**

CONTINUED ON FOLLOWING PAGE

ITEM	PART NO.	DESCRIPTION	QTY				
1.	52704109	HOUSING	1	32.	73054420	SELECTOR VALVE	1
2.	52701065	ARM	2	33.	72532666	ELBOW 3/4MSTR3/4MJICXLG 90°	3
3.	52704867	SLEEVE	2	34.	72053763	ELBOW 3/4MSTR 3/4MJIC 90°	3
4.	52704868	LEG-STD	2	36.	72532351	ADAPTER 7/16MSTR 7/16MJIC	4
5.	3B166820	PWR DOWN CYLINDER	2	37.	72532690	ELBOW 7/16MJIC 7/16FJIC SWVL	2
6.	3B210522	PWR OUT CYLINDER	2	38.	72532768	TEE 7/16MJIC	2
7.	60010354	CLAMP PLATE	4	39.	72532669	ADAPTER 7/8MJIC 3/4MJIC	2
8.	60106716	CLAMP PLATE	4	40.	72532668	ELBOW 1-1/16MSTR 7/8MJIC 90°	2
9.	60030053	ROLLER	4	41.	72532360	ADAPTER 1-1/16MSTR 3/4MJIC	2
10.	60106968	PIN CYL/LEG	2	42.	51703032	HOSE ASM 3/8X66	2
11.	60013202	PIN CYL/HSG	1	43.	51703253	HOSE ASM 3/8X108	2
12.	60106281	PIN CYL/ARM	2	44.	51704022	HOSE ASM 1/4X13	4
13.	60106314	PIN ARM/ROLLER	4	45.	51703591	HOSE ASM 1/4X20	1
14.	71014053	TIE-DOWN STUD 1-8X26	8	46.	51703590	HOSE ASM 1/4X23	1
15.	60106380	SPACER	4	47.	51703931	HOSE ASM 1/2X312	1
16.	70392566	DECAL-SELECTOR VALVE	1	48.	51703347	HOSE ASM 1/2X20	1
18.	72060795	CAP SCR 1/2-13X1-1/2 SH	12	49.	72532779	ELBOW 9/16MSTR 3/4MJIC XLG	4
19.	72060102	CAP SCR 1/2-13X5-1/2 HHGR5	4	50.	72053747	ADAPTER 1-1/16MSTR 3/4FPT	1
21.	72060581	SET SCR 3/8-16X3/4 SH	2	51.	73014848	VALVE HANDLE	3
22.	72062107	NUT 1/2-13 CTR LOCK	4	52.	70392864	DECAL-WARNINGR STD CLR	3
24.	72062141	NUT 1-8 LOCK	16				
25.	72063066	WASHER 1" HI-STRENGTH	16	54.	72062109	NUT 5/16-18 LOCK	3
26.	72063034	MACH BUSHING 1X10GA	6	55.	72060033	CAP SCR 5/16X3 HHGR5	3
27.	72066125	RETAINING RING 1" HD	6	56.	94731839	LINK & PIN KIT	3
28.	71392277	DECAL-PWR OUT	1	57.	72053556	STREET ELBOW 3/4NPT 90°	2
29.	72066178	COTTER PIN .12X1	8	58.	60035170	HOSE 3/4X240	1
30.	71392257	DECAL-PWR DN	1	59.	72531548	BARB NIPPLE 3/4MPT 3/4BARB	2
31.	51703619	VALVEBANK 3-SECT	1	60.	72066000	HOSE CLAMP #12	2
				61.	72531836	REDUCER BUSHING 1-1/4X3/4	1
				62.	72531994	STREET TEE 1-1/4NPT	1
				63.	72532665	ADAPTER 7/16MJIC 3/4FJIC	2



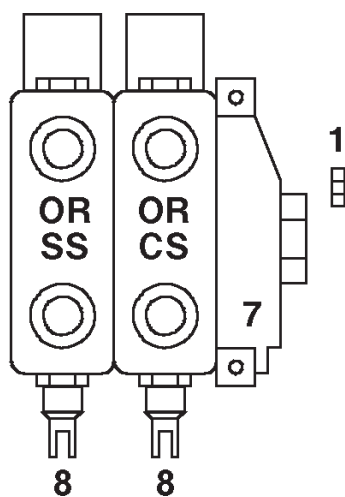
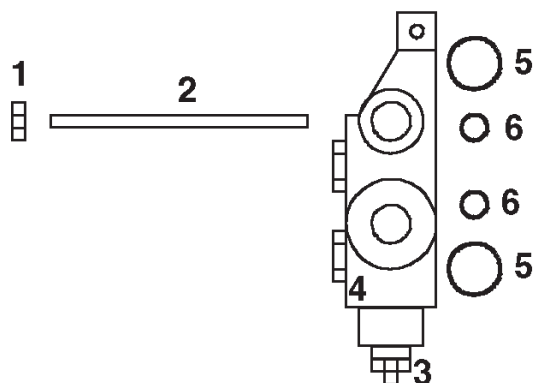
## **DECAL PLACEMENT**

ITEM	LOCATION
52	ONE ON EACH STABILIZER, ONE AT OR NEAR THE NORMAL OPERATING STATION
30	AT PWR DOWN CTRL HANDLES
28	AT PWR OUT CTRL HANDLE
16	AT SELECTOR VALVE



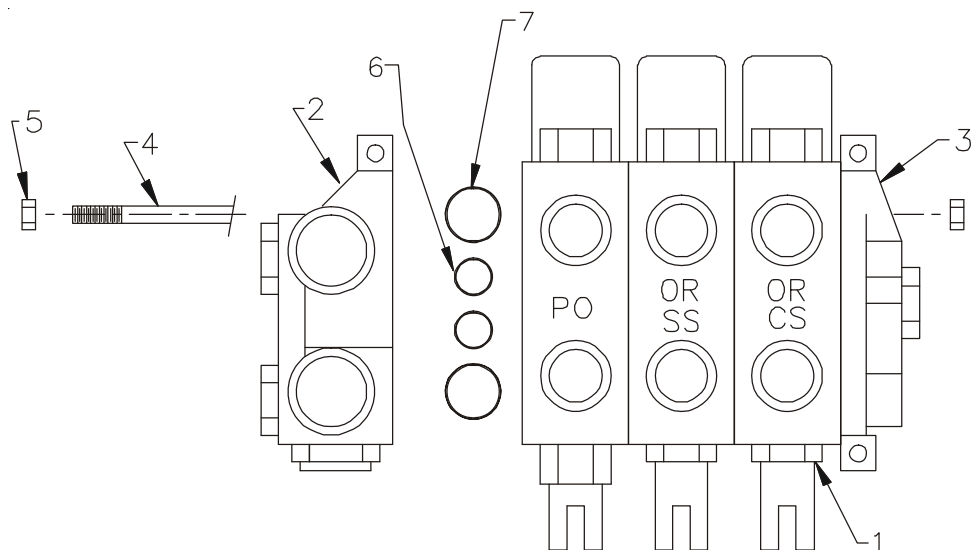
**VALVEBANK ASM-2 SECT (51703620)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	72062037	NUT	6
2.	73014629	STUD 3/8X6-1/2	3
3.	73054643	MAIN RELIEF 2300PSI	1REF
4.	73731424	END CAP - LH	1
5.	7Q072021	O-RING LG	6
6.	7Q072019	O-RING SM	6
7.	73731241	END CAP - RH W/CONV PLUG	1
8.	73054432	TANDEM VALVE SECTION	2



**VALVEBANK ASM-3 SECT (51703619)**

1.	73054432	TANDEM VALVE SECTION	3
2.	73731424	END CAP - LH (INCL:8)	1
3.	73731241	END CAP - RH W/CONV PLUG	1
4.	73014594	STUD	3
5.	72062037	NUT	6
6.	7Q072119	O-RING LG	8
7.	7Q072117	O-RING SM	8
8.	73054673	RELIEF VALVE 2750PSI	1REF



**CYLINDER - PWR DN (3B166820)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	4B166820	CASE (INCL:6)	1
2.	4G166820	ROD	1
3.	6I025087	PISTON	1
4.	6H025015	HEAD	1
5.	73054004	VALVE	1
6.	7PNPXT02	PIPE PLUG 1/8 (PART OF 1)	3REF
7.	6C075015	STOP TUBE	1
8.	72060708	CAP SCR 1/4-20 X 1-1/4 SH	6
9.	9B101214	SEAL KIT (INCL:10-18)	1
10.	7Q072137	O-RING (PART OF 9)	1REF
11.	7T66P025	PISTON SEAL (PART OF 9)	1REF
12.	7T61N087	LOCK RING SEAL (PART OF 9)	1REF
13.	7T2N8015	WEAR RING (PART OF 9)	1REF
14.	60138272	STOP TUBE (PART OF 9) (WAS 6A025015)	1REF
15.	7Q072228	O-RING (PART OF 9)	1REF
16.	7Q10P228	BACK-UP RING (PART OF 9)	1REF
17.	7R546015	ROD SEAL (PART OF 9)	1REF
18.	7R14P015	ROD WIPER (PART OF 9)	1REF
19.	60125699	PIN-LOCK TUBE (PART OF 9)	1REF

**NOTE**

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

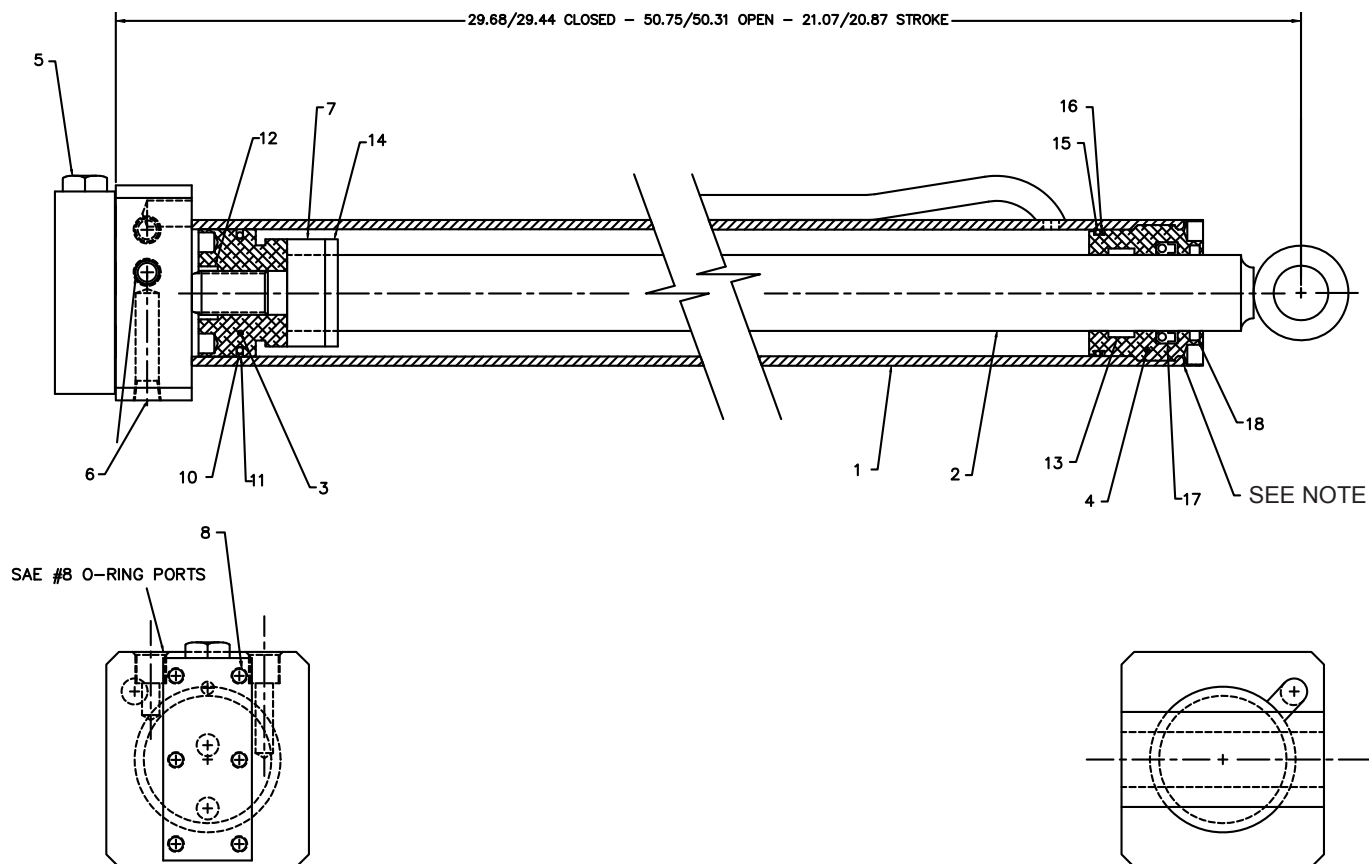
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

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

ITEM #14, STOP TUBE, REPLACES 6A025015 WAFER LOCK. USE STOP TUBE INSTEAD OF WAFER LOCK WHEN RESEALING CYLINDER.

PRESS LOCKING PIN (ITEM #19) INTO #15 HOLE DRILLED 0.188" DEEP.

TORQUE PISTON TO 100-130 FT-LB, HEAD TO 288 FT-LB, AND CARTRIDGE TO 30-35 FT-LB.



**CYLINDER-PWR OUT (3B210522)**

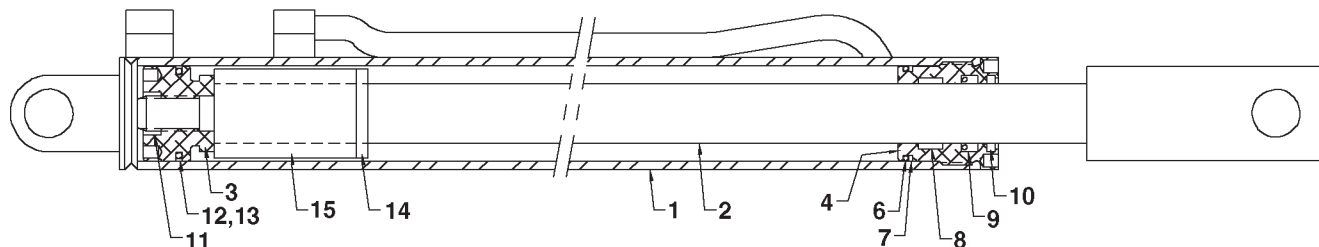
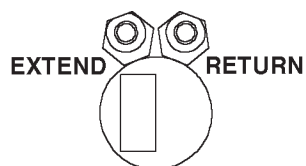
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B210522	CASE ASM	1
3.	6I020075	PISTON	1
4.	6H020012	HEAD	1
5.	9B081012	SEAL KIT (INCL:6-14)	1
6.	7Q072224	O-RING (PART OF 5)	1REF
7.	7Q10P224	BACK-UP RING (PART OF 5)	1REF
8.	7T2N8012	WEAR RING (PART OF 5)	1REF
9.	7R546012	ROD SEAL (PART OF 5)	1REF
10.	7R14P012	ROD WIPER (PART OF 5)	1REF
11.	7T61N075	LOCK RING SEAL (PART OF 5)	1REF
12.	7Q072129	O-RING (PART OF 5)	1REF
13.	7T66P020	PISTON SEAL (PART OF 5)	1REF
14.	6A025012	WAFER LOCK (PART OF 5)	1REF
15.	6C300012	STOP TUBE	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.

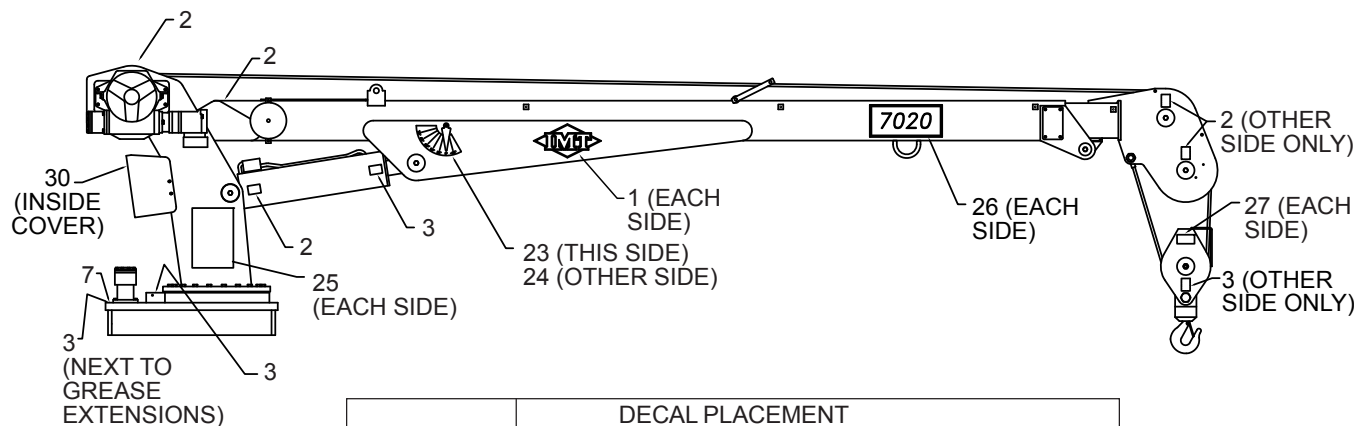
USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER.





**DECAL KIT (95708663)**

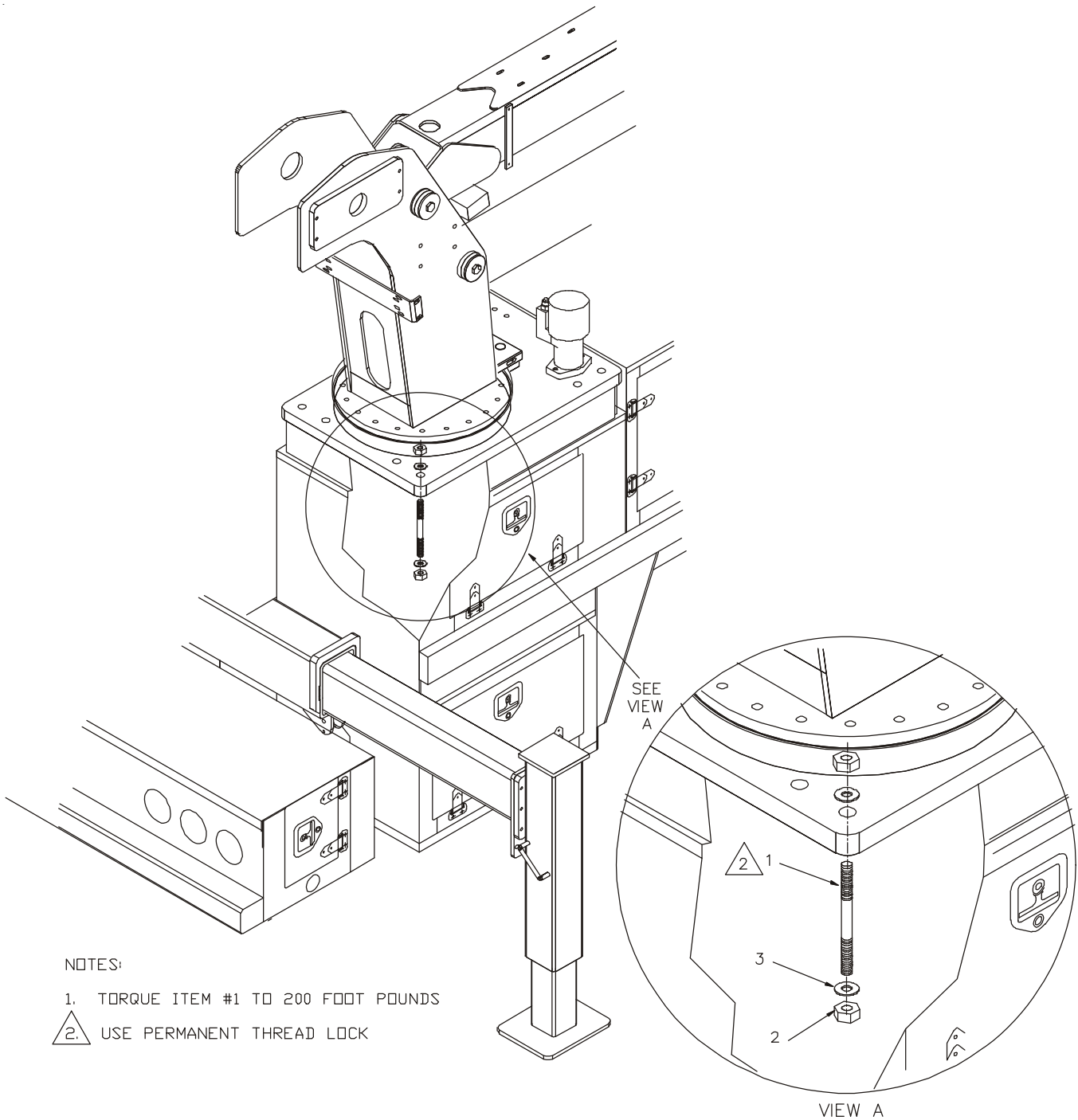
1. 70029251	IMT DIAMOND	2	15. 70392866	DECAL-DANGER OPER COND	1
2. 70391612	DECAL-GREASE WKLY LEFT	5	16. 70392867	DECAL-DGR OUTRG MOVING	1
3. 70391613	DECAL-GREASE WKLY RIGHT	4	17. 70392868	DECAL-DANGER LOADLINE	4
4. 70392108	DECAL-SUCTION LINE	1	18. 70392888	DECAL-DGR OPER RESTRICT	1
5. 70392109	DECAL-RETURN LINE	1	19. 70394446	DECAL-DGR RC ELECTRO	1
6. 70392213	DECAL-CAUTION WASH/WAX	1	20. 70392891	DECAL-DANGER DRIVELINE	1
7. 70392524	DECAL-ROT CRANE/GREASE	1	21. 70392982	DECAL-CONTACT IMT	1
8. 70394444	DECAL-DGR ELECTROCUTION	1	22. 71039134	DECAL-CAUTION OIL LEVEL	1
9. 70392814	DECAL-DGR OPERR TRAINING	1	23. 71391522	DECAL-ANGLE CHART RH	1
10. 70392815	DECAL-DANGER OPERATION	1	24. 71391523	DECAL-ANGLE CHART LH	1
11. 70392861	DECAL-DANGER 2-BLOCKING	1	25. 71392649	CAPACITY PLACARD	2
12. 70392863	DECAL-DGR HOISTING PERSON	1	26. 70392637	DECAL-IDENTIFICATION 7020	2
13. 70392864	DECAL-DGR OUTRG STND CLR	2	27. 71394082	DECAL-LOAD BLK RATING 7-T	2
14. 70394445	DECAL-DGR ELECTROCUTION	4	28. 70394189	DECAL-RECOMMEND HYD OIL	1
			30. 70394166	DECAL-MANL OPER INSTR	1
			31. 70395324	DECAL-ASME/ANSI B30.5	1



DECAL PLACEMENT	
ITEM#	LOCATION
6,8,9,10,11,12,15,16,18,19,21,22,25	AT OR NEAR REMOTE CONTROL STORAGE POINT
13	ONE ON EACH OUTRIGGER
14,17	ONE ON EACH SIDE OF CARRIER VEHICLE
5	ON RESERVOIR AT RETURN LINE
4	ON RESERVOIR AT SUCTION LINE
28	AT OR NEAR HYDRAULIC RESERVOIR
20	AT OR NEAR DRIVELINE
31	PLACE UNDER SERIAL TAG

**INSTALLATION KIT-MTG HARDWARE  
(93715349)**

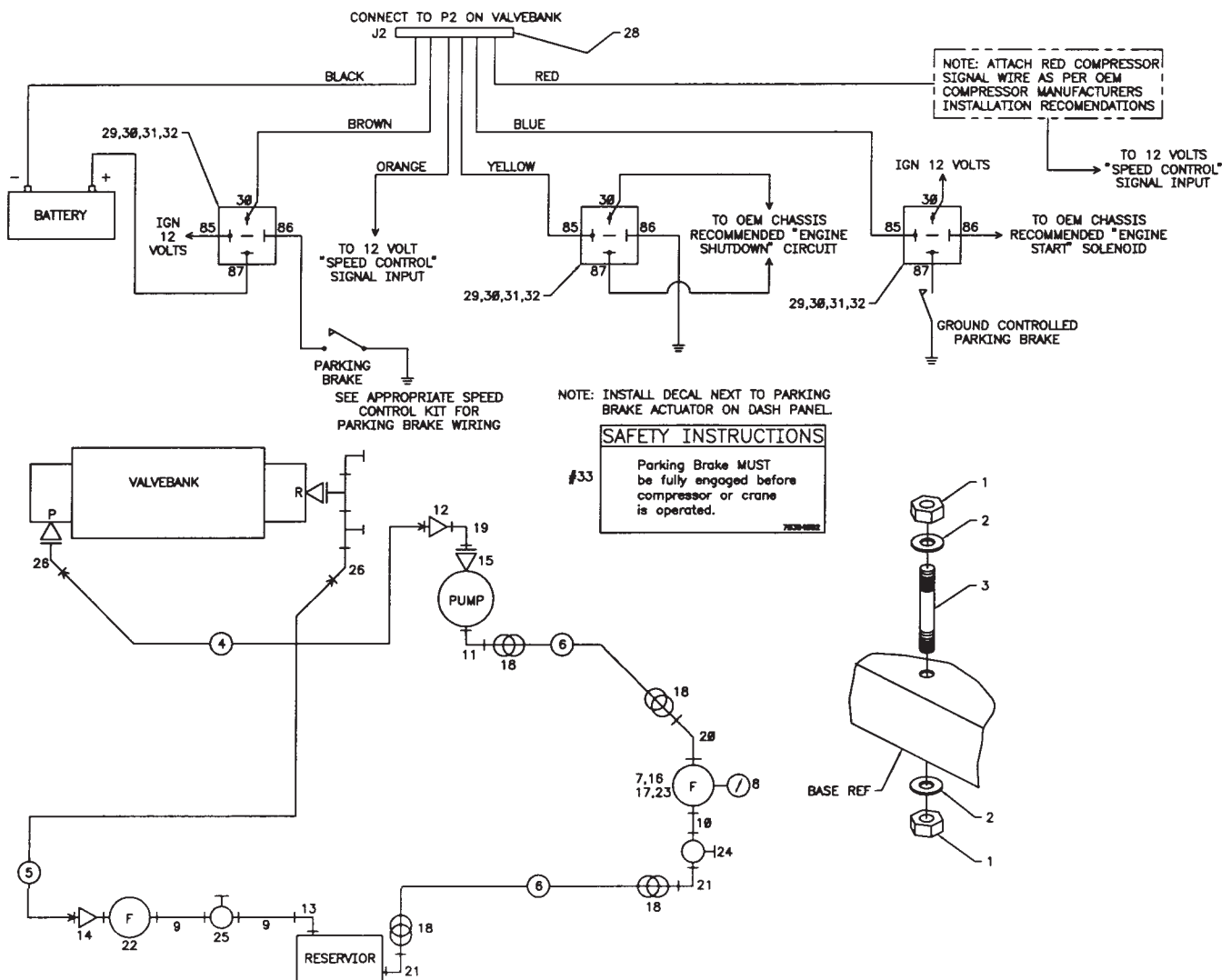
1. 60106481	TIE DN STUD 1X12-1/2	8
2. 72062141	NUT 1-8 LOCK STL INSERT	16
3. 72063066	WASHER 1 HI-STRGTH	16
4. 73052091	RETURN FILTER 10MIC (NOT SHOWN)	1



**INSTALLATION KIT (93709115)**

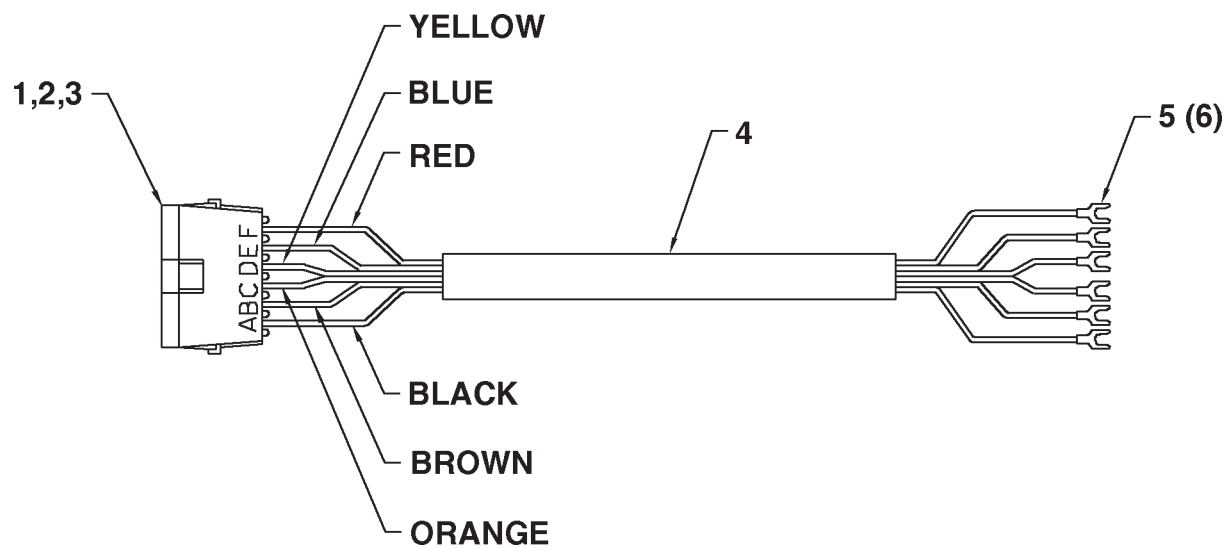
ITEM	PART NO.	DESCRIPTION	QTY
1.	72062141	NUT 1-8 LOCK STL-INSERT	16
2.	72063066	WASHER 1 HI-STRENGTH	16
3.	60106481	TIE-DOWN STUD 1X12-1/2	8
4.	51703873	HOSE ASM 1/2X270 FF	1
5.	51703615	HOSE ASM 3/4X264 FF	1
6.	60035829	HOSE 1-1/4 100R4 X 48	2
7.	60103870	OIL FILTER BRACKET	1
8.	70048031	VACUUM GAUGE	1
9.	72053141	PIPE NIPPLE 3/4 X CLOSE	2
10.	72053211	PIPE NIPPLE 1-1/4 X CLOSE	1
11.	72532708	BEAD NIPPLE #16MSTR 1-1/4 90°	1
12.	72053497	ADAPTER 1/2MPT #8MJIC	1
13.	72053556	STREET ELBOW 3/4NPT 90°	1
14.	72053671	ADAPTER 3/4MPT #8MJIC	1
15.	72053749	ADAPTER #16MSTR 1/2FPT	1
16.	72060025	CAP SCR 5/16-18X1 HH GR5	2
17.	72063050	WASHER 5/16 LOCK	2

18.	72661642	CLAMP - T-BOLT 1.75	4
19.	72531133	STREET ELBOW 1/2NPT 90°	1
20.	72531196	BARB NIPPLE 1-1/4MPT 1-1/4 45°	1
21.	72532346	BARB NIPPLE 1-1/4MPT 1-1/4 90°	2
22.	73052000	RETURN FILTER 10-MIC 3/4NPT	1
	73052006	ELEMENT 10-MIC SPIN	REF
23.	73052012	SUCTION FILTER 25-MIC 1-1/4	1
	70048149	ELEMENT 100-MESH	REF
	73052014	ELEMENT 25-MIC SPIN	REF
24.	73054130	GATE VALVE 1-1/4NPT	1
25.	73054129	GATE VALVE 3/4NPT	1
26.	72532670	ELBOW #8MJIC #8FJIC 45°	2
28.	51713199	CABLE ASM 14GA/6WIREX35	1
29.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	3
30.	72062104	NUT 1/4-20 HEX NYLOC	3
31.	72063001	WASHER	3
32.	77041251	RELAY	3
33.	70394092	DECAL CAUTION BRK/CPRSR	1



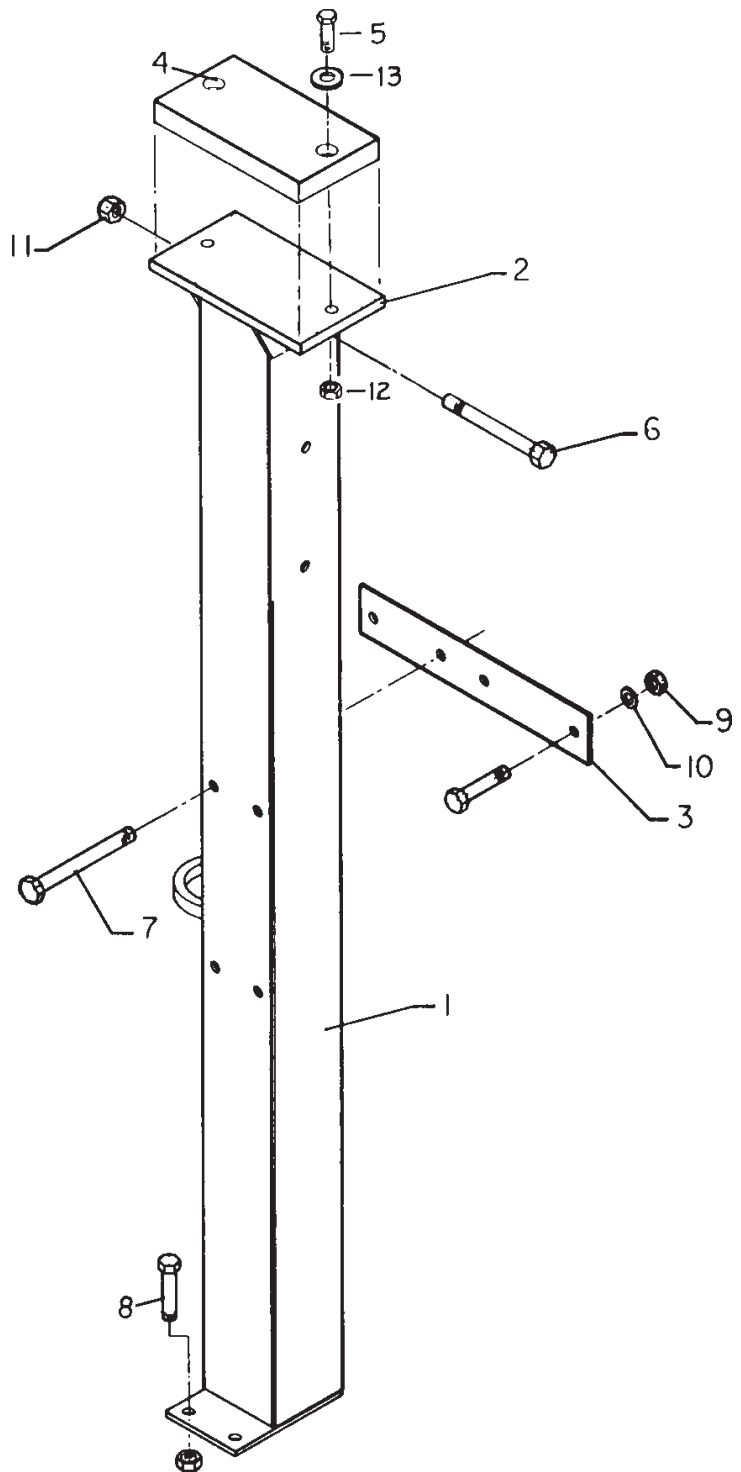
**CABLE ASM 14GA 6WIRE X 35'**  
**(51713199)**

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



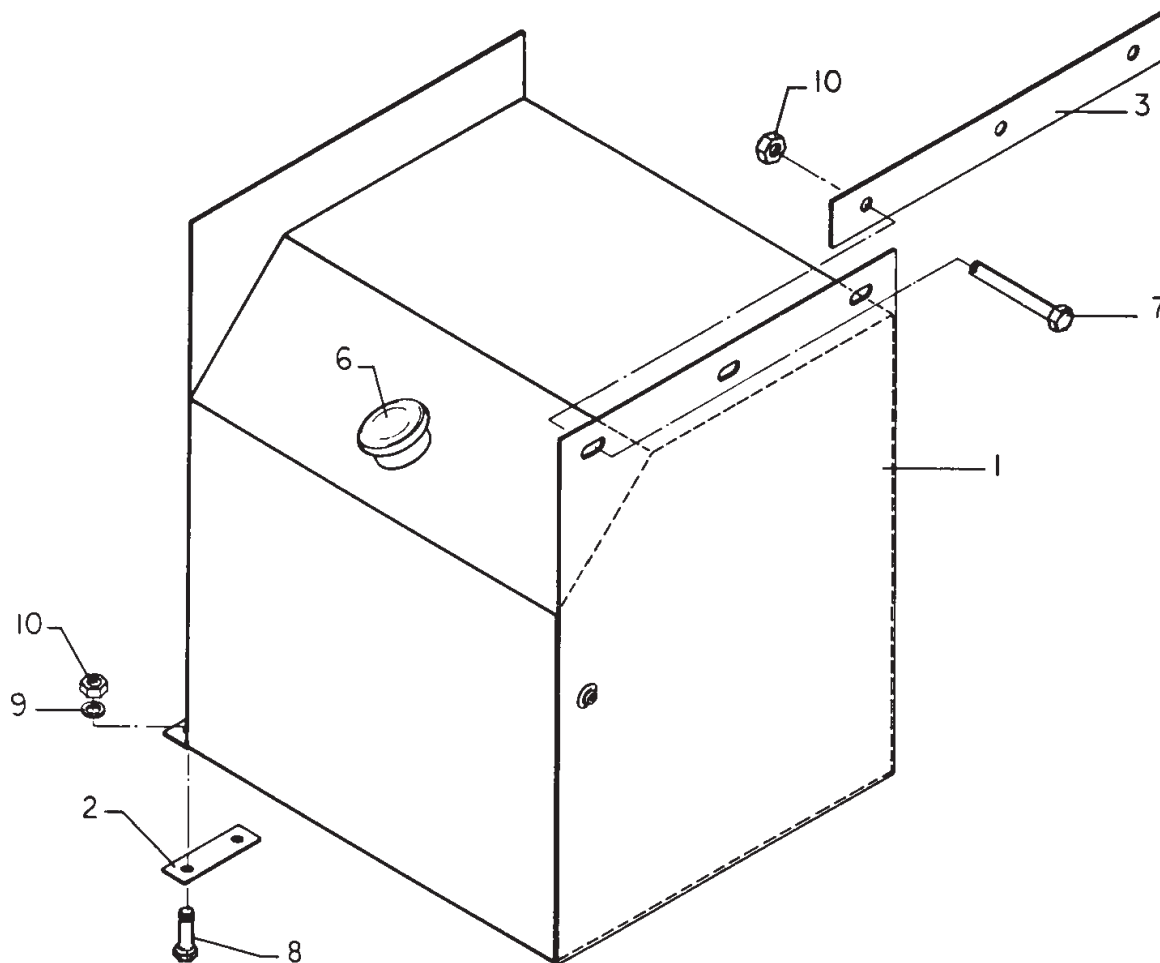
# **OPTION-BOOM SUPPORT ASM** **(51708366)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52708644	TUBE	1
2.	52708643	SADDLE	1
3.	60112767	MOUNTING BAR	1
4.	60030295	WEAR PAD	1
5.	72060026	CAP SCR 5/16-18X1-1/4 HHGR5	2
6.	72060193	CAP SCR 3/4-10X6 HHGR5	1
7.	72060101	CAP SCR 1/2-13X5 HHGR5	2
8.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
9.	72062080	NUT 1/2-13 HEX	6
10.	72063005	WASHER 1/2 WRT	4
11.	72062114	NUT 3/4-10 HEX	1
12.	72062109	NUT 5/16 LOCK	2
13.	72063001	WASHER 1/4 WRT	2



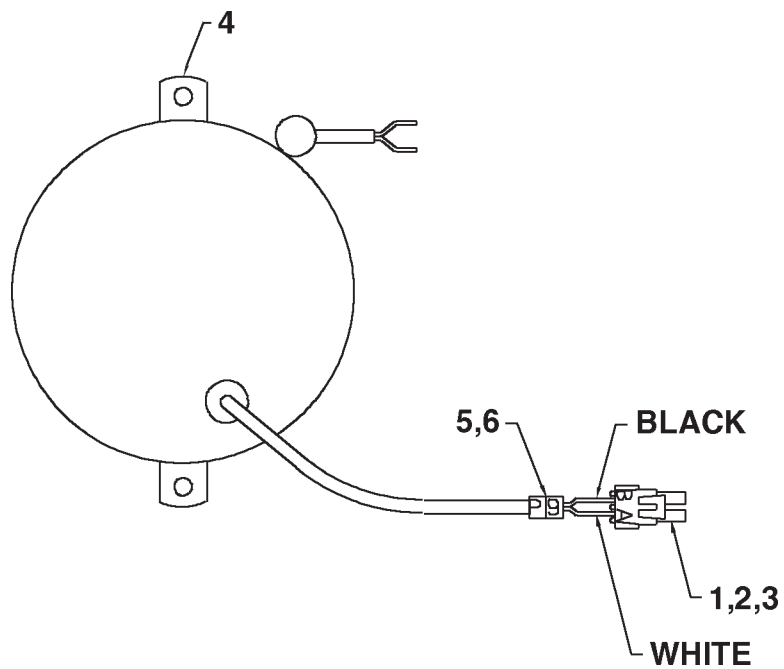
# **OPTION-RESERVOIR ASM-34 GAL** **(51708368)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52707349	RESERVOIR 34 GAL	1
2.	60112662	BOTTOM SHIM	2
3.	60112663	SIDE SHIM	1
4.	73141276	FILL NECK SCREEN	1
5.	73052001	PIPE PLUG 3/4NPT MAGNETIC	1
6.	73014671	FILL CAP	1
7.	72060053	CAP SCR 3/8-16 X 2-3/4 HHGR5	3
8.	72060046	CAP SCR 3/8-16 X 1-1/4 HHGR5	4
9.	72063003	WASHER 3/8 WRT	4
10.	72062179	NUT 3/8-16 LOCK	7



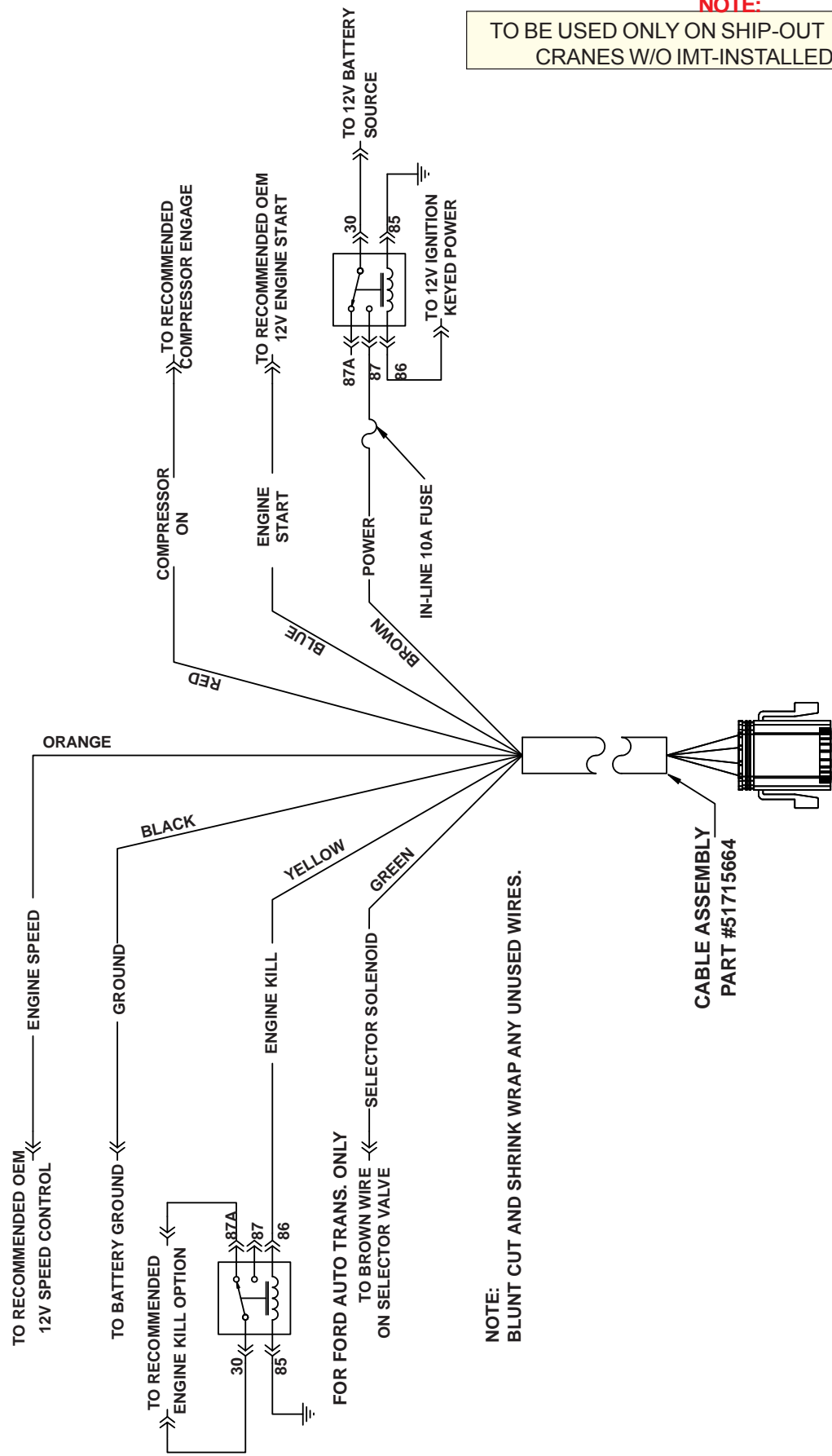
**CORD REEL ASM (51713168)**

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



NOTE:

TO BE USED ONLY ON SHIP-OUT TELESCOPIC  
CRANES W/O IMT-INSTALLED BODIES.





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

[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		



## 4

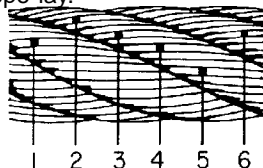
[illegible]

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

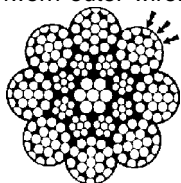
**WIRE ROPE INSPECTION**

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

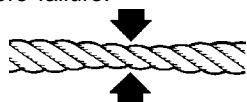
- A. Corrosion can be cause for replacement. Any development of corrosion must be noted and monitored closely.
- B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



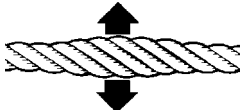
- C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



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



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



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



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



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

**HOOK INSPECTION**

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

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

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

**Increased Throat Opening**

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

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

**B. WEAR**

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

**C. CRACKS, NICKS, GOUGES**

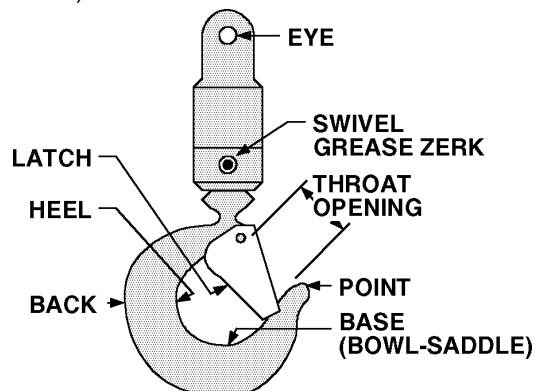
Repair of cracks, nicks, and gouges shall be carried out by a designated person by grinding longitudinally, following the contour of the hook, provided that no dimension is reduced more than 10% of its original value. (Or as recommended by the manufacturer) (A qualified person may authorize continued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

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

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

**E. HOOK ATTACHMENTS & SECURING MEANS**

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



**HOLDING VALVE INSPECTION**

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

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

**ANTI-TWO BLOCKING DEVICE INSPECTION**

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

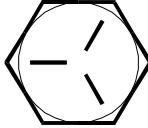

The anti two block system should be checked daily as follows:

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

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

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

**COARSE THREAD BOLTS**

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

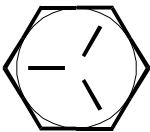
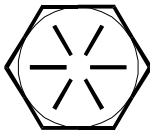
**WARNING**

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.

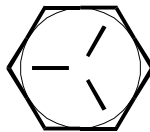
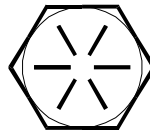


# TORQUE DATA CHART - DOMESTIC

## FINE THREAD BOLTS

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

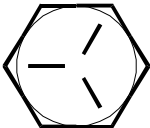

1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special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

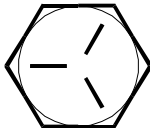
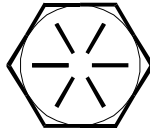
Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing. 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.

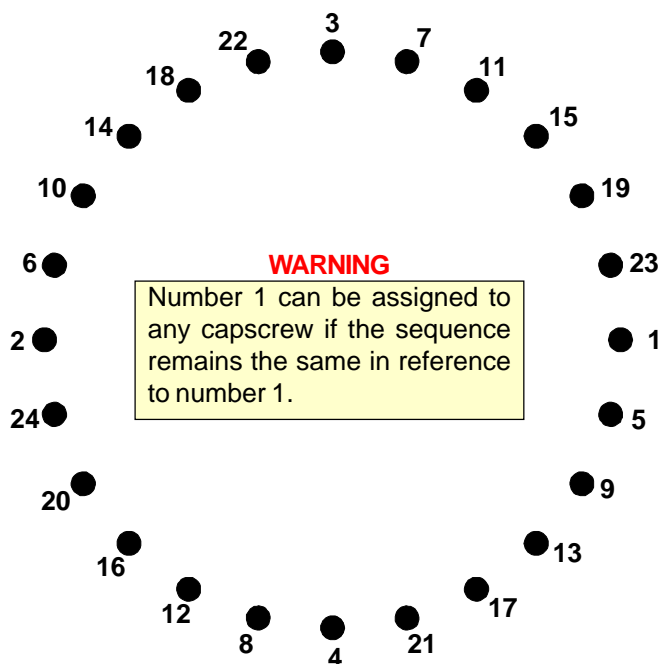
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in kilogram-meters.
4. Torque values specified are for bolts with residual oils or no special lubricants applied.  
If special lubricants 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.

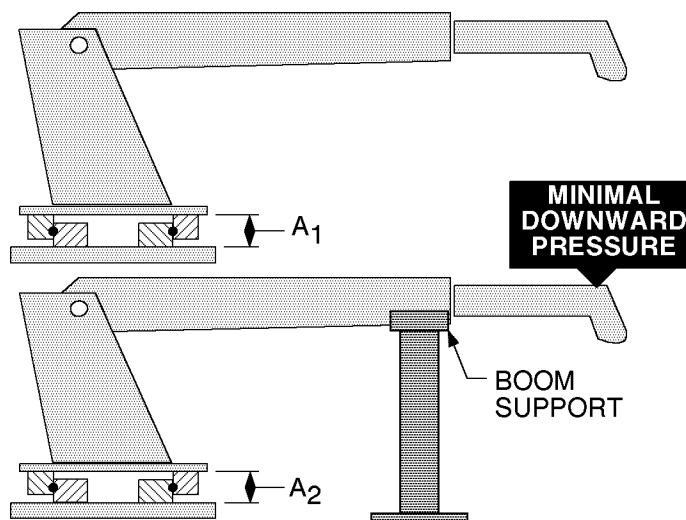
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing (A1), using a dial indicator for accuracy.

### STEP 2.

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

### STEP 3.

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



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

<div><b>NOTE</b></div> <div>THE FIGURES LISTED IN THIS CHART ARE SERVICE GUIDELINES AND DO NOT, IN THEMSELVES, REQUIRE THAT THE BEARING BE INSPECTED.</div> <div>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.</div>	<div>IMT CRANE, LOADER OR TIREHAND MODEL</div>	1007 1014 1014A 1015 2015/2020 2109 3000 3816/3820 3016/3020 421/425 4300 5016/5020 6016/6020 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
	<div>BALL DIA. (REF)</div>	.875" (22mm)	1.00" (25mm)	1.18"-1.25" (30-32mm)	1.75" (44mm)
	<div>TILT DIM. (A<sub>1</sub>-A<sub>2</sub>)</div>	.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

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.**  
BOX 189, GARNER, IA 50438-0189  
TEL: 641-923-3711  
TECHNICAL SUPPORT FAX: 641-923-2424  
[www.imt.com](http://www.imt.com)