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LIFTMOORE MODEL 3660XP CRANES

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* Continuous Rotation Models Only

LIFTMOORE TRUCK CRANES

11505 TODD ROAD
HOUSTON, TEXAS 77080
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533

CRANE SAFETY RULES

CAUTION!

1. READ AND UNDERSTAND OPERATOR'S MANUAL.

2. INSPECT VEHICLE AND CRANE INCLUDING ITS OPERATION BEFORE DAILY USE.

3. USE THIS EQUIPMENT ONLY ON SOLID LEVEL GROUND WITH OUTRIGGERS OR JACKSTAND PROPERLY SET.

4. BEFORE OPERATING THE CRANE REFER TO MAXIMUM LOAD CHART ON CRANE FOR OPERATING LOAD LIMITS.

5. BE SURE LOADS BEING LIFTED ARE WITHIN SAFE WINCH CAPACITY AS WELL AS SAFE CRANE CAPACITY. MULTI-PART WIRELINE OPERATION IS REQUIRED WHEN SINGLE LINE LOAD CAPACITY OF WINCH IS EXCEEDED.

6. DO NOT OPERATE, WALK OR STAND UNDER THE BOOM OR ANY SUSPENDED LOAD.

7. ALWAYS PAY OUT LOAD LINE BEFORE EXTENDING BOOM. WIRE ROPE DAMAGE AND / OR BREAKAGE MAY OCCUR.

8. BOOM MUST BE IN ITS REST BEFORE MOVING VEHICLE.

9. BOOM TIP MUST BE DIRECTLY OVER LOAD BEFORE ANY LIFTING IS STARTED. DO NOT DRAG LOADS WITH THIS CRANE.

10. MAINTAIN THIS CRANE AS REQUIRED IN THE OWNER'S MANUAL.

11. DO NOT ALLOW PERSONNEL TO RIDE ON THE LOAD LINE, LOAD OR BOOM OF THIS CRANE.

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IMPORTANT OPERATOR INFORMATION!
READ AND UNDERSTAND BEFORE USING YOUR LIFTMOORE CRANE

Before each use visually check the crane that all components are correctly aligned and not damaged. Check that all bolts are secured and tight. Check the boom and side plates for evidence of damage, cracking or bending caused by excessive loads. Any missing or damaged parts must be replaced before use.

Inspect the winch wire rope for kinked or frayed wires. The cable strength is reduced when the wire is damaged. Also, check that the thimble end of the wire is holding properly. Replace the wire rope if it is damaged.

NOTE: These cranes are governed by OSHA specification numbered 29 CFR 1910.180. This standard requires initial, daily, monthly and annual inspection by the owner of the unit. An example of an inspection report is included with this manual. Contact Liftmoore if further information is needed.

These cranes are used for lifting heavy objects. The operator must be careful to reduce the risk of accidents. No one should ever be under a suspended load. All or part of the load could fall resulting in serious injury or worse.

It is recommended that a new operator first try the crane on some light loads rather than heavy loads - getting familiar not only with the controls, but with the tilt caused on the vehicle on which the crane is mounted.

Care must be used when maneuvering loads into and out of the vehicle. Do not raise loads higher than is needed to get them into and out of the vehicle.

This crane is a lifting device only. It is not to be used to pull loads across the ground either with the winch or the rotation gears. Loads from the side of any kind should never be applied as damage may result. This damage may not be apparent until the crane is used at a later date.

Any objects that are lifted must be free of all constraints. That is, the load must be disconnected from whatever it may be mounted or bolted on. Pulling against an object that is not free can result in damage either because of an overload condition or when the load breaks loose. If posts are pulled with the crane a support must be placed under the boom tip. When this is done the load sensor will not work.

PERSONNEL: These cranes are not designed to and should not be used to lift or move people. If you need to move people you must use a device that is designed with the safety factor required for this purpose.

Stay clear of the load at all times. Serious injury can result from either all or part of the load falling.

ELECTRICAL WARNING: These cranes are not insulated against contact with overhead electrical wires. Contact with these wires will result in electrical shock to anyone in contact with the vehicle, crane or any attachments. Be aware of and avoid contact with overhead electrical wires at all times.

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CRANE OPERATION
MODEL 2550XP, 3660XP AND 5080XP

Always set the jackstand and/or outrigger before using the crane. The outrigger will keep the truck as level as possible. This reduces the stress on the crane's rotation mechanism. Additionally, using an outrigger keeps the crane load off the truck's springs, spring hangers, axles, wheels, lug bolts and tires.

The crane rating may be derated over some areas of its operating radius because of stability with the truck mounting. Refer to the rating chart on the crane before lifting loads to determine its capacity in the areas where it is derated.

This crane has powered functions as follows:

Power Hoist Winch
Power Boom Elevation -5 to +75 degrees
Power Boom Extension from 10 to 16 feet
Power Rotation

These powered functions are controlled by toggle switches located in the pendant control. A trigger switch in the pendant's handle allows accurate speed control for each function.

Rotation is continuous on the models that do not have engine controls in the pendant. Models with engine controls have the rotation limited to approximately 400 degrees.

A Load Sensor switch is located in the base end of the cylinder. The switch will discontinue operation of winch up, boom extend, and boom down functions whenever an overload is detected.

An Anti Two-Block device is provided to discontinue operation of winch up, boom extend, and boom down functions before the wire line is stretched and broken.

Do not disconnect these safety devices. They are necessary to prevent damage to the crane and possible injury to the operator.

HYDRAULIC OPERATION: See the Hydraulic Operation section later in this manual.

ELECTRICAL OPERATION: See the Electrical Operation section later in this manual.

PENDANT CONTROL: A remote pendant is supplied to control the crane's functions through momentary contact toggle switches. There is an on-off switch in the center of the control. There is one switch for directional control of each function. A trigger switch in the pendant's handle controls the fluid flow rate to each function. This allows accurate speed control for each function.

The pendant control plugs into a socket located on the crane's housing. Use care when inserting the plug that all socket pins are straight and check that the plug and socket are clean and free from corrosion. Twist the locking ring approximately 1/3-turn until it snaps into the locked position. This will insure good electrical contact.

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CRANE OPERATION, Cont.

To operate the crane's functions first move the toggle switch that controls the function you want to operate. Next, gradually open the proportional valve (the "trigger" on the handle). Caution should be exercised when opening the proportional valve. The function can accelerate rapidly if the proportional valve is opened first. Depressing the proportional trigger first will send full fluid flow to the function when the directional control switch is activated. This can cause uncontrolled rapid movement of the crane. Always select the directional control first then depress the trigger. Release the proportional trigger before releasing the directional control switch to stop movement.

Do not operate the function any faster than necessary. Be especially cautious when rotating loads to prevent swinging of the load. Always maintain control of the load.

When the crane is not in use the pendant control must be removed and stored in the truck. Keep the control out of the weather. Condensation can form inside the control box if left outside. Do not coil the control wire too tightly as the internal wires can break. Do not store heavy or sharp objects on the wire as it can be broken or cut by such objects. Take good care of the pendant, as it is expensive to replace.

Some units include engine controls in the pendant. The engine high speed, start and auxiliary switches will be on the face of the pendant box.

DISCONNECT SWITCH: A toggle switch quick disconnect is provided. This switch will disconnect the crane from the vehicle's batteries. This switch should be turned off whenever the crane is not in use to prevent unauthorized use or inadvertent operation of the crane.

WINCH: The worm gear winch is driven by a hydraulic motor. The winch includes an automatic brake that is designed to hold loads from falling. Duty cycle of the winch is limited by the heat buildup in the lubricating oil. Lifting loads with the winch should be limited to 200 Ft. maximum before allowing the oil to cool.

Always wind the wire rope over the top of the drum. The wire rope can be accidentally reversed by running the wire rope all the way out and then winding it under the bottom side of the drum. Underwinding the cable is a dangerous situation as the cable can be broken by pulling it over the boom mounting angles.

Keep a minimum of five wraps of wire rope on the winch drum at all times. With fewer wraps the wire rope could break loose from the drum under load.

The winch can be used single line for loads of less than one half the maximum rated load of the crane. For higher loads a traveling block is included for two-part use.

TRAVELING BLOCK: The traveling block should be used for single and two-part operation. A clevis pin is included to hook the cable to the block for single part operation or to the boom tip crown plate for two-part operation. Remove the hook from the traveling block to change from single to two-part operation. When using two-part operation, the wire rope runs between the hook and the sheave. The divider that is welded between the block's side plates should always be at the top of the block.

Always keep the traveling block on the end of the wire rope as its weight will keep tension on the rope and lessen the chance of tangling the rope on the winch drum. Also, the block will not be lost or misplaced if it is kept on the wire rope.

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CRANE OPERATION, Cont.

WIRE ROPE: This crane is equipped with 5/16" galvanized aircraft cable. Keep the cable straight and tight as it winds onto the winch drum. For long life do not wrap the wire rope around any loads. Use a chain or nylon sling to reduce damage to the cable. Whenever the cable is kinked or frayed it must be replaced as its strength is reduced. Care must be taken to keep the cable in good repair.

Keep a minimum of five wraps of wire rope on the winch drum at all times. With fewer wraps the wire rope can break loose from the drum clamp mechanism when loaded.

BOOM: Keep the boom as upright as possible. Operating the crane with the boom elevated is easier on the boom and causes less tilt on the truck.

The telescoping boom is extended by a hydraulic cylinder from 10 Ft. to 16 Ft. It can be extended and retracted while loaded. Remember that the load capacity decreases as the load radius increases. On models with 20-Ft. long booms a 4-Ft. manual pullout section is included. The manual section has an additional position at its midpoint. Never use the crane unless the hitch pin for this section is properly inserted with its hairpin keeper in place.

LOAD SENSOR: The load sensor acts to stop the lifting functions when the crane is overloaded. The sensor is a pressure switch located on the base end of the boom elevation cylinder. When an overload is detected (by a pressure increase above a predetermined value) the switch will open. Winch up, boom extend and boom down will not function under this condition. The pressure switch will reset after the load is removed by lowering it. This can be done by setting the load down with the winch or the extension cylinder. The pressure switch will then reset. Rotation is not stopped by the load sensor so the crane can be rotated if necessary before lowering the load. Note: the boom up function is limited by the system relief valve pressure setting (2750 psi).

The load sensor will not function when the elevation cylinder is fully retracted. At this point the rod is against the cylinder base and no hydraulic pressure is generated for the sensor to monitor. For positions below zero degree boom angle the load sensor is not accurate and may shut down before reaching the crane's full capacity.

ANTI-TWO BLOCK: An Anti Two-Block protection device is included with this crane. The Anti Two-Block will disable the winch up, boom extend, and boom down functions whenever the traveling block lifts the attached weight through which the wire rope travels. This will prevent contact between the boom tip and the traveling block when operating any of these functions. If the boom tip contacts the traveling block it is possible for the wire rope to be stretched and/or broken. The load will then fall with potentially catastrophic results.

LOAD CHART: Consult the load chart on the side of the crane for capacities at various load radii. NEVER exceed the rated load at a particular load radius.

BOOM ANGLE INDICATOR: This indicator is the pointer located on the side of the boom. As the boom angle changes be certain that the pointer hangs vertically. By knowing the boom length the pointer will indicate the maximum load that can be lifted at this boom angle. Do not exceed this load at any time.

LIFTING CAPACITIES: This crane's moment rating and lifting capacity at various load radii are listed on the following page.

LABELS: Read and understand the yellow caution label on the crane. Also, read and understand all other labels shown on the crane.

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CRANE LIFTING CAPACITIES
MODEL 3660XP

MOMENT RATING: 36,000 Ft.-Lbs.

LIFTING CAPACITIES: Capacities at various load radii are as follows:

LOAD RADIUS - FT.	CAPACITY - LBS.
6	6000
8	4500
10	3600
12	3000
14	2571
16	2250
18	2000
20	1800

NOTE: Wire rope rigging requirements are as follows:

Below 3000 Lbs.	-	Single Line
3000 to 6000 Lbs.	-	Two-part Line

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HYDRAULIC OPERATING SYSTEM DESCRIPTION
MODEL 2550XP, 3660XP AND 5080XP

This crane uses a proportional control system that gives the operator control of the hydraulic flow rate to each crane function. This allows accurate speed control for each function operation.

A series type circuit is used so that two functions can be operated at the same time. When operating more than one function, the crane will not function if the total pressure requirement is greater than the relief setting.

Pressure compensated flow control is incorporated in this system. A pilot operated differential pressure sensing valve diverts 100% of the input flow to the reservoir when no function is being operated. When a function is operated, this flow control valve supplies the required flow to the function as controlled by the proportional valve. The excess flow is returned to the tank. The overall pressure requirement is not significantly greater than the pressure required by the function.

For example, if 6 GPM is supplied to the crane and the crane is being rotated, 2.5 GPM is going to the swing motor and 3.5 GPM is going back to the reservoir at the pressure required to swing the crane plus valve spring and line losses. This system results in the least possible pressure drop and heat build up when using a constant flow pump.

Pump flow to the crane should not exceed 6 gallons per minute. Higher flows will result in excessive heat buildup and premature failure of the hydraulic seals.

Control of each operation is through a 4-Way/3-position 12 VDC solenoid valve. The valves are open-centered, with each function being dumped to the reservoir when not being used.

Manual override controls are provided on each valve (Ref. Dwg. 50462). To run the crane manually, push the override button for the function you wish to operate, then depress the override button on the proportional valve. Operate only one function at a time until the crane is secured.

On continuous rotation models, a hydraulic swivel is located under the crane and all oil flow is through this swivel. An electrical swivel is also mounted under the crane to supply the 12 VDC current requirements of the valves. These two swivels allow the crane to be rotated continuously without limit.

On limited rotation models two pressure relief valves limit the maximum pressure to the rotation motor.

The elevation and extension cylinders have integrally mounted counterbalance valves. These valves have three purposes. The valve acts as a check valve and will block flow in the cylinder holding the cylinder in position until powered down; the valve is a relief valve that will retract if the crane is overloaded by a load applied on the boom; and the valve limits the rate of descent to the flow rate into the cylinder. The valves are opened by pilot pressure when the cylinder is retracted. There is also a pilot operated check valve in the extension cylinder. This valve prevents the cylinder from creeping out when there is no load on the crane.

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ELECTRICAL OPERATING SYSTEM DESCRIPTION
MODEL 2550XP, 3660XP AND 5080XP

PENDANT CONTROL: All crane functions are controlled by the remote pendant control. It has momentary contact toggle switches controlling the directional functions and a "trigger" switch that controls the hydraulic flow rate to the crane functions.

PROPORTIONAL CIRCUIT: The hydraulic flow rate is regulated by a proportional valve that is operated by a circuit board. This board is located in the rain tight box on the left side plate of the crane housing. The board works in conjunction with the "trigger" switch in the remote pendant control. Flow rate to the directional functions varies as the trigger is squeezed or released. When operating the crane always open a directional control valve with the toggle switch before squeezing the trigger switch.

A procedure for troubleshooting the proportional system is included later in this manual.

SOLID-STATE RELAY BOARD: A relay circuit board is mounted in the rain tight box with the proportional circuit board. This board controls the winch up, boom down and boom extend functions, based on input from the load sensor and anti two-block devices. An LED light on the board will light whenever one of the three functions is actuated. For proper crane operation the relay board must receive a positive signal from the load sensor and anti two-block switches.

LOAD SENSOR: The load sensor is a pressure switch located at the base end of the boom elevation cylinder. There is also an up-limit switch that stops the boom up before fluid pressure builds in the base end and opens the pressure switch. When the switch opens, the electrical circuit to the winch up, boom down and boom extend out coils is interrupted and these operations will stop.

An up limit switch is mounted on the top inside of the crane housing. This switch stops boom up before the cylinder "dead heads". This would cause an increase in the cylinder pressure tripping the load sensor. The crane would then need to be lowered using the manual over ride on the boom down valve.

ANTI TWO-BLOCK: The Anti Two-Block device is a switch located at the boom tip. It is a normally open switch that is held closed. When the weight is lifted the switch opens and interrupts the winch up, boom down and boom extend out circuits.

CIRCUIT PROTECTION: During installation a fuse is mounted near the battery to protect against short circuits. A toggle switch is mounted under the crane that will disconnect the crane from the battery. This will add to the component life, as all power will be disconnected when the crane is not in service.

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CRANE MAINTENANCE
MODEL 2550XP, 3660XP AND 5080XP

Inspect the crane for signs of damage or wear. The cable should be checked for kinked or frayed wire. Cable strength is reduced if these conditions are present and it must be replaced.

Visually inspect that all bolts are in place and tight. As these units are mounted to vehicles, vibration can result in loosening these fasteners. The mounting bolts should be checked at least every 4 months and retightened. Maximum recommended torque for the 1" Grade 8 bolts on the 5080XP is 900 Ft.-Lbs. For the 7/8 In. Grade 8 bolts on the 3660XP & 2550XP it is 600 Ft.-Lbs.

The winch gearbox is lubricated with Sunep 460 gear oil at the factory. This is an ISO grade 460 or AGMA grade 7EP oil. The rotation gearbox is filled with Sunoco Prestige 740 EP grease. This is NLGI grade 0 grease. Check these levels monthly and refill as necessary.

Lubricate the grease fittings as shown on drawing 50048 at least every other week.

The rotation gear bearing is a critical component of the crane and must be correctly maintained. Failure to keep this bearing greased can result in catastrophic failure and expensive repair cost. Follow these guidelines carefully:

1. The bearing bolts should be checked every 4 months and retightened to 176 Ft.-Lbs. torque.

2. Lubricate the bearing after every 6 hours of operation. Rotate the bearing through two rotations during the lubrication process to fill cavities around each ball bearing.

3. Lubricate the gear teeth every 6 hours of operation.

Lubricate the bearing and the gear teeth with NLGI Grade 2 grease (ex. Oil Center Research PM600 military grease).

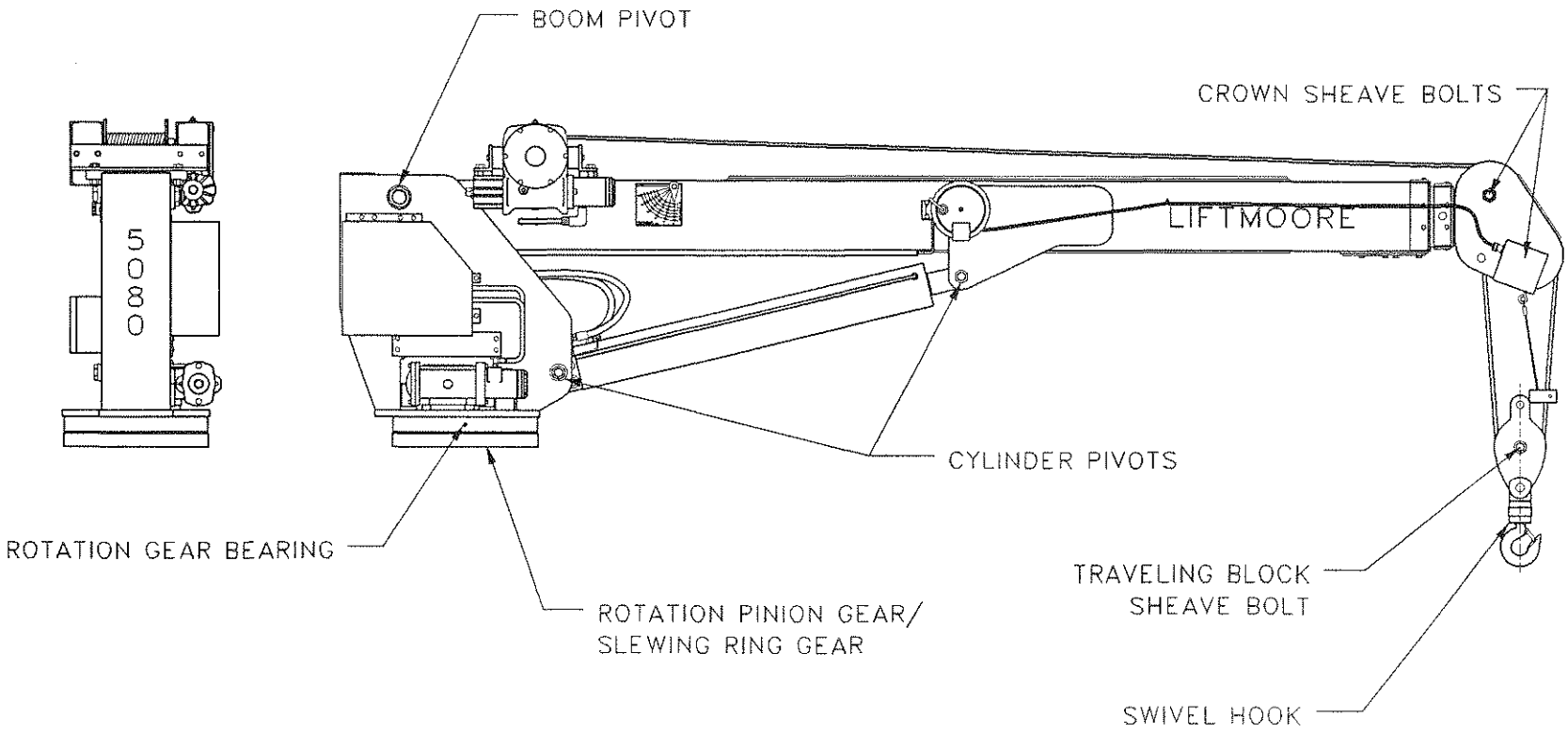
If the crane has been stored for a long period of time, the gear bearing should be lubricated before putting it back into service.

The winch brake is set when received. If the winch line is drifting down under load because of wear, the brake must be reset (Ref. Dwg. 50231). Loosen the locknut (Item 9) while keeping screw (Item 8) from turning. Tighten the screw (Item 8) 1/4 turn and check for drift. If it still drifts tighten in 1/4-turn increments until it holds. If it does not hold, the stator plates and friction discs or spring may need replacement. Do not overtighten, as overheating and premature wear of the brake parts will occur. Retighten the locknut (Item 9) when done.

The power extendible boom section is coated with "Slip Plate" manufactured by Superior Graphite Company. It should be re-coated periodically.

We use a hydraulic oil equivalent to Chevron AW Hydraulic Oil 46, an SAE 15 weight. For colder climates use AW 32, an SAE 10 weight hydraulic oil. Keep the system reservoir as full as possible to reduce the natural condensation of water that will occur.

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- FOR ALL GREASE ZERKS AND ON ROTATION PINION GEAR/ SLEWING RING GEAR FACES, USE NLGI GRADE 2 GREASE (eg. OIL CENTER RESEARCH PM600 MILITARY GREASE).
- RE-LUBRICATE THESE POINTS AFTER EVERY 6 HOURS OF RUN TIME.

REVISIONS		
NO.	DATE	BY
A	07-21-99	SGB
B		
C		
D		
E		

LIFTMOORE, INC

CRANE LUBRICATION POINTS: 25K – 50K

DRAWN BY MEC	SCALE 1/20	MATERIAL
CHK'D	DATE 2-17-94	DRAWING NO. 50048

MONTHLY INSPECTION REPORT
MODEL 2550XP, 3660XP AND 5080XP

Crane Model No._____ **Serial Number**_____

Are Boom Hitch Pins and Keepers in place?	Yes_____	No_____
Wire Line Hook with Safety Latch Working?	Yes_____	No_____
Is Hook OK, (Not bent)?	Yes_____	No_____
Is Thimble on Wire Rope OK?	Yes_____	No_____
Is Traveling Block in use?	Yes_____	No_____
Is Wire Rope OK, not kinked or frayed?	Yes_____	No_____
Are all Boom Sections straight?	Yes_____	No_____
Are Sheave Bolts in place and tight?	Yes_____	No_____
Do all Sheaves rotate easily?	Yes_____	No_____
Are Mounting Bolts tight?	Yes_____	No_____
Is Anti Two-Block functioning properly?	Yes_____	No_____
Is Boom Angle Indicator in place and functioning and is Chart legible?	Yes_____	No_____
Are Cylinder Mounting Bolts secure?	Yes_____	No_____
Are Winch Mounting Bolts tight?	Yes_____	No_____
When stopped does winch drift less than 1.0 Inches?	Yes_____	No_____
Is Load Chart in place and easily read?	Yes_____	No_____
Are functions on Pendant operating correctly?	Yes_____	No_____
Is Hydraulic Reservoir full?	Yes_____	No_____
Is Outrigger straight and functioning?	Yes_____	No_____

Any items checked 'No' must be repaired before using this crane.

Inspected By_____ **Date**_____

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Troubleshooting Procedure

Hydraulic Crane with Proportional Control (XP Models)
KT Control with 14-Pin Quick-Disconnect Plug
(Beginning S.N. M3012)

This procedure should be used to identify problems with the crane proportional control system. It will help to determine if the problem is with the Control Pendant, the Valve Driver Board, the Proportional Valve, or some other part of the crane system.

Table 1 indicates the expected time that should be required for operation of crane functions for the different model XP cranes. This information is for cranes operating at the specified 6 GPM maximum hydraulic flow input, with the control trigger fully depressed. For lower flow rates the times may be higher than those shown here.

> **Note**: Whenever operating a function, check that there is proper clearance for the crane's boom. Take care not to run the crane boom into any objects.

Table 1. Expected Time for Function Operation for various crane models

	Expected Time for Function Operation (sec.)						
Crane	Hoist*		Extend		Elevate		Rotate
Model	Up	Down	Out	In	Up	Down	90 Deg.
2550XP	15	16	22	17	18	14	12
3660XP	17	18	26	18	19	15	12
5080XP	20	21	26	18	23	19	12

* Hoist Speed: Times given are for three complete rotations of the winch drum

I. Identify the Problem:

1. **Some functions not operating** – If some functions are operating properly but some are not operating at all, it is possible that the coil wiring for the particular functions is faulty. Check the wiring to each of the non-functioning valve coils to make certain that the coil is receiving power when the pendant switch is activated. The resistance of the non-functioning coils can also be checked with an ohmmeter to determine if they have the correct resistance of about 5.5Ω.
   > ***Note:*** *If the functions that are not operating are the Hoist Up, Elevate Down and Extend Out, the problem is not the proportional circuit but the crane safety circuit. Check your Load Sensor and ATB devices.*
2. **No functions operating** – Check that the crane is receiving power (12 VDC). There is a hot wire coming into the crane that is connected to a fuse link. Make sure that the fuse is not blown. If the fuse is OK, proceed to Section II.
3. **All functions operating slowly** – This is likely due to a problem with either the Pendant Control Trigger mechanism, or with the Valve Driver Board. Proceed to Section II.
   > ***Note:*** *If the crane has just been installed and has never operated at the proper speeds, the problem could be that the crane is not receiving the proper hydraulic flow. Check the crane is receiving 6 GPM flow rate at 2750 psi.*

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II. Troubleshooting Procedures:

Manual Crane Operation: (Ref. Fig. 1) The crane can be operated manually using the manual override buttons on the valves, while hydraulic power is being supplied to the crane. To operate a function, depress the button on the directional control valve for the function you wish to operate, and then depress the button on the proportional valve. The directional control valve controls the function direction, while the proportional valve controls the flow rate (speed). If the crane works OK using the manual overrides, the problem is in the electrical circuit.

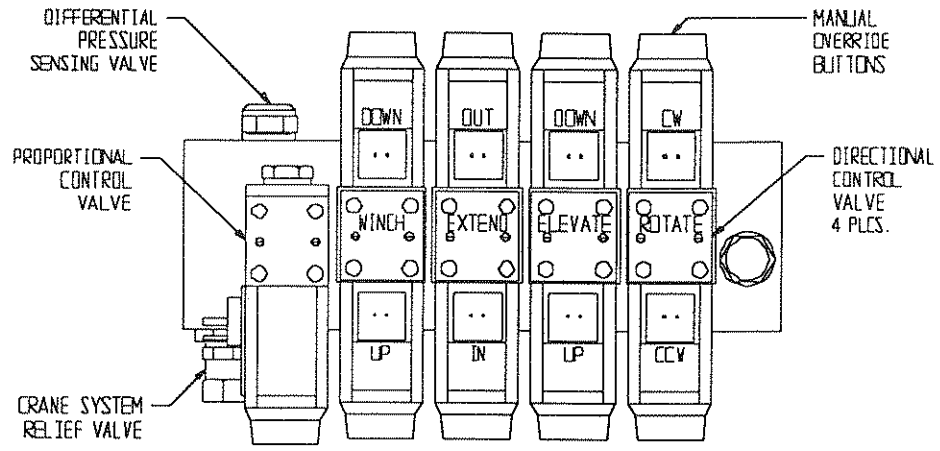


Fig. 1. Proportional Manifold assembly showing various components

Checking the Proportional Valve: Attempt to run a crane function by shifting a toggle switch on the remote pendant and depressing the proportional valve's manual override. If the crane operates, the proportional valve should be checked as described below:

1. Check the resistance of the proportional Valve coil. Disconnect one wire from the circuit and measure the resistance across the coil. This reading should be approximately 8.0Ω.

2. Turn on power to the crane and connect a voltmeter across the valve (in parallel with the coil). Make sure the engine is running to develop enough voltage. 12.8 VDC is required.

3. Shift the toggle switch for one of the crane functions and operate the trigger. With the trigger only slightly depressed the voltmeter should read 4.8 volts. This is the minimum voltage required to shift the valve spool. At this point a small percentage of available flow is being supplied to the function and it will begin operation. Next depress the trigger completely. The voltmeter should read at least 11.8 volts (With the engine running the maximum voltage can be as high as the alternator output but it must be at least 11.8 volts). This should supply 100 percent of available flow, causing the function to operate at its maximum speed. If no voltage is found, the problem is possibly in the pendant trigger and it should be checked as detailed below.

Checking the Pendant Trigger: Remove pendant from the crane and place an ohmmeter across the K and B pins on the pendant plug. The resistance should measure between 80 and 150 Ohms with the trigger released and between 1.3KΩ and 1.6KΩ when the trigger is fully depressed. Also, check the resistance between the A and B pins. This value should be between 9KΩ and 11KΩ. If these parameters are not met, trigger needs to be replaced. If the pendant trigger checks OK, the Valve Driver Board settings must be adjusted.

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PHONE: (713) 688-5533

Checking the Valve Driver Board: The Valve Driver Board (Ref. Fig. 2) is located inside the rain tight box on the side of the crane housing. To check the operation of this board, connect a voltmeter across the valve coil as was done previously.

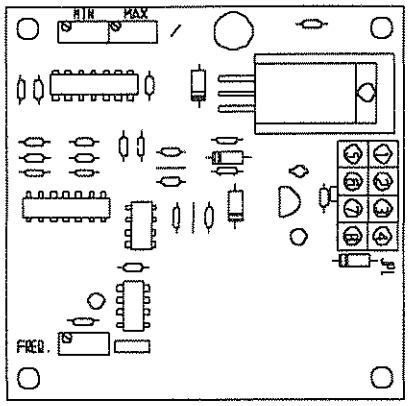


Fig. 2. Proportional Driver Board showing adjustable potentiometers (MIN, MAX & Freq.)

1. This board has three adjustable potentiometers on it (MIN, MAX & frequency). ***Important: Do not change the "frequency" potentiometer.*** The MAX pot should be adjusted to get 11.8 volts with the trigger fully depressed. The MIN pot should be adjusted to get the minimum or threshold voltage of 4.8 volts with the trigger only slightly depressed. Turn the pot clockwise to increase and counter-clockwise to decrease the voltage. After adjusting the pots, a drop of liquid finger nail polish on the adjustment screw will hold their position.

2. If the correct voltages cannot be achieved, one of the settings may be too high. To correct this turn both the MAX and MIN pot screws 22 turns counterclockwise. Then turn the MAX pot five turns clockwise. Set the voltages as detailed in step 1 above.

3. After obtaining the proper voltage readings, the crane should now run at maximum speed as shown in Table 1. Check for maximum speed by operating a function, depressing the pendant trigger completely and then pressing on the proportional valve's manual over ride button. The speed should not increase when the proportional valve is depressed.

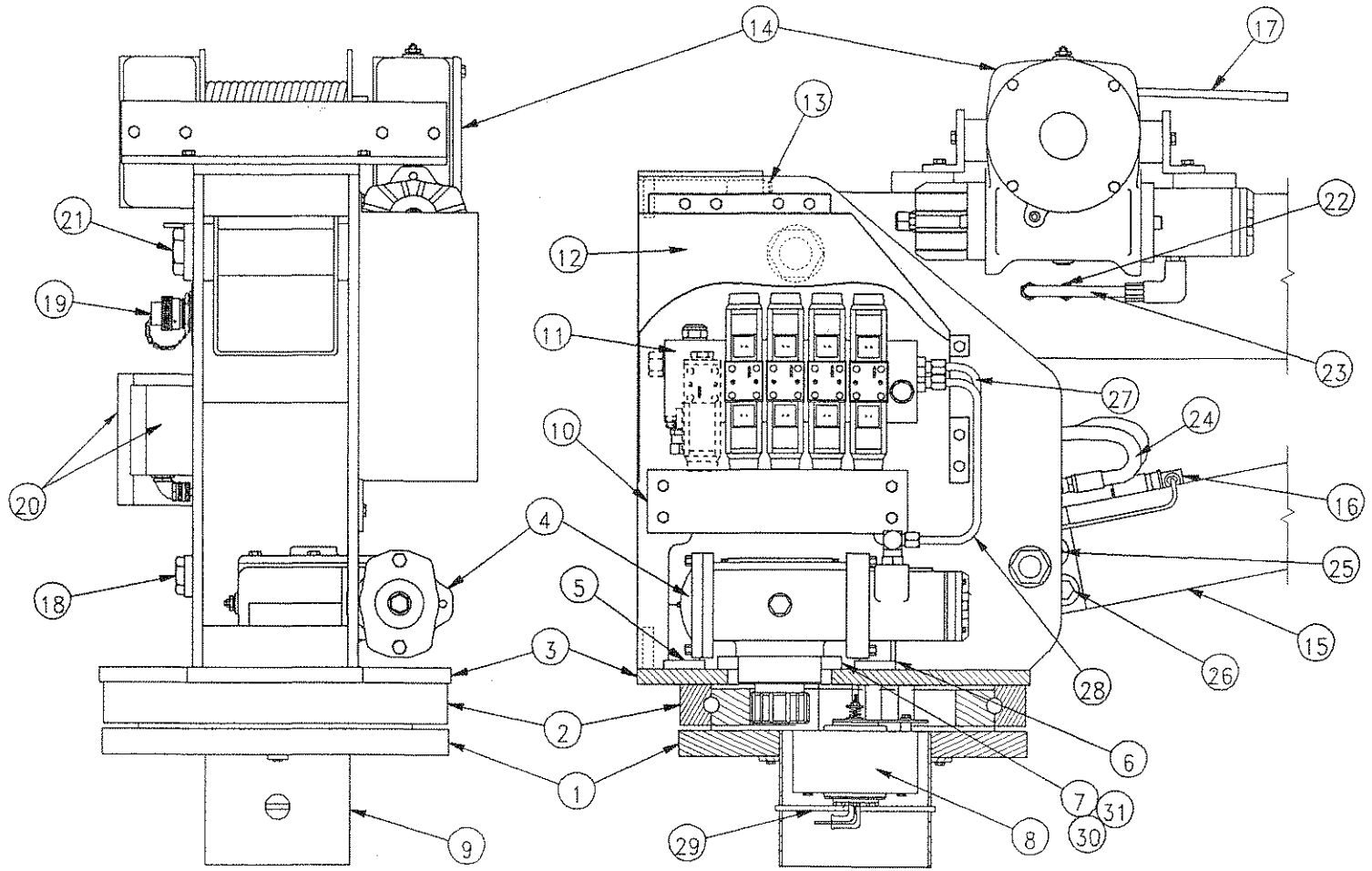
Check the Hydraulic System: If all functions work at their normal speed except those requiring high pressure (extend in and elevate down, when the crane is not loaded), the problem could be that the hydraulic system is not developing sufficient pressure .

1. This can be caused by the Crane System Relief Valve (Ref. Fig. 1) being stuck partially open. Remove the relief valve and check for contamination. Clean or replace as necessary and then check the crane operation. If this does not solve the problem proceed to the next step.

2. Install a pressure gauge at the pump output and check for adequate pressure. In order to check this, deadhead a cylinder (operate the *extend in* function or the *elevate down* function until the cylinder is fully retracted). The system should develop approximately 2750 psi under this condition. If the system is not developing this pressure, check the adjustment of the main system relief valve (external to the crane).

3. Should all the above check out, the Differential Pressure Sensing Valve (Ref. Fig. 1) should be checked for proper functioning. Remove it and check that it is not stuck and that the pilot port is not plugged, as this will prevent the valve from closing to allow adequate flow to the crane functions.

11505 TODD ROAD
HOUSTON, TEXAS 77080
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533



USE FORM 991

REVISIONS		
NO.	DATE	BY
A	9-17-99	LEM
B		
C		
D		
E		

LIFTMOORE, INC

CRANE ASSEMBLY 3660X/XP
CONTINUOUS ROTATION

DRAWN BY DV	SCALE 1/8	MATERIAL
CHK'D	DATE 08-11-99	DRAWING NO. 58031

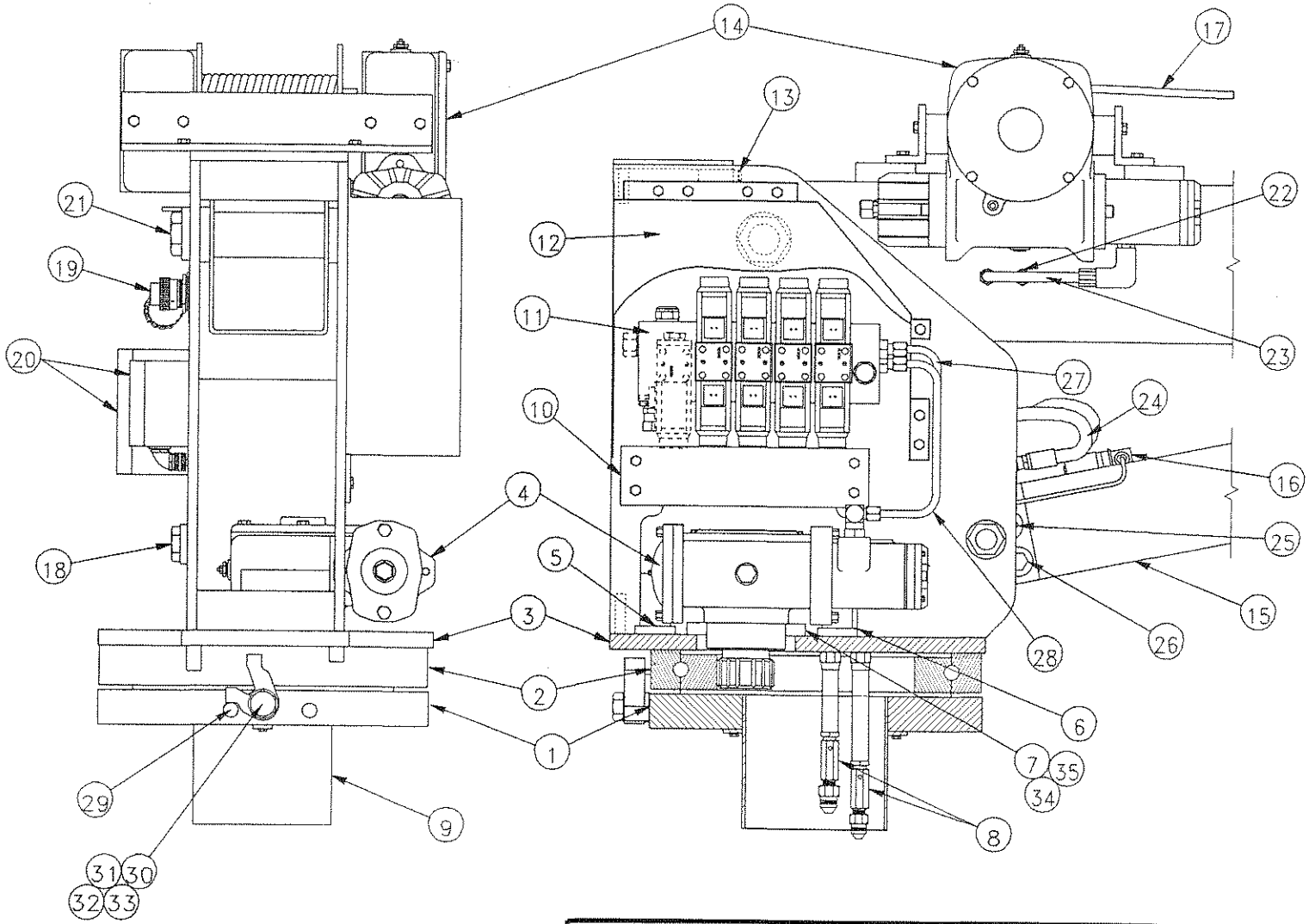
CRANE PARTS LIST
LIFTMOORE, INC. MODEL 3660X/3660XP C.R.
REFER TO DRAWING NO. 58031

ITEM	QUANTITY		PART NO.	DESCRIPTION
	X	XP		
1	1	1	18336	BASE PLATE
2	1	1	30787	GEAR BEARING
3	1	1	33571	HOUSING WELDMENT
4	1	1	31287	SPEED REDUCER (SEE DWG. 31287)
5	1	1	32117	FRONT SPEED REDUCER SPACER
6	1	1	15677	REAR SPEED REDUCER SPACER
7	1	1	31288	ECCENTRIC RING
8	1	1	32099	SWIVEL HYD./ELEC. ASSY (SEE DWG. 32099)
9	1	1	18263	SWIVEL PROTECTOR
10	1	1	31437	SIDE COVER
11	n/a	1	34004	MANIFOLD ASSEMBLY (SEE DWG. 50462)
11	1	n/a	34039	MANIFOLD ASSEMBLY (SEE DWG. 50413)
12	1	1	33467	MANIFOLD COVER
13	1	1	32209	LIMIT SWITCH
14	1	1	32283	WINCH (SEE DWG. 32283)
15	n/a	1	17605	ELEVATION CYLINDER
15	1	n/a	31973	ELEVATION CYLINDER
16	1	1	31498	PRESSURE SWITCH
17	1	1	32384	WIRE ROPE
18	1	1	16994	HEX HEAD CAPSCREW
19	1	1	19013	SOCKET ASSEMBLY 14-PIN/13-WIRE
20	n/a	1	18406	RELAY BOX/PROP. ASSY (SEE DWG. 18406)
20	1	n/a	18343	RELAY BOX ASSY (SEE DWG. 18343)
21	1	1	31294	HEX HEAD CAPSCREW
22	1	1	32774	HYDRAULIC TUBE - WINCH INNER
23	1	1	32773	HYDRAULIC TUBE - WINCH OUTER
24	2	2	31413	HOSE ASSEMBLY
25	1	1	18577	COUNTERBALANCE VALVE CARTRIDGE
26	n/a	1	31591	P.O. CHECK VALVE CARTRIDGE
27	1	1	19041	HYDRAULIC TUBE - ROT. PORT B
28	1	1	19040	HYDRAULIC TUBE - ROT. PORT A
29	1	1	18266	SWIVEL MOUNTING PLATE
30	1	1	17472	O-RING SEAL - OUTER
31	1	1	17473	O-RING SEAL - INNER
*	1	1	31609	BACK COVER
*	n/a	1	18971	PENDANT CONTROL (SEE DWG. 50461)
*	1	n/a	18970	PENDANT CONTROL (SEE DWG. 50457)
*	n/a	1	50418	ELECT. SCHEM. (SEE DWG. 50418)
*	1	n/a	50419	ELECT. SCHEM. (SEE DWG. 50419)
*	n/a	1	50368	HYD. SCHEM. (SEE DWG. 50368)
*	1	n/a	50414	HYD. SCHEM. (SEE DWG. 50414)

(* ITEMS NOT SHOWN ON DRAWING)

LIFTMOORE
TRUCK CRANES

11505 TODD ROAD
HOUSTON, TEXAS 77055
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533



USE FORM 992

REVISIONS		
NO.	DATE	BY
A		
B		
C		
D		
E		

LIFTMOORE, INC

CRANE ASSEMBLY 3660X/XP
LIMITED ROTATION

DRAWN BY DV	SCALE 1/8	MATERIAL
CHK'D	DATE 08-13-99	DRAWING NO. 58032

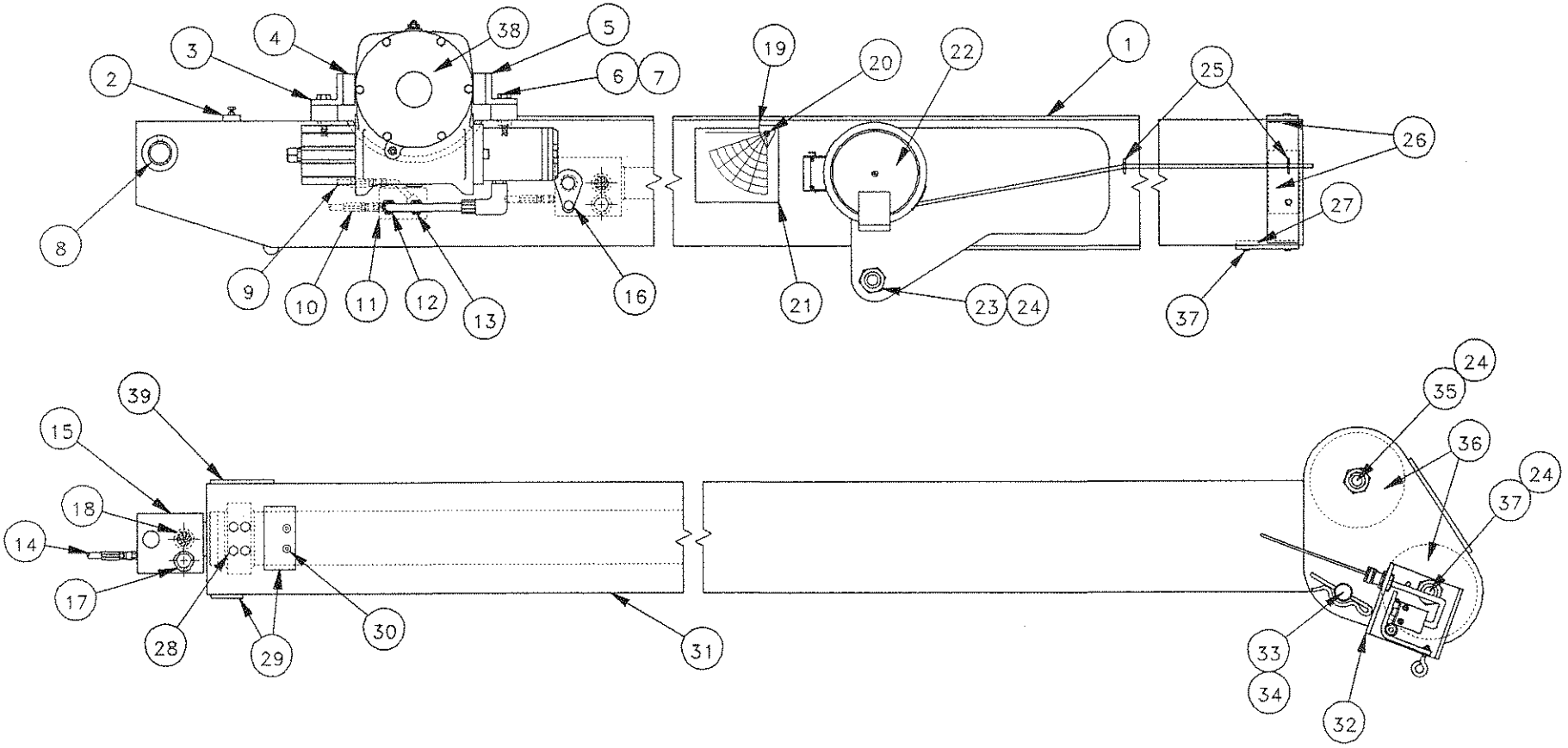
CRANE PARTS LIST
LIFTMOORE, INC. MODEL 3660X/3660XP L.R.
REFER TO DRAWING NO. 58032

ITEM	QUANTITY X	QUANTITY XP	PART NO.	DESCRIPTION
1	1	1	18337	BASE PLATE
2	1	1	30787	GEAR BEARING
3	1	1	33571	HOUSING WELDMENT
4	1	1	31287	SPEED REDUCER (SEE DWG. 31287)
5	1	1	15677	SPEED REDUCER SPACER - REAR
6	1	1	32117	SPEED REDUCER SPACER - FRONT
7	1	1	31288	ECCENTRIC RING
8	1	1	32286	SWIVEL ADAPTER
9	1	1	18263	SWIVEL PROTECTOR
10	1	1	31437	SIDE COVER
11	n/a	1	34290	MANIFOLD ASSEMBLY (SEE DWG. 50462)
11	1	n/a	18358	MANIFOLD ASSEMBLY (SEE DWG. 50413)
12	1	1	33467	MANIFOLD COVER
13	1	1	32209	LIMIT SWITCH
14	1	1	32283	WINCH (SEE DWG. 32283)
15	n/a	1	18301	ELEVATION CYLINDER
15	1	n/a	31585	ELEVATION CYLINDER
16	1	1	31498	PRESSURE SWITCH
17	1	1	32384	WIRE ROPE
18	1	1	16994	HEX HEAD CAPSCREW
19	1	1	19013	SOCKET ASSEMBLY 14-PIN
20	n/a	1	18406	RELAY BOX/PROP. ASSY (SEE DWG. 18406)
20	1	n/a	18343	RELAY BOX ASSY (SEE DWG. 18343)
21	1	1	31294	HEX HEAD CAPSCREW
22	1	1	32774	HYDRAULIC TUBE - WINCH INNER
23	1	1	32773	HYDRAULIC TUBE - WINCH OUTER
24	2	2	31413	HOSE ASSEMBLY
25	1	1	18577	COUNTERBALANCE VALVE CARTRIDGE
26	n/a	1	31591	P.O. CHECK VALVE CARTRIDGE
27	1	1	19041	HYDRAULIC TUBE - ROT. PORT B
28	1	1	19040	HYDRAULIC TUBE - ROT. PORT A
29	2	2	33439	DOWEL PIN
30	1	1	31606	HEX HEAD CAPSCREW
31	1	1	33440	BELLEVILLE SPRING
32	1	1	16448	ROTATION LIMIT LEVER
33	1	1	16955	NYLON SPACER
34	1	1	17472	O-RING SEAL - OUTER
35	1	1	17473	O-RING SEAL - INNER
*	1	1	31609	BACK COVER
*	n/a	1	18971	PENDANT CONTROL (SEE DWG. 50461)
*	1	n/a	18970	PENDANT CONTROL (SEE DWG. 50457)
*	n/a	1	50418	ELECT. SCHEM. (SEE DWG. 50418)
*	1	n/a	50419	ELECT. SCHEM. (SEE DWG. 50419)
*	n/a	1	50368	HYD. SCHEM. (SEE DWG. 50368)
*	1	n/a	50414	HYD. SCHEM. (SEE DWG. 50414)

(* ITEMS NOT SHOWN ON DRAWING)

LIFTMOORE
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FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533



USE FORM 937

REVISIONS		
NO.	DATE	BY
A	3-24-99	JNW
B		
C		
D		
E		

LIFTMOORE, INC

BOOM ASSEMBLY 3660X/XP-16

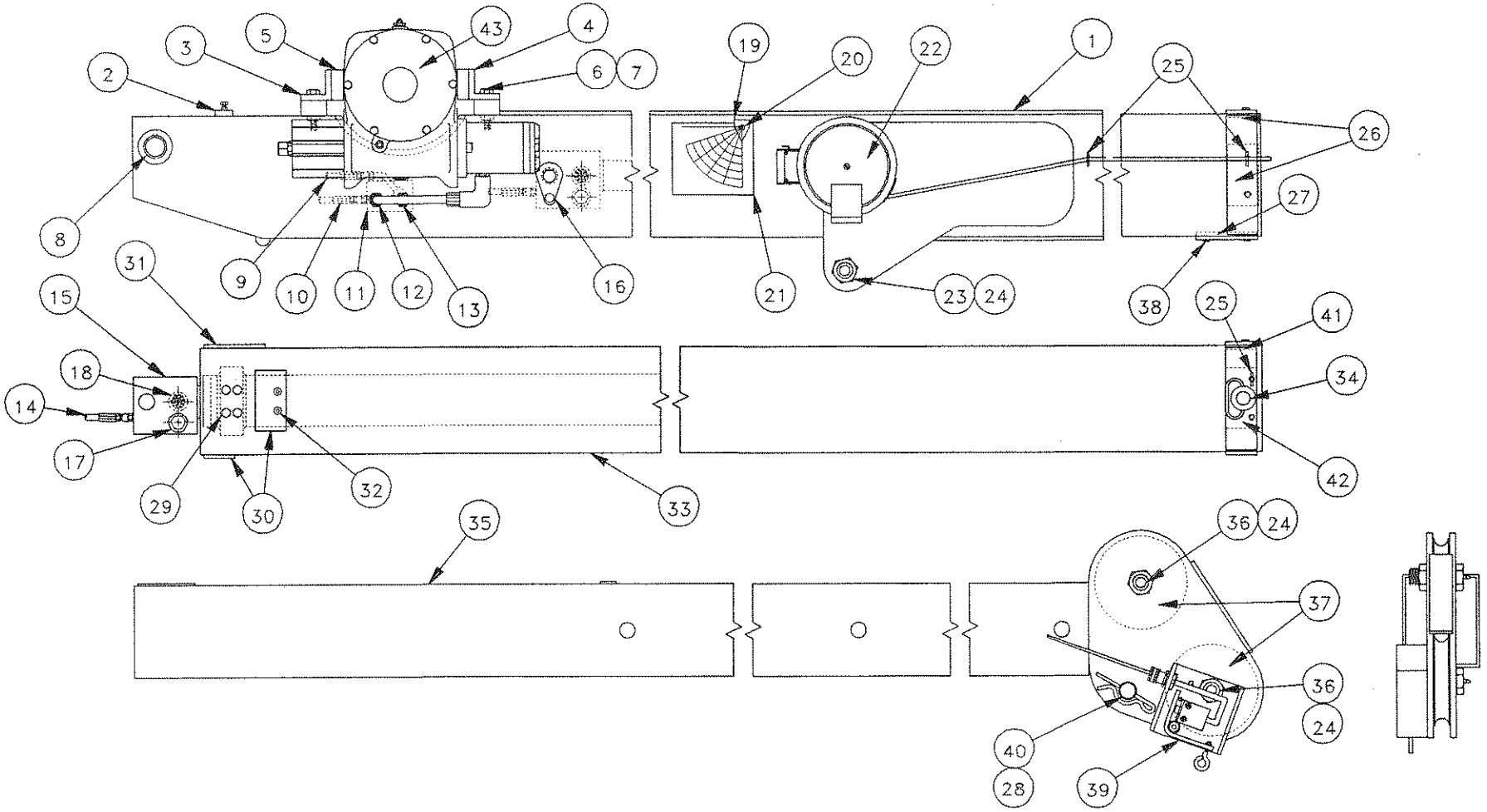
DRAWN BY JNW	SCALE 1/10	MATERIAL
CHK'D	DATE 7-31-98	DRAWING NO. 48034

BOOM PARTS LIST
LIFTMOORE, INC. MODEL 3660X/XP-16
REFER TO DRAWING 48034

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	31719	OUTER BOOM
2	1	18285	LIMIT SWITCH PLATE
3	1	16617	WINCH ANGLE MOUNT - REAR
4	1	16618	WINCH ANGLE MOUNT - FRONT
5	4	16620	WINCH SPACERS
6	4	31100	HEX HEAD CAPSCREW
7	4	34006	NYLOC HEX NUT
8	2	33481	BOOM PIVOT BUSHING
9	1	33567	HOSE ASSEMBLY - WINCH
10	1	33566	HOSE ASSEMBLY - WINCH
11	1	17037	BULKHEAD PLATE ASSEMBLY
12	1	32773	HYDRAULIC WINCH TUBE - OUTER
13	1	32774	HYDRAULIC WINCH TUBE - INNER
14	2	32961	HOSE ASSEMBLY - EXTENSION
15	1	34036	EXTENSION CYLINDER
16	1	33501	EXTENSION CYLINDER PIN
17	1	31591	P.O. CHECK VALVE CARTRIDGE
18	1	30851	COUNTERBALANCE VALVE CARTRIDGE
19	1	31013	PENDULUM
20	1	31017	PENDULUM SCREW
21	1	33450	LOAD CAPACITY DECAL
22	1	31755	ATB CORD REEL ASSY
23	1	30828	HEX HEAD CAPSCREW
24	3	30838	NYLOC HEX NUT
25	2	33367	EYE SCREW
26	3	33951	NYLON PAD (TAPPED)
27	1	33949	NYLON PAD (TAPPED)
28	8	30459	HEX HEAD CAPSCREW
29	3	33952	NYLON PAD (CSUNK)
30	10	33614	SOCKET HEAD SCREW
31	1	34277	INNER BOOM
32	1	18595	ATB ASSY (SEE DWG 50152)
33	1	32658	CLEVIS PIN
34	1	31947	HAIRPIN COTTER
35	2	32517	SHEAVE SCREW
36	2	34269	SHEAVE ASSEMBLY
37	9	30457	HEX HEAD CAPSCREW
38	1	33657	WINCH (SEE DWG 33657)
39	1	33950	NYLON PAD (CSUNK)

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FAX: (713) 688-6324
PHONE: (713) 688-5533



USE FORM 619

REVISIONS		
NO.	DATE	BY
A	7/31/98	JNW
B		
C		
D		
E		

LIFTMOORE, INC

BOOM ASSEMBLY 3660X/XP-20

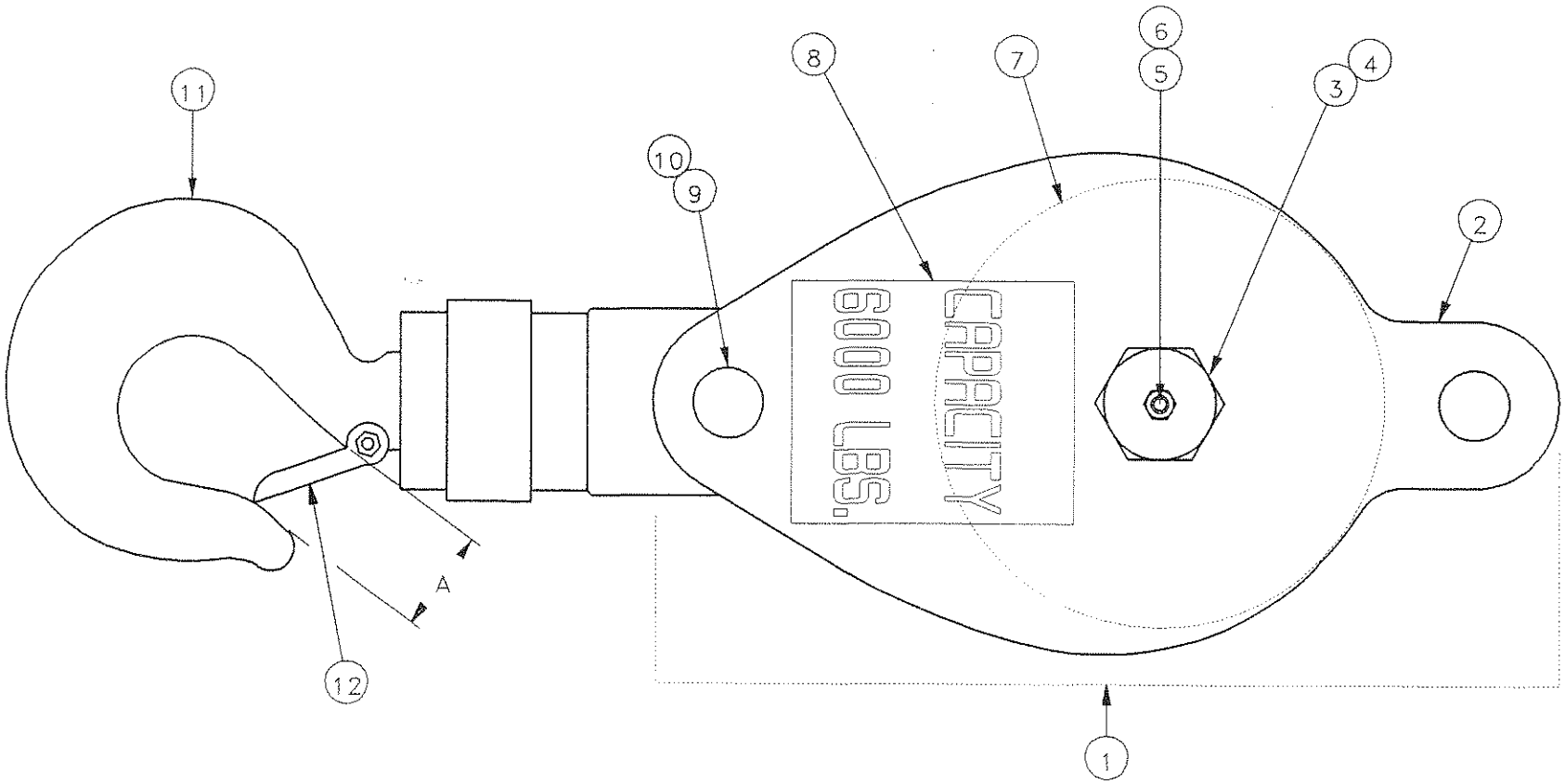
DRAWN BY SSC	SCALE 1/10	MATERIAL
CHK'D	DATE 11-15-94	DRAWING NO. 48016

BOOM PARTS LIST
LIFTMOORE, INC. MODEL 3660X/XP-20
REFER TO DRAWING 48016

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	31719	OUTER BOOM
2	1	18285	LIMIT SWITCH PLATE
3	1	16617	WINCH ANGLE MOUNT - REAR
4	1	16618	WINCH ANGLE MOUNT - FRONT
5	4	16620	WINCH SPACERS
6	4	31100	HEX HEAD CAPSCREW
7	4	34006	NYLOC HEX NUT
8	2	33481	BOOM PIVOT BUSHING
9	1	33567	HOSE ASSEMBLY - WINCH
10	1	33566	HOSE ASSEMBLY - WINCH
11	1	17037	BULKHEAD PLATE ASSEMBLY
12	1	32773	HYDRAULIC WINCH TUBE - OUTER
13	1	32774	HYDRAULIC WINCH TUBE - INNER
14	2	33565	HOSE ASSEMBLY - EXTENSION
15	1	34036	EXTENSION CYLINDER
16	1	33501	EXTENSION CYLINDER PIN
17	1	31591	P.O. CHECK VALVE CARTRIDGE
18	1	30851	COUNTERBALANCE VALVE CARTRIDGE
19	1	31013	PENDULUM
20	1	31017	PENDULUM SCREW
21	1	31978	LOAD CAPACITY DECAL
22	1	31755	ATB CORD REEL ASSY
23	1	30828	HEX HEAD CAPSCREW
24	3	30838	NYLOC HEX NUT
25	3	33367	EYE SCREW
26	3	33951	NYLON PAD (TAPPED)
27	1	33949	NYLON PAD (TAPPED)
28	1	31947	HAIRPIN COTTER
29	8	30459	HEX HEAD CAPSCREW
30	3	33952	NYLON PAD (CSUNK)
31	1	33950	NYLON PAD (CSUNK)
32	10	33614	SOCKET HEAD SCREW
33	1	32264	FIRST INNER BOOM
34	1	30754	HITCH PIN
35	1	34278	SECOND INNER BOOM
36	2	32517	SHEAVE SCREW
37	2	34269	SHEAVE ASSEMBLY
38	14	30457	HEX HEAD CAPSCREW
39	1	18595	ATB ASSY (SEE DWG 50152)
40	1	32658	CLEVIS PIN
41	1	16718	SPACER PLATE
42	2	34257	SPACER PLATE
43	1	32283	WINCH (SEE DWG 32283)

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HOUSTON, TEXAS 77055
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533



USE FORM 507

A – THROAT OPENING DIMENSION = 1.687"

NEVER USE A HOOK WHOSE THROAT OPENING HAS BEEN INCREASED, OR WHOSE TIP HAS BEEN BENT MORE THAN 10 DEGREES OUT OF PLANE FROM THE HOOK BODY, OR IS IN ANY WAY DISTORTED OR BENT.

REVISIONS		
NO.	DATE	BY
A	12-05-94	MEC
B	8-11-99	LEM
C		
D		
E		

LIFTMOORE, INC

TRAVEL BLOCK ASSEMBLY – 3660

DRAWN BY MEC	SCALE 7/16	MATERIAL
CHK'D	DATE 9-19-94	DRAWING NO. 32619

TRAVEL BLOCK PARTS LIST

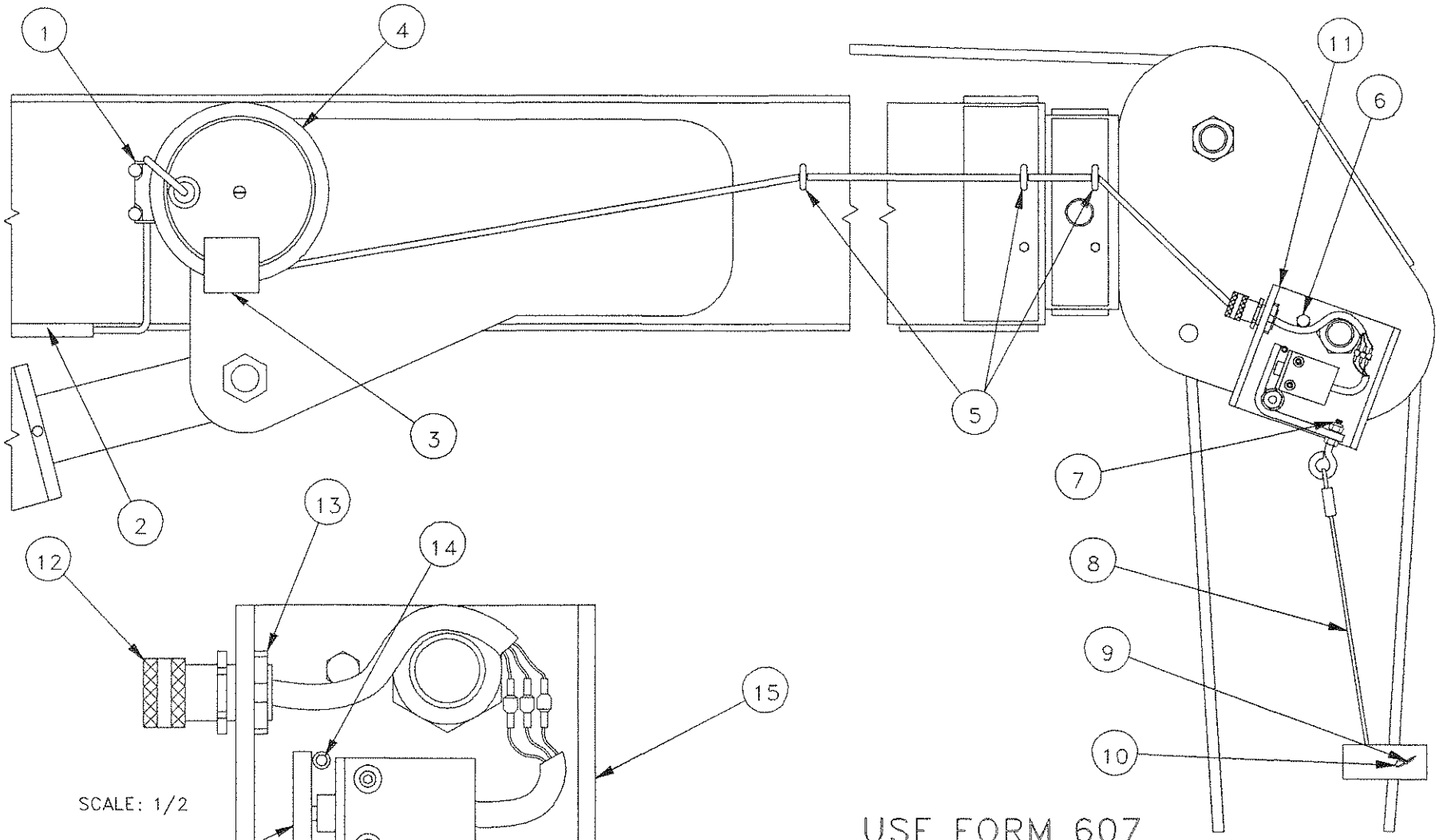
LIFTMOORE PART NO. 32619

REFER TO DRAWING 32619

ITEM	*QTY.*	*P.N.*	*DESCRIPTION*
1	1	32620	BODY ASSEMBLY (CONTAINS ITEMS 2-7)
2	1	34266	TRAVEL BLOCK WELDMENT
3	1	32517	SHEAVE SCREW
4	1	30838	NYLOC HEX NUT
5	1	30936	ZERK FITTING
6	1	31224	ZERK COVER
7	1	34269	SHEAVE
8	1	32820	DECAL, MAXIMUM LOAD
9	1	32658	CLEVIS PIN
10	1	31948	HAIRPIN COTTER
11	1	30758	3 TON SWIVEL HOOK
12	1	JB*471782	SAFETY LATCH KIT

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TRUCK CRANES

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HOUSTON, TEXAS 77055
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FAX: (713) 688-6324
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USE FORM 607

LIFTMOORE, INC

ANTI-TWO BLOCK ASSEMBLY

DRAWN BY SSC	SCALE 3/16	MATERIAL
REV'D 2-23-98 JNW	DATE 2-10-94	DRAWING NO. 50152

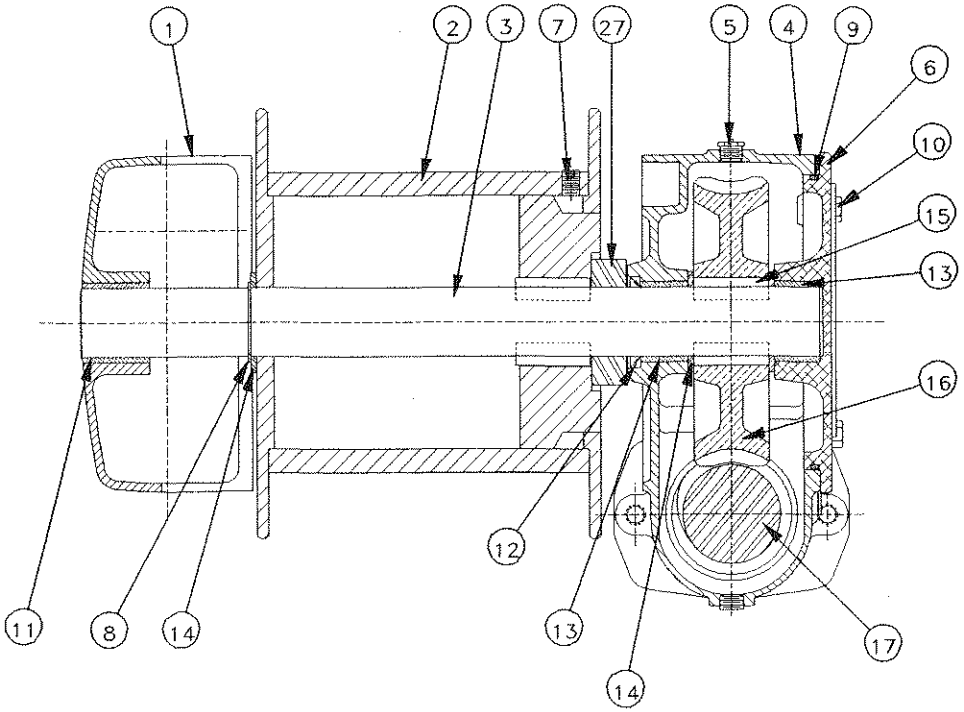
ANTI-TWO BLOCK PARTS LIST
LIFTMOORE, INC. - ALL MODELS
REFER TO DRAWING 50152

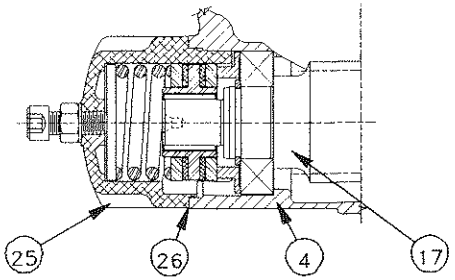
ITEM	QUANTITY 2-WIRE N.C.	QUANTITY 3-WIRE N.O./N.C.	QUANTITY 2-WIRE N.O.	PART	DESCRIPTION
1	1	1	1	16460	CORD REEL BRACKET
2	1	1	1	17004	CORD REEL TUBE - 3200
2	1	1	1	17704	CORD REEL TUBE - 5080
2	1	1	1	17833	CORD REEL TUBE - ALL OTHERS
3	1	1	1	17821	CORD REEL ANGLE
4	1	1	1	31755	CORD REEL ASSY
5	3	3	3	33367	EYE BOLT
6	1	1	1	30809	HEX HEAD CAPSCREW
7	1	1	1	30833	NYLOC HEX NUT
8	1	1	1	32481	ANTI-TWO BLOCK PICKLE ASSEMBLY
9	1	1	1	34216	CLEVIS PIN
10	1	1	1	17974	COTTER PIN
11	1	N/A	N/A	33416	ATB BODY ASSY (INCL. ITEMS 12-22)
11	N/A	1	N/A	17005	ATB BODY ASSY (INCL. ITEMS 12-22)
11	N/A	N/A	1	18599	ATB BODY ASSY (INCL. ITEMS 12-22)
12	1	1	1	33390	CORD GRIP CONNECTOR
13	1	1	1	33405	LOCK NUT
14	1	1	1	33415	ROLL PIN
15	1	1	1	17269	ANTI-TWO BLOCK HOUSING
16	1	1	1	33414	ANTI-TWO BLOCK LEVER
17	1	1	1	30834	NYLOC-HEX NUT
18	1	1	1	33424	BUSHING
19	2	2	2	30475	WASHER
20	2	2	2	32639	LOCK WASHER
21	2	2	2	17164	SOCKET HEAD CAPSCREW
22	1	N/A	N/A	17002	LIMIT SWITCH
22	N/A	1	N/A	17001	LIMIT SWITCH
22	N/A	N/A	1	18596	LIMIT SWITCH
*	1	1	1	33413	ANTI-TWO BLOCK HOUSING COVER
*	4	4	4	30989	SCREW (FOR HOUSING COVER)

* ITEMS NOT SHOWN ON DRAWING

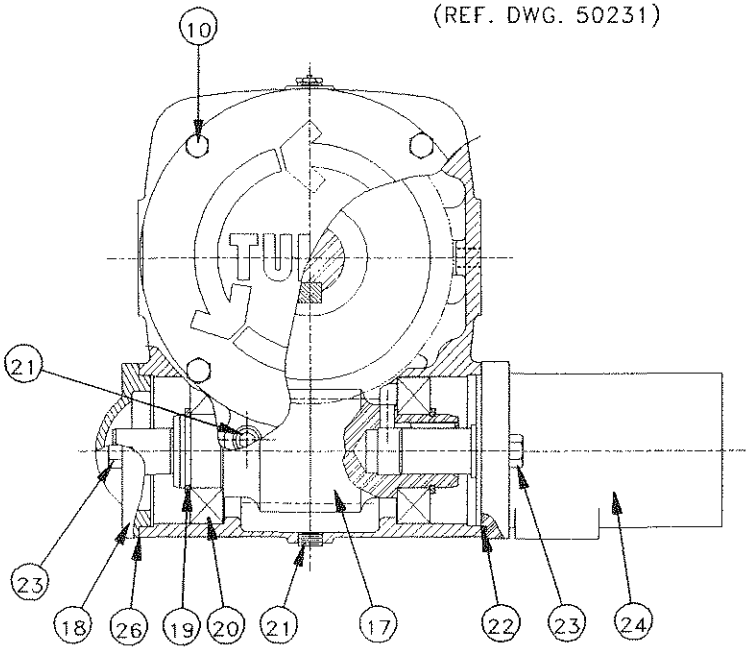
LIFTMOORE
TRUCK CRANES

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HOUSTON, TEXAS 77055
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533





OIL BRAKE DETAIL
(REF. DWG. 50231)



NOTES:

1. WORM GEAR CASE USES EP 140 WT. GEAR LUBE
2. LINEPULL RATING – 5,000 LBS.
3. BRAKE TORQUE SETTING: 8 FT.-LBS. AT WORM INPUT
4. DO NOT GREASE SHAFT.
5. DRUM MUST SLIDE FREELY.

USE FORM 431

(THIS DRAWING REPLACES FORM 432)

REVISIONS		
NO.	DATE	BY
A		
B		
C		
D		
E		

LIFTMOORE, INC

WINCH, HYDRAULIC ANSI 7.5" DRUM
MODEL 3660

DRAWN BY LEM	SCALE 1/4	MATERIAL
CHK'D	DATE 10-4-96	DRAWING NO. 32283

WINCH (MODEL 3660)

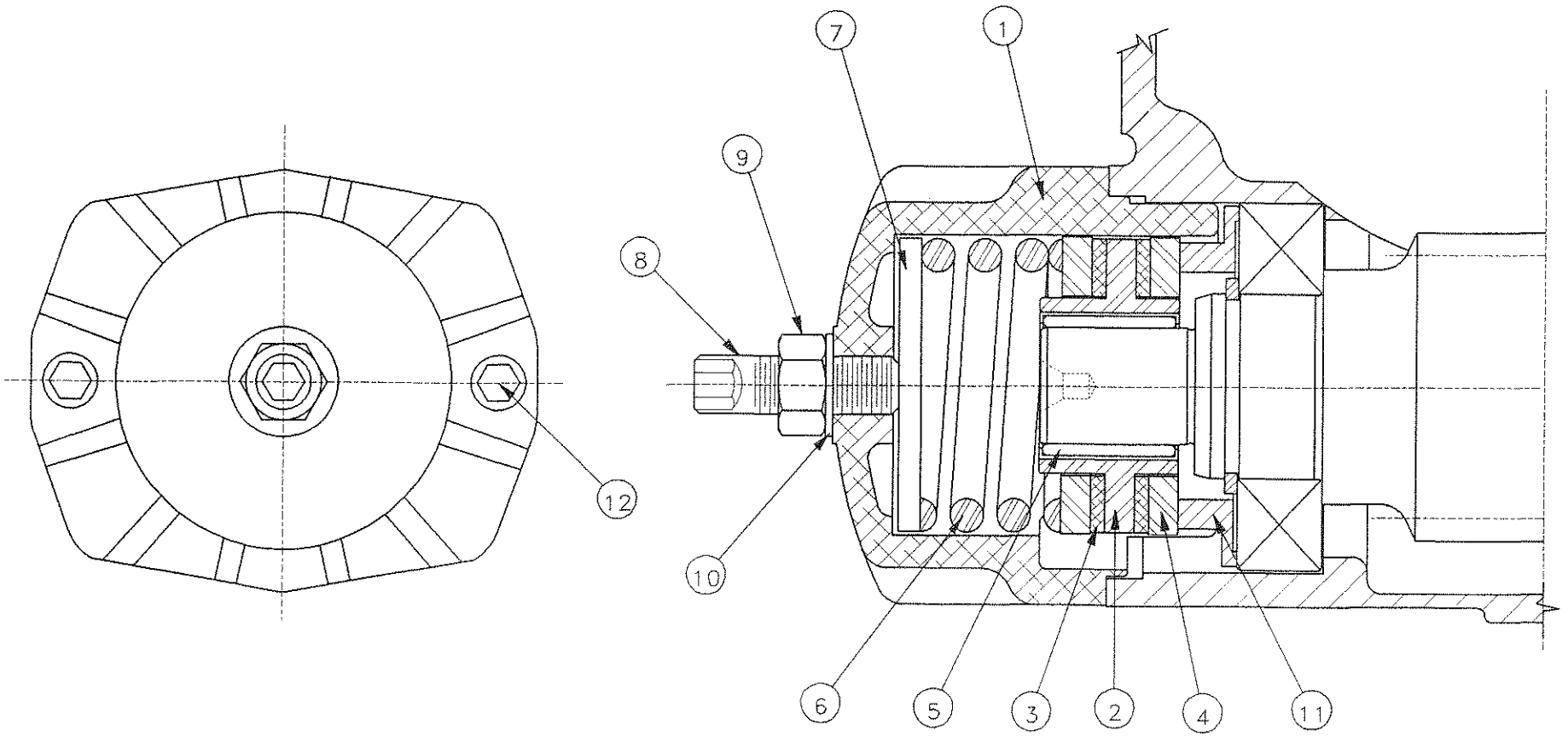
LIFTMOORE PART NO. 32283

TULSA WINCH PART NO. 80695

ITEM	QUANTITY	PART	DESCRIPTION
1	1	TW*40955	END BRACKET, MACH
2	1	TW*41310	DRUM
3	1	TW*41311	SHAFT, OUTPUT
4	1	TW*40383	HOUSING
5	1	TW*4101	BREATHER KIT
6	1	TW*40391	COVER. MACH.
7	1	TW*23582	SCREW -SET
8	1	TW*27240	RETAING RING
9	1	TW*40547	O-RING
10	4	TW*40407	CAPSCREW
11	1	TW*40399	BUSHING
12	1	TW*40401	SEAL OIL
13	2	TW*40400	BUSHING
14	3	TW*29017	WASHER
15	4	TW*40518	KEY
16	1	TW*40618	GEAR, SR
17	1	TW*40598	WORM, SR
18			OMIT
19	2	TW*40396	RING RETAINING
20	2	TW*40395	BEARING
21	2	TW*32220	PLUG, PIPE
22	1	TW*32566	O-RING
23	2	TW*40410	CAPSCREW
24	1	17034	MOTOR, HYDRAULIC
25	1	TW*4034	KIT, BRAKE, OIL
26	1	TW*40147	GASKET
27	1	TW*40940	SPACER

LIFTMOORE
TRUCK CRANES

11505 TODD ROAD
HOUSTON, TEXAS 77055
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533



USE FORM 473

REVISIONS		
NO.	DATE	BY
A		
B		
C		
D		
E		

LIFTMOORE, INC

WINCH BRAKE PARTS TW*4034
TULSA WINCH PARTS SA4034

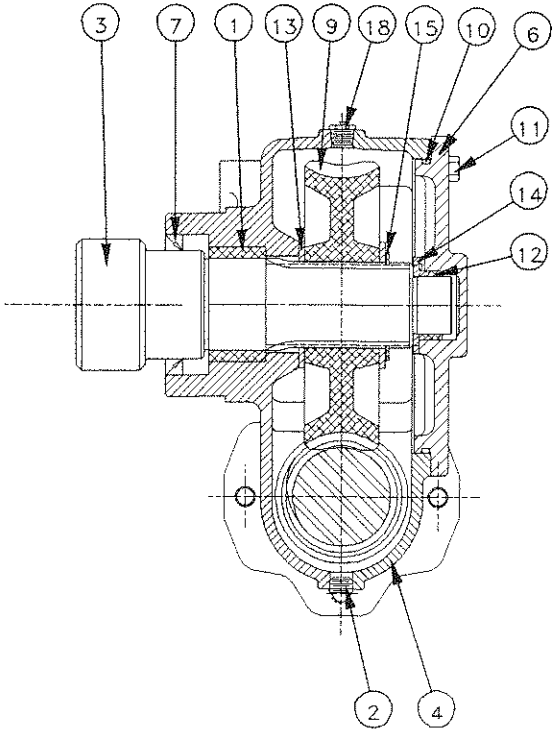
DRAWN BY SSC	SCALE NTS	MATERIAL
CHK'D	DATE 11-14-94	DRAWING NO. 50231

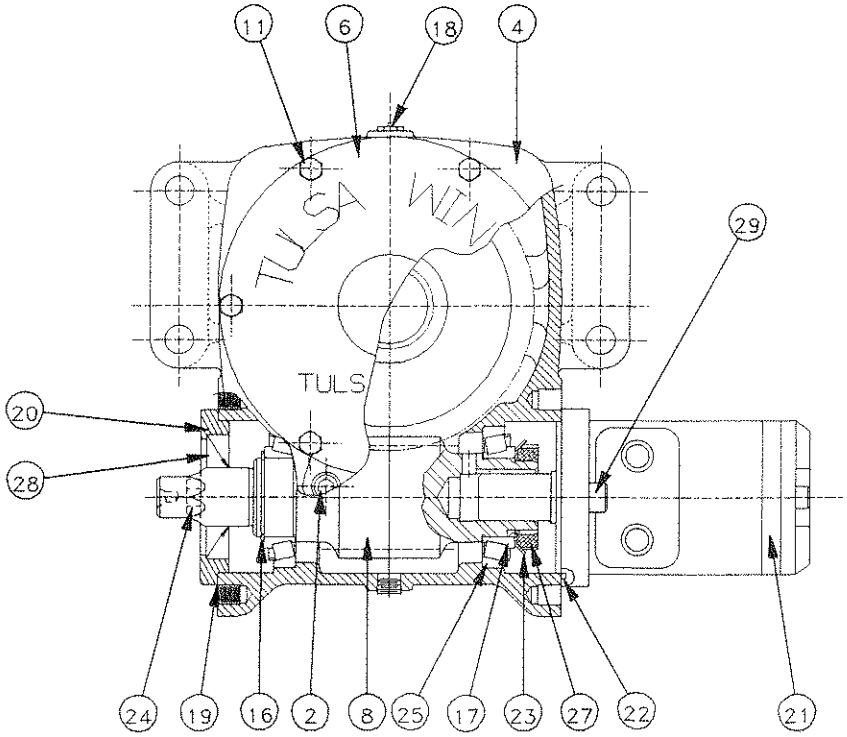
WINCH BRAKE PARTS LIST
LIFTMOORE PART NO. TW*4034
TULSA PART NO. SA4034

ITEM	QUANTITY	PART NO.	DESCRIPTION
1	1	TW*40069	HOUSING
2	1	TW*40617	HUB
3	2	TW*40075	FRICTION DISC
4	2	TW*40076	STATOR PLATE
5	1	TW*40113	CAM CLUTCH
6	1	TW*40077	SPRING
7	1	TW*40078	TRUST WASHER
8	1	TW*40775	SOCKET HEAD SET SCREW
9	1	TW*40774	NUT
10	1	TW*29044	WASHER
11	1	TW*40599	SPACER
12	2	TW*40546	SOCKET HEAD CAPSCREW

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USE FORM 314

GEARBOX USES CODE 901 MULTIFAK EP 0 GREASE.

TULSA WINCH PART NO. HFG945D

REVISIONS		
NO.	DATE	BY
A		
B		
C		
D		
E		

LIFTMOORE, INC

ROTATION SPEED REDUCER
5000, 2550, 6036, 3660, 8000, 5080

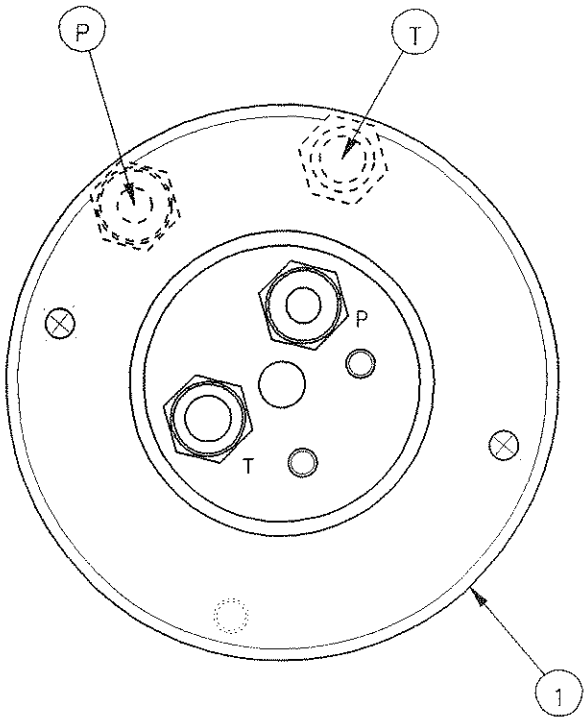
DRAWN BY MEC	SCALE 1/4	MATERIAL
CHK'D	DATE 10-21-94	DRAWING NO. 31287

SPEED REDUCER PARTS LIST
LIFTMOORE PART NO. 31287
REFER TO DRAWING NO. 31287 / TULSA 80687

ITEM	*QUANTITY*	*PART*	*DESCRIPTION*
1	1	TW*40887	BUSHING, G1500
2	2	TW*32220	PLUG, PIPE
3	1	TW*41313	SHAFT, OUTPUT
4	1	TW*41110	HOUSING
5			OMIT
6	1	TW*41107	COVER
7	1	TW*41382	OIL SEAL
8	1	TW*41312	WORM, SR
9	1	TW*41392	WORMGEAR, SR
10	1	TW*40547	O'RING
11	6	TW*40407	CAPSCREW
12	1	TW*17451	BUSHING
13	2	TW*27335	WASHER. MOD G6 & 8
14	1	TW*25890	WASHER, THRUST G6
15	1	TW*23862	RING, SNAP G6
16	1	TW*29455	RING, SNAP TP-1
17	2	TW*41119	CONE, ROLLER BEARING
18	1	TW*4101	BUSHING & BREATHER
19	2	TW*40147	GASKET
20	1	TW*40934	COVER, SEAL
21	1	TW*40799	MOTOR, C/L H
22	1	TW*32566	O'RING
23	1	TW*41299	LOCKWASHER
24	2	TW*40410	CAPSCREW
25	2	TW*41120	CUP, ROLLER BEARING
26			OMIT
27	1	TW*26528	LOCK NUT
28	1	TW*40926	SEAL, OIL
29	2	TW*41231	CAPSCREW

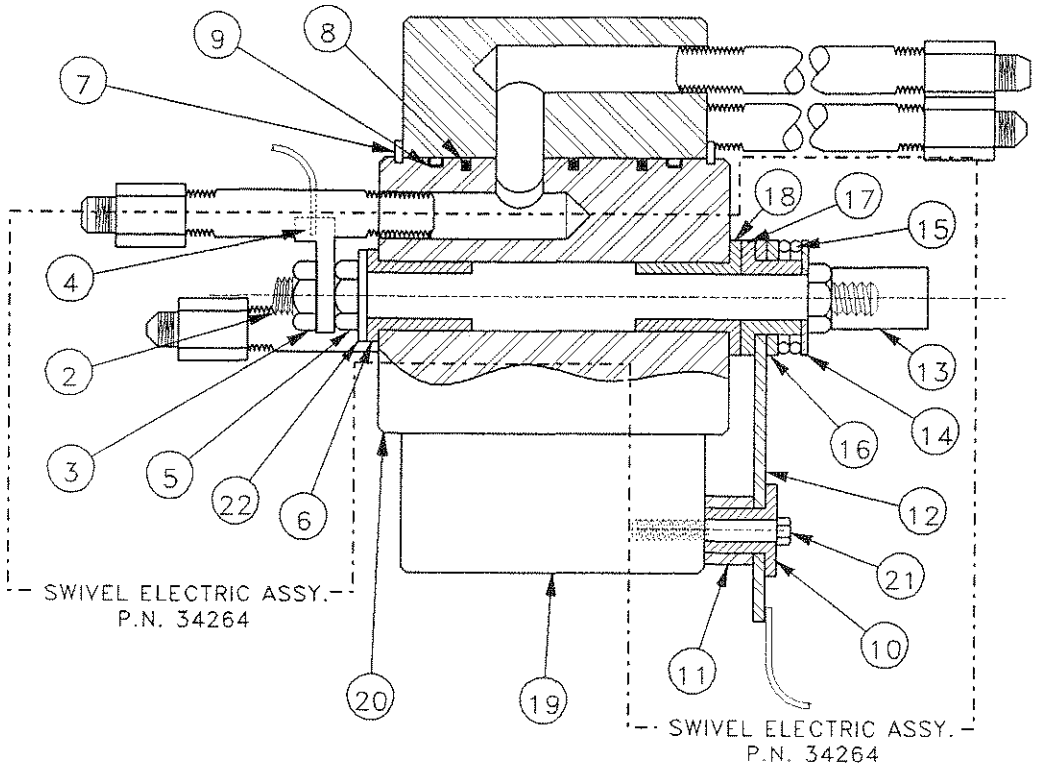
LIFTMOORE
TRUCK CRANES

11505 TODD ROAD
HOUSTON, TEXAS 77055
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533



BOTTOM VIEW OF CRANE

NOTE: HOT WIRE ASSEMBLY NOT SHOWN IN THIS VIEW



P= PRESSURE PORT

T= TANK RETURN

USE FORM 405

REVISIONS		
NO.	DATE	BY
A	5-24-94	SSC
B	12-7-94	SSC
C	12-19-95	SSC
D		
E		

LIFTMOORE, INC

HYDRAULIC-ELECTRIC SWIVEL ASSEMBLY

DRAWN BY SSC	SCALE N.T.S	MATERIAL
CHK'D	DATE 5-24-94	DRAWING NO. 32099

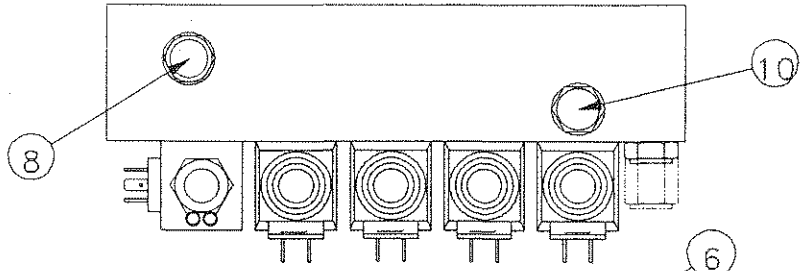
SWIVEL ELECTRICAL ASSEMBLY PARTS LIST
LIFTMOORE, INC. NO. 32099
REFER TO DRAWING NO.32099

ITEM	*QUANTITY*	*PART*	*DESCRIPTION*
1	1	32098	SWIVEL, HYDRAULIC
2	1	32277	STUD (DOUBLE MALE)
3	2	34255	HEX NUT
4	1	32278	TERMINAL WITH WIRE
5	1	34256	HEX NYLOC NUT
6	1	31383	INSULATOR , STUD (BOTTOM)
7	1	TM*PP-00212	RETAINING RING
8	3	TM*SO-00016	O-RING
9	2	TM*SM-00011	SLIPPER SEAL
10	1	31451	INSULATOR (ELEC. PLATE)
11	1	31450	INSULATOR SCREW SLEEVE
12	1	31380	ELECTRICAL PLATE W/ WIRE
13	1	32279	SLEEVE, SCREW INSULATOR
14	1	32368	WASHER, FLAT S.S.
15	1	31452	SPRING
16	1	32562	WASHER, FLAT S.S.
17	1	31381	SPACER, STUD
18	1	31382	INSULATOR, STUD (TOP)
19	1	TM*MM-00413	SWIVEL TUBE
20	1	TM*MM-00412	HUB
21	1	31032	HEX HEAD CAPSCREW
22	1	33353	WASHER, FLAT S.S.
*	1	TM*SK-00237	SEAL KIT (NOT SHOWN ON DRAWING)
**	*	34264	SWIVEL, ELECTRIC ASSEMBLY (COMPONENT ITEM NUMBERS SHOWN IN BOXED AREA)

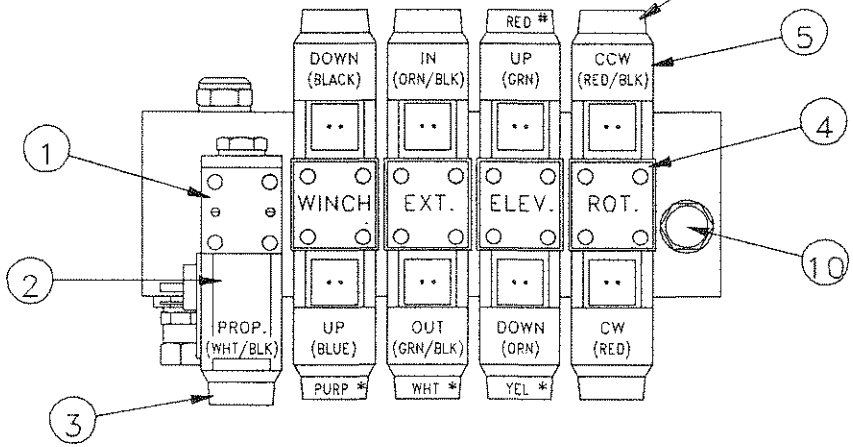
LIFTMOORE
TRUCK CRANES

11505 TODD ROAD
HOUSTON, TEXAS 77055
FAX: (800) 824-5559 (USA & Canada)
FAX: (713) 688-6324
PHONE: (713) 688-5533

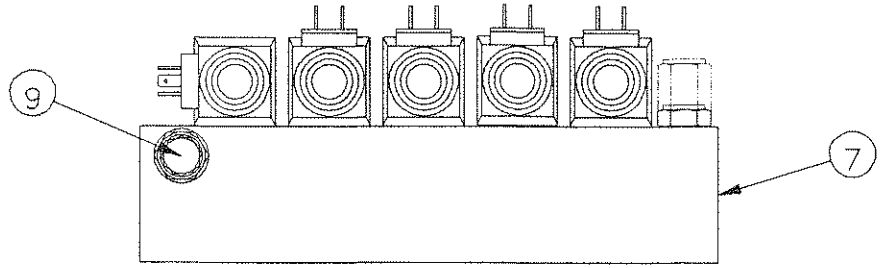
TOP VIEW



FRONT VIEW



BOTTOM VIEW



USE FORM 981

THE COLOR NAME IN PARENTHESES () INDICATES THE WIRE COLOR FOR THE OUTPUT SIGNAL FROM THE PENDANT CONTROL SOCKET. THE COLOR NAMES WITH THE SYMBOL NEXT TO THEM INDICATES THE OUTPUT WIRE COLOR FOR AN ADDITIONAL DEVICE WIRED IN SERIES FOR THE FUNCTION, WHEN INSTALLED, AS INDICATED BELOW:

* CONTROL WIRE COLOR FROM RELAY BOARD OUTPUT

\# CONTROL WIRE COLOR FROM UP-LIMIT SWITCH

REVISIONS		
NO.	DATE	BY
A		
B		
C		
D		
E		

LIFTMOORE, INC

MANIFOLD, HYDRAULIC PROPORTIONAL ASSEMBLY

DRAWN BY LEM	SCALE 1/4	MATERIAL
CHK'D	DATE 8-2-99	DRAWING NO. 50462

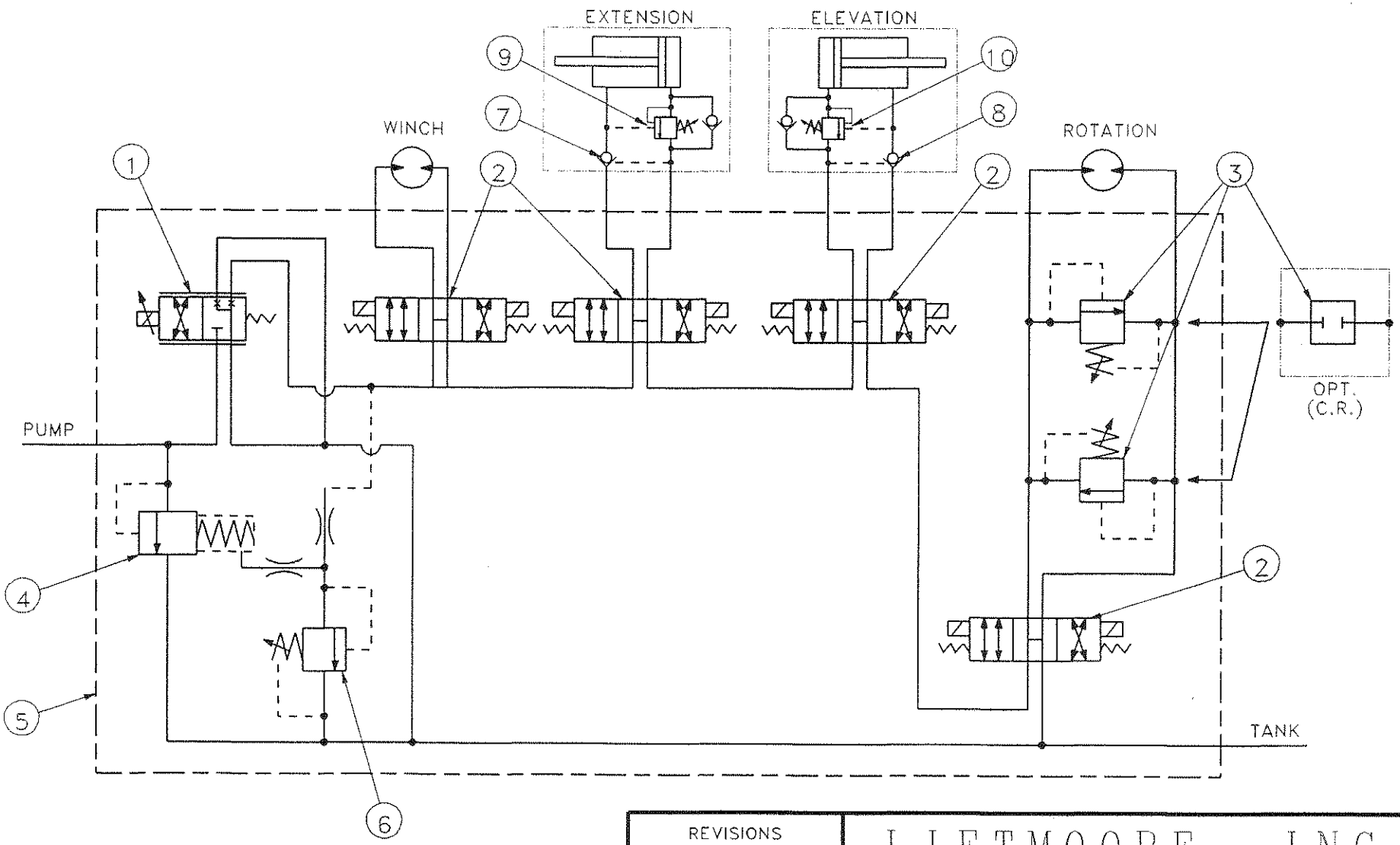
HYDRAULIC PROPORTIONAL MANIFOLD ASSEMBLY PARTS LIST
REFER TO DRAWING NO. 50462

FOR MANIFOLD ASSEMBLIES:
P.N. 34004 - CONTINUOUS ROTATION (C.R.)
P.N. 34290 - LIMITED ROTATION (L.R.)

ITEM	*QUANTITY*		*PART NO.*	*DESCRIPTION*
	C.R.	*L.R.*		
1	1	1	VKS*02-310307	SOLENOID VALVE - PROPORTIONAL (W/ MANUAL OVERRIDE)
2	1	1	VKS*02-134570	COIL 24V (PART OF ITEM 1)
3	1	1	VKS*02-697358	RETAINING NUT W/BOOT ASSY. (PART OF ITEM 1)
4	4	4	VKS*02-342881	SOLENOID VALVE - OPEN CENTER (W/ MANUAL OVERRIDE)
5	8	8	VKS*02-309452	COIL 12V (PART OF ITEM 4)
6	8	8	VKS*02-344736	RETAINING NUT W/BOOT ASSY. (PART OF ITEM 4)
7	1	1	VKS*41450	SERIES MANIFOLD BLOCK
8	1	1	VKS*DPS2-10-P-F-0-160	DIFFERENTIAL PRESSURE SENSING VALVE
9	1	1	VKS*RV6-10-C-O-50/25	RELIEF VALVE
10	2	N/A	VKS*20601	2-WAY CAVITY PLUG
10	N/A	2	VKS*RV1-10-I-O-18/13	RELIEF VALVE

LIFTMOORE
TRUCK CRANES

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PHONE: (713) 688-5533



USE FORM 867

REVISIONS		
NO.	DATE	BY
A	3-11-98	LEM
B	8-4-99	LEM
C		
D		
E		

LIFTMOORE, INC

HYDRAULIC SCHEMATIC – PROPORTIONAL CONTROL CRANES
CONTINUOUS & LIMITED ROTATION MODELS

DRAWN BY LEM	SCALE N.T.S.	MATERIAL
CHK'D	DATE 8-30-96	DRAWING NO. 50368

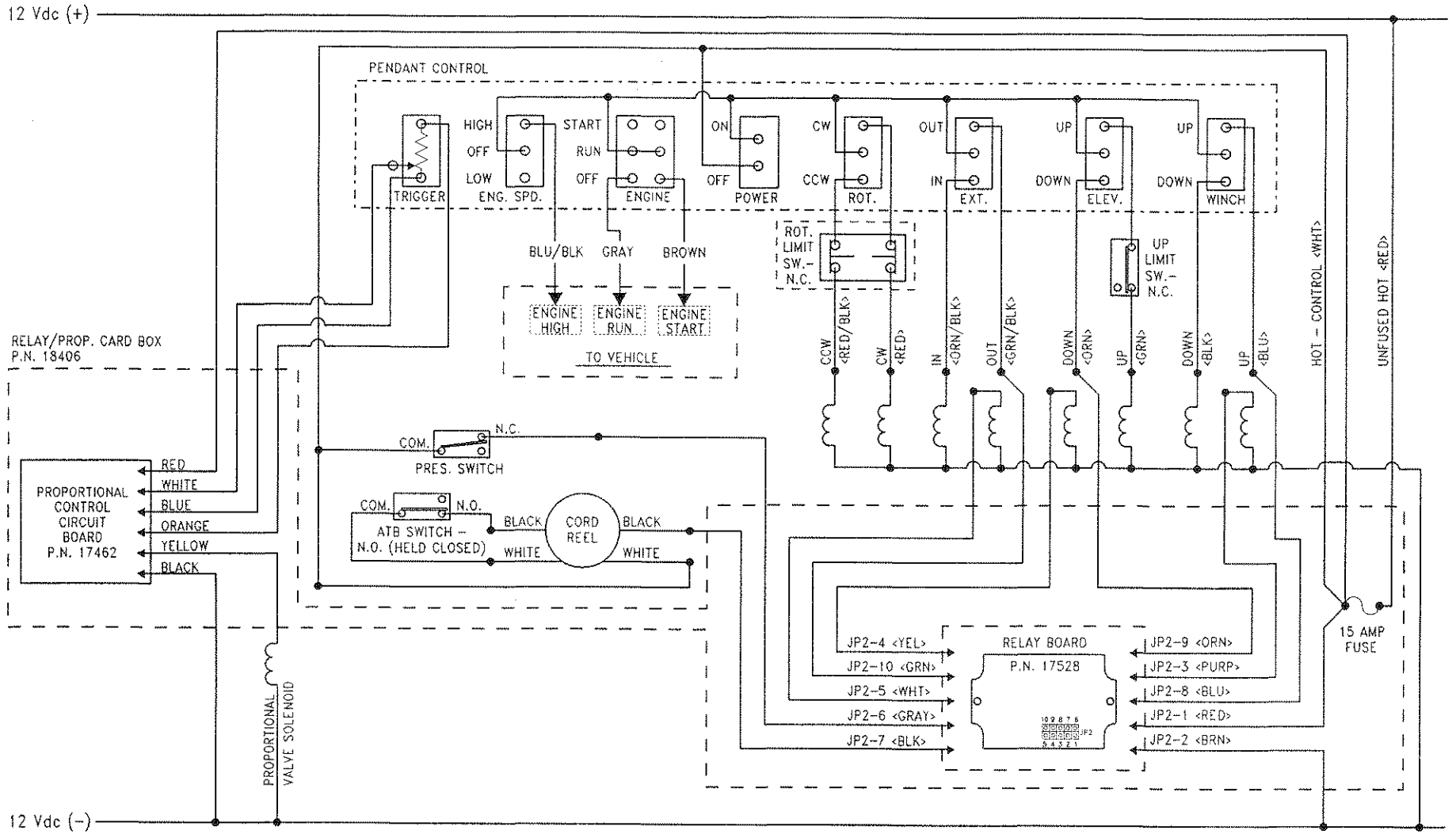
HYDRAULIC PROPORTIONAL CIRCUIT PARTS LIST
REFER TO DRAWING NO. 50368

FOR MANIFOLD ASSEMBLIES:
P.N. 34004 - CONTINUOUS ROTATION (C.R.)
P.N. 34290 - LIMITED ROTATION (L.R.)

ITEM	*QUANTITY*		*PART NO.*	*DESCRIPTION*
	C.R.	*L.R.*		
1	1	1	VKS*02-310307	SOLENOID VALVE - PROPORTIONAL (W/ MANUAL OVERRIDE)
2	4	4	VKS*02-342881	SOLENOID VALVE - OPEN CENTER (W/ MANUAL OVERRIDE)
3	2	N/A	VKS*20601	2-WAY CAVITY PLUG
3	N/A	2	VKS*RV1-10-I-O-18/13	RELIEF VALVE - ROTATION
4	1	1	VKS*DPS2-10-P-F-0-160	DIFFERENTIAL PRESSURE SENSING VALVE
5	1	1	VKS*41450	SERIES MANIFOLD BLOCK
6	1	1	VKS*RV6-10-C-O-50/25	RELIEF VALVE - MAIN
7	1	1	31591	PILOT OPERATED CHECK VALVE EXT.-ALL MODELS EXCEPT 2525XP
7	1	1	TM*PP-00228	PILOT OPERATED CHECK VALVE EXT.- MODEL 2525XP ONLY
8	1	1	31591	PILOT OPERATED CHECK VALVE ELEV.-ALL MODELS EXCEPT 1032XP
9	1	1	30851	COUNTERBALANCE VALVE – 2000 PSI EXT.-ALL MODELS
10	1	1	30851	COUNTERBALANCE VALVE – 2000 PSI ELEV.-MODEL 1032XP ONLY
10	1	1	18577	COUNTERBALANCE VALVE – 2700 PSI ELEV.-ALL MODELS EXCEPT 1032XP

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HOUSTON, TEXAS 77055
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CRANE MODEL (* OPTIONAL FUNCTIONS)	PLUG TYPE	PENDANT
STD. (4-FUNCTIONS + POWER SWITCH)	16-PIN	P.N. 17573
STD. (4-FUNCTIONS + POWER SWITCH)	14-PIN	P.N. 18971
STD. + ENG. SPEED CTRL (D)*	16-PIN	P.N. 17577
STD. + ENG. SPEED CTRL (D)*	14-PIN	P.N. 18972
STD. + ENG. START & SPEED CTRL (DR-G)* GAS	16-PIN	P.N. 17574
STD. + ENG. START & SPEED CTRL (DR-D)* DIESEL	16-PIN	P.N. 18161

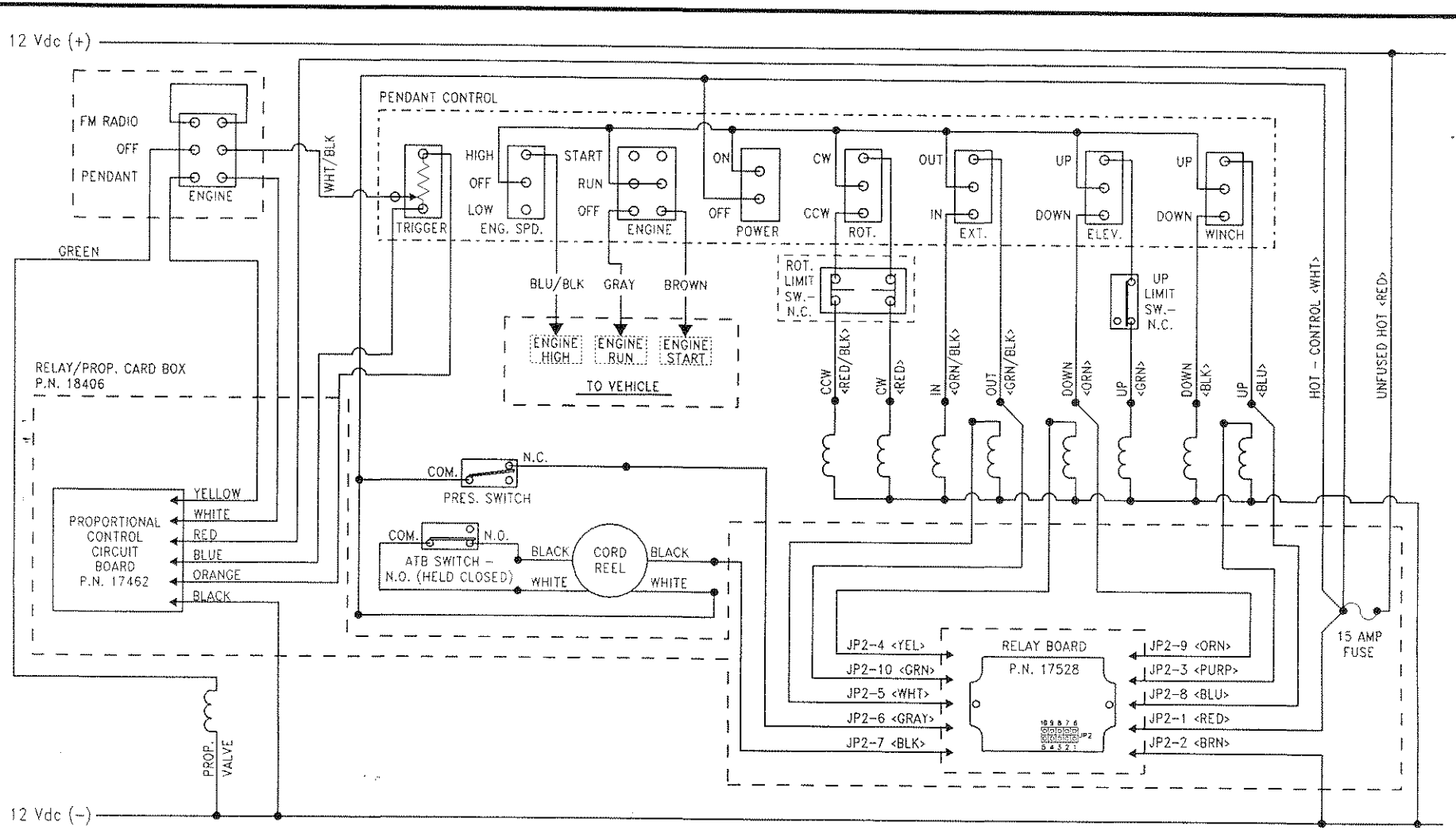
NOTES: 1) ELEV. UP FUNCTION LIMITED BY HYDRAULIC SYSTEM RELIEF PRESSURE:
- SET AT 2500 PSI FOR 1032 MODELS.
- SET AT 2750 PSI FOR ALL OTHER MODELS.
2) ROTATION LIMIT SWITCH USED ONLY ON 1032 MODELS.

REVISIONS		
NO.	DATE	BY
A	7-6-98	LEM
B	8-6-99	LEM
C		
D		
E		

LIFTMOORE, INC

SCHEMATIC, CONTROL WIRING - HYDRAULIC CRANES WITH PROPORTIONAL MANIFOLD

DRAWN BY LEM	SCALE NTS	MATERIAL
CHK'D	DATE 4-28-98	DRAWING NO. 50418



CRANE MODEL (* OPTIONAL FUNCTIONS)	PLUG TYPE	PENDANT
STD. (4-FUNCTIONS + POWER SWITCH)	16-PIN	P.N. 17573
STD. (4-FUNCTIONS + POWER SWITCH)	14-PIN	P.N. 18971
STD. + ENG. SPEED CTRL (D)*	16-PIN	P.N. 17577
STD. + ENG. SPEED CTRL (D)*	14-PIN	P.N. 18972
STD. + ENG. START & SPEED CTRL (DR-D)* DIESEL	16-PIN	P.N. 18161
STD. + ENG. START & SPEED CTRL (DR-D)* DIESEL	23-PIN	P.N. 19201

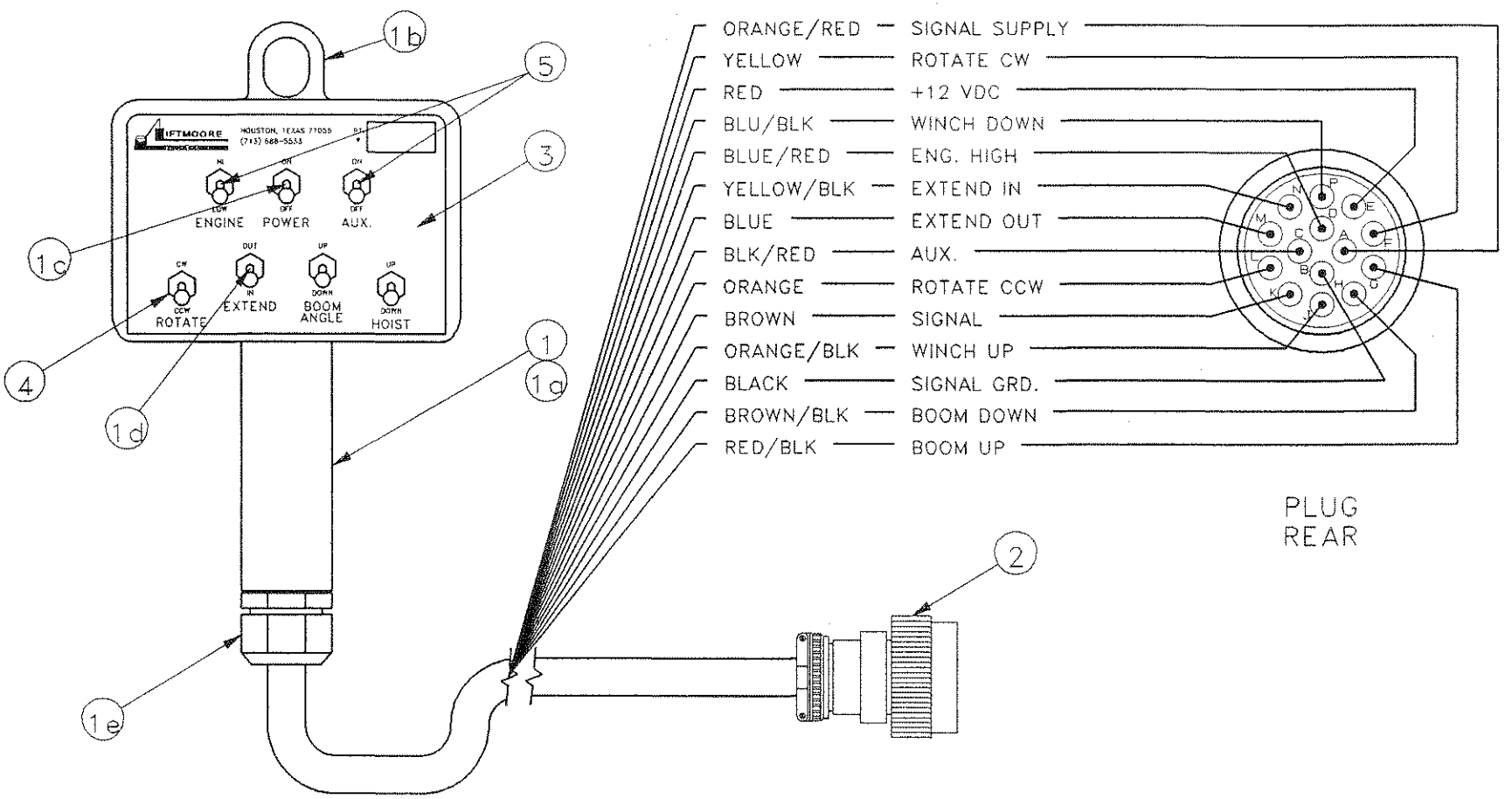
NOTES: 1) ELEV. UP FUNCTION LIMITED BY HYDRAULIC SYSTEM RELIEF PRESSURE:
- SET AT 2500 PSI FOR 1032 MODELS.
- SET AT 2750 PSI FOR ALL OTHER MODELS.
2) ROTATION LIMIT SWITCH USED ONLY ON 1032 MODELS.

REVISIONS		
NO.	DATE	BY
A		
B		
C		
D		
E		

LIFTMOORE, INC

SCHEMATIC, CONTROL WIRING - HYDRAULIC CRANES
W/ PROPORTIONAL MANIFOLD & FM RADIO CONTROL

DRAWN BY LEM	SCALE NTS	MATERIAL
CHK'D	DATE 10-22-99	DRAWING NO. 50418.FM



USE FORM 978

P.N.	DESCRIPTION
18971	STD – 4 CRANE FUNCTIONS
18972	D – ENGINE SPEED CONTROL OPTION
	A – AUXILLARY CONTROL OPTION

REVISIONS		
NO.	DATE	BY
A		
B		
C		
D		
E		

LIFTMOORE, INC

CONTROL, PENDANT XP / STD / D / A
(W/ENG. SPEED CONTROL & AUX.)

DRAWN BY DV	SCALE N.T.S.	MATERIAL
CHK'D	DATE 7-29-99	DRAWING NO. 50461

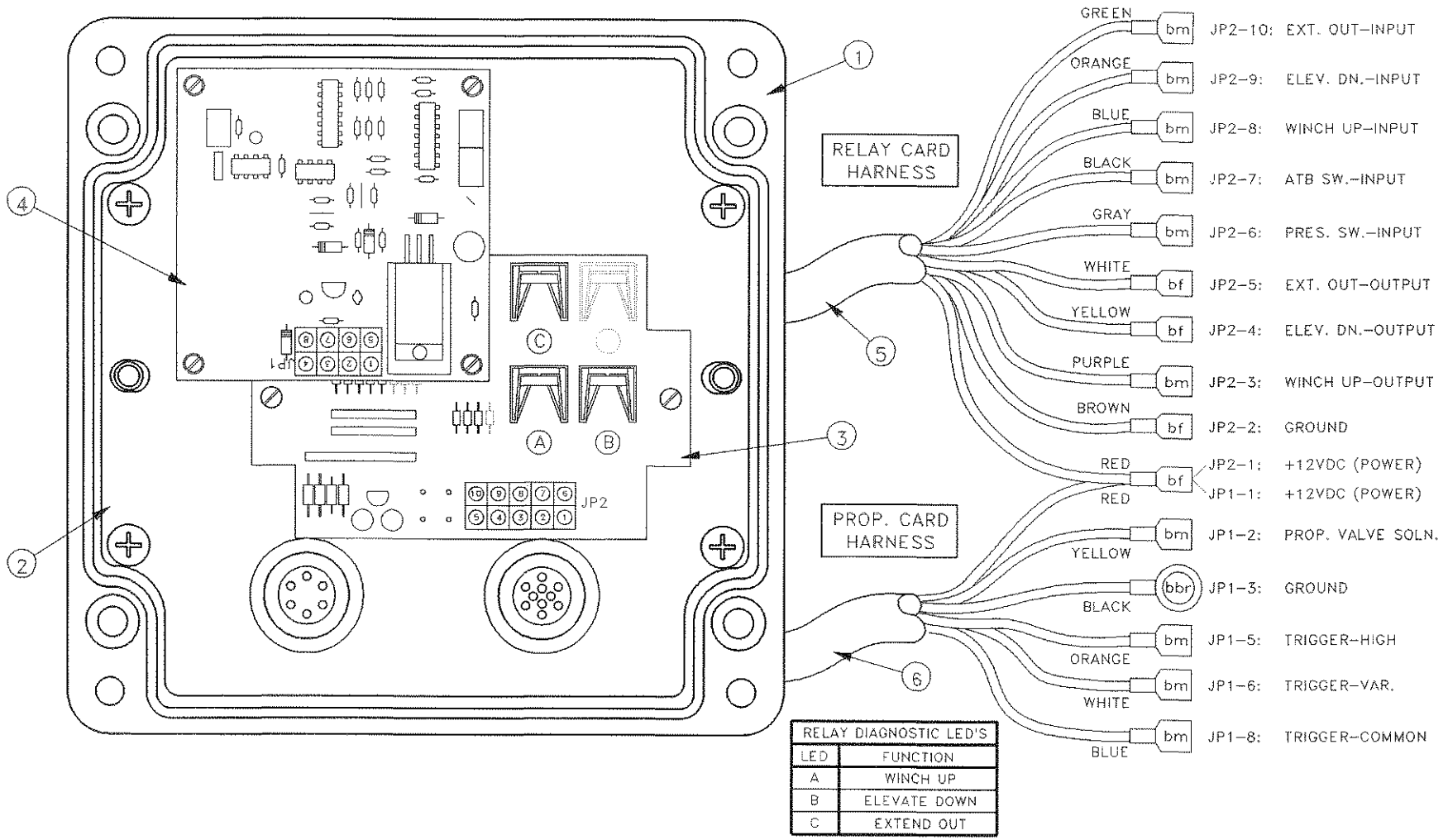
PENDANT CONTROL PARTS LIST
LIFTMOORE, INC. MODEL XP/KT STD/D/A
REFER TO DRAWING 50461

ITEM	QUANTITY			PART	DESCRIPTION
	STD	D	A		
1	1	1	1	17461	CONTROL, PENDANT XP W/O PLUG/S
1a	1	1	1	KT*320032A	BOX, CONTROL-PISTOL GRIP BLANK
1b	1	1	1	KT*320034A	COVER, BACK PROP. CONTROL BOX
1c	1	1	1	17012	SWITCH, TOGGLE SPST
1d	4	4	4	30453	SWITCH, TOGGLE SPDT
1e	1	1	1	16997	CONNECTOR, CGB
2	1	1	1	18753	PLUG, CONTROL 14-PIN
3	1	1	1	33548	DECAL, CONTROL 7 FUNCTION
4	5	6	6	30675	COVER, TOGGLE SWITCH
5	N/A	1	1	17012	SWITCH, TOGGLE SPST
*	1	1	1	KT*320038A	TRIGGER ASSEMBLY
*	1	1	1	19076	CONTROL WIRE W/PLUG 14-PIN

NOTE: ITEMS 1a - 1e ARE COMPONENTS OF ITEM 1

LIFTMOORE
TRUCK CRANES

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RELAY DIAGNOSTIC LED'S	
LED	FUNCTION
A	WINCH UP
B	ELEVATE DOWN
C	EXTEND OUT

ITEM	QTY.	PART NO.	DESCRIPTION
1	1	17014	NEMA 4 BOX (CAP NOT SHOWN)
2	1	17015	BACK PANEL
3	1	17528	RELAY BOARD - SOLID STATE
4	1	17462	PROPORTIONAL CONTROL CARD
5	1	18407	RELAY BOARD HARNESS
6	1	17027	PROPORTIONAL CARD HARNESS

REVISIONS		
NO.	DATE	BY
A	5-4-99	LEM
B		
C		
D		
E		

LIFTMOORE, INC

RELAY BOARD / PROP CARD ASSY

DRAWN BY LEM	SCALE 3/4	MATERIAL
CHK'D	DATE 6-22-98	DRAWING NO. 18406

LIFTMOORE LIMITED WARRANTY

Liftmoore, Inc. warrants each LIFTMOORE crane to be free from defects in materials and workmanship for six (6) months from the date of delivery to the original customer. LIFTMOORE, Inc. will repair or replace, as its sole discretion, any equipment or part that is returned f.o.b. to LIFTMOORE, Inc.'s plant at 11505 Todd Street, Houston, Texas 77055, or to one of its authorized dealers, and is found by LIFTMOORE, Inc. or its authorized dealer to have been defective at the time of original delivery.

The foregoing warranty is the exclusive warranty made by LIFTMOORE, Inc. with respect to its cranes and is in lieu of all other warranties. ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS OF ANY CRANE FOR A PARTICULAR PURPOSE OR OPERATION, ARE HERBY EXPRESSLY DISCLAIMED.

The foregoing warranty applies only to LIFTMOORE cranes under normal use and service and does not apply in the event of damage caused by repair or alteration or damage during shipment, accident, negligence, overloading, or misuse, including operator's failure to follow any of the instructions issued with the crane.

This warranty is limited to the original purchaser and is not assignable. In order to submit a claim, the original purchaser must provide a copy of the original invoice for the crane in question within six (6) months following the delivery date and within 30 days from the date of repair.

The warranty applies only when the LIFTMOORE crane is used for commercial purposes and does not cover any purchase for use for personal, family or household purposes.

LIMITATION OF LIABILITY: LIFTMOORE, Inc.'s liability for any losses or damages resulting from any cause whatsoever, including LIFTMOORE, Inc.'s NEGLIGENCE or from a defective crane irrespective of whether such defects are discoverable or latent, shall in no event exceed the purchase price of the crane to which losses or damages are claimed, or at the election of LIFTMOORE, Inc., the repair or replacement of the defective crane.

In no event shall LIFTMOORE, Inc. be liable for any special, incidental, or consequential damages, including commercial losses or costs of any kind sustained by purchaser or any other person or for any damages for which purchaser may be liable to other persons by reason of any defect in any LIFTMOORE crane or any part thereof.

LIFTMOORE, Inc. reserves the right to make changes in design or construction of its cranes at any time without obligating itself to make such changes on cranes previously manufactured.

No agent, employee, or representative of LIFTMOORE, Inc. has authority to amend or modify the foregoing warranty or to bind LIFTMOORE, Inc. by any other warranty, guaranty, or assumption of liability.

In the event any provision of this warranty is for any reason held ineffective, the remaining provisions shall remain in full force and effect.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other legal rights that vary from state to state.

LIFTMOORE
TRUCK CRANES

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