MAXI-LITE 4
OPERATOR’S MANUAL

Models:
MAXI-LITE C
& MAXI-LITE H

Allmand Bros. Inc.
West Highway 23, P.O. Box 888 • Holdrege, Nebraska 68949
(308) 995-4495 • FAX (308) 995-5887
Inspection Check List
FOR PREPARING MAXI-LITE 4 FOR DELIVERY OR RENTAL

The Maxi-Lite 4 requires service as well as proper operation in order to provide the performance and safety it was designed for. Never deliver or put a machine into service with known defects or missing instructions or decals. Always instruct the customer in the proper operation and safety procedures as described in the operator’s manual. Always provide the manual with the equipment for proper and safe operation.

Check list:

- Visually inspect the equipment to ensure that all instructions and decals are in place and legible.
- Inspect the electric winch to ensure all mounting fixtures and bolts are secure, the chain is adjusted correctly and lubricated, and the pillow block bearings are in good condition and lubricated.
- Inspect the winch cable for proper routing and signs of damage. Check the condition of the pulleys.
- Inspect the flat spring and interlocking pin for damage. Always operate to verify that the sections are locked together before raising, before towing and when lowering from vertical to horizontal.
- Inspect the red tower release lever and spring latch assembly which locks the tower in vertical position. Make sure the latch automatically locks the tower in vertical position before the mast is extended.
- Check the hitch assembly and safety tow chains.
  NOTE: See operator’s manual for scheduled maintenance intervals.
- Check the outriggers and jacks to make sure they operate properly.
- Inspect the light assemblies for damage and test for proper operation. Inspect the electrical wiring for signs of damage. Check the condition of the spring mount springs.
- Inspect the tires to ensure good condition and proper inflation.
- Check the ground rod cable and the ground lug. Make sure they are clean, undamaged and functional.
- Make sure the battery is fully charged, and the terminals are tight and clean. Ensure the electrolyte is at the correct level.
- Check the service intervals for oil filters, fuel filter, air cleaner and engine oil (see operator’s manual). Check the oil and fuel levels.
- Check to make sure the operator’s manual is with the equipment.

After completing the inspection check list, operate the tower through a complete cycle up and down, following the operating instructions in the operator’s manual.

⚠️ SAFETY WARNING!

- NEVER ALLOW ANYONE TO OPERATE THE EQUIPMENT WITHOUT PROPER TRAINING. ALWAYS READ THE INSTRUCTIONS FIRST.
INTRODUCTION

This manual provides the information necessary for the safe operation and maintenance of the Allmand Bros., Inc. Maxi-Lite 4 C and Maxi-Lite 4 H.

The “C” and “H” designation indicates the means of raising and lowering the lights to operating position. The “C” model uses a 120V electric winch system to erect and extend the three section mechanical tower.

The “H” designates a hydraulic system which both erects and extends the mast to operating position.

Specific operating instructions and specifications are contained in this publication to familiarize the operator and maintenance person with the correct and safe procedures necessary to maintain and operate this equipment.

Take time to read this book thoroughly. If you are uncertain about any of the information presented, contact your dealer for clarification before operation.

SAFETY SYMBOL

The purpose of the SAFETY INFORMATION SYMBOL shown below is to attract your special attention to safety related information contained in the text.

⚠️ SAFETY WARNING!

● FAILURE TO UNDERSTAND AND COMPLY WITH SAFETY RELATED INFORMATION AND INSTRUCTIONS MAY RESULT IN INJURY TO THE OPERATOR OR OTHERS. IF YOU DO NOT UNDERSTAND ANY PART OF THIS INFORMATION, CONTACT YOUR DEALER FOR CLARIFICATION PRIOR TO OPERATING EQUIPMENT.

NOTE

The word NOTE is used to bring your attention to supplementary information relating to various aspects of proper operation and maintenance.

NOTE: Keep this book accessible during operation to provide convenient reference.

NOTE: Any reference in this manual to LEFT or RIGHT shall be determined by looking at the trailer from the REAR.
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SAFETY DECALS

⚠️ SAFETY WARNING!

- ALWAYS REPLACE ANY SAFETY AND INSTRUCTION DECALS THAT BECOME DAMAGED, PAINTED OVER OR OTHERWISE ILLEGIBLE.

Refer to these representations of the safety warning decals used on the MAXI-LITE 4 to insure correct ordering if replacement becomes necessary.

**DANGER**

HIGH VOLTAGE

PART NO. D-002
Location: Ballast compartment cover.

**WARNING**

POSSIBLE HEAD CONTACT AREA. BE AWARE OF COMPONENTS TO AVOID POSSIBILITY OF INJURY.

PART NO. D-140
Location: Bottom of tower, above jack; Top of tower, near light bar; On air duct inside left door.

**WARNING**

Check for overhead obstructions before raising or lowering mast.

PART NO. D-005
Location: Inside control panel.

**WARNING**

Do not stand in front of Mast or underneath rear of Mast when raising or lowering.

PART NO. D-003
Location: On left front corner and left rear corner of enclosure.

**WARNING**

FALLURE TO USE GROUND ROD COULD LEAD TO SEVERE INJURY OR DEATH.

PART NO. D-023
Location: Top of inner fender, engine side.

**WARNING**

Chain Drive: Keep fingers, hands and loose clothing clear.

PART NO. D-006
Location: Chain guard.

**WARNING**

This trailer is equipped with three sliding outrigger jacks and one tongue jack. Two sliding jacks extend from the sides and one extends from the rear. All outriggers must be extended with all jacks firmly against ground, leveling trailer, before raising mast. D-131

PART NO. D-131
Location: Inside control panel door.

**WARNING**

Non-vertical tower can cause severe injury or death. Do not lower the tower to the horizontal position unless the Lift Spring and Pin assembly at the front of the mast securely locks the sections together.

PART NO. D-152
Location: Inside control panel door.

**WARNING**

LIFTING INSTRUCTIONS

A MINIMUM OF TWO LIFTING CAPACITY IS REQUIRED TO LIFT THIS MACHINE.

RETURN LIFTING:

1. Lower outrigger to the outrigger pin (above shown) is fully lowered and secure to trailer.
2. Lower lift spring and pin assembly.
3. Remove rear end attachment.
4. Pull out rear wheels and move to work distance away.

Lifting must be performed in a controlled manner, the作家 personnel on or near the machine and keep a distance away. Failure to follow these instructions could result in severe injury or death.

PART NO. D-153
Location: On roof above control panel door.

**WARNING**

PART NO. D-150
Location: Outside left door panel.
MODEL AND SERIAL NUMBERING SYSTEM

MODEL NUMBERING SYSTEM

EXAMPLE: ML4C AOMXV
Maxi-Lite 4 / Cable electric tower / LPA-3 / Allmand generator / Metal Halide lamps / Taillights / Visors
ML4 - Indicates Maxi-Lite 4
C - Cable electric tower, 120V winch
H - Hydraclu tower, 12V hydraulic power unit
A - Lister LPA-3 Alpha series diesel
T - Lister TS-2 diesel
O - Allmand 6KW generator
P - Pow’R Gard 6.5KW generator
N - Newage generator
L - Lima 5.5 or 8KW generator
(8KW available with TS-2 only)
M - Metal Halide, multi-vapor lamps
H - High pressure sodium lamps (Lucalux)
R - Electric rotating light bar
X - Optional stop, turn & tail lights
V - Visors
S - Sound attenuation package

Any variations in the above numbering system indicate a special option not standard in production, and any reference to a non-standard model should include complete model number as shown on model number plate located on L.H. side of front tower support.

SERIAL NUMBERING SYSTEM

EXAMPLE: 85-01-30
85 - year of manufacture
01 - month of manufacture
30 - Allmand code indicating that this unit was the 30th produced that month.

SERIAL NUMBER LOCATION

Trailer: All Maxi-Lite 4 models have a serial number plate attached to the left hand side of the drawbar.
Generator: Plate attached to the top of the generator housing.
Engine: Plate attached to the engine.
LPA-3: Top of intake manifold
TS-2: Top of engine, near valve covers

DESCRIPTION OF MODELS AND OPTIONS

CABLE ELECTRIC TOWER WINCH SYSTEM
The Maxi-Lite 4 C mast is operated by a 1/2 HP 120 volt, 10 amp totally enclosed thermally protected motor. The motor drives through a direct coupled worm gear speed reducer to a chain driven winch drum, including a torque limiting clutch.

The ML-4 C includes a standard rotating light bar, which the operator can position from the ground with the tower fully extended.

HYDRAULIC MAST SYSTEM
The Maxi-Lite 4 H tower system is powered by a totally self-contained 12 volt hydraulic power unit. It consists of a 5-gallon reservoir and DC drive motor.

The operator controls all functions with two double-throw toggle switches, activating solenoid cartridge valves.

RECOMMENDED FLUID:
Mobil AERO HFA Aviation Hydraulic Fluid or equivalent.

The Maxi-Lite 4 H is offered with an optional electric light bar enabling the operator to direct the lights anywhere within a 360° circle from the ground while the lights are in operation and the mast is in the fully erected position.

The electric rotating light bar consists of a formed steel frame which is affixed to the top mast section by means of a rotating spindle. The light bar frame has a linear actuator attached to itself which when activated rotates the light bar frame about the spindle 360° through a chain and sprocket linkage.

The actuator contains a 120V motor which can be operated from the ground by the operator.
Fig. 1 Control Panel

1. Switch, Breaker (Lights 1 through 4)
2. Switch, Breaker, 120V Receptacles
3. Switch, Breaker, 240V Receptacle
4. Switch, Electric Rotator (if equipped)
5. Switch, Electric Winch
   Push button switch operates electric winch to raise and lower mast.
6. Hour Meter
   Shows total elapsed hours of engine operation.
7. Voltmeter
   Indicates charging circuit voltage.
8. Ignition ON/OFF Switch
9. Pre-heat and Start Assist Switch
   Push to activate fuel solenoid and glow plug prior to and while depressing start switch.
10. Start Switch
    Push to start.
11. Latch Handle
    Pull to release spring loaded tower latch.

Fig. 2 Ballast Compartment

⚠️ SAFETY WARNING!

- HIGH VOLTAGE! DO NOT ATTEMPT TO TEST AND REPAIR GENERATOR AND BALLAST ELECTRICAL SYSTEMS UNLESS YOU UNDERSTAND AND ARE QUALIFIED TO WORK ON SUCH SYSTEMS.

12. Terminal Board
13. 240 Volt DC Outlet Receptacle (15 Amp)
14. Ballast, Lamps 1 through 4
15. 120 Volt Outlet Receptacles (Ground fault)
16. Grounding Lug
   Attach ground rod wire here.
17. Ground Rod

⚠️ SAFETY WARNING!

- FAILURE TO USE GROUND ROD COULD LEAD TO SEVERE INJURY OR DEATH!

18. Air Duct with Pre-filter (if equipped)

19. Spring Loaded Tower Latch
20. Fuel Filter
21. Air Cleaner

22. Flat Spring with Interlocking Pin

Pin interlocks tower sections, preventing extension of mast until it has first been raised from horizontal to vertical. The spring contacts the front tower support as the tower reaches vertical, then retracts the pin, permitting extension of the retracted sections.

⚠️ SAFETY WARNING!

- FLAT SPRING WITH INTERLOCKING PIN SHOULD ALWAYS BE VISUALLY INSPECTED AFTER LOWERING MAST, TO ENSURE THAT IT HAS ENGAGED INNER SECTIONS. THIS PIN PREVENTS EXTENSION OF THE MAST SECTIONS DURING TOWING AND ALSO PREVENTS MAST FROM EXTENDING BEFORE IT HAS REACHED VERTICAL.

- INSPECT THIS PIN REGULARLY FOR LOOSE BOLTS AND POSSIBLE CRACKS OR WEAR ON THE PIN. IF ANY ABNORMAL WEAR APPEARS, REPLACE THE PIN.
23. Spring Loaded Tower Latch
   Locks tower into vertical position. Released with red tower release lever inside control panel.

⚠️ SAFETY WARNING!

● ENSURE SPRING LATCH IS ENGAGED BEFORE MAST IS EXTENDED VERTICALLY. MAST MAY OVERTURN AND FALL TO HORIZONTAL POSITION IF LATCH IS NOT ENGAGED.

24. Cable Pulley (needle bearing)

25. Retainer, Light Bar
26. Roll Pin, Retaining Pin
27. Pin
   Locks light bar in position for transporting.

28. Pin
   Retains outriggers in retracted position for towing. Right side and left side of Maxi-Lite.
29. Pin  
Retains rear outrigger in retracted position for towing.

30. Snap Ring  
Retains jack on outrigger.

31. Jack Pin  
Pull to allow jack to rotate.

⚠️ SAFETY WARNING!

- EXERCISE CARE WHEN RELEASING PIN. SPRING ACTION CAN PINCH FINGERS BETWEEN PIN AND JACK.

32. Jack Handle  
Crank handle to raise and lower foot of jack to level trailer.

33. Outrigger Jack

34. Pin  
Locks tower into rear tower support.

35. Rear Tower Support
36. Reversible Hitch
   2" ball and pintle hitch.
37. Safety Tow Chains

38. Lift Ring
   CAUTION! Lift at this point only with rear tower support pin locked. See item 34, Fig. 11.

39. Winch, 90° Worm Drive
   Winch attaches to telescopic drive line inside tower, attached to light bar.
40. Winch Handle
41. Spring Latch
   Secondary latch, which automatically locks tower in vertical position when mast is extended.
42. Strike
   Spring loaded tower latch, item 23, Fig. 6, engages this strike when the tower is vertical.
CONTROLS AND COMPONENTS, HYDRAULIC ONLY

1. Switch, Breaker (Lights 1 through 4)
2. Switch, Breaker, 120V Receptacles
3. Switch, Breaker, 240V Receptacle
4. Switch, Electric Rotator (if equipped)
   NOTE: Electric rotating light bar can rotate 360°. When limit has been reached in one direction, reverse the switch to rotate in the opposite direction.
   NOTE: Do not hold the switch in either position after limit has been reached.
5. Hour Meter
   Shows total hours of engine operation.
6. Voltmeter
   Indicates charging circuit voltage.
7. Ignition ON/OFF Switch
8. Pre-heat and Start Assist Switch
   Push to activate fuel solenoid and glow plug prior to and while depressing start switch.
9. Start Switch
   Push to start.
10. Lift Cylinder Switch
    Lift switch to raise tower from horizontal to vertical, push down to lower from vertical to horizontal.
11. Extend Cylinder Switch
    Lift switch up to extend telescopic cylinder, push down to retract telescopic cylinder.
12. Red Tower Release Lever
    Pull to release spring loaded tower latch (item 15, Fig. 17).
13. Flat Spring with Interlocking Pin
    Pin interlocks tower sections when raising and lowering and during towing.
14. Lock Valve
    Position handle horizontal as shown to prevent fluid from seeping back to reservoir.
15. Spring Loaded Tower Latch
   Locks tower into vertical position. Release with red tower release lever inside control panel.
   (See item 12, Fig. 15.)
16. Lift Cylinder
   Raises tower from horizontal to vertical.
17. Flow Control Valve
   Adjusts flow to cylinder to control speed of erecting and lowering. (Restricts flow of hydraulic fluid.)

18. Fill Cap, Hydraulic Reservoir
19. Sight Level Gauge
   Oil level should be visible when the tower is in the towing position.
20. Solenoid, 12V (Hydraulic Power Unit)
SPECIFICATIONS

GENERATOR
The generator is a 6000 watt permanent magnet, self-excited controlled output, brushless type and bearingless, capable of supplying 120/240 volt A.C. 60 cycle for continuous or intermittent duty. The generator is directly bolted to the engine flywheel and is covered by a 10-year limited warranty.

NOTE: This alternator is not a wound field generator and, therefore, will not produce an initial overload surge of electrical power over and above its rated output. This limited output protects it from burnout due to overload. However, it should never be used to start electrical motors that require more power than its rated output, as damage to the electrical motor could result.

FLOOD LIGHT ASSEMBLY
Four one thousand watt lamps in spring-mounted fixtures sealed for all weather use. Lamps can be either 1000 watt metal halide or 1000 watt high pressure sodium.

1000 WATT MULTI-VAPOR - Metal halide. Laboratory rated life is 12,000 hours.
- Lumen rating: 107,800
- Warm-up time: 2-4 minutes
- Restart time: 10-15 minutes

1000 WATT LUCALUX - High pressure sodium, often referred to as H.P.S. Laboratory rated life is 24,000 hours.
- Lumen rating: 140,000
- Warm-up time: 3-4 minutes
- Restart time: 1 minute

NOTE: A trailer equipped with multi-vapor lights and a trailer equipped with Luclux lights use different ballasts and starters. Therefore, it is not advisable to interchange bulb types.

NOTE: Fixtures containing position-oriented sockets can also use standard lamps.

TRAILER
The complete generator is housed in a lockable enclosure with the frame fabricated from heavy gauge steel mounted on a two-wheel, leaf spring axle.

The design enables the trailer to contain the outriggers in a simple compact position.

When the mast is in the operating position it is located in the middle of a four point outrigger system for optimum balance and stability. This system was engineered to allow the light plant to remain operational in sustained winds of 65 MPH with the mast extended to full height and the outriggers in position.

The design includes an adjustable-height reversible hitch, which includes a 2" ball and pintle hook hitch.

MAST
Three-section steel tube mast, which extends to 30 feet. The mast is extended by a single electrically driven cable winch system or an optional hydraulic system (designated by "C" or "H")

ENGINE
Lister LPA-3 Alpha Series, direct injection
3 Cylinder
- Displacement: 66.44 cu. in. (1088.75 cc)
- Bore: 2.99 in. (7.6 cm)
- Stroke: 3.15 in. (8.0 cm)
- Power output: 12.1 BHP continuous
- Power output derating: 3.5% for every 1000 ft. (305 m) above sea level
- Air inlet temp.: 2% for every 10° F (4.7° C) above 85° F (29.4° C)
- Fuel: Diesel
- Fuel consumption: 0.46 gal (1.74 L/hr) at 63% load
- Starting: 12V electric
- Oil sump capacity (excluding filter): 4.43 US qt. (4.16L)
- Low oil pressure and high engine temp. shutdown standard

OPTIONAL ENGINE
Lister TS-2 Diesel
2 Cylinder
- Displacement: 77 cu. in. (1261.8 cc)
- Bore: 3.75 in. (9.5 cm)
- Stroke: 3.50 in. (8.9 cm)
- Power output: 14.7 BHP continuous
- Power output derating: 3.5% for every 1000 ft. (305 m) above sea level
- Air inlet temp.: 2% for every 10° F (4.7° C) above 85° F (29.4° C)
- Fuel: Diesel
- Fuel consumption: 0.43 gal (1.63 L/hr) at 50% load
- Starting: 12V electric
- Oil sump capacity: 4.2 US qt. (3.97 L)
- Low oil pressure and high engine temp. shutdown standard

MAXI-LITE DIMENSIONS
- Height lowered: 5' 9" (1.75 m)
- Height raised: 30' (9.14 m)
- Length: 14' (4.26 m)
- Width: 6' 3" (1.9 m)
- Outrigger width: 11' 6" (3.5 m)
- Trailer: Structural steel frame, Leaf spring axle, Wheels & tires: 15" (.38 m)

DOMESTIC SHIPPING WEIGHT
Domestic: 4-Light Model
- Fixtures: 48 lbs. ea. = 192 lbs. (87.09 kg)
- Mast: 350 lbs. (158.76 kg)
- Trailer: 2,208 lbs. (1001.53 kg)
- Total weight: 2,750 lbs. (1247.38 kg)
FUEL AND LUBRICATING OIL
The temperatures mentioned in the table are the ambient temperatures at the time the engine is started. However, if the running ambient temperatures are much higher than the starting temperatures, a compromise must be struck and a higher viscosity oil used (provided starting is satisfactory). Multigrade oils overcome the problem, provided they have a suitable specification.

NOTE: In testing this engine at the factory, we use fuel and oil for moderate temperature. Replace with proper weight fuel and oil if engine is to be used in low temperature. Additional information on fuel and lubricating specifications can be found in the Lister Industrial Engine Operator's Handbook.

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<td>Monograde</td>
<td>Multigrade</td>
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<tr>
<td></td>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>Below</td>
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<tr>
<td>Above</td>
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See engine operator's handbook for further specifications.
OPERATION

NOTE: In conditions of high ambient temperature, operating the Maxi-Lite with the doors open improves cooling and will increase the life of the components. (This will increase the level of noise slightly.)

TOWING INSTRUCTIONS

BEFORE TOWING THE MAXI-LITE 4, THE TRAILER SHOULD BE INSPECTED VISUALLY TO ENSURE THAT THE FOLLOWING OPERATIONS HAVE BEEN COMPLETED:

1. Hitch is securely attached to towing vehicle (safety chain secure—use 9" wrench to tighten).
2. All outriggers and jacks are retracted and secured.
3. Rear tower support pin is in place (see Fig. 11).
4. Light fixtures are positioned for transport.
5. Light bar lock pin is engaged (see Fig. 7).
6. Doors are closed and secure.
7. Check for adequate tire pressure.
8. Taillights are connected and operating (if equipped).
9. Ground rod is removed from ground and secured in trailer (see Fig. 3).
10. Spring loaded pin (see Fig. 16) which interlocks telescopic sections is positioned properly.

ENGINE STARTING PROCEDURE

BEFORE STARTING:

1. Fill the engine with the right grade of lubricating oil (see page 15), to correct level (check dipstick).
2. Ensure there is an adequate supply of fuel.
3. Ensure that the air cleaner (see Fig. 4) is firmly attached and air canister seals and hose clamps are properly sealed. Air cleaner element should be checked and replaced if necessary (Part #340036).

STARTING ENGINE:

NOTE: LPA-3 Lister includes a glow plug cold start system controlled by the pre-heat switch on the control panel. This switch also activates the fuel solenoid for quick starts. Use the pre-heat switch routinely during engine starts.

1. Turn ON/OFF toggle switch to the up (ON) position.

2. Depress pre-heat, start-assist switch, engaging the fuel solenoid and powering the glow plug. Hold in until step 3 (below) has been completed.

NOTE: At temperatures below 30°F, depress the pre-heat switch for approximately one minute before going on to step 3.

3. Depress start switch until the engine fires. Release pre-heat switch and start switch as soon as the engine starts.

NOTE: To prevent equipment damage, do not hold start switch in for more than 10 seconds. Allow cool down time between cranking intervals.

LOW OIL PRESSURE SHUT-OFF SYSTEM

NOTE: See schematic section, page 28, for wiring circuit of low oil pressure shut off system.

DESCRIPTION OF OPERATION

By depressing the pre-heat switch, the fuel solenoid is energized. The solenoid plunger is drawn into the coil and activates the fuel control linkage to RUN position. When the engine starts, adequate engine oil pressure at the oil pressure switch will maintain the solenoid in the energized position. The pre-heat switch can be released as soon as the engine starts.

Should a LOW OIL PRESSURE CONDITION occur, the sending unit breaks the circuit between the battery and the solenoid, allowing the spring load to immediately move the fuel control to the fuel shut off position.

A 10A inline fuse protects the solenoid from electrical damage.

STOP the engine by flipping the toggle switch to the OFF position.
DESCRIPTION OF OPERATION

The Allmand Bros. cable telescoping mast consists of three sections, a 31/2" round inner tube supported by a 4" square section surrounded by a 5" square section which is attached to the trailer at its mast pivot. The 5" section includes roller guides for smooth operation.

The system includes a single electric winch and two 1/4" cables. As the first cable is reeled up on the winch drum, the mast is first raised from horizontal to vertical because the telescoping sections are locked together with a flat spring containing a pin which prevents extension until the mast is vertical. When the mast is erected to the vertical position, the flat spring contacts the trailer frame, removing the pin from the mast sections and permitting the telescoping extension of the mast.

The trailer has a spring loaded latch assembly (see Fig. 6) which, when the mast is raised to vertical position, locks the mast in the vertical position. This eliminates the need to manually insert a safety pin.

The design also includes a secondary automatic spring loaded latch (see Fig. 14), which locks the mast in the vertical position when the mast sections are extended vertically. Alternately, it releases when the mast sections are retracted.

As cable is continually reeled up, the mast telescopes to vertical with both the 31/2" round and 4" square sections extending at the same time due to the 4" square section acting on the second cable, which is attached to the bottom of the round section and the top of the 5" section.

When the vertical extension limit is reached, the sections contact a stop pin on the side of the 5" section, preventing overextension.

Upon reaching the extension limit, the operator should discontinue operation of the electric winch. The electric winch system design also includes a torque limiting clutch to prevent damage to the mast and cables when the vertical extension limit is reached.

When the mast is lowered, cable is reeled off the winch drum, allowing the 31/2" round and 4" square sections to be lowered to the fully retracted vertical position. At this position the spring loaded tower latch assembly can be released manually (see Fig. 1 for tower release lever location); the secondary spring loaded latch (see Fig. 14) releases automatically.

As more cable is reeled off the winch drum, the mast proceeds toward horizontal, with telescoping prevented by the flat spring pin which has now engaged the 31/2" round and 4" square sections.

SAFETY WARNING!

- Always check for overhead obstructions before raising and lowering mast. Allow 35' clearance. Avoid all overhead electrical wires.

- To prevent instability and help ensure safe operation, always provide proper ground support before raising mast.

- Before raising mast, visually inspect equipment for damage or wear. Familiarize yourself with the location and function of all operating parts by studying this manual. Observe all caution decals located on equipment.

TO ERECT MAST AND RAISE LIGHTS:

1. Extend both side outrigger jacks and one rear outrigger jack to stabilize and level the trailer. Red tags on the outriggers indicate when they are fully extended.

2. Attach the ground rod to the grounding lug (see Fig. 2) and drive the ground rod into the earth for adequate electrical ground.

3. Release the pin that prevents light bar rotation (see Fig. 7).

4. Release the pin that secures the mast to the rear mast support (see Fig. 11).

5. The electrical breaker switch on the control panel (see Fig. 1) marked 120V must be ON.

6. Operate electric winch switch marked UP (Fig. 1) to erect mast from horizontal to vertical.

NOTE: This is a two stage operation—when the mast reaches vertical, release the switch and check to ensure the spring loaded tower latch is engaged with the strike to hold the mast vertical before proceeding (viewed through open door—See Fig 6).
7. Operate winch switch to extend tower to desired height. When complete extension has been reached, release winch switch.

NOTE: The Maxi-Lite 4 C system includes a torque limiter to prevent damage when tower extension is completed. For more details, see electric winch system, page 16.

8. Lights are turned on with circuit breakers (marked LIGHTS) on the control panel (see Fig. 1). Lights will not attain full brilliance for several minutes.

NOTE: When the lights are switched OFF and then ON, it will take 5 to 15 minutes to re-ignite the bulb.

TO LOWER MAST:

1. Turn off lights.

2. Operate electric winch switch DOWN button until the mast is fully retracted.

3. Rotate light bar parallel to the axle.

4. Pull back red tower release lever to release the spring loaded tower latch. Hold lever back until step 3 is started and mast has begun to tilt horizontally, to prevent the latch from re-engaging and causing the cable to slacken.

SAFETY WARNING!

● IF THE SWITCH IS OPERATED WHILE THE LATCH IS STILL ENGAGED, THE CABLE SLACKENS. WHEN THE LATCH IS RELEASED, THIS CONDITION COULD ALLOW THE MAST TO FALL HORIZONTALLY UNTIL IT TAKES UP THE SLACK, POSSIBLY CAUSING PERSONAL INJURY OR EQUIPMENT DAMAGE.

5. Press winch switch DOWN button and start to lower mast from vertical to horizontal position. Stop after the mast has moved a few degrees off vertical and check to verify that the flat spring and locking pin (see Fig. 5) has properly engaged.

SAFETY WARNING!

● AS MAST ROTATES AWAY FROM FRONT TOWER SUPPORT, VISUALLY INSPECT FLAT SPRING AND LOCKING PIN (Fig. 5) TO ENSURE THAT THE PIN HAS ENGAGED IN INNER TOWER SECTIONS. IF IT HAS NOT ENGAGED, STOP, EXAMINE THE MECHANISM AND REPAIR IT IF NECESSARY. WHEN IT ENGAGES SATISFACTORILY, THE MAST CAN BE LOWERED TO HORIZONTAL POSITION.

6. Operate winch switch to lower mast to horizontal position.

NOTE: To avoid possible damage to the lights, the light bar should be in a position parallel to the trailer axle as the mast it is lowered, to ensure the lights will not contact the rear outrigger as the mast comes down.

7. Secure pin locking mast to rear mast support.

8. Retract the two side outrigger jacks, one rear outrigger jack and tongue jack and secure before towing.

NOTE: Ensure the detent pins are properly engaged in the outriggers before towing.

9. Secure pin preventing light bar rotation. (Operate worm drive winch handle (see Fig. 14) as required to rotate the light bar into position so the pin will engage.)

10. Remove ground rod from earth and secure in trailer.
EMERGENCY MAST OPERATION (C only)
LOWER MAST FROM AN AUXILIARY POWER SUPPLY WHEN CURRENT IS NOT AVAILABLE FROM GENERATOR SET:

Electric winch can be operated from an outside power source should the engine-generator set fail to function. Simply unplug the male-female electrical connector located inside below the control panel and plug the male end into the extension cord and an auxiliary 120 volt power supply. This method can be used to lower the cable electric mast to the towing position should the generator set need fuel, repairs, etc.

ELECTRIC WINCH SYSTEM

The Maxi-Lite 4 C mast is operated by a 1/2 HP 120 volt, 10 amp totally enclosed thermally protected motor. The motor drives through a direct coupled worm gear speed reducer to a chain driven winch drum. (See Fig. 4.)

The winch system has a slip clutch mounting the large chain sprocket that slips when an overload condition occurs. The clutch is set and tested at the factory but may require adjustment through normal use.

⚠️ SAFETY WARNING!

● WHENEVER ADJUSTMENT IS MADE ON THE WINCH SYSTEM, THE CIRCUIT BREAKER SHOULD BE IN THE OFF POSITION, WITH NO ENGINE GENERATOR OPERATION, TO PREVENT PERSONAL INJURY.

TORQUE LIMITER ADJUSTMENT:

If the large chain sprocket slips on the winch drum shaft when the tower is being raised, the TORQUE LIMITER NEEDS ADJUSTMENT.

ADJUSTMENT PROCEDURE:

1. There should be no tension on the lower cable, so the clutch should be adjusted when the tower is resting in the horizontal position or standing in the retracted vertical position with the spring loaded lock pin engaged in the strike plate.
2. Roller chain must be installed on the drive and driven sprocket to prevent winch drum from turning (see Fig.4).
3. Loosen two set screws in large adjusting nut.
4. Tighten adjusting nut to 185 ft. lbs. Tighten set screws and check for proper operation. If necessary, increase torque until adequate to raise mast without slipping.

NOTE: The clutch should be set to the minimum torque necessary to raise the mast, but when the mast has reached full extension the clutch should slip, preventing damage to the cable and motor.

NOTE: The winch motor is thermally protected against overload, controlled and protected by a 15A circuit breaker.

ROUTINE MAINTENANCE AND INSPECTION OF WINCH SYSTEM:

The following maintenance and inspection should be performed on a regular basis depending on use:

1. Make sure all mounting fixtures and bolts are secure.
2. Lubricate and adjust the chain.
3. Check the condition of the steel cable and make sure it is properly secured.
4. Lubricate the needle bearings in the cable sheave at the bottom of the front tower supports.
5. Check the worm drive speed reducer for adequate lubrication.
6. Lubricate the winch drum pillow block bearings.

NOTE: This winch system can be operated without engine/generator operation. There is a male-female electrical connector located inside, below the control panel. Unplug and connect the male lead to an adequate 120V power supply.
HYDRAULIC MAST OPERATION

DESCRIPTION OF OPERATION

The Allmand Bros. hydraulic telescoping mast consists of a hydraulic cylinder and a two piece supporting structure consisting of a 4" steel section which is supported by a surrounding 5" steel section.

The telescopic cylinder is mounted with the largest end being the top of the mast and the smallest end supported and fixed inside the bottom of the 5" steel section.

As the cylinder is filled with fluid the largest cylinder end extends first, due to its hydraulic advantage. It extends approximately 1/3 mast height until it contacts a pin in the 4" steel section, which is then pulled up. The cylinder continues upward until the middle sized hydraulic cylinder section telescopes, continuing to carry the 4" steel support until it reaches a stop bolt located in the 5" steel support section. When that stop bolt is reached, all hydraulic fluid is diverted over a pre-set relief valve until the operator releases the switch.

By using the hydraulic cylinder's largest end as the top of the mast, we eliminate the need for a 3-section supporting mast. The hydraulic cylinder is the sole lifting member and also serves as the top section of the mast to which the light bar is attached.

The mast has rollers which support the sections and reduce friction as they are extended.

The hydraulic mast is raised from the horizontal to vertical position by another hydraulic cylinder which has one end attached to the 5" support section and the other end to the trailer frame.

The tower pivots from horizontal to vertical and back with the pivot pin being on the opposite side of the 5" section as to the direction it lays down. Therefore, the weight of the mast enables it to lay itself down by gravity alone when hydraulic pressure is relieved.

The mast also has a locking feature which prevents the sections from being extended until they are in the vertical position.

This consists of a flat spring containing a pin which prevents the sections from being extended until they are in the vertical position (see Fig. 5). The pin fits through aligning holes in the 4" & 5" steel sections and contacts a shaft attached to the large end of the hydraulic cylinder.

When the tower is erected to the vertical position, the flat spring contacts the trailer frame, removing the pin from the mast sections and permitting the telescoping extension of the mast.

The mast also has a spring loaded locking pin located inside enclosure (see Fig. 6) which, when the mast is raised from the horizontal to vertical position, contacts the strike until it engages and locks in place. This eliminates the need to manually insert a safety pin.

TO ERECT HYDRAULIC MAST AND RAISE LIGHTS:

⚠️ SAFETY WARNING!

- BEFORE RAISING MAST, VISUALLY INSPECT EQUIPMENT FOR DAMAGE OR WEAR.
- FAMILIARIZE YOURSELF WITH THE LOCATION AND FUNCTION OF ALL OPERATING PARTS BY STUDYING THIS MANUAL. OBSERVE ALL CAUTION DECALS LOCATED ON EQUIPMENT.
- ALWAYS CHECK OVERHEAD OBSTRUCTIONS BEFORE RAISING AND LOWERING MAST.
- WHEN SETTING UP MAXI-LITE 4 FOR OPERATION, ATTENTION SHOULD BE PAID TO LOCATION TO ASSURE SAFE OPERATION. OVERHEAD OBSTRUCTIONS, OVERHEAD ELECTRICAL LINES AND IMPROPER GROUND SUPPORT ARE TYPICAL LOCATION HAZARDS.

1. Extend both side outrigger jacks and one rear outrigger jack. Use outrigger jacks as well as tongue jack to level trailer.

⚠️ SAFETY WARNING!

- WHEN EXTENDING OUTRIGGERS AND JACKS, WATCH TO ENSURE YOU ARE CLEAR OF THE OVERHANGING ENDS OF THE MAST BEFORE YOU BEND OVER OR STAND UP.

NOTE: Jacks must be placed on firm footing for safe operation.

2. Attach the ground rod to the grounding lug (see Fig. 2) and drive the ground rod into the earth for adequate electrical ground.

3. Release the pin that secures the mast to the rear mast support (see Fig. 11).

4. Operate lift cylinder switch UP to raise mast from horizontal to vertical (spring loaded tower latch should engage).

5. Assure that the 1/4 turn ball valve on the bottom of the tower is in the open position.

6. Operate the extend cylinder switch UP to extend the mast to the full vertical position or to the desired height.

⚠️ SAFETY WARNING!

- DO NOT ATTEMPT TO EXTEND MAST WITH EXTEND CYLINDER SWITCH UNTIL MAST IS IN VERTICAL POSITION AND THE SPRING LOADED SAFETY PIN IS ENGAGED.
7. Close the 1/4 turn ball valve on the bottom of the mast to prevent the mast from bleeding down.

8. Lights are turned on with circuit breakers (marked LIGHTS) in the outlet box (Fig. 15). Lights will not attain full brilliancy for several minutes.

NOTE: When lights are switched OFF and then back ON, they require 5 to 15 minutes before they will re-ignite.

TO LOWER HYDRAULIC MAST:

NOTE: Engine does not need to be running when lowering hydraulic mast.

⚠️ SAFETY WARNING!

● VISUALLY INSPECT EQUIPMENT FOR DAMAGE BEFORE OPERATING. ALLOW ADEQUATE CLEARANCE AROUND TRAILER FOR TOWER AND ENSURE THAT NO PERSONS ARE STANDING IN FRONT OF OR BEHIND UNIT WHEN LOWERING.

1. If using optional light bar rotator, rotate lights so they will be parallel to ground when mast is horizontal.

2. Place 1/4 turn valve located at bottom of mast (Fig. 16) in open position (parallel to mast).

3. Operate extend cylinder switch DOWN to allow mast to retract to the lowest vertical position. When it bottoms out, release the switch.

4. Release the spring loaded tower latch from inside the control panel. Hold the red tower release lever back until step 5 is started and the mast has begun to tilt horizontally, to prevent the latch from re-engaging.

5. Operate lift cylinder switch DOWN to allow mast to move to horizontal position.

⚠️ SAFETY WARNING!

● MAKE SURE THAT THE FLAT SPRING PIN HAS RETRACTED AND THAT BOTH SECTIONS ARE FULLY COLLAPSED. DO NOT TOW THE MAXI-LITE 4 UNLESS THE RETAINING PIN IS ENGAGED AND THE MAST SECTIONS ARE LOCKED TOGETHER.
ROUTINE MAINTENANCE SCHEDULE

ELECTRIC WINCH SYSTEM:
The following maintenance and inspection should be performed on a regular basis depending on use:

1. Make sure all mounting fixtures and bolts are secure.
2. Lubricate and adjust the chain.
3. Check the condition of the steel cable and make sure it is properly secured.
4. Lubricate the needle bearings in the cable sheave at the bottom of the front tower supports.
5. Check the worm drive speed reducer for adequate lubrication.
6. Lubricate the winch drum pillow block bearings.

NOTE: The electric winch system can be operated without engine/generator operation by connecting to an adequate 120V power supply cord. There is a male-female electrical connector located inside the enclosure, below the control panel. Unplug and connect the male lead to an adequate 120V power supply.

ELECTRIC ROTATING LIGHT BAR ASSEMBLY:

1. At regular intervals, check the chain tension and clean and lubricate the chain guide, chain and chrome guide shaft.
2. Periodically adjust the chain on the rotating light bar assembly.

INSPECTION AND LUBRICATION SCHEDULE

Lubricating grease specifications: N.G.L.I. consistency #2, high-temperature, anti-friction, bearing lubricating grease.

Service intervals shown below have been established for operation under normal conditions. Where equipment is operated under severe conditions (very dusty, extreme heat or cold, etc.) affected items should be serviced more frequently.

<table>
<thead>
<tr>
<th>INTERVAL</th>
<th>ITEM</th>
<th>PROCEDURE</th>
<th>C</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily or 10 hrs.</td>
<td>Fuel oil level</td>
<td>Check and fill as necessary.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Lubricating oil</td>
<td>Check level and condition.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Precleaner filter (air cleaner)</td>
<td>Clean as necessary.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Air cleaner</td>
<td>Clean under very dusty conditions.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>125 hrs.</td>
<td>All 10 hr. items</td>
<td>As above.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Air cleaner</td>
<td>Change element if necessary or clean under moderately dusty conditions.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Battery</td>
<td>Check level of electrolyte.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Engine generator assembly</td>
<td>Check for fuel and lubricating oil leaks.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>250 hrs.</td>
<td>All 125 hr. items</td>
<td>As above.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Engine lubricating oil system</td>
<td>Drain lubricating oil, flush out system, renew filter element and refill with correct grade and type oil.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Fuel injector nozzles</td>
<td>Clean if the exhaust is dirty.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Fuel filter</td>
<td>Renew element if fuel not perfectly clean.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>INTERVAL</td>
<td>ITEM</td>
<td>PROCEDURE</td>
<td>C</td>
<td>H</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------</td>
<td>------------------------------------------------</td>
<td>---</td>
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</tr>
<tr>
<td>500 hrs.</td>
<td>All 250 hr. items</td>
<td>As above.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Fuel filter</td>
<td>Renew filter element.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Rotating light bar drive chain</td>
<td>Clean, lubricate and adjust.</td>
<td>Opt</td>
<td>Opt</td>
</tr>
<tr>
<td></td>
<td>Electric winch drum bearings</td>
<td>Grease.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tower pivot bearings</td>
<td>Grease.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Spring loaded tower latch inside enclosure</td>
<td>Clean and lubricate.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Electric winch drum drive chain</td>
<td>Clean, lubricate, and adjust.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydraulic power unit</td>
<td>Check fluid level.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>1000 hrs. or yearly</td>
<td>All 500 hr. items</td>
<td>As above.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Engine service</td>
<td>Decarbonize if the engine shows loss of compression or blow-by past the piston. Do not disturb otherwise.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Engine valves</td>
<td>Adjust clearance.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Engine service</td>
<td>Clean the cylinder and cylinder head finning under dusty conditions if necessary.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Engine service</td>
<td>Clean the restrictor banjo union at the top end of the lubricating oil feed pipe to each cylinder head.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Cable pulley at the bottom of the front mast support</td>
<td>Remove, clean and grease.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Cable pulleys on mast (5)</td>
<td>Inspect for wear. Clean and lubricate.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Electric winch 90° gear drive</td>
<td>Check fluid.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electric winch torque limiter</td>
<td>Inspect and adjust as necessary.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Axle wheel bearings</td>
<td>Clean and repack.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Fuel system</td>
<td>Clean sediment from tank.</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
OPTIONS SERVICE / GENERATOR REPLACEMENT

ROTATING LIGHT BAR

NOTE: The rotating light bar is an available option on MAXI-LITE 4 H.

Fig. 19
1. Linear Actuator
2. Idler Adjustment Plate
3. Adjusting Bolt

The Maxi-Lite 4 H is offered with an optional 360° rotating light bar, enabling the operator to direct the lights anywhere within a 360° circle from the ground while the lights are in operation and the mast is in the fully erected position.

The rotating light bar consists of a formed steel frame which is affixed to the top mast section by means of a rotating spindle. A linear actuator attached to the light bar frame (see Fig. 19) rotates the light bar frame about the spindle 360° through a chain and sprocket linkage.

The actuator contains a 120V motor which can be operated from the ground by the operator.

A clutch is built into the actuator which will slip when the actuator is extended or retracted to its limit, protecting motor and components from damage.

CAUTION:

- REGULARLY INSPECT THE LIGHT BAR AND THE CLAMPING ARRANGEMENT AFFIXING THE LIGHT BAR TO THE TOWER FOR DAMAGE. ALSO REGULARLY CHECK ALL NUTS AND BOLTS TO ENSURE THEY ARE TIGHT AND SECURELY FASTENED.

NOTE: Proper and regular maintenance should be given to the rotating light bar assembly. This includes keeping the chain tension correct and assuring that the chain guide, chain and chrome guide shaft are clean and well lubricated.

NOTE: The light bar system requires a capacitor for the 120V linear actuator. This capacitor is located in the ballast box.

ADJUSTMENT:

The rotating light bar assembly will need periodic adjustment of the chain. Procedure is as follows:

The idler adjustment plate (see Fig. 19) should be loosened from the frame by loosening two 1/2” bolts which secure it to the frame. The chain tension can then be adjusted by turning the adjusting bolt located within the light bar frame. When proper tension is attained, the two bolts attaching the idler adjusting plate to the frame can be retightened, as can the jam nut on the adjusting bolt (see Fig. 19). Recheck tension and check for proper operation.

MOUNTING ALLMAND GENERATOR TO LISTER TS-2 ENGINE ONLY:

1. Face of flywheel and engine bellhousing should be inspected for nicks to ensure a clean mounting surface for attachment of rotor and stator.

2. Face of generator rotor and stator should be inspected and be free of dirt, scratches, nicks, etc.

3. Engine should be set at T.D.C. #1 position.

4. With the engine at T.D.C. #1, the flywheel has one of the six mounting holes at the top. This hole (1) will be used in reference to timing the rotor.

5. To determine the corresponding mounting hole in rotor, locate the arrow stamped on the back side (opposite the mounting face) of the rotor. The mounting hole in rotor hub which most closely lines up with the arrow on the back of the rotor should index to the (1) hole in flywheel.

6. Attach the rotor to the engine flywheel with six 12 MM bolts (included). Torque evenly to 80 ft. lbs, in a staggered sequence.

7. Runout of rotor shaft should be checked and be within .005. If it is not, rotor mounting bolts should be loosened and retorqued in a different sequence until proper mount is achieved.

8. Stator can then be carefully slid over rotor and bolted to engine belt housing. A .030 air gap should be consistent between rotor and stator laminations.

NOTE: The rotor is permanently magnetized, so care should be taken when mounting or removing. Whenever the rotor and stator are separated, a certain amount of magnetism is lost in the rotor. Therefore, when separated parts leave the factory they are overly magnetized to account for this loss.

NOTE: Mounting an Allmand generator to a Lister LPA-3 is similar to the above; however, you can skip steps that involve timing the generator to the engine.
When one lamp does not light, TURN OFF THE GENERATOR and test the lamp by switching leads with a lamp that DOES light. DO NOT WEAR JEWELRY WHILE WORKING WITH ELECTRICITY! If the following procedures do not solve your problem, have the circuit tested by a licensed electrician. DO NOT attempt to test generator voltage or ballast electrical systems unless you are a qualified electrician. Consult the factory for voltage specifications and test procedures.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or more lights do not light up.</td>
<td>1. Circuit breakers in the outlet box are not turned on or have tripped.</td>
</tr>
<tr>
<td></td>
<td>2. Lamps are not allowed time to cool after last being lit. You must allow 15 minutes between the time the lights are shut off and the time they are restarted.</td>
</tr>
<tr>
<td></td>
<td>3. The lamp or lamps are burned out or broken.</td>
</tr>
<tr>
<td></td>
<td>4. One or more of the lamps are not screwed in securely.</td>
</tr>
<tr>
<td></td>
<td>5. Plug and socket at light bar not securely pushed together and locked.</td>
</tr>
<tr>
<td></td>
<td>6. The temperature of the ballast is below -20 degrees F. When the temperature of the ballast is below -20 degrees F. the efficiency of the capacitors in the ballast is not enough to ignite the lamps. For operations where the temperature of the ballasts falls below -20 degrees F. some means of warming the ballast must be used. It is suggested that a portable heater or heating tape be used to warm the ballast enough to ignite the lamps. Once the lamps have ignited the ballast will generate and maintain enough heat for normal operation.</td>
</tr>
<tr>
<td></td>
<td>7. A loose connection in the back of the lamp socket in the lamp holder.</td>
</tr>
<tr>
<td></td>
<td>8. A circuit breaker or breakers are defective.</td>
</tr>
<tr>
<td></td>
<td>9. A loose connection on the terminal board.</td>
</tr>
<tr>
<td></td>
<td>10. The generator and engine are not running up to speed (1800 R.P.M.) — results in low voltage.</td>
</tr>
<tr>
<td></td>
<td>11. A wrong style replacement lamp (requiring a different ballast) has been installed.</td>
</tr>
<tr>
<td></td>
<td>12. Too much power is being drawn from the auxiliary outlets.</td>
</tr>
<tr>
<td>Lights won’t rotate with automatic rotator.</td>
<td>1. Slip clutch nut is too loose, so clutch slips.</td>
</tr>
<tr>
<td>Battery charger has too little output when tested in shop.</td>
<td>1. Charger needs to be tested with the generator under load, because it works with induction current from the generator coils.</td>
</tr>
<tr>
<td>Tower will not go all the way up (hydraulic).</td>
<td>1. Hydraulic fluid level is low.</td>
</tr>
<tr>
<td>Mast will not raise (hydraulic).</td>
<td>1. 1/4 turn lock valve on mast is closed.</td>
</tr>
<tr>
<td></td>
<td>2. Dump valve is open.</td>
</tr>
<tr>
<td>Mast lowers too slowly (hydraulic).</td>
<td>1. Hydraulic fluid thick due to temperature. Open dump valve bypassing fluid to tank.</td>
</tr>
<tr>
<td>Tower extends as mast is being lowered to horizontal (electric winch).</td>
<td>1. Interlocking pin (Fig. 5) is not engaged, locking sections together.</td>
</tr>
</tbody>
</table>
SYSTEM SCHEMATICS

HYDRAULIC SYSTEM SCHEMATIC

<table>
<thead>
<tr>
<th>REF. NO.</th>
<th>ALLMAND NO.</th>
<th>DESCRIPTION</th>
<th>REF. NO.</th>
<th>ALLMAND NO.</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>320008</td>
<td>Telescopic Cylinder</td>
<td>14</td>
<td>320079</td>
<td>Adapter, 6NPTM–6JICM</td>
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<tr>
<td>2</td>
<td>320050</td>
<td>Air bleed screw</td>
<td>15</td>
<td>320426</td>
<td>Hydraulic power unit, 12V</td>
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<tr>
<td>3</td>
<td>320085</td>
<td>Nipple, 1/2 x 3 heavy-duty</td>
<td>16</td>
<td>320540</td>
<td>Filler breather cap</td>
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<tr>
<td>4</td>
<td>320086</td>
<td>Adapter, 8NPTF–8JICM</td>
<td>17</td>
<td>320530</td>
<td>Hose</td>
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<tr>
<td>5</td>
<td>320036</td>
<td>Hose</td>
<td>18</td>
<td>320545</td>
<td>Solenoid coil</td>
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<tr>
<td>6</td>
<td>320054</td>
<td>Bulkhead, 90°–8JICM–\</td>
<td>19</td>
<td>320534</td>
<td>Hose</td>
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<tr>
<td></td>
<td></td>
<td>8JICM–90° Bulkhead</td>
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<tr>
<td>7</td>
<td>320083</td>
<td>Adapter, 8NPTF–8JICFX</td>
<td>20</td>
<td>320030</td>
<td>Erecting cylinder</td>
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<tr>
<td>8</td>
<td>320084</td>
<td>Nipple, 8NPTM–8NPTM</td>
<td>21</td>
<td>320078</td>
<td>Adapter, 6NPTM–4JICM</td>
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<tr>
<td>9</td>
<td>320088</td>
<td>1/2” 1/4 turn ball valve</td>
<td>22</td>
<td>320087</td>
<td>Flow control valve</td>
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<tr>
<td>10</td>
<td>320077</td>
<td>Adapter, 8NPTM–8JICM</td>
<td>23</td>
<td>320080</td>
<td>90° Elbow, 4NPTM–6JICM</td>
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<td>11</td>
<td>320038</td>
<td>Hose</td>
<td>24</td>
<td>320550</td>
<td>Sight glass</td>
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<tr>
<td>12</td>
<td>320532</td>
<td>Hose</td>
<td>25</td>
<td>320555</td>
<td>UP cartridges only</td>
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<tr>
<td>13</td>
<td>320076</td>
<td>Adapter, 60RM–6JICM</td>
<td>26</td>
<td>320560</td>
<td>DOWN cartridge only</td>
</tr>
</tbody>
</table>
HYDRAULIC POWER UNIT SCHEMATIC
TAIL LAMP WIRING SCHEMATIC

MAST ELECTRICAL WIRING SCHEMATIC
MAST ELECTRICAL WIRING with OPTIONAL ROTATING LIGHT BAR
BALLAST BOX WIRING SCHEMATIC — CABLE ELECTRIC MULTI-VAPOR BALLASTS