

AllmandTM

MAXI-LITE V-SERIES

ML 15/ML 20 OPERATOR'S MANUAL

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AllmandTM **MAXI-LITE SERIES**

For Parts and Updates visit Allmand on the Web at www.allmand.com

INSPECTION CHECK LIST

FOR PREPARING THE MAXI LITE FOR DELIVERY OR RENTAL

The **MAXI LITE V-SERIES** requires service as well as proper operation in order to provide the performance and safety it has been 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 tower latch and knob assembly which locks the tower in the vertical position for proper operation
- Check the hitch assembly and safety tow chains
- 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 ground rod cable and the ground lug. Make sure they are clean, undamaged, and functional.
- Inspect the tires to ensure good condition and proper inflation
- Check oil, fuel, coolant levels, and hydraulic fluid levels.
- Check to make sure the operator's manual is with the equipment.
- Inspect the machine physically for damage and repair if necessary.
- Inspect the light bar and latch in transport position.

NOTE: See appropriate section of manual for scheduled maintenance intervals.

After completing the inspection check list, operate the tower through a complete operation cycle, following the operating instructions in the operator's manual.



WARNING

**NEVER ALLOW ANYONE TO OPERATE THE EQUIPMENT WITHOUT
PROPER TRAINING!**

ALWAYS READ THE INSTRUCTIONS FIRST!

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INTRODUCTION

- This manual provides the information necessary for the safe operation of the Allmand Bros., Inc., **MAXI-LITE V-SERIES** light tower.
- The **MAXI-LITE V-SERIES** standard tower is operated with a 12 VDC hydraulic pump and hydraulic cylinder.
- Specific operating instructions and specifications are contained in this publication to familiarize the operator and maintenance personnel with the correct and safe procedures necessary to maintain and operate the equipment.

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

SAFETY SYMBOLS

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



DANGER



WARNING



CAUTION

FAILURE TO UNDERSTAND AND COMPLY WITH SAFETY RELATED INFORMATIONAL INSTRUCTIONS MAY RESULT IN INJURY TO 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 in relation to various aspects of proper operation and maintenance.

NOTE: Keep this manual 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.

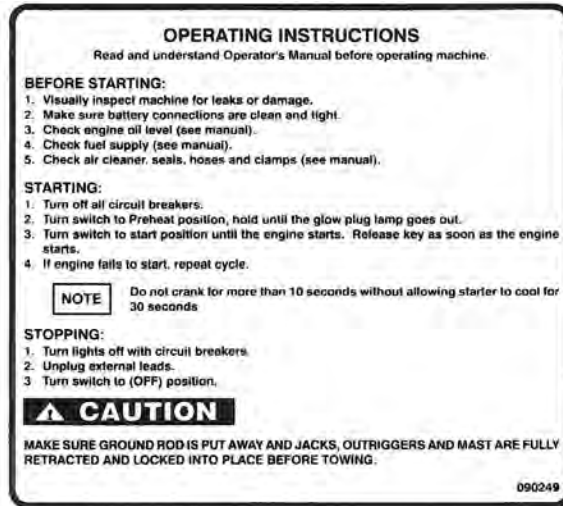
SAFETY AND WARNING DECALS



SAFETY WARNING

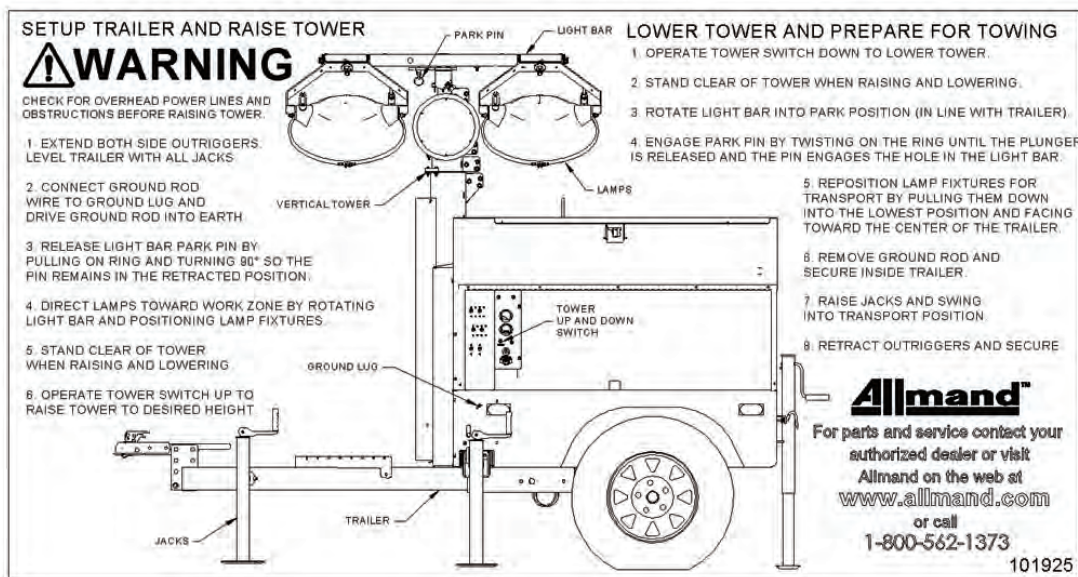
ALWAYS REPLACE ANY SAFETY AND INSTRUCTION DECALS THAT BECOME DAMAGED, PAINTED, OR OTHERWISE ILLEGIBLE.

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



PART NO. 090249

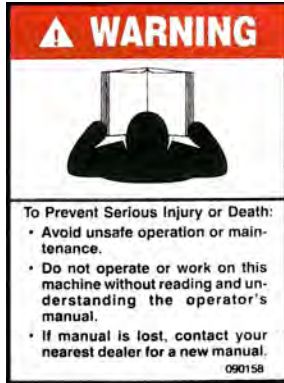
Location: Inside left hand door panel.



PART NO. 101925

Location: Inside left hand door panel.

SAFETY AND WARNING DECALS



PART NO. 090158
Location: AC control panel



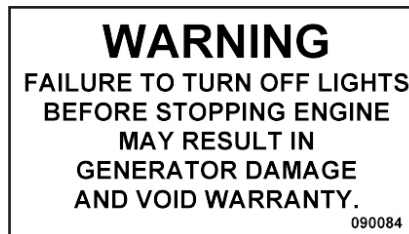
PART NO. 090166
Location: Inside left hand door panel



PART NO. 090163
Location: On left side wheel well



PART NO. 090165
Location: Inside left hand door panel



PART NO. 090084
Location: AC control panel



PART NO. 090162
Location: On left front enclosure panel

**GROUNDING
LUG** 090133

PART NO. 090133
Location: On left side panel below ground lug

DIESEL 090034

PART NO. 090034
Location: On left inner fender adjacent to fuel tank filler neck



PART NO. 090226
Location: Left front panel.



PART NO. 090159
Location: On right hand wheel well

SAFETY AND WARNING DECALS



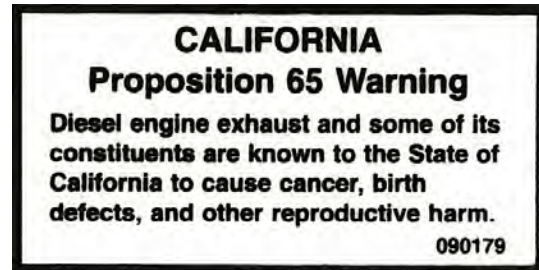
PART NO. 090002
Location: On light bar assembly



PART NO. 090005
Location: Inside left door panel



PART NO. 090160
Location: On trailer drawbar near reversible hitch assembly.



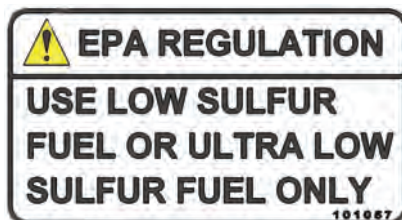
PART NO. 090179
Location: On fuel tank near filler neck.



PART NO. 100247
Location: Inside left door panel.



PART NO. 101404
Location: On either side of mast assembly immediately above roof panel.



PART NO. 101057
Location: On fuel tank near filler neck.



PART NO. 090306
Location: On DC control panel



PART NO. 090465
Location: Inside left door panel.

HYDRAULIC LIFT VERTICAL MAST OPERATION

DESCRIPTION OF OPERATION

The Allmand **MAXI-LITE V Series** hydraulic lift tower assembly consists of a seven section telescoping mast which can be extended by operating a single hydraulic cylinder. The light bar assembly can be rotated into position by releasing the light bar park pin. To release the park pin, pull the ring and turn it 90 degrees so that the pin remains in the retracted position. The light bar is designed to rotate with enough resistance so that the bar will stay in the desired position once the operator has directed the lights on the work zone. If the light bar rotates too easily or does not stay in position, remove the cap plug from the center of the light bar cover and tighten the nut to achieve the desired resistance and replace the cap plug.



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 SET UP TOWER AND RAISE LIGHTS

1. Extend both side outrigger jacks, rear jack and tongue jack to stabilize and level the trailer.

NOTE: Jacks should be placed only on firm footing.



SAFETY WARNING!

THE SUPPLEMENTAL GROUND ROD IS A SAFETY DEVICE THAT MAY REDUCE THE CHANCE OF PERSONAL INJURY FROM STRAY ELECTRICAL CURRENT. Therefore, Allmand recommends using the ground rod. However, it is the user's responsibility to determine the requirements and/or applicability of local, state, or national electrical code which governs the use of the ground rod.

2. Attach the ground rod to the grounding lug, and drive the ground rod fully for adequate electrical ground, as required by local, state, or national code.
3. Start engine. (NOTE: Tower may be raised and lowered as needed without engine running.)
4. While the tower is still in the down position, position the light bar and lamps so they are aimed at the work zone and tilted at the approximate angle to get maximum coverage once the tower is raised.
5. Stand clear of the tower when raising and lowering the lights.

HYDRAULIC LIFT VERTICAL MAST OPERATION

6. Operate the hydraulic lift switch to the "up" position to raise tower to the desired height.
7. If lights need to be adjusted for better lighting of the work zone after raising the tower, lower the tower using the "down" switch position and make desired adjustments to the light bar and light fixtures. Raise the tower into position. Repeat this step if necessary.
5. Reposition the lamp fixtures for transport by pulling them down into the lowest position and face the fixtures toward the center of the trailer.
6. Remove ground rod from earth. Disconnect wire from ground lug and secure in trailer
7. Raise jacks and rear stand, retract outriggers and secure for towing

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



SAFETY WARNING!

VISUALLY INSPECT EQUIPMENT FOR DAMAGE BEFORE OPERATING. ALLOW ADEQUATE CLEARANCE AROUND TRAILER FOR TOWER AND INSURE THAT NO PERSONS ARE STANDING IN UNDER THE LIGHTS WHEN LOWERING.

TO LOWER TOWER AND LIGHTS

1. Turn off lights.
2. Operate the hydraulic lift switch in the down position to lower the lights to the lowest vertical position. When tower reaches the bottom, run switch for three additional seconds to ensure that the tower is at it's lowest possible position.
3. Stop engine.
4. Rotate the light bar into the transport park position (in line with trailer) and engage the park pin by twisting on the park pin ring until the plunger is released and the pin engages the hole in the light bar.

HYDRAULIC TOWER POWER UNIT

GENERAL START UP INSTRUCTIONS

NOTE: The ports are marked on the casing UP and DN. When facing the power unit with the motor up, plug the right hand, or DN port. Jog the motor until the oil flows from the left hand, or up port. If oil does not flow from the UP port, reverse the wire leads on the motor, and repeat. The pump is now primed. Connect the hose (or tubing) to the UP port and tighten. Connect the other hose end to the blind end of a fully retracted hydraulic cylinder. With the hose fitting loose, operate the power unit until oil (and no air) bleeds from the fitting. Tighten the fitting. Refill the reservoir.

HYDRAULIC PUMP

Hydraulic Oil Specifications

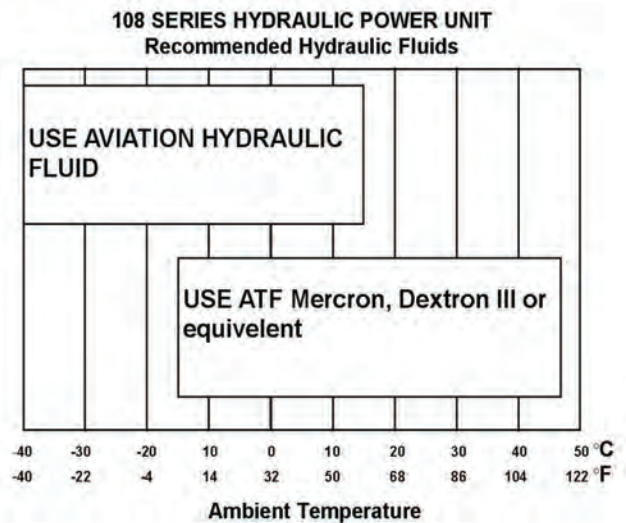


Figure 31

Adding Hydraulic Oil

Fill the reservoir with automatic transmission fluid or any clean hydraulic fluid having a viscosity index that is suitable for the climate conditions in which the unit will be operated. Standard units are supplied with automatic transmission fluid (ATF), and arctic units are supplied with aviation hydraulic fluid (see Figure 31).



Figure 32

TOWING AND STARTING INSTRUCTIONS

TOWING INSTRUCTIONS

Before towing the MAXI-LITE the trailer should be inspected visually to insure that the following operations have been completed.

1. Hitch is securely attached to towing vehicle (safety chains secure).
2. All outriggers and jacks are retracted and secured.
3. Tower is lowered.
4. Light fixtures are positioned for transport.
5. Doors are closed and secure.
6. Check tires for adequate air pressure
7. Taillights are connected and operating (if equipped).
8. Ground rod is removed from ground and secured in the trailer

GROUND ROD INSTRUCTIONS (If so equipped)

1. Remove optional ground rod stowed just inside the left door (attached to the lower frame)
2. Unroll the electrical wire lead from the ground rod.
3. Attach the ground rod lead to the grounding lug located near the ballast compartment.
4. Drive the ground rod a minimum of 2 1/2 FT into the earth for adequate electrical grounding. If this is not possible consult your local qualified electrician.
5. **AFTER SHUTDOWN OF ENGINE:** Remove the ground rod from the earth, remove lead from the trailer ground lug and store ground rod inside left door.

BEFORE STARTING

1. Fill the engine with the right grade of lubricating oil (see pg. 19) and to correct level (check dipstick).
2. Ensure there is an adequate supply of fuel.
3. Ensure **that the air cleaner is firmly attached**, the air canister seals and the hose clamps are properly sealed. Air cleaner element should be checked and replaced if necessary.
4. Install the ground rod.

DESCRIPTION OF OPERATION

By depressing the start assist 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 start assist switch can be released as soon as the engine starts. A 10A inline fuse protects the solenoid from electrical damage.

LOW OIL PRESSURE SHUTOFF SYSTEM

Should a low oil pressure condition occur (less than 5 PSI), the pressure sending unit breaks the circuit between the battery and the fuel solenoid, allowing the spring load to immediately move the fuel control to the shutoff position.

HIGH COOLANT TEMPERATURE SHUTOFF SYSTEM

Should a high coolant temperature condition occur, the temperature sending unit breaks the circuit between the battery and the fuel solenoid, allowing the spring load to immediately move the fuel control to the shutoff position.

STARTING INSTRUCTIONS

STARTING THE ENGINE

NOTE: *The Isuzu engine includes a glow plug cold start system controlled by the ignition switch on the control panel. Glow plugs are not needed on a warm engine or if the ambient temperature is above 50 F. Do not use starting fluid or ether!*

1. Turn the ignition switch to the **PREHEAT** position and hold until the glow plug lamp goes out.
2. Turn the ignition switch to the Start position until the engine starts. Release key as soon as the engine starts.
3. If engine fails to start it may be necessary to cycle the glow plugs again.

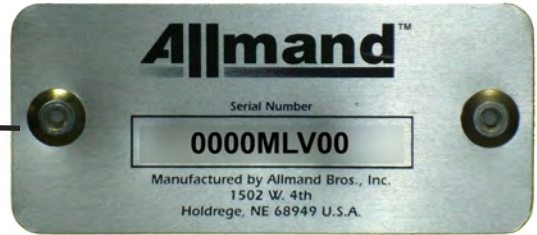
NOTE: *To prevent equipment damage, **DO NOT** hold ignition switch for more than 10 seconds in the start position. If the engine does not start in 10 seconds, wait 30 seconds and try the start sequence again. Do not run the cell motor for more than 20 seconds continuously. Limit engine cranking to 3 attempts with a 2 minute cool-down between each. After 3 attempts allow to cool to ambient temperature.*

STOPPING THE ENGINE

1. Turn the ignition switch to the OFF position. This breaks the circuit between the battery and the fuel solenoid, allowing the spring load to immediately move the fuel control to the shutoff position.
2. Disconnect the ground rod (if so equipped).

SERIAL NUMBER LOCATIONS

Trailer: All MAXI-LITE ML 15/ML 20 V-SERIES models have a serial number plate located on the lower left corner of the rear panel.



Generator: Label attached to the side of the generator housing.

Engine: ISUZU 4LE1 - Plate attached to the engine right side, near the fuel filter.



SPECIFICATIONS

MAXI-LITE DIMENSIONS

Height lowered:	7'8" (2.34 m)
Height extended:	25'6" (7.8 m)
Length:	10'4" (3.25 m)
Width:	6'4" (1.92 m)
Outrigger width:	12'10" (3.5 m)
Trailer:	Structural steel frame Leaf spring axle
Wheels & tires:	15"

DOMESTIC SHIPPING WEIGHT

Fixtures:	15 lbs. ea. = 60 lbs.
Total weight:	2,580 lbs. (963 kg)

TRAILER

The engine-generator set 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. The design includes an adjustable-height reversible hitch that includes a 2" ball and a 3" pintle hook hitch.

MAST

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.

The mast consists of seven fabricated steel sections that telescope to 25' 6" (7.8m) and UHMW plastic guide pads to provide smooth operation and reduced friction. The mast sections are extended with either a manual or electric winch, or hydraulic pump. The electric winch design includes limit switches that turn the winch off when the mast reaches full extension or is fully retracted.

STABILIZERS

Four (4) point outrigger design with tower center mounted between two (2) retractable side outriggers, tongue jack and rear jack.

FLOOD LIGHT ASSEMBLY

The flood light assembly consists of four 1250 watt metal halide, four 1000 watt metal halide or four 1000 watt high pressure sodium (HPS) lamp fixtures sealed for all weather use.

SHO 1250 fixture - Metal Halide Lamp

Lumen rating: 150,000 initial lumens

SHO 1000 fixture - Metal Halide Lamp

Lumen rating: 110,000 initial lumens

SHO 1000 fixture - HPS Lamp

Lumen rating: 140,000 initial lumens

ISUZU 4LE1 ENGINE

Isuzu 4LE1, Indirect injection 4 Cylinder

Displacement:	133 cu. in. (2179 cc)
Bore:	85 mm
Stroke:	96 mm
Power output:	34.1 BHP@ 1800 RPM
Power output derating:	3.5% for every 1000 ft altitude (305 m) above sea level
Air Inlet Temp: 1% per 10°F (5.6C) above 77° F (25°C)	
Fuel:	Diesel
Oil sump capacity:	Fill to correct level
Starting:	12 volt electric

Low oil pressure, high engine temperature shut-downs and a glow plug cold start assist are standard equipment on the Isuzu 4LE1 diesel engine.

NOTE: Consult the Isuzu Operator's Manual for cold weather starting instructions.

*Horsepower ratings are established in accordance with Society of Automotive Engineers
Small Engine Test Code- J1349 GROSS.*

SPECIFICATIONS

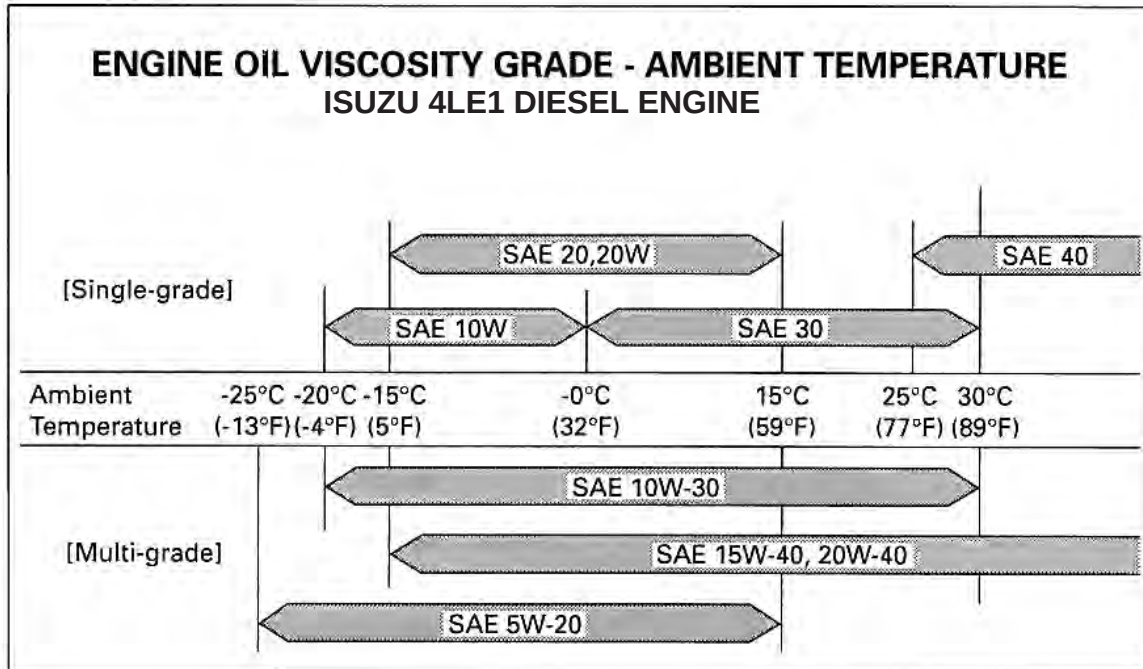
GENERATOR

- 15 kW single phase and 20 kW single and three phase models available
- 60 hz and 50 hz models available (50 hz 15 kW only)

FUEL REQUIREMENTS

Use a clean No. 2 Diesel fuel oil (SAE J313 JUN87) according to ASTM D975. Do not use alternative fuel, because its quality is unknown or it may be inferior in quality. Do not use kerosene, which has a very low cetane rating, and can adversely effect the engine. Refer to the Isuzu Operators Manual for more detailed fuel requirements.

LUBRICATION REQUIREMENTS



CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS



FIG. 1. AC CONTROL PANEL

1. Switch, Circuit Breaker (Lights 1&2 and lights 3&4)



FIG. 2. DC CONTROL PANEL

2. Momentary Contact Switch. Lift up to raise and extend the tower.
Press down to lower the tower.
3. 2 AMP Circuit Breaker (Hydraulic Pump)



FIGURE 3

FIG. 3. ISUZU ENGINE CONTROL PANEL

4. Ignition Switch
5. Glow Plug Indicator
6. Engine Fault Warning Lamps
7. Hour Meter



SAFETY WARNING

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CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS

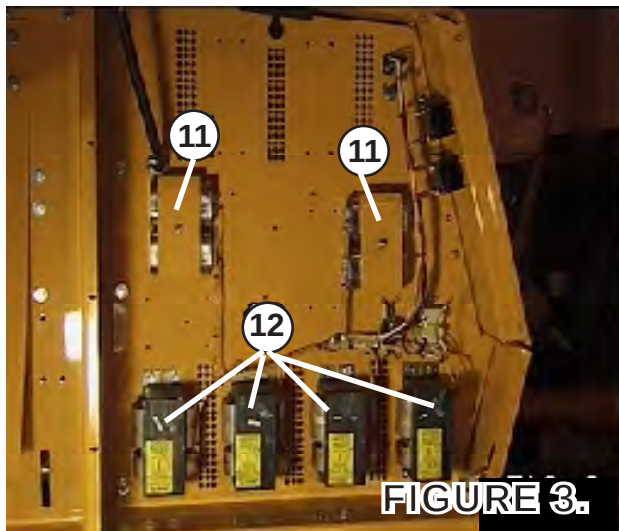
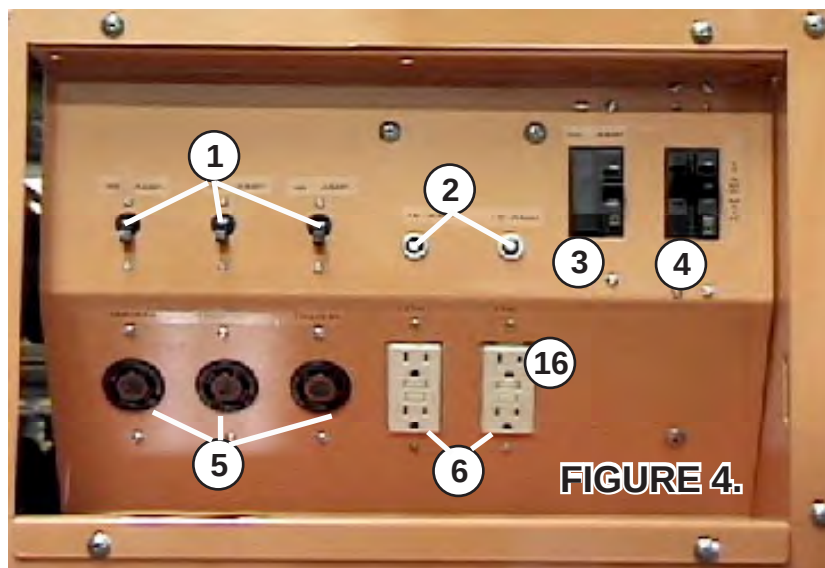


FIG. 3 BALLAST PANEL

- 11. Ballast, Capacitors 1 through 4
- 12. Ballast, Transformers 1 through 4

FIG. 4 CONVENIENCE PANEL

- 1. 30 Amp Breakers
- 2. 15 Amp Breakers
- 3. 50 Amp Breaker
- 4. 70 or 90 Amp Main Breaker
- 5. 120/240 volt Receptacles
- 6. 110/120 Volt Outlet Receptacles (Ground fault)



SAFETY WARNING

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CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS

FIG. 5 GROUND ROD (Optional)

16. Ground Rod

Ground Rod should be attached to grounding lug with wire provided and ground rod and then driven fully into the earth for adequate electrical ground as required by local, state or national electrical codes.

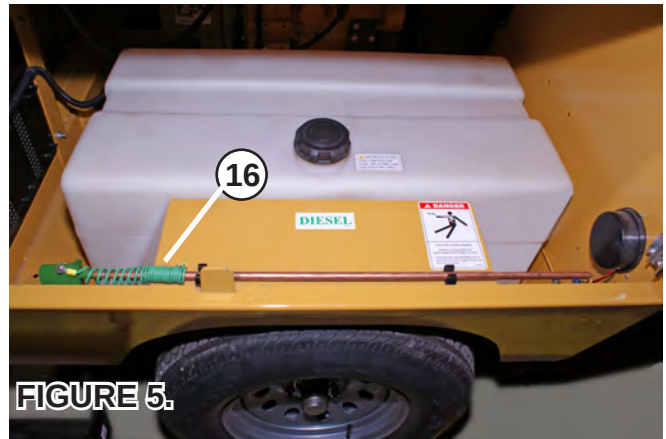


FIG. 6 ENGINE (Left Side)

17. Air Cleaner

18. Fuel Filter

19. Oil Filter

20. Radiator

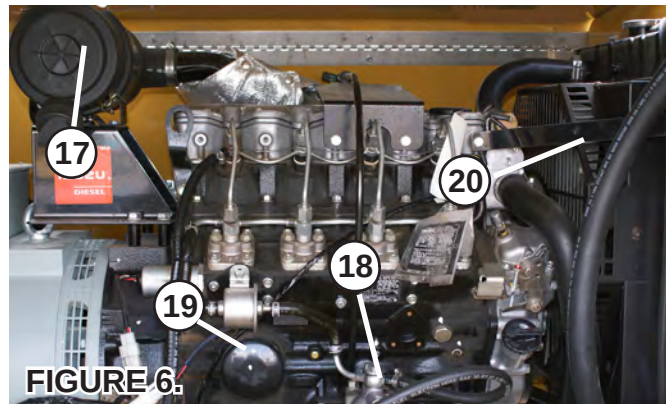
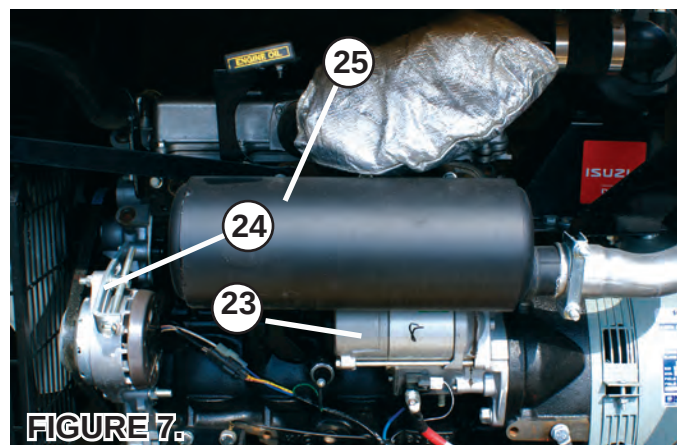


FIG. 7 ENGINE (Right Side)

23. Starter

24. Alternator

25. Muffler



NOTE: Above photos illustrate component locations on the Isuzu 4LE1 diesel engine. Component location on other engine models may vary from the locations indicated above.

CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS

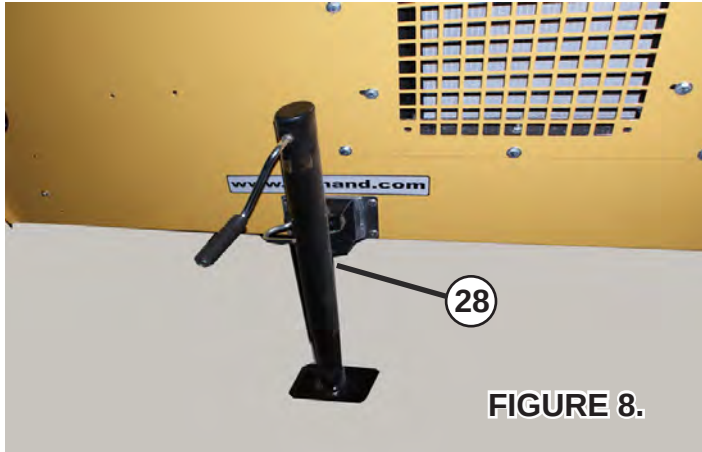


FIG. 8 REAR JACK

28. Rear Jack

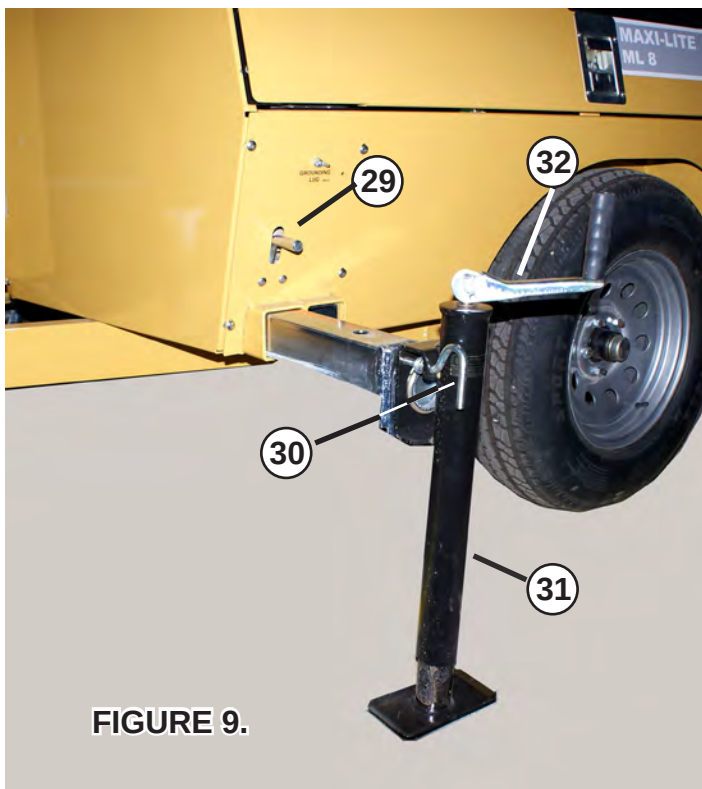


FIG. 9 OUTRIGGER JACK

29. Pin--Retains outrigger in retracted position for towing.

30. Jack Pin--Pull to allow jack to rotate

31. Outrigger Jack

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

CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS

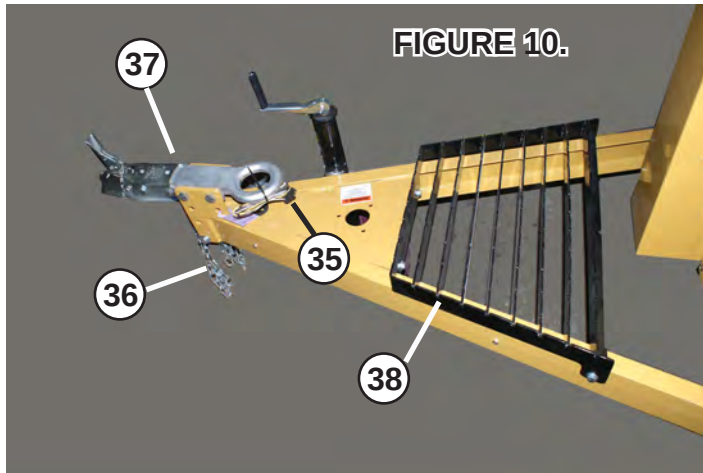


FIG. 10 TONGUE ASSEMBLY

- 35. Taillight Wiring Harness
- 36. Safety Tow Chains
- 37. Reversible Hitch (2" Ball and 3" Pintle Hitch)
- 38. Step Plate--Allows operator to position light fixtures prior to raising tower.

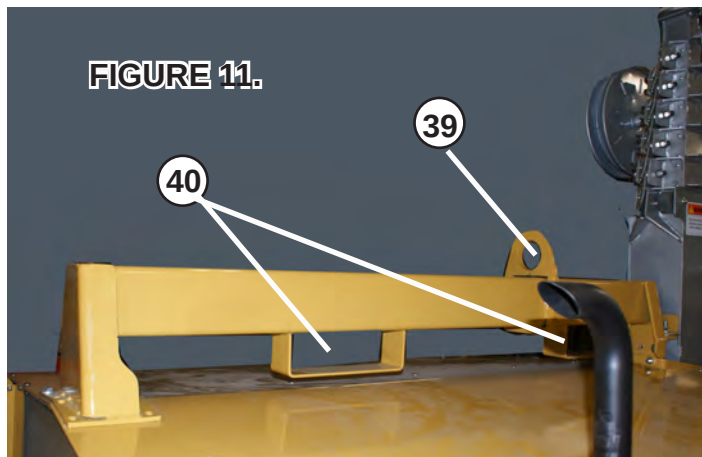


FIG. 11 FORKLIFT POCKETS

- 39. Lifting Eye
- 40. Forklift Pockets

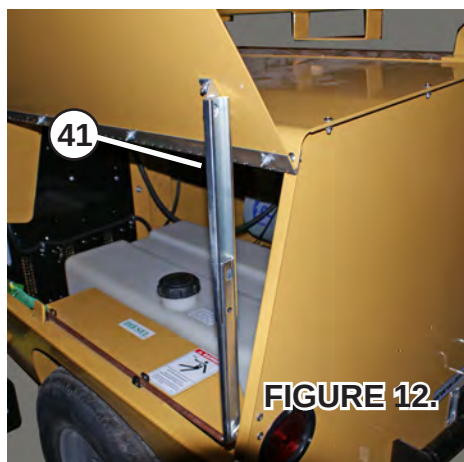


FIG. 12 DOOR PROP

- 41. Door Prop--Locks door panel in open position.

CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS

Fig. 13. Hydraulic Bypass Valve

- 41. Bypass Valve
Allows tower to be lowered manually in the event of a failure.

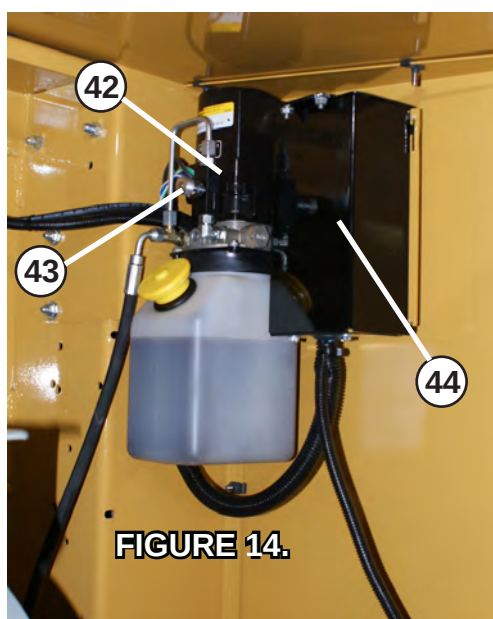
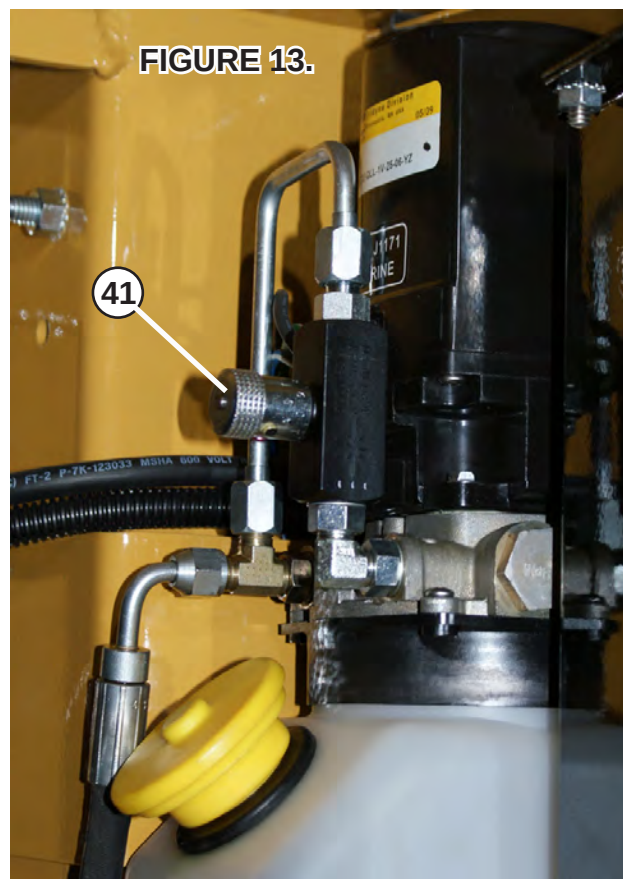


Fig 14. Hydraulic Power Unit Assembly

- 42. Hydraulic Pump
- 43. Bypass Valve
- 44. 12 VDC Enclosure
Houses 125A fuse and 100A solenoid

CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS

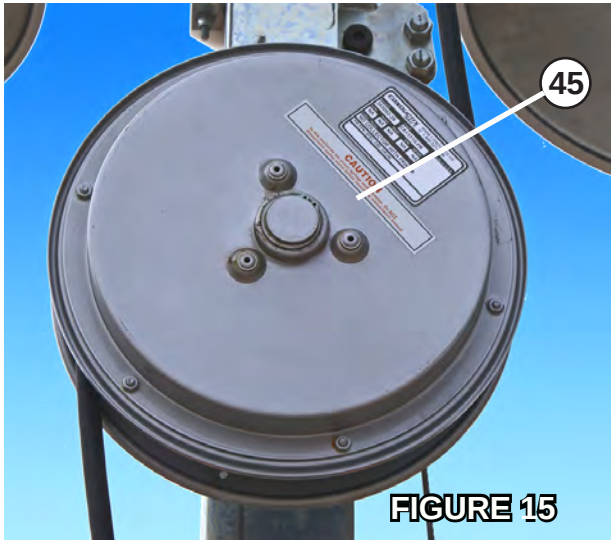


FIG. 15 Cord Reel

45. Cord reel —*Manages the mast power cable and prevents tangling.*

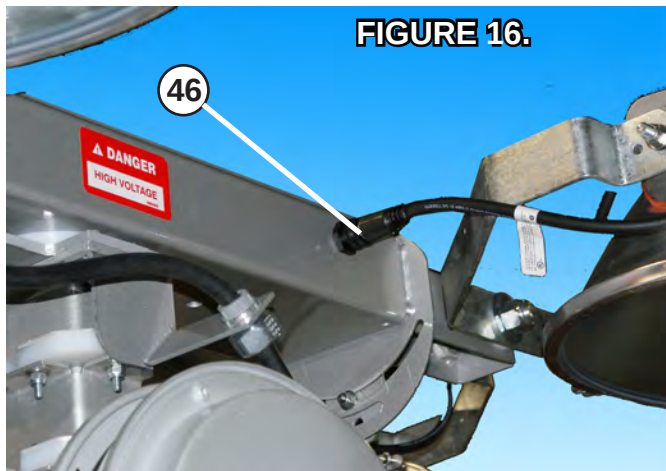


FIG. 16 Light Bar

46. Lamp Connector Lead—*Allows quick connecting/disconnecting of the lamp fixtures*

CONTROLS AND COMPONENTS

NOTE: PHOTOGRAPHS MAY SHOW NON-STANDARD EQUIPMENT AND OPTIONS

FIG. 17 Vertical Tower

- 1. Seven Section Vertical Tower**
- 2. Light Mounting Locations** --Mount lights here for use during operation
- 3. Light connector sockets**—attach light leads to light bar at these female receptacles when provided

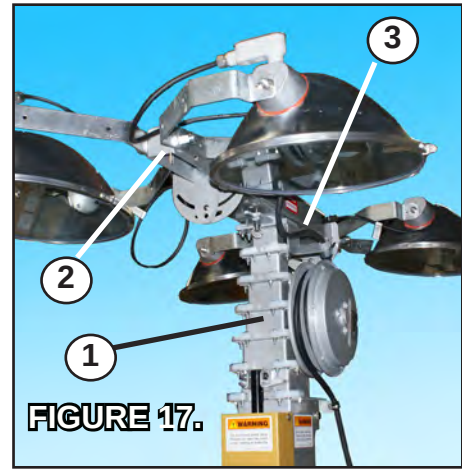
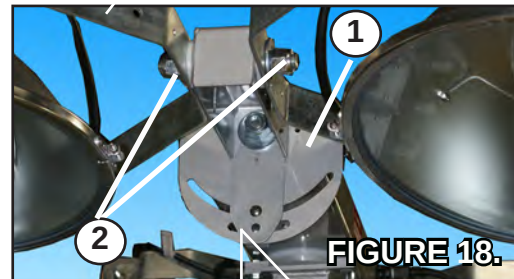


FIG. 18 Light Bar and Mounting Locations

- 1. Light Bar**
- 2. Light mounting locations** —Mount lights here for use during operation



ROUTINE MAINTENANCE

ISUZU 4LE1

INSPECTION, MAINTENANCE, AND LUBRICATION SCHEDULE

Check condition of the steel tower cables and make sure they are properly secured.

LUBRICATION 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.

INTERVAL	ITEM	PROCEDURE
DAILY OR 10 HOUR	Fuel Level	Check and fill as necessary
	Lubricating Oil	Check level and condition
	Oil Pressure Warning Lamp	
50 HOUR	All 10 Hour Items	As above
	Air Cleaner	Service as required. Service requirements may be accelerated
	Engine Oil	Check engine oil and replace if necessary
	Engine Generator Assembly	Check for fuel and lubricating oil leaks
250 Hour	All 50 Hour Items	As above
	Engine Oil System	Drain lubricating oil, flush out system, renew filter element and refill with correct grade and type of oil.
	Coolant	Check level and condition
500 Hour	All 250 Hour items	As above
	Fuel Filter	Replace with new
	Oil Filter Element	Replace with new
750 Hour	Engine Oil System	Drain lubricating oil, flush out system, renew filter element and refill with correct grade and type of oil.
	Fan Belt	Check tension and condition
	Radiator	Clean out fins with water or air
1000 Hour or Yearly	All 750 Hour Items	As above
	Engine Valves	Adjust Clearance
	Cable pulleys on tower	Inspect for wear. Clean and lubricate
	Axle Wheel Bearings	Clean and repack
	Fuel System	Clean sediment from tank, replace filter element

TROUBLESHOOTING



SAFETY WARNING

DANGER!

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.

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

PROBLEM	POSSIBLE CAUSE
ONE OR MORE LIGHTS DO NOT LIGHT UP.	1. Circuit breakers in the outlet box are not turned on or have tripped.
	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.
	3. The lamp or lamps are burned out or broken.
	4. One or more of the lamps are not screwed in securely.
	5. Plug and socket at light bar not securely pushed together and locked.
	6. 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 temperatures of the ballasts falls below -20 degrees F. some means of warming the ballast must be used.
	7. Low electrical system voltage.
	8. A loose connection in the back of the lamp socket in the lamp holder.
	9. A circuit breaker or breakers are defective.
	10. A loose connection on the terminal board.
	11. The engine and generator are not running up to speed (1800 RPM)
	12. A wrong style replacement lamp (requiring a different ballast) has been installed.
	13. Too much power is being drawn from the auxiliary outlets.
	14. Capacitor or transformer have failed.
	15. Corrosion has occurred on the lamp bases.

For engine and generator troubleshooting, see engine and generator manuals or contact your dealer.