Doosan Infracore
Portable Power

OPERATION and MAINTENANCE MANUAL

LIGHT TOWER MODELS

L6-60HZ-T4F	**(D48)**
L8-60HZ-T4F	**(D49)**
LS-60HZ-T4F	**(D56)**
LSC-60HZ-T4F	**(E06)**
LSCWKUB-60HZ-T4F	**(E83)**
LSCWKUB-50HZ-T4F	**(E84)**
LSWKUB-60HZ-T4F	**(F86)**
LSCWKUB-60HZ-T4F	**(G08)**
LSCWKUB-50HZ-T4F	**(G09)**
LS60HZ-T4F	**(G12)**
L8-60HZ-T4F	**(G11)**
L6-60HA-T4F	**(G10)**

This manual contains important safety information.
Do not destroy this manual.
This manual must be available to the personnel who operate and maintain this compressor.

Doosan Infracore Portable Power
1293 Glenway Drive
Statesville, N.C. 28625
DoosanPortablePower.com

PN: 22924369 (07-2015) Rev E

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Operating & Maintenance Manual

Foreword

Information

The contents of this manual are considered to be proprietary and confidential to Doosan Infracore Portable Power (herein referred to as “Portable Power”), and should not be reproduced without the prior written permission of Portable Power.

Nothing contained in this document is intended to extend any promise, warranty, or representation, expressed or implied, regarding the Portable Power products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request.

This manual contains instructions and technical data to cover all routine operation and scheduled maintenance tasks by operation and maintenance staff. Major overhauls are outside the scope of this manual and should be referred to an authorized Portable Power Service department.

All components, accessories, pipes, and connectors added should be:

- of good quality, procured from a reputable manufacturer and, wherever possible, be of a type approved by Portable Power.
- accompanied with instructions for safe installation, operation, and maintenance.

Details of approved equipment are available from Portable Power Service department. Use of repair parts other than those included within the approved parts list may create hazardous conditions over which Portable Power has no control. Therefore, Portable Power cannot be held responsible for equipment in which non-approved repair parts are installed.

Portable Power reserves the right to make changes and improvements to products without notice and without incurring any obligation to make such changes or add such improvements to products sold previously.

The intended uses of this unit are outlined below and examples of unapproved usage are also given. However, Portable Power cannot anticipate every application or work situation that may arise. **If in doubt, consult supervision**.

This unit has been designed and supplied for above ground operation.

This unit should NOT be used:

A. Outside the ambient temperature range specified in the General Data Section of this manual.

B. When an actual or foreseeable risk of hazardous levels of flammable gases or vapors exists.

C. With other than Portable Power approved components.

D. With guards, controls, or switches missing or disabled.

E. For storage or transportation of materials inside or on the enclosure.

Portable Power accepts no responsibility for errors in translation of this manual from the original English version.

You, as the customer, are expected to provide certain service and maintenance items. Your Portable Power dealer will provide all other more detailed service and maintenance items on a special preventive maintenance schedule for each unit. It is very important that the minimum service and maintenance requirements explained in this manual be performed at the required intervals. Exceeding these intervals may reduce the reliability of the unit.

The purpose of this manual is to train the operator with functions, operation, and basic service and maintenance requirements of the unit. During the preparation of this manual, every effort was made to ensure the accuracy and adequacy of the contents.

Safety

Safety

Safety Precautions

General Information

Never operate unit without first observing all safety warnings and carefully reading the Operation and Maintenance Manual shipped from the factory with this machine.

Ensure the operator reads and understands the decals and consults the manuals before maintenance or operation.

Ensure maintenance personnel are adequately trained, competent, and have read the manuals.

Ensure all protective covers are in place and the canopy/doors are closed during operation.

The specification of this machine is such that the machine is not suitable for use in flammable gas risk areas. If such an application is required, all local regulations, codes of practice, and site rules must be observed. To ensure the machine can operate in a safe and reliable manner, additional equipment, such as, gas detection, exhaust spark arrestors, and intake (shut-off) valves may be required, dependent on local regulations or the degree of risk involved.

A weekly visual check must be made on all fasteners/fixing screws securing mechanical parts. In particular, safety-related parts, such as, coupling hitch, drawbar components, road-wheels, and lifting bail should be checked for total security.

All components which are loose, damaged, or unserviceable must be rectified without delay.

This unit produces loud noise with the doors open. Extended exposure to loud noise can cause hearing loss. Always wear hearing protection when doors are open.

Never inspect or service unit without first disconnecting battery cable(s) to prevent accidental starting.

Do not use petroleum products (solvents or fuels) under high pressure as this can penetrate the skin and result in serious illness. Wear eye protection while cleaning unit with compressed air to prevent debris from injuring eye(s).

Rotating fan blade can cause serious injury. Do not operate without fan guard in place.

Use care to avoid contacting hot surfaces (engine exhaust manifold and piping).

Never operate unit with guards, covers, or screens removed. Keep hands, hair, clothing, tools, blow gun tips, etc. well away from moving parts.

⚠ WARNING

Extend and Retract the tower only in the vertical position.

⚠ WARNING

The tower must be operated in the vertical position with lock pin installed and locked.

⚠ DANGER

Do NOT raise or position light tower under electrical power lines.

⚠ WARNING

Do NOT operate lights with missing or broken lens. Do NOT operate if glass bulb is broken or punctured.

⚠ WARNING

Flammable Fuels - Do not fill tank when engine is running. Do not smoke or use open flame in the vicinity of the unit or fuel tank. Do not permit smoking, open flame, or sparks to occur near the battery, fuel, cleaning solvents, or other flammable substances and explosive gases. Do not operate unit if fuel has been spilled inside or near the unit.

⚠ WARNING

Electrical Shock. Do not operate electrical equipment while standing in water, on wet ground, or with wet hands or shoes. Use extreme caution when working on electrical components. Battery voltage (12VDC) is present unless the battery cables have been disconnected. Higher voltage (potentially 240) is possibly present at all times.

⚠ WARNING

Always treat electrical circuits as if they are energized. Disable Start Control before attempting any repair service. Disconnect all leads to electrical power requirements and disconnect battery to prevent start up.

Grounding

Depending upon your application, it may be MANDATORY to ground this unit to earth or to NOT ground this unit to earth. Comply with local electrical codes.

⚠ WARNING

The unit can produce high voltages, which can cause severe injury or death to personnel and damage to equipment. This unit should have proper internal and external ground when required by National Electrical Code. The unit is internally grounded neutral to the frame. This internal ground connection is essential for proper performance and personal protection.

External grounding consists of connecting the machine neutral to a solid earth ground and is the responsibility of the operator when grounding is required by National Electrical Code, Article 250, and other local codes as applicable. Several methods are employed to externally ground the unit depending on the intended use and code requirements. In all cases, a continuous length of splice-free copper cable, no smaller than AWG#8, shall be used for the external ground conductor, when grounding is required. A qualified, licensed electrical contractor, knowledgeable in local codes, should be consulted.

⚠ WARNING

Failure to properly ground the unit can result in severe injury or death.

Materials

Engine exhaust fumes may be produced during the operation of this unit. Avoid inhalation of fumes.

⚠ WARNING

Avoid inhalation.

Ensure that adequate ventilation of the cooling system and exhaust gases is maintained at all times. The following substances are used in the manufacture of this unit and may be hazardous to health if used incorrectly:

- antifreeze
- engine lubricant
- preservative grease
- rust preventative
- diesel fuel
- battery electrolyte

⚠ WARNING

Avoid ingestion, skin contact, and inhalation of fumes.

Do NOT start or operate this unit in a confined area. Avoid breathing exhaust fumes when working on or near the unit.

This unit may include such materials as oil, diesel fuel, antifreeze, brake fluid, oil/air filters, and batteries which may require proper disposal when performing maintenance and service tasks. Contact local authorities for proper disposal of these materials.

Battery

A battery contains sulfuric acid and can produce gases which are corrosive and potentially explosive. Avoid contact with skin, eyes, and clothing. In case of contact, flush area immediately with water.

⚠ WARNING

Do not attempt to jumpstart a frozen battery since this may cause it to explode.

Exercise extreme caution when using an external method to jumpstart a unit. Verify the electrical systems on the weak battery system and the external jump system are the same voltage type system, 12VDC or 24VDC. Connect the Positive (+) terminal of the external system to the Positive (+) terminal on the weak system. Connect the Negative (-) terminal of the external system to the Negative (-) terminal of the weak system. Always disconnect the two systems in reverse order.

Radiator

Hot engine coolant and steam can cause injury. Ensure the radiator pressure cap is removed with due care and attention.

Do not remove the pressure cap from a HOT radiator. Allow radiator to cool before removing pressure cap.

Transport

When loading or transporting machines, ensure the specified lifting and tie down points are used.

When loading or transporting machines, ensure the towing vehicle, its size, weight, towing hitch, and electrical supply are all suitable to provide safe and stable towing at speeds either, up to the legal maximum for the country in which it is being towed or, as specified for the machine model if lower than the legal maximum.

Towing

⚠ WARNING

Do not tow these units (LS/L6/L8) in excess of 65 mph (104 km/hr).
Do not tow this unit (LSC) in excess of 45 mph (72 km/hr).

Do not tow unit with a vehicle whose towing capacity is less than the gross weight of unit.

Steps for determining correct load limit:

- Locate the statement “The weight of cargo should never exceed xxx kg or xxx lbs” on your vehicle’s placard.
- This figure equals the available amount of cargo and luggage load capacity.
- Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity.

Always ensure the wheels, tires, and towbar connectors are in safe operating condition and tow bar is properly connected before towing.

Chock the wheels of the unit when it is not connected to the tow vehicle.

Do not store or transport material or equipment in or on the unit.

Do not exceed gross vehicle weight rating.

Before towing the unit, ensure:

- the tires and towing hitch are in serviceable condition.
- the canopy is secure.
- all ancillary equipment is stored in a safe and secure manner.
- the brakes and lights are functioning correctly and meet necessary road traffic requirements.
- breakaway cables/safety chains are properly connected to the towing vehicle.

The unit must be towed in a level attitude in order to maintain correct handling, braking, and lighting functions. This can be achieved by correct selection and adjustment of the vehicle towing hitch and, on variable height running gear, adjustment of the drawbar.

Safety Chains

Ensure the breakaway cable is securely coupled to the unit and also to a substantial anchor point on the towing vehicle.

Ensure the cable length is as short as possible, while still allowing enough slackness for the unit to articulate without the handbrake being applied.

Loop the chains onto the towing vehicle using the towing vehicle hitch as an anchor point, or any other point of similar strength.

Ensure the effective chain length is as short as possible while still allowing normal articulation of the unit and effective operation of the breakaway cable.

Welding

Prior to any welding on the unit, disconnect any control box connections and battery cables. Open all circuit breakers and remove any external connections (except grounding rod, if applicable). Connect the welding ground as close as possible to the area being welded.

Decals

Decals are located on the machine to point out potential safety hazards. Read and follow these instructions. If you do not understand the instructions, inform your supervisor.

Note there are different decal headings:

(Red Background)

Indicates the presence of a hazard which WILL cause serious injury, death, or property damage if ignored.

⚠ WARNING

(Orange Background)

Indicates the presence of a hazard which CAN cause serious injury, death, or property damage if ignored.

⚠ CAUTION

(Yellow Background)

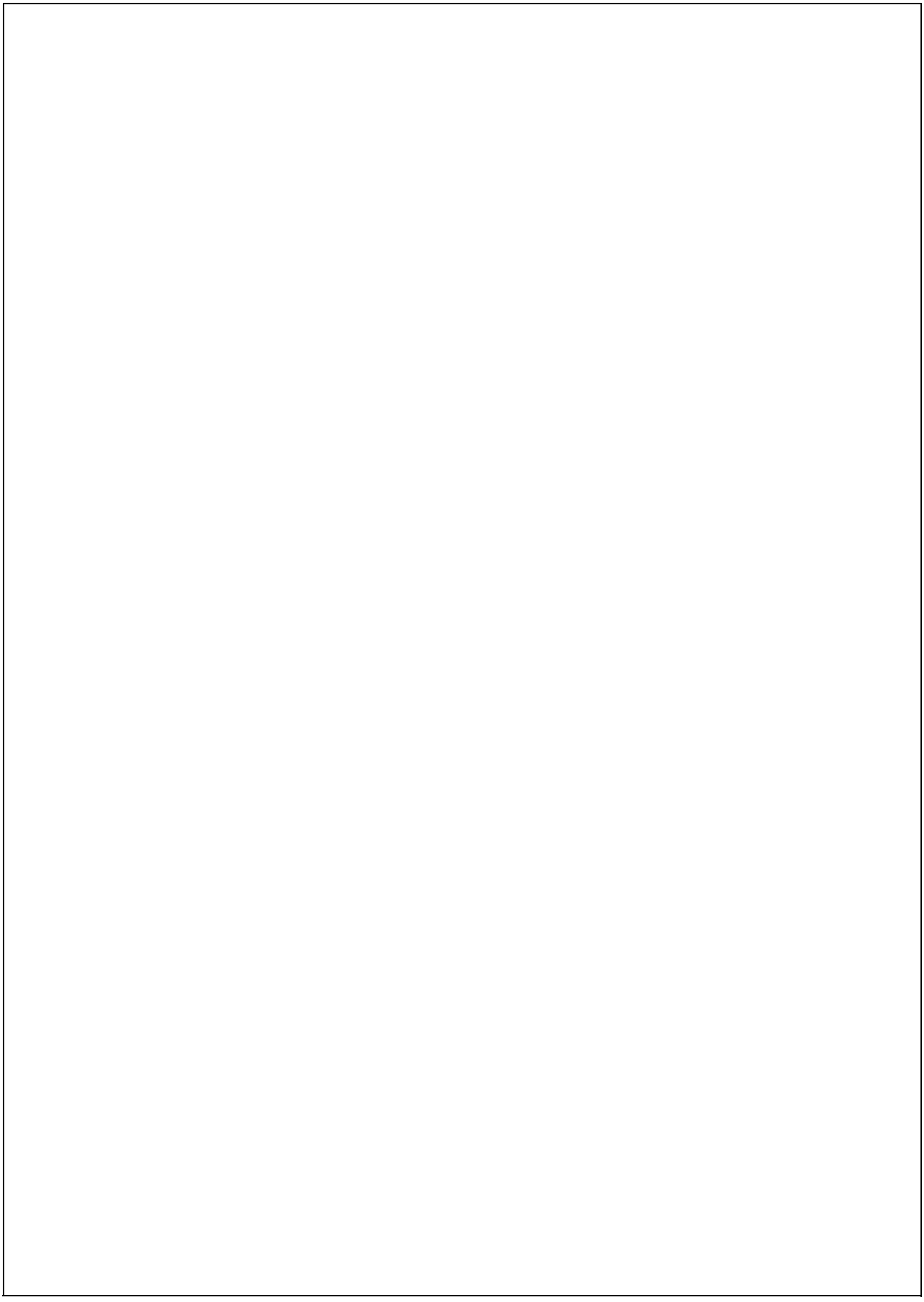
Indicates the presence of a hazard which WILL or can cause injury or property damage if ignored.

NOTICE

(Blue Background)

Indicates important set-up, operating, or maintenance information.

FREE SAFETY DECALS
To promote communication of Safety Warnings on products manufactured by the Portable Power Division in Statesville, N.C. Safety Decals are available free of charge. Safety decals are identified by the decal heading: DANGER, WARNING, or CAUTION. Decal part numbers are on the bottom of each decal and are also listed in the units Parts Manual. Submit orders for Safety Decals to the Statesville Parts Service Department. The no charge order should contain only Safety Decals. Help promote product safety! Replace decals that are not readable.



General Data

General Data

MODELS	L6-60HZ-T4F	L8-60HZ-T4F	LS-60HZ-T4F	LSWKUB-60HZ-T4F	LSC-60HZ-T4F
Rated Power Output - kilowatts	6	8	6	6	6
Number of Lamps	4	4 or 6	4	4	4
Type of Lamps	MH-HPS TH1000	MH HPS TH1500	MH HPS	MH HPS	MH
Engine Model (diesel)	Kubota D1105BG	Kubota D1105BG	Kubota D1105BG	Kubota D1005BG	Kubota D1005BG
Crankcase Capacity (quarts/litres)	4.5/4.3	4.5/4.3	4.5/4.3	4.5/4.3	4.5/4.3
Coolant Capacity (gallons/litres)	1.6/5.9	1.6/5.9	1.6/5.9	1.6/5.9	1.6/5.9
Unit Gross Weight with fuel (pounds/kilograms)	2127/965	2127/965	1954/886	1954/886	1619/734
Unit Generator Frequency (Cycles/ Seconds)	60 Hertz	60 Hertz	60 Hertz	60 Hertz	60 Hertz
Available Voltage	120/240V AC	120/240V AC	120/240V AC	120/240V AC	120V AC
Engine Speed	1800 rpm	1800 rpm	1800 rpm	1800 rpm	1800 rpm
Engine Electrical System	12 Volts DC	12 Volts DC	12 Volts DC	12 Volts DC	12 Volts DC
Fuel Tank Capacity (gallons/liters)	27/102	27/102	27/102	27/102	28/106
Length, including towbar	15.2 ft (4.42 meters)	15.2 ft (4.42 meters)	15.2 ft (4.42 meters)	15.2 ft (4.42 meters)	13.9 ft (4.2 meters)
Height	7.4 ft (2.3 meters)	7.4 ft (2.3 meters)	7.4 ft (2.3 meters)	7.4 ft (2.3 meters)	5 ft 9 inches (1.5) meters)
Width	6.6 ft (2.0 meters)	6.6 ft (2.0 meters)	4.9 ft (1.5 meters)	4.9 ft (1.5 meters)	4.7 ft (1.5 meters)
Tire Size	ST175/80D13	ST175/80D13	ST175/80D13	ST175/80D13	ST175/80D13
Cold Inflation Pressure	32 psi (220 kPa)	32 psi (220 kPa)	32 psi (220 kPa)	32 psi (220 kPa)	32 psi (220 kPa)
Maximum Towing Speed	65 mph (104 km/ hr)	65 mph (104 km/ hr)	65 mph (104 km/ hr)	65 mph (104 km/ hr)	45 mph (72 km/ hr)
Wind Speed Rating (steady State-Maximum) 4 pt mounting system (2 outriggers, 2 jacks)	65 mph	65 mph	65 mph	65 mph	65 mph

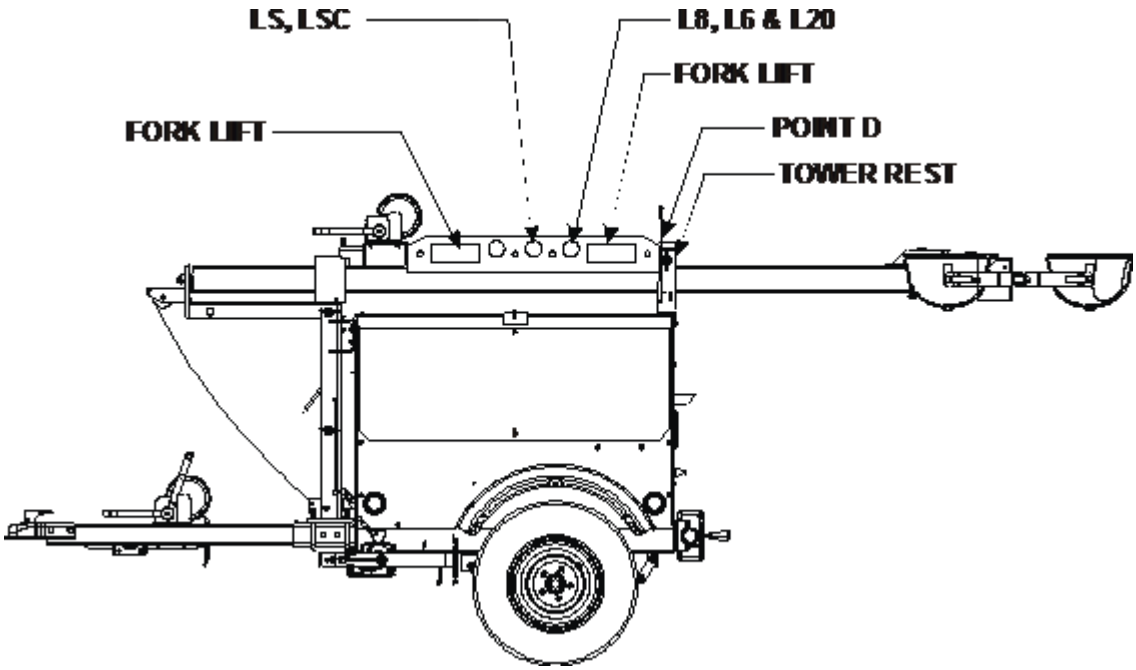
Maintenance Interval Kits

46618979 .....Filter Kit 250 hours - LSCWKUB

46618980 .....Filter Kit 500 hours - LSCWKUB

Operating Instructions

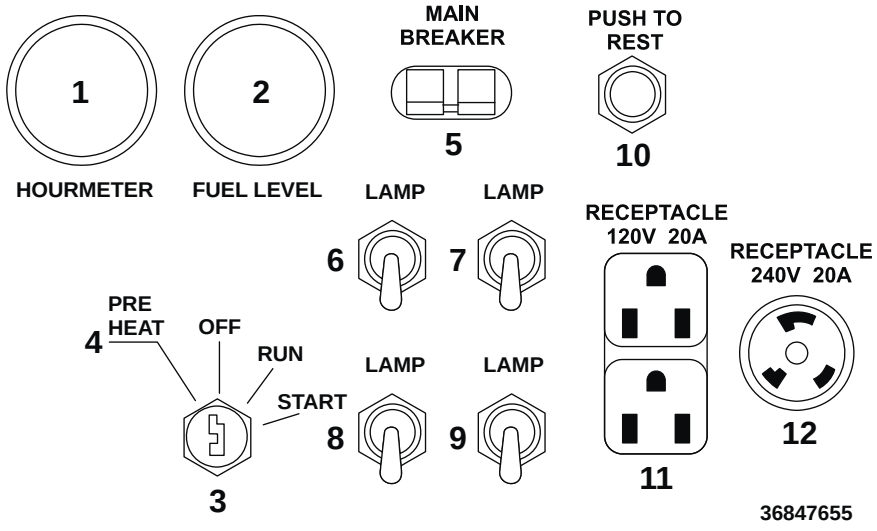
Lifting Instructions



Before Lifting, ensure:

- Tower holddown pin at point D is fully inserted through both sides of tower rest and lock pin is installed.
- No loose objects shall be stored inside or on top of machine.
- No additional equipment is to be hung onto or under machine.
- Any device used for lifting shall be rated at a minimum of 2 ton working capacity.
- No personnel should be on or under machine at any time during lifting.

L6 Operating Instructions



L6 Operating Controls and Instruments

The operating controls and instruments are arranged on the control panel as shown above. A description of each panel device is as follows:

1. **Hourmeter:** Records cumulative engine operating hours for maintenance purposes.
2. **Fuel Level Gauge (Optional):** Indicates fuel level in tank.
3. **Rotary Switch with Key:** Positions (left to right).

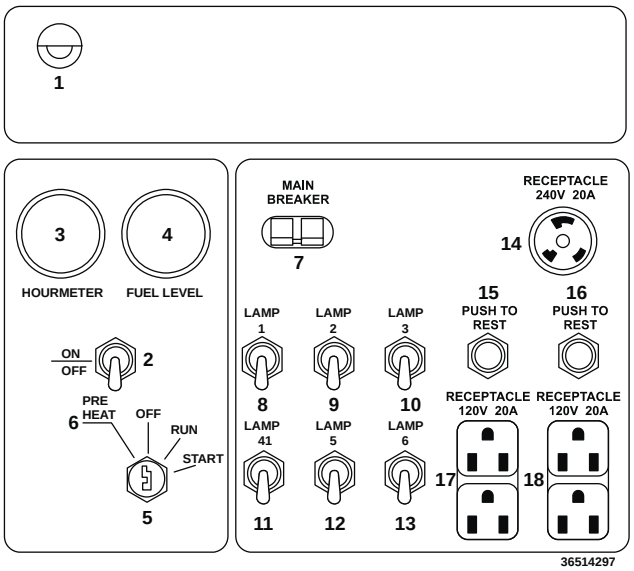
   PREHEAT - Energizes Glow Plug in engine manifold to assist starting.

   OFF - Shuts down engine.

   RUN - Normal engine operating position.

   START - Energizes engine cranking motor.
4. **Preheat Position:** Place rotary switch in Preheat position for 5 seconds. Move switch to START position.
5. **Main Breaker:** 25 amp for all lamp circuits and panel receptacles.
6. **Switches:** For standard lamps 1 thru 4.
7. **Switches**: For standard lamps 1 thru 4.
8. **Switches**: For standard lamps 1 thru 4.
9. **Switches:** For standard lamps 1 thru 4.
10. **Push to Reset Breaker:** For receptacle (Item 11).
11. **Receptacle:** 120 Volt 20 amp.
12. **Receptacle:** 240 Volt 20 amp.

L8 Operating Instructions



L8 Operating Controls and Instruments

The operating controls and instruments are arranged on the control panel as shown above. A description of each panel device is as follows:

1. **Panel Light:** Illuminates when activated by TOGGLE SWITCH.
2. **Toggle Switch:** Activates PANEL LIGHT above ON and OFF.
3. **Hourmeter:** Records cumulative engine operating hours for maintenance purposes.
4. **Fuel Level Gauge (Optional):** Indicates fuel level in tank.
5. **Rotary Switch with Key:** 25 amp for all lamp circuits and panel receptacles.

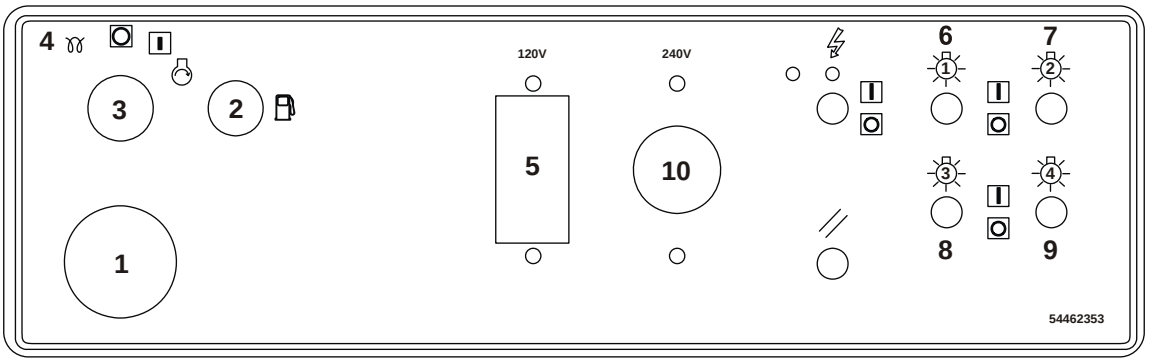
   PREHEAT - Energizes Glow Plug in engine manifold to assist starting.

   RUN - Normal engine operating position.

   OFF - Shuts down engine.

   START - Energizes engine cranking motor.
6. **Preheat Position:** Place rotary switch in Preheat position for 5 seconds. Move switch to START position.
7. **Main Breaker:** 35 amp for all lamp circuits and panel receptacles.
8. **Switch (Breaker):** For standard lamps 1 thru 4.
9. **Switch:** For standard lamps 1 thru 4.
10. **Switch:** For standard lamps 1 thru 4.
11. **Switch:** For standard lamps 1 thru 4.
12. thru 13. **8kW Option Only:** Switches (Breakers) - for lamps 5 and 6.
15. thru 16. **Switches:** Push to reset.
17. thru 18. **Receptacle:** 120 volt 20 amp.

LS Operating Controls and Instruments



1. **Hourmeter:** Records cumulative engine operating hours for maintenance purposes.
2. **Fuel Level Gauge (Optional):** Indicates fuel level in tank.
3. **Rotary Switch with Key:** Positions (left to right) for all lamp circuits and panel receptacles.
4. **Preheat Position:** Place rotary switch in Preheat position for 5 seconds. Move switch to START position.

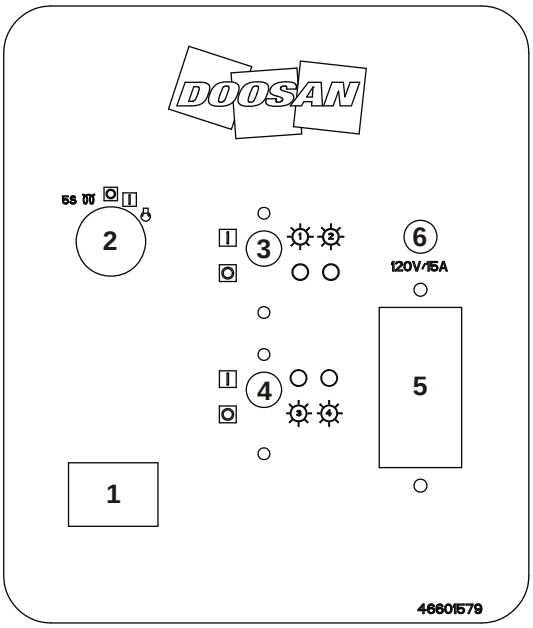
   PREHEAT - Energizes Glow Plug in engine manifold to assist starting.

   RUN - Normal engine operating position.

   OFF - Shuts down engine.

   START - Energizes engine cranking motor.
5. **Main Breaker:** 25 amp for all lamp circuits and panel receptacles.
6. **Switch:** Lamp 1
7. **Switch:** Lamp 2
8. **Switch:** Lamp 3
9. **Switch:** Lamp 4
10. **Twist-Loc Receptacle**: 240V 25 Amp

LSC with Kubota Engine Control Panel (60 Hz)



The operating controls and instruments are arranged on the control panel as shown above. A description of each panel device is as follows:

1. **Hourmeter:** Records cumulative engine operating hours for maintenance purposes.
2. **Rotary Switch with Key:** Positions (left to right).

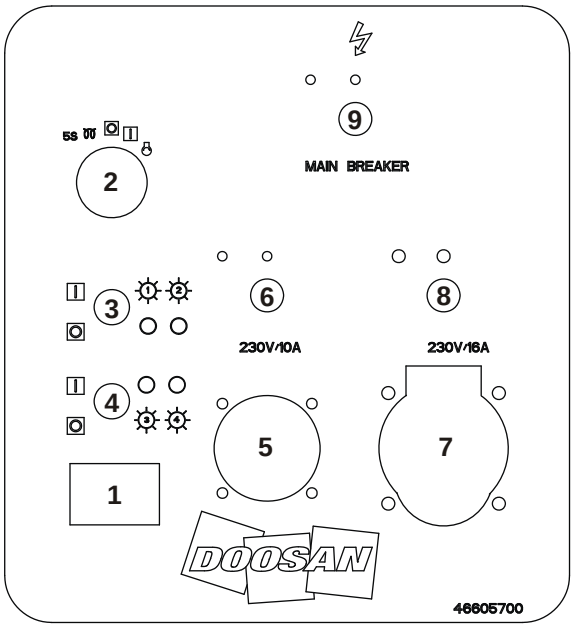
   PREHEAT- Energizes Glow Plug in engine manifold to assist starting.

   OFF - Shuts down engine.

   RUN - Normal engine operating position.

   START - Energizes engine cranking motor.
3. **Lamps 1-2 Switch:** Energizes lamps 1 and 2.
4. **Lamps 3-4 Switch:** Energizes lamps 3 and 4.
5. **Receptacle:** 120 Volt (15 amp) GFCI.
6. **Push to Reset Breaker:** For receptacle Item 5.

LSC with Kubota Engine Control Panel (50 Hz)



The operating controls and instruments are arranged on the control panel as shown above. A description of each panel device is as follows:

1. **Hourmeter:** Records cumulative engine operating hours for maintenance purposes.
2. **Rotary Switch with Key:** Positions (left to right).

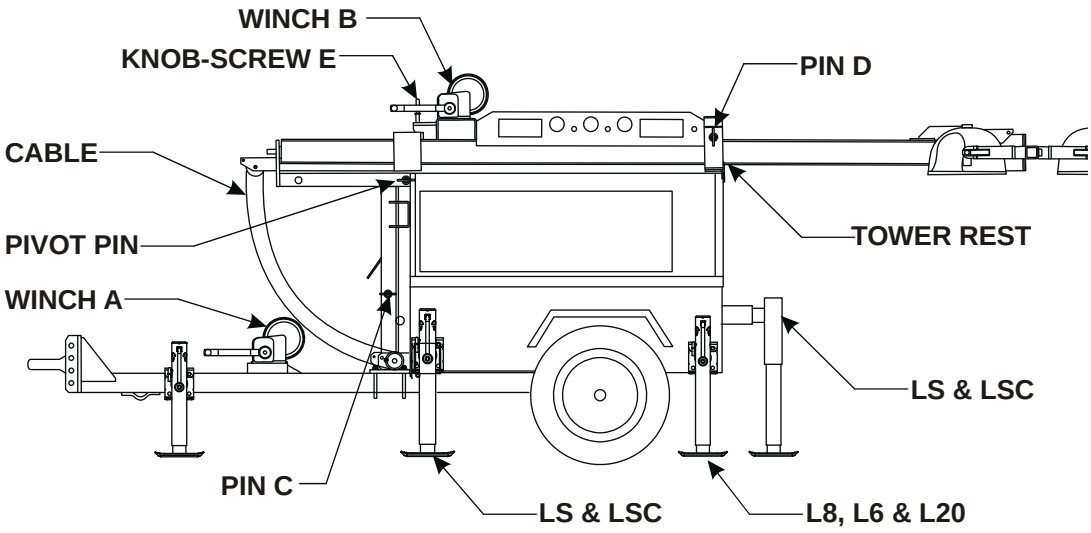
   PREHEAT- Energizes Glow Plug in engine manifold to assist starting.

   OFF - Shuts down engine.

   RUN - Normal engine operating position.

   START - Energizes engine cranking motor.
3. **Lamps 1-2 Switch:** Energizes lamps 1 and 2.
4. **Lamps 3-4 Switch:** Energizes lamps 3 and 4.
5. **Receptacle:** 230 Volt (10 amp).
6. **Breaker:** 10 amp switch type.
7. **Receptacle:** 230 Volt (16 amp).
8. **Breaker:** 16 amp switch type.
9. **Main Breaker:** 25A/25A switch type.

Winch Operating Instructions



Manual Operation

SET-UP (Prior to Raising Tower):

- Inspect cables.
- Ensure no obstruction overhead within 40 feet.
- Mount lamps on cross bar and aim as desired. (L6, L8 &L20 only)
- Extend both outriggers and insert locking pins fully.
- Level unit using jacks and bubble level indicator.
- Jacks must support entire unit weight (tires off the ground).
- Remove pin D.
- Remove pin C.

⚠ DANGER

Do NOT raise or position tower under electrical power lines.

Raise Tower

- Operate winch A to raise tower.
- Insert lock pin C to secure tower in upright position.

Extending Tower for Upright Operation

⚠ WARNING

Extend and retract the tower only in the vertical or upright position.

- With tower in upright position, operate winch B to extend tower to desired height. Do NOT extend past maximum upright mark on tower.
- Loosen screw E to rotate tower. Tighten screw E after rotating tower.

⚠ WARNING

Operate in vertical or upright position with lock pin installed and locked.

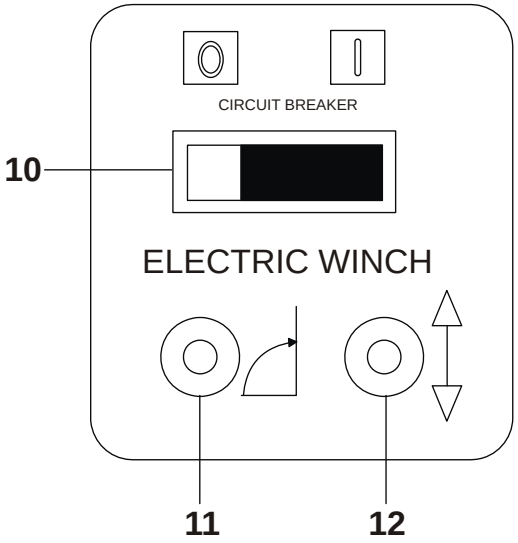
Prior to Lowering Tower

- Shut off lamps.
- Shut off engine.
- Disconnect any devices plugged into external power receptacles.
- Allow lamps to cool for a minimum of 10 minutes.

Lowering Tower (From Upright Position)

- Loosen screw E to rotate tower.
- Rotate tower to line up arrows.
- Tighten screw E.
- Operate winch B to lower tower.
- Remove lock pin C.
- Crank winch A to lower tower to horizontal position. Insert and lock pin D before moving or lifting unit.

Electric Winch



Raise Tower

- On the Electric Winch Controls panel, move winch circuit breaker to the ON position.
- Operate winch A by moving the Raise control switch to the UP position to raise the tower.
- Insert and lock pin C to secure tower in upright position.

Extending Tower for Upright Operation

- With tower in upright position, operate winch B by moving the EXTEND control switch to the UP position to extend tower to desired height. DO NOT extend past upright mark on tower.
- Loosen screw E to rotate tower. Tighten screw E after rotating tower to desired position.
- On the Electric Winch Controls panel, move winch circuit breaker to the OFF position.

Prior to Lowering Tower

- Shut off lamps.
- Shut down engine.
- Disconnect any devices plugged into external power receptacles.
- Allow lamps to cool at least 10 minutes.

Lowering Tower - (From Upright Position)

- Loosen screw E.
- Rotate tower to line up arrows.
- Tighten screw E.
- On the Electric Winch Controls panel, move winch circuit breaker to the ON position.
- Operate winch B EXTEND control switch to the DOWN position to lower tower.
- Remove lock pin C.
- Operate winch A RAISE control switch to the DOWN position to lower tower to horizontal position.
- Insert and lock pin D before moving or lifting.
- On the Electric Winch Controls panel, move winch circuit breaker to the OFF position.

Before Moving

- Chock tires. Raise jacks.
- Swivel all jacks to horizontal position and pin in place.
- Withdraw outrigger locking pins and slide both outriggers to stored position. Install locking pins.
- Operate winch B EXTEND control switch to the DOWN position to lower tower.
- Remove lock pin C.
- Operate winch A RAISE control switch to the DOWN position to lower tower to horizontal position; insert and lock pin D before moving or lifting.
- Insert and lock pin D before moving or lifting.
- On the Electric Winch Controls panel, move winch circuit breaker to the OFF position.

During raising and lowering tower, ensure there is no one behind the machine in the area of the tower. Ensure there is no obstruction overhead within forty feet. Before operating the winch, inspect the cable for damage. Replace damaged cables immediately. When operating the winch, do NOT overcrank when cable is tight. This will damage cable. Do not continue cranking winch when cable becomes loose. This will enable the cable to unwind from winch drum causing kinks and knots.

Damaged cables may break during tower operation allowing the tower to fall. Do not operate tower with damaged cables. Replace damaged cables immediately.

Hazards may exist on the jobsite should this unit shut down automatically and all lamps be extinguished. Personnel should be advised of the possibility and have additional lighting.

Before Starting

Check the following:

1. Engine oil level. Add as required.

Do not remove the pressure cap from a HOT radiator. Allow radiator to cool before removing pressure cap.

2. Engine coolant level. Add as required.
3. Fuel filter. Drain any accumulation of water. Clean or replace element as required.
4. Air cleaner service indicator (if equipped). Service when showing red.

⚠ CAUTION

No smoking, sparks, or open flame near fuel. Do not operate if fuel has been spilled in or near unit.

5. Fuel level in tank. Fill, using clean LOW SULFUR DIESEL fuel, at the end of the day to minimize condensation accumulating in tank.
6. Battery. Keep terminals clean and lightly greased.
7. Engine belts and hoses. Check for proper fit and/or damage. Service as required.
8. Air Vents/Grilles. Both engine radiator and generator cooling air. Check for obstructions (leaves, paper, etc).
9. Visual Inspection. Check for excessive fluid leaks, evidence of arcing around control panel, and loose wire-routing clamps.
10. Engine. Maintain per Engine Operation Manual furnished with this unit.

⚠ CAUTION

Electrical repairs should be made by qualified personnel only.

Starting

1. All external loads should be OFF.
2. All Lamp Switches must be OFF.

⚠ CAUTION

Ether is extremely volatile. Do NOT use in conjunction with Glow Plug preheat system furnished on this engine.

3. Place Rotary Switch to preheat for 5 seconds prior to starting.

NOTE: In extreme cold temperatures, preheat may take up to 10 seconds.

NOTE:

⚠ WARNING

Electrical power is present upon cranking engine.

4. Immediately move Rotary Switch to START position.

   NOTE: Do NOT crank for more than 15 seconds without allowing starter to cool for 30 seconds. If engine does not start after a few attempts, refer to Troubleshooting Section in this manual.

5. Release Rotary Switch after engine continues to run.
6. Allow the engine to warm-up for 3 to 5 minutes. If the engine stops unexpectedly, refer to Troubleshooting Section in this manual.
7. Lamp Switches and Receptacles may now be used.

   NOTE: Keep side doors closed for optimum cooling of unit while running.

Stopping

1. Shut down or unplug (at receptacles) all external loads.
2. Place all LAMP Switches to OFF position.
3. Move Rotary Switch to OFF position.

Maintenance

Maintenance

	Daily	Weekly	Monthly	3 Months 250 hrs.	6 Months 500 hrs.	12 Months 1000 hrs.
Evidence of Arcing Electrical Terminals	C					
Loose Wire Routing Clamps	C					
Engine Oil and Coolant Level	C					
Proper Grounding Circuit	C					
Instruments	C					
Frayed/Loose Fan Belts, Hoses, Wiring Insulation	C					
Inspect Tower Cables for damaged areas	C					
Obstructions in Air Vents	C					
Fuel/Water Separator	Drain					
Precleaner Dumps		C				
Tires		C				
Battery Connections		C				
Engine Radiator (exterior)			C			
Air Intake Hoses and Flexible Hoses			C			
Fasteners (tighten)			C			
Engine Protection Shutdown System			C			
Air Cleaner Housing				C		
Control Compartment (interior)					C	
Fuel Tank (fill at end of each day)					Drain	
Fuel/Water Separator Element				C	R	
Wheel Bearings & Grease Seals					Repack	
Engine Shutdown System Switches (setting)						C
Exterior Finish	As Needed					
Engine	Refer to Engine Operator Manual					
Decals	Replace decals if removed, damaged or missing					

C = Check (adjust, clean or replace as necessary)

R = Replace

Engine Maintenance

Interval and Service Item	
Every 50 service hours Air Cleaner	Fuel Tank - Drain Water
	If water sedimenter is installed, drain water every 500 service hours or 1 year)
	Check
First 50 service hours for a new or overhauled engine	Solenoid Fuel Pump Filter - Inspect and Clean (Note: N/A LSC and LS)
	Engine oil and Oil filter - Replace
	Bolts and nuts on the engine - Retighten
Every 100 service hours	Solenoid Fuel Pump Filter - Inspect and Clean (Note: N/A LSC and LS)
Every 250 service hours	Engine oil and Oil filter - Replace
	Belt and belt tension - Inspect and Adjust
	Radiator fins - Check and Clean
Every 400 service hours	Fuel filter (cartridge type) - Replace
Every 500 service hours	Fuel filter element (switching cock type) - Replace
	Solenoid fuel pump filter - Replace (Note: N/A LSC and LS)
	Valve clearance - Inspect
	Cleaning the fuel tank - (Every 500 service hours or every 1 year.
	Checking glow plug
Every 1000 hours	Starter - Inspect
	Alternator - Inspect
	Bolts and nuts on the engine - Retighten
Every 1500 service hours	Nozzle Tip - Clean
Every 3000 service hours	Fuel injection nozzle - Check and Maintenance
Every 2 years	Coolant - Change
As required	Air cleaner element - Clean, Check, Replace
	Fuel system - Bleed air
	Water sedimenter - Drain water
	Specific gravity of battery electrolyte - Check

Routine Maintenance

⚠ CAUTION

Any unauthorized modification or failure to maintain this equipment may make it unsafe and void factory warranty.

⚠ WARNING

Before attempting any repair service, disconnect engine battery cables and all leads to electrical power requirements. Failure to do so can result in severe personal injury, death, or damage to the equipment.

GENERAL

In addition to periodic inspections, many of the components in this unit requires periodic servicing to provide maximum output and performance. Servicing may consist of pre-operation and post-operation procedures to be performed by the operating or maintenance personnel. The primary function of preventive maintenance is to prevent failure, and consequently, the need for repair. Preventive maintenance is the easiest and the least expensive type of maintenance. Maintaining your unit and keeping it clean at all times will facilitate servicing.

SCHEDULED MAINTENANCE

The maintenance schedule is based on normal operation of the unit. In the event unusual environmental operating conditions exist, the schedule should be adjusted accordingly.

Wire Routing Clamps

Daily check for loose wire routing clamps. Clamps must be secure and properly mounted. Also check wiring for wear, deterioration, and vibration abrasion.

Electrical Terminals

Check daily for evidence of arcing around the electrical terminals.

Grounding Circuit

Daily check that the grounding circuit is in accordance with the National Electric Code Article 250 and the local code requirements. As a minimum, the wire size should be American Wire Gauge 8 (AWG#8) from the grounding terminal, when required. Check to ensure continuity between the grounding terminal, frame, generator, and engine block.

Hoses

Each month it is recommended that the intake hoses from the air cleaner and all flexible hoses used for water and fuel be inspected for the following:

1. All rubber hose joints and the screw type hose clamps must be tight and the hoses showing no signs of wear, abrasion, or deterioration.

2. All flexible hoses must be free of wear, deterioration, and vibration abrasion. Routing clamps must be properly mounted and secure.

Wiring Insulation

Daily check for loose or frayed wiring insulation or sleeving.

Fuel/Water Separator

Daily check for water in the fuel filter/water separator unit. Some engines have a translucent bowl for visual inspection and others have a drain valve below the primary element.

Every six months or 500 hours, (less if fuel is of poor quality or contaminated) replace the bowl element(s).

Air Vents

Daily clean the air vents of any obstructions or debris.

Air Cleaner

Proper maintenance of the air cleaner provides maximum protection against airborne dust. Squeeze the rubber valve (Precleaner Dirt Dump) periodically to ensure that it is not clogged.

To service the air cleaners, proceed as follows:

1. Remove Filter element.
2. Inspect Air Cleaner housing for any condition that might cause a leak. Correct as necessary.
3. Wipe inside of Air Cleaner housing with a clean, damp cloth to remove any dirt accumulation to allow a better seal for Filter element gasket.
4. Install Filter element.

The Air Cleaner Assembly (housing) should be inspected every three months or 500 hours for any leakage paths.

NOTE: Ensure the inlet is free from obstruction.

Ensure the air cleaner mounting bolts and clamps are tight and the air cleaner is mounted securely. Check the air cleaner housing for dents or damage to the cleaner which could lead to a leak.

Tires

Weekly check the condition of the tires and gauge the air pressure. Tires that have cuts, cracks, or little tread depth should be repaired or replaced.

Engine Radiator

Check the coolant level in the radiator. The coolant must cover the tubes in the top tank (approximately 1 inch high on a clean measuring rod, stuck down filler neck).

⚠ WARNING

Remove pressure cap slowly to relieve pressure from HOT radiator. Protect skin and eyes. Hot water or steam and chemical additives can cause serious personal injury.

Tower Cables

Each week the tower lifting cables should be inspected to ensure the ends are attached securely. The cables should be checked for fraying or other damage and replaced if damaged. Also, the pulleys should be checked for unusual wear or damage and replaced if worn excessively or damaged.

Tower Locking Pins

All tower locking pins should be checked weekly. Replace any missing or damaged pins before lifting the unit or raising the tower.

Tower Guides

Every month, inspect all of the tower guides for proper operation. Clean and lubricate sliding surfaces. Replace any missing or damaged parts before raising the tower.

Engine Coolant

The engine coolant system is normally filled with a 50/50 mixture of water and ethylene glycol. This permanent type antifreeze contains rust inhibitors and provides protection to -35°F (-37°C). The use of such a mixture is recommended for both summer and winter operation.

When using only water, add a reputable brand of rust inhibitor to prevent internal corrosion to the cooling system.

It is recommended to test the freezing protection of the coolant every six months or prior to freezing temperatures. Replenish with a fresh mixture every twelve months.

Each month, inspect the radiator exterior for obstructions, dirt, and debris. If present, blow water or compressed air containing a non-flammable solvent between the fins in a direction opposite the normal air flow. Should the radiator be clogged internally, reverse flushing, using a commercial product and the supplier's recommended procedure, may correct the problem.

Engine Protection Shutdown System

The operation of the Engine Protection Shutdown System should be checked every month or whenever it appears not to be operating properly. The three switches involved in this protective shutdown system are the Engine Coolant High Temperature Switch, the Engine Oil Pressure Switch and the Low Fuel Switch.

The Engine Oil Pressure Switch prevents the engine from operating with low oil pressure. Once a month, remove a wire from the engine oil pressure switch (ground the wire on LSC models only) to check the shutdown system for proper operation. Test the Engine Oil Pressure Switch by removing it and connecting it to a source of controlled pressure while monitoring an ohmmeter connected to the switch terminals. On the L6, L8, LS models, as pressure is applied slowly from the controlled source, the switch should close at 12 psi (84 kPa) and show continuity through the contacts. As pressure is slowly decreased to 10 psi (70 kPa) the contacts should open and the ohmmeter should show a lack of continuity through the contacts.

On LSC model, as pressure is applied slowly, the switch should open at 6.5 psi (49 kPa) and show open circuit on the contacts. As the pressure is slowly decreased, the contact should close and the ohmmeter should show continuity through the contact. Replace a defective switch before continuing to operate the unit.

Once a year, the Engine Coolant High Temperature Switch should be tested. Remove switch from the unit and place it in a bath of heated oil. The Engine Coolant High Temperature Switch will require a temperature of approximately 220°F (104°C) to actuate.

NOTE: The Engine Temperature Switch does NOT offer protection when NO coolant is present. Test the switch operation by connecting an ohmmeter between the two wire terminals. The ohmmeter should show zero ohms. When the switch is placed in the heated oil bath and its contact closed, the ohmmeter should indicate zero ohms. Tap the switch lightly during the checking operation.

Replace any defective switch before continuing to operate the unit.

⚠ CAUTION

Never operate the unit with a defective safety shutdown switch or with a by-passed or disconnected switch.

Control Compartment

Every six months or 500 hours with the unit OFF, perform visual inspection for loose connections, dirt, arcing, or damage to electrical components.

Fuel Tank

In order to minimize condensation inside the fuel tank, refill as soon as possible after every use or at the end of each work day. Use only clean, low sulfur fuel. When using a funnel, ensure it is clean and free from dust. Every six months, drain any sediment or accumulated condensate from tank.

Battery

Keep the battery posts and cable connections clean and lightly coated with a grease.

Fasteners

Monthly spot check several capscrews and nuts for proper torque. If any are found loose, a more thorough inspection must be made and deficiencies corrected.

Instruments

Inspect the instrument lamps, gauges, and switches prior to start-up and during operation to ensure proper functioning. Refer to Instrument and Control Panel Section for normal readings.

Running Gear

Every six months the wheel bearings, grease seals, and axle spindles should be inspected for damage and wear (i.e., from corrosion, scratches, or metal particles). Replace any damaged or worn parts. Repack wheel bearings.

Use a wheel bearing grease conforming to specification N.L.G.I. #2 LIthium base grease (preferred) or MIL-G-10924 and suitable for all ambient temperatures.

Grease can be replaced in a wheel bearing using a special fixture or by hand as follows:

1. Place a spoonful of grease in the palm of one hand and take the bearing in the other hand. Push a segment of the wider end of the bearing down into the outer edge of the grease pile closest to the thumb. Keep lifting and pushing the bearing down into the edge of the grease pile until grease oozes out, both from the top and from between the rollers.
2. Rotate the bearing to repeat this operation on the next segment. Repeat until you have the entire bearing completely filled with grease. Before installing bearing, place a light coat of grease on the bearing cups which are pressed in the hub.

   NOTE: Excessive grease in the hub or grease cap serves no purpose due to the fact that there is no way to force the grease into the bearing. The manufacturer's standard procedure is to thoroughly pack the inner and outer bearing with grease and then to apply only a very small amount of grease into the grease cap. If bearing adjustment is required or the hub has been removed for any reason, the following procedure must be followed to ensure a correct bearing adjustment of 0.001" to 0.012" end play.

1. While rotating hub slowly to seat the bearings, tighten spindle nut to approximately 50 Ibs-ft. (68 Nm).
2. Loosen nut slightly to remove preload torque. Do not rotate hub.

3. Finger tighten nut until just snug and place cotter pin in the first nut castellation which lines up with cotter pin hole in spindle.
4. Bend over cotter pin legs to secure nut and clear grease or oil cap.
5. Nut should be free to move with only restraint being the cotter pin.

Cleaning Instructions (General)

Keeping the generator set clean of any oil and dirt is recommended for both appearance and maximum service life of the equipment. The frequency of cleaning will be dependent on local conditions and the severity and frequency of operation.

NOTE: Do not use high pressure water, steam, or solvent on the exterior finish of the unit housing.

EXTERIOR FINISH CARE

This unit was painted and heat cured at the factory with a high quality, thermoset polyester powder coating. The following care will ensure the longest possible life from this finish.

1. If necessary to remove dust, pollen, etc. from housing, wash with water and automotive shampoo or mild dish washing liquid detergent. Do not scrub with a rough cloth, pad, etc.
2. To remove grease, a fast evaporating alcohol or chlorinated solvent can be used. Note: This may cause some dulling of the paint finish.
3. If the paint has faded or chalked, the use of a commercial grade, non-abrasive car wax may partially restore the color and gloss.

Field Repair of Texture Paint

1. The sheet metal should be washed and clean of foreign material and thoroughly dried.
2. Clean and remove all grease and wax from the area to be painted using Dupont 3900S Cleaner prior to sanding.
3. Use 320 grit sanding paper to repair any scratches or defects.
4. Scuff sand the entire area to be painted with a red Scotch Brite Pad.
5. Wipe the area clean using Dupont 3900S.
6. Blow and tack the area to be painted.
7. Apply a smooth coat of Dupont 1854S Tuffcoat Primer to all bare metal areas and allow to dry.
8. Apply 2 medium -wet coats of Dupont 222S Adhesion Promoter over the entire area to be painted, with a 5 minute flash in between coats.
9. To apply the texture coat, use Dupont 1854S Tuffcoat Primer. The proper technique to do this is to spray the Tuffcoat Primer using a pressure pot and use about 2-5 pounds of air pressure. This will allow the primer to splatter, causing the textured look.

NOTE: You must be careful not to put too much primer on at one time, this will effect the amount of texture that you are trying to achieve. Allow the texture coat to flash for 20 minutes or until dry to touch.

10. Apply any Dupont Topcoat Finish, such as, Imron TM or Centari TM according to the label instructions.

NOTE: To re-top coat the textured surfaces when sheet metal repairs are not necessary, follow steps 1, 2, 4, 5, 6. 8 and 10.

Troubleshooting

Troubleshooting

Introduction

Troubleshooting for a light tower is an organized study of a particular problem or series of problems and a planned method of procedure for investigation and correction. The troubleshooting chart that follows includes some of the problems that an operator may encounter during the operation.

The chart does not attempt to list all of the troubles that may occur, nor does it attempt to give all of the answers for correction of the problems. The chart does give those problems that are most likely to occur.

Find the complaint depicted as a bold heading.

Follow down that column to find the potential cause or causes. The causes are listed in order (1,2,3 etc.) to suggest an order to follow in troubleshooting.

Action Plan

Think Before Acting

Study the problem thoroughly and ask yourself these questions:

1. What were the warning signals (if any) that preceded the trouble?
2. Has a similar trouble occurred before?
3. What previous maintenance work has been done?
4. If the alternator will still operate, is it safe to continue operating it to make further checks?

Do The Simplest Things First

Most troubles are simple and easily corrected. Always check the easiest and most obvious things first; Following this simple rule will save time and trouble.

Double Check Before Disassembly

The source of most troubles can be traced not to one component alone, but to the relationship of one component with another. Too often, a machine can be partially disassembled in search of the cause of a certain trouble and all evidence is destroyed during disassembly. Check again to be sure an easy solution to the problem has not been overlooked.

Find And Correct Basic Cause

After a mechanical failure has been corrected, be sure to locate and correct the cause of the trouble so the same failure will not be repeated.

Trouble Shooting Chart

Bold Headings depict the COMPLAINT - Subheadings indicate CAUSES

NOTE: Subheadings suggest sequence to follow troubleshooting.

Table 1: Unit Shutdown

Cause	Corrective Action
Short Air Cleaner Life	Dirty operating conditions Inadequate element cleaning Defective service indicator Wrong air filter element
Engine RPM Low	Clogged fuel filter Incorrect engine speed adjustment Dirty air filter Electrical output overload Engine malfunctioning
Excessive Vibration	Low engine rpm Rubber mounts damaged Out of balance fan Engine malfunctioning Alternator malfunctioning
Unit Shutdown	Out of fuel Engine oil pressure too low Engine temperature too high Broken engine fan belt Loose wire connection Defective fuel solenoid Malfunctioning relay Blown fuse Engine malfunctioning
Unit Fails to Shutdown	Defective switches Defective fuel solenoid Malfunctioning relay Defective engine start switch
Alternator Lamp Stays ON	Loose or broken belts Loose wire connection Defective battery Malfunctioning alternator Malfunctioning diagnostic module
Alternator Lamp Stays OFF	Loose wire connection Malfunctioning Diagnostic Module
Won’t START/RUN	Low battery voltage Out of fuel Malfunctioning engine start switch Clogged fuel filters Blown fuse Defective fuel solenoid

Won't START/RUN cont'd	Engine water temperature too high Engine oil pressure too low Loose wire connection Defective switches Malfunctioning relay Engine malfunctioning
Engine Temperature Shutdown	Loose or broken engine fan belt Ambient temperature too high Dirty operating conditions Dirty radiator Electrical output overload
Engine Oil Pressure Shutdown	Low oil level Out of level > 15 degrees Wrong lube oil Engine malfunctioning Defective switch
Main Circuit Breaker - cannot be reset	Loose or intermittent wire connection(s) Incorrect electrical connection Defective main breaker
No Alternator Voltage Output	Main circuit breaker OFF Loose or intermittent wire Electrical output overload Low engine power Incorrect electrical connection Defective alternator diode bridge assembly Defective alternator
High/Low Alternator Voltage Output	Incorrect electrical connection Incorrect engine speed adjustment Unstable engine speed (oscillation) Unstable electrical requirements Low engine power Loose or intermittent wire connection(s) Defective alternator diode bridge assembly
High/Low Alternator Frequency Output	Incorrect engine speed adjustment Incorrect electrical connection Low engine power Unstable engine speed (oscillation) Unstable electrical connection Electrical output overload Loose or intermittent wire connections
Fluctuating Alternator Frequency/ Voltage and or Oscillating Engine	Unstable electrical requirements Unstable engine speed (oscillation) Incorrect engine speed adjustment Low engine power Electrical output overload Clogged air/fuel filter(s) Loose or intermittent wire connection(s) Incorrect electrical connection Main circuit breaker(s) OFF Defective Generator

Revision History

Rev.	EC Number	Comments
A		Original release
B	SVC31250	Added new LSC-60HZ-T4F Model
C	CN023221	Added LSCWKUB T4F Models
D		Updated content
E		Added LSWKUB-60HZ-T4F

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