WARNING
California Proposition 65. Engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

(000004)

WARNING
California Proposition 65. This product contains or emits chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm.

(000005)
# Table of Contents

## Section 1 Introduction and Safety
- Introduction ................................................................. 1
- Safety Rules ................................................................. 1
- General Hazards ......................................................... 2
- Explosion and Fire Hazards ....................................... 2
- Trailer Hazards ............................................................ 2
- Battery Hazards ............................................................ 3

## Section 2 General Information
- Component Locations .................................................. 5
- Engine Oil Recommendations ...................................... 6
- Coolant Recommendation ............................................ 6
- Fuel System ................................................................. 6
- Hydraulic Oil ............................................................... 6
- Trailer Towing Guidelines ........................................... 6
  - Wheel Chock Guidelines ......................................... 7
- Informational Decals ..................................................... 7
  - Monitoring, Diagnostic, and Protective Features ......... 8

## Section 3 Operation
- Before Starting Engine .................................................. 9
  - Pre-start Checklist ................................................... 9
  - Engine Oil Check ..................................................... 9
  - Hydraulic Oil Check ............................................... 9
  - Engine Coolant Check ............................................. 9
  - Battery Check ......................................................... 9
- Engine and Heater Startup .......................................... 10
- Adjusting Heater Output ............................................. 11
  - AUTO Mode ......................................................... 11
  - MANUAL Mode ..................................................... 11
- Heater and Engine Shutdown ....................................... 11

## Section 4 Maintenance
- Maintenance Tasks ..................................................... 13
  - Daily Walk Around Inspection ................................ 13
  - Check Engine Oil Level ......................................... 13
  - Drain the Oil ......................................................... 13
  - Adding Coolant ..................................................... 14
- Maintenance Schedule ................................................ 14
  - Engine Maintenance Schedule ................................. 15
- Battery Inspection ...................................................... 16
  - Battery Installation and Replacement ..................... 17
  - Other Maintenance Checks .................................. 17

## Section 5 Troubleshooting
- General Troubleshooting Guide ................................ 19
- Digital Controller Status Messages .......................... 21

## Section 6 Installation Diagrams and Service Log
- Engine Harness (1 of 3) .............................................. 23
- Engine Harness (2 of 3) .............................................. 24
- Engine Harness (3 of 3) .............................................. 25
- Trailer Wiring Harness ............................................... 26
- Service Log .............................................................. 27
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Section 1 Introduction and Safety

Introduction
Thank you for purchasing a Generac Mobile Product. This unit has been designed to provide high-performance, efficient operation, and years of quality use when maintained properly.

The MAC 750F flameless air heater is designed and built for sustained, reliable heat production in industrial operating conditions and environments. The MAC 750F is built to withstand frequent handling under these conditions.

The unit is mounted on a trailer that has forklift access and chain attach points on both sides. The fully enclosed design protects the operating components, allowing all-weather storage and operations.

If any section of the manual is not understood, contact your nearest Independent Authorized Service Dealer (IASD), or contact Generac Mobile Products at 800-926-9768, or www.generacmobile.com with any questions or concerns.

The owner is responsible for proper maintenance and safe use of the equipment. SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions for the heater that should be followed during installation, operation and maintenance of the heater and batteries. ALWAYS supply this manual to any individual that will use this machine.

THE INFORMATION CONTAINED HEREIN WAS BASED ON MACHINES IN PRODUCTION AT THE TIME OF PUBLICATION. GENERAC RESERVES THE RIGHT TO MODIFY THIS MANUAL AT ANY TIME.

Safety Rules
The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are, therefore, not all inclusive. If using a procedure, work method or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others. Also make sure the procedure, work method or operating technique utilized does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the unit, DANGER, WARNING, CAUTION and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:

DANGER
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTE: Notes contain additional information important to a procedure and will be found within the regular text of this manual.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.
Introduction and Safety

General Hazards

**DANGER**
Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.  

(000103)

**DANGER**
Hydraulic Fluid Injection. High-pressure, high-temperature hydraulic fluid can pierce skin and cause severe burns. Do not check for leaks with hands. Seek immediate medical attention in case of accident. Failure to protect body accordingly will result in death or serious injury.  

(000239)

**WARNING**
Do not operate this unit while transporting. Doing so could result in death or serious injury.  

(000231)

**WARNING**
Hearing Loss. Hearing protection is recommended when using this machine. Failure to wear hearing protection could result in permanent hearing loss.  

(000107)

**WARNING**
Moving Parts. Keep clothing, hair, and appendages away from moving parts. Failure to do so could result in death or serious injury.  

(000111)

**WARNING**
Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire.  

(000108)

**CAUTION**
Equipment or property damage. Do not block air intake or restrict proper air flow. Doing so could result in unsafe operation or damage to unit.  

(000229)

**CAUTION**
Unit damage. Do not stop engine before heating unit is cooled. Doing so could result in unit damage.  

(000240a)

Explosion and Fire Hazards

**DANGER**
Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Add fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.  

(000105)

**WARNING**
Risk of Fire. Unit must be positioned in a manner that prevents combustible material accumulation underneath. Failure to do so could result in death or serious injury.  

(000147)

Trailer Hazards

**WARNING**
Trailer must be securely coupled to the hitch and chains correctly attached. Uncoupled or unchained towing could result in death or serious injury.  

(000233)

**WARNING**
Verify unit is properly secured with wheel chocks and on level ground. Failure to do so could result in death or serious injury.  

(000234)

**WARNING**
Property or Equipment Damage. Tighten wheel lug nuts after first 50 miles to factory specifications. Failure to do so could result in death, serious injury, property or equipment damage.  

(000235)
Battery Hazards

⚠️ WARNING ⚠️

Expansion. Batteries emit explosive gases while charging. Keep fire and spark away. Wear protective gear when working with batteries. Failure to do so could result in death or serious injury.

(000137a)

⚠️ WARNING ⚠️

Expansion. Do not dispose of batteries in a fire. Batteries are explosive. Electrolyte solution can cause burns and blindness. If electrolyte contacts skin or eyes, flush with water and seek immediate medical attention.

(000162)

⚠️ WARNING ⚠️

Risk of burn. Do not open or mutilate batteries. Batteries contain electrolyte solution which can cause burns and blindness. If electrolyte contacts skin or eyes, flush with water and seek immediate medical attention.

(000163a)

⚠️ WARNING ⚠️

Accidental Start-up. Disconnect the negative battery cable, then the positive battery cable when working on unit. Failure to do so could result in death or serious injury.

(000130)

⚠️ WARNING ⚠️

Vision Loss. Eye protection is required to avoid spray from spark plug hole when cranking engine. Failure to do so could result in vision loss.

(000181)

⚠️ WARNING ⚠️

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death or serious injury.

(000228)
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Section 2 General Information

Component Locations

Figure 2-1. Features and Controls

Table 1 - Heater Components

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Engine radiator</td>
</tr>
<tr>
<td>B</td>
<td>Breakaway battery for trailer brakes</td>
</tr>
<tr>
<td>C</td>
<td>Diesel engine</td>
</tr>
<tr>
<td>D</td>
<td>Hydraulic fluid filters</td>
</tr>
<tr>
<td>E</td>
<td>Hydraulic fluid fill</td>
</tr>
<tr>
<td>F</td>
<td>Hydraulic fluid reservoir tank</td>
</tr>
<tr>
<td>G</td>
<td>Hydraulic fluid breather/separator</td>
</tr>
<tr>
<td>H</td>
<td>Controller</td>
</tr>
<tr>
<td>I</td>
<td>Manual compartment</td>
</tr>
<tr>
<td>J</td>
<td>Diesel engine turbo charger</td>
</tr>
<tr>
<td>K</td>
<td>Diesel engine oil dipstick</td>
</tr>
<tr>
<td>L</td>
<td>Engine fuel filters</td>
</tr>
<tr>
<td>M</td>
<td>Automatic positive air shutdown</td>
</tr>
</tbody>
</table>
Engine Oil Recommendations

Genuine Generac parts are recommended for all maintenance items. Generac oil kits include both the oil filter and air filter, and can be obtained through any IASD. All Generac oil kits meet minimum American Petroleum Institute (API) Service Class CJ-4/SM. Select the appropriate viscosity oil grade according to the expected operating temperature. Synthetic oil also can be used in the appropriate weight as standard, once the engine has been broken in. Once synthetic oil is used, it should be used for the life of the unit. It is not recommended to go back to a mineral oil. Do not use special additives. Engine oil capacity (including filter) is 15.85qt (15L).

NOTE: For temperatures below -13°F use SAE 5W-30. For more information, see the engine manual.

Fuel System

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Keep fire and spark away. Failure to do so will result in death or serious injury. (000168)

Explosion and Fire. Do not overfill fuel tank. Overfilling may cause fuel to leak and ignite or explode, resulting in death or serious injury. (000204)

The heater is designed to operate with diesel fuel. Fuel tank is 160 gal (605.67L) with 152 gal (575L) usable.

IMPORTANT NOTE: Comply with all laws regulating the storage and handling of fuels.

Follow these guidelines:

- Use only ultra-low-sulfur diesel fuel
- When temperatures are at or below freezing, use No. 1D diesel fuel.
- When temperatures are above freezing, use No. 2D diesel fuel.
- In some areas of the country, Climatized Fuel—a mixture of 1D and 2D, may also be used.

Hydraulic Oil

Hydraulic Fluid Injection. High-pressure, high-temperature hydraulic fluid can burn skin and cause severe burns. Do not check for leaks with hands. Seek immediate medical attention in case of accident. Failure to protect body accordingly will result in death or serious injury. (000239)

Type: Exxon Mobile DTE-10 ISO VG 68 hydraulic oil
System capacity: 25 gal (94.64 L)

Trailer Towing Guidelines

Trailer must be securely coupled to the hitch and chains correctly attached. Uncoupled or unchained towing could result in death or serious injury. (000233)

Property or Equipment Damage. Tighten wheel lug nuts after first 50 miles to factory specifications. Failure to do so could result in death, serious injury, property or equipment damage. (000235)
Driving a vehicle with a trailer in tow is vastly different than driving the same vehicle without a trailer in tow. Consider the following:

- It takes longer to get up to speed.
- More room is needed to turn and pass.
- More distance is needed to stop.
- The driver is responsible for keeping the vehicle and trailer in control.

Before towing, verify the following:

1. The coupling, safety chains, safety brake, tires, wheels and lights are in working order.
2. The breakaway battery is fully charged.
3. Wheel lug nuts are tightened to 85-95 ft-lbs (115-129 Nm).
4. Brake controller engages the trailer brakes before the tow vehicle brakes.

While towing, make regular stops to verify the following:

1. Coupler is secured to the hitch and locked.
2. Electrical connections are made.
3. Appropriate slack in the safety chains.
4. Appropriate slack in the breakaway switch pull-pin cable.
5. Tires are inflated to proper air pressure and no damage or unusual wear to tread or sidewalls.
6. Trailer and doors are secured and latched.

Wheel Chock Guidelines

**WARNING**

Verify unit is properly secured with wheel chocks and on level ground. Failure to do so could result in death or serious injury.

- Select wheel chock according to equipment type and size
- Always use in pairs and on firm surfaces
- Chock in direction of grade
- Chock both sides of wheel if direction of grade is unknown
- Use wheel chock only after parking brake is applied and tested
- Center chocks squarely against tread of each wheel
- Do not drive over wheel chocks

### Informational Decals

<table>
<thead>
<tr>
<th>Location</th>
<th>Decal Description</th>
</tr>
</thead>
</table>
| On back of right-side door | -Tire and loading information  
-Manufacturer’s label; provides VIN #, model #, date of manufacture, GVWR, vehicle class, and tire and rim size  
-Emissions label |
| Inside unit, right side, riveted to blower housing | -Serial #, Model #, VIN, MAC phone #  
(Metal, blue/silver color) |
| Front of trailer, near jack | -Tire and loading information  
-Decal showing VIN #, model #, date of manufacture, GVWR, and tire and rim size |

### Controller

For troubleshooting, see Digital Controller Status Messages.

![Figure 2-2. Controller](001576)

<table>
<thead>
<tr>
<th>Button Position</th>
<th>Manual Mode</th>
<th>Auto Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Increase heat</td>
<td>Increase temperature setting</td>
</tr>
<tr>
<td>B</td>
<td>Increase fan</td>
<td>Decrease temperature setting</td>
</tr>
<tr>
<td>C</td>
<td>Overview/Analog gauge screen</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Main menu</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Heater on/off</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Next screen</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Popup “Softkeys”</td>
<td></td>
</tr>
</tbody>
</table>
**Monitoring, Diagnostic, and Protective Features**

The unit mechanical and electrical systems are connected to various sensors that monitor unit status. If conditions occur outside of predetermined manufacturing parameters, the controller will automatically stop the machine and display fault information. The controller can also display a variety of critical alerts, diagnostics, and recommendations. The controller provides a variety of real-time current operating condition data on outlet temperature, engine RPMs, and fuel level. For more information, refer to the controller wiring diagrams.
Section 3 Operation

Before Starting Engine

Pre-start Checklist

• Remove all flammable materials and fire hazards within 5 feet of heater
• Keep heater a minimum of 5 feet from structures or barricades
• Verify unit is not leaking fluids: check inside and outside the unit for leaking fuel, engine oil, HTF/hydraulic oil, and engine coolant
• Verify the following are clear of debris and obstructions:
  – Engine air intake
  – Engine exhaust stack
  – Outlets and fan intakes
• Verify air duct hose is securely fastened to outlet duct assembly
• Check fuel, engine oil, and engine coolant levels
• Verify unit is properly secure with jacks deployed, if applicable, wheels chocked and level
• Check alternator drive belt for tension and wear

Engine Oil Check

Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

1. Remove dipstick from crankcase and wipe it clean.
2. Insert dipstick fully and remove slowly.
3. Oil level must be between the FULL and ADD marks on the dipstick.

Hydraulic Oil Check

1. On the hydraulic fluid reservoir tank is a gauge showing hydraulic oil level. Verify level is between MIN and MAX.

Engine Coolant Check

WARNING
Risk of burns. Do not open coolant system until engine has completely cooled. Doing so could result in serious injury.

1. Remove radiator fill cap.
2. Check coolant level and degrees of fouling.
   • Coolant level should be approximately 10 mm below the radiator core top
3. Install radiator cap securely.

Battery Check

WARNING
Electrical shock. Disconnect battery ground terminal before working on battery or battery wires. Failure to do so could result in death or serious injury.

1. Verify battery cable connections are not loose or corroded.
2. Verify battery electrolyte level is sufficient. If necessary, replenish with a commercially available electrolyte, such as distilled water
Engine and Heater Startup

1. Close all doors that access the unit’s interior.  

**IMPORTANT NOTE:** All doors on the unit must be closed during operation.

2. Turn ignition key to ON. The screen displays “Engine Preheat” (Figure 3-1).

3. When screen displays “Start Engine” (Figure 3-2), turn ignition key to START.

   **CAUTION**
   Equipment Damage. Do not continuously crank engine for more than ten seconds. Doing so will lead to overdischarge of batteries and starter seizure.

4. The screen displays “Engine Warming” (Figure 3-3).

5. When the coolant temperature reaches 140°F (60°C), engine warming is complete and the heater automatically begins warming up. The screen displays “Heater is warming up—Please wait” (Figure 3-4).

6. When the heater is warm, heat begins blowing from ducts and screen displays “Heater on—Press Off to stop the heater” (Figure 3-5).
Adjusting Heater Output
The heater has two modes, AUTO and MANUAL. The current mode displays at the top of the controller screen.

AUTO Mode
In AUTO mode, output temperature is manually set, as follows:

- To increase output temperature, press (+) (Figure 3-6, item A)
- To decrease output temperature, press (-) (Figure 3-6, item B)

Figure 3-6. AUTO mode.

MANUAL Mode
In MANUAL mode, heater output can be set to minimum fan or maximum fan, as follows:

- For minimum fan, press MIN FAN (Figure 3-7, item A).
- For maximum fan, press MAX FAN (Figure 3-7, item B).

Figure 3-7. MANUAL mode.

Heater and Engine Shutdown
1. Press OFF to stop the heater (Figure 3-7, item C). The screen displays “Heater is cooling down--Please wait” (Figure 3-8).

Figure 3-8. Heater Cooling

NOTE: During cool down, the ON button is disabled.
When cool down is complete, the screen displays as shown in Figure 3-9.

Figure 3-9. Cool-down Complete

CAUTION
Unit damage. Do not stop engine before heating unit is cooled. Doing so could result in unit damage.

2. When the control screen indicates it is safe to turn off the engine, turn the ignition key to OFF.
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Section 4 Maintenance

NOTE: Normal maintenance service and replacement of parts is the responsibility of the owner and, as such, are not considered defects in materials or workmanship within the terms of the warranty. It is strongly recommended that equipment be periodically checked by an IASD.

Maintenance Tasks

Daily checks must be performed when unit is operated continuously for extended periods of time. Daily checks and routine monthly checks can be performed by an authorized operator.

Daily Walk Around Inspection

Look for conditions that could hinder performance or safety, such as (but not limited to) oil, coolant, fuel leakage, blocked vents, loose or missing hardware and electrical connections. Check for foreign matter blocking the vents and on top of unit.

- Visually inspect outer cover for significant damage beyond scuffs and small nicks.
- Visually inspect for wire abrasion.
- Visually inspect the fan belt for cracks, fraying and stretching. Verify belt is properly seated in the pulley grooves. Every 750 hours, it is recommended that the belt be removed and checked for wear. While belt is removed, inspect pulleys and bearing. Rotate and feel for hard turning or unusual sounds.
- Coolant should be checked daily.
- Check electrical connectors, battery and ground points. Look for loose or missing hardware.
- Check all flexible rubber hoses for deterioration.
- Check hydraulic hoses for signs of wear.
- Verify hoses are not crushed, kinked or twisted.
- Verify there are no cracks or corrosion.

Check Engine Oil Level

WARNING
Risk of burns. Allow engine to cool before draining oil or coolant. Failure to do so could result in death or serious injury. (000139)

WARNING
Potential of cancer. Prolonged or repeated contact with used motor oil has been shown to cause cancer in laboratory animals. Thoroughly wash exposed areas with soap and water. (000127a)

1. Place container under drain port, or connect hose or piping to drain port leading to container.
2. Remove plug from oil drain.
3. Open drain valve.
4. See engine manual for oil filter information.
5. Close drain valve.
6. Remove hose or piping if applicable.
7. Replace plug in drain port on sub base.

Check Engine Oil Level

CAUTION
Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage. (000135)

NOTE: If engine was running, wait at least ten minutes before proceeding.

1. Remove dipstick and wipe it dry with a clean, lint free cloth.
2. Slowly insert the clean dipstick into the tube. Verify the dipstick is fully seated in the dipstick tube.

3. After ten seconds, remove the dipstick and look at the oil level on both sides. The lower of the two readings will be the correct oil level measurement.
4. Add oil (if necessary) to adjust the level. After adding or changing the oil, the engine should run for one minute before checking the oil level. Wait ten minutes to allow the engine to cool and oil to fully drain into the oil pan.

Typical causes of inaccurate oil level readings:
- Reading the high level of the dipstick.
- Reading the dipstick before the oil fully drains into the oil pan.
- Inserting and removing the dipstick too quickly.
- The dipstick is not fully seated in the dipstick tube.
Adding Coolant

**DANGER**
Risk of poisoning. Do not use mouth to siphon coolant. Doing so will result in death or serious injury.

**WARNING**
Risk of burns. Do not open coolant system until engine has completely cooled. Doing so could result in serious injury.

**CAUTION**
Do not use any chromate base rust inhibitor with propylene glycol base antifreeze, boosters or additives. Doing so will cause overheating.

If coolant level is below the filler neck, coolant needs to be added (see Coolant Recommendation).

1. Verify engine is stopped and cooled.
2. Remove radiator cap.
3. Fill radiator slowly with coolant until it comes up to the filler neck.
4. Operate engine approximately five minutes at a low idle speed to bleed the air in the coolant circuit.

**NOTE:** Coolant level will drop.

5. Stop the engine and, once cooled, replenish with coolant.

---

**Maintenance Schedule**

Periodic inspection, service, and maintenance of this unit is critical to ensure reliable operation. The following is the manufacturer's recommended maintenance schedule. The maintenance items will need to be performed more frequently if the heater is used in severe applications (such as very high or very low ambient conditions or extremely dirty/dusty environments). Use the heater hour meter or calendar time, whichever occurs first, from the previous maintenance interval to determine the next required maintenance interval. Note that some checks are based on hours of operation.

Follow all applicable safety alerts found in this manual or engine service manual before performing any maintenance checks or service.

This maintenance schedule reflects the minimum tasks that need to be accomplished to verify the heater remains operational. Some of the tasks can be performed by an authorized operator and others must be performed by an IASD.

**NOTE:** An authorized operator is one who has been trained by a IASD in proper operation and inspection of this unit.
# Engine Maintenance Schedule

<table>
<thead>
<tr>
<th>Interval</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| Daily            | • Check engine oil level  
|                  | • Inspect engine for fuel, oil and coolant leaks  
|                  | • Check oil pressure gauge registration  
|                  | • Check oil pressure warning lamp  
|                  | • Drain water in fuel filter  
|                  | • Check coolant for abnormal color  
|                  | • Check coolant level  
|                  | • Check coolant temperature gauge  
|                  | • Check radiator filler cap fitting condition  
|                  | • Check alternator drive belt tension and replace if necessary  
|                  | • Inspect air cooler for water leaks  
|                  | • Check Engine Malfunction Indicator Lamp and LCD Display Panel  
|                  | • Check electrolyte level  
|                  | • Clean battery  
|                  | • Check battery charge condition  
|                  |   – Ammeter registration  
|                  |   – Charge warning lamp  
|                  | • Check preheating condition  
|                  | • Check engine starting condition  
|                  | • Check exhaust smoke condition  
| Every 250 Hours  | • Replace fuel filter element*  
| Every 500 Hours  | • Replace engine oil and oil filter element  
|                  | • Replace fuel filter element  
|                  | • Replace engine air filter  
|                  | • Check alternator drive belt tension and replace if necessary  
| Every 750 Hours  | • Replace fuel filter element*  
| Every 1000 Hours | • Replace engine oil and oil filter element  
|                  | • Replace fuel filter element  
|                  | • Change hydraulic fluid  
|                  | • Replace hydraulic filters  
|                  | • Check alternator drive belt tension and replace if necessary  
|                  | • Check and clean the starter and alternator  
|                  | • Check cylinder compression pressure*  
|                  | • Check valve clearance*  
| Every 1250 Hours | • Replace fuel filter element*  
| Every 1500 Hours | • Replace engine oil and oil filter element  
|                  | • Replace fuel filter element  
|                  | • Check alternator drive belt tension and replace if necessary  
| After 1500 Hours | • All hours-based checks and maintenance should now be performed every 250 hours  

The following maintenance items should be performed annually, regardless of operation hours:

<table>
<thead>
<tr>
<th>Change</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| Annual          | • Hydraulic breather/separator  
|                 | • Carbon Monoxide (CO) test at outlet air duct by trained service technician  
|                 | • Blower/fan hardware for condition and tightness  

---

**Owner's Manual for Flameless Air Heater**
NOTE: For items marked (*), consult equipment supplier.

NOTE: All service and maintenance or repairs are recommended to be completed by an IASD to maintain the warranty status of a unit. You cannot be denied emissions warranty coverage solely based on failure to complete recommended service maintenance.

NOTE: For additional maintenance information, see engine manual.

Battery Inspection

**WARNING**

Explosion. Batteries emit explosive gases while charging. Keep fire and spark away. Wear protective gear when working with batteries. Failure to do so could result in death or serious injury.

(000137a)

**WARNING**

Explosion. Do not dispose of batteries in a fire. Batteries are explosive. Electrolyte solution can cause burns and blindness. If electrolyte contacts skin or eyes, flush with water and seek immediate medical attention.

(000162)

**WARNING**

Risk of burn. Do no open or mutilate batteries. Batteries contain electrolyte solution which can cause burns and blindness. If electrolyte contacts skin or eyes, flush with water and seek immediate medical attention.

(000163a)

**WARNING**

Accidental Start-up. Disconnect the negative battery cable, then the positive battery cable when working on unit. Failure to do so could result in death or serious injury.

(000130)

**WARNING**

Vision Loss. Eye protection is required to avoid spray from spark plug hole when cranking engine. Failure to do so could result in vision loss.

(000181)

**WARNING**

Environmental Hazard. Always recycle batteries at an official recycling center in accordance with all local laws and regulations. Failure to do so could result in environmental damage, death or serious injury.

(000228)

NOTE: Remove five amp controller fuse from control panel.

An authorized operator should inspect the engine battery monthly. At this time, the battery fluid level should be checked using a load tester and distilled water added if needed. Battery cables and connections should also be inspected for cleanliness and corrosion. Once every six months, an IASD should inspect the battery system. At this time, the battery condition and state of charge should be checked using a load test battery. The battery should be recharged or replaced as required.

Battery service is to be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away. Observe the following precautions when working on batteries:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of battery.
- Disconnect charging source prior to connecting or disconnecting battery terminals.

NOTE: Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of one pound (500 grams) bicarbonate of soda (baking soda) to one gallon (four liters) of water. The bicarbonate of soda solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water.

- Discharge static electricity before touching battery by first touching a grounded metal surface.
Battery Installation and Replacement

When required, the battery must be replaced with one of equivalent size, voltage, and CCA (cold crank amp capacity). Minimum CCA for this unit is 2200 (2 pairs of 2 1100 CCA 12 volt batteries in series to give 1100 Amps at 24 volts, connected in parallel to provide 2200 CCA at 24 volts). Contact the local IASD for correct battery size. A new battery must be filled with the proper electrolyte and be fully charged before install.

Battery cables are connected to the unit at the factory. Connect cables to battery posts as follows.

1. Connect battery cable from starter contactor to positive (POS or +) battery post.
2. Connect black battery cable to negative (NEG or -) battery post.
3. Refer to Starting the Engine.

Other Maintenance Checks

The following inspections should be performed by an authorized service technician, or a properly trained authorized operator. These maintenance items require a high level of experience and skill to evaluate and correct.

- Inspect engine accessory drive belts
- Inspect hoses and connections
- Inspect fuel supply system
- Inspect exhaust system
- Inspect exhaust pipe sleeve
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# Section 5 Troubleshooting

## General Troubleshooting Guide

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Cranks But Will Not Start</td>
<td>No fuel.</td>
<td>Verify there is no fuel leakage and replenish.</td>
</tr>
<tr>
<td></td>
<td>Low oil level.</td>
<td>Replenish oil to full.</td>
</tr>
<tr>
<td></td>
<td>Emergency shutdown switch is ON.</td>
<td>Turn emergency shutdown switch OFF.</td>
</tr>
<tr>
<td></td>
<td>Air in fuel system.</td>
<td>Bleed air.</td>
</tr>
<tr>
<td></td>
<td>Fuel filter is clogged.</td>
<td>Remove water and change element.</td>
</tr>
<tr>
<td></td>
<td>Fuel is frozen.</td>
<td>Warm fuel pipes with hot water or wait until ambient temperature rises.</td>
</tr>
<tr>
<td></td>
<td>Injection pump fails.</td>
<td>Contact Generac Technical Service</td>
</tr>
<tr>
<td></td>
<td>Electromagnetic type fuel pump failure.</td>
<td>Contact Generac Technical Service</td>
</tr>
<tr>
<td></td>
<td>Engine control system failure.</td>
<td>Contact Generac Technical Service</td>
</tr>
<tr>
<td></td>
<td>Restricted air flow.</td>
<td>Check/replace air filter.</td>
</tr>
<tr>
<td></td>
<td>LCD Display panel shows engine failure.</td>
<td>Contact Generac Technical Service</td>
</tr>
<tr>
<td></td>
<td>Strainer is clogged.</td>
<td>Contact Generac Technical Service</td>
</tr>
<tr>
<td></td>
<td>Pre-heating device failure.</td>
<td></td>
</tr>
<tr>
<td>Engine Will Not Crank (Electric Start)</td>
<td>Dead battery.</td>
<td>Replace battery.</td>
</tr>
<tr>
<td></td>
<td>Battery terminal is disconnected, loose or corroded.</td>
<td>Replace corroded part and tighten securely.</td>
</tr>
<tr>
<td></td>
<td>Starter ground terminal is disconnected, loose or corroded.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine oil viscosity is too high.</td>
<td>Change with oil of correct viscosity.</td>
</tr>
<tr>
<td></td>
<td>Starter or electrical system failure.</td>
<td>Contact Generac Technical Service</td>
</tr>
<tr>
<td>Engine Starts But Stops Shortly Thereafter</td>
<td>Idling is too low.</td>
<td>Adjust by idling control equipment on the machine. If adjustment is not possible, contact ISUZU dealer.</td>
</tr>
<tr>
<td></td>
<td>Fuel filter is clogged.</td>
<td>Remove water and change element.</td>
</tr>
<tr>
<td></td>
<td>Pre-fuel filter is clogged.</td>
<td>Clean or change element.</td>
</tr>
<tr>
<td></td>
<td>Air cleaner is clogged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine control system failure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Injection pump failure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strainer is clogged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electromagnetic type fuel pump failure.</td>
<td></td>
</tr>
<tr>
<td>Engine Running is Unstable</td>
<td>Fuel system failure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water or air is in fuel system.</td>
<td>Bleed air or remove water.</td>
</tr>
<tr>
<td></td>
<td>Engine control system failure.</td>
<td>Contact Generac Technical Service</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Exhaust Smoke is White</td>
<td>Needs more warm-up time.</td>
<td>Conduct warm-up operation.</td>
</tr>
<tr>
<td></td>
<td>Too much engine oil.</td>
<td>Correct oil level.</td>
</tr>
<tr>
<td></td>
<td>Engine control system fails.</td>
<td>Contact Generac Technical Service.</td>
</tr>
<tr>
<td></td>
<td>Injection pump failure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fuel system failure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Long time idling (more than two hours).</td>
<td>Keep stopping the equipment and press throttle pedal.</td>
</tr>
<tr>
<td>Exhaust smoke is Black</td>
<td>Excessive speed.</td>
<td>Verify engine RPM. Check AVR adjustment.</td>
</tr>
<tr>
<td></td>
<td>Injection pump failure.</td>
<td>Contact Generac Technical Service.</td>
</tr>
<tr>
<td></td>
<td>Air cleaner is clogged.</td>
<td>Clean or change element.</td>
</tr>
<tr>
<td></td>
<td>Intercooler is clogged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exhaust system is clogged.</td>
<td></td>
</tr>
<tr>
<td>Engine Overheats</td>
<td>No coolant.</td>
<td>Add coolant.</td>
</tr>
<tr>
<td></td>
<td>Front of radiator is clogged with dust.</td>
<td>Clean with soft brush.</td>
</tr>
<tr>
<td></td>
<td>Sub tank cap is not tightened.</td>
<td>Tighten or replace sub tank cap.</td>
</tr>
<tr>
<td></td>
<td>Coolant is fouled.</td>
<td>Clean inside of radiator and change coolant.</td>
</tr>
<tr>
<td></td>
<td>Oil is in coolant.</td>
<td>Contact Generac Technical Service.</td>
</tr>
<tr>
<td></td>
<td>Thermostat failure.</td>
<td>Change thermostat.</td>
</tr>
<tr>
<td>Oil Pressure Does Not Rise</td>
<td>Engine oil viscosity is incorrect.</td>
<td>Change with oil of correct viscosity.</td>
</tr>
<tr>
<td></td>
<td>Engine oil level is not sufficient.</td>
<td>Replenish.</td>
</tr>
<tr>
<td></td>
<td>Meter, lamp or switch failure.</td>
<td></td>
</tr>
<tr>
<td>Engine Has No Power</td>
<td>Air cleaner is clogged.</td>
<td>Clean element.</td>
</tr>
<tr>
<td></td>
<td>Pre-fuel filter is clogged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fuel filter is clogged.</td>
<td>Remove water and change element.</td>
</tr>
<tr>
<td></td>
<td>Strainer is clogged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine control system failure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exhaust system is clogged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fuel system failure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type of fuel is incorrect.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electromagnetic type fuel pump failure.</td>
<td></td>
</tr>
<tr>
<td>Overheat/shutdown condition</td>
<td>Access doors are open</td>
<td>Close all access doors</td>
</tr>
<tr>
<td></td>
<td>Air outlets are not open</td>
<td>Open the air outlets and verify there are no obstructions or kinks in the ducting</td>
</tr>
<tr>
<td></td>
<td>Front radiator or rear oil cooler are full of debris</td>
<td>Clean the machine</td>
</tr>
<tr>
<td></td>
<td>Engine RPM is set too high based on ambient temperature</td>
<td>Lower the engine RPM</td>
</tr>
<tr>
<td></td>
<td>Faulty temperature sensor</td>
<td>Check air outlet sensor operation</td>
</tr>
<tr>
<td></td>
<td>Blower fan not operating correctly</td>
<td>Remove ducting; check blower fan operation</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No/low heat condition</td>
<td>Incorrect heater setting (target temperature too low)</td>
<td>Adjust heater output</td>
</tr>
<tr>
<td></td>
<td>Access doors are open</td>
<td>Close all access doors</td>
</tr>
</tbody>
</table>
| | Low HTF/hydraulic oil level | • Check level on tank sight glass, adjust as needed  
• Inspect HTF hoses for leaks or loose fittings  
• Check fluid for foaming |
| | HTF/hydraulic oil filters clogged | Check restriction gauges/replace HTF filters |
| | Ducting too long for ambient conditions | Move unit closer to heat recipient if possible |
| | HTF pump drive sheared | Contact Generac technical service |

### Digital Controller Status Messages

<table>
<thead>
<tr>
<th>Message</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Warming – Please Wait</td>
<td>Engine coolant temperature &lt; 140°</td>
</tr>
<tr>
<td>Engine Preheat</td>
<td>Wait approximately ten seconds after heater power up</td>
</tr>
</tbody>
</table>
| Engine is not ready – Check RPMs, Fuel Level or Wait to Start | Engine RPMs < 500  
Fuel level < 10%  
Wait to Start signal |
| Low Fuel Warning | Fuel level < 20%  
• Fuel level notification appears on screen  
Fuel level <= 16%  
• Fuel level notification appears on screen  
• Heat/fan load reduced to 50%  
Fuel level <= 12%  
• Fuel level notification appears on screen  
• Open heat circuit and close scroll fan circuit  
• Drop engine to idle  
Fuel level <= 8%  
• Fuel level notification appears on screen  
• Engine shuts down |
| Check heater settings or connections, then Reset on the Machine Overview | IFM controller detected a short or break in a sender |
| Heater is cooling down – Please wait | IFM controller detects heater is in cool down. ON button disabled. |
| Engine is going to shutdown | Fuel level <= 12% for 3 hours and 15 minutes |
| Engine Fault Shutdown | Low engine oil pressure  
High engine coolant temperature  
Engine overspeed |
### Troubleshooting

<table>
<thead>
<tr>
<th>Message</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater Shutdown due to temperature, pressure</td>
<td>High hydraulic temperature</td>
</tr>
<tr>
<td>or level out of range</td>
<td>Low hydraulic pressure</td>
</tr>
<tr>
<td></td>
<td>Low hydraulic level</td>
</tr>
<tr>
<td>Fuel Over temp.</td>
<td>Fuel temperature &gt;= 140° F</td>
</tr>
<tr>
<td></td>
<td>1. Open heat circuit solenoid</td>
</tr>
<tr>
<td></td>
<td>2. Increase scroll fan RPM to max RPM via</td>
</tr>
<tr>
<td></td>
<td>fan circuit solenoid and drop engine to</td>
</tr>
<tr>
<td></td>
<td>idle</td>
</tr>
<tr>
<td></td>
<td>3. Monitor fuel temperature for five</td>
</tr>
<tr>
<td></td>
<td>minutes</td>
</tr>
<tr>
<td></td>
<td>Fuel temperature is still &gt;= 140° F</td>
</tr>
<tr>
<td></td>
<td>1. Open heat circuit solenoid</td>
</tr>
<tr>
<td></td>
<td>2. Drop engine to idle</td>
</tr>
<tr>
<td></td>
<td>3. Unit will shut down after five minutes</td>
</tr>
</tbody>
</table>
Section 6 Installation Diagrams and Service Log

Engine Harness (1 of 3)
NOTES:
1. ALL WIRES ON SHEET 2 TO BE 18 GA. WHITE, UNLESS SPECIFIED OTHERWISE.
2. TWISTED WIRES, MINIMUM ONE TWIST PER INCH.
3. SHIELDED CABLE
4. LABEL CONNECTORS AS SHOWN.
5. FUSE 7 & 8 LOCATED ON THE REAR OF THE PANEL DOOR.

FAN COIL CONNECTOR
WIRE INSERTION VIEW
MURPHY: 00-00-9620
DEUTSCH: W2P

HEAT COIL CONNECTOR
WIRE INSERTION VIEW
MURPHY: 00-00-9692
DEUTSCH: W2P

ENGINE HATCH
WIRE INSERTION VIEW
MURPHY: 00-00-9677
DEUTSCH: W2P

24 Owner's Manual for Flameless Air Heater
Installation Diagrams and Service Log

Engine Harness (2 of 3)
Service Log

OIL GRADE: ____________________________  BRAND: ____________________________

COOLANT MIXTURE: ____________________________  BRAND: ____________________________

Date | Hours to Service | Oil Level | Coolant Level | Date | Hours to Service | Oil Level | Coolant Level
--- | --- | --- | --- | --- | --- | --- | ---

