

MAC1.2G

Indirect Fired Heater

Owner's Manual



MODEL NUMBER: _____

SERIAL NUMBER: _____

DATE PURCHASED: _____

SAVE THIS MANUAL FOR FUTURE REFERENCE

⚠ WARNING

CANCER AND REPRODUCTIVE HARM

www.P65Warnings.ca.gov.

(000393a)

⚠ WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to

www.P65Warnings.ca.gov/diesel.

(000394)

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Section 1: Introduction and Safety

Introduction

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

The MAC1.2G indirect fired heater is designed and built for sustained, reliable heat production in industrial operating conditions and environments. The MAC1.2G 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.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Read This Manual Thoroughly



WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

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

The owner is responsible for proper maintenance and safe use of the unit. The manufacturer strongly recommends that all users read the owner's manual and thoroughly understand all instructions before using this unit. The manufacturer also strongly recommends instructing other users to properly start and operate the unit. This prepares them if they need to operate the unit in an emergency.

SAVE THESE INSTRUCTIONS for future reference. This manual contains important instructions for the unit that should be followed during placement, operation, and maintenance of the unit and its components. Always supply this manual to any individual that will use this unit.

Intended Applications

The machine is designed for industrial use. Examples of intended applications include, but are not limited to:

- Gas and oil exploration
- Utilities and power plants

- Mining
- Construction
- Agricultural applications
- Employee locker areas and housing
- Emergency thawing
- Pre-warming of equipment and motors
- Offshore drilling rigs
- Painting and coating locations
- Airline hanger heat
- Dehumidification

Using this machine for applications other than its intended purpose may void the warranty. Examples of misuse include, but are not limited to, using the machine:

- To transport persons or equipment.
- As a tow vehicle.
- As a ladder or work surface.
- During extreme weather.
- Indoors.
- If it is incorrectly serviced or maintained.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The alerts in this manual, and on tags and decals affixed to the unit, are 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 and 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. Alert definitions are as follows:

DANGER

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

(000001)

WARNING

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

(000002)

CAUTION

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

(000003)

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

These safety alerts 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.

How to Obtain Service

When the unit requires servicing or repairs, contact a GMP ASD for assistance. Service technicians are factory-trained and are capable of handling all service needs. For assistance locating a dealer, go to <https://www.generacmobileproducts.com/parts-service/find-service>.

When contacting a GMP ASD about parts and service, always supply the complete model and serial number of the unit as given on the data decal located on the unit. Record the model and serial numbers in the spaces provided on the front cover of this manual.

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)

WARNING

Personal injury. Do not operate unit during transport. Doing so could result in death, serious injury, or property damage. (000231a)



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

Equipment damage. Do not attempt to start or operate a unit in need of repair or scheduled maintenance. Doing so could result in serious injury, death, or equipment failure or damage. (000291)



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)



WARNING

Hearing Loss. Hearing protection is recommended when using this machine. Failure to wear hearing protection could result in permanent hearing loss. (000107)

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)



DANGER

Explosion and Fire. Do not fill fuel tank past full line. Allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury. (000214)

**⚠ DANGER**

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

(000143)

**⚠ 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)

**⚠ WARNING**

Fire risk. Fuel and vapors are extremely flammable. Do not operate indoors. Doing so could result in death, serious injury, or property or equipment damage.

(000281)

**⚠ WARNING**

Explosion and fire risk. Do not smoke near unit. Keep fire and spark away. Failure to do so could result in death, serious injury, or property or equipment damage.

(000282)

Trailer Hazards

⚠ WARNING

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

(000233a)

⚠ WARNING

Crushing hazard. Verify unit is properly secured and on level ground. An unsecured unit can suddenly roll or move, causing death or serious injury.

(000234a)

⚠ 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)

⚠ WARNING

Rollover hazard. Unit must be placed on flat, level ground to prevent tipping or rollover. Failure to do so could result in death, serious injury, or property or equipment damage.

(000283)

⚠ WARNING

Property or equipment damage. Do not alter the trailer. Alterations can damage essential safety items. Doing so could result in death, serious injury, or property or equipment damage.

(000285)

Battery Hazards

**⚠ 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 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)

Always recycle batteries in accordance with local laws and regulations. Contact your local solid waste collection site or recycling facility to obtain information on local recycling processes. For more information on battery recycling, visit the Battery Council International website at: <http://batteryCouncil.org>

Service Safety



Personal injury. Wear appropriate personal protective equipment at all times while operating and servicing unit. Failure to do so could result in personal injury.

(000419)

- **DO NOT** perform even routine service (oil/filter changes, cleaning, etc.) unless all electrical components are shut down.
- Replace all missing and hard to read decals. Decals provide important operating instructions and warn of dangers and hazards.

Towing Safety

Towing a trailer requires care. The trailer and vehicle must be in good condition and securely fastened to each other to reduce the possibility of an accident. Some states require that large trailers be registered and licensed. Contact your local Department of Transportation (DOT) office to verify license requirements for your particular unit.

Hitch and Coupling

- Verify the hitch and coupling on the towing vehicle are rated equal to, or greater than, the trailer's Gross Vehicle Weight Rating (GVWR).
- Verify the trailer hitch and the coupling are compatible. Verify the coupling is securely fastened to the vehicle.
- **DO NOT** tow the trailer using defective parts. Inspect the hitch and coupling for wear or damage before every tow.
- To eliminate squeaking, wipe the coupler clean and apply fresh grease each time the trailer is towed.
- Connect safety chains in a crossing pattern under the tongue.
- Before towing the trailer, verify that the weight of the trailer is equal across all tires. On trailers with adjustable height hitches, adjust the angle of the trailer tongue to keep the trailer as level as possible.
- Verify all access doors on the trailer are closed and locked.

Running Lights

- Verify directional and brake lights on trailer are connected and working properly.

Safe Towing Techniques

- Practice turning, stopping, and backing up in an area away from heavy traffic prior to transporting the unit.
- Maximum recommended speed for highway towing is 45 mph (72 km/h). Recommended off-road towing speed is 10 mph (16 km/h) or less, depending on terrain.
- When towing, maintain extra space between vehicles and avoid soft shoulders, curbs, and sudden lane changes.
- Reduce speed before curves, and maintain speed throughout the curve.
- Reduce speed before going over bumps or holes. Keep your foot off the accelerator while going over bumps or holes.

Reporting Trailer Safety Defects

If you believe your trailer has a defect which could cause a crash, injury, or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Generac Mobile Products, LLC.

If NHTSA receives similar complaints, it may open an investigation. If it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in an individual problem between you, your dealer, or Generac Mobile Products, LLC.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-888-327-4236 (TTY:1-800-424-9153), go to <http://www.safercar.gov>; or write to:

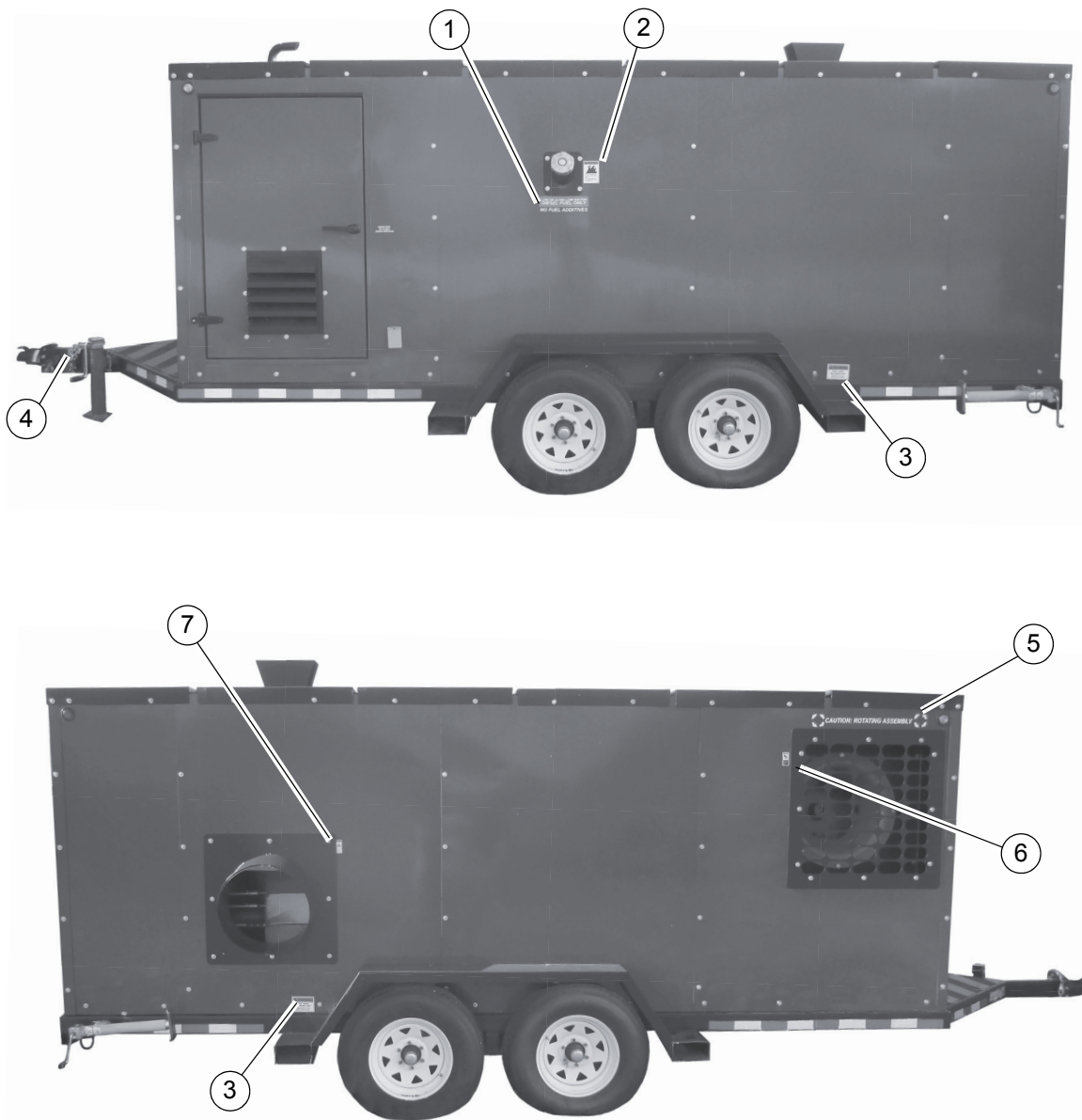
Administrator
NHTSA
1200 New Jersey Avenue S.E.
Washington, DC 20590

You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

Safety and Operating Decals

See [Figure 1-1](#). This unit features numerous safety and operating decals. These decals provide important operating instructions and warn of dangers and hazards. The following diagrams illustrate decal locations and descrip-

tions. Replace any missing or hard-to-read decals and use care when washing and cleaning the unit. Decal part numbers can be found in the unit parts manual at www.generacmobileproducts.com.



008975

Figure 1-1. Safety and Operating Decal Locations

Item No.	Label Description	Item No.	Label Description
1	No fuel additives. Low or ultra low sulfur diesel fuel only	5	Caution: Rotating assembly
2	Warning: Fire from flammable fuel can cause serious injury or death. No smoking, sparks, or open flame during fueling or wash-down	6	Danger: Moving parts can cut or crush
3	Warning: Wheel lugnuts may become loose	7	Warning: Hot surfaces
4	Trailer identification information		

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Section 2: General Information

Specifications

Heater	1,200,000 BTU/hour (351.69 kW/hour) maximum
Type	Indirect fired
Power	ISUZU 3CE1 Tier 4 Final diesel, 23.4 HP (17.4 kW)
Operating Speed	1,800 rpm
Engine Controls/Display	LOFA, keyed ignition switch
Air Volume	6,500 CFM (11,044 m ³ /hour)
Battery	Standard: 575 CCA (115 CCA Reserve) Cold Weather Package: EON dry cell, 1150 CCA
Static Pressure	3 in H ₂ O
Air Outlet	1 x 20 in (50.8 cm)
Electrical	12V
Engine Fuel	Diesel
Engine Fuel Capacity	USA — 270 gal (1022 L)
Engine Oil Capacity	7.1 qt (6.7 L)
Engine Coolant Capacity	2.1 qt (2 L)
Engine Fuel Rate (at 100% prime)	1.25 gph (4.76 Lph)
Burner Fuel Rate (at 100% prime)	10.18 gph (38.5 Lph)
Run Time	33.8 hours
Temperature Rise	180 °F (82 °C)
Fan	Class 2, SWSI, 222 BC
Hitch Type	Electric, 2-5/16 in ball coupler
Duct Diameter	1 x 20 in (50.8 cm)
Estimated Heater Efficiency	85%
Dimensions	255 in x 96 in x 102 in (6.5 m x 2.4 m x 2.6 m)
Weight	Dry: 8,265 lbs (3,749 kg) Operating: 10,280 lbs (4,663 kg)
Burner	Riello RL38/M
Generator	Marathon 282PSL1704

Engine Component Locations

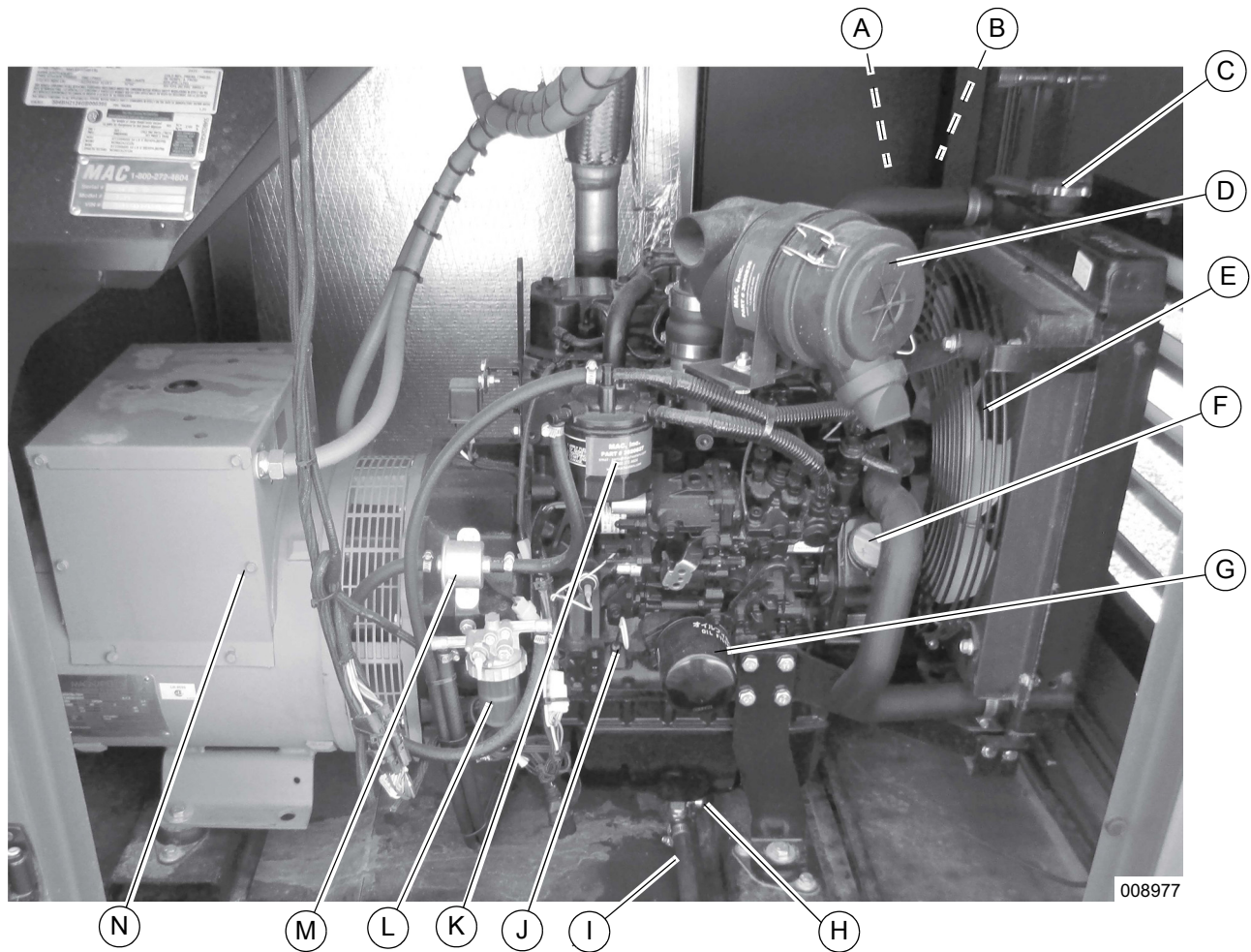
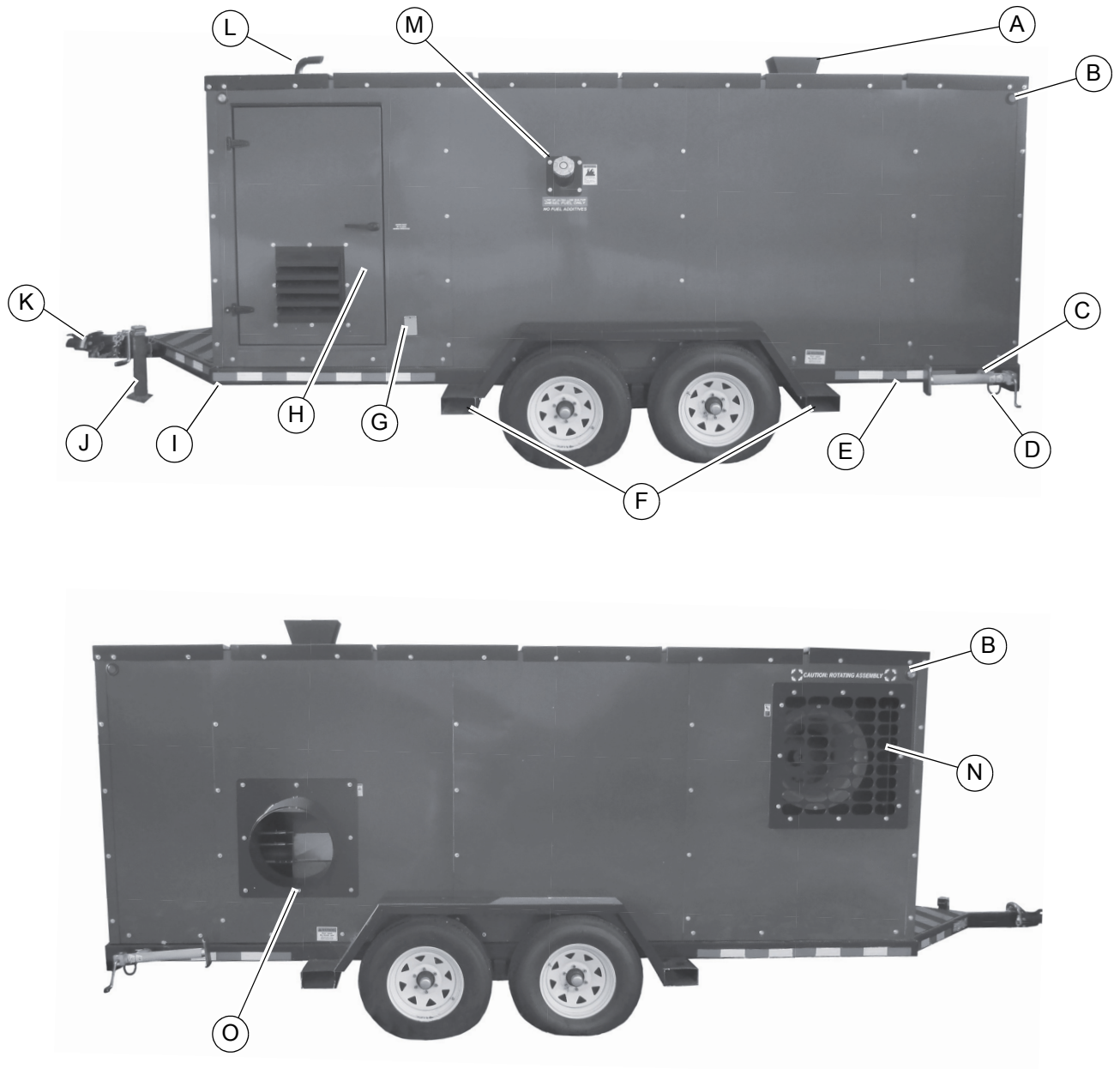


Figure 2-1. Engine Components

- | | | | |
|---|------------------------------|---|--------------------------|
| A | Battery (not shown) | H | Engine oil drain valve |
| B | Coolant sub-tank (not shown) | I | Engine oil drain hose |
| C | Radiator fill cap | J | Engine oil dipstick |
| D | Engine air cleaner assembly | K | Engine fuel filter |
| E | Engine fan | L | Water separator assembly |
| F | Engine oil fill | M | Engine fuel pump |
| G | Engine oil filter | N | Generator |

External Components



008975

Figure 2-2. External Components

- | | | | |
|---|---------------------|---|----------------------------|
| A | Burner exhaust | I | Oil drain hose (not shown) |
| B | Reflector | J | Trailer support jack |
| C | Rear support jack | K | Trailer hitch |
| D | D-ring | L | Engine exhaust |
| E | Reflector tape | M | Fuel fill |
| F | Fork lift pockets | N | Air inlet panel |
| G | Power receptacle | O | Air outlet |
| H | Engine access panel | | |

Heater Components

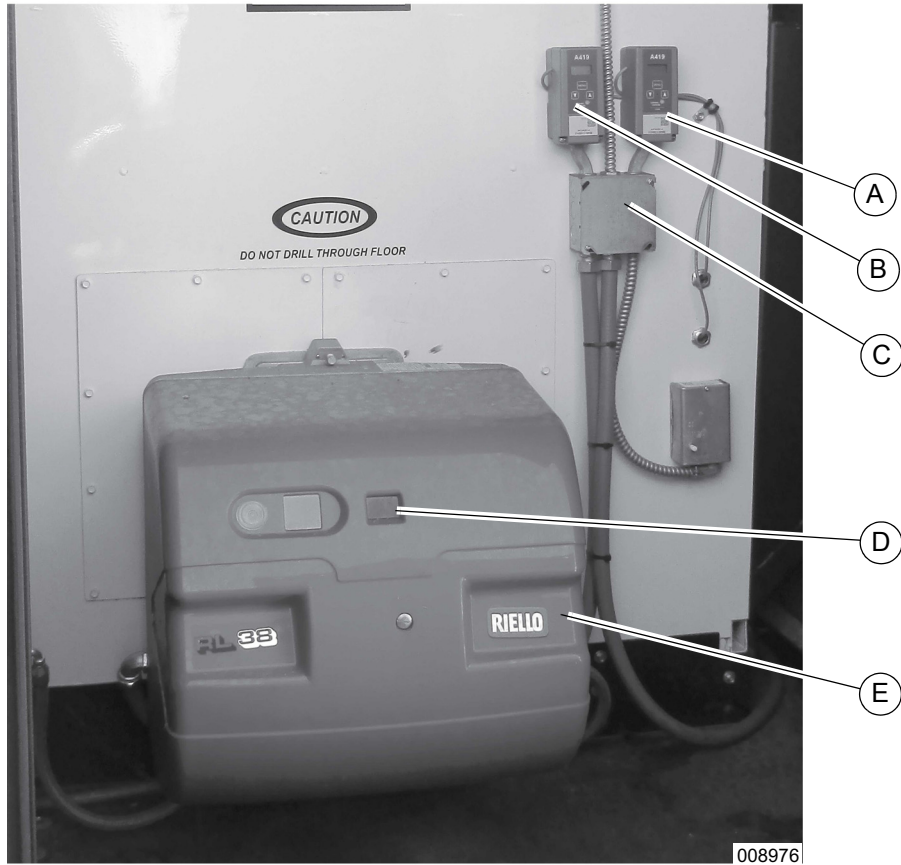


Figure 2-3. Heater Components

- | | | | |
|---|------------------------|---|---------------------|
| A | Outlet temp thermostat | D | Inspection window |
| B | Burner temp thermostat | E | Diesel fired burner |
| C | Electrical control box | | |

Emissions

The United States Environmental Protection Agency (US EPA) (and California Air Resources Board (CARB), for engines/equipment certified to California standards) requires that this engine/equipment complies with exhaust and evaporative emissions standards. Locate the emissions compliance decal on the engine to determine applicable standards. For emissions warranty information, please reference the included emissions warranty. It is important to follow the maintenance specifications in the manual to ensure that the engine complies with the applicable emissions standards for the duration of the product's life.

Engine Oil Recommendations

Change oil and oil filter at least once every 12 months, even if the hours of operation are fewer than the otherwise recommended service interval. See the applicable engine manual for recommended oil types. Use only approved oil types.

For more information, see the engine manual.

Coolant Recommendation



⚠ DANGER

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

(000149)

⚠ CAUTION

Engine damage. Use approved coolant only. Failure to do so could result in equipment damage.

(000323)

Use demineralized or distilled water for best results. Hard water causes scale deposits, which reduces cooling efficiency and raises internal temperatures, possibly leading to engine damage.

See the engine manual for recommended coolants.

Use a Long Life Coolant Antifreeze or Extended Life Coolant that meets or exceeds these specifications:

- Isuzu Part Number 8-12346-290-0
- ASTM D4985

See the engine manual for recommended coolants.

Test coolant yearly, or every 1,000 hours, whichever comes first.

For more information, see the engine manual.

Fuel System



⚠ DANGER

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)



⚠ DANGER

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.

IMPORTANT NOTE: Comply with all laws regulating the storage, handling, and transporting 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.

For more information, see the engine manual.

Trailer Towing Guidelines

⚠ WARNING

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

⚠ 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)

⚠ WARNING

Property or equipment damage. Do not alter the trailer. Alterations can damage essential safety items. Doing so could result in death, serious injury, or property or equipment damage. (000285)

WARNING

Personal injury. Do not operate unit during transport. Doing so could result in death, serious injury, or property damage.

(000231a)

Driving a vehicle with a trailer in tow is 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 under control.

When towing, make regular stops to verify the following:

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

Other towing guidelines:

- Use the tow vehicles mirrors to verify there is enough room for lane changes or entering/exiting traffic.
- Allow plenty of stopping distance for the trailer and tow vehicle.
- Do not drive faster than the conditions allow.
- A rule of thumb for passing distance is the distance with a trailer is four times the passing distance without a trailer.
- Use lower gears for climbing and descending grades.
- Do not ride the brakes while descending grades; this can cause overheating and potential brake failure.
- Do not apply the tow vehicle brakes to correct extreme trailer swaying. Continued pulling of the trailer, and even slight acceleration, or carefully applying the trailer brakes (using the electronic brake controller) will provide a stabilizing force.

Wheel Chock Guidelines

WARNING

Crushing hazard. Verify unit is properly secured and on level ground. An unsecured unit can suddenly roll or move, causing death or serious injury.

(000234a)

- 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.

Control Panel

The control panel is located in the front compartment of the unit.

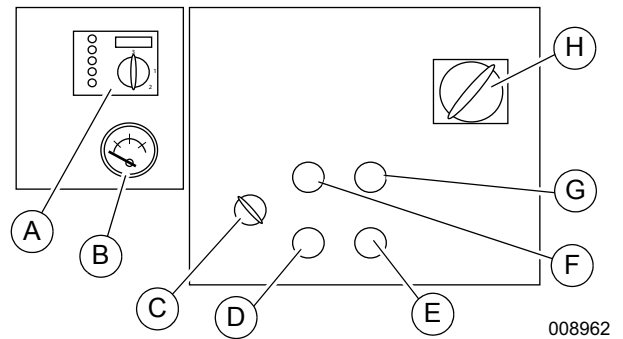


Figure 2-4. Control Panel Features

A	Engine control box and ignition
B	Fuel gauge
C	Burner ON/OFF switch
D	Blower START push button
E	Blower STOP push button
F	Blower ON indicator lamp
G	Blower OFF indicator lamp
H	Control panel main disconnect switch

Section 3: Operation

Before Starting Engine

Pre-start Checklist



⚠️ 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)

- Remove all flammable materials and fire hazards within 5 ft (1.5 m) of unit.
- Keep unit a minimum of 5 ft (1.5 m) from structures or barricades.
- Verify the unit is not leaking fluids: inspect 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.
- Inspect the alternator drive belt for tension and abnormalities.
- Verify that the burner cover is securely installed.
- Inspect the generator. See the generator manual.
- Verify battery cables are not loose or corroded.
- Inspect ducting for damage or unusual wear.

Engine Oil Level Check

⚠️ 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 10 minutes before proceeding.

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

3. After 10 seconds, remove the oil 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, run the engine for one minute before checking the oil level. Wait 10 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 oil dipstick.
- Reading the oil dipstick before the oil fully drains into the oil pan.
- Inserting and removing the oil dipstick too quickly.
- The oil dipstick is not fully seated in the oil dipstick tube.

Engine Coolant Check



⚠️ WARNING

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

(000154)

Inspect the coolant sub-tank to check the coolant level. Check the coolant level when the engine is cold, as coolant flows to the sub-tank when the radiator is still hot, which provides an inaccurate reading. Replace the coolant according to the [Maintenance Schedule](#), or if it is contaminated or dirty. See [Adding Coolant](#).

Ducting Guidelines



⚠️ 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)

⚠️ WARNING

Burn hazard. Do not remove ducting until all air pressure has been emptied from hose duct. Failure to do so could result in severe injury.

(000288)

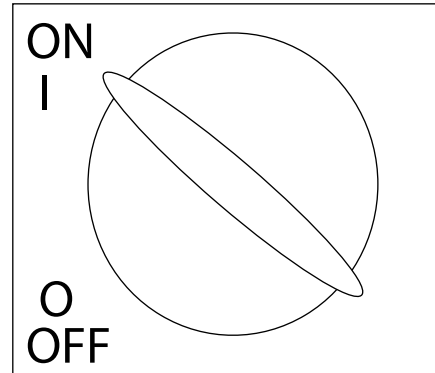
- Place ducting in desired configuration before operating the unit.
- Tightly secure ducting end to the unit. Verify any additional ducting is also tightly secured.

- Avoid sharp bends or 90° turns in the ducting.
- Use only the necessary length of ducting required; do not exceed maximum length.
- Verify that ducting is not in a high traffic area, and will not impede workers or other machinery. Care should be taken to prohibit the need to step or climb over ducting.
- **DO NOT** place ducting over combustible materials.
- **DO NOT** place ducting over surfaces that may cause damage or reduce performance, such as water, sharp rocks or glass, electrical wiring, piping, etc.
- **DO NOT** place or drape anything over ducting, such as covers, insulation (insulated ducting is available), blankets or cloth, or electrical wires.
- Inspect ducting for damage or unusual wear before each use.

1. Turn ignition key to RUN and wait for the light to expire.
2. Turn ignition key to START.

NOTE: Do not hold the engine starter key in the start position for more than 15 seconds. Doing so will overheat the starter motor. Wait 30 seconds for the starter motor to cool before making a second attempt to start if the engine fails to start.

3. Warm up engine for 90 seconds.
4. See **Figure 3-1**. Turn main disconnect switch to ON.



008974

Figure 3-1. Main Disconnect Switch

Engine and Heater Startup



⚠️ 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)

⚠️ WARNING

Crushing hazard. Verify unit is properly secured and on level ground. An unsecured unit can suddenly roll or move, causing death or serious injury. (000234a)

⚠️ WARNING

Equipment damage. Do not attempt to start or operate a unit in need of repair or scheduled maintenance. Doing so could result in serious injury, death, or equipment failure or damage. (000291)

⚠️ 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

Equipment damage. Do not cover unit during operation. All ducting ports must remain open even if not being used. Failure to do so will result in equipment damage. (000290)

5. Press green START button.
6. Turn burner to ON.
7. See **Ducting Guidelines**. Place heating ducts as appropriate for the application.

IMPORTANT NOTE: A twisted or bent air duct will cause loss of air pressure and temperature.

NOTE: Do not use starting aids, such as gasoline. Doing so will damage the engine.

Adjusting Heater Output

See **Thermostat Control** to adjust the setpoint (SP) and differential (dIF). If SP is set to 180 °F (82 °C) and dIF is set to 10 degrees, the following will happen:

1. Temperature will rise to 180 °F (82 °C).
2. Burner shuts off until temperature cools down 10 degrees.
3. Burner turns back on.

Engine and Heater Shutdown



Equipment damage. Shut down the heater before turning off the generator. Failure to do so could result in equipment damage.

(000295)

1. Turn burner switch to OFF.
2. Allow outlet air temperature to cool for at least 90 seconds.

IMPORTANT NOTE: Do not detach ducting until all air pressure has been emptied from hose duct.

3. Press STOP.
4. Turn ignition key to OFF.

Thermostat

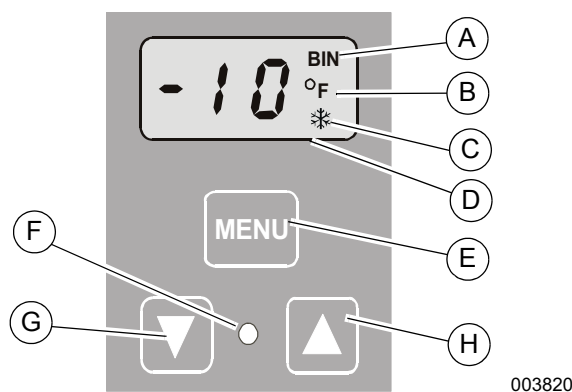


Figure 3-2. Thermostat Features

A	Temperature offset indicator
B	Temperature units indicator
C	Operating mode indicator
D	Liquid Crystal Display (LCD)
E	MENU button
F	Output relay status indicator LED
G	Down arrow button
H	Up arrow button

Changing Temperature Units

The thermostat is factory set to display temperature in Fahrenheit. Press the up and down buttons simultaneously to convert to Celsius.

Thermostat Control

1. Press and hold the MENU button until the display changes to flashing SP.
2. Press the up or down buttons to reach desired function.
3. Press the MENU button to display current value of function.
4. Press the up or down buttons until desired value is reached.
5. Press the MENU button to save. The display will return to the sensor temperature.

NOTE: If the MENU button is not pressed after changing the setpoint value, the new value will not be saved.

See the table below for all thermostat functions.

Function	Range	Factory Setting
SP = Setpoint	-30 to 212 °F (-34 to 100 °C)	30
diF = Differential	1 to 30 °F or C	5
ASd = Anti-short Cycle Delay	0 to 12 minutes	1
OFS = Temperature Offset	0 to 50 °F or C	0
SF = Sensor Failure Operation	0 = output de-energized 1 = output energized	1

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Section 4: Maintenance

Maintenance

Regular maintenance will improve performance and extend engine/equipment life. Generac Mobile Products, LLC recommends that all maintenance work be performed by a Generac Mobile Products Authorized Service Dealer (GMP ASD). Regular maintenance, replacement, or repair of the emissions control devices and systems may be performed by any repair shop or person of the owner's choosing. To obtain emissions control warranty service free of charge, the work must be performed by a GMP ASD. See the emissions warranty.

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.

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

Daily Walk Around Inspection

Inspect for conditions that could hinder performance or safety, such as (but not limited to) oil, coolant, and fuel leakage, blocked vents, loose or missing hardware, and improper electrical connections. Check for foreign matter blocking vents and on top of unit. Perform any necessary maintenance tasks. See [Trailer Maintenance](#) before towing.

- Inspect outer cover for significant damage beyond scuffs and small nicks.
- Inspect for electrical wire abrasion.
- Inspect the fan belt for cracking, fraying, and stretching. Verify the belt is properly seated in the pulley grooves. See [Maintenance Schedule](#).
- Check fluid levels.
- Inspect electrical connectors, battery, and ground points. Look for loose or missing hardware.
- Inspect all flexible rubber hoses for deterioration.
- Inspect hydraulic hoses for signs of wear.
- Verify hoses are not crushed, bent, or twisted.
- Verify there are no cracks or corrosion.
- Inspect tires for unusual wear.
- Inspect ducting for damage or unusual wear.

Draining and Refilling the Oil



⚠ 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. See [Figure 2-2](#). Place container under the oil drain hose (I).
2. Remove plug from oil drain hose.
3. See [Figure 2-1](#). Open oil drain valve (H). Drain oil.
4. Close drain valve once draining is complete.
5. See engine manual for oil filter information.
6. See [Figure 2-1](#). Remove filler cap (yellow) (F) on the rocker arm cover.
7. Fill oil pan to specified level.
8. Replace filler cap.

NOTE: Do not overtighten filler cap. Doing so may damage filler cap.

9. Start engine and let run for five minutes. Verify there are no leaks.
10. Stop engine and let cool for approximately 10 minutes. Verify oil level is correct. (See [Engine Oil Level Check](#).) Repeat steps 6–9 until oil is properly filled.

IMPORTANT NOTE: Do not overfill oil pan. Overfilling may result in white exhaust smoke, sudden over engine speed, or engine damage.

Adding Coolant



⚠ DANGER

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

(000149)



WARNING

Risk of burns. Contents under pressure. Do not remove the radiator pressure cap while engine is hot. Doing so could result in death or serious injury. (000322a)



WARNING

Risk of burns. Do not open coolant system until engine has completely cooled. Doing so could result in serious injury. (000154)

CAUTION

Risk of overheating. Do not use any chromate base rust inhibitor with propylene glycol base antifreeze, boosters, or additives. Doing so will cause overheating and possible equipment damage. (000165a)

CAUTION

Personal injury. Wear appropriate personal protective equipment at all times while operating and servicing unit. Failure to do so could result in personal injury. (000419)

Coolant must be changed every year or at 1,000 hours of operation. Check coolant level and degree of fouling according to the steps below. Correct coolant level is approximately 0.39 in (10 mm) below the radiator core top. Wear proper PPE when handling Long Life Coolant.

1. Verify engine is stopped and cooled.
2. See [Figure 4-1](#). Verify coolant drain plug (A) is closed.

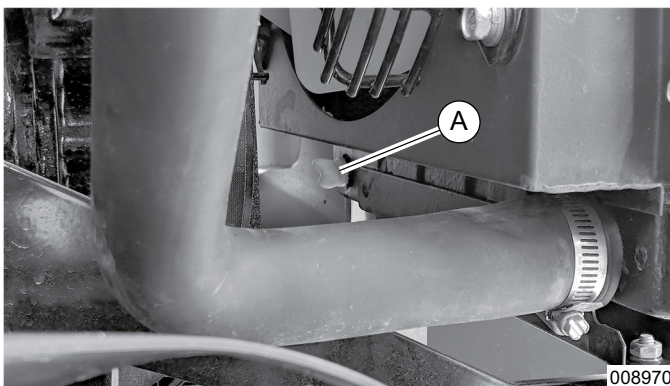


Figure 4-1. Coolant Drain Plug

3. See [Figure 4-2](#). Remove radiator cap (B).

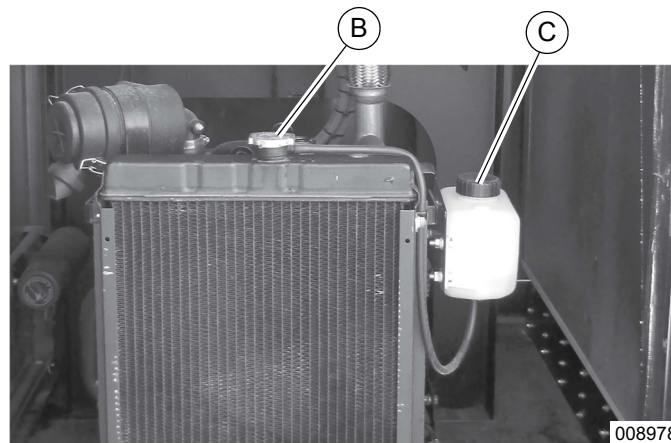


Figure 4-2. Radiator Location

4. Fill radiator slowly with coolant until it reaches the lip of the filler port.
5. Replace radiator cap.
6. Remove cap (C) from sub-tank.
7. Fill sub-tank with coolant until it reaches the FULL mark.
8. Replace sub-tank cap.
9. Operate engine approximately five minutes at a low idle speed to purge air in the coolant system.

NOTE: Coolant level will drop.

10. Stop engine and, once cooled, replenish with coolant until the sub-tank reaches the FULL mark.

Maintenance Schedule

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

NOTE: Some checks are based on hours of operation.

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

This maintenance schedule reflects the minimum tasks needed to verify the unit remains operational. Some of the tasks can be performed by an authorized operator, and others must be performed by a GMP ASD.

NOTE: An authorized operator is one who has been trained by a GMP ASD in proper operation and inspection of this unit.

Engine Maintenance Schedule

Daily	<ul style="list-style-type: none"> • Check engine oil level. • Check fuel level. • Check engine coolant level. • Drain water from fuel filters. • Inspect air cleaner, dust unloader valve, and indicator. • Perform visual walk around inspection. • Inspect generator windings for dirty or grime.
50 Hour Break-In	<ul style="list-style-type: none"> • Replace engine oil and engine oil filter. • Inspect and adjust cooling fan V-belt.
Every 500 Hours	<ul style="list-style-type: none"> • Drain water from fuel tank. • Drain oil/water separator. • Service battery. • Change engine oil and replace oil filter. ^{1 2} • Inspect coolant pump. • Inspect open crankcase vent (OCV) system. • Remove and replace fuel filter elements. • Inspect belt wear. • Inspect belt tensioner. • Inspect cooling system. • Pressure test cooling system. • Check and adjust engine speeds. • Inspect engine mounts. • Inspect engine ground connection.
Every 1000 Hours	<ul style="list-style-type: none"> • Inspect generator ball bearings.
Every 2000 Hours	<ul style="list-style-type: none"> • Check the DC no load excitation voltage. See generator manual.
Every 3000 Hours	<ul style="list-style-type: none"> • Inspect crankshaft vibration damper. • Adjust valve clearance. • Test glow plugs for continuity.
Every 6000 Hours	<ul style="list-style-type: none"> • Flush and refill cooling system. • Test thermostat opening temperature.
As Required	<ul style="list-style-type: none"> • Drain water from fuel filters. • Add coolant. • Replace air filter element. • Inspect primary air filter element. • Replace fan belt. • Inspect fuses. • Inspect electrical wiring and connections. • Purge fuel system.
<p>¹ During the initial operation of a new or rebuilt engine with Break-In Plus, change the oil and filter between a minimum of 100 hours and a maximum of up to 500 hours.</p> <p>² Service intervals depend on sulfur content of the diesel fuel, oil pan capacity, and the oil and filter used.</p> <p>NOTE: For more information, see engine manual.</p>	

Battery Inspection



⚠ DANGER

Electrocution. Do not wear jewelry while working on this equipment. Doing so will result in death or serious injury.

(000188)



⚠ 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 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)

Always recycle batteries in accordance with local laws and regulations. Contact your local solid waste collection site or recycling facility to obtain information on local recycling processes. For more information on battery recycling, visit the Battery Council International website at: <http://batteryCouncil.org>

NOTE: Remove the 5 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.

A GMP ASD should inspect the battery system once every six months. At this time, the battery condition and state of charge should be checked using a load test battery. Recharge or replace the battery 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: Wash spilled electrolyte down with an acid neutralizing agent. A common practice is to use a solution of 1 lb (454 g) bicarbonate of soda (baking soda) to 1 gal (3.8 L) of water. Add the bicarbonate of soda solution until the evidence of reaction (foaming) has ceased. Flush the resulting liquid with water.

NOTE: Discharge static electricity before touching the battery by first touching a grounded metal surface.

Battery Installation and Replacement



⚠ WARNING

Explosion hazard. Never add acid to a battery. Add distilled water only. Failure to do so could result in death, serious injury, or equipment damage.

(000316)



⚠ CAUTION

Equipment damage. Do not make battery connections in reverse. Doing so will result in equipment damage.

(000167a)

When required, the battery must be replaced with one of equivalent size, voltage, and CCA (cold crank amp capacity). Contact a GMP ASD 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.

Proceed as follows to connect cables to battery posts.

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 [Engine and Heater Startup](#).

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.

Trailer Maintenance

Perform daily inspections of the trailer before each use.

- Inspect trailer for damage, such as dents, cracks, gouges, or deep scratches.
- Inspect trailer for corrosion or abrasion.
- Inspect trailer tires for wear and deflation.
- Inspect all safety devices for damage or unusual wear.
- Inspect all electrical connections for any bare wires or other damage.
- Rectify any issues before using the trailer.

Short Term Storage

When the machine will not be in use for three or more months, follow the guidelines below to properly store the machine:

- Perform all necessary maintenance or repairs based on the [Maintenance Schedule](#). Perform any upcoming necessary maintenance task before storing.
- Fill the fuel tank to FULL.
- Fill coolant to FULL. Do not drain.
- Remove all dirt and debris from inside and outside the enclosure.
- Lock the machine to prevent any unauthorized operation.
- Store in a safe location — do not position near or on top of any combustible materials; observe any local, state, or national codes or regulations. Store in a low moisture, low dust area.
- Disconnect the negative cable from the battery.

Return to Service

Follow the guidelines below for engines and machines that have not been operated for three to six months:

- Conduct a thorough inspection of the machine before starting the engine.
- Verify the maintenance schedule is up to date.
- Connect the negative battery cable.
- After starting the engine, let it warm up for more than 10 minutes at idle.

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Section 5: Troubleshooting

General Troubleshooting Guide

Problem	Cause	Solution
Engine will not crank	Low battery output voltage or discharged battery.	Charge or replace batteries. See Battery Inspection .
	Loose or corroded connections.	Clean and tighten connections.
	Faulty start circuit relay.	Contact a GMP ASD.
	Blown fuse.	Replace fuse.
	Faulty main switch or start safety switch.	Repair switch as required.
	Faulty starter solenoid.	Replace solenoid.
	Faulty starter.	Replace starter.
Starter cranks slowly	Low battery output voltage or discharged battery.	Charge or replace batteries. See Battery Inspection .
	Excessive crankcase oil viscosity.	Drain crankcase oil and replace with correct viscosity oil. See Draining and Refilling the Oil .
	Loose or corroded connections.	Clean and tighten connections.
Hard to start or will not start	Engine starting under load.	Disengage PTO.
	Incorrect starting procedure.	Review starting procedure. See Pre-start Checklist and Engine and Heater Startup .
	Restricted exhaust.	Inspect and correct exhaust restriction.
	No fuel.	Check fuel tank.
	Air in fuel line.	Purge fuel lines. See engine manual.
	Poor fuel quality.	Drain fuel and replace with proper grade and quality of fuel for operating condition.
	Water, dirt, or air in fuel system.	Drain, flush, fill, and purge fuel system.
	Fuel filter restricted or full of water.	Replace fuel filter or drain water from fuel filter.
	Dirty or faulty fuel injectors.	Contact a GMP ASD.
	Electronic fuel system failure.	
	Cold weather.	Use cold weather starting aids (see engine manual).
	Excessive crankcase oil viscosity.	Drain crankcase oil and replace with correct viscosity oil. See Draining and Refilling the Oil .
	Electronic control system problem or basic engine problem.	Contact a GMP ASD.

Problem	Cause	Solution
Engine misfiring or runs irregularly	Poor fuel quality; incorrect fuel/dirty fuel.	Test fuel, drain water from fuel bowl.
	Restricted fuel filter.	Replace fuel filter element.
	Water, dirt, or air in fuel system.	Drain, flush, fill, and purge fuel system.
	Low coolant temperature.	Remove and check thermostat.
	Dirty or faulty fuel injectors.	Contact a GMP ASD.
	Electronic fuel system problem.	
	Electronic control system problem or basic engine problem.	
Lack of engine power	Restricted air intake.	Service air cleaner.
	Restricted exhaust.	Check and correct exhaust restriction.
	Poor fuel quality.	Drain fuel and replace with proper grade and quality of fuel for operating condition.
	Restricted fuel filter.	Replace fuel filter elements.
	Engine overloaded.	Reduce engine load.
	Incorrect crankcase oil.	Drain crankcase oil and replace with correct viscosity oil. See <i>Draining and Refilling the Oil</i> .
	Low coolant temperature.	Remove and check thermostat.
	Incorrect valve clearance.	Adjust valve clearance or contact a GMP ASD.
	Dirty or faulty fuel injectors.	Contact a GMP ASD.
	Air leak in engine intake or exhaust manifold.	Check intake and exhaust manifold gaskets and manifolds; repair as required or contact a GMP ASD.
	Engine is in derate due to DTC.	Contact a GMP ASD.
	Electronic control system problem or basic engine problem.	
Engine idles poorly	Poor fuel quality.	Drain fuel and replace with proper grade and quality of fuel for operating condition.
	Electronic control system problem or basic engine problem.	Contact a GMP ASD.
Excessive fuel consumption	Engine overloaded.	Reduce engine load.
	Restricted or dirty air cleaner.	Replace air cleaner element as required.
	Insufficient compression.	Determine cause of low compression and repair as required.
	Leaks in fuel supply system.	Locate source of leak and repair as required.
	Poor fuel quality/improper type of fuel.	Drain fuel and replace with proper grade and quality of fuel for operating condition.
	Incorrect valve clearance.	Adjust valve clearance or contact a GMP ASD.
	Dirty or faulty fuel injectors.	Contact a GMP ASD.
	Electronic fuel system failure.	
	Electronic control system problem or basic engine problem.	
	Low engine temperature.	Remove and check thermostat(s).

Problem	Cause	Solution
Fuel in oil	Restricted fuel return line.	Check and fix fuel return lines.
	Engine load too light.	Increase engine load.
	Leaking fuel injectors.	Contact a GMP ASD.
Low-pressure fuel system — fuel pressure low	Restricted fuel filter.	Replace fuel filter.
	Restricted fuel line.	Locate restriction, repair as required.
	Faulty transfer pump.	Contact a GMP ASD.
	Faulty high-pressure fuel pump.	Remove fuel pump, repair/replace pump as required.
Abnormal engine noise	Worn main or connecting rod bearings.	Contact a GMP ASD.
	Excessive crankshaft end play.	
	Loose main bearing caps.	
	Worn connecting rod bushings and piston pins.	
	Scored pistons.	
	Worn timing gears or excess backlash.	
	Excessive valve clearance.	
	Worn camshaft lobes.	
	Worn rocker arm shaft(s).	
	Worn valve guides.	
	Damaged valve retainers.	
	Loose or worn rocker arms.	
	Bent pushrods.	
	Broken valve springs.	
	Bent connecting rods.	
	Worn flywheel.	
	Loose flywheel.	
Engine emits white smoke	Insufficient engine compression.	Determine cause of low compression and repair as required, or contact a GMP ASD.
	Faulty thermostat(s) (does not close).	Test thermostats; replace thermostats as required.
	Coolant entering combustion chamber (failed cylinder head gasket or cracked cylinder head).	Repair or replace as required, or contact a GMP ASD.
	Electronic control system problem or basic engine problem.	Contact a GMP ASD.
	Poor fuel quality or incorrect type of fuel.	Drain fuel and replace with proper grade and quality of fuel for operating condition.
	Low engine temperature.	Warm up engine to normal operating temperature.
	Faulty fuel injectors.	Contact a GMP ASD.

Problem	Cause	Solution
Engine emits black, gray, or blue smoke	Restricted or dirty air cleaner.	Replace air cleaner element as required.
	Incorrect type of fuel.	Drain fuel and replace with proper grade, type, and quality of fuel for operating condition.
	Engine burning oil.	Contact a GMP ASD.
	Electronic control system problem or basic engine problem.	
	Cracked or damaged exhaust filter.	
	Dirty fuel injectors.	
Engine overheats	Restricted or dirty air cleaner.	Replace air cleaner element as required.
	Insufficient coolant in cooling system.	Fill cooling system to proper level. Check radiator and hoses for loose connections or leaks. See Adding Coolant .
	Insufficient engine oil.	Check oil level. Add oil as required. See Draining and Refilling the Oil .
	Dirty radiator core.	Clean cooling system as required.
	Cooling system needs flushing.	Flush coolant system.
	Engine overloaded.	Reduce engine load.
	Loose or faulty fan belt.	Check automatic belt tensioner and belts. Replace as required.
	Faulty or wrong type of thermostat(s).	Test thermostat opening temperature, replace thermostats as required.
	Faulty radiator cap.	Replace radiator cap as required.
	Faulty temperature gauge or sender.	Check coolant temperature with thermometer and replace if necessary.
	Incorrect grade of fuel.	Drain fuel and replace with proper grade, and quality of fuel for operating condition.
	Damaged or leaking cylinder head gasket.	Contact a GMP ASD.
	Faulty coolant pump.	
Coolant temperature below normal	Faulty thermostat(s).	Test and replace thermostats as required.
	Faulty temperature gauge or temperature sender.	Check gauge, sender, and connections.
Coolant in crankcase	Faulty cylinder head gasket.	Contact a GMP ASD.
	Cracked cylinder head or block.	
	Leaking cylinder liner seals.	
	Pitted cylinder liners.	
	Leaking oil cooler.	
	Faulty oil cooler O-rings.	
	Leaking EGR cooler system. Faulty coolant pump seal; weep hole plugged; coolant leaking through bearing.	

Problem	Cause	Solution
Excessive oil consumption	Insufficient crankcase oil viscosity.	Drain crankcase and refill with correct viscosity oil. See Draining and Refilling the Oil .
	Excessive crankcase oil.	Drain oil until oil level is correct. See Draining and Refilling the Oil .
	External oil leak(s).	Determine source of oil leak(s) and repair as required.
	Restricted crankcase vent tube.	Clean vent tube, verify that crankcase oil level is correct.
	Excessive oil pressure.	Contact a GMP ASD.
	Worn, broken, or unseated oil control rings.	
	Scored cylinder liners or pistons.	
	Worn valve guides or stems.	
	Faulty turbocharger.	
	Front and/or rear crankshaft oil seal faulty.	
	Piston ring gaps not staggered.	
	Insufficient piston ring tension.	
Piston rings sticking in ring grooves.		
Piston ring grooves excessively worn.		
Batteries will not charge	Loose or corroded connections.	Clean and tighten connections.
	Sulfated or worn-out batteries.	Replace batteries. See Battery Installation and Replacement .
	Stretched belt or faulty belt tensioner.	Adjust belt tension or replace belts.
Entire electrical system does not function	Faulty battery connection.	Clean and tighten connections.
	Sulfated or worn-out batteries.	Replace batteries. See Battery Installation and Replacement .
	Blown fuse.	Replace fuse.
Generator overheating	Overloaded generator.	Reduce load.
	Clogged ventilation screens.	Remove debris and clean air passages.
	High altitude.	Reduce load or improve ventilation. Contact a GMP ASD.
	Insufficient air circulation.	Contact a GMP ASD.
Unbalanced load.		
Abnormal generator noises	Faulty bearing.	Contact a GMP ASD.
	Loose or misaligned coupling.	
	Belt slap or loose guards.	
Thermostat not functioning	Incorrect wiring.	Contact a GMP ASD.
	Insufficient supply voltage.	
	Incorrect sensor operation.	
	Display shows fault code.	See thermostat manual, or contact a GMP ASD.
No heat	Burner malfunction.	Contact a GMP ASD.

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