

Service Manual

9-10

Model DKHA

981-0544 (Issue 5)

California

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.



WARNING



**Do not use this genset on a boat
Such use may violate U. S. Coast Guard
regulations and can result in
severe personal injury or death from
fire, electrocution, or
carbon monoxide poisoning**

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1. SAFETY PRECAUTIONS

INTRODUCTION

Thoroughly read the OPERATOR'S MANUAL before operating the APU. Safe operation and top performance can only be obtained when equipment is properly operated and maintained.

The following symbols in this manual alert you to potential hazards to the operator, service person and equipment.

⚠ WARNING alerts you to a hazard or unsafe practice that can result in severe personal injury or death.

⚠ CAUTION alerts you to a hazard or unsafe practice that can result in personal injury or equipment damage.

Exhaust, electricity, moving parts, batteries and fuel present hazards that can result in severe personal injury or death.

GENERAL PRECAUTIONS

- Keep children away from the APU.
- Do not use evaporative starting fluids, such as ether. They are highly explosive and can cause engine damage.
- Let the engine cool down before removing the coolant pressure cap or opening the coolant drain. Hot coolant under pressure can spray out and cause severe burns.
- Keep the APU and its compartment clean. Excess oil and oily rags can catch fire. Dirt and gear stowed in the compartment can restrict cooling air.
- Make sure all fasteners are secure and torqued properly.
- Do not perform APU maintenance or service when mentally or physically fatigued or after having consumed alcohol or drugs.
- You must be trained and experienced to make adjustments while the APU is running—hot, moving or electrically live parts can cause severe personal injury or death.
- Used engine oil has been identified by some U. S. state and federal agencies as causing

cancer or reproductive toxicity. Do not ingest, inhale, or contact used oil or its vapors.

- Ethylene glycol, used as engine antifreeze, is toxic to humans and animals. Clean up spills and dispose of used engine coolant in accordance with local environmental regulations.
- Keep a multi-class ABC fire extinguisher in the vehicle. Class A fires involve ordinary combustible materials such as wood and cloth. Class B fires involve combustible and flammable liquids and gaseous fuels. Class C fires involve live electrical equipment. (ref. NFPA No. 10)
- APU installation and operation must comply with all applicable local, state and federal codes and regulations.

ENGINE EXHAUST IS DEADLY

Engine exhaust gases include CARBON MONOXIDE (CO), an odorless, colorless, poisonous gas that can cause severe personal injury or death. Symptoms of CO poisoning include:

- Dizziness, Headache or Throbbing Temples
- Weakness or Muscular Twitching
- Sleepiness or Confusion
- Nausea or Vomiting

If you or anyone else experiences any of these symptoms, get out into fresh air immediately and seek advice from poison control, medical center or 911. Do not operate the APU again until it has been repaired and inspected.

To reduce the risk of CO poisoning:

- Inspect for exhaust leaks at every startup and after every eight hours of running.
- Never sleep in the vehicle while the APU is running unless the vehicle is equipped with a working carbon monoxide detector.
- Do not operate the APU when the vehicle is parked in a confined space, such as a garage.
- Disable AUTO before storing the vehicle or parking it in a garage or other confined space.

- The exhaust system must be installed in accordance with the APU Installation Manual.
- Do not use engine cooling air for heating the vehicle.

GENERATOR VOLTAGE IS DEADLY

- Disable AUTO, stop the APU and disconnect the battery cables (negative [-] first) from the batteries before servicing the APU.
- Generator electrical output connections must be made by a trained and experienced electrician in accordance with the APU Installation Manual and applicable codes.
- The improper transfer of loads between APU and shore power can lead to electrocution of utility line workers and damage to equipment. Connections must be made by a trained and experienced electrician in accordance with applicable codes.
- Use caution when working on live electrical equipment. Remove jewelry, make sure clothing and shoes are dry, stand on a dry wooden platform or rubber insulating mat and use tools with insulated handles.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Disable AUTO, stop the APU and disconnect the battery cables (negative [-] first) from the batteries before servicing the APU.
- Do not wear loose clothing or jewelry near moving parts such as fans, belts and pulleys.
- Keep hands away from moving parts.
- Keep guards in place over fans, belts, pulleys, and other moving parts.

BATTERY GAS IS EXPLOSIVE

- Do not smoke near batteries.
- Wear safety glasses when servicing batteries.
- Disable AUTO, stop the APU and disconnect the battery cables from the batteries before servicing the batteries.
- Always disconnect negative [-] first and reconnect last to prevent sparks between tools and vehicle frame.
- Secure battery terminal protective covers to prevent accidental shorting with metal tools.

DIESEL FUEL IS COMBUSTIBLE

- Do not smoke or turn electrical switches ON or OFF where fuel fumes are present or in areas sharing ventilation with fuel tanks or equipment. Keep flames, sparks, pilot lights, arc-producing equipment and all other sources of ignition well away.
- Fuel lines must be secured, free of leaks and separated or shielded from electrical wiring.

FLAMMABLE VAPORS CAN BE IGNITED BY VEHICLE ELECTRICAL SYSTEMS

Disable AUTO and stop the APU before fueling the vehicle.

FLAMMABLE VAPORS CAN CAUSE A DIESEL ENGINE TO OVERSPEED

Do not operate the diesel-powered APU where there are or can be flammable vapors created by fuel spills, gas leaks, etc. Flammable vapors drawn into a diesel engine air intake system can cause the engine to overspeed, which can result in fire, explosion and equipment damage. The owners and operators of the APU are solely responsible for safe operation.

2. Specifications

APU CONTROLLER: Integrated Microprocessor Based Engine and Generator Controller	
GENERATOR: Two-Bearing, Two-Pole Rotating Field, 3600 RPM, "Poly-Vee" Belt Drive	
Power (@1.0 power factor)	See Nameplate
Voltage	120
Frequency	60 Hz
Number of Phases	1
Current	33 amps
Line Circuit Breaker	30 amps
FUEL CONSUMPTION:	
No-load	0.25 gph (0.93 lph)
Half-load	0.35 gph (1.32 lph)
Full-load	0.55 gph (2.08 lph)
ENGINE: 2-Cylinder In-Line, Water-Cooled, Indirect-Injection, 2374 RPM, 4-Stroke Cycle Diesel	
Bore	2.64 in (67 mm)
Stroke	2.68 in (68 mm)
Displacement	29.23 in ³ (479 cc)
Compression Ratio	23 : 1
Fuel Injection Timing (BTDC)	18°-20°
Injection Order	1-2
Fuel Nozzle Injection Pressure	1991 psi (13.73 mPa)
Valve Lash: Intake & Exhaust (cold)	0.0059 – 0.0073 inch (0.145 – 0.185 mm)
Oil Capacity (with filter)	3.2 quart (3.0 liter)
Cooling System Capacity	2.5 quart (2.4 liter)
Lubricating Oil Pressure	14 to 64 psi over speed range
Cylinder Compression Pressure	414 to 469 psi, 327 psi minimum
DC SYSTEM:	
Nominal Battery Voltage	12 volts
Minimum Battery Capacity CCA (Cold Cranking Amps)	475 amps down to 0°F (-17°C) 650 amps down to -20°F (-29°C)
Battery Charging Capacity	40 Amperes
Fuse F1 (control, start and glow plug circuits)	30 amp mini-bayonet
Fuse F2 (Remote B+)	5 amp mini-bayonet
APU Weight: 375 lbs (170 kg)	
APU Dimensions: (L x W x H): 25 x 21.2 x 28.8 in (635 x 539 x 732 mm)	
Total Combined Weight of APU and HVAC System (Typical): 525 lbs (239 kg)	

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