SECTION 6: TROUBLESHOOTING

6.1 GENERAL INFORMATION

The information contained in this section has been compiled from years' worth of information gathered from the field. It contains symptoms and usual causes for the most common types of problems that may occur. All available data concerning the trouble should be systematically analyzed before undertaking any repairs or component replacement.

A visual inspection is worth performing for almost all problems and may avoid unnecessary additional damage to the machine. The procedures which can be performed in the least amount of time and with the least amount of removal or disassembly of parts, should be performed first. Adherence to a routine maintenance regimen will minimize the occurrence of many common problems. Refer to **Table 5A: Maintenance Schedule**, for a typical maintenance regimen program.

Although Vanair® strives to anticipate situations that may occur during the operation life of the machine package, the **Troubleshooting Guide** may not cover all possible situations. Be aware that additional troubleshooting information may be found in other sources such as the Engine Operation Manual. Should the situation remain unresolved after exhausting available sources, contact the Vanair Service Department at:

Toll Free: (844) VAN-SERV

(844) 826-7378

⚠ WARNING

DO NOT operate any of the CAP•START® 3000 functions if there is a known unsafe condition. Disable the equipment by disconnecting it from its power source. Install a lock-out tag to identify the equipment as inoperable to other personnel to prevent accidental application.

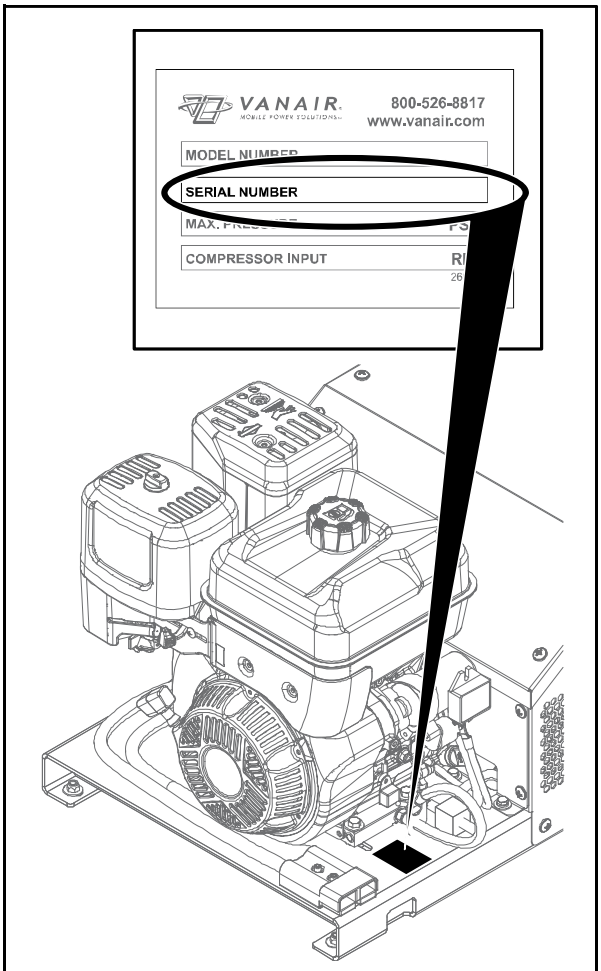

Figure 6-1: Machine Serial Plate Location

NOTE

When contacting the Vanair Service Department, please have machine serial number on hand to quickly expedite service. See *Figure 6-1* for machine serial plate location.

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE[I]		
For additional information concerning the engine, consult the Engine Operation Manual		
Engine will not crank,	Faulty battery connection.	Check for proper battery connections and battery charge.
	Battery out of power	Recharge or replace battery.
	Faulty starter connection	Check for proper electrical connections at starter.
	Faulty starter	Replace.
	Faulty starter solenoid	Replace.
	Engine seized	Replace.
Engine will crank, but not start	Low fuel and/or oil supply	Check fuel level. Check engine oil level; refer to **Table 5A, Key No. 2**. Replenish as necessary. Consult the Engine Operation Manual for additional information.
	Choke not being engaged correctly	Engage choke as needed (refer to **Section 4.2.1**).
	Wrong fuel type fill	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operation Manual for information on engine fuel type to use.
	Pinched fuel line	Replace or reroute if necessary.
	Low battery voltage	Recharge or replace if necessary.
		Loose connections; tighten connections.
		Dirty connections; clean connections.
	Restricted engine air filter	Check that the air cleaner element and pre-cleaner are clean and all components are properly secured (**Table 5A, Key No. 7**). Clean or replace as necessary.
	Poor ground connection	Check and clean/renew connection.
	Fouled spark plug	Check spark plug; clean or replace if necessary. Refer to Engine Operation Manual.

Continued on next page

[I] Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Contact the Engine manufacturer.

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE[I] (CONTINUED)		
Engine will crank, but not start (continued)	Broken or faulty wiring	Check harness connections and wiring condition (Reference wiring diagrams **Section 7.13 [12V]**, and **7.14 [12V/24V]**)
Improper Control Operation: Engine does not speed up	Governor stuck	Shut unit down. Free governor and lubricate if necessary.
Improper Control Operation: Engine does not slow down	Governor stuck	Shut unit down. Free governor and lubricate if necessary.
Engine overheats	Located too close to obstruction	Move further from obstruction, or move obstructing obstacle(s).
	Restricted cooling air in or out	Clean engine intake grill; also refer to the Engine Operation Manual.
	Low oil level	Check engine oil level; refer to **Table 5A, Key No. 2**. Replenish as necessary. Also refer to the Engine Operation Manual.
	Restricted engine air filter	Refer to **Table 5A, Key No. 7**. Check that the air cleaner element and pre-cleaner are clean and all components are properly secured. Clean or replace as necessary. Refer to Engine Operation Manual.
	RPM's too high	Adjust setting.
	Demand too high	Check requirements; adjust demand level accordingly.
Engine stops during operation	Low oil level	Check engine oil level; refer to **Table 5A, Key No. 2**. Replenish as necessary. Also refer to the Engine Operation Manual.
	Low fuel	Check fuel level. Fill as necessary.
	Wrong fuel type	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operation Manual for information on engine fuel type to use.
	Restricted engine air filter	Replace.
	Restricted cooling air in or out	Clean engine intake grill; also refer to the Engine Operation Manual.
	Dead battery	Check voltage; recharge or replace.

Continued on next page

[I] Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Contact the Engine manufacturer.

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE[I] (CONTINUED)		
Engine stops during operation (continued)	Fouled spark plug	Check spark plug; clean or replace if necessary. Refer to Engine Operation Manual.
	Demand too high	Check requirements; adjust demand level accordingly.
	Faulty voltage regulator	Check; replace if necessary.
Gradual loss of engine power	Contaminated fuel	Drain and replace fuel supply.
	Restricted engine air filter	Refer to **Table 5A, Key No. 7**. Check that the air cleaner element and pre-cleaner are clean and all components are properly secured. Clean or replace as necessary. Refer to Engine Operation Manual.
	Wrong fuel type	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operation Manual for information on engine fuel type to use.
	Fuel filter(s) and/or fuel lines partly plugged	Replace fuel filter or lines. Refer to **Table 5A, Key No. 15**, and the Engine Operation Manual.
	Vapor lock	Machine overheating. Allow to cool.
		Refer to **"Engine overheats"** section in this Troubleshooting Guide.
	Fouled spark plug	Check spark plug; clean or replace if necessary. See Engine Operation Manual.
	Demand too high	Check requirements; adjust demand level accordingly.
CHARGE / START SYSTEM		
Battery charger behaves erratically	Connection cables or receptacles are soiled/contaminated	Check for soiled, contaminated, damaged or loose receptacle connections.
		Untwist and/or straighten out any suspected cable tensions. Carefully wipe off any contaminants to receptacle connectors before re-connecting. Replace any worn or damaged cables or receptacles. Contact Vanair Mfg., Inc. Service Department if behavior persists.

Continued on next page

CHARGE / START SYSTEM (CONTINUED)

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
No DC output	Blown fuse	Replace the fuse. Refer to **Section 5.4, Servicing the System Fuses and Control Relays**.
	Loose or faulty wiring	Check wiring: Loose—secure; faulty—replace.
	Faulty regulator	Replace.
	V-belts out of position or malfunctioning	Re-situate and adjust belt tension, or replace belt if necessary. Consult ***Section 5.3.3***.
	Faulty relay	Check; replace if necessary.
	Faulty contactor	Check; replace if necessary.
Display not working	Loose or faulty wiring	Check wiring: Loose—secure; faulty—replace.
Connection fault	Loose cable connection	Check and clean cable connection.
	Poor clamp connection	Clean clamp and Terminal and reattach clamp securely.
	Faulty battery	Replace Battery With a New Battery (Do not try to force CAP•START® 3000 to charge faulty battery).
	Cables not connected	Check and clean all cable connections.
	Clamps are reversed	Check clamps to make sure they are correctly attached to Battery.
	Jumper cables not connected	Check cables and make sure they are connected properly.
Voltage fault	Battery is below minimum required sensing voltage	Check cables and connections to make sure they are correct. Use override switch to enable charging/start function.
	Clamps are touching one another	Separate and Isolate clamps so they are not touching. Use a piece of non-conductive rubber if needed to keep clamps apart in tight quarters.
	Jumper cables have short	Replace jumper cables with new cables.
	Internal Wiring has short	Consult Vanair.
Vehicle fails to start	Extreme cold / vehicle battery frozen	Wait until CAP•START® 3000 has charged batteries to minimum vehicle starting voltage and try again.

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CHARGE / START SYSTEM (CONTINUED)

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
Vehicle fails to start (continued)	Extreme cold / vehicle battery frozen (continued)	Consult professional mechanic.
	Batteries are below minimum starting voltage of vehicle	Wait a few minutes for CAP•START® 3000 to charge batteries and try again
Vehicle fails to start after third (3rd) try	One or more batteries are faulty	Change batteries
	Vehicle has unknown issues	Consult professional mechanic.
	Batteries below minimum starting voltage	Wait until CAP•START® 3000 has charged batteries to minimum vehicle starting voltage and try again.
Sparks occur from clamps	Polarity reversed while using override	Turn mode selector switch to OFF and correct cables to correct polarity.

6.3 EXTREME CONDITION OPERATION

When operating in extreme humidity, cold or hot conditions, dusty environments, or at high altitudes, extra attention should be given to any indication that could lead to a serious problem. Engine power will be reduced at high altitude or hot ambient temperatures.

Machine review and maintenance check schedules should be more frequent than the normal suggestions given in the **Table 5A**, **Routine Maintenance Table**, in **Section 5**).

Become acquainted with the situation-adjusted operation approaches given in this section before operating the power system package in any type of extreme ambient condition. For additional operation information consult the Engine Operator's Manual.

6.3.1 COLD WEATHER OPERATION

Consult the information in **Table 6.3A** for preventative and/or repair measures. The CAP•START® 3000 can be more difficult to start in cold weather. Once the engine is started, the air density becomes larger and the intake efficiency also becomes higher. More output can be expected in cold areas. When the temperature is very low, extra care must be taken regarding fuel and oil changes in their viscosity, freezing of water contained in the piping, or of water adhering on the filter.

6.3.2 HIGH TEMPERATURE OPERATION

Consult the information in **Table 6.3B** for preventative and/or repair measures. Reduce load duty cycle to less than 60% when operating in ambient temperatures above 104°F (40°C).

Extra care should be taken to keep the engine clean and to not restrict the air flow around the unit. Consult the Engine Operator's Manual for fuel, lubrication oil and cooling requirements under extreme temperatures.

When operating the machine in high temperature areas, precautions should be taken to prevent overheating. At the minimum, all vents, including air passage ways around the vents, should be free of debris and dirt.

TABLE 6.3A COLD WEATHER OPERATION

Symptom	Cause	Prevention / Corrective Action
Water freezes in the fuel line Lubrication oil viscosity increases	**WATER** Water in the fuel can freeze at temperatures below 32°F (0°C), blocking fuel lines. At an extremely cold temperature, the viscosity of lubrication oil may increase and the torque of starter may exceed its permissible value, hindering proper starting.	• Park the vehicle or equipment indoors when not in use. • For additional engine precautions, consult the Engine Operator's Manual. • Vanair® recommends installation of the cold weather heater option kit. Consult **Table 7A** in **Section 7** for cold weather kit (no. 033095) option. • Keep the fuel tank full to prevent condensation from forming inside the tank and lessen the chances of water getting in the fuel line. • Refer to the Engine Operator's Manual for engine cold weather oil recommendations.

TABLE 6.3B HIGH TEMPERATURE OPERATION

Symptom	Cause	Prevention / Corrective Action
Overheating/high compartment temperatures Diminished engine performance	High ambient temperatures, confined spaces, soundproof cases and other reasons. Among these the most important factor is the temperature of the intake and cooling air.	• Extra care should be taken to keep the engine clean and to not restrict the air flow around the unit. • Consult the Engine Operator's Manual for cooling requirements under extreme temperatures. • At the minimum, all air passage ways around the cooler unit, should be free of debris and dirt. The fan is electric-driven, and turns on at 150°F. • If high ambient overheating occurs, reduce the duty cycle. The operator should be aware that high temperatures can influence engine performance, which can directly effect some machine function capacity outputs.

The operator should be aware that high temperatures can influence engine performance, which can directly effect some machine function capacity outputs.

6.3.3 HIGH DUST CONTENT OPERATION

Consult the information in **Table 6.3C** for preventative and/or repair measures. When the machine is to be used in continuously dusty environments, special care must be taken with the engine's air cleaner.

6.3.4 HIGH ALTITUDE OPERATION

Engine horsepower will decrease by 3.5% for every 1,000 feet above sea level. At high altitude overall unit performance will deteriorate, and care will need to be taken not to overload the engine.

TABLE 6.3C HIGH DUST CONTENT OPERATION

Symptom	Cause	Prevention / Corrective Action
Overheating System contamination Stalling	Machine components exposed to frequent or constant dust interaction, can result in diminished system performance, or machine cessation.	• If the machine is not being used for an extended period of time, an additional precaution, such as covering the machine with a tarp, will help to keep the inside of the machine free of dust particle accumulation. • For extreme cases of high dust content environments, engine oil may need to be replaced at more frequent intervals. Adjust maintenance schedule accordingly.