

SECTION 6: TROUBLESHOOTING

6.1 GENERAL INFORMATION

This section 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 and the Generator Operation Manual. Should the situation remain unresolved after exhausting available sources, contact the Vanair Service Department at:

Phone (toll free): (800) 526-8817
Service (toll free): 844-VAN-SERV
844-826-7378
Phone: 219-879-5100, ext. 400
Fax: 219-879-5335

NOTE

When contacting the Vanair Service Department, please have machine serial number readily available to quickly expedite service. See *Figure 6-1* for serial plate and serial number locations.

⚠ WARNING

Before starting, performing maintenance, or replacing parts, relieve the entire system pressure by opening the air tank drain/vent valve, which will vent all pressure to the atmosphere.

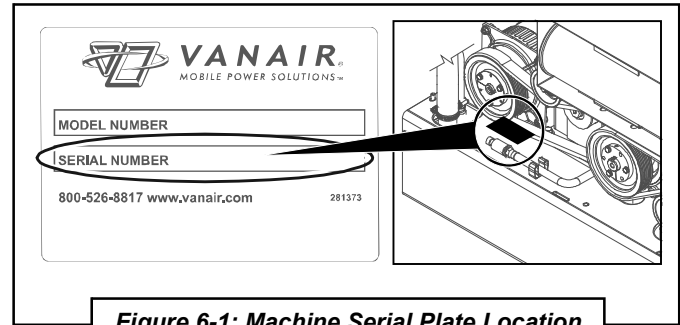


Figure 6-1: Machine Serial Plate Location

⚠ WARNING

Refer to *Figure 6-2*. Open fill cap **SLOWLY** (contents under pressure) to make sure all pressure has been relieved.

⚠ WARNING

DO NOT operate any of the PowerFlex™ AE's 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.

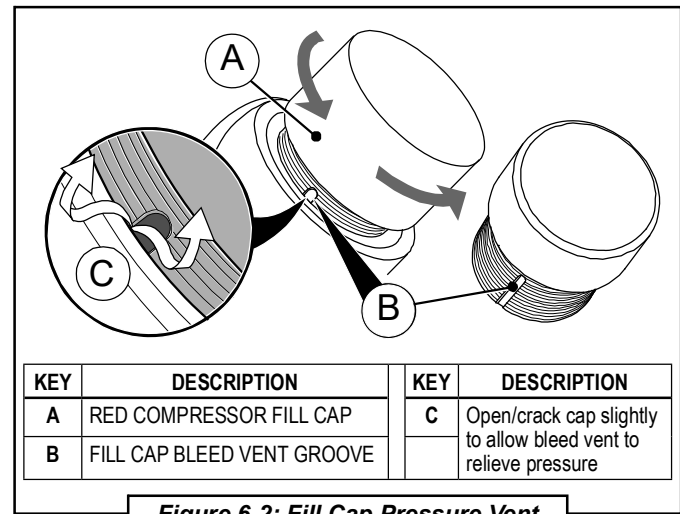


Figure 6-2: Fill Cap Pressure Vent

TABLE 6A: TROUBLESHOOTING GUIDE		Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.
Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (For additional information concerning an engine problem, 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.
	Engine fuse blown	Check engine fuse: See Section 5.4.4, Servicing the System Fuses and Circuit Breakers , and/or consult the Engine Operation Manual.
	Possible starter and/or solenoid problem	Replace if defective.
	Possible seized engine	Consult the Vanair® Service Department.
	Hood switch malfunction	Replace if defective.
	Machine hood shutdown safety switch prevents start-up of engine	Close hood panel or check if roof switch is faulty. See Section 1.8, Machine Canopy Access Safety Switches .
Engine will not start	Low fuel and/or oil supply	Check fuel gauge. Check engine oil level. Replenish as necessary. Consult the Engine Operation Manual for additional information on engine maintenance.
	Pinched fuel line	Replace or reroute if necessary.
	Plugged fuel filter(s)	Replace if necessary. Refer to the Engine Operation Manual.
	Low battery voltage	Recharge or replace if necessary.
		Loose connections—tighten connections.
		Dirty connections—clean connections.
	Plugged engine air filter	Replace engine air filter. Refer to Engine Operation Manual.
	Defective oil pressure switch	Check continuity, and replace if necessary.
	Defective engine temperature switch	Check continuity, and replace if necessary.
Poor ground connection	Check and clean/renew connection.	
Improper Control Operation: Engine does not speed up	Throttle solenoid stuck	Lubricate; replace throttle solenoid if necessary.
	Governor stuck	Free governor and lubricate if necessary.
	Fuel filter partly plugged	Replace fuel filter. Refer to the Engine Operation Manual.
	Fuel filter partly plugged (continued)	Auxiliary fuel pump may be needed for remote fuel tank. Refer to Section 3, Installation .
	Pressure switch faulty	Replace pressure switch.
Defective Throttle Control Relay	Solenoid not actuating	Inspect; replace if necessary.
Improper Control Operation: Engine does not slow down replace relay.	Leak in control line	Check for leaks; replace line if necessary.
	Pressure switch out of adjustment	Adjust to proper pressure setting. Refer to Section 5.4.2, Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Pressure switch faulty	Replace pressure switch.
	Throttle solenoid stuck	Lubricate; replace throttle solenoid if necessary.
	Throttle relay faulty	Check for presence of power - if present,
	Governor stuck	Free governor and lubricate if necessary. Refer to Engine Operation Manual.

Continued on next page



TABLE 6A: TROUBLESHOOTING GUIDE		Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.
Fault/Malfunction	Possible Cause	Corrective Action
ENGINE CONT. (For additional information concerning an engine problem, consult the Engine Operation Manual)		
Engine overheats	Low oil level	Check engine oil level. Consult the Engine Operation Manual for additional information on engine maintenance.
	Located too close to obstruction	Move further from obstruction.
	Engine oil filter plugged	Replace engine oil filter. Refer to Engine Operation Manual.
	Engine oil radiator plugged	Clear debris/dirt from cooler core/flush shroud.
	Restricted cooling air in or out	Clear debris/dirt from engine radiator.
Engine stops during operation	Low oil level	Check engine oil level. Consult the Engine Operation Manual for additional information on engine maintenance.
	High engine temperature	Let engine cool. Check for engine coolant level. Refer to Engine Overheats fault.
	Engine shutdown switch activated	Confirm that access door is properly in place. Replace faulty engine shutdown switch; see Section 1.8, Machine Canopy Access Safety Switches .
Gradual loss of engine power	Contaminated fuel	Draw and replace fuel supply.
	Engine air filter contaminated	Check engine air filter. Replace if necessary (refer to the Engine Operation Manual).
	Low fuel level	Add fuel.
	Fuel filter(s) contaminated	Check fuel filters. Refer to the Engine Operation Manual.
	Overload	Reduce load; check load use, and reduce.
	Engine not warmed up	Allow engine to warm up.
COMPRESSOR		
Compressor overheats <i>This condition will cause a compressor shutdown and compressor fault light to turn on. Before restarting the compressor, determine the cause for overheating.</i>	Low compressor oil level	Check oil level and refill to proper level if necessary (ensure machine is parked on a level surface).
	Obstructed cooler fins	Clear/clean if required.
	Insufficient air flow over cooler	Check for obstructions (frame, body, etc.) to cooling air flow.
	Defective temperature switch	Check switch; replace if necessary.
	Compressor oil filter plugged	Replace compressor oil filter. Consult Section 5, Table 5A for periodic oil filter system maintenance procedures.
	Input rpm too high	Adjust to proper setting; refer to Section 5.4.1, Adjusting the Engine Speed , and the Engine Operation Manual.
	Fan not operating	Check fan switch. Check ground connection. Check for / confirm +12V.
Compressor shuts down	Compressor temperature switch opening	Check compressor oil level. Replenish if necessary.
	Restricted cooling air intake	Reposition machine.
	Fan not operating	Check fan switch.
		Check ground connection. Check for / confirm +12V.

Continued on next page

TABLE 6A: TROUBLESHOOTING GUIDE		Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (continued)		
Compressor shuts down (continued)	Compressor oil filter plugged	Replace compressor oil filter. Consult Section 5, Table 5A for periodic oil filter system maintenance procedures.
	Clutch faulty	Inspect; replace if necessary.
	Plugged or restricted cooler core	Flush cooler. Consult the Vanair® Service Department for assistance in cleaning/flushing the cooler core.
	Contaminated cooler fins	Clean cooler fins.
Compressor will not build up pressure	Low compressor oil level	Check oil level and refill to proper level if necessary (ensure machine is parked on a level surface).
	Air demand too high	Check for leaks and take corrective action.
		Check air tools for wear, damage, or malfunctions. Replace or repair.
	Compressor capacity too low to accommodate demand	Substitute larger capacity compressor system.
	Compressor air filter plugged	Check compressor air filter. Replace if necessary.
	Pressure switch out of adjustment	Reset pressure switch. Refer to Section 5.4.2, Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Defective pressure switch	Replace pressure switch.
	Engine does not speed up	Adjust speed control. Consult Section 5.4.1, Adjusting the Engine Speed , and the Engine Operation Manual.
	Belt(s) slipping	Re-situate and adjust belt tension, or replace belt if necessary. Consult Section 5.4.3, Re-tensioning and Replacing the Serpentine Belts .
	Service valve is open	Close service valve.
	Pressure gauge is malfunctioning	Check pressure gauge function/control line routing: adjust, repair or replace as necessary.
		Check for proper operation with an auxiliary air source. Replace if necessary.
Inlet solenoid valve fails to open	Repair/replace inlet valve.	
Inlet solenoid faulty	Replace solenoid.	
Compressor system over-pressures <i>This condition will cause a compressor shutdown, and a fault light will turn on. Before restarting the compressor, determine the cause of the over-pressure. May also cause the relief valve to open.</i>	Pressure switch setting too high	Reset pressure switch. Refer to Section 5.4.2, Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Pressure switch malfunction	Check for operation/damage: repair or replace.
	Unload solenoid valve defective	Replace solenoid valve.
	Leak in air control line	Check for leaks and take corrective action.
	Restriction in control line	Clean if soiled; if ice is present, clear and remove.
	Damaged/kinked control line	Check line for damage (wear, kinks, etc.). Re-route, re-tie or replace if necessary (refer to Section 7.13, Hose Installation Guide for assistance in running or checking hose lines).
Continued on next page		



TABLE 6A: TROUBLESHOOTING GUIDE		Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (continued)		
Compressor system over-pressures (continued) <i>This condition will cause a compressor shutdown, and a fault light will turn on. Before restarting the compressor, determine the cause of the over-pressure. May also cause the relief valve to open</i>	Damaged/kinked control line	Check line for damage (wear, kinks, etc.). Re-route, re-tie or replace if necessary (refer to Section 7.13, Hose Installation Guide for assistance in running or checking hose lines).
	Control line connections are not properly seated/poor connection quality	Check lines for proper seating/ensure line ends have been cut cleanly and are square. • Refer to Section 7.13, Hose Installation Guide for assistance in running or checking hose lines. • DO NOT use wire cutters: use a loom cutting tool or a clean, sharp razor blade.
	Inlet valve Teflon “O” ring popped out of groove	Replace “O” ring.
	Inlet valve piston is stuck in down position	Check for proper operation with an auxiliary air source—replace or rebuild inlet valve.
	Compressor shaft seal is leaking	Replace shaft seal with available kit.
	Minimum pressure/check valve is malfunctioning	Rebuild or replace check valve.
	Pressure gauge is malfunctioning	Check gauge for proper operation; replace if necessary and check controls.
	Defective safety valve	Replace safety valve.
	Plugged coalescer	Replace coalescer.
No service air output (see also Compressor will not build up pressure)	If equipped, OSHA valve/velocity fuse, not functioning properly	Reset or replace OSHA valve.
	Clogged compressor air filter	Check compressor air filter; replace if necessary.
	Solenoid valve sending continuous signal to inlet valve	Rebuild or replace solenoid valve if defective.
	Incorrect compressor speed	Adjust speed. Refer to Section 5.4.2, Adjusting the Pressure Setting .
	Minimum pressure/check valve is malfunctioning	Rebuild or replace check valve.
	Belt not tensioned properly	Check belt tension; replace belt(s) if necessary. Refer to Section 5.4.3, Re-tensioning and Replacing the Serpentine Belts for belt maintenance or replacement procedures.
Compressor stalls	Pressure switch setting too high	Adjust pressure switch setting. Refer to Section 5.4.2, Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Speed is set too low	Check to see if compressor goes to high speed.
System operating pressure below specified minimum	Air demand too high	Check air tools for wear, damage, or malfunctions. Replace or repair.
	Compressor capacity too low to accommodate demand	Substitute larger capacity compressor system.
Continued on next page		

TABLE 6A: TROUBLESHOOTING GUIDE		Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (continued)		
System operating pressure below specified minimum (continued)	System leaks or is damaged	Inspect for leaks. Repair and/or replace damaged parts as necessary.
	Pressure switch set too low/malfunction	Adjust pressure switch setting. Section 5.4.2, Adjusting the Pressure Setting. Replace if switch continues to deviate from setting.
	Input rpm too low	Adjust to proper setting.
	Contaminated inlet valve	Remove valve and clean piston. Order inlet valve repair kit if necessary.
	Inlet solenoid valve fails to open	Repair/replace inlet valve.
	Inlet valve frozen shut	Repair/replace inlet valve.
Excess amount of oil in air discharge	Machine not on level surface	Move machine to level surface.
	Compressor oil level too high	The correct oil level is between the bottom of the oil port threads (low level) to the top lip of the port's threads (high level) (refer to Figure 5-1). Drain excess oil to correct level.
	Scavenger system not operating	Inspect scavenger line for obstructions or leaks. Replace if necessary.
	Coalescer element plugged or damaged	Replace the coalescer element.
Excessive moisture in the compressed air	Moisture accumulating in air tank	Drain water from air tank.
GENERATOR		
No AC generator output	Circuit breaker / GFCI tripped	Replace/reset breakers.
	Serpentine belt damaged or not tensioned properly	Re-situate and adjust belt tension, or replace belt if necessary. Consult Section 5.4.3, Re-tensioning and Replacing the Serpentine Belts. Order replacement belt.
	Faulty AC generator relay	Check; replace if necessary.
	Faulty capacitor	Check; replace if necessary.
Low AC voltage	Engine speed too low for demand	Adjust speed control. Consult Section 5.4.1, Adjusting the Engine Speed, and the Engine Operation Manual.
	Weak, faulty or incorrect capacitor	Check; replace if necessary.
	Serpentine belt damaged or not tensioned properly	Re-situate and adjust belt tension, or replace belt if necessary. Consult Section 5.4.3, Re-tensioning and Replacing the Serpentine Belts.
High AC voltage	Engine speed too high for demand	Adjust speed control. Consult Section 5.4.1, Adjusting the Engine Speed, and the Engine Operation Manual.
	Wrong capacitor	Replace with correct-rated capacitor.

6.2 EXTREME CONDITION OPERATION

When operating in extreme cold or hot condi-

tions, in the presence of high humidity, or at a high altitude, extra attention should be given to any indication that could lead to a serious problem. Engine power and compressor air output will be reduced at high altitude or hot ambient tem-

peratures.

Machine review and maintenance check schedules should be more frequent than the normal suggestions given in the **Routine Maintenance Schedule (Table 5A 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 Operation Manual, or visit the engine manufacturer’s web site given in that manual.

6.2.1 HIGH MOISTURE CONDITION OF COMPRESSOR OIL

Refer to **Section 4.2.2, High Moisture Condition: Emulsification of Rotary Screw Compressor Oil**, in **Section 4, Operation** for de-

scription and prevention of moisture condition obstacles.

6.2.2 COLD WEATHER OPERATION

Refer to the Engine Operation Manual for cold weather recommendations for engine operation, and **Table 6.2A**. When the temperature is very low, extra care must be taken regarding oil changes and viscosity. Also, for the overall system operation, freezing of water contained in the piping can also be a factor.

6.2.3 HIGH TEMPERATURE OPERATION

Consult the information in **Table 6.2B** for preventative and/or repair measures. Reduce load duty cycle to less than 60% when operating in ambient temperatures above 104°F (40°C).

TABLE 6.2A: COLD WEATHER OPERATION		
Symptom	Cause	Prevention / Corrective Action
Water freezes in the fuel line Lubrication oil viscosity increases	<p>WATER</p> <p>Water in the fuel can freeze at temperatures below 32°F (0°C), blocking fuel lines.</p> <p>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.</p>	<ul style="list-style-type: none"> • Park the vehicle or equipment indoors when not in use. • Use a block heater. • Maintain the battery; this will make it easier to start a diesel engine in cold weather. • In below zero temperatures a fuel line deicer product may need to be used. • Check the fuel filter regularly to insure that it contains no water. • For additional engine precautions, consult the Engine Operation Manual. • Vanair® recommends installation of the cold weather heater option kit. Consult Vanair for details. • Keep the fuel tank full to prevent condensation from forming inside the tank and lessen the chances of water getting in the fuel line. • The standard recommendation of 15W-40 engine oil is suitable for temperatures down to -4°F (-20°C). If temperatures are consistently below 30°F (-1°C), it is recommended that 5W-30 oil be used. If temperatures are below -25°F (-32°C), a high-performance, fully synthetic oil, such as AMSOIL 5W-30 should be used which is suitable to temperatures of -55°F (-48°C).
	Air lines freeze; moisture in hoses	<ul style="list-style-type: none"> • Ensure to operate the compressor at temperature and under load for 20 minutes in order to burn off excessive moisture. May need inline de-icer to prevent freezing.



TABLE 6.2B: 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.	<ul style="list-style-type: none"> • Extra care should be taken to keep the engine clean and to not restrict the air flow around the unit. • Consult the Engine Operation Manual for fuel, lubrication oil and cooling requirements under extreme temperatures. • At the minimum, all coolers, including air passage ways around the coolers, should be free of debris and dirt. The fan, driven by the engine, is designed to run continuously to assure a constant flow of cooling air. <p>The operator should be aware that high temperatures can influence engine performance, which can directly effect some machine function capacity outputs.</p>

Extra care should be taken to keep the engine and air compressor clean and to not restrict the air flow around the unit. Consult the Engine Operation 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 coolers, including air passage ways around the coolers, should be free of debris and dirt. The fan, driven by the engine, is designed to run continuously to assure a constant flow of cooling air.

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

6.2.4 HIGH DUST CONTENT OPERATION

Consult the information in **Table 6.2C** 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 and radiator.

6.2.5 HIGH ALTITUDE OPERATION

Engine horsepower will decrease by 3.5% for every 1,000 feet over 6,000 feet increase in altitude. At high altitude overall unit performance will deteriorate, and care will need to be taken not to overload the engine.

TABLE 6.2C: 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.	<ul style="list-style-type: none"> • The intake air must be cleaned with the air cleaner—inspect the air filter frequently for dust build-up and replace as needed. • Ensure that the oil cooler fins are kept clean to prevent overheating. • 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, machine fluids may need to be replaced at more frequent intervals. Adjust maintenance schedule accordingly.