

SECTION 6: TROUBLESHOOTING

6.1 GENERAL INFORMATION

The information contained in the Troubleshooting chart has been compiled from field report data and factory experience. It contains symptoms and usual causes for the described problems. However, **DO NOT** assume that these are the only problems that may occur. All available data concerning the trouble should be systematically analyzed before undertaking any repairs or component replacement procedures.

A detailed visual inspection is worth performing for almost all problems and may avoid unnecessary additional damage to the compressor.

1. Check for loose fitting.
2. Check for damaged piping.
3. Check for parts damaged by heat or an electrical short circuit, usually apparent by discoloration or a burnt odor.
4. Should your problem persist after making the recommended check, consult your nearest Vanair® representative or the Vanair Service Department.

Vanair® Service Department

Toll Free: 800-526-8817
 Service (TF): 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 on hand to quickly expedite service (refer to Figure 6-1).

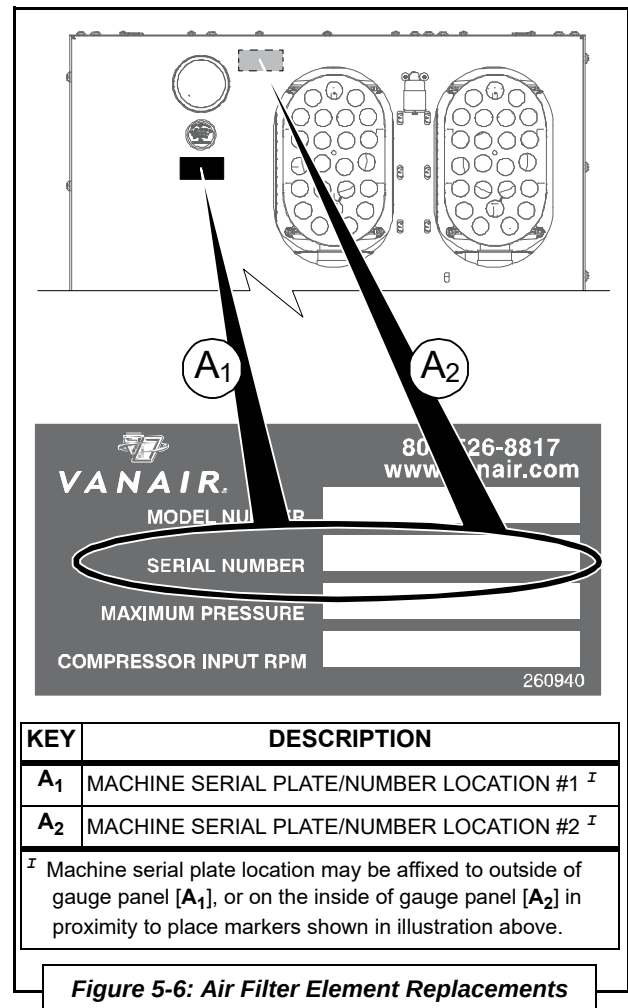


Figure 5-6: Air Filter Element Replacements

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR SHUTS DOWN WITH AIR DEMAND PRESENT	Compressor Discharge Temperature Switch is Open	Cooling air flow is insufficient; clean cooler and check for proper ventilation. Low fluid sump level; add fluid. Dirty fluid; change fluid. Clogged fluid filter; change element. The temperature regulating valve is not functioning properly. Defective discharge temperature switch; check for a short or open circuit to the engine ignition coil. Should this check out normal, it would be possible that the temperature switch is defective.
COMPRESSOR WILL NOT BUILD UP PRESSURE	Air Demand is Too Great	Check demand service lines for leaks or open valves.
	Dirty Air Filter	Check the filter indicator and change element if required.
	Pressure Regulator Out of Adjustment	Adjust regulator according to control adjustment instructions in the Maintenance section.
	Defective Pressure Regulator	Check diaphragm and replace if necessary (kit available).
	Defective Minimum Pressure Valve	Check that piston is moving freely.
	Pilot Valve Out of Adjustment	Adjust pilot valve according to control adjustment instructions.
IMPROPER UNLOADING WITH AN EXCESSIVE PRESSURE BUILD-UP CAUSING PRESSURE RELIEF VALVE TO OPEN	Pressure Regulating Valve is Set Too High	Readjust.
	Leak in the Control System Causing Loss of Pressure Signal	Check control line. Defective pressure regulating valve; repair valve (kit available).
	Inlet Valve Jammed	Free or replace valve.
	Restriction in the Control System	Check all control lines and components. Ice and other contaminants could cause restrictions.
	Defective Pressure Relief Valve	Replace pressure relief valve.
	Pilot Valve Out of Adjustment	Adjust pilot valve according to control adjustment instructions.
INSUFFICIENT AIR DELIVERY	Plugged Air Filter	Clear or replace.
	Plugged Air/Fluid Separator	Replace separator element and also change compressor fluid and fluid filter at this time.
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6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
INSUFFICIENT AIR DELIVERY (CONTINUED)	Filter Pilot Valve Out of Adjustment	Adjust pilot valve according to control adjustment instructions.
	Defective Pressure Regulator	Adjust or repair.
	Power Source Speed Too Low	Readjust engine speed.
	Filter Pilot Valve Out of Adjustment	Adjust pilot valve according to control adjustment instructions.
EXCESSIVE COMPRESSOR FLUID CONSUMPTION	Clogged Return Line	Clear line.
	Separator Element Damaged or Not Functioning Properly	Change separator element.
	Leak in the Lubrication System	Check all pipes, connections and components.
	Defective Blowdown Valve	Replace valve.
COMPRESSOR OVERHEATING	Dirty Fluid Cooler Core	Clean core thoroughly.
	Faulty Thermostat in Thermal Valve	Change thermostat element.
	Plugged Fluid Cooler Tubes (Internal)	Clean tubes thoroughly.
	Low Sump Fluid Level	Fill to proper level.
	Plugged Compressor Fluid Filter	Change element.
	Plugged Fluid Return Line	Clean orifice.

6.3 EXTREME CONDITION OPERATION

When operating in extreme cold or hot conditions, 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 temperatures.

Machine review and maintenance check schedules should be more frequent than the normal suggestions given in the **Maintenance Schedule Tables (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 (if applicable) consult the Engine Operator's Manual, or visit the engine manufacturer's web site given in that manual.

6.3.1 HIGH MOISTURE CONDITION: EMULSIFICATION OF OIL IN ROTARY SCREW COMPRESSOR SYSTEMS

Consult the information in **Table 6.3A** for preventative and/or repair measures. If machine is operating in a high moisture environment, water contamination may persist after following the regular preventative

TABLE 6.3A HIGH MOISTURE CONDITION OPERATION

Symptom	Cause	Prevention / Corrective Action
Emulsification of oil in compressor system: - Compressor oil is milky white in color - Compressor oil is broken down and lacks lubricity. - Compressor oil may develop solid chunks or clumps	Operating the compressor system for short periods of time: - Short cycling prevents the temperature of the oil from attaining a high enough temperature capable of vaporizing the moisture droplets. Operating the compressor system unloaded without air flow from the service line for long periods of time: - This can keep the oil temperature from getting hot enough to vaporize the moisture droplets, preventing the moisture from being able to escape the system. Additionally, there is no path for the moisture to escape the system. The air filter is saturated with water: - This forces moisture to be ingested by the compressor. Any of the above causes will be exacerbated in especially humid environments.	RECOMMENDED CHANGES: If the problem is not corrected by standard operating practices and regular preventative maintenance, consider the following: - Raise the average temperature of the compressor oil. - Change the operating procedure to allow for the compressor oil temperature to reach 180 °F before discharging any air. If the compressor isn't discharging any air, it's not ingesting any potentially humid air. It will build pressure upon initial startup, but then it will run closed and allow it to heat up. REPAIR/MAINTENANCE: Refer to Section 5 of the Operator's Manual for inspection, cleaning, and repair instructions. - Once the compressor oil becomes emulsified, it must be replaced along with the oil filter. Depending on the severity, other parts might also need to be replaced. - Check that the separator element is in good, working condition. - Check that the scavenge line is working properly. If the system is badly contaminated, Vanair® recommends a lube flush that will help clean out any remaining contamination throughout the system. Consult Vanair Service Department for lube flush instructions. PREVENTION Before starting a cold system, carefully crack the drain valve and allow approximately a cup of discharge fluid to drain for the purpose of relieving any condensed water that may have accumulated in the system. Ensure that the valve is shut completely before starting.

maintenance schedule and standard operating procedures.

6.3.2 COLD WEATHER OPERATION

Consult the information in **Table 6.3B** for preventative and/or repair measures. 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.

TABLE 6.3B 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. • 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. • Vanguard™ Premium Synthetic Oil is suitable for use from -40°F to 110°F (-40°C to 43°C). • For additional engine precautions, consult the Engine Operator's Manual. • Vanair® recommends installation of the cold weather heater option kit. Consult Vanair Service Department for cold weather kit 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. • 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).

6.3.3 HIGH TEMPERATURE OPERATION

Consult the information in **Table 6.3C** for preventative and/or repair measures.

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 Operator's Manual (if applicable) 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 operator should be aware that high temperatures can influence engine

performance, which can directly effect some machine function capacity outputs.

The use of Vanguard High Pressure Oil as compressor system fill will improve operation for machines located in areas of high temperature. For further information on Vanguard™ High Pressure Oil application, consult the Vanair Service Department.

NOTE

If changing oil types, always perform a full system drain before charging with new oil. Never mix oil types within the system.

6.3.4 HIGH DUST CONTENT OPERATION

Consult the information in **Table 6.3D** for preventative and/or repair measures. When the machine is to be used in continuously

TABLE 6.3C 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 and air compressor 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. - At the minimum, all coolers, including air passage ways around the coolers, should be free of debris and dirt. The fan, driven by the hydraulic motor, is designed to run continuously to assure a constant flow of cooling air. - 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.

dusty environments, special care must be taken with the engine's air cleaner, compressor air cleaner, and compressor oil cooler.

6.3.5 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 6.3D 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.	- 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.