

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

**Phone: 800-526-8817 (toll free)**

**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. See *Figures W-1* in the *Warranty Details Section* for machine, and specific engine, compressor and generator serial plate locations.

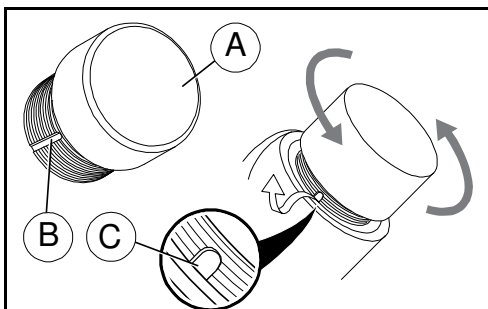
### ! WARNING

**DO NOT operate any of the Air N Arc I-300 Series' 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.**

### ! 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.**

**Refer to *Figure 6-1*. Open fill cap SLOWLY (contents under pressure) to make sure all pressure has been relieved.**



KEY	DESCRIPTION
A	COMPRESSOR FILL CAP (red)
B	FILL CAP BLEED VENT GROOVE
C	Open/crack cap <b>slightly</b> to allow bleed vent to relieve pressure

**Figure 6-1: Pressure Relief**

6.2 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
<b>ENGINE</b>		
Engine will not crank	Faulty battery connection.	Check for proper battery connections and battery charge.
	Engine fuse blown	Check engine fuse: See <b>Section 5.4.4, Servicing the System Fuses and Circuit Breakers</b> , 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 <b>Section 1.12, Machine Canopy Access Safety Switches</b> .
	Low or dead battery voltage	Recharge or replace battery.
	Poor grounding	Check and confirm ground connection.
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.
Glow plugs not engaging	Check fuse, wiring, and Engine Operation Manual.	

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6.2 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
<b>ENGINE (CONTINUED)</b>		
Engine will not start (continued)	Fuel solenoid	Call Vanair Service Department.
Improper Control Operation: Engine does not speed up	Throttle solenoid cable improperly set	Call Vanair Service Department.
	Operating pressure too high	Adjust to proper pressure setting. Refer to <b>Section 5.4.2, Adjusting the Pressure Setting</b> . Replace if switch continues to deviate from setting.
	Fuel filter partly plugged	Replace fuel filter. Refer to the Engine Operation Manual.  Auxiliary fuel pump may be needed for remote fuel tank. Refer to <b>Section 3, Installation</b> .
	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	Leak in control line	Check for leaks; replace line if necessary.
	Pressure switch out of adjustment	Adjust to proper pressure setting. Refer to <b>Section 5.4.2, Adjusting the Pressure Setting</b> . Replace if switch continues to deviate from setting.
	Generator switch left on	Turn generator switch off.
	Pressure switch faulty	Replace pressure switch.
	Throttle solenoid stuck	Free governor and lubricate if necessary. Refer to Engine Operation Manual.
Engine overheats	Low oil level	Check engine oil level. Consult the Engine Operation Manual for additional information on engine maintenance.
	Engine coolant level low	Check coolant level; add if necessary.
	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.
	Faulty hydraulic fan pump / motor	Repair hydraulic fan pump / motor.
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<b>6.2 TROUBLESHOOTING GUIDE</b>		Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.
<b>Fault/Malfunction</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>ENGINE (CONTINUED)</b>		
Engine overheats (continued)	Fault with engine cooling system	Consult Engine Operation Manual.
Engine stops during operation	belt access panel switch faulty	Close access panel. Check switch.
	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 <i>Engine Overheats</i> fault.
	Engine shutdown switch activated	Confirm that access door is properly in place. Replace faulty engine shutdown switch; see <b>Section 1.12, Machine Canopy Access Safety Switches</b> .
	Excessive hydraulic pressure overload	Check hydraulic pressure.
	Low Fuel	Check and refill fuel tank if necessary.
	Plugged air filter	Check and replace air filter element if necessary.
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).
	Fuel filter(s) contaminated	Check fuel filters. Refer to the Engine Operation Manual.
	Low fuel level	Add fuel.
	Overload	Reduce load; check load use, and reduce.
	Engine not warmed up	Allow engine to warm up.
<b>COMPRESSOR</b>		
Compressor overheats  This condition will cause a compressor shutdown and compressor fault light to turn on. Before restarting the compressor, determine the cause for overheating.	Low compressor oil level	Check oil level and refill to proper level if necessary (ensure machine is parked on a level surface).
<b>For additional information concerning an engine problem, consult the Engine Operation Manual.</b>		
<i>Continued on next page</i>		

<b>6.2 TROUBLESHOOTING GUIDE</b>		<b>Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.</b>
<b>Fault/Malfunction</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>COMPRESSOR (CONTINUED)</b>		
Compressor overheats (cont.) This condition will cause a compressor shutdown and compressor fault light to turn on. Before restarting the compressor, determine the cause for overheating.	Obstructed fluid cooler	Clear debris/dirt from cooler core/flush shroud.
	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. Also consult <b>Section 5, Table 5A</b> for additional periodic oil filter system maintenance.
	Input rpm too high	Adjust to proper setting; refer to <b>Section 5.4.1, Adjusting the Engine Speed</b> , and the Engine Operation Manual.
	Fan not operating	Low compressor oil; check oil level and refill to proper level if necessary (ensure machine is parked on a level surface).
		Hydraulic oil low; check hydraulic oil reservoir level; fill as necessary.
Belt slip on hydraulic pump. Refer to the hydraulic pump sub-sections in <b>Section 5.4.3, Re-tensioning and Replacing the Serpentine Drive Belts</b> .		
Faulty pump motor	Check / isolate cause; replace if necessary.	
Compressor shuts down with air demand present	Compressor temperature switch opening	Check compressor oil level. Replenish if necessary.
	Restricted cooling air intake	Reposition machine.
	Fan not operating	Refer to Corrective Action under “fan not operating”, under ‘compressor overheats’ category above.
	Compressor oil filter plugged	Replace compressor oil filter. Also consult <b>Section 5, Table 5A</b> for additional periodic oil filter system maintenance.
	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.
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Fault/Malfunction	Possible Cause	Corrective Action	
<b>COMPRESSOR (CONTINUED)</b>			
Compressor shuts down with air demand present (continued)	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.	
	Air demand too high (continued)	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 <b>Section 5.4.2, Adjusting the Pressure Setting</b> . Replace if switch continues to deviate from setting.	
	Defective pressure switch	Replace pressure switch.	
	Belt(s) slipping	Re-situate and adjust belt tension, or replace belt if necessary. Consult <b>Section 5.4.3, Re-tensioning and Replacing the Serpentine Belts</b> .	
	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 valve frozen shut	Repair/replace inlet valve.	
Clutch faulty	Inspect; replace if necessary.		
Broken or loose belt	Re-tension or replace belt.		

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6.2 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
<b>COMPRESSOR (CONTINUED)</b>		
<p>Compressor system over-pressures</p> <p>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.</p>	Pressure switch setting too high	Reset pressure switch. Refer to <b>Section 5.4.2, Adjusting the Pressure Setting</b> . 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 <b>Section 7.20, Hose Installation Guide</b> 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. <ul style="list-style-type: none"> <li>• Refer to <b>Section 7.20, Hose Installation Guide</b> for assistance in running or checking hose lines.</li> <li>• <b>DO NOT</b> use wire cutters: use a loom cutting tool or a clean, sharp razor blade.</li> </ul>
	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.
Plugged coalescer	Replace coalescer.	
<p>No service air output (See also <i>Compressor will not build up pressure</i>)</p>	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 <b>Section 5.4.2, Adjusting the Pressure Setting</b> .
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<b>6.2 TROUBLESHOOTING GUIDE</b>		<b>Use Section 7, Illustrated Parts List, to visually identify and confirm any part number that may need to be replaced.</b>
<b>Fault/Malfunction</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>COMPRESSOR (CONTINUED)</b>		
No service air output (See also <i>Compressor will not build up pressure</i> ) (continued)	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 <b>Section 5.4.3</b> for belt maintenance or replacement procedures.
Compressor stalls	Pressure switch setting too high	Adjust pressure switch setting. Refer to <b>Section 5.4.2, Adjusting the Pressure Setting</b> . 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.
	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. <b>Section 5.4.2, Adjusting the Pressure Setting</b> . 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 <b>Figure 5-1</b> ). 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.

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<b>Fault/Malfunction</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
<b>COMPRESSOR (CONTINUED)</b>		
Excessive moisture in the compressed air	Moisture accumulating in air tank	Drain water from air tank.
	Emulsified or contaminated compressor oil	Change oil; refer also to <b>Section 6.3.1.</b>
<b>WELDER</b>		
Welder and battery charger behave erratically	Connection cables or receptacles are soiled/contaminated	Check for twisted cables and/or soiled/contaminated 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® Service Department if behavior persists.
	Welding function is not drawing enough operating power	If running more than one function simultaneously, turn off competing function.
No welder output	Fuse at welder field blown	Replace the welder field fuse. Refer to <b>Section 5.4.4, Servicing the System Fuses and Circuit Breakers</b>
	Main cable loose connection	All Anderson (weld cable) connection plugs on machine and instrument panel.
	Broken or loose belt	Re-tension or replace belt.
No welder output in CC mode	Bad ground connect	Make sure of connection. Clean welding surface.
	Faulty electrical circuit	Check electrical circuit.
	Broken or loose belt	Re-tension or replace belt.
<b>GENERATOR</b>		
No AC generator output	Serpentine belt damaged or not tensioned properly	Re-situate and adjust belt tension, or replace belt if necessary. Consult <b>Section 5.4.3, Re-tensioning and Replacing the Serpentine Belts.</b> Order replacement belt.
	Faulty AC generator relay	Check; replace if necessary.
	Faulty capacitor	Check; replace if necessary.
	Circuit breaker / GFCI tripped	Replace/reset breakers.
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6.2 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
Low AC voltage	Engine speed too low for demand	Adjust speed control. Consult <b>Section 5.4.1, Adjusting the Engine Speed</b> , 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 <b>Section 5.4.3, Re-tensioning and Replacing the Serpentine Belts</b> .
High AC voltage	Engine speed too high for demand	Adjust speed control. Consult <b>Section 5.4.1, Adjusting the Engine Speed</b> , and the Engine Operation Manual.
BATTERY BOOST		
No voltage shows when select charge or boost	Hooked to battery with less than (<) 2.5 volts; battery voltage inadequate. Battery must be sized/charged greater than 2.5 volts (> 2.5V).	Check battery voltage; battery must be at properly-sized/charged battery. Replace if necessary.

### 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 5.3A, and Table 5.3B 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, 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 maintenance schedule and standard operating procedures.

**TABLE 6.3A HIGH MOISTURE CONDITION OPERATION**

Symptom	Cause	Prevention / Corrective Action
<p>Emulsification of oil in compressor system:</p> <ul style="list-style-type: none"> <li>• Compressor oil is milky white in color</li> <li>• Compressor oil is broken down and lacks lubricity.</li> <li>• Compressor oil may develop solid chunks or clumps</li> </ul>	<p><b>Operating the compressor system for short periods of time:</b></p> <ul style="list-style-type: none"> <li>• Short cycling prevents the temperature of the oil from attaining a high enough temperature capable of vaporizing the moisture droplets.</li> </ul> <p><b>Operating the compressor system unloaded without air flow from the service line for long periods of time:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul> <p><b>The thermal valve is faulty and activating the cooling fan too soon:</b></p> <ul style="list-style-type: none"> <li>• This prevents the oil from attaining a high enough temperature capable of vaporizing the moisture droplets.</li> </ul> <p><b>The air filter is saturated with water:</b></p> <ul style="list-style-type: none"> <li>• This forces moisture to be ingested by the compressor.</li> </ul> <p><b>Any of the above causes will be exacerbated in especially humid environments.</b></p>	<p><b>RECOMMENDED CHANGES:</b></p> <p>If the problem is not corrected by standard operating practices and regular preventative maintenance, consider the following:</p> <ul style="list-style-type: none"> <li>• Raise the average temperature of the compressor oil.</li> <li>• 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.</li> </ul> <p><b>REPAIR/MAINTENANCE:</b></p> <p>Refer to <b>Section 5</b> of the Operator's Manual for inspection, cleaning, and repair instructions.</p> <ol style="list-style-type: none"> <li>1. 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.</li> <li>2. Check that the separator element is in good, working condition.</li> <li>3. Check that the scavenge line is working properly.</li> </ol> <p>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.</p> <p>Check the moisture drain frequently on the air tank reservoir, to alleviate moisture build-up.</p>