

SECTION 6: TROUBLESHOOTING

6.1 GENERAL INFORMATION

The information contained in this section has been compiled from field report data and factory experience. It contains symptoms and usual causes for the most common types of problems that may occur. 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 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. Always remember to:

1. Check for loose wiring.
2. Check for damaged piping.
3. Check for parts damaged by heat or an electrical short circuit, usually noticeable by discoloration or a burnt odor.

Should the problem persist after making the recommended check, consult your nearest Vanair® representative or the Vanair Service Department. Make sure to have the machine serial number readily available to help expedite assistance. Refer to **Figure 6-1** for

machine, motor and compressor serial number plate and serial number locations.

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⚠ WARNING

Before starting, performing maintenance, or replacing parts, relieve the entire system pressure by opening a service valve, which will vent all pressure to the atmosphere.

⚠ WARNING

DO NOT operate the compressor or any of its systems if there is a known unsafe condition. Disable the equipment by disconnecting it from its power source.

NOTE THAT THE SYSTEM CAN BE STARTED REMOTELY:

Install a lock-out tag to identify the equipment as inoperable to other personnel to prevent accidental application.

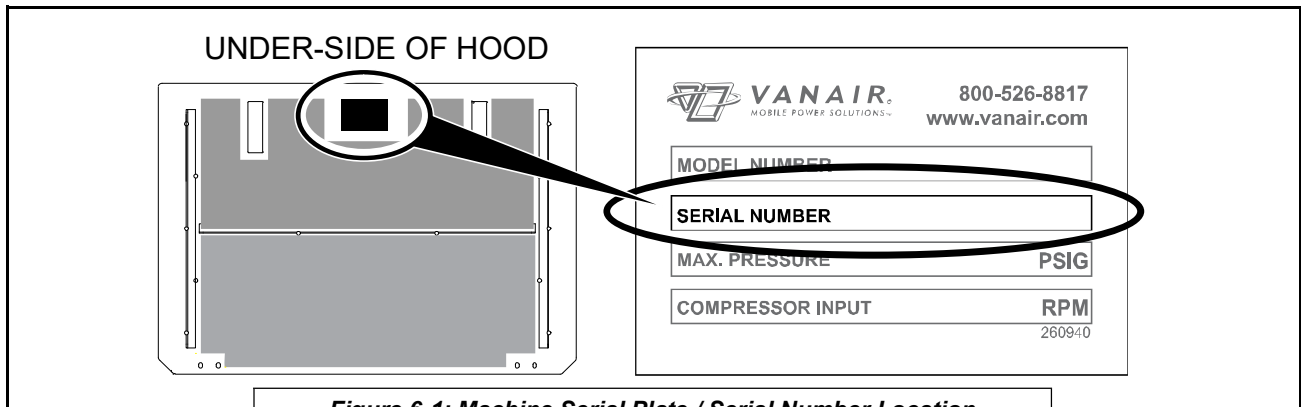


Figure 6-1: Machine Serial Plate / Serial Number Location

6.2 TROUBLESHOOTING GUIDE - MACHINE OPERATION

MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
Compressor will not build up pressure	Air demand is too great	Check service lines for leaks or open valves. Too much air demand.
	Dirty air filter	Check the filter and clean or change element if required.
	Defective pressure transducer	Replace pressure transducer.
	Motor does not speed up	Check hydraulic flow and pressure and adjust if necessary.
	Service valve wide open	Close service valve.
	Solenoid valve stuck	Replace solenoid valve.
	Inlet valve stuck	Free or replace inlet valve. Order rebuild kit if necessary.
Compressor over pressures	Defective pressure transducer	Replace pressure transducer; Contact factory service department.
	Inlet valve stuck open	Free or replace valve.
	Solenoid valve not energized or faulty	Check for power. Replace if necessary.
	Plugged coalescer	Replace coalescer.
Insufficient air delivery	Plugged air filter	Replace air filter.
	Plugged coalescer	Replace coalescer element.
	Motor speed too low	Check hydraulic flow and pressure and adjust if necessary.
	Inlet valve stuck	Free or replace inlet valve. Order rebuild kit if necessary.
	Minimum pressure / check valve malfunctioning	Rebuild or replace check valve.
Oil carryover	Oil level overfull	Drain to proper level.
	Plugged oil scavenge line	Contact the Vanair® Service Department.
	Discharge pressure too low	Check minimum pressure valve and adjust. Replace if necessary.
	Defective coalescer	Replace coalescer element.
	Overspeed	Adjust hydraulic flow to maintain compressor RPM speed.

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6.2 TROUBLESHOOTING GUIDE - MACHINE OPERATION

MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
Compressor overheating	Insufficient oil	Check oil level and fill to proper level.
	Restricted cooling air flow	Reposition machine to assure proper air flow.
	Fan not operating	Check ground connection and ensure proper connection.
		Check circuit breaker.
		Check for short in wires.
		Check fan motor.
	Plugged oil filter	Replace oil filter.
	Contaminated cooler core	Remove and clean cooler core. Consult service department for recommended flushing procedure.
	Pressure set too high	Contact factory service department.
	Unit running too fast	Check hydraulic flow and pressure and adjust if necessary.
Thermal valve	Faulty valve; replace thermal valve.	
Oil level too low	Check level; replenish as necessary.	
System retains pressure after shutdown	Solenoid valve stuck	Should be no power to solenoid valve.
		Replace solenoid valve.
	Leak back from air line	Check minimum pressure valve for leaks.
Compressor stalls	Insufficient hydraulic system pressure flow. This can occur if another hydraulically activated component is used off same pump system. Activating the secondary component may drop hydraulic supply system pressure/flow and leave insufficient for compressor.	NOTE: Even a momentary drop in supply hydraulic supply pressure/flow may initiate compressor blowdown to commence. Check setting on supply pressure system relief valve. Check to ensure adequate pressure/flow. Check if other systems are activated off same supply.
	Pressure relief valve set too low	Contact factory service department.
	Leak in seals on pressure relief valve.	Remove and check seals or fit new valve cartridge.
	Air pressure set too high for hydraulic system.	Adjust pressure setting to reduce air pressure.

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6.2 TROUBLESHOOTING GUIDE - MACHINE OPERATION		
MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
Compressor stalls (continued)	Leak in solenoid valve cartridge (directional flow control valve) on manifold.	Remove and check seals or fit new valve cartridge.
	Check over-pressure or over-temperature	Adjust if necessary.

6.3 TROUBLESHOOTING GUIDE - HYDRAULICS		
MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
HYDRAULIC DRIVE SYSTEM: EXCESSIVE NOISE		
Pump is too noisy	Cavitation	Regard any or all of the following: Replace dirty filters; wash strainers in solvent compatible with system fluid; clean clogged inlet line; clean or replace reservoir breather vent; change system fluid; change to proper pump drive motor speed; overhaul or replace supercharge pump; fluid may be too cold.
	Air is present in fluid	Regard any or all of the following: Tighten leaking connections; fill reservoir to proper level (with rare exception all return lines should be below fluid level in reservoir); bleed air from system; replace pump shaft seal (and shaft if worn at seal journal).
	Coupling is mis-aligned	Align unit and check condition of seals, bearings and coupling.
	Pump is worn or damaged	Overhaul or replace pump.
Motor is too noisy	Coupling is mis-aligned	Align unit and check condition of seals, bearings and coupling.
	Motor and/or coupling is/are worn or damaged	Regard any or all of the following: Tighten leaking connections; fill reservoir to proper level (with rare exception all return lines should be below fluid level in reservoir); bleed air from system; replace pump shaft seal (and shaft if worn at seal journal).
Relief valve too noisy	Valve setting is set too low or too close to another valve setting	Install pressure gauge and adjust to correct pressure.
	Worn poppet and/or seat	Overhaul or replace poppet and/or seat.
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6.3 TROUBLESHOOTING GUIDE - HYDRAULICS

MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
HYDRAULIC DRIVE SYSTEM: EXCESSIVE HEAT		
Pump is heated	Refer to information under "Fluid is heated" heading below.	Refer to information under "Fluid is heated" heading below.
	Cavitation	Regard any or all of the following: Replace dirty filters; clean clogged inlet line; clean or replace reservoir breather vent; change system fluid; change to proper pump drive motor speed; overhaul or replace supercharge pump.
Pump is heated (continued)	Air is present in fluid	Regard any or all of the following: Tighten leaking connections; fill reservoir to proper level (with rare exception all return lines should be below fluid level in reservoir); bleed air from system; replace pump shaft seal (and shaft if worn at seal journal).
	Relief or unloading valve is set too high	Install pressure gauge and adjust to correct pressure (keep at least 125 PSI difference between valve settings).
	Load is excessive	Align unit and check condition of seals and bearings; locate and correct mechanical binding; check for work load in excess of circuit design.
	Pump is worn or damaged	Overhaul or replace pump.
Motor is heated	Fluid is heated	Refer to information under "Fluid is heated" heading below.
	Relief or unloading valve is set too high	Install pressure gauge and adjust to correct pressure (keep at least 125 PSI difference between valve settings).
	Load is excessive	Align unit and check condition of seals and bearings; locate and correct mechanical binding; check for work load in excess of circuit design.
	Motor is worn or damaged	Overhaul or replace motor.
Relief valve is heated	Fluid is heated	Refer to information under "Fluid is heated" heading below.
	Valve is set incorrectly	Install pressure gauge and adjust to correct pressure (keep at least 125 PSI difference between valve settings).
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6.3 TROUBLESHOOTING GUIDE - HYDRAULICS		
MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
HYDRAULIC DRIVE SYSTEM: EXCESSIVE HEAT (CONTINUED)		
Relief valve is heated (continued)	Valve is worn or damaged	Rebuild or replace valve.
Fluid is heated	System pressure is too high	Install pressure gauge and adjust to correct pressure (keep at least 125 PSI difference between valve settings).
	Unloading valve is set too high	Install pressure gauge and adjust to correct pressure (keep at least 125 PSI difference between valve settings).
Fluid is heated (continued)	Fluid is fouled or quantity too low	Change filters and also system fluid if improper viscosity; fill reservoir to proper level.
	Fluid viscosity is not correct	Change filters and also system fluid if improper viscosity; fill reservoir to proper level.
	Fluid cooling system is faulty	Clean cooler and/or cooler strainer; replace cooler control valve; repair or replace cooler.
	Pump, valve, motor, cylinder or other component is/are worn	Overhaul or replace item as noted.
HYDRAULIC DRIVE SYSTEM: INCORRECT FLOW CONDITION		
No existing flow	Pump not receiving fluid	Regard any or all of the following: Replace dirty filters; clean clogged inlet line; clean or replace reservoir breather vent; fill reservoir to proper level; overhaul or replace supercharge pump.
	Pump drive motor not operating	Overhaul or replace pump drive motor.
	Drive coupling of pump sheared	Check for damaged pump or pump drive—replace as necessary, and align coupling.
	Pump drive motor rotating in wrong direction	Reverse rotation.
	Entire flow passing over relief valve	Adjust as necessary.
	Pump is damaged	Check for damaged pump or pump drive—replace as necessary, and align coupling.
	Pump is assembled improperly	Overhaul or replace pump.
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6.3 TROUBLESHOOTING GUIDE - HYDRAULICS

MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
HYDRAULIC DRIVE SYSTEM: INCORRECT FLOW CONDITION (CONTINUED)		
Flow is low	Flow control is set too low	Adjust as necessary.
	Relief or unloading valve is set too low	Adjust as necessary.
	Flow is bypassing through partially-opened valve	Check position of manually operated controls; check electrical circuit on solenoid operated controls; repair or replace pilot pressure pump. Rebuild or replace valve, if necessary.
	External leak in the system exists	Locate and tighten leaking connections.
	Yoke actuating device is inoperative (variable displacement pumps)	Overhaul or replace yoke actuating device.
	Pump drive motor RPM is incorrect	Replace with correct unit.
	Pump, valve, motor, cylinder or other component is/are worn	Overhaul or replace item as noted.
Flow is excessive	Flow control is set too high	Adjust as necessary.
	Yoke actuating device is inoperative (variable displacement pumps)	Overhaul or replace yoke actuating device.
	Pump drive motor RPM is incorrect	Replace with correct unit.
	Replacement pump is not properly sized	Replace with correct unit.
HYDRAULIC DRIVE SYSTEM: INCORRECT PRESSURE CONDITION		
Pressure is absent	No flow	Refer to information in the "No Existing Flow" column under INCORRECT FLOW CONDITION in this guide
Pressure is low	Pressure relief path is present	Refer to information in the "No Existing Flow" and the "Flow is Low" columns under INCORRECT FLOW CONDITION in this guide
	Pressure reducing valve is set too low	Adjust pressure reducing valve. Rebuild or replace if necessary.
	Pressure reducing valve is damaged or inoperable	Rebuild or replace pressure valve.
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6.3 TROUBLESHOOTING GUIDE - HYDRAULICS

MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
HYDRAULIC DRIVE SYSTEM: INCORRECT PRESSURE CONDITION (CONTINUED)		
Pressure is low (continued)	Pump, motor or cylinder is damaged or inoperable	Overhaul or replace as necessary.
Pressure is erratic	Air is present in fluid	Tighten leaking connections, fill reservoir to proper level, and bleed air from system.
	Relief valve is worn or inoperable	Rebuild or replace valve.
	Fluid is contaminated	Check system fluid and filters; replace if necessary.
	Accumulator is defective or has lost charge	Overhaul or replace as necessary.
	Pump, motor or cylinder is worn	Overhaul or replace as necessary.
Pressure is excessive	Pressure reducing, relief, or unloading valve out of adjustment	Adjust; Rebuild or replace if necessary.
	Yoke actuating device is inoperative (variable displacement pumps)	Overhaul or replace yoke actuating device.
	Pressure reducing, relief, or unloading valve is worn or damaged	Overhaul or replace as necessary.
HYDRAULIC DRIVE SYSTEM: FAULTY OPERATION		
Hydraulic Flow Does Not Move	No flow or pressure	Refer to information under INCORRECT FLOW CONDITION in this guide.
	Limitation component is (mechanical, electrical or hydraulic) is inoperative or out of adjustment	Overhaul or replace.
	Mechanically bound	Locate the bind, and repair.
	Command signal to servo amplifier is absent	Repair command console or connection wire(s).
	Servo amplifier is inoperative or out of adjustment	Adjust, repair or replace.
	Servo valve is inoperative or out of adjustment	Adjust, repair or replace.
	Cylinder or motor is worn or damaged	Overhaul or replace cylinder or motor.
Hydraulic Flow Moves Slowly	Low system flow	Refer to information under INCORRECT FLOW CONDITION in this guide.
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6.3 TROUBLESHOOTING GUIDE - HYDRAULICS

MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
HYDRAULIC DRIVE SYSTEM: FAULTY OPERATION (CONTINUED)		
Hydraulic Flow Moves Slowly (continued)	Viscosity of fluid too high	Fluid may be too cold; allow system to warm up.
		Fluid may be fouled; change system fluid to correct viscosity fluid.
	Insufficient control pressure for valve operation	Refer to information under INCORRECT PRESSURE in this guide.
	Machine integral components a/o linkage not lubricated	Lubricate as needed.
	Servo amplifier is out of adjustment or malfunctioning	Adjust, repair or replace.
	Servo valve sticks	Adjust, repair or replace.
	Cylinder or motor is worn or damaged	Overhaul or replace cylinder or motor.
Hydraulic Flow Moves Erratically	Pressure is erratic	Refer to information under INCORRECT PRESSURE in this guide.
	Air is present in fluid	Refer to information under EXCESSIVE NOISE in this guide.
	Machine integral components a/o linkage not lubricated	Lubricate as needed.
	Command signal is erratic	Repair command console or connection wire(s).
	Servo amplifier is out of adjustment or malfunctioning	Adjust, repair or replace.
	Feedback transducer malfunctioning	Overhaul or replace feedback transducer.
	Servo valve sticks	Clean and adjust; replace if necessary. Check system fluid and filters; replace if necessary.
	Cylinder or motor is worn or damaged	Overhaul or replace cylinder or motor.
Hydraulic Flow Moves Excessively	Flow is excessive	Refer to information under INCORRECT FLOW CONDITION in this guide.
	Feedback transducer malfunctioning	Overhaul or replace feedback transducer.
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6.3 TROUBLESHOOTING GUIDE - HYDRAULICS

MALFUNCTION/FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
HYDRAULIC DRIVE SYSTEM: FAULTY OPERATION (CONTINUED)		
Hydraulic Flow Moves Excessively (continued)	Servo amplifier is out of adjustment or malfunctioning	Adjust, repair or replace.
	Work load is overriding	Adjust, repair or replace the counter-balance valve.