ARMSTRONG

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SUPERSEDES:	New
DATE:	New

VFD BOOSTER TROUBLE SHOOTING CHART

CAUSES	SOLUTIONS
1. PUMP DOES NOT RUN	
No power to the motor	• Check for voltage at the motor terminal box • If no voltage at motor check wiring between VFD and motor • Check incoming voltage to VFD (should not be over or under by 10% of nameplate voltage)
Fuses are blown or circuit breakers are tripped	• Turn off power and remove fuses and check for continuity with ohmmeter • Replace blown fuses or reset circuit breakers • If new fuses blow or circuit breaker trips, the motor and wires should be checked • System should be verified for unusual pump cycling
Pumps / booster is set in “OFF” mode	• Check VFD and make sure VFD is set to “AUTO” • Check Booster Control Panel and make sure pump is set to “AUTO” • Check Booster Control Panel and make sure booster is set to “Local ON” • If Booster is getting remote start / stop signal, make sure remote start / stop contact is closed for start command
Motor is defective	• Disconnect power and wiring to motor • Measure lead to lead resistance’s • Measure lead to ground resistance’s • If and open or grounded winding is found, remove motor and repair or replace
Pump is bound	• If pump is bound, VFD will indicate “Over current Alarm” • Turn off power and manually rotate pump shaft • If shaft does not rotate easily remove pump • Disassemble and repair
2. LAG PUMPS DO NOT SEQUENCE ON	
Lag pump is set in “OFF” mode	• Check VFD and make sure VFD is set to “AUTO” • Check Booster Control Panel and make sure pump is set to “AUTO”
Booster Control Panel is set up for 1 pump only	• Check Booster Control Panel setup and make sure number of pumps matches the actual number of pumps on the system
Booster Control Panel speed staging is setup incorrectly	• Check Booster Control Panel setup for lag pump stage on speed. The primary pump has to reach this speed for 60 seconds (default) before triggering the lag pump(s) on
3. LAG PUMP DOES NOT SHUT OFF	
Booster Control Panel speed staging is setup incorrectly	• Check Booster Control Panel setup for lag pump stage off speed. The pumps have to reach this speed for 60 seconds (default) before triggering the lag pump(s) off • Check VFD and make sure VFD is set to “AUTO” • Check Booster Control Panel and make sure pump is set to “AUTO”
4. SUCTION / DISCHARGE PRESSURE TOO HIGH / LOW	
Booster Control Panel Discharge Pressure Setpoint is incorrect	• Check Booster Control Panel setup for Discharge Pressure Setpoint – adjust accordingly • Check Booster Control Panel setup and make sure setpoint high and low limits are setup to be +/- 15 psi from setpoint
Booster PID loop tuned too aggressively	• Check Booster Control Panel setup for Kc and Ti values. If system is overshooting pressure all the time, tune system by increasing Kc and Ti values to reach a “soft” approach PID
Suction / Discharge sensing lines are blocked / closed off	• Make sure suction and discharge pressure sensor isolation valves are open and unclogged

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4. SUCTION / DISCHARGE PRESSURE TOO HIGH / LOW (cont'd)	
Wiring is loose or broken between sensor and panel	• Check wiring integrity between sensor head and panel terminal strip (sensor signal wire is polarity sensitive - check your wiring diagram before rewiring!)
Check valves failed open and bleeding discharge back into suction	• Close isolation valve on non-running pump and see if problem (high suction pressure) goes away • If problem goes away, reopen valve and see if problem reappears. If it does, the check valve on that pump is failed. Remove and inspect for debris or damage. Replace as necessary
5. PUMP RUNS AT REDUCED CAPACITY OR DOES NOT DELIVER WATER	
Suction / Discharge valves closed	• Make sure suction / discharge valves are fully open and not blocked
Wrong pump rotation	• Check incoming wiring for proper connections • Correct wiring
Pump impeller, suction strainers, check valves, foot valves or upstream piping are clogged	• Disassemble pump and inspect • Remove strainers and valves and inspect • Remove all foreign materials found
Suction or discharge piping leaks	• Pump runs backward when turned off • Air in suction piping • Suction piping must be air tight, repair any leaks and tighten any loose fittings
Pump is worn	• Install pressure gauge on pump discharge • Gradually close discharge isolation valve and read pressure at shut off (at full speed) • If measured pressure is close to pump curve pump is probably OK • If not remove and inspect pump
Pump is overdrawing amps – VFD is limiting speed	• Check amp draw using amp clamp and confirm VFD amp readings • Make sure VFD is set for variable torque and not constant torque • If pump is overdrawing amps, check differential pressure across pump and note speed. Confirm against pump curve to determine is pump is running out on its curve. • Pump maybe seizing. Check motor and/or pump bearings – repair as necessary.
6. LEAD PUMP CYCLES ON TOO FREQUENTLY	
Discharge pressure sensor / header is leaking	• Isolate a known pressure inside the discharge header and see if pressure holds • If pressure does not hold, find and repair leak in header
Insufficient air charging or leaking expansion tank	• Check if expansion tank on system holds air charge using a tire pressure gauge • Replace bladder / tank if necessary
Tank is too small	• Tank should be sized for an average storage of 20 Gallons (Refer to catalogue for proper tank sizing) • Replace tank if necessary
7. PUMP IS NOISY	
Faulty pump motor	• Grease bearing and let run, observe change • Check motor amperage • Disconnect motor and have it checked by service dealer • Have bearings changed • If motor Amps are above nameplate FLA, windings and stator should be verified

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