

## BOOSTER TROUBLE SHOOTING CHART

CAUSES	SOLUTIONS
<b>- 1 - PUMP DOES NOT RUN</b>	
No power to the motor	<ul style="list-style-type: none"> <li>• Check for voltage at the motor terminal box</li> <li>• If no voltage at motor check control panel for tripped circuits</li> <li>• Reset circuit</li> </ul>
Fuses are blown or circuit breakers are tripped	<ul style="list-style-type: none"> <li>• Turn off power and remove fuses and check for continuity with ohmmeter</li> <li>• Replace blown fuses or reset circuit breakers</li> <li>• If new fuses blow or circuit breaker trips, the motor and wires should be checked</li> <li>• System should be verified for unusual pump cycling</li> </ul>
Motor starter overloads are burned or have tripped out	<ul style="list-style-type: none"> <li>• Check for voltage on load side and line side of starter</li> <li>• Replace burned heaters</li> <li>• Inspect starter for other damage</li> <li>• If heater trips again check supply voltage, holding coil</li> <li>• Allow time for overloads to cool before resetting</li> <li>• System should be verified for unusual pump cycling</li> </ul>
Starter does not energize	<ul style="list-style-type: none"> <li>• Energize control circuit and check for voltage at the holding coil</li> <li>• If no voltage, check control circuit fuses/breakers</li> <li>• If voltage exists check holding coil for shorts and replace bad coil</li> </ul>
Defective or wrongly adjusted pressure switches	<ul style="list-style-type: none"> <li>• Check all safety controls i.e.: Low suction, high suction, high and low system pressure switches</li> <li>• Low suction pressure switch = 5 PSI</li> <li>• High suction pressure switch = required system pressure +5 PSI                             <ul style="list-style-type: none"> <li>• High system pressure = system required pressure +25 PSI or according to system limitations</li> </ul> </li> <li>• Low system pressure = 25% below system required pressure</li> <li>• Check contacts on control devices</li> <li>• Replace worn or defective parts or switches</li> </ul>
Motor is defective	<ul style="list-style-type: none"> <li>• Disconnect power and wiring to motor</li> <li>• Measure lead to lead resistance's</li> <li>• Measure lead to ground resistance's</li> <li>• If and open or grounded winding is found, remove motor and repair or replace</li> </ul>
Pump is bound	<ul style="list-style-type: none"> <li>• Turn off power and manually rotate pump shaft</li> <li>• If shaft does not rotate easily remove pump</li> <li>• Disassemble and repair</li> </ul>
<b>- 2 - LAG PUMPS DO NOT SEQUENCE ON</b>	
Current sensing relay not set properly	<ul style="list-style-type: none"> <li>• With main pump running, turn the main current dial counterclockwise until the lag pump starts</li> <li>• Starting value should be FLA of motor. If this value is not achieved current sensor has to be set at the current value corresponding to the pump GPM required (Factory test result should be included on panel)                             <math display="block">I = \frac{(GPM * PSI * 2.31) * 746}{(1.73 * V * E_m * E_p * 3960 * PF)}</math> </li> <li>• Current relay should be set with amprobe on motor wire while adjusting. (See relay adjusting instructions in panel)</li> </ul>
<b>- 3 - LAG PUMP DOES NOT SHUT OFF</b>	
Current sensing relay reset (Hysterisis) value improperly set	<ul style="list-style-type: none"> <li>• Turn current reset clockwise (Hysterisis adjustment to 0 - 50%)</li> <li>• Reset value has to be set to value corresponding to current draw of lead pump operating within it's capabilities (Normal values fo 15 - 20% are used)</li> </ul>

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<b>- 4 - OUTLET PRESSURE TOO HIGH</b>	
PRV has to be readjusted	<ul style="list-style-type: none"> <li>• Check pressure gauge on discharge header</li> <li>• To decrease outlet pressure turn adjustment screw counterclockwise on pressure control valve on pilot assembly</li> </ul>
PRV does not close	<ul style="list-style-type: none"> <li>• Check pilot system for: closed isolation and control valves, damaged control line, blocked strainers, obstruction in valve between disk and seat, damaged diaphragm, inoperative pilot PRV</li> <li>• Open all valves, check strainers for foreign material and pilot tubing for any damage</li> <li>• If foreign material is suspect in the main body chamber valve will have to be disassembled</li> </ul>
<b>- 5 - OUTLET PRESSURE TOO LOW</b>	
PRV has to be readjusted	<ul style="list-style-type: none"> <li>• Check pressure gauge on discharge header</li> <li>• To increase outlet pressure turn adjustment screw clockwise on pressure control valve on pilot assembly</li> </ul>
PRV does not open	<ul style="list-style-type: none"> <li>• Ensure that there is pressure at the valve main inlet</li> <li>Verify the following: valve opening flow control device is blocked or inoperative, main valve diaphragm assembly is inoperative, Pilot Control Valve is not opening and inlet strainer for blockage</li> <li>• Disassemble flow control valve clean &amp; polish stem and replace worn parts</li> <li>• Disassemble diaphragm clean &amp; polish stem, replace worn parts</li> </ul>
<b>- 6 - PRV DOES NOT REGULATE</b>	
Air in the main valve cover and / or tubing	<ul style="list-style-type: none"> <li>• Loosen top cover plug and fittings and bleed air</li> <li>• Bleed air from top chamber and pilot</li> </ul>
Pilot Control Valve internal interference	<ul style="list-style-type: none"> <li>• Disassemble Pilot Control Valve</li> </ul>
Pilot spring not in correct range to control	<ul style="list-style-type: none"> <li>• Check spring vs. chart in O &amp; I manual</li> </ul>
<b>- 7 - PRV CHECK VALVE FEATURE NOT WORKING</b>	
Pilot check valve inoperative or pilot isolation valve closed	<ul style="list-style-type: none"> <li>• Open isolation valve</li> <li>• Remove check valve</li> <li>• Clean or replace check valve</li> </ul>
<b>- 8 - PUMP RUNS AT REDUCED CAPACITY OR DOES NOT DELIVER</b>	
Wrong pump rotation	<ul style="list-style-type: none"> <li>• Check incoming wiring for proper connections</li> <li>• Correct wiring</li> </ul>
Pump impeller, suction strainers, check valves, foot valves or upstream piping are clogged	<ul style="list-style-type: none"> <li>• Disassemble pump and inspect</li> <li>• Remove strainers and valves and inspect</li> <li>• Remove all foreign materials found</li> </ul>
Suction or discharge piping leaks	<ul style="list-style-type: none"> <li>• Pump runs backward when turned off</li> <li>• Air in suction piping</li> <li>• Suction piping must be air tight, repair any leaks and tighten any loose fittings</li> </ul>
Pump is worn	<ul style="list-style-type: none"> <li>• Install pressure gauge on pump discharge</li> <li>• Gradually close discharge isolation valve and read pressure at shut off</li> <li>• If measured pressure is close to pump curve pump is probably OK</li> <li>• If not remove and inspect pump</li> </ul>

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CAUSES	POSSIBLE SOLUTIONS
<b>- 9 - LAG PUMP CYCLES TOO MUCH</b>	
Current setting or trip point (Threshold) set too low Current rest value set to low (Hysteresis)	<ul style="list-style-type: none"> <li>Increase set point (Threshold) and observe</li> <li>Generally set near FLA of motor, do not go beyond the motor service factor Amps</li> <li>Increase Reset value (Hysteresis) and observe</li> <li>Threshold set between 15 - 25% in most instances</li> <li>If the value is overshot then lag pump will never shut off</li> </ul>
<b>- 10 - LEAD PUMP CYCLES TOO MUCH (Units with no-flow shutdown)</b>	
Pressure switch needs readjusting or is defective	<ul style="list-style-type: none"> <li>Check pressure setting on switch and observe operation</li> <li>Check voltage across closed contacts</li> <li>Readjust switch to minimum of 15 PSI below system required pressure or replace if necessary</li> </ul>
Insufficient air charging or leaking tank	<ul style="list-style-type: none"> <li>Pressurize tank to 2 - 3 PSI below system required pressure</li> <li>Check for leaks or loss of pressure using soap &amp; water</li> <li>Repair as required</li> </ul>
Tank is too small	<ul style="list-style-type: none"> <li>Tank should be sized for an average storage of 20 Gallons (Refer to catalogue for proper tank sizing)</li> <li>Replace tank if necessary</li> </ul>
Temperature probe has to be readjusted	<ul style="list-style-type: none"> <li>Temperature probe should be set at 90° F</li> <li>Raising the temperature will reduce cycling at low flow conditions</li> <li>See I &amp; O manual for probe temperature adjustment</li> </ul>
<b>- 11- PUMP IS NOISY</b>	
Faulty pump motor	<ul style="list-style-type: none"> <li>Grease bearing and let run, observe change</li> <li>Check motor amperage</li> <li>Disconnect motor and have it check by service dealer</li> <li>Have bearings changed</li> <li>If motor Amps are above nameplate FLA, windings and stator should be verified</li> </ul>

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