

Air Compressor Piston Trouble Shooting Guide

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TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
<p>Motor Will Not Run.</p> <p>(Failure to start)</p> <p>1</p>	<ul style="list-style-type: none"> ▪ Power not on ▪ Blown main fuses (size 175% of motor nameplate) ▪ Blown control fuses (size per nec article 450-3) ▪ Breaker tripped ▪ Safety device tripped ▪ Motor starter overloads tripped ▪ Faulty motor starter coil ▪ Pressure switch incorrectly set ▪ Pressure switch defective ▪ Start switch contacts defective ▪ Auxiliary contacts defective ▪ Loose electrical wire ▪ Wire broken or off terminal ▪ Thermal overload inside motor tripped ▪ Low voltage ▪ Motor defective ▪ Wiring incorrect 	<p>Turn power on</p> <p>Replace fuses</p> <p>Replace fuses</p> <p>Reset or replace breaker</p> <p>Reset safety devices</p> <p>Reset or replace overloads</p> <p>Replace starter coil</p> <p>Adjust pressure switch</p> <p>Replace pressure switch</p> <p>Replace start switch</p> <p>Replace Auxiliary</p> <p>Tighten electrical wires</p> <p>Replace wire or reconnect</p> <p>Reset or replace motor</p> <p>Must be 10 % of nameplate</p> <p>Replace motor</p> <p>Correct wiring</p>

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<p>Starter Trips Repeatedly</p> <p>Excessive current draw <i>(To determine maximum amperage allowed, multiply the FLA on the motor nameplate by the service factor.)</i></p> <p>2</p>	<ul style="list-style-type: none"> ▪ Low voltage <i>(must be within 10% of nameplate)</i> ▪ Wrong heater size (check heater amps) ▪ Wrong overload setting (check motor amps) ▪ Loose electrical connection ▪ Wire size too small ▪ Motor defective ▪ Motor sized incorrectly ▪ Pressure switch unloader defective ▪ Centrifugal Unloader valve defective ▪ Electric solenoid unloader valve defective ▪ Hydraulic unloader valve defective ▪ In-tank check valve defective ▪ Unloaders not unloading suction valves ▪ Defective compressor valves ▪ Unloader control line plugged ▪ Discharge pressure too high ▪ Drive belts too tight ▪ Head gasket blown between the cylinders ▪ No crankshaft endplay (.001 per inch of bearing od) ▪ Rod bearing tight or seizing (.001 per inch diameter) ▪ Pistons seizing to cylinders ▪ Incorrect oil ▪ Intercooler plugging (30-50) psig normal ▪ Compressor unit seized (locked up) 	<p>Check voltage @ disconnect</p> <p>Replace heaters elements</p> <p>Adjust overload setting</p> <p>Tighten all wire connections</p> <p>Install correct size wire</p> <p>Replace motor</p> <p>Resize & replace motor</p> <p>Replace pressure switch</p> <p>Replace valve</p> <p>Replace valve</p> <p>Replace valve</p> <p>Replace valve</p> <p>Check for pressure / rebuilt</p> <p>Replace compressor valves</p> <p>Replace control line</p> <p>Adjust switch or replace</p> <p>Adjust to correct tension</p> <p>Replace head gasket</p> <p>Adjust bearings tolerance</p> <p>Replace bearings or rods</p> <p>Replace pistons / rebuilt</p> <p>Change to correct weight</p> <p>Remove clean or replace</p> <p>Remove & disassemble unit</p>

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Pressure Switch Defective 3	<ul style="list-style-type: none"> ▪ Moisture build up on the switch diaphragm ▪ Ruptured diaphragm (air leak) ▪ Burned contact points ▪ Unloader valve leaking (when running) ▪ Pressure setting changes ▪ Plugged air passage in unloader valve 	Replace pressure switch Replace pressure switch Replace pressure switch Replace pressure switch Replace pressure switch
Pilot Valve Unloader Defective 4	Pilot valve unloader unloads at to low or high pressure Pilot valve unloader loads/unloads excessively Pilot valve unloader leaking when running Pilot valve unloader leaking when stopped	Adjust pilot unloader valve Adjust pilot unloader valve Replace pilot unloader valve Replace pilot unloader valve
ELECTRIC SOLENOID UNLOADER VALVE 5	Solenoid leaking @ exhaust port when stopped Solenoid leaking @ cylinder port when running Solenoid does not click when electricity is applied	Replace electric solenoid valve Replace electric solenoid valve Replace electric solenoid valve
Centrifugal Unloader Leaking 6	<ul style="list-style-type: none"> ▪ Centrifugal Unloader valve leaking when running ▪ Centrifugal Unloader valve leaking when stopped 	Adjust or replace unloader Replace in-tank check valve
Hydraulic Unloader Faulty 7	<ul style="list-style-type: none"> ▪ Hydraulic unloader valve passes air to suction unloader when running oil pressure less than 15 psig ▪ Hydraulic unloader valve passes air to suction unloader when running with 25 psig oil pressure ▪ Hydraulic unloader passes no air to suction unloader when not running 	Adjust oil pressure to 25 psig Replace hydraulic unloader Replace hydraulic unloader

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Intercooler relief valve pops off (the two stage models) 8	<ul style="list-style-type: none"> ▪ Safety Relief valve defective (set 45-100 psig) ▪ Relief Valve pops off when running & pumping ▪ Valve pops off when running & not pumping ▪ Valve pops off when not running ▪ Intercooler restricted or plugged 	Replace Safety relief valve Replace unloaders or valves Replace unloaders or valves Replace unloaders or valves Clean or replace intercooler
Intercooler pressure abnormally low (Two stage models only) 9	<ul style="list-style-type: none"> ▪ Defective pressure gauge ▪ Leaking intercooler connections ▪ Leaking intercooler ▪ Compressor valves in L.P. defective ▪ Suction Unloaders in L.P. defective ▪ Restricted air inlet filter ▪ Compressor valve defective ▪ Pilot valve defective ▪ Hydraulic valve not functioning properly ▪ Electric solenoid valve not functioning properly ▪ Worn piston rings 	Replace air pressure gauge Tighten connection Replace intercooler Replace valves Rebuild or replace Replace inlet filter Replace compressor valves Replace pilot valve Replace hydraulic unloader Replace solenoid valve Replace piston rings
Discharge Safety Valve Pops Off 10	<ul style="list-style-type: none"> ▪ Relief valve defective (set 150% of tank psig) ▪ Restricted in-tank check valve ▪ Restricted discharge pipe 	Replace relief valve Replace check valve Clean or replace pipe

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<p>Excessive air pressure in air receiver</p> <p>11</p>	<ul style="list-style-type: none"> ▪ Air pressure gauge inaccurate ▪ Leaks in unloader piping system ▪ Defective compressor suction unloaders ▪ Pilot valve set incorrectly or defective ▪ Pressure switch set incorrectly or defective ▪ Pressure switch wired incorrectly ▪ Hydraulic valve not functioning properly ▪ Electric solenoid valve not functioning properly ▪ Tube to compressor unloader valve plugged 	<p>Replace air pressure gauge</p> <p>Repair leaks in control piping</p> <p>Repair or replace unloader</p> <p>Adjust or replace valve</p> <p>Adjust or replace switch</p> <p>Correct wiring</p> <p>Replace hydraulic valve</p> <p>Replace solenoid valve</p> <p>Replace control air line</p>
<p>Tank Pressure Builds Too Fast</p> <p>12</p>	<ul style="list-style-type: none"> ▪ Air pressure gauge inaccurate ▪ Tank full of water 	<p>Replace air pressure gauge</p> <p>Drain water from tank</p>

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Tank Pressure Raises Slowly 13	<ul style="list-style-type: none"> ▪ Defective pressure gauge ▪ Restricted air inlet filter ▪ Pressure switch defective ▪ Pressure switch set wrong ▪ Unloader pilot defective ▪ Unloader pilot set wrong ▪ Faulty hydraulic unloader ▪ Electric solenoid valve not functioning properly ▪ Centrifugal Unloader valve leaking when running ▪ Defective compressor valves ▪ Leaking head gasket ▪ Loose compressor valves leaking at valve gaskets ▪ Low oil pressure ▪ Drive belt slipping ▪ Incorrect speed ▪ Clogged intercooler (internal) ▪ Excessive running clearances ▪ Worn piston rings or loose piston ▪ Leaks in the compressed air distribution system ▪ Drain valve open ▪ Pressure relief valve leaking ▪ Compressor incorrectly sized for the altitude 	<p>Replace pressure gauge</p> <p>Replace inlet filter</p> <p>Replace pressure switch</p> <p>Adjust pressure switch</p> <p>Replace pilot valve</p> <p>Adjust pilot valve</p> <p>Replace hydraulic unloader</p> <p>Replace solenoid valve</p> <p>Replace centrifugal valve</p> <p>Replace compressor valves</p> <p>Replace head gasket</p> <p>Replace valve gasket</p> <p>Adjust oil pressure</p> <p>Adjust belt tension</p> <p>Change motor pulley</p> <p>Clean or replace</p> <p>Rebuilt compressor pump</p> <p>Rebuilt compressor pump</p> <p>Find & Repair air leaks</p> <p>Close drain valve</p> <p>Replace relief valve</p> <p>Install larger compressor</p>

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Compressor loads and unloads excessively 14	<ul style="list-style-type: none"> ▪ Pressure switch defective ▪ Pilot valve set incorrectly or defective ▪ Electric solenoid valve not functioning properly ▪ Compressor valves defective ▪ Suction unloaders leaking ▪ Compressor operating at incorrect speed ▪ Excessive system leakage ▪ Air receiver tank too small 	<p>Replace pressure switch</p> <p>Replace pilot valve</p> <p>Replace solenoid valve</p> <p>Replace compressor valves</p> <p>Repair leaking unloader</p> <p>Install correct pulley</p> <p>Repair air leaks</p> <p>Install larger receiver tank</p>

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<p>Low Oil Pressure</p> <p>15</p>	<ul style="list-style-type: none"> ▪ Defective pressure gauge ▪ Low oil level ▪ Oil pump direction reversed ▪ Oil sump strainer plugged ▪ Plugged oil filter ▪ Leakage at mains & rod bearings ▪ Oil pressure adjusting screw not set properly 	<p>Replace oil gauge</p> <p>Add oil to full mark</p> <p>Change rotation</p> <p>Clean or replace strainer</p> <p>Replace oil filter</p> <p>Rebuilt compressor pump</p> <p>Adjust oil pressure to spec</p>
<p>TROUBLE</p>	<p>PROBABLE CAUSE</p>	<p>CORRECTIVE ACTION</p>

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<p>Excessive Oil consumption</p> <p>16</p>	<ul style="list-style-type: none"> ▪ Compressor runs unloaded too long ▪ Worn piston rings ▪ Restricted intake system ▪ Compressor running too hot ▪ Breather valve not functioning properly ▪ Oil level in crankcase too high ▪ Oil viscosity wrong for the application ▪ Connecting rod out of alignment, bent or twisted ▪ Leaking oil seal ▪ Piston rings not seated (<i>300 hours for seating</i>) ▪ Wrong oil (<i>detergent oil has a tendency to foam</i>) 	<p>Run in start/stop position</p> <p>Replace ring</p> <p>Replace inlet filter</p> <p>See high discharge temp</p> <p>Replace breather valve</p> <p>Drain to proper oil level</p> <p>Change to correct viscosity</p> <p>Replace connecting rods</p> <p>Replace shaft oil seal</p> <p>Change to non detergent oil</p> <p>Use air compressor oil</p>
<p>High Discharge Temperature</p> <p>17</p>	<ul style="list-style-type: none"> ▪ Defective temperature gauge or switch ▪ Compressor valve assemblies defective ▪ Pulley/sheave rotation wrong ▪ Discharge pressure too high ▪ Ambient temperature too high ▪ Inadequate ventilation or hot air recirculating ▪ Cooling surfaces of compressor excessively dirty ▪ Intercooler excessively dirty internal or external ▪ Defective water temperature regulating valve ▪ Clogged water passages in head &/or cylinders ▪ Inadequate cooling water flow ▪ Cooling water temperature too hot ▪ Lubrication inadequate ▪ Running clearances insufficient ▪ Scored or excessively worn cylinder walls 	<p>Replace temp gauge or switch</p> <p>Replace compressor valves</p> <p>Change rotation</p> <p>Adjust pressure lower</p> <p>Lower ambient temperature</p> <p>Vent hot air out of room</p> <p>Clean cooling fins</p> <p>Clean internal & external</p> <p>Replace water regulating val</p> <p>Clean water passages</p> <p>Increase water flow</p> <p>Lower temperature of water</p> <p>Use air compressor oil</p> <p>Change clearances</p> <p>Replace cylinder</p>
<p>High Discharge Temperature</p>		

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(continued)	<ul style="list-style-type: none"> ▪ Incorrect speed ▪ Compressor incorrectly size 	<p>Change motor pulley</p> <p>Install larger compressor</p>
TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Compressor knocks 18	<ul style="list-style-type: none"> ▪ Loose belts ▪ Head clearance insufficient ▪ Piston loose in cylinder bore worn piston rings ▪ Worn rods or main bearing ▪ Pressure setting excessive high ▪ Crankcase lubrication inadequate ▪ Loose pulley/sheave ▪ Compressor valve assemblies loose ▪ Loose compressor or motor mounting bolts ▪ In-tank check defective 	<p>Adjust belts</p> <p>Check piston to head clearance</p> <p>Rebuilt compressor pump</p> <p>Rebuilt compressor pump</p> <p>Adjust to lower pressure</p> <p>Correct lubrication problem</p> <p>Tighten pulley & sheave</p> <p>Tighten compressor valves</p> <p>Tighten mounting bolts</p> <p>Replace check valve</p>
Excessive drive belt wear 19	<ul style="list-style-type: none"> ▪ Pulley/sheave out of alignment ▪ Belt too loose or too tight ▪ Belt slipping ▪ Pulley/sheave wobbling ▪ Pulley/sheave groove damaged or worn ▪ Incorrect belts 	<p>Realign pulley & sheave</p> <p>Adjust to correct tension</p> <p>Replace belts</p> <p>Tighten to shafts</p> <p>Replace pulley & sheave</p> <p>Replace with correct belts</p>
Excessive vibration 20	<ul style="list-style-type: none"> ▪ Compressor feet not level ▪ Compressor tightened into a bind ▪ Motor or engine not secured tightly ▪ Foundation or frame inadequate ▪ Piping inadequately supported ▪ Piping tightened into a bind ▪ Excessive discharge pressure 	<p>Shim compressor feet</p> <p>Retighten & shim</p> <p>Tighten motor secure</p> <p>Install correct foundation</p> <p>Install additional support</p> <p>Install flexiblemetal hose</p> <p>Lower pressure setting</p>

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<p>Excessive vibration (continued) 20</p>	<ul style="list-style-type: none"> ▪ Loose pulley/sheave ▪ Incorrect speed ▪ Compressor valves not functioning properly ▪ Motor or engine out of balance 	<p>Tighten pulley & sheave</p> <p>Change to correct rpms</p> <p>Replace compressor valves</p> <p>Balance motor or engine</p>
TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
<p>Rusty valves and/or cylinders 21</p>	<ul style="list-style-type: none"> ▪ Compressor operated too infrequently ▪ Compressor does not run long enough to get hot ▪ Leaking water jacket or cylinder head ▪ Cooling water circulating in compressor too cold ▪ System pressure leaking back through compressor 	<p>Run compressor more</p> <p>Install smaller compressor</p> <p>Repair water leak</p> <p>Replace water regulator valve</p> <p>Re-pipe & add a check valve</p>
<p>Water in the crankcase (lubricant appears milky) 22</p>	<ul style="list-style-type: none"> ▪ Compressor does not run long enough to get hot ▪ System pressure leaking back through compressor ▪ Leaking water jacket or cylinder head ▪ Cooling water circulating in compressor too cold ▪ Incorrect or inferior grade of lubricant 	<p>Install smaller compressor</p> <p>Re-pipe & add a check valve</p> <p>Repair water leak</p> <p>Replace water regulator valve</p> <p>Use air compressor oil</p>