

Trouble Shooting Pump

Trouble	Possible Cause	Remedy
Oil leaking in the area of water pump crankshaft	Worn crankshaft seal, bad bearing, grooved shaft, or failure of retainer o-ring.	Remove and replace.
Excessive play on crankshaft	Defective bearings.	See "Worn bearing."
	Excess shims.	Set up crankshaft.
Loud knocking in pump	Loose connecting rod screws.	Tighten connecting rod screws per PUMP SPECIFICATIONS
	Worn connecting rod.	Replace connecting rod per PUMP MAINTENANCE.
	Worn bearings.	Replace bearings per PUMP MAINTENANCE.
	Loose plunger bushing screw.	Tighten plunger screw per PUMP SPECIFICATIONS.
Oil leaking at the rear portion of the pump	Damaged or improperly installed oil gauge window gasket or rear cover.	Replace gasket or o-ring.
	Oil gauge loosed.	Tighten oil gauge.
	Rear cover screws loose.	Tighten rear screws to torque values in PUMP SPECIFICATIONS.
	Pump overfilled with oil, displaced through crankcase breather hole in oil cap/ dipstick.	Drain oil. Refill to recommended oil level as stated in OIL LEVEL in PUMP MAINTENANCE.
Water in crankcase	May be caused by humid air condensing into water inside.	Maintain or step up lubrication schedule.
	Worn or damaged plunger screw o-ring.	Remove and replace. See PLUNGER SERVICE in PUMP MAINTENANCE.
Worn bearing	Excessive belt tension.	See BELT TENSION in MACHINE MAINTENANCE.
	Oil contamination.	Check oil type and change intervals per PUMP SPECIFICATIONS.
Short bearing life	Excessive belt tension.	See BELT TENSION in MACHINE MAINTENANCE.
	Misalignment between pump and motor.	Re-align pump and motor.
	Oil has not been changed on regular basis.	Check oil type and change intervals per PUMP SPECIFICATIONS.

Short seal life	Damaged plunger bushing.	Replace plunger bushing.
	Worn connecting rod.	Replace connecting rod.
	Excess pressure beyond the pump's maximum rating.	Match pressure stated in PUMP SPECIFICATIONS.
	High water temperature.	Lower water temperature stated in PUMP SPECIFICATIONS.
Dirty or worn check valves	Normal wear.	Remove and replace.
	Debris.	Check for lack of water inlet screens.
Presence of metal particles during oil change	Failure of internal component.	Remove and disassemble to find probable cause.
	New pump.	New pumps have machine fillings and debris and should be drained and refilled per PUMP SPECIFICATIONS.
Water leakage from under head	Worn packing.	Install new packing.
	Cracked/scored plunger.	Remove and replace plunger.
	Failure of plunger retainer o-ring.	Remove and replace plunger retainer o-ring.
Loud knocking noise in pump	Pulley loose on crankshaft.	Check key and tighten set screw.
	Defective bearing.	Remove and replace bearing.
	Worn connecting rod, crankshaft, or crosshead.	Remove and replace.
Frequent or premature failure of the packing	Scored, damaged, or worn plunger.	Remove and replace plungers.
	Overpressure to inlet manifold.	Reduce inlet pressure.
	Abrasive material in the fluid being pumped.	Install proper filtration on pump inlet pumping.
	Excessive pressure and/or temperature of fluid being pumped.	Check pressures and fluid inlet temperature. Be sure they are within specified range.
	Over pressure of pumps.	Reduce pressure.
	Running pump dry.	Do not run pump without water.

Low Pressure	Dirty or worn check valves.	Clean/replace check valves.
	Worn packing.	Remove and replace packing.
	Belt slipping.	See BELT TENSION in MACHINE MAINTENANCE.
	Improperly sized spray tip or nozzle.	See MACHINE SPECIFICATIO SN for specified spray tip or nozzle.
	Inlet filter screen is clogged.	Clean inlet filter screen.
	Pitted valves.	See VALVE SERVICE in PUMP MAINTENANCE.
Erratic pressure; pump runs rough	Dirty or worn check valves.	Clean/replace check valves.
	Foreign particles in valve assemblies.	
	High inlet water temperature.	See temperature in PUMP SPECIFICATIONS.
Excessive vibration	Dirty or worn check valves	See “Dirty or worn check valves.”
Scored plungers	Abrasive material in fluid being pumped.	Install proper filtration on pump inlet plumbing.
Fitted plungers	Cavitation.	Decrease inlet water temperature and/or increase inlet water pressure.
Cavitation	High inlet fluid temperature, low inlet pressure.	Lower inlet fluid temperature and raise inlet fluid pressure.

Burner

Trouble	Possible Cause	Remedy
Burner will not ignite	Electrodes out of alignment.	See "ADJUSTING ELECTRODE ASSEMBLY" in BURNER MAINTENANCE SECTION.
	Electrode insulator failure.	Remove and replace if there are breaks, cracks, or spark trails.
	Water flow switch not closing.	Adjust, repair, or replace switch.
	Vacuum switch not closing.	Adjust, repair, or replace switch.
	Temperature control switch not closing.	Adjust or replace the TEMPERATURE CONTROL.
	Fuel solenoid valve not opening.	Clean, repair, or replace solenoid.
	Weak transformer.	Clean and check transformer terminals. Check transformer for spark pre "TRANSFORMER TEST" in BURNER MAINTENANCE SECTION.
	Faulty cad cell (if equipped).	Clean and test cad cell, replace if required.
	Faulty primary control (if equipped).	Replace primary control.
	Burner motor thermal protector locked out.	See "Burner motor thermal protector locked out."
	Wiring.	All wire contacts are to be clean and tight. Wire should not be cracked or frayed.
	Burner switch.	Test switch operation. Remove and replace as necessary.
	Pump pressure.	See "Low fuel pressure."
	Venting.	A downdraft will cause delayed ignition. Soot deposits on the coil and burner can interrupt air flow, and cause shorting of the electrodes. Clean as required.
Sooting.	Soot deposits on the coil and burner can interrupt air flow, and cause shorting of the electrodes. Clean as required.	
No fuel.	See "No fuel."	

No fuel	Clogged fuel filter.	Remove and replace filter per FUEL FILTER SECTION.
	Fuel leak.	Repair as necessary.
	Kinked or collapsed fuel line.	Remove and replace fuel line.
	Low fuel pressure.	See “Low fuel pressure.”
	Faulty burner oil pump.	Adjust pressure or replace.
	Air leak in intake lines.	Tighten all fittings.
	Clogged burner nozzle.	Remove and replace (do not clean).
Low fuel pressure	Clogged fuel filter.	See “No Fuel.”
	Clogged fuel pump filter screen.	Remove pump cover and clean strainer using a brush and clean fuel oil, diesel oil or kerosene.
	Fuel oil too viscous.	Operate a lighter oil or in warmer area.
	Air leaks in intake lines.	Tighten all fittings.
	Kinked or collapsed fuel line.	Remove and replace.
	Burner shaft coupling slipping.	Remove and replace.
	Fuel nozzle worn.	Remove and replace with specified nozzle on BURNER ASSEMBLY.
	Faulty oil pump.	Remove and replace.
Pulsating pressure	Partially clogged fuel pump strainer or filter.	Remove and replace strainer per FUEL PUMP FILTER in OIL BURNER MAINTENANCE section.
	Air leaking around fuel pump cover.	Check fuel pump cover screws for tightness and damaged gasket.
Unit smokes	Improper fuel.	Refuel with FUEL specified on MACHINE SPECIFICATIONS.
	Air to burner insufficient.	See AIR BAND ADJUSTMENT in OIL BURNER MAINTENANCE section.
	Fuel nozzle interior loose.	Replace nozzle.
	Water in fuel	Inspect fuel filter for water presence.
	Gun out of alignment.	Bend oil pipe to center burner nozzle.

Burner motor thermal protector kicked out	Low voltage.	Voltage must match those specified in the BURNER section of MACHINE SPECIFICATIONS section.
	Fuel too viscous.	See “Low fuel pressure.”
	Fuel pump defective.	Check that fuel pump turns freely.
	Motor defective.	Call service technician or take motor to repair/warranty station.
Delayed ignition (rumbling, noise starts)	Dirty or damaged electrodes.	Clean or replace.
	Air adjustment open too far.	Readjust per AIR BAND ADJUSTMENT in OIL BURNER MAINTENANCE section.
	Poor fuel spray pattern.	Remove and replace with fuel nozzle specified in BURNER ASSEMBLY.
	Incorrect electrode setting.	Readjust per ADJUSTING ELECTRODE ASSEMBLY in OIL BURNER MAINTENANCE section.
	Weak transformer.	See TRANSFORMER CHECK on OIL BURNER MAINTENANCE section.
Burner does not electrically come on	Burner motor reset button tripped.	Reset if necessary. CAUTION: Do not keep hitting the “reset” button if you have oil pressure you are just filling the burner combustion chamber with oil and if ignited will cause an explosion.
	High limit temp control reset tripped if so equipped.	Reset if necessary.

Water Heater

Trouble	Possible Cause	Remedy
Machine will not rise to operating temperature	Low fuel pressure.	See BURNER on MODEL SPECIFICATIONS for specified pressure.
	Water in fuel piping.	Drain fuel tank and remove and replace filter per FUEL FILTER INSERT.
	Fuel filter clogged.	Remove and replace fuel filter element per FUEL FILTER INSERT.
	Poor combustion.	See “Poor combustion.”
	Improper fuel supply.	Use fuel specified in BURNER section of the MODEL SPECIFICATIONS.
	Temperature control inoperative (if equipped).	See TEMPERATURE CONTROL INSERT.
Machine overheats	Insufficient water.	See “Low operating pressure” on MACHINE TROUBLESHOOTING insert.
	Temperature control inoperative.	See TEMPERATURE CONTROL INSERT.
	Improper fuel supply.	Use fuel specified in BURNER section of the MODEL SPECIFICATIONS.
Dry steam (very little moisture, very hot steam)	Insufficient water.	See “Low operating pressure” on MACHINE TROUBLESHOOTING insert.
	Improper fuel supply.	Use fuel specified in BURNER section of the MACHINE SPECIFICATIONS.
	Improper fuel pressure.	See BURNER on MODEL SPECIFICATIONS for specified pressure.
Machine smokes (sweet smelling exhaust)	Improper fuel supply.	Use fuel specified in BURNER section of MODEL SPECIFICATIONS.
	Insufficient combustion air.	See AIR BAND ADJUSTMENT on OIL BURNER MAINTENANCE insert.
	Leaking fuel system.	Correct leakage problem.
	Clogged or improper burner nozzle.	Remove (DO NOT CLEAN) and replace nozzle per BURNER ASSEMBLY INSERT.
	Loose burner nozzle.	See BURNER MAINTENANCE insert.

Machine fumes (exhaust burns eyes)	Too much combustion air.	See BURNER TROUBLESHOOTING insert.
	Improper fuel pressure.	See FUEL on MODEL SPECIFICATIONS for specified pressure.
Excessive oil dripping from laydown coil condensate.	Loose nozzle.	See BURNER TROUBLESHOOTING insert.
	Fuel pressure too high.	See FUEL PRESSURE ADJUSTMENT section on BURNER MAINTENANCE insert.
	Burner nozzle defective.	Remove and replace with appropriate nozzle found on the BURNER ASSEMBLY or BREAKDOWN insert.
	Incorrect burner nozzle.	Remove and replace with appropriate nozzle found on the BURNER ASSEMBLY or BREAKDOWN insert.
Poor combustion	Low fuel pressure.	See “Low fuel pressure” on BURNER TROUBLESHOOTING insert.
	Improper fuel supply.	See “Low fuel pressure” on BURNER TROUBLESHOOTING insert.
	Insufficient combustion air.	See AIR BAND ADJUSTMENT section on OIL BURNER MAINTENANCE.