4. TROUBLESHOOTING

Table 4-1 lists the symptoms of some common problems and possible corrective measures. Before calling Hale or a Hale authorized parts service center for assistance, eliminate problem causes using Table 4-1. If you cannot correct a problem, please have the following information ready prior to calling the Hale Customer Service Technician Department for assistance. Customer Service Number: 610-825-6300.

- Pump Model and Serial Number
- Pump Configuration Information
- Observed Symptoms and Under What Conditions The Symptoms Occur

TABLE 4-1. HALE MIDSHIP PUMP TROUBLE ANALYSIS

CONDITION	POSSIBLE CAUSE	SUGGESTED CORRECTION
PUMP WILL NOT ENGAGE Standard transmission with Manual Pump Shift	Clutch not fully disengaged or malfunction in shift linkage	Check clutch disengagement. Drive shaft must come to a complete stop before attempting pump shift
Automatic Transmission with Manual Pump Shift	Automatic transmission not in neutral position	Repeat recommended shift procedures with transmission in neutral position
Standard Transmission with Power Shift System	Insufficient air supply in shift system	Repeat recommended shift procedures. Check system for loss of air supply. Turn the engine off and employ shift override procedures as follows: 1. Hole is provided in shift shaft to accomplish emergency shifting. 2. Complete shift of control in cab to neutral and proceed to complete shift of lower control manually.
Automatic Transmission With Power Shift System	Automatic transmission not in neutral position Pump shift attempted before vehicle was completely stopped Premature application of parking brake system (before truck comes to a complete stop Insufficient air in shift system	Repeat recommended shift procedures with transmission in neutral position. Release braking system momentarily. Then reset and repeat recommended shifting procedures. Release braking system momentarily. Then reset and repeat recommended shifting procedures. Repeat recommended shift procedures.

CONDITION	POSSIBLE CAUSE	SUGGESTED CORRECTION
Automatic Transmission With Power Shift System (continued)	Air leaks in shift system	Check system for loss of air. Check of leak in system. Employ manual override procedures if necessary. See Standard Transmission with Power Shift System. Attempt to locate and repair leak(s). Leakage, if external, may be detected audibly. Leakage could be internal and not as easily detected.

NOTICE

DO NOT LEAVE THE CAB AFTER PUMP SHIFTING UNLESS THE SHIFT INDICATOR LIGHT IS ON, OR A SPEEDOMETER READING IS NOTED.

CONDITION	POSSIBLE CAUSE	SUGGESTED CORRECTION
PUMP LOSES PRIME OR IT WILL NOT PRIME NOTE: Weekly priming pump operation is recommended to provide good operation.	Electric Priming System	No recommended engine speed is required to operate the electric primer, however, 1,000 engine RPM will maintain truck electrical system while providing enough speed for initial pumping operation
	Defective Priming System	Check priming system by performing "Dry Vacuum Test" per NFPA standards. If pump is tight, but primer pulls less than 22 inches of vacuum, it could indicate excessive wear in the primer.
	Suction lifts too high	Do not attempt lifts exceeding 22 feet except at low elevation.
	Blocked suction strainer	Remove obstruction from suction hose strainer..
	Suction connections	Clean and tighten all suction connections. Check suction hose and hose gaskets for possible defects.
	Primer not operated long enough.	Proper priming procedures should be followed. Do not release the primer control before assuring a complete prime. Open the discharge valve slowly during completion of prime to ensure same. NOTICE: Do not run the primer over 45 seconds. If prime is not achieved in 45 seconds, stop and look for causes (for example, air leaks or blocked suction).

CONDITION	POSSIBLE CAUSE	SUGGESTED CORRECTION
PUMP LOSES PRIME OR IT WILL NOT PRIME (CONTINUED)	Air Trap in Suction Line	Avoid placing any part of the suction hose higher than the suction intake. Suction hose should be laid with continuous decline to water supply. If trap in hose is unavoidable, repeated priming may be necessary to eliminate air pocket in suction hose.
	Pump Pressure too low when nozzle is opened	Prime the pump again and maintain higher pump pressure while opening discharge valve slowly.
	Air Leaks	Attempt to locate and correct air leaks using the following procedure. 1. Perform dry vacuum test on pump per NFPA standards with 22 inches minimum vacuum required with loss not to exceed 10 inches of vacuum in 5 minutes. 2. If a minimum of 22 inches of vacuum cannot be achieved, the priming device or system may be defective, or the leak is too big for the primer to overcome (such as an open valve). The loss of vacuum indicates leakage and could prevent priming or cause loss of prime. 3. Attempt above dry prime and shut off engine. Audible detection of a leak is often possible. 4. Connect the suction hose from the hydrant or the discharge of another pumper to pressurize the pump with water, and look for visible leakage and correct. A pressure of 100 PSI (6.9 BAR) should be sufficient. Do not exceed pressure limitations of pump, pump accessories, or piping connections. 5. Check pump packing during attempt to locate leakage. If leakage is in excess of recommendations, adjust accordingly following instructions in Section 3. 6. The suction side relief valve can leak. Plug the valve outlet connection and retest.

CONDITION	POSSIBLE CAUSE	SUGGESTED CORRECTION
INSUFFICIENT PUMP CAPACITY	Insufficient engine power	Engine power check or tune up may be required for peak engine and pump performance.
	Transfer Valve not in proper "Volume" position	**TWO STAGE PUMPS ONLY.** Place transfer valve in "Volume" position (parallel) when pumping more than 2/3 rated capacity. For pressure above 200 PSI (13.8 BAR), pump should be placed in "Pressure" (series) position.
	Relief Valve improperly set	If relief valve control is set for too low a pressure, it will allow relief valve to open and bypass water. Reset Relief Valve control per the procedures in Section 3. Other bypass lines (such as foam system or inline valves) may reduce pump capacity or pressure.
	Engine Governor set incorrectly	Engine governor, if set too low a pressure when on automatic, will decelerate engine speed before desired pressure is achieved. Reset the governor per manufacturer's procedures.
	Truck transmission in wrong gear or clutch is slipping	Recheck the pumping procedure for the recommended transmission or gear range; see Section 3 for assistance.
	Air Leaks	Use mechanical speed counter on the pump panel to check speed against possible clutch or transmission slipping or inaccurate tachometer. (Check the truck manual for the proper speed counter ratio). See air leaks under **"PUMP LOSES PRIME OR WILL NOT PRIME".**
INSUFFICENT PRESSURE	Check similar causes for insufficient capacity	Recheck pumping procedure for recommended transmission gear or range. Use mechanical speed counter on pump panel to check actual speed against possible clutch or transmission slippage or inaccurate tachometer. (Check the truck manual for proper speed counter ratio).
	Transfer Valve not in "Pressure" position	**TWO STAGE PUMPS ONLY.** For desired pump pressure above 200 PSI (13.8 BAR), transfer valve should be in "Pressure" position.

CONDITION	POSSIBLE CAUSE	SUGGESTED CORRECTION
LEAK AT PUMP PACKING	Packing out of adjustment or worn.	Adjust the packing per the procedure in Section 3 of this manual (8 to 10 drops per minute leakage at 150 PSI (10 BAR) preferred). Replace pump packing per Section 3 of this manual. Packing replacement is recommended every 2 or 3 years depending on usage.
REMOTE CONTROL DIFFICULT TO OPERATE	Lack of lubrication	Lubricate the remote control linkages and collar with oil.
ENGINE SPEEDS TOO HIGH FOR REQUIRED CAPACTICTY OR PRESSURE	Impeller blockage	Blockage in the impeller can prevent loss of both capacity and pressure. Back flushing of pumps from discharge to suction may free blockage. Removal of one half of the pump body may be required (this is considered a major repair).
	Worn pump impeller(s) and clearance rings	Installation of new parts required.
	Blockage of suction hose entry	Clean suction hose strainer of obstruction and follow recommended practices for laying suction hose. Keep off the bottom of the water supply but a least 2 feet below the surface of the water.
	Defective suction hose	Inner line of suction hose may collapse when drafting and is usually undetectable. Try a different suction hose on same pump; test for comparison against original hose.
	Lift too high, suction hose too small	Higher than normal lift (10 feet) will cause higher engine speeds, high vacuum and rough operation. Use larger suction hose.
	Truck transmission in wrong range or gear	Check recommended procedures for correct transmission selection; see Section 3 and truck manual.
RELIEF VALVE DOES NOT RELIEVE PRESSURE WHEN VALVES ARE CLOSED	Incorrect setting of Control (Pilot) Valve	Check and repeat proper procedures for setting relief valve system. (see Section 3)
	Relief Valve inoperative	Possibly in need of lubrication. Remove relief valve from pump; dismantle; clean and lubricate. Weekly use of the Relief Valve is recommended.

CONDITION	POSSIBLE CAUSE	SUGGESTED CORRECTION
RELIEF VALVE DOES NOT RECOVER AND RETURN TO ORGINAL PRESSURE SETTING AFTER OPENING VALVES	Dirt in system causing sticky or slow reaction	Relief valve dirty or sticky. Follow instructions for disassembling, cleaning, and lubricating. Blocked relief valve. Clean the valve with a small wire or straightened paper clip.
RELIEF VALVE OPENS WHEN CONTROL VALVE IS LOCKED OUT	Drain hole in housing, piston, or sensing valve blocked	Clean the hole with a small wire or straightened paper clip. Dismantle and clean the sensing valve.
UNABLE TO OBTAIN PROPER SETTING ON RELIEF VALVE	Wrong procedure Blocked strainer Foreign matter in the Control Valve Hunting condition	Check instruction for setting the relief valve and reset. Check and clean the strainer in the supply line from the pump discharge to the control valve. Check the truck manual for the exact location. Check and clean tubing lines related to the relief valve and control valve. Remove the control valve and clean. Insufficient water supply coming from the pump to the control valve. Check the strainer in the Relief Valve system. Foreign matter in the control valve. Remove the control valve and clean.
WATER IN PUMP GEARBOX	Leak coming from above pump	Check all piping connections and tank overflow for possible spillage falling directly on the pump gearbox. Follow the procedures in Section 3 of this manual for adjustment or replacement of packing. Excess packing leakage permits the flushing of water over the gearbox casing to the input shaft area. Induction of this excessive water may occur through the oil seal or speedometer connection. Inspect the oil seal and replace if necessary.
DISCHARGE VALVES DIFFICULT TO OPERATE	Lack of lubrication Valve in need of more clearance	Recommended weekly lubrication of discharge and suction valve, use a good grade of petroleum base or silicone grease. Add gasket to the valve cover per the truck manual. Multi-gasket design allows additional gaskets for more clearance and free operation. NOTE: Addition of too many gaskets to the valve will permit leakage.