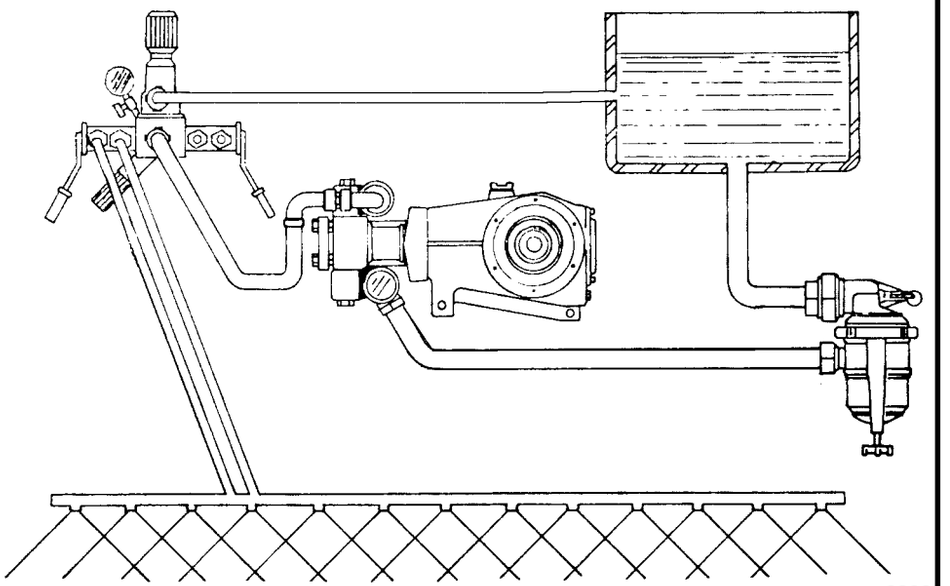
OPERATOR'S MANUAL

HYDRAULIC CIRCUIT
Trouble-shooting



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11/99 - 980003 - *MI-0206*

a)- LACK OF PRESSURE

No liquid flow.
No return to the tank.

PROBLABLE CAUSE	CORRECTIONS
1 - Lack of water.	Fill up the tank.
2 - Clogged tank outlet.	Check for impurities in the tank.
3 - Closed valve.	Open the valve.
4 - Dirty filter.	Open the filter shut off valve. If it continues, take the filter cap out and check for impurities in the water flow.
5 - Air entering the system.	Verify if all the connections of the system are well tightened and with o-ring. If it continues, check for damage hoses. Replace them if necessary.
6 -Pump seal damaged.	Replace the mechanical seal.

b - PRESSURE DEFICIENCY

PROBABLE CAUSES	CORRECTIONS
1 - Low PTO rpm.	Increase the PTO rpm to 540.
2 - Air entering the system.	See item a-4 above.
3 - Pump.	Check the distance between the pump wall and the rotor.

INTRODUCTION

This manual is divided in three parts.

The first part contains information on trouble-shooting the hydraulic circuit on the sprayers equipped with JP-140, JP-401 and JP-402 pumps.

The sencond part includes sprayers equipped with JP-75, JP-100, JP-150 and JP-300 piston pumps.

Finally, the third part includes sprayers equipped with centrifugal pumps and rotary atomizers.

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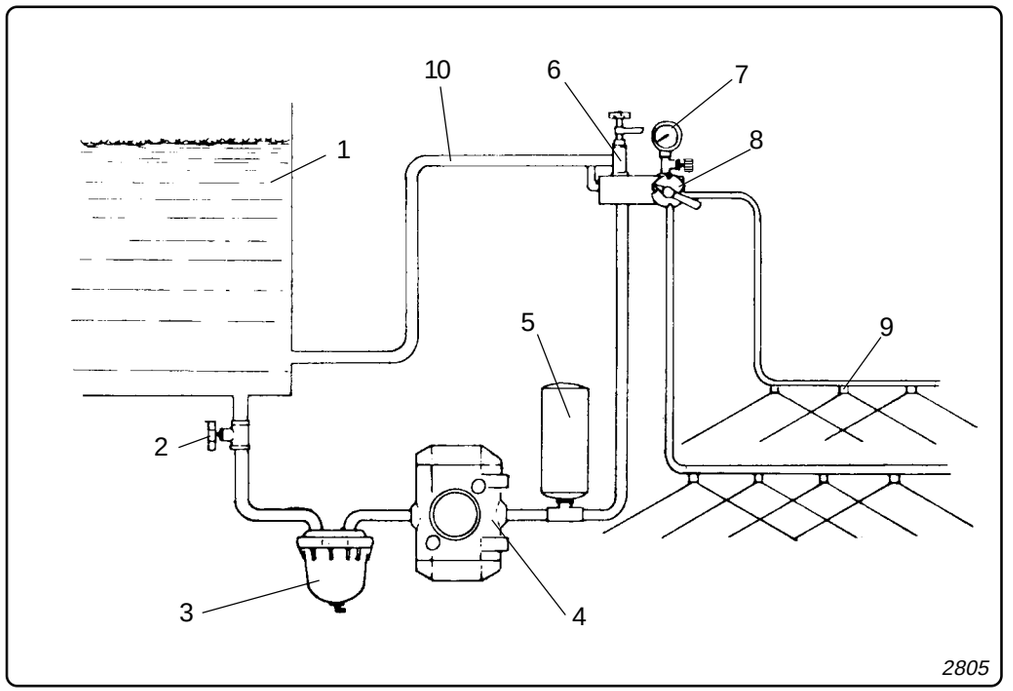
(for JP-140, JP-401 and JP-402 pumps)

TROUBLE-SHOOTING

To find and identify the eventual problems that can occur on Jacto sprayers equipped with piston pump, it is necessary to know the hydraulic circuit operational diagram and the location of components in the circuit.

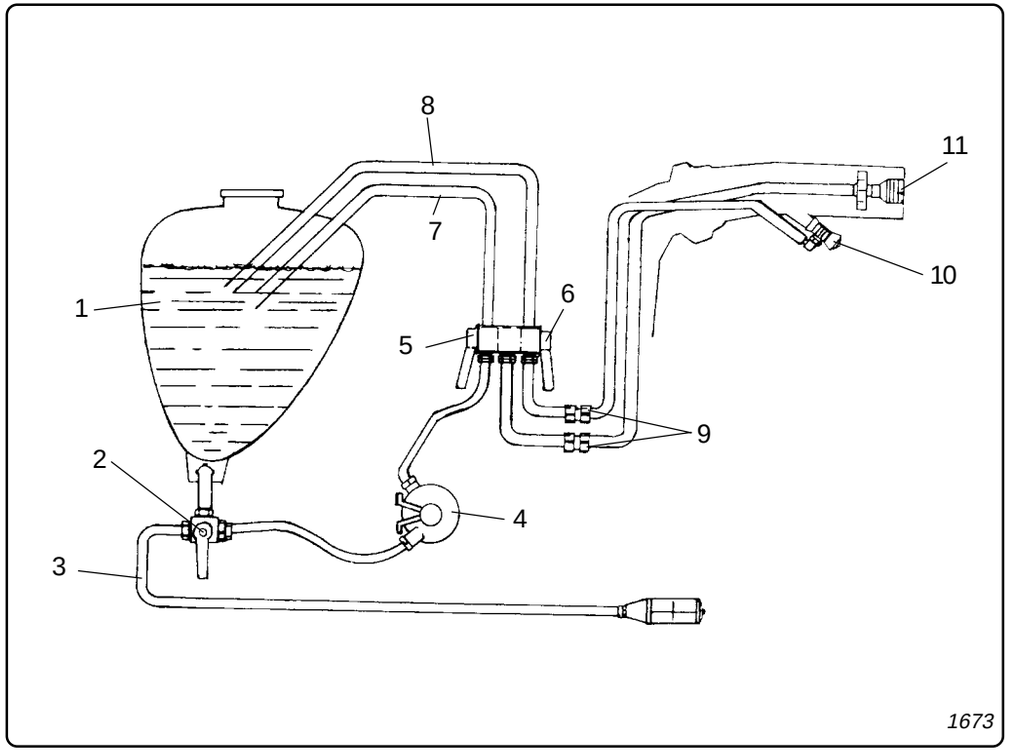
The standard diagram and the hydraulic system components of the sprayers equipped with JP-140, JP-401 and JP-402 pumps are shown in the figure below.



Hydraulic circuit components

1 - Tank
2 - Valve
3 - Filter
4 - Pump
5 - Compensation chamber
6 - Pressure Regulator
7 - Pressure gauge
8 - Nozzles valve
9 - Nozzles
10 - Return hose

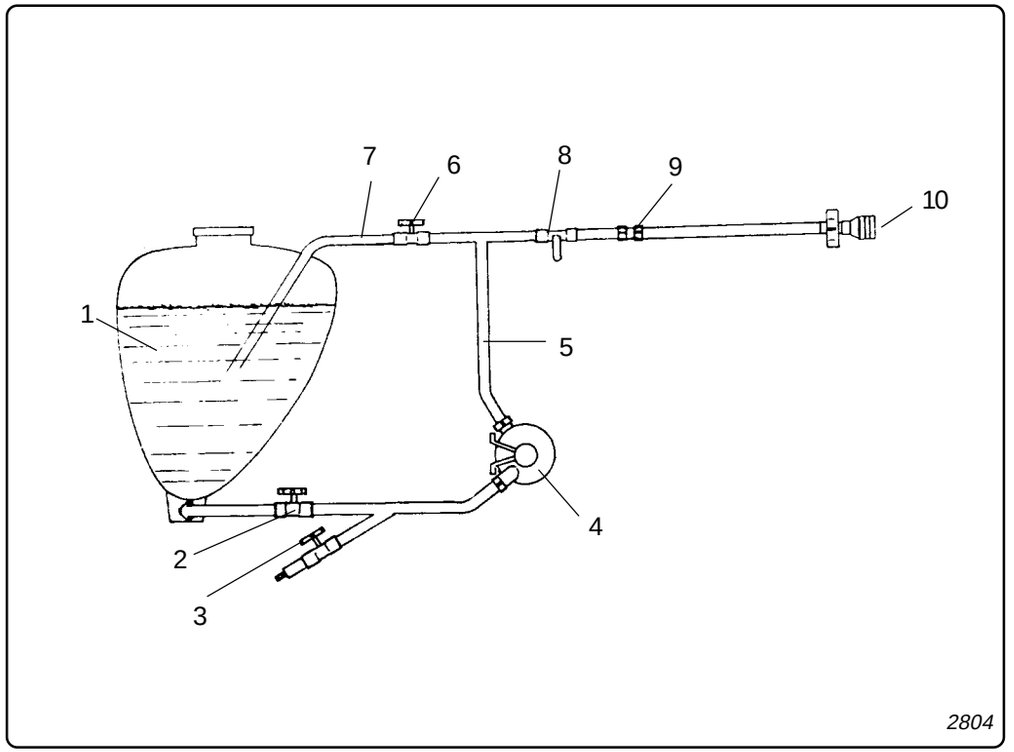
TROUBLE-SHOOTING THE HYDRAULIC CIRCUIT ON SPRAYERS EQUIPPED WITH CENTRIFUGAL PUMP.



Hydraulic circuit diagram (with two rotary atomizers)

1 - Tank
2 - Three way valve
3 - Filler unit hose with check valve
4 - Centrifugal pump
5 - Pressure regulator
6 - Lever (Bypass)
7 - Return hose
8 - Bypass hose
9 - In-line filter
10 - Auxiliary rotary atomizer
11- Main rotary atomizer

TROUBLE-SHOOTING THE HYDRAULIC CIRCUIT ON SPRAYERS EQUIPPED WITH CENTRIFUGAL PUMP.



Hydraulic diagram (with one rotary atomizer)

1 - Tank
2 - Tank valve
3 - Filler unit valve
4 - Centrifugal pump
5 - Pressure hose
6 - Pressure regulator
7 - Return hose
8 - Quick shut off valve
9 - In-line filter
10 -Mult-disc rotary atomizer

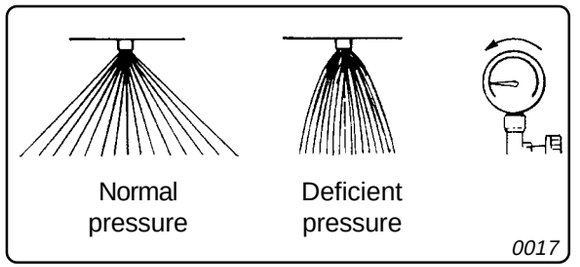
Whenever Jacto sprayers equipped with piston pumps present problems, try to classify them in one of the following four groups.

a) LACK OF SUCTION AND PUMP CAPACITY (total lack of pressure)

- No liquid flow through the nozzles.
- No return to tank.
- Pressure gauge does not indicate pressure.

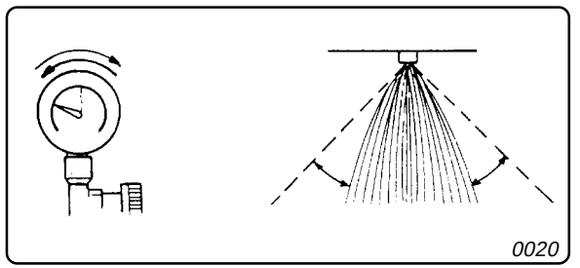
b) PRESSURE DEFICIENCY (partial lack of pressure)

- Desired pressure is not attained.
- Specified nozzle spraying angle is not attained.
- Pressure gauge shows lower pressure.



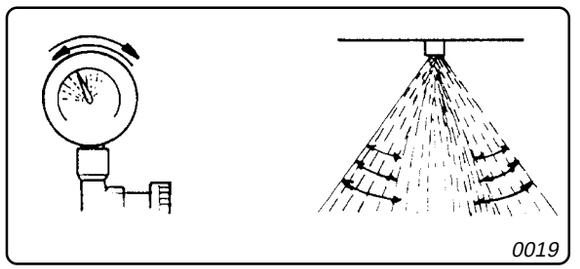
c) PRESSURE OSCILLATION

- The pressure gauge needle oscilates;
- The nozzle spraying angle oscillates.

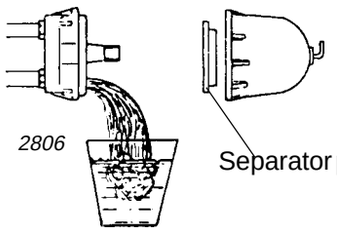


d) INTERMITTENT PRESSURE

- The pressure gauge needle vibrates with intensity.
- The pressure hoses vibrate with intensity.
- The nozzle spraying angle varies.



a) LACK OF PRESSURE

PROBABLE CAUSES	SOLUTIONS
1 - Lack of rpm on PTO.	The sprayer should run with 540 rpm at PTO.
2 - Lack of water in the tank.	To run the hydraulic system, it is necessary to contain a minimum quantity of liquid, otherwise there will be no pressure.
3 - Closed tank valve.	The liquid flow is interrupted and does not feed the pump. Open it.
4 - Dirty filter or inverted separator plate . 	Impurities in the filter prevent a free liquid flow. Clean the filter whenever filling the tank, or more frequent depending on the quality of the water and the type of product applied. Mount the separator plate correctly according to the guide. If it is damaged, replace it.
5 - Obstruction in the intake hose.	Check wheter the hose connecting the filter to the pump is twisted. Check wheter there is any obstruction in the hoses from the tank to the filter. Fill up the tank with water, open the valve and verify if it flows freely.
6 -Air in the system.	Check the filter packing ring. The filter should not leak.
7 - Insufficient pump suction	Disconnect the pump intake hose, open the control valve, run the sprayer and check for suction. Clean or replace the pump valves if necessary.

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c) - PRESSURE OSCILLATION

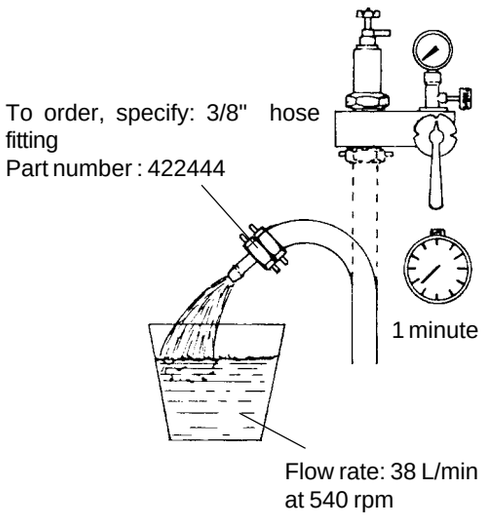
PROBABLE CAUSES	SOLUTIONS
1 - Loose belts.	Check belt tension and tighten if necessary.
2 - Air in the intake system.	Check for damage hoses, filter packing rings, etc., and repair if necessary.
3 - Pressure regulator.	Check the regulator components and clean or replace them if necessary.

d) - INTERMITTENT PRESSURE

PROBABLE CAUSES	SOLUTIONS
1 - Filter shut off valve closed.	When the pump runs, liquid will pass through the valve even in the closed position, however flow will be insufficient.
2 - Pump valve deficiency.	Valve with sealing deficiency or stuck due to impurities.
3 - Head perforated internally.	Replace the head.

b) - PRESSURE DIFICIENCY

PROBABLE CAUSES	SOLUTIONS
1 - Low rpm on the PTO.	The proper PTO rotation is 540 rpm.
2 - Valve partially closed.	The gate valve must be totally open not to obstruct the liquid flow .
3 - Filter partially obstructed.	The filter should be clean to allow free liquid flow.
4 - Intake hose partially obstructed.	A deficient pump will cause depressurization. Check whether the hose connecting the filter to the pump is twisted. Verify whether there is any obstruction in the hoses connecting the tank to the filter. Fill the tank with water, open the valve and observe if it flows freely.
5 - Air in the system.	Check the o-ring connections and leather seal. 90% of the causes of pressure deficiency are caused by air in the system.
6 - Pressure regulator.	Verify whether the kit installed is the specific for the desired pressure. Check whether the components are damaged.
7 - Worn nozzles.	Check if the nozzles flow rate is within the recommended (check the flow rate tables). Replace the nozzles when the flow rate exceeds 10% of the specified. __Use only the nozzles recommended by the sprayer manufacturer.

PROBABLE CAUSES	SOLUTIONS
8 - Pump with low flow rate.	Determination of pump actual capacity : - Disconnect the hose from the control and install the 3/8"hose fitting (of the filler), to pressurize the circuit. - Run the machine at 540 rpm (measure to be sure). - Collect water for one minute and measure. - Actual capacity of JP-140, JP-401 and JP-402 pumps: 38 liters per minute at 540 rpm. -If the collected volume is below 38 liters per minute, disassemble the pump to check.  *2802*

b –PRESSURE DEFICIENCY

PROBABLE CAUSES	SOLUTIONS
1 - Low rpm on the PTO.	The proper PTO rotation is 540 rpm.
2 -Filter shut off valve closed.	When the pumps runs, liquid will pass through the valve enven in the closed position, however flow will be insufficient.
3 - Filter partially obstructed.	The filter should be clean to allow free liquid flow.
4 - Intake hose partially obstructed.	A deficient pump will cause depressurization. Check whether the hose connecting the filter to the pump is twisted. Veriify whether there is any obstruction in the hoses connecting the tank to the filter. Fill the tank with water, open the valve and observe if it flows freely.
5 - Air in the system.	Check the connections and the o-rings of the tank outlet and the pump inlet.
6 - Pressure regulator.	Check the valve and valve seat.
7 -Worn nozzles.	Check whether the nozzle flow rate is within the recommended. Replace the nozzles when the flow rate exceeds 10% of the specified. Use only nozzles recommended by the sprayer manufacturer.
8 - Pump with lower flow rate.	Disconnect the pressure hose from the control valve. Run the sprayer at 540 rpm. Collect water for one minute and measure. The volume collected should approximate this shown below for each pump model: JP - 402 = 38 L/min | JP - 100 = 100 L/min JP - 42 = 42 L/min | JP - 150 = 150 L/min JP - 75 = 75 L/min | JP - 300 = 300 L/min

a - LACK OF PRESSURE

PROBABLE CAUSES	SOLUTIONS
1 - PTO not turning.	The sprayer should be run with 540 rpm at PTO. Check visually whether the pump is being used.
2 - Lack of water in the tank.	To run the hydraulic system, it is necessary to contain a minimum quantity of liquid, otherwise there will be no pressure.
3 - Filter shut off valve closed.	When the pump runs, liquid will pass through the valve even in the closed positio, however it will be no pressure.
4 - Dirty filter.	Impurities in the filter prevent a free liquid flow. Clean the filter whenever filling the tank, or with more frequency depending on the quality of the water and the type of product applied.
5 - Obstruction in the intake hoses.	Check whether the hose connecting the filter to the pump is twisted. Check whether there is any obstruction in the hoses from the tank to filter. Fill up the tank with water, open the valve and verify if if flows freely.
6 - Air in the system.	Check the filter packing ring. The filter should not leak.
7 -Insufficient pump suction.	Disconnect the pump inlet hose, open the control valve, run the sprayer and check for suction. Clean or replace the pump valves if necessary.

c - PRESSURE OSCILLATION

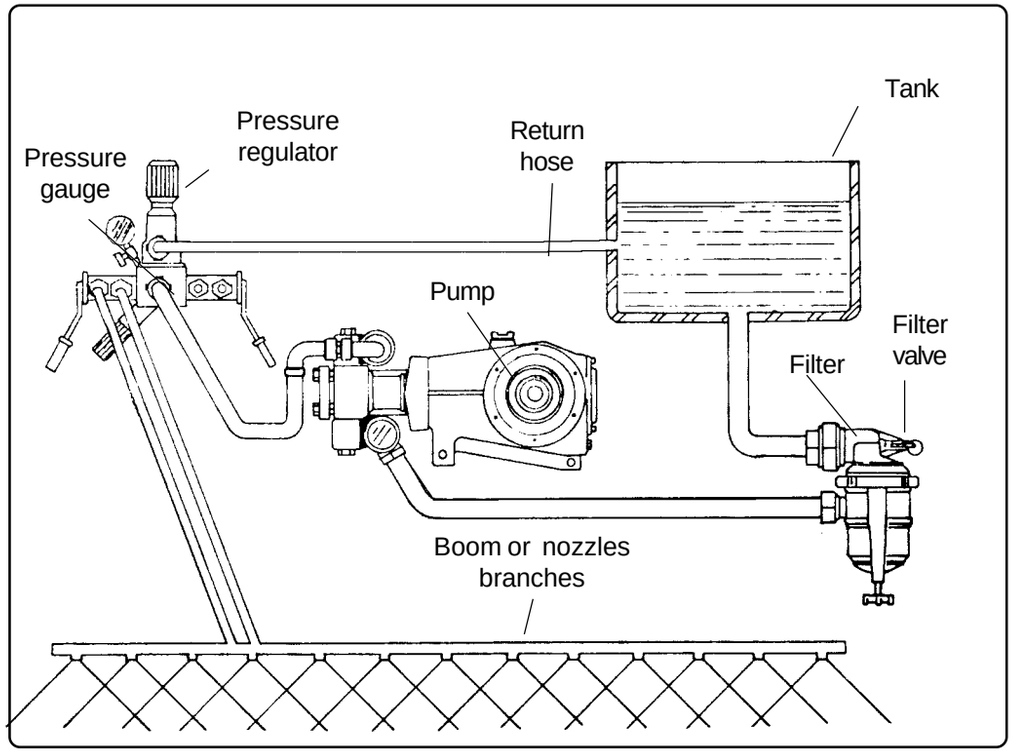
PROBABLE CAUSES	SOLUTIONS
1 - Loose belts.	Check the belt tension and tighten if necessary.
2 - Air in the intake system.	Check for damaged hoses, filter packing rings, etc., and repair if necessary.
3 - Pressure regulator.	Check the regulator components and clean or replace them if necessary.
4 - Partial obstruction of intake hose or filter.	Pressure oscillation occurs if the sprayer is operating with low flow rate (around 25% of the pump capacity and pressure above 100 psi).

d -INTERMITTENT PRESSURE

PROBABLE CAUSES	SOLUTIONS
1 - Compensation champer filled with water.	Drain the compensation chamber (close the tank valve, remove the filter cover and run the pump for 1/2 minute). Note: The pump can not run without water for a long time.
2 - Pump valve deficiency.	Valve with sealing deficiency or stuck due to impurities.

TABLE OF CONTENTS
(for JP-75, JP-100, JP-150 and JP-300 pumps)

TROUBLE-SHOOTING THE HYDRAULIC CIRCUIT ON SPRAYERS EQUIPPED WITH JP-75, JP-100, JP-150 AND JP-300 PISTON PUMPS.



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The troubles that we are going to present will be the same mentioned before. The causes were changed because these systems use pumps, filters, valves, and controls diferent from the prior system.