

When a control pedal is activated, fluid goes to the cylinders. When the cylinders come to the end of their travel, the system relief valve opens in the control valve (Fig. 2-3).

Fluid returns from the control valve to the inlet of the vane pump through a by-pass valve. The by-pass valve keeps back pressure on the returning oil to supply oil to the hydrostatic system pumps and motors.

2-2 GENERAL INFORMATION

2-2.1 Clean Area

When making repairs on the hydraulic/hydrostatic system, be careful to keep dirt out of the system. If the filter replacement is done correctly, dirt can only enter when fittings are disconnected. When there is a failure in the system, always clean the connecting tubes, valves, etc., to keep dirt out of the replacement parts. When a component failure lets foreign material into the system, or when metal particles are made by wear in the component system, both hydraulic filters must have replacement made.

2-2.2 Air Leaks

When the loader hydraulic/hydrostatic system becomes noisy or operation is rough, air is entering the system. The loader must be stopped and the cause for air leakage corrected. Air leaks can cause transmission damage if repairs are not made.

2-2.3 Tubelines, Hoses, Fittings

Correct installation of hydraulic connections can prevent damage to the Bobcat and loss of fluid.

2-2.4 37° Flare Connections

These are the most common in use in the system. Most leaks on flare fittings are caused by loose connections. To tighten flared fittings, use this method.

1. Tighten the nut until it makes contact with the seat.
2. Make a line from the nut to the adapter (Fig. 2-4).
3. See the chart to find correct tightening for fittings.

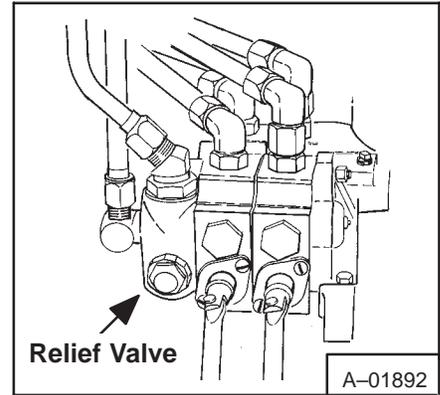


Fig. 2-3 Control Valve

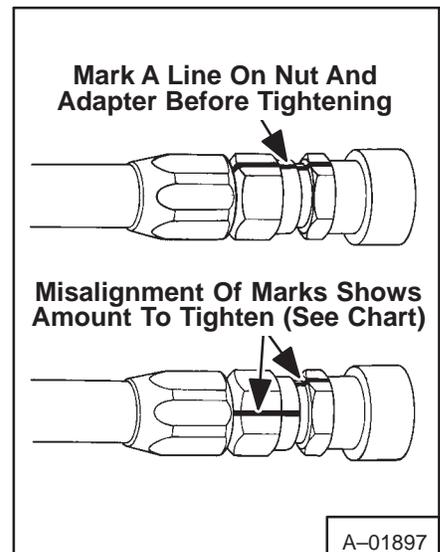


Fig. 2-4 Tightening Flared Fittings

Fitting Size	Rotate No. of Hex Flats
0.500 inch	2.0 2
0.625 inch	1.500 – 2.0
0.750 inch	1.0
0.875 inch	0.750 – 1.0
1.0 inch	0.750 – 1.0

2-2.5 Straight Thread O-Ring Connections

These connections seal by compression of the O-ring. To tighten O-ring fittings, use this method:

1. Loosen the nut and slide the washer and O-ring against the thread (Fig. 2-5). Put oil on the O-ring.
2. Tighten the fitting in place by hand. If the fitting is an elbow, turn it to line up with the tubeline or hose.

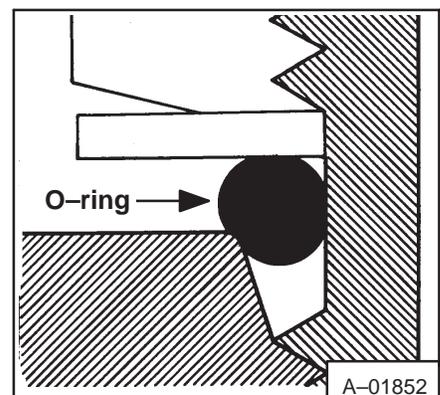


Fig. 2-5 Straight Thread Seal

3. Hold the fitting with a wrench. Use another wrench to tighten the lock nut (Fig. 2-6). The ring will fit into the space as shown.
4. If the fitting is not turned in far enough, the O-ring will be damaged and the fitting will leak (Fig. 2-7).

2-2.6 Pipe Thread Connections

These leaks at high pressure more than other connections. Put sealant on the male thread to avoid leaks. Be sure the threads are clean and not damaged.

2-2.7 Tubelines And Hoses

Bent tubelines must be replaced or there will be restriction to flow. This will cause heat and slow hydraulic action. Exchange hoses when they show wear or damage. If not exchanged, there can be loss of oil or an accident. Be sure to use correct clamps to hold hoses and tubelines in place.

TROUBLESHOOTING CHART FOR HYDRAULIC SYSTEM

PROBLEM	CHART NO.	PROCEDURE
No hydraulic action	A	System precheck.
Hydraulic action is rough	A	System precheck.
Slow hydraulic action	B	Check pump release pressure, check control valve.
Rough control pedal action.	None	Lubricate pedals, check for tight spool in valve bore (See Note).
Cylinder moves when pedals are in neutral position.	None	Check for pedals moving freely (See Note).

NOTE: If the spool is tight in the valve, two items may be checked before making valve replacement.

1. Disconnect the control pedal linkage and rotate the valve spool 180° check its operation again.
2. Loosen the four bolts which hold the valve together, then tighten the bolts evenly to 20 ft.-lbs. (27 Nm).

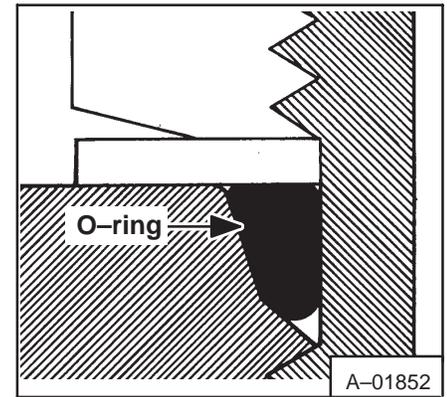


Fig. 2-6 Seal In Place

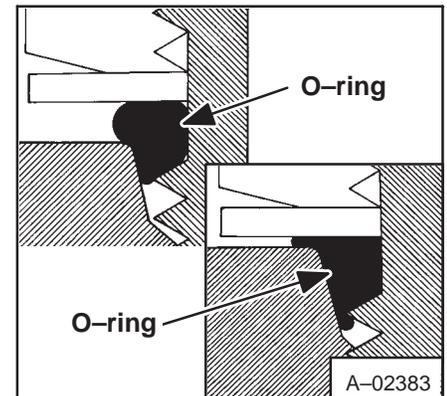


Fig. 2-7 Wrong Installation

2-3 PROBLEM ANALYSIS CHARTS

CHART A
ROUGH ACTION OR NO ACTION OF HYDRAULIC CYLINDERS

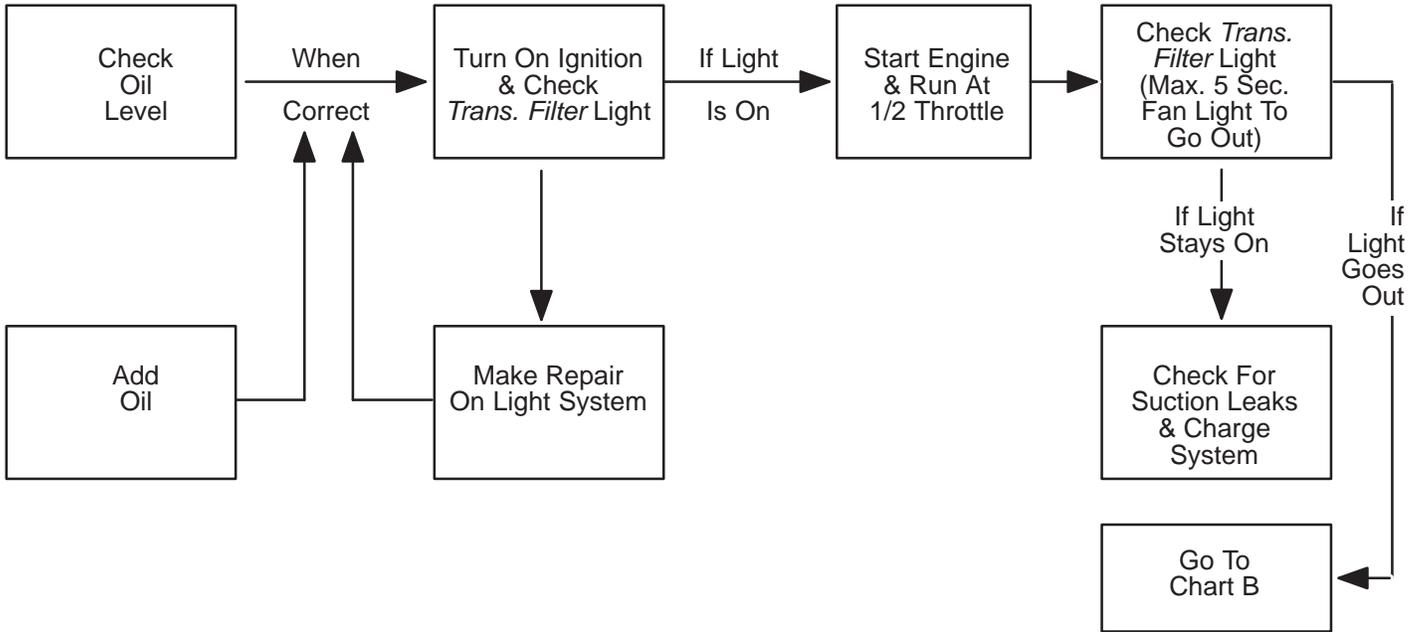
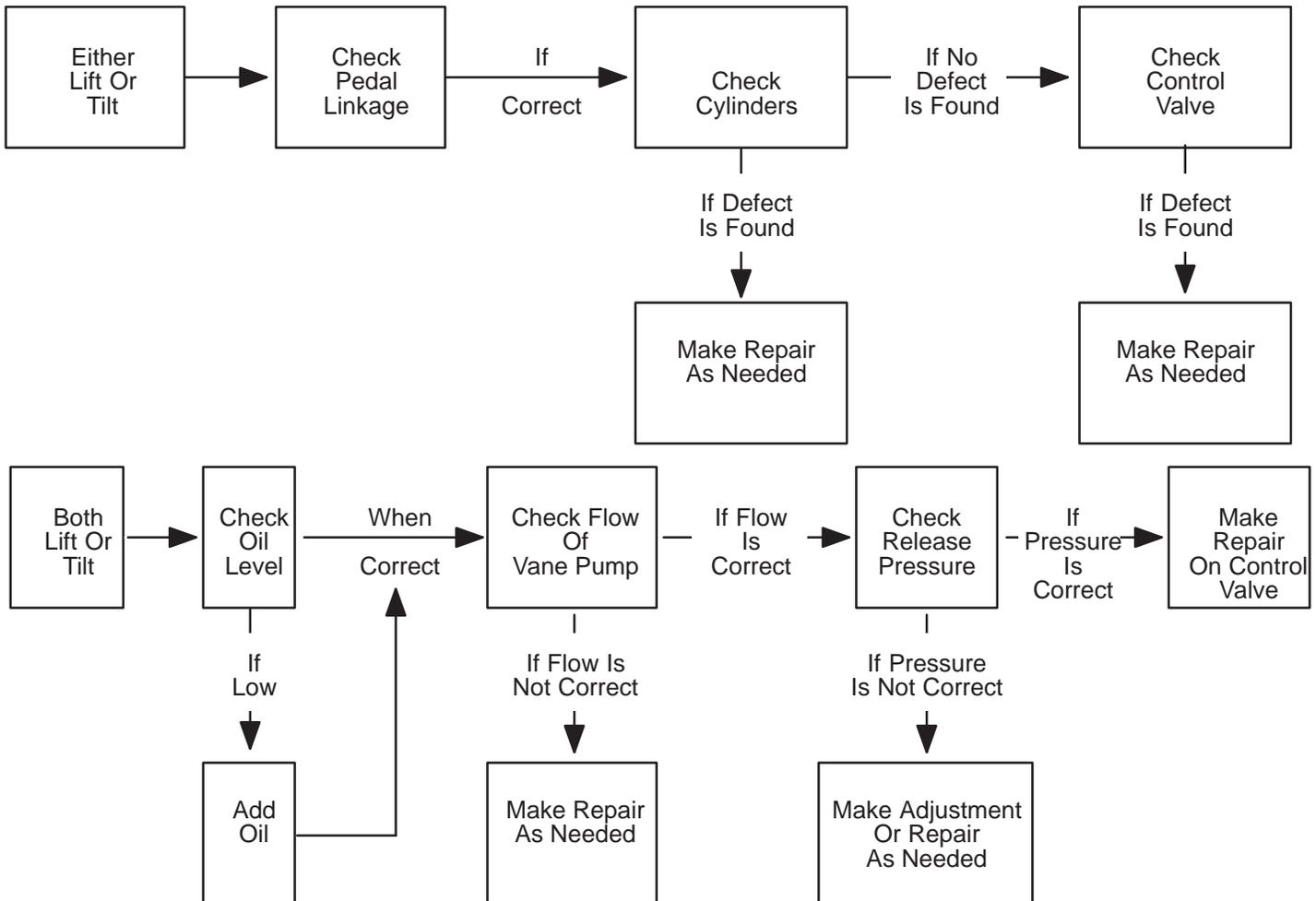


CHART B
SLOW HYDRAULIC ACTION



2-4 CHARGING THE VANE PUMP AND CHECKING FOR SUCTION LEAKS

If there is a loss of hydraulic charge, or the hydraulic action is rough, put air pressure in the reservoir as follows:

1. Install pipe plugs in the reservoir vents. (See Fig. 2-8.)
2. Connect a pressure hose and regulator to the reservoir fill hole. Put 10-15 PSI (70-100 kPa) of pressure in the reservoir.

IMPORTANT

Do not go over 15 PSI (100 kPa)!

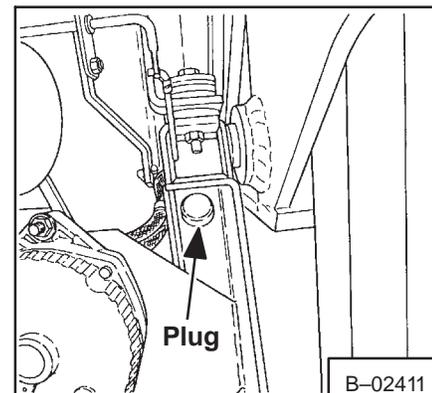


Fig. 2-8 Reservoir Vent Plug

3. Loosen fitting at the top of the pump (Fig. 2-9, Item 1). When fluid begins to flow out, tighten the fitting.
4. While the reservoir is under pressure, check the eight areas shown (Fig. 2-9, marked with *). See if hydraulic oil is leaking from any of those areas. If it is, correct the cause of leak and check again.

NOTE: This procedure may also be followed to check for leaks around axles, axle seals, etc.

5. Install the filler plug and reservoir vents.
6. Start the loader and run 3/4 throttle. Operate the hydraulic controls and drive the machine for about 15 minutes. If the hydraulic action is still not smooth, repeat steps 1, 2 and 4. If no leaks can be found, make replacement of the 25 micron filter element.

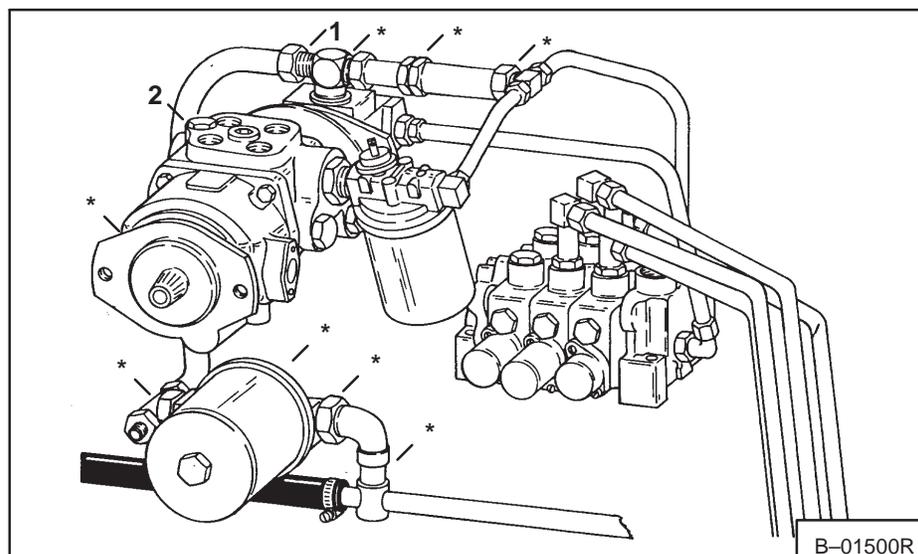


Fig. 2-9 Hydraulic System (Possible Leak Locations)

2-4.1 Charging The Pump When No Source Of Air Pressure Is Available

1. Disconnect the high pressure tube from the side of the vane pump. Disconnect the suction tube from the top of the vane pump (Fig. 2-10).
2. Use a funnel to pour clean hydraulic fluid into the top opening. Pour until fluid flows out the side opening. Connect the tubelines to the pump.
3. Start the engine and run at 3/4 throttle. Operate the hydraulic controls and drive the machine for about 15 minutes. If the hydraulic action is still not smooth, check the system for air leaks.

2-4.2 Another Method To Check The System For Air Leaks

1. Remove the plug from the top of the valve plate (Fig. 2-9, Item 2).
2. Put a fitting with a petcock valve in the valve plate and connect a clear hose to the end of the fitting. Put the other end of the hose in the reservoir filler pipe.
3. Start the engine and operate at 3/4 throttle, open the petcock to remove any air. Operate the hydraulic controls for about 15 minutes and check for air in flowing oil coming from hose. Check the eight places shown for loose or damaged connections. Repair as necessary and check again. If no leaks can be found and hydraulic action is not smooth, make a replacement of the 25 micron filter.

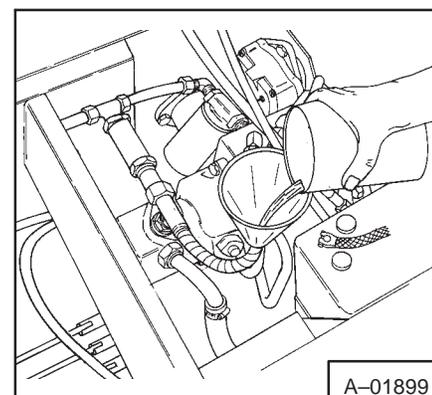


Fig. 2-10 Charging Hydraulic Pump