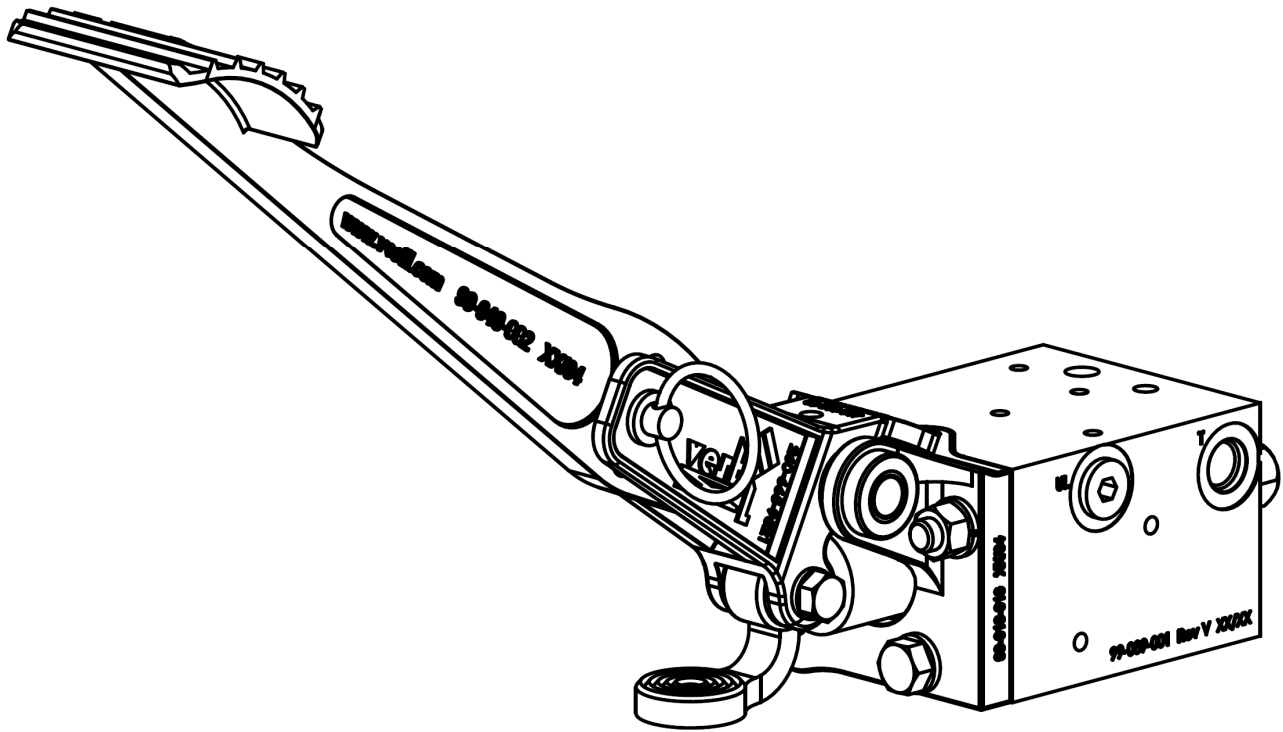




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# TWO SPEED, AUTO-SHIFTING FOOT PUMP INSTRUCTION MANUAL



## Receiving instructions:

After delivery, remove the packaging from the product. Inspect the product closely to determine whether it sustained damage during transport. If damage is discovered, record a complete description of it on the bill of lading. If the product is undamaged, discard the packaging.

## Note:

The end-user is solely responsible for confirming that product design, installation, use, and maintenance comply with laws, regulations, codes, and mandatory standards applied where the product is used.

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### Features:

Your new lift equipment includes a two-speed pump that automatically shifts between speeds based on the output pressure of the hydraulic system. Internal features of your pump include primary pressure relief and pressure compensated return-flow mechanisms, an integrated lowering valve, and an auto-shifting valve assembly. The pump also utilizes replaceable sleeve bearings, valve components, and seals to simplify maintenance requirements and maximize service life.

### Operating Instructions:

This product uses an auto-shifting, two-speed foot pump to extend and retract one (or more) cylinders. Pump speed is automatically selected based on the output pressure of the hydraulic system. For example, when the unit is unloaded (e.g. nothing on the tabletop or forks) and pressure in the hydraulic system is low, the pump operates in high speed mode. Each stroke of the foot pedal pumps approximately 1.2 cubic inches of oil. When a load is applied to the unit, system pressure increases. At pressures in the range of 800-1000 psi the pump automatically shifts to low speed mode. In low speed mode, less effort is required to move the pedal because each stroke only pumps - 0.44 cubic inches of oil.

The cylinder extends with each stroke of the foot pedal. If an applied load weighs more than the capacity of your product, a pressure relief valve opens and allows oil to flow back into the oil reservoir rather than to the cylinder(s). As a result, the cylinder will not extend until the weight of the load either equals or is less than the capacity of the equipment.

To retract the cylinder (i.e. lower the tabletop/forks), press the release lever (see item no. 21 on pp. 3, 4). A pressure compensated flow control valve ensures that the cylinder retracts at a controlled rate. Do not increase the pressure relief setting more than necessary and never more than the pressure rating of the components in the hydraulic system.

### Purging Air from the Pump:

Whether your pump is new or used, air probably is trapped inside the pump and must be removed. When air is present in the hydraulic system, you might notice that the foot pedal feels spongy.

**NOTE:** If your product is a cart or table, the tabletop must be supported by the maintenance prop(s).

Raise the tabletop and install the maintenance prop(s). Then, lower the table until the tabletop is entirely supported by the maintenance prop(s).

1. Remove the fill plug from the oil reservoir.
2. Disconnect the hydraulic hose from the port on the cylinder and insert the free end of the hose into the fill port of the reservoir.
3. Pump the foot pedal several times and pay close attention to the stream of oil flowing from the hose. Pockets of air will escape as oil flows into the reservoir.
4. When you no longer see/hear air escaping, reconnect the pump to the cylinder by reattaching the hydraulic hose to the cylinder port.
5. Check all of the hydraulic lines for oil leaks.
6. Return the table to service.
7. Although air has been removed from the pump, air could still be trapped in the cylinder. The next procedure explains how to remove air from the cylinder.

### Purging Air from the Cylinder:

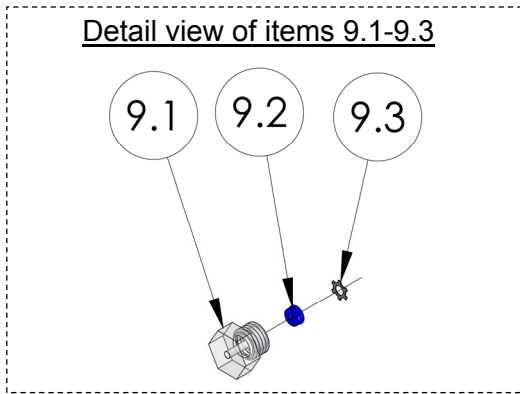
A bleeder screw is located at the top of the cylinder (see "Exploded view" in your product owner's manual). The bleeder screw includes a hose fitting for a small diameter hose. By attaching a hose to the screw, any oil that escapes during the bleeding process can be directed into a container for proper disposal.

To bleed air from the cylinder:

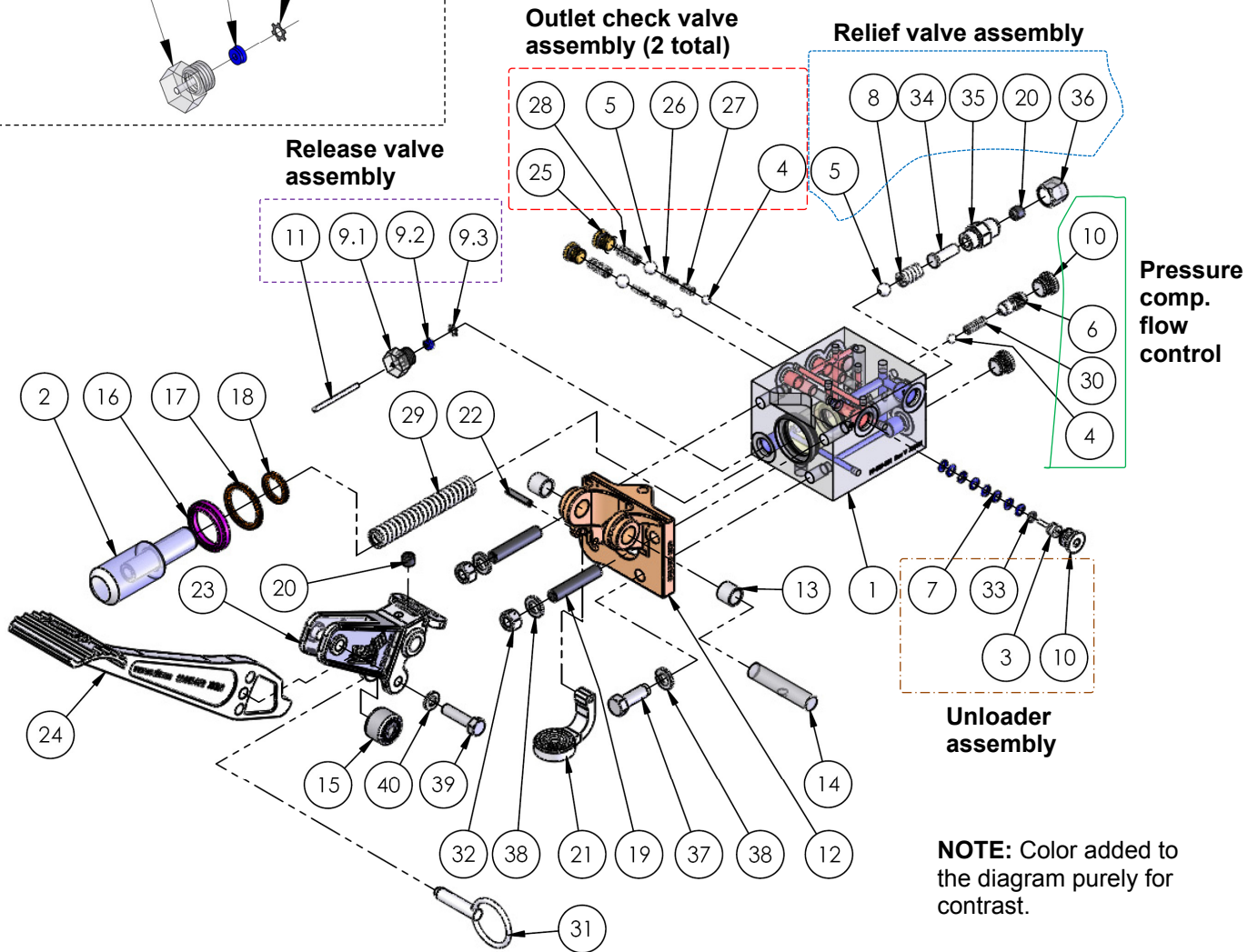
**Scissor carts & tables:** Raise the tabletop and install the maintenance prop(s). Lower the tabletop until it is entirely supported by the maintenance prop(s).

1. Gently pump the foot pedal once.
2. Carefully open the bleeder screw. The pressure in the system generated by pumping the pedal causes air (and oil) to flow out of the bleeder screw. Pressure will drop as air and oil flow from the cylinder. To pressurize the system, close the bleeder screw and again pump the pedal just once. Open the bleeder screw again to allow more trapped air to escape;
3. Repeat step 3 until air is completely removed from the cylinder (i.e. only oil flows from the bleeder screw).
4. Check all of the hydraulic lines for oil leaks.
5. Close the bleeder screw and return the unit to service.

Exploded Parts View  
[Bill of Materials on Next Page]



Item	Part no.	Description	Quantity
9.1	99-031-022	Release valve pin seal retainer	1
9.2	99-144-017	Seal, release valve	1
9.3	99-145-127	Star washer	1



A kit of replacement seals is available for this pump. To order a seal kit, contact the Parts and Technical Service Department at [http://www.vestilmfg.com/parts\\_info.htm](http://www.vestilmfg.com/parts_info.htm). Enter part no. 99-136-013 in the "What are you looking for?" field. Alternatively, you may request replacement parts and/or service by calling (260) 665-7586. Tell the operator to connect you to the Parts Department.

**Ports in pump manifold (#1 in diagram):**  
The manifold has the following ports:

- 2 pressure ports: marked "P" and "FC/P";
- 2 intake/return ports: marked "T" - one is located on the rear and the other is located on the right side.

Including 2 pressure ports and 2 intake/return ports allows the circuit configuration to be adapted to varied applications. The unused pressure and intake/return ports are each plugged with an SAE #6 port plug.

Bill of Materials: Items marked with an asterisk (\*) are components of seal kit 99-136-013.

Item	Part No.	Description	Quantity
1	99-039-001	Manifold, manual pump, 1.75/0.75 bore	1
2	99-041-001	Piston, pump, 1 <sup>1</sup> / <sub>4</sub> " x 3 <sup>3</sup> / <sub>4</sub> "	1
3	99-041-002	Piston, pump, unloader	1
4	99-110-007	Bearing, ball, 1 <sup>1</sup> / <sub>4</sub> "	3
5	99-110-006	Bearing, ball, 3 <sup>3</sup> / <sub>8</sub> "	3
6	99-153-038	Flow control spool, pressure compensated, 1.0 gal.	1
7	99-114-001	Washer, beveled spring washer	8
8	99-146-008	Spring, relief	1
9	99-653-005	Assembly, release valve packing	1
9.1	99-031-022	Accessory, hydraulic, relief valve pin seal retainer	1
*9.2	99-144-017	Seal, release valve	1
*9.3	99-145-127	Washer, star	1
10	99-031-066	Plug, SAE #6 port	3
11	99-112-009	Pin, release pin	1
12	99-016-018	Bracket, pivot plate	1
*13	01-111-013	Bushing, polygon 1 <sup>1</sup> / <sub>2</sub> " inner diameter x 1 <sup>1</sup> / <sub>2</sub> " long	2
14	99-112-008	Pin, pivot	1
15	20-110-003	Cam roller with seal	1
*16	99-031-067	Wiper, 1 <sup>1</sup> / <sub>4</sub> " inner diameter x 1 <sup>1</sup> / <sub>2</sub> " outer diameter x 3 <sup>3</sup> / <sub>16</sub> "	1
*17	99-144-018	Seal, 1 <sup>1</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>8</sub> " CS	1
*18	99-144-015	U-cup, 3 <sup>3</sup> / <sub>4</sub> " x 1.000 x 0.125"	1
19	25547	Socket head set screw, black oxide finish, 3 <sup>3</sup> / <sub>8</sub> " – 16 x 2"	2
20	25537	SSS, CP, utility grade, 3 <sup>3</sup> / <sub>8</sub> " – 16 x 3 <sup>3</sup> / <sub>8</sub> "	2
21	99-040-001	Lever, release pedal	1
22	64133	Pin, spring pin, 3 <sup>3</sup> / <sub>16</sub> " – 1" long	1
23	99-016-017	Bracket, pedal link	1
24	99-040-002	Lever, foot pedal, 2-speed, auto-shifter	1
25	99-116-005	MORB hollow hex plug, SAE 4	2
26	99-146-004	Spring, compression, inlet check	2
27	99-146-006	Spring, compression, retainer	2
28	99-146-005	Spring, compression, outlet check	2
29	99-146-009	Spring, compression, return piston	1
30	99-146-007	Spring, release ball	1
31	99-112-049	Pin, detent ring	1
32	36106	Hex nut, grade A, zinc plated, 3 <sup>3</sup> / <sub>8</sub> " – 16	2
*33	99-144-019	O-ring, 1 <sup>1</sup> / <sub>32</sub> " inner diameter x 1 <sup>1</sup> / <sub>32</sub> " outer diameter x 1 <sup>1</sup> / <sub>16</sub> " CS	1
34	99-112-050	Pin, spring guide	1
35	99-153-070	Valve, relief	1
36	99-031-069	Cap, #6 JIC	1
37	11105	Hex bolt, grade A, zinc plated, 3 <sup>3</sup> / <sub>8</sub> " – 16 x 1"	1
38	33622	Split lock washer, carbon steel, medium zinc finish, 3 <sup>3</sup> / <sub>8</sub> "	3
39	11057	Hex bolt, grade A, zinc plated, 5 <sup>5</sup> / <sub>16</sub> " – 18 x 1 <sup>1</sup> / <sub>4</sub> "	1
40	33620	Lock washer, medium split, 5 <sup>5</sup> / <sub>16</sub> "	1

## Inspections and Maintenance:

Before putting the unit into regular service, make a written record that describes the appearance of the foot pump. Pay particular attention to pivot points and pivot point fasteners. Pump the foot pedal several times to partially extend the cylinder. Describe how easily the pedal moves, i.e. how much force is required to move it in high speed/unloaded mode. Apply a load to the unit (tabletop, forks, etc.) and pump the pedal again. Describe the movement of the pedal in low speed mode. Include descriptions of the hoses and fittings. This record establishes "normal condition".

**NOTE:** If your product is a table or cart with a tabletop that raises and lowers, you must apply the maintenance prop(s) before inspecting and/or maintaining it: 1) Unload the tabletop. Raise it to its maximum height. Insert the maintenance prop(s) between the leg rollers and the front end of the frame; 2) Lower the deck until the rollers rest firmly against the maintenance prop.

(A) Before Each Use Check For Any of the Following Conditions.

- Oil leaks from the pump, hoses, hose fittings, etc.

- Pinched or chafed hoses
- Unusual noise or binding

## (B) At least once per month:

- Check the oil level. Oil should be 1" to 1-1/2" below the top of the reservoir/tank with the cylinder retracted. Add oil, if necessary.
- Check for oil leaks. Resolve the issue as described in "Troubleshooting" section.
- Check the hydraulic system for worn or damaged hoses. Replace damaged hoses as necessary.
- Cycle the cylinder (fully extended and then completely retracted) and listen for unusual noise. See "Troubleshooting".

## (C) Yearly maintenance:

Change the oil at least once a year or sooner if it darkens, is gritty, or appears milky. Milky appearance indicates the presence of water. Replace the oil with AW-32 hydraulic fluid or its equivalent.

**Troubleshooting:** [NOTE: Refer to Exploded Parts View and Bill of Materials on pages 3 & 4. Numbers in parentheses ( ) correspond to items in Bill of Materials on p. 4.]

Issue	Explanation	Remedy
1. Cylinder does not extend when I pump the pedal	a. Too much weight applied (load exceeds capacity). b. Too little oil in hydraulic system. c. Pinched hydraulic hose. d. Relief valve pressure setting too low.	a. Remove enough of load that weight of load is within capacity. b. Add oil until level is within one inch of top of reservoir. c. Correct as appropriate. d. Increase pressure setting as necessary, but NEVER more than 3,000psi
2. A lot of force is required to pump the pedal	e. Autoshifter valve stuck in deactivated position. f. Load exceeds capacity.	e. Remove port plug (10) from port marked "UL" (on manifold); then remove piston. Inspect piston and springs f. Reduce load to be within capacity
3. Cylinder extends only when unloaded or pedal pumped rapidly; I can pump the pedal but the cylinder does not move.	g. Pump is air locked. h. Debris on seat of inlet check valve. i. Pressure setting of relief valve needs adjustment. j. Debris on seat of relief valve.	g. Remove air from the pump (see "Purging Air from Pump" on p. 2) h. Remove inlet check valve and clean debris from valve seat (the bottom of the cavity in pump body that valve fits into) i. Increase pressure setting as necessary, but NEVER more than 3,000psi. j. Remove relief valve and clean debris from valve seat in pump body.
4. Cylinder extends during the down stroke of the pedal, but lowers during the return stroke.	k. Outlet check valve stuck in open position.	k. Remove, disassemble, clean (with mineral spirits or kerosene), reassemble and reinstall outlet check valve assemblies.
5. Have to keep pumping pedal to maintain deck height	l. Outlet check valve allowing oil to return to pump chamber. m. Release valve allowing oil to leak back to the tank. n. Unloader piston leaking.	l. Remove both outlet check valves. Clean valves. Score bottom of chamber for ball bearing (4). m. Remove release valve assembly, inspect, clean, & repair as necessary n. Replace unloader O-ring (33).
6. Cylinder extends very slowly when pumping	o. Autoshifter valve stuck in open/activated position (piston in)	o. Remove port plug (10) from port marked "UL" (on manifold (1)); then remove piston. Inspect piston and springs
7. Pump pedal feels spongy or cylinder extends in jerks	p. Debris interfering with leg rollers q. Oil level is low r. Air present in pump and/or cylinders	p. Clean the inside of the frame and underside of deck as necessary q. Add oil until level is within 1in. of top of reservoir. r. Purge air by following "Pump purging procedure" and "Cylinder purging procedure" on p. 2.
8. Cylinder retracts very slowly	s. Flow control valve obstructed	s. Remove valve and inspect for debris or non-operating spool
9. Cylinder retracts too rapidly	t. Flow control valve obstructed or not moving freely	t. Remove valve and inspect for debris or non-operating spool
10. Cylinder begins to extend but stops	u. Air trapped in small pump chamber	u. Perform "Pump purging procedure" on p. 2.