

Trouble Shooting Guide

Causes and Remedies

Problem	Causes and Remedies
1. No pressure or no capacity	a. Inlet not fully immersed in tank, or low tank level. b. Pump not properly primed c. Clogged inlet strainer d. Suction line air leaks. Use plumber's joint compound or Teflon tape. Tighten all connections. Check hoses for cracks or pin holes. e. Suction line blocked or hose collapsed. f. Pump is air-bound. Check for dry tank, or "traps" in the line. Try removing one nozzle until pump starts priming. g. Worn and leaking seals. Replace. h. Pump turning in wrong direction. This pump rotates opposite of a tractor PTO shaft rotation.
2. Pump runs but low pressure and capacity.	a. Suction line and fittings partially blocked or too small. Hose kinked. b. Worn rollers. Replace with new (see parts list). c. Clogged inlet strainer.
3. Pump pressure good but low output through the nozzles.	a. Nozzle orifices too small. Install larger sizes. b. Outlet line too small or blocked. c. Bypass partially open. Close it.
4. Excessive noise or vibration.	a. Possible loose coupler, bent or damaged shaft. b. Suction line leaks or clogged strainer. (See problem 1 remedy d. above.) c. Worn rollers. Replace with new (see parts list).
5. Impossible to rotate shaft.	a. Improper assembly. Tap shaft with brass hammer. (refer to assembly instructions). b. Corrosion or foreign object in pump. Disassemble and thoroughly clean all parts. Replace worn parts. See section on MAINTENANCE.

Delavan Products Warranty

All products sold by Delavan are warranted only to purchasers from Delavan for resale or for use in purchasers' own business or original equipment manufacture, against defects in workmanship or materials under normal use, maintenance and service (rental use excluded), if notice of said defect is received by Delavan of the factory within 90 days after installation or one year from date of shipment from the factory, whichever first occurs. The sole and exclusive obligation of Delavan under this or any implied warranty shall be to replace or, at its option, to repair, without charge, any product which is determined by Delavan to be defective in workmanship or materials after the product is returned to the Delavan factory, shipping costs prepaid. In no event shall Delavan be liable to any person for

indirect or consequential damages or for injury or commercial loss resulting from any use or inability to use and Delavan product. Delavan expressly negates any other warranty, express or implied, including any warranty of merchantability or fitness for a particular purpose, or arising from any course of dealing or custom or usage of trade. No person, including any dealer or representative of Delavan, is authorized to make any representation or warranty on behalf of Delavan in addition to or inconsistent with these provisions. Purchasers to whom these provisions apply agree to hold Delavan harmless from claims by their customers in excess of the obligations of Delavan expressly set forth herein.



1228 Chestnut Avenue • Minneapolis, MN 55403
Toll Free: 1-866-DELAVAN (335-2826)
(612) 333-3189
Toll Free Fax: 1-888-726-5906
(612) 333-3231



12V DC Motor Driven 4-Roller Pump

Instruction Manual No. 2067



12V DC Motor Driven 4-Roller Side-Port Pump

4401CM2 Cast Iron Pump and Motor Assembly
4401NM2 Ni-Resist Pump and Motor Assembly
4401DM2 Diamond Pump and Motor Assembly

Specifications:

- Pressures to 100 PSIG
- Capacity: 7 GPM at 0 PSIG, 5.22 GPM at 40 PSIG
- Draws 22 amperes at 40 PSIG

Features:

- Body and Endplate - Cast Iron, Ni-Resist, Diamond
- Ball Bearings - Heavy-duty shielded bearings support shaft at both ends. These sealed bearings are lubricated at the factory for the life of the pump.
- Shaft - 1/2" dia. hollow, 416 stainless steel
- Roller - Corrosion and wear resistant alloy or stainless steel
- Rollers - 1/2" Ultra Rollers
- Seals - Cartridge type, Viton lip seals
- Ports - 3/4" NPT (F) side ports
- Rotations - Clockwise rotation when facing the shaft end
- Mounting hole configuration interchanges with competitive series roller pump.

Ratings for 12 Volt DC/4-Roller Pump

PRESSURE (PSIG)	FLOW RATE (GPM)	AMP DRAW	VOLTS	RPM
0	7.0	10.6	12V DC	2000
10	6.4	12.6	12V DC	2000
20	5.94	15.8	12V DC	1975
30	5.54	19.0	12V DC	1925
40	5.22	22.0	12V DC	1900
50	4.88	25.2	12V DC	1850
60	4.46	28.4	12V DC	1825
70	4.19	31.3	12V DC	1800
80	3.86	34.0	12V DC	1775
90	3.53	37.5	12V DC	1750
100	3.25	40.5	12V DC	1725

Installation:

- 12V DC motor must be mounted securely to a rigid frame
- **WARNING: DO NOT MOUNT PUMP RIGIDLY.**
- Connect red lead to positive (+)
- Connect black lead to negative (-)
- Pressure relief valve for bypass and a control valve for regulating pressure should be installed in the system to limit pump pressure to 100 PSI.
- Any switches or speed controller installed with unit should be rated at or above 30 AMPS.

CAUTION: Pump motor surface may become **HOT** during use. Allow to cool sufficiently before handling motor.

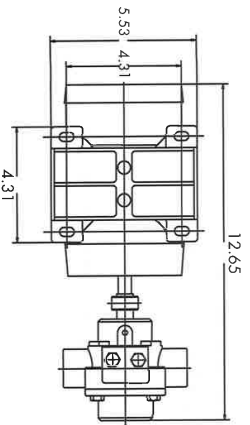
Operation:

1. With a clear suction line and open discharge line, the pump should displace liquid within 15 seconds. A squirt of oil in the suction side of the pump before starting will accelerate priming action.
2. Never run the pump dry. Excessive heat will damage roller and seals.
3. Do not pump abrasive white wash, paints or other abrasive liquids.
4. Do not use rusty supply barrels or sandy water.
5. Do not close the discharge line of the pump while it is running unless a means of bypassing the liquid has been installed. A simple relief or bypass valve can be easily installed in the discharge side.

Maintenance:

1. Your Delavan pump is equipped with permanently lubricated ball bearings. They do not require further lubrication.
2. Do not inject oil or grease into the two weep holes on the underside of the bearing housings. These holes are to reveal seal leakage and to prevent the solution from forcing its way into the bearings. The holes must be kept clean.
3. **AFTER SPRAYING:** Thoroughly flush the pump with clear water or use a solution of approximately one cup of ammonia in 10 gallons of water. This will dissolve most residue remaining in the pump. Squirt a light oil in the pump and rotate to cover the inner surfaces with a protective film.
4. **STORAGE:** If the pump is to be out of service for several days or stored, flush pump with clear water or use a solution of one cup of ammonia in 10 gallons of water. Then pump a 50 percent permanent antifreeze solution through the pump. Plug ports.

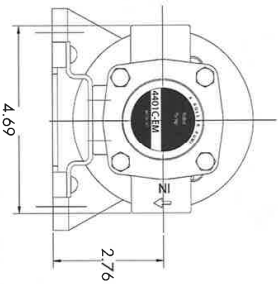
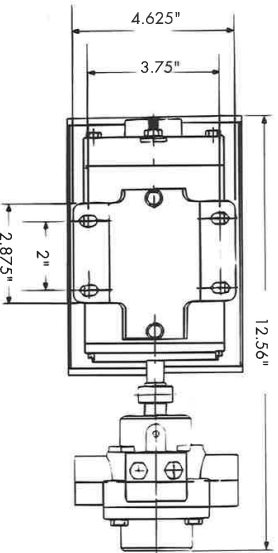
CAUTION: Do not use gasoline, kerosene, or fuel oil, as these materials will affect pump seals and rollers.



For replacement parts for 4401 C-M12 12 Volt DC 4-Roller Pump.

Use parts listed for 4-Roller Pump 4400.

Use repair kit 44-4000RK, same as for 4400 Series pump.

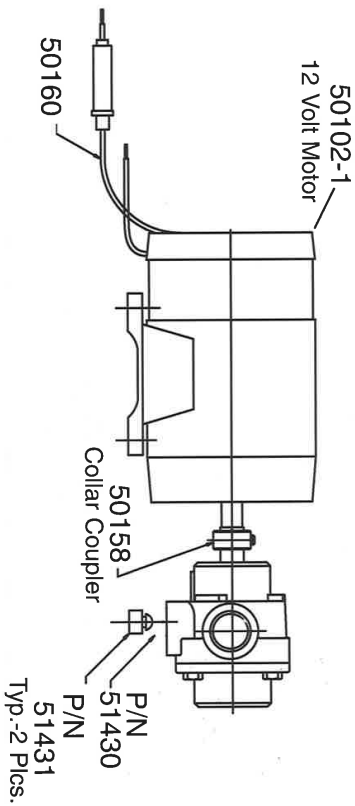


- Pump and Motor Repair:**
1. Do not attempt to repair motor yourself. Return motor to Delovon-Delta, Inc. for repair.
 2. When removing pump from motor, loosen allen screw in coupler and slide pump off motor shaft.

Pump Disassembly:

- Note:** The numbers in parentheses used in the following text are reference numbers that are found in the exploded view.
1. With screwdriver, remove snap ring (1). Lift out nameplate (2).
 2. Unscrew capscrews (3).
 3. With shaft pointing down, cradle pump on ports on fixture under an arbor press. A cradle can be constructed of 2" x 4" lumber. Press the shaft and rotor assembly (6) down through the pump body, bearing and seal. The shaft and rotor assembly will remain in the end plate.
 4. Lift off seal ring (9). Slide out rollers (5).
 5. Check body for wear. File off any burrs that appear on rotor.
 6. Make sure rollers (5) move freely in rotor slots. Replace rollers if out-of-round or badly worn.
 7. If further disassembly is required:
 - a) Press out shaft and rotor assembly (6) from end plate (7) with an arbor press while supporting the end plate (7) with an arbor press while supporting the end plate on a cradle. Remove snapping (1).
 - b) To remove bearing (8), use a small piece of brass rod and gently tap with hammer on the inner edges of the bearing. Drive the seal (9) out with a screwdriver and hammer. Discard seal.

- Pump Assembly:**
1. A repair kit including 4 rollers, 2 lip seals and a seal ring is available (see parts list).
 2. Position a new seal in housing with folded edge down. Press seal down on outer edge until it "bottoms".
 3. Position bearing (4) in bearing housing and press downward until it "bottoms". Apply pressure to outer bearing race.
 4. File off any burrs on the rotor faces and roller slots that may have been caused by disassembly and handling.
 5. Apply a light oil to shaft, end plate surface and inside pump body.
 6. Press shaft and rotor into body, by easing the rotor shaft through the seal: then press shaft with an arbor press while supporting body bearing inner race.
 7. Insert rollers (5), one in each slot.
 8. Place seal ring (9) in groove.
 9. Position end plate (7) for pressing down on pump body (6), easing the shaft carefully through the seal. Carefully line up matching holes of pump body and end plate.
 10. Press pump together in an arbor press, making sure the pressing force is applied to the inner race of the ball bearing. A sleeve with at least a 1/2-inch bore (that does not exceed 2 inches outside diameter) should be used.
 11. Secure end plate with four capscrews (3).
 12. After tightening capscrews, turn the shaft to make sure rotor is not binding in pump. (It may be necessary to hold shaft in vise when rotating body to check for binding.)
 13. Top shaft with a brass hammer. If this fails to center rotor, tap the other end of the shaft lightly. The rotor should turn freely.



Replacement Parts for 4401X-M12 12V DC Motor Driven 4-Roller Side-Port Pump

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ.
1	50102-1	12 Volt DC Motor	1
2	50158	Collar Coupler	1
3	15070	Snap Ring	2
4	15072	Ball Bearing	2
5	20468	Lip Seal, Viton	2
6	48229-1	Pump Body, Cast Iron	1
7	48234	Roller, Polypropylene, 1/2"	4
8	31661-18	1/2" Hollow Stainless Steel Shaft/ Powdered Metal Rotor	1
9	31350-142	Seal Ring, Buna-N	1
10	48231-12	Endplate, Cast Iron	1
11	48236	Screw	4
12	48337	Nameplate	1
13	48236	Screw	2
14	51430	Base Plate	1
15	50160	Lead, Positive w/ Fuse Holder	1
16	50161	Lead, Negative	1

44-4000RK 4-Roller Pump Repair Kit for 4401X-M12 Pump/Motor Assembly

PART NO.	DESCRIPTION	QUANTITY PER KIT
48234	Ultra Roller, 1/2" dia	4
20468	Lip Seal, Fluorocarbon (Viton)	2
31350-142	Seal Ring	1

MAX. RECOMMENDED PRESSURE: 100 psig (276 KPa)
MAX. RECOMMENDED TEMPERATURE: 120°F (50°C)