

# ***Balcrank***

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## **BOBCAT 130 SERIES**

1:1 Ratio Pump

*Multi-Purpose Transfer*

Models:

1110-001	General Lube
1110-003	General Lube
1160-002	Antifreeze
1160-003	Antifreeze




Thoroughly read and understand this manual before installing, operating or servicing this equipment.


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**OPERATION, INSTALLATION,  
MAINTENANCE AND REPAIR GUIDE**


# General Safety


Thoroughly read and understand this manual before installing, operating or servicing the described products.


	<p><b>! IMPORTANT</b></p>
<p>Because this pump can be incorporated into a pressurized systems, the following safety precautions should be observed.</p>	
<p>Check equipment regularly and repair or replace worn and damaged parts.</p>	
<p>Never alter or modify any parts of this pump, doing so may cause damage to pump and/or personal injury.</p>	
<p>Under no circumstances should the dispensing valve be aimed at any person at any time. Personal injury may result.</p>	
<p>Release pressures built up in the system before any service or repair is begun. See the pressure relief procedure below.</p>	
<p>Do not operate this pump above 150 PSI (10.3 BAR) air inlet pressure or 300 cycles per minute.</p>	
<p>Always read and follow the fluid manufacturer's recommendations regarding the use of protective eye wear, clothing and respirators.</p>	

	<p><b>! WARNING</b></p>
<p><b>WARNING:</b> Bobcat™ 3:1 pump (1130-005) develops 450 psi (30.7 Bar) maximum working pressure at 150 psi (10.3 Bar) maximum inlet air pressure and stall conditions. Be sure that any components or accessories used in the system are rated to withstand this pressure. To determine fluid output pressure at stall conditions, multiply the ratio of the pump by the air pressure being used.</p>	
<p><b>EXAMPLE:</b> 3:1 Pump Ratio x 100 psi air pressure = 300 psi fluid pressure at stall.</p>	

	<p><b>! WARNING</b></p>
<p><b>THIS PUMP CONTAINS ALUMINUM AND PARTS. DO NOT use</b></p>	
<p>1-1-1 Trichloroethane, methylene chloride or other halogenated hydrocarbon solvents or fluids containing such solvents in this pump. Use of these solvents/fluids may result in a violent chemical reaction, causing serious bodily injury, property damage or death. All fluids used in this pump must be chemically compatible with the wetted parts materials shown on page two (3) of this manual. Consult your chemical supplier to ensure compatibility.</p>	

	<p><b>! WARNING</b></p>
<p>Pressure Relief Procedure:</p>	
<p>Follow this procedure whenever you shut off the pump, when checking or servicing any part of the system and when installing, cleaning or changing any part of the system.</p>	
<ol style="list-style-type: none"> <li>1) Disconnect the air to the pump.</li> <li>2) Point dispensing valve away from yourself and others.</li> <li>3) Open dispensing valve until pressure is relieved.</li> </ol>	

	<p><b>! WARNING</b></p>
<p><b>DANGER:</b> Not for use with fluids that have a flash point below 100°F (38°C). Examples: gasoline, alcohol. Sparking could result in an explosion which could result in death.</p>	

	<p><b>! WARNING</b></p>
<p>In the presence of explosive vapors, take action to prevent static sparking. Failure to ground the pump, piping, valves, containers, or other miscellaneous equipment can result in fire or explosion. A green grounding lug is provided on the pump.</p>	

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## TECHNICAL DATA

Pressure Ratio.....	1.3:1
Air Pressure Operating Range.....	40-150 psi
Maximum Fluid Working PResure.....	195 psi
Effective Air Piston Area.....	1.77 sq. in.
Effective Fluid Piston Area.....	1.38 sq. in.
Stroke Length.....	3.88 in.
Air Inlet Port Size.....	1/4" NPTF
Fluid INlet Port Size.....	1" NPTF
Fluid Outlet Port Size.....	3/4" NPTF
Wetted Parts:	
(General Lube).....	Steel, Al, Acetal, Buna-N
(Antifreeze)....	300 Series S/Steel, Acetal, Viton
Noise Level (dBA).....	72-82
Shipping Weight: (Stub pump).....	14.5 lbs.
(Drum length).....	16.5 lbs.

## PERFORMANCE/FLOW CURVES

Note: Test Fluid 10W30 Motor Oil

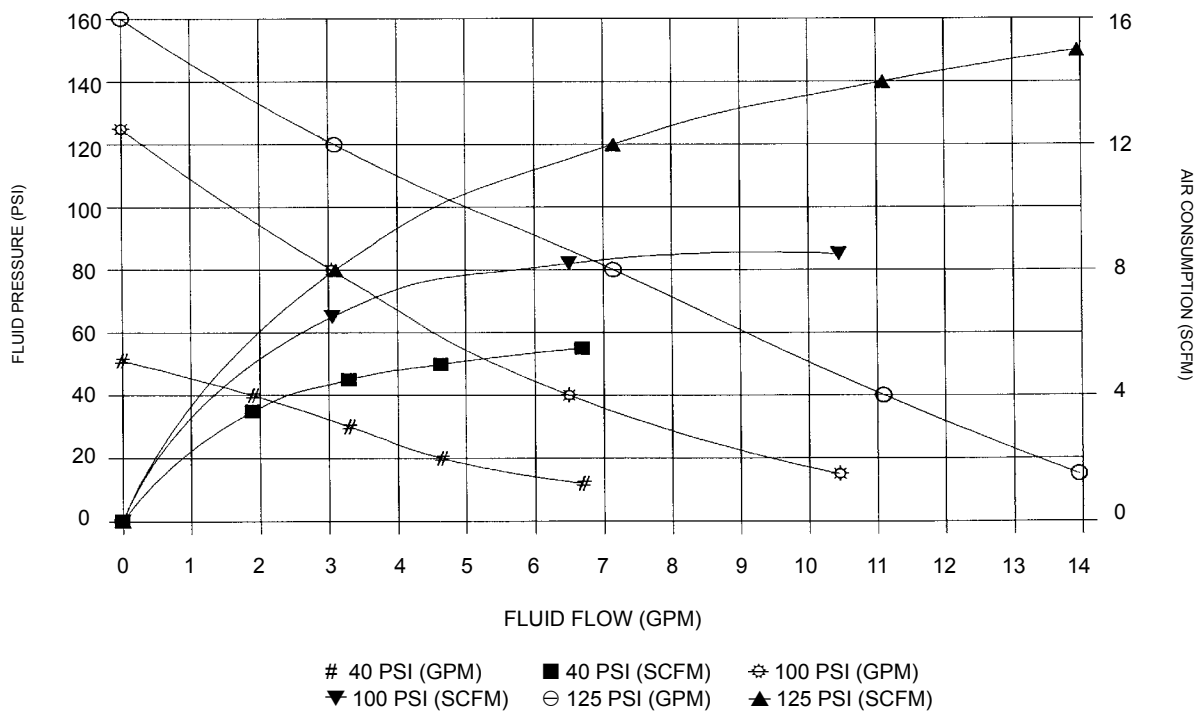


Figure 1  
Flow Curves

## PRODUCT DESCRIPTION

The “Bobcat 130” pump family replaces the earlier “Trans-Jet 130”, “131A-CB & 131A-CBL”, “121”, “Econo-Jet”™ (1.5:1) and P-160/P-161 food pumps. These pumps are suitable for petroleum products, chemicals, and USDA applications.

Four versions are currently available, two each in stub and drum lengths. The 1110-001 and 1110-003 are composed of carbon steel parts with Buna-N seals for long life.

The 1160-002 and 1160-003 have all “wetted parts” made from 304 SS or 316 SS and Viton and are USDA approved.

All pumps contain a pair of 1 inch Delrin® balls which provide compatibility for many fluids and a smooth flow on both pump strokes. For fluids more viscous than 90W gear lube, carbon steel or 300-series SS balls may be substituted.

All pumps are composed of a 2-piece body with the upper section being Aluminum and the lower section being Aluminum or 316 SS, depending on model number.

The lower section’s flanged coupling contains an 4-hole bolt pattern which allows 360° rotation of the inlet and outlet ports in 90° degree increments. This feature is useful when installing a pump on a wall bracket that limits orientation of the hoses.

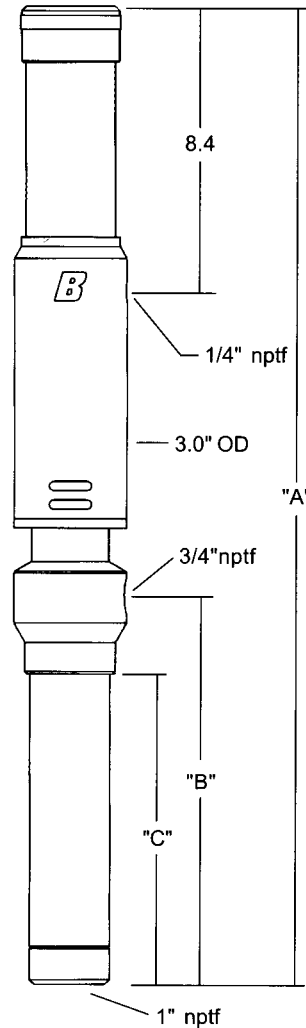
All pumps contain a pair of internal exhaust mufflers which provide efficient operation with low noise levels conforming to OSHA regulations. These mufflers also act as filters, inhibiting air line debris from exiting the pump where cleaner environments are required.

The 1 -piece pump/motor is factory-lubricated with a life-tested, synthetic grease (Balcrank #826733). This grease coats all internal parts and repels air line moisture to inhibit corrosion. Steel components exposed to air line moisture are surface treated to inhibit corrosion.

NOTE: Delrin® is a registered trademark of the DuPont Company

## DIMENSIONS & MOUNTING DIAGRAM

Figure 2  
Pump Dimensions



MODEL	OVERALL LENGTH		
	"A"	"B"	"C"
(Stub Length)			
1110-001	26.2"	9.8"	8.2"
1160-002	26.2"	9.8"	8.2"
(Drum Length)			
1110-003	50.4"	34.0"	32.4"
1160-003	50.4"	34.0"	32.4"

## INSTALLATION

Remove pump from carton and attach to cover, bung fitting or other mountings.

Blow out any foreign material from the air supply line before connecting to pump. An air line filter/regulator is recommended for all applications; wet and dirty air will shorten the life of the pump.

**NOTE:** For severe duty applications, an air line lubricator is recommended for better performance and longer pump life. Use an SAE 10 oil and set the lubricator for 2 drops per hour.

Be sure the air supply is OFF before connecting accessories and/or pump.

**NOTE:** *DO NOT* hang Filters/Regulators/Lubricators or other equipment of this type directly from pump air inlet. The fittings are not strong enough to support the weight and may cause one or more to leak and/or break. A bracket should be used to support the use of these products.



**CAUTION:** If you are not using a low-level cut-off at the pump fluid intake, install a pump runaway valve to shut off the air to the pump, when the pump accelerates beyond the pre-adjusted setting. A pump that runs too fast can be seriously damaged.

1. Install an air line regulator to control pump speed and air pressure for the system.
2. Install an air line filter to remove and trap contaminants that could cause unwanted wear and tear on pump air motor.
3. Install a quick disconnect coupler to relieve air pressure between the pump air motor and regulator for servicing purposes later.
4. Install fluid hose, making note of fluid and pressure compatibility of hose.

## TYPICAL INSTALLATIONS

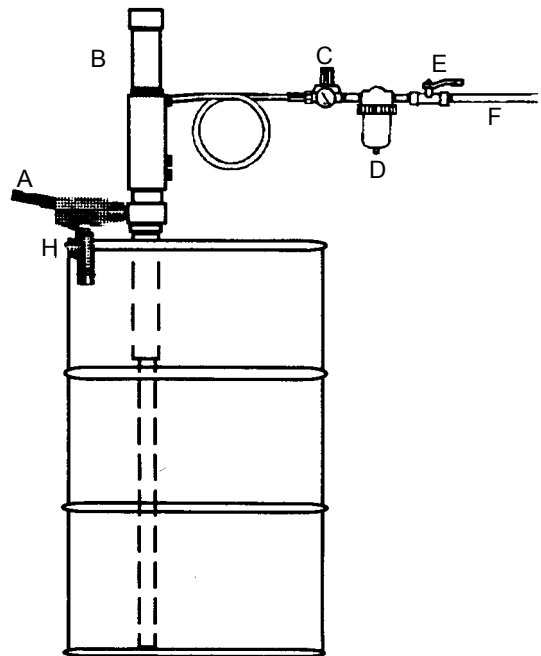


Figure 3  
Drum Installation

- A Fluid Outlet
- B 1:3 to 1 Ratio Pump
- C Air Regulator
- D Air Filter/Separator
- E Shut Off Valve
- F Air Supply
- H Pressure Relief Valve

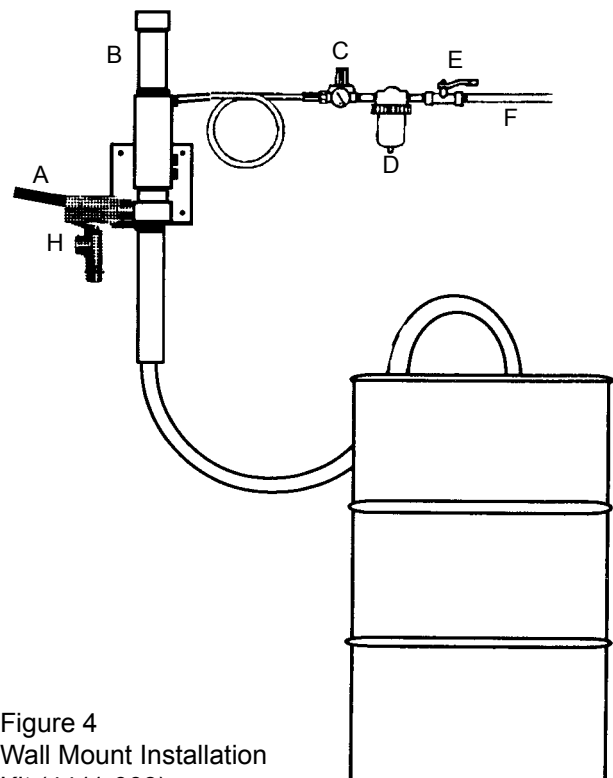


Figure 4  
Wall Mount Installation  
Kit (4411-008)

# OPERATION


**NOTE:** All fluids used in this pump must be chemically compatible with the materials used to manufacture the “wetted parts”. Consult your chemical supplier to ensure compatibility.

## TO START PUMP:


1. Connect air coupler to pump and turn the air regulator to the minimum setting.
2. Direct outlet hose into an approved waste oil container.
3. Slowly adjust air regulator until pump is primed and is running smoothly. Be sure all air has been purged from system. The pump should only take a few strokes to prime. However, in a large system, it may take longer.
4. Use the air regulator to control the pump speed and cycle rate. Always use the lowest pressure needed to obtain the desired flow rate. This will increase pump and seal life!
5. Never allow a pump to run dry of the fluid being pumped. A dry pump quickly speeds up and can damage the air motor. If it speeds up, shut off air supply immediately. Refill the supply container and prime the pump to eliminate air in the fluid line.

**NOTE:** To prevent air from being sucked into the pump and fluid lines, if the supply container should run dry, use a low-level cutoff valve at the pump fluid intake. (4411-004, 3/4” fluid intake)

6. Read and follow the instructions supplied with each component in your system.
7. If the pump will be unattended for any period of time, or to shut off the system at the end of the work shift, *always* follow the **Pressure Relief Procedure**.

 <b>WARNING:</b> Pump develops 195 psi (13.3 bar) maximum working pressure at 150 psi (10.3 bar) maximum inlet air pressure. NEVER exceed the maximum working pressure of the lowest rated equipment of your system.
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 <b>CAUTION:</b> Before servicing reduce fluid supply pressure to zero.
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	<b>WARNING</b>
	<b>PRESSURE RELIEF PROCEDURE:</b> Follow this procedure whenever you shut off the pump, when checking or servicing any part of the system and when installing, cleaning or changing any part of the system. 1 ) Disconnect the air to the pump. 2) Point dispensing valve away from yourself and others. 3) Open dispensing valve until pressure is relieved.

# TROUBLESHOOTING GUIDE

**NOTE:** Check all other possible causes before disassembling the pump.

 **CAUTION:** Before servicing reduce fluid supply pressure to zero.

## Pressure Relief Procedure:

To reduce the risk of serious bodily injury, including fluid injection or splashing into the eyes and/or onto the skin, follow this procedure below before maintaining and/or repairing the pump, solenoid and/or impulse meter or any part of your system.

1. Disconnect the air supply from the pump.
2. Open the dispensing valve into an approved waste container to relieve pressure on the system.
3. Leave any bleed-type drain valves open until you are ready to use the system again.

TROUBLE	PROBABLE CAUSES	REMEDY
Pump does not operate	Inadequate air supply pressure or restricted air line Clogged fluid lines, hoses, valves, etc. Damaged air motor Empty fluid supply	Increase air supply; clear <sup>(1)</sup> Open; clear <sup>(1)</sup> Service/replace air motor Refill, reprime and/or flush
Air motor not tripping over	Air motor o-rings are worn/damaged	Service/replace air motor
Air leaking from exhaust	Worn or damaged air motor o-ring and/or seal, etc.	Service/replace air motor
Fluid leaking from exhaust	Seal (30) is worn and/or damaged	Replace
Erratic pump operation	Air entering suction line Fluid level too low Air motor icing	Check for loose connections Refill, reprime or flush Run pump at lower pressure; run at lower cycles per minute; clean mufflers
Pump runs "wild"	Empty fluid supply Blockage in pump tube or footvalve Lower ball is stuck in footvalve Lower seal (6) on fluid piston is worn or damaged	Refill, reprime or flush Remove pump tube; clean blockage Replace ball and reseal footvalve Replace with new seal
Fluid output on one stroke only or continues to operate when dispensing valve is closed	Retainer (38) is broken (ball floats with fluid) Upper ball (14) is lodged in piston (15)	Service and replace Service and replace
Pump operates, but output low on both strokes	Inadequate air supply pressure or restricted air lines Closed or clogged solenoid valve, meter, dispensing valve, etc. Empty fluid supply Air inlet strainer/filter clogged	Increase air supply; increase delivery line size Clear <sup>(1)</sup> Refill, reprime or flush Clear <sup>(1)</sup>

(1) Follow the **Pressure Relief Procedure**, above and disconnect the fluid line. If the pump star when the air is turned on again, the line, etc. is clogged.

# Pump Schematic Bobcat 130 Series 1:1 Ratio Pump

This assembly used on Model Nos. 1110-003 and 1160-003

This assembly used on Model Nos. 1110-001 and 1160-002

These assemblies used on all Bobcat 130 pumps

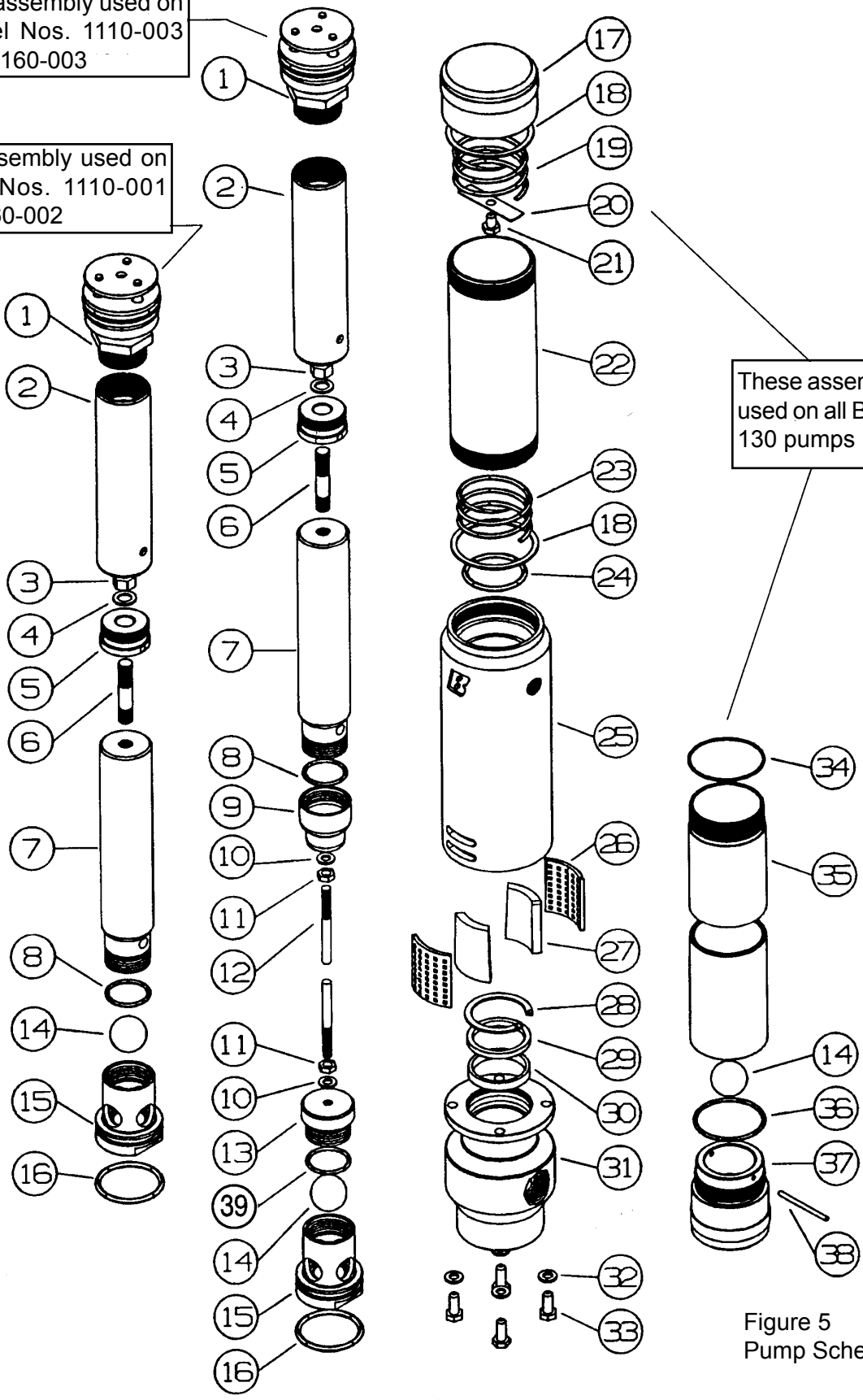


Figure 5  
Pump Schematic



Parts List			1110-001	1160-002	1110-003	1160-003
ITEM	PART	DESCRIPTION				
1	827710	AIR VALVE ASSEMBLY	1	1	1	1
2	826658	UPPER PUMP ROD	1	1	1	1
3	805723	CRIMP NUT	1	1	1	1
4	805756	WASHER	1	1	1	1
5	826052	ADAPTOR	1	1	1	1
6	826680	ROD	1	1	1	1
7	827414	LOWER PUMP ROD (ALUM)	1		1	
	827415	LOWER PUMP ROD (316SS)		1		1
8	820015	#120 O-RING (BUNA-N)	1		1	
	827441	#120 O-RING (VITON)		1		1
9	827416	PUMP ROD ADAPTOR (ALUM)			1	
	827417	PUMP ROD ADAPTOR (316SS)				1
10	827428	LOCK WASHER (18-8SS)			2	2
11	827429	NUT (18-8SS)			2	2
12	827418	CONNECTING ROD (STL)			1	
	827419	CONNECTING ROD (316SS)				1
13	827420	PISTON ADAPTOR (ALUM)			1	
	827421	PISTON ADAPTOR (316SS)				1
14	827168	"1" BALL (DELFIN)	2	2	2	2
15	827422	FLUID PISTON (ALUM)	1		1	
	828988	FLUID PISTON (316SS)		1		1
16	816853	#223 O-RING (BUNA-N)	1		1	
	827065	#223 O-RING (VITON)		1		1
17	826660	CAP (ALUM)	1	1	1	1
18	828529	FLAT GASKET (NYLON)*	2	2	2	2
19	826663	SPRING*	1	1	1	1
20	826664	SPRING RETAINER	1	1	1	1
21	826665	"1/4-20 X 1/2" SCREW"	1	1	1	1
22	827727	AIR PISTON TUBE (STL)	1	1	1	1
23	808439	SPRING*	1	1	1	1
24	807342	#222 O-RING (BUNA-N)*	1	1	1	1
25	827780	UPPER BODY (ALUM)	1	1	1	1
26	827767	MUFFLER SCREEN (BRASS)	2	2	2	2
27	827766	MUFFLER FOAM ***	2	2	2	2
28	827426	RETAINING RING	1	1	1	1
29	827425	BACKUP RING (BRASS)	1	1	1	1
30	826071	WIPER SEAL (BUNA-N)**	1		1	
	826072	WIPER SEAL (VITON)***		1		1
31	828365	LOWER BODY (ALUM)	1		1	
	828366	LOWER BODY (316SS)		1		1
32	829002	LOCK WASHER (STL)	4	4	4	4
33	829001	"1/4-20 x 3/4" SCREW (STL)"	4	4	4	4
34	826678	# 33 O-RING (BUNA-N)**	1		1	
	826679	#132 O-RING (VITON)***		1		1
35	828361	PUMP TUBE (STL)	1			
	828363	PUMP TUBE (304SS)		1		
	828362	PUMP TUBE (STL)			1	
	828364	PUMP TUBE (304SS)				1
36	826678	#133 O-RING (BUNA-N)**	1		1	
	826679	#132 O-RING (VITON)***		1		1
37	826060	FOOTVALVE (STL)	1		1	
	829027	FOOTVALVE (316SS)		1		1
38	827427	RETAINING PIN (316SS)****	1	1	1	1
39	827062	#215 O-RING (BUNA-N)		1		
	827063	#215 O-RING (VITON)				1

## PUMP SERVICING

**NOTE:** Air motor is lubricated with a life tested synthetic grease (Balcrank P/N 826733) at the factory. This grease coats all parts and repels air line moisture to inhibit corrosion. It is imperative that any grease removed during routine maintenance be replaced. Contact your local Balcrank Distributor, using the above part number, for replacement grease.

**NOTE:** The following steps and item numbers pertain to the stub pumps. Except for a few fluid section components (pump tube, pump rod, fluid piston, etc.), stub and drum pumps are alike. When repairing a drum pump, pay close attention to different parts that may carry the same item number as their stub counterparts, such as the pump tube (35).

**Repair Kits:** There are three kits available to repair the stub and drum "Bobcat 130" pumps:

- \* 827711 (air piston parts for all pumps)
- \*\* 828069 (fluid seals for carbon steel pumps)
- \*\*\* 828070 (fluid seals for stainless steel pumps).

**NOTE:** A complete list of materials for each repair kit is on page 11 - Repair Kits

**CAUTION:** Before servicing reduce fluid supply pressure to zero.

### Pressure Relief Procedure:

To reduce the risk of serious bodily injury, including fluid injection or splashing into the eyes and/or onto the skin, follow this procedure below before maintaining and/or repairing the pump, solenoid and/or impulse meter or any part of your system.

1. Disconnect the air supply from the pump.
2. Open the dispensing valve into an approved waste container to relieve pressure on the system.
3. Leave any bleed-type drain valves open until you are ready to use the system again.

## PUMP SERVICING

**Pump Disassembly:** This operation must be performed before continuing to the following sections. See page 11 for applicable repair kits.

Grip the upper pump body (25) in a padded-jaw or smooth-jaw vise. Unscrew air piston tube (22), with cap (17) attached, from the upper body. Unscrew the pump tube (35), with footvalve (37) attached, from the lower body (31).

Place a 1/4" diameter rod through hole at the bottom of the lower pump rod (7). Use an adjustable wrench to unscrew the fluid piston (15) from the pump rod. Remove ball (14) and set aside. Grip air motor assembly (1) by hand and pull out the entire assembly (air motor and both pump rods). Wrap the pump rods to prevent damaging the surfaces. Keep the lower spring (23) with the rod.

**Upper Body O-ring Replacement:** O-ring (24) can be removed by using a curved pick or small-bladed screw driver. Wipe O-ring groove to remove debris and replace.

**Lower Body Seal Replacement:** This seal must be replaced each time the lower rod is pulled through the body.

The wiper seal (30) is replaced by removing screws (33) and washers (32) and separating the upper (25) and lower (31) body sections. Use snap ring pliers to remove the retaining ring (28). Remove the backup ring (29) and seal (30). Apply Balcrank lubricating grease (p/n 826733) to the seal area and install a new seal flairedside down. Work carefully to avoid seal tearing around the snap ring groove. Reassemble in reverse order.

**Lower Spring and Air Motor Replacement:** Replace the spring (23) by sliding off the old spring and sliding on the new part. The air motor (1) is a 1-piece, staked assembly that cannot be disassembled for repair of internal O-rings or upper seal. Replace the entire assembly using Balcrank Repair Kit 827711.

Wrap the upper pump rod (2) with protective sheet material or use wood/plastic blocks to grip it in a vise. Use a wrench to remove the air motor assembly at the hex adaptor/pump rod (1/2) joint. **Note:** If the upper pump rod needs replacement, do so before the new air motor is installed (refer to Replacing the Upper Pump Rod). Apply thread adhesive to the air motor before installation.

**Upper Spring and Flat Seal Replacement:** Unscrew cap (17) from air piston tube (22). Remove screw (21), spring retainer (20) and spring (19) and lift out upper gasket (Item 18, 1 of 2). Reassemble in reverse order. Replace the lower gasket (Item 18,2

of 2) while the tube is off the body (25). Be sure the new gasket is flat against the body before assembling the tube.

**Replacing Parts in the Footvalve:** Grip pump tube (35) and footvalve (37) with separate pipe wrenches. Unscrew the footvalve, drive out retainer pin (38) with a 1/8" diameter punch, remove lower ball (14) and/or O-ring (36) as necessary. When reassembling the pump tube to the lower pump body, be sure to check the upper O-ring (34) for damage and replace as necessary. Apply grease to the footvalve threads and O-rings (34,36) and reassemble.

**Replacing the Upper Pump Rod:** Grip only the upper rod in a vise. Use a 1/8" spanner wrench to remove the floating joint adapter (5) and air motor assembly (1) from the upper rod. Wrap the replacement upper rod in protective material before placing in the vise. Apply thread adhesive to both internal threads of the pump rod and reassemble the connecting parts.

**Replacing the Lower Pump Rod:** Grip only the lower rod in a vise. Use a 1/8" spanner wrench to remove the floating joint adapter (5) from the upper rod (2). Wrap the upper rod and air motor assembly and set aside.

Use an adjustable wrench to remove lock nut (3). Slide offwasher (4) and adapter (5). Remove connecting rod (6) with a pipe wrench. Wrap replacement lower rod in protective sheet material before placing in the vise. Apply thread adhesive to the connecting rod and reassemble with the short thread length into the rod. Replace the washer, adapter and nut. Tighten nut completely then back off 1/4-tum to allow free movement of adapter. Apply thread adhesive to the adapter and reassembly.

**Pump Reassembly:** Apply grease to the lower pump rod end, wiper seal (30) and O-ring (24). Slide the lower spring (23) over the upper pump rod and then the entire upper rod/lower rod/air motor assembly through the pump. Some resistance will be encountered as the lower rod passes through the wiper seal. Reinstall the upper ball (14) and piston (15). Insert a 1/4" diameter rod through the pump rod and tighten the fluid piston with a wrench. File off any burrs or raised areas created during the repair process.

Grease O-rings (16,34) and pump tube (35) threads before reassembling to the body. Tighten with a pipe wrench. Grease the air motor assembly and inside the tube (22), reassemble and tighten with a strap wrench.

## ACCESSORIES

### Air Regulators

- 3260-028** 1/4" nptf (mini)
- 3260-029** 1/4" nptf
- 3230-003** 3/8" notf

### Air Filter/Regulators

- 3260-033** 1/4"nDtf (mini)
- 3260-034** 1/4" nptf
- 3260-002** 3/8" notf

### Pump Over-Run Controls

- 3241-001** 1/2" npt
- 3241-002** 1/4" npt

### In-Line Hand Operated Valves

- 3230-003** 300 psi (air), 1/4" npt
- 3260-002** 2,000 psi, 1/2" npt

### Spigot & Tube Kit

- 4410-009**
  - Gooseneck spigot
  - 1" npt X 26.5" suction tube
  - Air hose
  - Air coupler and nipple
  - Bung Adapter

### Telescoping Suction Tube

- 4412-004**
  - 1"npt (fits 55 gal drum and 250 gal tank)

### Hose & S/S Tube Kit

- 4410-013**
  - Suction tube, 304 SS, 1" npt
  - Air hose, 1/4" npt x 3 ft.
  - Air coupler, needle valve and nipple

### Hose & Tube Kit

- 4410-010**
  - 1" npt telescoping suction tube
  - Air eliminator set (float and retainer)
  - Air hose, 1/4" npt x 3 ft.
  - Fluid hose, 3/4" npt x 5 ft.
  - Bell coupling, 3/4" nptx 1" npt
  - Air coupler, needle valve and nipple

### Hose & Tube Kit

- 4410-011**
  - 1" NPT telescoping suction tube
  - Air hose, 5/16" npt x 3 ft.
  - Fluid hose, 3/4" npt x 5 ft.
  - Air coupler and nipple
  - Bung Adapter

### Nozzle Kit

- 4410-012**
  - 1" NPT telescoping suction tube
  - Air hose, 1/4"npt x 3ft.
  - Fluid hose, 3/4" npt x 5 ft.
  - Ball valve, 3/4" npt
  - Dispensing nozzle
  - Air coupler, needle valve and nipple

### Bung Adapter Kit

- 4411-009**
  - Mounts all Bobcat 130 pumps to 2" npt bung threads and wall mount brackets

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## REPAIR KITS

### Air Valve Kit

- 827711**
  - Fits all pump models
  - 1-piece staked air valve assembly
  - Buna-N O-rings and flat gaskets

### Suction End Seal Kit

- 828069**
  - Repairs suction end of carbon steel pumps (1110-001 & 1110-003 series)
  - Bun'a:N fluid seals/O-rings, Delrin balls

### Suction End Seal Kit

- 828070**
  - Repairs suction end of stainless steel pumps (1160-002 & 1160-003 series)
  - Viton fluid seals/O-rings, Delrin balls

**For Warranty Information Visit:  
[www.balcrank.com](http://www.balcrank.com)**

Balcrank Corporation  
Weaverville, NC 28787  
800-747-5300  
800-763-0840 Fax

**Revision Log:**

Rev. K - Item 14 (1" Ball Delrin) removed from  
repair kits (828069 & 828070) per  
ECN 13719

SERVICE BULLETIN SB1028  
Rev. K 10/14