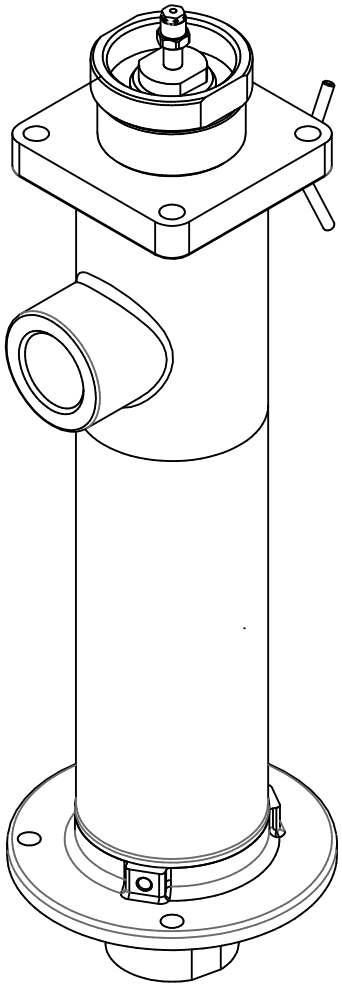
User and maintenance instructions

Pile Driver III pump assembly

Models 2328, 2356, 84923, series “C”



Date of issue	**February 2018**
Form number	**404395**
Version	**2**

Contents

Explanation of safety signals

NOTE

Emphasizes useful hints and recommendations as well as information for efficient and trouble-free operation.

⚠ CAUTION

Indicates a dangerous situation that can lead to light personal injury or property damage if precautionary measures are ignored.

⚠ WARNING

Indicates a dangerous situation that can lead to death or serious injury if precautionary measures are ignored.

⚠ DANGER

Indicates a dangerous situation that will lead to death or serious injury if precautionary measures are ignored.

Safety

- Read and carefully observe operating instructions before unpacking and operating pump. Pump must be operated, maintained and repaired exclusively by persons familiar with operating instructions. Local safety regulations regarding installation, operation and maintenance must be followed.
- Operate this pump only after safety instructions and this service manual are fully understood.

Gland packing design

Many industrial type materials (sealants, adhesives, inks, etc.) display a tendency to dry out and build up on pump plunger rod. Hard, dried out materials cause gland packing to wear rapidly, resulting in leakage and pump failure. Also problematic is gland seal exposure to high pressure and in particular, to pressure fluctuation during pump operation (stroke change over).

The gland packing design of Pile Driver III pumps addresses both problems.

Externally, a special spring-type metal wiper (**5**) scrapes built-up and dried material from pump plunger before it is pulled through gland packing on down stroke. In order to help metal wiper work longer and more efficiently, lubrication well of pump should be filled with a fluid compatible with material being pumped.

Do not fill lubrication well to full capacity, as reciprocating movement of pump may draw fluid into airmotor.

Internally, a special protection sleeve (**9**) with concentric grooves creates a labyrinth path that reduces effects of internal pressure and stroke change over fluctuation on gland seal. In addition, a second internal wiper limits gland seal exposure to pumped material.

The combination of metal wipers and protection sleeve results in longer gland seal life and helps to prevent leakage.

Specifications

Pump stroke	6 in *(152 mm)*
Output per cycle	85 in^3 *(1 393 cm^3)*
Operating temperature	–30 to +160 °F *(–34 to +71 °C)*
Recommended speed	max. 75 cycles/min
Output at 75 cycles/minute	27.6 gal/min *(104,5 l/min)*
Wetted part materials	carbon steel, bronze, polyurethane, nitrile
Weight	69 lb *(31,3 kg)*

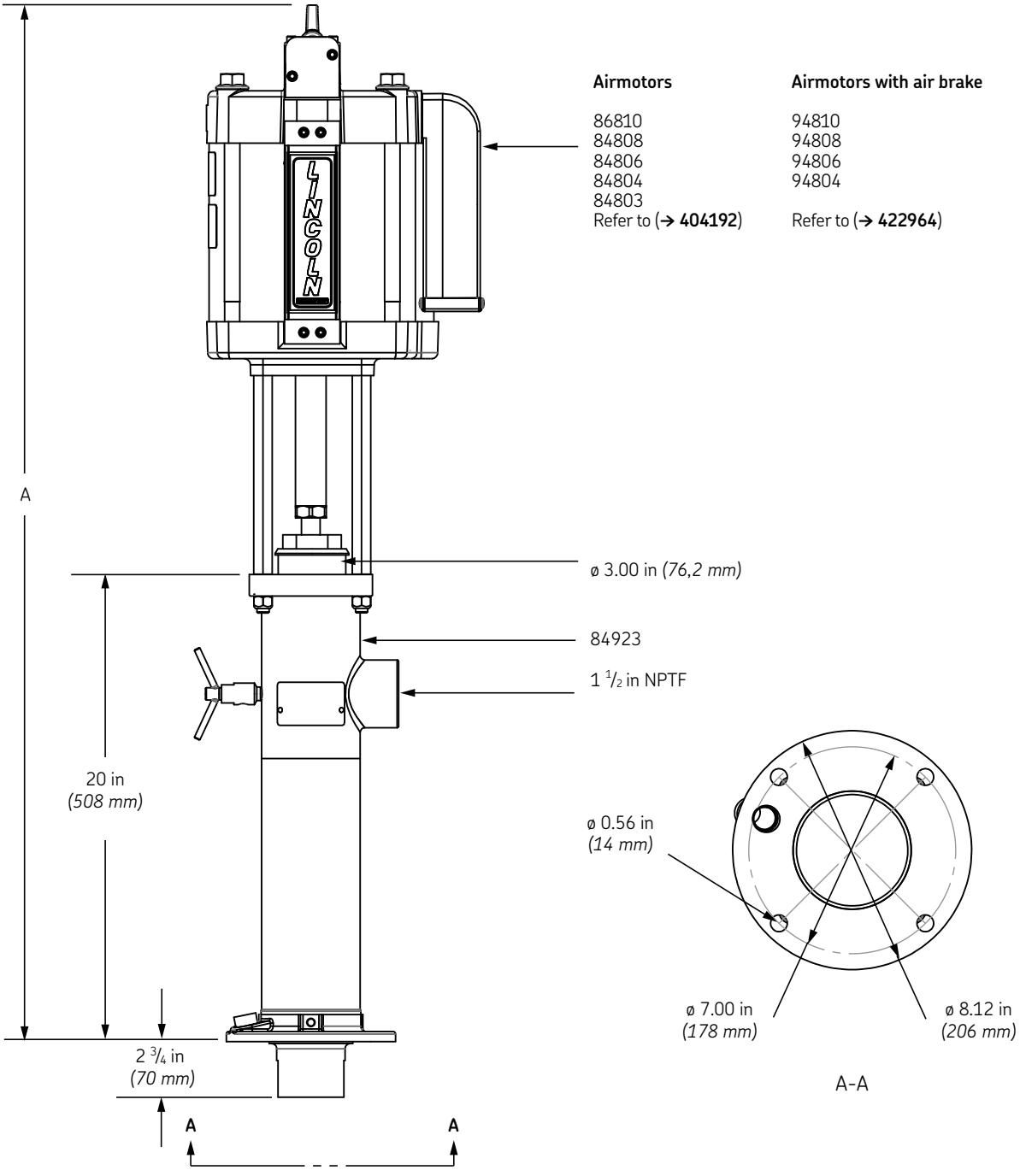
Model chart

Pump model	Airmotor *	Ratio	Maximum delivery pressure		Maximum air pressure	
			psi	*bar*	psi	*bar*
–	86810	10:1	1 000	*69*	100	*7*
2328	84808	6:1	600	*41*	100	*7*
2356	84806	3:1	300	*21*	100	*7*
–	84804	1.5:1	300	*21*	200	*14*
–	84803	1:1	200	*14*	200	*14*

* Refer to (**→ Airmotor owner/operator manual**, **404192**).

Fig. 1

Dimensions



Airmotors	Airmotors with air brake
86810	94810
84808	94808
84806	94806
84804	94804
84803	
Refer to (→ **404192**)	Refer to (→ **422964**)

Dimensions

Pump tube	Airmotor	Airmotor with air brake	A	
			in	*mm*
84923	86810	94810	42 3/4	*1 086*
84923	84808	94808	42 3/4	*1 086*
84923	84806	94806	42 3/4	*1 086*
84923	84804	94804	43 5/8	*1 108*
84923	84803	–	43 5/8	*1 108*

NOTE

Install pump in upright position.

Use model 83727 stand pipe for bulk material dispensing.

Locate pump as close to tank as possible with minimum 3 in *(76 mm)* ID inlet hose or pipe.

Attach airmotor to pump tube

1. Tightly attach tie rods to airmotor (use short threaded end of tie rods).
2. Mount airmotor on top of pump tube outlet and tightly connect coupling nut (**2**) to airmotor piston rod.
3. Hand tighten tie rods to pump tube with four nuts supplied with airmotor.
4. Slowly cycle pump several times, using just enough air pressure to operate pump without stalling.
5. Stop pump on an "up" stroke and tighten four nuts to securely fasten airmotor to pump tube.

⚠ WARNING

Do not exceed stated maximum working pressure of pump or of lowest rated component in system.

Do not alter or modify any part of equipment.

Do not operate equipment with combustible gas or fuel, gasoline, diesel fuel, kerosene, etc.

Do not attempt to repair or disassemble the equipment while the system is pressurized.

Securely tighten all fluid connections before using equipment.

Read and follow fluid manufacturer's recommendations regarding fluid compatibility, and use of protective clothing and equipment.

Check all equipment regularly and repair or replace worn or damaged parts immediately.

Check equipment for proper operation before each use. Safety devices should be in place and operating properly.

Failure to comply may result in equipment damage and/or serious personal injury, fire, explosion or property damage.

⚠ WARNING

Do not operate pump without proper grounding. Pump, dispensing valve and containers must be grounded when handling inflammable fluids, such as petroleum products, paints, lacquers, etc. and wherever discharge of static electricity is a hazard.

Failure to comply may result in fire or explosion.

NOTE

Do not allow pump to operate when out of material.

Operation precautions

- Use Lincoln replacement parts to assure compatible pressure rating.
- Heed all warnings.
- Material hoses and other components must be able to withstand fluid pressures developed by pump.
- Do not operate pump continuously at speeds in excess of 75 cycles per minute.
- Disconnect air line from pump airmotor when system sits idle for long periods of time.
- Do not service or clean pump, or remove fluid hose or gun from unit without first disconnecting air lines and bleeding pressure from system.
- Check static wire connection with ohmmeter. Place one probe on one hose fitting and other probe on other hose fitting. Proper grounding through hose is good when reading is obtained on ohmmeter.
- Do not pump, flush or recirculate volatile solvents without adequate ventilation. Failure to comply may result in fire.
- Keep solvents away from heat, sparks and open flames. Keep containers closed when not in use.

Pump prime

To begin operation, pump has to be primed with pumped material. Pile Driver III pump is a double acting (pumps material on "up" and "down" stroke) positive displacement reciprocating pump and intakes material only on the "up" stroke.

To prime pump:

1 Open output line (material valve) and slowly open air supply valve until pump starts.
2 Allow pump to cycle very slowly until all air is pushed out of lines and material fills up pump and lines.
3 Close output line (material shut-off valve). Pump should stall against pressure.
4 If pump fails to prime properly, open bleeder valve (**12**) slightly to expel trapped air. Tightly close valve at first sign of material coming out of valve.

When repairing pump, reassemble in vertical position to achieve optimum life of seals and packings.

Outlet position adjustment

Position of pump outlet may be adjusted by loosening three set screws (**30**) and rotating pump tube outlet into position desired. Tighten screws to 25 lbf-ft *(18,4 Nm)*.

NOTE

Flush pump before using to prevent contamination of material to be pumped. Pumps are factory tested with light oil and some remains to protect pump parts during storage and transportation.

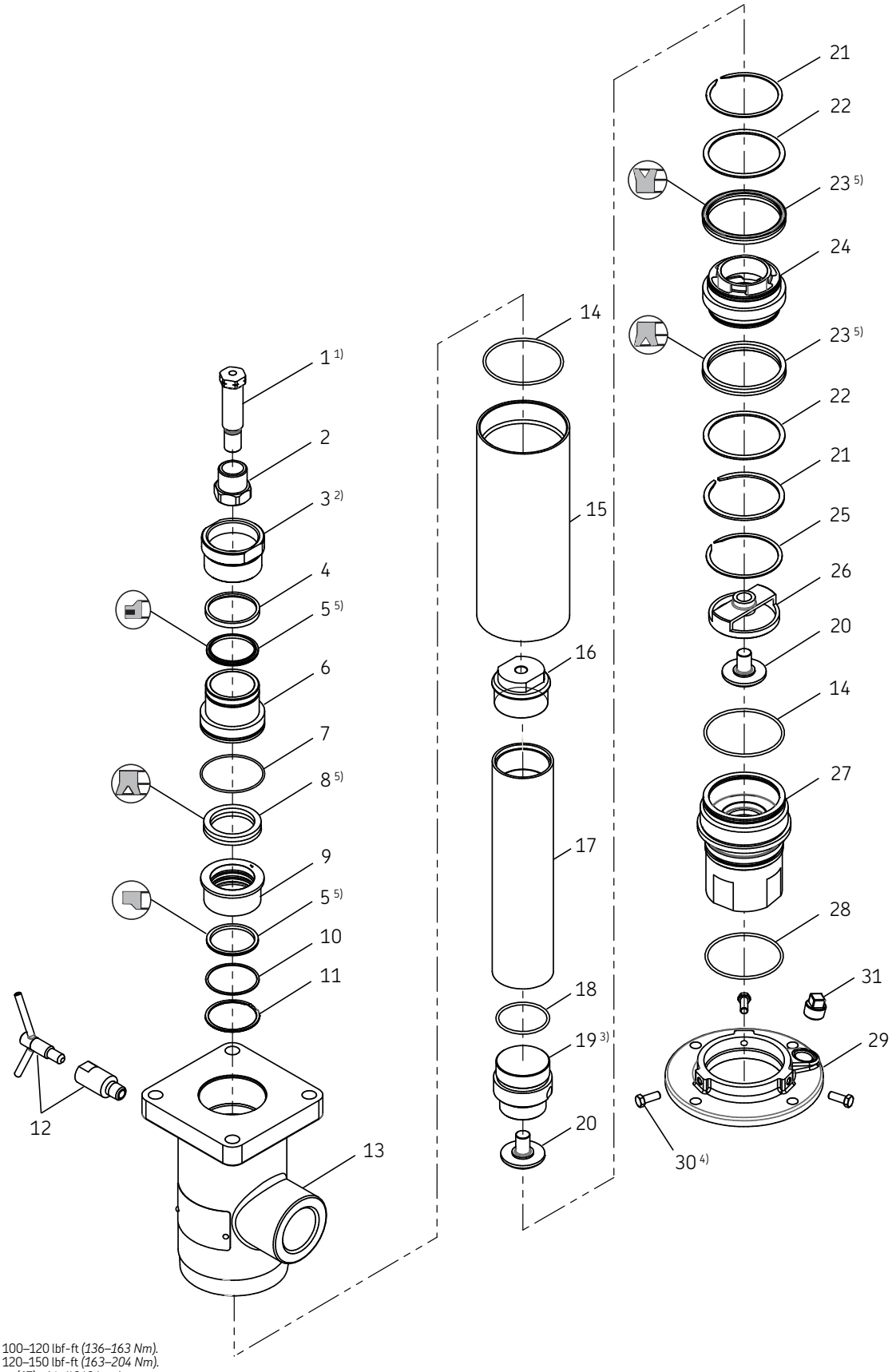
Disassembly

Standard tools required are:

9/16 in wrench	(**30**)
5/8 in wrench	(**31**)
3/4 in wrench	(**12**)
7/8 in wrench	(**1**)
1 1/4 in wrench	(**2**)
2 in wrench	(**16**)
3 3/4 in wrench	(**27**)
4 1/8 in wrench	(**3**)
4 3/4 in dia. strap wrench	(**15**)
2 screwdrivers	(**6**, **11**, **21**, **25**)

1 Remove screws (**30**) from mounting flange (**29**).
2 Remove mounting flange (**29**) from inlet bushing (**27**).
  2.1 Remove pipe plug (**31**) from mounting flange (**29**).
3 Remove inlet bushing (**27**) from pump tube (**15**).
  3.1 Remove O-ring (**28**) from inlet bushing (**27**).
  3.2 Remove O-ring (**14**) from inlet bushing (**27**).
  3.3 Remove retaining ring (**25**) from inlet bushing (**27**).
  3.4 Remove check guide (**26**) and check (**20**) from inlet bushing (**27**).
4 Remove bolt connector (**1**) from end plug (**16**).
  4.1 Slide coupling nut (**2**) off bolt connector (**1**).
5 Remove piston and plunger assembly from bottom of pump tube (**15**).
  5.1 Remove piston assembly from piston (**19**).
  5.2 Remove check (**20**) from piston (**19**).
  5.3 Remove retaining rings (**21**) from piston (**24**).
  5.4 Remove washers (**22**) and U-cups (**23**) from piston (**24**).
  5.5 Remove piston (**19**) from piston tube (**17**).
  5.6 Remove O-ring (**18**) from piston (**19**).
  5.7 Remove end plug (**16**) from piston tube (**17**).
6 Remove pump tube (**15**) from outlet body (**13**).
7 Remove O-ring (**14**) from outlet body (**13**).
8 Remove bleeder valve (**12**) from outlet body (**13**).
9 Remove gland nut (**3**) from outlet body (**13**).
  9.1 Remove wiper (**5**) and spacer (**4**) from gland nut (**3**).
10 Remove bushing (**6**) from outlet body (**13**).
  10.1 Remove O-ring (**7**) and U-cup (**8**).
11 Remove sleeve (**9**), wiper (**5**), washer (**10**) and retaining ring (**11**) from outlet body (**13**).
12 To reassemble pump, reverse disassembly procedure. Refer to (→ **Fig. IPB 1, page 7**) for torque specifications.

Fig. IPB 1



1) Torque to 100–120 lbf-ft *(136–163 Nm)*.
2) Torque to 120–150 lbf-ft *(163–204 Nm)*.
3) Assemble to (**17**) with #242 Loctite.
4) Torque to 24–26 lbf-ft *(33–35 Nm)*.
5) Install wipers (**5**) and U-cups (**8**, **23**) in direction shown in enlarged views.

Parts list

Item	Description	Quantity	Part number
1	Bolt connector, 7/8 in hex	1	236225
2	Coupling nut, 1 1/4 in hex	1	237051
3	Gland nut, 4 1/8 in flats	1	272833
4	Spacer	1	272835
5	Wiper	2	241603 [1]
6	Bushing	1	272834
7	O-ring, polyurethane	1	239921 [1] [2] [3]
8	U-cup, polyurethane	1	239927 [1] [2] [3]
9	Sleeve	1	247272
10	Washer	1	247280 [1]
11	Retaining ring	1	247278 [1]
12	Bleeder valve, 3/4 in flats	1	84012
13	Outlet body	1	241046
14	O-ring, polyurethane	2	239920 [1] [3]
15	Pump tube	1	239915
16	End plug, 2 in flats	1	239922
17	Piston tube	1	239916
18	O-ring, polyurethane	1	239932 [1] [3]
19	Piston	1	241019
20	Check	1	241037
21	Retaining ring	2	239906 [1]
22	Washer	2	239905
23	U-cup, polyurethane	2	239904 [1] [3]
24	Piston	1	241061
25	Retaining ring	1	241036 [1]
26	Check guide	1	241035
27	Inlet bushing, 3 3/4 in flats	1	246919
28	O-ring, nitrile	1	246837 [1] [3]
29	Mounting flange	1	246920
30	Hex cap screw, 9/16 in hex	3	272821
31	Pipe plug, 5/8 in square	1	67224

[1] Included in repair parts kit 241682.
[2] Included in gland seal kit 85316.
[3] Included in seal kit 84924.

Pump tube service kits

	Polyurethane	Fluorelastomer
Repair kit	241682	–
Seal kit	84924	84925
Gland seal kit	85316	85326

Repair kit contains all parts needed for complete pump tube rebuild.
Polyurethane seal kit contains all soft seals.
Fluorelastomer and polyethylene seal kits contain gland and piston U-cups only.
Gland seal kits contain gland U-cup and O-ring only.

Troubleshooting

Condition	Possible cause	Corrective action
Pump does not operate.	Restricted or inadequate air supply.	Check air supply pressure and air hose diameter for minimum air supply hose diameter.
	Obstructed material output.	Check output line for restrictions.
Pump speeds up or runs erratically.	Pump is not primed.	Prime pump (→ **Pump prime**, **page 6**).
	Insufficient material supply.	Refill material supply.
	Material is too heavy for priming.	Decrease output with material valve Increase pressure to pressure primer (if in use). Check for inlet restrictions.
Pump operates on “down” stroke only (missing “up” stroke).	Worn or damaged piston U-cup (**23**) or piston check (**20**, **24**).	Check and replace if needed.
Pump operates on “up” stroke only (missing “down” stroke).	Worn or damaged inlet check (**20**, **27**).	Check and replace if needed.
	Insufficient material supply. Pump is not taking in enough material to dispense on both strokes.	Check inlet for restrictions. Decrease output with material valve.
Pump is operating but not dispensing material.	Inlet check (**20**, **27**) is not seating or is damaged.	Check and replace if needed.

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Warranty

The instructions do not contain any information on the warranty. This can be found in the General Conditions of Sales, available at: www.lincolnindustrial.com/technicalservice or www.skf.com/lubrication.

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February 2018 · Form 404395 Version 2