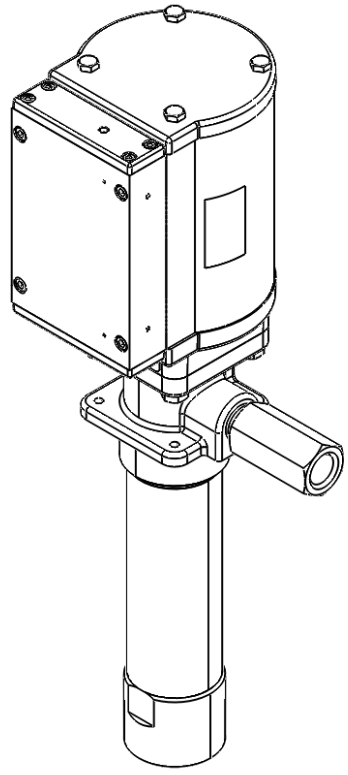
LINCOLN

PMV oil pump

Model V406000000, series “A”, 6:1 ratio (4.25 in. motor)



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Page	**70E**

⚠ DANGER

Read manual prior to installation or use of this product. Keep manual nearby for future reference. Failure to follow instructions and safety precautions may result in death or serious injury.

SKF

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Safety

Read and carefully observe these instructions before installing, operating or troubleshooting this equipment.

Notice
Failure to comply with any danger, warning, caution, or notice, as well as any unintended or misuse, will result in loss of claim for warranty or liability for this equipment.

- Do not install or operate pump until all instructions within this guide are completely understood.
- Equipment must only be installed, maintained, and repaired by persons familiar with these instructions.
- Wear adequate personal protection each time the pump is used or repaired.
- Do not allow oil to contact skin or eyes.
- Disconnect power source (electricity, air or hydraulic) from equipment when not in use.
- Disconnect air coupler from pump when not in use.

Explanation of signal words for safety

This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

SAFETY INSTRUCTION

Safety instruction signs indicate specific safety-related instructions or procedures.

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided will result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Owner/operator responsibility

It is the owner/operator responsibility to properly use and maintain this equipment.

The instructions and warnings contained in this manual shall be read and understood by the owner/operator prior to operating this equipment.

It is the owner/operator responsibility to maintain the legibility of all warning and instruction labels.

The owner/operator shall retain this manual for future reference to important warnings, operating and maintenance instructions.

⚠ WARNING

If any fluid appears to penetrate the skin, get emergency medical attention immediately and notify attending physician of the exact type of fluid that was injected.

Do not treat injury as a simple cut. .

Description

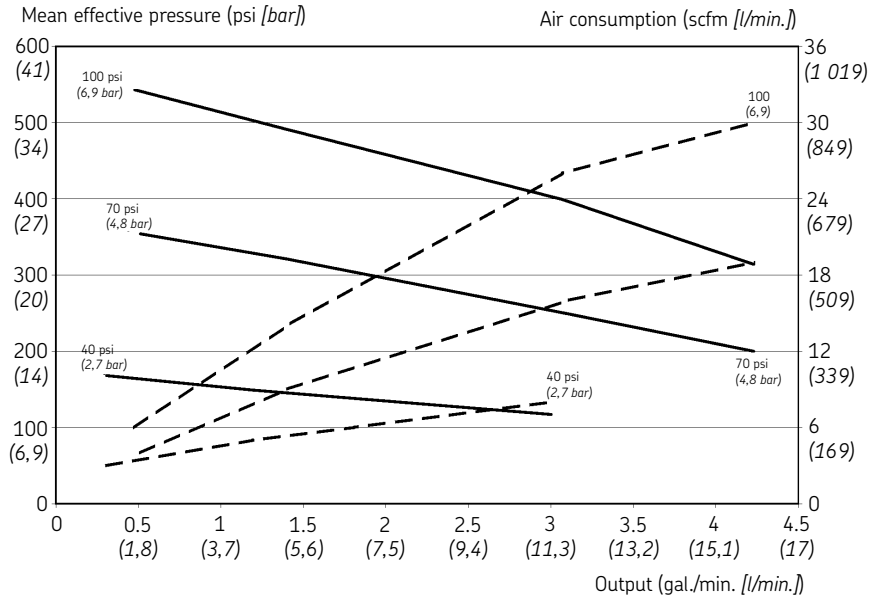
Model V406000000 is an air operated double acting pump for dispensing low and medium viscosity lubricants from tanks or drums. The pumps are self-priming.

Model V406000000 is a stub pump with a 1 1/2 NPT threaded inlet. It may mounted in the bung opening of an oil drum by using an optional bung bushing and suction tube (→ **fig. 1**, **page 5**). It may also be attached to a reservoir standpipe or with an optional suction kit and hose for large bulk tanks (→ **Installation**, **page 4** for recommendations on mounting the pump).

Pump specifications

Pumping ratio	6:1
Air pressure	40 to 150 psi *(2,7 to 10,3 bar)*
Maximum output pressure	900 psi *(62 bar)*
Operating temperature	–40 to 150 °F *(–40 to 65 °C)*
Air inlet	3/8 NPTF
Material outlet	1/2 NPTF
Material inlet	1 1/2 NPTF
Airmotor bore diameter	4.5 in *(108 mm)*
Stroke	3.25 in. *(82,5 mm)*
Output per cycle	11.9 in.^{3} *(195 cm^3)*
Wetted parts	Carbon steel, brass, zinc, polyurethane, nitrile

Performance chart



Appropriate use

This equipment is designed to pump low- and medium- viscosity lubricants, including:

- synthetic- and petroleum- based motor oils
- transmission fluids
- petroleum-based automotive hydraulic fluids

Pump is designed to deliver lubricants directly from a drum into an intended reservior. It can be used with tank-mounted or overhead reel source. Fluid meters are recommended, but not required.

⚠ WARNING

Do not use this equipment to pump any fluids other than the fluids for which it is designed. Types of fluids not to be pumped with this equipment include:

- gasoline
- fuel oil
- diesel fuel
- windshield washer solvent
- antifreeze
- brake fluid
- water

Failure to comply may result in serious personal injury, significant damage to equipment, and fire or other types of property damage.

Failure to comply will also result in loss of claim for warranty or liability.

⚠ WARNING

Pumps are to be operated using compressed air only.

- Do not operate pump using any type of combustible gasses.
- Do not exceed listed maximum air pressures.

Failure to comply may result in serious personal injury, significant damage to equipment, and fire or other types of property damage.

Failure to comply will also result in loss of claim for warranty or liability.

⚠ WARNING

Failure to comply with the warnings listed below may result in serious personal injury, significant damage to equipment, and fire or other types of property damage.

Failure to comply will also result in loss of claim for warranty or liability.

- Do not alter or modify any part of the equipment.

Before each use:

- Read and follow fluid manufacturer's recommendations regarding fluid compatibility and use of protective clothing/equipment.
- Confirm equipment and safety devices are in place and operating properly.
- Immediately repair or replace any parts that are found to be worn or damaged.
- Confirm all oil connections are tightened securely.

Once system is pressurized:

- Do not attempt to repair, disassemble, or replace any part of the equipment without de-pressurizing system first.
- Do not exceed the stated maximum working pressure of pump or the lowest pressure-rated component of the system.
- Do not point dispensing valve at any part of the body or at another person.
- Do not attempt to block fluid coming out of dispensing valve, leading connection, or other component with any part of the body.

Installation

Pumps may be used with suction tube configurations other than those listed in this manual.

Pumps are tested in light oil before shipment.

1. Flush all supply lines, hoses, reels and fittings used in the dispensing system with mineral spirits.
2. Blow dry components with air after flushing.
3. Pump the oil to be used into system to remove any particles. dirt, chips, or other foreign matter that might damage system components.
4. Place a low restriction shut-off valve (such as a ball or gate valve) into the system between the pump outlet and overhead delivery system. This will allow the pump to be isolated from the system and be removed for service.

! Notice

Lincoln recommends using a filter/regulator (3/8 in. NPT port size) such as a Lincoln #602136 in the air supply line to regulate the air pressure to the pump.

⚠ WARNING

Do not use teflon tape as sealant for pump connections.

Bung bushing installation

Thread bung bushing into 2 in. NPT bung on top of reservoir drum or tank. (→ **fig. 1**) Tighten bung bushing securely into bung thread. (**fig. 1** illustrates a 55-gallon drum; other containers will be installed in a similar manner.)

Wall mount installation

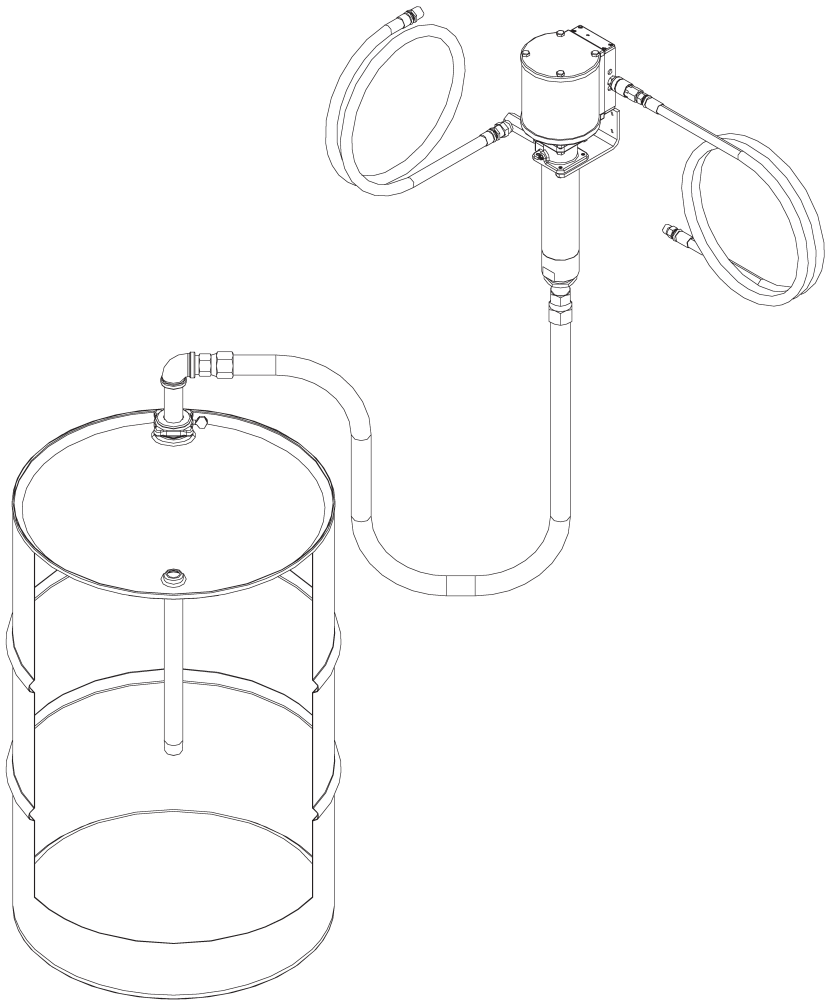
Lincoln #84945 remote suction kit includes a suction tube, hose, and bung bushing. The remote kit will allow the pump to be mounted separate from the reservoir. A Lincoln 275413 wall bracket, for example, may be used to secure the pump to a wall or other stationary surface. The lubricant barrel can be easily changed without removing the entire pump from the lubricant reservoir.

Stand pipe installation

1. Install a shut-off valve ahead of the pump standpipe to allow for pump repair/ servicing without draining the tank.
2. Apply pipe thread sealant to 1 ½ NPT male thread on standpipe and tighten securely into pump inlet.
3. Install connections to pump outlet. Open the shut-off valve ahead of the pump, and check for leaks. (All hoses to pump outlet must be connected and control valves must be closed before opening the valve between the pump and tank. Otherwise the tank may be drained through the pump.)
4. Insert pump tube through bung bushing. Tighten thumb screw.

Fig. 1

Wall mount installation



Configuration options

The pumps may be used with other suction tube configurations than those listed in the previous section.

- Lincoln #85949 universal suction kit includes a suction tube that may be cut to fit. A foot valve is also included with the kit.
- Lincoln #84945 remote suction kit includes a suction tube, hose, and bung bushing. The remote kit will allow the pump to be mounted separate from the reservoir.
- A Lincoln 275413 wall bracket may be used to secure the pump to a wall or other stationary surface. The lubricant barrel can then be easily changed without removing the entire pump from the lubricant reservoir.
- Outlet check valve 277337 is included to protect the pump from damage by excessive system back pressure caused by conditions like thermal expansion. Install the check valve in the pump outlet.

⚠ WARNING

Failure to comply to the following warnings may result in personal injury and/or property damage.

- Determine the correct air pressure to operate the lubrication pump. This pump can develop over 3,750 psi *(258 bar)*. To determine the air pressure to operate the lubrication pump, simply divide the rated pressure of the lowest rated component on the down stream side of the pump by the lubricant to air pressure ratio of the pump. **Example**: The lowest rated component has a rating of 4,000 psi *(275 bar)*. If the lubrication pump is a 50:1 pump, divide 4,000 psi *(275 bar)* by 50 to determine the correct air pressure setting, (4,000 psi *(275 bar)*/50 = 80 psi *(5,5 bar)*). Set the air regulator that controls the air to the pump to 80 psi *(5,5 bar)* or less.

Thermal expansion

⚠ WARNING

Thermal expansion of oil can damage components of the lubrication system. Install pressure relief valve kit Lincoln p/n 277601-1 (→ **instruction manual section K5**, **page 31** series).

Install the check valve in the pump outlet. Outlet check valve 277337 is included to protect the pump from damage caused by excessive system back pressure from conditions like thermal expansion.

Notice
The check valve protects the pump only. An optional thermal relief valve is required for total system protection.

Thermal expansion occurs when the oil reservoir is located in an environment that is significantly colder than the rest of the system.

If an oil reservoir feeds a piping system inside a warmer environment, the cooler oil will expand as it adjusts to the warmer climate. If the oil has no room to expand, the pressure inside the system will rise - in some cases, beyond the pressure ratings of system components, causing leakage and damage to the various components .

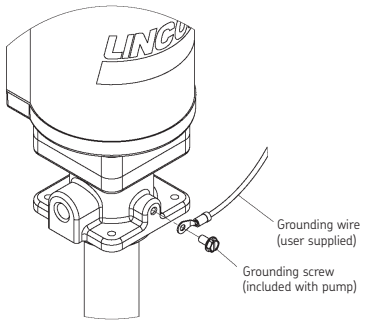
Thermal expansion may also occur when a system remains inactive during a rise in temperature, causing the pressure to rise as it warms. This can also cause system or component damage if the pressure exceeds the components' pressure ratings.

Notice
Lincoln recommends that a 900 psi *(62 bar)* pressure relief valve kit, such as Lincoln P/N 277601-1, be

Pump grounding

The pump should be grounded to reduce static discharge. To ground the pump, remove the grounding screw from the pump outlet body and insert the screw through a ring terminal that has been attached to a grounding wire.
Securely tighten the screw into the outlet body.
The other end of the ground wire should be securely connected to a true earth ground.

Fig. 2



Sealant application instructions

1 Clean and dry all surfaces where sealant will be applied.
2 Apply small bead of Dow Corning 1437 RTV sealant (or an equivalent sealant) around end of exhaust cavities where part (**6**) is displayed in Figure 4.
3 Reassemble pump.

Notice
Allow sealant to dry for 1-2 hours before applying any air pressure to the pump.

System start-up

When operating the pump in a system for the first time, purge all air from the system in order for the pump to prime and operate reliably. Before connecting the pump to a system, make sure the pump is placed into a container of the oil that is to be dispensed. Connect a short length of hose to the pump outlet and direct the open end of the hose into a container to catch the oil. Operate the pump at low air pressure, 40 psi *(2,7 bar)*, until the pump primes, and oil flows smoothly from the end of the hose.

The system can now be connected to the pump outlet. Purge the entire system in a similar manner, slowly pumping oil through all reels and control valves until oil, free of air, flows smoothly from each outlet.

Notice
After the pump and hose have been primed and are free of air, the air pressure may be increased to the desired operating pressure. Check for leaks at all connections.

Basic pump operation

The air pressure should be adjusted so that the pump can overcome the backpressure in the lube system. Too much air pressure can cause the pump to deliver oil very rapidly, which can damage the equipment being lubricated.

When the pump is not in operation, disconnect the air supply to the pump and relieve all pressure on the control valve and oil hose (→ **Pressure relief procedure**, below).

Followers are recommended with lubricants that do not readily seek their own level, or in cold temperature conditions. They help by keeping the oil on an even level and reduce the air pockets that can form in the oil by the removal of oil by the pump from the bottom of the container.

Pressure relief procedure

The following procedure should be followed when it becomes necessary to shut the system down for service or container changes.

1. Disconnect the air supply from the inlet of the pump.
2. Bleed the lubricant pressure off the system by opening a dispensing valve into a container. Hold the valve open until all flow from the system stops.
3. Close the shut-off valve between the pump and reservoir on standpipe installations (if present).
4. Close the shut-off valve between the pump outlet and supply lines (if present).
5. Slowly loosen the lubricant supply line at the pump outlet. A very small volume of oil will leak from the threads. If pressure is present, stop the loosening procedure and repeat steps 1 through 4.

Pump repair

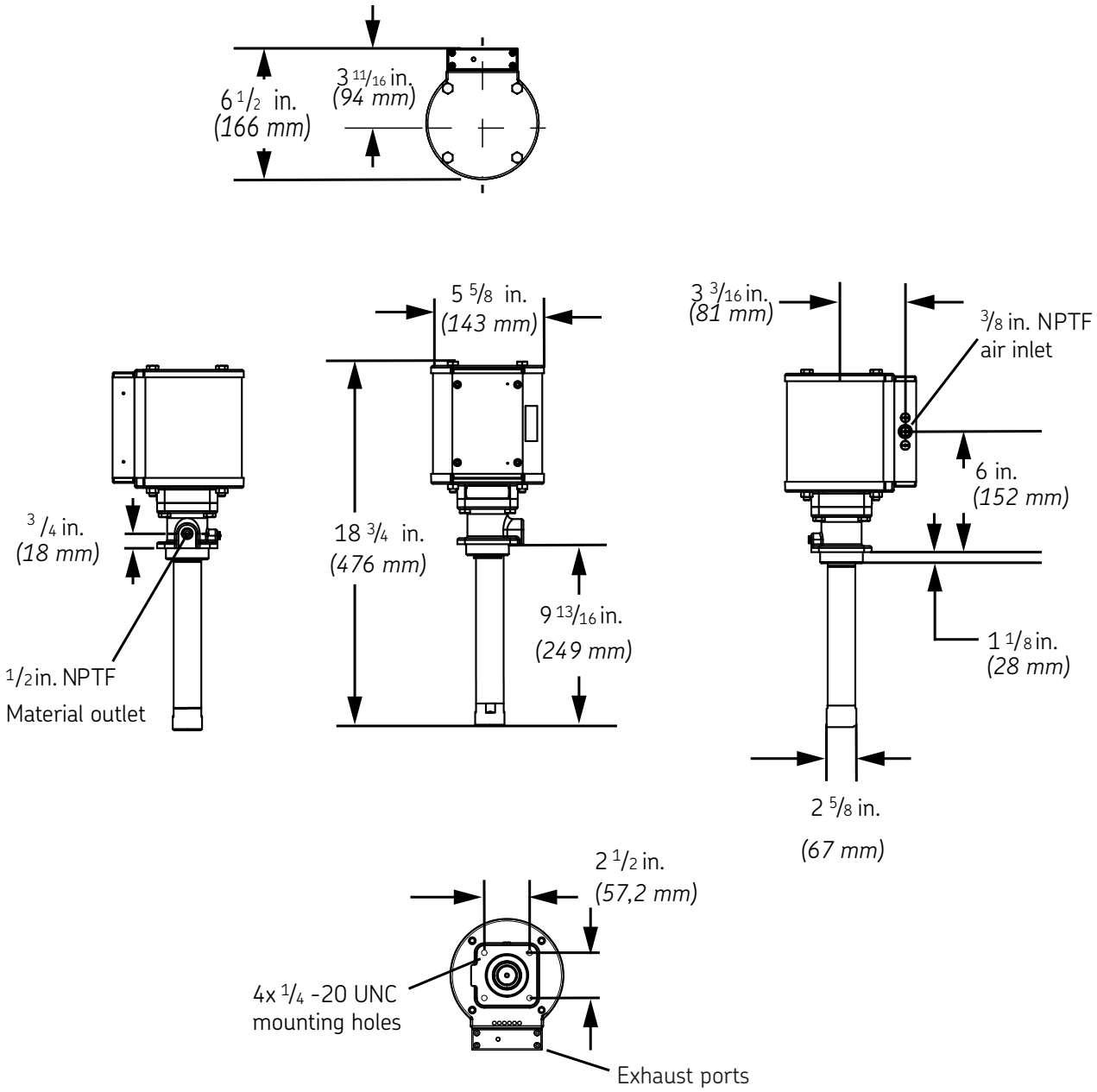
Repair is limited to the service parts listed on following pages. In most cases, service is going to be the replacement of soft seals in the pump (→ **fig. 5** and **6** for internal components of the pump, and **fig. 7** for internal components if its an air valve.

Contact your nearest authorized Lincoln service dealer or Lincoln technical services for assistance.

When ordering replacement parts, order by part number and description. The model number and series letter may also be required.

Notice
New outlet body and gasket
New outlet body is designed for a copper gasket. This gasket replaced the o-ring that was installed on PMV pumps manufactured prior to December 2013.

Replace o-ring with copper gasket.


6 1/2 in.
(166 mm)
3 11/16 in.
(94 mm)
5 5/8 in.
(143 mm)
3 3/16 in.
(81 mm)
3/8 in. NPTF
air inlet
3/4 in.
(18 mm)
18 3/4 in.
(476 mm)
9 13/16 in.
(249 mm)
6 in.
(152 mm)
1 1/8 in.
(28 mm)
1/2 in. NPTF
Material outlet
2 5/8 in.
(67 mm)
2 1/2 in.
(57,2 mm)
4x 1/4 -20 UNC
mounting holes
Exhaust ports

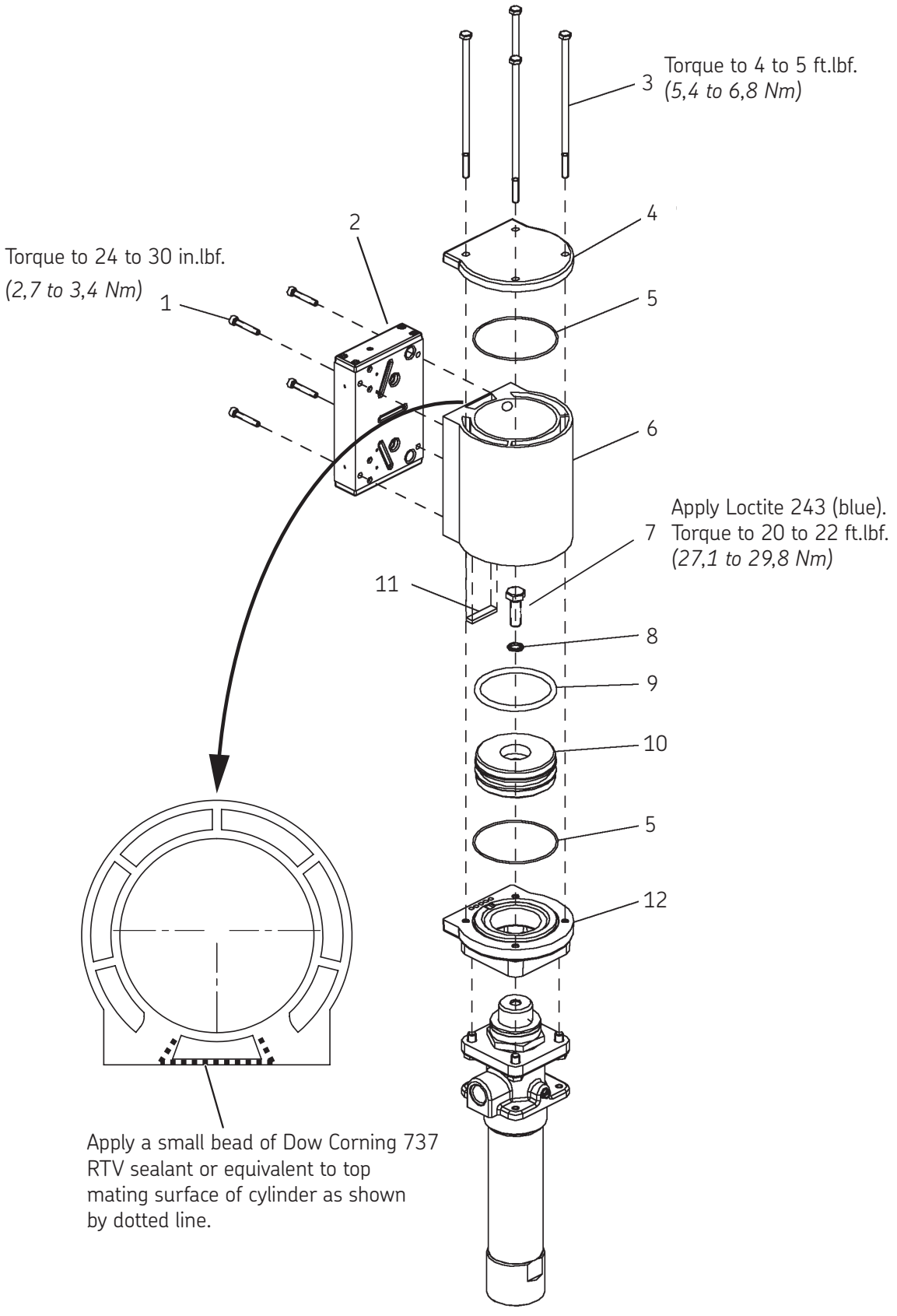
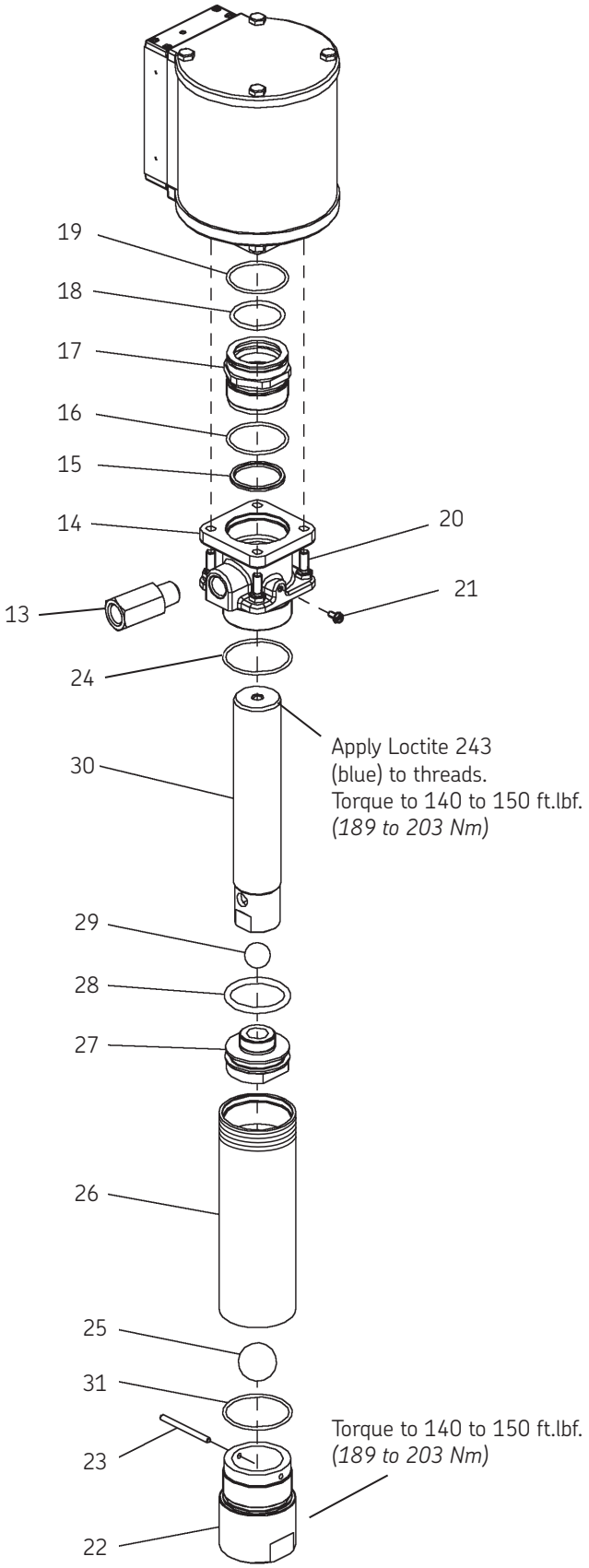

Torque to 4 to 5 ft.lbf.
(5,4 to 6,8 Nm)
3
4
2
Torque to 24 to 30 in.lbf.
(2,7 to 3,4 Nm)
1
5
6
Apply Loctite 243 (blue).
Torque to 20 to 22 ft.lbf.
(27,1 to 29,8 Nm)
7
11
8
9
10
5
12
Apply a small bead of Dow Corning 737
RTV sealant or equivalent to top
mating surface of cylinder as shown
by dotted line.

Fig. 5


19
18
17
16
15
14
20
21
13
24
30
Apply Loctite 243
(blue) to threads.
Torque to 140 to 150 ft.lbf.
(189 to 203 Nm)
29
28
27
26
25
31
23
22
Torque to 140 to 150 ft.lbf.
(189 to 203 Nm)

Parts list

Item no.	Description	Qty.	Part no.
1	Socket head screw (M5 x 0.8 x 30 mm)	4	275045
2	Valve bar assembly	1	275408[1)]
3	Hex head screw (M8 x 1.25 x 160 mm)	4	275039
4	Cylinder head	1	275051
5	O-ring (nitrile)	2	275037[2)]
6	Air cylinder	1	275047
7	Hex head screw (M10 x 1.5 x 30 mm)	1	275035
8	Seal (nitrile)	1	275036[2)]
9	O-ring (nitrile)	1	34358[2)]
10	Piston	1	275054
11	Muffler element	1	275178[2)]
12	Cylinder base	1	275053
13	PMV check valve	1	277337
14	Outlet body and gasket kit	1	278903
15	U-cup (polyurethane/nitrile)	1	275084[2)]
16	O-ring (polyurethane)	1	34770[2)]
17	Gland nut	1	275071
18	O-ring (nitrile)	1	34398[2)]
19	O-ring (nitrile)	1	34309[2)]
20	Hex head screw (M8 x 1.25 x 20 mm)	4	275066
21	Grounding screw (#10-32 x 3/8 in.)	1	275129
22	Foot valve body	1	275079
23	Pin	1	275080
24	Gasket (copper)	1	278659[2)]
25	Check ball	1	68649
26	Pump tube	1	275078
27	Piston	1	275081
28	O-ring (polyurethane)	1	275086[2)]
29	Check ball	1	275083
30	Plunger rod	1	275067
31	O-ring (polyurethane)	1	275085

[1)] Use 278080 O-ring kit to replace o-rings in 275408. O-ring for valve spool is not included.
[2)] Denotes parts supplied in 275401 seal kit
* Indicates change

Troubleshooting

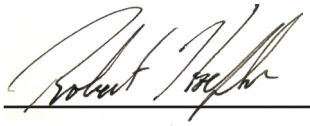
Condition	Possible cause	Corrective action
Pump does not operate.	No air or low air to pump.	Make sure air pressure to pump is adequate to operate pump.
	Muffler element (**13**) clogged.	Remove muffler element and clean or replace.
	Damaged air valve bar assembly (**1**).	Replace air valve bar assembly.
Erratic operation or short stroking.	Insufficient material supply.	Refill material supply.
	Damaged air valve bar assembly (**1**).	Replace air valve bar assembly.
Pump operates but dispenses material on only one stroke.	Worn or damaged piston o-ring (**25**) or piston check (**24** and **26**).	Inspect and replace if needed.
	Worn or damaged inlet check (**28** and **30**).	Inspect and replace if needed.
	Insufficient material supply. Pump is not intaking enough material to dispense on both strokes.	Check inlet for restrictions. Decrease air pressure to reduce pump speed.
Pump is operating but not dispensing material.	Inlet check (**28** and **30**) is not seating or is damaged.	Inspect and replace if needed.

Declaration of conformity as defined by Machinery Directive 98/37/EG annex II A

This is to declare that the design of the PMV 6:1 oil pump (model V406000000) complies with the provisions of directive 98/37/EG

Applied standards:

- EN 292-1 Safety of Machinery - Basic Concepts, General Principles and Design - Part 1: Basic Terminology, Methodology
- EN 292-2 Safety of Machinery - Basic Concepts, General Principles and Design - Part 2: Technical Principles and Specifications - Incorporates amendments 1 (1995) and 2 (1997) EN 809 Pumps and Pump Units for Liquids - Common Safety Requirements
- EN 349 Safety of Machinery - Minimum Gaps to Avoid Crushing of Parts of the Human Body



St. Louis, MO 08/14,
Bob Hoefler,
Director Product Development and Product Engineering

Lincoln industrial standard warranty

Standard limited warranty

Lincoln warrants the equipment manufactured and supplied by Lincoln to be free from defects in material and workmanship for a period of one (1) year following the date of purchase, excluding there from any special, extended, or limited warranty published by Lincoln. If equipment is determined to be defective during this warranty period, it will be repaired or replaced, within Lincoln's sole discretion, without charge.

This warranty is conditioned upon the determination of a Lincoln authorized representative that the equipment is defective. To obtain repair or replacement, you must ship the equipment, transportation charges prepaid, with proof of purchase to a Lincoln Authorized Warranty and Service Center within the warranty period.

This warranty is extended to the original retail purchaser only. This warranty does not apply to equipment damaged from accident, overload, abuse, misuse, negligence, faulty installation or abrasive or corrosive material, equipment that has been altered, or equipment repaired by anyone not authorized by Lincoln. This warranty applies only to equipment installed, operated and maintained in strict accordance with the written specifications and recommendations provided by Lincoln or its authorized field personnel.

This warranty is exclusive and is in lieu of any other warranties, express or implied, including, but not limited to, the warranty of merchantability or warranty of fitness for a particular purpose. Warranty on items sold by Lincoln, but not manufactured by Lincoln are subject to the warranty consideration, if any, of their manufacturer (such as hoses, hydraulic and electric motors, electrical controllers, etc.) Assistance in making such warranty claims can be offered as required.

In no event shall Lincoln be liable for incidental or consequential damages. Lincoln's liability for any claim for loss or damages arising out of the sale, resale or use of any Lincoln equipment shall in no event exceed the purchase price. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, therefore the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights. You may also have other rights that vary by jurisdiction.

Customers not located in the Western Hemisphere or East Asia: Please contact Lincoln GmbH and Co. Kg, Walldorf, Germany, for your warranty rights.

Special limited warranties

Special limited 2 year warranty SL-V series, single injectors – 85772, 85782, and replacement injectors – 85771, 85781

Lincoln warrants the SL-V Injector series to be free from defects in material and workmanship for two (2) years following the date of purchase. If an injector model (single or replacement) is determined to be defective by Lincoln, in its sole discretion, during this warranty period, it will be repaired or replaced, at Lincoln's discretion, without charge.

Special limited 5 year warranty series 20, 25, 40 bare pumps, pmv bare pumps, heavy duty and 94000 series bare reels

Lincoln warrants series 20, 25, 40 bare pumps, PMV bare pumps, heavy duty (82206), mini bench (81133, 81323), and all 94000 LFR series (single arm and dual arm) bare reels to be free from defects in material and workmanship for five (5) years following the date of purchase. If equipment is determined by Lincoln, in its sole discretion, to be defective during the first year of the warranty period, it will be repaired or replaced at Lincoln's discretion, without charge. In years two (2) and three (3), the warranty on this equipment is limited to repair with Lincoln paying parts and labor only. In years four (4) and five (5), the warranty on this equipment is limited to repair with Lincoln paying for parts only.

Special limited 5 year warranty limited oil meters, limited fluid control valves, aod (air-operated diaphragm pumps)

Lincoln warrants the 712 series control valves, 912 series lube meters, electronic lube meters (980, 981, 982 series), our universal inline digital meters (812/813 series), and our AOD pump offering to be free from defects in material and workmanship for five (5) years following the date of purchase. If either is determined to be defective by Lincoln, in its sole discretion, during the warranty period, they will be repaired or replaced, at Lincoln's discretion, without charge.

Special DEF (diesel exhaust fluid) limited warranty

DEF products are warranted to be free from defects in material and workmanship for a period of one (1) year following the date of purchase. The following exceptions to the standard warranty period are in effect:

- **85700-30/85700-50 DEF hose reels (bare reel only),**
  277251/277252 AC DEF pumps, and 277256 and 277257 DEF meters are warranted for two (2) years from date of purchase.

- **85623 DEF AOD**
  (air operated diaphragm) pumps
  are covered under the standard five (5) year AOD pump warranty.

If either is determined to be defective by Lincoln, in its sole discretion, during the warranty period, they will be repaired or replaced, at Lincoln's discretion, without charge.

Lincoln Industrial contact information

To find Lincoln Industrial's nearest service center call the following number; customer service 314-679-4200 (international number 01-314-679-4200) or you may also use our website www.lincolnindustrial.com

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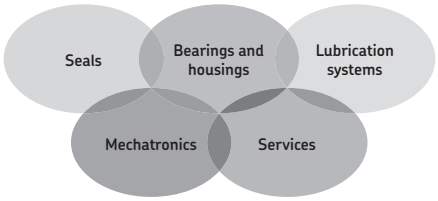

The Power of Knowledge Engineering
Combining products, people, and application-specific knowledge, SKF delivers innovative solutions to equipment manufacturers and production facilities in every major industry worldwide. Having expertise in multiple competence areas supports SKF Life Cycle Management, a proven approach to improving equipment reliability, optimizing operational and energy efficiency and reducing total cost of ownership.

These competence areas include bearings and units, seals, lubrication systems, mechatronics, and a wide range of services, from 3-D computer modelling to cloud-based condition monitoring and asset management services.

SKF's global footprint provides SKF customers with uniform quality standards and worldwide product availability. Our local presence provides direct access to the experience, knowledge and ingenuity of SKF people.

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