



INSTRUCTION MANUAL



Product: LE-type Motor Driven Pump

Attention for Safety Use

Before operation, read carefully the instructions below for the safety use of LUBYACE lubrication system.

These safety-use instructions, composed of “ Warning” and “ Caution”, are designed to protect customers from any possible harm and damage caused by misusing this system.

Read and follow these instructions carefully to prevent misuse-driven this system troubles and protect yourself from danger.

- | | |
|--|---|
|  Warning | If ignoring instructions with this sign and operating wrong way, death or serious injury will happen. |
|  Caution | If ignoring instructions with this sign and operating wrong way, injury and equipment damage will happen. |

WARNING

1. Turn off the control panel's power switch before installing, removing or maintaining the product; otherwise, electric shock will happen. Or the pump will operate automatically, eventually causing leakage or diffusion and tainting the surroundings.
2. Do not step on or pull the lubricator and pipe-related section as foothold or hand rail; you will slip and fall or it will damage the lubrication system.
3. Do not remodel or disassemble the equipment. If necessary, contact us beforehand. And if on-site maintenance job is needed, professional staff familiar with the mechanism must to work on it.
4. When using the equipment, put some protectors on, in response to a situation, to avoid a wound.

CAUTION

1. In case of air venting, protect the pump beforehand with vinyl case or other alternatives; otherwise, grease (or oil)-contained air will diffuse and damage your eyes and other objects.
2. Use protectors whenever handling grease (or oil); otherwise eye damage or skin inflammation will happen when grease (or oil) contacts your eyes or skin.
3. Do periodical inspection, such as checking grease (and oil) amount and operation, to maintain the lubrication system. If do not, machine trouble driven by bearing injuring will happen.
4. Use the system within the rated capacity and under the adequate operational environment. If ignoring them and using it beyond the capacity or under the dangerous environment, including its installment nearby fire and explosives, the system will have mechanical problems or cause fire.

LE-type Motor Driven Pump INSTRUCTION MANUAL

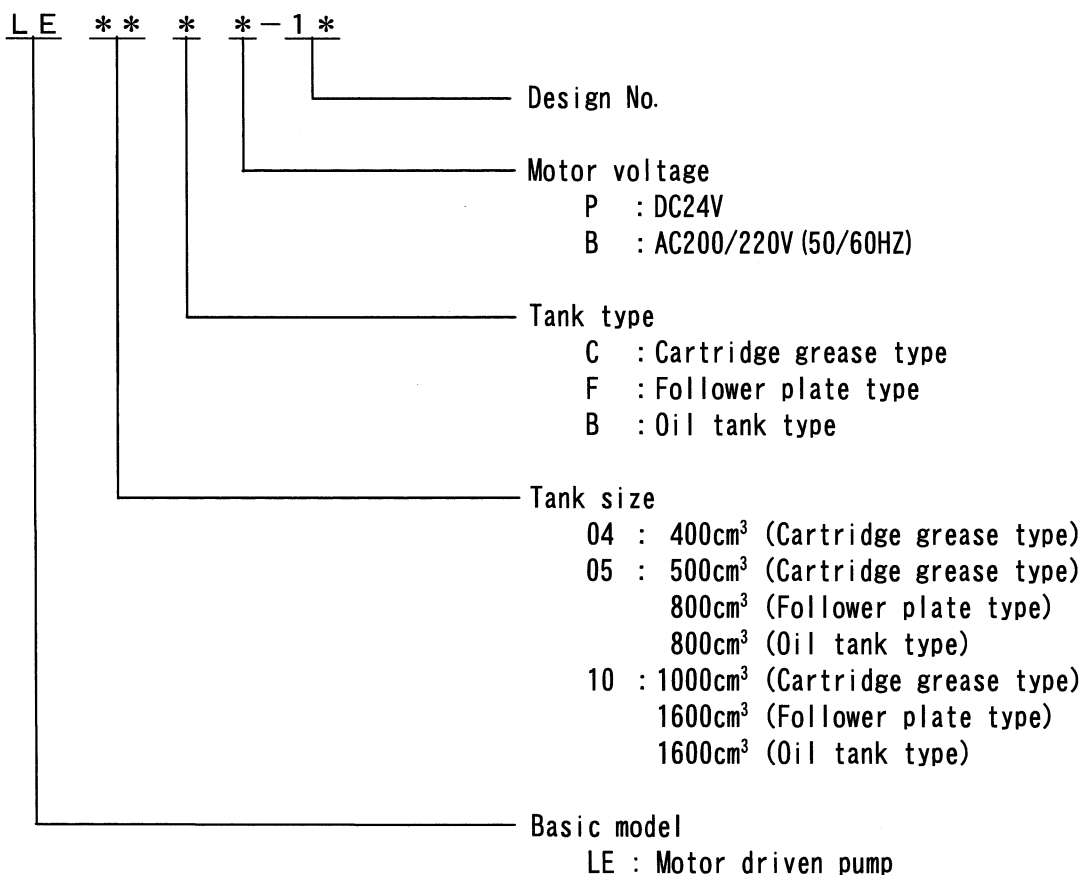
1. General Description

The motor-driven pump is a high-pressure pump with compactly integrated grease or oil tank. In combination with controller, it is used as an automatic lubrication system's source of supply by cycle control or time control.

There are two kinds of grease tank construction available: cartridge type and follower plate type. The cartridge type prevents inclusion of dust and foreign matter at the time of grease replenishment and permits replacement of cartridge grease in a short time without swearing the hand.

Where cartridge grease for use with the pump is unavailable or where local procurement of cartridge grease is presumed to be difficult due to main machines being exported overseas, then the pump with tank construction of follower plate type should be used.

2. Key to Type Code



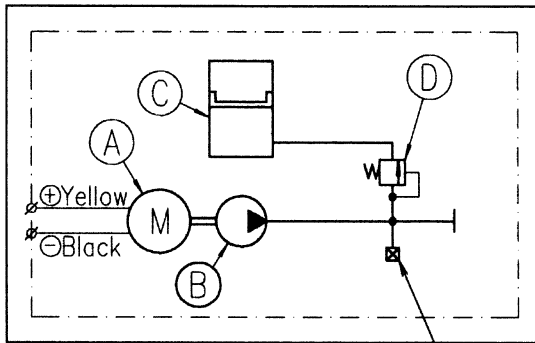
3. Specifications

Model		LE04CP	LE05CP	LE10CP	LE05FP	LE10FP	LE05BP
Max. working pressure MPa		17					7
Discharge volume cm ³ /min		12					
Tank type cm ³	Cartridge type	400	500	1000	---	---	---
	Follower plate type	---	---	---	800	1600	---
	Oil type	---	---	---	---	---	800
Working temperature range °C		-5 to +50					
Vibration resistance (Max.) G		3	8.9				3
Consistency of applicable grease		NLGI No. 0 to No. 2 (Lithium group)					ISO VG68 or 100
Source voltage V		DC24					
Rated current A		3					2
Protection class		Drip-proof					

Model		LE04CB	LE05CB	LE10CB	LE05FB	LE10FB	LE10BP
Max. working pressure MPa		17					7
Discharge volume cm ³ /min		8.3/10 (50/60Hz)					12
Tank type cm ³	Cartridge type	400	500	1000	---	---	---
	Follower plate type	---	---	---	800	1600	---
	Oil type	---	---	---	---	---	1600
Working temperature range °C		-5 to +50					
Vibration resistance (Max.) G		3					
Consistency of applicable grease		NLGI No. 0 to No. 2 (Lithium group)					ISO VG68 or 100
Source voltage V		AC200/220 (50/60Hz)					DC24
Rated current A		0.30/0.26					2
Protection class		Drip-proof					

4. Circuit Diagram

DC MOTOR

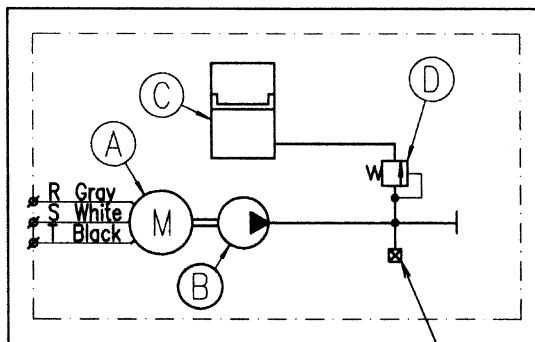


FORMATION

- (A) DC MOTOR or AC MOTOR
- (B) PUMP
- (C) TANK
- (D) RELIEF VALVE

Connecting port for pressure gauge
(Rc1/8 Plug)

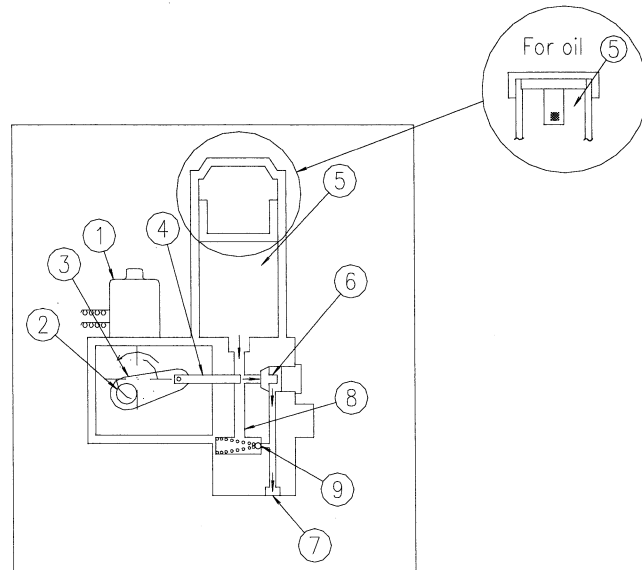
AC MOTOR



Connecting port for pressure gauge
(Rc1/8 Plug)

5. Principle of Operation

1) Lubrication and operation



- When ① Motor starts on forward rotation, ② Eccentric wheel rotates counter-clockwise to put ④ Pump piston in reciprocating motion through ③ Link plate. The ④ Pump piston will suck in grease or oil contained in ⑤ Tank in its return stroke and push ⑥ Check valve to open it, so that grease or oil is pushed out toward Discharge ⑦ Port path.

- In case of abnormal pressure in the discharge ⑦ Port path, ⑨ Steel ball of relief valve will open to allow the pressure to escape into ⑧ Return path so that the given pressure will not be exceeded, thus protecting the circuit.

2) Method of Controlling Pump

- Cycle control by indicator

Optional detecting switch detect 1 cycle operation of distributing valve indicator and control motor driven pump.

There are two lubrication systems: 1 cycle lubrication system and many cycles lubrication system that control motor-driven pump to measure that control motor-driven pump optional cycle number to measure cycle number of indicator by counter.

- Time control by timer

Pump operating time lubrication control pump operating time by timer to get discharge volume of system necessary volume (= total lubrication volume).

Generally, in case there is the small number of feed port and small volume of lubrication for each port, use 1-cycle lubrication system.

Use many cycles lubrication system for following cases. In case there is many feed ports and large volume of lubrication for each port or small number of feed port with special bearing construction sealed by grease or it needs large volume of lubrication under the very bad environmental conditions.

6. Selection of the Tank

① C-type Tank

- Grease replenishment of screw-in cartridge system is extremely easy without smearing the hand, permitting work to be carried out cleanly.

As dust and air are hardly intermixed, troubles with the lubrication system can also be prevented.

However, careful attention should be given to availability of the grease in the place where it is used due to the fact that suppliers of cartridge grease and kinds of grease are limited.

• Type of Genuine Cartridge Grease

Type	GKL-*-100	GKL-*-050	G-KL1	GSL-*-100	GSL-*-050
Volume cm ³	1000	500	400	1000	500
Name of grease	UNILIB DL			ALVANIA EP	
Grease oil	Kyodo Oil			Showa Shell Oil	
NLGI consistency No.	Grease No. 0 to No. 2 (*) (Lithium group)				

Note) Maker (*) in Type Code represents consistency No.

② F-type Tank

- For grease replenishment, optional grease charge pump should be used.
This tank should be selected in the local area where cartridge grease is unavailable or in the case where grease other than genuine one has to be used.

③ Oil tank

- For oil replenishment, use lubricating oil on the market (suitable for VG68 or 100).
Replenish through the filter prevents inclusion of dust and foreign matter.

7. Procedure for Installation of the Pump

- 1) For installation, select such a place as is easy of inspection and grease replenishment, free from exposure to direct sunlight, and excellent in environmental conditions pertaining to sand and soil, dust, heat, vibration, etc.
It is ideal to keep it with protect cover.
- 2) For the tightening torque to the pump discharge port piping Rc 3/8, apply 3000 to 3400 N · cm.
- 3) For wiring to motor, use cables equivalent in size to those which are appended to the pump and connect them securely with solderless terminals or connectors.
Refrain from using ornamental terminals as they may cause contact failure.
- 4) Where the pump is to be painted, carry out the painting work after masking resin parts such as tank cover, connectors, etc. to protect against deposition of paint.

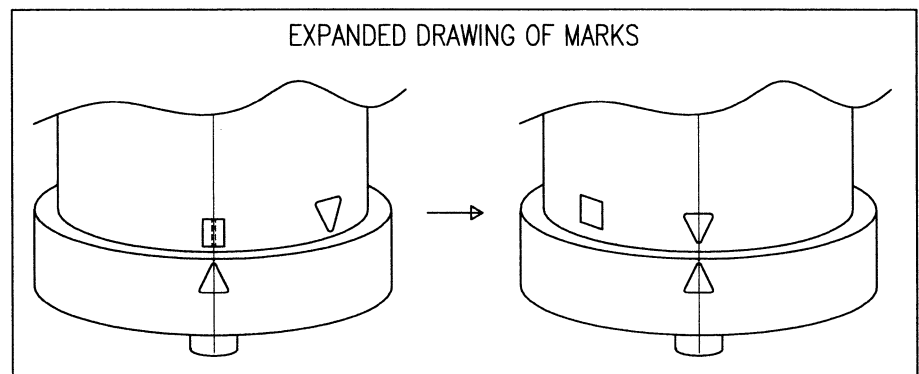
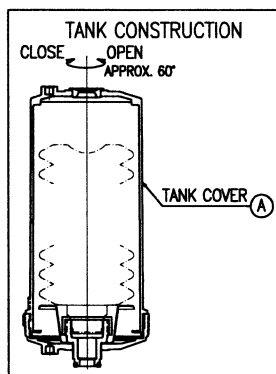
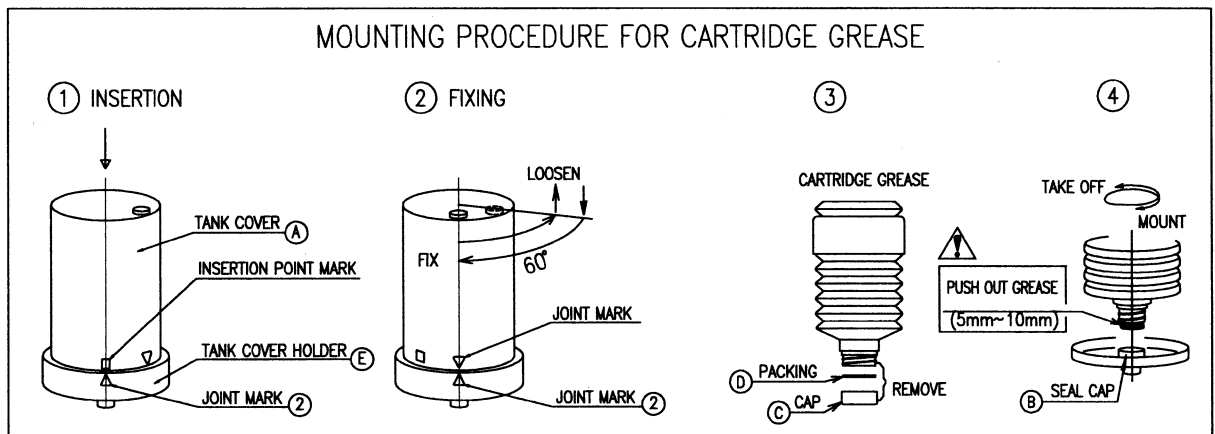
8. Mounting procedure for cartridge grease

① Mounting procedure for cartridge grease of C-type Tank

Carry out replacement of cartridge grease in according with the following procedure.

Note. Insufficient screwing up may lead to inclusion air so that pump work would be blocked.

- 1) Rotate ① Tank cover counterclockwise by approx. 60° to take it Off.
- 2) Remove the used-up cartridge grease by counterclockwise rotation.
At this time, do not remove ② Seal cap. Next remove ③ Cap and ④ Packing of brand-new cartridge grease firmly screwing-up the Cartridges grease.
- 3) When mounting, slightly press down the cartridge grease (Approx. 5 to 10 mm) to allow grease emerge from the open end and screw up the cartridge into the section port, so that no inclusion of air is caused.
- 4) Joining "Insertion point mark" of ① Tank cover on to ⑤ Tank cover holder, insert and rotate clockwise to tighten up it firmly until it has become fixed as it was. At this time, rotate it until a point of sound "clack".
Insufficient tightening may cause ① Tank cover to be loosened by the vibration of main machine.

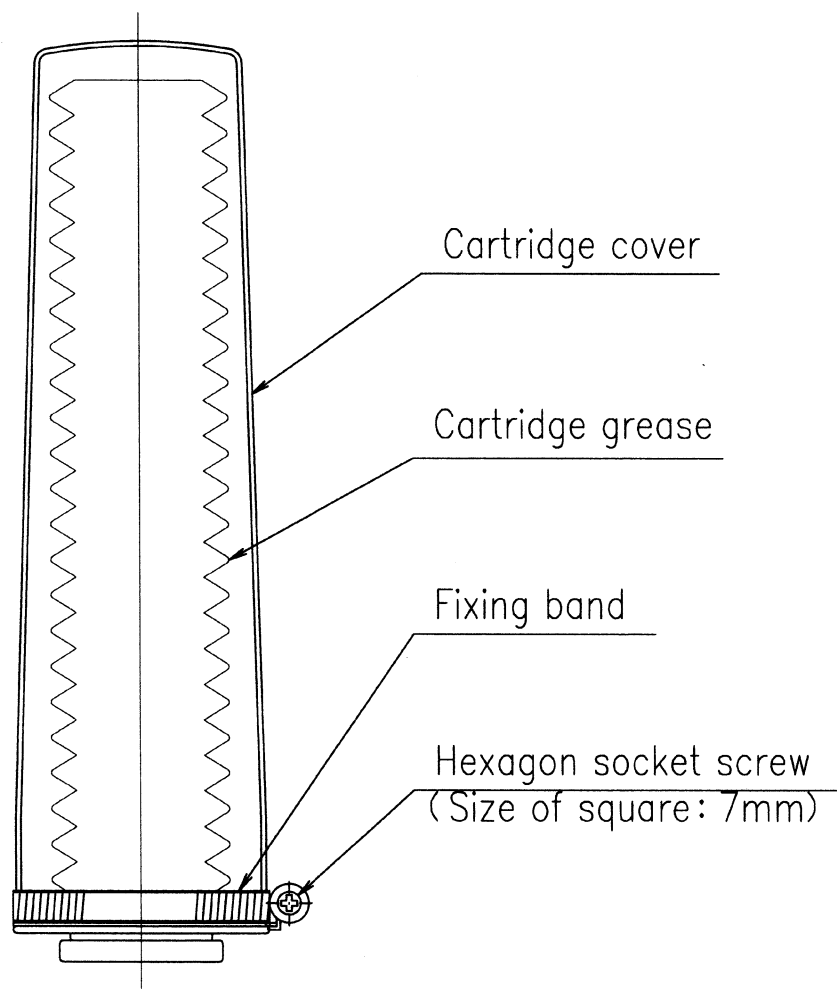


5) Case of LE04C*-13

Install general goods in the market for cartridge grease 400cm³.

Install following method.

- Loosen hexagon socket screw (size of square is 7mm) of fixing band. (Using a spanner or a screwdriver)
- Remove cartridge cover of the pump pull up (to be felled down) by hand.
- Screw the top of cartridge on the part of center screw of the pump body.
- When put the cartridge cover as it was, and tighten the screw of fixing band, installation is completed.

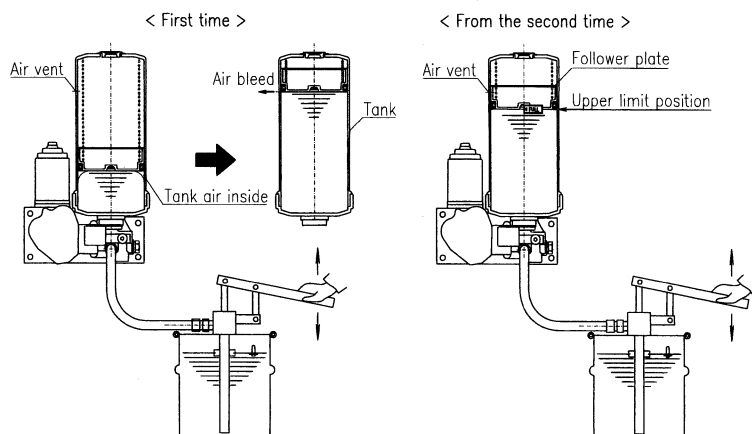


② Grease filling procedure for F-type tank

For grease replenishment, be sure to use Model FM3-10 (option) grease filling pump and carry out the replenishment work so as not to allow air and dust to be intermixed in accordance with the following procedure.

In addition, carry out the replenishment work slowly (about 4sec/stroke) because the flow of grease is slow in the low temperature.

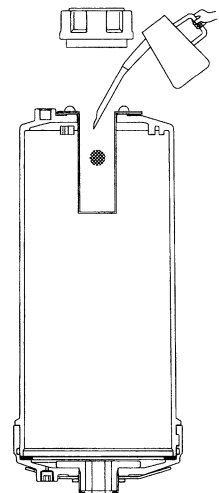
- 1) Make preparation for brand-new 18-kg pail-can grease and remove the cover. First press the follower plate of grease filling pump against the grease surface, then insert the pump and set the exclusive cover to the pail-can. Next operate the pump handle and make sure that fresh grease comes out from the leading end of hose.
- 2) After removing the cap of pump discharge port, screw up the hose fitting into the port and operate the filling pump.
- 3) Greasing replenishment (see the figure below)
 - <First time>
 - Replenish grease to the air vent.
 - ※For bleeding work at the bottom of the follower plate.
 - <After the second time>
 - Grease up to **FULL** (upper limit position) in the tank.
 - ※If it exceeds the upper limit position, there is possibility of grease leakage and do not exceed.
- 4) Upon completion of grease replenishment, disconnect the hose fitting and be sure to fit the cap to the pump discharge port. At the same time, keep the filling pump and pail-can in the clean area that there is no dust.

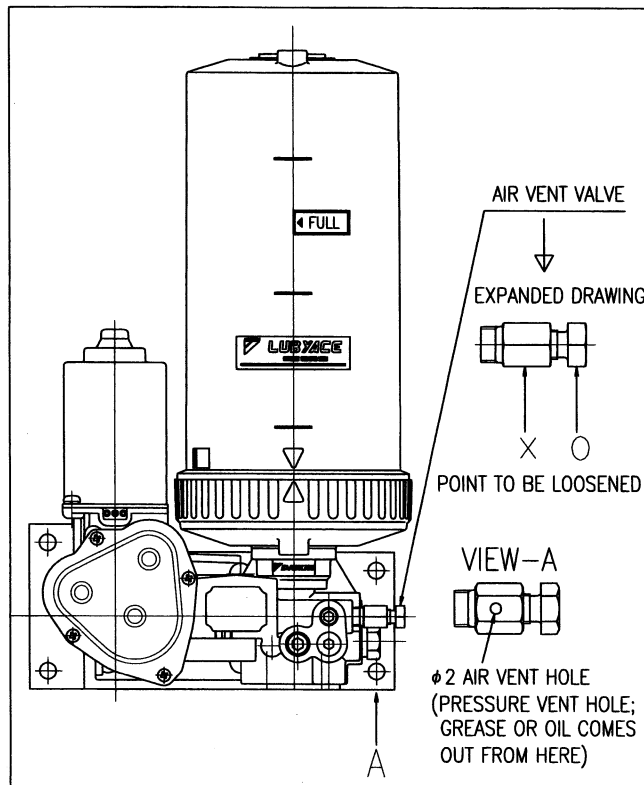


③ Method of replenishing lubricating oil to the oil tank

Remove the tank cap and replenish oil up to the high limit. However, in case the pump is installed in moving equipment, replenish less than the high limit because oil oozes from the upper tank cap by fluctuating oil surface.

After replenishment, put the tank cap.





9. Procedure for air venting of the pump

Before starting operation, confirm that the power source to lubricating system is turned off, the electric power source is completely stopped and the pressure in lubricating circuit is released.

After loosening air vent valve of the pump side with spanner of hexagon 12, turn on the power and push the start key to operate the pump.

At the same time, from air vent hole grease or oil include bubble push out entirely and fresh grease or oil comes out continuously, then turn off the power to stop the pump.

At this time, be careful of direction of air vent hole (that looks down) and be careful to avoid the grease or oil comes into your eyes.

After that, tighten air vent valve.

Tighten by hand first, when it becomes tight, tighten again by wrench at angle of approx. 30° .

10. Procedure for Maintenance of the Pump

1) Routine checks

- In the initial stage, check for the extent of the fall of tank oil level in proportion to the operating time of main machine. Thereafter, proper consumption of grease can be checked by watching the fall of oil level. It is also convenient to check and record the number of days taken until empty tank after full tank.
- Check the periphery of tank for leaks of grease and oil. If there are any leaks, wipe off the leak oil and check for the cause of leaks to make repairs. As the cartridge type may be insufficiently or obliquely screw up the cartridge perpendicularly and firmly in position.

2) Periodic inspection

- Put the pump into operation and check if indicator of distributing valve performs normally.
- In case the filter of oil tank is smeared with dust or foreign matter, remove and clean it.

11. Others

- 1) As the pump casing is internally sealed up with molybdenum-group No. 2 grease, seal it up internally with the same grease by 30g when it has been disassembled for repairs.
- 2) Since safety valve is preset by pressure, do not disassemble and decompose it.
- 3) Turn off the power surely before check the pump motor, so as not to get an electric shock.
- 4) Then installing cartridge grease and replenish grease (oil) to the tank, take care not to include sand, dust and foreign matter in it. It may cause trouble of the pump.