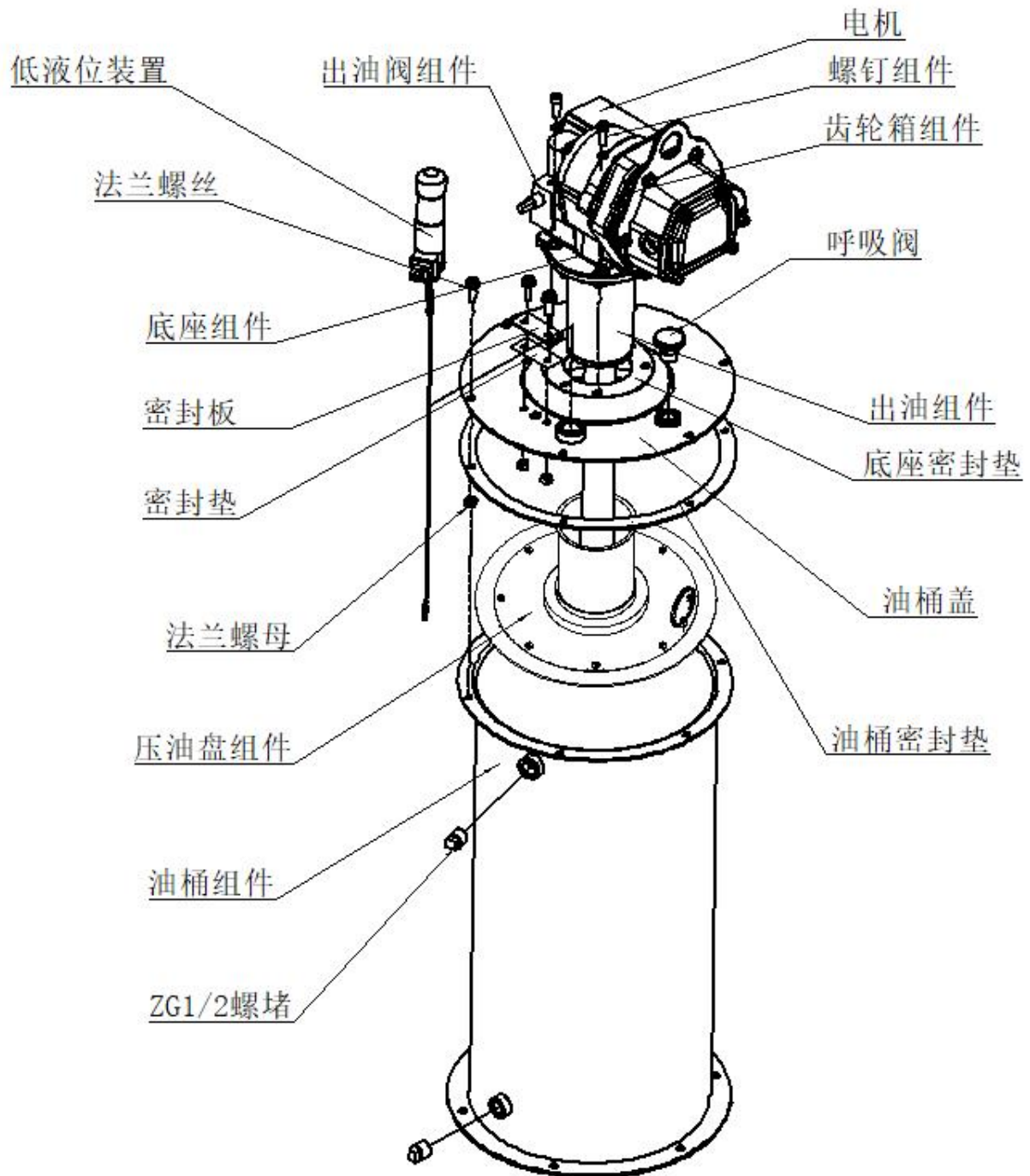


Equipment Drawings



Exploded view of equipment



1. Cautions

1.1 Fire hazard

When there are flammable liquids in the work area, the use of this equipment may ignite the flammable liquids will be issued after the gas, thus creating a fire, attention should be paid to:

- (1) Use the device only in air circulation areas
- (2) Keep away from all ignition sources, such as cigarettes, portable electric lights, etc.
- (3) No debris, such as rags, gasoline, etc., are allowed to be placed in the work area.
- (4) Do not plug in or unplug when combustible gases are present in the surrounding area.
- (5) Ground all equipment in the work area, using only grounded hoses.
- (6) If the lubrication pump produces sparks, vibrations and other symptoms, the operation should be stopped without solving

No further use of the lubrication pump is allowed until the problem is solved.

- (7) Fire extinguishers must be provided in the work area.

1.2 Liquid splash hazard

Lubrication pump high-pressure state work, if the hose rupture or component damage will lead to high-pressure liquid injection, causing

danger to personnel, should pay attention to:

- (1) Do not point the dispenser at surrounding personnel.
- (2) Do not block or deflect leaks with your hands.
- (3) When stopping work, maintenance and moving lubrication pump, pressure relief operation should be carried out.
- (4) Tighten all line connections before working on the lubrication pump.
- (5) Check hoses and fittings daily and replace worn and damaged parts immediately.

1.3 Equipment misuse hazard

Improper operation of the lubrication pump can lead to damage to equipment and injury to personnel and attention should be paid to:

- (1) Operators are not allowed to use the lubrication pump when they are fatigued or have been drinking.
- (2) The maximum working pressure must not be exceeded when using the lubrication pump.
- (3) When the lubrication pump is not in use, turn off the power supply and solenoid valve for pressure relief operation.
- (4) Check the lubrication pump every day, if there are damaged parts should be repaired or replaced immediately.
- (5) The device cannot be modified without permission.
- (6) Keep hoses and cables away from traffic areas and away from

sharp, hot objects.

Do not kink or overbend cables or hoses.

1.4 Equipment movement hazard

To avoid injuries to personnel, care should be taken to:

- (1) Do not operate the lubrication pump with the guard removed again.
- (2) Before moving or servicing the lubrication pump, disconnect the relevant power supply and perform pressure relief operation.
- (3) Do not move the lubrication pump unless necessary.

1.5 Burn hazard

Lubrication pump after a long period of work, the solenoid valve temperature rises sharply, should pay attention to:

- (1) It is forbidden to touch the solenoid valve after the lubrication pump has been working for a long time to avoid burns.

1.6 Personal Protection

Appropriate protective equipment should be worn in the work area to prevent injuries to personnel, such as protective eyewear and protective gloves.

1.7 Wiring hazards

To avoid damage to the lubrication pump, a fuse needs to be installed:

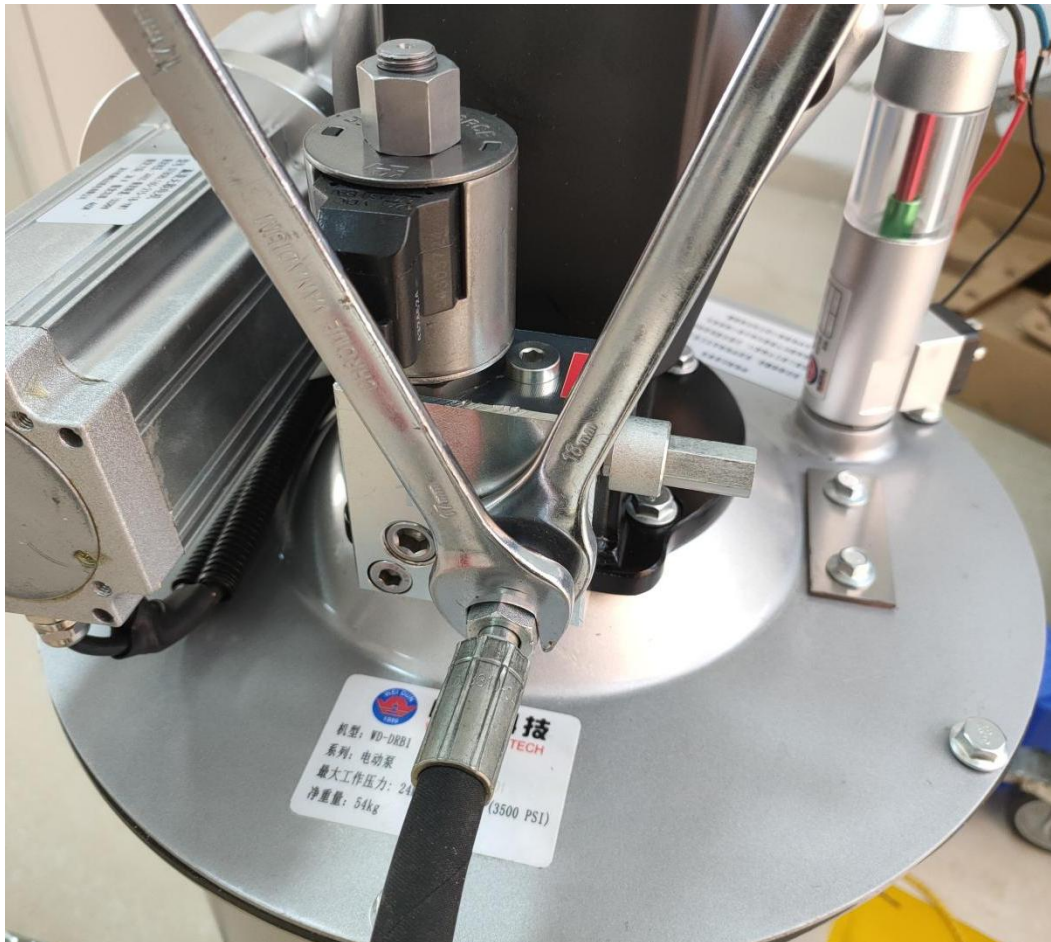
- (1) Do not operate the lubrication pump without a fuse

installed.

(2) The fuse installed needs to meet the requirements, a 35A fuse is recommended.

2. Pressure relief operation procedure

After the lubrication pump work, lubrication pump has been in the back pressure state, in order to prevent high pressure liquid splash caused by personnel injuries, should be in the lubrication pump stop working, the pressure relief operation, as follows:

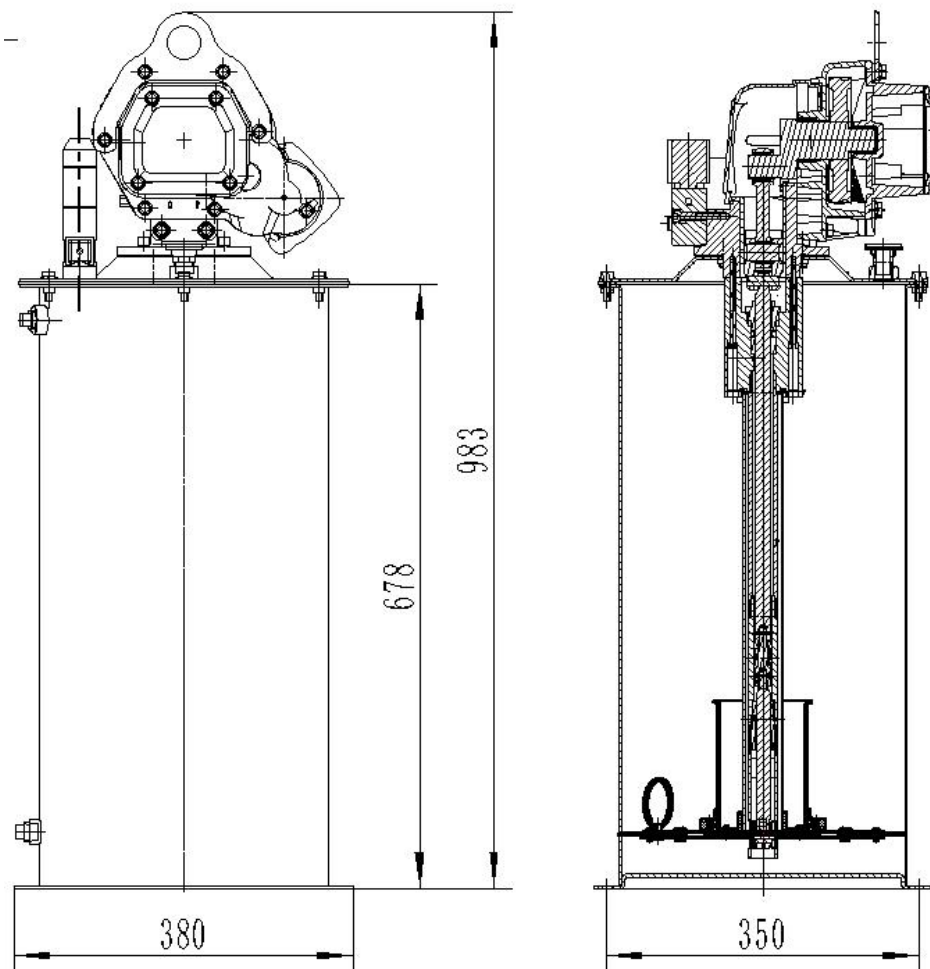


In order to reduce the pressure of the system, cut off the power of the solenoid valve, then take a piece of cloth pad under the oil outlet,

use two wrenches, one stuck on the outlet connector and the other stuck on the oil pipe joint, work in the opposite direction and slowly loosen the pipe joint until no grease flows from the joint, as shown in the figure below.

3. Basic parameters

3.1 Form factor



3.2 Technical parameters

Model	Supply voltage	Rated Displacement	Overflow pressure	Applicable fats and oils	Oil drum volume
	V	ml/cyc	MPa	NLGI	L
WD-DRB1	24	2.8	25	000#--2#	50

3.3 Electrical related

3.3.1 Driver and motor wiring

Basic parameters

Operating voltage: 18-30VDC

Load power: 30A max.

Overheat protection: Yes (PCB and motor windings should have overheat protection)

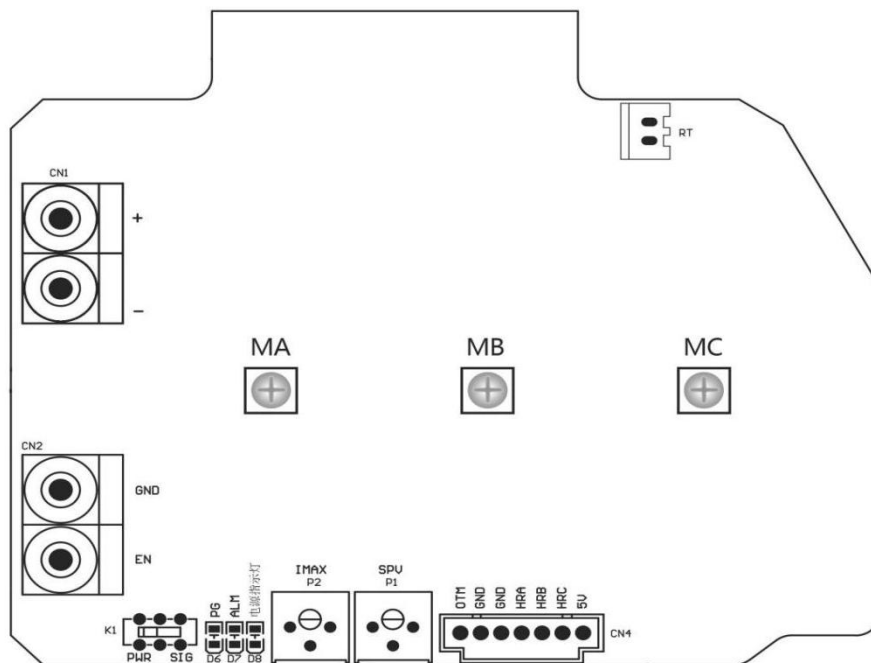
Over and under voltage protection: Yes

Power and signal reversal protection: Yes

Start/Stop signal: external 24VDC start, or toggle switch on PCB start/stop (see Figure 1)

PCB indicators: power (orange), start (yellow-green), fault (red, see Table I for definition of fault flashing)

1、
input



Power
CN1

Lead name	Chinese Definition
+	Power supply positive terminal
-	Power supply negative terminal

2、 Motor input

Lead name	Chinese Definition
MA	Motor A phase
MB	Motor B phase
MC	Motor C phase

3、 Control signal part CN2

Lead name	Chinese Definition
GND	External 24V power supply to start the negative terminal
EN	External 24V power supply to start the positive pole

4、Hall signal part CN4

Lead name	Chinese Definition
OTM	Connect the motor winding temperature sensor (regardless of direction)
GND	Connect the motor winding temperature sensor (regardless of direction)
GND	Ground for Hall signals
HRA	Hall signal A-phase input
HRB	Hall signal B-phase input
HRC	Hall signal C-phase input
+5V	Power side of Hall signal

POWER -- power input

SIGNAL -- start signal input

K1 -- Local start/stop switch (Start/stop is controlled by external signal when the switch is in "SIG" position. When there is no external signal, the switch is placed in the "PWR" position to start and in the "SIG" position to stop)

P2 (IMAX) - current adjustment potentiometer

P1 (SPV) - speed adjustment potentiometer

RT -- PCB temperature sensor socket

MA\MB\MC-- Motor drive terminal block

D6, D7, D8 - Indicators start (yellow-green), fault (red), power (orange)

Drive current limit: turn the current adjustment potentiometer (IMAX) to adjust the size of the current limit, clockwise to adjust the current limit is small, the minimum limit current of 6A, counterclockwise to adjust the limit current, the maximum is 30A. (Over the maximum current or short circuit when the fault light prompts, and must be re-powered to reset).

Rotational speed setting adjustment: rotate the speed adjustment potentiometer (SPV) to adjust the size of the current limit, clockwise to adjust the motor speed, the minimum is 0, the motor start speed up to 10% of the motor rated speed, counterclockwise to adjust the motor speed, the maximum speed of the motor rated speed.

Local start/stop switch: Toggle switch K1, when the switch is in "SIG" position, the start/stop is controlled by external signal. When there is no external signal, the switch

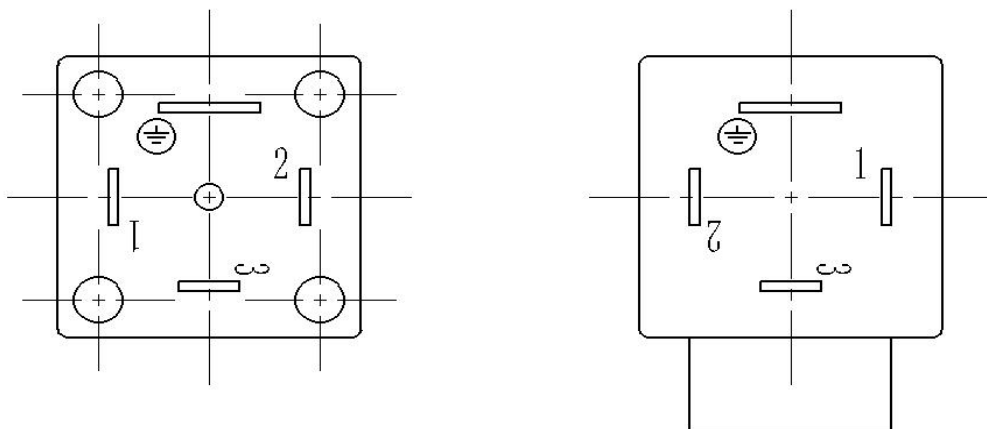
is set to the "PWR" position to start and the switch is set to the "SIG" position to stop.

Protection function and number of alarm light flashes:

Table 1

Fault content	Number of red light flashes and conditions	Reason for alarm
Overcurrent	1 In the startup state	Input current exceeds the set limit current
Motor blocking	2 In the start-up state	Alarm shutdown in case of drive damage
Power over-voltage, under-voltage	3 When the power is on	Input voltage lower than 16.8VDC or higher than 30.3VDC
Motor winding overheating	4 In the start-up state	Motor winding temperature reaches 120°C
Motor winding temperature sensing abnormal	5 Start-up status	Motor winding temperature sensing is bad
PCB overheating	6 Start-up state	PCB temperature over 78°C
Hall sensor anomaly	7 In the start-up state	Hall didn't pick it up.

3.3.2 Low level wiring

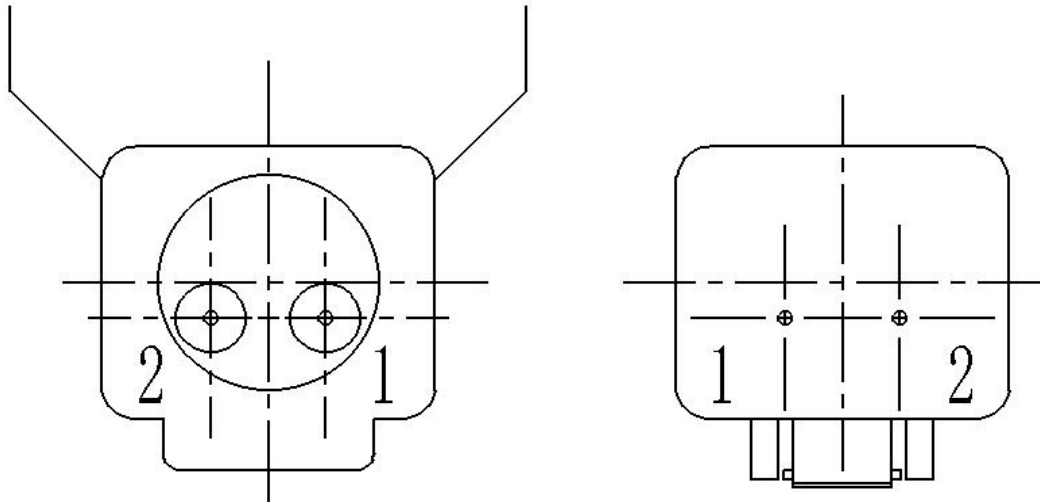


Pin Name	Wiring (24V)
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1	positive pole
3	Signal

Male Female

3.3.3 Solenoid valve wiring



Male Female

Pin Name	Wiring (24V)
1	Negative Pole
2	positive pole

4. Lubrication pump commissioning and grease filling

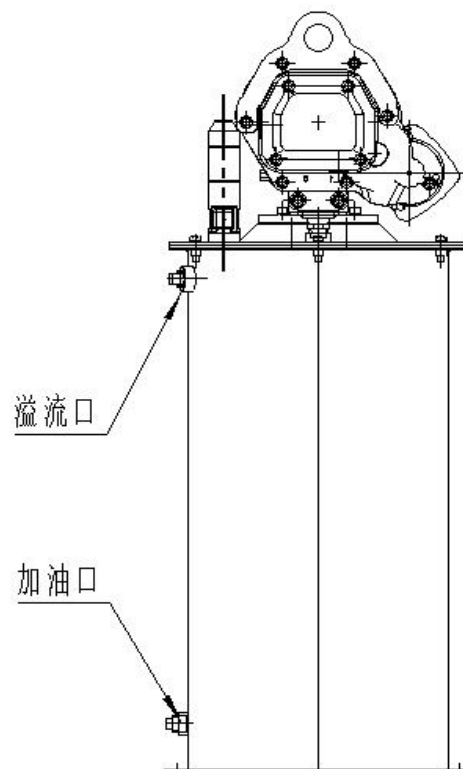
When first starting the lubrication pump or after repairing the lubrication pump, the basic commissioning of the lubrication pump is required:

- (1) Connect the low level line, observe whether the low level device is alarmed, if it is alarmed, use the prescribed refueling tool from the prescribed refueling port, fill the lubrication pump tank with clean lubricating grease until the green rod reaches the middle position.

(2) In the lubrication pump outlet connected to an oil pipe, start the lubrication pump and solenoid valve, observe the outlet oil, work for one minute, if the oil is smooth, the commissioning is over; if the phenomenon of air discharge, continue to work to the low level alarm, repeat (1) (2) operation, until the phenomenon of air discharge no longer occurs.

(3) Unscrew the overflow port screw plug with a wrench and continue to fill the grease from the filling port until the overflow port overflows, then stop filling the grease and tighten the overflow port screw plug, then the grease filling is finished.

Note: In the maintenance, installation of lubrication pump pay attention to the cleanliness of the parts, so as not to mix with impurities damage lubrication pump and distributor; pay attention to the bearings, gears need to apply a lot of lubricant, so as not to aggravate the bearing, gear wear.



5. Care and maintenance

(1) routine maintenance and overhaul must be operated in accordance with the relevant provisions of this manual, do not violate the operation, resulting in damage to the lubrication device.

(2) Regularly check each component tightening, penetration and other phenomena, maintenance in a timely manner. Do early detection of problems, early solution to reduce losses.

(3) regularly check the oil level in the oil drum, timely filling grease to prevent the pump body device dry wear and air into the pipeline, resulting in system failure.

(4) Remove the shield regularly and apply lubricant between the connecting rod bushing and the copper bushing to reduce the wear of the connecting rod bushing and the copper bushing.

(5) Keep the environment and each component clean inside and outside.

(6) This lubrication device, if there are specific parameters required or maintenance difficulties, please consult our company in a timely manner, do not take the risk.

6. Troubleshooting guide

Anomalies	Reason	Exclusion method
Lubrication pump running, but no grease discharge or discharge grease with air holes (when the oil, when not oil)	The grease layer in the lubrication pump is too low	Replenish grease for lubrication pump
	Wear of upper and lower spool or oil seal	Contact the manufacturer for replacement
	Damaged solenoid valve	Solenoid valve replacement
	Relief valve check valve failure	Clean the check valve and re-regulate the pressure
Lubrication pump does not run after power is applied	Drive voltage and current are too small	Increase the voltage and current to the specified value
	Motor burnout	Motor replacement
	Poor cable contact	Check the condition of each line
	Electric control board burned	Replace the circuit board
The working pressure of lubrication pump is too low (can't afford to play high pressure)	Wear of upper and lower spool or oil seal	Replace upper and lower spool or oil seal
	Relief valve check valve failure	Clean the check valve and re-regulate the pressure
Lubrication pump operating pressure overload (discharge	Blockage of the base runner hole	Cleaning the base runner hole
	Clogged flow path with	Replace grease, clean each

distributor failure)	impurities	runner and joint
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