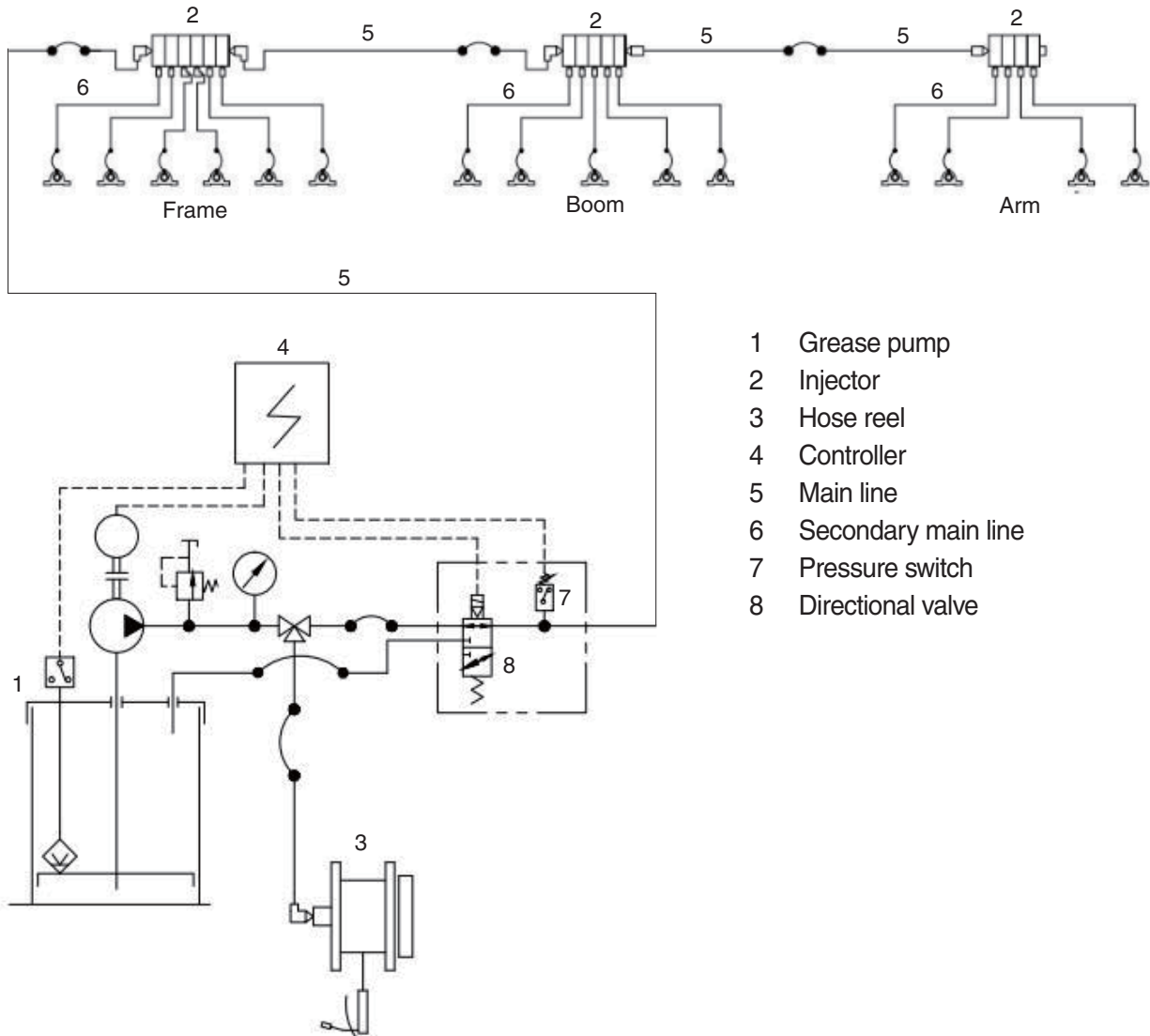


1. CENTRAL GREASE LUBRICATION SYSTEM

1) OUTLINE

(1) System diagram



1200L8AG01

(2) Major device

① Grease pump

A device for generating a high pressure of pressure to discharge lubricant.

② Injector

A device for supplying the transferred lubricant to each lubrication point.

③ Hose reel

The lubricant transferred from the pump is used for manual lubrication at the lubrication point using a hose reel grease gun.

④ Controller

Adjusts the operation time and the rest time of the fueling pump, and controls the system.

⑤ Main line

The grease fed from the pump is transferred to the injector.

⑥ Secondary main line

It transfers grease from the injector to lubrication point.

⑦ Pressure switch

The pressure switch is activated when the pump operates and the pressure in the main line for grease discharge is generated and reaches the set pressure.

⑧ Directional valve

It is a valve that acts to bypass the grease pressure of the main line to the pump.

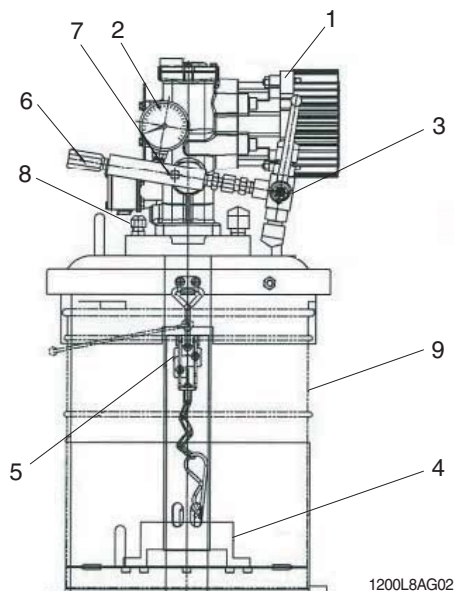
(3) Safety management guidelines

- ① Before using grease pump, please read this manual carefully.
- ② In order to use this product stably, please observe safety management guidelines.
- ③ While driving the pump, make sure that the direction of the grease gun and the discharge port are not facing the person.
- ④ Be sure to turn off the power when repairing or servicing the pump.
- ⑤ If the pump is used for purposes other than greasing, it may cause physical injury due to damage or malfunction of the pump.
- ⑥ For the purpose of maintenance, do not spray water directly to the products which constitute the auto grease system. (pumps, controllers, injectors, valves)
- ⑦ When performing maintenance, inspection, or replacement of grease containers, do not allow foreign objects to enter the pump or piping or fittings.

2) MAJOR COMPONENT

(1) Grease pump

① Structure



- 1 Grease pump assy
- 2 Pressure gauge
- 3 3-way ball valve
- 4 Follow plate
- 5 Fastener
- 6 Safety valve
- 7 Air vent
- 8 Low level
- 9 Grease can

② Specifications

Item		Specification
Pump	Model	85748
	Max operating pressure	344 bar
	Outlet volume	57 cc/min (50 r/min)
	Operating temperature	-30 ~65 °C
	Suitable lubricants	NLGI EP00~EP1
	Pump outlet	NPTF 1/4"
	Output/pump cycle	1.15 CC
Motor	Voltage	DC 24V
	Power	0.25 kW
	Gear ratio	34 : 1
	Speed	3~50 r/min

③ Function

a. Pressure gauge

Confirms the operating pressure of the fueling pump during pump operation.

b. Air vent

When the pump is in operation, if the grease can not be pumped due to the mixing of air in the grease. the function is to open the air vent to discharge the air penetrated into the grease.

c. Safety valve

It is a valve to protect the pump when the abnormal pressure rises due to

d. Low level switch

It is a low-level signal function that tells you when to replace the grease.

e. Three-way valve

It is used by operating Auto mode and Manual mode according to pump operation condition.

f. Follower plate

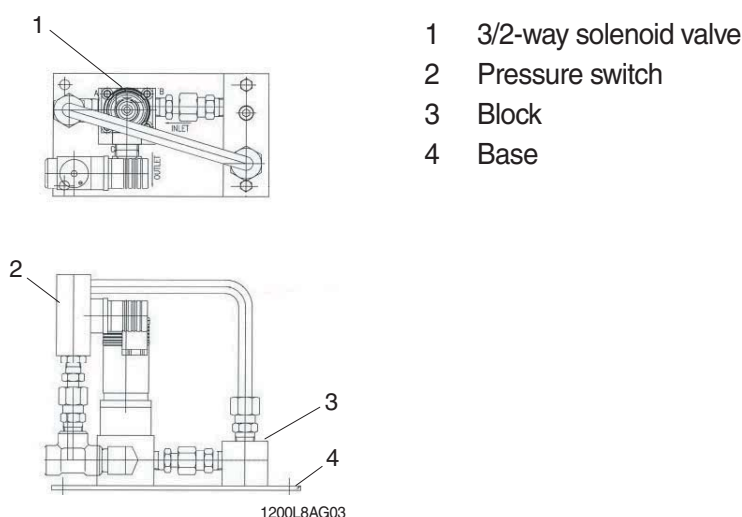
It is located inside the grease container to help pumping the pump smoothly and to clean the grease on the inner wall of the container.

g. Fastener

It is a device for dismantling or fixing a lock (clamp) using a Fastener of a pump before and after a grease container change.

※ If you did not change the grease "consistency" according to the atmospheric temperature condition, it will cause poor pump performance and malfunction. Therefore, change the grease (consistency) to match the temperature condition.

(2) Directional valve

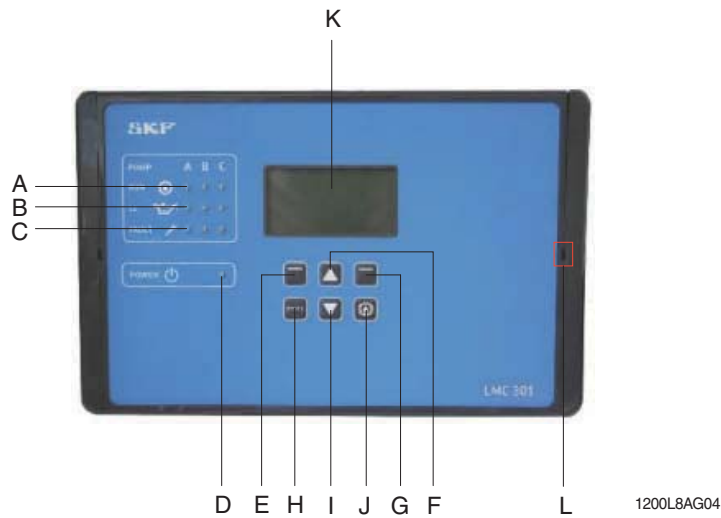


Specifications

Item	Specification
Type	3/2-way solenoid valve
Model	VP1Z-1/2-G24
Max operating pressure	400 bar
Flow rate Qmax	15 lpm
Line connection (A, B, C)	PF 1/2"
Solenoid voltage	24V DC

(3) Controller

① Configuration

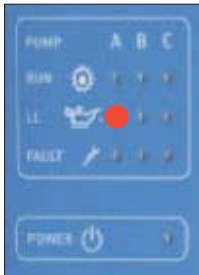


Point	Name	Function
A	Pump run LED	Light up during pump running.
B	Low level LED	Light up during low level alarm.
C	Fault LED	Light up during other alarm except low level.
D	Power LED	Light up during energized.
E	Left selection button	Push to select bottom left square menu in the LCD screen.
F	Up selection button	Push to select upper menu or increase input value in the LCD screen.
G	Right selection button	Push to select bottom right square menu in the LCD screen.
H	Reset button	Push to eliminate alarm or stop the lubrication cycle during pump running.
I	Down selection button	Push to select downer menu or reduce input value in the LCD screen.
J	Manual lubrication button	Hold 3 seconds to manual lubricate for 1 cycle.
K	LCD screen	LCD screen.
I	Controller opening tip	Use a (-) driver to open the controller.

② Specifications

Item	Specification
Cabinet size	10.6299 (L) x 6.6929 (W) x 3.5433 (H) (inch)
Working voltage	DC 24V +/- 10%
Power consumption	3A internal fuse (only for controller)
Motor driver current	MAX. 15A (DC)
Working temperature	- 30 ~ 70 (°C)
Output CH	4CH 8 count, contact 8A of 2 to max. 15A
Input CH	4CH 10 count, short-circuit-proof, 2 are analog capable
Ingress protection	IP 65

③ Error and display icons



1200L8AG05

a. LL indicate

Low level alarm is ringing. Check the grease bucket and change the grease bucket if it is empty.



1200L8AG06

b. Fault indicate

The pump is not filling the grease line or malfunction happened in the pressure switch. Check the whole system including the injector movement.
















1200L8AG07

c. Power light is not working

Energizing to the auto lubrication system has a problem. Check the cable or the fuse.

④ LCD display

Symbol	Status	Function
	Stopped/OFF	The system was stopped by pressing the reset key and can be restarted by briefly pressing the running key.
	Pause	The respective lubrication area is currently in the interval time.
	Wait Temperature	Temperature waiting time.
	Wait	Lubrication zone waiting because another zone currently being lubricated.
	Lubricate	The system lubricates.
	Hold	Holding time.
	Pressure relief	System relieved.
	Runtime	Pump runs.
	Secured/Access denied	No access as local admin or supervisor.
	Access	Access as local admin or supervisor.
	Fault	There is a fault.
	Digital inputs/outputs on	Digital output switched on.
	Digital inputs/outputs off	Digital output switched off.

⑤ Cable connection

a. Main cable display

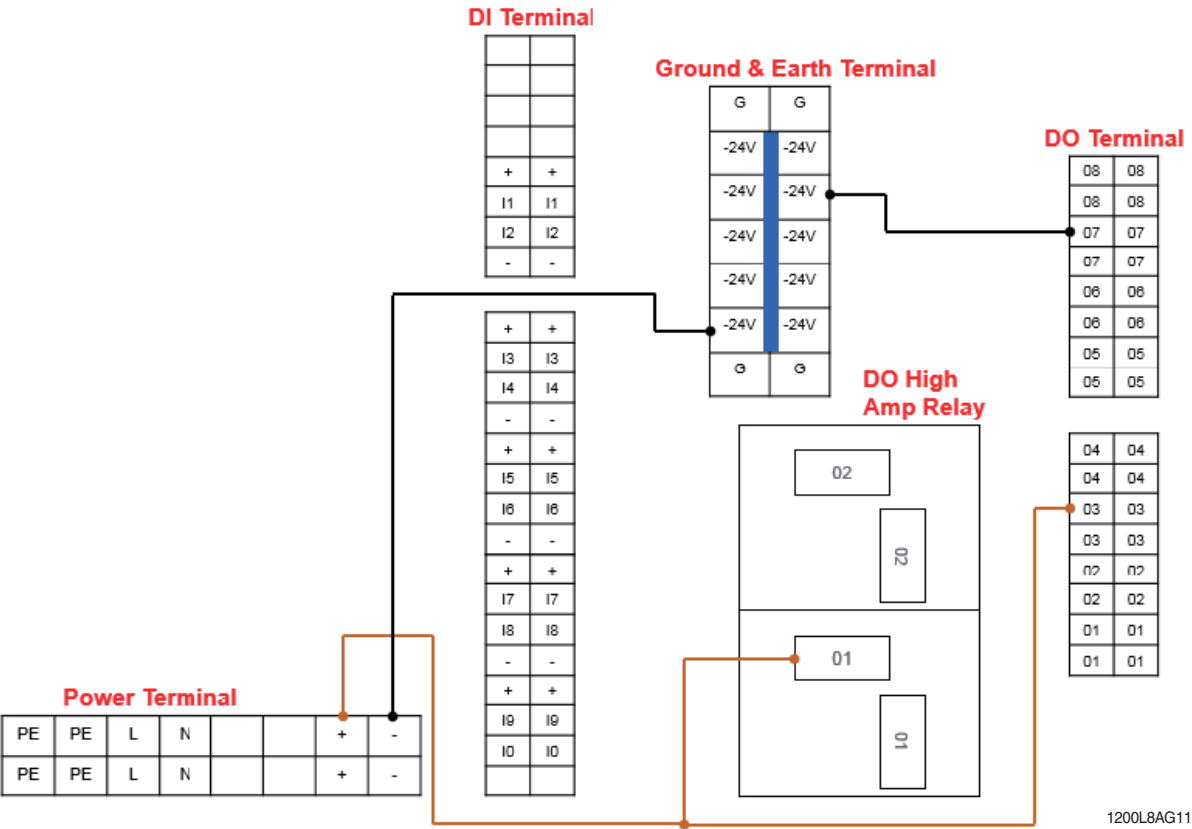


X1	4P cable from main excavator
X2	2P pressure switch
	2P low level switch
	2P relief valve
X3	2P pump power

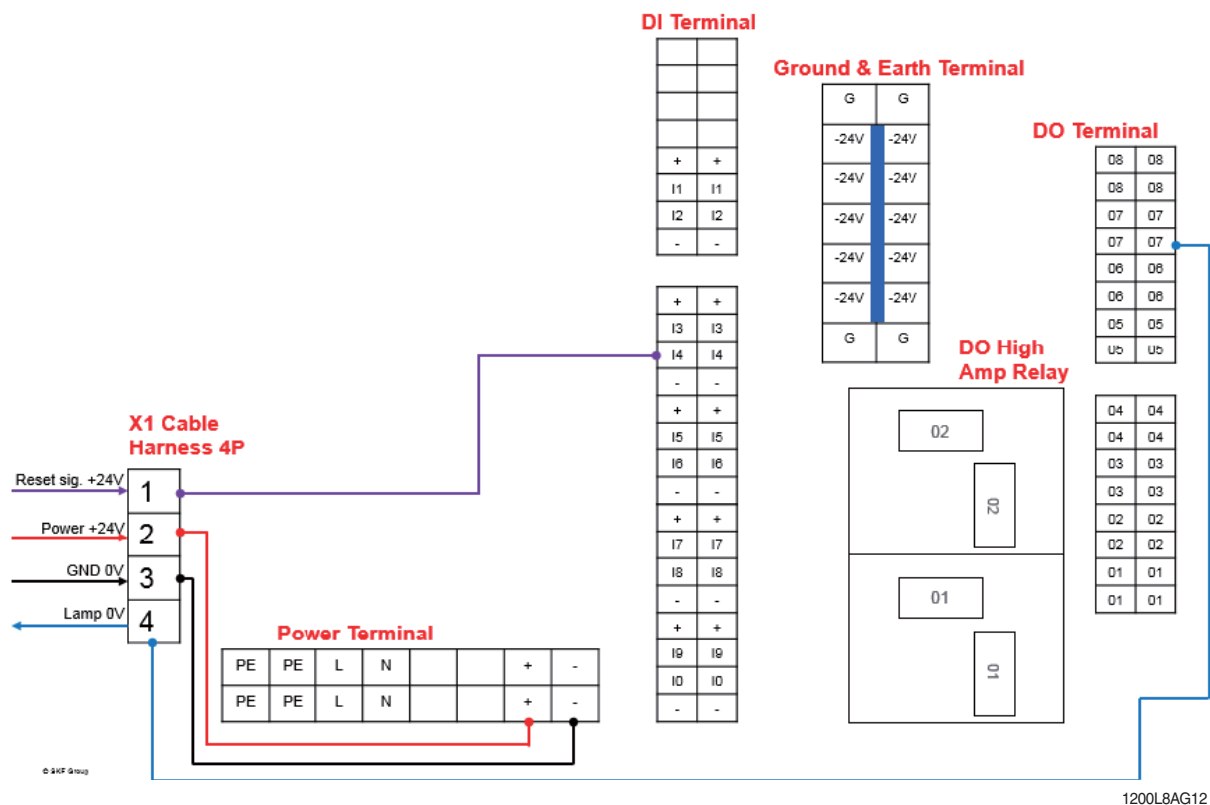
b. Inner circuit connection diagram



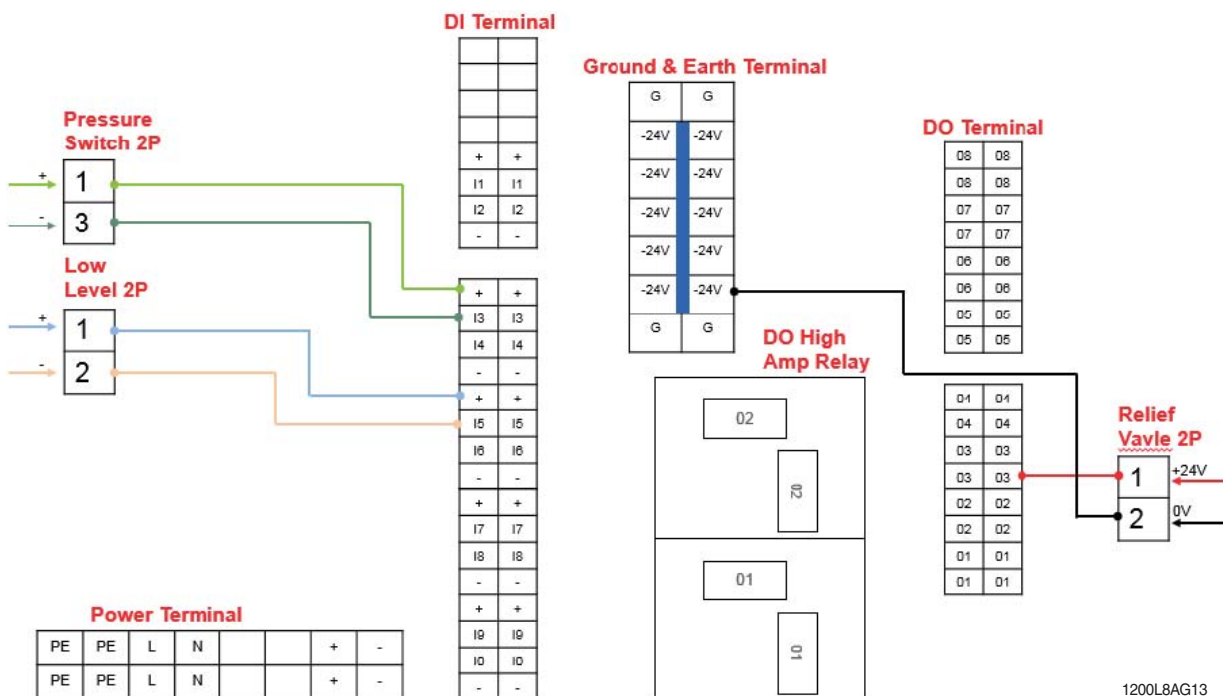
1200L8AG10



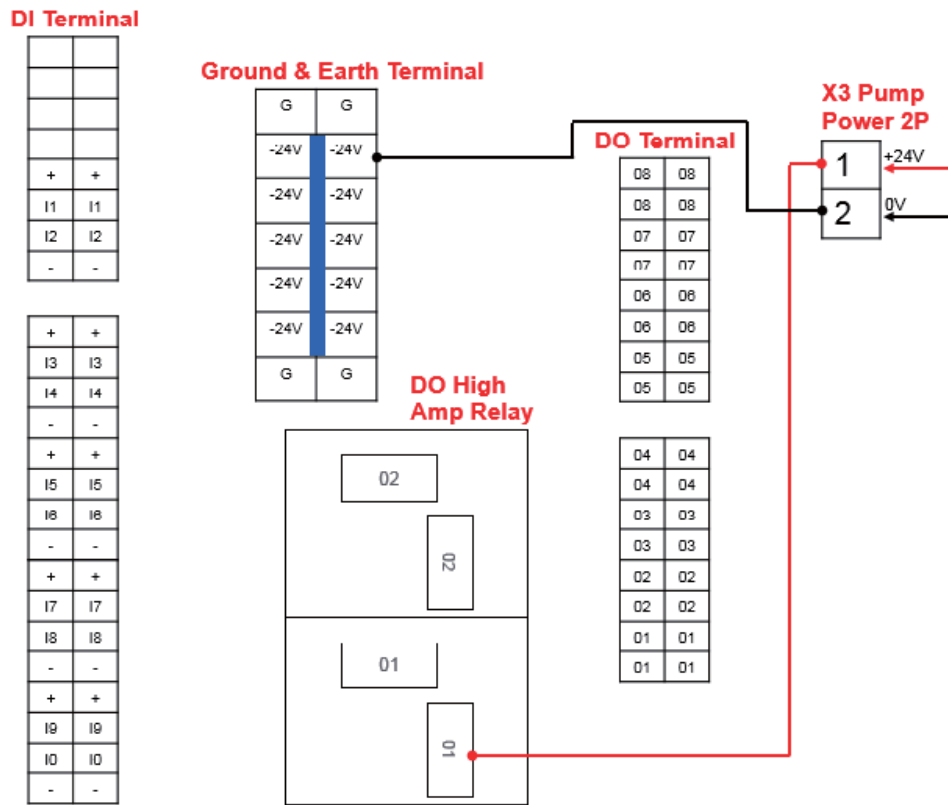
c. X1 cable connection diagram



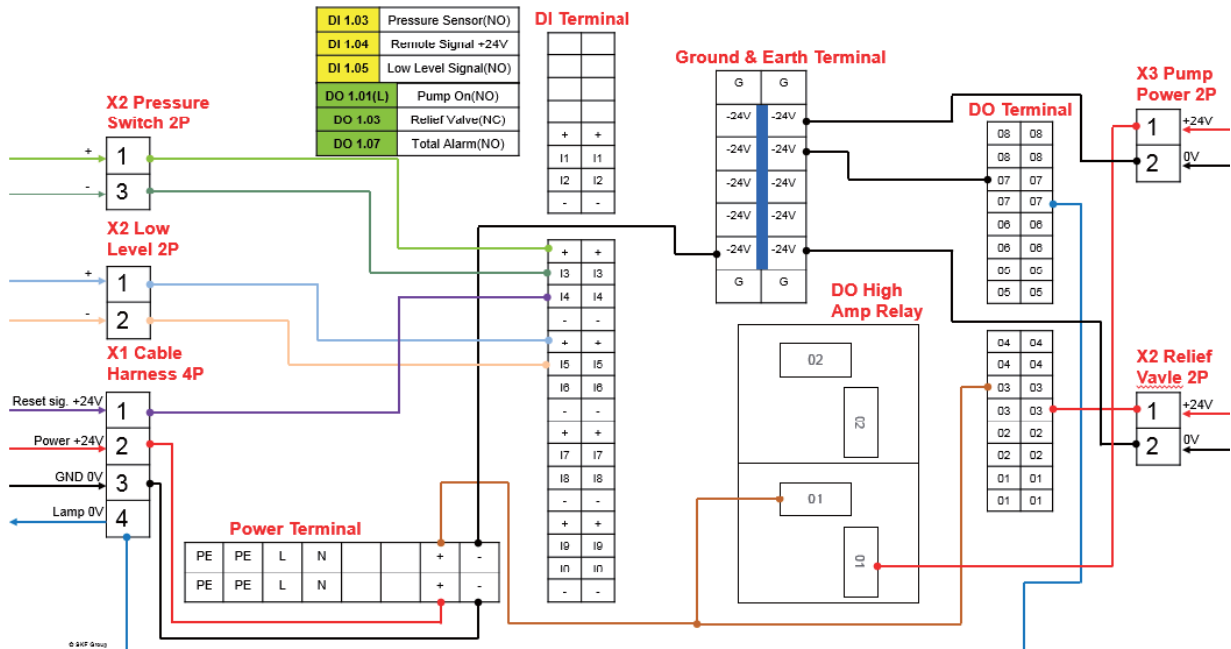
d. X2 cable connection diagram



e. X3 cable connection diagram



f. Full connection diagram



(4) Injector



1200L8AG16

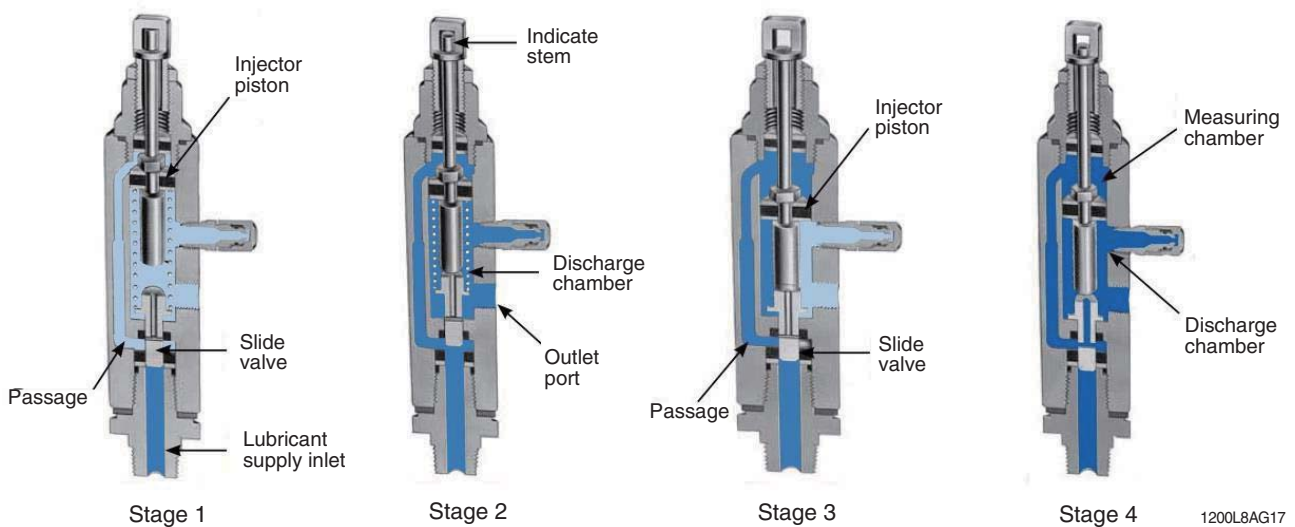
① Description

- a. Visible monitoring through indicator pins
- b. Individual injector exchangeable
- c. Discharge amount, stroke (each) : 0.131 ~ 1.31 cc

② Adjustment of discharge amount

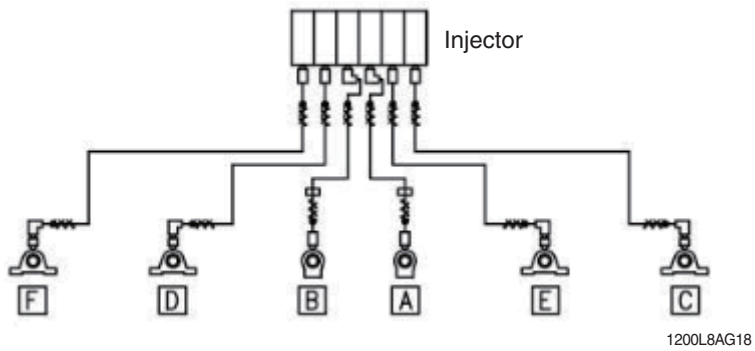
- a. Loosen the locknut counterclockwise and turn it one more turn to the loose position.
- b. While holding the locknut, tighten the adjusting screw clockwise (with your fingers) until it stops.
At this point, the discharge volume is 0.147 cc.
- c. Adjust the adjusting screw by turning it counterclockwise as much as necessary discharge amount. Each output becomes (0.147 cc), and when it is adjusted about 8 times, the maximum discharge amount (1.31 cc) becomes.
- d. The lock nuts are tightened with a torque of 1.0~1.2 kgf · m (7.4~8.9 lbf · ft).

③ Operation



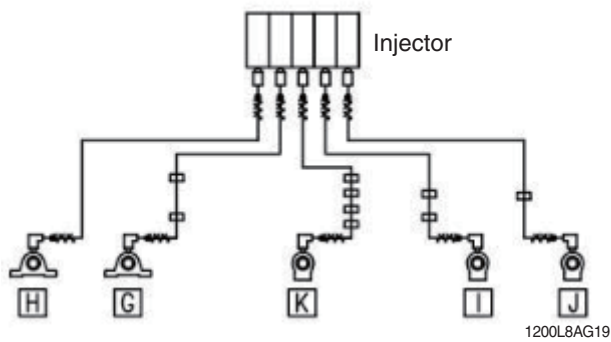
④ Operation

a. Frame



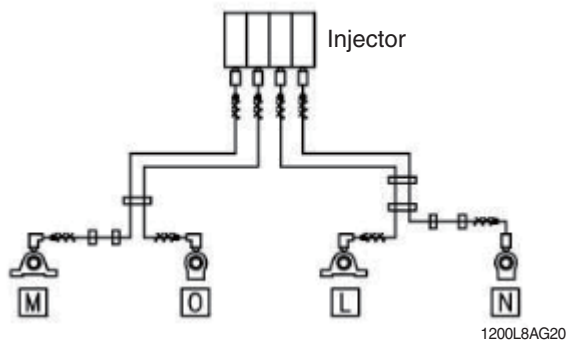
- A Boom cylinder B/RH
- B Boom cylinder B/LH
- C Swing R/LH
- D Swing F/LH
- E Swing F/RH
- F Swing R/RH

b. Boom



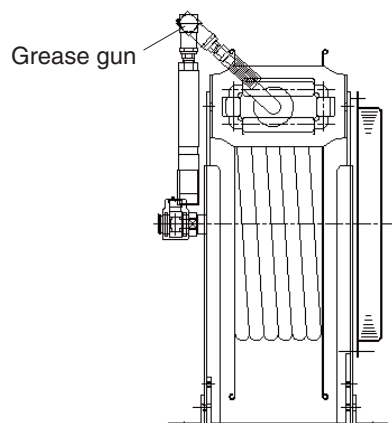
- G Boom B/LH
- H Boom B/RH
- I Arm cylinder L/C
- J Boom cylinder T/LH
- K Boom cylinder T/RH

c. Arm



- L Boom T/LH
- M Boom T/RH
- N Arm cylinder S/C
- O Bucket cylinder L/C

⑤ Hose reel



Item	Specification
Model	RHA-925
Max operating pressure	280 bar
Hose size	3/8" x 2W
Winding length	15 m
Painting color	Yellow

3) OPERATION

(1) Operation Mode

- ① Automatic operation : Automatic grease injection
- ② Manual Operation : Manual grease injection using grease gun

(2) Automatic Operation

Usage for frame / boom / arm lubrication.



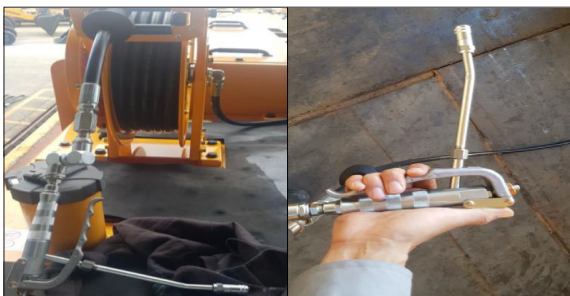
1200L8AG21

- ① Pump operation should be performed when operation stops. (wait for a while during pump operation)
- ② Check the pump run lamp and power lamp of the controller. (At this time, the lamp lights up)
- ③ Use the knob on the valve (3-way) to change direction to auto position.



1200L8AG22

- ※ At this time, the residual pressure in the piping of the grease hose must be relieved by using the manual gun. (when the high pressure inside the hose is left, it can cause malfunction in the pump operation. Also, it can protect the hose by removing the high pressure in the pipe)




1200L8AG23

- ④ The internal pressure of the manual hose reel, must be pressure removed by means of a grease gun before performing the following operations.



1200L8AG24

- ⑤ When you press  holding on the manual lube button in the controller, the pump starts operating. (auto mode is set at the factory.)

- ⑥ The pump starts to operate, and grease is supplied to the injector through the piping to supply lubricant.
 - ⑦ When the pump reaches the set pressure, the pump stops operating. (factory setting pressure is 200 bar)
 - ⑧ The grease in the main line is goes back to the pump through the relief valve (bypass) and will be ready for the next operation.
- ※ **Refer to page 8-37 for controller.**

- ※ How to change the manual mode
- Usage for frame / boom / arm lubrication.
- The operating sequence must be observed.



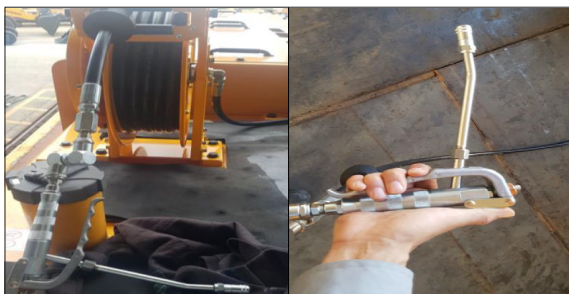
1200L8AG21

- ① Turn valve to up (check) position.



1200L8AG22

- ② Key on the engine.
Green light will appear and start automatically.




1200L8AG23

- ③ Eliminate pressure in hose reel by squeezing the gun handle.



1200L8AG24

- ④ Hold on  for 3 seconds for additional lubrication.

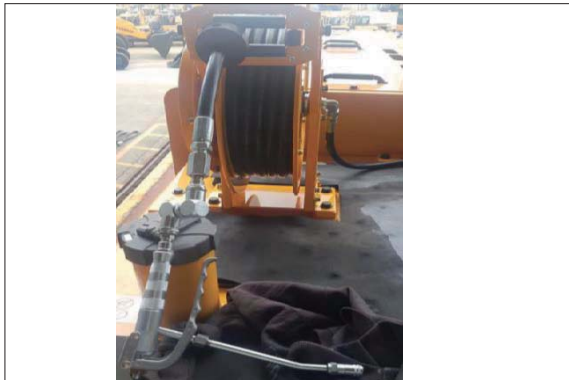
(3) Manual operation

Usage for bucket lubrication only.



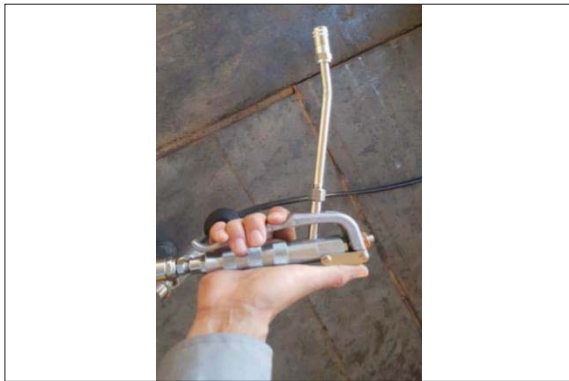
1200L8AG25

- ① Pump operation should performed when operation stops. (wait for a while during pump operation)
- ② Use the knob on the valve (3-way) to change direction to manual.
- ③ When you hold on the controllers manual lube button for 3 seconds, the pump starts manual operating.
- ④ When the pump reaches the set pressure, the pump stops operating. (factory setting pressure is 240 bar))



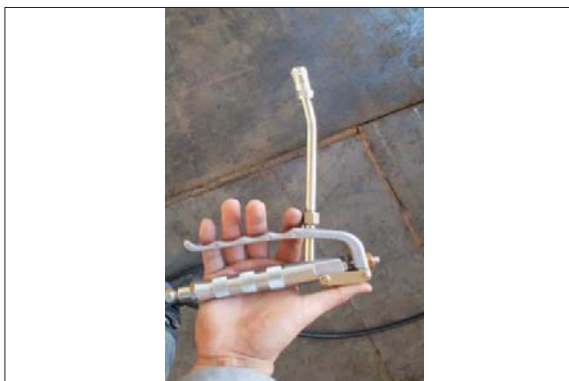
1200L8AG25-1

- ⑤ You can lubricate the grease with a grease gun at the feeding position using the hose reel



1200L8AG25-2

- ⑥ During lubrication, the pump is operated.



1200L8AG25-3

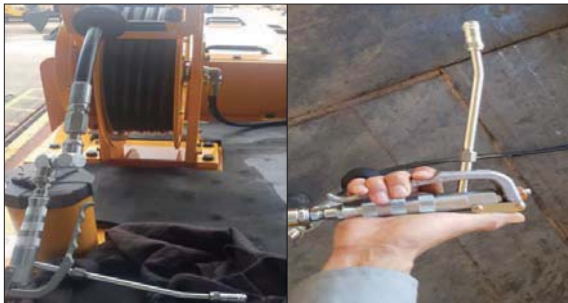
- ⑦ When the lubrication is stopped, the pump will stop operating.
- ⑧ When lubrication is finished, put the hose and place it in the original position.

- ※ How to change the automatic mode
- Usage for frame / boom / arm lubrication.
- The operating sequence must be observed.



1200L8AG25

- ① Turn valve to right position.




1200L8AG23

- ② Get grease gun from reel.



1200L8AG24

- ③ Hold on  for 3 seconds to start the pump.
The pump will stop soon unless the grease gun is not used.



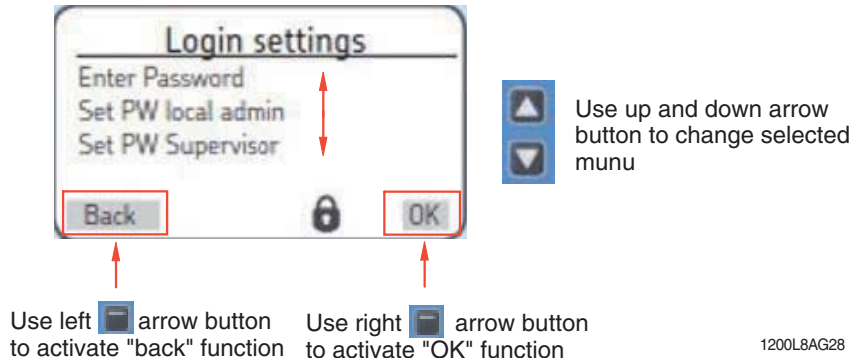
1200L8AG26

- ④ Connect the outlet to bucket point and squeeze the handle.
Pump will start running when pressure falls.

5) SYSTEM SETTING

(1) Usage of select button

※ Refer to page 8-5 for details.



(2) Operation default value and changing value

① I/O address

DI 1.03	Pressure sensor (NO)	DO 1.01 (Large relay)	Pump on (NO)
DI 1.04	Remote signal +24V	DO 1.03	Relief valve (NC)
DI 1.05	Low level signal (NO)	DO 1.07	Total alarm (NO)

② Factory set value

Item	Set value
Control type	Pressure control.
Low level active condition	10 seconds steady signal received.
Normal lube cycle time	10 minutes repeating cycle. Set in as normal.(factory default)
Heavy lube cycle time	20 minutes repeating cycle. Configuration change needed. Change the lube cycle to heavy mode to reduce grease amount. Unless, use normal mode as default set.
Monitoring time	25 minutes. Pressure switch signal needs to be received under 25 minutes. After finishing using the manual mode, switch the 2 way valve to the auto mode direction. It will send an alarm when using manual mode too long.
Pump control	Max 3 pumps are controllable. Only one pump is controllable in this system.(default)
Zone control	Max 3 zones are controllable. Only one zone is controllable in this system.(default)

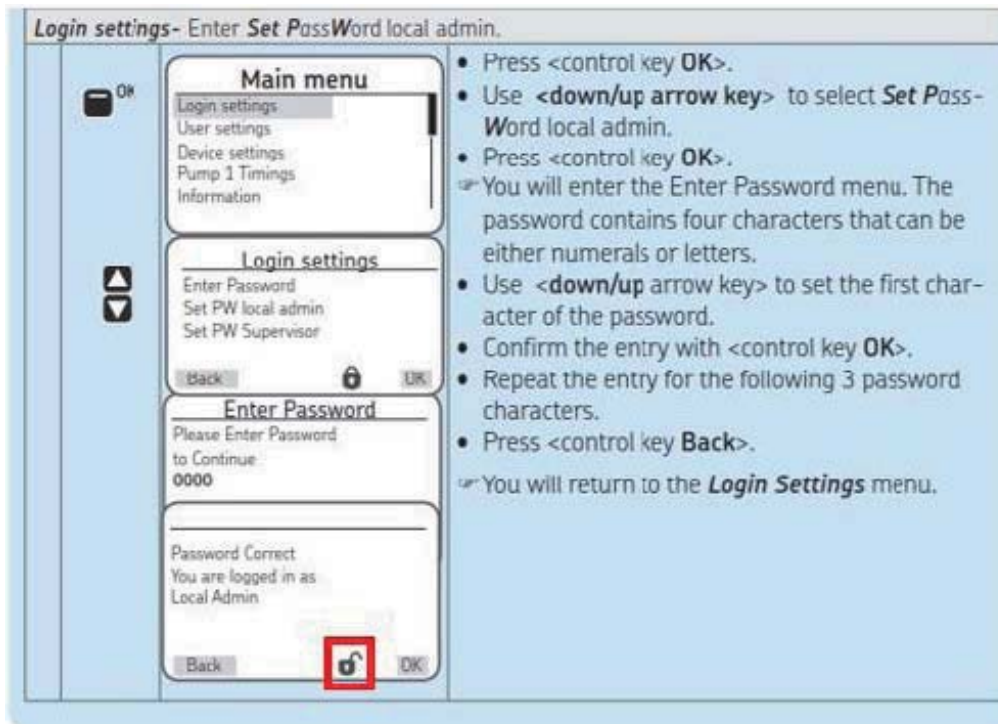
※ Do not reprogram the controller without any permission.

Changing function values might lead to a malfunction of the whole auto lubrication system.

③ Login setting

Need to access as Supervisor to change setting. Unless, value changeable menus will no appear.

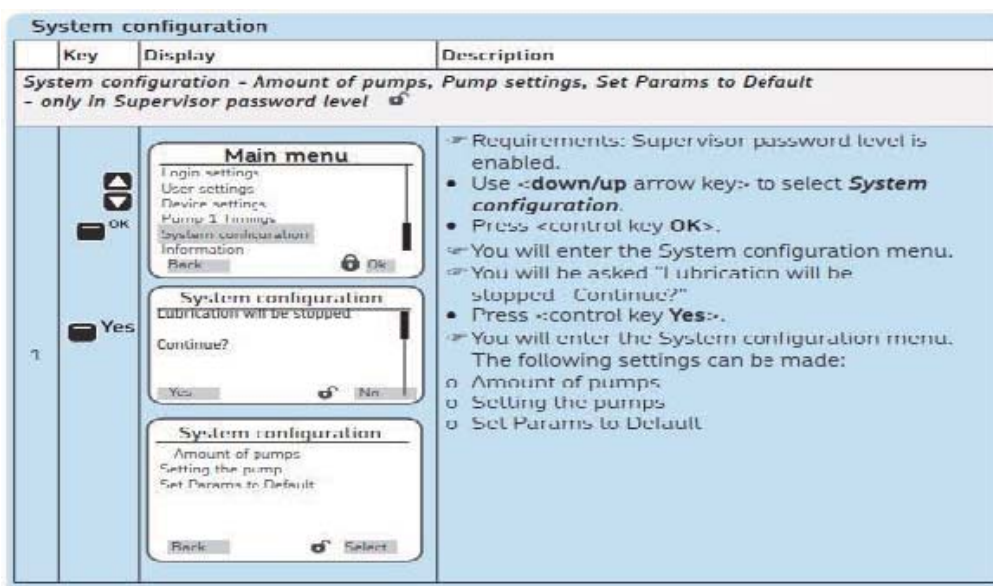
User type	Password
Operator	without password access
Local administrator	1000
Supervisor	2020



1200L8AG29

· Changing configuration

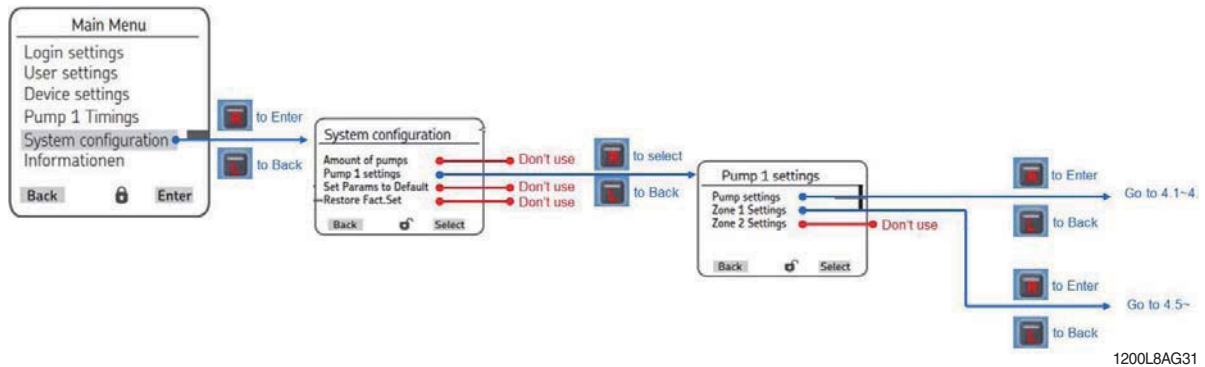
“System configuration” menu will appear after logged on as supervisor. Bottom icon will change as unlocked.



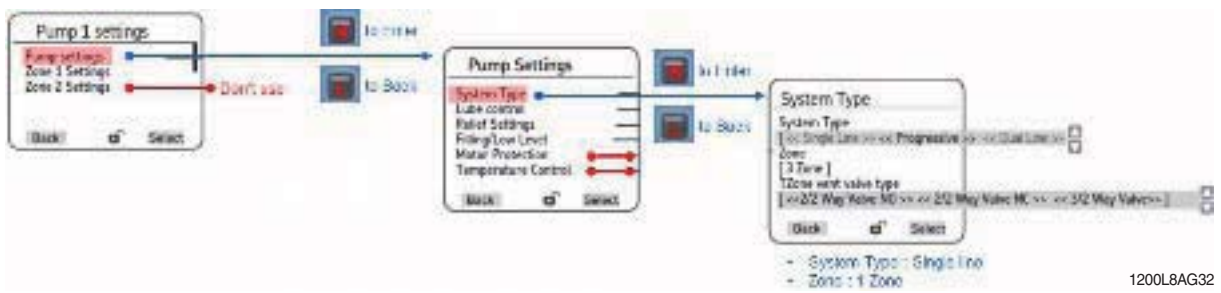
1200L8AG30

④ Setting system

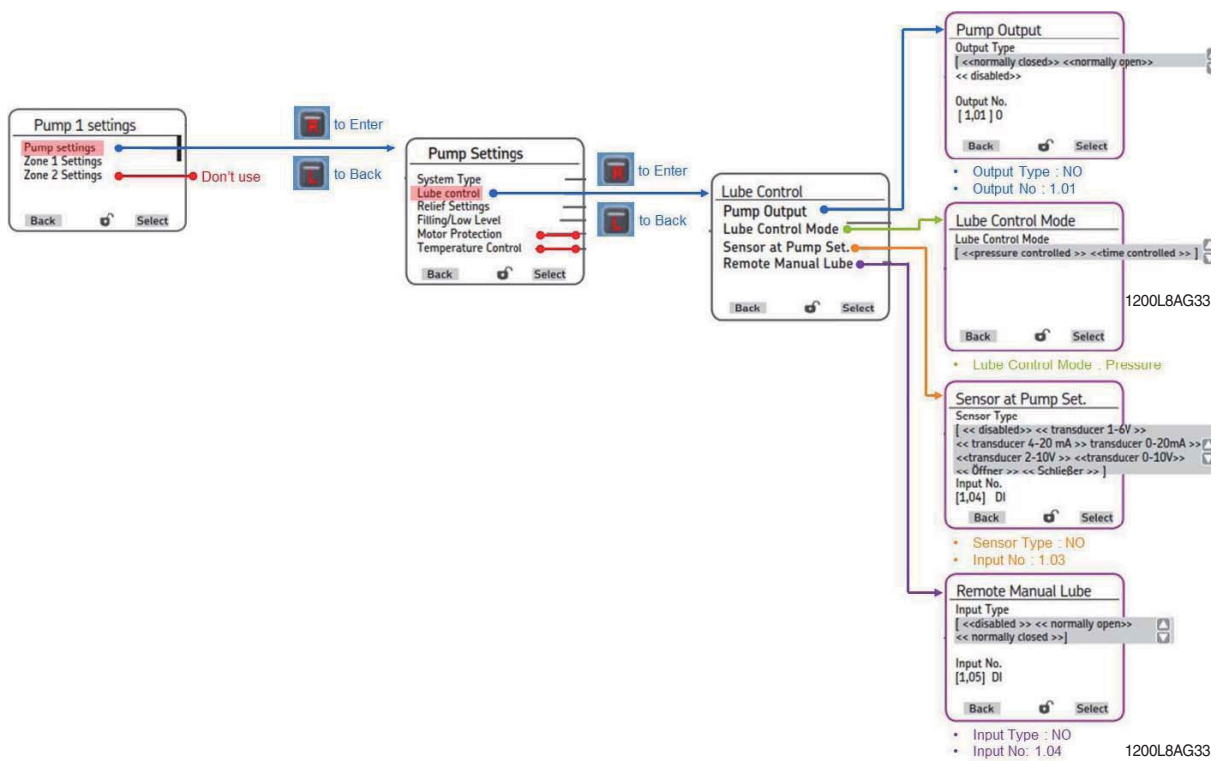
a. Configuration



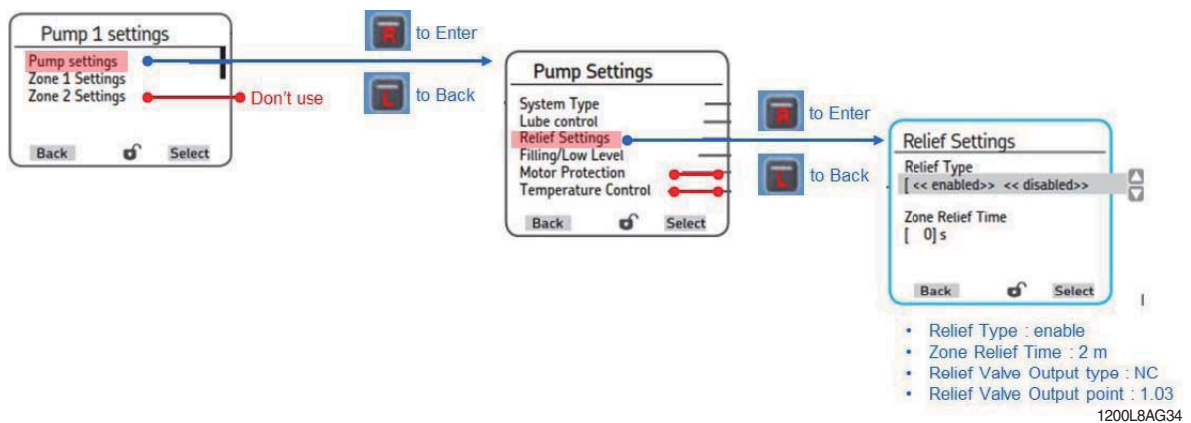
b. System type setting (pump setting)



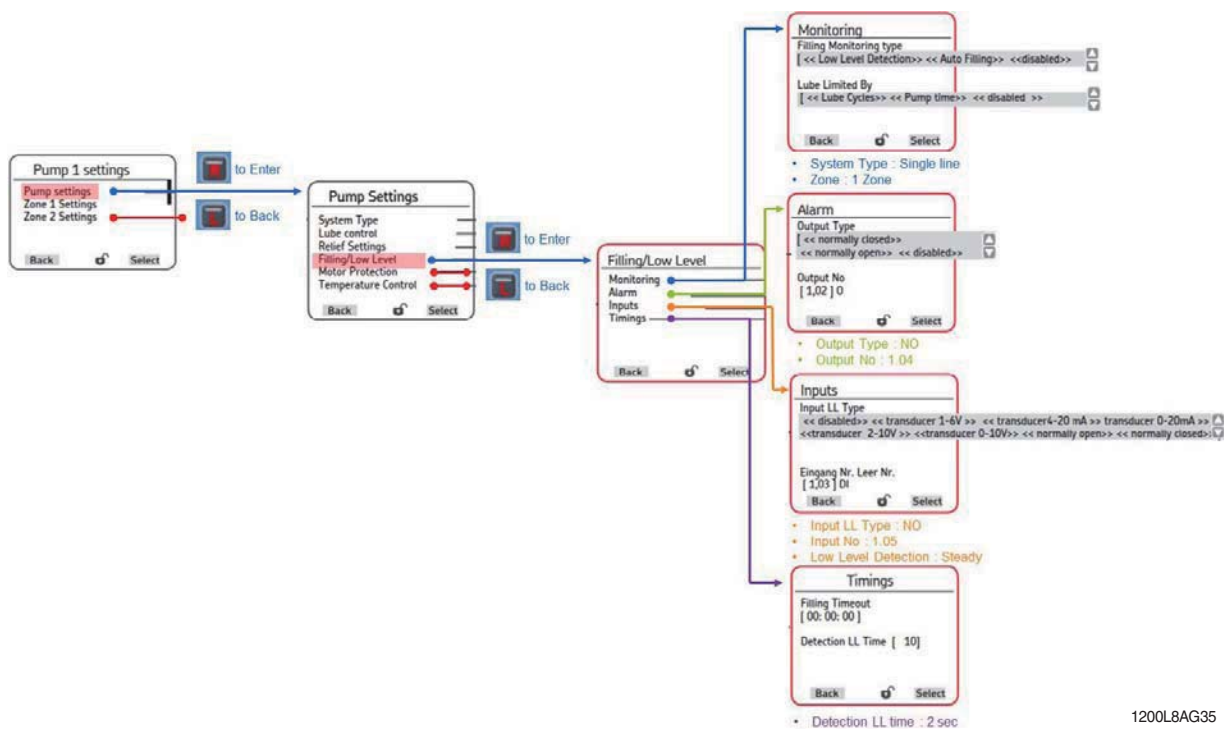
c. Lube control setting (pump setting)



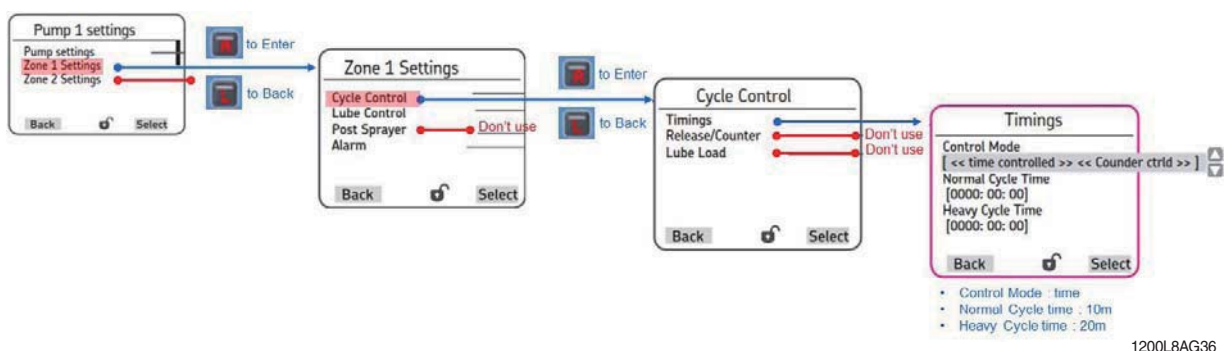
d. Relief setting (pump setting)



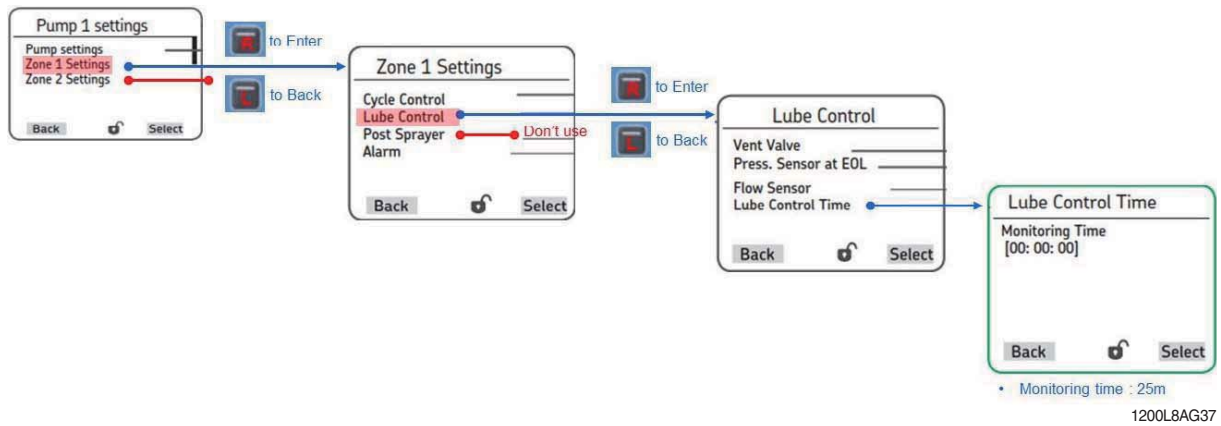
e. Relief setting (pump setting)



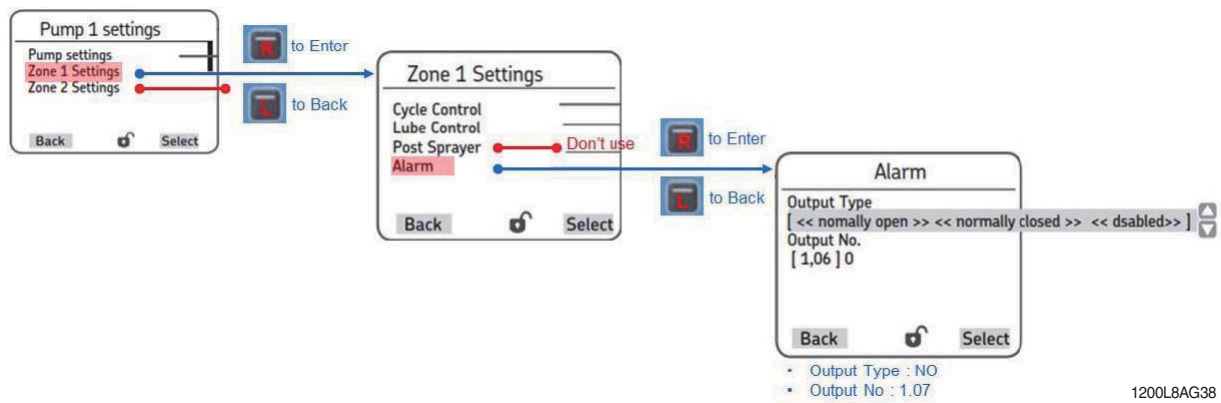
f. Cycle control setting (zone 1 settings)



g. Cycle control setting (zone 1 settings)



h. Cycle control setting (zone 1 settings)



6) MAINTENANCE

(1) Regulator inspection of pump

Cycle	Check	Measure
Daily	Pump operating status	Check pump motor drive
	Controller status	Power lamp (standby) lights visual confirmation.
	Grease balance	Check the grease level gauge
	Pump leakage	Check pump connection
	Pump braced tight	Check pump fixing clamp (2 places)
	Injector operating status	Check injector pin is operating correctly {* Normal discharge of lubrication point grease}
Weekly	Grease balance	Check grease level in grease cans (pail)
	Hose reel braced tight	Check clamping clamp (4 places)
	Hose reel leakage	Confirmation of connection piping
	Controller operating status	(1-Cycle) operating switch
	Controller braced tight	Confirmation of fixed clamp (2 places)
	Controller connector pinned	Cable connector (2 places) check the fixing part
	Injector locked state	Check injector (sl-4,5,6) fixing part
	Feeding point leakage	Confirmation of grease onlet (15 places)
Yearly	Pump component fastened correctly	Check tightening bolt's tightness
	Soling valve unit fastened correctly	Check tightening bolt's tightness
	Injector component mounted correctly	Check tightening bolt's tightness
	Feeding point status	Check tightening bolt's tightness

※ When replacing the grease container, always clean the grease on the follower-plate and pump suction pipe before proceeding to replace the container. There is no filter inside or outside of the pump. Users should be careful about the prevention of foreign matter mixing to ensure pump performance.

(2) Replacing grease can

- ※ It is necessary to carry out the container replacement with two people together to prevent the contamination of foreign matter as much as possible.
- ▲ Turn OFF the controller power before the grease can replacement.



1200L8AG39

- ① Remove the two connecting pins located at the front and rear of the pump, then open the fixed ring.



1200L8AG40

- ② Remove two motor connecting cable connectors and one low-level cable connector.



1200L8AG41

- ③ Use the upper handle of the pump to lift the pump.

▲ Be careful when lifting up the pump. It is heavy.

- ※ The piping hoses and cables are connected to the pump so extra caution is required when lifting the pump.
- ※ Be careful not to expose the lifted pump to surrounding objects.
- ※ Contamination of foreign materials can cause pump failure.

- ④ Lift up the grease can.

- ⑤ Use the follower-plate handle to remove a can from the exterior can.

※ Grease on the top of the plate has to be cleanly wiped at every replacement. Keep it clean.

※ Pump suction pipe and grease can need to be cleaned at every replacement to keep it clean.



1200L8AG43



1200L8AG43

- ⑥ After preparing the new grease, open the lid and place a clean follower plate on the top of grease can with a little pressure.



1200L8AG44

- ⑦ Hold the pump slightly tilted and carefully push it into the center circle of the follower plate.

※ To prevent foreign matter from penetrating
Be extremely careful.



1200L8AG45

- ⑧ Connect the separated motor cable connector and low-level connector as shown in the picture.



1200L8AG46

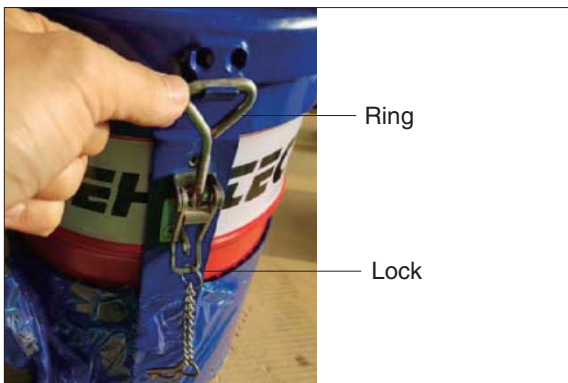
- ⑨ Place the pump correctly.
⑩ Fasten 2 cicada rings on pump top plate.
Next, secure the two safety pins.
※ You must insert the safety pin to prevent the detachment of the hook.



1200L8AG47

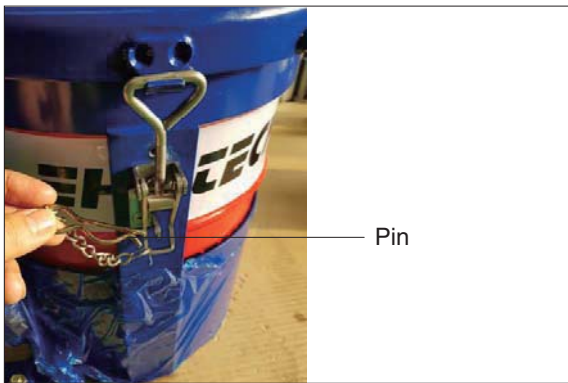
- ⑪ When the vessel change is complete, the pump is ready for operation.
- ⑫ Turn the controller power ON. Be sure to check the pump-operation-selection switch and direction valve.
Press the start button to start the operation.

(3) Locking the can



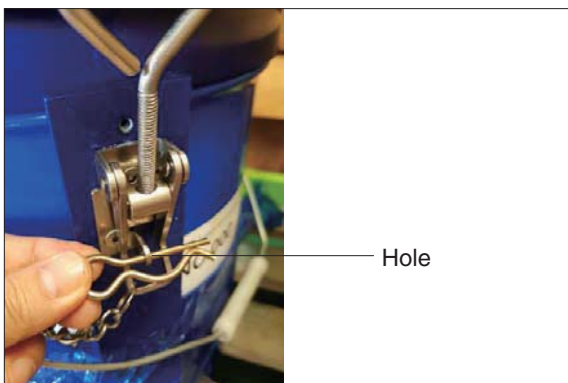
1200L8AG48

- ① First place the hook as shown in figure and press the lock device down gently to hold.
- ※ **There are two fixing hooks on front and rear.**



1200L8AG49

- ② Use a secure pin and push it into the hole at the center of the hook.

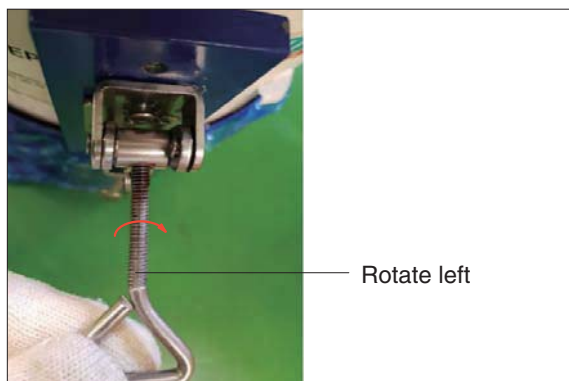


1200L8AG50

- ③ Be sure to insert it correctly to prevent a misplacement of the cicadas ring or the pump.
- ④ To open the secure ring, follow this description in reverse order.

(4) Can height adjustment

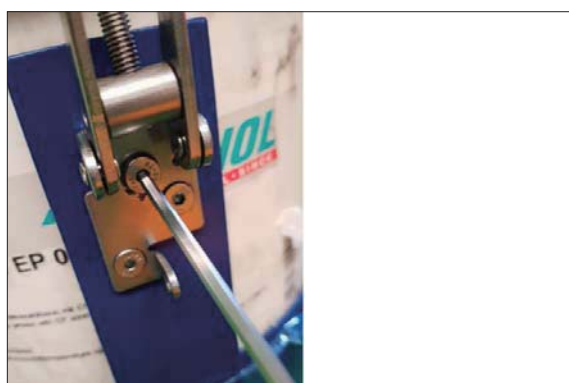
※ When shipped from the factory, it is designed as a grease can height (370 ~ 380 mm).



1200L8AG51

① If it is not fastened to the connecting ring, or if it is loose, rotate the ring to the proper position. Set it to be fixed.

※ Excessive tightening of the ring and rock may cause breakage or bending of the linkage, so be careful.

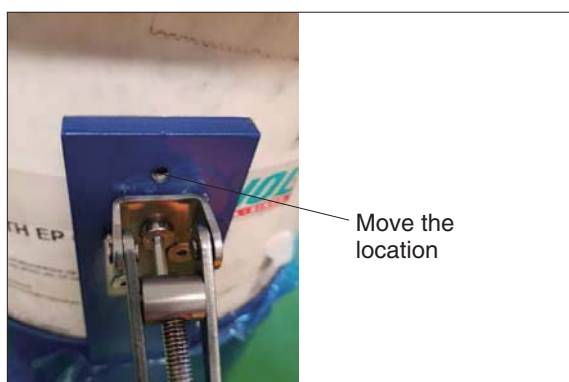


1200L8AG52

② If it is impossible to lock the can to the holder, use a L wrench to change the position.

③ Remove the screws and replace the locking fittings up or down to change the position. Find the right position using different heights of grease can.

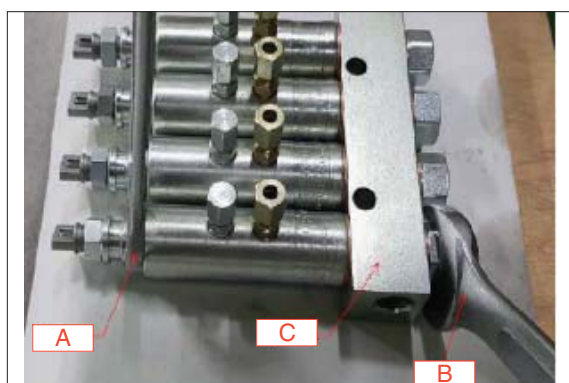
※ When working with L-wrench, be sure to work in a tight position. Using worn tools (wrenches) may cause a difficult to loosen the bolt due to wear and detachment of bolt loosening parts.



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※ Two holes to change the locking height.

Replacing injector



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① Hold "A" with a tool and turn "B" to the counter clockwise. Then the injector disconnects from the manifold.

② After finalizing the replacement work. You can proceed in reverse order to put items back together.

※ Make sure the injector outlet direction is same with the other injecting points.

7) CHECK AND REPAIR

Item		Cause		Measure
If pump does not work		Power connection status		Check main power/connector
		Motor cable connector connection		Check
		Controller connector connection status		Check
When grease can not be discharged		Grease exhaustion		Grease can replacement
		Air intrusion in grease		Air extract operation
		Selects grease to match ambient		Change the grease consistency★ ¹
Description of each function	Controller ★ ²	Power switch disabled		Check main power / connector
		Operation switch disabled		Replace controller
	Low-level error	Grease shortage		Replace controller
	Over time	No grease discharge		Change the grease consistency
		Air mixture ★ ³		Air extract operation
		Hose fastening pipe leak check		Pipe connection
		Hose leak check		Hose fastening and replacement
Injector discharge disable		Check injector pin operation	Pin function	Normal
			Pin malfunction	Change
Check hose reel		Hose leakage		Change
		Grease gun leakage		Change

★¹ If you did not change the grease "consistency" according to the atmospheric temperature condition, it will cause poor pump performance and malfunction. Therefore, change the grease (consistency) to match the temperature condition.

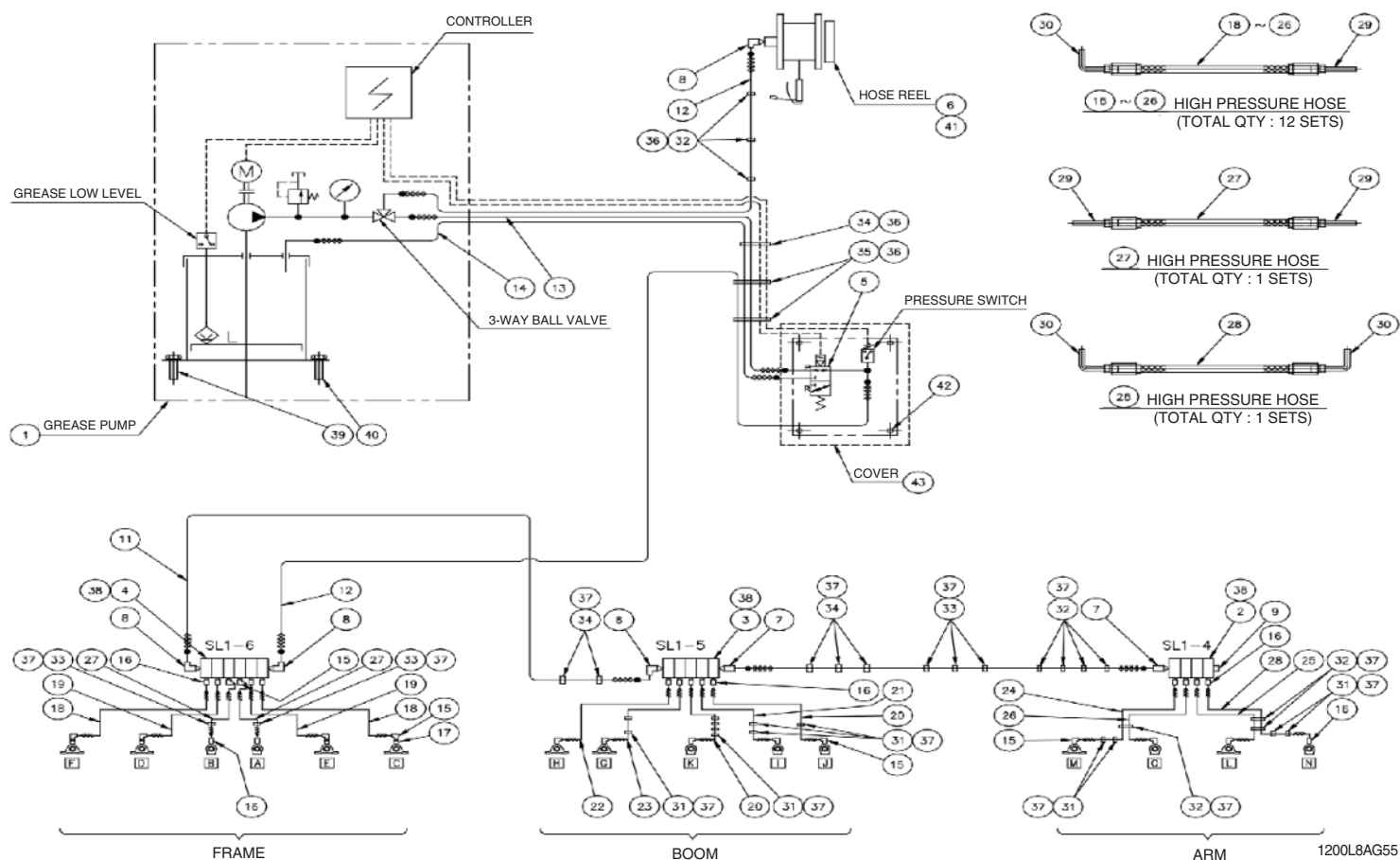
★² The controller should not be sprayed with water or directly hit from it.
Water penetration is a direct cause of malfunction of the product.

★³ When air is taken into the air vents due to air entrainment, sometimes grease color becomes white under high pressure, the grease does not come out continuously with the air vents. And there are tough sounds ("pooock, pooock") continue air ejection until it is continuously discharged continuously.

8) TROUBLESHOOTING

Effect	Condition	Check	Cause or remedy
If pump does not work	Check controller power lamp (if power lamp off)	Power fuse check (fuse box)	Fuse replace
		Check cable connection (controller)	Cable or connector damaged
	Check controller power lamp (if power lamp on)	Check cable connection (pump motor)	Cable or connector damaged
		Push start button and check pump working	Controller PCB damaged
Pressure gauge is not going up when pump drives	Check injector pin moving (if all injector pin move)	Open the outlet line and check grease coming out	Pressure gauge damaged
	Check injector pin moving (if all injector pin not move)	Check line leakage	Main line leakage
Injector indicator pin does not move	Check all injector indicator pin (all does not move)	Check pump or pressure gauge	Check pump or pressure gauge effect
	Check all injector indicator pin (some does not move)	Open the outlet fitting from the stucked indicator injector	Injector is damaged (if no grease is coming out)
			Bearing point or injector to bearing point secondary line is blocked.(open the fitting connected to the bearing and run pump several times)
If all bearing are dry	Check low level in controller	Low level alarms on	Replace a new grease can
		Low level alarms off	Check pump, injector effect

9) TROUBLESHOOTING



- | | | |
|--------------------------|-----------------------|--------------------------------------|
| 1 Grease pump assy | 16 Male connector | 31 Band clamp |
| 2 Injector | 17 Bushing | 32 Band clamp |
| 3 Injector | 18 High pressure hose | 33 Band clamp |
| 4 Injector | 19 High pressure hose | 34 Band clamp |
| 5 Directional valve assy | 20 High pressure hose | 35 Band clamp |
| 6 Hose reel assy | 21 High pressure hose | 36 Hex bolt w/ plain washer |
| 7 Hose nipple connector | 22 High pressure hose | 37 Hex bolt w/ plain washer |
| 8 Hose nipple elbow | 23 High pressure hose | 38 Hex bolt w/ plain washer |
| 9 Hex plug | 24 High pressure hose | 39 Hex bolt w/ spring washer |
| 10 Flexible hose | 25 High pressure hose | 40 Hex bolt w/ spring washer |
| 11 Flexible hose | 26 High pressure hose | 41 Hex bolt w/ spring washer |
| 12 Flexible hose | 27 High pressure hose | 42 Hex bolt w/ plain & spring washer |
| 13 Flexible hose | 28 High pressure hose | 43 Cover |
| 14 Flexible hose | 29 Stud and sleeve | |
| 15 Male elbow | 30 Stud and sleeve | |