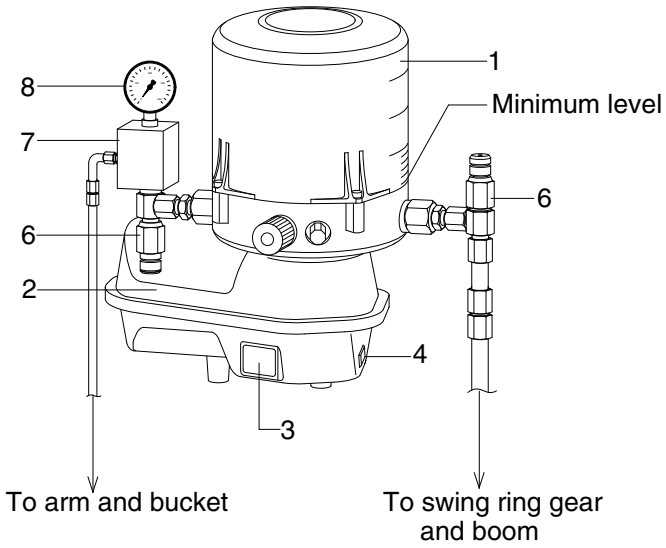
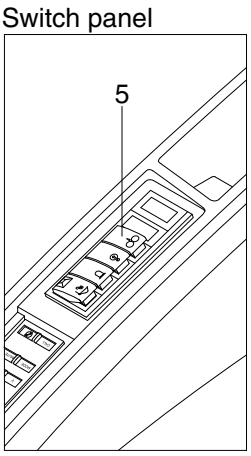
1. CENTRAL GREASE LUBRICATION SYSTEM (-#0008)

1) MAJOR COMPONENT

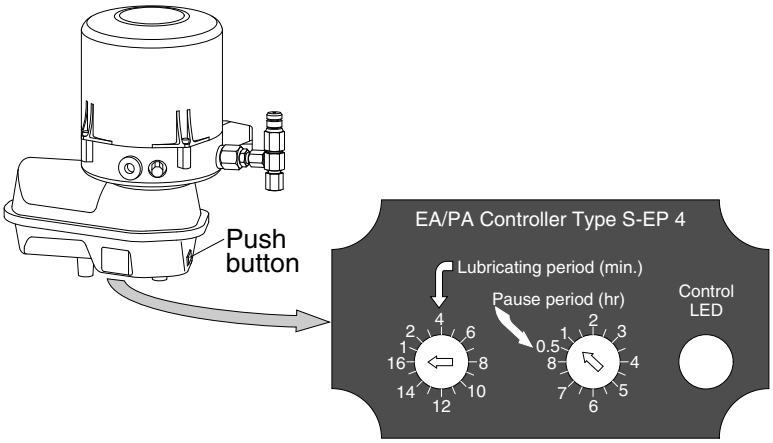




80098CG01

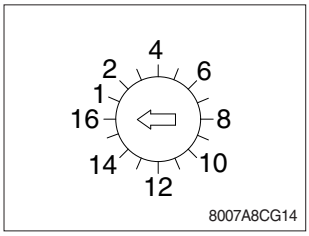
1 Grease tank
2 Grease pump
3 Control unit
4 Push button
5 Central grease lubrication switch
(Refer to the page 3-27)
6 Pump element
7 Relief valve
8 Pressure indicator

2) ELECTRONIC CONTROL UNIT



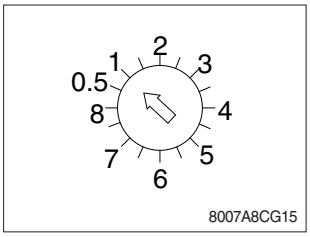
8007A8CG18

(1) Lubricating period setting dial



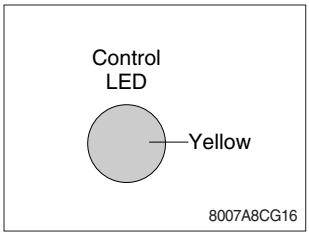
① This dial use to set the greasing period from 1 to 16 minutes.
② Default period is 16 minutes.
※ **Use a minus(-) screw driver to change settings.**

(2) Pause period setting dial



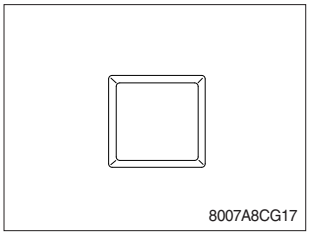
① This dial is use to set the pause period from 0.5 to 8 hours.
② Default period is one hour.

(3) Control LED



① This LED indicates operating status of the central grease lubrication system.
② Turn the starting switch ON, the LED will light up for 1.5 seconds.
③ During the central grease lubrication system is operated, it will blink at 0.5 second intervals.
④ When the lubrication system is failed, the LED is light up continuously.

3) PUSH BUTTON



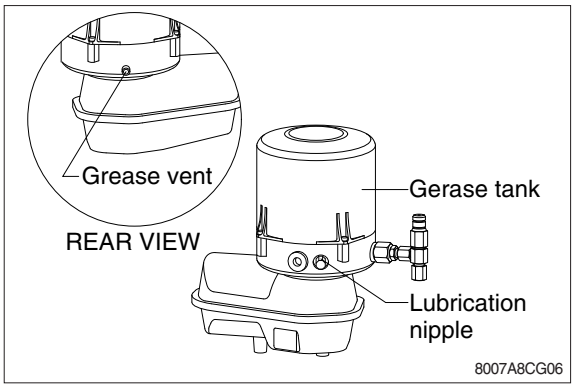
① This button use to operate the central grease lubrication system.
② Pushing the button, the central grease lubrication system is operated for 16 minutes once.

4) FILLING THE GREASE TANK

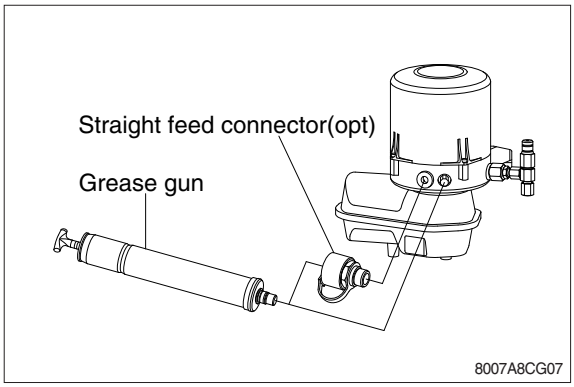
(1) Standard filling via lubrication nipple with manual or pneumatic grease gun.

※ **Lubricate the grease until it flows out to the grease vent.**

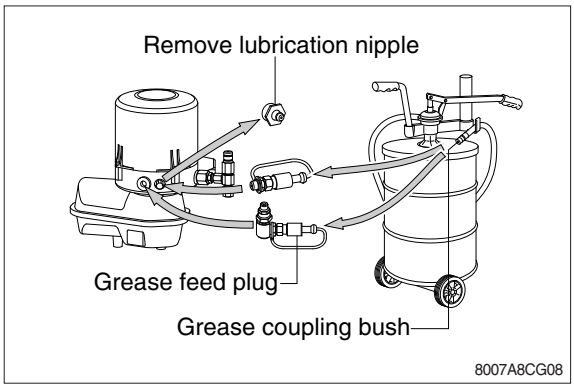
· Capacity : 8 kg (18.6 lb)



(2) Manual hand grease gun.



(3) Pneumatic grease pump (option).



5) REPAIR INSTRUCTIONS

(1) Case of system blockage

① A creased or clogged lubricant pipe
② Grease points overfilled or clogged by lubricant
③ Lubricant not suitable for central lubrication system
④ Distributor outlet closed
⑤ Blocked distributor

(2) Message signalling a blockage

The system pressure is exceeded (265 kgf/cm^2), a blockage may exist in the system and will be signalled by one of the followings.

① The pressure indicator at grease pump.
② The pressure indicator at secondary distributor.

(3) Repair of a distributor when blocked :

① Remove the main distributor from the system, nothing the sequence of removal.
② Remove the plugscrews from the piston holes and move the pistons to and fro (don't expel them); re-insert the plug-screws.
③ If the main distributor is not blocked, do the secondary distributor as above mentioned.
④ Push the piston of the blocked distributor outside and check the drilling and the piston surface for scratches and deficiencies.
⑤ Renew the distributor affected by serious deficiencies.

※ Pistons are not interchangeables for main and secondary distributor.

※ Deposits of hardened grease detected at pistons and drillings of distributor must be eliminated by washing and blowing. The drillings in distributor must be free of residues of grease. This should be checked by use of some thin wire.

※ Hardening of grease indicates that the lubricant being used is not suitable for the central grease lubrication system. Ask for advice by the supplier of the lubricant. After having checked both distributor, re-assemble the distributor complying with the sequence noted down previously. In order to preclude jamming of pistons, tighten the plug-screws to the specified tightening torque.

· Tightening torque : 1.2 kgf·m (8.7 lbf·ft)

① Check the distributor for correct operation, using oil or grease.
② Install the distributor in the system.
③ Start the machine and check it for correct operating pressure (150 kgf/cm^2).

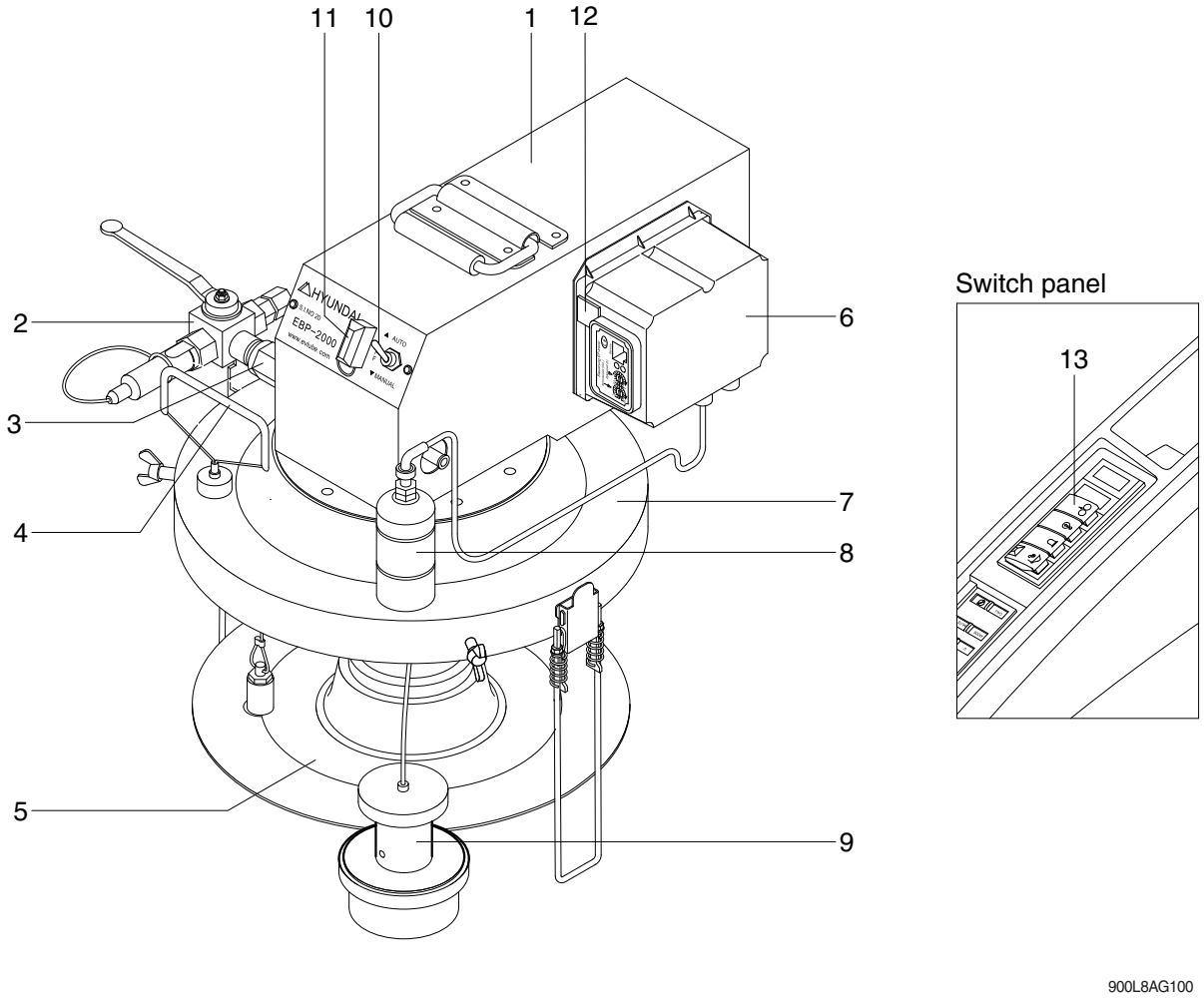
※ The repair work has to be done under maximum cleanliness.

6) TROUBLESHOOTING

Category	Applications	Service
Pump does not work	Defective electronic control unit Electric cable is broken Pump is defective	Replace the control unit Renew the electric cable Replace the pump
Pump is working, but does not supply of lubrication	Air in the feed piston filling Grease level dropped below minimum level Defective pump element	Bleed the pump Refill the grease tank Replace the pump element
No grease at all points of lubrication	Pump does not work. Inoperative time is too long or period of lubrication is too short. System is blocked.	Refer to "Pump does not work". Reduce the inoperative time or increase the period of lubrication. Refer to "Excessive pressure (above 265 kgf/cm^2) of the pressure indicator".
No grease at some points of lubrication	Some pipes are burst or leakage Leakage at screwed unions	Renew the pipes Retighten or renew the screwed union
No grease at one point of lubrication	The lubrication pipe is burst or leakage Leakage at screwed unions	Renew the pipe Retighten or renew the screwed union
Reduced pump speed	High pressure in the system Low ambient temperature	Check the system / bearing points Not a defective (1 or 2 intermediate lubrication cycles may be useful)
Excessive pressure (above 265 kgf/cm^2) of the pressure indicator	Excessive pressure in the system Progressive distributor is blocked System is blocked Defective valve spring	Check the system Replace the distributor Repair clogged / seized greasing points Replace the pressure relief valve
Signal of the LED	The LED of control unit is light up continuously	Check electrical system and control unit

CENTRAL GREASE LUBRICATION SYSTEM (#0009-0184)

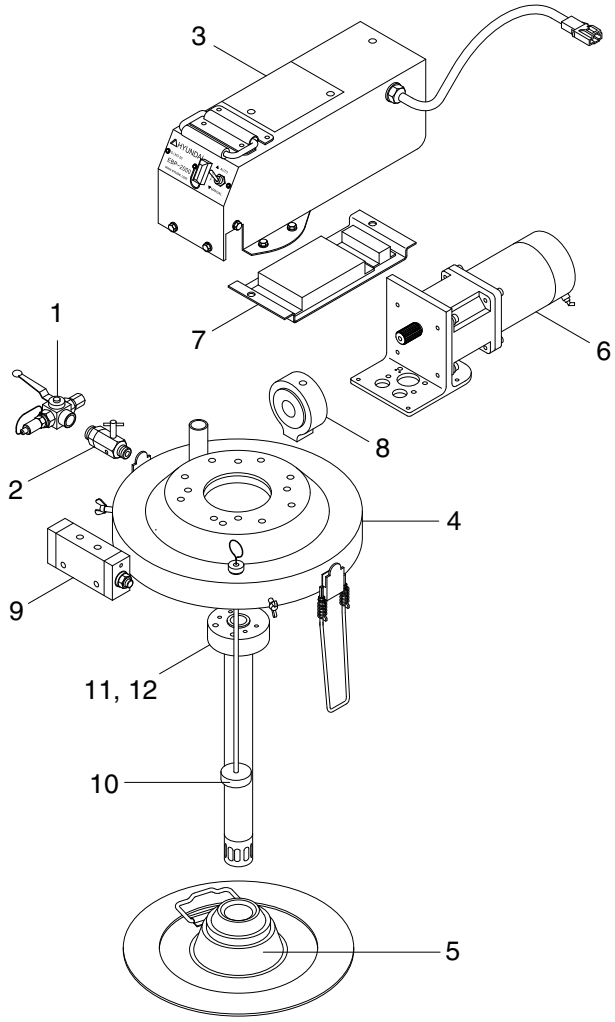
1) MAJOR COMPONENT



900L8AG100

1	Pump cover assy	6	Controller assy	10	Toggle switch
2	3-way valve assy	7	Main plate assy	11	Fuse
3	Inline check and air vent	8	Low level sensor and level indicator assy	12	Reset switch
4	Follow plate air vent handle			13	Central grease lubrication switch (refer to the page 3-27)
5	Follow plate assy	9	Cylinder assy and piston assy		

· PUMP PARTS LIST



900L8AG101

1	3-way valve assy	6	Motor assy	10	Low level sensor and level indicator assy
2	Inline check and air vent	7	Controller		
3	Pump cover assy	8	Cam assy	11	Piston assy
4	Main plate assy	9	Distributor assy	12	Cylinder assy
5	Follower plate assy				

2) SPECIFICATIONS

(1) Pump

Item	Specification
Input power	24 VDC
Speed	60 rpm
Current	Max 15 amp
Output volume	110.0 cc/min ± 20%
Pressure	Max. 280 bar ± 20%, at 20 ˚C, NLGI No.2
Operating temperature	-35 to 70 ˚C (depending on the grease type)
Dimension (W x L x H)	369 × 419 × 496 mm
Filter	1st filter ; #60, 2nd filter ; #500
Grease can	I.D : 280~300 mm, Height : 336~363 mm
Lubricant	NLGI No.1 or No.2

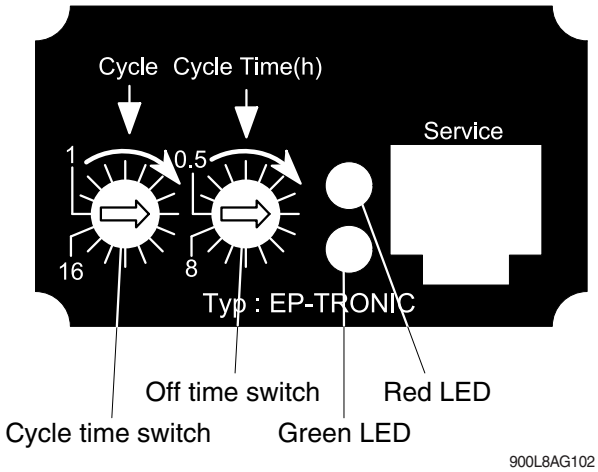
※ **It could be reducing a grease output volume after 30 min running.**

※ **When you use pump lower then -10 ˚C continuously, you should use a low temperature grease and check air bubble periodically.**

(2) Controller

Item	Specification
Type	EP-tronic
Power	24 VDC
Current max	Max 6 A
Temperature	On stroke : -40 ~ 85˚C, In service : -35 ~ 70 ˚C
Lube cycle	Max 16 (1 increment)
Off time	0.5 h up to 8 hrs (1 increment 0.5 h)

· **Controller front view**



· **Cycle time switch**
17 to 32 stroke (16 grades, every 1 stroke)

· **OFF time switch**
0.5 to 8 hours (16 grades, every 0.5 h)

3) SAFETY INSTRUCTION

Please observe the contents of the following description to use this product safely. In this manual warning and caution are intended to prevent death or serious injury that may be caused to the operator who are around the product and damage that may be caused the articles that are around the product, as well as to use safely and correctly.

(1) Do not use strange materials to clean the pump in any case.
Otherwise it may cause damage and explosion of pump.
(2) Do not remodel the pump in any case . It may result in a bodily accident or failure.
(3) Do not use gasoline to clean the pump in any case. It may cause ignition or explosion.
(4) Do not use any solvent or chemical which corrode these materials .
(5) Do not operate the gun lever with the discharge port facing to another person during machine operation at any case.
(6) Do not use silicon grease
(7) After the end of using pump, please be sure to shut off the power of this machine to release the internal pressure.
(8) When replacing any port as maintenance, please be sure to stop the power to the machine to avoid having fingers nipped because of a malfunction.
(9) Using of the pump for other purpose could lead to personal injuries or damages on properties.

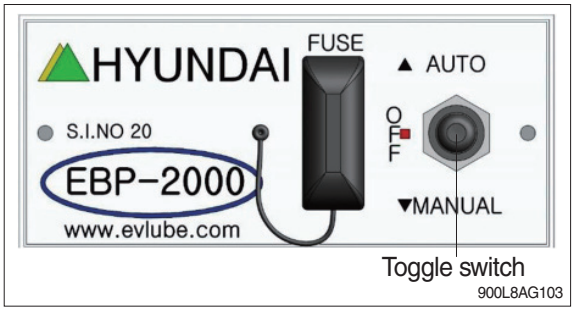
4) OPERATIONS

(1) Pump

① **Change mode**

Change mode with toggle switch at front of pump.

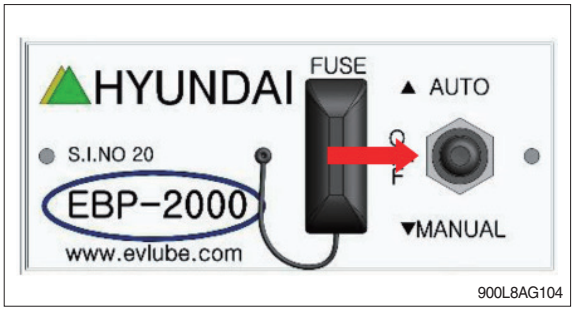
a. AUTO – Automatic mode
b. MANUAL – Manual mode
c. OFF – Power off



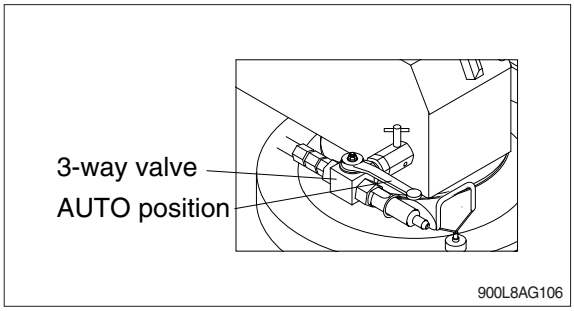
② **Exchange of AUTO mode**

Please follow the following process to change auto mode.

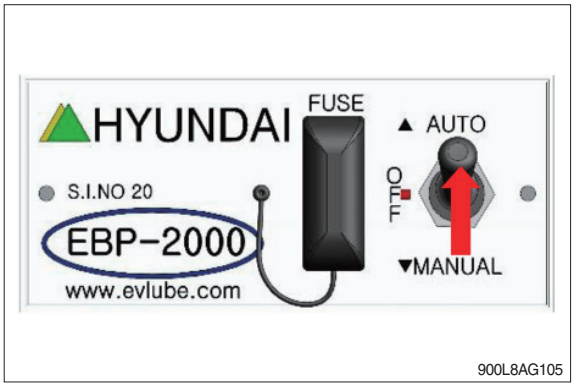
a. Change toggle switch to OFF mode.



b. Change 3-way valve to AUTO position.



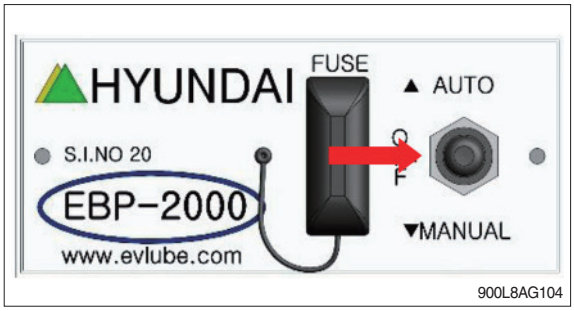
c. Change toggle switch to AUTO mode.



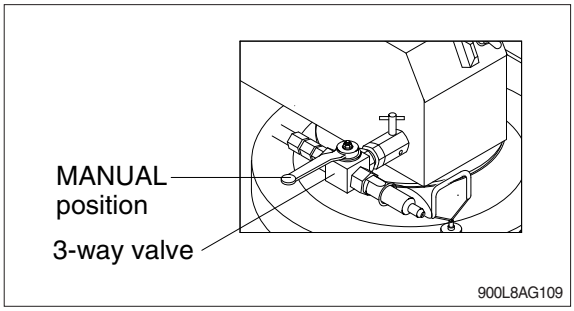
③ **Exchange of MANUAL mode**

Please follow the following process to change manual mode.

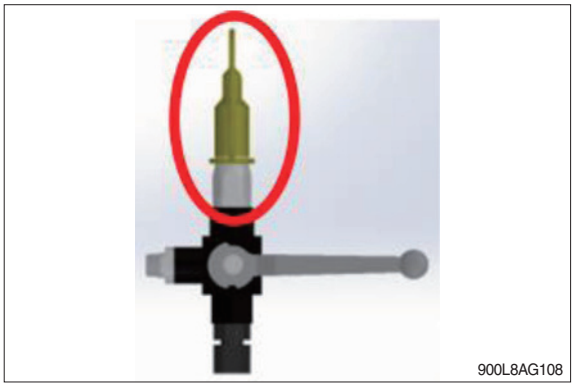
a. Change toggle switch to OFF mode.



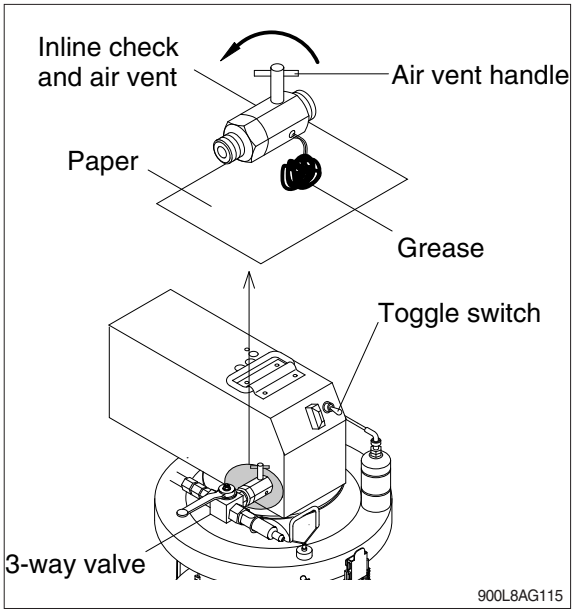
b. Change 3-way valve to MANUAL position.



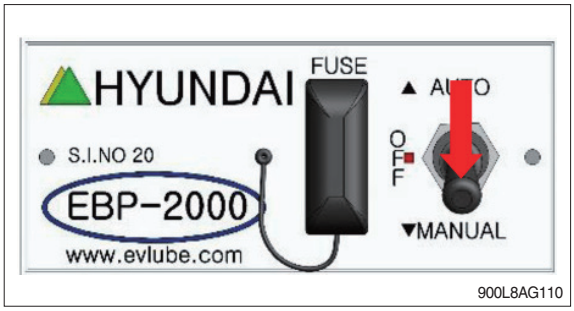
c. Connect the grease gun assy to the quick coupler.



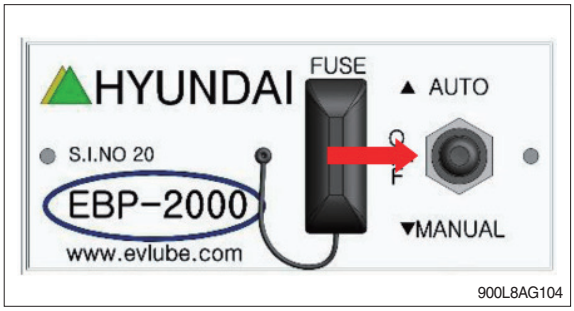
d. If pressure remaining in the pump, it is difficult to connect grease gun assy. In case, open the air vent and release the pressure and connect the quick coupler.



e. Change toggle switch to MANUAL mode and move to the lube point for the greasing.



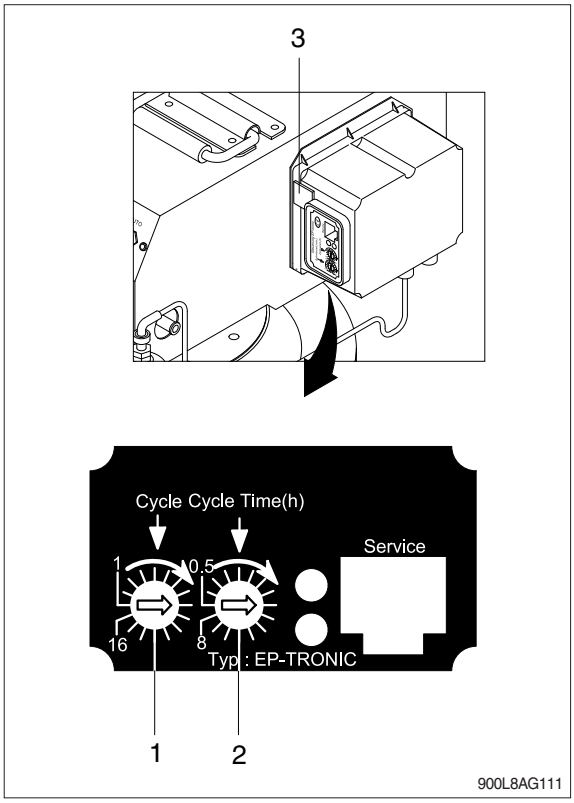
f. After greasing, change toggle switch to OFF and release pressure inside grease hose and store it.



(2) Controller

Please follow the following procedure to change lube on and lube off cycle.

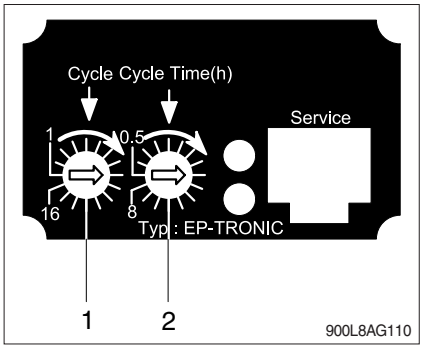
① Change toggle switch to OFF mode at front of pump.
② Open dust cap of controller.
③ Set number of lube cycle with -driver. (1 in figure, max. 16 cycle, 1 increment every 1 notch, total 16 notches.)
④ Set number of lube off time with -driver. (2 in figure, 0.5 h up to 8 hours, 0.5 h increment every 1 notch, total 16 notches.)
⑤ Close dust cap.
⑥ Change toggle switch to AUTO mode.
⑦ After one lube cycle off, push reset switch (3 in figure).
⑧ Check whether pump is working as programed or not. (Please check number of moving a stroke of D0 distributor sensor.)



※ Please make sure to close controller protection cap. If it is not closed perfect, it will cause malfunction of controller.

※ Please change lube on and lube off cycle setting according to the working condition of equipment.

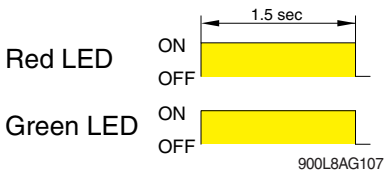
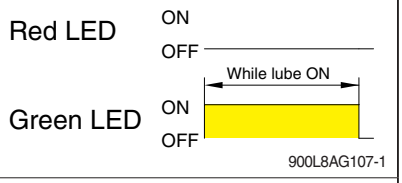
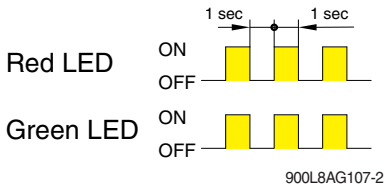
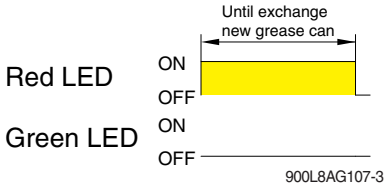
5) MAINTENANCE AND INSPECTION



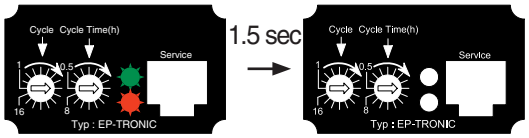
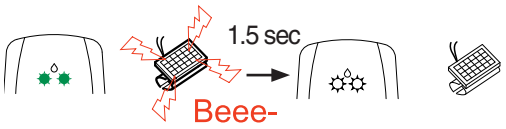
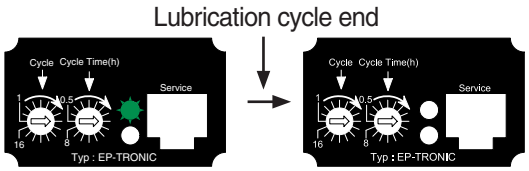
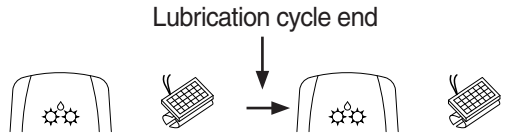
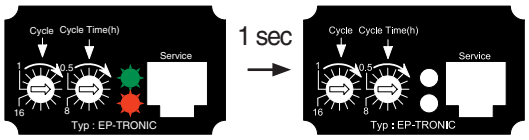
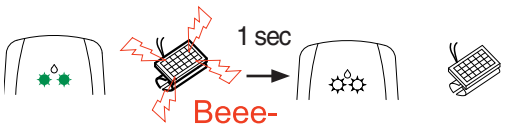
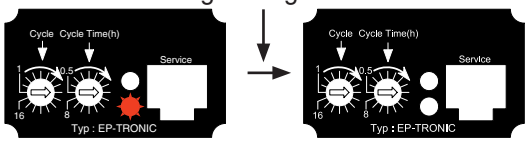
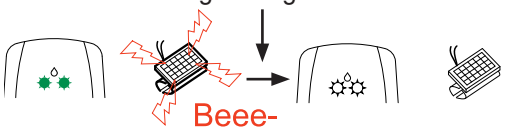
※ Operation status of the pump is displayed 2 LEDs on the front of the controller as below.
Green LED (1) : Operation status
Red LED (2) : Error occurred

※ The red LED is light or blink when error is occurred. Also the pilot lamp of the central grease lubrication switch in the cab is light or blink same as the red LED operation pattern.

(1) Controller LED display

Item	Reason	Descriptions	LED display
Standby	Controller standby	Not error	
Lubrication ON	Working lubrication ON	Not error	
Cycle error	Stop main distributor	Refer to page 9-27, 1 and 2 of (2) system and page 9-30, (3) How to find distributor and lube line blocked.	
	Pump out of order	Refer to page 9-27, 1, 2 and 3 of (1) Pump.	
Grease level error	Grease level too low	Refer to page 9-23, (4) Exchange grease canister.	

(2) LED display (Controller/Reset switch)

Status	Control panel	Reset switch / Buzzer
Standby	 900L8AG102-1 900L8AG102-6	 900L8AG102-4 900L8AG102-5
Pump running	 900L8AG102-2 900L8AG102-6	 900L8AG102-5 900L8AG102-5
Stroke error	 900L8AG102-1 900L8AG102-6	 900L8AG102-4 900L8AG102-5
Level error	 900L8AG102-3 900L8AG102-6	 900L8AG102-4 900L8AG102-5

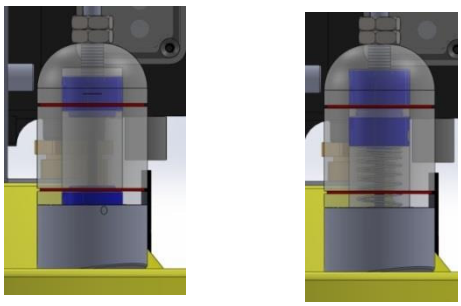
※ If system run normal, it does not displayed.

※ The pilot lamp of the central grease lubrication switch in the cab is displayed when error occurs.

(3) Check grease level

※ Grease level could be checked as follows.

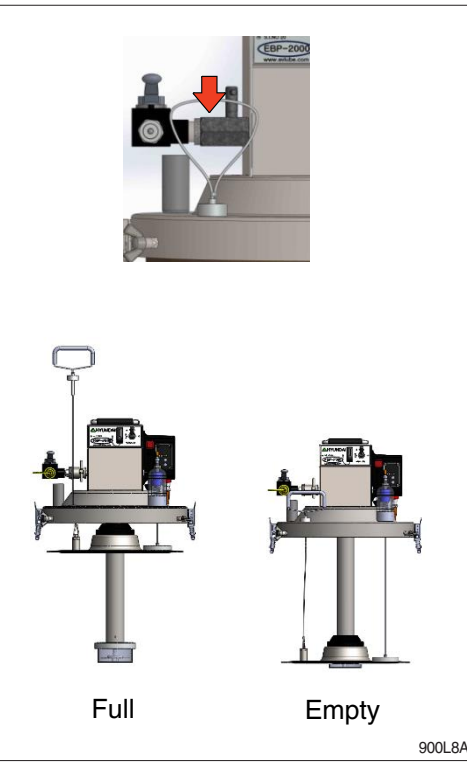
① Error LED of controller.
② Level indicator of pump.



Full and medium　　Empty

900L8AG112

③ Air vent handle of follower plate.



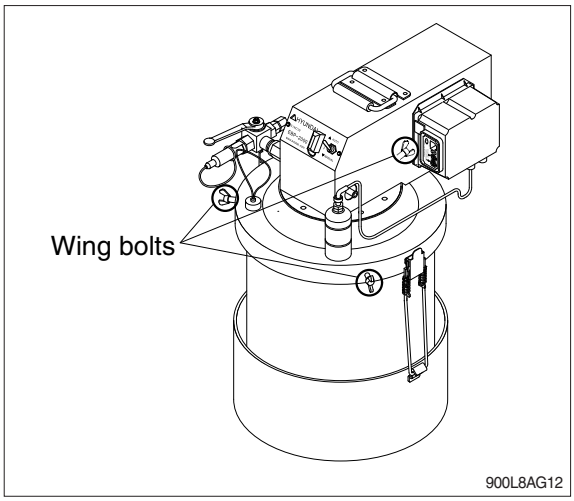
Full　　Empty

900L8AG113

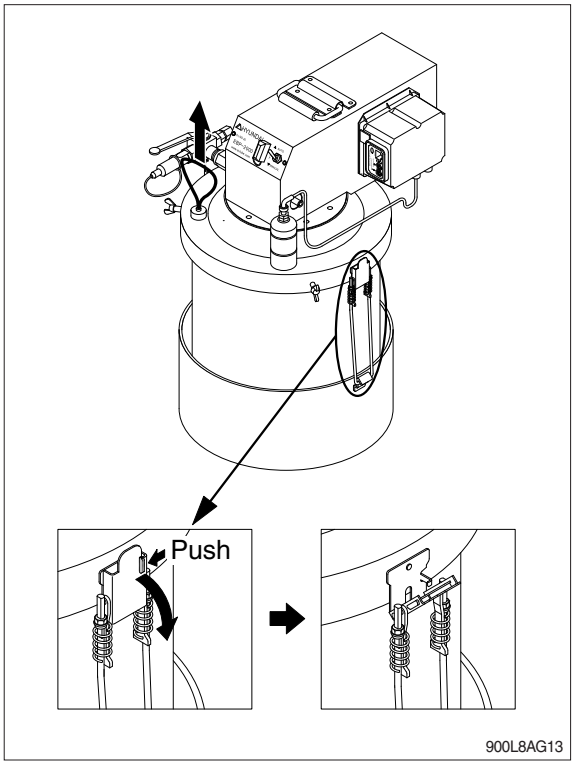
(4) Exchange grease canister

※ Exchange of grease canister is a following procedure.

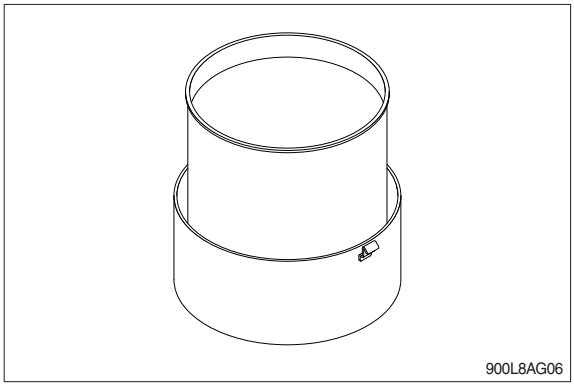
① Replace toggle switch to OFF and disconnect power cable.
② Unfasten wing bolts (3EA).



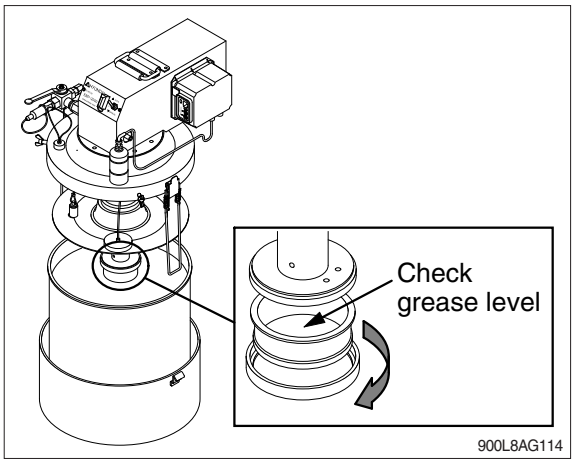
③ Unlock the clamp and loosen the clamp leg.
④ Pull air vent handle of following plate up.
⑤ Remove grease pump from grease canister.



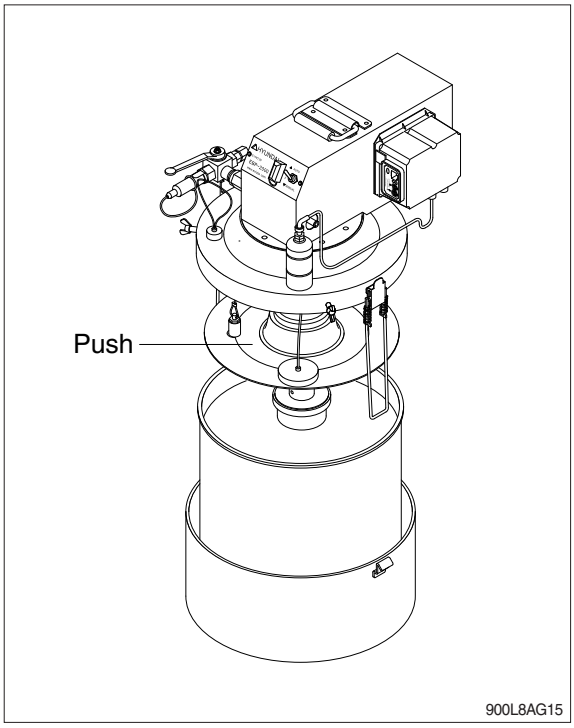
⑥ Remove grease canister and fix new grease canister.



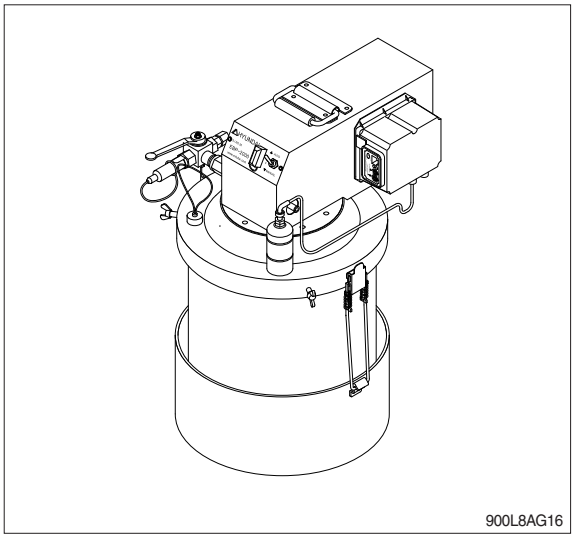
⑦ Open cover of grease canister and make grease level inside of canister as parallel.
⑧ Arrange follower plate to be moved the center of grease canister and check the indicator of level and air vent handle of follower plate.



⑨ Insert pump into grease canister and push follower plate down as well.

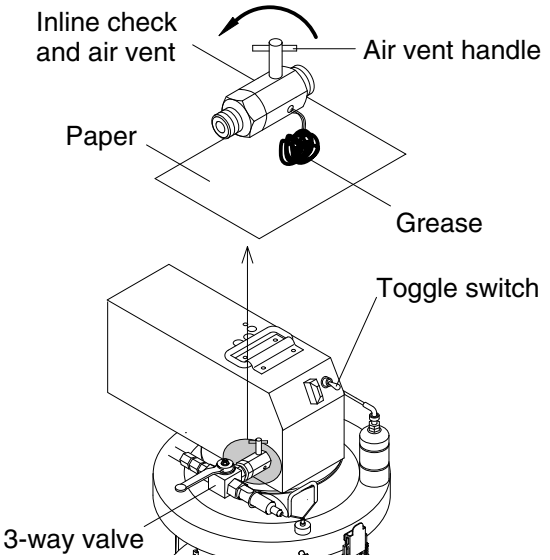


⑩ Close clamp and fasten wing bolts (3EA).
⑪ Check grease level position and connect power cable.
⑫ Change toggle switch to AUTO mode and remove air inside of pump.
※ **Refer to page 9-25, (5) How to remove air pocket.**



(5) How to remove air pocket

① Turn 3-way valve to MANUAL position.
Refer to page 9-17, ② Exchange of AUTO mode.
② Lay paper down under air vent.
③ Change toggle switch to MANUAL mode.
Refer to page 9-18, ③ Exchange of MANUAL mode.
④ Open air vent.
⑤ Open air vent until grease mixed air come out.
⑥ Close air vent and turn toggle switch and 3-way valve to AUTO position.
Refer to page 9-17, ② Exchange of AUTO mode.
⑦ Clean air vent and pump.
※ **The grease mixed air is cloudy in white.**

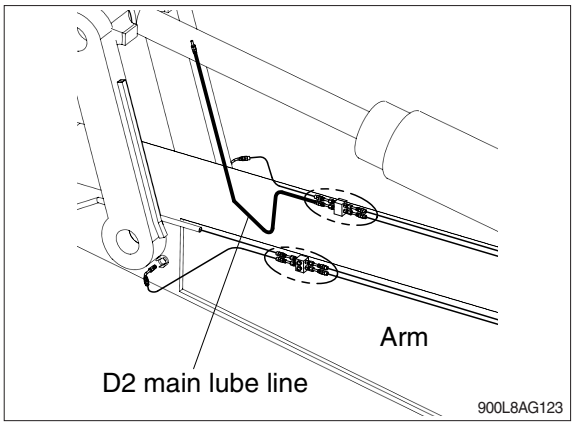


(6) Inspection of pump

Interval	Item	Descriptions
Daily	Pump	- Check output pressure - Check sensor of D0 distributor
	Controller	- Check status of controller display
	Grease level	- Check grease level gauge and manual level handle
Weekly	1st filter	- Check filter and clean if necessary
	Leakage of grease	- Make screw a part leak edged up
	Fixing pump	- Check clamp
	Controller	- Push reset switch (Refer to page 9-19, (2) controller) and check
Yearly	Cam ring	- Fill grease into cam ring bearing if necessary
	Parts fastened	- Check and make it tidy if necessary

(7) Inspection of lube system

Interval	Item	Descriptions
Daily	Lube line	Check the end of arm lube point / D2 main lube line (refer below figure)
	Lube point	Check optical
Weekly	Distributor leakage	Replace fitting or make it tidy if leakage



6) TROUBLESHOOTING

(1) Pump

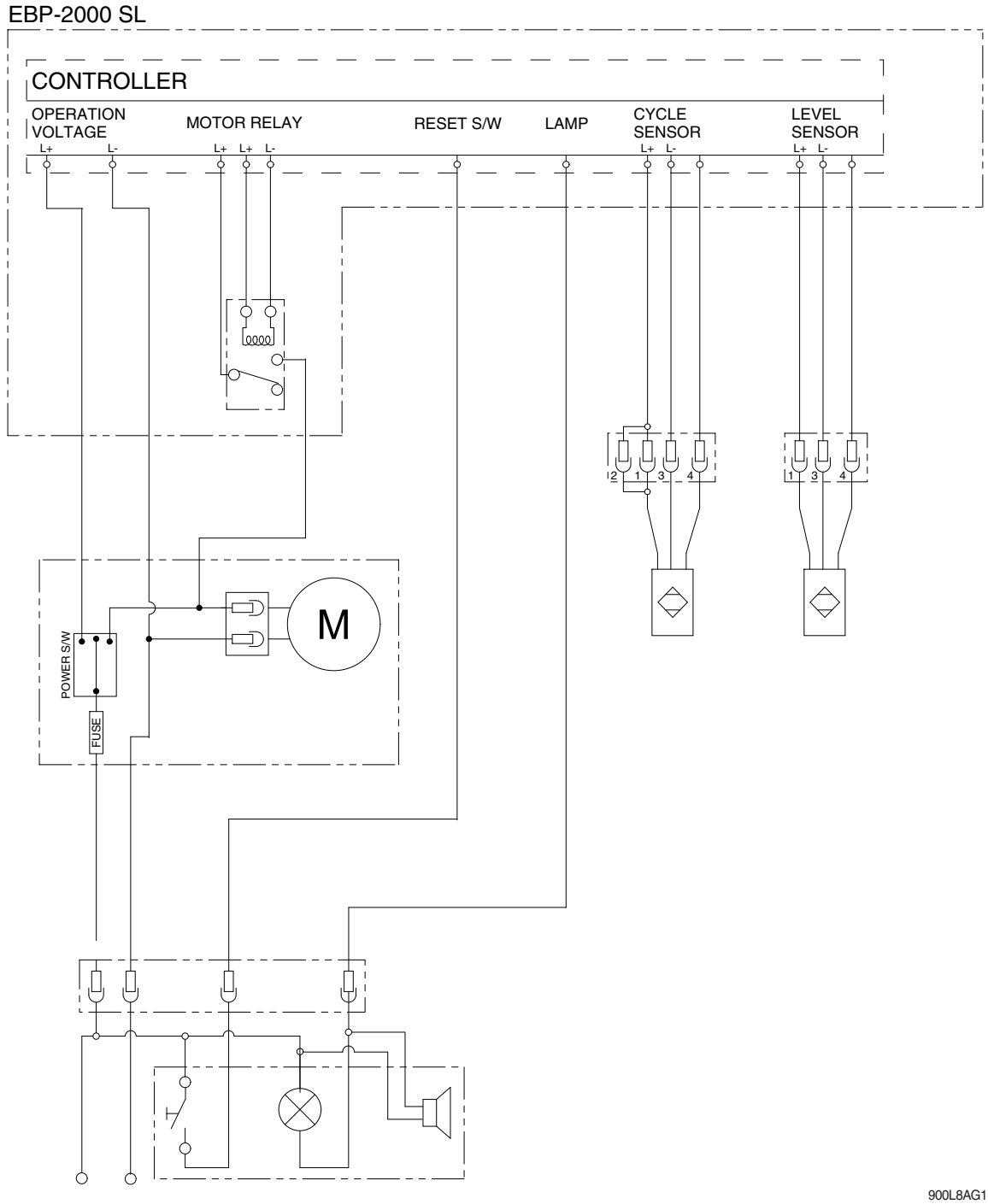
Trouble	Reason	Service
1. Pump does not working	1) Power off 2) Pump motor broken	1) Check fuse and toggle switch 2) Replace the motor assy
2. Grease doesn't discharge although pump is operating	1) Grease low level 2) Pump element broken 3) Piston assy broken 4) Relief valve broken 5) Filter blocked 6) Air inside pump	1) Replace grease canister 2) Replace the cylinder assy 3) Replace the pump piston assy 4) Replace distributor assy 5) Check filter and clean 6) Remove air using air vent. ※ **Refer to page 9-25, (5) How to remove air pocket.**
3. Could not either pump high pressure or accurate grease volume	1) Relief valve broken 2) Seal inside of pump broken 3) Filter blocked 4) Air inside pump	1) Relief valve readjust or replace distributor assy 2) Replace the cylinder assy 3) Check filter and clean 4) Remove air using air vent ※ **Refer to page 9-25, (5) How to remove air pocket.**
4. Reduced pump speed	1) High pressure in the lube line 2) Low ambient temperature	1) Check the lube line and points 2) Change grease with low NLGI grade
5. When pumping pressure will be gone up too higher	1) Lube line/point blocked 2) Relief valve broken	1) Check lube line/point and repair 2) Relief valve readjust or replace the distributor assy
6. Other trouble	Contact Hyundai or Hyundai distributor	

(2) System

Trouble	Reason	Service
1. Certain lube point not delivered grease	1) Lube line broken 2) Distributor blocked	1) Change lube line 2) Change distributor
2. Cycle error	1) Pump out of order or grease empty 2) Lube point blocked 3) Lube line blocked 4) Main lube line blocked/broken/leakage	1) Please refer to this page, (1) Pump. 2) Check lube point 3) Change lube line 4) Check main lube line and change it
3. Noise at certain point	1) Lack of grease 2) Blocked lube point 3) Lube line broken or blocked	1) Adjust lube on cycle (Refer to page 9-19, (2) Controller.) 2) Check Lube point 3) Check lube line and change it
6. Other trouble	Contact Hyundai or Hyundai distributor.	

7) ELECTRIC WIRING DIAGRAM

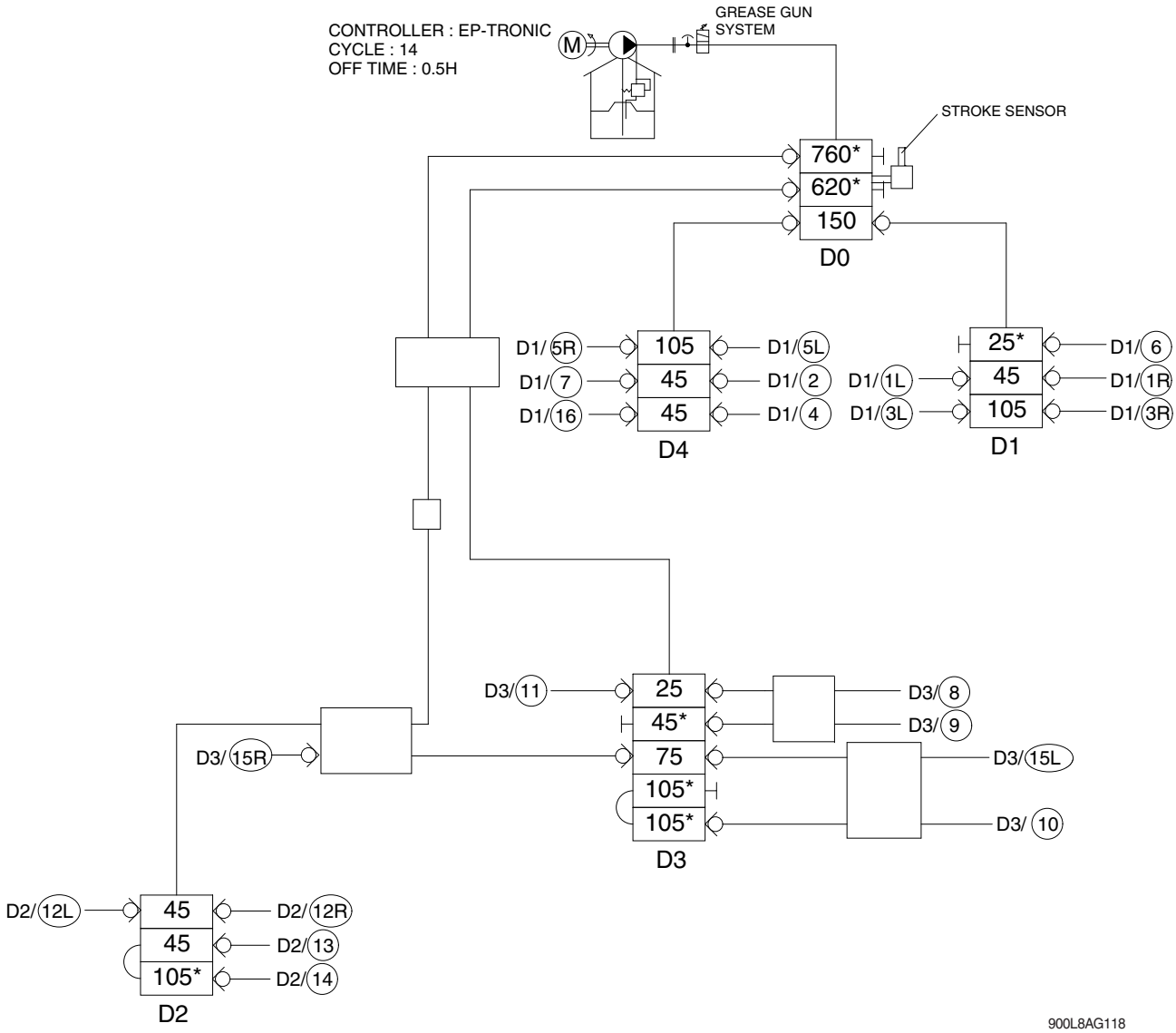
EBP-2000 SL



900L8AG117

8) CENTRALIZED LUBE SYSTEM

(1) System layout



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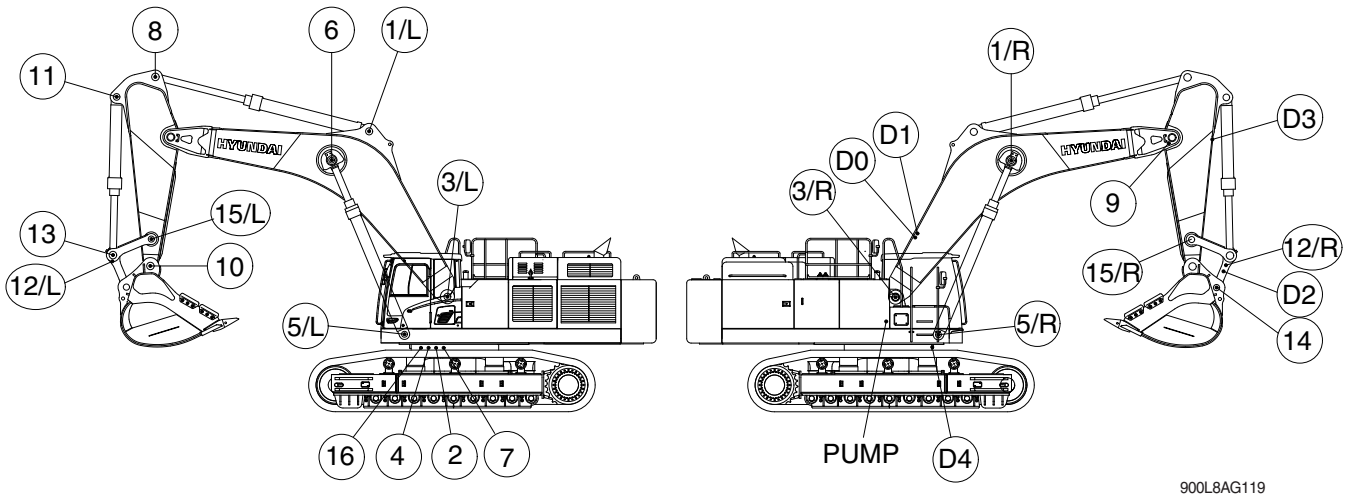
(2) Lube point



900L8AG119

(3) How to find distributor and lube line blocked

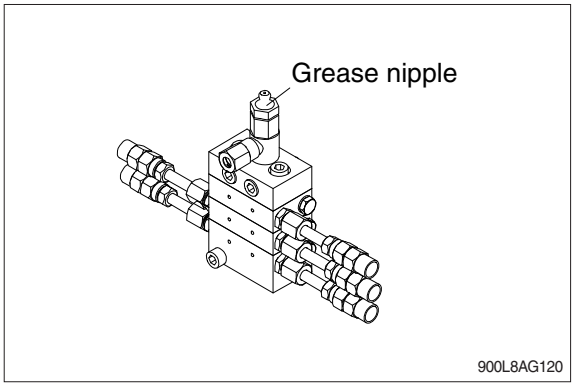
Please follow the following information.

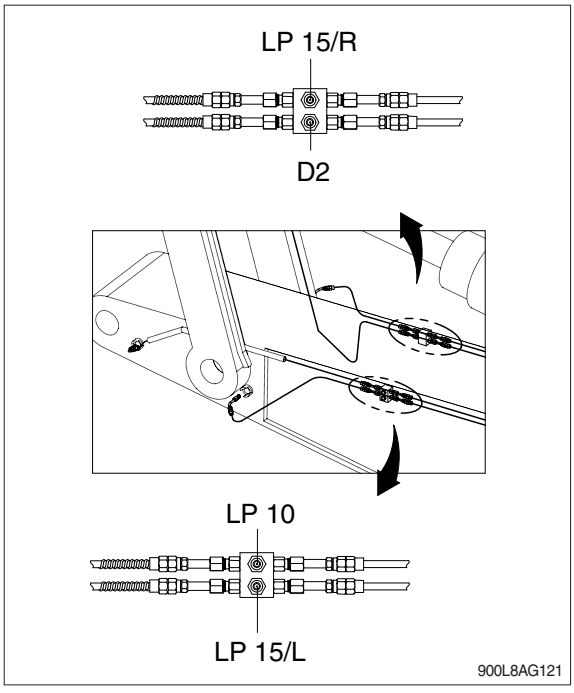
※ Refer to page 9-31, 9) CHECK AND REPAIR LUBE LINE AND DISTRIBUTOR.

① Disconnect input main lube line of main distributor.
② Check whether grease come out through main lube line or not.
③ Connect main lube line and check each outlet of distributor as one by one after disconnect each sub lube line.
④ Please check for sub distributor as main distributor done.
⑤ Although all distributor and lube line are not out of order, if grease could not come out through certain distributor or lube line, it means this distributor or lube line is blocked.
Therefore please change this distributor or lube line.
⑥ Although all distributor and lube line are not out of order, if stroke error display continually, please fill grease at this lube point with manual grease gun and check it.

(4) Grease nipple for manual filling

There is grease nipple installed at distributor and grease nipple block for filling grease needed additionally or emergency.

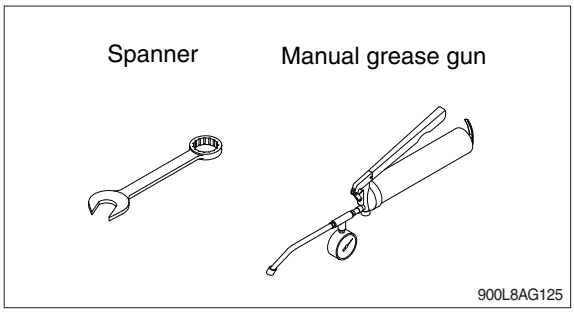




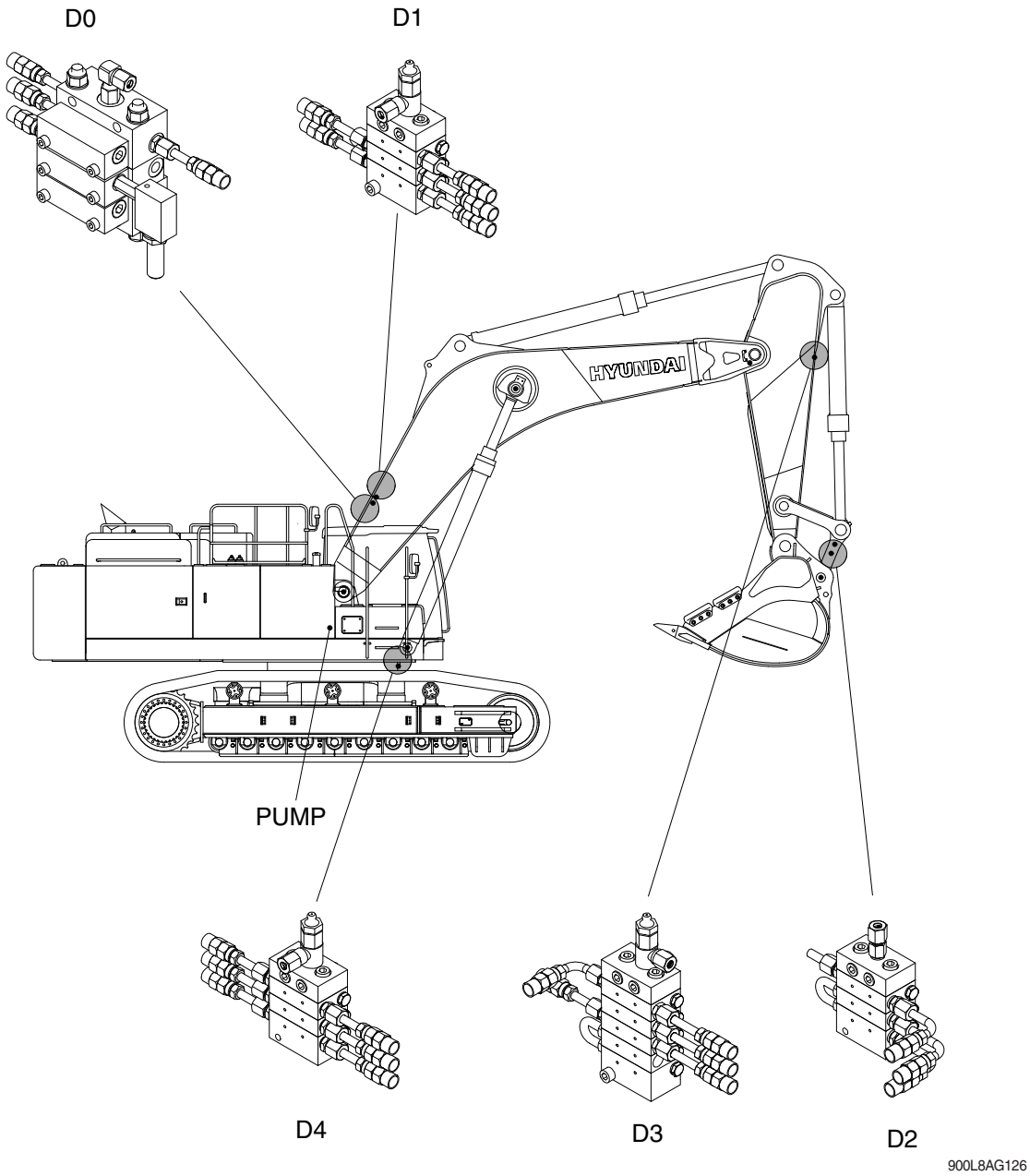
9) CHECK AND REPAIR LUBE LINE AND DISTRIBUTOR

(1) Tools

① Spanner : 12, 14, 17 mm
② Manual grease gun with pressure gauge.

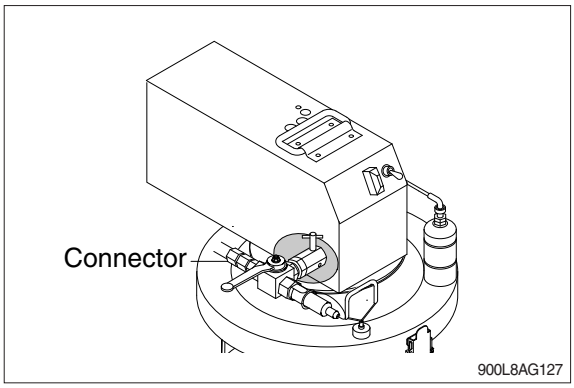


(2) Distributor position

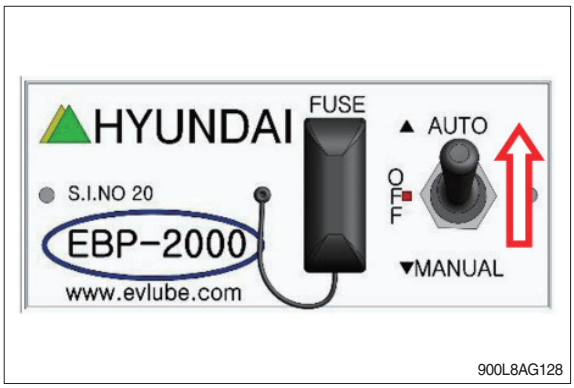


(3) Inspection of main lube line at pump

① Disconnect connector using a 17 mm spanner.



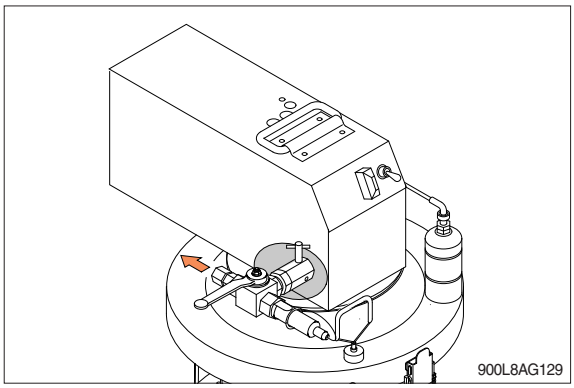
② Place toggle switch to AUTO mode and push reset switch.



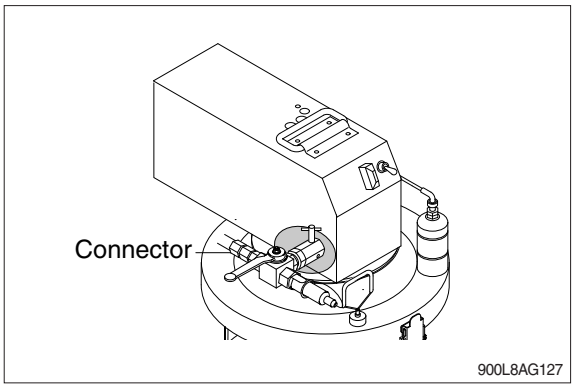
③ Check grease come out.

※ Although pump run, but there is no grease come out.

- Check grease level -> Exchange grease canister
- Pump out of order -> Please refer to page 9-27, 2 of (1) Pump.

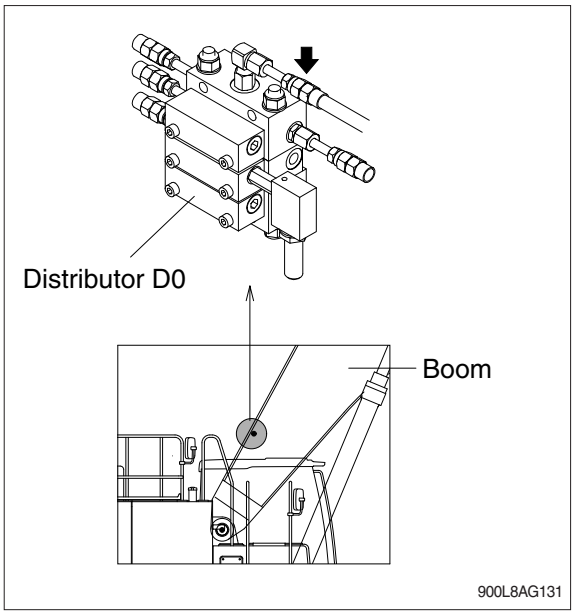


④ Connect connector using a 17 mm spanner.

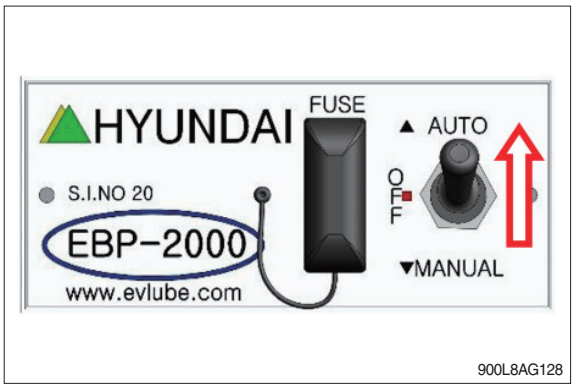


(4) Inspection of main lube line at main distributor

① Disconnect connector using a 17 mm spanner.



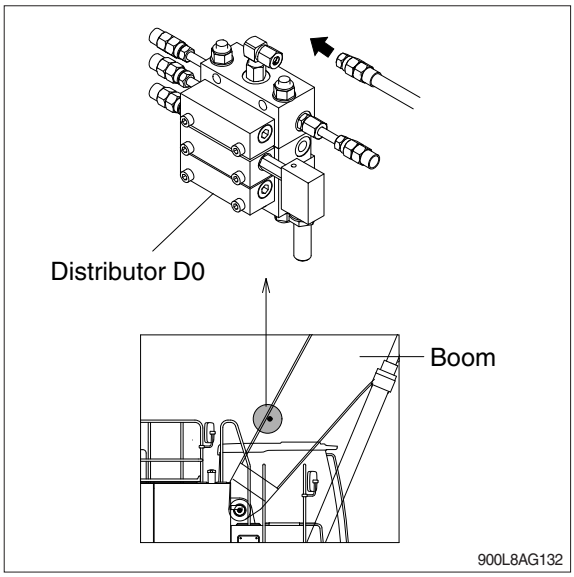
② Place toggle switch to AUTO mode and push reset switch.



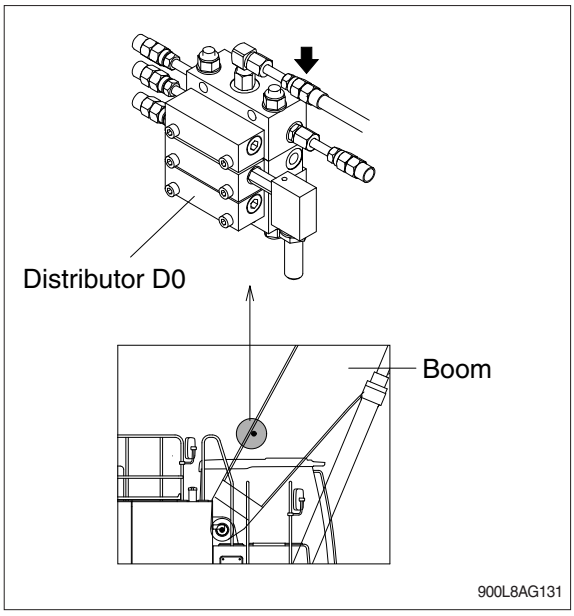
③ Check grease come out.

※ Although pump run, but there is no grease come out.

- Blocked main lube line -> Exchange main lube line
- Check 3-way valve direction (Refer to page 9-17, ② Exchange AUTO mode.)
- Pump out of order -> Refer to page 9-27, 3 of (1) Pump.



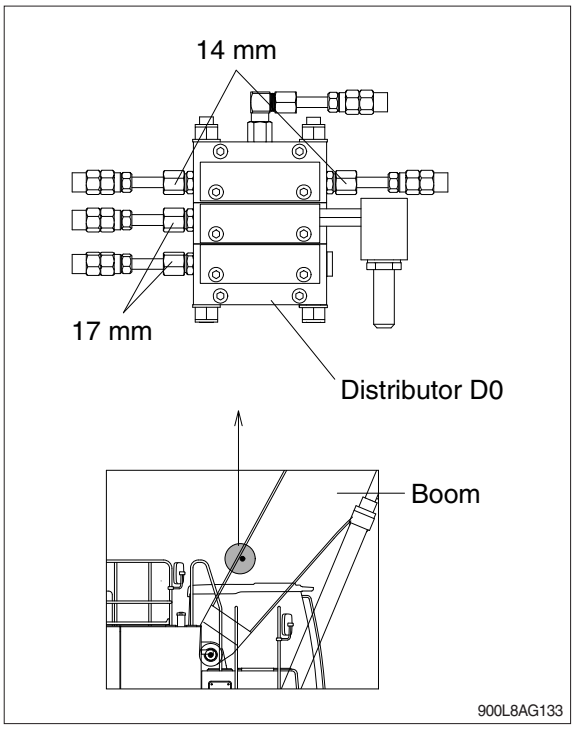
④ Connect fitting using a 17 ㎜ spanner.



(5) Inspection of main distributor

① Disconnect connector using a 17 ㎜ spanner and 14 ㎜ spanner.

※ Whenever you disconnect main lube line from main distributor, please mark number of main lube line clearly.

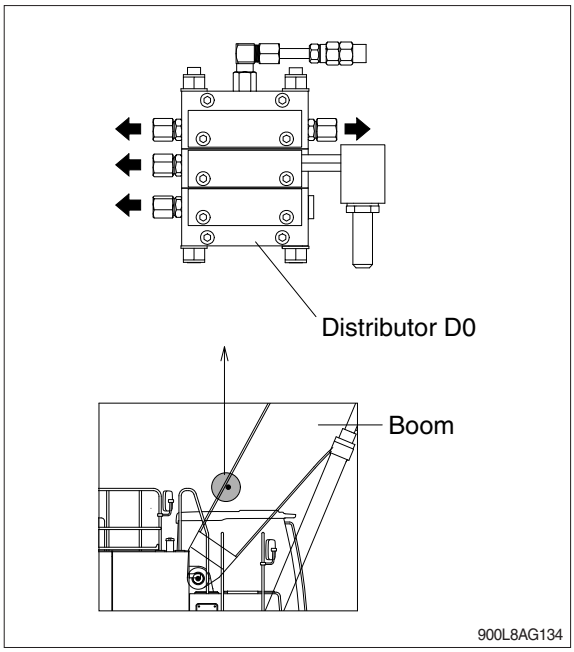


② Check each outlet grease come out.

※ During inspection if pump stop, then push reset switch again.

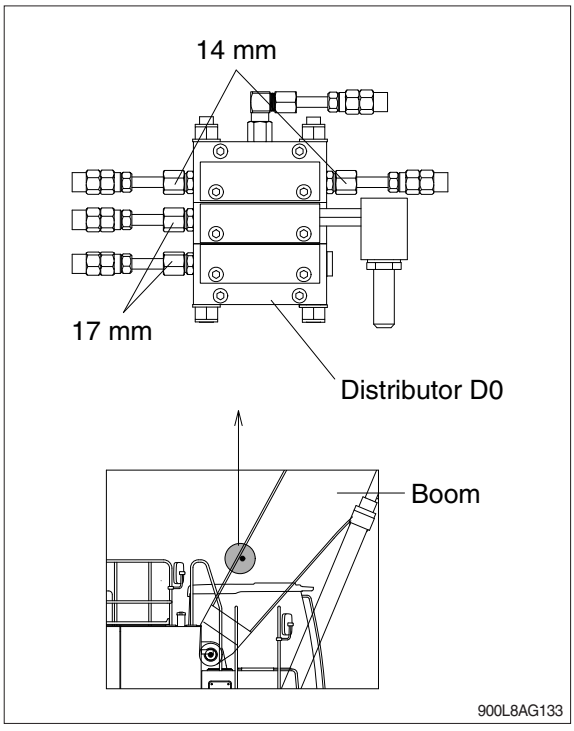
※ Although pump run, there is no grease come out.

- Main distributor blocked. -> Exchange main distributor.



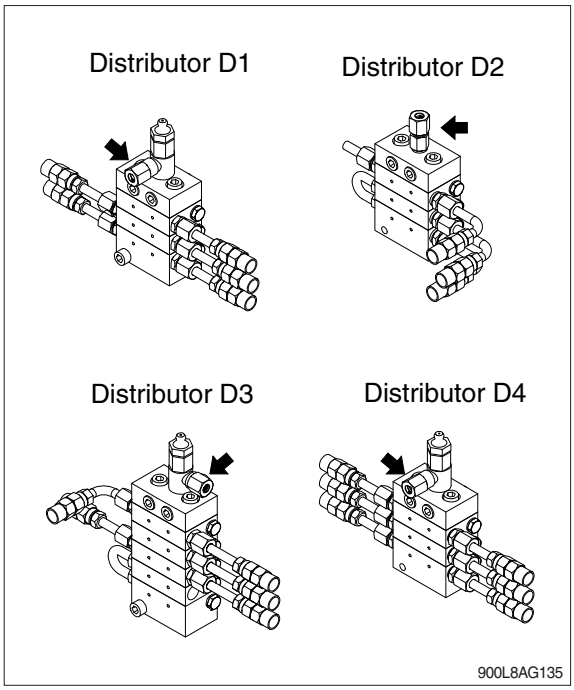
③ Connect connector using a 17 mm spanner and 14 mm spanner.

※ Whenever you connect main lube line to main distributor, please connect according to number of main lube line accordingly.



(6) Inspection of main lube line at sub distributor

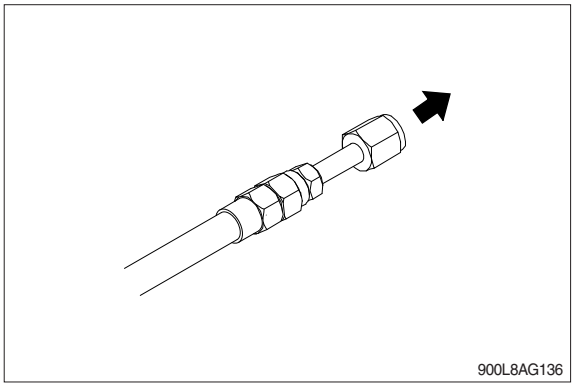
① Disconnect connector using a 14 mm spanner.



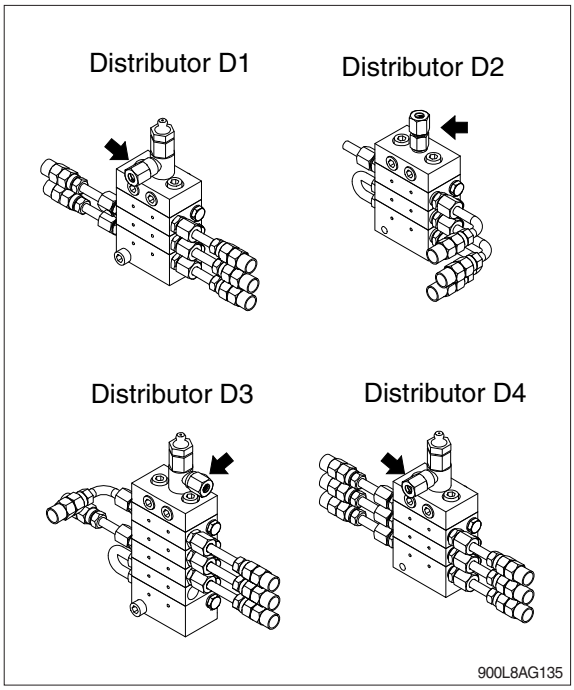
② Check main lube line grease come out.

※ Although pump run, there is no grease come out.

- Sub distributor main lube line blocked. -> Exchange main lube line.

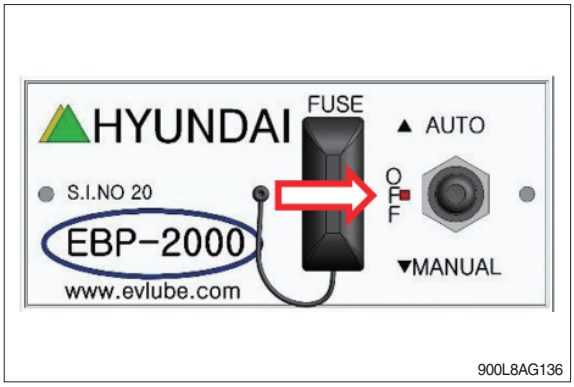


③ Connect connector using a 14 mm spanner.

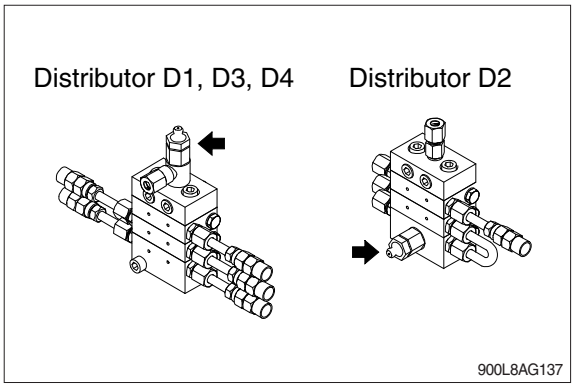


(7) Inspection of sub distributor

① Place toggle switch to OFF position.

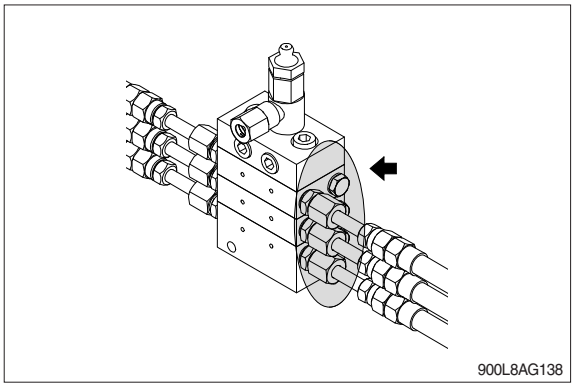


② Check grease nipple of distributor.



③ Disconnect connector using a 12 ㎜ spanner.

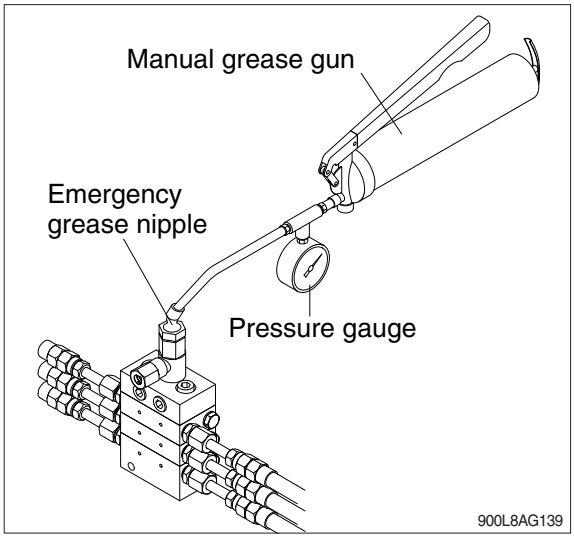
⚠ Whenever you disconnect main lube line from main distributor, please mark number of main lube line clearly.



④ Fill grease to emergency grease nipple of sub distributor and check pressure of output with manual grease gun.

※ Grease not come out from sub distributor.

- Sub distributor blocked. -> Exchange sub distributor.

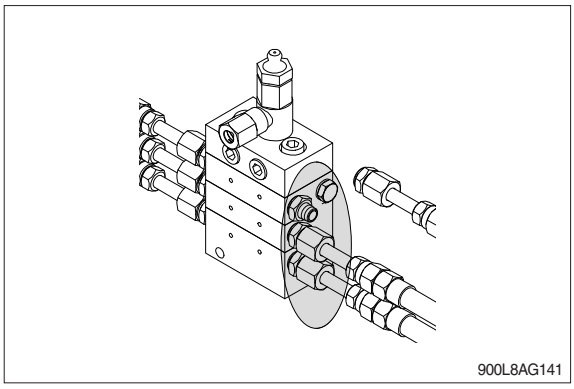


(8) Inspection of sub distributor sub lube line

① Make lube line as one bundle after disconnection.

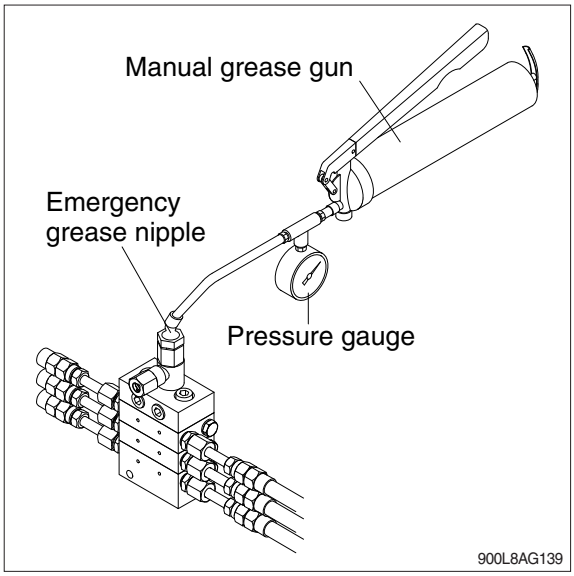
※ Whenever you connect main lube line to main distributor, please connect according to No. of main lube line accordingly.

※ After connect all lube line, please check lube line whether it is connected as before disconnection or not.

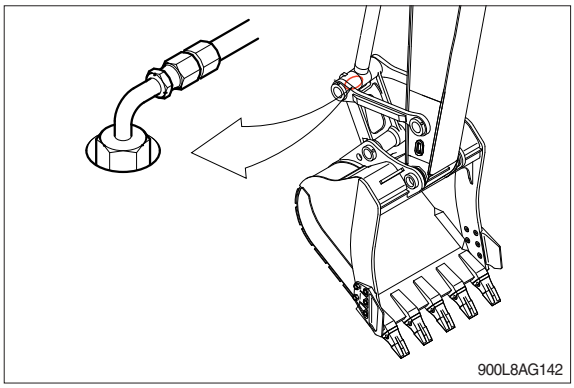


② Please check pressure gauge and output of grease from sub distributor.

③ Case 1 : Pressure does not goes up high.
-> Repeat above ① and ②.
Case 2 : Pressure goes up high.
-> Go to ④



④ Disconnect cap using a 12 ㎜ spanner.



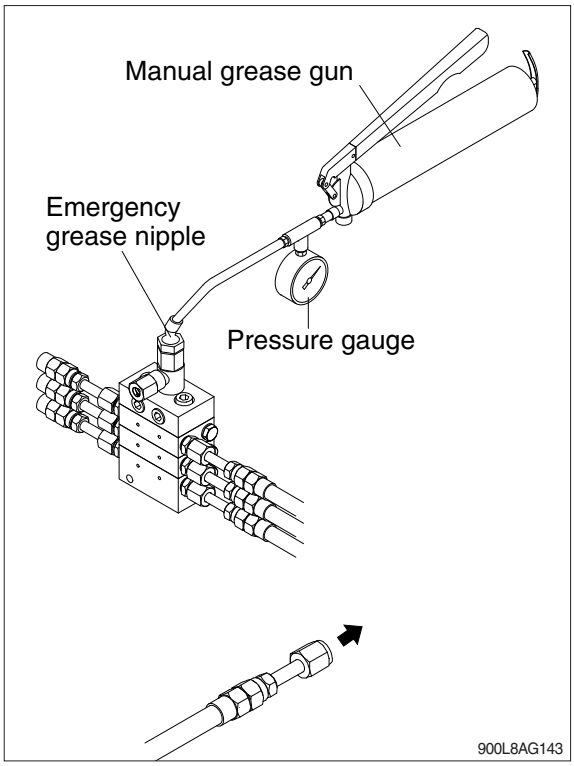
⑤ Check whether grease come out or not after fill grease into emergency grease nipple of distributor with manual grease gun.

※ In case grease does not come out from sub lube line.

- Sub lube line blocked. -> Exchange sub lube line.

※ In case grease come out from sub lube line.

- Lube point blocked. -> Repair or replace.



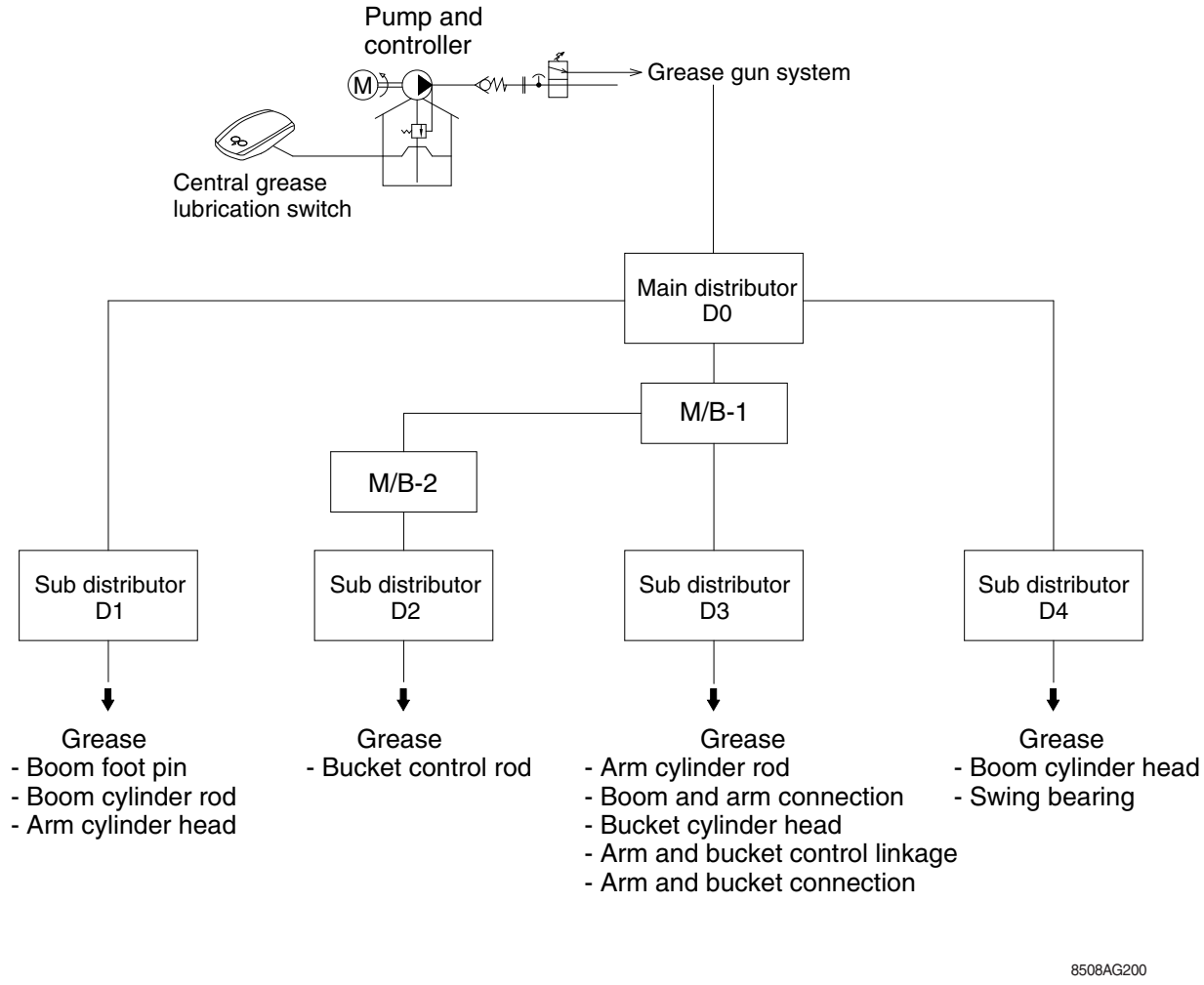
CENTRAL GREASE LUBRICATION SYSTEM (#0185-)

1) SAFETY INSTRUCTION

Please observe the contents of the following description to use this product safely. In this manual warning and caution are intended to prevent death or serious injury that may be caused to the operator who are around the product and damage that may be caused the articles that are around the product, as well as to use safely and correctly.

(1) Do not use strange materials to clean the pump in any case.
Otherwise it may cause damage and explosion of pump.
(2) Do not remodel the pump in any case. It may result in a bodily accident or failure.
(3) Do not use gasoline to clean the pump in any case. It may cause ignition or explosion.
(4) Do not use any solvent or chemical which corrode these materials.
(5) Do not operate the gun lever with the discharge port facing to another person during machine operation at any case.
(6) Do not use silicon grease.
(7) After the end of using pump, please be sure to shut off the power of this machine to release the internal pressure.
(8) When replacing any port as maintenance, please be sure to stop the power to the machine to avoid having fingers nipped because of a malfunction.
(9) Using of the pump for other purpose could lead to personal injuries or damages on properties.

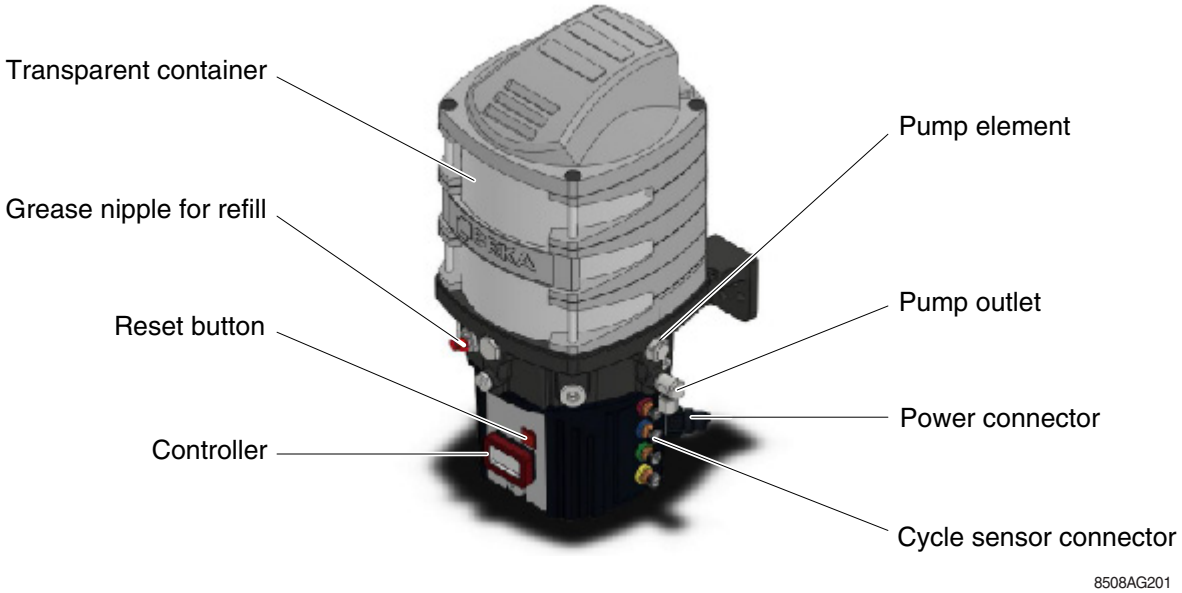
2) SYSTEM LAYOUT



※ Refer to 9-32-14 page for details.

3) PUMP DEVICE

(1) Major component



(2) Specification

Item	Specification
Input power	24 VDC
RPM	17 rpm
Current	6.3 A medium time-delay (fuse not included in the device)
Controller	Yes
Output volume (cc/min)	8.5 cc/min ± 20 %
Discharge pressure (bar)	Max. 280 bar ± 20 % at 20 ˚C, NLGI No.2
Operating temperature	-30 to 70 ˚C (depending on the lubricant used)
Lubricant	Greases up to NLGI No. 2
Dimension (W x L x H)	280 x 289 x 505 mm
Grease reservoir	8 liters

(3) Grease at temperature

Temperature	NLGI	Remark
0˚ above	#2	-
0˚C ~ -15˚C	#0	-
-15˚C ~ -29˚C	#00	Suited for extremly low temperature
-30˚C below	#000	

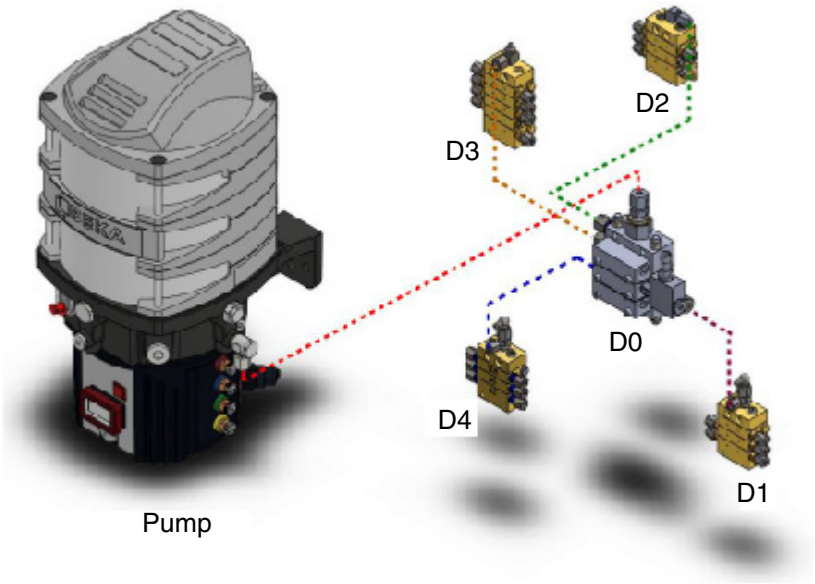
※ **It could be reducing a grease output volume after 30 min running.**

※ **When you use pump lower then -10˚C continuously, you should use a low temperature grease.**

3) HOW TO OPERATE PUMP

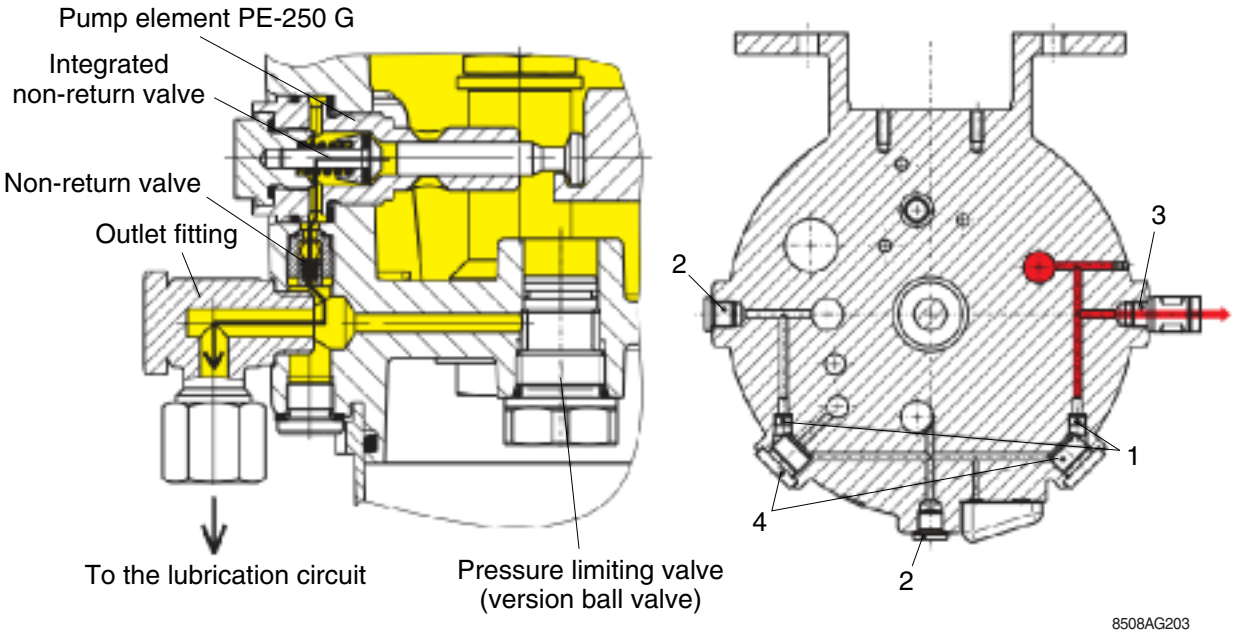
(1) The central lubrication pump is used to supply a progressive central lubrication system.

(2) The central lubrication pump pumps the lubricant into a main distributor D0. This distributes the lubricant in the correct ratio to the secondary distributors D1, D2, D3, and D4, which then distribute the lubricant to the lubrication points.



8508AG202

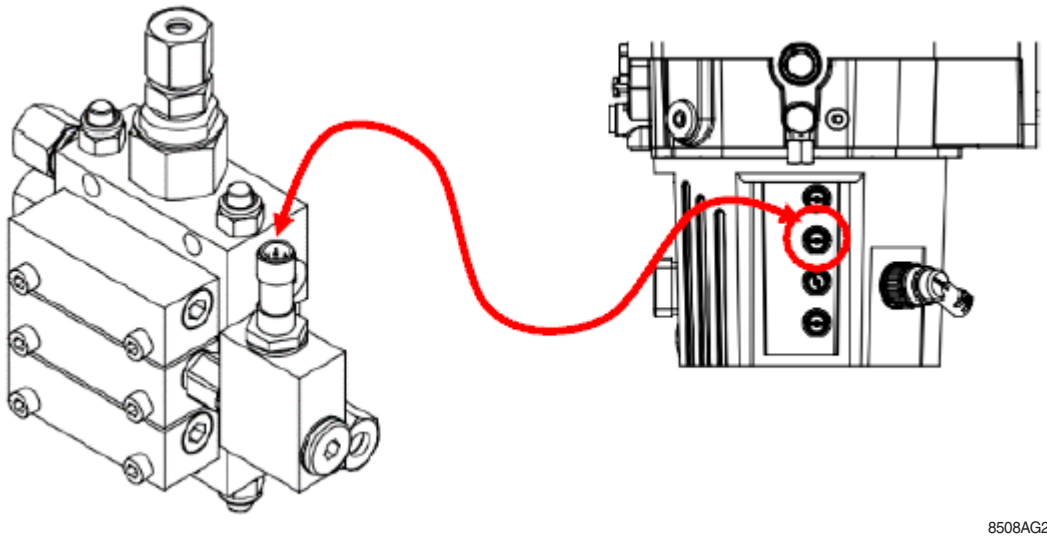
(3) In case a lube point would not get lubrication from the distributor, the distributor blocks. The system pressure would exceed 280 bar but is limited by a pressure limiting valve at the pump element at the pump. The pump limits the pressure by an installed pressure limiting valve directly at the pump.



(4) The pump element meters the lubricant quantity and supplies it though a non-return valve that is integrated in the pump element towards the pump outlet where it is forwarded into the lubrication cycle by means of the outlet fitting. The pump's integrated pressure limiting valve (version ball valve) protects the lubrication cycle if the system pressure exceeds 280 bar.

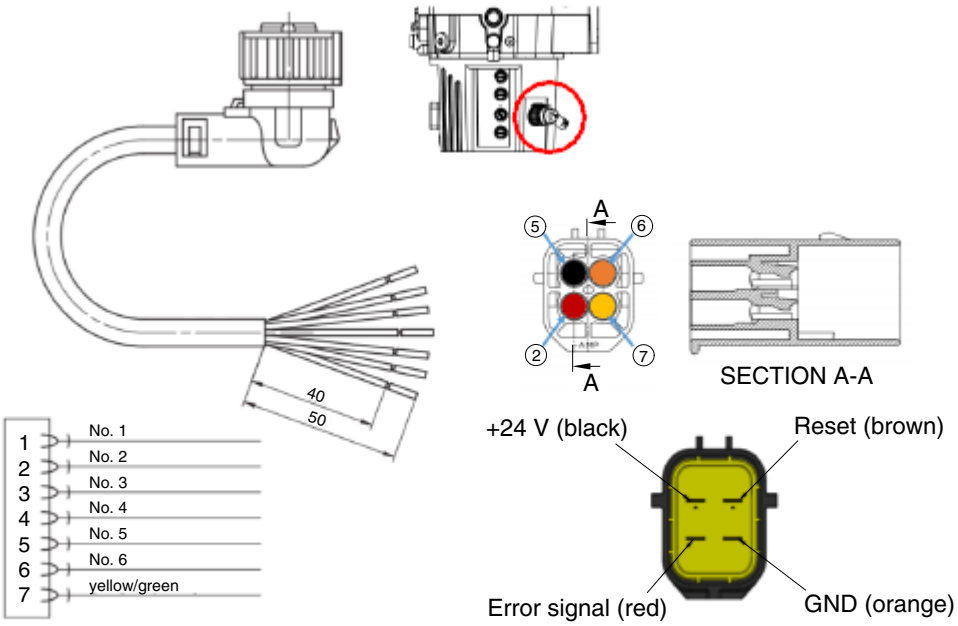
(5) Cycle sensor connector

Pump receives it's lubrication cycle signal from the first distributor DO via cycle sensor cable.



(6) Circuit diagram for power connector

Pump can be connected to the excavator with bayonet connector. Please see the cable wiring.



Terminals diagram

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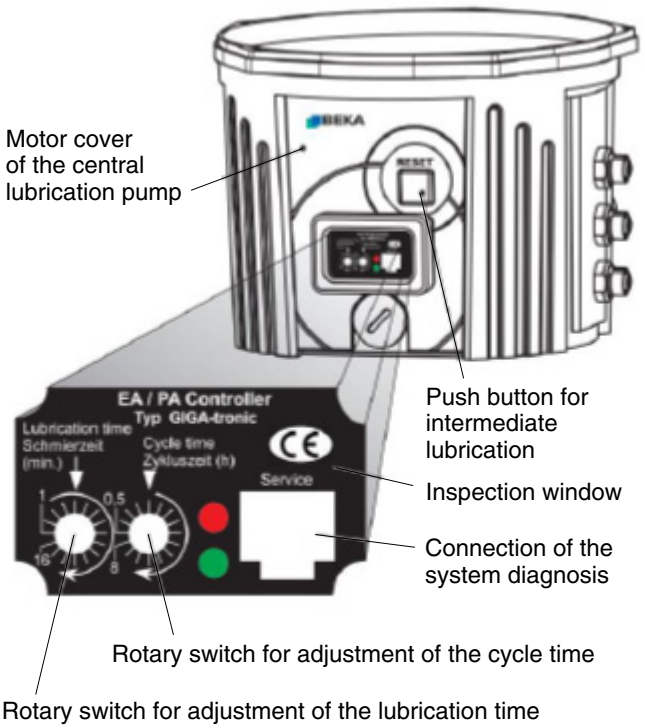
4) CONTROLLER

(1) Structure



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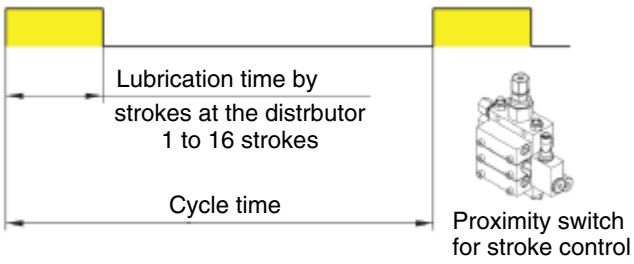
(2) Specification of controller

Item	Specification
Power	Supply voltage 10 to 60 VDC
Current	Max. 6 amp. (Fuse - not enclosed F 6.3 A)
Control	Cycle No. of main distributor stroke
Temperature	On stock : -30 ~ +70˚C depends on lubricant
	In service : -40 ~ +70˚C
Lube cycle	Max. 32
Off time	0.5 h up to 32 h

(3) Operation

① With the integrated electronic control device GIGA-tronic, the lubrication time can be defined by the number of lubrication pulses (cycle) at the progressive distributor D0. Lubricant supply is also monitored thereby.

② It is necessary to count the number of piston strokes to that purpose. When lubricant is supllied into the progressive distributor, the piston is moved permanently and progressively. A proximity switch is mounted to one of these pistions which sends a signal to the control with each piston stroke. These signals are counted by the controller.



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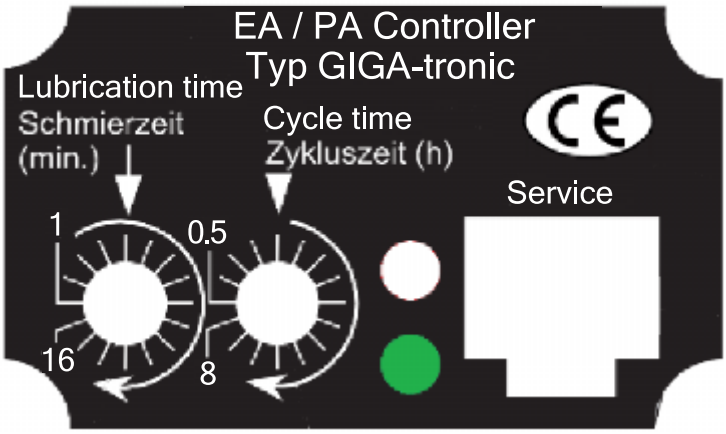
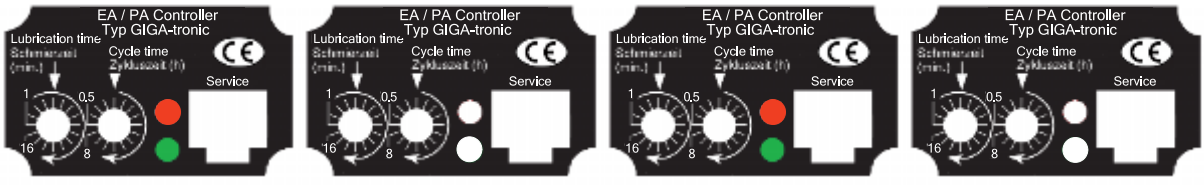
③ When the pump is running (lubrication time), the green LED in the inspection window is on until it set lubrication cycle is finished. Grease in the pump is supping to the D0 distributor via main Line.



8508AG208

④ If these signals are missing for a longer period than the set monitoring time (12 min. as a standard), the control will indicate malfunction. The green and the red LED in the inspection window start flashing. Possible case is grease in the pump is lower than min level, or distributor or end lube point is blocked, or pump is in malfunction.



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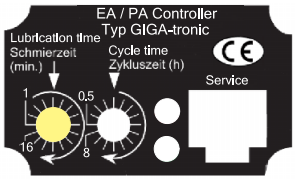
(4) How to set the cycle time

① Lubrication cycle time

No. of lubrication cycle can be selected with rotary switch “Lubrication time”. (standard 16 cycle)



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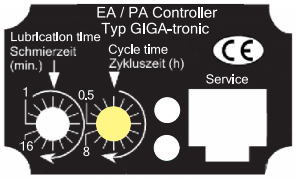
S/W No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cycle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

② Lubrication off cycle time

Off time can be selected with rotary switch “Cycle time(h)”. (standard 0.5 h)



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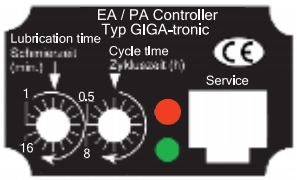
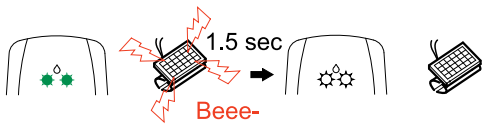
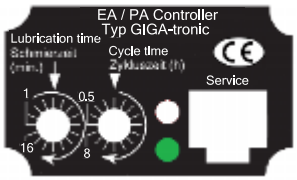
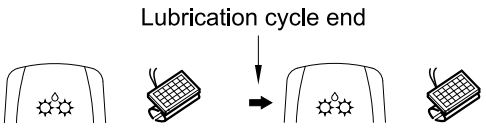
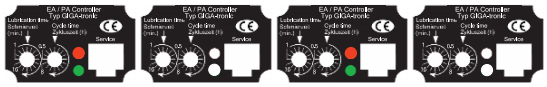
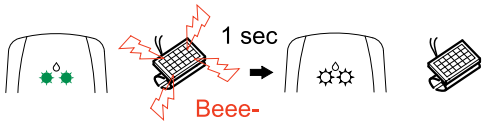
Mark	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Off time (h)	0.5	1	2	3	4	5	6	7	8	9	12	16	20	24	28	32

(5) Display (controller/reset switch)

Status	Control panel	Reset switch / buzzer
Standby		
Pump running		
Stroke error		

※ If system runs normal, it does not displayed.

※ Green LED on reset switch is displayed when error occurs.

5) HOW TO CHECK GREASE LEVEL

Every day check visually the residual grease in the container and if the grease is 1/4 level in the transparent container please refill the grease until max. level.

6) HOW TO REFILL GREASE TO THE PUMP

Please follow the following procedure.

(1) Open the cap and clean the grease nipple for refill

(2) Refill the grease to the container via grease filling pump until max. level.
Be careful do not enter the foreign substance into the pump inside.
Strongly recommends to use clean grease filling unit, do not cause malfunction.

(3) Clean the grease nipple for refill and close the cap

(4) Push RESET button

(5) Check pump is running until pump goes to rest mode.
(Pump turns off when set lubrication cycle counted.)

7) MAINTENANCE

(1) Pump device

Interval	Item	Remarks
Daily	Grease level Controller	Check residual grease level Check status of controller display
Monthly	Pump Controller Parts fastened	Output Pressure Push reset switch(Refer to page 9-32-7) and check Check and make it fasten if necessary

(2) Lube system

Interval	Item	Remarks
Daily	Lube point & gauge	Check visually lubrication status of lube points & gauge
Weekly	Distributor leakage Lubricant level	Please change fitting or make it tidy if leakage Check grease level with level sensor and manual lever
Monthly	Grease output pressure Lube line	Check pressure gauge Check lube visually

8) TROUBLESHOOTING

(1) Pump device

Trouble	Reason	Solution
Central lubrication pump is not working	No power supply Break in electrical cable Pump faulty Pump element not hooked in	Renew fuse if available Replace electrical cable Repair or replace central lubrication pump Replace pump element
Pump is working but does not pump	Air cushion in the delivery piston Level is below min. fill level Pump element faulty	Vent central lubrication pump Fill the storage reservoir Replace pump element
No grease collar at multiple lubrication points	Supply line to the secondary distributor has burst or is not leak-tight Fitting not leak-tight Integrated pressure limiting valve defective	Replace line Tighten or replace fitting Exchange pressure limiting valve
No grease collar at a lubrication point	Relevant lubrication line has burst or is not leak-tight Fitting not leak-tight	Replace line Tighten or replace fitting
Pump speed reduced	High system pressure Supply voltage too low	Check system/bearing points No damage (interim lubrication may be required 1 to 2 times) Check voltage
Other troubles	Contact to Hyundai dealer or service center.	

(2) Lube system

Item	Reason	Solution
Grease are not delivered to certain lube point	Lube line broken	Change lube point fitting and line
	Lube point broken	Check lube point blocked
	Distributor blocked	Change distributor
Cycle error	Please push reset switch and check cycle error again and follow the following procedure if there is cycle error will not be gone	
	Grease empty	Please refill grease
	Air pocket occurred	Remove air pocket
	Certain lube point blocked	Check lube point
	Lube line blocked	Check lube line
	Distributor locked broken leakage	Check distributor and change it
	Pump out of order	Check pump as pump manual
Noise at certain point	Lack of grease	Adjust lube on cycle (refer to page 9-32-7)
	Blocked lube point	Check Lube point
Main distributor (D0) are leaked and pressure gauge goes up to higher	Seal broken due to over pressure occurred by certain lube point blocked	Change seal and repair lube point blocked
	Filter blocked at front of main distributor (D0)	Clean filter
Others	Contact to Hyundai dealer or service center.	

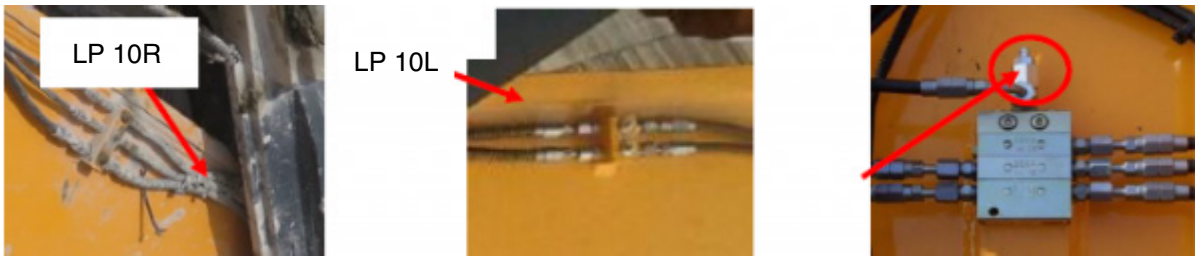
(3) Find distributor and lube line blocked

Please follow the following information. (refer to page 9-32-15)

① Disconnect input main lube line of main distributor (D0).
② Check whether grease come out through main lube line or not.
③ Connect main lube line and check each outlet of distributor as one by one after disconnect each sub lube line to each sub distributor.
④ Please check for sub distributor as main distributor (D0) done.
⑤ Although all distributor and lube line are not out of order, if grease could not come out through certain distributor or lube line, it means this distributor or lube line is blocked.
Therefore please change this distributor or lube line.
⑥ Although all distributor and lube line are not out of order, if cycle sensor error display continually, please connect at this lube point with manual grease gun and check it.

9) GREASE NIPPLE FOR MANUAL FILLING

There is grease nipple installed at distributor and grease nipple block for filling grease needed additionally or emergency.



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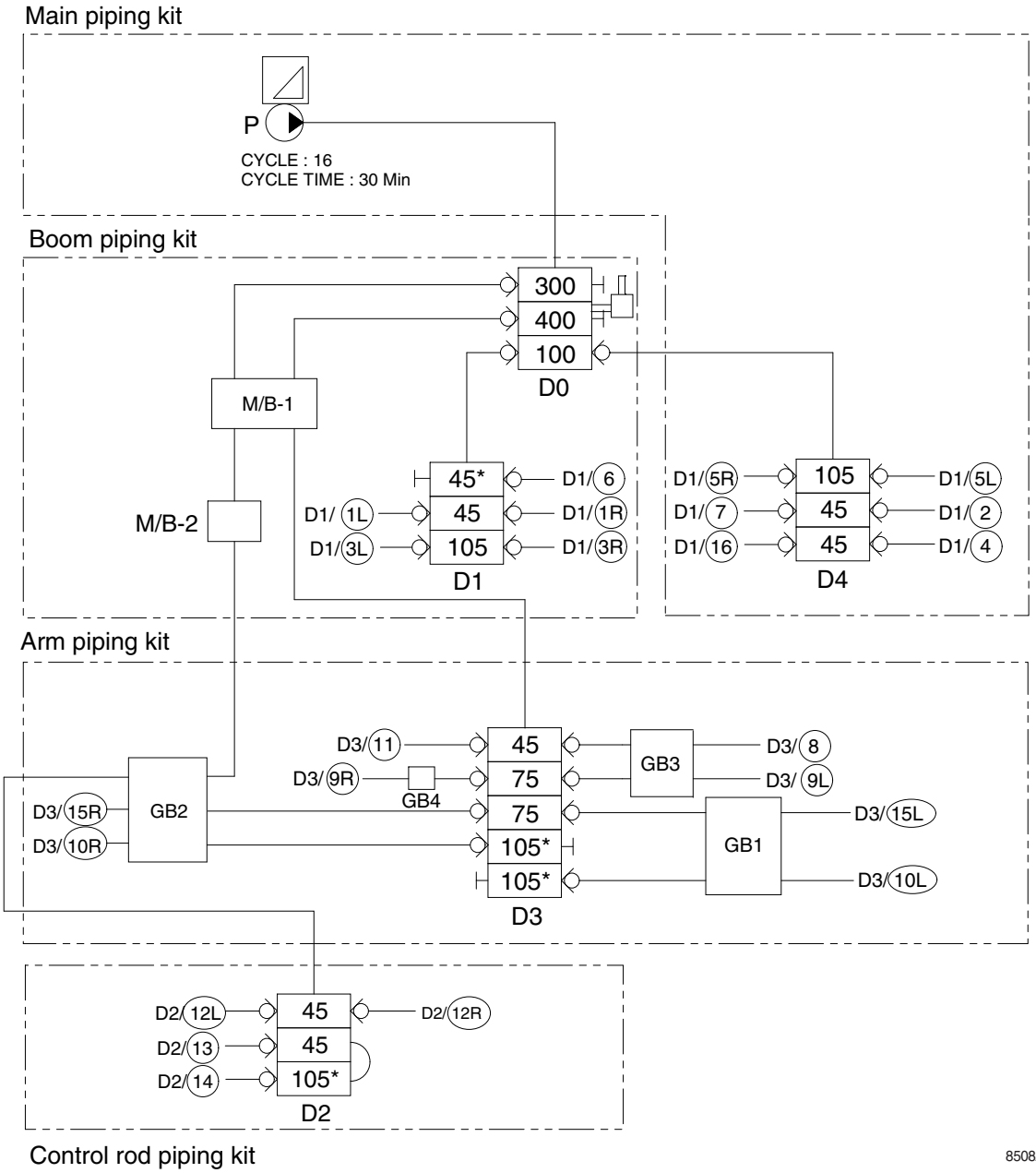
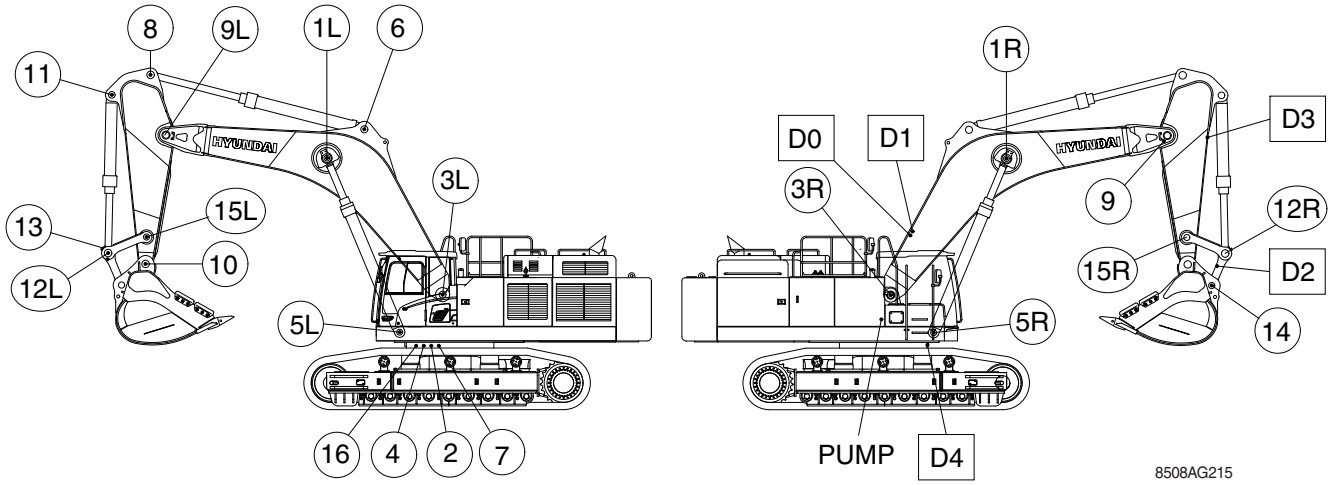
10) SYSTEM DIAGRAM

(1) Lube system

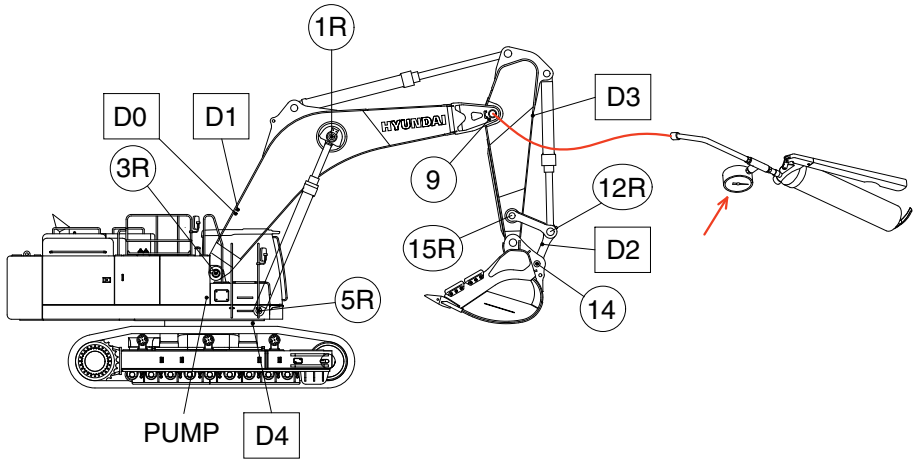


(2) Lube point



Appendix 1

Example
To find out the end blocked point

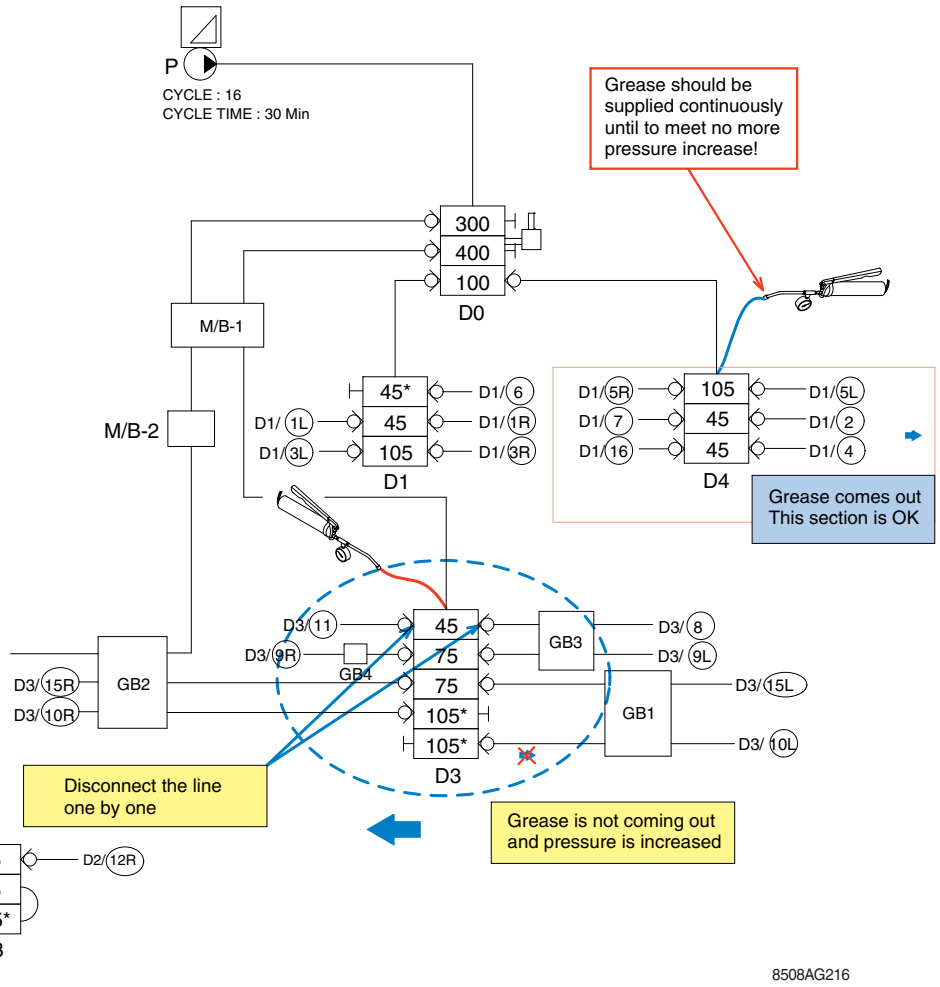


When it has some problem, the pressure is increased over 300~400 bar.

Check end point whether it is block or not.

Grease is not coming at distributor (when a line is just disconnected)
->
Distributor is not blocked
Please check last disconnected hose line and it's end point at machine side.

Grease is not coming at distributor (all line is disconnected)
->
Distributor is blocked
Please replace it.



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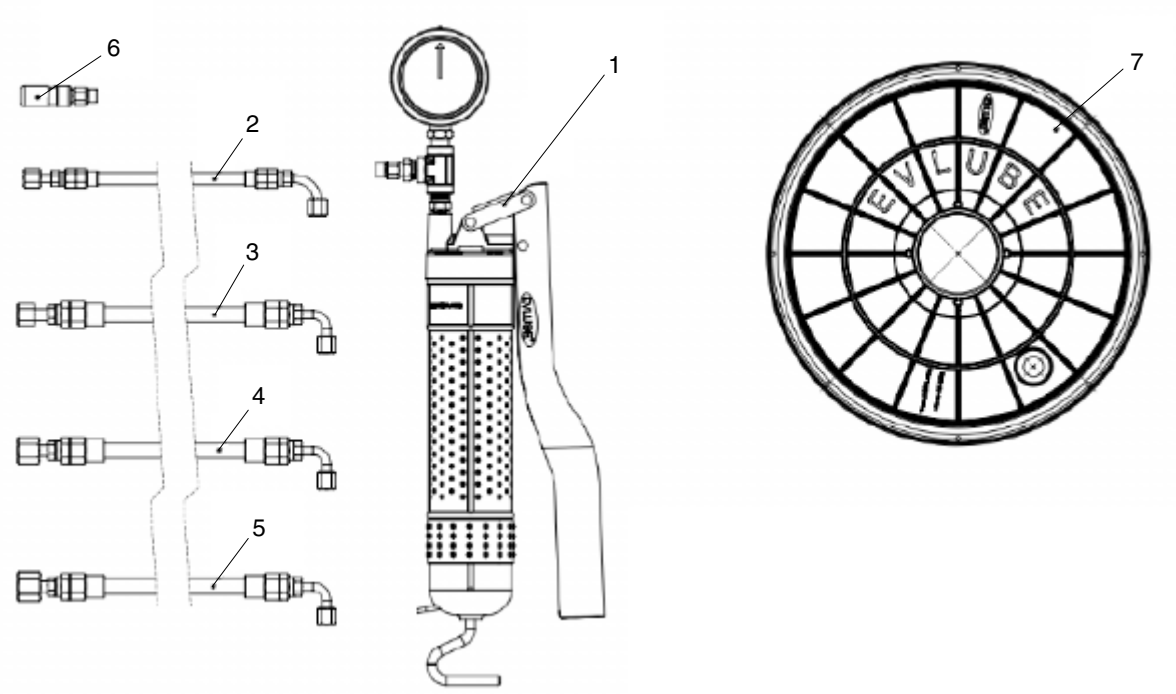
Appendix 2

Test Kit

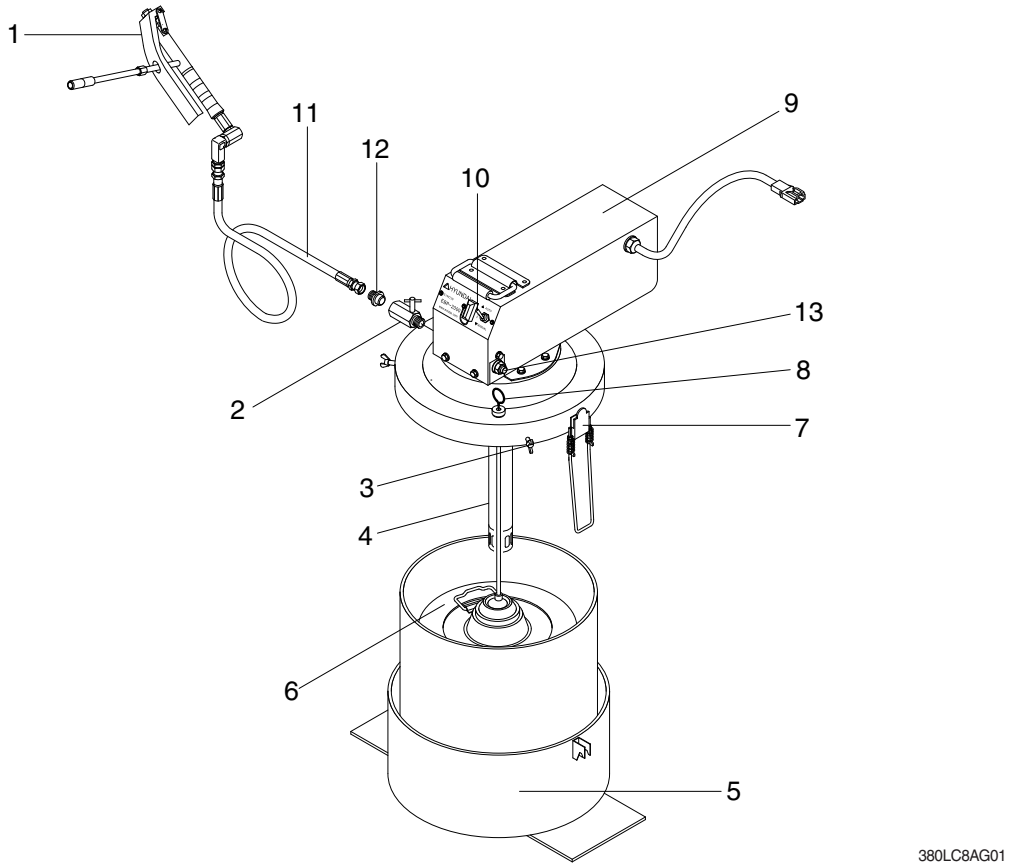


8508AG217

1 HPG-400 with pressure gauge
2 D1, D4 and end LP check hose
3 D2, D3 check hose
4 Joint block check hose
5 D0 check hose
6 4 jaw grease nozzle
7 Bulk cleaning follower BCF400

2. SEMI AUTO GREASE LUBRICATION SYSTEM

1) MAJOR COMPONENT



1 Grease gun
2 Inline check & airvent
3 Wing bolt
4 Piston & cylinder
5 Grease can holder
6 Follower plate
7 Grease can clamp
8 Level gauge
9 Grease pump
10 Grease lubrication switch
11 Grease hose
12 Grease filter
13 Over pressure control valve

· Specifications

Item	Specification
Input power	24VDC
RPM	60
Current	15 amp
Output volume	110.0 cc/min ± 20%
Pressure	Max. 280 bar ± 20%
Operating temperature	-35˚C to 70˚C (depending on the grease type)
Weight	15 kg
Filter	1st filter ; 1.0 mm, 2nd filter ; 0.2 mm
Grease can	20 liter
Grease hose	10 meter

2) PREPARATION FOR OPERATION

(1) Instruction

※ **Place the unit on flat and stable place.**

※ **After you use the grease, please make sure to change it into new grease can. Never use it by filling the grease, for it becomes the cause of system failure.**

① Loosen the wing bolts, clamp and remove the grease pump from the grease can.

② Remove the follower plate and level gauge.

③ Change a new grease can.

④ Place the follower plate on the grease can horizontally and push it down by rubbing it to left and right with hand until the grease comes out from the packing in the middle of the follower plate.

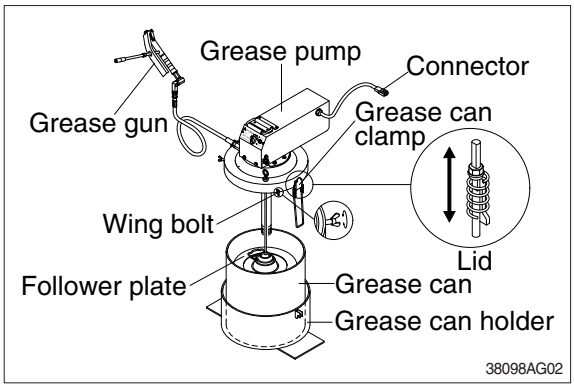
※ **Take care not to allow sand and dust to adhere on the suction tube and follower plate of the pump.**

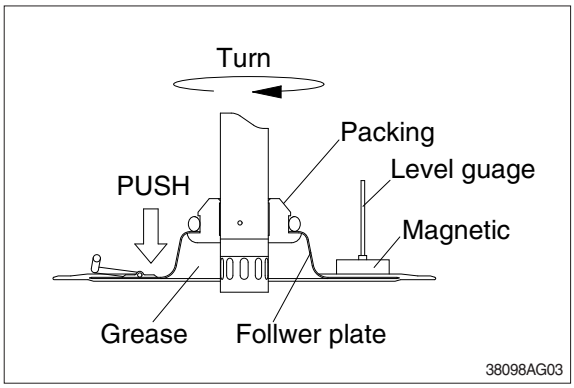
⑤ Place the magnetic of level gauge on the follower plate.

⑥ Insert the grease pump into the center of grease follower plate.

⑦ Install the clamp tight (2EA) according the height of can and tighen the wing bolt (3EA).

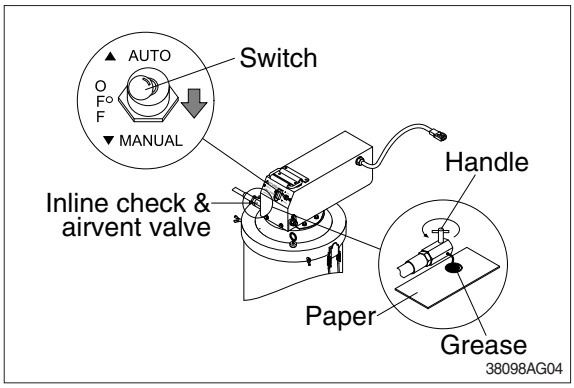
⑧ Check the power connector.





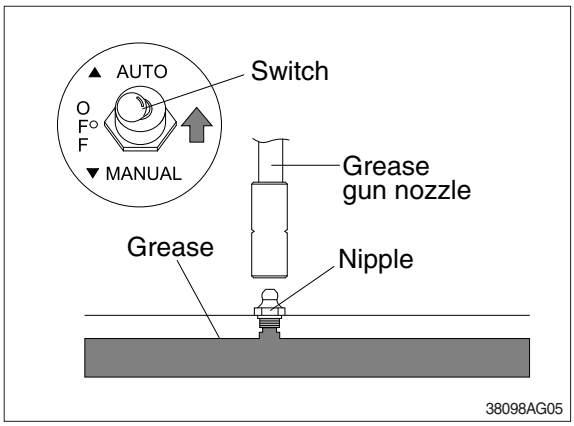
(2) Grease gun operation

① Switch on to the MANUAL.
② Open the inline check & airvent valve and operate the pump until grease will be discharged from a small hole under check valve.
③ After grease is discharged fully, close the valve handle.



④ Switch on to the AUTO, take out grease gun and hose to the point where you want to lubricate and lubricate a grease to lube point after hold grease gun handle.
⑤ Rearrange the grease gun and hose after lubricate all lube points and keep it in the tool box.
⑥ Switch OFF.

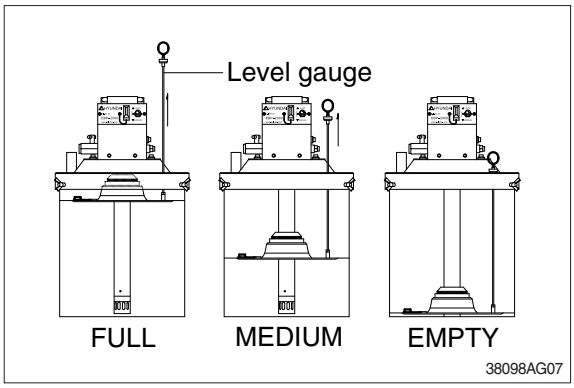
※ It could be reducing a grease output volume after 30 minute running.
※ When you use pump lower than -10°C continuously, you should use a low temperature grease.
※ The grease mixed air is cloudy in white replace the new grease.



(3) Grease level check

① Hold the level gauge handle and make straight line between the gauge plate attached follower plate and gauge handle.
② Check the length of the level gauge between gauge handle to the top of pump. The distance of gauge (wire rope) is indicated grease level.
③ When grease level goes down to the emply the level gauge plate will be separated from the follower plate (It is attached with magnet). Replace the new grease can.

※ Pump will be pumping out a remaining grease for 3 minutes after the grease level indicated empty.



3) SAFETY INSTRUCTION AND MAINTENANCE

(1) Safety instruction

① Do not use silicon grease.
② Do not operate the grease gun with the discharge port facing to another person during machine operation at any case.
③ After the end of using pump, please be sure to shut off the power of this machine to release the internal pressure.
④ When replacing any port as maintenance, please be sure to stop the power to the machine.

(2) Maintenance

① If any leakage is found, replace seals leaked and also it is required to replace them once a year.
② Check whether pump could pump the accurate grease volume or not periodically.
③ Please clean grease filter if output volume is less then 25% of stroke volume. (110 cc/min)

4) TROUBLESHOOTING

Category	Applications	Service
Pump does not work	Electric cable is broken Pump is defective	Renew the electric cable and fuse Replace the pump
Pump is working but does not supply of lubrication	Grease low level Air packed in the grease can Air packed in the lube line Defective pump element Defective cam and piston Pipes are burst or leakage Defective over pressure valve	Replace the grease can Remove air packet using with follower plate Remove air packet using inline air vent handle Replace the pump element Replace the pump piston Renew the pipes Replace the over pressure valve
Could not either pump high pressure or accurate grease volume	Defective over pressure valve Defective seal in side pump Defective pump parts	Replace the over pressure valve Replace the pump seal Replace the pump parts
Reduced pump speed	Pump and grease pipes is blocked Low ambient temperature	Check and replace the grease pipes Replace the low temperature grease
Leakage of grease at the over pressure valve	Grease filter is blocked Grease pipes is blocked	Clean grease filter Clean grease pipes