1. SELECTING HYDRAULIC BREAKER

※ **Read safety hints in this manual and breaker & quick coupler manuals in website (Dealer Portal) before using breaker and quick coupler.**

1) Become familiar with the manual and select breakers suitable to machine specifications.

2) Make careful selection in consideration of oil quantity, pressure and striking force, to enable satisfied performance.

3) When apply a breaker to the machine, consult your local dealer of HD Hyundai Construction Equipment for further explanation.

2. CIRCUIT CONFIGURATION

1) As for breaker oil pressure line, use extra spool of main control valve.

2) Set proper breaker pressure on load relief valve.

※ **The initial setting pressure of load relief valve for breaker is 200 bar.**

3) The pressure of the HX900 L system is 330 kgf/cm^2 (4690 psi).

4) Adjusting oil quantity

(1) Use the breaker mode from work tool of cluster. Use select switch to control the oil flow quantity.

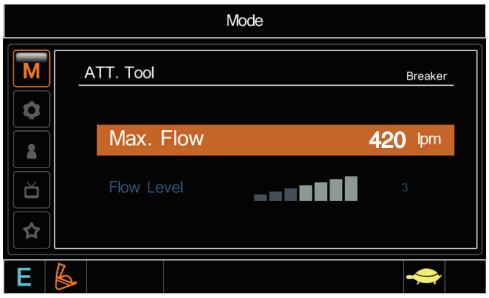
· Setting oil quantity : 420 lpm

Flow set

· Max flow : Set the maximum flow for the attachment.

(2) If the quantity of hydraulic oil is not controlled properly, it causes short lifecycle of the breaker and the machine by increased breaking force and count.

Oil quantity setting



80098HB02

5) The accumulator should be used to the breaker charging and return line.
If the accumulator is not used, it will be damage as the input wave is delivered.

※ **Keep the pressure pulsation of pump below 60 kgf/cm^2 (853 psi) by installing the accumulator.**

6) Do not connect the breaker return line to the main control, but connect to the return line front of the cooler.

7) Do not connect the breaker return line to drain lines, such as of swing motor, travel motor or pump, otherwise they should be damaged.

8) One of spool of the main control valve should be connected to the tank.

9) Select the size of pipe laying considering the back pressure.

10) Shimless tube should be used for the piping. The hose and seal should be used HD Hyundai Construction Equipment genuine parts.

11) Weld the bracket for pipe clamp to prevent damage caused by vibration.

3. MAINTENANCE

1) MAINTENANCE OF HYDRAULIC OIL AND FILTER

(1) As machine with an hydraulic breaker provides the hydraulic oil becomes severely contaminated.

(2) So, unless frequently maintained, the machine may easily go out of order.

(3) Inspect and maintain hydraulic oil and 3 kinds of filter elements in particular, in order to prolong machine life.

2) RELEASE THE PRESSURE IN BREAKER CIRCUIT

When breaker operating is finished, stop engine and push pedal or switch for breaker to release pressure in breaker circuit.

If pressure still remains, the lifetime of the diaphragm in the accumulator will be shortened.

3) Be careful to prevent contamination by dust, sand and etc.

If such pollution become mixed into the oil, the pump moving parts will wear abnormally, shorten lifetime and become damaged.

4) When operating breaker, bolts and nuts of main equipment may be loosened by vibration. So, it must be inspected periodically.

Service interval

unit : hours

Attachment	Operating rate	Hydraulic oil	Filter element
Breaker	100 %	600★1	200
		1000★2	

★1 : Conventional hydraulic oil

★2 : HD Hyundai Construction Equipment genuine long life hydraulic oil

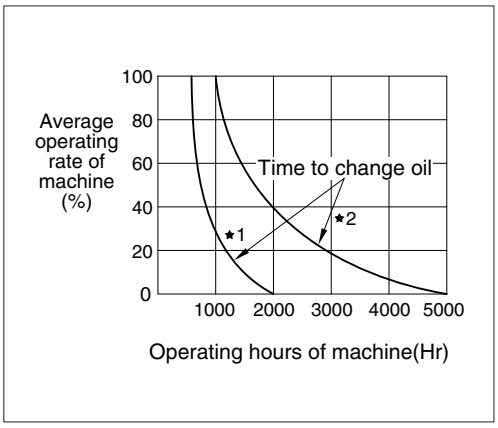
● **Replace following filter same time**

· Hydraulic return filter : 1 EA

· Pilot line filter : 1 EA

· Drain filter cartridge : 1 EA

Hyd oil change guide for hydraulic breaker



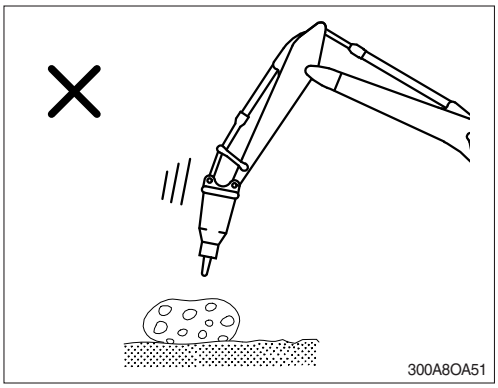
★1 : Conventional hydraulic oil

★2 : HD Hyundai Construction Equipment genuine long life hydraulic oil

4. PRECAUTIONS WHILE OPERATING THE BREAKER

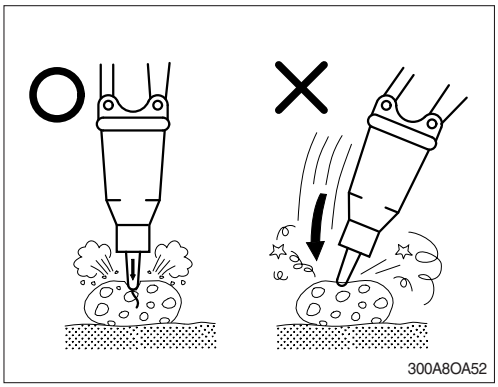
DO NOT BREAK ROCK WHILE LOWERING

As the breaker is heavy in comparison with bucket, it must be operated slowly.
If breaker is rapidly pushed down, working device may be damaged.



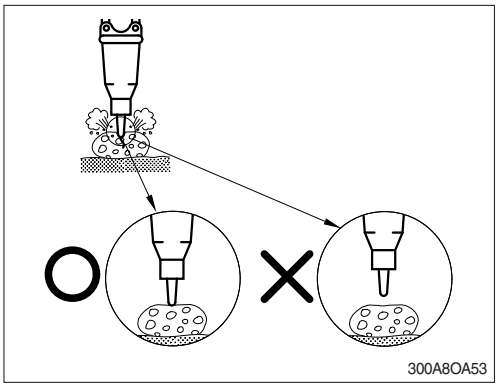
DIRECTION OF THRUST

Apply a thrust in a straight line with the tool. Place the tool on a rock with the hammering side as vertically as possible. If the hammering side is oblique, the tool may slip during hammering, causing the chisel and piston to break, or seized. When breaking, select the point of a rock on which hammering can perform stably and fully stabilize the chisel to the hammer.

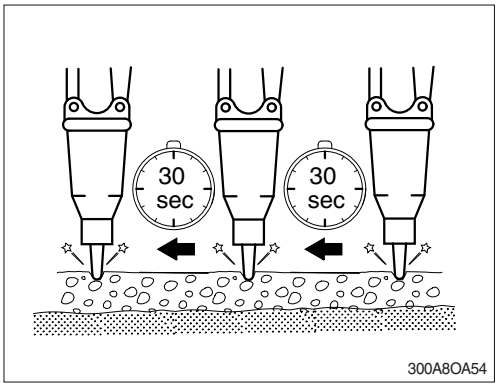


PROPER THRUST

To break effectively, a proper thrust force must be applied to the breaker. If thrust is too low, impact energy of the piston may not be sufficient to break rocks.
Breaking force is transferred to the breaker body, arm and boom resulting in damage of those parts.

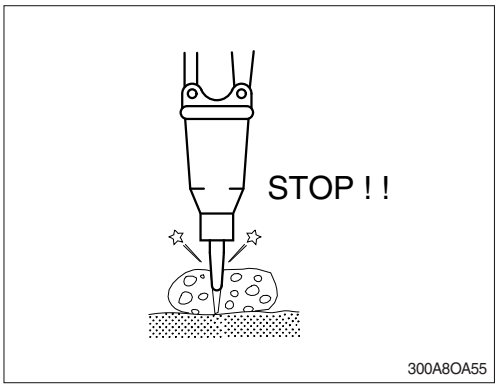


Move the impact point from the edge to the interior. Never try to break off a too large block, if the object has not broken within 30 seconds. The object should be broken up piece by piece in small blocks. Large distance steps will not improve working results.
Operating the breaker longer than 30 seconds may cause damage to the breaker.



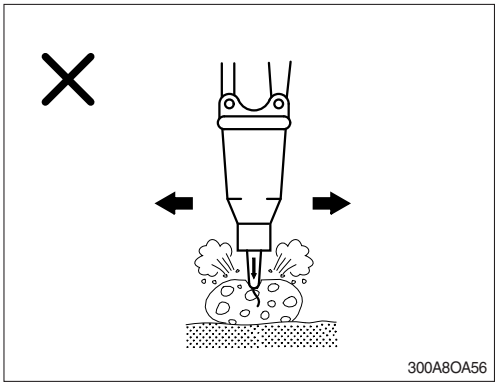
BLANKS THRUST

Blank blows, which are impact on the chisel without contact with the object, are very harmful for the breaker. Always press the chisel down onto the material before starting the breaker. And stop operation immediately as soon as the object has been broken. If operation is continued, blank blows could result in excessive wear to major components.



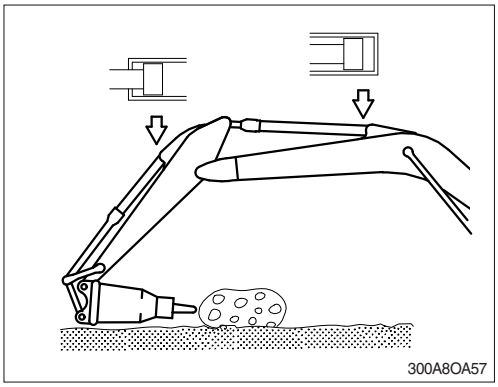
DO NOT MOVE MACHINE OR BREAKER WHILE STRIKING

Do not move hammer while striking.
This will cause damage to the working device and the swing system.



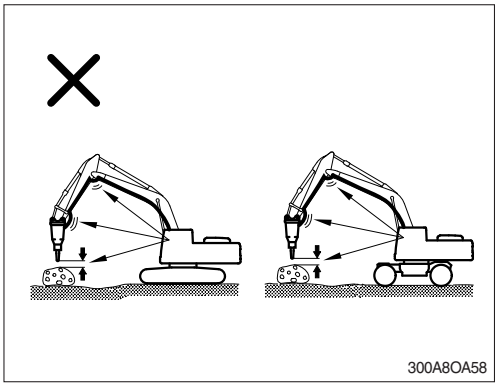
OPERATE BREAKER WITH A GAP IN EXCESS OF 100 mm (4 inches) FROM THE END OF THE STROKE TIP

If breaker is operated with the end tip, the cylinder may be damaged.



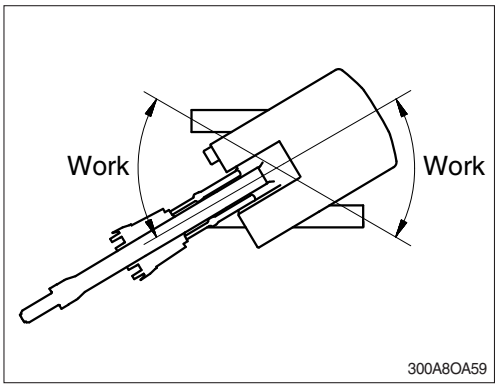
STOP THE OPERATION IMMEDIATELY IF HOSES VIBRATE EXCESSIVELY

Violent pulsations of the high / low pressure breaker hoses could indicate an accumulator fault. Check for oil leaks at the hose fitting points retightening as necessary. Should symptoms persist, contact the service shop appointed by the Hyundal dealer in your territory for repair. An excessive gap between tool and workpiece between strikes may indicate seizure of the tool in the front head. Disassemble the front head, inspect the components and repair or replace defective parts.

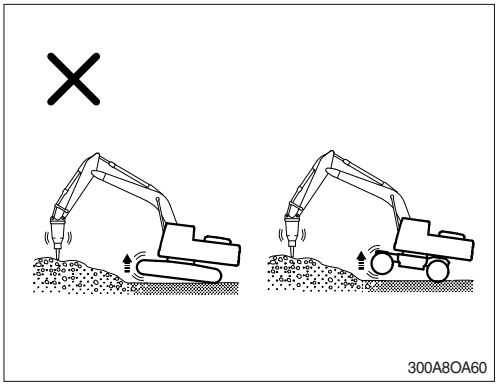


DO NOT WORK WHILE IN A SWING STATE

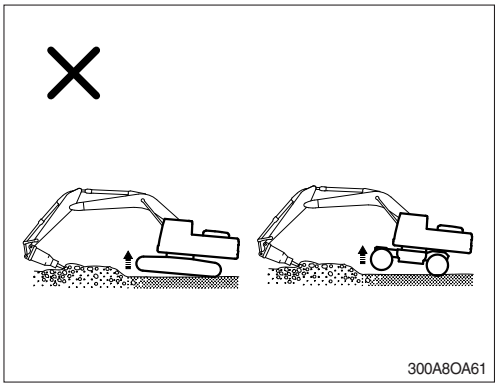
Do not work while swinging the upper structure. It cause oil leakage of the bend in the track shoe and rollers.



Conversely, if thrust is excessive or breaking is performed with boom of the lower chassis raised as shown, the machine may suddenly tip toward the movement. The breaker body may strike the broken rocks violently resulting in damage.

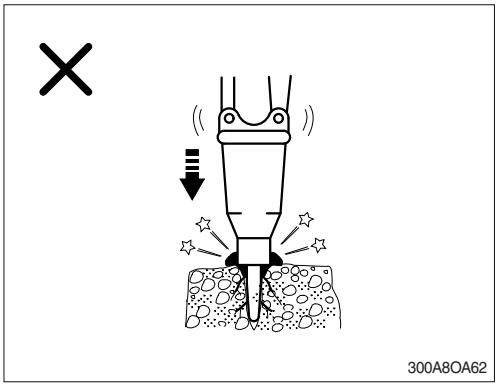


Do not extend the bucket cylinder fully and thrusting to raise the machine off the ground.



Excessive force as above may also result in vibrations being transmitted to the tracks causing damage.

Care is required to ensure adequate but not excessive force is applied to the breaker in operation.



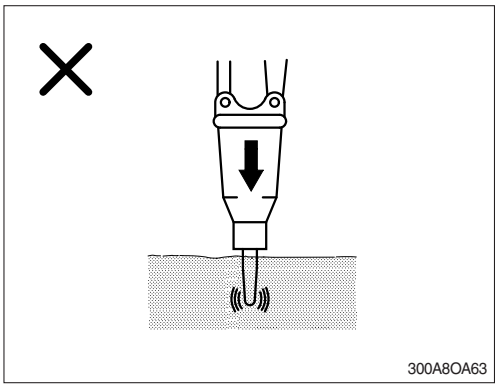
NEVER DRIVE THE CHISEL INTO THE GROUND

If the advance is too large and the chisel is not rocked to release the dust, the chisel will be driven into the material without breaking the material. This causes the chisel tip to glow red-hot and lose its hardness.

As a result, the chisel wears out more quickly. Operating in this way is not permitted.

Dust dampens impact power, when the chisel is inserted into the ground, and reduces the efficiency of the breaker. Tilt the breaker slightly backward and forward, not more than 5°, while operating so that the dust can escape.

Do not rock the breaker at angles greater than 5° or the chisel will be broken.

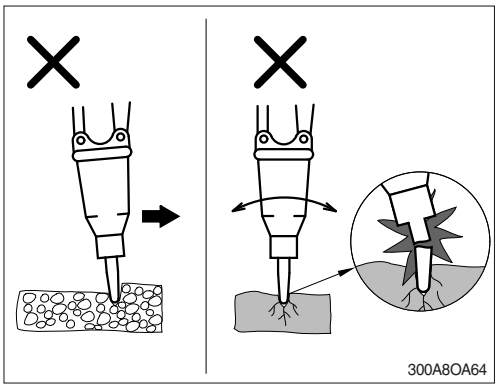


NEVER USE AS A LEVER

Do not use the chisel as a lever; e.g. crowbar, as this will cause the chisel to break.

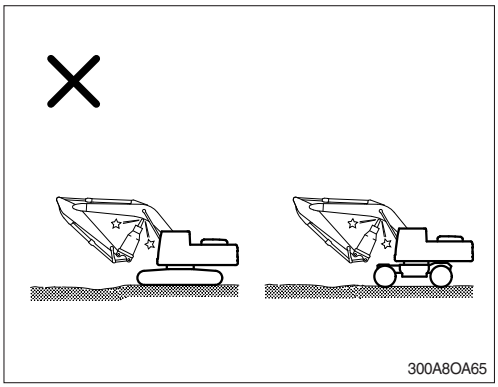
Under any circumstances, operating in this way is not permitted.

Most of bending failure of the chisel may be caused by lever action in stone that is inside hard or frozen ground. Be careful and stop operating if you feel sudden resistance under the chisel.



TAKE CARE OF CHISEL AND BOOM INTERFACE

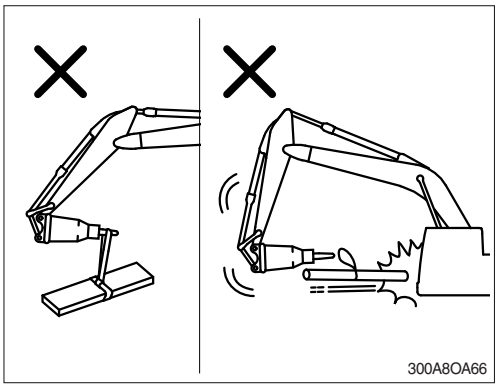
Be aware of clearance between breaker tip and the underside of boom as shown.



NEVER USE FOR LIFT OR TRANSPORT PURPOSES

The hydraulic breaker is not designed to lift or transport loads. Never use the chisel as a lifting point.

This is dangerous and could damage the breaker or the chisel.

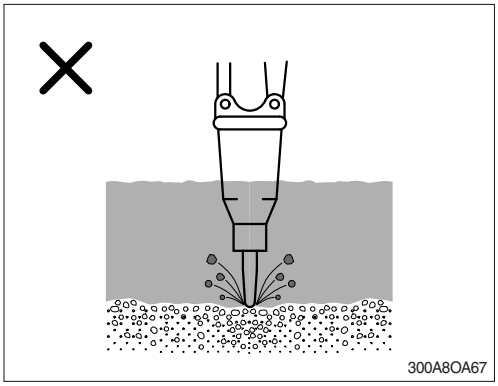


NEVER USE THE HYDRAULIC BREAKER UNDER WATER

The hydraulic breaker, as a standard assembly, never be used in or under water without prior conversion. If you use under water, water fills the impact chamber between the piston and the chisel, a strong hydraulic pressure wave is generated and will damage the seals in the breaker. And, in addition, corrosion, lack of lubrication or penetration of water could result in further damage to components of the breaker and the lower chassis.

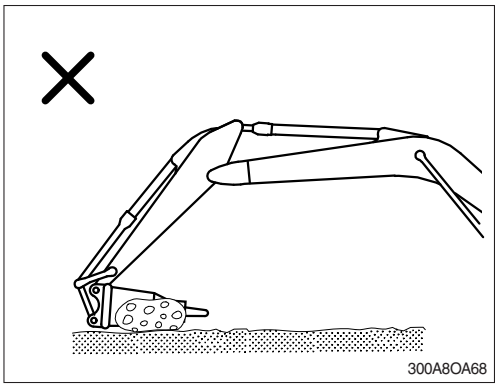
To operate the breaker under water, compressed air must be supplied into the breaker, into the impact chamber of the front-head, prior to use.

Consult your HD Hyundai Construction Equipment dealer for the underwater kit.



DO NOT USE BREAKER TO CARRY BROKEN STONE OR ROCK BY SWING OPERATING

This may damage the operation device and swing system.

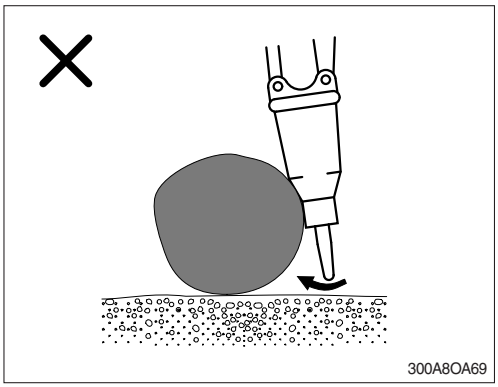


NEVER USE THE CHISEL OR HYDRAULIC BREAKER TO MOVE ROCKS OR OTHER OBJUCTS

The hydraulic breaker is not designed for this usage.

Do not use the breaker or chisel to roll, push the object or reposition the lower chassis.

This may cause damage to the breaker and the lower chassis.

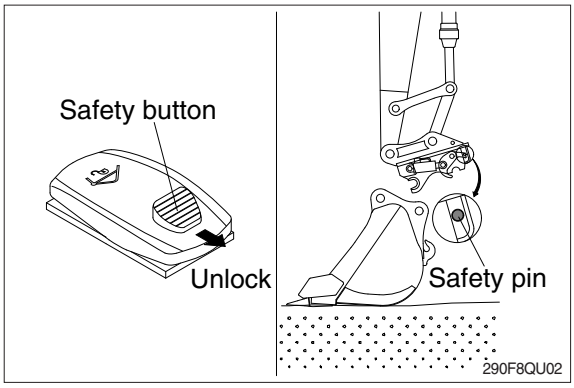


5. QUICK CLAMP

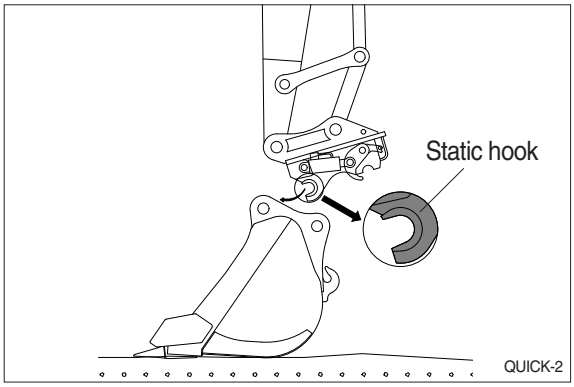
1) FIXING BUCKET WITH QUICK CLAMP

(1) Before fixing bucket, remove safety pin of the moving hook.

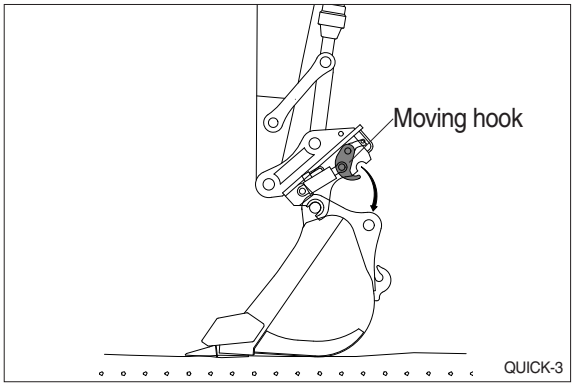
(2) Pulling safety button, press the quick clamp switch to unlock position. Then, the moving hook is placed on release position.



(3) Aligning the arm and bucket, insert static hook of quick clamp to the bucket pin.

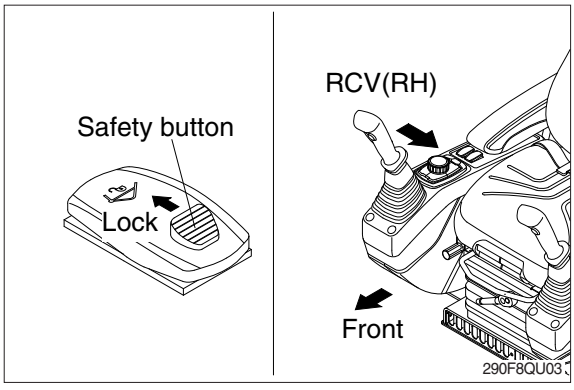


(4) Operate RCV lever to bucket-in position. Then, the moving hook is coupled with the bucket link pin.
Make sure that the moving hook is completely contacted with bucket link pin.

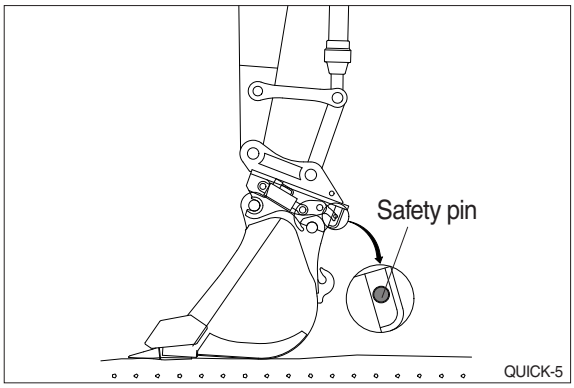


(5) Push safety button to lock position.
Operate RCV lever to bucket-in position.

※ **Be sure to check connection status between bucket pins and hooks of quick clamp.**



(6) After checking the connection status between bucket pins and hooks of quick clamp, **insert safety pin of moving hook to lock position.**

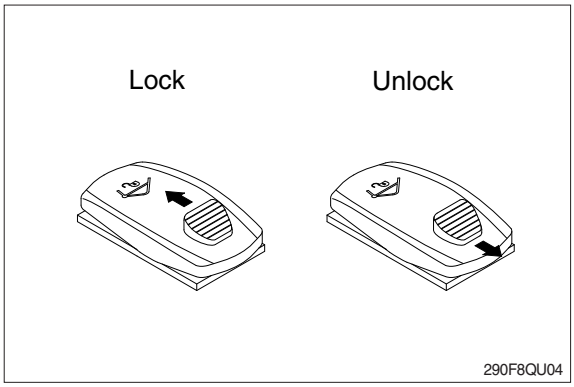


2) REMOVE BUCKET FROM QUICK CLAMP

Removing procedure is reverse of fixing.

3) PRECAUTION OF USING QUICK CLAMP

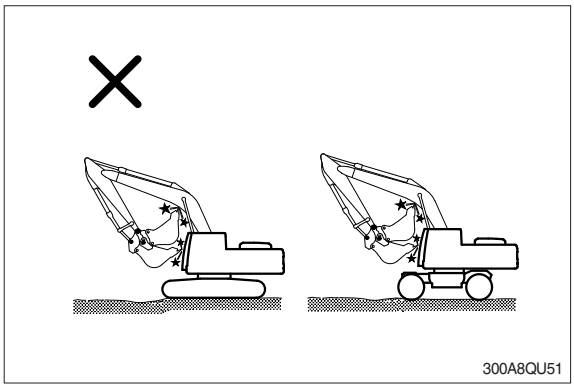
⚠ **When operating the machine with quick clamp, confirm that the quick clamp switch is lock position and safety pin of moving hook is inserted.**
Operating the machine with quick clamp switch unlocked and without safety pin of moving hook can cause the bucket to drop off and bring about the accident.



⚠ **Serious injury or death can result from this accident.**

⚠ **Be careful to operate the machine equipped with quick clamp. The bucket may hit cab, boom and boom cylinders when it reaches vicinity of them.**

HD Hyundai Construction Equipment will not be responsible for any injury or damage in case that safety pin is not installed properly.



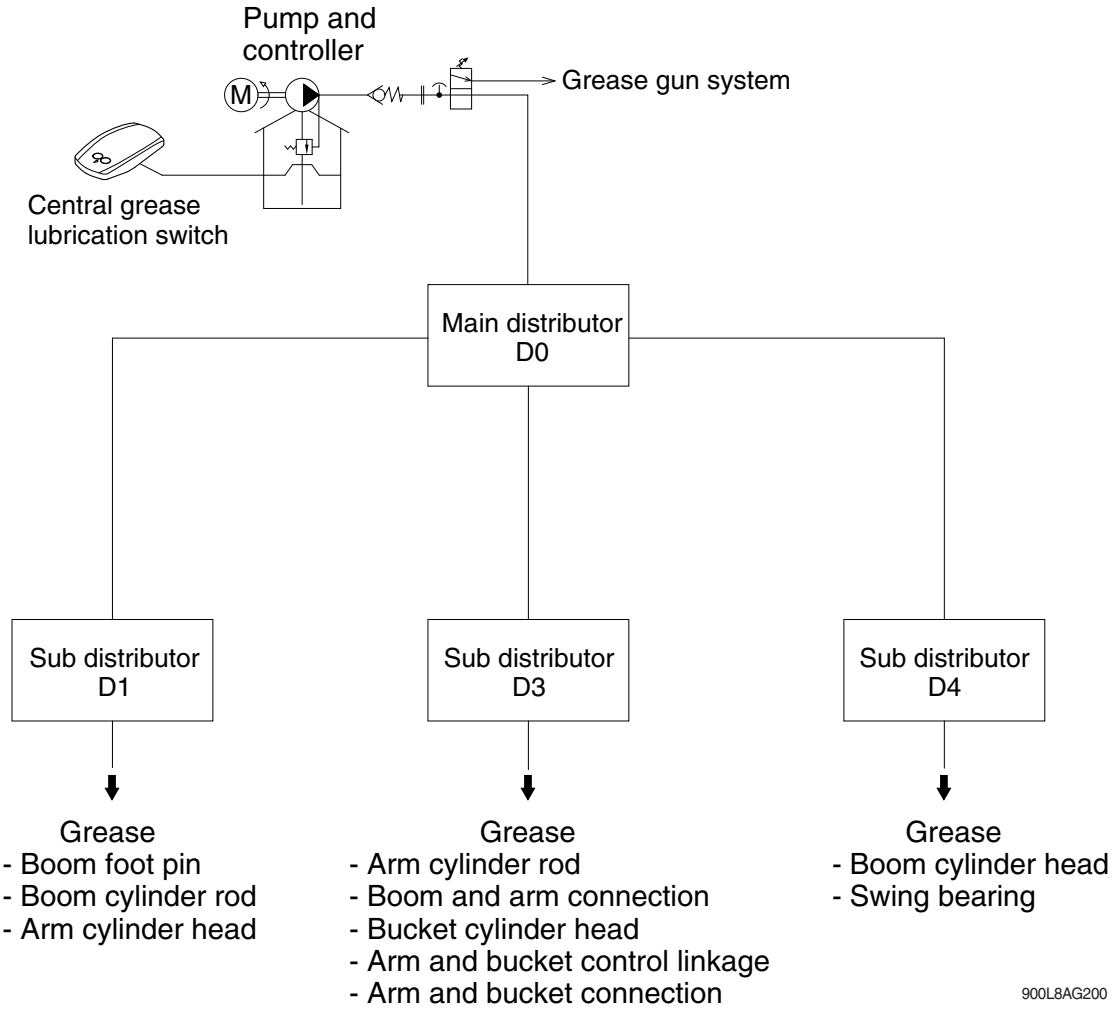
6. CENTRAL GREASE LUBRICATION SYSTEM

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.

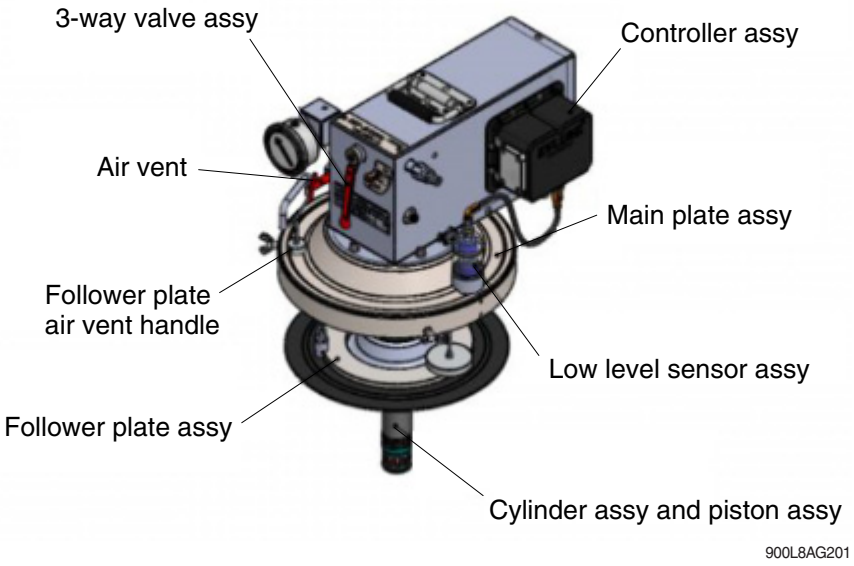
2) SYSTEM LAYOUT

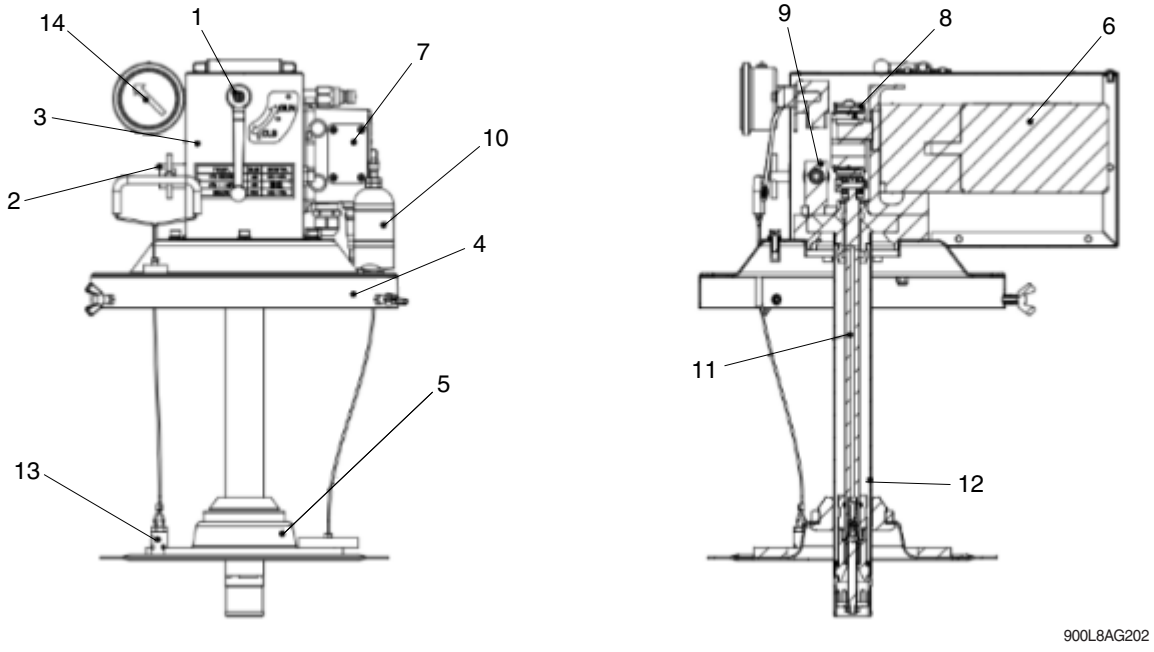


※ Refer to 8-23 page for details.

3) PUMP DEVICE

(1) Major component





1	3-way valve assy	6	Motor assy	11	Piston assy
2	Inline air vent assy	7	Controller	12	Cylinder assy
3	Pump cover assy	8	Cam assy	13	Grease level gauge & airvent handle
4	Main plate assy	9	Distributor assy	14	Pressure gauge block assy
5	Follower plate assy	10	Low level sensor		

(2) Specification

Item	Specification
Input power	24 VDC
RPM	25 rpm
Current	Max 15 amp
Output volume	50 cc/min ± 20 %
Discharge pressure	Max. 280 bar ± 20 % at 20 ˚C, NLGI No.2
Operating temperature	-35 to 70 ˚C (depending on the grease type)
Lubricant	NLGI No. 000 ~ NLGI No. 2
Filter	1st filter : #30, 2nd filter : #50
Dimension (W x L x H)	369 x 419 x 496 mm
Grease canister	I.D : 280~300 mm, Height : 345 mm

(3) Grease at temperature

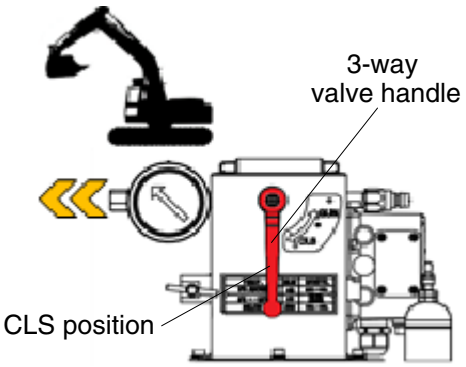
Temperature	NLGI	Remark
0˚C above	#2	-
0 ~ -15˚C	#0	-
-15 ~ -29˚C	#00	Suited for extremly low temperature
-30˚C below	#000	

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

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

(4) Selection of mode

① Two kinds of operation modes can be selected as below.



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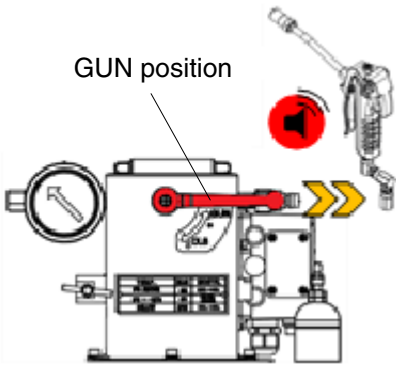

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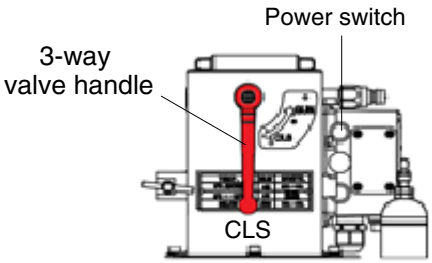
② **CLS mode**

Please follow the following process to change CLS mode.

a. Power switch OFF.
b. Change 3-way valve handle to CLS position
c. Power switch ON.



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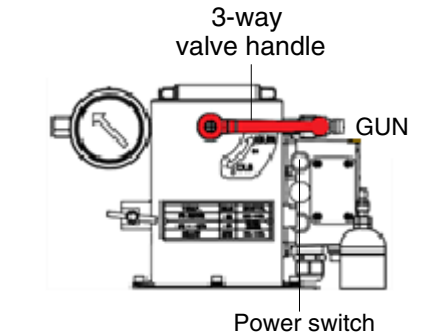
③ **GUN mode**

Please follow the following process to change GUN mode.

a. Power switch OFF.
b. Change 3-way valve handle to GUN position
c. Power switch ON.



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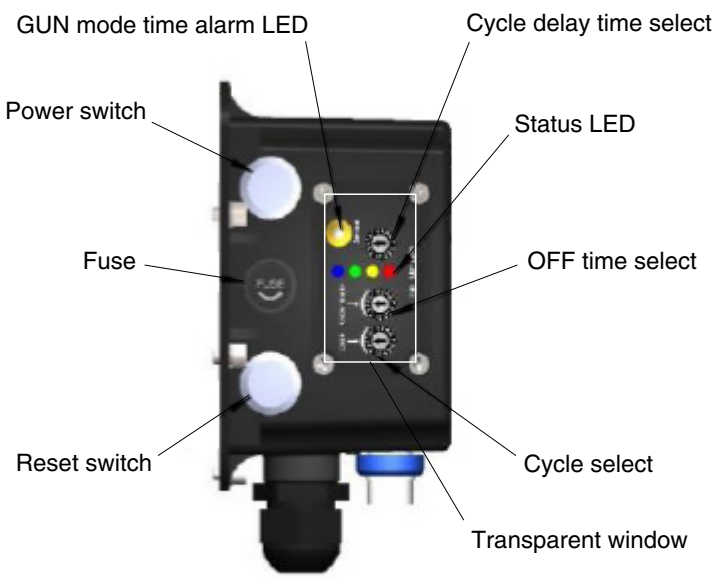
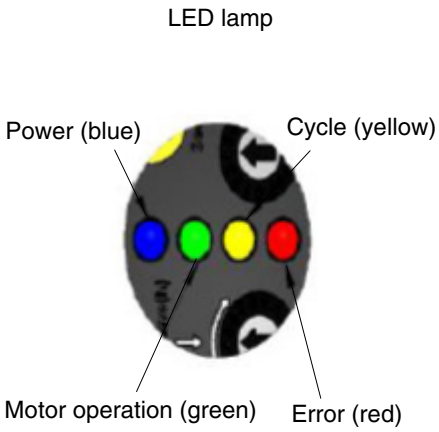
4) CONTROLLER

(1) Control panel and connector





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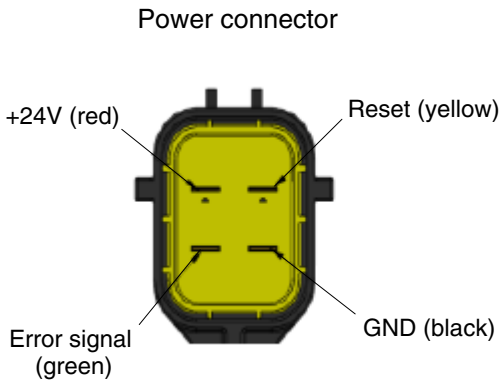

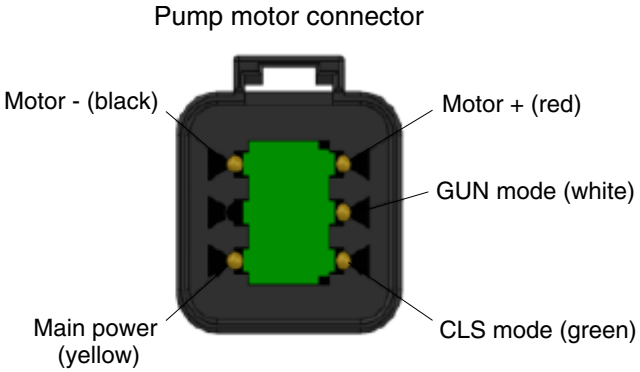

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(2) Specification of controller

Item	Specification
Power	24 VDC
Current	Max. 6 amp.
Control	Cycle No. of main distributor stroke
Temperature	On stock : -40 ~ +85 ˚C
	In service : -35 ~ +70 ˚C
Lube cycle	Max. 32
Off time	0.5 h up to 32 h

(3) Parameter change procedures

This procedures are carry out at the CLS mode.

a. Power switch OFF.
b. Open transparent window in front of the controller.
c. Set number of lube cycle with a minus (-) screw driver.

※ **Refer to 8-15 page for details.**

d. Set number of lube off time with a minus (-) screw driver.

※ **Refer to 8-15 page for details.**

e. Close transparent window.
f. Power switch ON.
g. After one lube cycle off, push reset switch.
h. Check whether pump is working as programmed or not.

※ **Please check number of moving a stroke of D0 distributor sensor or cycle LED at LED display.**

⚠ **Please make sure to close controller transparent window.**

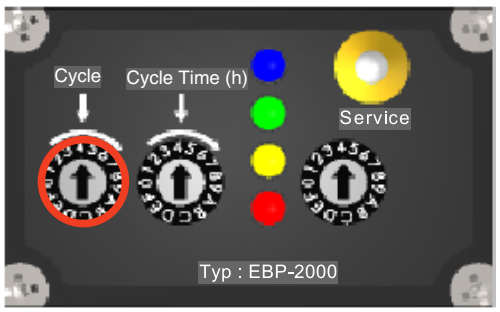
⚠ **If it is not closed perfect, it will cause malfunction of controller**

⚠ **Please change lube on and lube off cycle setting according to the working condition of equipment such as working hours per day, working environment etc.**

(4) Parameter selection

① Cycle

Number of lubrication cycle can be selected with rotary switch “Cycle”. (standard 16 cycle)

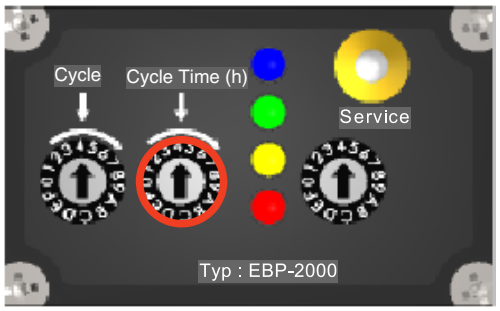


900L8AG209

Mark	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Cycle	0	1	2	3	4	5	6	7	8	9	12	16	20	24	28	32

② Off time

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



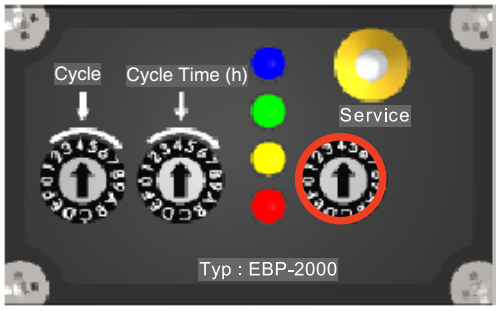
900L8AG210

Mark	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Off time (h)	0.5	1	2	3	4	5	6	7	8	9	12	16	20	24	28	32

③ Cycle delay time

(Please let this parameter as standard without modification)

Cycle delay time can be selected with rotary switch “Service”. (standard 12 min)



900L8AG211

Mark	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Cycle delay time (h)	0.5	1	2	3	4	5	6	7	8	9	12	16	20	24	28	32

(5) LED lamp display

① Lube on/off and error

Status	Reason	Reference	LED display
Standby	Controller standby	Not error	CLS system LED
Lube on	Working lube on (motor running)	Not error	Pump running
Cycle error	Stop main distributor	See page 8-21	Cycle error Check the system in accordance with the guideline Cabin
	Pump out of order	See page 8-20	
Level error	Grease level too low	See page 8-17	Level error Cabin Replace a new lubricant

② Reset switch and buzzer

Status	Control panel	Reset switch / buzzer
Standby	CLS system LED	1.5 sec Beee-
Pump running	Pump running	Lubrication cycle end
Stroke error	Cycle error Check the system in accordance with the guideline Cabin	1 sec Beee-
Level error	Level error Cabin Replace a new lubricant	Replace a new grease can Beee-

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

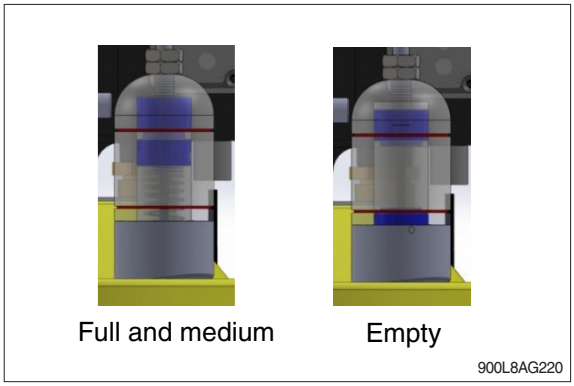
5) GREASE LEVEL CHECK AND REPLACE GREASE CANISTER

(1) Check grease level

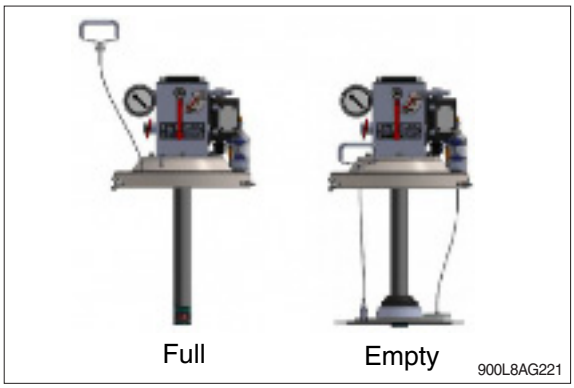
Grease level could be checked as follows.

① Error LED of controller : Refer to page 8-16.

② Level sensor of pump



③ Air vent handle of follower plate

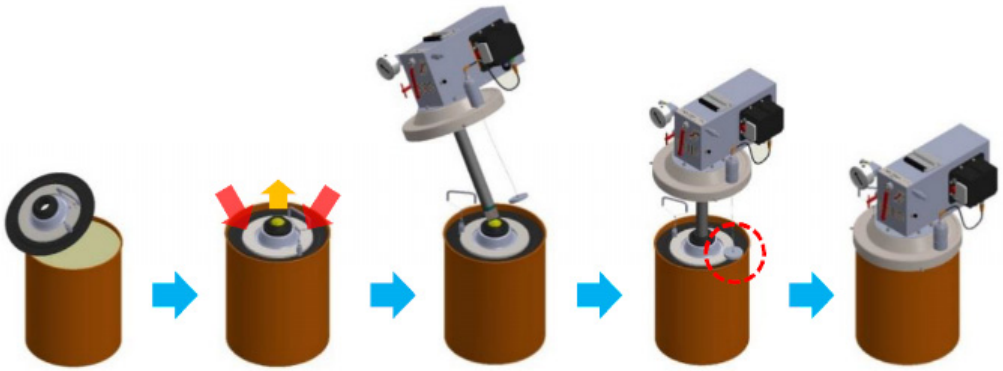


(2) Replace grease canister

Please follow the below procedure.

① Power switch off.
② Open clamp and unfasten wing bolt (3EA).
③ Pull air vent handle of follower plate up.
④ Remove grease pump from grease canister.
⑤ Remove grease canister and fix a new grease canister and open cover of canister.
⑥ Arrange follower plate to be fixed the center of grease canister and check below.
   a. Level sensor cable to be striated.
   b. air vent handle cable to be striated.
⑦ Insert pump into grease canister and push follower plate down as well as.
⑧ Close clamp and fasten wing bolt (3EA).
⑨ Power switch on.
⑩ Remove air bubble with air vent according to the instruction.

※ Refer to page 8-19 for details.



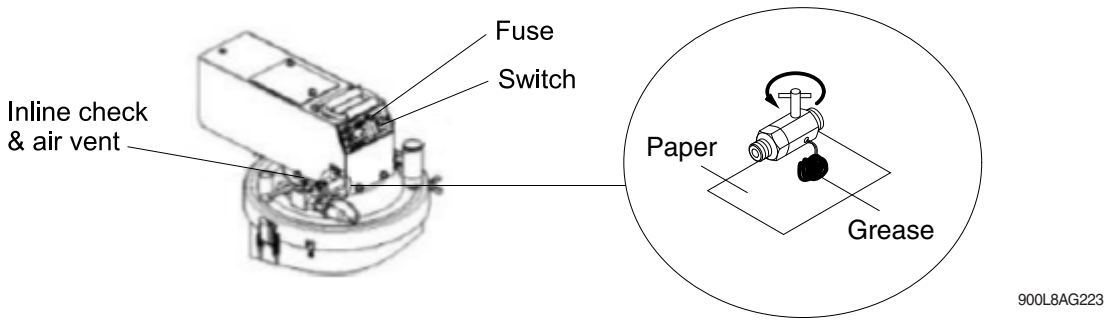
900L8AG222

※ Please follow the reversed procedure of the above procedure when you take out pump from canister. Please check air vent when you replace grease canister if there is not higher pressure or low grease output volume.

6) REMOVE AIR POCKET

(1) Turn 3-way valve handle to GUN position.
(2) Lay paper down under air vent.
(3) Push reset switch ON.
(4) Open air vent until air mixed grease come out completely.
(5) Close air vent and turn 3-way valve handle to CLS position.
(6) Check pressure gage.

※ The grease mixed air is cloudy in white



7) MAINTENANCE

(1) Pump device

Interval	Item	Remarks
Daily	Pump Controller	Check output pressure Check status of controller display
Monthly	Check pump clamping Controller Grease level Parts fastened	Check pump Push reset switch (page 8-13) and check Check grease level sensor and manual level handle Check and make it fasten if necessary

(2) Lube system

Interval	Item	Remarks
Daily	Lube point & gage	Check visually lubrication status of lube points & gage
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 gage Check lube visually

8) TROUBLESHOOTING

(1) Pump device

Item	Reason	Solution
Pump does not work	Power off	Check fuse and 3-way valve handle
	Electric cable connector disconnected	Re-connect cable connector
	Fuse out	Change fuse
	Pump motor broken	Change motor assy
Grease are not discharged although pump operate	Grease low level	Change grease canister
	Air pocket occurred	Remove air pocket using air vent
	Filter blocked	Check filter and clean
	Piston assy broken	Change piston assy
Pump could not have either a high pressure or accurate grease volume	Air pocket at inside pump	Remove air pocket using with air vent
	Filter blocked	Check filter and clean
	Pump seal broken	Change cylinder assy
	Relief valve broken	Relief valve re-adjust or change distributor assy
Reduced pump RPM	High pressure in lube line	Check lube line and points.
	Too low temperature	Change kind of grease as low temperature grade
Pumping pressure will be gone up too high	Relief valve adjusted too high	Relief valve re-adjust or change distributor assy
Others	Contact to HD Hyundai Construction Equipment 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 refer to page 8-18
	Air pocket occurred	Remove air pocket
	Certain lube point blocked	Check lube point
	Lube line blocked	Check lube line
	Distributor blocked, broken or 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 8-14)
	Blocked lube point	Check Lube point
Main distributor (D0) are leaked and pressure gage 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
Level sensor error	Check grease level	Change grease canister
	Temperature too low	Change kind of grease as pump manual
Others	Contact to HD Hyundai Construction Equipment dealer or service center.	

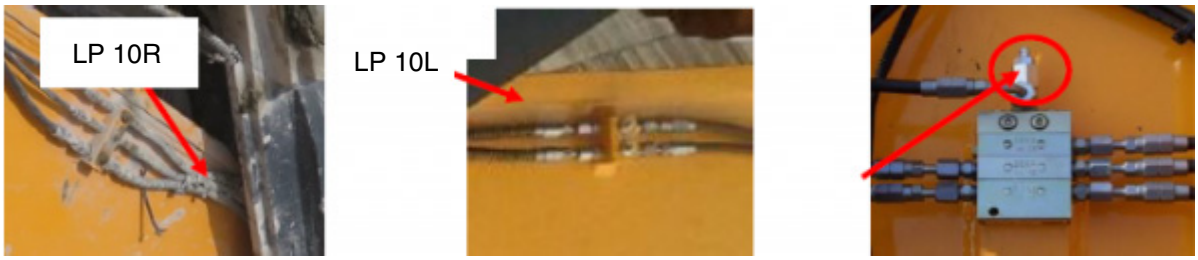
(3) Find distributor and lube line blocked

Please follow the following information. (refer to page 8-25)

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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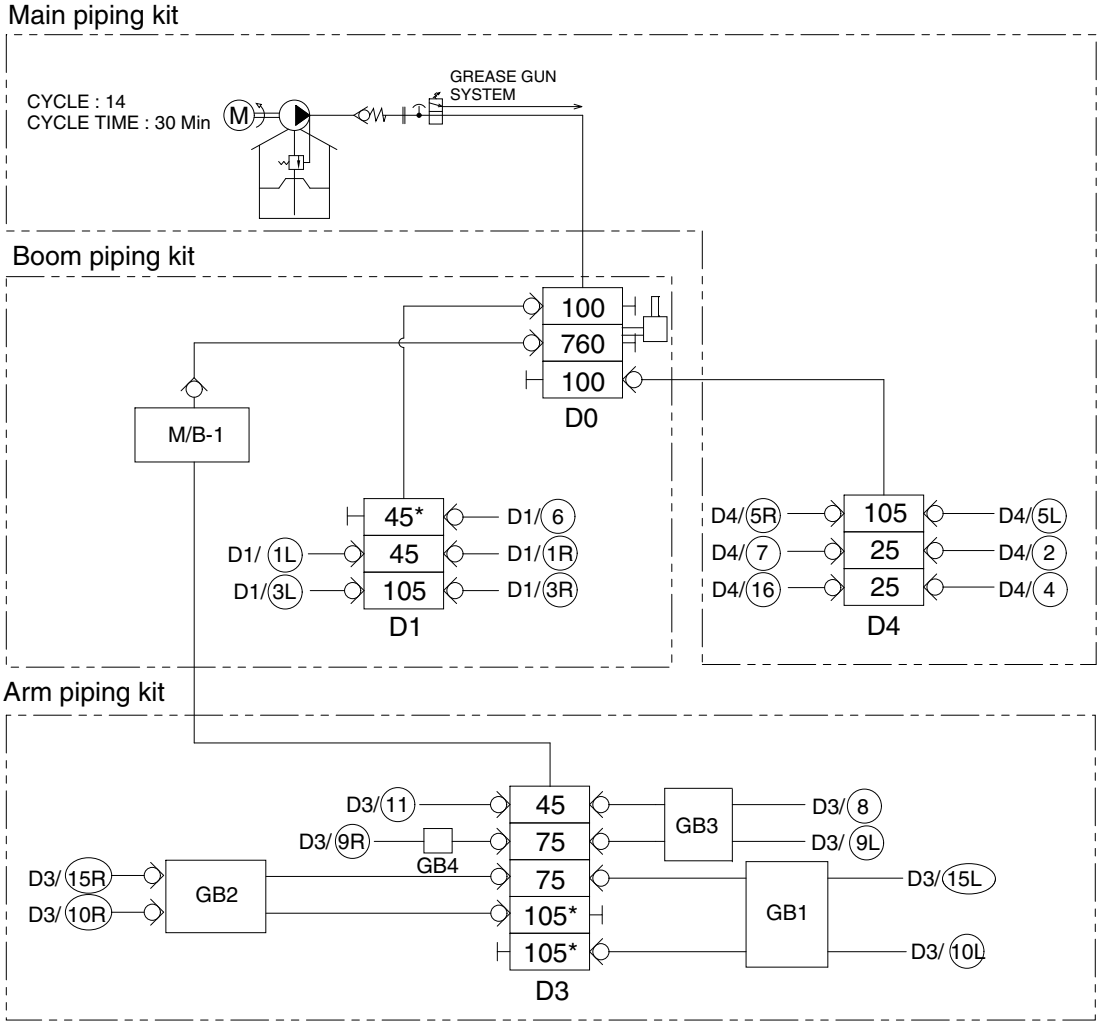
10) SYSTEM DIAGRAM

(1) Lube system



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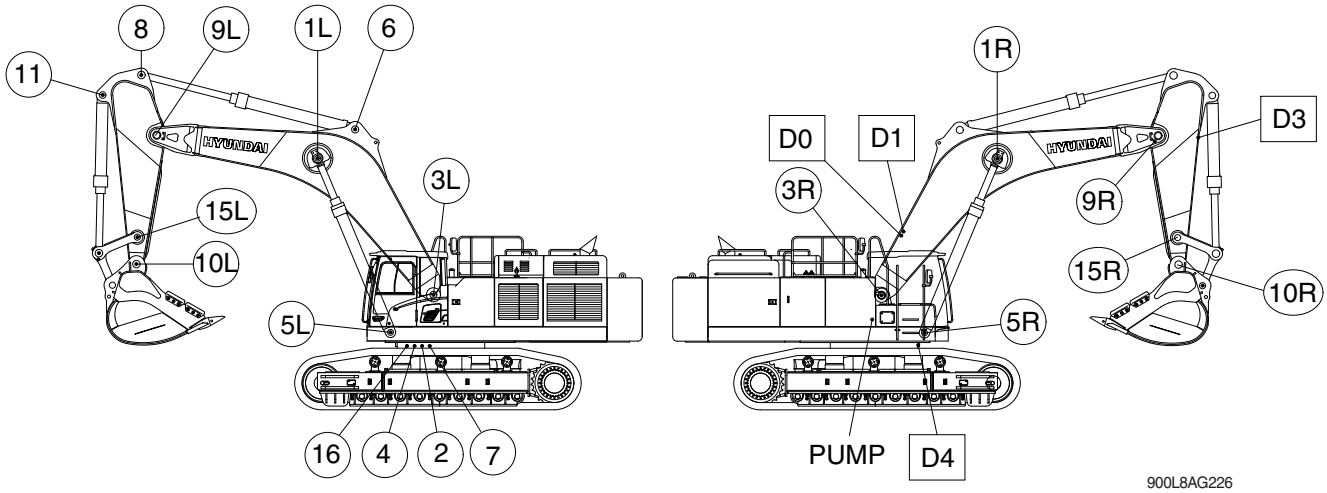
(2) Lube point



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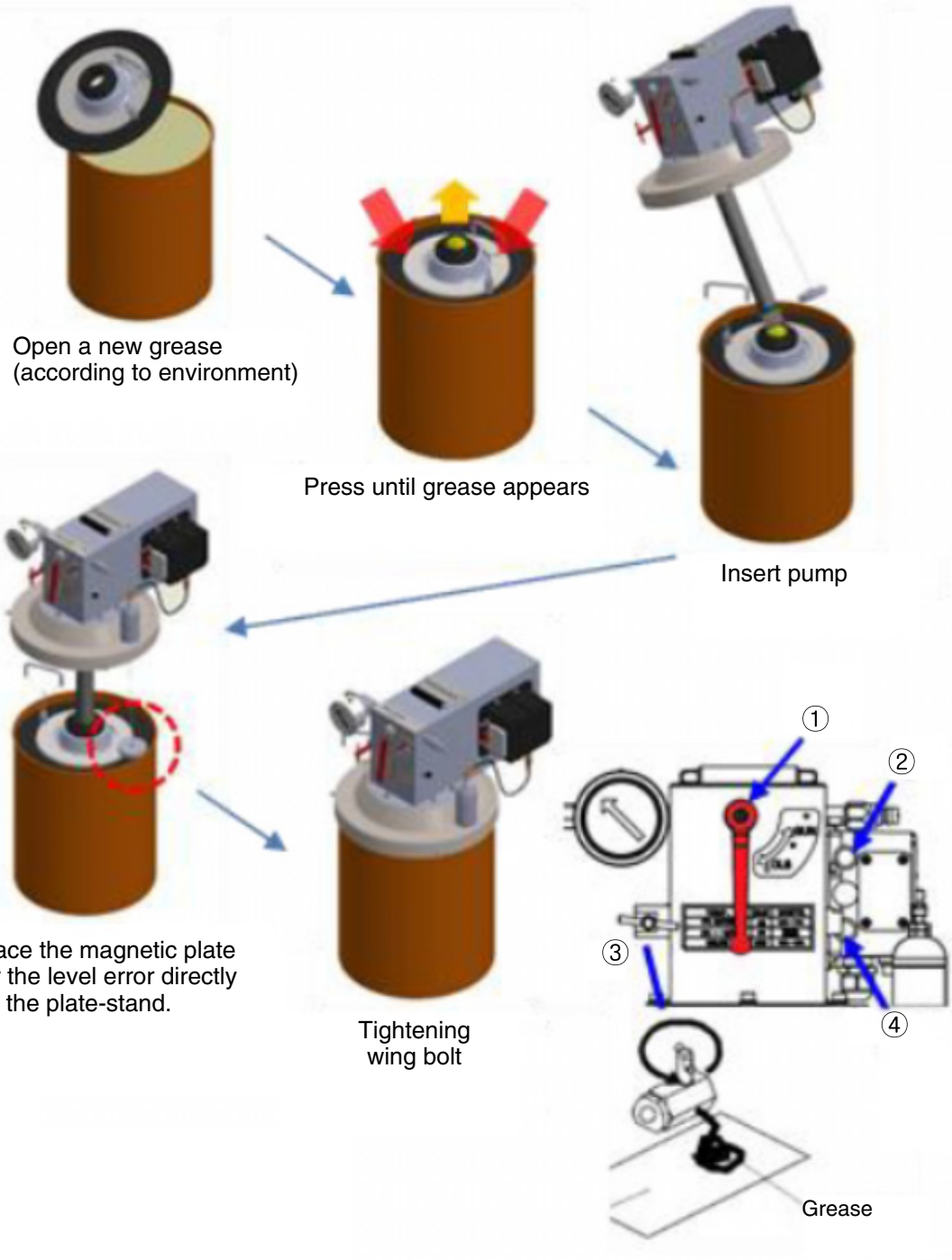
Appendix 1

Replace a new lubricant



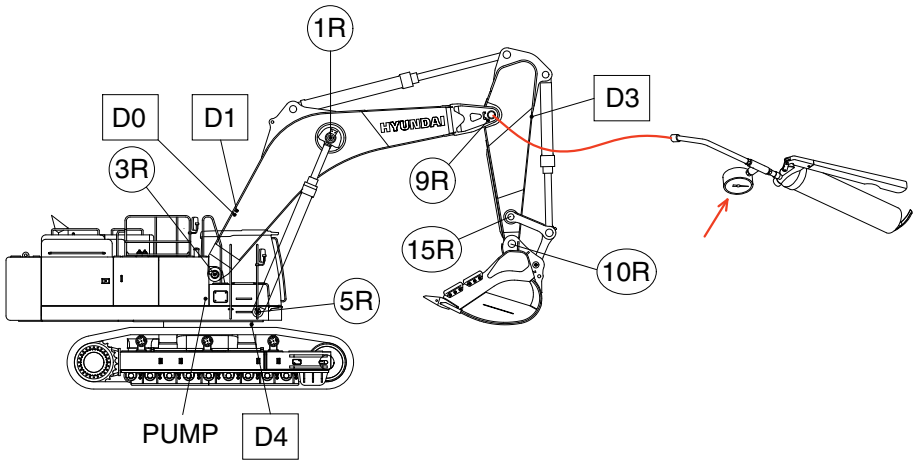
① CLS lever position
② Power switch ON
③ Open air vent handle

④ Click the "Reset" button.
The pump is running
-> grease is coming out with out air
-> close "air vent"

900L8AG230

Appendix 2

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.