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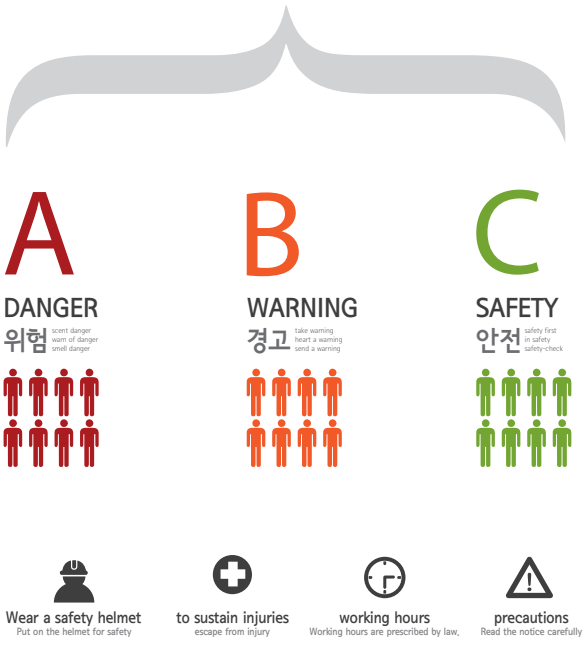

OPERATION MANUAL
장비 사용 설명서

CONCRETE PUMP CAR
콘크리트 펌프카

"The power of global technology"

JUNJIN HEAVY INDUSTRY

⊙ Foreword ⊙

The operating instructions contain important information on how to operate the machine safely, properly and efficiently.
Observing these instuctions helps to avoid danger, to reduce repair costs and downtimes and to increase the reliability and service life of the machine.

The operating instructions are to be supplemented by the respective national rules and requlations for accident prevention and environmental protection.

The operating instructions must always be available wherever the machine is in use.
These operating instructions must be read and applied by any person in charge of carrying out work with on the machine various operation on the machine.

You will make it much easier for us to answer any questions if you can give us the details of the model and the machine number.

These operating Instructions describe the vehicle superstructure only.
The operating instructions is used by the vehicle manufatcrer apply for the vehicle itself.

In the interests of constant improvement, modifications are made from time to time and it could be possible that we were unable to take these into consideration when these operating instuctions were printed.

Should you have questions or problems, please don't hesitate to contact us.
Remember, our warranty is avoided if your equipment is not operated and maintained in accordance with our directions.

USE	① **Work of construction-House, Apartment etc.**
	② **Civil engineering work-Bridge,Road etc.**
	③ **Work of subway construction**

Company : Jun Jin Heavy Industry Co.Ltd
Address: 33, Oseon - Ri
Geumwang - Eup, Eumsung - Gun
Chungbuk Korea

Tel : +82-43-879-2600
Fax : +82-43-882-7171
A/S Tel : +82-43-877-3023

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안전수칙

SAFETY RULES

01

1.1 General safety rules

1.1.1 ⚠ CAUTION Before you read the safety rules

- This safety manual is described about the safety rules which fundamental hazard factors and guide for the prevention of accidents.
- Regardless of how thorough a manual like this may be, there is always the unexpected, therefore you are responsible for your own safety.
- Please read and understand the plates and caution symbol items on the safety rules.
- You must understand hazard factors and proper action for the each case before you operate your machine.

1.1.2 ⚠ CAUTION Safety symbol and signal word explanation

- The triangle with the exclamation point inside is used to inform you the information about the safety which is [Danger / Warning / Caution / Important]
- Using the safety symbol rules are must observed, if not, will lead to death or serious injury
- One of the following signal words will appear after the safety symbol.

⚠ DANGER If the safety symbol is followed by the signal word DAN GER it indicates a hazardous situation which, if not avoided, WILL lead to death or serious injury.

⚠ WARNING If the safety symbol is followed by the signal word WARNING, it indicates a potentially hazardous situation which, if not avoided COULD result in death or serious injury.

CAUTION If the safety symbol is followed by the signal word CAUTION, it indicates a potentially hazardous situation which, if not avoided, COULD result in minor to moderate injury.

IMPORTANCE If the safety symbol is followed by the signal word IMPORTANCE, it means the point address a hazard which, if not avoided, COULD cause damage to equipment or property.

1.1.3 CAUTION The operator basic safety rules

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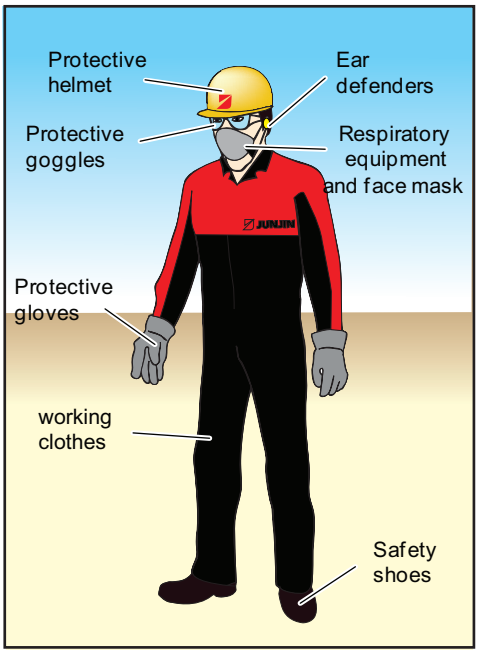
- The operator should read and understand completely the Operating instructions manual and safety decals.
- The operator is responsible for checking that all safety decals are in place and are in readable condition. If found to be missing or unreadable for any reason, steps should be taken to obtain replacements.
- Operating an equipment is required a certificate.
- The Operator should to recognize proper operating method.
- The machine should be maintained proper condition.
- Do not modify the machine without asking manufacturer for permission. if not avoided, could lead to serious problem or reducing durability.
- The operator should care of unexpected situation because SAFETY RULES shows only basic situations.

1.1.4 ⚠ WARNING Dress in appropriate apparel

- Operator should always wear basic items when pumping concrete.
- Be sure that any clothing you wear does not have strings, fringes, or other external tightening means that could be caught in moving parts.
- Do not wear too loose clothes and accessories when pumping because it could be caugh in lever or projection.



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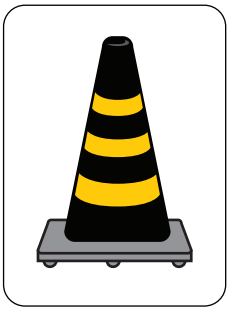
1.1.5 ⚠ CAUTION The requirement of the operator

- The operator should be an adult who is healthy and has a lots of experience in operating machine.
- The operator should get the proper driver license and certificate of heavy equipment operation.
- The operator should get an enough education about the safety operation and related regulation.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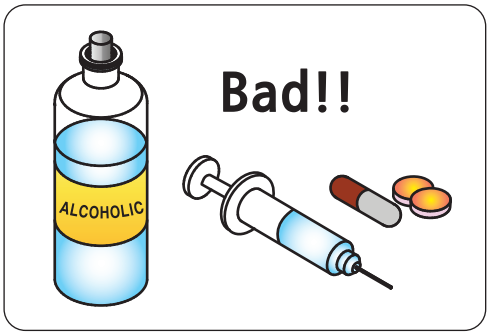
- If not satisfied above items, COULD cause dangerous situation.
- Not approved persons who except operator and person who get a proper education person are prohibited from approaching the machine because the fellow rider can be bumped some object or drop from a machine and get injury. Also the fellow rider can obstruct the operator's view, it could cause an accident.

1.1.6 ⚠ CAUTION Prohibited Action for Operator

- Never go to work on a construction site or work on around or near a piece of machinery when under the influence of drugs or alcohol.
- Beware of "over the counter" drugs, many of which have specific warnings about operating machinery after taking the medication.



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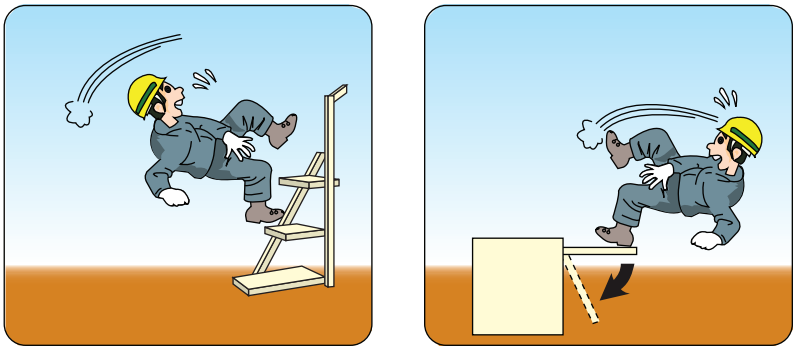
- Do not bring your personal problems to work with you. In an office setting this may be annoying to co-workers, but on a construction site it can be deadly. The workers around you depend on you for their safety.

1.1.7 ⚠ DANGER Avoid a drop

- Mount or dismount the pump or truck using the 3 Point Rule. One hand and two feet or two hands and one foot are to be in contact with a secure surface at all times.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- Mount or dismount the pump or truck must stand face to a pumps.
- Do not make a mistake to catch an operating switch.
- Do not mount or dismount the pump during the working.
- Even though pump is not working, do not jump up or jump down on pump.
- In case of outrigger, if deck and steps are slippery by oil or water, be sure to wipe there by using a cloth immediately.

1.2 Safety rules about truck

1.2.1 IMPORTANCE Basic Safety Rules of Before Driving

- Pre-checking should do one time per day before driving.
- Driver should have a proper degree license.
- Do not drive the truck until you read and understand the unit's operation manual.

1.2.2 IMPORTANCE Checking inside the Cab of Truck

- Be sure there is nothing in the cab of the truck (such as empty soda cans, loose tools, etc.) that could interfere with the operation of the vehicle.
- In case of floor, lever, step and knob are slippery by oil or water, must wipe with a cloth.

1.2.3 IMPORTANCE Checking the windshield and light

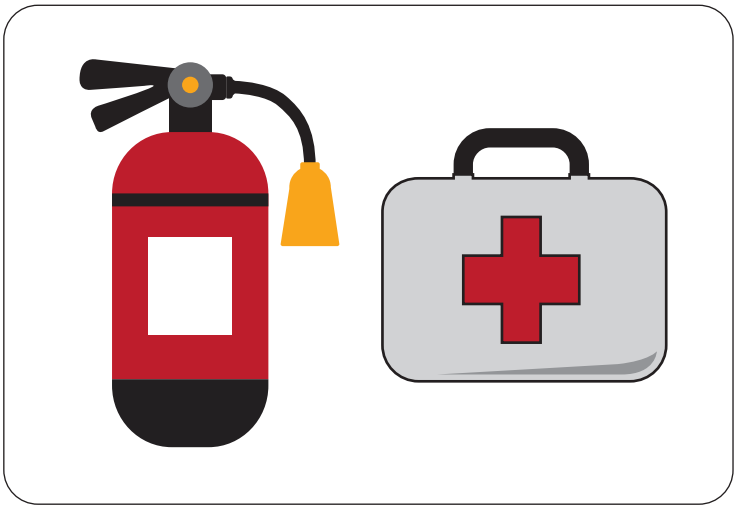
- Be sure the windshield and mirrors are clean and free of frost or ice, and that the mirrors are properly adjusted.
- Verify that head lights, tail lights, turn signals, brake lights, backup warning horn, and backup lights are operational.

1.2.4 IMPORTANCE Adjust a driver's seat

- If seat is not adjusted properly, driver can be tired it could lead an accident.
- The driver seat should be adjusted when driver changed.
- The driver should fasten the seat belt to minimize an injury by accident.
- The driver should to check the seat belt's buckle, belt and fixing tool before using. Regardless of the matter, the seat belt should be changed minimize one time per three years.

1.2.5 CAUTION Checking the first aid kit & the fire extinguisher

- Please make provision against an injury or a fire.
- Furnishing a machine with the first aid kit and fire extinguisher. Especially, driver should know well how to use the extinguisher.
- Please make a note of emergency numbers such as an emergency room, an ambulance and fire house.



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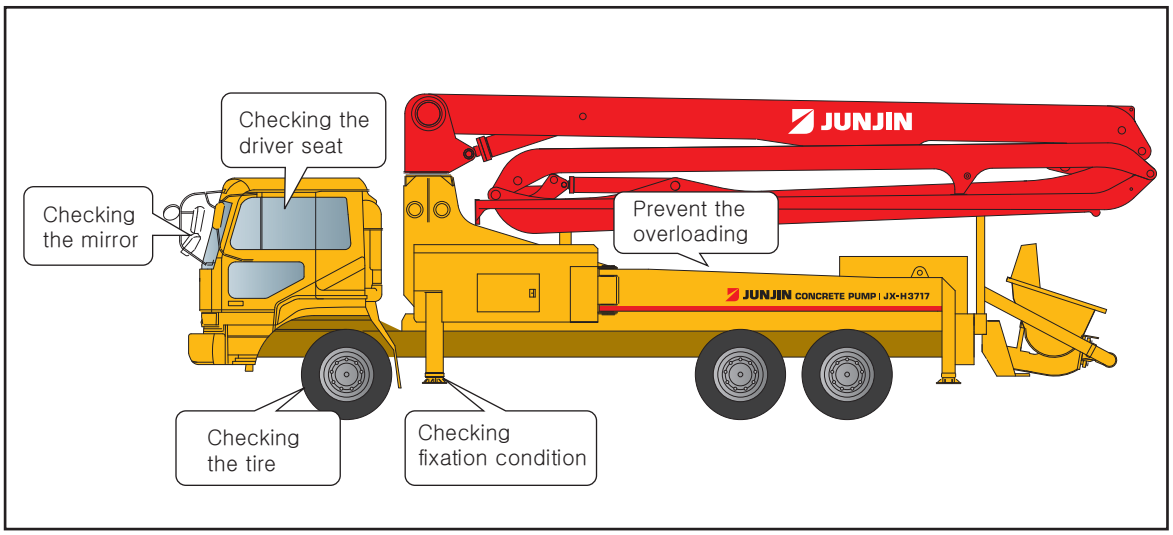
1.2.6 ⚠ CAUTION Checking the safety items of the machine

- Checking the wear condition of tire.
- Before driving the unit, be sure the boom is securely in its cradle, resting on approved boom rests that are in good condition.
- Be certain that all loose items on the unit are secured for travel before driving.
- Do not install illegal equipments.
- Driver should have thorough knowledge of local road regulation.
- Take precautions to prevent an overloading by needless loading.



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1.2.7 ⚠ CAUTION Checking the hyd. Pump and PTO

- Please check the hyd. Pump and PTO to reference the 'Chap.4 Maintenance of the machine.'
- Before driving the unit, ensure the drive mode on PTO box.
- In case of getting a problem on PTO box, please contact to the service department of local dealer.

1.2.8 ⚠ CAUTION Basic Safety Rules of During Driving

- Driver should have a proper degree license for driving.
- Be sure to know the weight, height, and width of the machine.
- If found an insecurity factor, driving must stop until the situation has been made safe.
- Please consulting a Basic operating instruction on the maintenance guide book

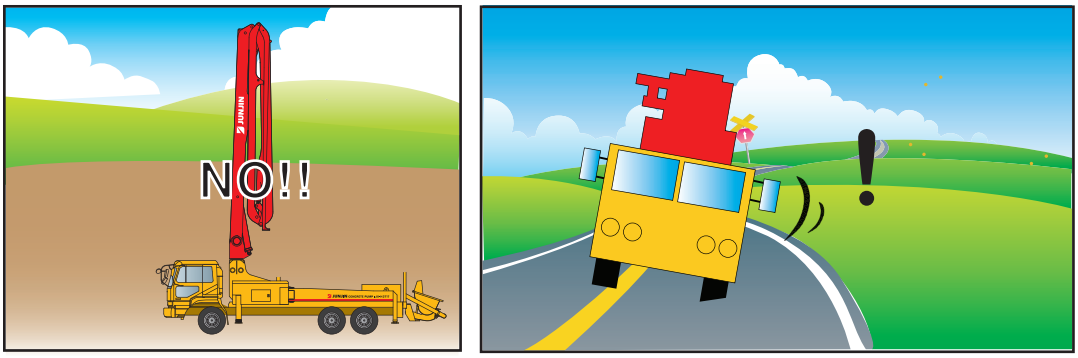
1.2.9 ⚠ CAUTION Safety Instruction of Climbing up(down) the Hill.

- Be careful when climbing up or down the hill.
- Be careful the Load fall from the machine.
- Please reduce the speed during climbing up(down) the hill.
- If found an insecurity factor, must reduce the speed and stop the machine.

CPCK8

1.2.10 ⚠ WARNING Run away truck hazard

- Never drive the truck with boom are extended.
- When going down a hill, use one gear lower going down than it would take to go up.
- Truck mounted concrete pumps are generally top-heavy. Use caution when making sharp turns with the vehicle
- Slow down at intersections, near playgrounds, residential areas, and near schools. Children have no knowledge of the increased stopping distances required by heavy vehicles.
- Be familiar with your emergency equipment. Know how to light a flare, etc.
- Drive defensively. You are at a distinct disadvantage when it comes to maneuverability and stopping distance.



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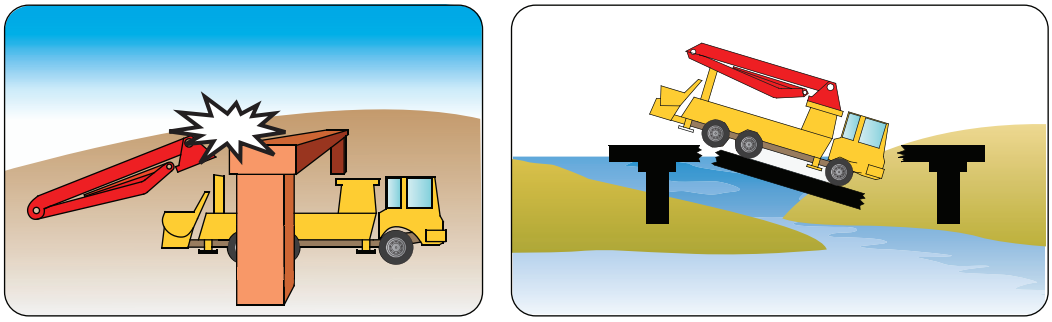
1.2.11 ⚠ CAUTION Safety rules for driving truck mounted concrete pumps

- If you're going to drive under low-hanging overhead power lines and it is not possible to maintain adequate safety distance between the pump and the wires, You should look for another route. If none is available contact the power company responsible for the lines and have them de-energized.
- Carefully select your route of travel. Avoid steep hills, residential areas, construction, low overpass clearances and narrow bridges whenever possible. The driver is responsible for knowing the weight and height of the vehicle.
- Before driving on bridge or elevated road-ways, be sure that they can support the weight of the vehicle
- Before driving under ANT structure, Be sure that the machine will clear.



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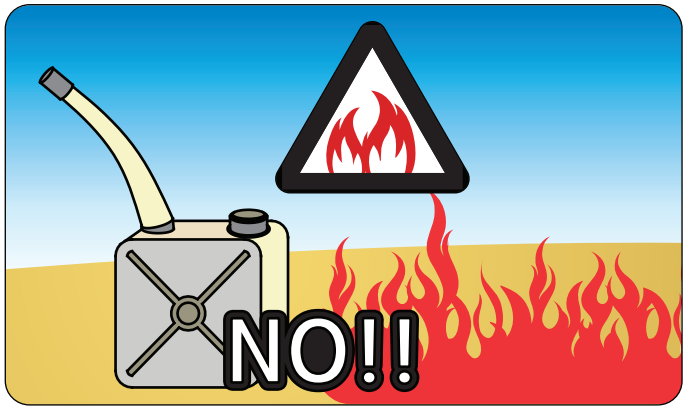
1.3 Warning of the danger of fire

1.3.1 ⚠ WARNING Fire prevention

- Remove inflammable like woods, leaves and / or papers away from the engine because a fire could broke out possibly by then.
- Be sure to check oil-leakage like fuel, lubricating - oil and hyd oil, if necessary, repair damaged part.
- Be sure to check a fire extinguisher's usage and located place.



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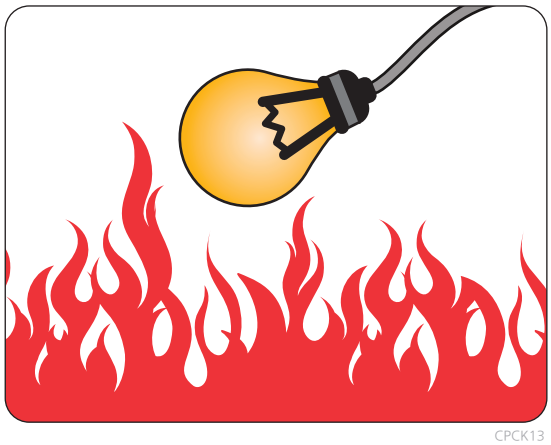
1.3.2 ⚠ WARNING Using ant-explosive bulbs

- When checking fuel, oil, coolant and liquid of battery, Anti-explosive bulbs must be used, if not, if causes a fire by exploded bulbs.
- Remove the dangerous materials from job site, if antiexplosive bulbs are not available.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1.3.3 ⚠ WARNING Warning of oil - handling

• Fuel, oiled - material and anti - freezing liquid are very dangerous because of high flammable property be sure to keep them away from fire, if near, it can be caugh in a fire.

- Keep inflammable away from fire during fueling. No smoking !
- stop the engine during fueling.
- fueling must be done out of doors.

• fuel and inflammable must be safe kept in ventilate place and away from fire.

• By cleaning, try to keep the machine without extra attachments and something like contaminations and/or grease.

• Do not put oiled - cloth on the inflammable because it can be burnt spontaneously.

1.3.4 ⚠ WARNING Prevention from a Burn

• Be sure that your skin is not exposed to the hot coolant or steam.

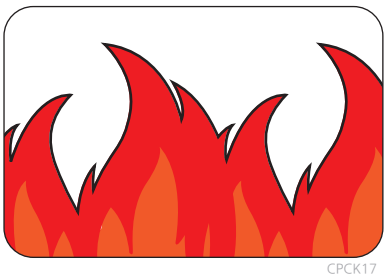
• The coolant in the radiator or engine is being steamed during driving. Stop the engine for radiator to be cooled properly before maintenance.

• When the engine is just stopped, the coolant must be in a hot compressed condition. it needs to be careful to handle

- Radiator cap should be removed after cooled by unfasten the cap slowly for the pressure of the radiator could be removed.
- Be sure that your skin is not supposed to be contacted with the hot oil. you could be got burn by the hot oil.
- The engine oil and gear oil would be heated as high temperature as well as the engine, hoses and other equipments. Maintain the machine after all parts are cooled completely.
- Hydraulic tank is also compressed. Must open the cap after stop the engine. Be sure that hydraulic oil must be cooled completely before remove the pressure in the tank by open the air removal valve. Then open the hydraulic tank cap.

1.3.5 ⚠ WARNING Inspection for Fire Prevention

- Hoses and pipes

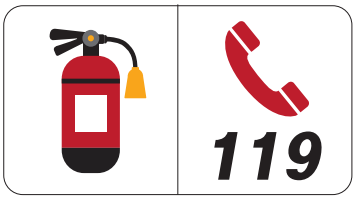


  - Leaks of flammable fluid cause to break out the fire. Check not only leaks of the hoses or pipes but also check the other sections whether some oil is leaked or not.
  - Inspect the condition of the plug, hoses, even pipes whether something is missed or be twisted or not.

- Electric cable and wiring
  - A short circuit by hardened cable or damaged wire cause to brake out the fire. Check the condition of cable and wire once a day.
  - Keep the all electric connections tidy all the time. Emergency Measure for the Fire.

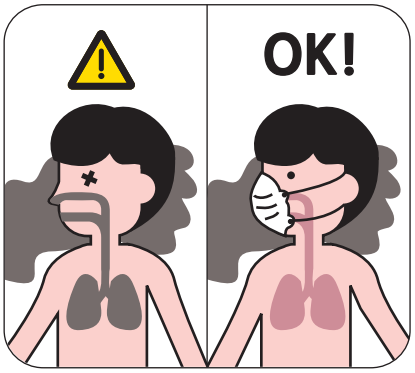
1.3.6 ⚠ CAUTION Emergency Measure for the Fire

- In case of the fire is not seriously big, put the fire out immediately by using the fire extinguisher which are equipped in the truck.
- If the fire is under the control with the fire extinguisher, do not approach to the machine and contact to fire department to prevent the casualty to be worse.



1.3.7 ⚠ CAUTION Notice of Asbestos Dust

- Be careful if you breathe the asbestos dust while handle the parts which are contained asbestos. It could give the damage to your lung seriously.
- The brake pad, brake band, lining, clutch plate are possible to be contained asbestos as well as things of gaskets.



1.3.8 ⚠ CAUTION Prevention of Asbestos Dust

• When you handle the parts which have the asbestos inside, should be careful about with following.

- Do not use the pressurized air for cleaning.
- Do not grind or polish them.
- Wear the recommendation mask for working.
- If it is possible, use the vacuum cleaner for cleaning.
- If the vacuum cleaner is not available, make the asbestos parts humid with the water or some oil.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- Be not allowed anybody to approach in job site during working.

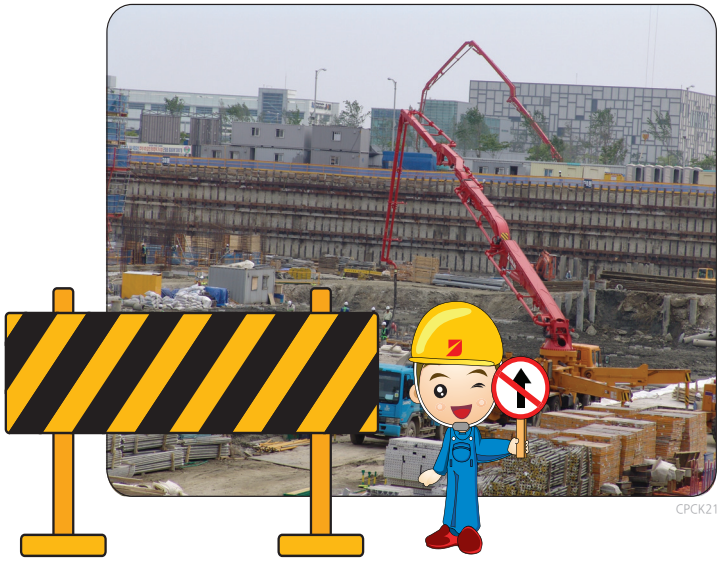
1.3.9 ⚠ CAUTION Careful with the Dust of Asbestos

• Be exposed with the dust of the asbestos for long time could be caused of the lung cancer or other fatal diseases.

1.4 Safety rules for machine setting

1.4.1 ⚠ CAUTION Job Site condition for Machine Setting

- The operator should handle the machine with the good view from the job site environment to secure the view.
- Block the way between the job site and public place if the machine is necessary to be worked on the public place.
- Be sure that you should wear the personal protective equipments all the time. (helmet, goggles, mask, gloves etc.)
- Do not give the permission to people who are not related with working to access the job site.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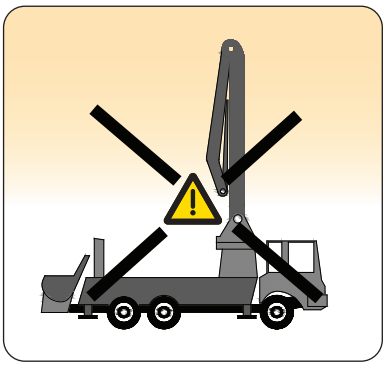
1.4.2 ⚠ CAUTION Important Safety Rules during the Machine Setting

- Do not unfold the boom unless the Outriggers are set completely.
- Extension hose with components must be tied by the safety chain completely.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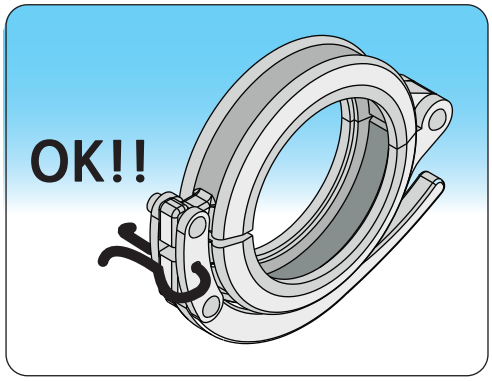
1.4.3 ⚠ CAUTION Inspection of Coupling Connection

- Put the pin for locking to not be coupling open during pumping.
- Check the connection of boom and chassis before working.
- Be sure that the delivery lines and coupling hoses are connected perfectly.



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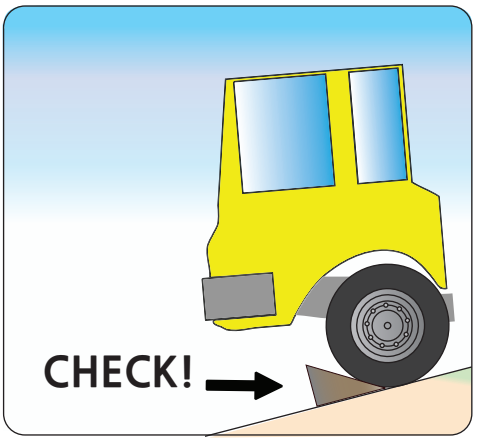
1.4.4 ⚠ CAUTION In Case of set the Machine on the Slope

- When the machine is needed to be set on the slop, put the wedge under the each wheels and hold the hand brake as. well as the parking brake. then extend the O/R for setting.
- The wedges would not be supported the truck because the material of the wedge is not stable. In this case the machine may be slipped forward to lower position. Be sure that must put the wedges under the wheels before set the O/R.



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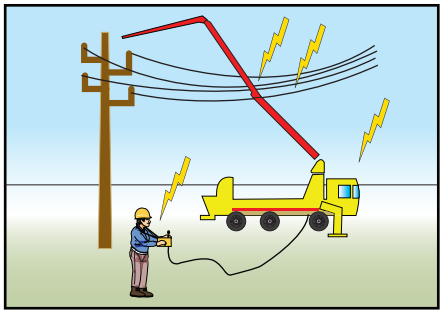
1.4.5 ⚠ CAUTION Keep Safety Clearance Against High Voltage electric Wire

- Be sure that you must keep the safety distance as below.
- The boom must be distant from the electric wire.
- The electric wire nearby the O/R is very dangerous. Do not set the O/R nearby the electric wire.
- The machine could be out of control by the magnetic field from the electric wire.
- Keep the minimum clearance as below.



Reted voltage	Safety clearance
0 - 1KV	1m (3ft)
1KV - 110KV	3m (10ft)
110KV - 220KV	4m (14ft)
220KV - 400KV	5m (17ft)
Unknown rated voltage	5m (17ft)

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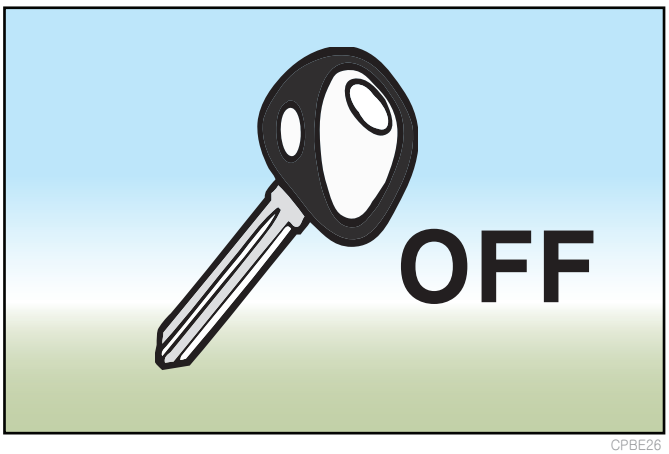
1.4.6 ⚠ CAUTION Lock the Doors of the Truck during Setting

- Be sure that you should switch off as well as lock the truck doors. Even you leave the machine in a minute, be sure to switch off all the time.
- If you check that somebody is inside of the truck, Push the emergency switch down to prevent an accident.



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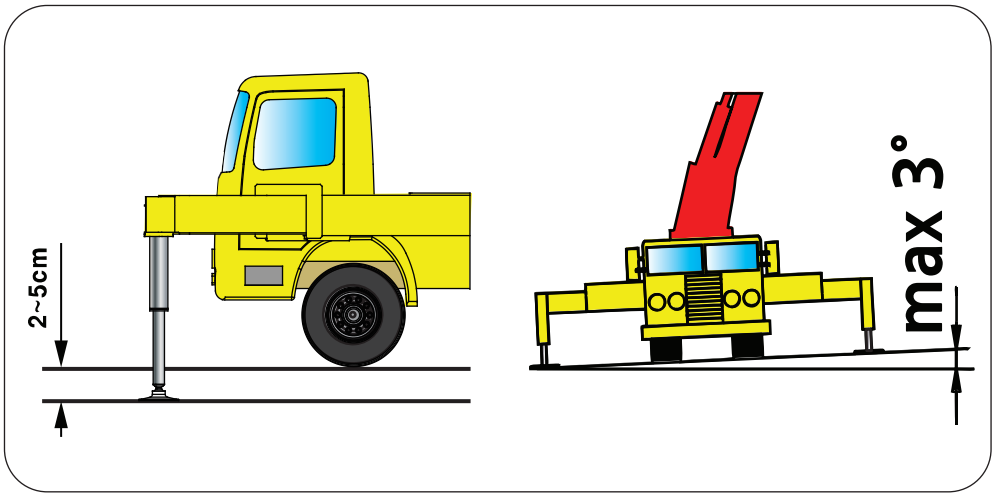
1.4.7 ⚠ CAUTION Allowable Angle of Outrigger Setting

- Extend outriggers with the front tires lifted within 5cm the ground.
  Rear tires could touch the ground slightly under condition that machine weight is not loaded on the tires.
- The machine must be kept vertical position. And maximum side allowable degree of an angle should not be set more than 3 degrees.



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1.4.8 ⚠ CAUTION Procedure in Bad Weather

- wind

Return the boom to the driving position in the event of storms or bad weather

- booms with a vertical reach of 42 m more may only be operated in wind forces up to wind speed 61 km/h
- booms with a vertial reach of less than 42 m may only be operated in wind forces up to wind speed 74 km/h.

Wind speeds in accordance with the Beaufort scale are average wind speeds measured over a period of 10 minutes.

Higher speed gusts of wind may occur briefly during the measuring period.

Higher wind speeds jeopardize stability and safety of the structural elements.

There is a risk of lightning strike in a thunderstom.

construction sites generally have wind speed measuring equipment, so that you can ask about the any speed at any time.

If no wind speed measuring equipment is available, you can ask the nearest meteorological office

what the wind speed is, or estimate the wind speed is, or estimate the wind speed using the following rule of thumb.

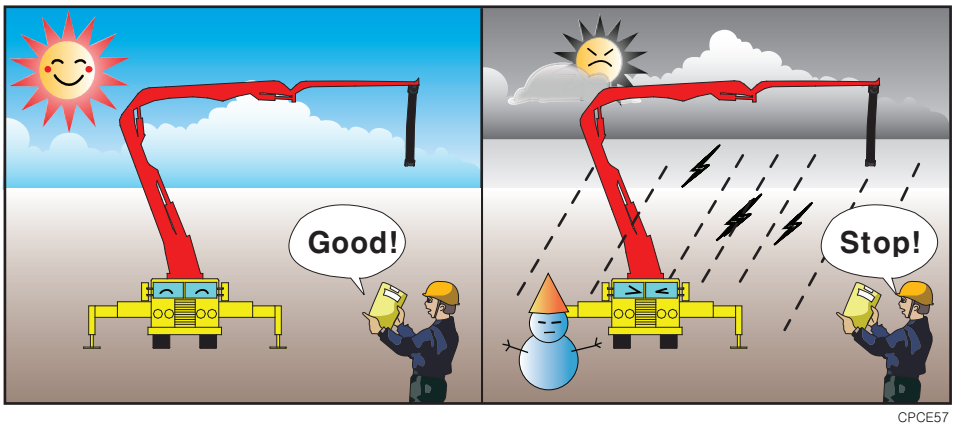
- In winds of force 61 km/h and greater, green leaves break from trees and there is a perceptible hindrance to walking in the open.
- In winds of force 74 km/h and greater, small branches break from trees and walking outside is made significantly more difficult.

• Concreting in cold weather

The boom must not be used in temperatures below minus 15℃(+5℃) unless the manufacturer has given express approval.

There is a danger of damage to the steel (brittle fracture) and the seals throughout the system at such extreme minus temperatures.

In addition, such minus temperatures should be considered the realistic lower limit for concrete placement, as it is no longer possible to prepare concrete such that it can achieve its strength without the use of special additives.



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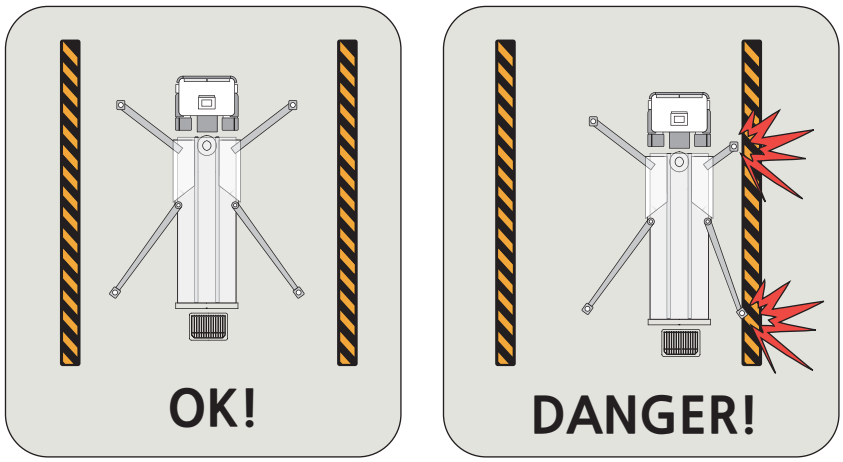
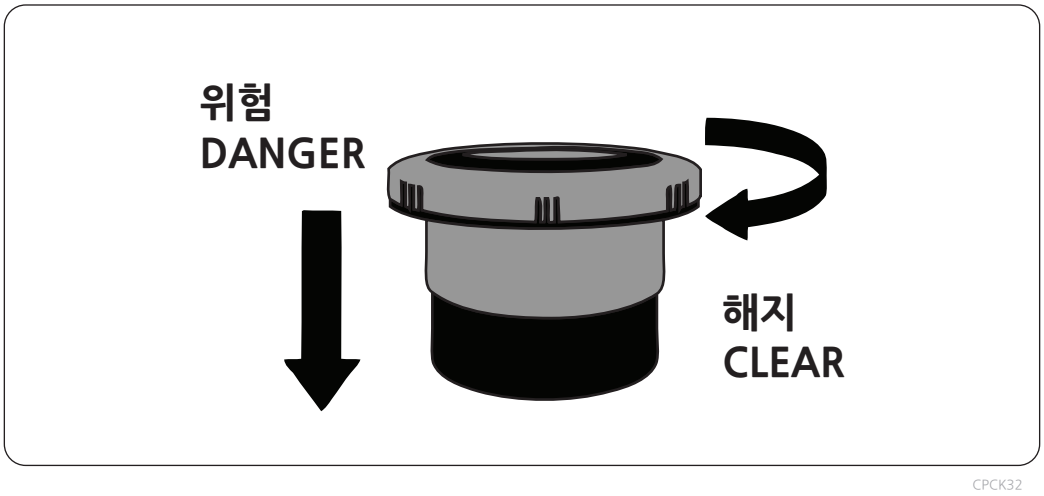
1.4.9 ⚠ CAUTION Safety Rules of Outrigger Setting

• Be sure the proper clearance for extend the O/R.

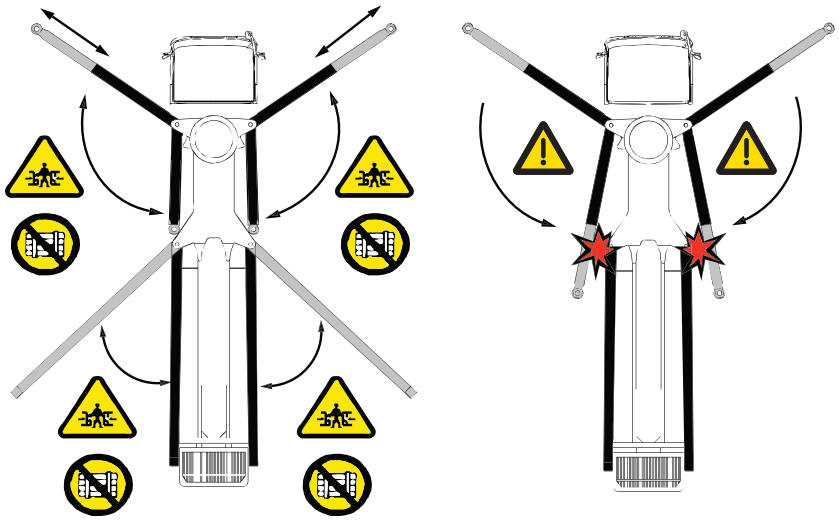


• The range of turning the O/R for setting must be checked before operation, and be careful that until finished the setting whether something is inside of the operation range or not.

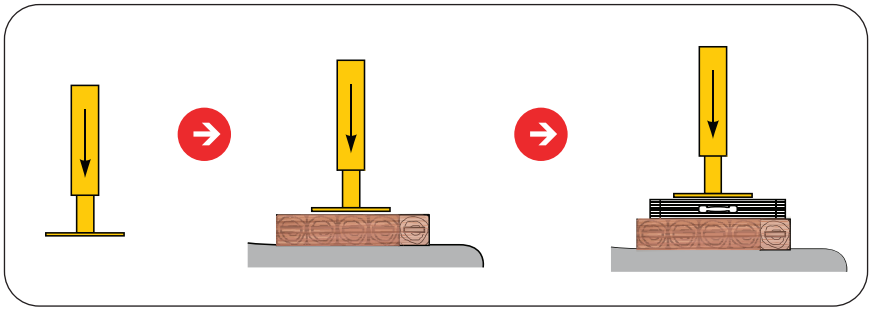
• If somebody approach to the dangerous area, press the emergency stop switch immediately to stop the machine.



• Turn the O/R completely and extend them until the end of extension distance.

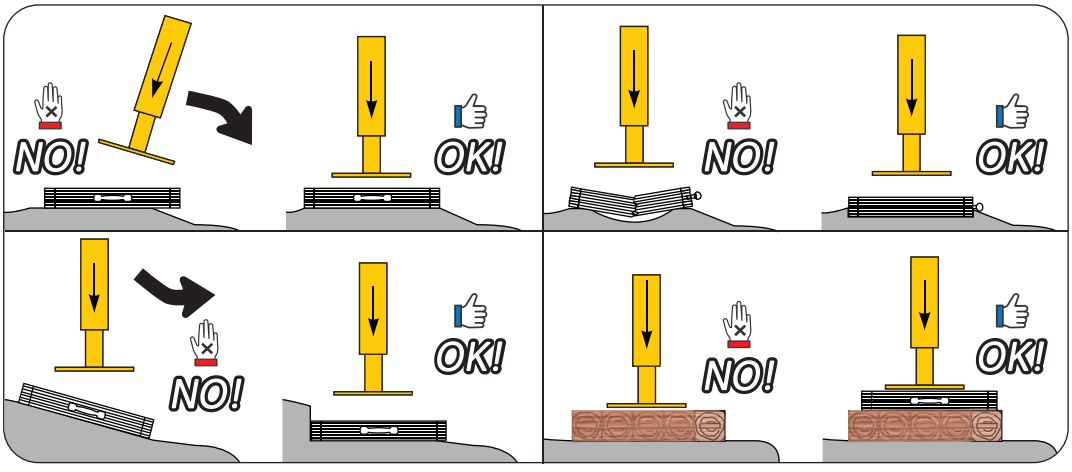


• The machine must be set on hardened ground by using the support plates. If the allowable load weight per unit area is exceeded, widen the load area by using the support plates. Support plates should be removed the grease or oil as well as the ice for the machine to not be slipped.



CPCK33

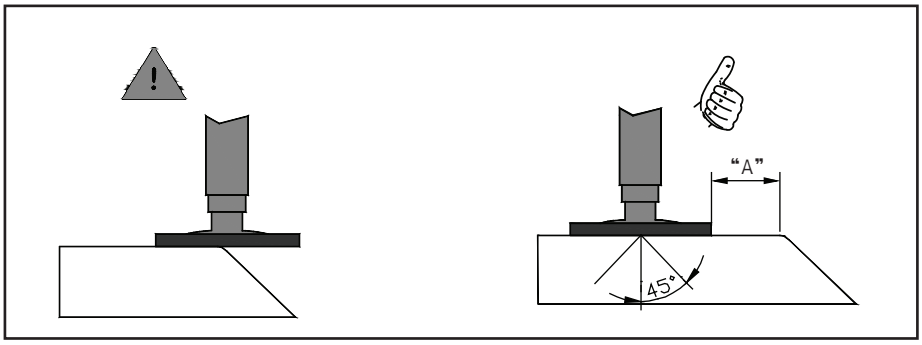
• The slope or the holes, channels could be callapsed down by the pressure of O/R. secure the proper distance against those area for safety.



CPCK34

1.4.10 ⚠ CAUTION Minimum clearance form pits

• The support force diffuses through the ground in a conical pattern at an angle of 45˚ this imaginary cone shall not exit at the wall of a pit.

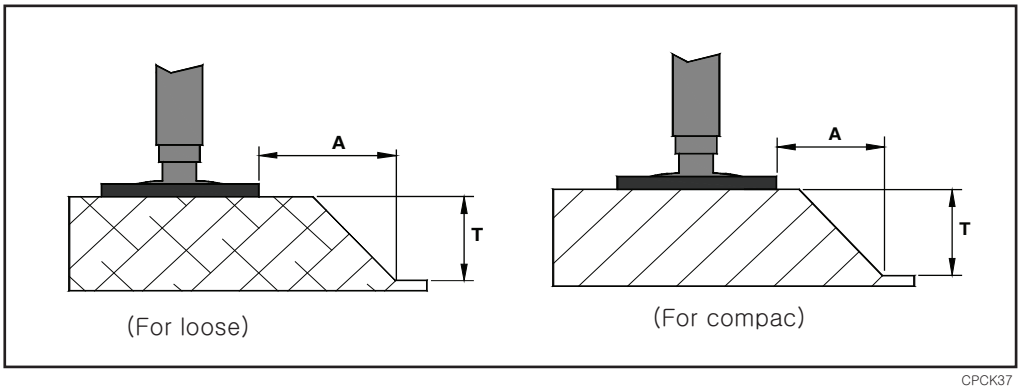


• You must maintain the minimum clearance " A " even if the pit is not deep and the ground has a very x cone shall not capacity.

• The minimum clearance " A " for machines.

- up to 12TON permissible gross weight is 1M,
- over 12TON permissible gross weight is 2M.

1.4.11 ⚠ CAUTION Safety clearance form pits



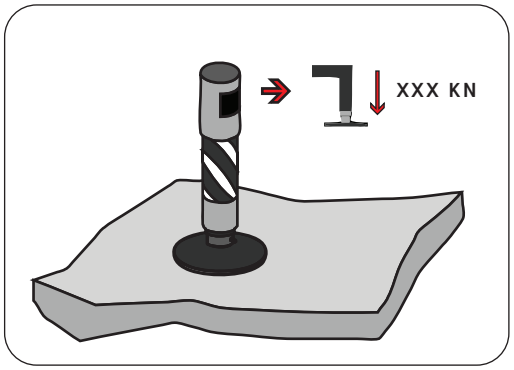
• Maintain an additional safety clearance A

The safety clearance A

- For loose, back filled ground is A ≥ 2 X pit depth T.
- For compact, non-friable ground is A≥ 1 X pit depth T.

1.4.12 ⚠ CAUTION Outrigger Max. Load Support Weight

• Maximum O/R bearing pressure is shown on the O/R.



CPCK38

• Be sure that the job site maximum allowable bearing pressure by check it with job site inspector.

• If the result of the calculation for bearing square, It should be smaller than job site value.

• Calculate the max. bearing pressure by below formula

$$\text{Max. Load Support Weight} = \frac{\text{Machine bearing force}}{\text{Indication square}}$$

CPCE38

• In accordance with up calculation, requirement allowable pressure of the bearing square is bigger. For this reason, the support plate must be put in between the ground and the O/R.

1.4.13 ⚠ CAUTION Outrigger Min. Support Square Calculation List

• Calculate the minimum ground square by using the below diagram.

Conversion : 100 KN/㎡ = 100,000 N/㎡

Support forces in (KN) (see support leg) → / Permissible pressure per unit area KN/㎡ ↓	Lengths of timber in (width x length cm)															
	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400
Natural soil 100	71	84	112	138	166										
Asphalt 200			84	104	126	147	166								
Hardcore 250				84	89	117	132	150	166						
Clayey.coarse clay 300					84	96	112	126	138	154	166				
Mixed stone 350						84	96	106	120	132	144	153	166		
Leyered gravel 400							84	94	104	115	126	135	147	156	166
500								74	84	91	98	109	117	126	132
750												73	77	84	89
Rock 1000															

Support blocks without additional timbers.

⚠ Supporting ground is not suited for supports.

CPCE39

EX) Min. ground square calculation

• Condition

A) The ground which were hardened by the macadam.

B) The allowable pressure of the soil is 250 KN

C) In case of the an O/R loaded force is 150KN

• Result : Support plate for O/R must be bigger than 89cm as below diagram.

Support forces in (KN) (see support leg) → / Permissible pressure per unit area KN/㎡ ↓	Lengths of timber in (width x length cm)														
	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400
Natural soil 100	71	84	112	138	166										
Asphalt 200			84	104	126	147	166								
Hardcore 250				84	89	117	132	150	166						
Clayey.coarse clay 300					84	96	112	126	138	154	166				
Mixed stone 350						84	96	106	120	132	144	153	166		
Leyered gravel 400							84	94	104	115	126	135	147	156	166
500								74	84	91	98	109	117	126	132
750												73	77	84	89
Rock 1000															

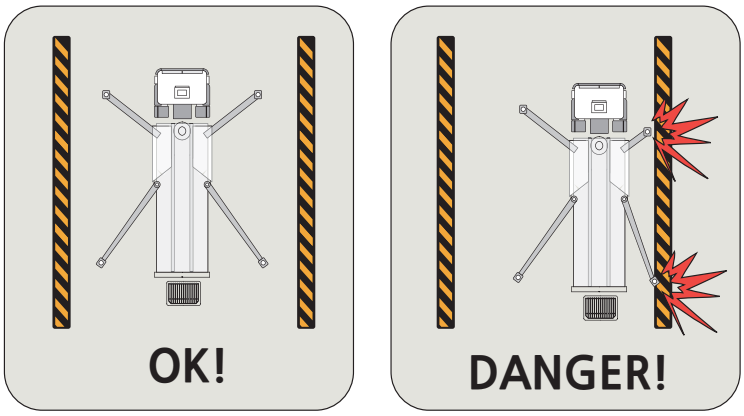
Support blocks without additional timbers.

⚠ Supporting ground is not suited for supports.

CPCE40

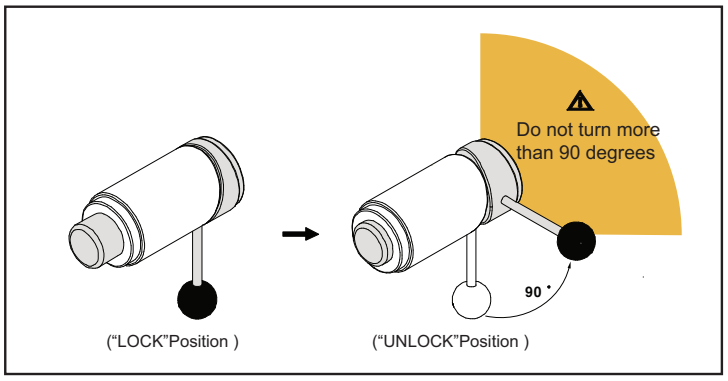
1.4.14 ⚠ CAUTION Safety rules for outriggers setting

• Secure enough outriggers setting area firstly and then operate outriggers. Operator should check outriggers setting area and if booms are folded completely then extend outriggers safely.

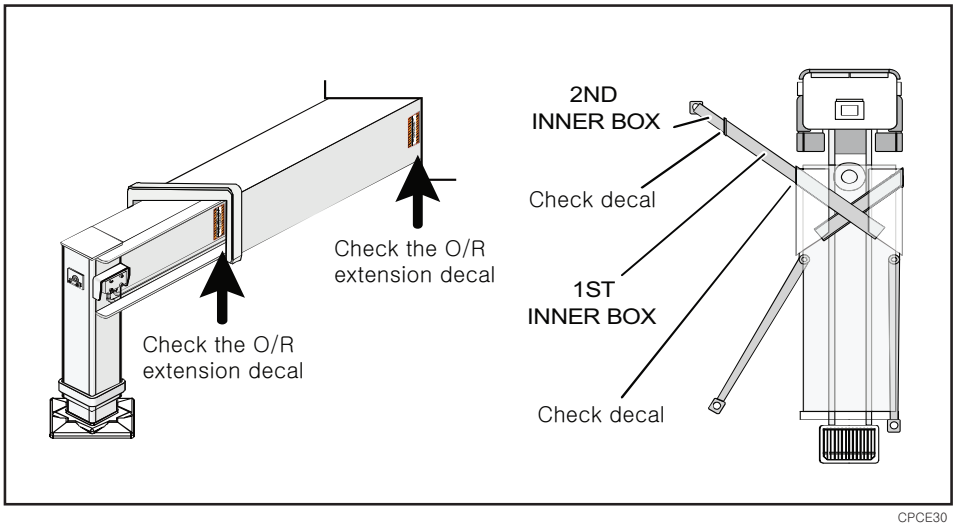


• Firstly release outriggers levers for "LOCK" by turning the lever 90 degrees (do not turn more the lever than 90 degrees) and then extend outriggers.

• After outriggers extension, be sure to check if levers are "LOCK" position.



When extending outriggers, all outriggers should be extended until <O/R extension decal location> as below.

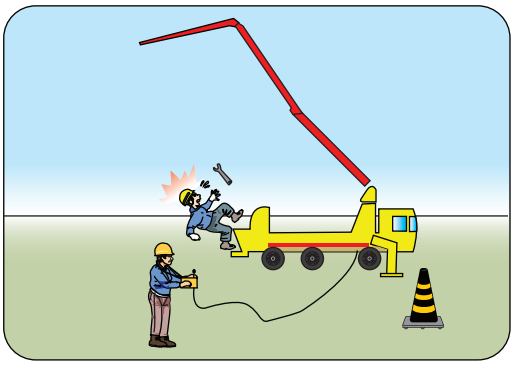


1.5 Safety regulation during working

1.5.1 DANGER Prevention of the Injury by the Equipment

Be sure the hands or the body are not be put into the cylinders or other moving equipments.

The gap of the equipment is changeable during working. It could make a serious injury to the people.



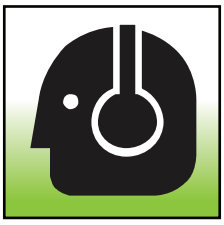
CPCK41

1.5.2 CAUTION Caution for Engine Start

- Please check whether the people or other interferences are around the machine before driving.
- Do not start the engine if the warning post is hanged up on the operation levers.
- Inform the warning by sound a horn just before start the engine.
- The other people except driver are not permitted to get on the machine or driver seat.
- Driving alarm system equipped machine(Option) should be inspected regularly.

1.5.3 ⚠ CAUTION Preparative for Noise

Be exposed to noise for a long time may be caused of hearing difficulties. Protect your ears by wearing earplug against the continuance noise and even the sudden noise.



CPCE42

1.5.4 ⚠ CAUTION Notice of Exhaust Gas

- The exhaust gas from the engine is poisonous. Please be careful when you need to work inside.
- Open the door to let the fresh air in properly.
- Connect the exhaust pipe to install it outside.

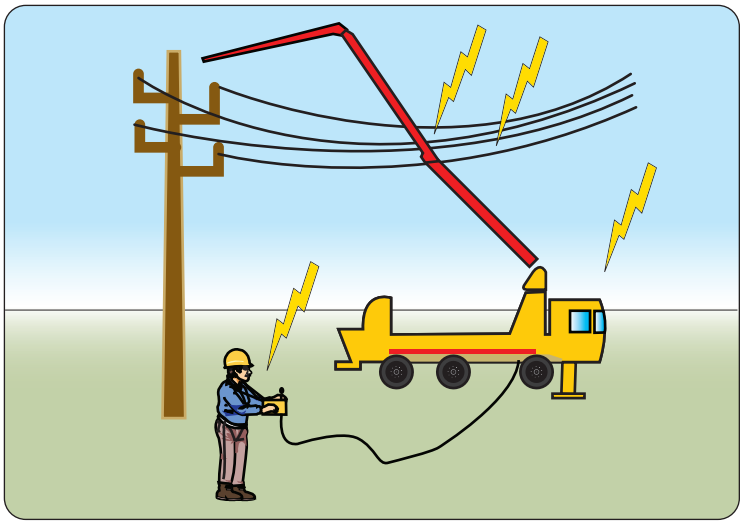
CPCK43

1.5.5 ⚠ CAUTION Secure the proper visual field

- If there is too dark to see, install the working lights or headlight depends on the job site condition.
- If you do not secure the visual field properly, stop the working to wait for the good working condition is comming

1.5.6 ⚠ DANGER Notice of High Voltage Electric Wire

- If the boom approach the high voltage electric wire, you could be got the electric shock. Do not work around high voltage electric wire.
- Be sure that below instructions.
  - Wear the safety rubber shoes.
  - The boom guide should be placed to inform the Rick.
- If the boom contact the electric wire, driver must not leave the driver seat.
- If the machine is working in the tunnel, nearby footbridge, under the wire, or in the garage, please handle the boom carefully to avoid interferences.



CPCK25

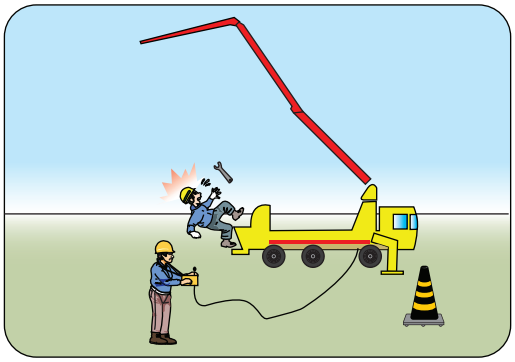
1.5.7 ⚠ WARNING Notice for Working of High Building

- Be sure to secure the proper working range as well as enough information regarding the job site during working for high building.
- The boom must be kept the distance from the high building.
- If there is some risk such as the high voltage electric wire, operate the boom to avoid the interferences.
- Something could be fallen down while work for the high building. Be sure that the machine should be worked as keep the safety distance.

CPCK45

1.5.8 ⚠ WARNING Keep the Distance from the Machine for Safety

- Keep the people out of machine during working.
- If some problems are founded with the machine, approach the machine after stop the machine.
- Do not stand on machine during opertion.

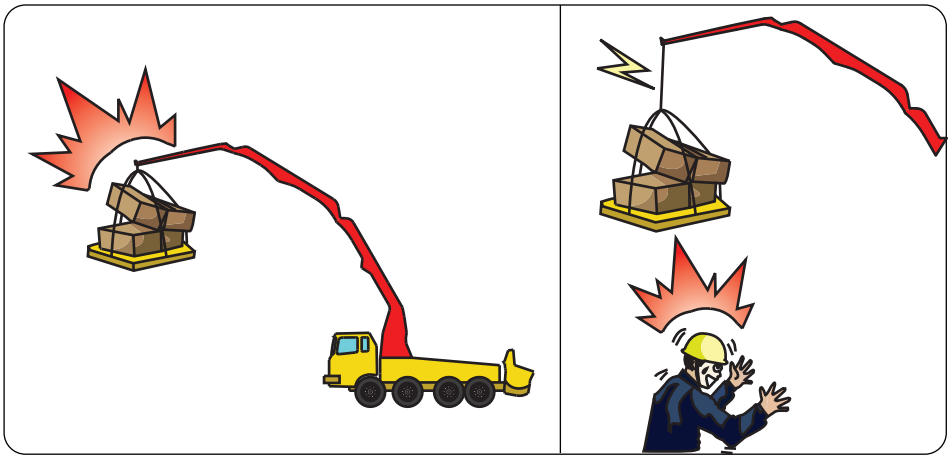


CPCK41

- Give the notice people that do not approach around the machine during pumping.
- If somebody approach to the machine, turn the people out from the machine to safety place after stop the machine immediately.

1.5.9 DANGER Do not Use the Machine as the Crane

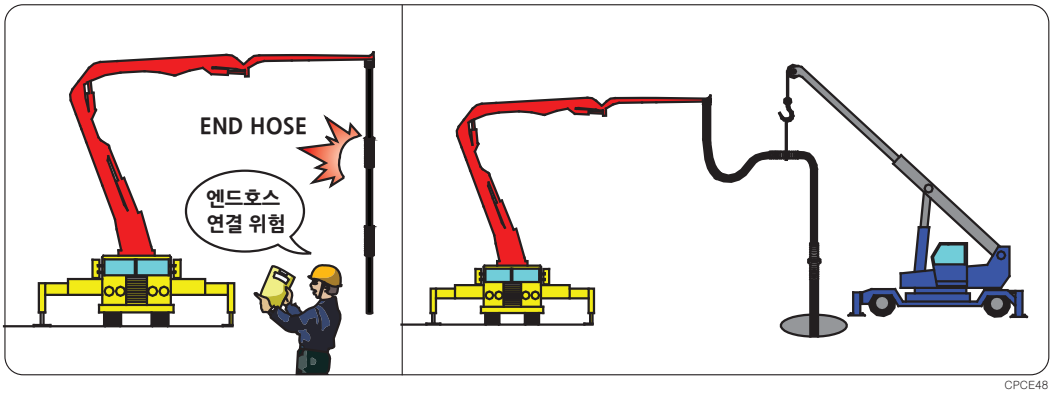
- Do not use the machine as the crane due to the machine has not equipped any other safety items for doing the crane work.
- Boom is supposed to be used for only concrete pumping. Do not use the machine in other way except pumping. It may give some bad influences to the machine or make dangerous situation.
- Manufactured company disclaim the responsibility for all accident by using the machine as a crane.



CPCK47

1.5.10 DANGER Not Permitted the Modification

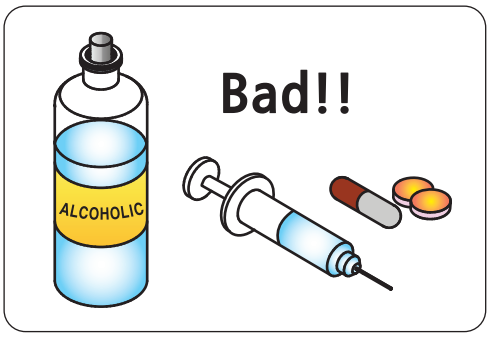
- Never extend the boom or add the end hose by yourself. It cause the machine be got the damage or caused of accident happening.
- Please use the JUNJIN genuine end hose. Using the imitation end hose nect more end hose could be give the damage for the machine. Please use the provided end hose.
- If you must connect more end hose, use the crane to support the end hose as below pictures for safety.



CPCE48

1.5.11 ⚠ CAUTION Safety Rules of Worker during the Pumping

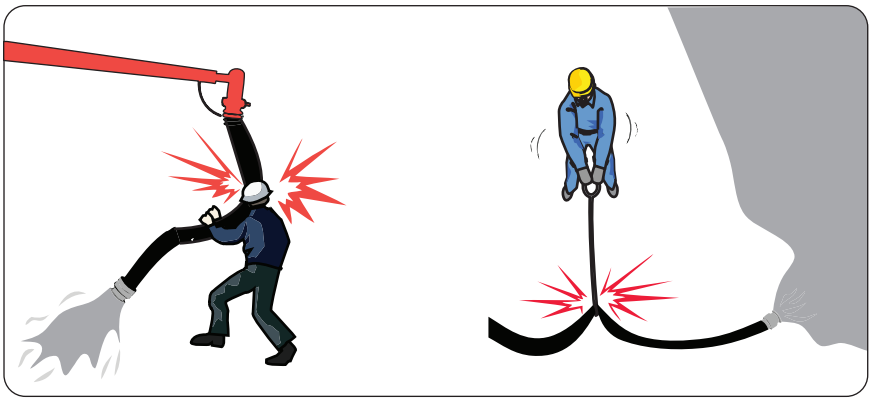
- Do not operate the machine when under the influence of alcohol or drugs.
- When you feel tired or sick, do not operate the machine.
- Please keep out of the risk at all time.



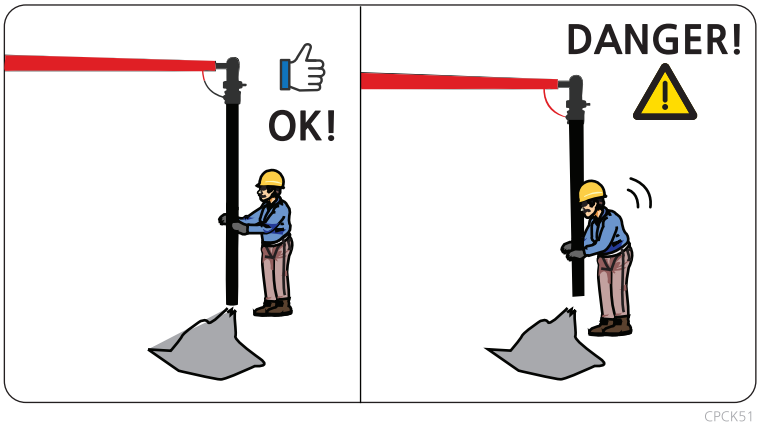
CPCK4

1.5.12 ⚠ WARNING Notice of End Hose Using

- Kink the end hose may be caused the hose be damaged as well as the dangerous accident may be happened. Please handle it carefully.

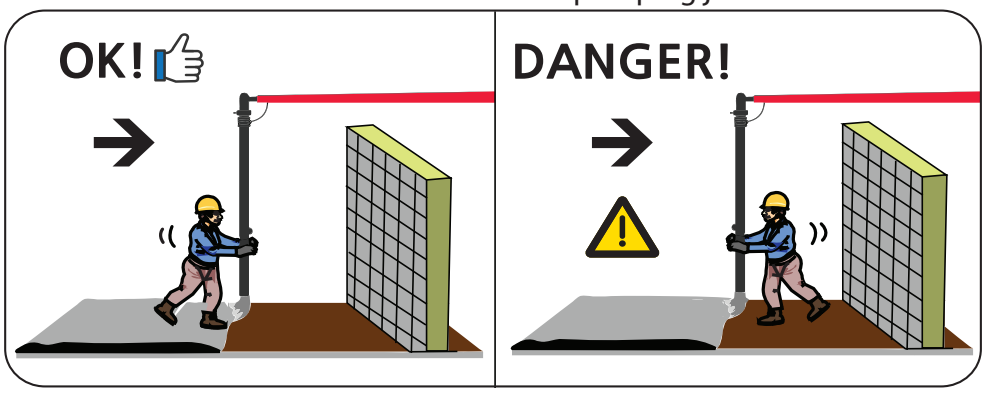

CPCK50

- The end hose must not be huge by operator. Only hold the end hose by both hands to allow it move freely. Keep the safety distance between the end hose and the body.



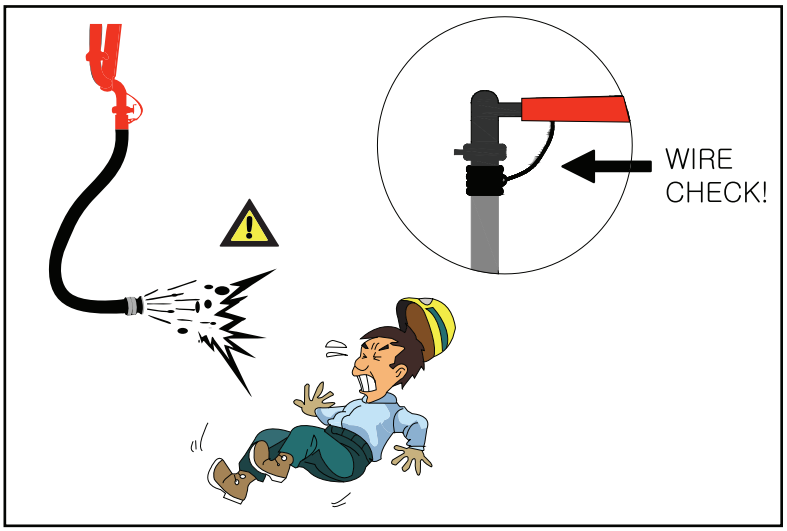
CPCK51

• The hose man should walk forward to do pumping job.



CPCK52

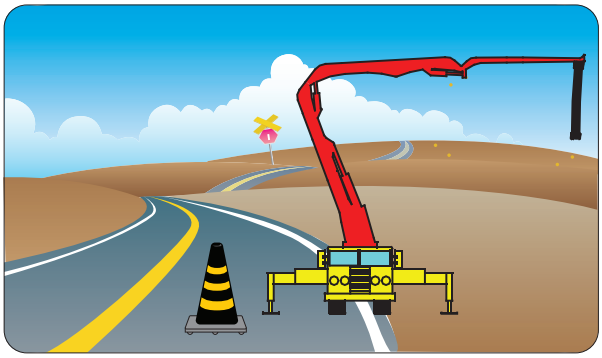
• When start the pumping, end hose may be jumped extremely. For this reason, keep the people out of the end hose working range.



CPCE53

1.5.13 ⚠ CAUTION If the machine must set on the road

- If the machine must set on the road, do not interference the traffic.
- Please draw the security line around the machine when work on the road.
- Security line must be not interference the traffic.

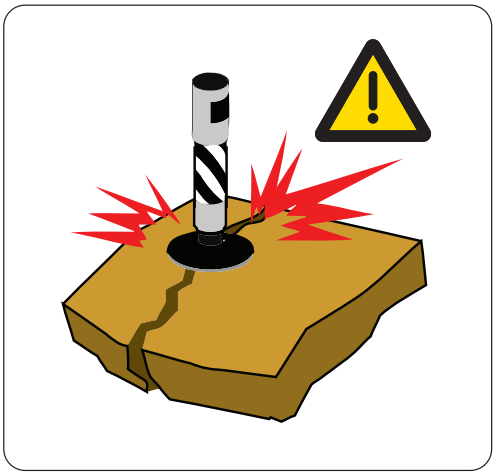


1.5.14 ⚠ WARNING Working on the Snow or Frozen Road

- When the pumping job is being done on the snow, or icy road, the machine parked on the slope could be slipped. Drive slowly at all time and be restrained.
- After snow-removing work, there may be something dangerous material inside of the heaped snow. Please be careful with this.

1.5.15 ⚠ WARNING Working on the Unstable Ground

- Do not work on the deep cannel, edge of the precipice, under the cliff.
- Working on the unstable ground, machine could be felled down by the collapse of the ground.
- Especially, be careful the working on the ground after heavy rained or blast work.
- The ground where the hole is formed by excavated may be caused of falling down for the machine due to the ground could be collapsed down influence of vibration of machine weight.
- Concrete pumping job nearby the rockslide dangerous area could be given the machine serious damage as well as the operator.

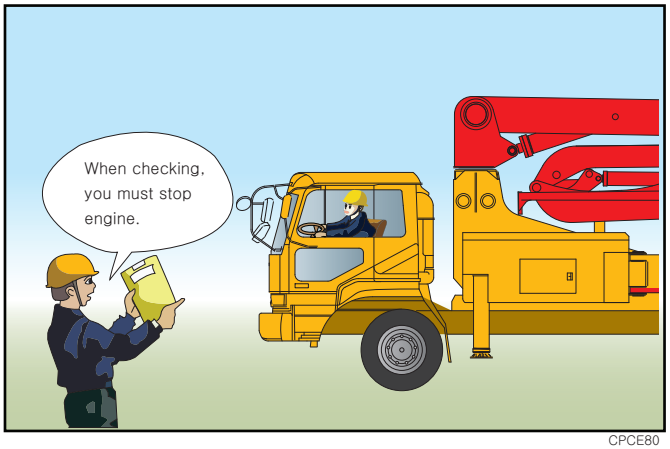


CPCK56

1.6 Safety regulation during maintance

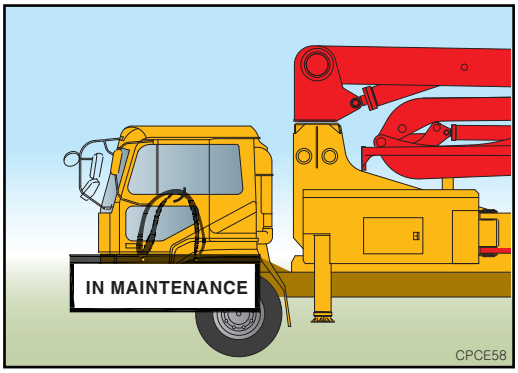
1.6.1 ⚠ CAUTION Stop the Engine during Maintanance

- Stop the engine after park the machine on the evenness ground for maintenance.
- If you must maintain the parts such as radiator without stop the engine, the should be 2 people for maintain. One person should sit on the driver seat to stop the engine immediately when the emergency situation happened.
- Be sure that if any clothing you wear or your body could be touch or contact the moving parts.



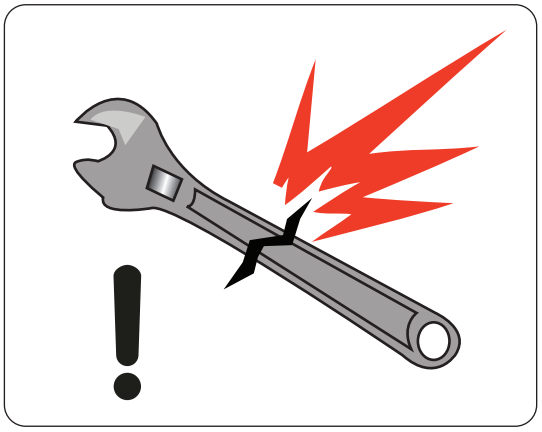
1.6.2 ⚠ CAUTION Warning sign of maintenance

- During maintenance if someone started the engine and/or operate some devices, it would be very danger and caused serious injury.
- WARNING SIGN OF MAINTENANCE must be shown "IN MAINTENANCE" on the very visible area like truck door or somewhere.



1.6.3 ⚠ CAUTION Use the suitable tools for maintenance

- Use the suitable tools for maintenance. Defected tools or lower quality tools might be dangerous.
- Unsuitable tools may be given the damage to machine as well as the tools.



CPCK59

1.6.4 ⚠ WARNING Notice for Refueling the Fuel or Oil

- The oil or fuel on the machine could be caused for the fire or slip. Please clean it.
- Be sure the fuel cap and oil cap if they are fastened completely.
- Do not clean the parts with the fuel.
- Refuel in the well ventilated place.

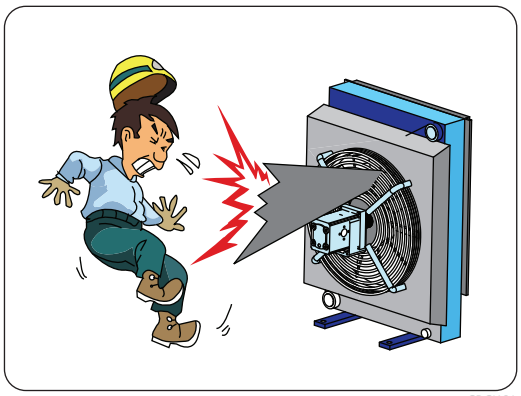
CPCK14

1.6.5 ⚠ CAUTION Regular Replacement for Main Safety Part

- The parts that related fire is replacement regular.(ex. fuel hose, hyd hose..)
- Evenif parts that related fire don't have problem, have to replacement regular.
- As time goes on weak.
- If patrs are finded probem, have to replacement immediately.

1.6.6 ⚠ CAUTION Coolant Level of Oil Cooler

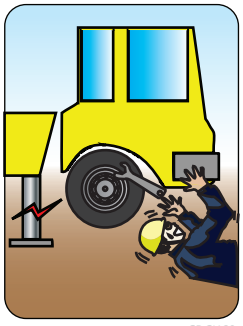
- Recharge the coolant after stop the engine as well as the engine and radiator should be cooled completely.
- Release the cap slowly to remove the residual pressure before open the cap completely.



CPCK61

1.6.7 ⚠ CAUTION Maintenance for Bottom of the Machine

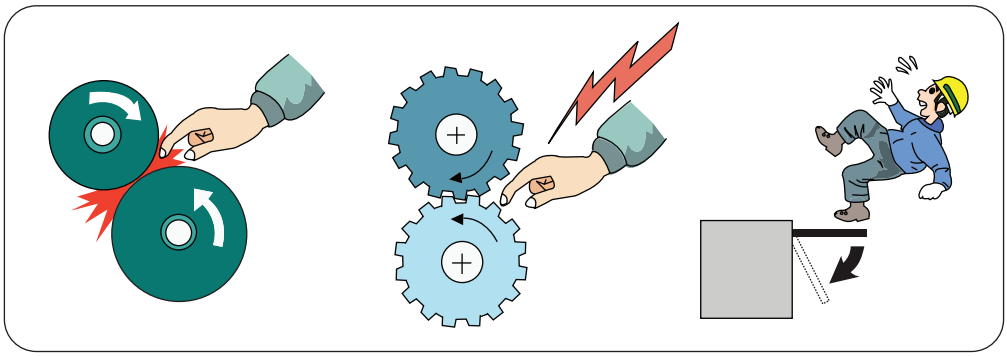
- Be sure that the truck has to be supported by wheel props to not be moved.
- Never repair the bottom side of the machine if the machine is not supported properly.



CPCK62

1.6.8 ⚠ CAUTION Caution during Cleaning

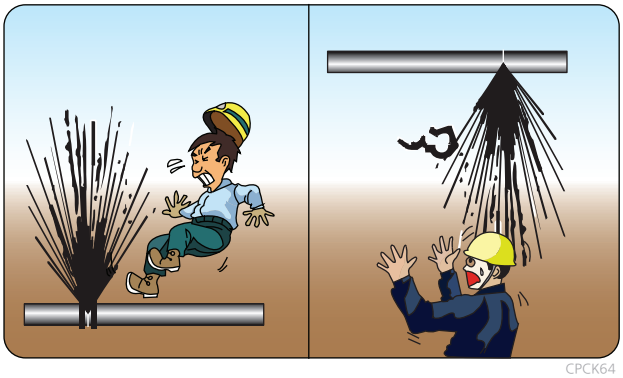
- Should be careful with the slippery material such as overflowed oil or grease for safety.
- Please make the machine clean at all time.
- If the water is flown in the electric unit, it could be caused for defect of the operation. Never clean the electrical parts such as sensors, connectors, inside of cabin with steam or water
- Never touch or contact the moving parts.



CPCK63

1.6.9 ⚠ CAUTION Caution for High Pressure Oil

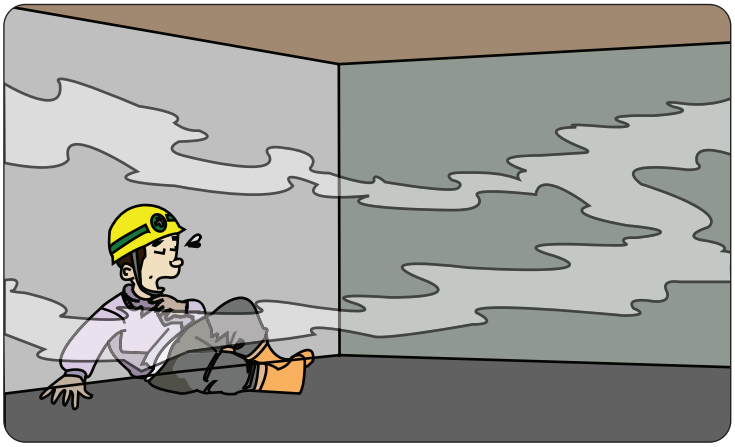
- EYES OR SKIN might be injured seriously, If fuel high pressurized hyd oil went into eyes or skin.
  - BE SURE TO RELIEVE pressure before disassembling of hyd components and/or pipes and also before operating check out whether there're disconnected lines or problems without fail.
  - In case of hyd oil-leakage, check out by using paper-board or wooden-board
  - KEEP HANDS OR SKIN AWAY FROM PRESSURIZED HYD OIL.
  - IF CONTACT, medical-testing by consulting a doctor must be done.
  - THE CELLULAR TISSUES CAN BE DAMAGED, if hyd oil wasn't removed by few hours after oil-penetration.



CPCK64

1.6.10 ⚠ CAUTION Notice of Maintenance for hydraulic parts

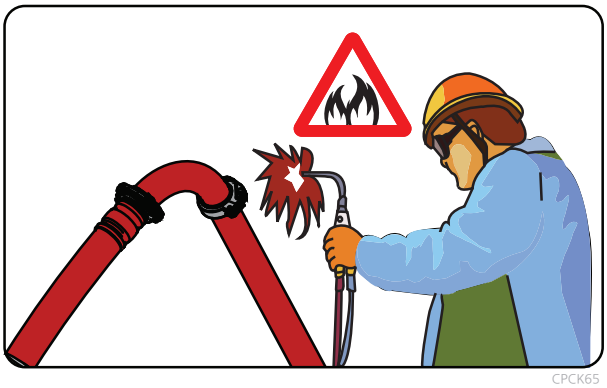
- Keep out of harmful smoke or dust.
- When the painted surface is heated by welding, salering, torch B1061, the harmful smoke could be occurred. Please do the work in outside or well ventilated place.
- Remove the painting before welding or heating.
- Put on the breathing mask while remove the painting with grinder to protect the workers from the dust.
- If the solvent was remained, please clean it with water or soapy water.
- Do not leave the solvent nearby fire hazard.
- Weld or heat after 15 minutes later from removed painting.



CPCK19

1.6.11 ⚠ CAUTION Do not heat the hydraulic equipments or pipe lines

- If the hydraulic equipments or pipe lines are heated up, It could be catch the fire easily with inflammable steam or atomizing which are occurred from them.
- If weld or cut the pipes and tubes which have the inflammable fluid it could be fired. Please remove the inflammable fluid with noninflammable solvent in advance.
- Do not heat the nearby hydraulic equipment or pipe lines with welding, soldering, torch.



CPCK65

1.6.12 ⚠ CAUTION Caution of Inspection for Hydraulic Parts

- Put the bucket on the vertical ground. Do not give the damage to the cylinder circuit for inspection or maintenance.
- Be sure to engine stop.
- After operation, do not repair the machine due to hydraulic oil or lubricating oil would be hot maintenance. Remove the retained pressure by Loosen the bolts or plugs, hoses slowly due to it could be give you the serious injury. Do not be in front of the parts during disassemble.
- Remove the pressure by removal of air from hydraulic tank during maintenance of hydraulic circuit. The retained pressure could be remained in the hydraulic circuit. Please handle the each lever two or three times to remove the retained pressure.
- Please check the condition for O-ring after disassemble the high pressure hoses. If the O-ring is damaged, please replace it.
- Remove the air from the circuit after cleaning or replace for hydraulic filter element, strainer as well as disassemble or replace of the hydraulic equipments, pipes, hoses.
- Do not inspect or repair the turning motors and driving motors on the incline due to the machine could be moved by gravitation.

1.6.13 ⚠ CAUTION Disposal of Waste

- Catch the waste in the bucket.
- Do not dump the waste in anywhere to keep the environment. It is seriously not permitted.
- Be sure that if the waste could be flown into the ground or lake.


CPCK67

- Dispose the waste such as oil, fuel, cooling water, filter, brake fluid, battery in accordance with the regulation (Disposal of industrial waste regulation)

1.7 Security instruction and maintenance

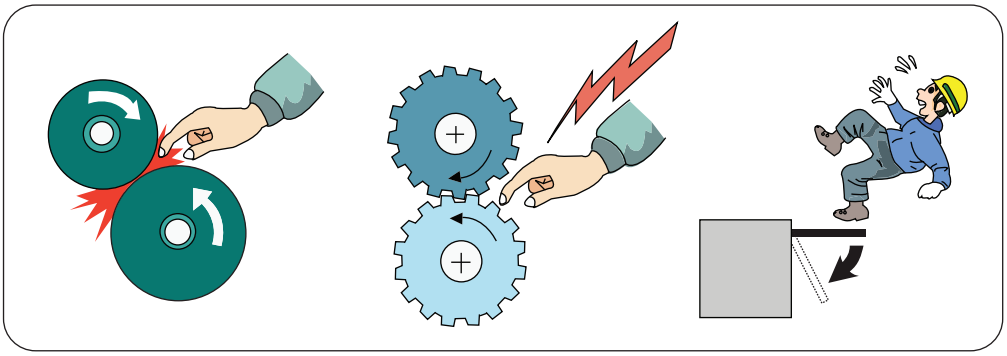
1.7.1 ⚠ CAUTION Notice of Normal Security Instruction

• Please operate and manage the machine in accordance with JUNJIN operating manual.

CPCK2

• The boom and concrete pump must be operated in accordance with JUNJIN operation manual and Be sure that please keep the operating manual inside of the car.

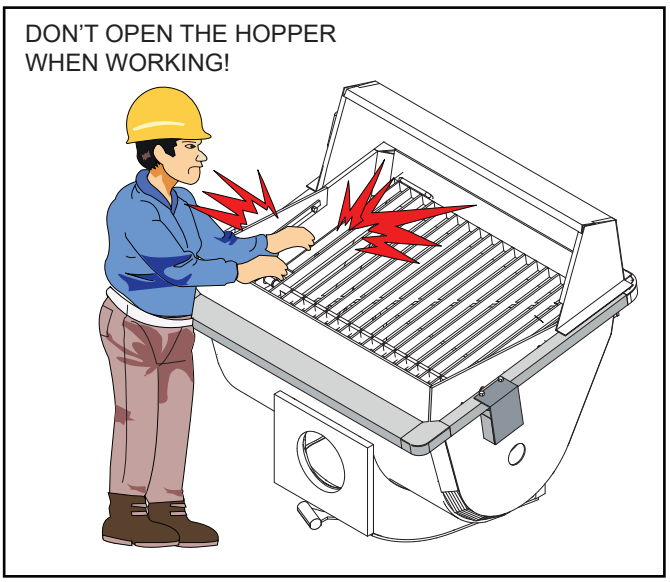
• Do not modify or remove the all equipments while they are being worked due to it might give the operators serious injury.



CPCK63

• Do not set the security equipments or remove the protection equipments by yourself while the machine is operated. And do not open the hopper cover during operating.

If operator needs to open hopper screen for cleaning or maintenance, truck engine must be turned off and remove the KEY. During hopper screen opened, the accumulator pressure has to be drained by opening the ball valve to prevent S-valve from changing over unexpectedly.



CPCE69

• The concrete pump and the boom with concrete pipes must be checked interval 500 hours for safety condition, please inspect the machine by the professional service team at the least of once a year.

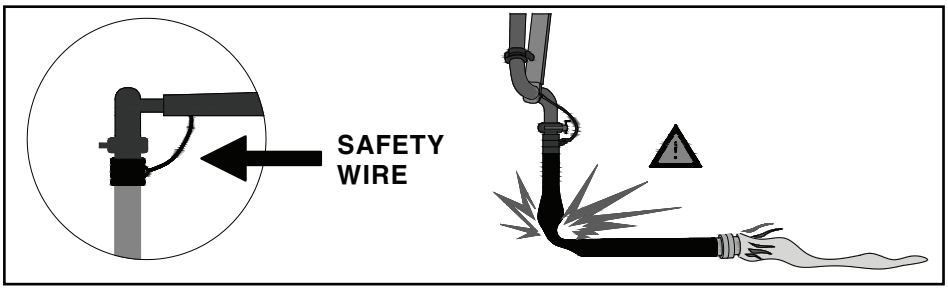
CPCK60

• Be folded end hose by the exterior force could be got the damage because the concrete is stuck and it may reason for other accidents.

• The end hose must be used with the wire which is Holden the end hose to prevent falling down.

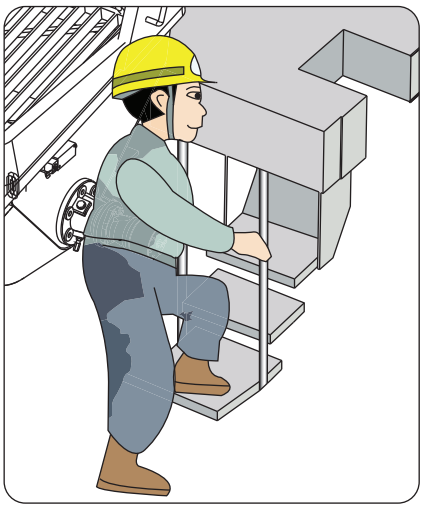
• Korea occupational safety and health standards regulation (Observance of stability etc.) In cases of using a construction machinery to work, an employer shall observe its structures and stability, maximum working load to prevent rollover accident or any of working structures damage such as boom and arm etc.

• JUNJIN disclaim all the responsibility for the accident if you removed the safety wire.



CPCE70

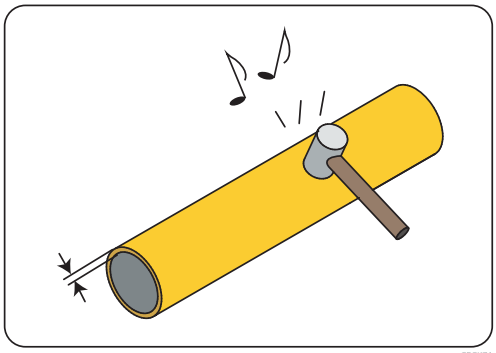
• Please use the grip of the step to get on the machine.


CPCK79

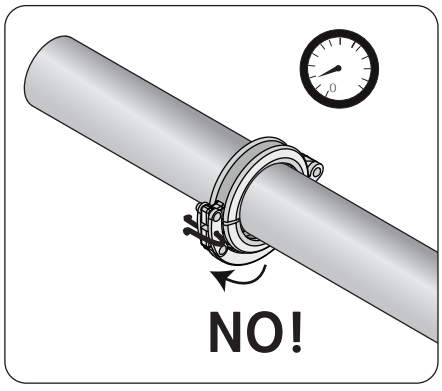
• Be sure the step, passage, controllers, indicators whether they are contaminated with such as oil or snow, ice.

• Clean the concrete pipe with the water only, do not use the pressurized air for cleaning due to serious accident.

- Use the max. delivery pressure more than specified pressure in the specification.
- In wireless equipment case, please emergency switch "ON" all the time for carrying. Press the switch down as below arrow direction. Turn the switch as below direction when the dangerous situation is destroied.
- Inspect the concrete pipes once a day by hit or check the thickness to confirm the worn condition.
- Please replace the parts which are already worn.
- Refer to section 4 regular inspection for concrete cylinder minimum thickness for using.
- JUNJIN disclaim all the responsibility for the damage which occurred by using the concrete cylinder not in accordance with recommended minimum thickness


CPCK71

- Do not disassemble the concrete pipe without remove the residual pressure.
- Especially, if disassemble the pipes caused by stuck inside, must be done the reverse pumping to remove the pressure before disassemble the pipes.
- Do not open or hit the pipes when the pressure is filled in the pipes.

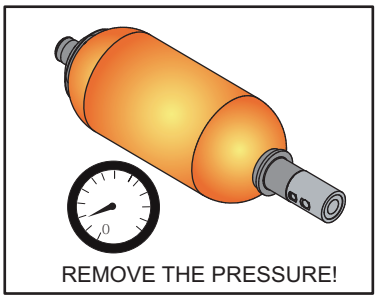


CPCK72

• Do not put the hands into the concrete supplier, delivery equipments, water box, hopper etc, even the machine is not operated, do not touch the transfer valve or other equipments which could be moved. If there is accumulator, please stop the engine to remove the accumulator pressure.

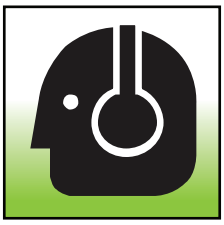
• Do not modify the accumulator circuit.

• It is not permitted to modify the hydraulic pipes or remove the safety valve.



CPCE73

• We recommend you to wear the earplug if the noise from the end hose is louder than 85db or it is necessary to be close in 5m with the machine


CPCE42

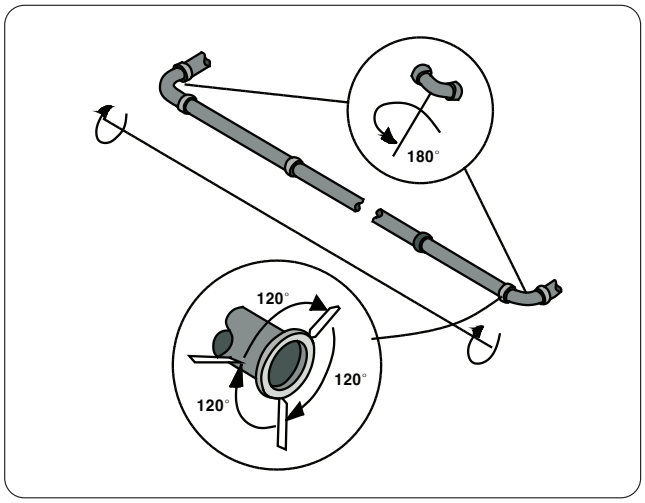
MODEL	DRIVER SIT	EXHAUST PORT	HORN	DIRECTION	7M	15M	30M
20M 30M 40M	76.5	89.5	77.3	FRONT	75.8	72.2	68.8
				REAR	71.6	69.7	67.1
				LEFT	77.5	72.9	68.7
				RIGHT	77.4	74.6	71.4

UNIT : db(A)

1.7.2 ⚠ CAUTION Maintenance and Repair

CPCK2

- The engine must be stopped and the hydraulic equipments and the line are also removed the pressure to inspect the machine.
- The boom maintenance must be done by drop the boom with the support stably after stop the engine.
- Support the boom properly to maintain such as pressure valves or cylinders, hydraulic lines.
- When the hydraulic or pneumatic parts are needed to be replaced, please use the genuine parts according to circuit or data of the manual book.
- Please use the concrete line after 6000㎥ operating as turn the pipes about 120˚ and about 180˚for the elbows to extend the parts life.



CPCK74

- Record the position for interior components during the disassembling. It helps you for assemble.
- Protect the sections by block with the protectors which are not supposed to be inserted the substance during water steam(high pressure cleaner) cleaning. Especially, be careful the electric motors and switch box. If some water are leaked into those section, please request about it with service department.

1.7.3 ⚠ CAUTION Summary of Security Inspection

- Please be familiar with the machine by learn the operation manual book properly.
- Keep the other people from the machine except licensed person.
- Do not remove or modify the safety equipments.
- If the machine has some problem, please stop the machine immediately to repair.
- The electric and manual operation condition must be normal condition all the time.
- Keep out the hands and foot from the hopper and parts relating to S-valve.
- Be careful the machine because it is operated by remote operation.
- Please get some help from the other people to secure the enough working range.
- If some dangerous situation occurs, please stop the machine immediately. Then recover the working condition as normal condition for operation again.
- Be sure the stability of the machine. If the ground condition is not stable, support some blocks under the O/R. The machine must be kept the horizontal condition against the ground for operation.
- Be sure to operate machine within proper boom operation range in accordance with O/R height, and boom swing operation.
- Extend the O/R completely before unfold the boom to secure the stability of the machine.
- Check the O/R lock condition before driving on the road.
- Drive the car after check the boom and O/R whether they are folded completely or not.
- Please tie the end hose with the chain or rope completely for driving.
- The boom and end hose are not permitted to be extended for using.
- Do not use the boom as the Crain or hoist. It is strongly not permitted.
- Do not drive the truck with not - completely - folded boom.

- Keep the safety clearance from the high voltage electric wire properly to prevent electric shock accident.
- Keep the machine at least 5m from the high voltage electric wire, operator must be careful that could be got the electric shock by the remote and the wire.
- Booms with a vertical reach of 42 m more may only be operated in wind forces up to wind speed 61 km/h
- Booms with a vertial reach of less than 42 m may only be operated in wind forces up to wind speed 74 km/h.
- When plumbing the pipes vertically or horizontally, please support them properly.
- Do the reverse pumping to remove pressure inside of concrete pipes before disjoint the pipes, and be careful when you remove the coupling.
- The cleaning with the air or water must be done by the skilled worker. Especially be careful with the air cleaning, it could be caused of dangerous situation. Use the ball catcher for end of the pipe.
- Be sure to wear the safety helmet with the safety goggles before being around the machine.
- Be sure to power off the remote control before leave the job site.
- Please wear the personal protective equipments in the job site all the time in accordance with regulation.
- Especially, be sure to wear that during the concrete or mortar mixture work.
- The machine could be started on by two way(The cabin start key and remote control start switch). So keep away the other people from the machine for safety. Please check the working site if the people are around the machine to provide people against serious injury.
- Korea occupational safety and health standards regulation (Observance of stability etc.) In cases of using a construction machinery to work, an employer shall observe its structures and stability, maximum working load to prevent rollover accident or any of working structures damage such as boom and arm etc.

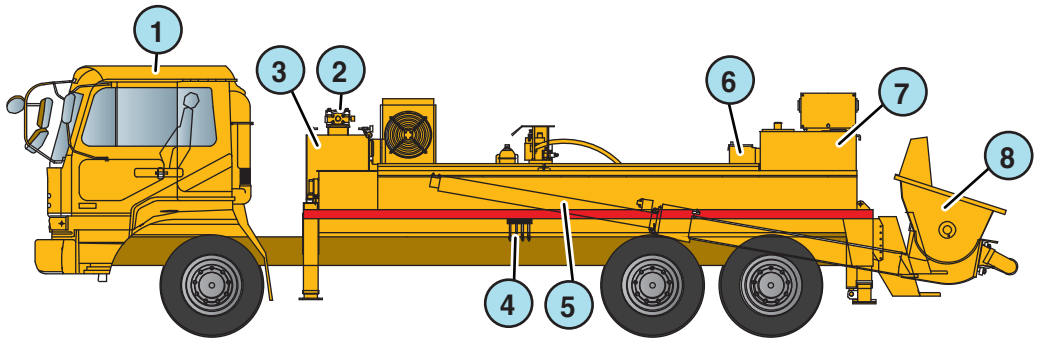
장비 제원표

TECHNICAL DATA

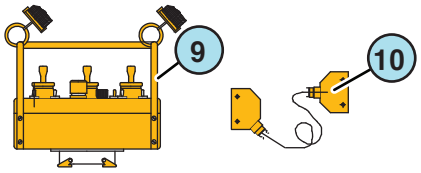
02

2.1 DESCRIPTION OF MAIN COMPONENTS

2.1.1 MOLI - MACHINE WITHOUT BOOM (with 3axle chassis)

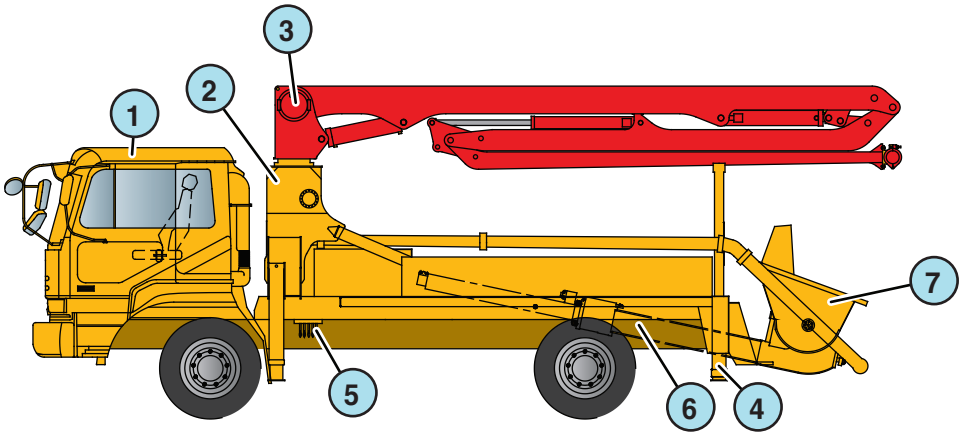


① Cabin	⑥ Greese tank
② Return filter	⑦ Water tank
③ Oil tank	⑧ Hopper
④ Outrigger control valve	⑨ Remocon
⑤ Main hydraulic cylinder	⑩ Cable (18PX20M)

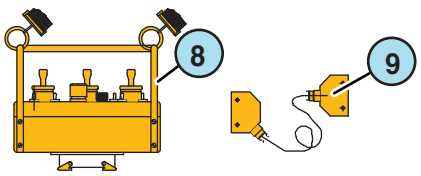


CPCE2001

2.1.2 20M CLASS(1) - Z FOLD 3SECTION (with 2axle chassis)

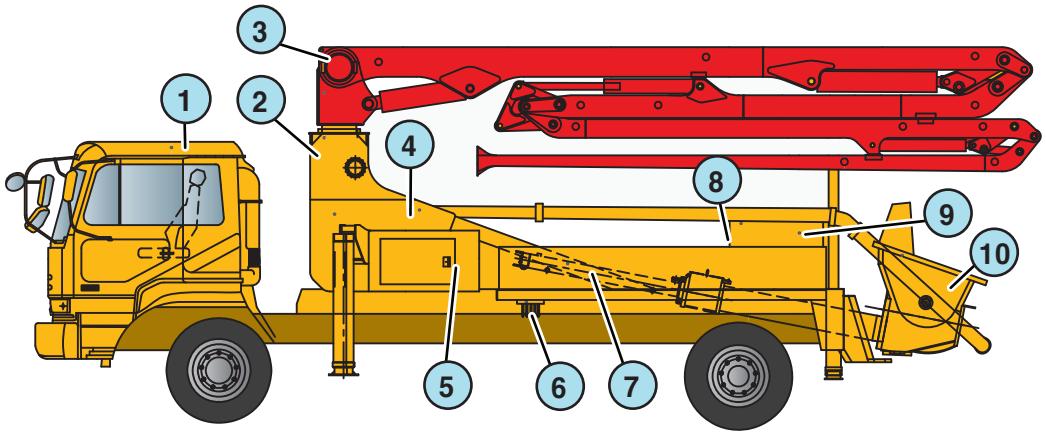


① Cabin	⑥ Main hyraulic cylinder
② Turning base	⑦ Hopper
③ Turning column	⑧ Remocon
④ Outrigger	⑨ Cable (18PX20M)
⑤ Outrigger control valve	

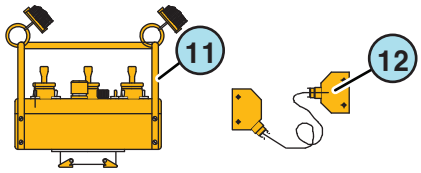


CPCE2031

2.1.3 20M CLASS(2) - Z FOLD 4SECTION (with 2axle & 3axle chassis)

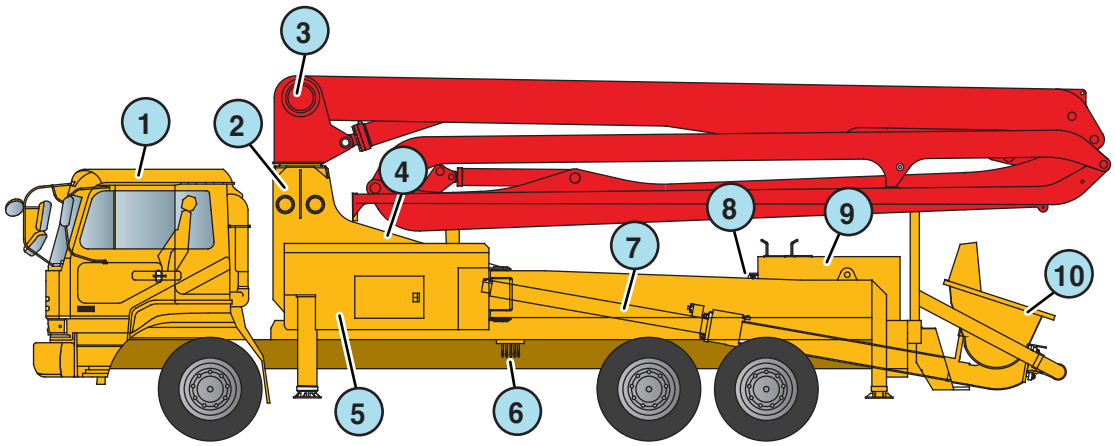


① Cabin	⑦ Main hyraulic cylinder
② Turning base	⑧ Grease tank
③ Turning column	⑨ Water tank
④ Return filter	⑩ Hopper
⑤ Oil tank	⑪ Remocon
⑥ Outrigger control valve	⑫ Cable (30PX40M)

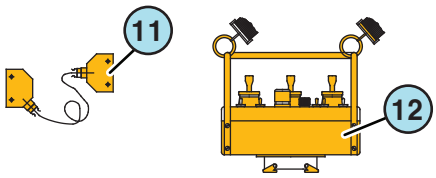


CPCE2032

2.1.4 30M CLASS(1) - ROLL FOLD 4SECTION (with 3axle chassis)

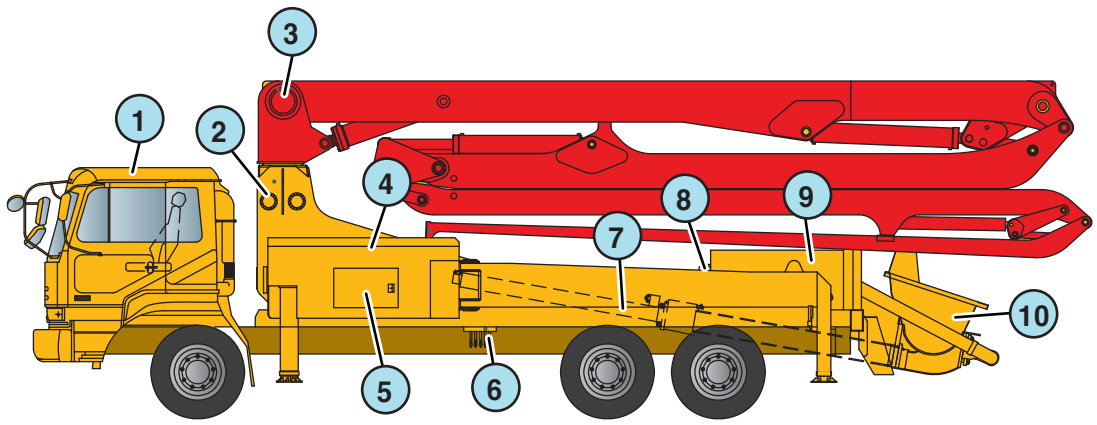


① Cabin	⑦ Main hyraulic cylinder
② Turning base	⑧ Grease tank
③ Turning column	⑨ Water tank
④ Return filter	⑩ Hopper
⑤ Oil tank	⑪ Remocon
⑥ Outrigger control valve	⑫ Cable (30PX40M)

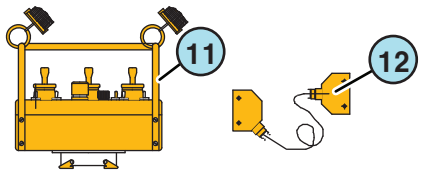


CPCE2002

2.1.5 30M CLASS(2) - Z FOLD 4SECTION (with 3axle chassis)

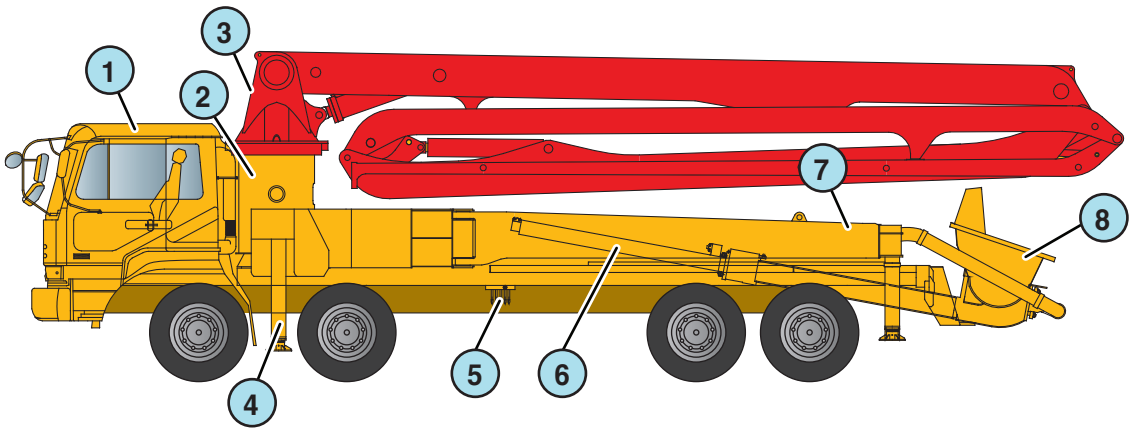


① Cabin	⑦ Main hyraulic cylinder
② Turning base	⑧ Grease tank
③ Turning column	⑨ Water tank
④ Return filter	⑩ Hopper
⑤ Oil tank	⑪ Remocon
⑥ Outrigger control valve	⑫ Cable (30PX40M)

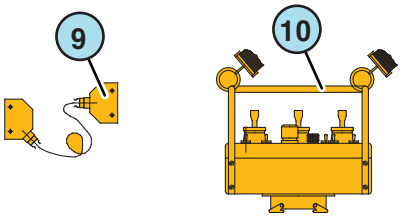


CPCE2033

2.1.6 40M CLASS - C.P.C (Concrete Pump Car)

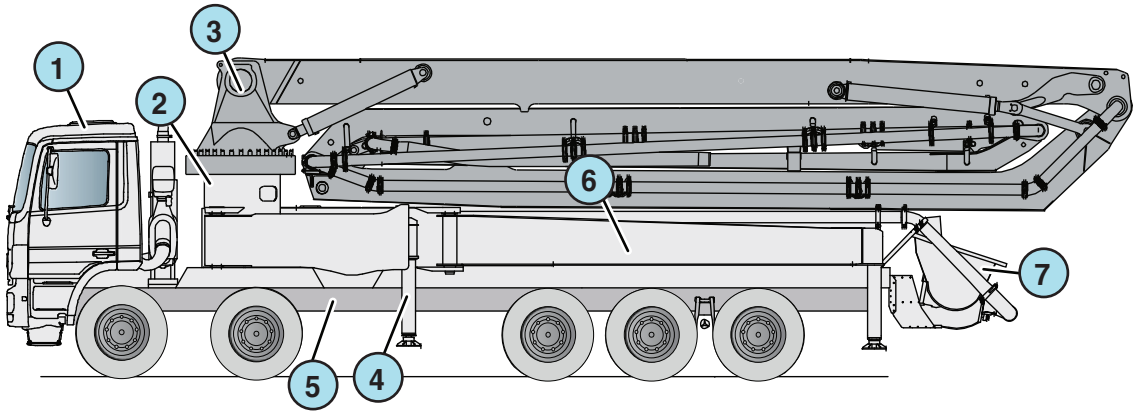


① Cabin	⑥ Main hyraulic cylinder
② Turning base	⑦ Grease tank
③ Turn table	⑧ Hopper
④ Outrigger	⑨ Remocon
⑤ Outrigger control valve	⑩ Cable (32PX40M)

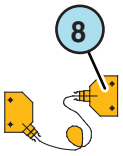


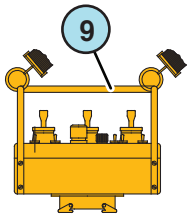
CPCE2003

2.1.7 40M CLASS(2) - ROLL FOLD 4SECTION (with 5axle chassis)



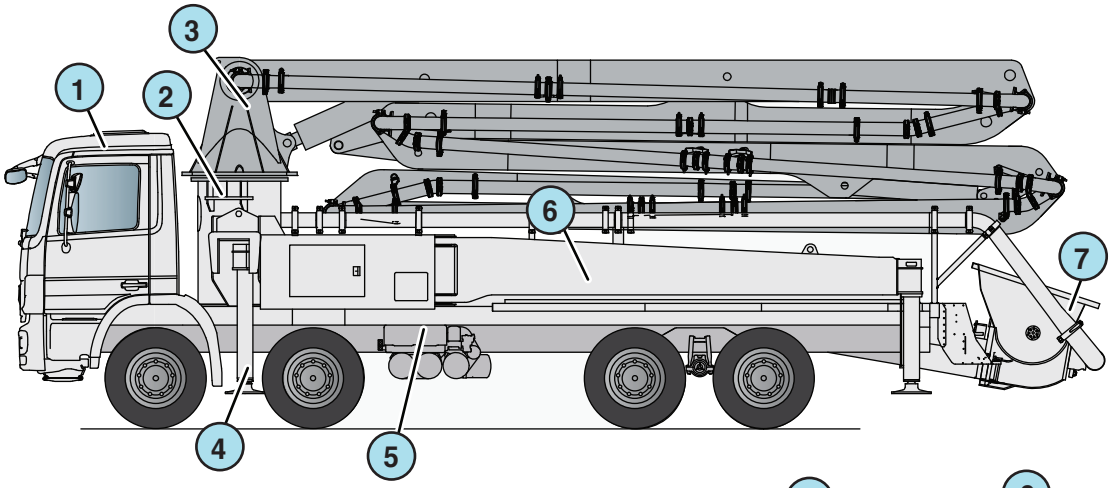
① Cabin	⑥ Main hyraulic cylinder
② Turning base	⑦ Hopper
③ Turn table	⑧ Remocon
④ Outrigger	⑨ Cable (30PX40M)
⑤ Outrigger control valve	



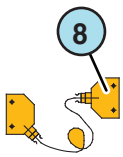


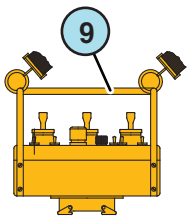
CPCE2034

2.1.8 40M CLASS(3) - Z FOLD 5SECTION(with 4axle chassis)



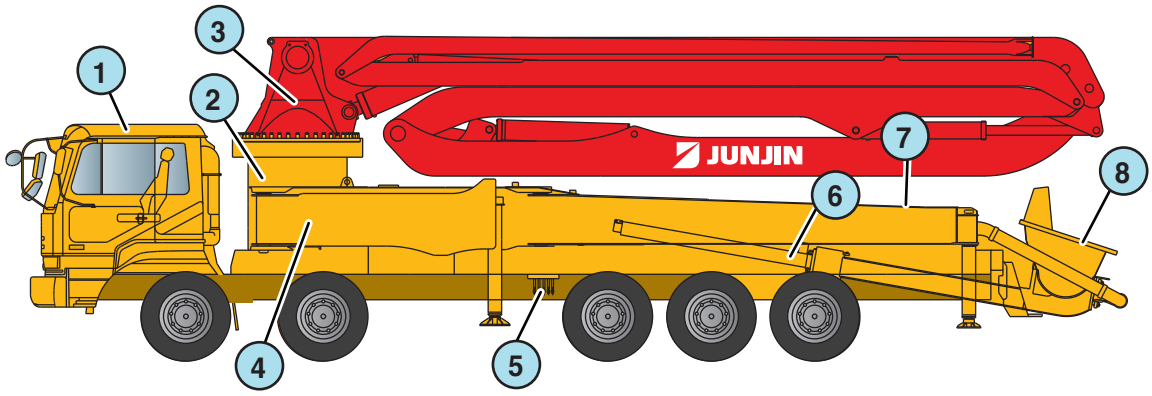
① Cabin	⑥ Main hyraulic cylinder
② Turning base	⑦ Hopper
③ Turn table	⑧ Remocon
④ Outrigger	⑨ Cable (30PX40M)
⑤ Outrigger control valve	

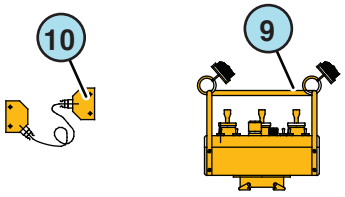




CPCE2035

2.1.9 50M CLASS - ROLL & Z FOLD 5SECTION(with 4axle & 5axle chassis)

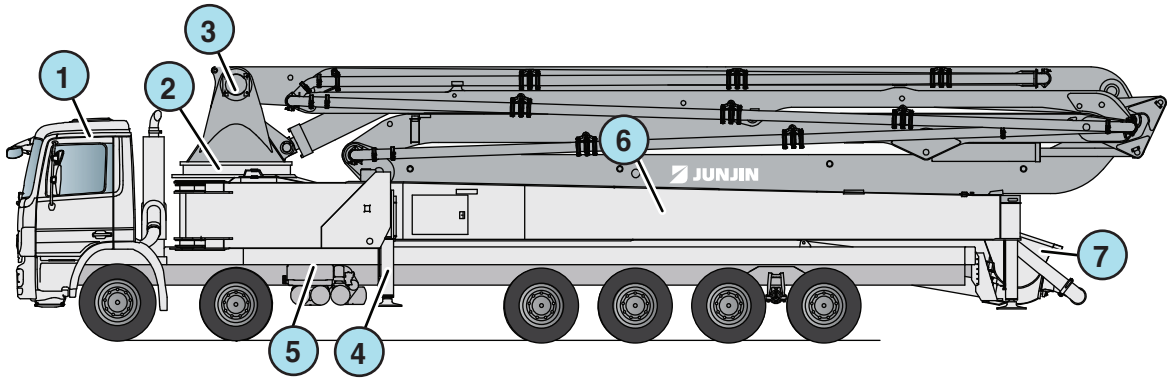


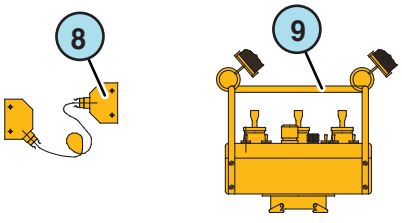


① Cabin	⑥ Main hyraulic cylinder
② Turning base	⑦ Grease tank
③ Turn table	⑧ Hopper
④ Outrigger	⑧ Remocon
⑤ Outrigger control valve	⑨ Cable (32PX40M)

CPCE2004

2.1.10 60M CLASS - ROLL&Z FOLD 5SECTION (6axle chassis)





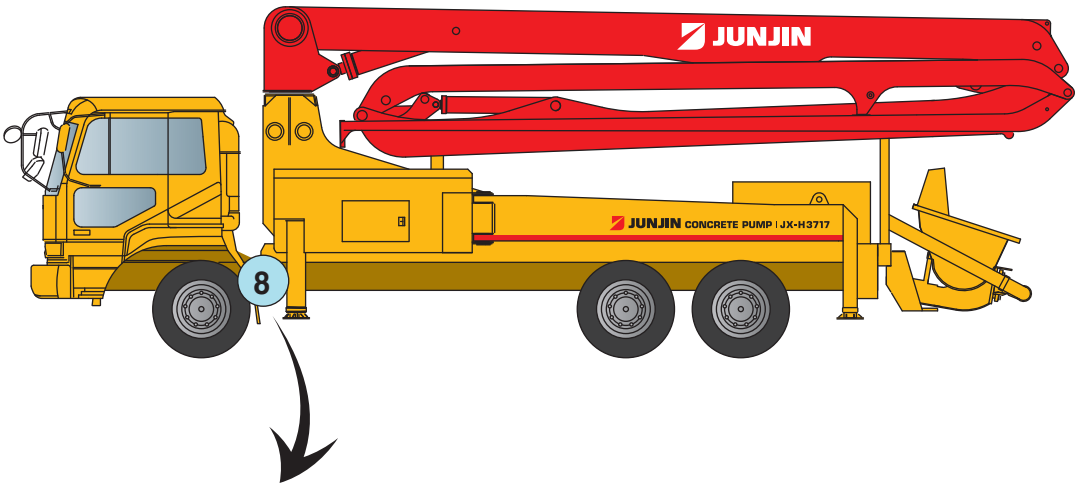
① Cabin	⑥ Main hyraulic cylinder
② Turning base	⑦ Hopper
③ Turn table	⑧ Remocon
④ Outrigger	⑨ Cable (30PX40M)
⑤ Outrigger control valve	

CPCE2036

2.2 Name Plate

2.2.1 Name plate

Name plate is attached onto truck chassis frame and the form is as follows.

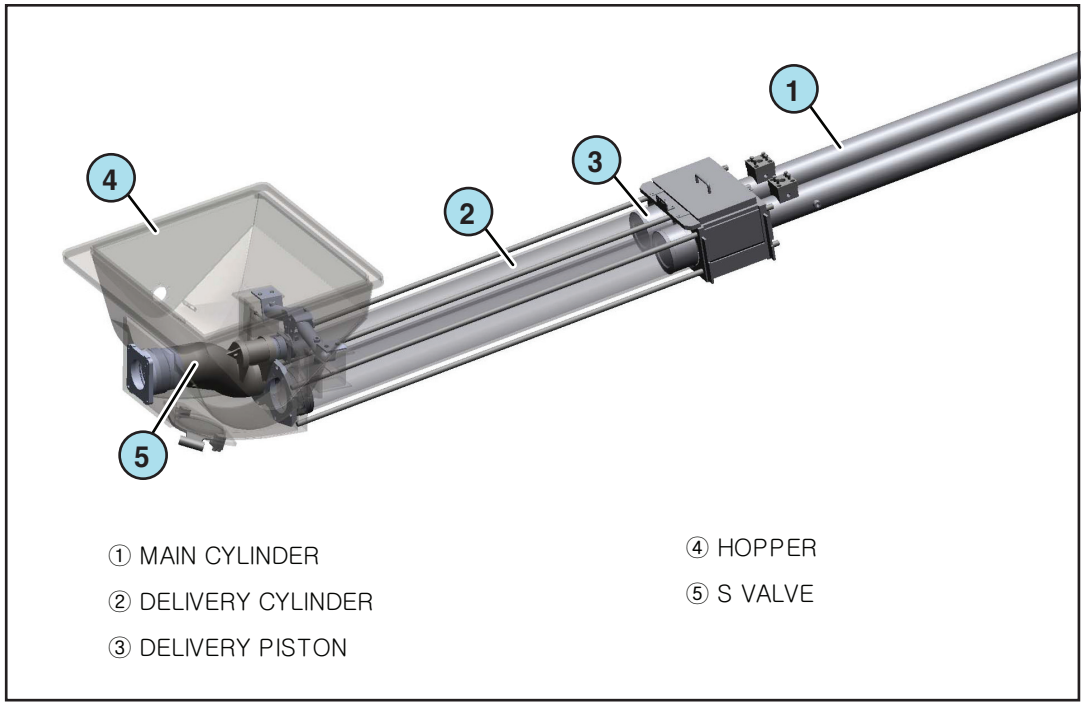


① Model
② Serial no.
③ Year
④ Weight
⑤ Concrete Press.(bar)
⑥ Hyd. press.
⑦ Max.RPM
⑧ location that nameplate is attached

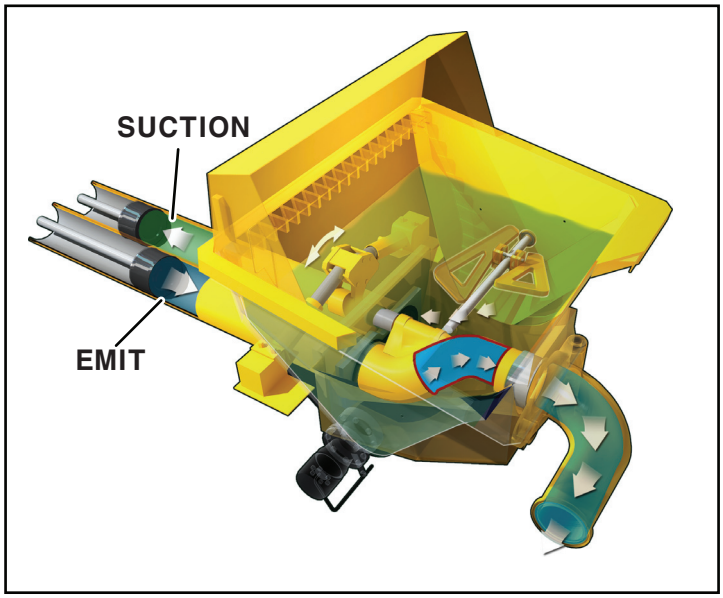
CPCE2005

2.3 Description of pumping system

2.3.1 Pumping system



CPCE2006

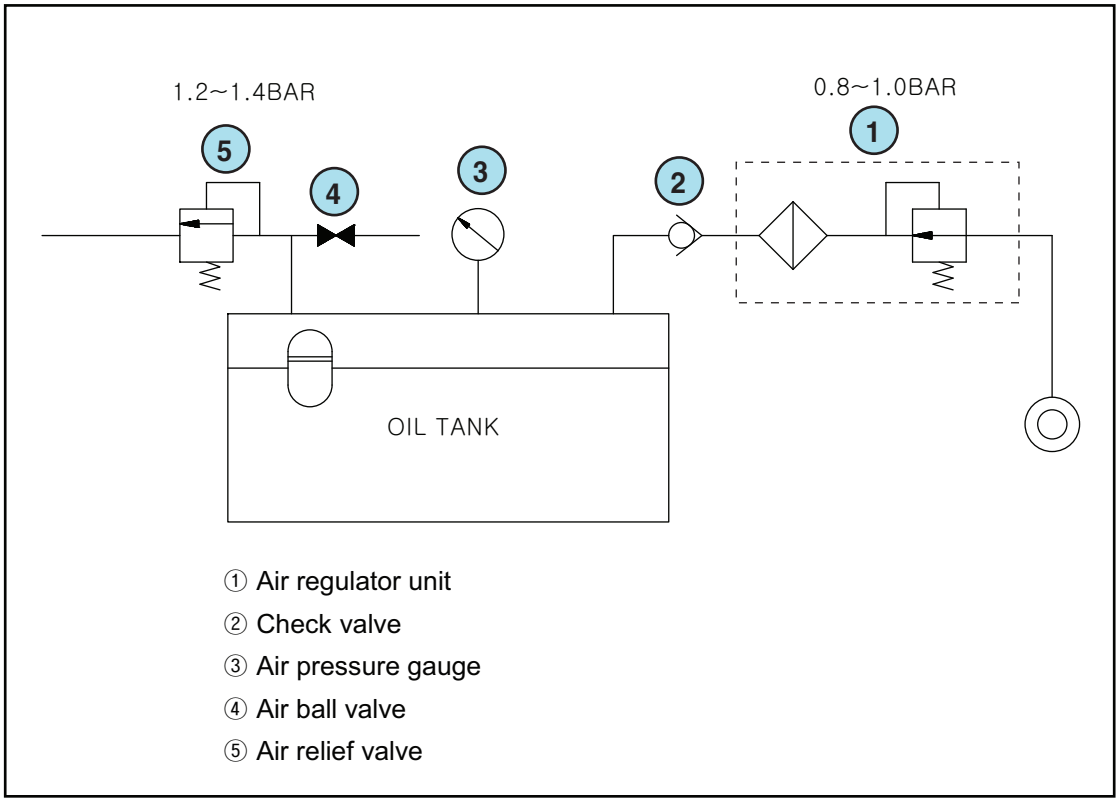


CPCE2007

- JUNJIN PUMPS installed PTO gear box are driven by diesel Engine of the chassis and the hydraulic power of them makes two piston rods(delivery pistons ③) of main cylinders operated in a push-pull mode.
- The concrete to be loaded are directly sucked from the hopper as one delivery piston runs backwards while the other pushes the sucked concrete via the s-valve. Two delivery pistons and s-valve switch over at the end of stroke. And if the "back pumping switch" is switched on the pushed concrete is sucked back through the s-valve by changing the push-direction of delivery piston to the pull-direction at once in the middle of a stroke without the s-valve switching over and the concrete sucked back through the s-valve switching over is conveyed into the hopper in a push-pull operation of delivery pistons without any interruption.
- The output can be regulated from the minimum to the maximum according to the hardness and slump of concrete.

2.4 Control devices

2.4.1 Air pressing circuit



CPCE2008

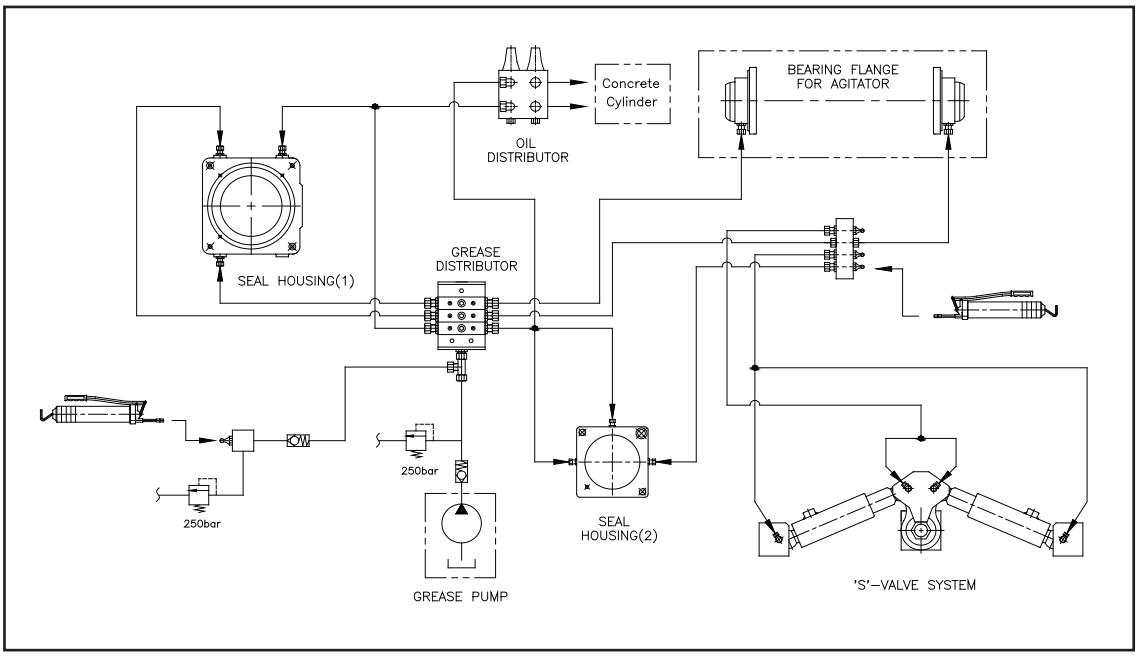
- To bring a good suction efficiency at suction ports of hydraulic pumps and to get out air bubbles made by hydraulic flow from oil tank, system is like about.

- Make sure to close the " ④ air ball valve before the operation and confirm air pressure of 0.8 ~ 1.0bar with pressure gauge.

⚠ CAUTION

- If you operate hydraulic pumps on the opening of "air ball valve", air bubbles into oil tank can lead to the cavitation and the breakage of hydraulic pumps.
- Ensure to open "air ball valve" and drain the air out of oil tank after operation or for maintenance.

2.4.2 Automatic greasing system



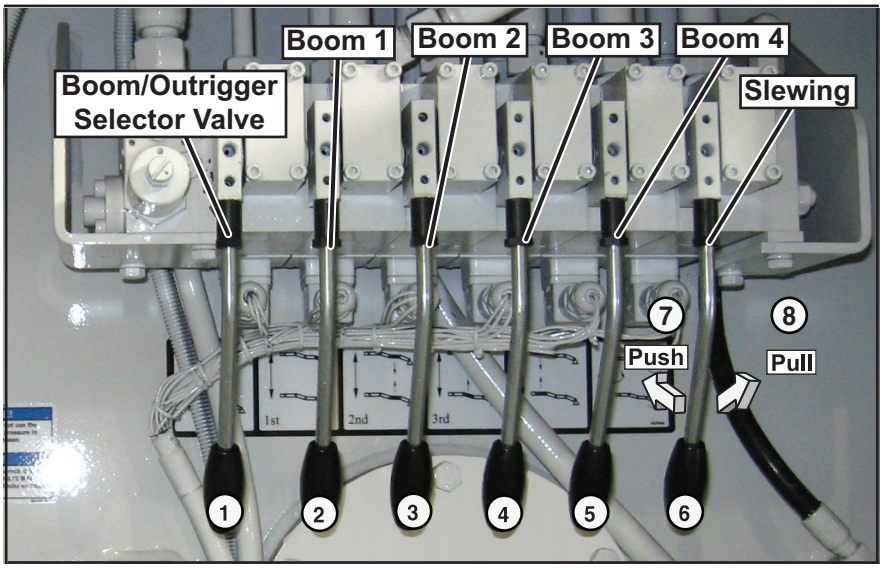
CPCK2009

⚠ CAUTION

- The operator should check whether grease with is being extruded to the outside of the greased parts after cleaning the inside of hopper with the pressurized water. The pumping of about 5 minutes should be done after the water cleaning.
- If the grease doesn't automatically come out to the inside of the greased points, the manual greasing should be done in to grease nipple with a grease gun.
- If the grease doesn't come out with the manual greasing, this means There are some parts damaged (bushings / o-rings / seals) or the malfunction of the "Grease lubricant" or the blockage of the greasing lines. At that time, please replace the troubled parts asap.
- If the grease isn't extruded from hearing flange the shaft of s-valve might be damaged

2.4.3 Control valve for boom function

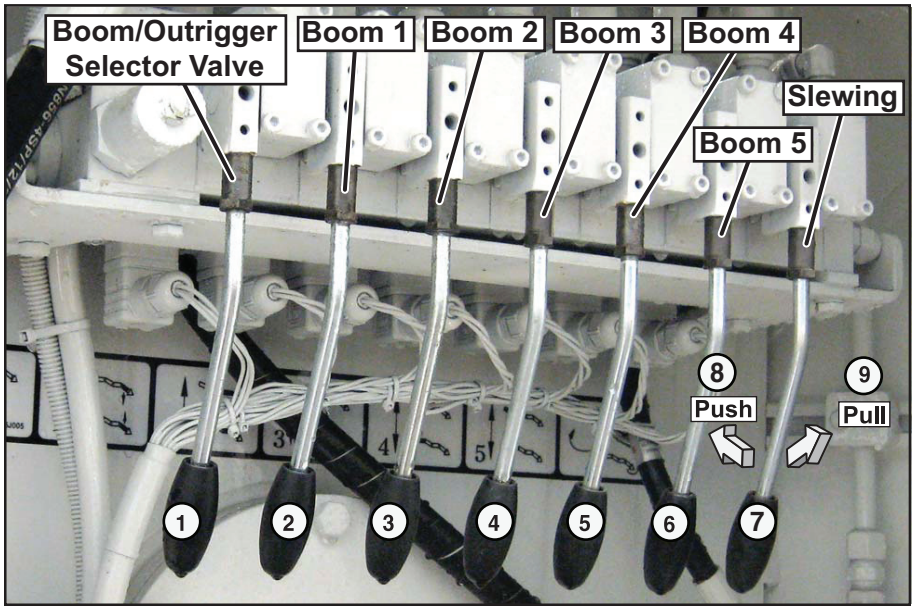
• 4 Section boom



CPCE2010

① Outrigger/boom function : ON-OFF
② Arm1 : UP - DOWN
③ Arm2 : UP - DOWN
④ Arm3 : UP - DOWN
⑤ Arm4 : UP - DOWN
⑥ Swing : Clockwise-Anticlockwise
⑦ Up : Clock wise
⑧ Down : Anti clock wise

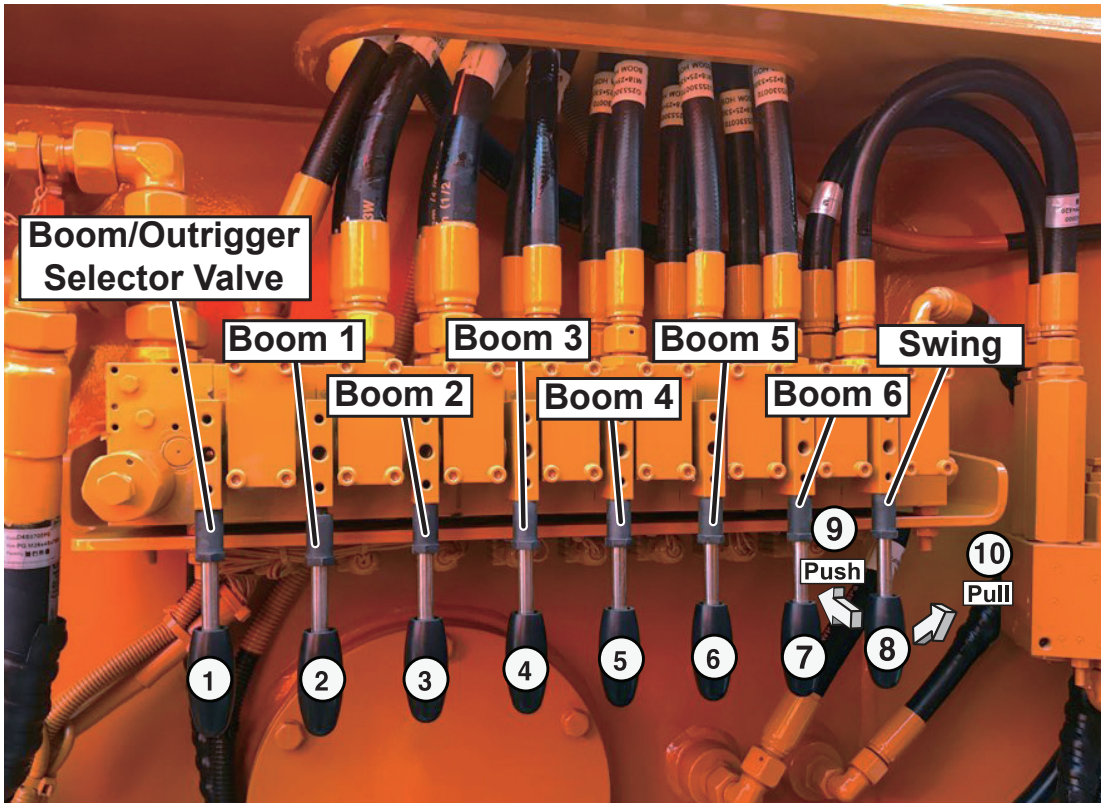
• 5 Section boom



CPCE2011

① Outrigger/boom function : ON-OFF
② Arm1 : UP - DOWN
③ Arm2 : UP - DOWN
④ Arm3 : UP - DOWN
⑤ Arm4 : UP - DOWN
⑥ Arm5 : UP - DOWN
⑦ Swing : Clockwise-Anticlockwise
⑧ Up : Clock wise
⑨ Down : Anti clock wise

• 6 Section boom

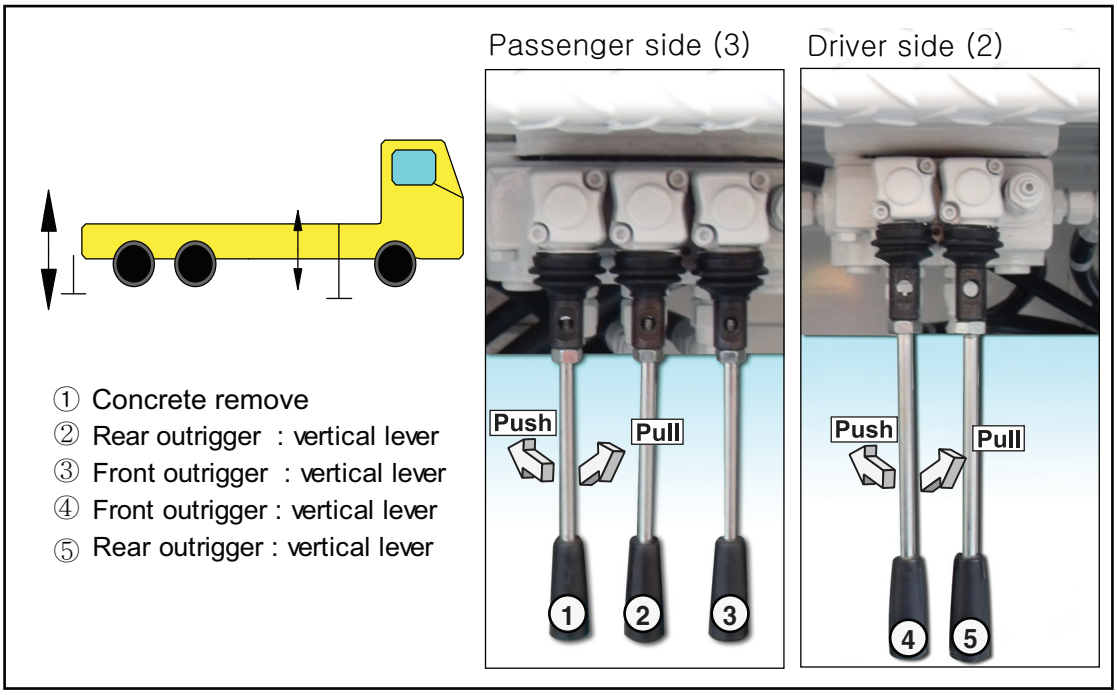


CPCK2031

① Outrigger/boom function : ON-OFF
② Arm1 : UP - DOWN
③ Arm2 : UP - DOWN
④ Arm3 : UP - DOWN
⑤ Arm4 : UP - DOWN
⑥ Arm5 : UP - DOWN
⑦ Arm6 : UP - DOWN
⑧ Swing : Clockwise-Anticlockwise
⑨ Up : Clock wise
⑩ Down : Anti clock wise

2.4.4 Outrigger control valve

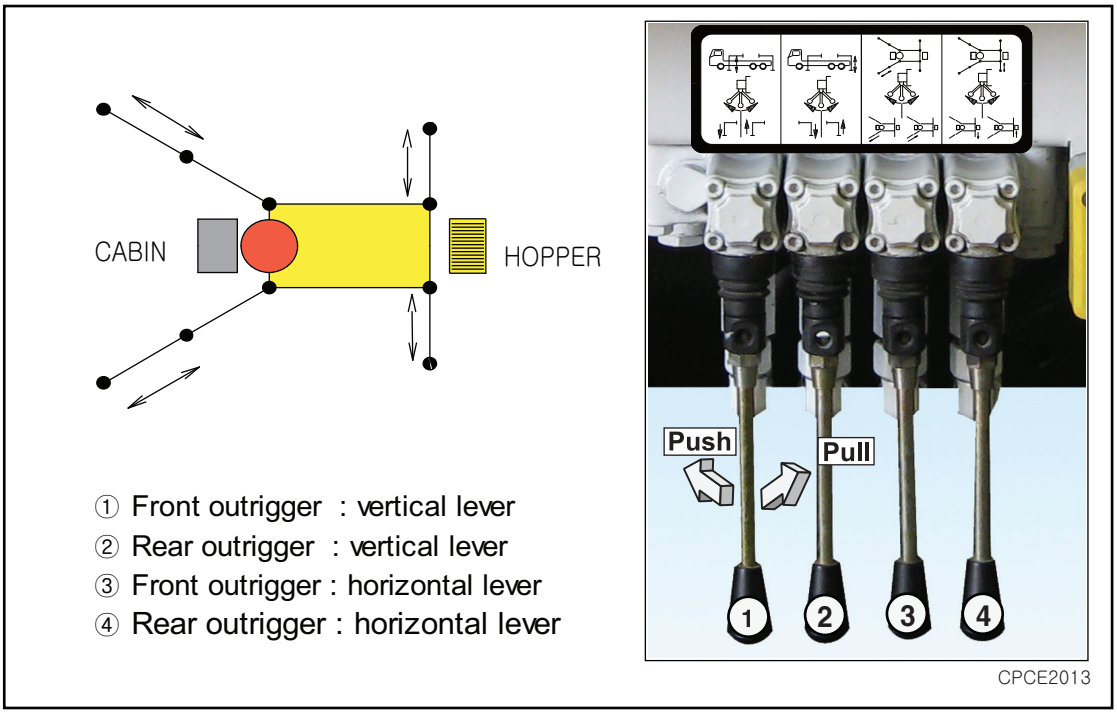
• 1type



① Concrete remove
② Rear outrigger : vertical lever
③ Front outrigger : vertical lever
④ Front outrigger : vertical lever
⑤ Rear outrigger : vertical lever

CPCE2012

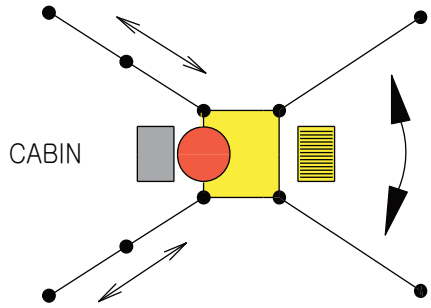
• 2Type



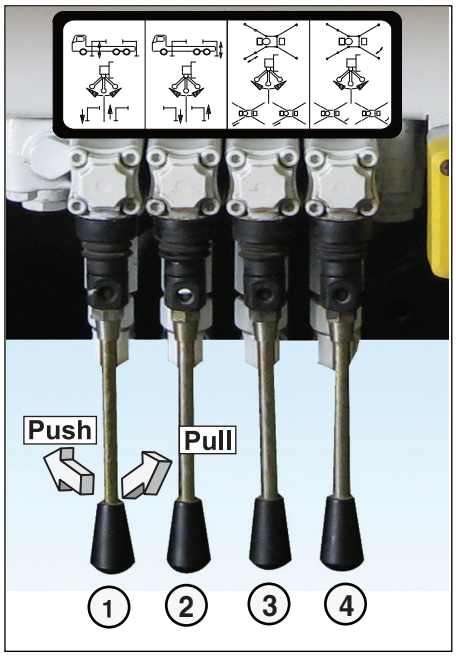
① Front outrigger : vertical lever
② Rear outrigger : vertical lever
③ Front outrigger : horizontal lever
④ Rear outrigger : horizontal lever

CPCE2013

• 3Type

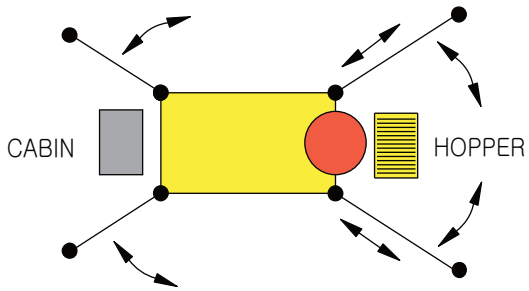


① Front outrigger : vertical lever
② Rear outrigger : vertical lever
③ Front outrigger : horizontal lever
④ Rear outrigger : swing lever

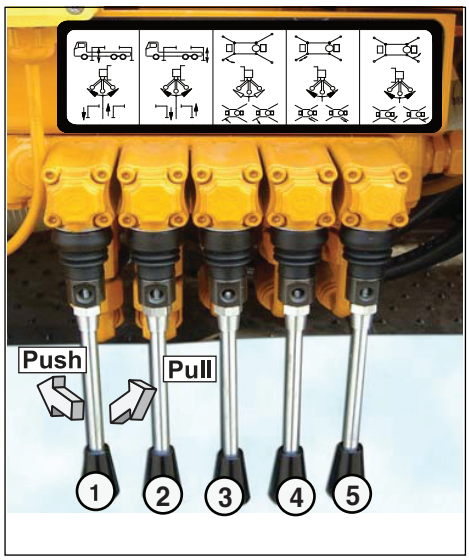


CPCE2014

• 4Type

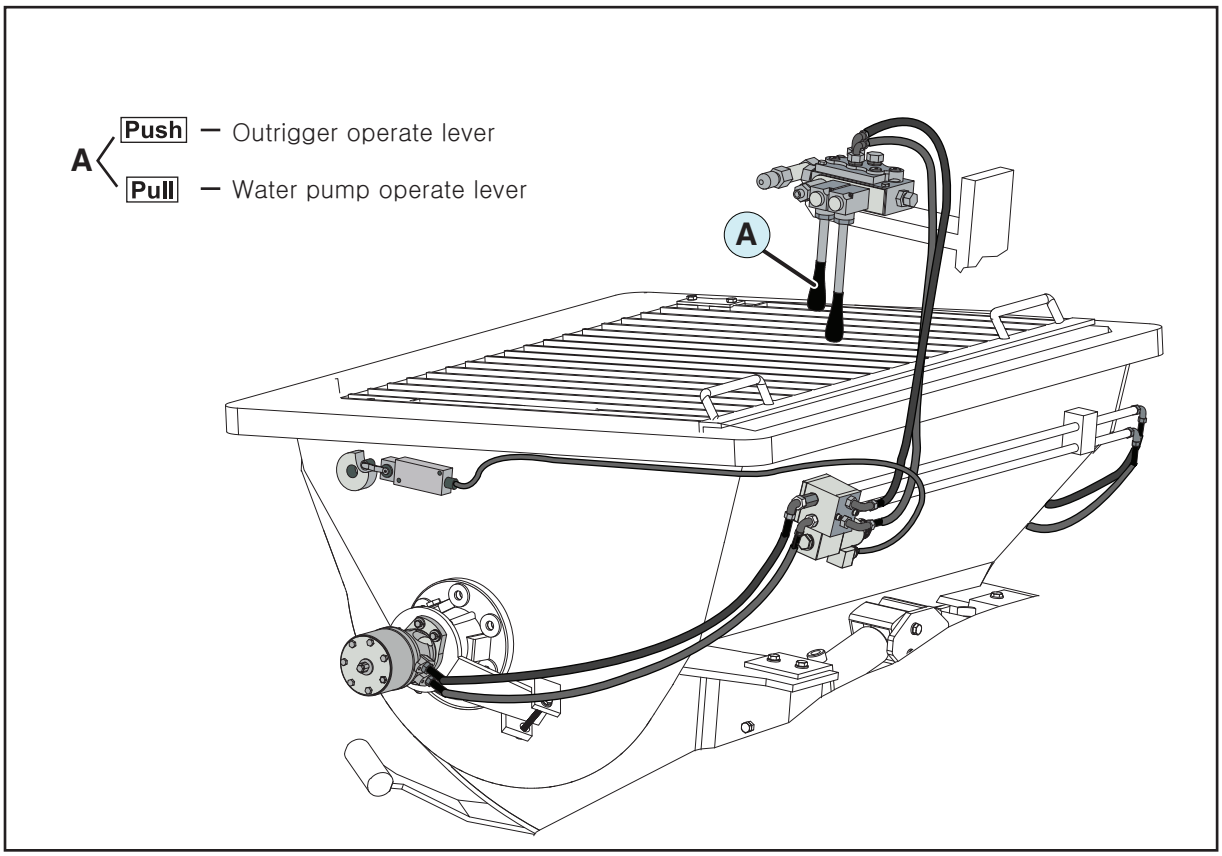


① Front outrigger : vertical lever
② Rear outrigger : vertical lever
③ Front outrigger : swing lever
④ Front outrigger : horizontal lever
⑤ Rear outrigger : swing lever



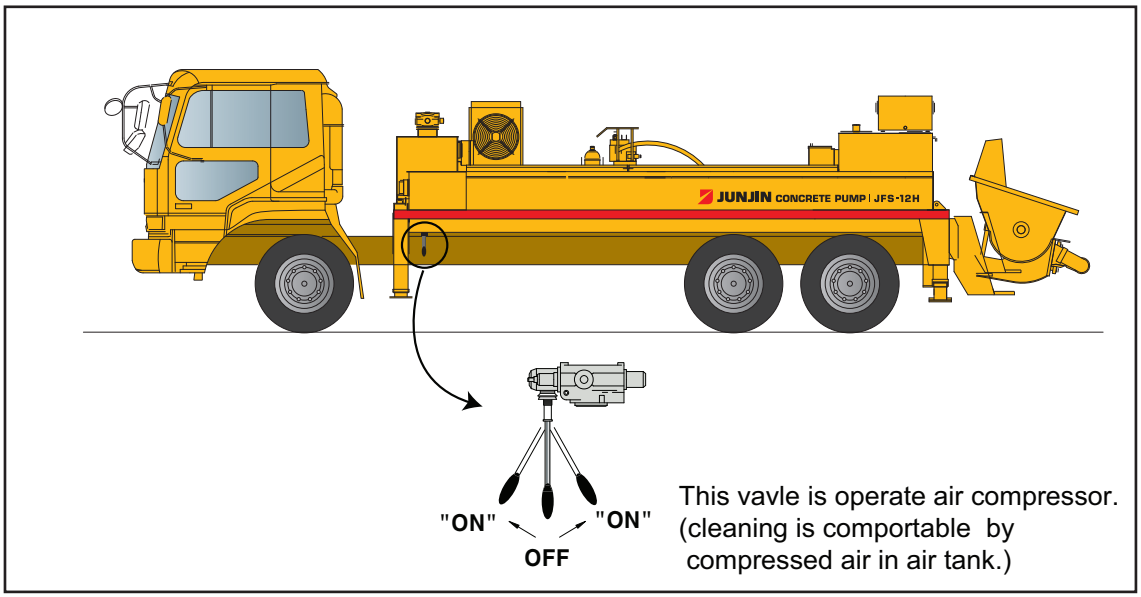
CPCE2015

2.4.5 Control valve for agitator/water pump & outrigger



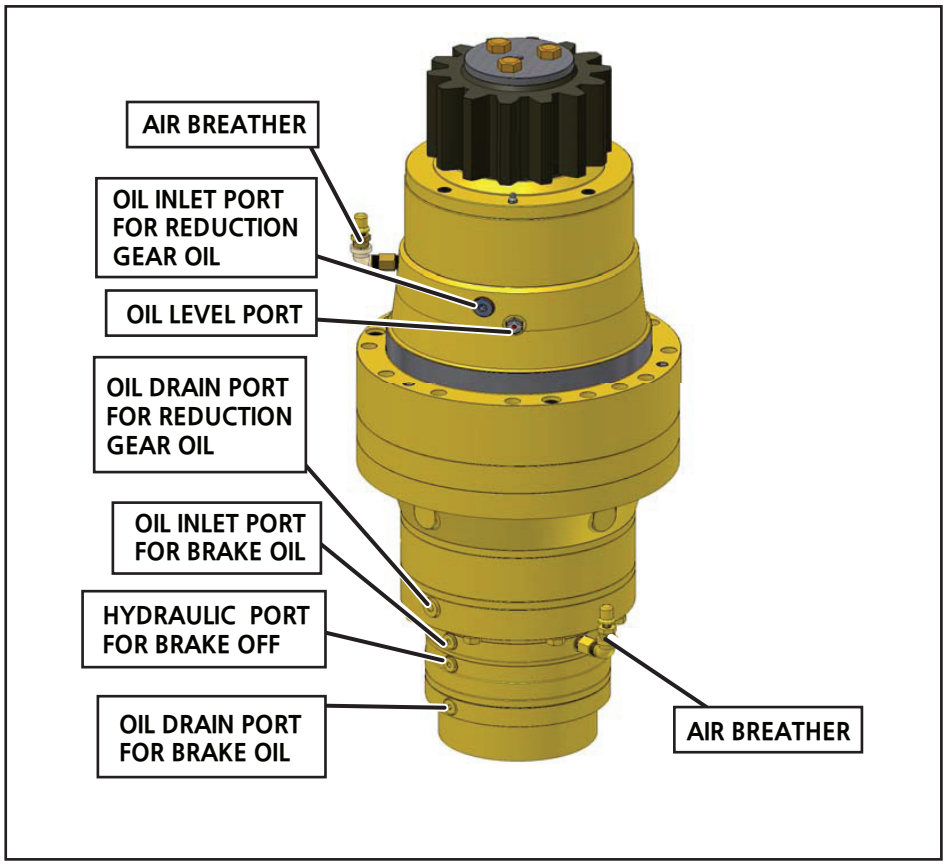
CPCE2016

2.4.6 Control valve for air compressor



CPCE2017

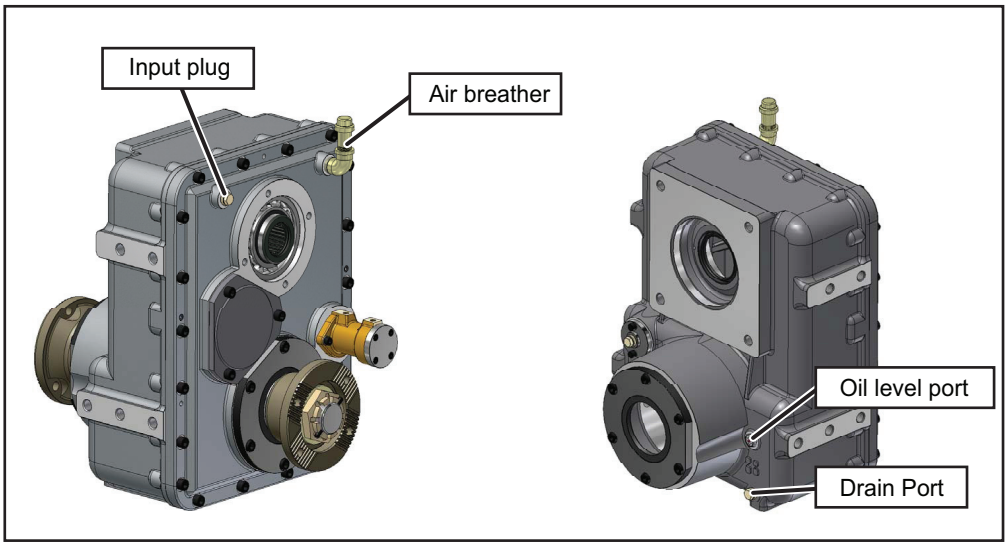
2.4.7 Reduction gear



CPCE2018

• Be sure to check the gear oil filled up to maked line of oil level gauge

2.4.8 PTO GEAR BOX

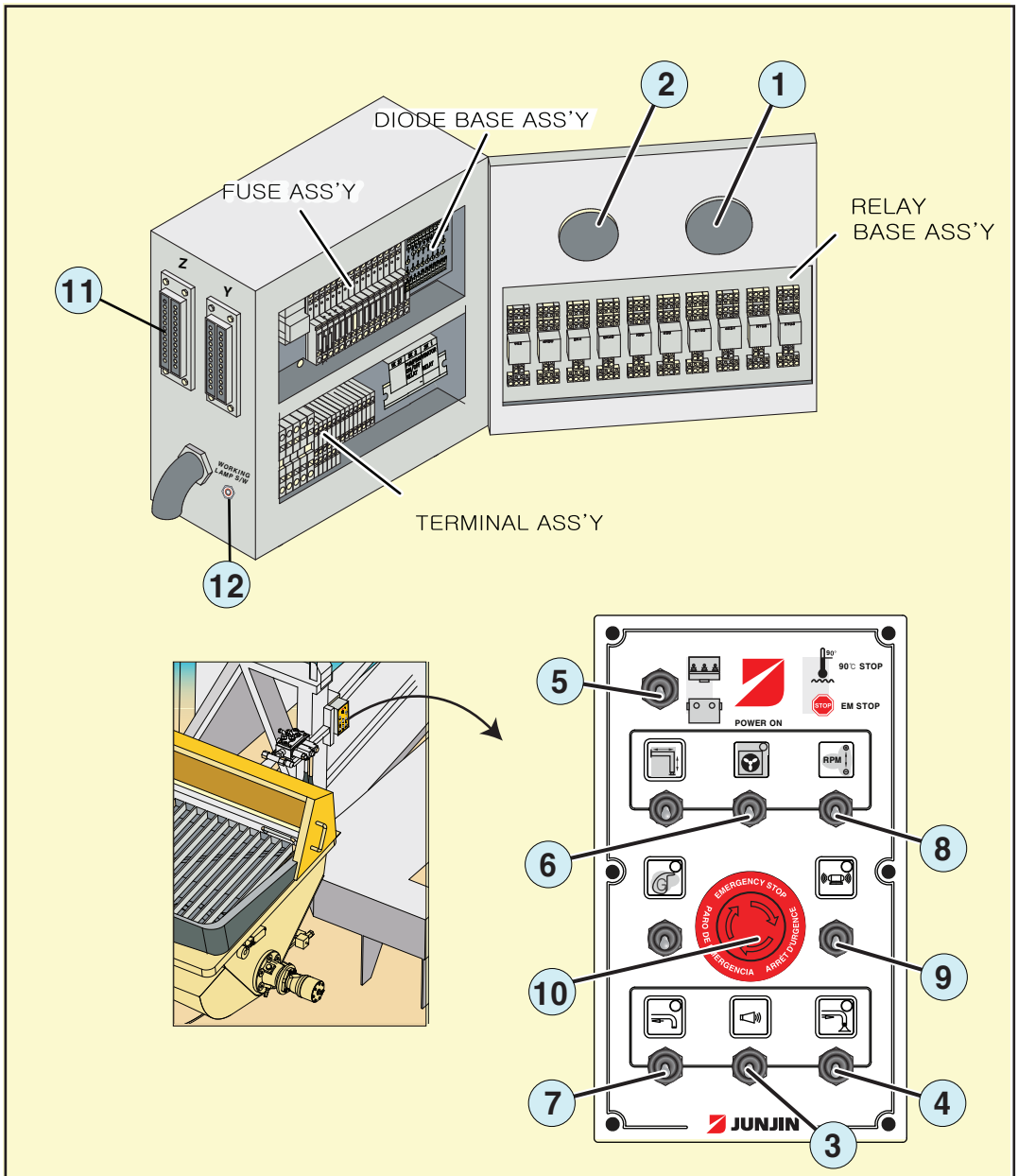


CPCE2019

• Be sure to check the gear oil filled up to maked line of oil level gauge

2.5 Electric control device

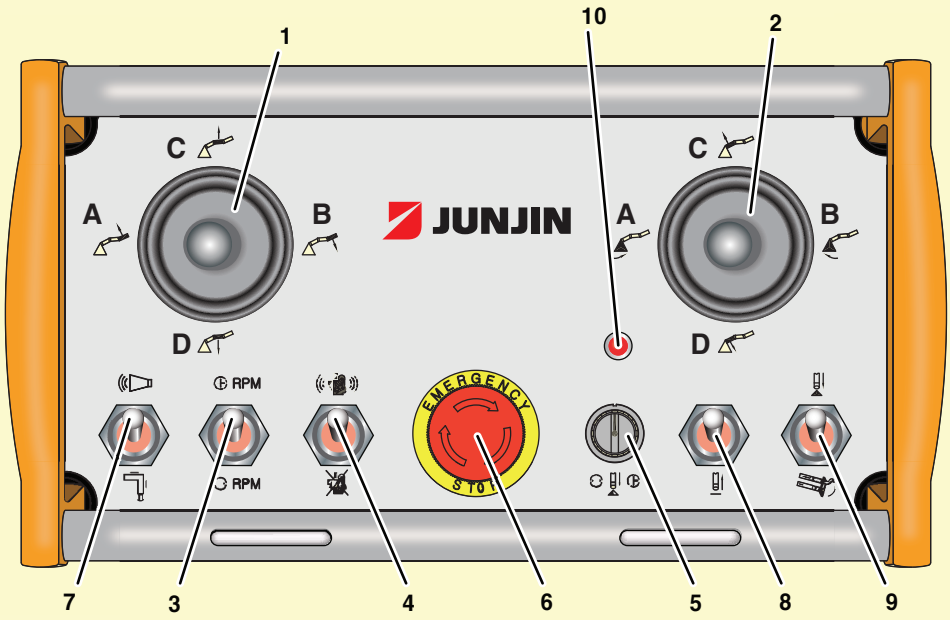
2.5.1 Control panel for Boom car



1. Working hour meter
2. Thermometer
3. Horn switch : ON - "OFF"
4. Pumping switch : ON - "OFF"
5. Selector switch : panel-remocon
6. Oil Cooler switch : ON - "OFF"
7. Back pumping switch : ON - "OFF"
8. Engine speed control switch : ON - "OFF"
9. Vibrator switch : ON - "OFF"
10. Emergency shot-down button
11. Connector receptacle
12. Working - lamp : ON - "OFF"

CPCE2020

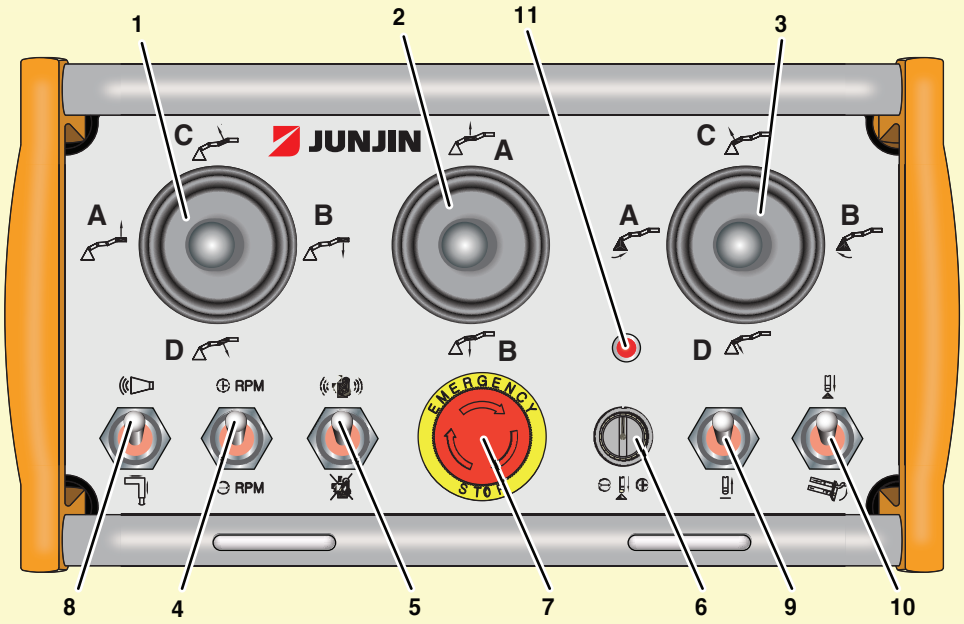
2.5.2 Radio remote control - 1Type (3 Section Boom Machine)



1. Boom control lever
   A : Unfolding boom section 3 B : folding boom section 3
   C : Unfolding boom section 2 D : folding boom section 2
2. Boom control lever
   A : Slewing to the left B : Slewing to the right
   C : Lifting boom section 1 D : Lowering boom section 1
3. Engine speed control switch : + increase / - reduce
4. Engine stop / start switch : ON - "OFF" - ON
5. Output adjustment switch : + increase / - reduce
6. Emergency shot-down button : PUSH " ON - OFF "
7. Horn switch : ON - "OFF"
8. Back pumping switch : ON - "OFF"
9. Pumping switch : ON - "OFF" - ON
10. Green indicator lamp : pumping

CPCE2022

2.5.3 Radio remote control - 2Type (4 Section Boom Machine)



1. Boom control lever
   A : Unfolding boom section 4 B : folding boom section 4
   C : Unfolding boom section 3 D : folding boom section 3

2. Boom control lever
   A : Unfolding boom section 2 B : folding boom section 2

3. Boom control lever
   A : Slewing to the left B : Slewing to the right
   C : Lifting boom section 1 D : Lowering boom section 1

4. Engine speed control switch : + increase / - reduce

5. Engine stop / start switch : ON - "OFF" - ON

6. Output adjustment switch : + increase / - reduce

7. Emergency shot-down button : PUSH " ON - OFF "

8. Horn switch : ON - "OFF"

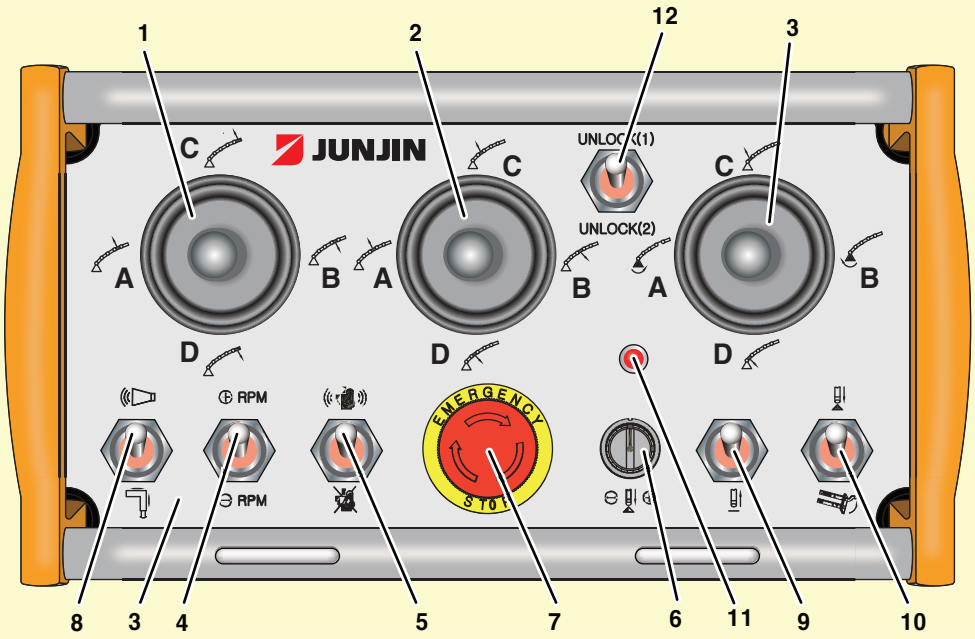
9. Back pumping switch : ON - "OFF"

10. Pumping switch : ON - "OFF" - ON

11. Green indicator lamp : pumping

CPCE2030

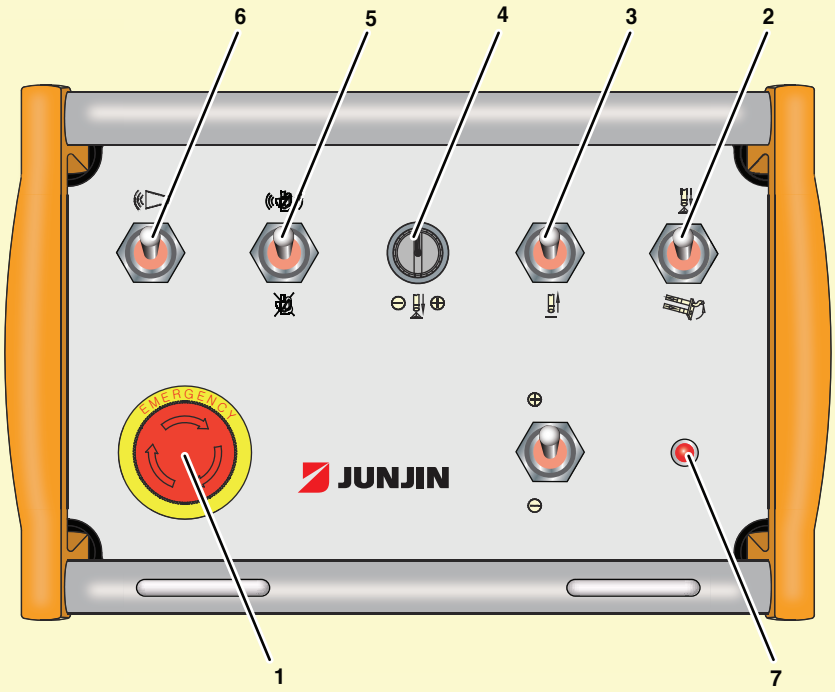
2.5.4 Radio remote control - 3Type (5 Section Boom Machine)



1. Boom control lever
   - A : Unfolding boom section 4
   - B : folding boom section 4
   - C : Unfolding boom section 5
   - D : folding boom section 5
2. Boom control lever
   - A : Unfolding boom section 3
   - B : folding boom section 3
   - C : Unfolding boom section 2
   - D : folding boom section 2
3. Boom control lever
   - A : Slewing to the left
   - B : Slewing to the right
   - C : Lifting boom section 1
   - D : Lowering boom section 1
4. Engine speed control switch : + increase / - reduce
5. Engine stop / start switch : ON - "OFF" - ON
6. Output adjustment switch : + increase / - reduce
7. Emergency shot-down button : PUSH " ON - OFF "
8. Horn switch : ON - "OFF"
9. Back pumping switch : ON - "OFF"
10. Pumping switch : ON - "OFF" - ON
11. Green indicator lamp : pumping
12. Unlock(1) / Unlock(2) switch : ON - "OFF"

CPCE2023

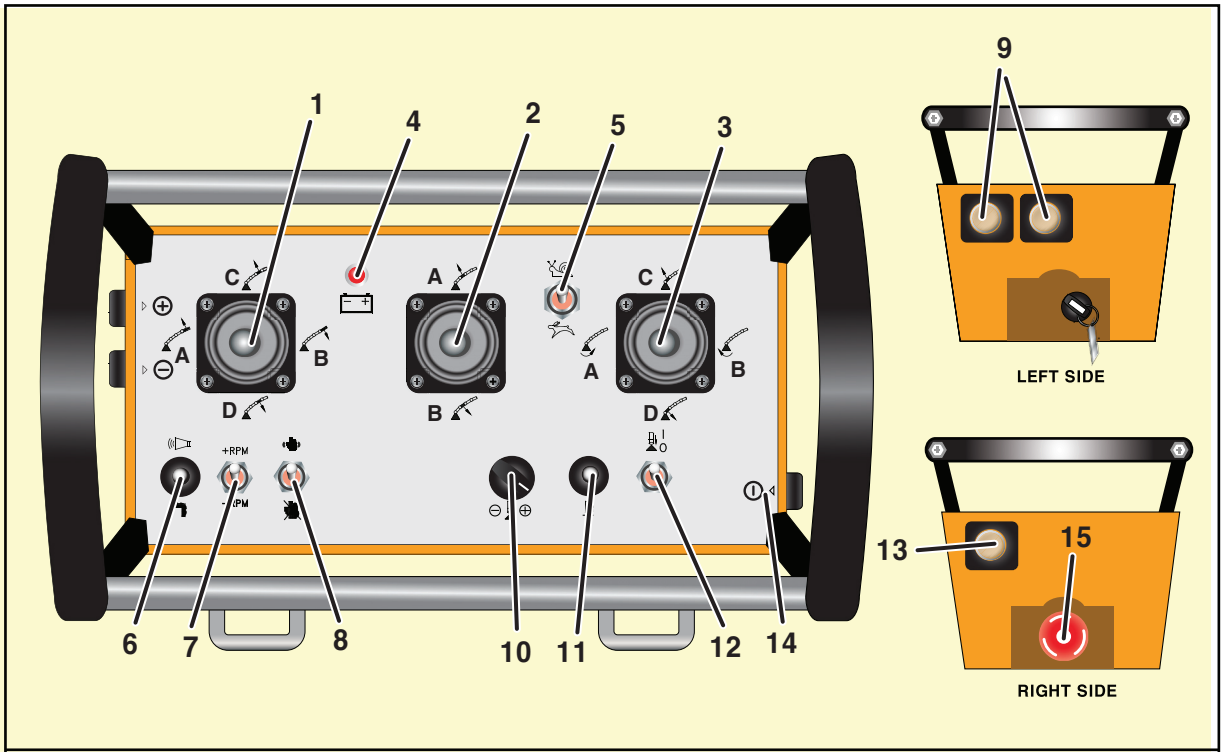
2.5.5 Radio remote control - 4Type (MOLI)



1. Emergency shot-down button : PUSH " ON - OFF "
2. Pumping switch : ON - "OFF" - ON
3. Back pumping switch : ON - "OFF"
4. Output adjustment switch : + increase / - reduce
5. Engine stop / start switch : ON - "OFF" - ON
6. Horn switch : ON - "OFF"
7. Green indicator lamp : pumping

CPCE2024

2.5.6 Remote control box- 1Type (4 Section Boom Machine)



1. Boom control lever

   A : Unfolding boom section 4 B : folding boom section 4
   C : Unfolding boom section 3 D : folding boom section 3

2. Boom control lever

   A : Unfolding boom section 2 B : folding boom section 2

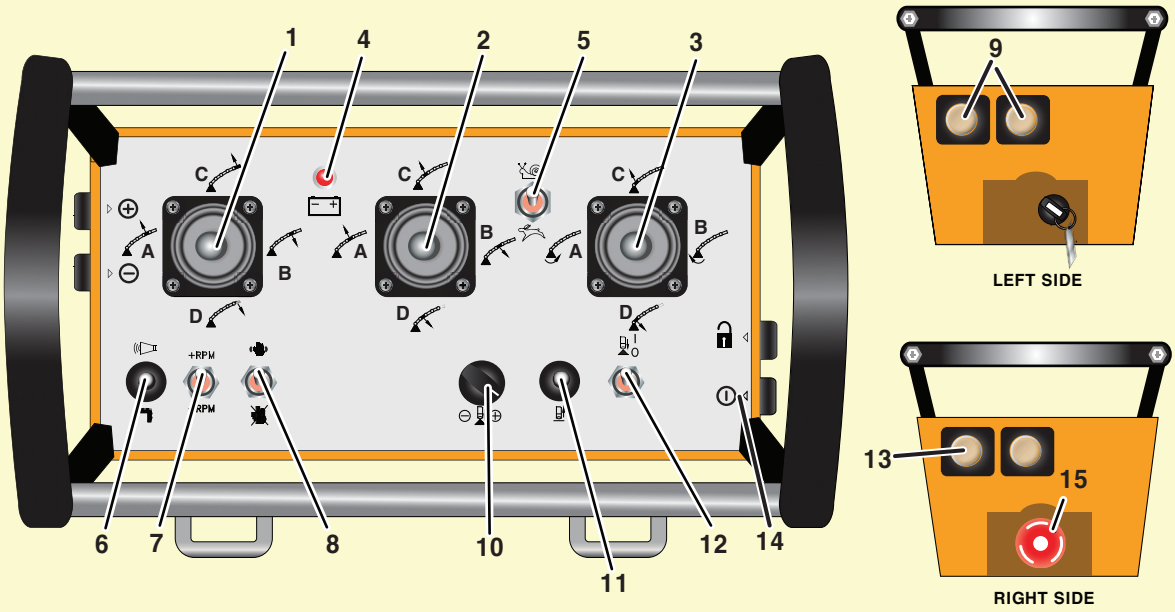
3. Boom control lever

   A : Slewing to the left B : Slewing to the right
   C : Lifting boom section 1 D : Lowering boom section 1

4. Red indicator lamp : battery change
5. Boom speed control switch : snail-hare
6. Horn-outrigger switch : "horn" - boom - "outrigger"
7. Engine speed control switch : + Increase / - reduce
8. Engine stop / start switch : ON - "OFF"
9. Radio channel scanner switch : 4-chammels
10. Output adjustment switch : + increase / - reduce
11. Back pumping system : ON -"OFF"
12. Pumping switch : ON - "OFF" - ON
13. Radio remote control stop : PUSH "ON - OFF"
14. Red indicator lamp : radio remote control
15. Emergency shot-down button : PUSH "ON - OFF"

CPCE2026

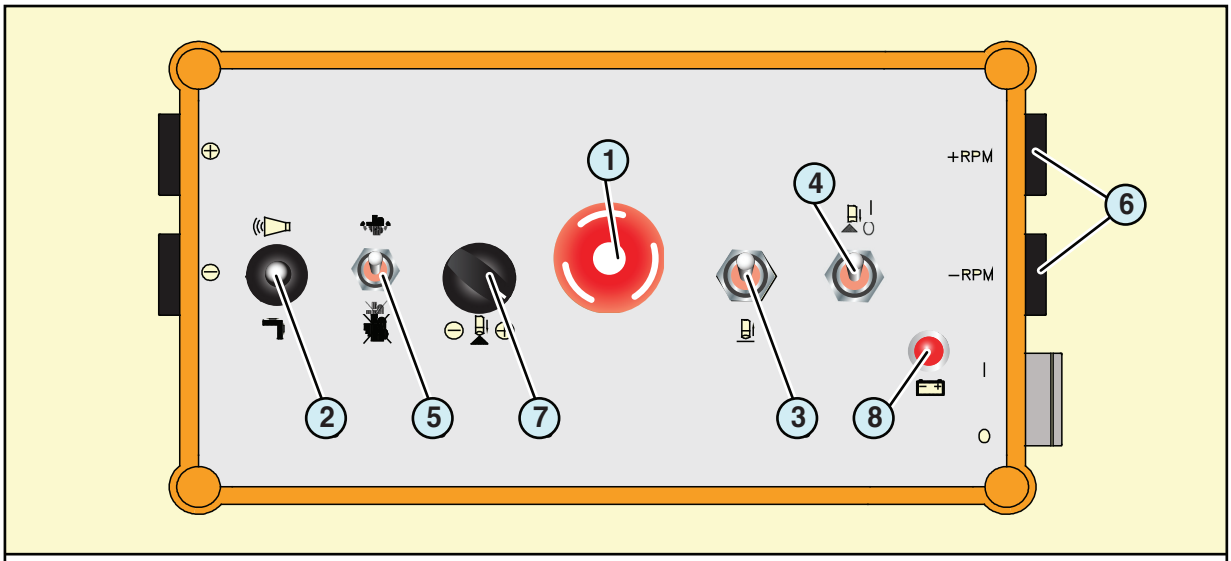
2.5.7 Remote control box - 2Type (5 Section Boom Machine)



1. Boom control lever
   A : Unfolding boom section 4 B : folding boom section 4
   C : Unfolding boom section 5 D : folding boom section 5
2. Boom control lever
   A : Unfolding boom section 3 B : folding boom section 3
   C : Unfolding boom section 2 D : folding boom section 2
3. Boom control lever
   A : Slewing to the left B : Slewing to the right
   C : Lifting boom section 1 D : Lowering boom section 1
4. Red indicator lamp : battery change
5. Boom speed control switch : snail-hare
6. Horn-outrigger switch : "horn" - boom - "outrigger"
7. Engine speed control switch : + Increase / - reduce
8. Engine stop / start switch : ON - "OFF"
9. Radio channel scanner switch : 4-chammels
10. Output adjustment switch : + increase / - reduce
11. Back pumping system : ON -"OFF"
12. Pumping switch : ON - "OFF" - ON
13. Radio remote control stop : PUSH "ON - OFF"
14. Red indicator lamp : radio remote control
15. Emergency shot-down button : PUSH "ON - OFF"

CPCE2027

2.5.8 Remote control box - 3Type(MOLI)

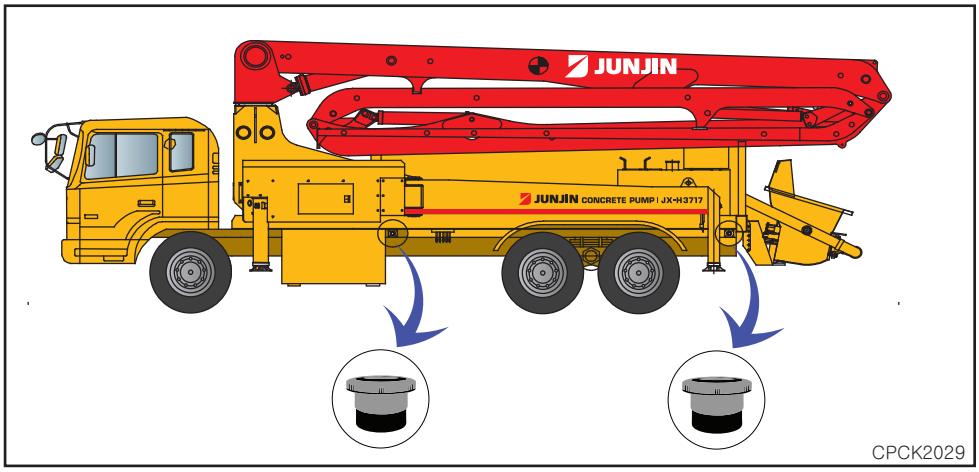


1. Emergency shot-down button : PUSH "ON - OFF"
2. Horn-outrigger switch : "horn" - boom - "outrigger"
3. Back pumping system : ON -"OFF"
4. Pumping switch : ON - "OFF" - ON
5. Engine stop / start switch : ON - "OFF"
6. Engine speed control switch : + Increase / - reduce
7. Output adjustment switch : + increase / - reduce
8. Green indicator lamp : pumping

CPCE2028

2.5.9 Additional "Emergency shut-down"

• These two buttons are installed next to the "control valve-outrigger" for the emergent situation. When the "emergency shut-down button" is pushed down, the pumping operation should be stopped and the Engine speed should be reduced automatically.



운전 조작

OPERATION

03

3.1 Power-Take-On/Off

3.1.1 Trial run of the pumping (Power-Take-On/Off)

• The power-take-off procedure and functional checks before starting work on the constructionist site should be done as follows.

▶ In case of vehicles of the full air brake

① Check water, oil and fuel level and fill these up as necessary.

② Turn ignition key to acc. position.

③ Wait for few minutes until the air pressure on the gauge is reached to above 7.8kg/㎠.

④ Confirm the gear in neutral position and engage the parking brake button.

⑤ Press the clutch pedal down and engage the P.T.O switch button.

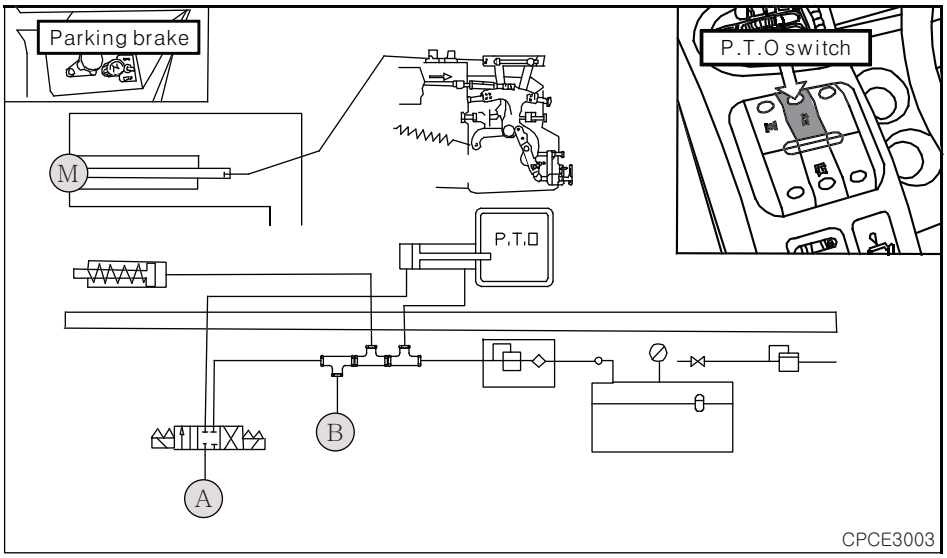
⑥ Engage the gear to the 5th position.

⑦ Release the clutch pedal so slowly and carefully.

• The increasing and decreasing of engine speed by the movement of accelerator pedal can not be controlled and the control of engine speed is possible by the actuating of "electric actuator" through the control panel and remote control.

• Before driving off, make sure to check whether the P.T.O and parking brake are disengaged.

< Conception diagram for P.T.O/electric actuator/wheel lock brake >



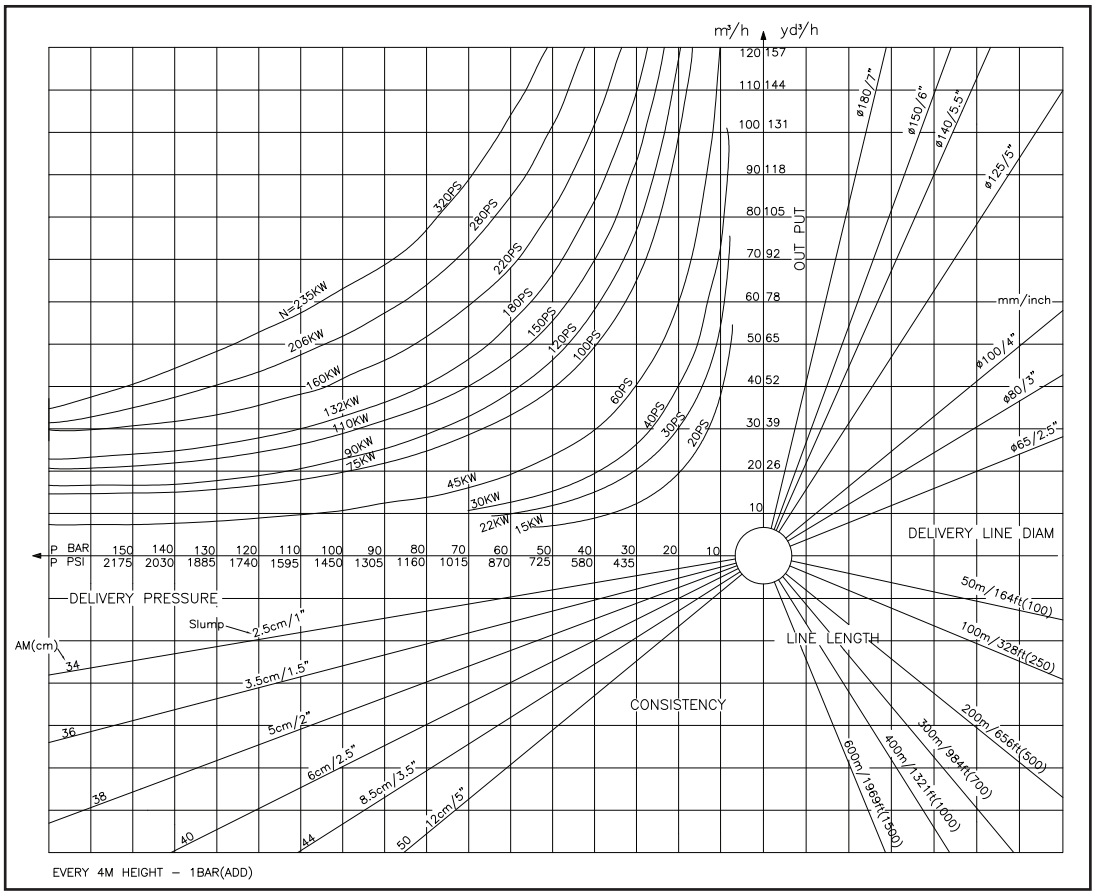
• Air line of break - system

Air line is connected with cylinder in order to lock all wheels while the operation.

In case of vehicles of the "full air brake" use a parking brake button while the operation.

3.1.2 NOMO GRAPH

• Nomograph is the diagram with actual parameters of concrete pumping job at construction site for knowing the availability of the machine.



CPCE3058

• Need of NOMO GRAPH

- Nomo graph is needed as you set up the height & distance in terms of three conditions such as vertical & horizontal distance of pumping, dilution of concrete and diameter & lenght of pipe line.

- Despite the different factor of job site, the value calculated by the graph is as approachable as actual value so that you are allowed to add more of 10% value to the calculated value.

• Use of NOMO GRAPH

- Related Conditions

1) Required horse power over machine's horse power : 300PS

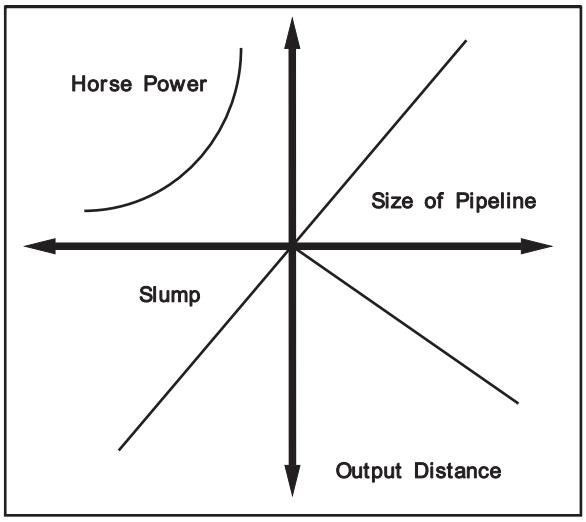
2) Actual Pressure of concrete cylinder : 80 BAR

3) Concrete Output per Hour : 50㎥/h

4) Dimension of pipe line : Φ125(5")

5) Concrete Output Distance at job site(vertical, Horizontal) : Vertical 200M, Horizontal 400M

6) Concrete slump : 8.5cm



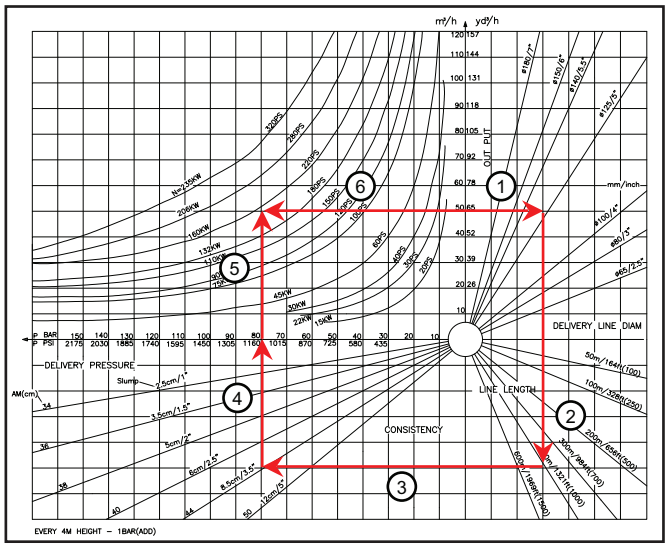
CPCE3057

• To mark job condition on NOMO GRAPH

1) To Line a right-horizontal line as you make sure of the amount of concrete & diameter of pipe line.

2) To line a vertical line from the end of 1) after you make sure of the height of concrete pour.

3) To line a left-horizontal line from the end of 2) after you make sure of the aggregate at site.



CPCE3059

4) To line a upper vertical line from the end of 3) for the check of pressure. for the check of pressure.

5) To measure engine HP at the end of 1) & 4)

• To measure the availability of Nomo graph according to the shown data.

▶ As job conditions are shown at site, actual conditions are measured as below.

▶ Consuming Horse Power according to HP of the machine.

1) Engine Horse power (EX.JB-2100HP) : Example. Max HP of 440PS (After P.T.O mode with Max RPM)

2) Additional Consuming HP : 14PS for agitator, excluding P>T.O Drive, must be subtracted.must be subtracted.

3) Feasible Engine HP when pumping: (Engine HP- HP excluding P.T.O Drive) X Engine Efficiency (440PS-14PS) X 0.85 = App.360PS

▶ To measure the concrete delivery pressure.

☞ Pressure : P= F/A, Cylinder Area : $A=\pi d^2/4$,
Rod side cylinder area : $A=\pi(d2^2 - d1^2)/4$

1) The rod side pressure of main cylinder (ϕ160 X ϕ90 X ST2100)

▶ $F_{MR} = P \times A$ = Max Pressure of Machine × Area = $350 \times 3.14 \times (160^2 - 902) \div 4$ = 4808125KG

2) The head side pressure of main cylinder (ϕ160 X ϕ90 X ST2100)

▶ $F_{MH} = P \times A$ = Max Pressure of Machine × Area = $350 \times 3.14 \times 160^2 \div 4$ = 7033600KG

3) The concrete cylinder pressure (ϕ230 X ST2100)

▶ $F_C = P \times A$ = Max Machine Pressure × Area = $350 \times 3.14 \times 200^2 \div 4$ = 10990000KG

4) Rate of delivery pressure for rod side : I_R = Force of concrete cylinder ÷ Force of main cylinder for rod side = $F_C \div F_{MR}$ = 2.28

5) Rate of delivery pressure for head side : I_H = Force of concrete cylinder ÷ Force of main cylinder for head side = $F_C \div F_{MH}$ = 1.56

6) Pressure of concrete delivery (rod side) : P_R = Max Pressure × Rate of delivery pressure for rod side = 350 × 2.28 = 153BAR

7) Pressure of concrete delivery (head side) : P_H = Max Pressure × Rate of delivery pressure for head side = 350 × 1.56 = 224BAR

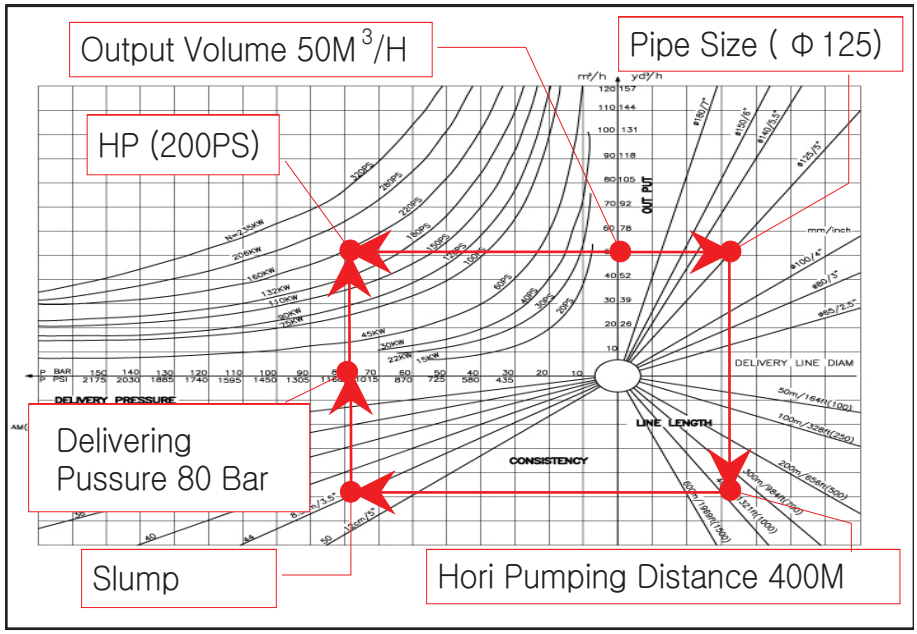
• Conditions for Horizontal Pumping

1) Concrete Output per Hour : 50M^3/H

2) Dimension of Pipeline : Φ125(5")

3) Concrete Output Distance: Horizontal 400M

4) Concrete slump : 8.5CM



CPCE3060

5) Developed Pressure by Nomo Graph : 80BAR

☞ Rod Pressure 153BAR > 80BAR available

6) Permitted Engine HP KW = Q X P ÷ 25

▶ Concrete Output X Delivery Pressure = 50 X 80 ÷ 25 = 144KW

▶ 1KW = 1.36PS ≒ 195PS

☞ Permitted Engine HP 360PS > 195PS available

☞ Feasible HP in terms of graph 200PS.

7) 2 conditions are available so that Horizon 400M is possible.

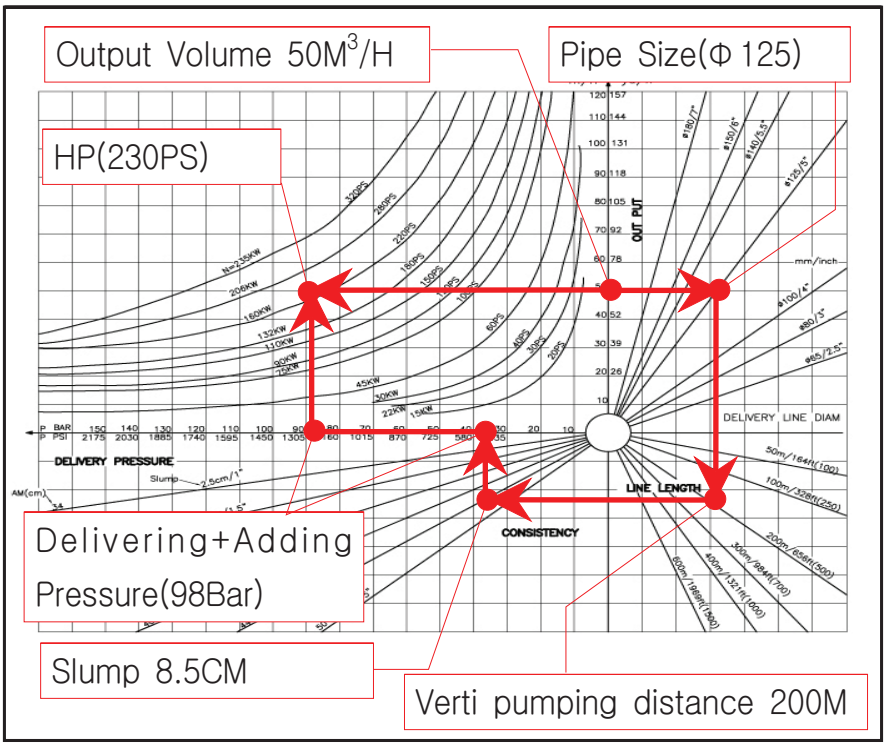
• Conditions for Vertical Pumping

1) Concrete Output per Hour : 50M³/H

2) Dimension of Pipeline : 125(5")

3) Concrete Output Distance Vertical 200M

4) Concrete Slump : 8.5CM



CPCE3061

• Delivery Pressure on NOMO GRAPH : 38BAR

☞ Horizontal 20M is added for the vertical pumping.

• Vertical Height Adding Pressure : 200 X 0.25 = 50BAR

☞ 100M of water output is equivalent to 10Bar Static, 100M of concrete output is 2.5 times heavier than water so that 1M of water is equivalent to 0.25Bar.

☞ Verti pipeline should be added by 0.25BAR per 1M.

• Graph P + Adding P = 38 + 50 = 88BAR

☞ Rod Side P 153BAR > 88BAR available

Permitted Engine HP KW = Q X P ÷ 25

: Concrete Output X Delivering Pressure = 50 X 88 ÷ 25 = 176KW

: 1KW = 1.36PS ≒ 239PS

☞ Engine HP 360PS > 239PS available

☞ Feasible HP in terms of graph 230PS.

2 conditions are satisfied that Vertical 200M is possible.

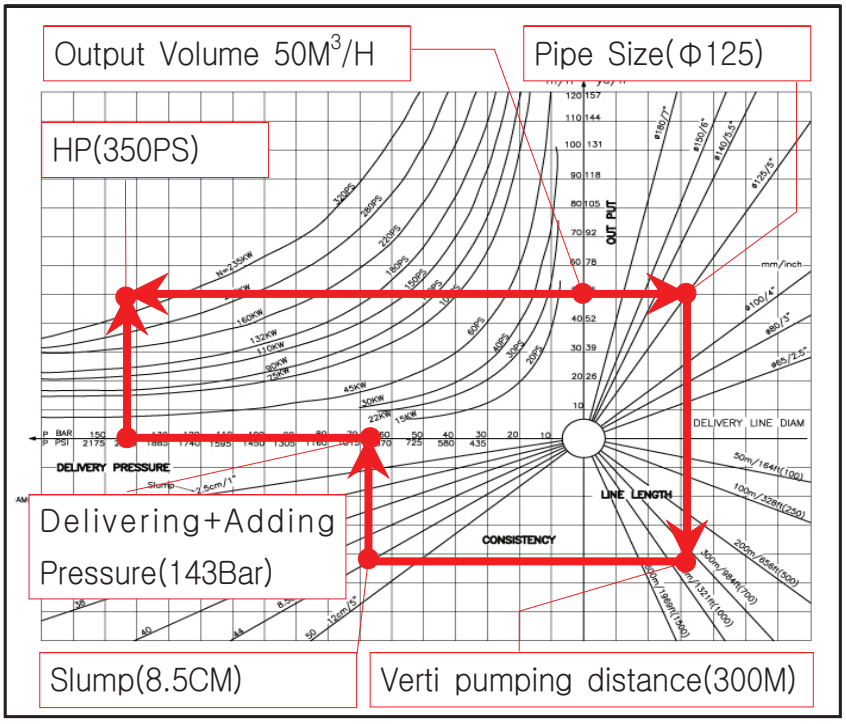
Conditions for Vertical Pumping

1)Concrete Output per Hour : 50M^3/H

2) Dimension of Pipeline: Φ 125(5")

3) Concrete Pumping Distance Vertical 300M

4) Concrete Slump : 8.5CM



CPCE3062

• Delivery Pressure on NOMO GRAPH : 68BAR

☞ Horizontal 20M is added for the vertical pumping.

• Vertical Height Adding Pressure : 300 X 0.25 = 75BAR

☞ 100M of water is equivalent to 10 Bar Static, 100M of concrete is 2.5 times heavier than water so that 1M of water is equivalent to 0.25Bar.

☞ Verti pipeline should be added by 0.25BAR per 1M.

• Graph P + Adding P = 68 + 75 = 143BAR

☞ Rod Side 153BAR > 143BAR available

Permitted Engine HP KW = Q X P ÷ 25

: Concrete Output X Delivering Pressure = 50 X 143 ÷ 25 = 336KW

: 1KW = 1.36PS ≒ 388PS

☞ Engine HP 360PS < 388PS Not available

☞ Feasible HP in terms of graph 350PS.

• 1 out of 2 conditions is not satisfied that Vertical 300M is impossible.

3.2 Set up the machine

3.2.1 Set up the outrigger

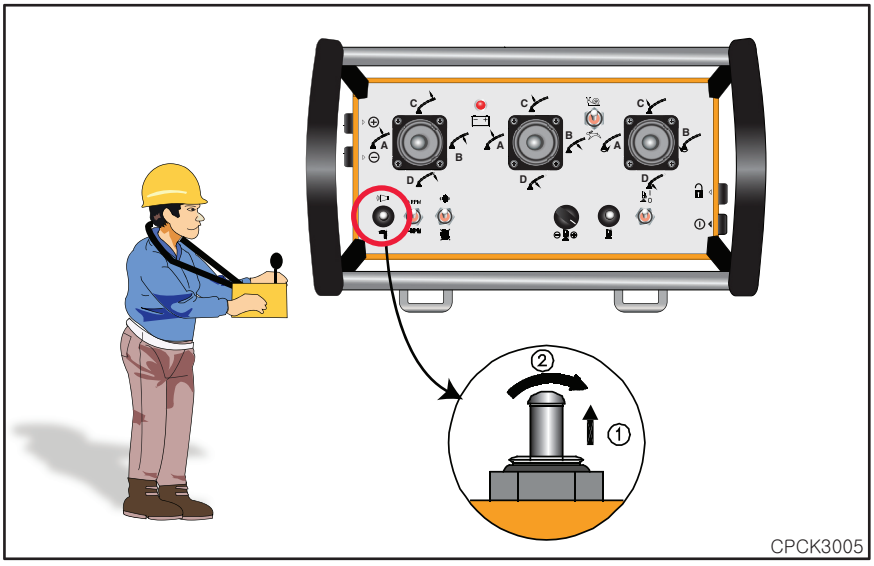
• In order to set up the machine correctly, keep the following set-up procedures. If these procedures are not kept, the machine can be damaged.

• Before setting the outriggers, be sure to check whether the watchers or dangerous materials are there and must have read chapter 1 safety instructions of setting.

1) The "set-up" function of the operator with boom is to be selected at the " outrigger horn' switch of remote control.

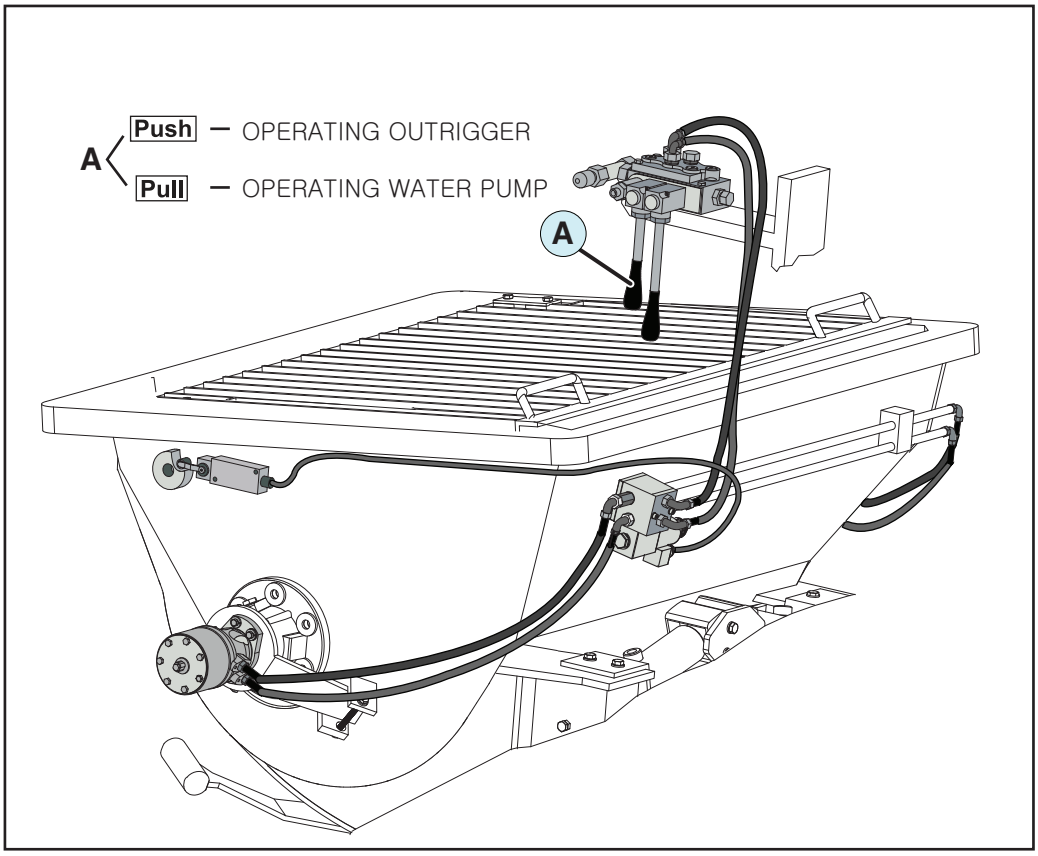
① Lift the switch button up.

② Shift the button to the outrigger.



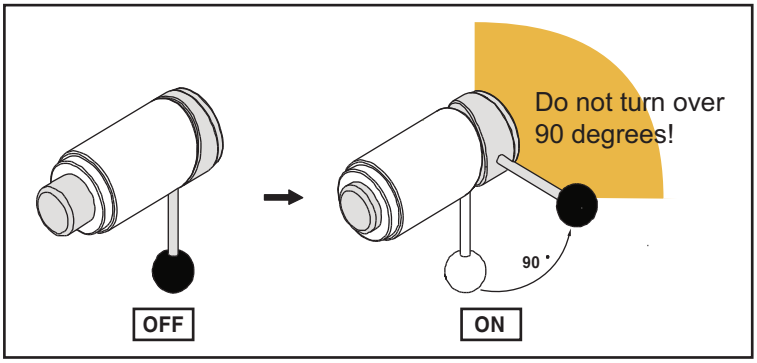
2) The "set-up" function of the operator without boom is to be selected at the "water pump/outrigger" lever or control valve beside the hopper.

- Select the lever of control valve to the outside of the hopper.



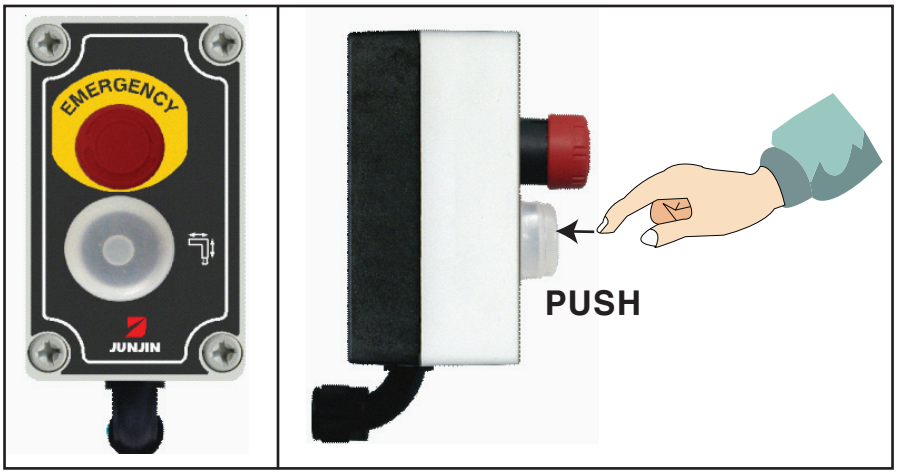
CPCE3016

3) Outriggers equipped with safety devices as STOPPER. Release STOPPER firstly, then slew or extend outriggers. If, during releasing STOPPER, do not turn over 90 degrees, it can not normally be locked up. If outriggers extend fully, STOPPER will be worked automatically. Make sure to check STOPPER position, after fully outriggers extended.



CPCE3004

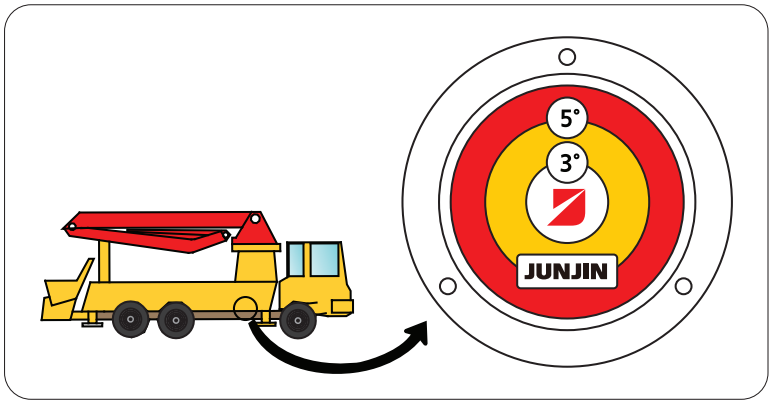
4) Please keep pressing hold-to-run butten during operation.



CPCK3007

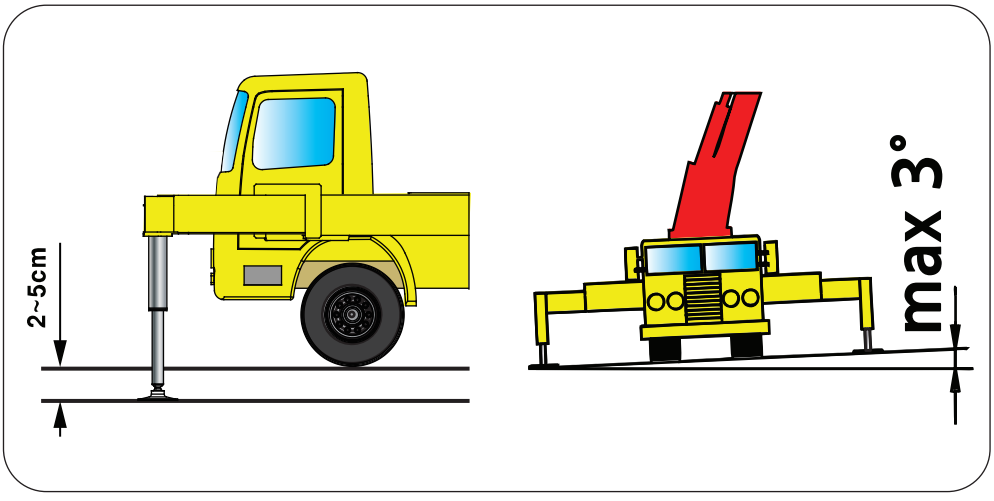
3.2.2 Set-up inclination

When the operator with boom are set up, make sure to keep the set-up inclination within the 3˚ of "level indicator" which are installed at the middle of both of right and left outriggers.



CPCK35

Extend outriggers with the front tires lifted within 5cm the ground.
Rear tires could touch the ground slightly under condition that machine weight is not loaded on the tires.



CPCK27

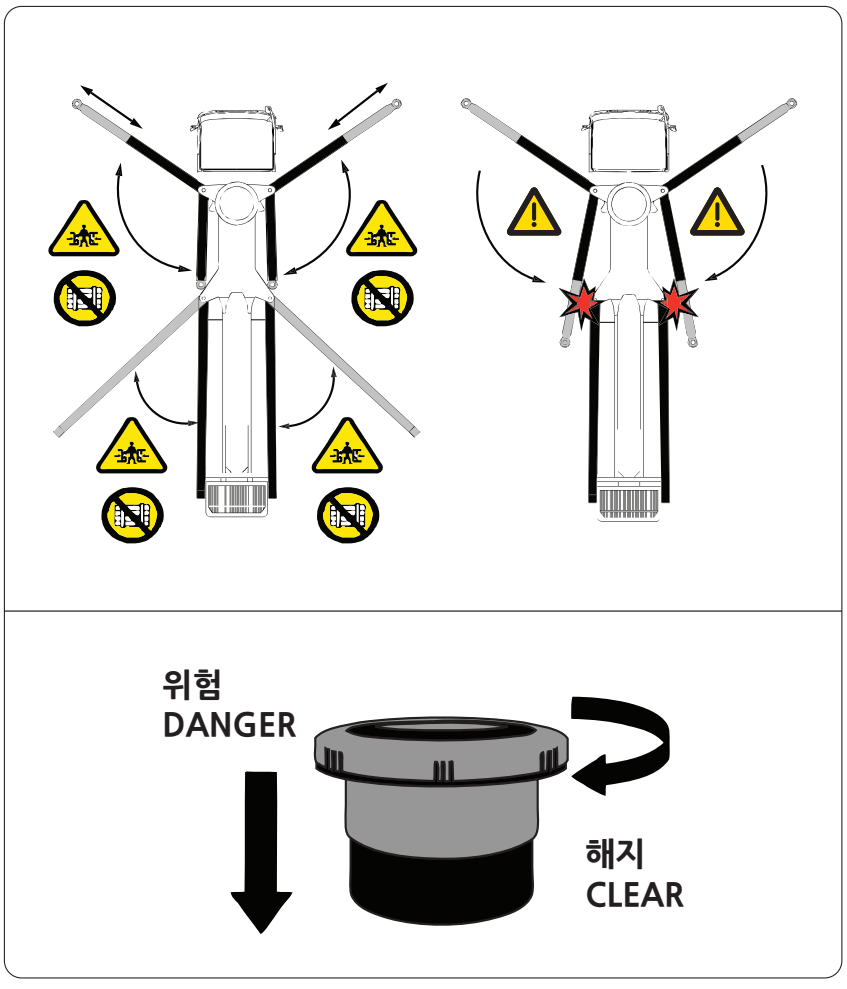
3.2.3 Danger zone or the outrigger

The danger zone when setting out the machine supports is the zone in which the supports are out or extended.

▶ Danger of crushing

There is a danger of crushing in the area through which the supports may be swung out or extended. Keep the danger zone under constant observation. You must hal

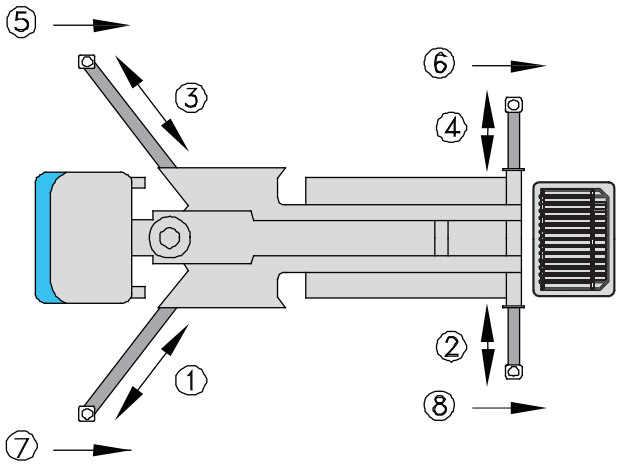
work and press the emergency shut-down button immediately if anyone approaches the danger zone.

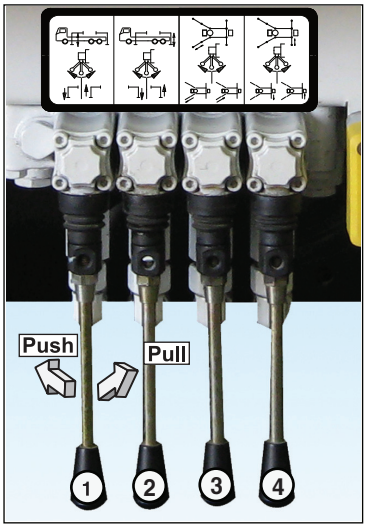


3.2.4 Set up the machine - 1Type

◈ After selecting the "outrigger-horn' switch to "outrigger" function at the remote control. set the outriggers up according to the following procedures.

◈ If the machie is set up correctly, make sure to return the "outrigger-horn" switch to the "neutral" position. if the switch is not in the “neutral" position, the boom should never be operated.





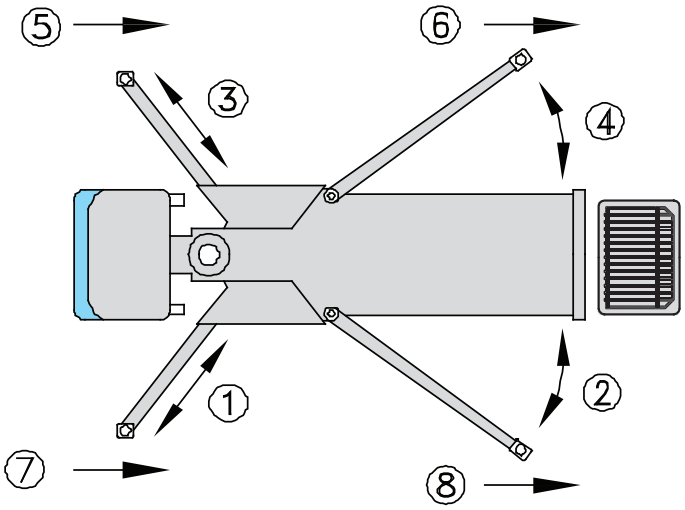
① Front outrigger : vertical lever
② Rear outrigger : vertical lever
③ Front outrigger : horizontal lever
④ Rear outrigger : horizontal lever

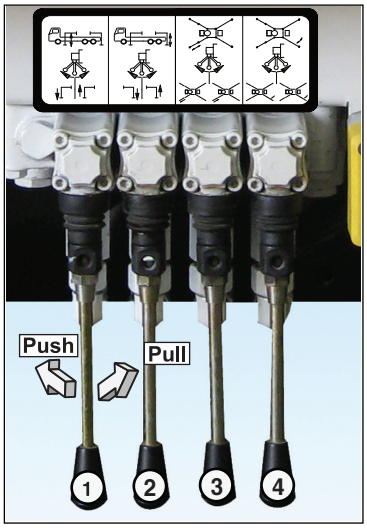
CPCE3011

3.2.5 Set up the machine - 2Type

◈ After selecting the "outrigger-horn' switch to "outrigger" function at the remote control. set the outriggers up according to the following procedures.

◈ If the machie is set up correctly, make sure to return the "outrigger-horn" switch to the "neutral" position. if the switch is not in the “neutral" position, the boom should never be operated.





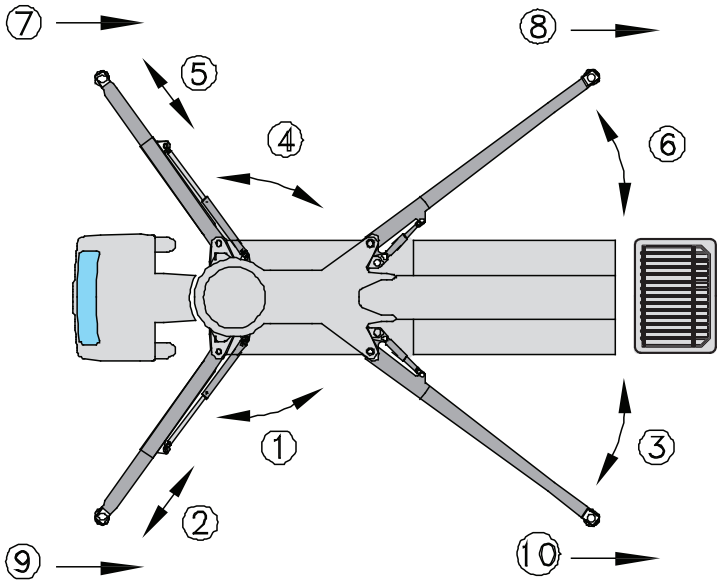
① Front outrigger : vertical lever
② Rear outrigger : vertical lever
③ Front outrigger : horizontal lever
④ Rear outrigger : swing lever

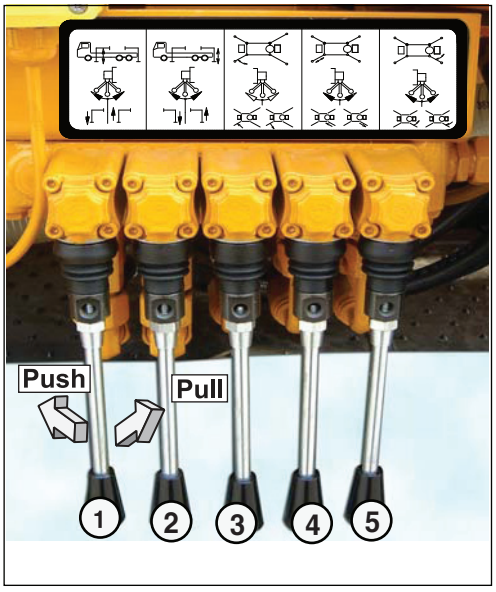
CPCE3012

3.2.6 Set up the machine - 3Type

◈ After selecting the "outrigger-horn' switch to "outrigger" function at the remote control. set the outriggers up according to the following procedures.

◈ If the machie is set up correctly, make sure to return the "outrigger-horn" switch to the "neutral" position. if the switch is not in the “neutral" position, the boom should never be operated.





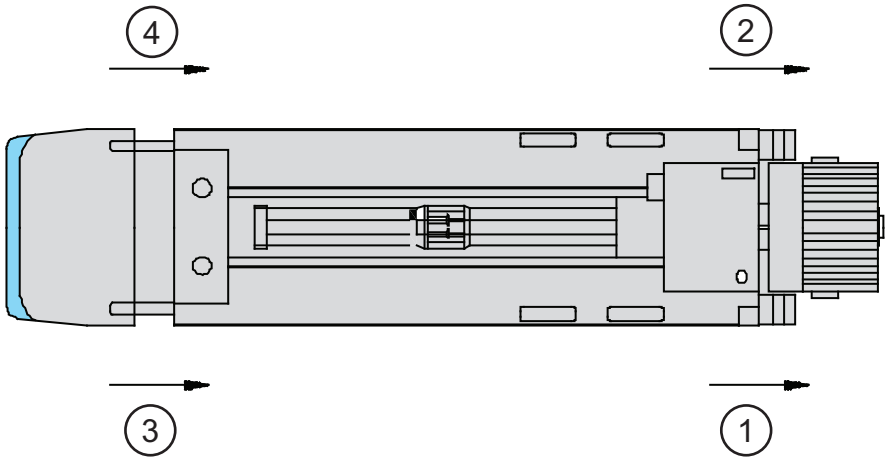
① Front outrigger : vertical lever
② Rear outrigger : vertical lever
③ Front outrigger : swing lever
④ Front outrigger : horizontal lever
⑤ Rear outrigger : swing lever

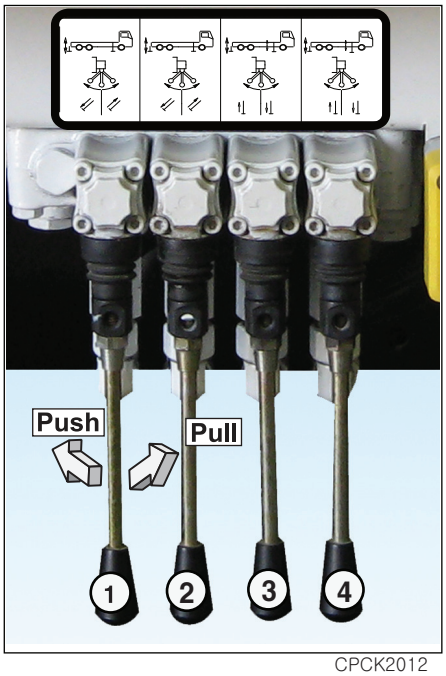
CPCE3013

3.2.7 Set up the machine - 4Type

◈ After selecting the "outrigger-horn' switch to "outrigger" function at the remote control. set the outriggers up according to the following procedures.

◈ If the machie is set up correctly, make sure to return the "outrigger-horn" switch to the "neutral" position. if the switch is not in the “neutral" position, the boom should never be operated.





CPCK2012

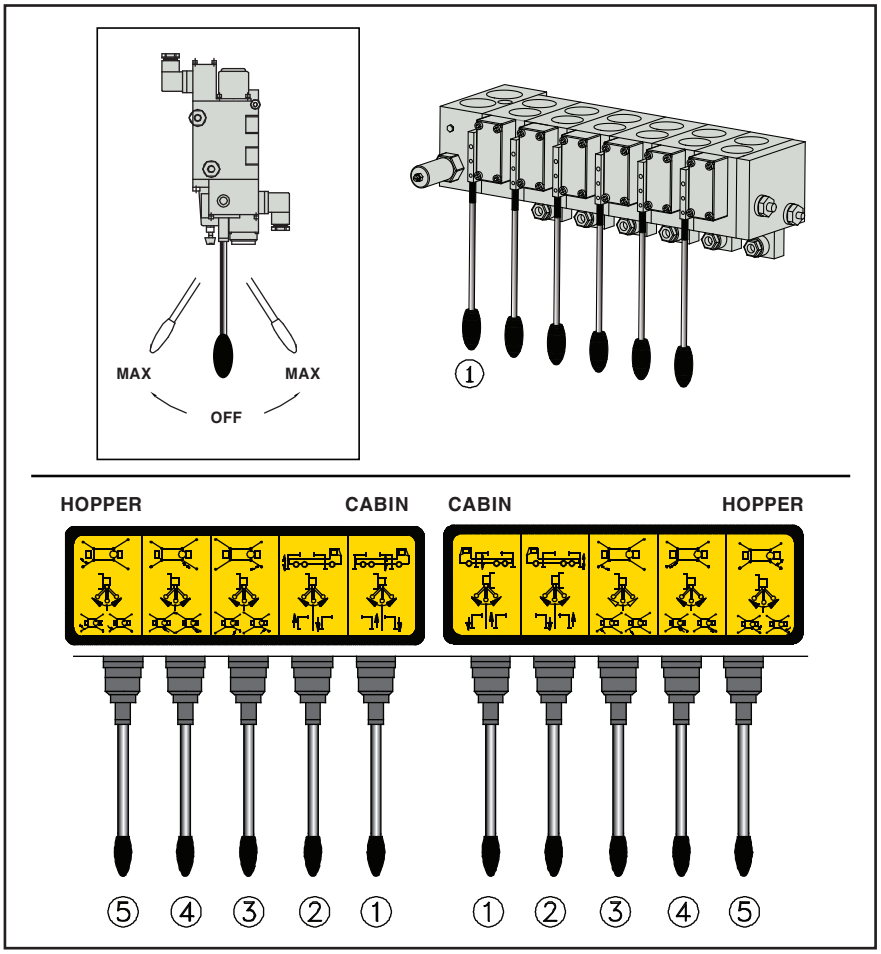
① Rear outrigger (LH) : vertical lever
② Rear outrigger (RH) : vertical lever
③ Front outrigger (LH) : vertical lever
④ Front outrigger (RH) : vertical lever

CPCE3014

3.2.8 Manual set-up with boom and outrigger control valves

• When the "horn-outrigger" switch at radio/cable remote control takes the trouble, the machine should be set up as follows and two person must operate the boom and outrigger control valves simultaneously.

▶ One pull the "outrigger/boom selection lever ① " to the direction of "outrigger" function until another finalize the operation of the "outrigger control valve" in order to set the machine up completely.



CPCE3022

With regard to the spreading order of outriggers, refer to the set-up procedure of ③ , ④ and ⑤

3.2.9 Retraction procedure

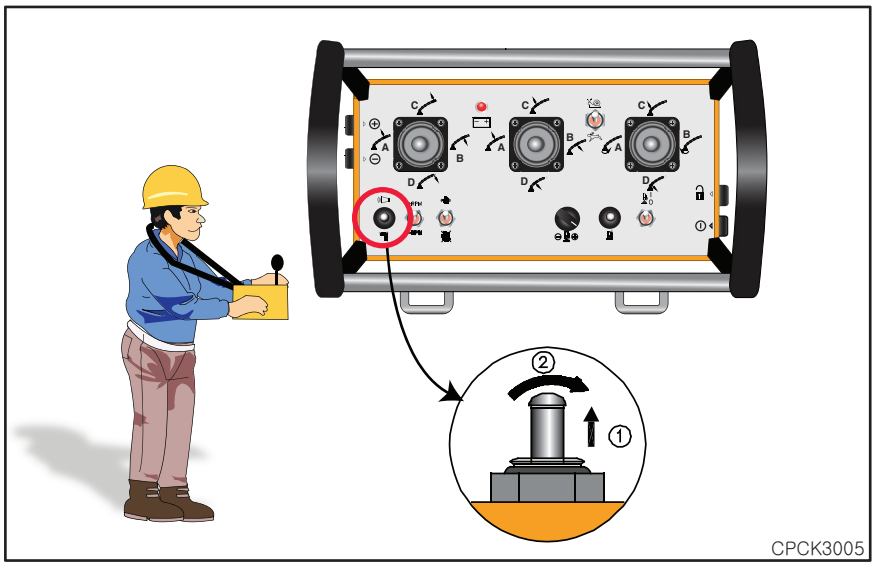
• The retraction procedure of the outriggers is opposed to the set-up procedure.

3.3 Boom operating procedure (with radio remote control)

3.3.1 Boom operating procedure

• Before operating the boom, make sure to check whether the position of "outrigger-horn" switch is in the neutral position.

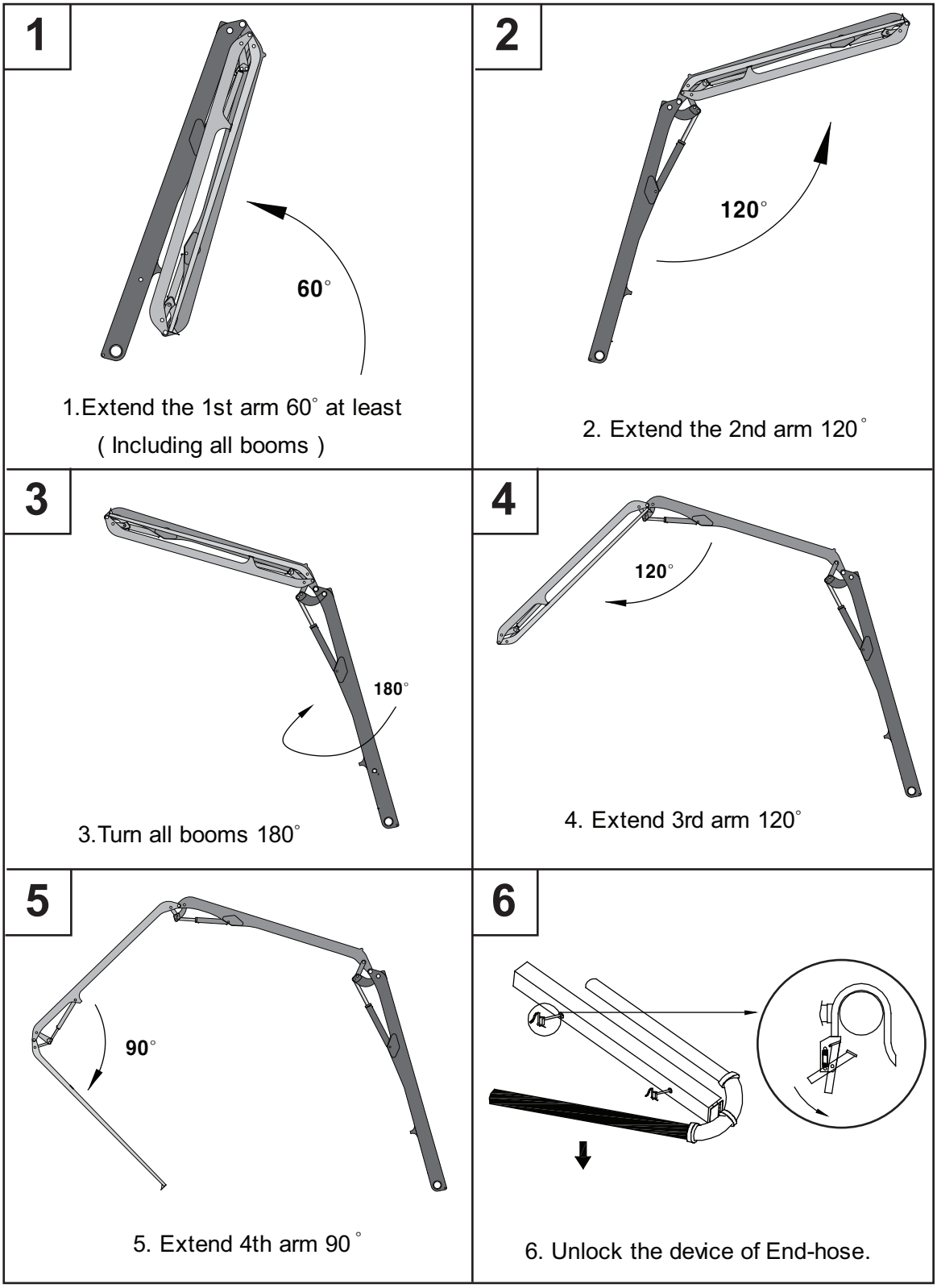
• If the switch is not in the neutral position, in spite of the actuation of the boom control levers" of the radio and cable remote control, the boom operation should be impossible.



• Switch on the "radio remote control stop/start switch"

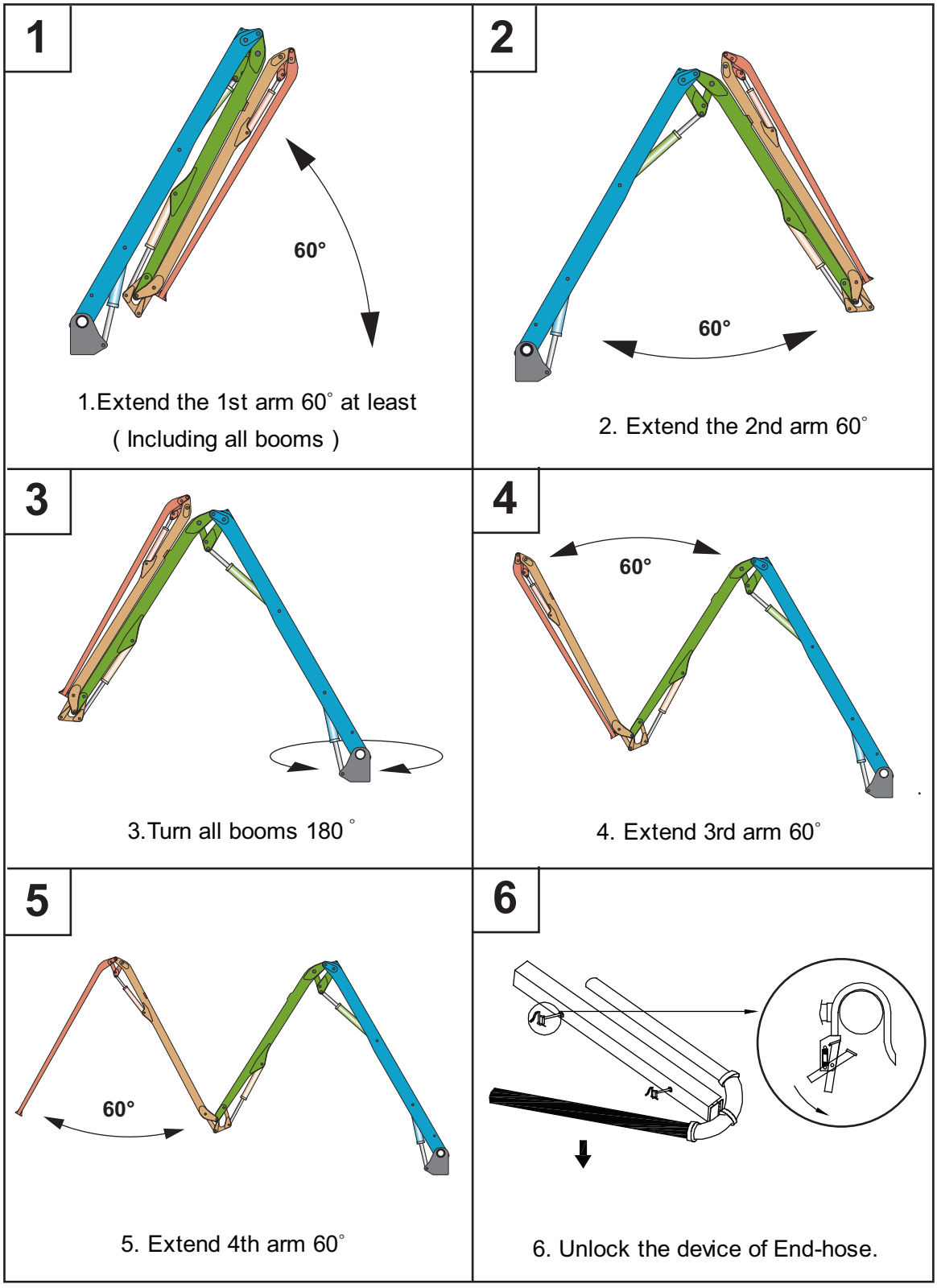
• Operate the "boom control levers" briefly several times while observing whether the levers of the boom control valve are actuated according to the movement of "boom control levers”

3.3.2 Roll fold 4 section boom - 1type



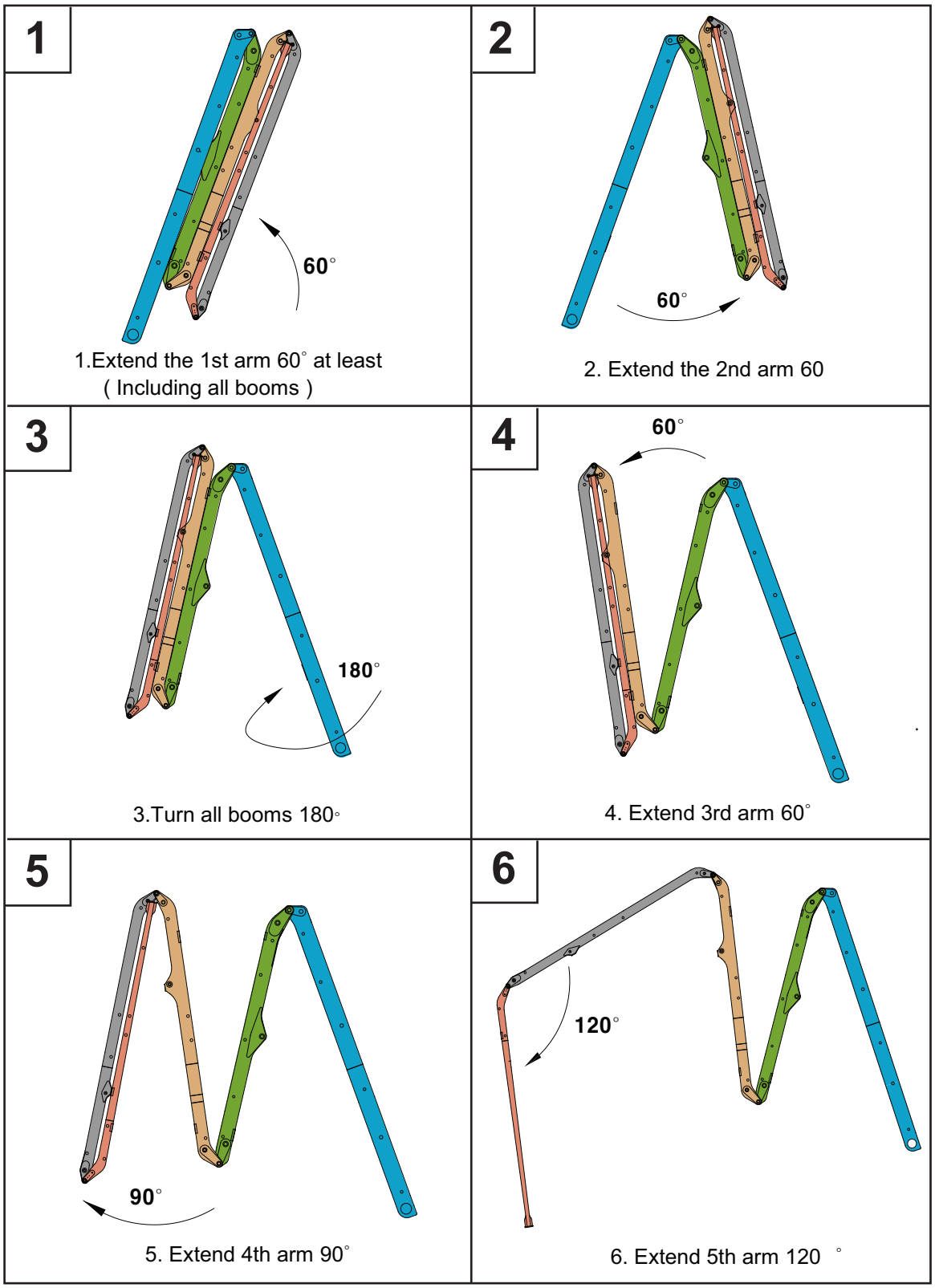
CPCE3015

3.3.3 Z fold 4 section boom - 2type



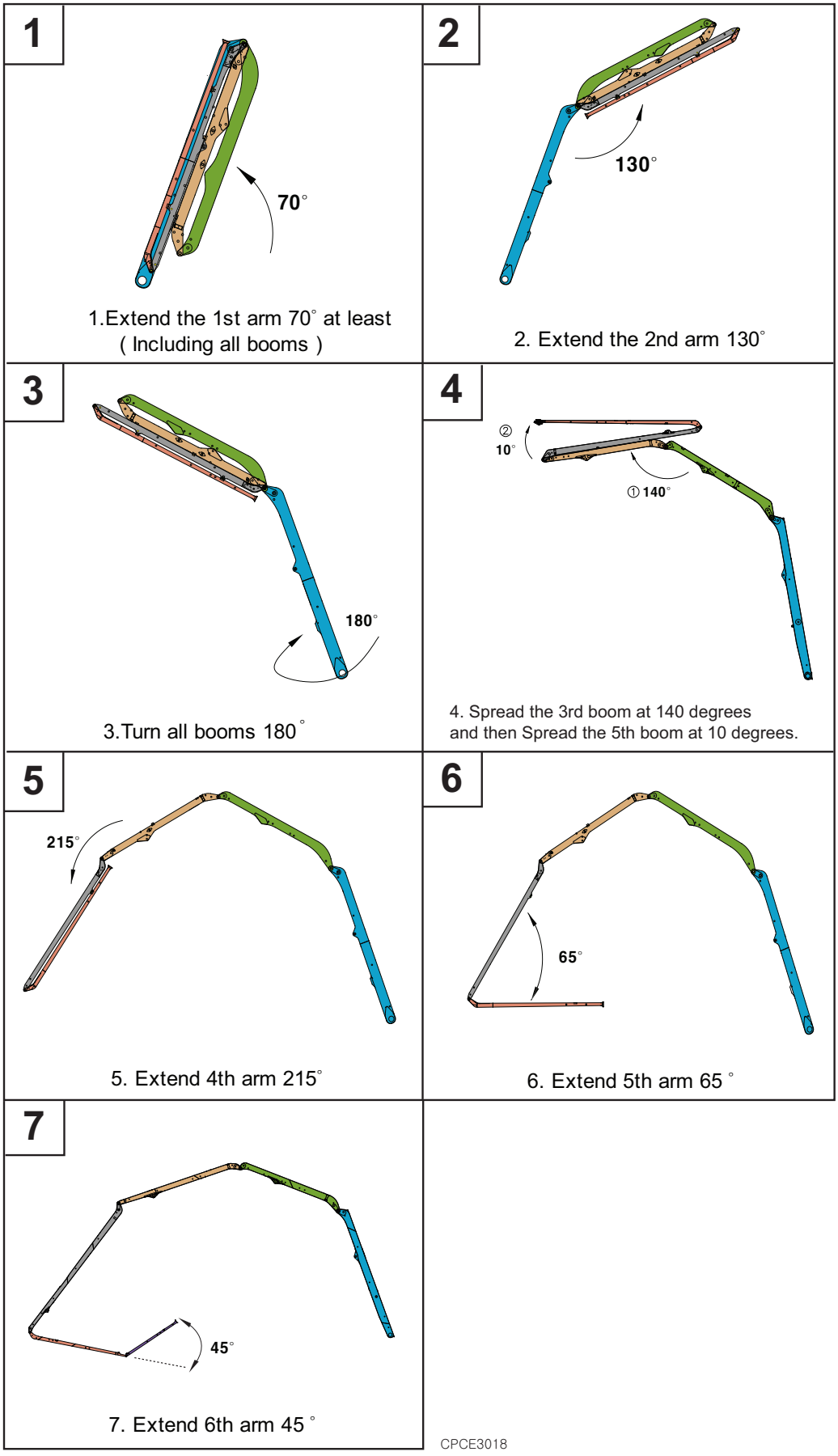
CPCE3017

3.3.4 Z & Roll fold 5 section boom - 3type



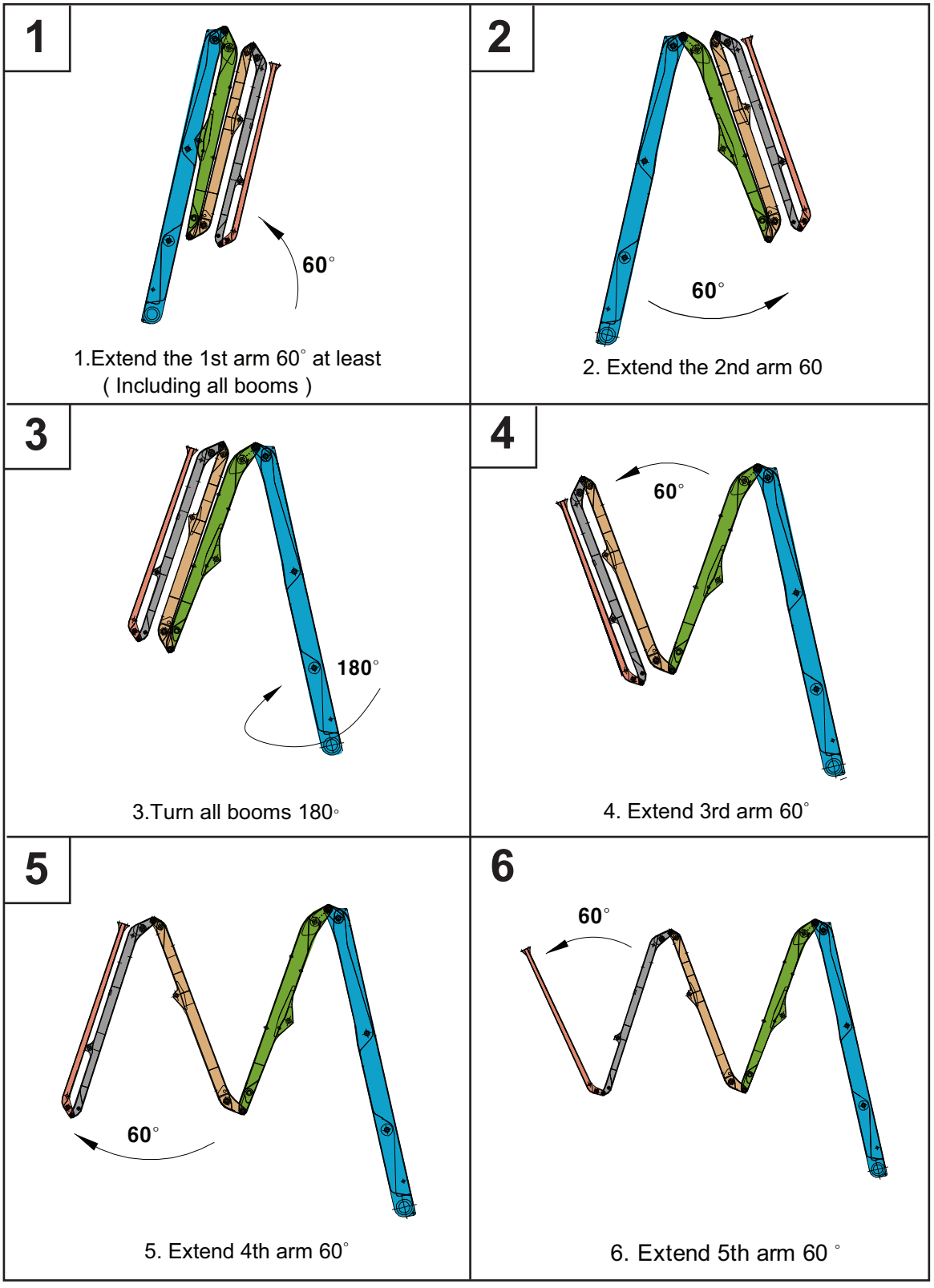
CPCE03017

3.3.5 Roll & Z fold 5 & 6section boom - 4type



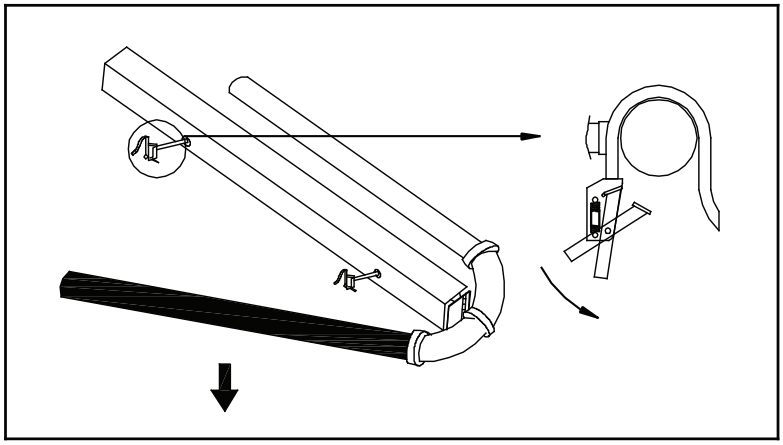
CPCE3018

3.3.6 ZZ fold 5 section boom - 5type



CPCE3017A

3.3.7 Unlock the holders to lock the End-hose



CPCE3019

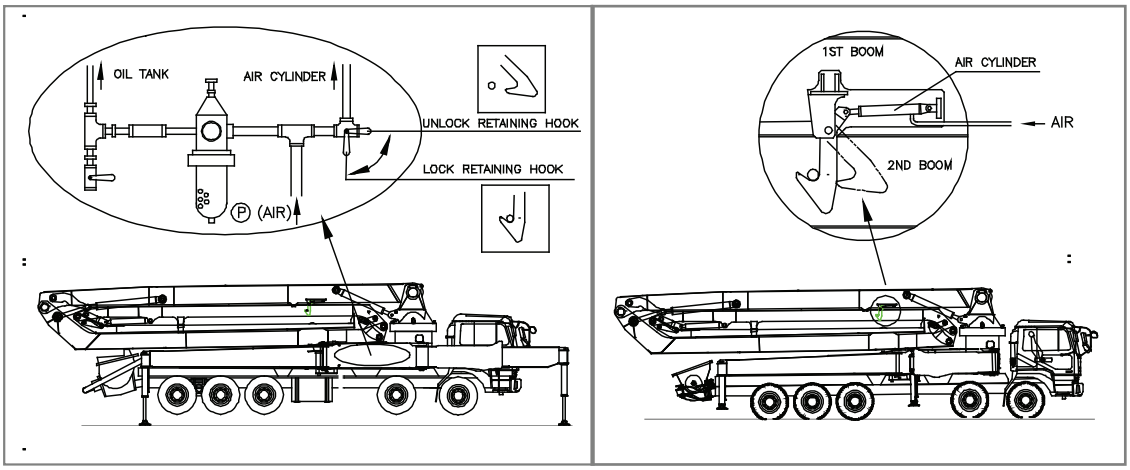
The holders lock the end hose automatically while the last section of boom is folded little strong with a slight shock.

3.3.8 Folding procedure boom

The folding procedure of the placing boom is opposed to the unfolding procedure

3.3.9 Air ball valve to unlock position and to check

In order to unfold the 2nd section of boom in case of Over 43M Boom be sure to rotate the "air valve" to the "unlock position" and to check the "retaining hook" unlocked. And be sure to check the "retaining hook" locked before driving off.



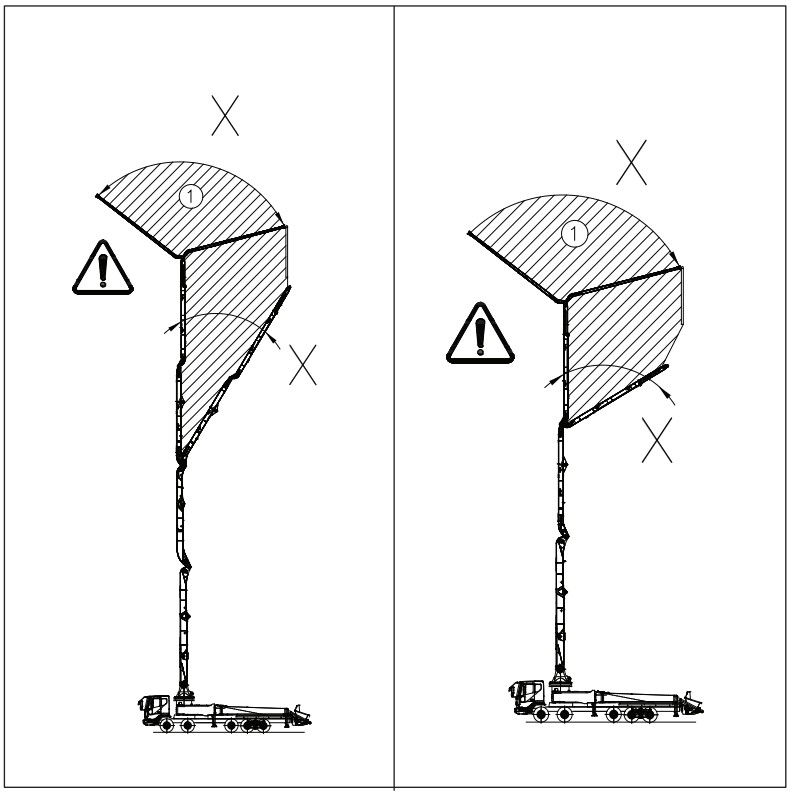
CPCK3024

• In case of manual hook operation, rotate the "air ball valve" to "unlock position" and check the "retaining hook" unlocked.

- In case of cable remote control or wireless remocon, at first, be sure to check that the "air ball valve" position is lock position" and then switch the "locking switch" to "unlocking position" and check the " retaining hook unlocked.
- Be sure to check the "retaining hook" locked

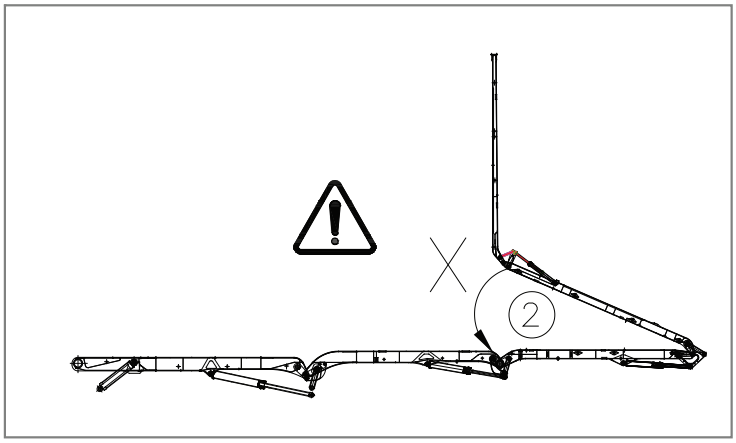
3.3.10 Working-ranges of the boom

When setting the booms, be sure to check whether working ranges is proper, if not, the booms might be damaged seriously. Under certain circumstances it is even possible to overload or cause damage to the boom. We have indicated such unacceptable working ranges by the use of appropriate notes in the Operating instructions. ① Range in which work with the end hose is not permitted.



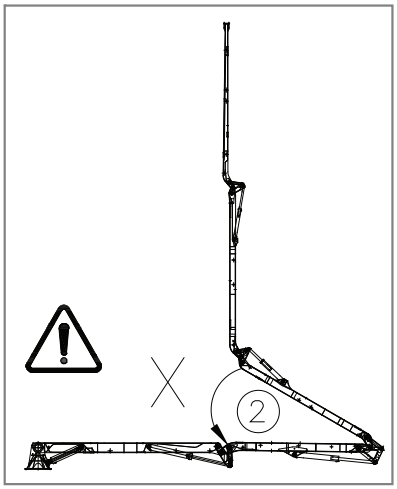
CPCE3020

In case of Roll & Z booms when folding the 4th boom section, you must fold it after 5th boom section has folded completely.



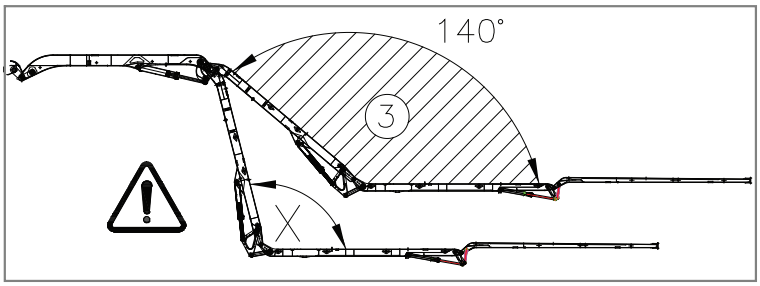
CPCE3021

In case of Z& Roll booms, When folding the 3rd boom section, you must fold it after 4/ 5th boom section has folded completely.



CPCE3023

In case of 5section boom the possible operating angle of 4th boom section is 0~250˚ So, it is impossible to operating below 140˚.

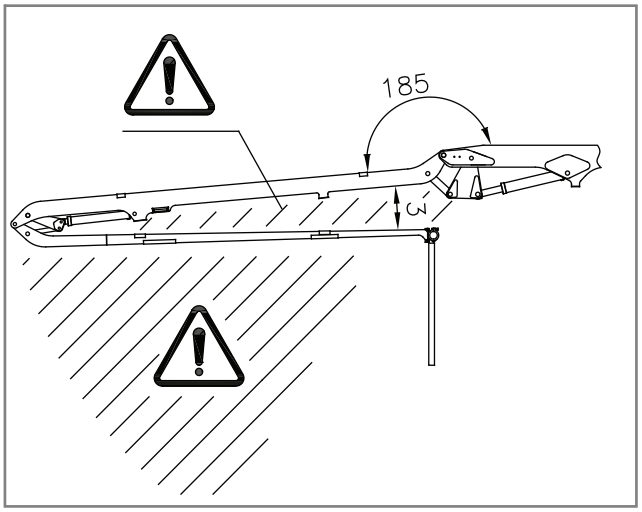


CPCE3024

In case of Z-boom don't spread 3rd boom more than 185˚ when 4th boom is folded less than 3˚.

Also, don't fold 4th boom less than 3˚, when 3rd boom is spread more than 185˚

In order to protect boom cylinder of link from any interferences with booms.

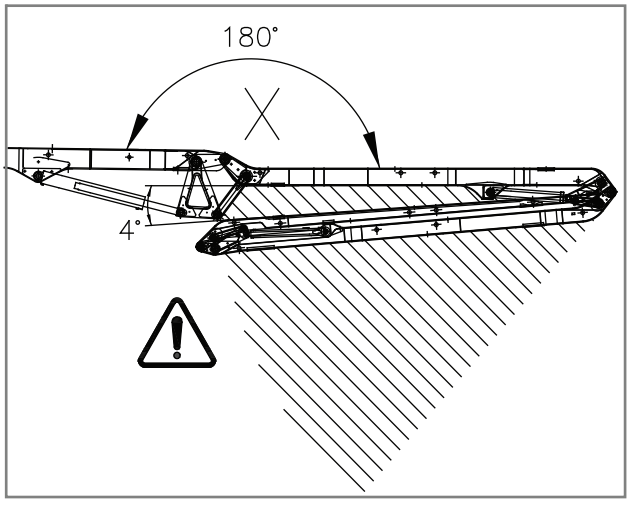


CPCE3025

In case of Z-boom don't extend the 3rd boom more than 180˚ when 4th boom is folded lass than 4˚

Also, don't fold 4th boom less than 4˚when 3rd boom is spread more than 180˚.

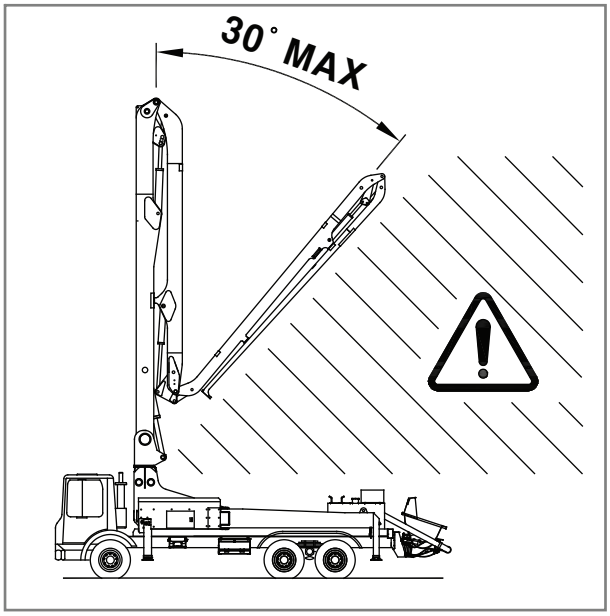
In order to protect boom cylinder or link from any interferences with booms.



CPCE3027

Don't spread 3rd boom more than 30˚ when 2nd boom is folded.

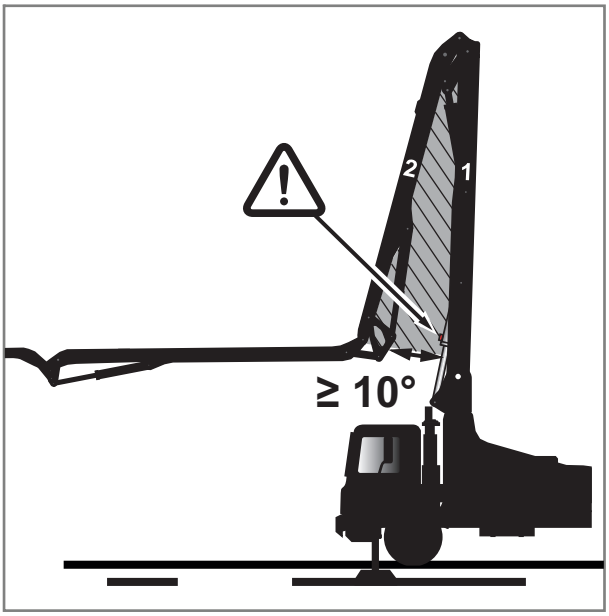
In order to protect boom cylinder or link from any interferences with booms.



CPCE3028

Falling-boom hazard. Do not retract boom 2 into boom 1 when unfolded.

Maintain at least 10° clearance. Possible damage to boom 1 holding valve.



CPCE3029

3.4 " Boom control " with radio and cable remote control

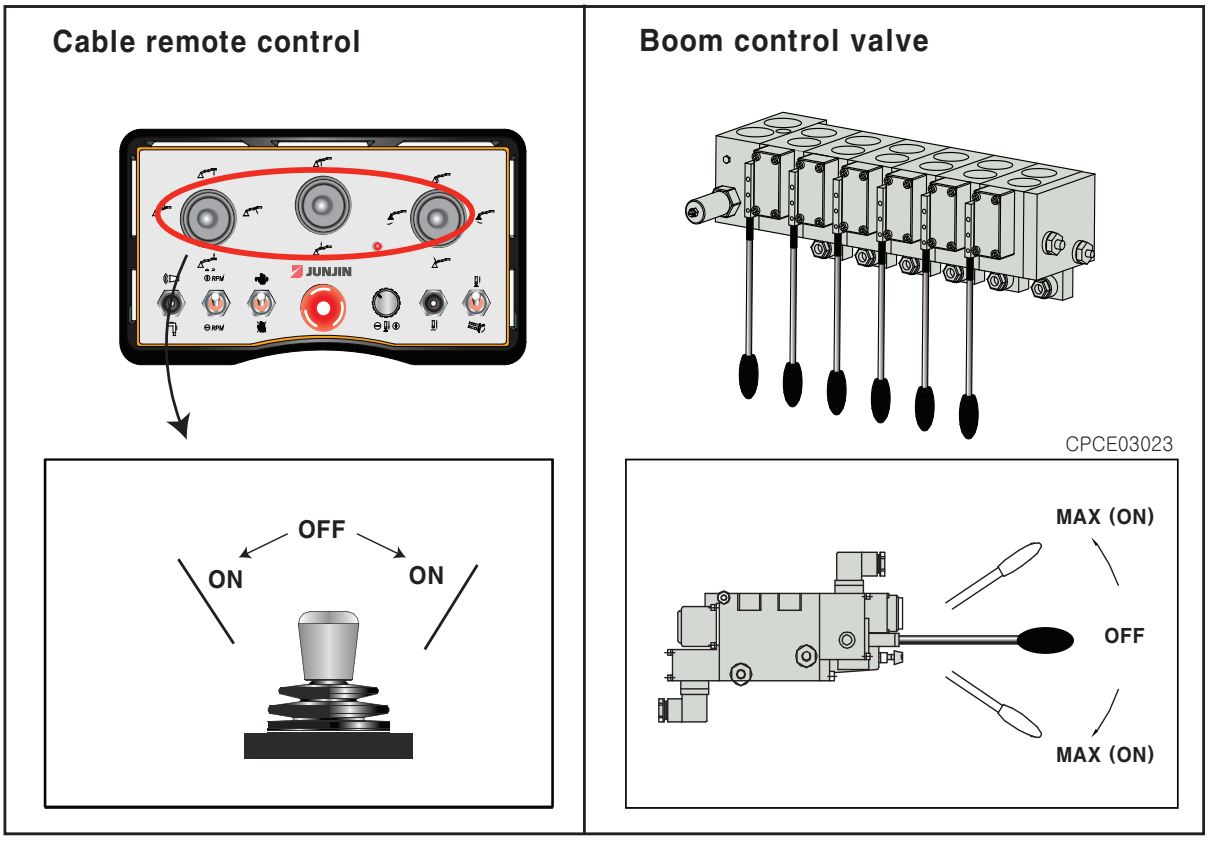
3.4.1 Boom control levers

• "Boom control levers" at radio remote control are adopting the electric proportion function in proportion to the solenoid current of boom control valve and those of cable remote control are adopting the electric function of on-off type.

1) The movement speed of boom with radio remote control is sensitively and smoothly regulated from the minimum to the maximum in proportion to the inclination angle of "boom control levers" at radio remote control.

The inclination angle of the levers of "boom control valve" to regulate the oil-flow volume toward the 'boom cylinders" is proportional to the inclination angle of "boom control levers" at radio remote control as follows

2) The movement of boom with cable remote control is little jerky compared with that with radio remote control, because the oil-flow control through the "boom control valve" is regulated as the zero ("switch-off") or the maximum ("switch-on") as follows..



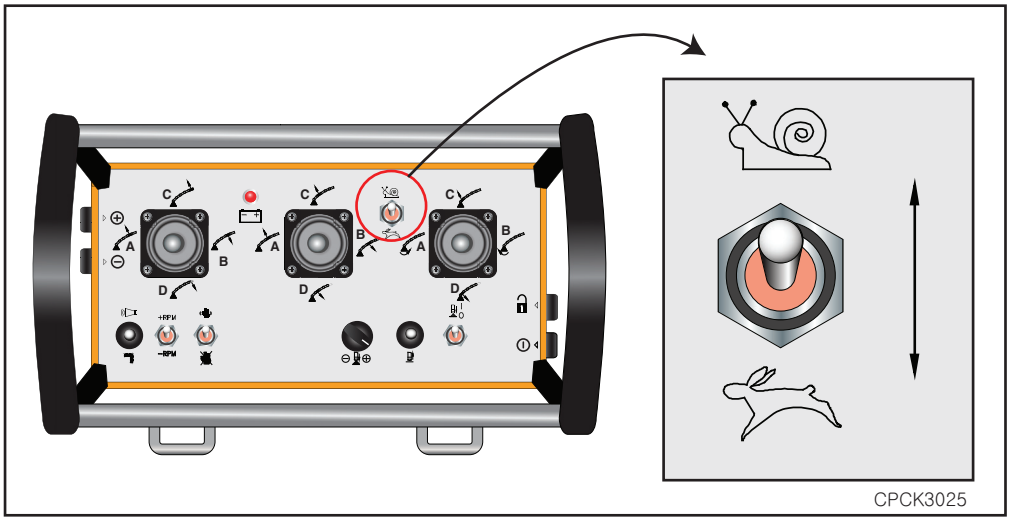
• Always use the radio remote control while the operation and use the cable remote control in case of emergency situation.

3.4.2 Boom control speed

[caution] The operator can have the boom control speed by actuating a "boom speed control switch" at radio remote control to the direction of "snail"

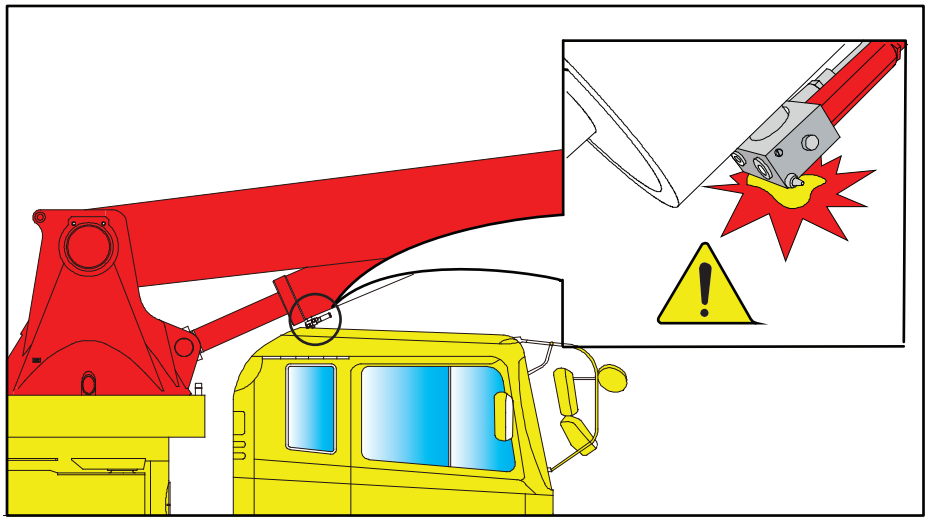
• Actuate the switch to the "snail". The boom control speed is halved.

• Actuate the switch to the "rabbit". The boom control speed becomes normal speed.



3.4.3 Cation of Boom operation

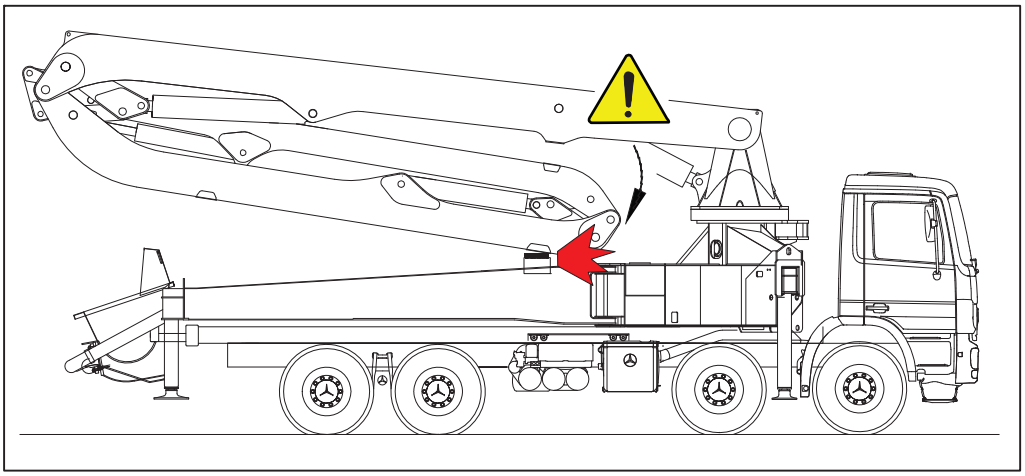
NOTE! Cabin could be touched and damaged by arm#1 folding.



CPCK3026

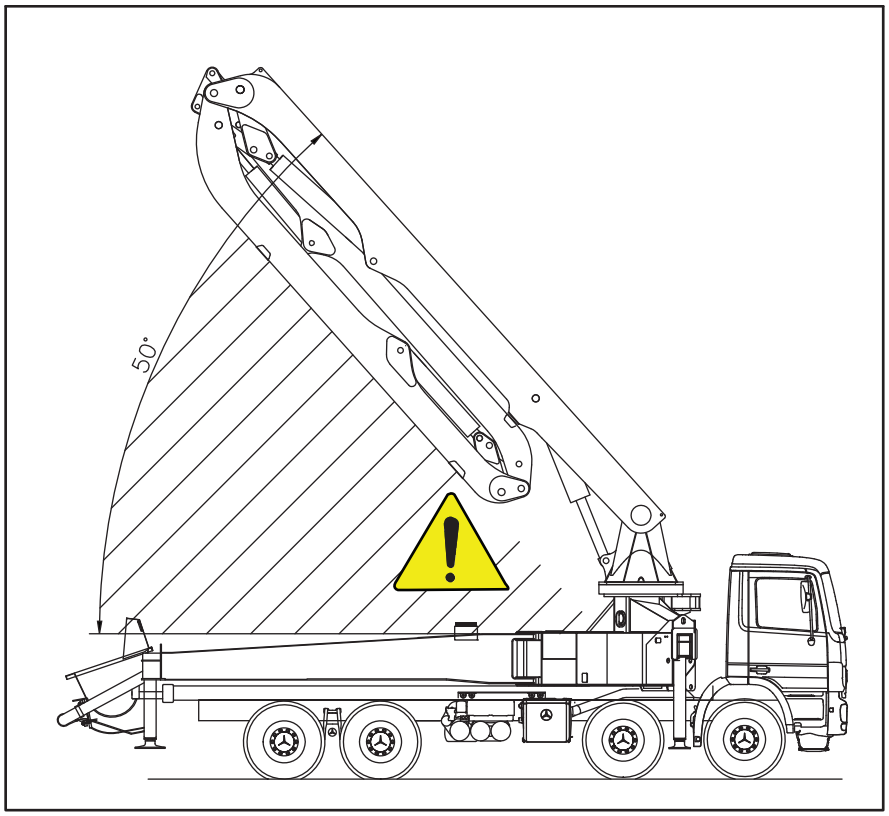
★ RZ43 MODEL ★

For the initial operation of the boom, the boom could be drooping. Please lift the first boom with the condition of holding the other booms after safety check.



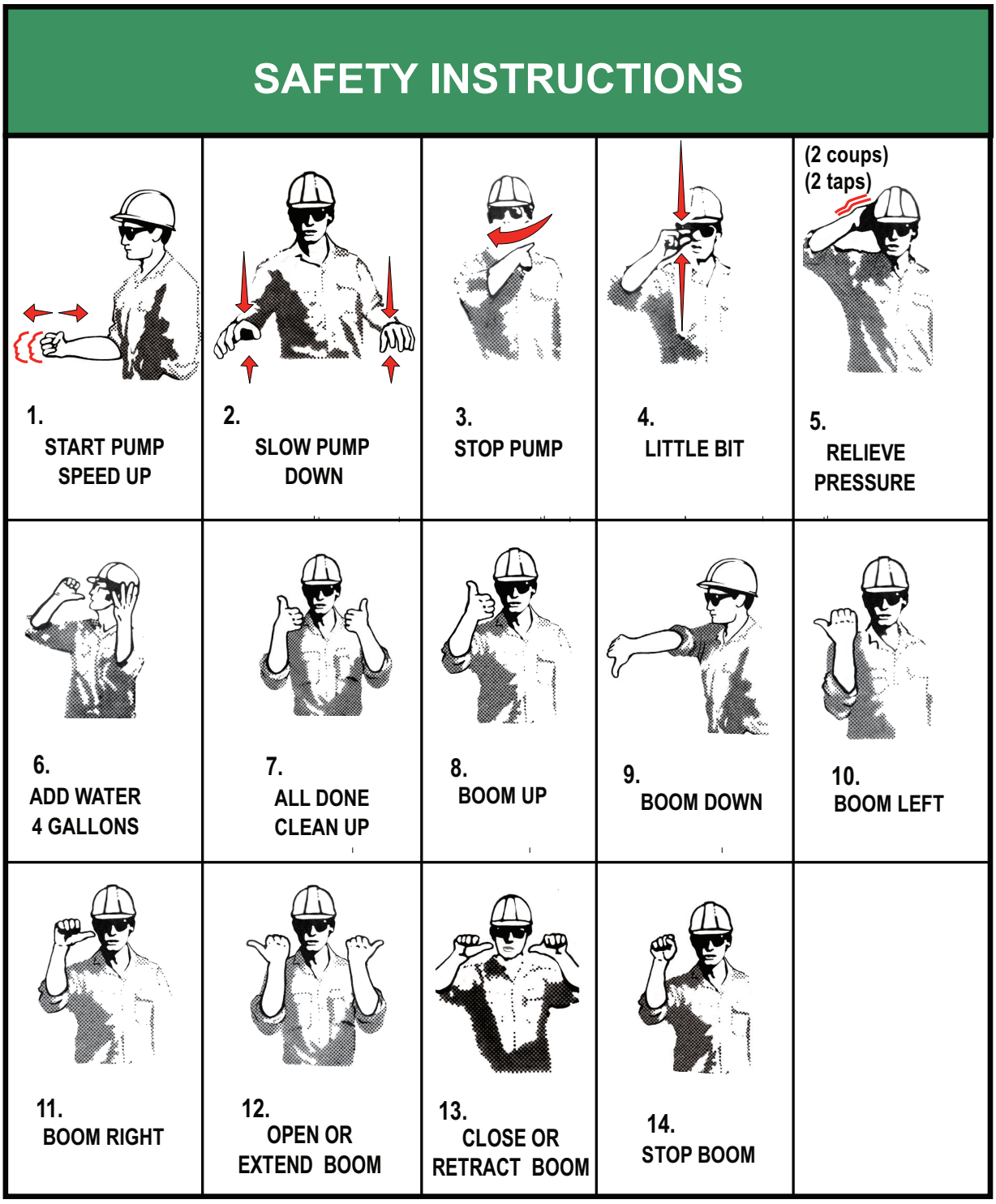
CPCE30266

In case the boom is holded as below picture, please make sure that the 1st boom should be lifted at least 50 degrees.



CPCE30267

3.4.4 Hand signal for boom operation



CPCE3000

To avoid confusion and conflicting signals, only one person should signal the pump operator. Before the pour begins, the hose man the operator and the spotter should agree on the hand signals

3.5 Pumping procedure

3.5.1 Before starting to pump

• Before starting to pump, make sure to check whether the enough water is filled into water box and it is necessary to warm the hydraulic system up through the test run.

3.5.2 Starting to pump

◈ Starting to pump

(1) Before pumping, insert two sponge balls into the pipeline and with the agitator turning, pour several buckets of cement/water slurry to coat the inside of the pipeline into the hopper. Start the pumping and fill well-mixed concrete into the hopper. pump very slowly until two sponge balls and a solid stream of concrete are discharged from the end hose.

- The max. conveying pressure must not be higher than that to be given on the data plate.
- Because new and long delivery lines give a considerable resistance, start the pumping with sufficient cement and water slurry.

◈ Switch the agitator on.

(3) Fill the concrete from the truck mixer esp. silo, etc into the hopper and pump several strokes at the slow pumping speed.

- Mix the concrete at the fastest speed in the truck mixer and make sure that the concrete mix is uniform.
- If the inside of delivery lines are so rusty, the output volume can be increased gradually after the pumping of several cubic meters.

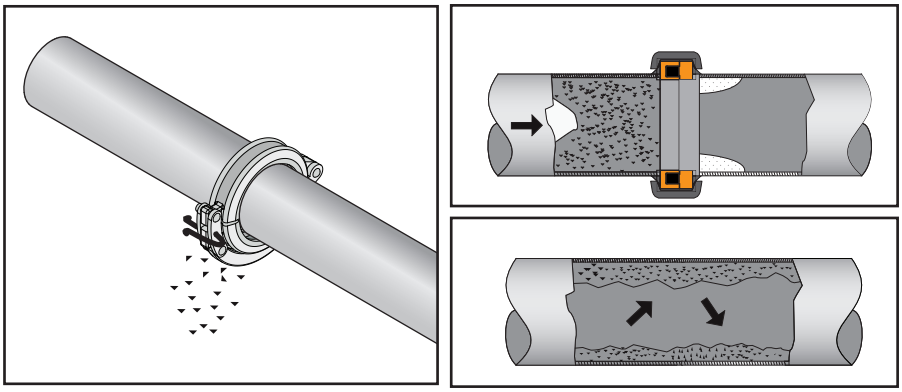
(4) If a blockage occurs, pump the concrete bake into hopper immediately and remix it.

- Don't switch over to the "pumping" position until the delivery cylinder and s-valve switch over automatically in proper manner.

(5) Pump again carefully

- If a blockage occurs again, repeat the procedure of (4) and (5).

(6) Cause of blockages



CPCK3029

① Delivery lines Insufficiently wetted by the slurry.

② S-valve leaking due to serious wear of wearing parts.

③ Leaking of delivery lines

④ Concrete remains into the s-valve and delivery lines

⑤ Unfavorable concrete mixing composition

⑥ Segregated concrete

2) Instruction for perfect pumping job

(1) In case of stopping the pumping due to the blockage of delivery pipe, relieve the pressure of delivery lines off by pumping shortly in reverse(2 to 3 strokes). If the broken pipe is disconnected under the pressure into the delivery lines, concrete can be spread and cause the dangerous accident.

(2) Relieve the delivery lines during short breaks in work by pumping in reverse (2 to 3 strokes). Move the concrete at short intervals by pumping forward.

(3) So wet concrete including much water tends to be segregated, the segregation makes the lubricating characteristic do the concrete deteriorated and if can cause the blockage of the delivery lines. Minimize the segregation of the concrete during breaks in work.

(4) With longer breaks in work, pump the concrete back into the hopper and the concrete must be remixed again before re-starting the pumping.

(5) The air sucked by the insufficient concrete pouring into the hopper and the replacement of the broken pipes is compressed into the delivery lines while the pumping and when the concrete is discharged from the and hose, the compressed air blows out the cement and fines. Take care of it.

(6) if the oil temperature exceeds 80? under the normal pumping conditions, the water box should be drained and refilled immediately with the cold water and should be changed continuously.

- If the oil temperature exceeds 55℃, the 2-way valve which is controlled by a thermostat is switched on and the oil cooler is automatically actuated.
- The oil cooler can also be switched on by a switch at the control panel.
- The hydraulic oil tank should not be sprinkled with water. This leads to the water condensation into the oil tank and can cause the damage of the hydraulic pumps.
- If the additional cooling is necessary, the main cylinders can be sprinkled.

(7) The thermostat sensor is installed on the oil tank and when the oil temperature exceeds 90?, the pumping is automatically stopped, the engine speed is decreased and a red warning lamp on the control panel lights up.

- look for the cause of overheating and remedy it.
- Never switch the engine off in order to keep the oil cooler operated continuously. If the cause of overheating isn't found immediately, wait until the oil has cooled and the red Indicator lamp at control panel has gone out. Switch the "pumping switch" on and continue the pumping slowly at reduced output. Once pumping operation has been completed, check the cause of overheating and remedy it.
- If the remedy for overheating is finished, bring a warning signal with a "horn" switch before re-starting the pumping and start the pumping again.

(8) If the engine has been working for so long times under heavy loading, never stop the engine immediately and let it cool down at idling speed of approx. 100rpm.

- This is so important for turbo-changed engine.

(9) Always adjust the engine speed higher than the so-called "rattling speed" of 700rpm

(10) When pumping the concrete with so long delivery lines like a stationary pumper, pay attention to check wheter the straight-pipes are installed to enough long distance and the suitable elbows are connected at the correct place. The incorrect installation of the delivery lines can allow the s-valve Switching system to be overstrained by so strong force caused due to the concrete loads into the delivery lines and it can result in the damage and the short life cycles of switching system.

(11) If the boom starts to bounce so strongly while the pumping operation, check whether the pumper is installed correctly (all four outriggers are positioned in the right way on the ground).

- If necessary, correct the stability by readjusting the outriggers accordingly.
- If the bouncing of boom is continued in spite of the stable installation of the outriggers, the pumping speed must be reduced.

(12) Cautions against the overloading to the boom

- Don't apply the artificial forces to the boom as the following actions.

ⓐ Collision to the buildings with the boom.

ⓑ Operating the boom to shift or throw away the obstacles at the working site.

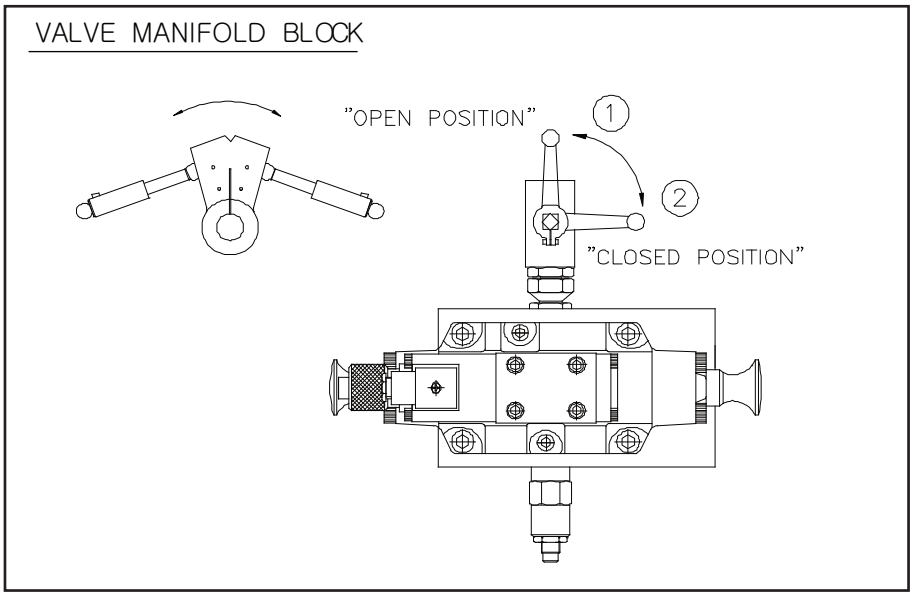
ⓒ To force the boom to drag or lift up so longer end hose jammed or corner-frame and etc.

• Damages caused by operating mistakes are not covered by the manufacturer's guarantee.

(13) Control the switching speed of the s-valve while the pumping operation according to the material characteristic of concrete.

– When the concrete is soft, shift the stop valve to "closed position" direction.

- When the concrete is so stiff, shift the stop valve to "open position" direction.



CPCK3030

(14) If the strange movements of the boom are felt while the operation, refer to the "LHDV load holding valve trouble shooting" and remedy them.

3.6 Cleaning

3.6.1 Cleaning

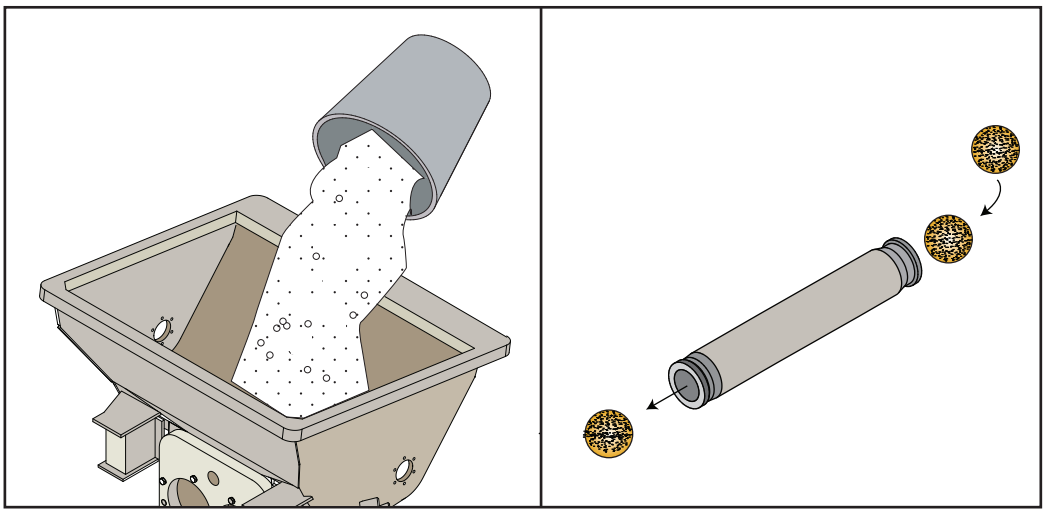
• In this section you will find the cleaning works to clean the concrete pump, filling hopper and boom delivery line after every working operation. Please memorize the following for more perfect cleaning jobs:

- During the first four weeks of operation, clean all painted surfaces solely with cold water at a maximum water pressure of 5bar.
- Do not use any aggressive cleaning additives or various concrete removal agents! Some of them attack rubber and plastic parts.
- The paint has been solidified after this period of time, and you can use stream je tguns or other aids
- Never use sea water or other salty water for cleaning the machine due to a risk of damage for the chrome.

>> plated layers of all hyd. Cylinders and delivery cylinder and an attacking risk of rubber and plastic parts. If any salty water comes into the machine, immediately rinse the surfaces affected.

Lock away the remote control units in the driver's cap while cleaning work. The remote control units do not have a water-tight housing. Carry out necessary machine functions at control panel while cleaning work.

To clean the delivery line should be done so well in order to begin the pumping immediately at the next job without need of more preparations. According to requirement, three cleaning methods are possible.

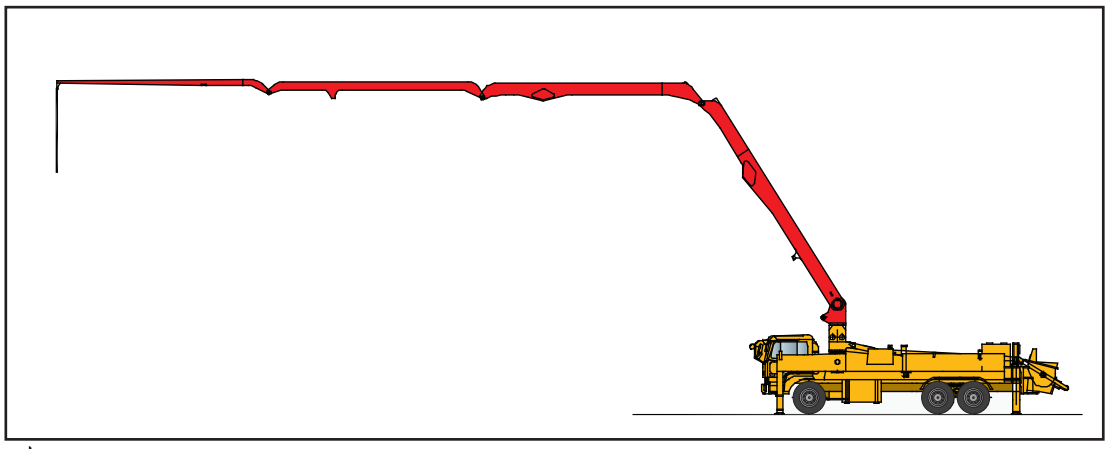


CPCK3028

3.6.2 Suction cleaning

This is the popular method for the pumper switch boom .

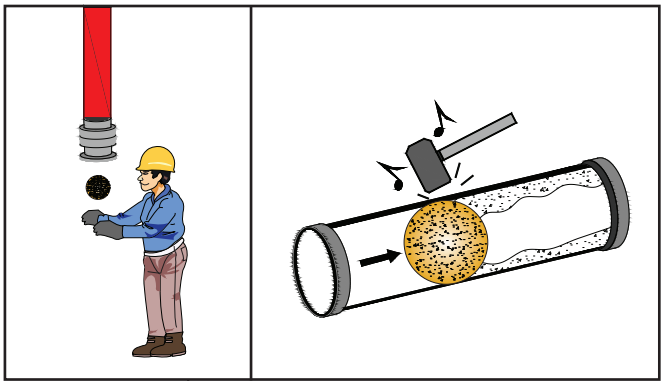
（1）Pump out the hopper to the upper edge of the delivery cylinder, then turn the "pumping switch" off.



CPCK3031

(2) position the placing boom in a gradually ascending position.

(3) Insert a water-soaked cleaning sponge(ball) into the end of the end hose.



CPCK3032

(4) Suck the cleaning sponge ball back into the hopper by switching the "back pumping switch" on. Slightly hammer on the delivery line until the cleaning sponge has passed the spot hammered on (this can be recognized by a hollow sound).

- Switch the "back pumping switch" off when the cleaning sponge reaches the taper pipe.

(5) for the operator bigger than on cleaning is not sufficient and the cleaning process of more than 2 times are necessary.

(6) Open the hopper flap to remove the remaining concrete.

- Disconnect two 90˚elbows(6") from the discharge pipe and the taper pipe
- Switch the water pump on by shifting the lever of control valve to the "water pump" position.
- Clean the s-valve, agitator, hopper, delivery cylinder and water box spraying the pressurized water carefully.
- Spray a mixture of oil and diesel into the inside of hopper slightly for the anti-rust purpose.

(7) Fully empty the water box, water tank and water pump during the winter season due to the freezing risk.

- The water box should also be emptied when the pump is not used for the time being.

3.6.3 Cleaning with the pressurized water

Cleaning of the machine with the pressurized water is one of the most practice-proven methods.

(1) Pump the hopper out as empty as possible.

- Switch the "pumping switch" off.
- Disconnect a 90˚ elbow(6") from the straight pipe and discharge pipe and swing it to on side.

(2) Remove the concrete from the straight pipe until a water soaked paper plug and a sponge ball (2 sponge balls) can be pressed into the taper pipe.

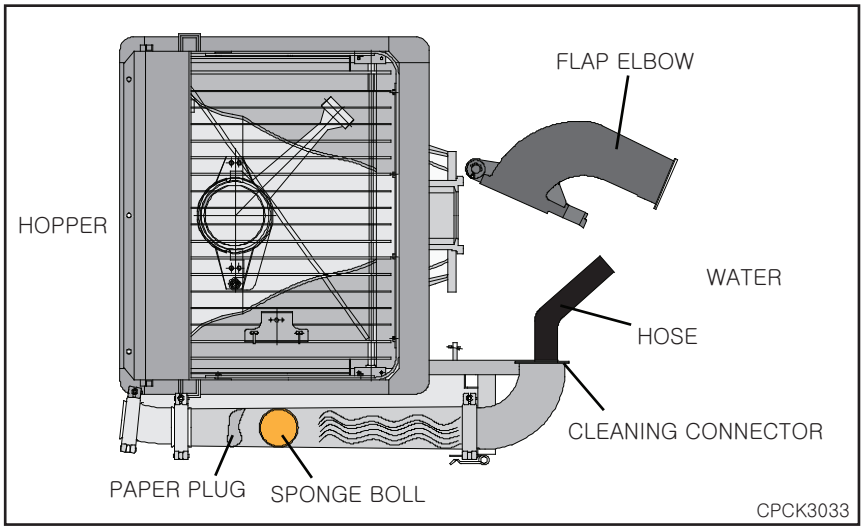
(3) Install the cleaning connector to the straight pipe and connect the water hose to it.

(4) Switch the water pump on until a paper plugand a sponge ball come out of the end hose.

- Be sure that nobody stay where the concrete is discharged.

(5) Switch the water pump off, disconnect the cleaning connector.

(6) Clean the hopper as described at the (6) of "suction cleaning"



3.6.4 Cleaning with the air compressor

This is the popular method for the operator without boom.

(1) Pump the hopper out as empty as possible.

(2) Disconnect a 90˚elbow(6") from the taper pipe.

(3) Remove the concrete from the straight pipe until a water soaked paper plug and a sponge ball can be pressed into the taper pipe.

(4) Install the cleaning connector to the straight pipe and connect the air hose to it.

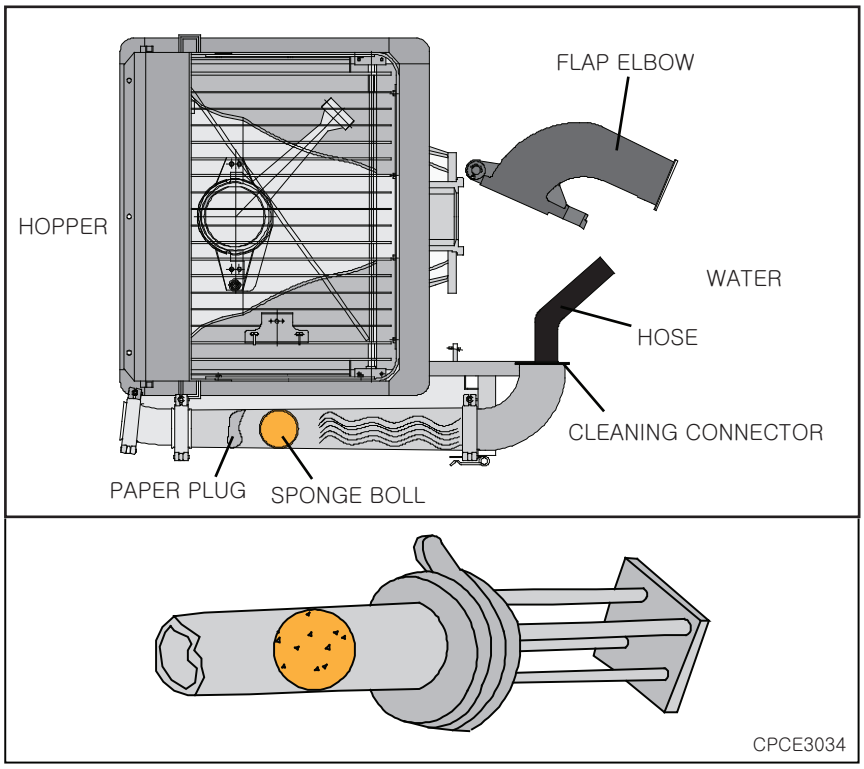
- Install the ball catcher at the end of delivery line.

(5) Switch the air compressor on by engaging the lever of control vale to the "on" position.

- Be sure that nobody stay where the concrete is discharged.

(6) Switch the air compressor off.

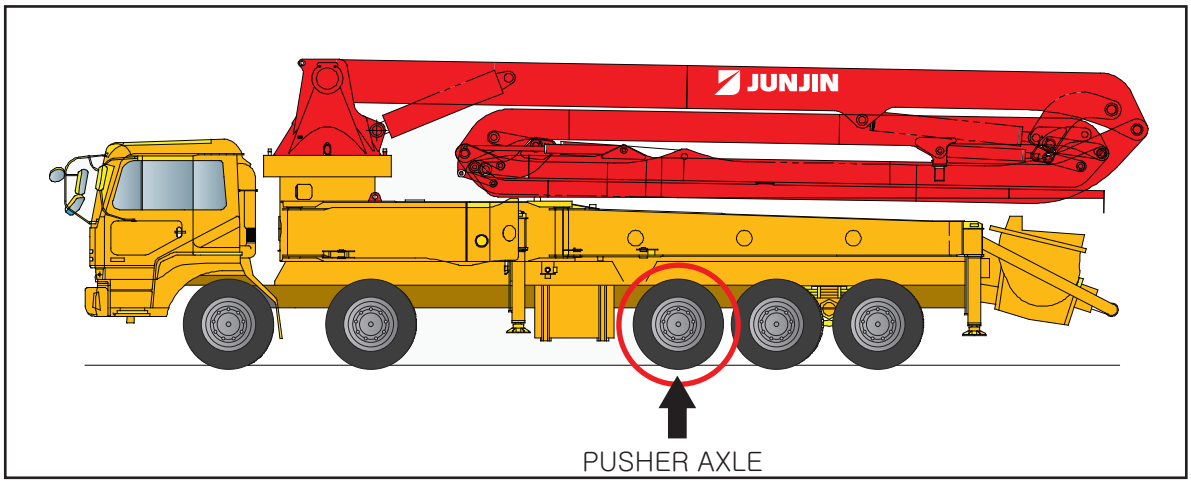
(7) Clean the hopper as described at the (6) of "suction cleaning".



3.7 How to operation Pusher axle

3.7.1 Summary

• Concrete pumpcar use pusher axle for propriety distribute of exle.



CPCK3035

3.7.2 How to operation Pusher axle and caution

1) When driving, you must take down pusher axle for propriety distribute.

- When drivig to back, pusher axle is lifted automatically.
- if pusher axle is not lift in Back gear, you can check. and if you are not lifted pusher axle when back drive, tire and assembly is breakaged.
- when pumping or extending outrigger, you must lift pusher axle.

3) you must lift axle when drive bad way.

4) you can adjust heavy of pusher axle by air prssure of pusher axle, but you never not adjust original setting value.

5) when running and changing gear (moving back -> moving forward), you must wait 2minute.

6) caution of when taking measure of weight

- it will get to lack a normal weiht because when pass the slide prevention sill, air pressure is dowened. so must pass slow(5km/h and under).

정기점검요령

MAINTENANCE

04

4.1 Daily checking points

4.1.1 Summary

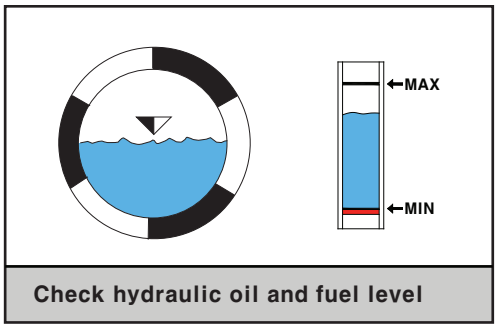
• In this section you will find the information on maintenance work which is necessary for the safe and efficient operation of the machine.

4.1.2 Daily checking points

• Check water, hydraulic oil and fuel level and fill them up if necessary.

• Check all wearing parts including delivery line which are contacting with the concrete and replace. them if necessary.

• Refer to the "3.Replacing wear plate and wear ring"



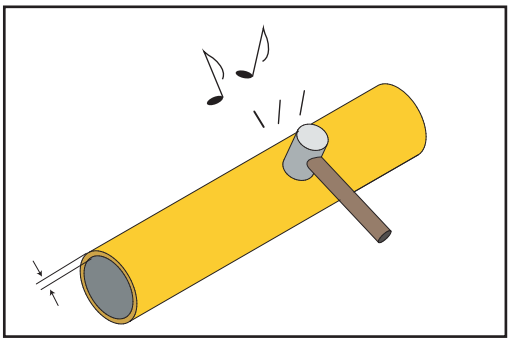
Check hydraulic oil and fuel level

CPCE3002

• Grease all greasing points according to maintenance intervals.

• Refer to the "6. Detailed greasing points".

• Clean grease nipples before/after greasing and remove excessive grease from greasing points. Refer to the "9. Minimum wall thickness and operating pressure".



CPCK71

• Check the thickness of concrete delivery line as tapping with a hard wooden handle of hammer or measuring device and replace if necessary.

• Check the clearance (max.3.5mm) between "S"-valve and wear ring.

• Check whether the grease into "grease tank" is sufficient or contaminated and the "automatic greasing system" is well operated.

- If the grease is contaminated, replace it with new one.

• Check the indicators of filters and replace the element if necessary.

- Carry out the checking of indicators at the oil temperature of more than 50℃

Refer to the "11.Indicators/elements of filters".

4.2 Maintenance intervals

4.2.1 Checking point

The following maintenance intervals specified are based on a daily operation of 8hours corresponding to 40 hours per week. If the pumpers are operated more frequently, the interval should be shortened accordingly.

Group	Checking Points	Intervals(Hours)					Remark
		Daily	Week	200	500	1000	
Hydraulic system	Drain the condensed water off	●					
	Check hydraulic oil level	●					
	Check the leakage at fitting/lines	●					
	Check the contamination indicators of filters	●					
	Check the tightening of hydaulic cylinders			●			
	Change the hydraulic oil/filter elements			●			
	Check hydraulic oil pressures		●				
Pumping kit	Check the wear of wear ring/wear plate	●					
	Clearance check between wear ring and s-valve	●					
	Check the wear of delivery pistons	●					
	Check the scratch of delivery cylinder		●				
	Check the tightening of bolts			●			
P.T.O gear box	Check the leaking and level of gear oil		●				
	Full oil change of power-take-off				●		
Electricity	Check the function of emergency shout-off buttons	●					
	Check visual inspection of wirings	●					
	Check the function of electrical switches and buttons	●					
Greasing	Check of the "greasing system"	●					
	Check grease level and contamination into grease tank		●				
	Grease the propeller shafts of P.T.O gear box		●				
	Grease all grease nipples of the boom/outriggers	●					
Water	Check water level into water tank	●					
	Check for contamination into water tank		●				
Delivery line	Check wall thickness	●					
	Fastening safety of couplings	●					
Truck	According to the truck manufacturer's maintenance instrucctions						

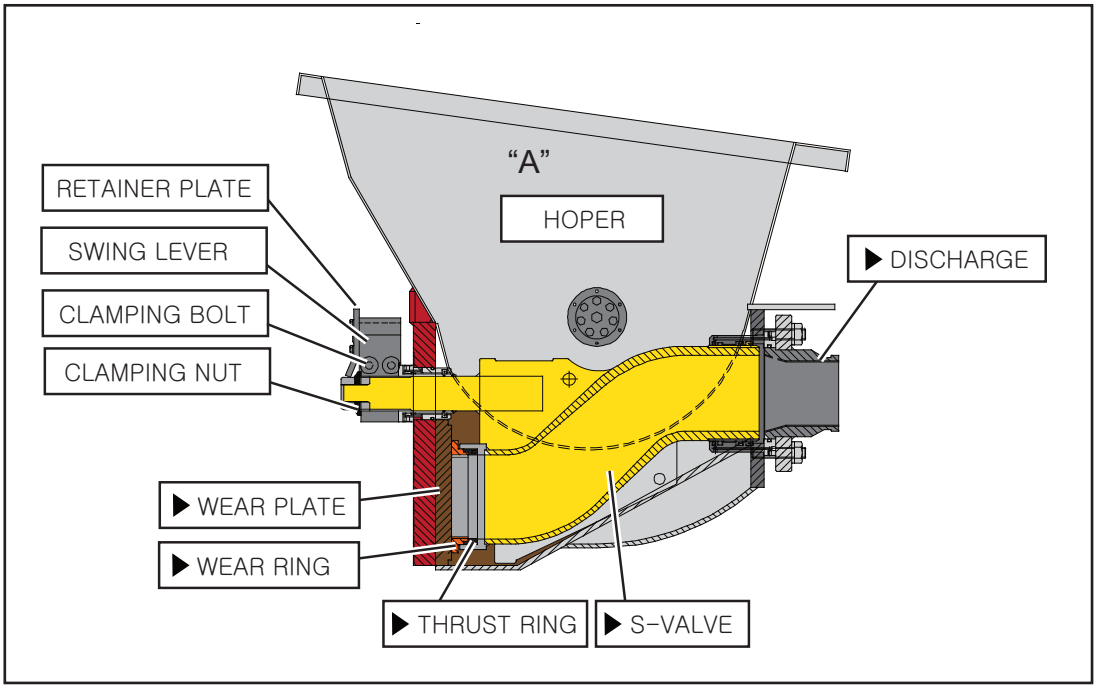
CPCE3039

4.3 Replacing wear plate and wear ring

4.3.1 Replacing wear plate and wear ring

• If the wear of "wear plate" and "wear ring" is so serious, two parts should be replaced together.

• General wearing parts are marked as ▶ on the following drawing.



CPCK3040

1) Open the "ball valve; in order to relieve the pressure of hydraulic line off before the maintenance (refer to the " hydraulic circuit : pumping")

2) Loosen the "clamping bolts" and "retainer plate".

3) Disconnect the "plunger cylinders"

4) Open grid of hopper and secure it.

5) Loosen the "clamping bolts" of swing lever and "clamping nut"

6) Loosen the "hex. Nuts" of discharge pipe and push S-valve back toward the discharge pipe.

7) Tank the wear plate, wear ring and thrust ring out.

▶ Remove the remaining concrete and mortar into the hopper.

8) Grease and assemble them with S-valve.

9) Fasten the "clamping nut" until S-valve doesn't move.

▶ if S-valve is settled completely, "A" clearance is about 1 to 3mm.

10) Fasten the "clamping bolts" of swing lever with 21kg.mm torque, connect the "plunger cylinders" and fasten "hex. Nut" of discharge pipe.

11) Close the "ball valve" surely.

12) Start the pumping and check whether the movement of switching system is smooth.

▶ if the movement of switching system is not smooth, adjust the tightening "clamping nut".

13) Fasten the "retainer plate" with "clamping bolts"

※ stepping on grill-type guards subject to wear is prohibited

4.3.2 Replacing only wear ring

• If the wear condition of wear plate is so good, only wear ring can be replaced.

1) Open the ball valve; in order to relieve the hydraulic line pressure off.

2) Loosen the "clamping bolts" and "retainer plate".

3) Open grid of hopper and secure it.

4) Loosen the "nut"

5) Push S-valve back toward the discharge pipe.

▶ If S-valve is not pushed back, loosen the "hex. Nuts" of discharge pipe.

6) Take the wear ring out and assemble new one.

7) Do the remaining jobs as described at 8) to 11) of "replacing wear plate and wear ring".

4.3.3 Adjustment of S-valve

• If the wear condition of wear ring is good and the clearance "A" between wear ring and S-valve exceeds

1) Open the ball valve and loosen the "clamping bolts" and "retainer plate".

2) Loosen the "clamping bolts" of swing lever

3) Pull S-valve toward the swing lever by fastening the "clamping nut" until S-valve doesn't move

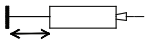
4) Do the remaining jobs as described at 8) to 11) of "replacing wear plate and ring".

4.4 Detailed greasing points

4.4.1 Detailed greasing points

• Due to neglect of management of JUNJIN such as timely grease refilling, BUSH would abnormally be worn, so this cause lead housing, pin, shaft to being damaged and might occur serious accidents finally.

• Any person assigned to operate JUNJIN must refill grease and inspect timely, so if anything should occur due to this failure, JUNJIN would have rights to deny manufacturer's responsibility to the customers.

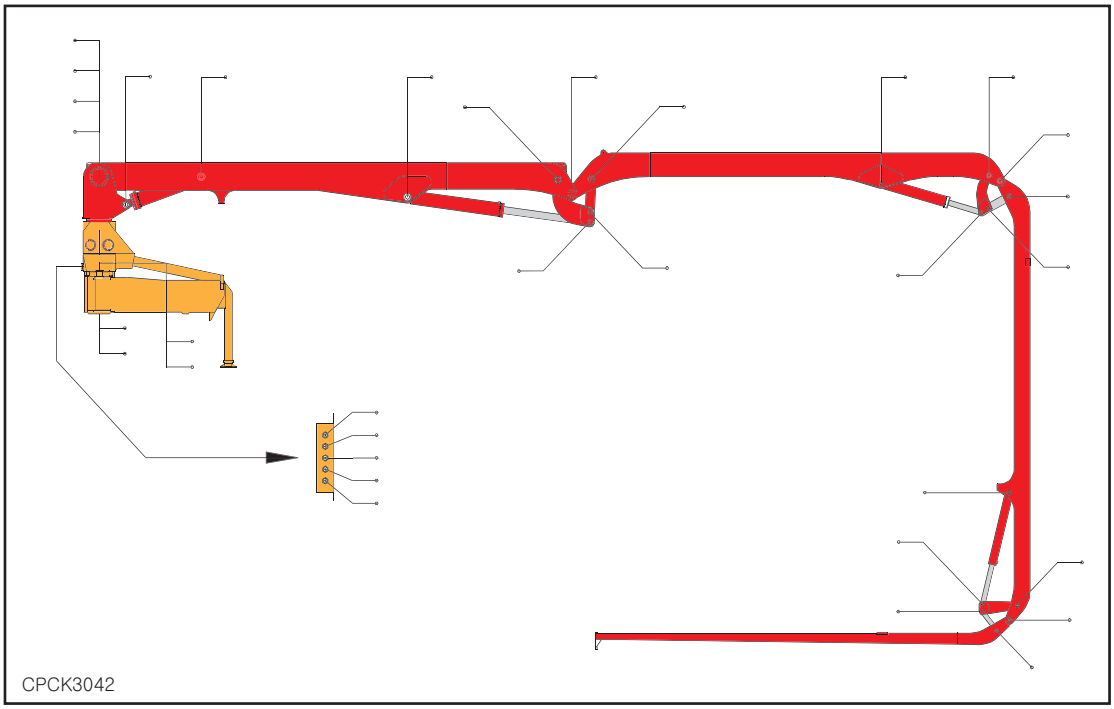
Greasing points	Greasing intervals & checking time	Checkpoints
TURNING SYSTEM/ OUTRIGGER/ BOOM	▶ WORKING TIME  1X24h  5 times ▶ CHECKING TIME 1X500H	▶ Check if, grease is refilled normally. ▶ Check if, during operating, BUSH is not fixed firmly. ▶ Check if, BUSH is damaged.

CPCE3041

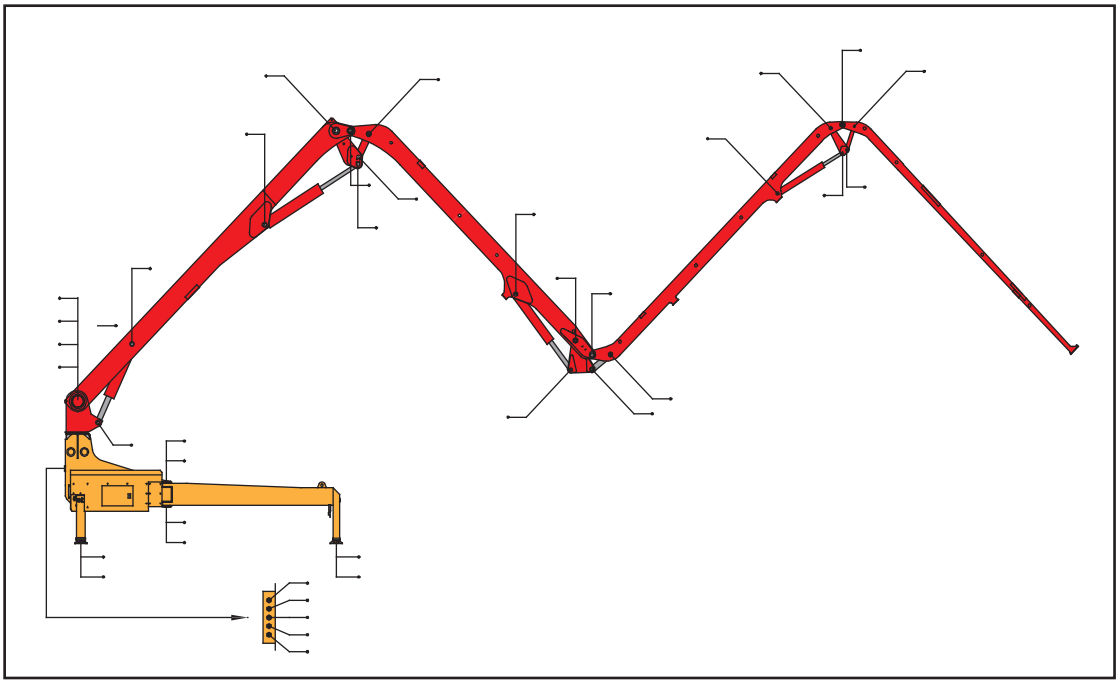
• Due to so intensive stress and friction given to the assembled parts of boom and outrigger, the grease of L-GREASE No.2 should be used at all greasing points

• Refer to next two pages.

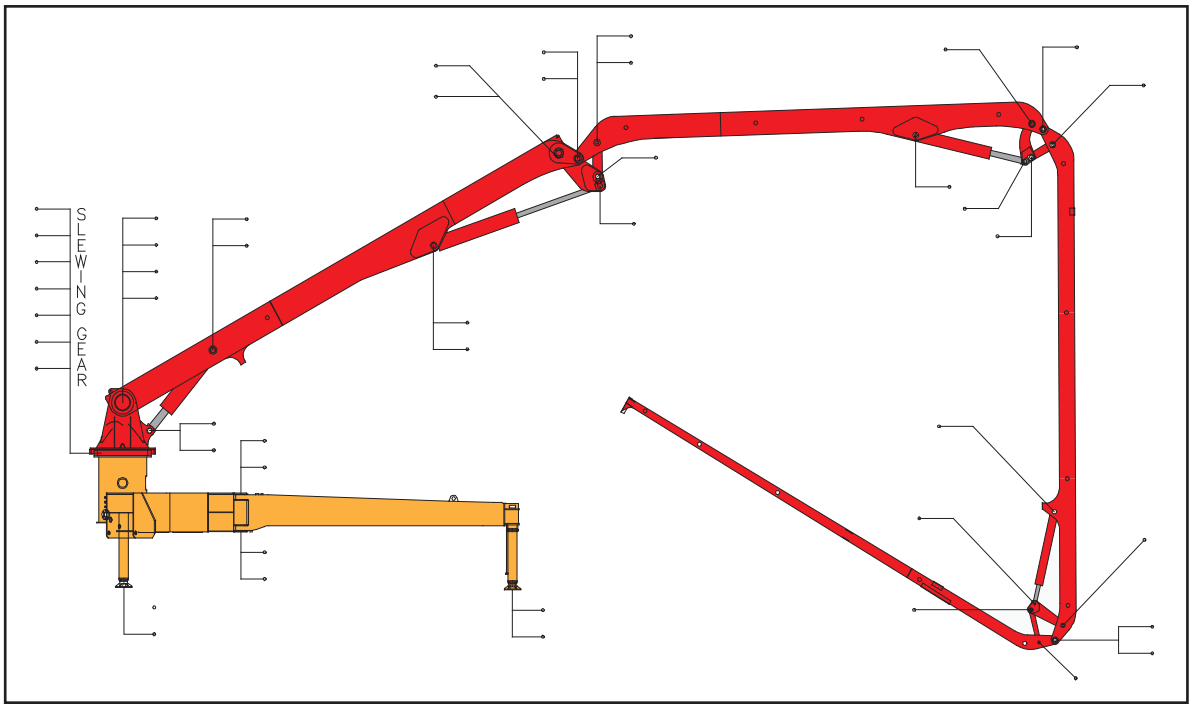
4.4.2 ROLL FOLD 4SECTION BOOM (TYPE-1)



4.4.3 Z-FOLD 4SECTION BOOM (TYPE-2)

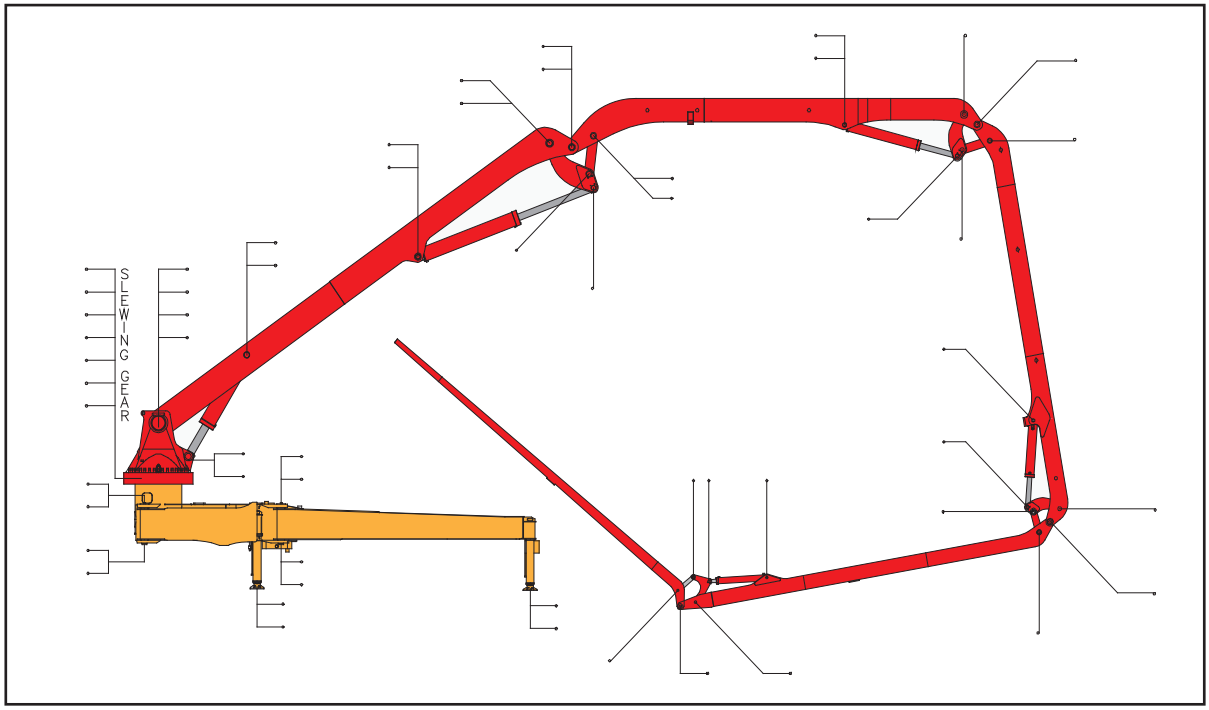


4.4.4 ROLL FOLD 4SECTION BOOM (TYPE-3)



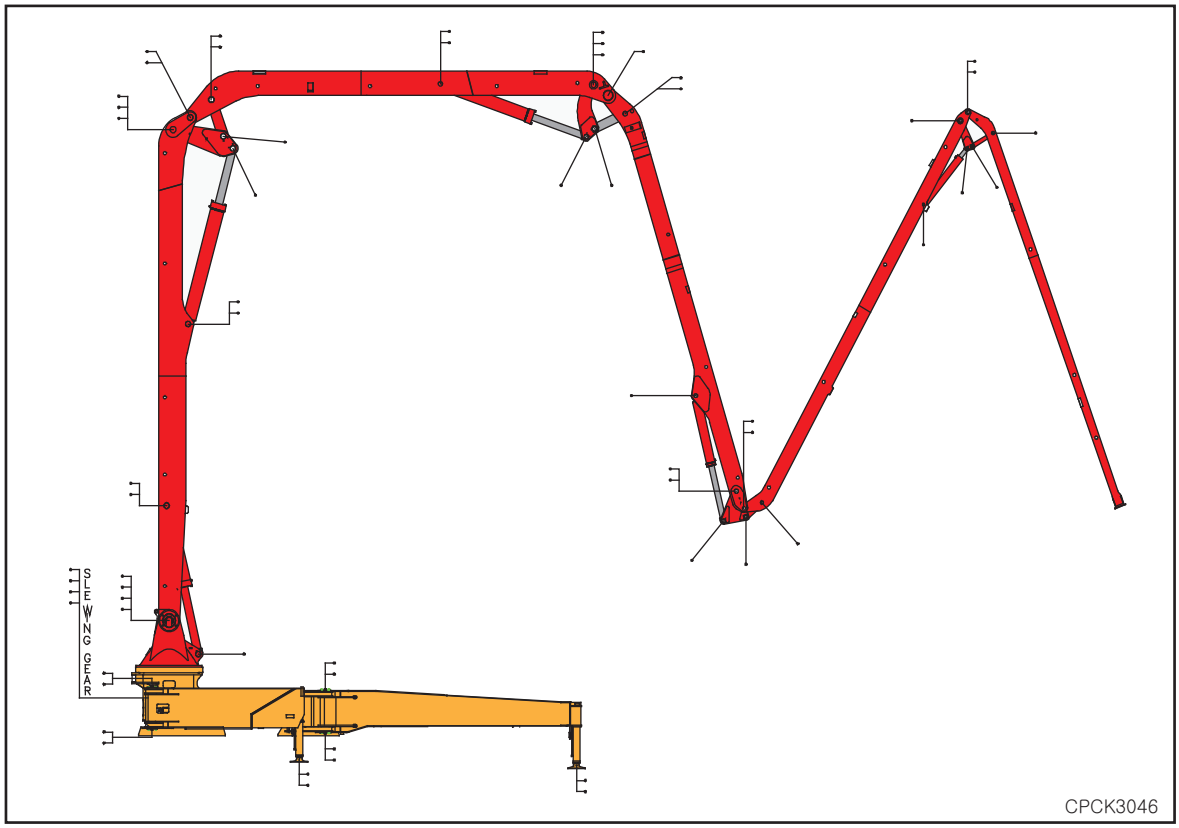
CPCK3044

4.4.5 Z&ROLL FOLD 5SECTION BOOM WITH SLEWING GEAR (TYPE-4)



CPCK3045

4.4.6 ROLL FOLD&Z FOLD 5SECTION BOOM (TYPE-5)



4.5 hydraulic pressure

4.5.1 How to check hydraulic oil pressure

With regard to the checking of hydraulic oil pressures, refer to the "Hydraulic Circuit" and "Main Components" sheets.

1) Main oil pump (pumping)

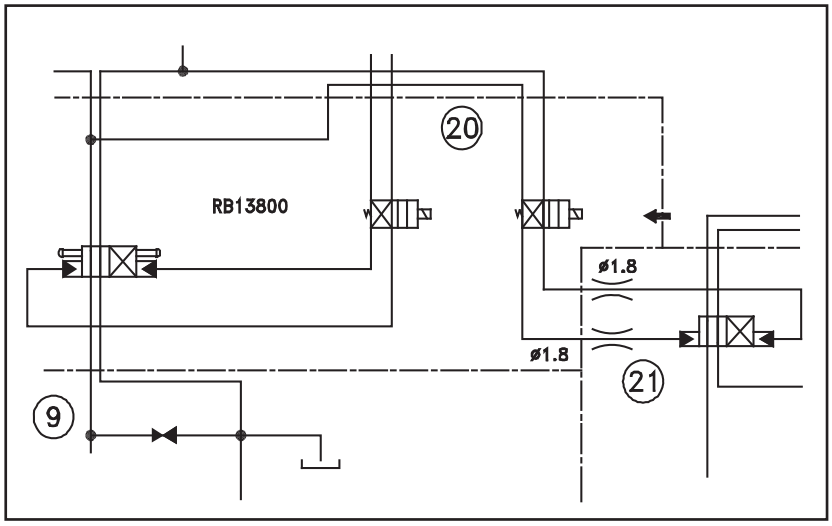
- Switch the "pumping switch" on
- Push the button of " solenoid valve#2 to be connected with "4-way valve"
- The needle of pressure gauge indicates 350 bar.

2) Valve oil pump (switching system)

- If the ball valve is closed and the "pumping switch" isn't switched on, the needle of pressure gauge indicates 190bar
- If the "pumping switch" is switched on, the needle of pressure gauge should indicate 90bar and then 190bar by turns according to the switching of S-valve.

3) Gear pump for oil cooler

- Execute the pressure check when there is a malfunction.
- loosen the "in-port side of oil cooler motor and plug the hole of hydraulic line surely.
- If the "oil cooler switch" is switched on, the needle of pressure gauge indicates the specified pressure on hydraulic circuit.



CPCK3047

4.5.2 Hydraulic oil and grease recommendations

	SHELL	MOBILE	ESSO	BP	ARAL
Hydr. Oil	S3V 46	DTE 25 AW 46	NUTO H 46	BP ENERGOL HLP-HM 46	ARAL VITAM GF 46
P.T.O oil	SPIRAX EP 90	MOBILUBE GX 85W-90A	GP-D 85W-90	ENERGEAR EP 90	HYP SAE 85W-90
Auto greaseing system	ALVANIA EP GREASE00	-	BEACON EP00	ENERGREASE EP00	-
boom & outrigger	RETINAX A	MOBILUX 2	BEACON 2	ENERGREASE LS 2	ARALLUB HL 2

CPCE3048

1) Our machines use SHELL S3V46(hydraulic oil), ZIC G5 80W/90 (P.T.O oil), MPA00 (automatic greasing system & general) and L-GREASE 2 (boom and outrigger)

2) L-GREASE 2 (including MoS2) should be used at rack and slewing gear parts and assembled parts of boom and outrigger such as pins and bushings

3) Never mix the oil of other makers when the oil is filled up.

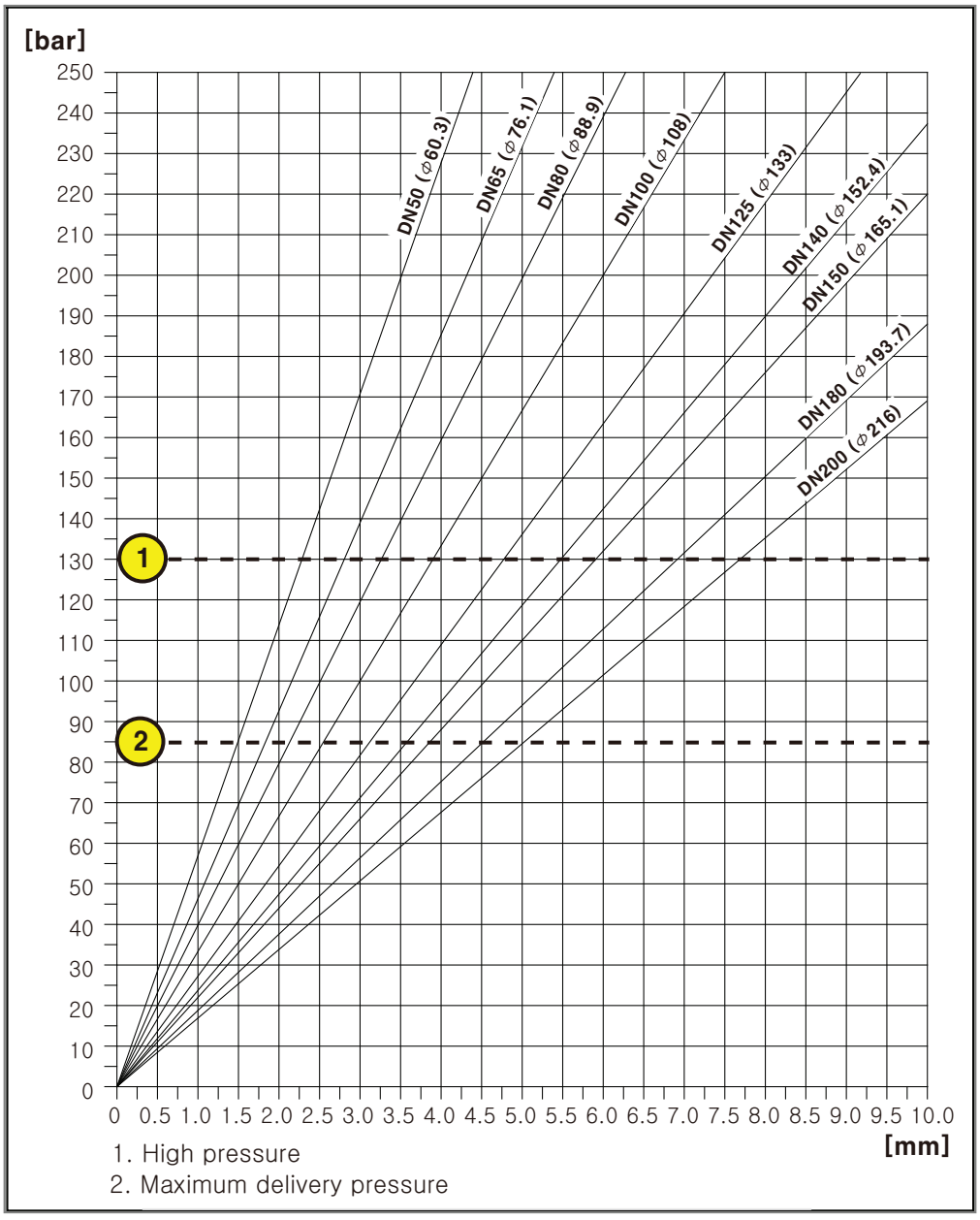
4.6 Minimum wall thickness and operating pressure

4.6.1 Minimum wall thickness

- Pipe and elbows must be replaced if the wall thickness is close to the minimum wall thickness.
- Our company has no responsibility for the damage caused by the pumping job which is done when the wall thickness is under the minimum wall thickness.

Ex1) Operating pressure = 120bar, inner diameter of delivery pipe=Φ150

Minimum wall thickness is 5.8mm(refer to the following graph)

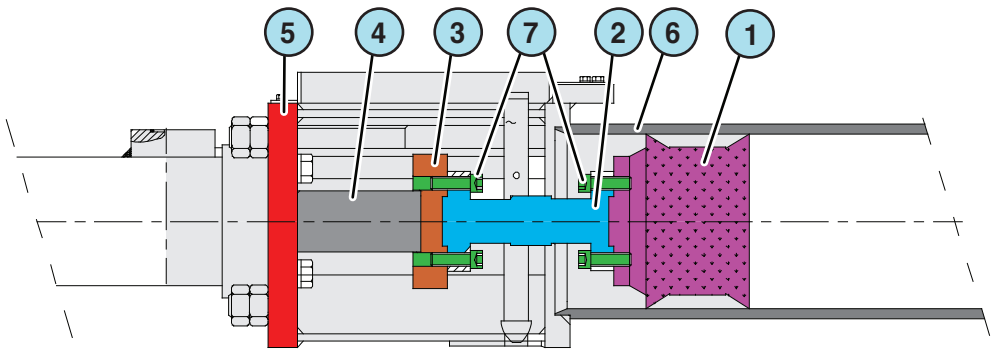


CPCE3049

4.7 Replacing of delivery piston

4.7.1 Removing procedure

Always keep the engine speed at the lowest rpm while the replacing job



① Delivery piston
② Spacer flange
③ Flange
④ Main cylinder rod
⑤ Water box
⑥ Delivery cylinder
⑦ Hex.bolt

CPCE3050

(1) Move the " ① delivery piston" to be removed to its end position

▶ The " ② spacer flange" must be fully visible into the water box and drain the water from water box.

(2) Stop the engine, unscrew the four "⑦ hex. Bolts" from the "①delivery piston" ③ flange" and tank the " ② spacer flange" out.

(3) Start the engine and slowly move the " ④ main cyl. Rod" to the " ① delivery piston" by switching the "pumping switch" on step by step.

▶ Take care not to push the " ① delivery piston" toward " ⑥ delivery cylinder".

(4) Stop the engine and bolt the "① delivery piston " to the "③ flange" with two "⑦ hex. Bolts"

(5) Start the engine and switch "back pumping switch" on till the ① delivery piston" is retracted from " ⑥ delivery cylinder" completely.

(6) Unscrew the two " ⑦ hex. Bolts" and take the old" ① delivery piston" out

4.7.2 Assembling procedure

(1) Grease a new "delivery piston" and the " ⑥ delivery cylinder"

(2) Bolt a new "delivery piston" to the " ③ flange" with the two " ⑦ hex bolts"

(3) Start the engine and slowly move the " ④ main cyl. Rod" into the " ⑥ delivery cylinder" by switching the "pumping switch" on step by step carefully.

▶ The enough space to fit the " ② spacer flange" between " ① delivery piston" and " ④ main cyl. Rod" must be taken.

(4) Stop the engine and unscrew the two " ⑦ hex. Bolts."

(5) Start the engine and retract the " ④ main cyl.rod" toward the water box by switching the "back pumping switch" on carefully

(6) Stop the engine and bolt the " ① delivery piston" and ② spacer flange" with the two" ⑦ hex. Bolts"

(7) Start the engine and move the " ④ main cyl. Rod" forward until the " ③ flange" contacts the " ② spacer flange"

(8) bolt the " ③ flange" and " ② spacer flange" with the two" ⑦ hex. Bolts" tightly.

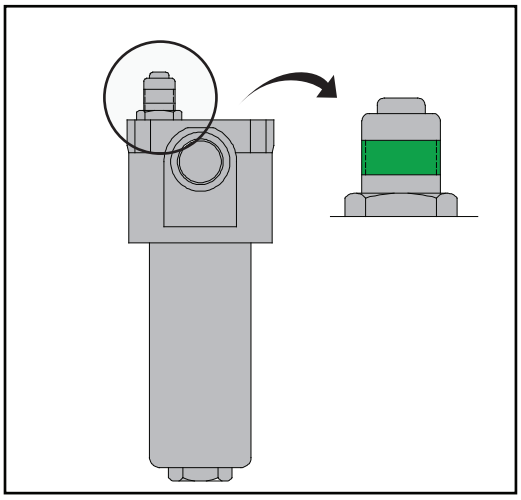
4.8 Indicators / Elements of filters

4.8.1 Elements of filters

The checking of indicators must be done at the oil temperature of more than 50 ℃ and the max. output rats.

▶ Green zone : "clean"

▶ Red zone : "Replacement"



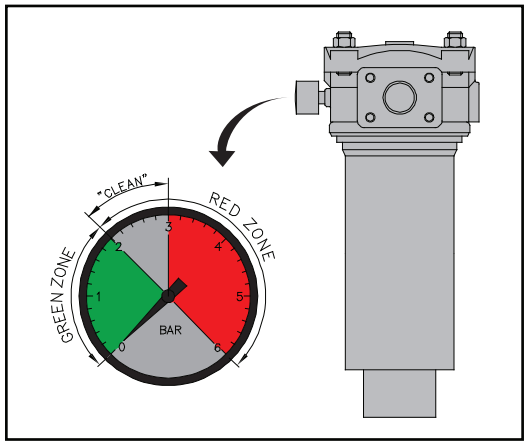
CPCK3051

4.8.2 Return filter

Additional pressure -1bar (by ressurised air system) apply for the indicator on return filter. So. Element is clean up to 3bar. Element should be replaced at above 3bar.

▶ Green zone : "clean"

▶ Red zone : "Replacement

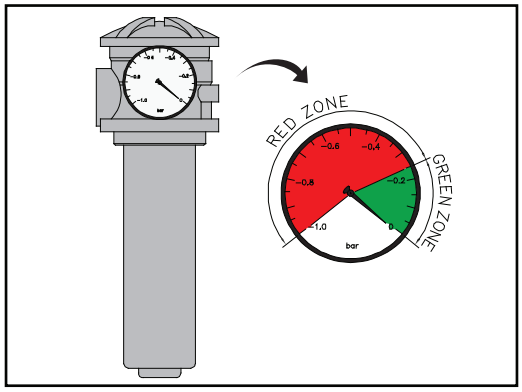


CPCK3038

4.8.3 Suction filter

▶ Green zone : "clean"

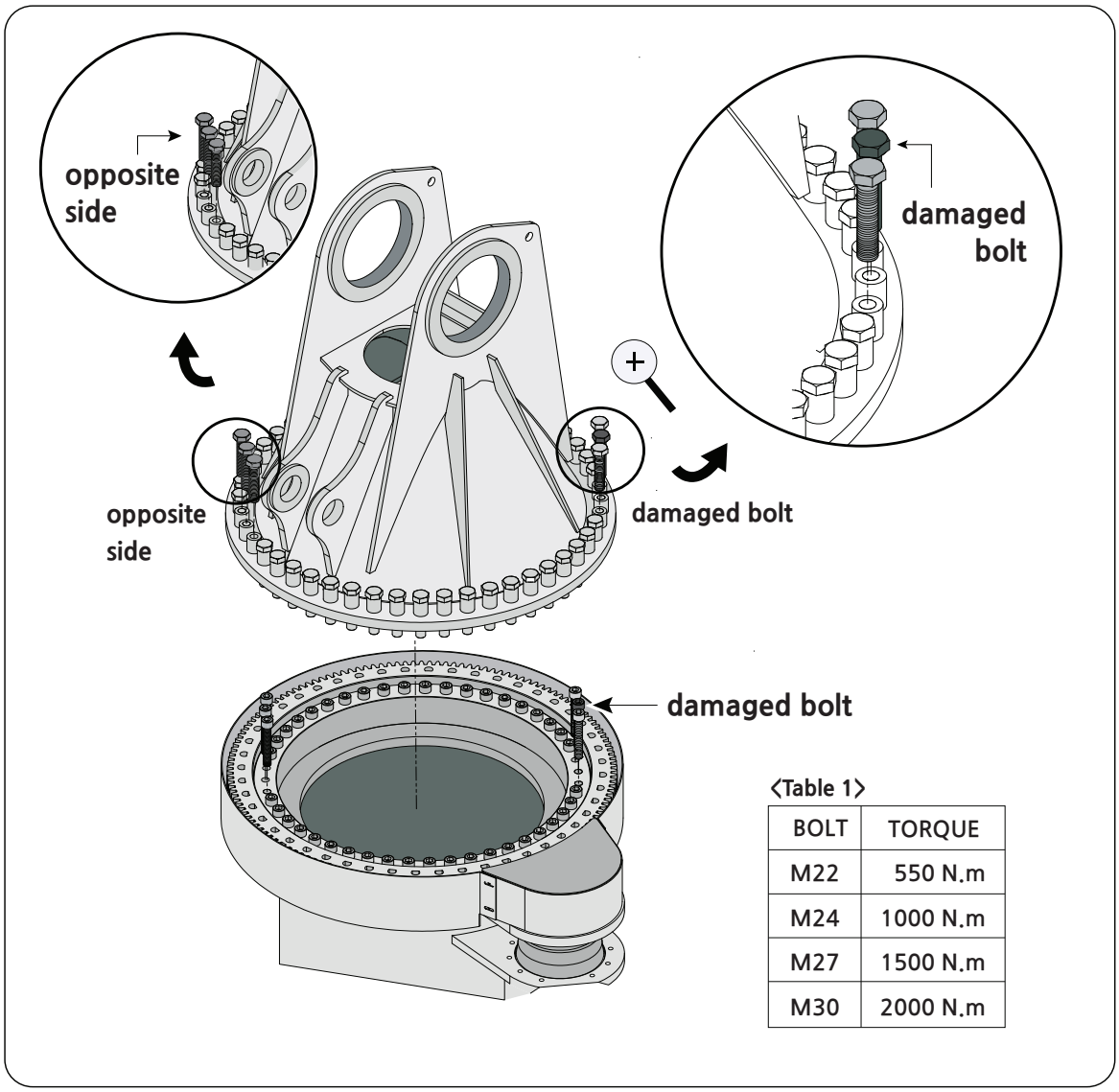
▶ Red zone : "Replacemen



CPCK3052

4.9 Turning base bolts checking and/or replacement

4.9.1 Turning base bolts checking and/or replacement



〈Table 1〉

BOLT	TORQUE
M22	550 N.m
M24	1000 N.m
M27	1500 N.m
M30	2000 N.m

CPCE3053

Be sure to check turning base bolts once per a month.

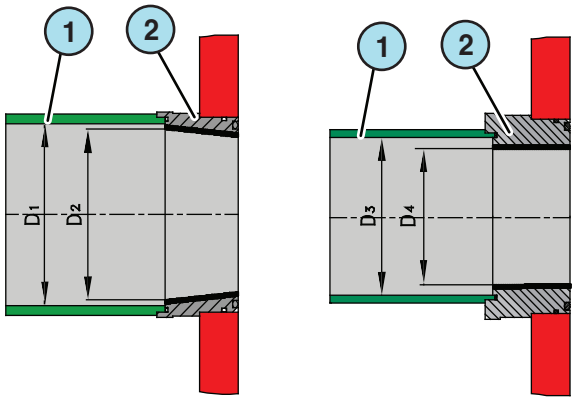
Caution : If any damaged or loose bolt is found, to fasten the bolt tightly cannot be solved the problem basically. As above pictures, not only damaged bolt but also left/ right side of bolts from Damaged one, plus opposite side bolt, total 3 of bolts should be changed completely.

※ On tightening Bolt, Torque should be done as Table.1.

(Strength of JUNJIN Bolt is 12.9T, but the regulation of torque is 10.9T)

4.10 4.10 Replacement of connecting ring

4.10.1 Replacement of connecting ring



Inner diameter of delivery cylinder		Maximum wear limit of connecting ring	
D1	Φ230	D2	Φ228
D3	Φ200	D4	Φ198

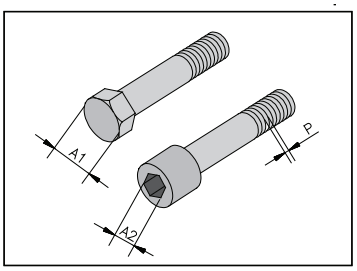
CPCE3054

▶ Replace the connecting ring if inner diameter reaches at the maximum limit.

4.11 Maximum tighting torque of metric thread

4.11.1 Maximum tightening torque of metric thread

- Tightening toque depend on bolt quality, thread friction and bolt head bearing area.
- The values given in the following table are for guidance.
- These values should only be used if no other values are specified in the relevant sections of the operating instructions.



CPCK3055

4.11.2 Maximum permissible torque

(Except the Turning base bolt, please refer to the Chapter 4.9.)

Size				Quality grade			
Spec.	Pitch	A1	A2	6.9T	8.8T	10.9T	12.9T
M4	0.7	7	2	2.4	2.9	4.1	4.9
M5	0.8	8	4	5	6	8	10
M6	1	10	5	8.5	10	14	17
M8	1.25	13	6	21	25	35	41
M10	1.5	17	8	41	49	69	83
M12	1.75	19	10	72	86	120	145
M14	2.0	22	12	115	135	190	230
M16	2.0	24	14	180	210	295	355
M18	2.5	27	14	245	290	405	485
M20	2.5	30	17	345	410	580	690
M22	2.5	32	17	485	550	780	930
M24	3.0	36	19	600	710	1000	1200
M27	3.0	41	19	890	1050	1500	1800
M30	3.5	46	22	1200	1450	2000	2400
M8×1	1.0	13	6	23	27	38	45
M10×1	1.0	17	8	44	52	73	88
M12×1	1.0	19	10	76	90	125	150
M14×1.5	1.5	22	12	125	150	210	250
M16×1.5	1.5	24	14	190	225	315	380
M24×2	2.0	34	19	650	780	1100	1300
M30×2	2.0	46	22	1350	1600	2250	2700

Units : N.m (10N.m = 1kg.m)

CPCK3056

★ Above sheet complies with all Junjin pumps except NZ36

고장진단 및 조치요령

TROUBLESHOOTING GUIDE

09

5.1 Troubleshooting guide

5.1.1 summary

- In this section you will find the possible cause of troubles which may happen while the pumping operation and how to diagnose and remedy them.
- The diagnosis and remedy of troubles described at this section are written under the diagnosis that "Daily checking points" is perfectly executed.
- The details of components described in this section are based on the "Hydraulic circuit and Main COMPONENTS" sheets.

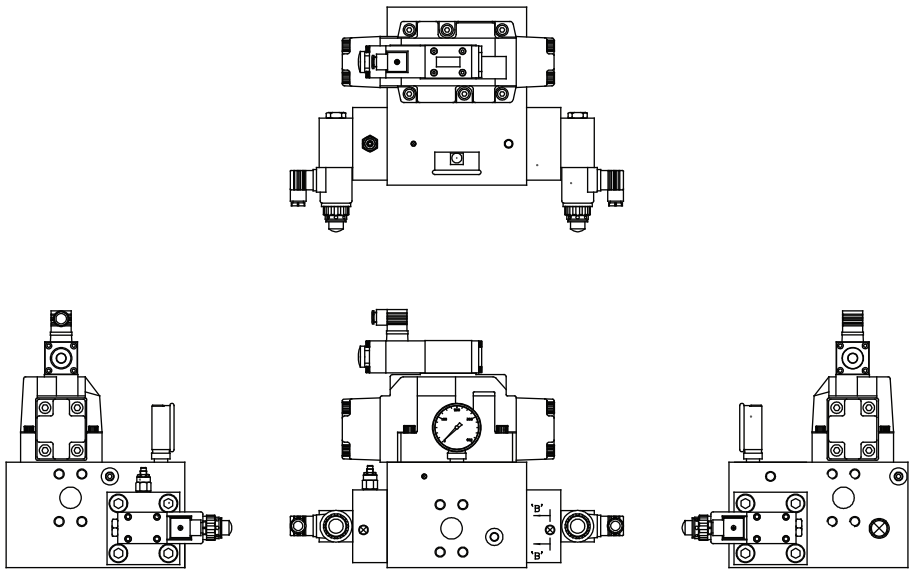
5.1.2 pumping operation is unsatisfactory

Checking points	Causes & action	Solution
Specified engine rpm	Check the specified engine rpm after switching the "engine speed control switch" on to the maximum position. PTO GEAR PLATE — ENGINE MAX.RPM R = 1.07 — 1950 RPM R = 1.12 — 1850 RPM R = 1.25 — 1650 RPM R = 1.32 — 1550 RPM	▶ Adjust the accelerating - device of governor.
Full strokes per minute	Rotate the "adjustment control switch" to the max. position under the specified max . Engine speed. ▶ 29 strokes/min	▶ if troubled contact us assp.

CPCE5002

5.1.3 Delivery pistons don't start

Checking points		Causes & action	Solution
Fuse (3F81 : Pumping) and Relay (3K2 : Pumping on/off)		If damaged.	▶ Replace them.
main hydraulic oil pressure	Lower than 350bar or irregular	Check the wiring connection and magnetic . "Coil of sol relief valve" ▶ Connect the wiring tightly, if loosened.	▶ If troubled, replace it.
		Check the fine particles into "logic-element" ▶ Blow them out.	▶ If troubled, replace it.
	Indicates the zero pressure	Check the damage of P.T.O gear box and main shaft of hydraulic pump".	▶ Contact us assp.
	Indicates 350bar	Check the damage of magnetic coil of sol valve	▶ If troubled, replace it.
		Check the spool in side of "4-way valve" stuck due to contamination ▶ Blow them out.	▶ If troubled, replace it.



CPCE5003

5.1.4 Main hyd. Cylinder blocked in end position

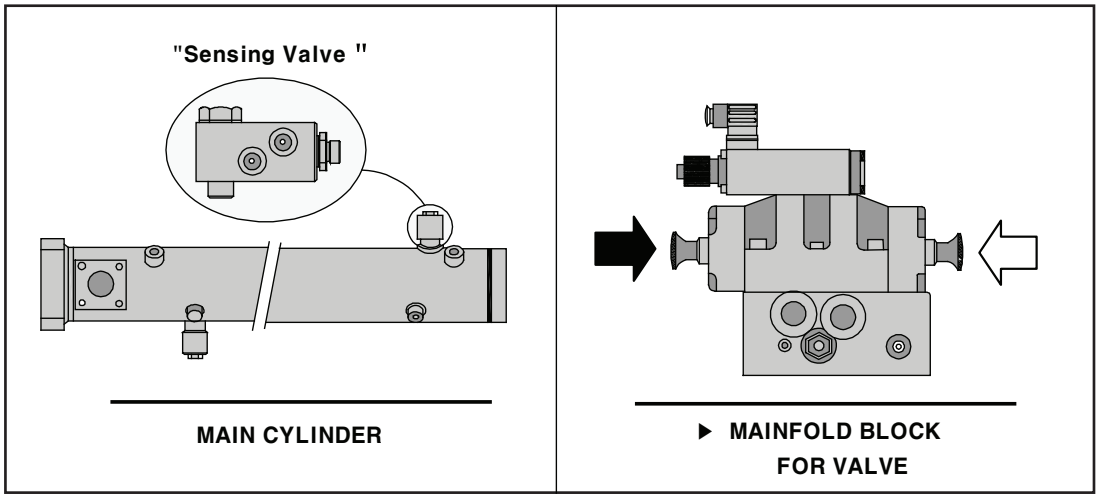
Checking points	Causes & action	Solution
Hyd.sensing valve	Check the spool of " hyd. Sensing valve " sticked due to the particles. Blow them out.	▶ If so much troubled, contact us assp.
Main 4-way valve	Check the spool of 4-way valve sticked due to the particles. ▶ Blow them out. Check that the particles into nozzle block the flow of hyd. Oil. ▶ Take them out and blow them out.	▶ If troubled, replace it.
4-way valve	Check the spool of 4-way valve sticked due to fine particles. ▶ Blow them out.	▶ It so seriously sticked, contact us asap.

CPCE5004

In case of no spare "hyd. Sensing valve" at the working site, do the emergency operating as follows.

1) Take the troubled "hyd. Sensing valve" out and plug the port of " main hyd. cylinder" in.

2) Switch the " 4-way valve's direction by pressing manual operation button by turns according to the switching of " main hyd. Cylinder".



CPCK5004

5.1.5 Back pumping does not work

Checking points	Causes & action	Solution
Fuse (1F79:"Reverse") and Relay(1K3 : "Back pumping relay")	If damaged, fuse or relay	▶ Replace them
"solenoid valves"	Check the magnetic coil of "Sol. Valve" malfunctioned.	▶ Replace them

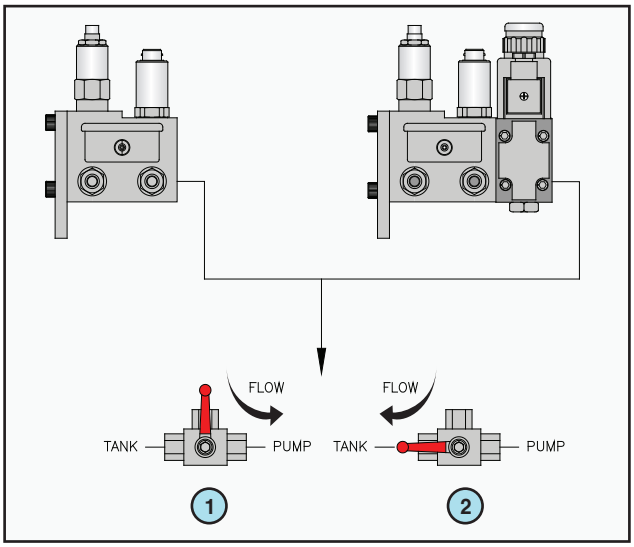
CPCE5005

5.1.6 Volume cannot or only minimum volume is available

Checking points	Causes & action	Solution
"Output adjustment switch"	Check the function of the switch.	▶ If malfunctioned, replace it.
Proportional "Reducing valve"	+ Check the magnetic coil of reducing valve. + Check the valve contaminated with fine particles.	▶ If malfunctioned, Replace it.
Control unit of main hydraulic pump	Check there are fine particles into the nozzle of spool ▶ Take them out.	▶ If troubled, contactus assp

CPCE5006

Manual output adjustment caused by the trouble of "reducing valve" at the working site.



CPCK5007

▶ In case of the trouble of "control unit"

1) Finish the work by adjusting the output volume with "engine speed control switch" of remote control

2) Contact out service representatives asap.

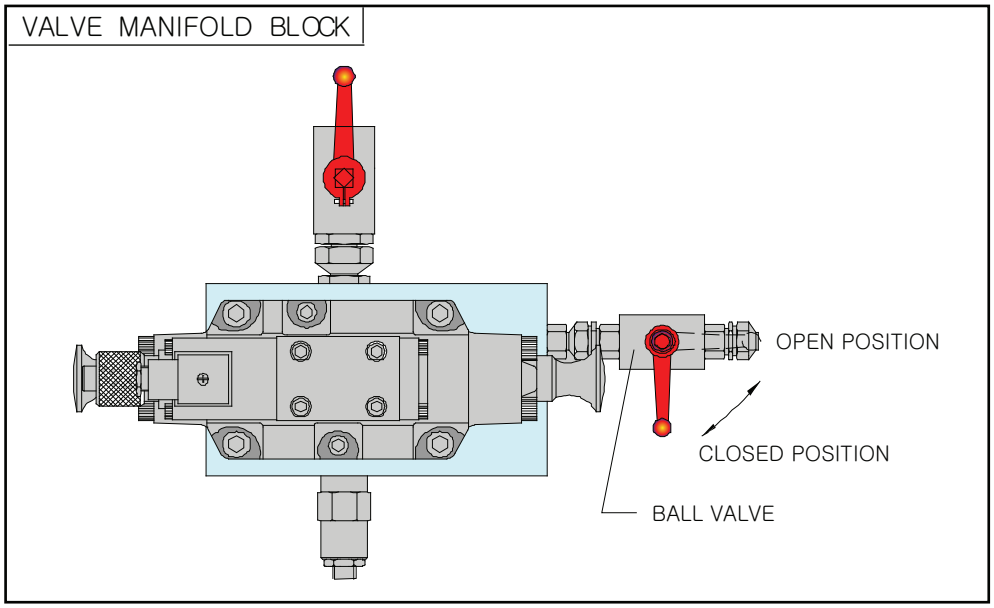
5.1.7 Switching-over of s-valve is unsatisfactory

The needle of " Pressure gauge " indicate 90bar and then 190bar by turns while the switching-over of s-valve.

Checking points		Causes & action	Solution
Ball valve		Check the lever of ball valve opened completely.	▶ Close it
Hydraulic oil pressure	Lower than 190bar	Check that the operating pressure of "valve oil pump" keeps 190bar under switching the "pumping switch "off	▶ If troubled, replace the pump.
	Indicates the zero pressure	Check the "check valve" blocked.	▶ If troubled, replace it.
	Lower than 90bar	+ Check the N_2 gas insufficient.	▶ If necessary, fill it up.
		+ Check the bladder of "accumulator"	▶ If troubled, replace it.
Jerky movement	4-Way valve	Check the fine particles is blocking the smooth spool movement. ▶ Blow them out.	▶ If troubled, replace it.
	Plunger cylinder	Check the seals of cylinder is damaged.	▶ If troubled, replace it.
	"A" clearance	Check the s-valve is tensioned so tightly.	▶ Adjust the "A" clearance

CPCE5007

The needle of " pressure gauge" indicate 90bar and then 190bar by turns while the switching-over of s-valve.



CPCK5009

5.1.8 Main hyd. Cylinders do not stop

When the "pumping switch" is switched off, two "main hyd. Cylinders" don't stop and move to end position.

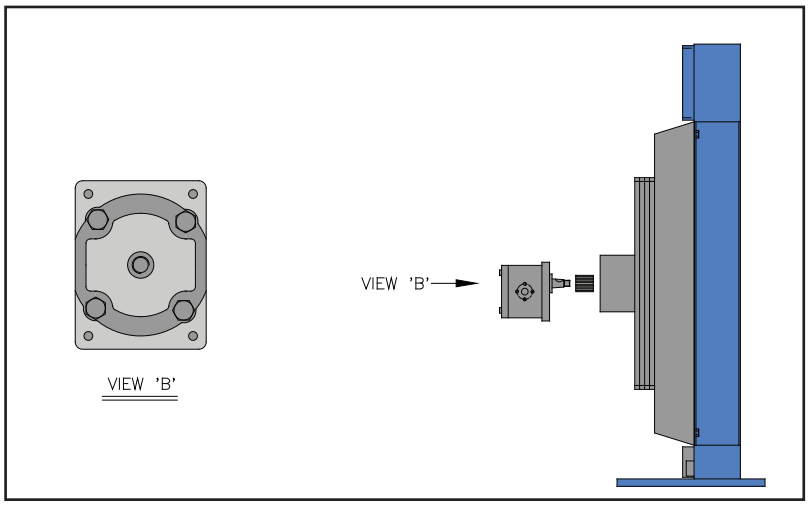
▶ Check the oil-leaking ("return flow") though the "shuttle valve" made by the damage or influx of fine particles into the inside of "shuttle valve". Blow the fine particles out and if necessary, replace it asap.

5.1.9 The red indicator lamp for "overheating" is lit.

Checking points	Causes & action	Solution
Fan is rotated.	+ Allow the hyd. Oil to cool + Fill it up, it necessary. + Replace the water in water box	Contact us asap
The ratation	+ Check the "relief valve" is contaminated. ▶ Blow the particles out.	If troubled, replace it
Fan isn't rotated. "Thermostat sensor"	Check the A of "solenoid valve" is tightening.	If troubled, replace it
	Switch on the "oil-cooler switch" + If rotated, the "thermostat sensor" is troubled. + If not rotated, check the wiring connection and magnetic coil of 2-way valve ▶ Connect the wiring tightly, if loosened.	If troubled, replace it
	Loosen the "in"-port side of "oil cooler motor" and plug the line in. + If the pressure is lower than specified pressure on hyd. circuit, the gear pump is troubled. + If the pressure keeps specified pressure on hyd. Circuit, the "oil cooler motor" is troubled.	If troubled, replace it

CPCE5008

• The 55℃ sensor is installed at the hyd oil tank

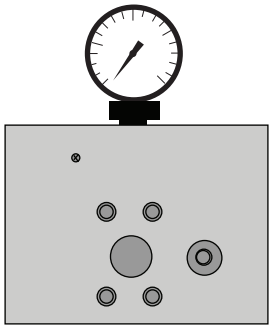


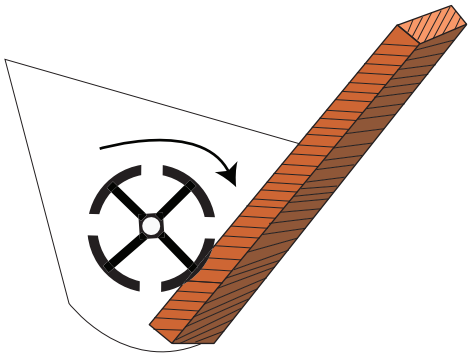
CPCK5011

5.1.10 The function of agitator and water pump is unsatisfactory

Wedge agitator a lump wood in order to check the pressure.

Checking points		Causes & action	Solution
Hydraulic oil pressure	Lower than the specified pressure on hydraulic cir.	Check the "relief valve "is contaminated first and adjust the pressure by screwing or unscrewing the head of "relief valve" with hex. wrench. ▶ Blow the particles out	If troubled, replace it
		Check the two "oil motors for agitator"	
	Indicates the specified pressure	Check the "oil motor for agitator"	If troubled, replace them.
		Check the "oil motor for water pump" or water pump" is troubled.	





CPCE5009

5.1.11 Radio remote system is unsatisfactory or don't work.

Checking points	Causes & action	Solution
"Bettery"	Check the contacts in the battery compartment Inadequate. ▶ Clean the contacts completely.	If troubled, replace it and contact us asap.
	Check the battary discharged. ▶ Replace it with newly charged one.	
"Receiver"	Check the fuses burnt. ▶ Replace it with new on.	

CPCE5010

If the radio remote control system is taking the trouble, use the cable remote control and contact us asap.

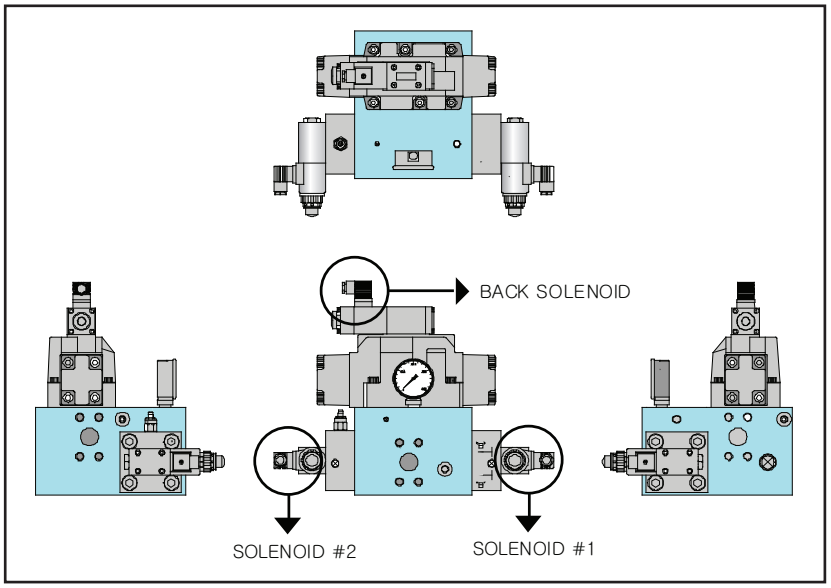
5.1.12 Emergency pumping operation

• Lock with the locker pressing "manual operation button " #1 solenoid valve and then do with " #2 sol. Relief valve" samely.

- Be sure to push #1 and then #2
- If the pumping operation is good, Adjust the pumping output increasing the engine speed step by step with the "remote control cable"

• If the locking of "solenoid valve" is released, after the "emergency operation button of "#1sol. relief valve" is released, pumping operation is stopped.

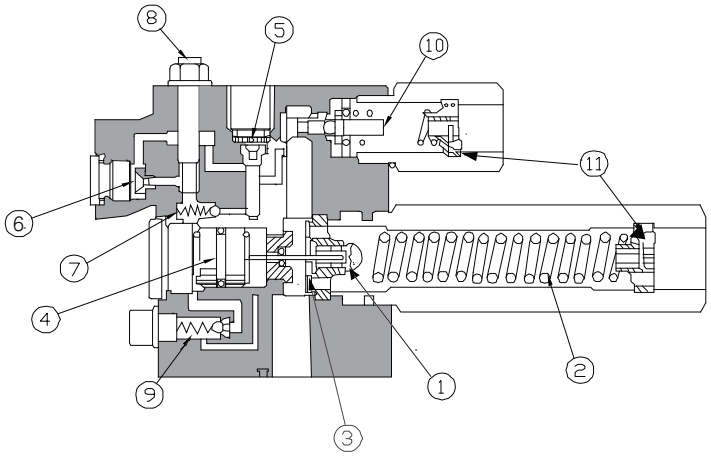
• In order to pump in reverse, simultaneously lock the two " solenoid valves"

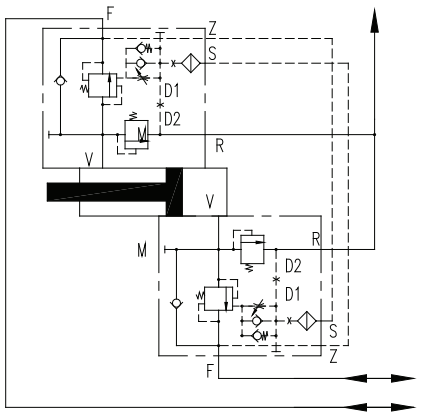


CPCE5014

5.1.13 LHDV Load holding valve troubleshooting

Trouble phenomenon	Possible cause	Solution
Boom is not operated even under the continuous rising of pressure.	+ blockage of oil flow at screen filter or orifice due to the connamintion particles. + Mis-connection of two pllot lines "Z" & "S"	▶ Blow the particles off with the pressurized air. ▶ Re-connection after the confirmation
Boom is dropped down at the neutral position of control valve	+ Internal oil-leaking through disc type check valve due to the contamination particles + Lower relief pressure more than the setting pressure + Internal oil-leaking due to the damage of piston seals of cylinder	▶ Blow the particles off with the pressurized air. ▶ Re-set the relief pressure. ▶ Consult with our service net-work
The stop leading time of boom is toolong after the neutral position of control valve.	The throttled oil-flow volume through ⑧ thread type throttle is small.	▶ Unscrew in ⑧ thread type throttle properly.
When the boom is stopped, the shock oscillation of the quick-braking is felt.	The throttled oil-flow volume through ⑧ thread type throttle is too much.	▶ Screw in ⑧ thread type throttle properly.
When the boom is operated, the movement is not smooth and the oscillation is felt.	Unsuitable combination of ⑥ orifice	▶ Replace ⑥ the orifice as below. - The oscillation is big : 0.7~0.8 - The oscillation is small : 0.4~0.5



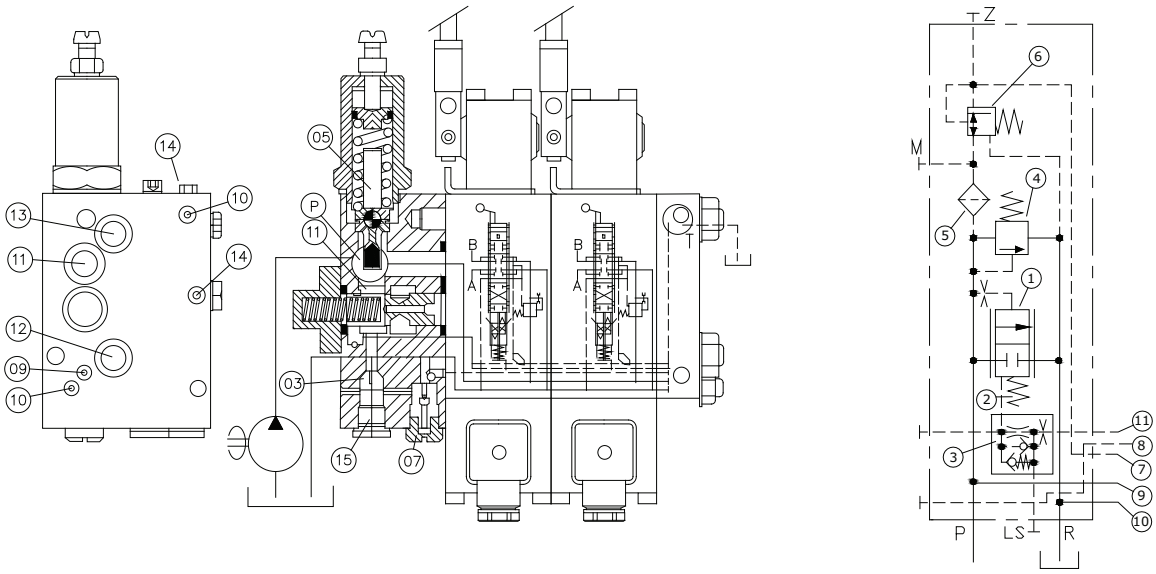


1	Valve Piston	7	Check Valve
2	Adjustment spring for pressure ratings	8	Thread type trottle
3	Disc type check valve	9	Pre-load valve
4	Pilot piston for opening	10	Relief Valve
5	D1 Orifice	11	Perforated threaded disk
6	D2 Orifice	12	

CPCE5015

5.1.14 Boom control system does not work or is unsatisfactory.

Trouble phenomenon	Possible cause	Solution
Boom does not work	Check the "emergency shut-down button" activated.	▶ Release the button
	Check the fuses into the receiver burnt.	▶ If troubled replace it
	Hold the hyd. Hose between "boom oil pump" and "pressure filter" and check whether there is chattering on it	▶ If troubled replace them.
	Check the "filter" and "reducing valve" contaminated due to fine particles. ▶ Blow them out.	▶ Request us the instruction.
Boom function is switched on and off in turns	Check the wiring connection to "twin solenoid valve" loosened or the "solenoid valve" damaged.	▶ If loosened, connect it tightly ▶ If damaged replace it asap.
Boom control function is unsatisfactory	Check the "pressure limiting valve" contaminated. ▶ Blow the particles out and clean the valve seat. Check the "3=way flow controller" operated correctly.	▶ Before disassembling the troubled parts, contact us and request the instruction.



1	3 –way flow controler	5	Input lifting valve
2	Dumping orifice	6	Filter
3	Contrl spring	7	Reducing valve
4	Dumping valve	8	

CPCE5016

5.1.15 How to replace the blocked pipe

• During pumping, If the delivery lines are blocked, relieve the delivery lines by reverse pumping. In spite of reverse pumping, if the blockage of delivery lines still remain, replace the blocked pipe as follows.

▶ Bent pipe such as elbow

① Find the blocked pipe by tapping with the hammer.

② Operate the boom so that the distance from the blocked pipe to ground is as close as possible

③ Before opening the clamp, at first, tighten it firmly as textile sling in order not to fall down. And then open the clamp & replace with new one. Be careful of pipe falling from delivery lines.

▶ Straight pipe

① How to replace is the same as bent pipe procedure ① ~ ③ above if the 3M straight pipe is blocked, fully replace it by using crane or chain.

※ Be careful of pipe falling from delivery lines. (The weight of 3M fully blocked pipe is approximately 140kg)

▶ in replacing, wear protective helmet and shoes

점검 체크표

CHECK LIST

06

6.1 100 - Hours Inspection

pump model		Date		Working Hours	

	Check list	Results
1.Initial Test	All electric functions are working	
	All manual functions are working	
2. Pressure Setting	Main pump relief pressure(350bar)	bar
	Accumulator pressure(190bar)	bar
	HAWE Boom control block relief pressure(350/380bar)	bar
	Volume control pilot pressure(0-35 bar)	bar
	Volume control pressure(40 bar)	bar
3. Radio Remote	All functions working (HBC/HETRONIC)	
	Hard wires – all functions work	
4. Main Panel	Wiring Connection inside panel	
	Main panel – all switches are working	
	Cleaning inside the panel – moisture free	
5.Visual on Hydraulic lines (no leaks)	All hydraulic – pumps assembly	
	All hydraulic – Lines on boom	
	Manifold block and main pumping lines	
	Hydraulic – Lines on hopper (plunger cylinders)	
	Outriggers hydraulics – lines	
	Lines are all tied up (fittings, hoses)	
6. Air System	Chassis air pressure (6 Bar)	bar
	Air relief pressure in hydraulic tank (1 Bar)	bar
	Lines are all tied up (no leaks)	

CPCE6001

	Check list	Results
7. Wear Parts	Wear of delivery lines (pipes, clamps)	
	Wear of S-Valve (wear rings, wear plate)	
	Wear of mixer shaft/bearing flange	
	Wear of mixing paddle	
	Wear of S-Valve seal housing/auto-greaser	
	Same travel distance of S-Valve	
8. Hydraulic Oil	Hydraulic oil level	
	Gear Oil level (reduction gear, PTO gear box)	
	Enough grease in greaser tanks	
9. Hydraulic filters	Suction filer vacuum gauge reading	
	High pressure boom filter indicator	
	Main return filter indicator	
10. Visual Checking	No leaks	
	Column bolts tightness	
	Concrete leakage through the piston cup	
	Water tank	
	Water pump	
	Boom structure welds	
	Mounting bracket welds and bolts tighten	
11. Miscell -aneous		

CPCE6002

6.2 500 Hours Inspection

Pump Model		Date		Working Hours	

	Check list	Results
1. Boom Structure	Check for Cracks (welded seams, boss area)	
	Check for boom deformations (welded area, boss area)	
	Check for link deformations (welded area, boss area)	
	All greasing points greased (pins, rotating area)	
	Boom hydraulic – Lines, no leaks (fittings,hoses)	
	Each boom cylinder (chromed rod, pin boss area)	
	Each boom load holding valve, no leaks	
2. Pressure Setting	Main Pump relief pressure (350 Bar)	bar
	Accumulator pressure (190 Bar)	bar
	Agitator relief pressure (200 Bar)	bar
	HAWE Boom control block relief pressure (350/380 Bar)	bar
	Volume control pilot pressure (0-35 Bar)	bar
	Volume control pressure(40 Bar)	bar
3. Visual on Hydraulic lines(no leaks)	All hydraulic – pumps assembly	
	All hydraulic – Lines on boom	
	Manifold block and main pumping lines	
	Hydraulic – Lines on hopper (plunger cylinders)	
	Outriggers hydraulics – lines	
	Lines are all tied up (fittings, hoses)	

CPCE6003

	Check list	Results
4. Wear Parts	Wear of delivery lines (pipes, clamps)	
	Wear of S-Valve (wear rings, wear plate)	
	Wear of mixer shaft/bearing flange	
	Wear of mixing paddle	
	Swing level bolts are well tights	
	Wear of S-Valve seal housing/auto-greaser	
	Same travel distance of S-Valve	
5. Hydraulic Oil	Hydraulic fluid level	
	Contamination of 3 filters	
	Gear Oil level PTO gear box (SAE 90)	
	Gear Oil level reduction gear (SAE 90)	
	Enough grease in greaser tanks	
	Oil cooler – check function	
6. Hydraulic filters	Suction filer vacuum gauge reading	
	High pressure boom filter indicator	
	Main return filter indicator	
7. Visual checking	Greasing on boom/hopper	
	No leaks	
	Column bolts tightness	
	Concrete leakage through the piston cup	
	Water tank	
	Water pump	
	Boom/structure welds	
	Mounting bracket welds and bolts tighten	

	Check list	Results
8. Electric	All emergency off functions - 6 buttons	
	All remote control functions work	
9. Parts to be placed		

CPCE6005

소모품 교환방법

HOW TO CHANGE WEAR PARTS

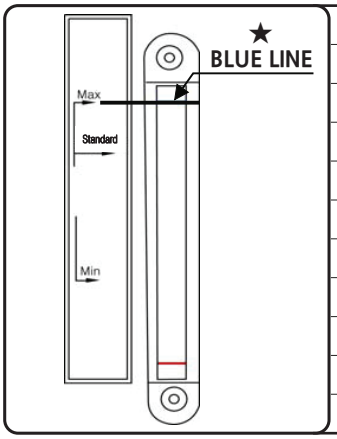
07

7.1 HOW TO CHANGE HYDRAULIC OIL

If the machine runs with contaminated hydraulic oil, hydraulic pumps or related hydraulic components service life would be shortened. Therefore, if hydraulic oil is contaminated or found to contain dirt particles, change hydraulic oil regardless of the service intervals.

Filling capacities for each family of machine.

- Quantities listed take into account residual oil that remains within various hydraulic cylinder & comonents.
  (Noted capacity applies to the "Maximum" or "blue line" on the sight glass of oil level gauge.)



NO	Machine Type	Filling capacities
1	M28 or below	300L
2	M33 ~ M38	460L
3	M40	440L
4	M42 ~ M43	470L
5	M47 ~ M57	630 ~ 670L
6	M50X	770L
7	M63	790L
8	HP-Line pump	300L
9	Mini-Line pump	300L
10	Stationary	380L

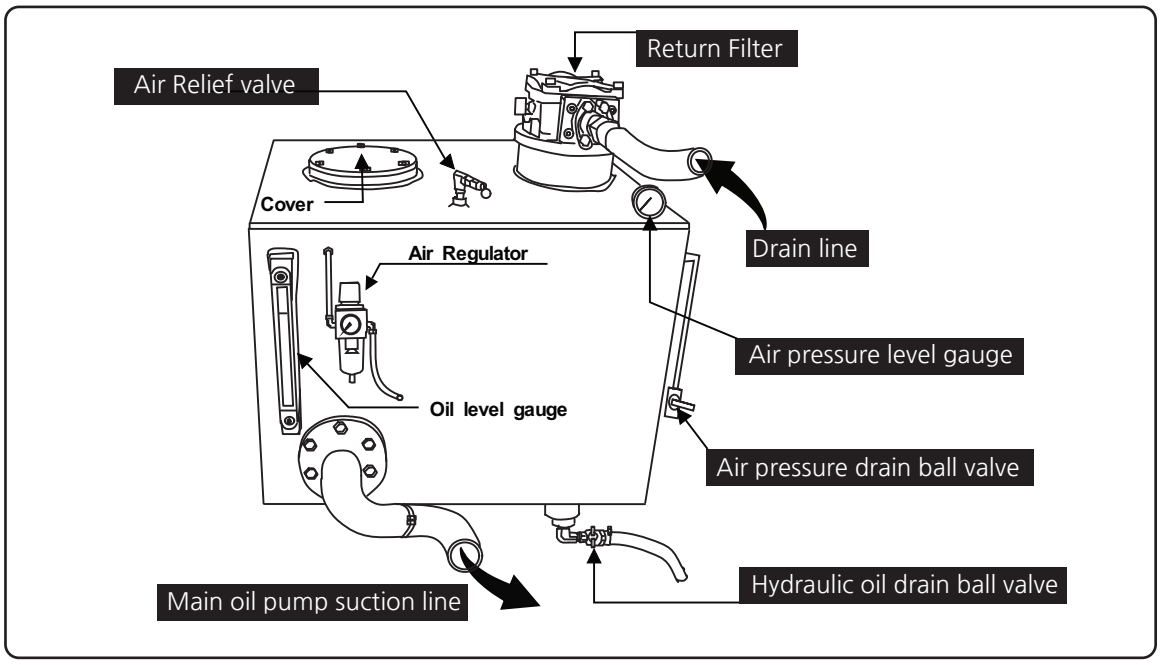
Specific Information

- Temperature, 10~30℃ : Viscosity 46, standard freezing point 46, freezing rate min. 41.4~max. 35.2
- Temperature, 30~50℃ : Viscosity 68, standard freezing point 68, freezing rate min. 61.2~max. 50.6
- Temperature, -10~10℃ : Viscosity 32, standard freezing point 32, freezing rate min. 28.8~max. 35.2
- Temperature, under -10℃ : Viscosity 22, standard freezing point 22, freezing rate min. 19.8~max. 24.2

Proper Change Intervals

Change oil after 100 pump hours accumulates, and there after every 500 pumping hours.

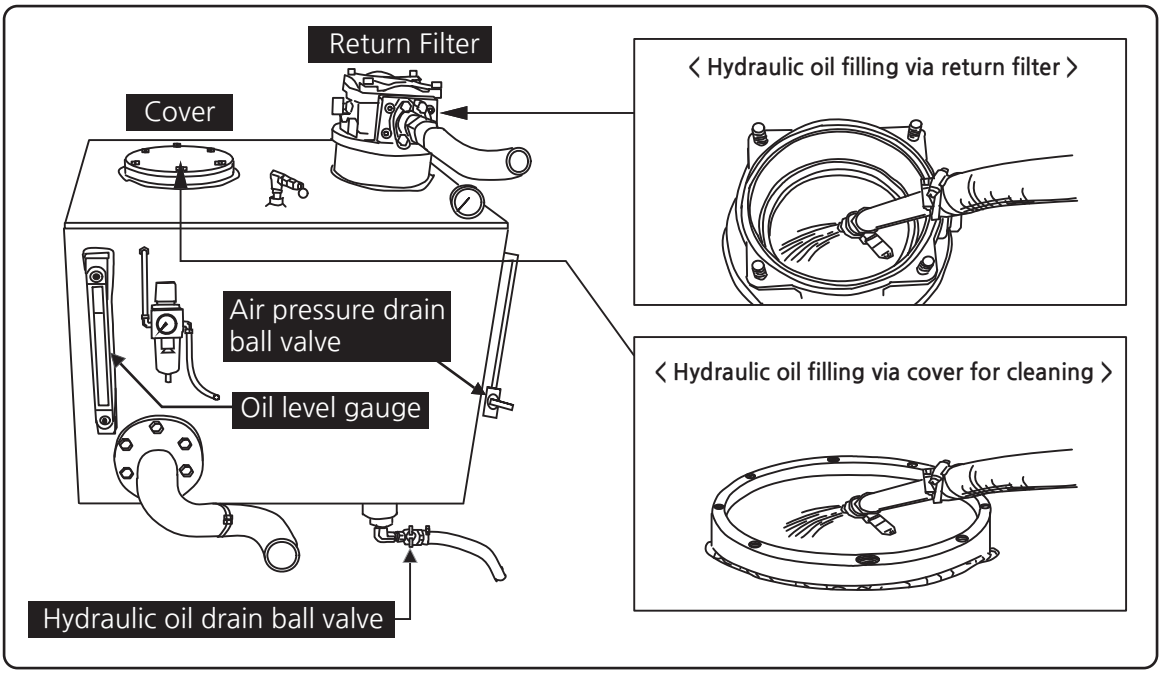
Reservoir and related parts



CPCE7001

⚠ **While hydraulic oil is being filled via return filter or cover for cleaning, please be sure to not be flown some kind of dust into the hydraulic tank.**

❶ hydraulic oil change procedures



CPCE7002

① Ensure all boom sections & outriggers are fully retracted.

② Open the air drain ball valve in order to relieve pressurized air from reservoir.

③ Take apart cover for cleaning or return filter lid, and remove element. After that, open the Hydraulic oil drain ball valve and drain hydraulic oil from reservoir.

※ Do not engage P.T.O with all of the hydraulic oil drained.

④ By using pressurized air or cloths, clean inside reservoir.

⑤ Remove magnet from bottom of reservoir, in order to clean both magnet & tank surfaces of contamination particles.

※ When reinstalling magnet, ensure it is positioned correctly and not able to block suction port.

⑥ Add new hydraulic oil through cover for cleaning or return filter.

※ Ensure proper hydraulic oil capacity is attained, by viewing the oil level gauge.

⑦ Reinstall a clean hydraulic filter element and cover for cleaning.

7.2 HOW TO CHANGE MAIN FILTER

⚠ **If element is contaminated or dirty articles are found, change element immediately with irrespective change intervals.**

When to change element, do not forget to disengage P.T.O and relieve pressurized air and ACC circuit pressure with opening the ball-V/V on the ACC block T-line.

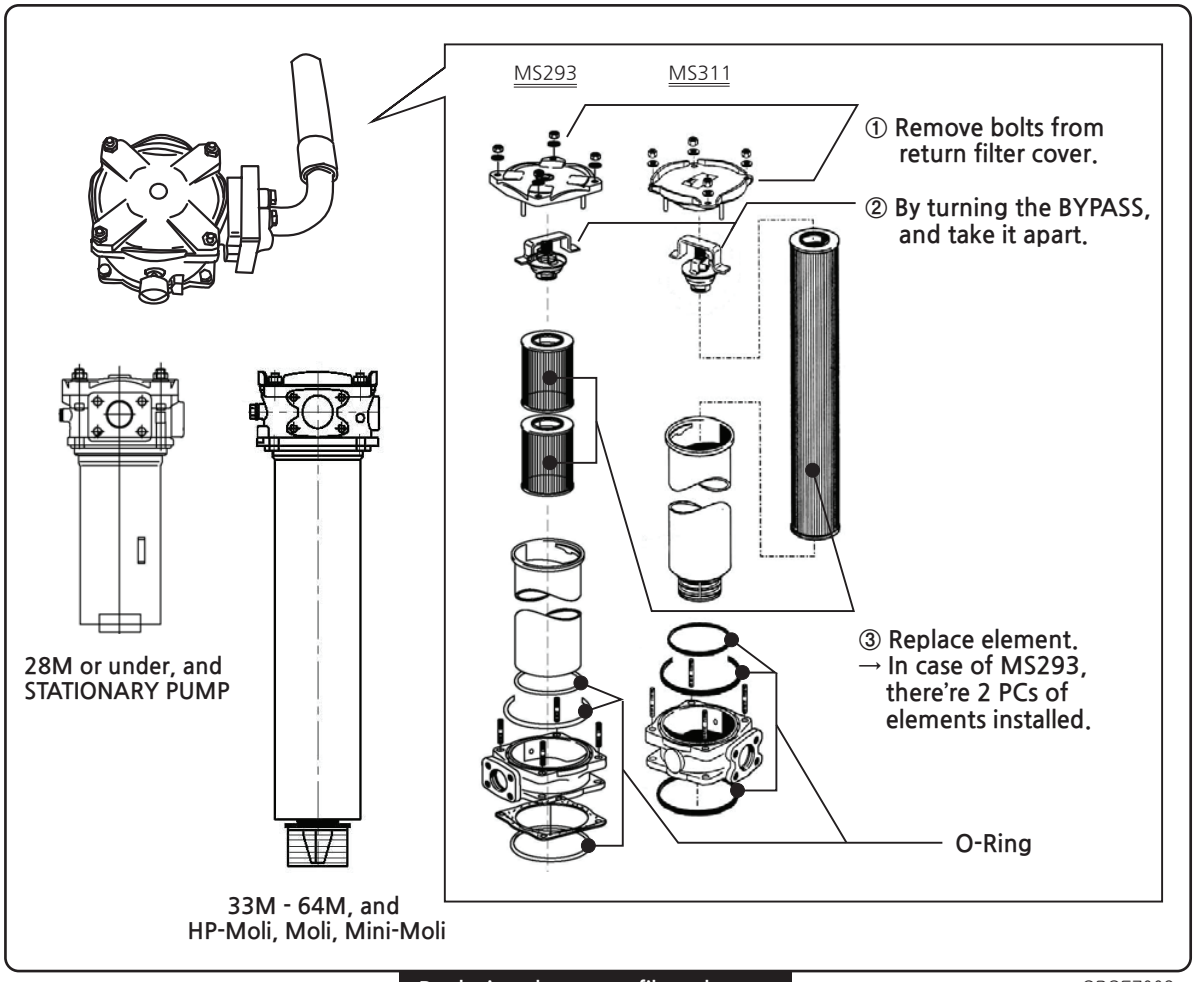
O Return filters P/N per each model

Model	28M or under, STATIONARY PUMP		33M~63M, HP-Moli, Moli, Mini-Moli	
Items	Filter Ass'y	Element	Filter Ass'y	Element
P/N	MS293	MS29303	RB311	RB31103

O Proper return filter element change intervals

If possible, when to change the hyd oil, element would rather be changed together. Normally, better change per a year or about 500 working hours which comes first.
☞ After that, change element about every 500 working hours.

O Return filter element change procedures



Replacing the return filter element

CPCE7003

be broken, change suction filter case.

❶ Suction(ACC) filter P/N per each model

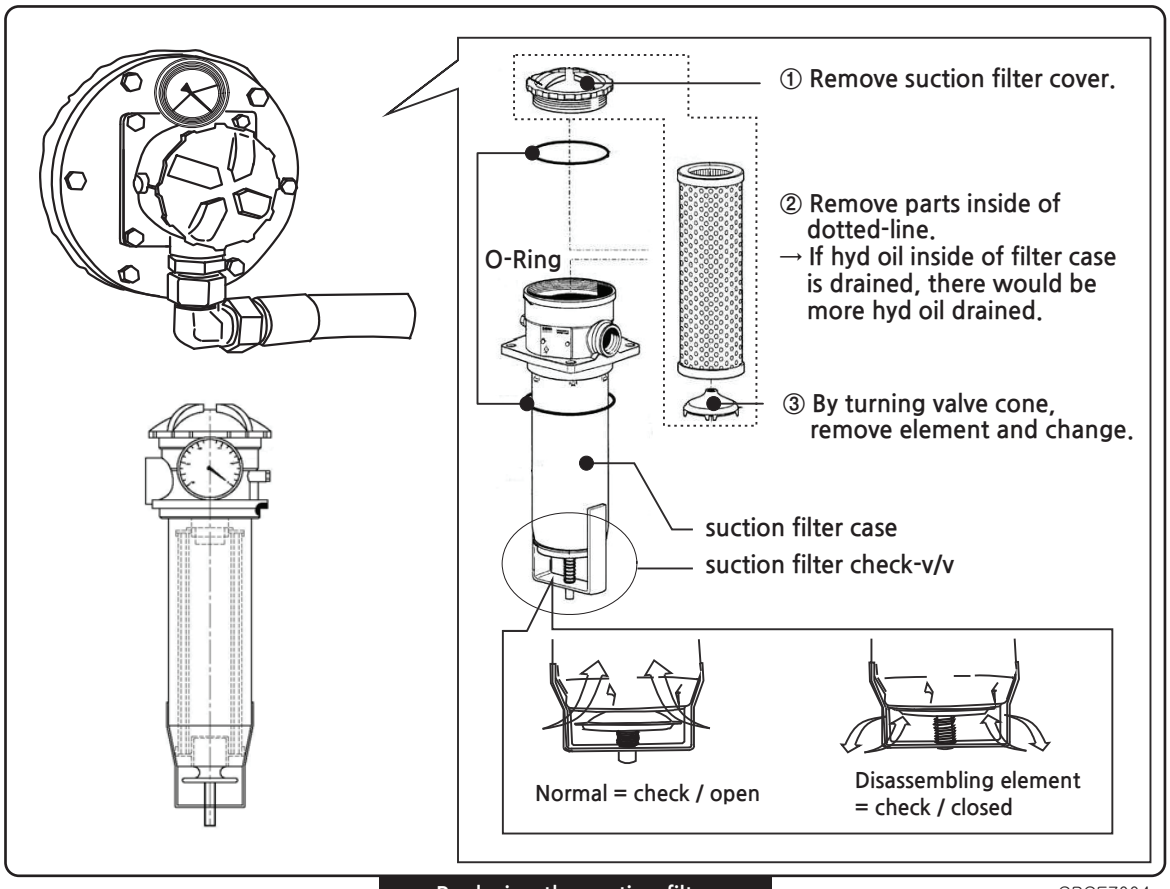
Type	All Models		The same
Item	Filter Ass'y	Element	
P/N	RB312	RB31203	

❶ Proper suction(ACC) filter change intervals

Change filter about every 4 months.

- Be sure to change suction(ACC) filter element at initial 100 pumping hours from initial pumping.

❶ Suction(ACC) filter element change procedures



Replacing the suction filter

CPCE7004

⚠ **When to change boom(high pressure) filter, be sure to prepare oil container too.**

Boom filter P/N per each model

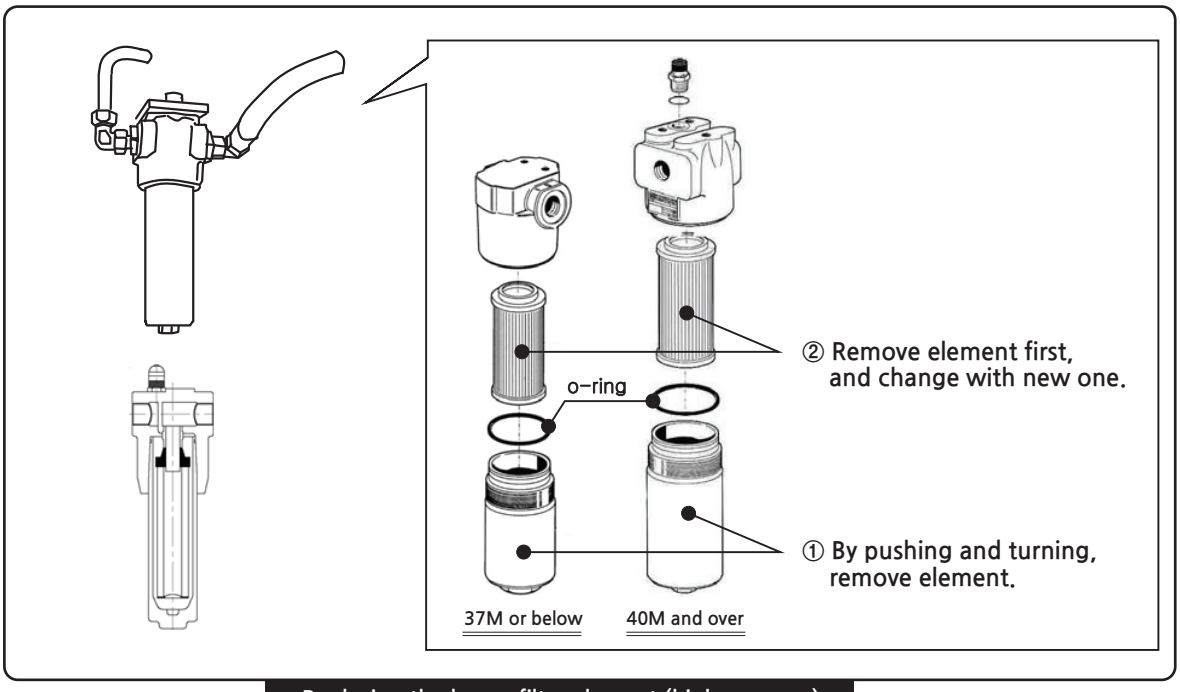
Machine Type	37M or below		40M~63M		HP-MOLI, MOLI, MINI MOLI STATIONARY PUMP
Item	Filter Ass'y	Element	Filter Ass'y	Element	No filters
P/N	RB313	RB31303	RB373	RB37303	

Proper boom(high pressure) filter element change intervals

Change filter elements about every 4 months.

Boom filter element change procedures

- Be sure to prepare hyd oil container.



Replacing the boom filter element (high pressure) CPCE7005

7.3 RAM

⚠ **Even if the life time of the rams is still remained, the rams should be replaced immediately when the mortar is leaked into the water box.**

Rams specs

TYPE	STANDARD	PART NO	DESCRIPTION	REMARK
ALL IN ONE TYPE	Ø200	J02390100	RUBBER PISTON	OTHER ASSEMBLIES ARE INTERCHANGEABLE
	Ø230	J01390100	RUBBER PISTON	
SEPARATION TYPE	Ø200	J07390600	DELIVERY PISTON SEAL	OTHER ASSEMBLIES ARE NOT INTERCHANGEABLE
		J07390700	GUIDE RING	
	Ø260	J13390300	DELIVERY PISTON SEAL	
		J13390200	GUIDE RING	

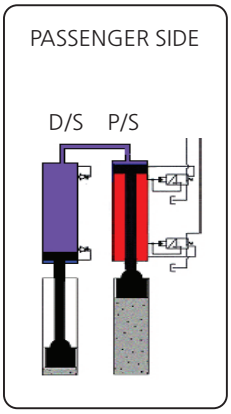
Proper rams change intervals

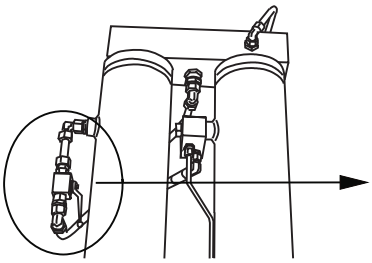
Below replacement cycle is set standards on the basis of pumping as 120㎥/h.

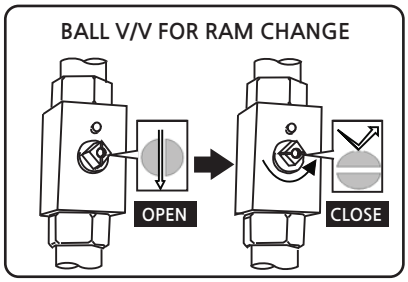
STANDARD	REPLACEMENT CYCLE	PROPERTY
OUTPUT	ABOUT 30,000~40,000㎥	The rams are being forced by concrete cyl. because diagram of the rams are bigger than cyl. The rams are gone bad by reason of material is rubber. The life time of rams are not extended even never be used.
PUMPING HOUR	ABOUT 250H~350H	
RAM LIFE TIME	ABOUT 4 MONTHS	

Rams change procedures

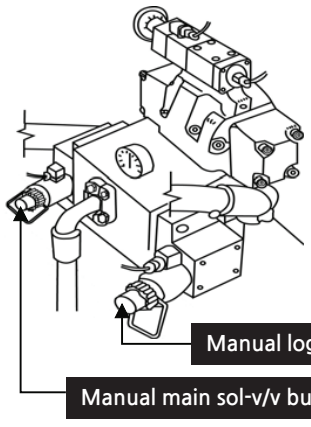
WORKING CONDITION | P.T.O GEAR = 1~2 GEAR LOWER THAN NORMAL | R.P.M = MIDDLE | NOT AIR PRESSURIZED







① Close the ram change ball valve of main cyl.
- Ram change ball v/v adjustmnet
  1) Release the lock nut then remove the ball v/v lever.
  2) Turn about 90 degrees to open the hyd. line..
     Ball v/v must be closed after replacement.



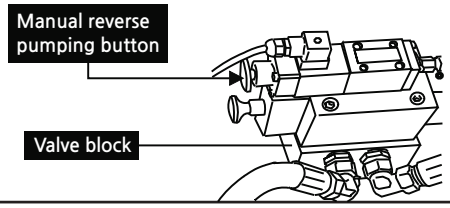
② Set the pump as above conditions and do the pumping 3~5 times
- How to operate the pump manually
  1) Fix the logic sol-v/v by the clip A
  2) Fix the main sol-v/v by the clip B

⚠ **Firstly release the manual main sol-v/v button B and release the manual logic sol-v/v button A to stop the pumping.**

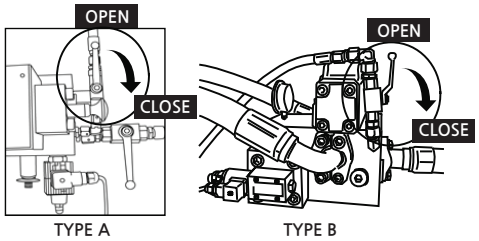
CPCE7006

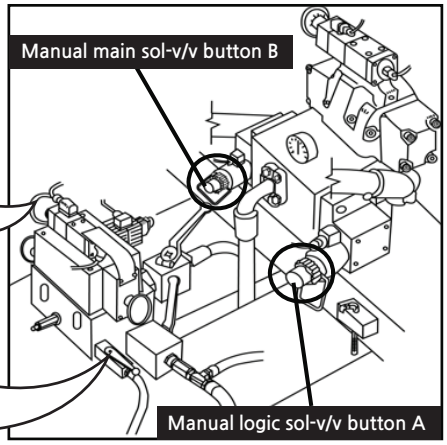
③ Fix the manual logic sol-v/v button A by the clip, then push the manual reverse pumping sol-v/v button or close the ram change ball v/v. And push the manual main sol-v/v button B in order to passenger side main cylinder rod is reached at the upper most.
- How to give the load into the passenger side main cylinder.

Method 1) Push the manual reverse pumping sol-v/v button which is on the valve block.

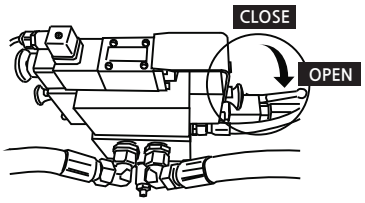


Method 2) Close the ram change ball valve.
⚠ Replace the ball valve after replacement.

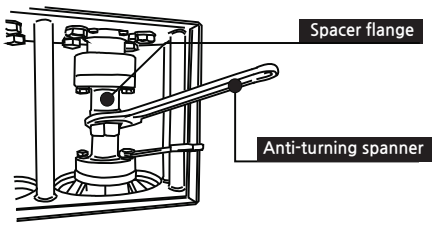




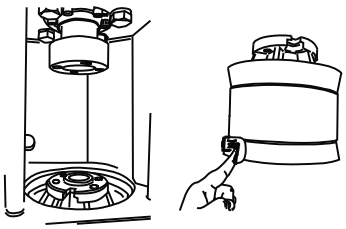
④ When the passenger side main cyl. rod is reached the upper most with the load, stop to push the manual main sol-v/v button B, and release the clip of manual logic sol-v/v button A.



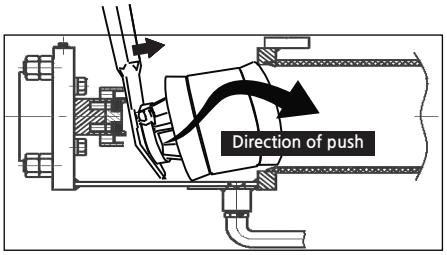
⑤ After finishing the working, the pressure of accumulator line must be drained out by open the above ball valve.
⚠ Be sure to check in order to prevent serious injury.



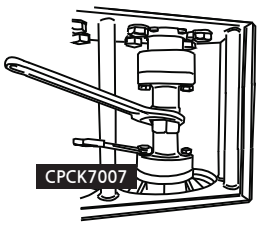
⑥ Set the spanner(60mm) at the spacer flange to not be turned, and unfasten the 4ea of fixed bolts.



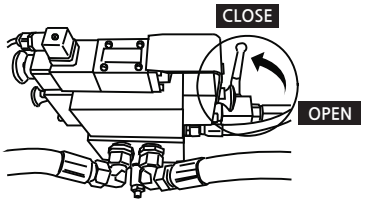
⑦ Remove the old ram and spread the grease onto the new ram.



⑧ Put the bottom side of the ram into the concrete cyl. and push it DOWN ⇨ UP by using the lever.



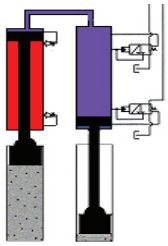
⑨ Assemble the spacer flange.



⑩ Close the above ball valve.

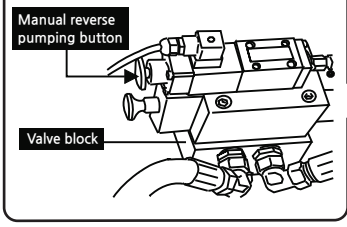
CPCE7007

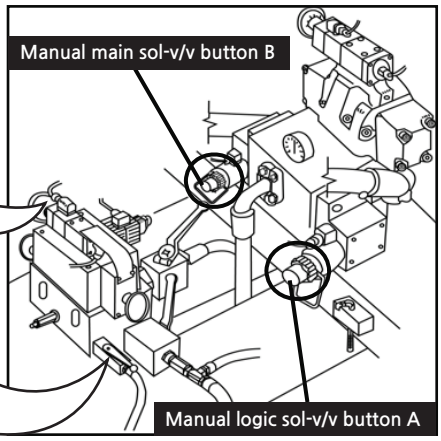
DRIVER SIDE
D/S P/S



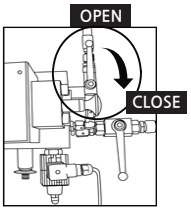
⑪ Fix the manual logic sol-v/v button A by the clip, then push the manual reverse pumping sol-v/v button or close the ram change ball v/v. And push the manual main sol-v/v button B in order to driver side main cylinder rod is reached at the upper most.
- How to make the driver side main cylinder to be loaded.

Method 1) Push the manual reverse pumping sol-v/v button which is on the valve block.

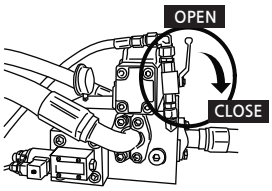




Method 2) Close the ram change ball valve.
⚠ Replace the ball valve after replacement.

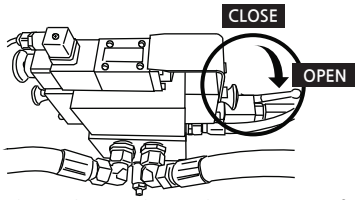


TYPE A

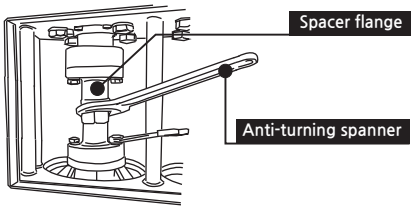


TYPE B

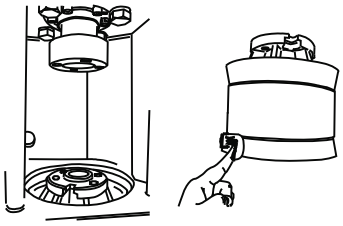
⑫ When the driver side main cyl. rod is reached the upper most with the load, stop to push the manual main sol-v/v button B, and release the clip of manual logic sol-v/v button A.



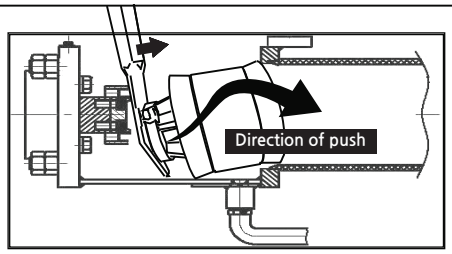
⑬ After finishing the working, the pressure of accumulator line must be drained out by open the above ball valve.
⚠ Be sure to check in order to prevent serious injury.



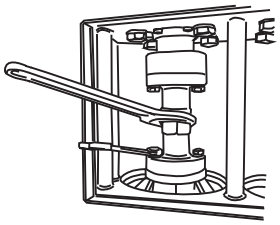
⑭ Set the spanner(60mm) at the spacer flange to not be turned,
and unfasten the 4ea of fixed bolts.



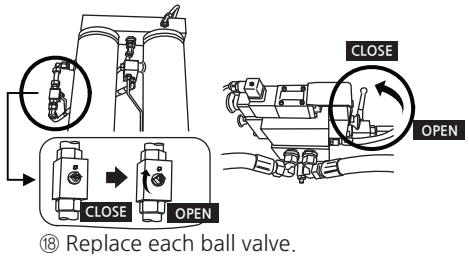
⑮ Remove the old ram and spread the grease onto the new ram.



⑯ Put the bottom side of the ram into the concrete cyl. and push it DOWN ⇨ UP by using the lever.



⑰ Assemble the spacer flange.

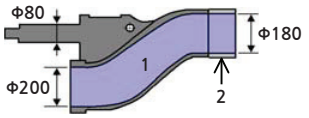
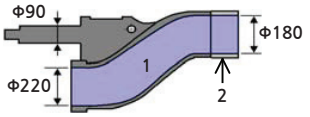
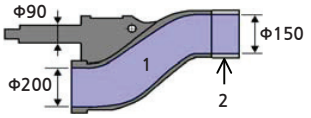
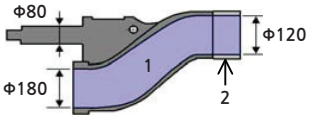
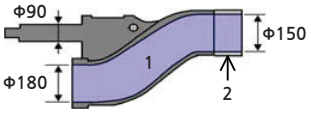


⑱ Replace each ball valve.

CPCE7008

7.4 S-V/V REPLACEMENT

S-V/V classified

		NO	PART NAME	P/N	SPEC	Q'TY	REMARK
NORMAL		1	S V/V	RB018	*	1	All boom pumps, standard MOLI, mini MOLI
		2	S V/V SLEEVE	RB01804	COMMON	1	
BIG MOLI		NO	PART NAME	P/N	SPEC	Q'TY	REMARK
		1	S V/V	MS851	*	1	Optional
		2	S V/V SLEEVE	RB01804	COMMON	1	
MOLI		NO	PART NAME	P/N	SPEC	Q'TY	REMARK
		1	S V/V	MS025	*	1	High-MOLI
		2	S V/V SLEEVE	RB01804	COMMON	1	
OTHER		NO	PART NAME	P/N	SPEC	Q'TY	REMARK
		1	S V/V	RB237	*	1	SHOTCRETE, UNDER 60㎥/h PUMPS
		2	S V/V SLEEVE	RB23703	*	1	
OTHER		NO	PART NAME	P/N	SPEC	Q'TY	REMARK
		1	S V/V	MS784	*	1	Super-stationary (JSP.2111SH-D)
		2	S V/V SLEEVE	RB01804	COMMON	1	

※ The S-valve without sleeve is not manufactured.

S-V/V replacement intervals

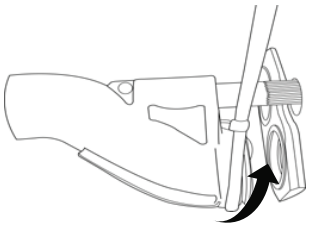
S-VALVE is basically used for pumping hours 800~1,200. Check the inside S-VALVE condition and replace it when it is necessary.

How to replace the S-V/V

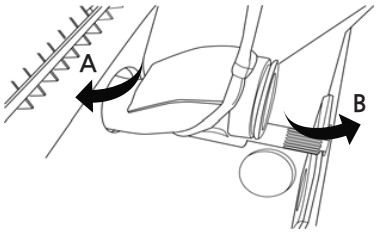
CONDITIONS	P.T.O OFF	Relieve ACC pressure (Ball valve OPEN)	Relieve pressurized air pressure from hyd. tank (Ball valve OPEN)

※ Be sure to provide above working condition to prevent serious injury.

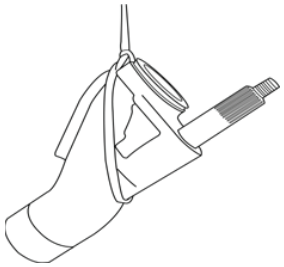
⚠ Remove the S-V/V after disassembling the seal housing of input and output.



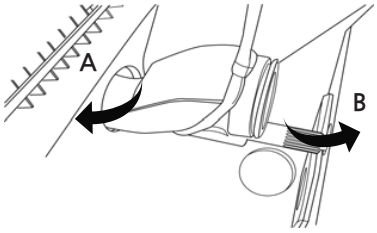
① Lift up the S-V/V gate at the sky.



② Remove the S-V/V from the hopper. Put the S-V/V body into A hole in order to remove the S-V/V shaft B.



③ Disassemble the S-V/V



④ Assemble the new S-V/V
- Put the S-V/V body into A hole in order to assemble the S V/V shaft B.
- Be sure to not be damaged the sleeve.

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7.5 S-VALVE SLEEVE REPLACEMNET

S- V/V sleeve specification

NO	S-V/V SPEC	DESCRIPTION	PART NUMBER		REMARK
1	STANDARD BIG MOUTH	S-VALVE SLEEVE	RB01804	INTERCHANGEABLE	THE SLEEVE COULD BE ORDERED SEPARATELY
2	OTHERS	S-VALVE SLEEVE	RB23703	SHOTCRETE, UNDER 60㎥/h PUMP	

S- V/V sleeve replacement cycle

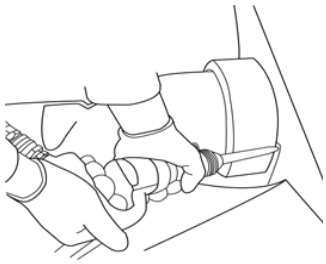
There is not particular replacement cycle. But if the S-VALVE sleeve is worn out badly during replacement of S-VALVE or seal kit, replace the S-VALVE sleeve.

How to replace the S-V/V

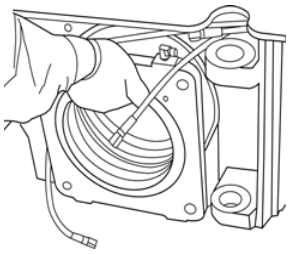
CONDITIONS	P.T.O OFF	Remove the ACC Line press (Ball valve OPEN)	Remove the air in the HYD. TANK (Ball valve OPEN)

※ Be sure to keep the above working condition to avoid the accident or injury

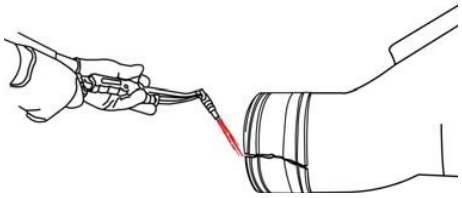
⚠ **Replace the S-V/V sleeve after disassembling the S-V/V output seal housing.**



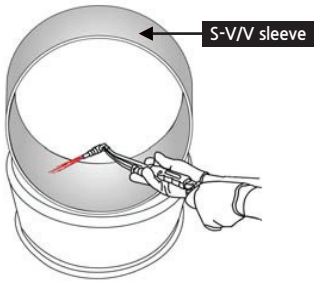
① Remove the concrete waste around seal housing.



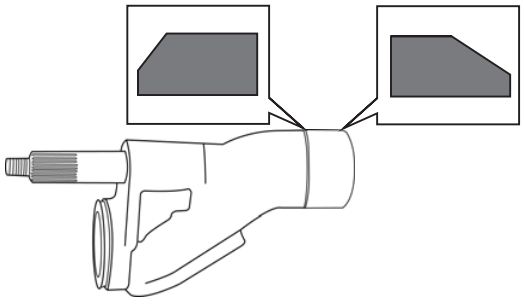
② Remove the grease hoses from the seal housing and remove the seal housing by using the removal bolts.
- There is not the fix bolt for housing of Moil.



③ Remove the worn out S-V/V sleeve.
- Cut the sleeve by using the oxygen cutter.



④ Heat the inside of the new S-V/V uniformly in order to be expanded.
- Be sure to not be damaged sleeve plating.



⑤ Insert the heat-expanded S-V/V sleeve into the S-VALVE and leave it to be air cooled.

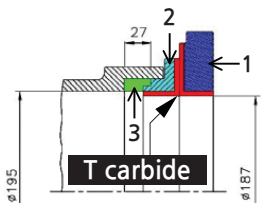
⚠ Be sure to not be shifted the direction of the sleeve during assembling.
Please heat it properly and assemble it at once.

CPCE7010

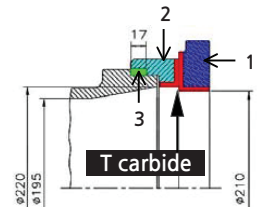
7.6 OTHER WEAR PARTS

Wear plate and wear ring specs

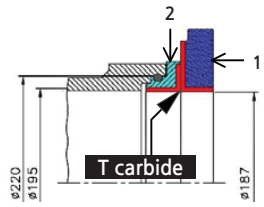
A

STANDARD	NO	PATRT NAME	P/N	SPECS	Q'ty	REMARK
	1	wear plate	J012392	*	1	Ass'y P/N J0323 (1~3 included)
	2	wear ring	J012393	thrust ring included	1	
	3	thrust ring	J012350	optional	1	
	machines involved		All boom cars, standard MOLI, mini MOLI, stationary(not super stationary)			

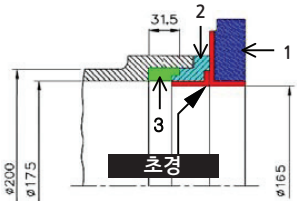
B

BIG MOUTH	NO	PATRT NAME	P/N	SPECS	Q'ty	REMARK
	1	wear plate	J012398	*	1	Ass'y P/N J0523 (1~3 included)
	2	wear ring	J012397	thrust ring included	1	
	3	thrust ring	J012396	optional	1	
	machines involved		optional			

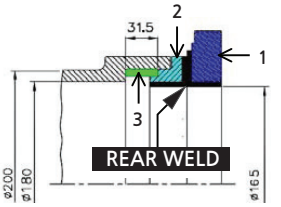
C

고압 몰리용(JM-2100HP)	NO	PATRT NAME	P/N	SPECS	Q'ty	REMARK
	1	wear plate	J012392	*	1	Ass'y P/N J1823 (1~2 included)
	2	wear ring + o-ring	J182304	o-ring included	1	
	▶ o-ring spec : G210 Hs90					

D

SUPPER STATIONARY(JSP.2111SH-D)	NO	PATRT NAME	P/N	SPECS	Q'ty	REMARK
	1	wear plate	J192303	*	1	Ass'y P/N J1923 (1~3 included)
	2	wear ring	J192304	thrust ring included	1	
	3	thrust ring	J192305	optional	1	

E

SPRAY PUMP	NO	PATRT NAME	P/N	SPECS	Q'ty	REMARK
	1	wear plate	J032303	*	1	Ass'y P/N J0723 (1~3 included)
	2	wear ring	J032304	thrust ring included	1	
	3	thrust ring	J032305	optional	1	

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Proper wear plate and wear ring change intervals

- Wear plate : Normally, 400 pumping hours but if worn plate is found, change immediately.
- Wear ring : Normally, 250 pumping hours but if worn ring is found, change immediately.

- For lengthening the service life of wear ring, turn it about 90 degrees about every 80 hours.

- Trust ring : Normally, trust ring would rather change when to s-v/v.

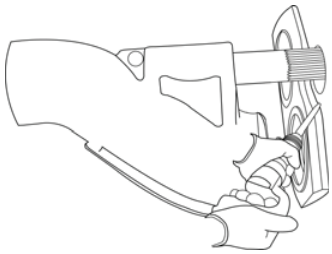
⚠ In case of REAR WELD TYPE such as E, change intervals are the same but this type is suitable to the machines with low capacities of concrete out volume and low delivery pressure.

Wear plate and wear ring change procedures

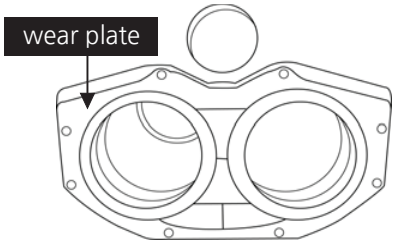
CONDITIONS	P.T.O OFF	Relieve ACC circuit pressure (Ball valve OPEN)	Relieve pressurized air from hyd oil tank (Ball valve OPEN)

※ Do not forget to relieve ACC circuit pressure and pressurized air from hyd oil tank for safety.

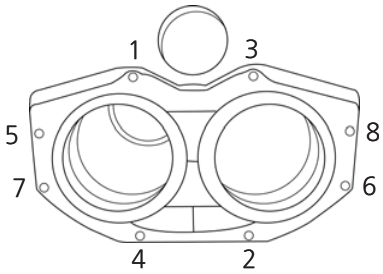
⚠ **Remove hopper front and rear seal housings first, let S-V/V shaft insert into hopper output gate. Then, It's possible to remove wear plate and wear ring.**



① Remove concrete around wear plate and wear ring first.

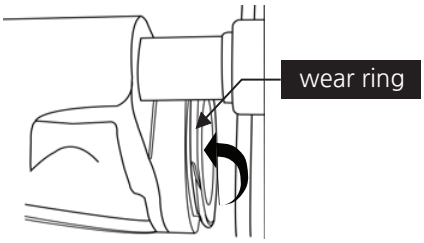


② Remove bolts from wear plate, and take it apart.
- After removing wear plate, remove concrete completely



③ When to install, bolt them on in order as above.
- Fixed bolt specs : M16 x 0.2 10.9T
- Fixed bolt torque

NO. 1,2,3,4 – 130 N.M	NO. 5,6,7,8 – 60 N.M



④ After installation, assemble other parts in the reverse order.

⚠ After re-assembling, be sure to keep 1-3mm between S-V/V and wear ring by adjusting of S-V/V nut.

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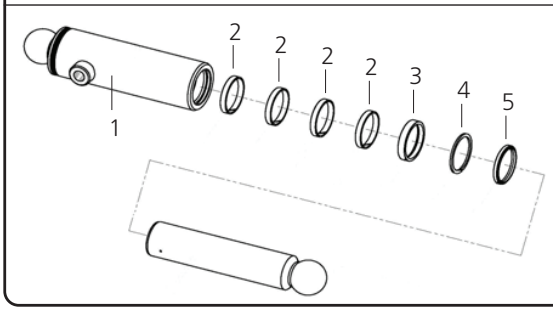
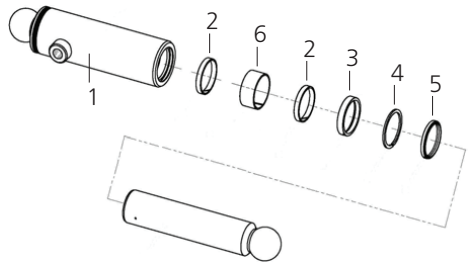
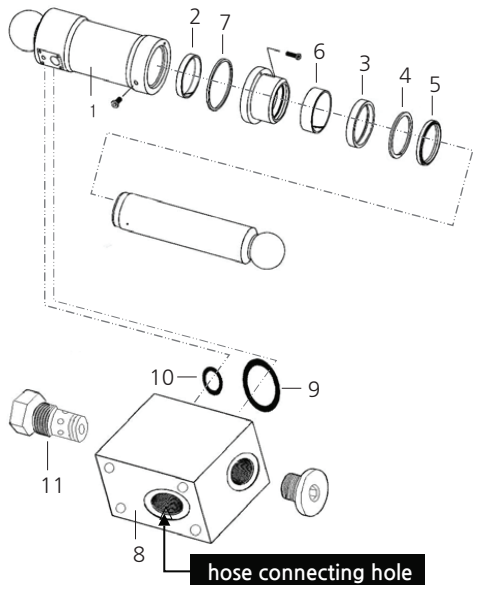
7.7 How to change PLUNGER CYLINDER SEAL KIT

⚠ If oil leaks from piston rod, change seals with irrespective change intervals.

● Related parts per each-spec

Ø60 of plunger cylinder	NO	P/N	PART NAME	SPECS	Q'ty
	1	PLUNGER CYL'D	J018000	Ø84XØ60 ST160	1
	2	WEAR RING	J018002	Ø60XØ65X9	4
	3	ROD PACKING	J018003	Ø60XØ70X12	1
	4	BACK UP RING	J018004	Ø60XØ70X3T	1
	5	DUST SEAL	J018005	Ø60XØ68X5X6.5	1
	Seal kit P/N : J01806(2,3,4,5 included)				

Ø80 of plunger cylinder	NO	P/N	PART NAME	SPECS	Q'ty
	1	PLUNGER CYL'D	J028000	Ø112XØ80 ST160	1
	2	WEAR RING	J028002	Ø80XØ85X9.5	2
	3	ROD PACKING	J028003	Ø80XØ90X12	1
	4	BACK UP RING	J028004	Ø80XØ90X1.5T	1
	5	DUST SEAL	J028005	Ø80XØ88X7X4	1
	6	WEAR RING	J028007	Ø80XØ85X24.5	1
	Seal kit P/N : J02806(2,3,4,5,6 included)				

Ø80 & bolting type of plunger cylinder	NO	P/N	PART NAME	SPECS	Q'ty
	1	PLUNGER CYL'D	J068000	Ø80 ST160	1
	2	WEAR RING	J068400	Ø81.4XØ76.7X10 bronze(PBC2B)	1
	3	ROD PACKING	J028003	Ø80XØ90X1.5T	1
	4	BACK UP RING	J028004	Ø80XØ90X1.5T	1
	5	DUST SEAL	J028005	Ø80XØ88X7X4	1
	6	WEAR RING	J028007	Ø80XØ85X24.5	1
	7	O-RING	ORGB0090	1B G90(Hs90)	1
	Seal kit P/N : J06806(2,3,4,5,6,7 included)				
	8	BLOCK	MS40601		1
	9	O-RING	ORPB0030	P30 Hs90	1
	10	O-RING	ORPB0015	P15 Hs90	1
	11	CHECK VALVE	MS40606		1
	plunger cylinder block Ass'y P/N : MS406(8,9,10,11 included)				

CPCE7018

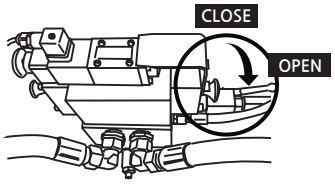
Plunger cylinder seals change intervals

Normally, change about every 6 months or every 400 working hours.

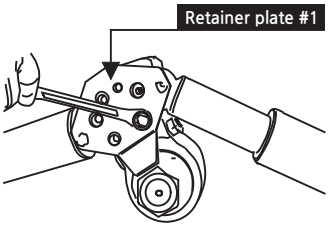
Plunger cylinder seals change procedures

PREPARATION	P.T.O OFF	Drain acc circuit pressure (Ball valve OPEN)	Drain pressur ized air from hyd tank (Ball valve OPEN)

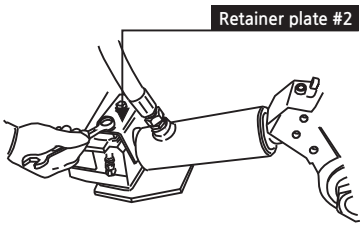
※ To prevent work-related accidents, drain acc pressure and pressurized air from hyd tank for safety.



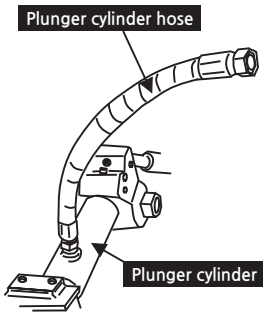
① Open the ball-V/V to relieve ACC circuit pressure.



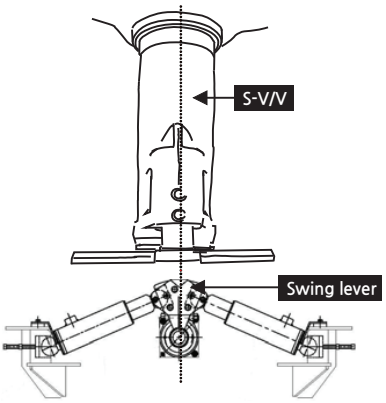
② Take retainer plate #1 off.



③ Take retainer plate #2 off.

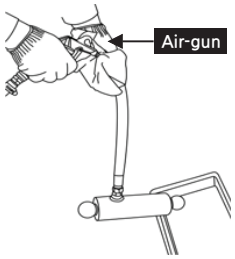


④ Remove plunger cylinder hose.



⑤ Keep S-v/v and swing lever straight, and take plunger cylinder apart.

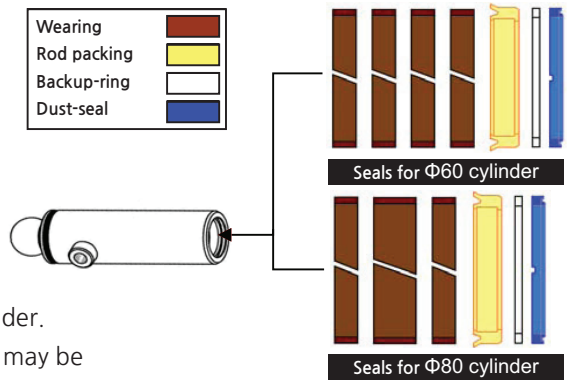
⚠ If air is injected quickly, rod could suddenly come out.
⚠ Be sure to remove very slowly. Be careful to let rod-surface not to be admaged.



⑥ By injecting air, remove cylinder rod from tube.

⑦ By using a sharp pointed pole, take apart seals and cleanup inside.

⚠ Be sure to let inside plunger cylinder not to be damaged during disassembling.



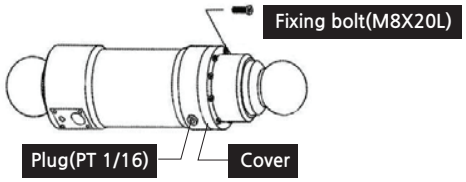
⑧ Do not insert seal with wrong direction. insert seals, and re-assemble plunger cylinder.

⚠ If it's headed wrong direction, hyd oil may be leaked from rod.

CPCE7020

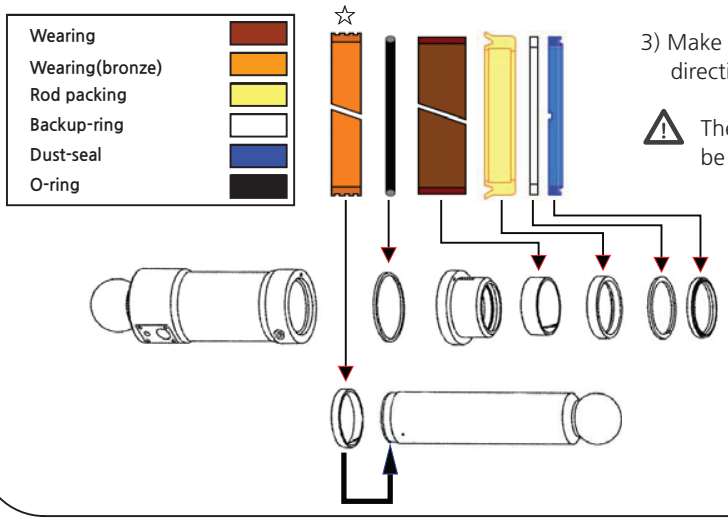
[SEAL KIT CHANGE TIPS]

※ Change bolt type of Φ80 plunger cylinder seal kit as blow.



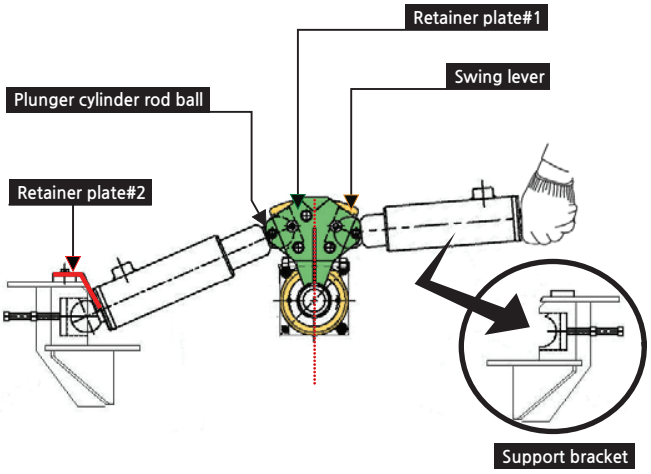
1) Unfasten fixing bolt(17ea) from cover, and take apart cover and rod.

2) After removing internal seal kit, cleanup as well.

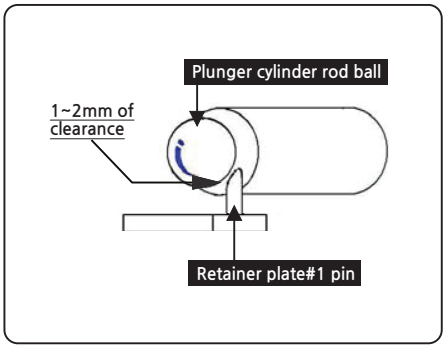


3) Make sure to install seal kit with correct direction, after that assemble cover and rod.

⚠ The bronze wearing ☆ (J068400) should be installed on cylinder rod.



⚠ Make sure to check for 1-2mm of clearance between retainer plate#1 pin and plunger cylinder rod ball.



⑨ Keep S-v/v and swing lever straight, and re-assemble as belows.
A. Insert 2 of plunger cylinder rod ball into swing lever, and re-assemble retainger plate#1.
B. Pull a plunger cylinder, and insert into support bracket.
C. Re-assemble retainger plate#2.

CPCE7021