CONTENTS

FOREWORD

This manual contains a number of instructions and safety recommendations regarding driving, handling, lubrication, maintenance, inspection and adjustment of the excavator.
This manual provides important instructions regarding the excavator, including important safety warnings and instructions for proper operation and maintenance of the excavator.

Keep this manual handy and have all personnel read it periodically.

If you sell the machine, you must provide this manual with the excavator.

This machine complies with EC directive "2006/42/EC".

1. **Read** and **understand** this manual before operating the machine.

   This operator's manual may contain attachments and optional equipment that are not available in your area. Please consult your local HD Hyundai Construction Equipment distributor for those items you require.

⚠ **Improper operation and maintenance of this machine can be hazardous and could result in serious injury or death.**

   The procedures and precautions given in this manual apply only to intended uses of the machine.
   If you use your machine for any unintended uses that are not specifically prohibited, you must be sure that it is safe for you and others. In no event should you or others engage in prohibited uses of actions as described in this manual.

   Some illustrations in this manual show details or attachments that can be different from your machine. Covers and guards might have been removed for illustrative purposes. Never operate the machine without the proper covers and guards in place.

   2. **Inspect** the jobsite and **follow** the safety recommendations in chapter 1, **Safety hints** before operating the machine.

   3. Use **genuine HD Hyundai Construction Equipment spare parts** for the replacement of parts.
   HD Hyundai Construction Equipment will not accept any responsibility for defects resulting from non-genuine parts or non workmanlike repair.
   In such cases HD Hyundai Construction Equipment cannot assume liability for any damage.

Continuing improvements in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult HD Hyundai Construction Equipment or your HD Hyundai Construction Equipment distributor for the latest available information for your machine or for questions regarding information in this manual.

BEFORE SERVICING THIS MACHINE

It is the responsibility of the owner and all service and maintenance personnel to avoid accidents and serious injury by keeping this machine properly maintained.

It also is the responsibility of the owner and all service and maintenance personnel to avoid accidents and serious injury while servicing the machine.

No one should service or attempt to repair this machine without proper training and supervision.

All service and maintenance personnel should be thoroughly familiar with the procedures and precautions contained in this manual.

All personnel also must be aware of any federal, state, provincial or local laws or regulations covering the use and service of construction equipment.

The procedures in this manual do not supersede any requirements imposed by federal, state, provincial or local laws.

HD Hyundai Construction Equipment can not anticipate every possible circumstance or environment in which this machine may be used and serviced.

All personnel must remain alert to potential hazards.

Work within your level of training and skill.

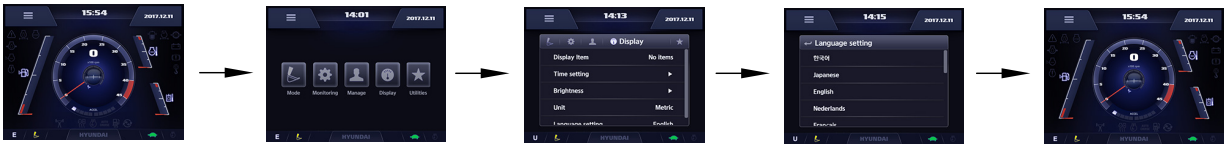
Ask your supervisor if you are uncertain about a particular task. Do not try to do too much too fast.

Use your common sense.

※ How to set the language of cluster

Selection of preferred language will change the language on all displays.

Normal type



220S0SG510A

Premium type

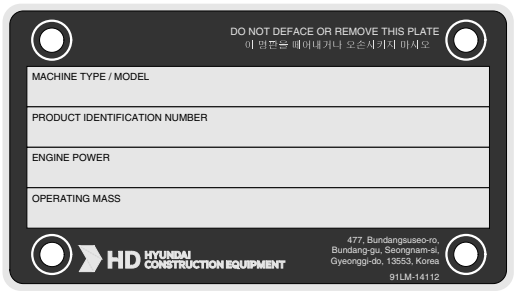
220S0SG10A

※ Please refer to the page 3-29 for the cluster.

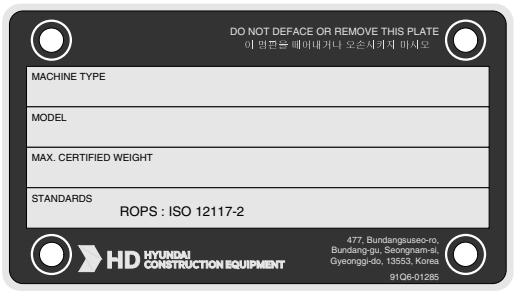
TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

Machine Serial No.	
Engine Serial No.	
Manufacturing year	
Manufacturer Address	HD Hyundai Construction Equipment Co., Ltd. 477 Bundangsuseo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 13553, Korea
Distributor for U.S.A Address	HD Hyundai Construction Equipment Americas, Inc 6100 Atlantic Boulevard Norcross GA 30071 U.S.A
Distributor for Europe Address	HD Hyundai Construction Equipment Europe N. V. Hyundailaan 4 3980 Tessenderlo Belgium
Dealer Address	

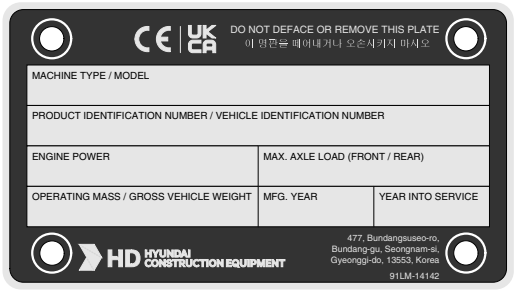
MACHINE DATA PLATE



For general

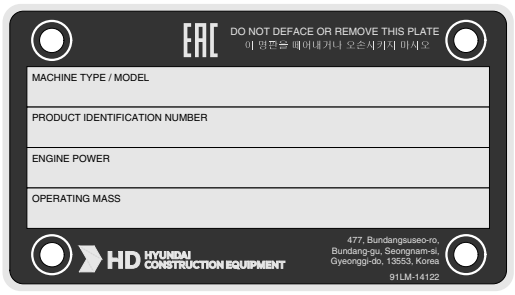


For ROPS



For EU only

For FOPS/FOG



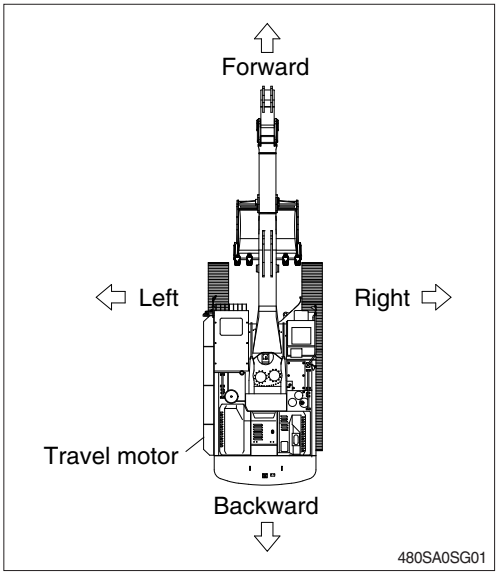
For EAC only

EX0MD01

※ The machine serial number assigned to this particular machine should be used when requesting information or ordering service parts for this machine from your authorized HD Hyundai Construction Equipment dealer. The machine serial number is also stamped on the frame.

1. DIRECTION

The direction of the arrows (as they are indicated) are with the travel motors to the rear and the boom facing the opposite direction. Refer to the right illustration.

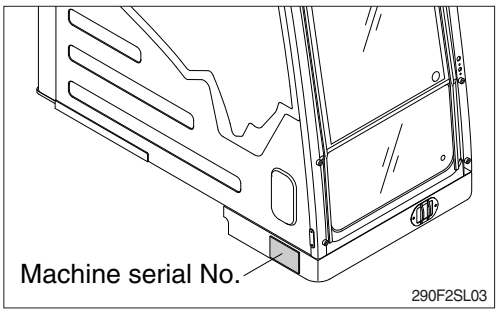


2. SERIAL NUMBER

Provides the serial number when ordering parts or seeking assistance.

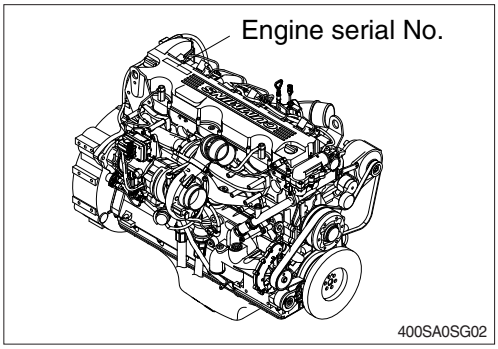
1) MACHINE SERIAL NUMBER

The numbers are located below the right window of the operator's cab.



2) ENGINE SERIAL NUMBER

The numbers are located on the engine name plate.



3. INTENDED USE

This machine is designed to be used mainly for the following work:

- Excavation work
- Loading work
- Leveling work
- Drainage work
- Lifting work
- Demolition work

※ Please refer to section, Efficient working method further details.

4. SYMBOLS

⚠ Provides important safety warnings. Failure to follow these warnings could result in serious injury or death.

△ Provides important instructions to prevent damage to the equipment.

※ Provides useful information for the operator.

1. CALIFORNIA PROPOSITION 65

⚠ WARNING

CALIFORNIA PROPOSITION 65

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

2. SAFETY INSTRUCTIONS

Safety Message

Intended Use

Machines should be operated in accordance with the procedures described in the operator manual.
The products described in the operator manual are designed and manufactured mainly for the following purposes:

- Excavation work
- Loading work
- Leveling work
- Drainage work
- Lifting work
- Demolition work

Do not operate the machine for any purpose other than those stated above or in areas where potential hazards have been identified. Make sure that you comply strictly with all safety instructions at all times. Please contact HD Hyundai Construction Equipment Co., Ltd. or your local dealer for more information.

HD Hyundai Construction Equipment strictly prohibits the use or operation of the machine in any of the following circumstances:

- Operation by an unskilled worker
- Lifting a worker up
- Transporting flammable or dangerous materials
- Driving down or extracting piles with the bucket
- Towing damaged vehicles

Safety guidelines

Most safety accidents related to the operation, maintenance/ inspection, and repair of the machine result from a failure to comply with the safety instructions or to take adequate preventive measures. Safety accidents can be prevented by eliminating potentially hazardous situations. The operator should attend all mandatory training courses on the operation of the machine, and fully understand how to use the tools.

Improper operation, refueling, inspection or repair of this machine may cause serious injury or death.
Do not attempt to operate, refuel, inspect or repair this machine before reading and understanding the product information on such tasks.
This manual describes preventive measures and warnings about the product.
Failure to comply with the warnings about potential risks may result in serious injury or death.

General Safety Information

Unauthorized modification

Any attempt to modify the machine, including the use of unauthorized accessories or spare parts, may have adverse effects on the conditions of the machine and its ability to function as it was designed.
Do not attempt to modify the machine in any way without advanced written consent of the company.
Unauthorized modification will void the manufacturer's warranty.

Never modify the operator's cabin by welding, grinding, drilling holes or adding attachments unless instructed by HD Hyundai Construction Equipment in writing. Changes to the cabin can cause loss of operator protection from roll-over and falling objects, and result in serious injury or death.

The user is responsible for all damages and liabilities resulting from unauthorized modifications.
The attachment, the accessory, or the spare part has been made or distributed by HD Hyundai Construction Equipment and has been installed according to approved methods described in a publication available from HD Hyundai Construction Equipment.
Any modification must be approved by the company in writing.

ROPS/FOPS

The cabin is designed to provide sufficient space to minimize impacts pursuant to ISO 12117-2 of Rollover Protective Structures (ROPS). If any additional devices are installed that exceed the Max. certified weight indicated on ROPS name plate, the ROPS certification may be nullified. The protective structure of the cabin should be replaced immediately if it is permanently deformed or damaged.

Machines operated in areas where there is a risk of objects falling onto the cabin are fitted with a Falling Object Protective Structure (FOPS) pursuant to ISO 10262.

Fire and Explosion

Preventing fires

The following actions should be taken to minimize the risk of fire:

- Do a visual inspection before operating the machine to check for any risk of fire.
- Do not operate the machine if there is a risk of fire.
- Be sure to identify the primary exit and alternative exit of the machine, and fully understand how to use the exits in the event of a fire.
- Do not perform any welding or drilling work on the engine cover.
- Keep the engine compartment free from the build-up of flammable materials such as dead leaves, small branches, paper, and other types of trash.
- Keep the covers of the major parts of the machine closed. Make sure that the covers operate normally in order to be able to use firefighting equipment in the event of a fire.

- Be careful when handling fuel. Fuel is a highly flammable.
- Always stop the engine when refueling the machine.
- Refuel outdoors.
- Remove any build-up of flammable materials from the machine.
- Do not operate the machine near a flame.

- All fuels and most lubricant and coolant mixtures are flammable materials, so special care should be exercised when handling such materials to prevent fire and explosion.
- Keep all fuels and lubricant in adequate containers.
- Never smoke in the area where refueling is taking place or in the space for handling battery electrolytes and other flammable materials.
- Oil leaked to a hot surface or electronic component may cause a fire.
- Do not operate the machine if there is an oil leak. Repair the source of the oil leak, and wipe clean any leaked oil before operating the machine.
- Always clean all electrical lines, connectors, and clamps, and check whether they are securely connected on a regular basis.
- If any electrical wire or connector is loose or damaged, repair it immediately.

- Do not weld, cut or use a cutting torch through any tubes or lines in which flammable flows. Check all tubes and lines for signs of abrasion or deterioration and replace if damaged.
- Dust or particles generated when repairing the non-metallic hood or fender are flammable or explosive. Repair such parts in a well ventilated area well away from flames or sparks, and be sure to wear suitable PPE (Personal Protective Equipment).

Preventing explosions

The following actions should be taken to minimize the risk of explosion:

- Never use starting aid fluid in a low-temperature environment as it can have an adverse effect on the engine performance and may cause an explosion.
- Do not attempt to charge a frozen battery. Forcibly charging a frozen batte ry may result in an explosion.
- Use caution when handling the batteries. Never let a tool make contact with the positive battery post and the frame of the machine simultaneously.
  Sparks may be generated, resulting in an explosion.
- Only charge the battery with a charger of equal voltage. Incorrect voltage may cause overheating and explosion.
- Do not use or charge the battery if the level of electrolytes in the battery is low.
  Regularly check the electrolyte level, and refill with distilled water to the maximum level.

- Do not attempt to start the engine using an unsuitable booster cable as it may result in an explosion and serious injury or death.
  Only use the booster cable to start the engine in a well ventilated open space. Starting the engine with a booster cable may generate flammable gas.
- When hydraulic equipment and piping are overheated, flammable gas or airborne particles may explode. Protect and insulate such parts to prevent overheating.

Corrective Actions Before and After a Fire

In the event of a fire in the machine, the top priority should be the safety of the operator and workers in the work area. In the event of a fire at a level that does not endanger the operator or workers, the following actions should be taken:

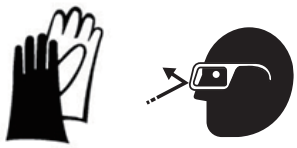
- Move the machine well away from any flammable materials (e.g., fuel, engine oil, clothes, and bits of wood) and adjacent buildings.
- If the engine is running, it may cause a persistent fire. Immediately stop the engine.
- In the event of an electric short, disconnect the batteries to eliminate the main ignition source.
  In the event of an electricity leak resulting from damage to the power wiring caused by fire, disconnect the batteries to eliminate the secondary ignition source.

If a fire becomes too large to control, assess the following risks:

- The tank, accumulator, hose and fitting may burst into flames, splashing fuel and scattering particles throughout the surrounding area.

If you have to handle a machine that has been damaged by fire or one that is exposed to excessively high heat after extinguishing a fire, take the following precautions:

- Wear thick protective gloves and protective goggles.
- Never touch any materials left after combustion with your bare hands.
- Avoid contact with melted polymer materials (e.g., plastics).



Information on fire extinguisher

Fire extinguishers (if equipped) should be kept in a fully operable condition, and be inspected by a qualified person on a regular basis. Workers should complete a training course on the use of fire extinguishers in advance.

Use fire extinguishers in accordance with the following procedures, if required:

① Pull the safety pin of the fire extinguisher first.
② Extend the nozzle, and stand toward the fire.
③ Aim the nozzle at the flames, and firmly press the top and bottom handles.
④ Stand in a downwind position, and evenly spray the foam over the flames.

If the weight of the fire extinguisher exceeds 4.5 kg, mount the extinguisher in a location near the bottom of the cabin. Do not mount the fire extinguisher at a level higher than one third of the height of the cabin.

Do not weld or drill ROPS to mount a fire extinguisher. Contact your dealer or distributor for more information about the correct mounting of fire extinguishers.

Health and Safety

Personal protective equipment

The wearing of personal protective gear is mandatory for protecting the human body from hazardous chemicals and hazardous environments.

The wearing of personal protective gear is a means of preventing injury, and should not interfere with the performance of jobs. It is designed to protect the human body from hazardous environments and hazardous materials, and should be kept in an easily accessible place.

List of personal protection gear

Name	Symbol	Remarks
Safety helmet		Protects the head from falling objects, and reduces risks when falling down.
Dust mask		Air-purifying dust mask should not be worn in workplaces with an oxygen concentration of less than 18%.
Gas mask		Prevents the inhalation of mist, airborne particles, or protects against the spray of hazardous chemicals.
Welding helmet		Blocks airborne dust and slag, and shields the face from bright light during welding.
Protective clothing		Blocks dust, mist and hazardous chemicals, and protects against burns.
Protective gloves		Electric insulation gloves: Should be worn when working in areas with a high risk of electric shock. Chemical protective gloves: Should be worn when working in areas where there is a risk of contact with hazardous chemicals including materials leaked from batteries.
Protective goggles		Protects the eyes from dust, particles and airborne materials in work areas.
Earplugs and earmuffs		Wear earplug and earmuffs separately or in combination depending on the level and duration of noise.
Safety shoes		Protects the feet from falling objects, impacts, and sharp objects.

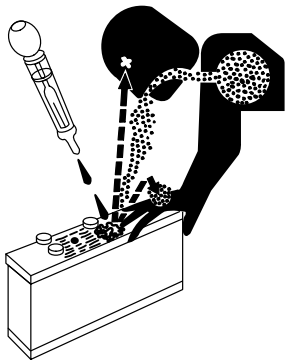
Health and safety instructions in hazardous environments

Comply with the following instructions during operation and maintenance of the machine.

When handling oil

Failure to wear personal protection may result in burns caused by contact with a high-temperature liquid. Make sure you wear protective goggles, protective gloves and protective clothing when handling oils such as hydraulic oils and engine oil.
If the eyes come into contact with oil, wash them with a sufficient quantity of water for 15 minutes or longer. If the skin comes into contact with oil, take off contaminated clothes and shoes, and wash the skin with soap and water for 15 minutes or longer.

When handling the battery



If battery electrolyte leaks while handling the battery, the sulfuric acid contained in the electrolyte may cause burns.
The lead components in battery electrolyte are toxic, so be sure to wear protective gloves and protective clothing.
Always wash your hands after handling the battery.
If a part of your body not protected by personal protective equipment comes into direct contact with battery electrolyte, immediately wash the affected part with flowing water for 20 minutes or more, and then see a doctor without delay.
If you accidentally swallow battery electrolyte, drink water, do not forcibly induce vomiting, and immediately seek medical help.

When handling refrigerant

Always wear protective goggles, protective gloves and other personal protective equipment when handling refrigerant to prevent direct contact of the skin with the refrigerant.
Wear protective gloves made of materials that are resistant to chemicals (such as neoprene and butyl rubber).
Never smoke when handing refrigerant.
If refrigerant comes into direct contact with the skin, wash the skin with warm water immediately.

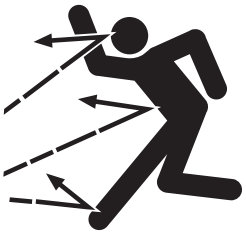
When handling coolants

Do not remove the radiator cap after operation of the machine until the engine has cooled and the pressure has dropped to a safe level. Failure to comply may result in serious burns.

Coolant contains toxic and combustible ethylene glycol, and should be handled in a cool, well-ventilated place only when wearing protective goggles, protective gloves, protective clothing, and a gas mask.
Avoid inhaling airborne particles or spray from coolant. If the substances make contact with skin or eyes, immediately wash the skin and eye with flowing water for 20 minutes or longer.

When working in a place subject to airborne particles and falling objects,

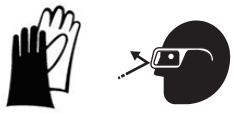
Always wear a safety helmet, protective goggles and safety shoes to prevent injury from airborne particles and thrown or falling objects. Earplugs or earmuffs may be necessary when working in a noisy place.



When working in places with a high level of noise

When the operator is exposed to the noise exceeding 90 dB (A) for 8 hours or longer, wear earplugs or earmuffs.

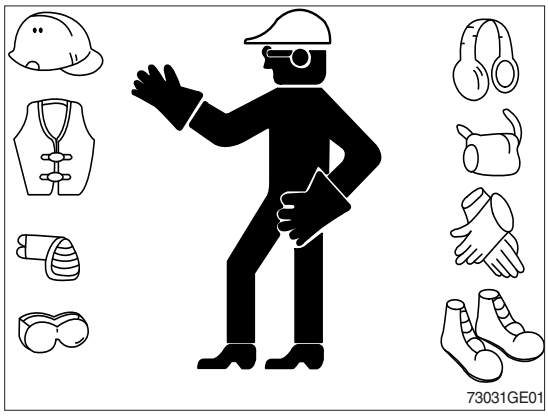
Personal protection gear for various situations

Situation	Symbol
Oil handling	
Battery handling	
Refrigerant handling	
Coolant handling	
Repair by welding	
Working in areas subject to airborne particles and falling objects	
Working in places with a high level of noise	
Handling machines damaged by fire or exposed to excessively high temperature	

WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

- Do not wear loose clothing and accessories. Secure long hair. These items can snag on controls or on other parts of equipment.
- Do not wear oily clothes. They are highly flammable.
- Wear a hard hat, safety shoes, safety goggles, mask, leather gloves, earplugs and other protective equipment, as required.
- While working on machine, never use inadequate tools. They could break or slip, or they may not adequately perform intended.



Noise and Vibration

Information on vibration

This part describes the vibration data of the machine, and methods of calculating the vibration level.

The vibration level of the machine varies according to any of the following conditions:

- Driving habits of the operator
- Quality of seat and suspension
- Type of machine, attachments, and conditions of machine
- Conditions of work site, working environment, ground surface conditions, and weather

Vibration also varies according to the duration of operation.

Physical Agents Directive 2002/44/EC defines the exposure action value as 0.5m/s^2, and the exposure limit value as 1.15 m/s^2. If the predicted value is near the exposure action value or exposure limit value, the predicted value should be assumed to exceed the two latter values, and necessary action should be taken.

In regards to the actions taken according to the vibrations, refer to the following table:

Daily vibration exposure (A(8))	Vibration exposure range	Actions to be taken
A(8) $\leq$ 0.5 m/s^2	Exposure action value or lower	When approaching the exposure activity value, reasonable measures should be taken to minimize exposure to vibration. The relevant information and opportunities for training on vibration reduction should be provided to the operator.
0.5 m/s^2 < A(8) $\leq$ 1.15 m/s^2	Exceeding the exposure action value, but not exceeding the exposure limit value	It is required to execute certain measures for reducing exposure to and risks of vibration to the minimum. The health of an operator who has been exposed to excessive vibration should be examined.
1.15 m/s^2<A(8)	Exceeding the exposure limit value:	Immediate action is required to reduce the vibration exposure level to below the exposure limit value.

※ For futher information, please contatct your local HD Hyundai Construction Equipment dealer.

The vibration level can be predicted based on the information in the following table which is used to calculate the daily level of vibration exposure.

Predict the vibration level in the three vibration directions of axes X, Y, and Z. The mean vibration level should be used under normal operation conditions. Scenario factors from mean vibration level based on operation by skilled operator and on smooth terrain are excluded. Scenario factors are included to obtain the mean vibration level based on aggressive operation and severe terrain to assess the expected vibration level.

※ **All vibration values are indicated in m/s^2.**

ISO Reference table - Vibration level equivalent to whole body vibration emission of the excavator (Unit : m/s^2)

Machine family	Machine kind	Typical operating condition	Vibration Levels			Scenario Factors		
			X axis	Y axis	Z axis	X axis	Y axis	Z axis
Excavator	Compact crawler excavator	Excavating	0.33	0.21	0.19	0.19	0.12	0.10
		Hydraulic breaker app.	0.49	0.28	0.36	0.20	0.13	0.17
		Transfer movement	0.45	0.39	0.62	0.17	0.18	0.28
	Crawler excavator	Excavating	0.44	0.27	0.30	0.24	0.16	0.17
		Hydraulic breaker app.	0.53	0.31	0.55	0.30	0.18	0.28
		Mining application	0.65	0.42	0.61	0.21	0.15	0.32
		Transfer movement	0.48	0.32	0.79	0.19	0.20	0.23
	Wheeled excavator	Excavating	0.52	0.35	0.29	0.26	0.22	0.13
		Transfer movement	0.41	0.53	0.61	0.12	0.20	0.19

Instructions on mitigating vibration

Machines should be correctly adjusted and maintained to ensure smooth operation. The terrain conditions should be observed. The following instructions will help reduce the whole body vibration level:

① Use the correct size attachments for your machine.

② Maintain the machines pursuant to the manufacturer's recommendations.

③ Maintain and provide good terrain conditions.

- Remove any large rocks or obstacles.
- Fill gutters or holes.
- Adjust speed and driving path as needed for the conditions.

④ Use a driver's seat that satisfies ISO 7096.

- Adjust the driver's seat and suspension for the weight and the size of the operator.
- Inspect the suspension and adjusting devices of the driver's seat.

⑤ Perform the following maneuvers without using excessive force :

- Steering
- Braking
- Accelerating
- Gear shifting

⑥ Move the attachments smoothly.

⑦ Keep the level of vibration minimal when working for a long time or driving for a long distance.

- Use a machine mounted with suspension system.
- Transport the machine when moving between worksites; do not drive the machine to get to another worksite.

⑨ Take the following actions for optimal operator comfort and convenience:

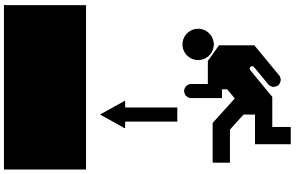
- Adjust the driver's seat adjustment device to allow a convenient posture.
- Adjust the angles of the mirrors to minimize awkward, compromised posture
- Avoid working for an excessively long time, and take regular breaks.
- Do not jump on or off the cabin.
- Minimize repeated handling of loads and lifting of loads.
- The vibration information and calculation procedures are based on <ISO/TR 25398> has been defined according to the emission of vibrations measured under the actual working conditions of the machines.

Information on noise

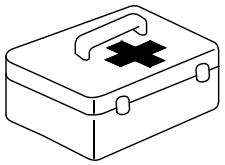
Noise level (EN 474-1:2018 and 2000/14/EC) are as follows :

- Sound pressure level (LpA)
- Sound power level (LwA)

Emergency situations



In the event of an emergency situation, use the emergency hammer installed inside the cabin to break the windshield of the cabin, and carefully escape from the cabin. The emergency hammer should always be kept inside the cabin for emergencies, and should not be removed or used for other purposes. If the emergency hammer is lost, replace it immediately.



Keep a first-aid kit inside the cabin or in another place at the worksite for safety accidents.

Keep contact information (e.g., phone number) to request help with an emergency situation or injury.

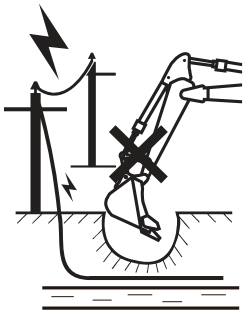
Safety Information on the Machines and Operation

Before Operating the Machine

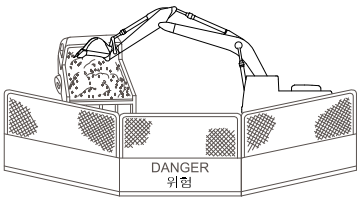
Carefully examine the following conditions and take any necessary actions to prevent risk factors before operating the machine:

Checking the worksite

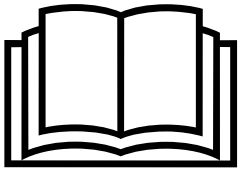
- Always be aware of weather conditions at your worksite. Fog or heavy rain may decrease visibility or render the machine inoperable. In the event of lightning, immediately put the bucket to the ground and evacuate to a safe place.
- Check the worksite for obstacles, and avoid collisions with such obstacles during operation. Check the surroundings of the machine for any obstacles that may hinder operation.
- Check the worksite for buried waterlines, telecommunication cables, power cables and oil pipelines in advance, and avoid damaging them.
- If the terrain of the worksite is too rough for normal operation of the machine, flatten the terrain before operating the machine. Make sure that the ground of the worksite is not soft as it may cause hazards during operation.



- If the worksite is a marshy place (e.g., shallow river, large or small lake, swamp, etc), check the conditions and the depth of marshy areas and the flow rate before driving or operating the machine. Do not operate the machine underwater.
- When operating the machine in water or when crossing shallow, check the bed soil condition and depth and flow speed of water, then proceed taking care that water is not above upper rollers.
- Do not operate the machine on cliffs or at the end of a road on soft ground as the machine may overturn. If operation of the machine on such terrain is unavoidable, keep the track perpendicular to the end, place the driving motor at the rear to facilitate escape from the machine in the event of an emergency situation.
- When operating the machine in areas with pedestrian or vehicle traffic, or in a zone in the vicinity of such an area, appoint workers exclusively responsible for controlling the traffic, or install fences or blocking wall to separate the worksite from the traffic area. Prevent unauthorized workers or machines from accessing the worksite.



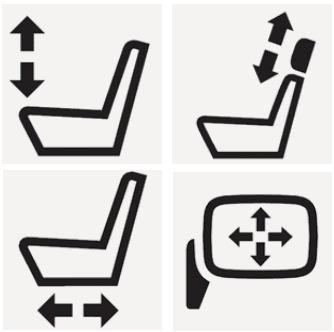
Instructions before operating the machine



- The machine shall be operated by authorized and skilled operators only.
- The operator should wear clothes and personal protection gear that are appropriate for the work environment.
- Do not operate the machine while under the influence of alcohol or drugs or while experiencing extreme fatigue or other conditions that may affect your awareness of your surroundings or your reaction time.
- The operator should read and fully understand the operator's manual before operating the machine.
- The operator should fully understand the details and procedures of the work to be performed.
- Do not perform work when a hazard is anticipated or encountered. Remove the hazard before beginning work. Failure to comply may result in serious injury or death.

Inspect the machine before operating the machine

- Check the machine for abnormal noise, vibration or heat, and for the leakage of engine oil, hydraulic oil, fuel or refrigerant.
- Remove any foreign substances from the engine and the battery. The buildup of such substances may cause a fire.
- Do not operate a machine until any necessary repairs are completed.
- Do not operate the machine until all regular inspection and service recommended in the operator's manual have been executed.

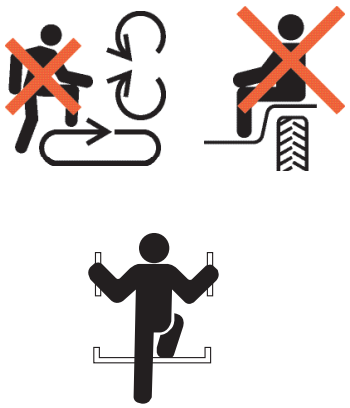


- Adjust the operator’s seat to suit the physical condition of the operator. Check the seatbelt for damage, and replace it if damaged. Do not store unnecessary objects or tools in the cabin.
- Keep clean all parts related to visibility, such as the windshield and rearview mirror. Adjust the rearview mirror to ensure that the operator’s field of vision is clear.
- Check the acoustic alarms (e.g., the horn and warning signal when driving backward or moving) for normal operation.

During Operation of the Machine

Getting on and off

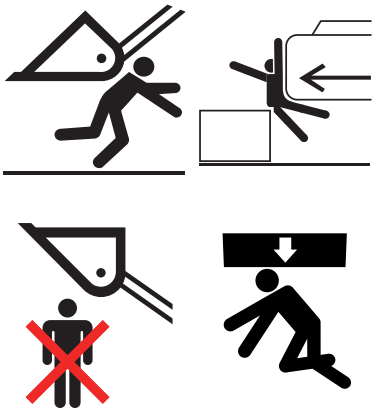
- Do not jump on or off the machine.
- Do not try to get on or off the machine while it is moving.
- Get on or off the machine using the handrail and step (or stepladder, if any). Always keep the handrail and step clean and free from mud or oil.
- Wear anti-slip shoes.
- Comply with the principle of three-point contact* by contacting the machine with either both hands and one foot or vice versa when getting on or off the machine.
- Do not sit on any part of the machine not intended for sitting.



※ **Three-point contact means making contact with the machine with both hands and one foot, or with one hand and both feet.**

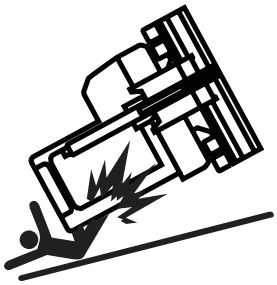
During operation

- The operator should start the engine only after sitting on the operator's seat. Make sure that all levers are shifted to the neutral position before starting the engine.
- Pay close to any obstacles when operating the machine, particularly when turning or moving backward, to prevent collision. Failure to comply may result in serious injury or death.
- Do not exceed the recommended size and weight of an object when lifting a load. Do not lift a heavy object with slings by suspending the slings on the tooth of the bucket.
- Do not allow anyone to stand under the bucket.

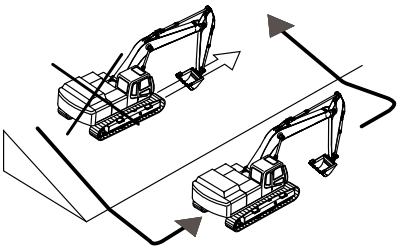


Operation on a slope

When operating the machine on a slope, failure to comply with these instructions could result in the machine tipping over, which may lead to serious injury or death.

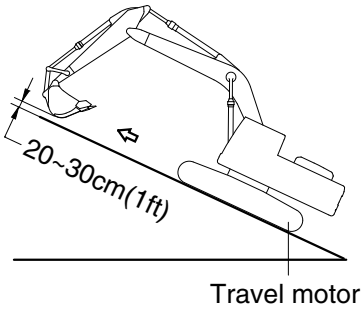


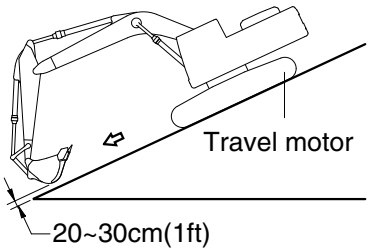
- Do not work on slopes of 10˚ or more.
- Do not exceed the maximum climbing angle of 30˚.
- If operation of the machine on a slope is unavoidable, perform the work after flattening the ground.
- When operating the machine laterally on a slope, there is a high risk of machine overturning or slipping. Do not operate the machine in such conditions.



- Do not operate the machine on a slope covered with wet grass or a thick layer of dead leaves, as the machine may slip.
- Do not park or stop the machine on a slope.
  If parking or stopping the machine on a slope is unavoidable, bring the bucket down to the ground, and support the wheels with wheel chocks.

- When traveling up a slope, operate the machine at a slow speed with the attachment extended forward to keep the machine balanced, and with the bucket raised at least 20 ~30 cm (1 ft) from the ground.
- When traveling down a slope, reduce the engine speed with the travel lever kept in the vicinity of the neutral position. Keep the bucket 20~30 cm (1 ft) above the ground, and use the bucket as a brake in an emergency situation.
- If the engine suddenly stalls, immediately bring the bucket to the ground.
- If the fuel gauge reaches the red zone while operating the machine, immediately refill with fuel. (If the machine operates on a slope under these conditions, air may be introduced into the engine, causing it to stall suddenly.)



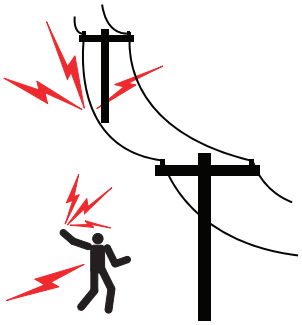


Operations to be avoided or prohibited

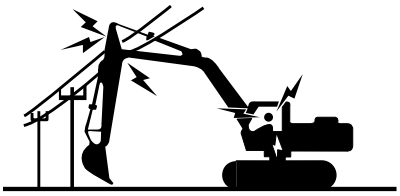
· Pay attention when operating the machine in an enclosed space as this may result in the risk of a buildup of hazardous gases.

· If the machine is operated in the vicinity of a high-voltage line, there is a risk of death or serious injury.
· Be aware of the height and working radius of the machine, and maintain the minimum safety distance.

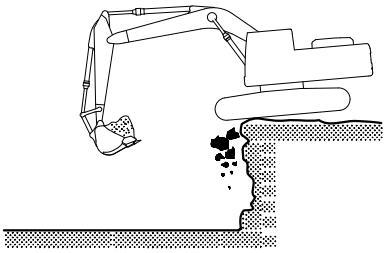
Voltage	Minimum safety distance
6.6 kV	3 m (10 ft)
33.0 kV	4 m (13 ft)
66.0 kV	5 m (16 ft)
154.0 kV	8 m (26 ft)
275.0 kV	10 m (33 ft)



· In the event of contact with a high-voltage line, keep sitting on the operator's seat until the electric current has been shut down.
· Warn any workers on the ground in the vicinity of the machine not to make contact with the machine.
· If leaving the machine is unavoidable, jump down to a place free from any contact with the machine.



· Avoid operating the machine on soft ground, a slope or cliff as there is a risk that it may overturn. Pay special attention when it is raining as the rainfall may soften the ground.
· When operating or driving the machine in water, check the floor conditions, depth of water and flow rate, and make sure that the top roller and axle housing are not immersed in water.
· Do not operate the machine under adverse weather conditions caused by overcast skies, snow and rainfall.
· Do not turn or travel with the machine when the bucket is stuck in the ground.

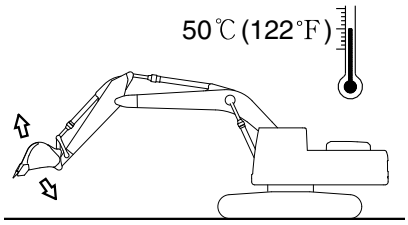


Cautions when operating in specific areas

Operating in extremely cold environments

· Do not attempt to start, stop or turn the machine suddenly as this may cause it to slip. There is potential for the machine to slip.
· Snow-covered or frozen ground may be slippery and dangerous.
· Idle operation of the machine may be required to elevate the engine temperature during startup.
· An impact resulting from a sudden movement of the boom or the attachments at an extremely low temperature may cause serious damage to the machine.
· The working cycle or loading weight might be reduced to lower than those under normal conditions.
· Follow these instructions when operation in cold environments:

- Warm up the engine for 3~4 seconds when starting up the engine.
- Always fully charge the battery. A discharged battery will freeze earlier than a fully charged battery.
- Use engine oil and fuel that are appropriate for the temperature.
- Keep the fuel tank full.
- Remove any moisture from the fuel tank, and change the fuel filter regularly.
- If the fuel filter is frozen, the flow of fuel may be blocked.
- Pour the proper volume of antifreeze into the coolant.
- Wait until the various parts of the machine reach the operating temperature after starting the engine.
- Make sure that every controller and function of the machine operates normally.
- Remove any dirt, snow and ice from the machine after completing the operation.



Operating in extremely hot environments

· Continuous operation of the machine for a long period of time may cause the machine to overheat. Pay special attention to prevent overheating of parts such as the engine and the hydraulic system. Stop the machine and take a break if necessary.

Check the following conditions frequently:
- Check the level of the coolant in the radiator.
- Check the radiator grill for clogging by any debris, and remove them, if any.
- Check the level of the battery electrolyte.
- If the battery will not be used for a long period of time, store it in a cool place.
- Check the hydraulic system for oil leakage.
- Check the lubrication oil on the respective parts, and lubricate as needed.
- If the paint coating of any parts has been effaced or damaged, coat the parts with paints or treat them with an anti-rust additive.
- Do not park the machine under direct light for a long period of time.
- When parking or storing the machine outdoors, use the proper cover to protect the machine from sunlight and dust.

Operating in dusty or sandy environments

- Check the radiator grill for clogging by any debris, and remove any debris.
- Check the fuel system, and protect it from dust or sand when refueling.
- Inspect the air cleaner regularly, and replace it if necessary.
- If the gauge lamp on the dashboard lights up and the buzzer sounds at the same time, clean or replace the air cleaner.
- Frequently check consumables such as hydraulic oil and lubrication oil, and change them if necessary. Protect against the introduction of dust or sand when changing the consumables.
- Check the air-conditioner and the heater filters regularly, and clean or replace them if necessary.
- When parking or storing the machine outdoors, use the proper cover to protect the machine from dust and sand.

Operating in rainy or humid environments

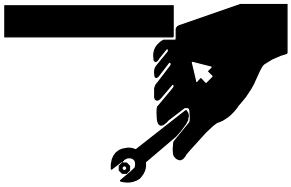
- Do not operate the machine in areas where there is heavy rainfall or thick fog.
- If operating the machine in such areas is unavoidable, perform operation after ensuring sufficient field of vision.
  - Use lighting devices such as the head lamp and working light.
  - Warn any workers within the radius of operation of the machine.
- Pay attention when operating the machine on smooth ground as there is a risk of it overturning.
- If the paint coating on any parts has been effaced or damaged, coat the parts with paint or treat them with an anti-rust additive.

Operating the machine in coastal areas

- Special care should be taken when operating the machine in coastal areas as exposed parts may be corroded easily.
- If the paint coating on any parts has been effaced or damaged, coat the parts with paint or treat them with an anti-rust additive.
- Perform inspection and maintenance of the parts promptly.

Cautions during maintenance

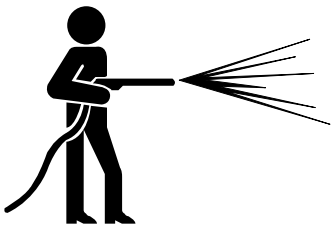
Tools



- Use the correct tools for each type of work.
- Using improper tools may damage the machine and its parts.
- Using deteriorated or damaged tools may result in bodily injury.

Inspection and servicing

- Prevent access to the machine by all unauthorized workers.
- Prior to inspection, park the machine in a flat area and attach a 'Under Inspection' sign.
- Clean the machine before inspection or maintenance.
  - When performing inspection or maintenance on a dirty machine, it may be difficult to diagnosis or detect the cause of a problem with the machine.
  - Dust or dirt accumulated on the machine may cause a worker to slip or fall.
  - Wear protective goggles and protective clothes when cleaning the machine using a compressed water.
  - Do not spray water directly on sensors or electric connectors (sensors or electrical connection units, etc.). If water gets into the electrical system, it can cause operational problems.



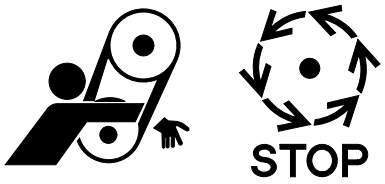
- Use proper lighting devices when operating the machine in a dark area.
- Use lighting devices that are explosion-proof when handling flammable materials such as fuel and hydraulic oil.
- Never attempt to use a direct flame such as a cigarette lighter in lieu of the lighting device.

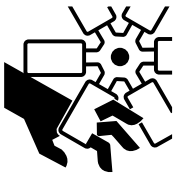
- Check the level of the cooling water after stopping and sufficiently cooling down the engine.
- Sufficiently relieve the inside pressure before opening the cooling water cap.
- The cooling system contains basic components. Use caution to prevent the skin or eyes from coming into contact with the basic materials.

- Exercise special care to protect the body from contact with hot fluid or parts.
- Replace the filters only after shutting off and sufficiently cooling down the engine.
- Slowly remove the operating oil filter plug to relieve the inside pressure.
- Relieve the pressure from the hydraulic system before disconnecting any lines and fittings.

Collision or cutting

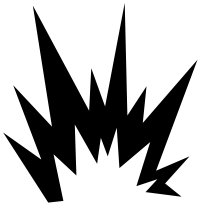
- Never perform a maintenance while the engine is running.
- Never open or remove the engine hood while the machine is in operation.
- If an inspection is required while the engine is running, two or more workers must perform the inspection.
- Keep areas in the vicinity of rotating or moving parts clean.
- Keep articles in the vicinity of the fan clean.
  - Wear safety gloves when handling the wire cables.
  - Wear protective goggles and protective clothes





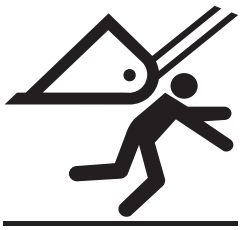
Preventing fire and explosion

- Use caution when handling fuels, lubrication oils, and coolant mixtures to prevent fire and explosion. Failure to comply may result in serious injury or death.
- Oil that leaks on to a hot surface or electronic components may cause a fire.
- Keep all fuels and lubrication oils in adequate containers.
- Do not smoke while refueling or while adding any fluids to the machine. Do not smoke near the fuel tank at anytime.
- Do not smoke in a space where battery electrolyte and other flammable materials are handled.
- Always keep all electrical lines, connectors, and clamps clean, and check whether they are securely connected on a regular basis.
- If any electrical wire or connector is loose or damaged, repair it immediately.
- Do not weld or cut with gas cutter pipes or tubes that contains flammable fluids.



Cautions on decoupling the attachments

- Do not allow unauthorized workers to access the machine.
- Place the machine in a safe position.
- Install safety fences around the machine.

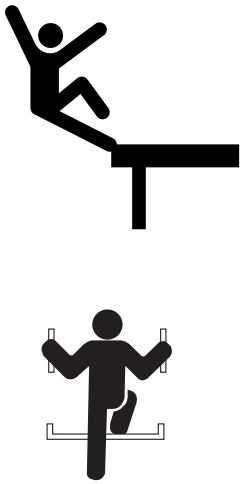


Repair by welding

- Only weld in an area where adequate facilities for welding are available.
- Welding work may be subject to risks of gas leak, flame and electric shock.
  Welding should be performed only by a qualified welder.
- Take the following precautions when welding to avoid serious injury or death:
  - Separate and remove the battery to prevent battery explosion.
  - Perform direct heating in a place free from the risk of explosion.
  - Cover parts such as rubber hoses subject to damage by welding with flame-resistant materials.
  - Wear a welding helmet, protective clothes, protective gloves, and safety shoes.
  - Perform welding work in a well-ventilated place.
  - Remove all inflammable materials from areas in the vicinity of welding work.
  - Provide fire extinguishers.

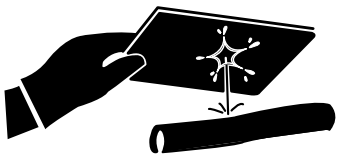
Precautions to take when working on the machine

- There is a risk of falling when working on the machine.
- Keep the area around the workers' feet clean and tidy.
- Do not spill oil or grease.
- Do not leave tools lying on the floor.
- Be careful on the floor when moving.
- Never jump from the machine.
- When getting off the machine, use the step or handrail and get off the machine while keeping to the principle of three-point contact.
- Wear protective clothes if necessary.
- Do not perform maintenance work in an area where no anti-slipping pads have been installed.
- Replace anti-slipping pads and step treads with new ones if they have deteriorated or no longer function.



Cautions when working with the high-pressure line or hose

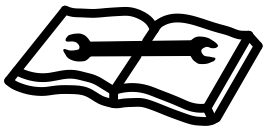
- Make sure that the internal pressure is released before replacing or checking the high-pressure line or hose.
- If the internal pressure is not released, serious injury may result.
- Take the following precautions to avoid serious injury or death:
  - Always check to make sure a working fire extinguisher is nearby
  - Leaked oil may penetrate the skin or cause serious injury.
  - Never check for oil leaks with your bare hands.
  - Check an oil leak using a wooden plate or cardboard.
  - Never bend or hit the high-pressure line hard.
  - Do not install a bent or damaged line or hose.
  - Make sure that all of the clamps and protective devices are properly installed.
- Check the pipes and hoses regularly and replace any damaged parts if necessary.



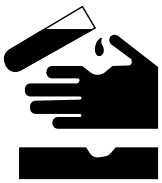
Cautions on inspecting the counterweight

- Failure to comply with these instructions may lead to serious injury or death.
- Never stand beneath the counterweight when installing or removing it.
- Make sure the condition of the lifting device is rated for the weight being lifted.
- Make sure lifting device is in good working order and free of damage or defects.

Battery

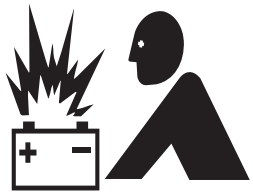


- The battery contains flammable materials.
- Never smoke in the vicinity of the battery.
- The battery electrolyte is strong acid. Pay attention to prevent the skin and eyes from coming into contact with the electrolyte.



- If the battery electrolyte accidentally comes into contact with the body or clothes, immediately wash off the electrolyte with water.
- If the battery electrolyte is frozen, do not use other devices to start the engine up.
- Always wear protective goggles and protective gloves when working on the battery.
- Always keep the switch in the 'OFF' position when working on the battery.
- Securely fasten the battery cap.
- Always disconnect the battery from the machine before charging the battery.
- Disconnect the cathode (-) first when removing the battery.
- Connect the anode (+) first when connecting the battery.
- Follow the safety procedures when jump starting or charging the battery. Improper connection of the cable may result in an explosion and serious injury.

- Use a voltmeter when inspecting the charging system.
- Regularly inspect the battery cable, and replace it if damaged.
- A battery cable with exposed wires may cause a short if it comes into contact with the grounding surface.
- A short circuit of the battery cable may cause heat from the battery current and result in a fire.



- If the wires of the ground cable are exposed between the battery and the master switch, the exposed wires make contact with the grounding surface and the current may bypass to the master switch. This may destabilize the machine operation.
  Repair or replace the part before operating the machine.

Battery disconnection switch

- Do not turn off the battery disconnect switch while engine is running. There is a risk of damaging electrical system.
- The battery disconnect switch can be found under the left-hand door of the machine.
- Make sure to turn off the battery disconnect switch when welding or servicing electrical systems, and before clocking out.

Switchboard

- The relay and fuse can be found on the switchboard at the rear of the cab.
- Do not use the fuse that has a higher amperage than indicated on the decal. There is a risk of damaging electric circuits or catching fire.

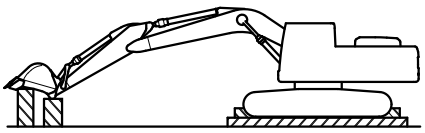
Parking and Storage

Cautions on parking

- Park the machine on flat ground.
- If parking the machine on a slope is unavoidable, use wheel chocks to prevent the machine from moving.
- Bring the bucket down and make firm contact with ground.
- Make sure that all of the switches are turned to the 'OFF' position.
- Do not turn off battery disconnect until led lamp at the disconnect goes off.
- Make sure that all of the controllers are turned to the neutral position.
- Stop the engine, and withdraw the ignition key.
- Close and lock the windshield, door and all covers.
- Install fences around the machine when parking it on a public road, and put up a warning sign.

Cautions on storage for a long period of time

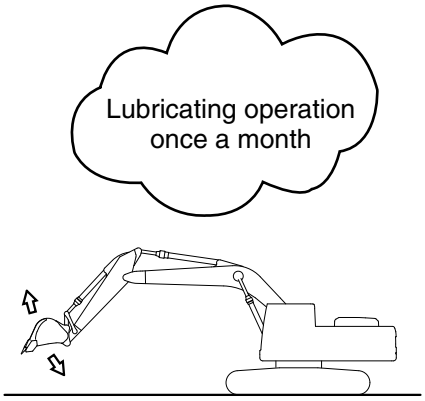
- Park the machine in accordance to any state and local laws.
- When storing the machine for a month or longer, follow these instructions to prevent deterioration of the machine performance :



  - Thoroughly clean the machine before storing.
  - Inject sufficient lubrication oil and grease into the injection ports.
  - If any of the machines fluids are low top them off. If any fluids are close to or in need of changing, do so before storing.
  - Oils and coolant may deteriorate during storage based on the length of storage. Please take this into consideration before using the machine.
  - The density of the oil may drop during storage.
  - Apply an anti-rust additive to the exposed area of the piston rod of the cylinder in areas where it is likely to rust quickly.
  - Keep the master switch mounted in the power box (or the toolbox on the left of the rear frame of the machine) turned 'OFF'.
  - Keep the machine in a dry indoor environment.
    If storing the machine outdoors is unavoidable, store it on a wooden pallet.
  - Keep all cylinders collapse so that the cylinder rods are not exposed.
  - Bring the attachments right down to the ground, and keep the tracks immobile by placing wheel chocks.

Regular lubrication (during storage)

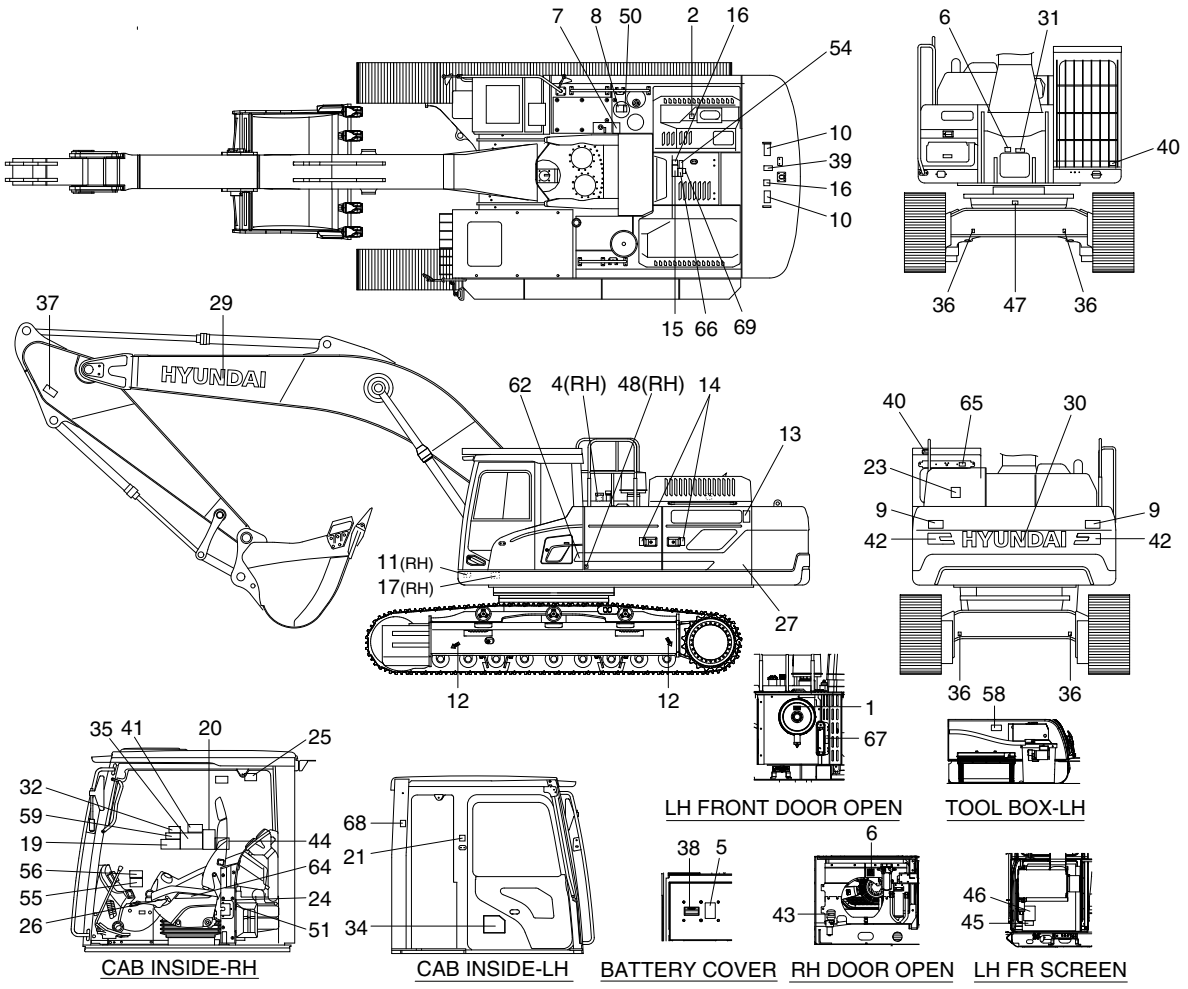
- Breaking the lubrication film on parts may cause abnormal abrasion during the next operation.
- Check the level of the engine oil and coolant when starting the engine up, and top them up if necessary.
- Thoroughly wipe off any oil from cylinder rod before operating machine as it will attract dust and debris.
- Start up the engine once a month, perform all functions. Operate machine utilizing all functions for a minimum of 15 minutes. Apply lubrication oil to every part.
- Fully charge and store the battery.
- If storing the excavator for longer than 6 months, disconnect the battery negative (-) terminal.



SAFETY LABELS

1. LOCATION

Always keep these labels clean. If they are lost or damaged, replace them with a new label.



90KB-01100-01

1	Air cleaner filter	24	Air conditioner filter	45	M/control pattern change-w/o valve
2	Turbocharger cover	25	ROPS plate		
4	Fueling	26	Safety knob	46	M/control pattern change-w/valve
5	Battery accident	27	Model name		
6	High pressure hose	29	Trade mark (boom)	47	Swing bearing grease
7	Hydraulic oil level	30	Trade mark (CWT)	48	Battery position
8	High pressure lub	31	Reduction gear grease	50	Fuel shut off
9	Keep clear-rear	32	Clamp locking	51	MCU/ECM connector
10	Lifting eye	34	Service instruction	54	Surge tank
11	Name plate	35	Lifting chart	55	Key off caution
12	Slinging ideogram	36	Tie	56	RCV lever
13	Keep clear-side	37	Keep clear-attachment	58	Leftover fuel
14	Stay fix	38	Electric welding	59	RCV control
15	Engine hood shearing	39	Falling	62	Band
16	No step	40	FOPS FOG plate	64	Console logo
17	Transporting	41	Caution (water separator, turbocharger)	65	Beacon lamp
19	M/control pattern			66	High pressure
20	Refer to operator's manual	42	Reflecting	67	Fuse caution
21	Hammer	43	Accumulator	68	Fire extinguisher
23	Emergency exit	44	M/control pattern change valve	69	Surge tank

2. DESCRIPTION

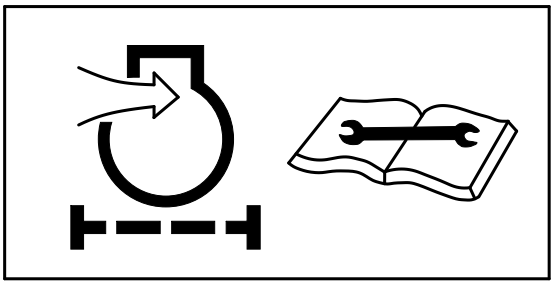
There are labels on this machine. Ensure you are familiar with all labels before operating the machine.

Replace any label that is damaged or missing. If a label is attached to a part that is replaced, install a label on the replacement part.

1) **AIR CLEANER FILTER** (item 1)

This label is positioned on the air cleaner cover.

※ **Periodic and proper inspection, cleaning and change of elements prolong engine life and maintains good engine performance.**



21070FW01

2) **TURBOCHARGER COVER** (item 2)

This label is positioned on the turbocharger cover.

⚠ **Do not touch turbocharger or it may cause severe burn, while the engine is running or immediately after the engine is shut down.**

21070FW02

3) **FUELING** (item 4)

This label is positioned on the right side of fuel filler neck.

⚠ **Stop the engine when refueling. Any lights or flames must be kept at a safe distance while refueling.**

4) BATTERY ACCIDENT (item 5)

This label is positioned on the battery cover. Follow all warnings. Failure to comply may result in serious injury or death.

⚠ Electrolyte containing sulfuric acid can cause severe burns. Avoid allowing contact with the skin, eyes or clothes. In the event of accident flush with sufficient water and contact a physician immediately. Failure to comply may result in serious injury or death.

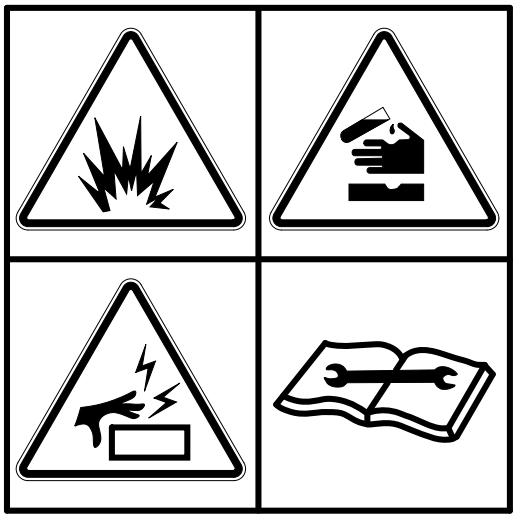
※ Maintain the electrolyte at the recommended level. Add distilled water to the battery only when starting up, never when shutting down.

With electrolyte at proper level, less space may cause the gases to be accumulated in the battery.

⚠ Do not allow any open flames or excessive heat near or when checking the battery.

⚠ Do not allow unauthorized personnel to change the battery or to use booster cables.

⚠ To prevent electric shock, do not touch battery terminal with wet hands.



36070FW05

5) HIGH PRESSURE HOSE (item 6)

This label is positioned on the pump screen and front side of the upper frame. Follow all warnings. Failure to comply may result in serious injury or death.

⚠ Escaping fluid under pressure can penetrate the skin causing serious injury or death.

⚠ Relieve all pressure before disconnecting any hydraulic, coolant or fuel lines etc.

※ See the maintenance section for details.

91N6-03133

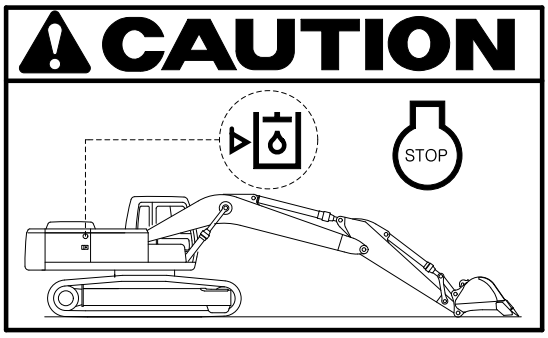
6) HYDRAULIC OIL LEVEL (item 7)

This label is positioned on the top side of the hydraulic tank.

⚠ Place the bucket on the ground whenever servicing the hydraulic system.

※ Check oil level on the level gauge as shown in the upper right hand illustration.

※ Using the recommend hydraulic oil, fill to the specified level if necessary. Please refer to section, Maintenance.



21070FW07

7) HYDRAULIC OIL LUBRICATION (item 8)

This label is positioned on the top side of the hydraulic tank.

※ Do not mix with different brand oils.

⚠ Never open the filler cap while high temperature.

⚠ Loosen the cap slowly and release internal pressure completely.

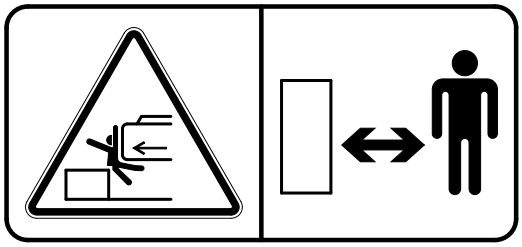
91N6-03112

8) KEEP CLEAR-REAR (item 9)

This label is positioned on the both sides of the counterweight.

⚠ To prevent serious personal injury or death keep clear of machine swing radius.

⚠ Do not deface or remove this label from the machine.



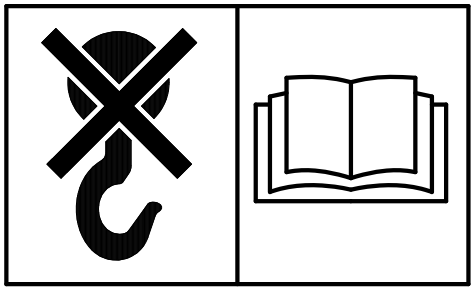
21090FW09

9) LIFTING EYE (item 10)

This label is positioned on the left and right upper sides of the counterweight.

⚠ Do not lift the machine by using lifting eyes on the counterweight or the lifting eyes may be subject to break causing serious injury or death.

※ See page 5-13 for proper lifting method of the machine.



21070FW10

10) **KEEP CLEAR-SIDE** (item 13)

This label is positioned on the LH and RH side cover.

⚠ **To prevent serious personal injury or death keep clear of machine swing radius.**

⚠ **Do not deface or remove this label from the machine.**

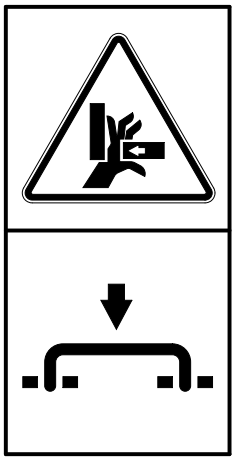
21070FW13

11) **STAY FIX** (item 14)

This label is positioned on the LH and RH side cover.

⚠ **Be sure to fix the stay when the door needs to be opened.**

⚠ **A door which is not fixed in the fully closed or open position (via stay) can suddenly move causing severe personal injury or death.**



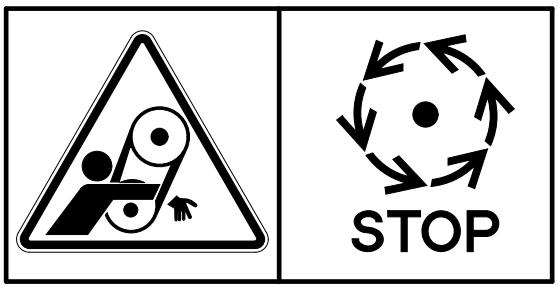
21070FW14

12) **ENGINE HOOD SHEARING** (item 15)

This label is positioned on the engine hood.

⚠ **Do not open the engine hood while the engine is running. Stay clear of rotating parts. Failure to comply may cause serious injury or death.**

⚠ **Do not touch exhaust pipe or it may cause severe burn.**



21070FW15

13) **NO STEP** (item 16)

This label is positioned on the engine hood and counterweight.

△ **Don't step on the engine hood and counterweight.**

21070FW16

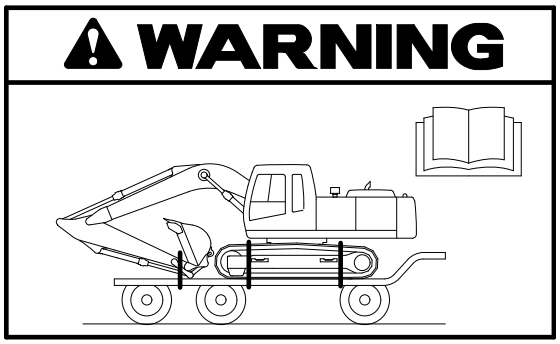
14) **TRANSPORTING** (item 17)

This label is positioned on the right side of upper frame.

⚠ **Review the operator's manual before transporting the machine. Tie down arm and track to the carrier with appropriate rated straps or chains.**

⚠ **Be sure to protect machine from damage when strapping by using appropriate material such as wood, cardboard etc.**

See page 5-12 for details.



14070FW17

15) **MACHINE CONTROL PATTERN** (item 19)

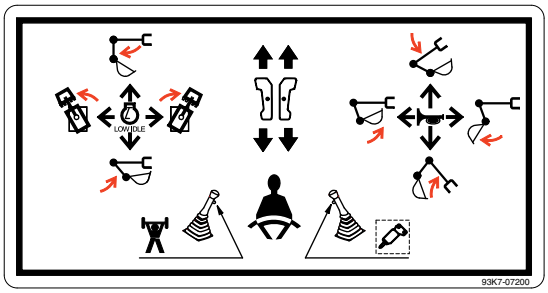
This label is positioned in the right window of inside the cab.

⚠ **Always ensure the label matches the control pattern. If it does not, replace label with appropriate control pattern label.**

⚠ **Failure to do so could result in serious injury or death.**

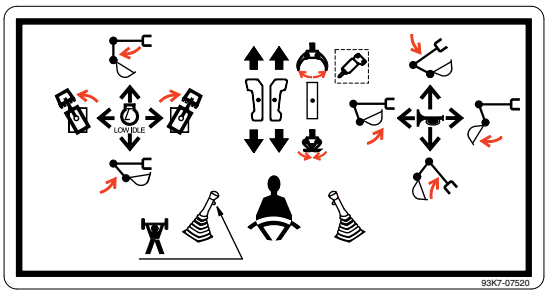
See page 2-12 for details.

ISO pattern+breaker



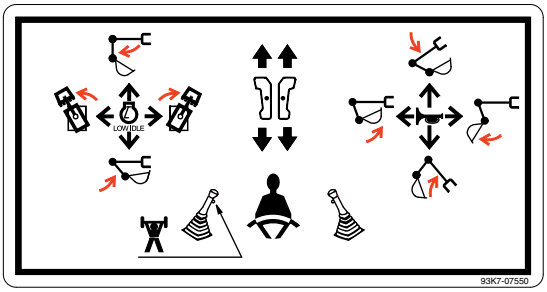
93K7-07200

ISO pattern+breaker+clamshell



93K7-07520

ISO pattern



93K7-07550

16) **REFER TO OPERATOR'S MANUAL** (item 20)

This label is positioned on the right window of inside the cab.

⚠ **Review the operator's manual before starting and operating machine.**

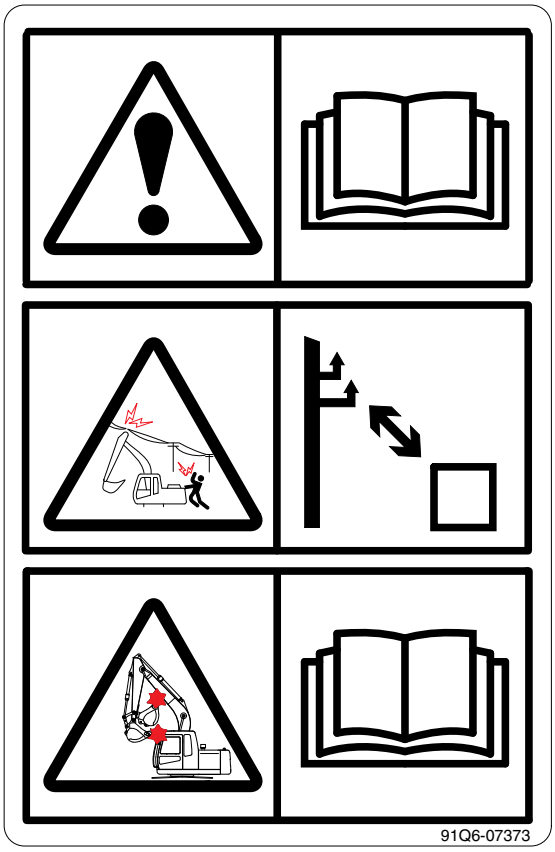
⚠ **Do not operate this machine unless you have read and understand the instructions and warnings in this manual. Failure to follow the instructions or warnings could result in serious injury or death.**

(1) Max height

⚠ **Serious injury or death can result from contact with electric lines. It is possible to receive shock by merely coming into the vicinity of electric lines, the minimum distance based on supply voltage should never be exceeded. Refer to page 1-21.**

(2) Interference

⚠ **When operating machine equipped with quick clamp or extensions, the bucket may come into contact with the boom, boom cylinders or cab, during the bucket or arm retraction operation.**



91Q6-07373

17) **HAMMER** (item 21)

This label is located inside the cab, on the center stay.

※ **The window serves as an alternate exit.**

※ **In emergency, break out the window using the hammer and escape from the cabin.**

91Q6-07280

18) **EMERGENCY EXIT** (item 23)

This label is positioned on the inside of rear window.

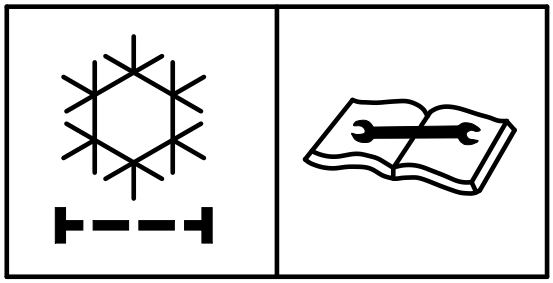
※ **The rear window serves as an alternate exit.**

※ **To remove rear window, pull the ring and push out the glass.**

19) **AIR CONDITIONER FILTER** (item 24)

This label is positioned on the air conditioner cover.

※ **Periodic and proper inspection, cleaning and change of filter prolong air conditioner life and maintain good performance.**



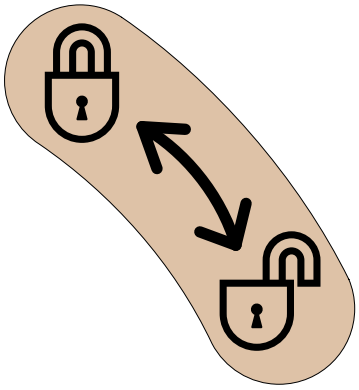
21070FW26

20) **SAFETY KNOB** (item 26)

This label is positioned on the cover of the safety knob, on the left side operators console.

⚠ **Before you get off the machine be sure to place the safety knob in the LOCKED position.**

※ **See page 3-38 for detail.**

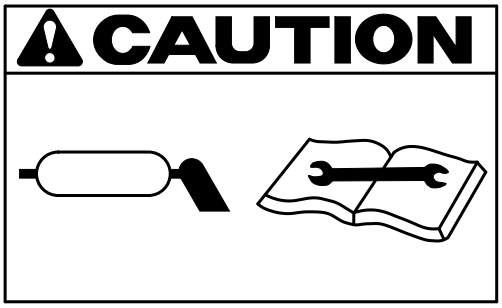


30007A1FW07A

21) **REDUCTION GEAR GREASE** (item 31)

This label is positioned in the front side of upper frame.

⚠ **Grease is under high pressure.**
Grease coming out of the grease plug under pressure can penetrate the body causing serious injury or death.



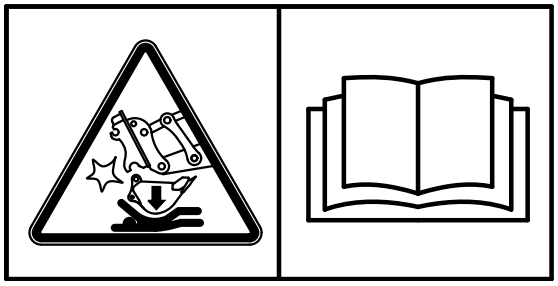
21070FW35

22) **CLAMP LOCKING** (item 32)

This label is positioned on the right window of inside the cab.

⚠ **Serious injury or death can result from a falling bucket.**

⚠ **Operating the machine with quick clamp switch unlocked or without safety pin of moving hook can cause the bucket to fall off.**



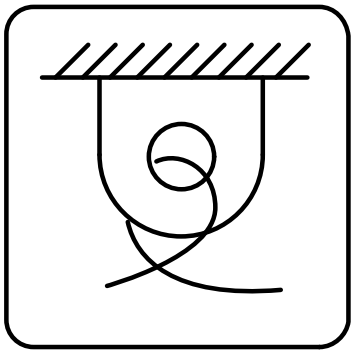
14070FW60

23) **TIE** (item 36)

This label is positioned on the front and rear of the lower frame.

⚠ **Never tow the machine using tie down eyelet as it may break resulting in personal injury or death.**

※ **See page 2-15 for detail.**



4507A0FW02

24) **KEEP CLEAR-ATTACHMENT** (item 37)

This label is positioned on both sides of the arm.

⚠ **Serious injury or death can result from a falling attachment.**

⚠ **To prevent serious injury or death, do not walk near, under implements or attachments. This applies when machine is in use, the implements are suspended in air or while the machine is being worked on.**

14070FW31

25) **ELECTRIC WELDING** (item 38)

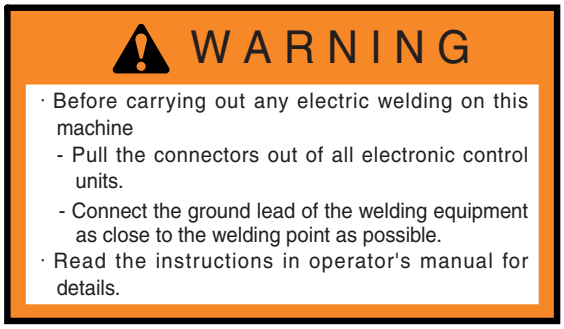
This label is positioned on the battery cover.

⚠ **Before carrying out any electric welding on this machine, follow the below procedure.**

- Pull the connectors out of all electric control units.
- Connect the ground lead of the welding equipment as close to the welding point as possible.

※ **Be sure to remove paint where ground will be applied to ensure proper grounding of welder. Once welding is complete, clean and repaint area.**

※ **See page 4-54 for detail.**



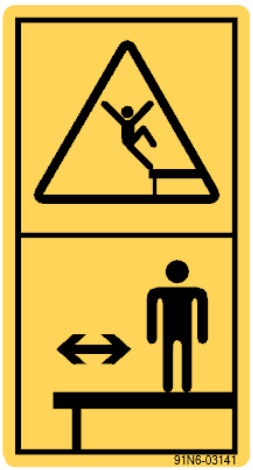
7807AFW20

26) **FALLING** (item 39)

This label is positioned on the top side of counterweight.

⚠ **Falling from machine is one of the major causes of personal injury or death.**

⚠ **Be careful of slippery conditions on the platforms, steps and handrails when standing on the machine.**



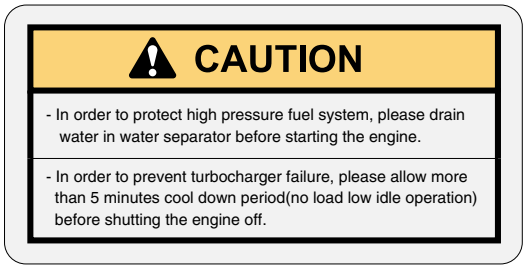
91N6-03141

27) **CAUTION (W/SEPARATOR, TURBOCHARGER)** (item 41)

This label is positioned on the right window of inside the cab.

⚠ **In order to protect high pressure fuel system, please drain water in water separator before starting the engine.**

⚠ **In order to prevent turbocharger failure, please allow more than 5 minutes cool down period (no load low idle operation) before shutting the engine off.**



120090SL02

28) **REFLECTING** (item 42)

This label is positioned on the rear side of the counterweight.

⚠ **To prevent serious personal injury or death keep clear of machine swing radius.**

⚠ **Do not deface or remove this label from the machine.**

290F0FW01

29) **ACCUMULATOR** (item 43)

This label is positioned on the accumulator of the solenoid valve.

※ **The accumulator is filled with high-pressure nitrogen gas, and it is extremely dangerous if it is handled in the wrong way. Always observe the following precautions.**

⚠ **Never make any holes in the accumulator or expose it to open flame or fire.**

⚠ **Do not weld anything to the accumulator.**

※ **When carrying out disassembly or maintenance of the accumulator, or when disposing of the accumulator. It is necessary to release the gas from the accumulator. A special air bleed valve is necessary for this operation, so please contact your HD Hyundai Construction Equipment distributor.**

1107A0FW46

30) **MACHINE CONTROL PATTERN CHANGE VALVE** (item 44)

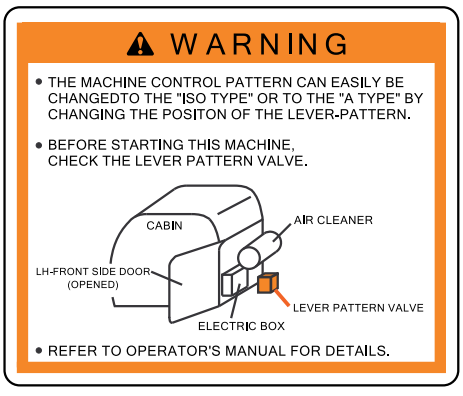
This label is positioned on the right window of inside the cab.

⚠ **The machine control pattern can easily be changed to the "ISO type" or to the "A type" by changing the position of the lever-pattern.**

⚠ **Before starting this machine, check the lever pattern change valve.**

※ **See page 2-27 for detail.**

2 PATTERN CHANGE VALVE



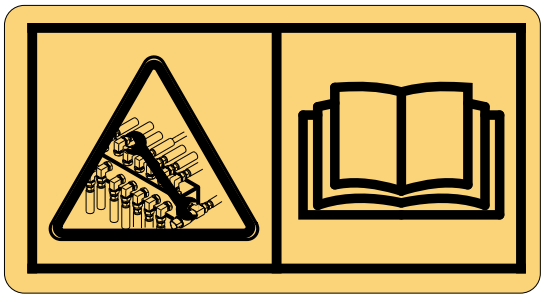
91N6-07400

31) **MACHINE CONTROL PATTERN CHANGE-W/O VALVE**(item 45)

This label is positioned on the LH front screen.

⚠ **Check the machine control pattern before starting this machine.**

※ **See page 2-26 for detail.**



14W90FW47

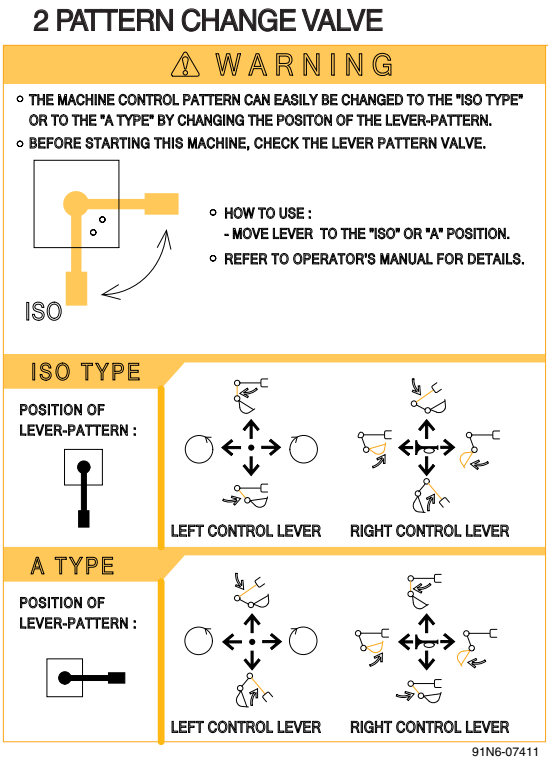
32) **MACHINE CONTROL PATTERN CHANGE-W/VALVE** (item 46)

This label is positioned on the LH front screen.

⚠ **Check the machine control pattern for conformance to the pattern on this label. If not, change label to match pattern before operating machine.**

⚠ **Failure to do so could result in serious injury or death.**

※ **See page 2-27 for details.**

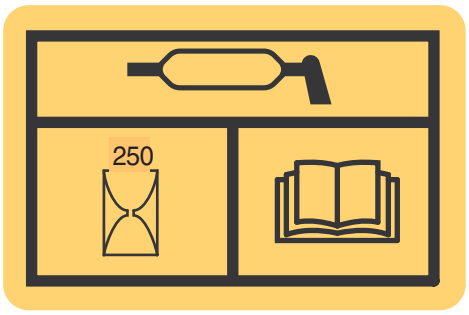


91N6-07411

33) **SWING BEARING GREASE** (item 47)

This label is positioned in the front side of swing bearing housing.

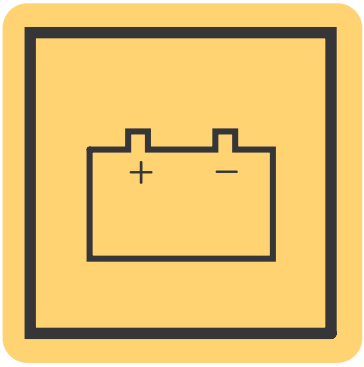
※ **See page 4-45 for details.**



38090FW02

34) **BATTERY POSITION** (item 48)

This label is positioned on the LH side of the tool box.



38090FW03

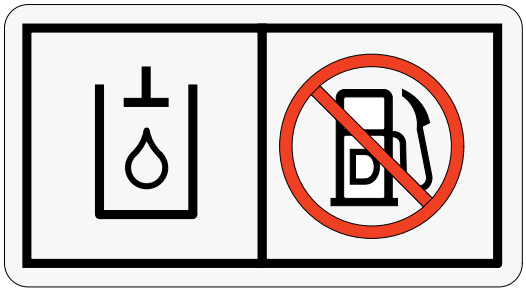
35) **FUEL SHUT OFF** (item 50)

This label is positioned on the top side of the hydraulic tank.

※ **Fill only with hydraulic oil.**

※ **Do not fill with diesel fuel.**

⚠ **Relieve tank pressure with the engine off by removing the cap slowly to prevent burns from hot oil.**



140WH90FW51

36) **MCU/ECM CONNECTOR** (item 51)

This label is positioned on the lower cover of the air conditioner inside the cab.

※ **MCU communicates the machine data through Laptop computer through RS232 service socket.**

※ **ECM communicates the engine data with cummins INSITE tool adapter through J1939 service socket.**

※ **See page 3-62 for details.**

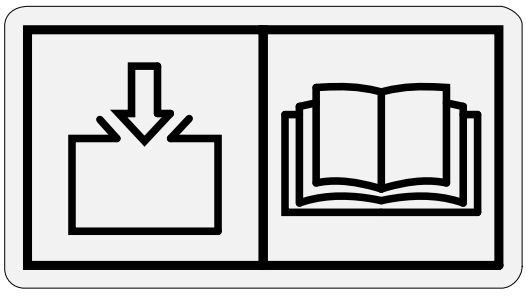
235Z90FW52

37) **SURGE TANK** (item 54)

This label is positioned on the top of the engine hood.

This system must be filled slowly to prevent air locks.

※ **Fill rate ≤ 12 lpm**



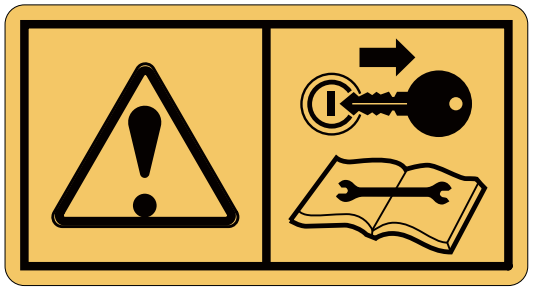
3009A0FW54

38) **KEY OFF CAUTION** (item 55)

This label is positioned on the right side window of inside the cab.

※ **Park on a flat place and stop the engine for inspecting and repairing. Properly TAG machine is not operational. (remove start key)**

Extreme care shall be taken during maintenance work.



290F0FW05

39) **RCV LEVER** (item 56)

This label is positioned on the right side window of inside the cab.

※ **When moving seat forward, interference is possible between cluster and RCV lever. To prevent such interference, follow the procedure below.**

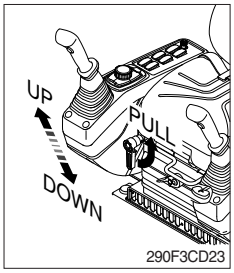
(1) Rotate cluster.

(2) Adjust the seat position using the seat height adjustment lever (grey lever which is front center of seat).

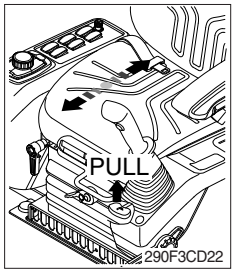
(3) Lower the console height using knob between RH console and seat cushion.

(4) Push back console and seat at the same time by using console adjust knob which is located between the LH console and lower seat cushion.

290F0FW04



290F3CD23



290F3CD22

40) **LEFTOVER FUEL** (item 58)

This label is positioned on the LH side of inside the tool box.

⚠ **Do not fuel a machine near open flames or sparks. Failure to comply may result in serious injury or death.**

⚠ **Properly clean areas of spillage.**

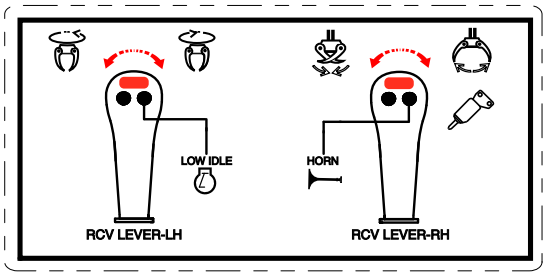
91K4-02700

91K4-02700

41) **RCV CONTROL** (item 59)

This label is positioned on the right side window of inside the cab.

※ **Read and understand the operation of the RCV lever.**

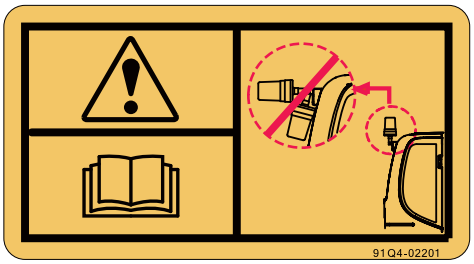


330F0SL05

42) **BEACON LAMP** (item 65)

This warning label is positioned on the rear side of the cab.

⚠ **Keep the beacon lamp straight up condition.**



91Q4-02201

43) **HIGH PRESSURE** (item 66)

This label is positioned on the top side of the engine hood.

⚠ **Do not touch hot or high pressure parts as it may cause severe burn.**

94K8-01110

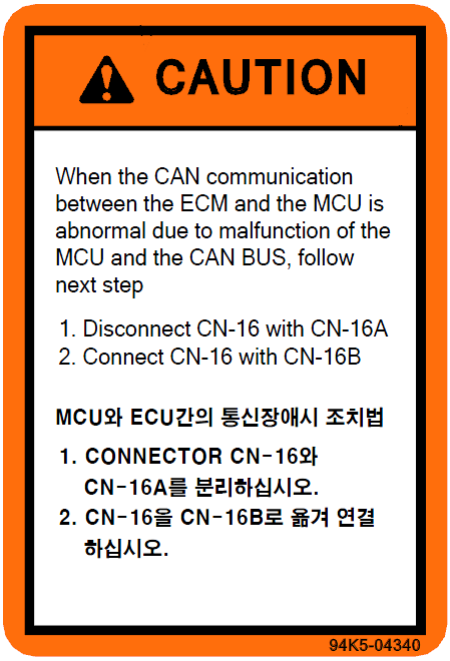
44) **FUSE CUATION** (item 67)

This label is positioned on the electric box cover.

※ **When the CAN communication between the ECM and the MCU is abnormal due to malfunction of the MCU and the CAN BUS, follow next step.**

(1) Disconnect CN-16 with CN-16A

(2) Connect CN-16 with CN-16B



94K5-04340

45) **FIRE EXTINGUISHER** (item 68)

This label is located on the left rear stay, inside the cabin.

※ **Read and understand the instructions label on the fire extinguisher.**

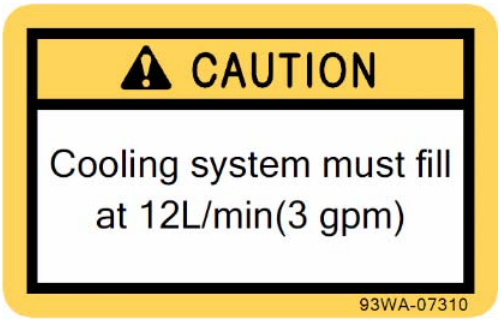
91Q6-07290

46) **SURGE TANK** (item 69)

This label is positioned on the top side of the engine hood.

※ **The cooling system has a maximum fill rate of 12 liters (3.2 U.S. gallons) per minute. Do not exceed this fill rate.**

※ **The cooling system must be filled slowly to prevent air locks.**



93WA-07310

Visibility

Before you start the machine, perform a walk-around inspection in order to ensure that there are no hazards around the machine.

While the machine is in operation, constantly survey the area around the machine in order to identify potential hazards as hazards become visible around the machine.

Your machine may be equipped with visual aids. Some examples of visual aids are Closed Circuit Television(CCTV), AAVM(Advanced Around View Monitoring) and mirrors. Before operating the machine, ensure that the visual aids are in proper working condition and that the visual aids are clean.

If may not be possible to provide direct visibility on large machines to all areas around the machine, appropriate job site organization is required in order to minimize hazards that are caused by restricted visibility. Job site organization is a collection of policies and procedures that coordinates machines and people that work together in the same area.

Examples of job site organization include the following:

- Safety instructions
- Controlled patterns of machine movement and vehicle movement
- Workers that direct traffic to move when it is safe
- Restricted areas
- Operator training
- Warning symbols or warning signs on machines or on vehicles
- A system of communication
- Communication between workers and operators prior to approaching the machine

Modifications of the machine configuration by the user could result in a restriction of the machine visibility. In this case, a new risk assessment must be performed according to ISO 5006:2017.

1. INSTRUCTION FOR NEW MACHINE

1) It takes about 100 operation hours to enhance its designed performance.

2) Operate according to the 3 steps below and avoid excessive operation for the initial hours.

Service meter	Load
Until 10 hours	About 60 %
Until 100 hours	About 80 %
After 100 hours	100 %

※ **Excessive operation may deteriorate the performance of the machine and shorten the life of the machine.**

480SA4OP01

3) Be careful during the initial 100 hours operation

(1) Check daily for the level and leakage of fluids.

(2) Check greasing points on a regular basis and grease all points as needed. Refer to greasing chart located on the machine.

(3) Check over all hose connections, bolts, nuts and screws, on a daily basis.

(4) Warm up the machine fully before operating.

(5) Check all gauges occasionally during the operation.

(6) Check if the machine is operating normally during operation of the machine.

4) After the initial 250 hours of operation replace the following:

Checking items	Hours
Engine oil	250
Engine oil filter	
Fuel filter element	
Fuel pre-filter element	
Hydraulic oil return filter	
Pilot line filter element	
Swing reduction gear oil	
Travel reduction gear oil	

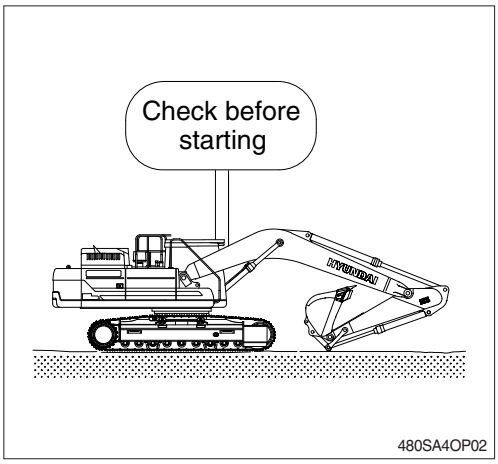
2. CHECK BEFORE STARTING THE ENGINE

1) Look around and under the machine to check:
   - · Check for loose nuts, bolts or wiring
   - · Collection of dirt
   - · Collection of dust at places which reach high temperature
   - · Leakage of oil, fuel or coolant
   - · Condition of the work equipment and hydraulic system.

※ **Refer to section, Maintenance check list in chapter 4.**

2) Adjust operator seat to best fit the operator.

3) Adjust all mirrors to best fit the operator.



480SA4OP02

3. STARTING AND STOPPING THE ENGINE

1) CHECK INDICATOR LIGHTS

(1) Confirm all operating levers are in the neutral position.

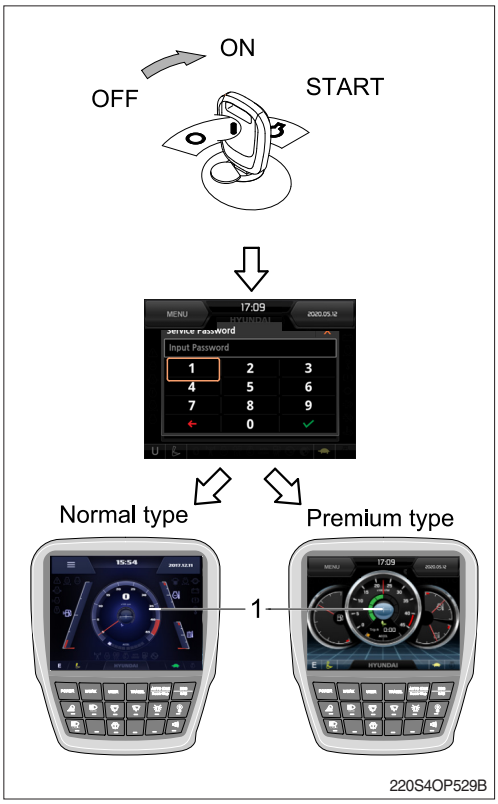
(2) Turn the starting switch to the ON position. Buzzer will sound for 4 seconds with HYUNDAI logo on cluster.

※ **If the ESL mode is set to enable mode, enter the password to start engine.**

※ **If the incorrect password in entered a total of 5 times, you must wait 30 minutes before trying again.**

※ **Refer to page 3-25 for ESL mode.**

(3) After initialization of cluster, the operating screen is displayed on LCD (1).
Also, self-diagnostic function is carried out.



2) STARTING ENGINE IN NORMAL

⚠ **Check if any obstacles or people are in the working area. Sound the horn to warn anyone in the vicinity that you are starting the engine.**

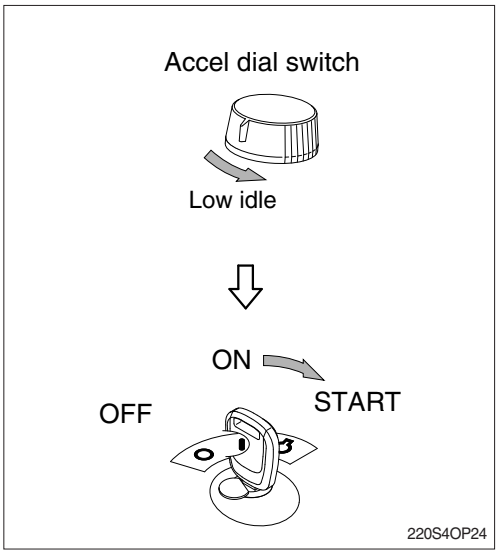
(1) Turn the multimodal dial to low idle position.

(2) Turn the starting switch to START position to start the engine.

△ **Do not hold the starting switch in the START position for longer than 20 seconds. The start system may be seriously damaged.**

※ **If the engine does not start, allow the stater to cool for about 2 minutes before re-attempting to start the engine again.**

(3) Release the starting switch instantly after the engine starts to avoid possible damage to the starting motor.



3) STARTING ENGINE IN COLD WEATHER

※ **By following below steps, you will be able to improve startability and fuel consumption in cold weather.**

⚠ **Always check for obstacles in the area and sound horn before starting the engine.**

※ **Check engine oil and fuel and replace as necessary. See page 7-37.**

※ **Top off coolant as needed.**

※ **When you turn ON starting switch, the fuel warmer automatically heats the fuel as needed by sensing coolant temperature.**

(1) Confirm all levers are in the neutral position.

(2) Turn the multimodal dial to low idle position.

(3) Turn the starting switch to the ON position, and wait 1~2 minutes. More time might be required, it depends on the ambient temperature.

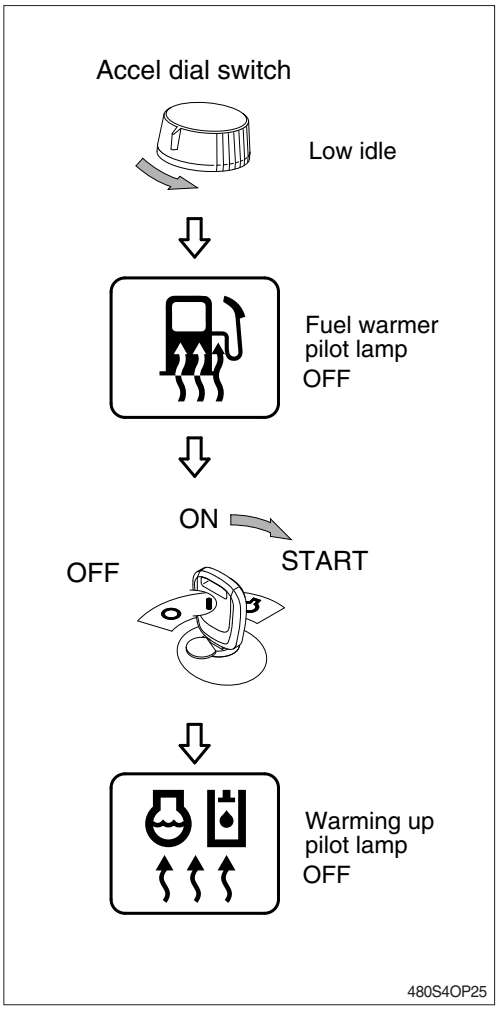
(4) Start the engine by turning the starting switch to START position after the fuel warmer pilot lamp OFF.

※ **If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.**

(5) Release the starting switch immediately after starting engine.

(6) If the temperature of the coolant is lower than 30˚C (86˚F) the warming up process automatically starts.

※ **Do not operate the working devices, or change the operation mode during the warming up.**



4) INSPECTION AFTER ENGINE START

Inspect and confirm the following after engine starts.

(1) Is the oil level gauge of hydraulic tank in the normal operation range?

(2) Is there any leakage of oil or water?

(3) Are any warning lamps ON?

(4) Are indicator for coolant temperature gauge (1) and hydraulic temperature gauge (2) in the operating range?

(5) Is the engine sound and the color of exhaust gas normal?

(6) Are the sound and vibration normal?

△ **Do not increase engine speed quickly after starting, it can damage engine or turbocharger.**

※ **If there are problems in the cluster, stop the engine immediately and correct problems as required.**

5) WARMING-UP OPERATION

※ **The most suitable temperature for the hydraulic oil is about 50˚C (122˚F).**

△ **If the hydraulic oil temperature drops below 25˚C (77˚F), sudden operation can damage the hydraulic system. So temperature must be raised to at least 25˚C (77˚F) before starting work.**

(1) Run the engine at low idle speed for 5 minutes.

(2) Speed up the engine by multimodal dial and run the engine at mid-range speed.

(3) Operate bucket lever for 5 minutes.

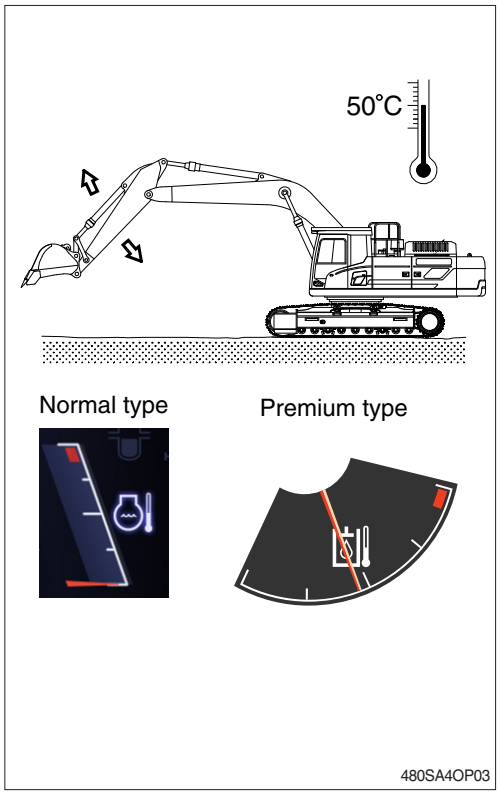
※ **Do not operate anything except bucket lever.**

(4) Run the engine at high speed and operate the bucket lever and arm lever for 5-10 minutes.

※ **Operate only the bucket lever and arm lever.**

(5) Finally this warming-up process will be completed by operating all cylinders several times along with the operation of swing and traveling.

※ **Increase the time for warming-up during winter.**



6) TO STOP THE ENGINE

※ **If the engine is abruptly stopped before it has cooled down, engine life may be greatly shortened. Consequently, do not abruptly stop the engine apart from an emergency.**

※ **In particular, if the engine has overheated, do not abruptly stop it but run it at low speed to allow it to cool gradually, then stop the engine.**

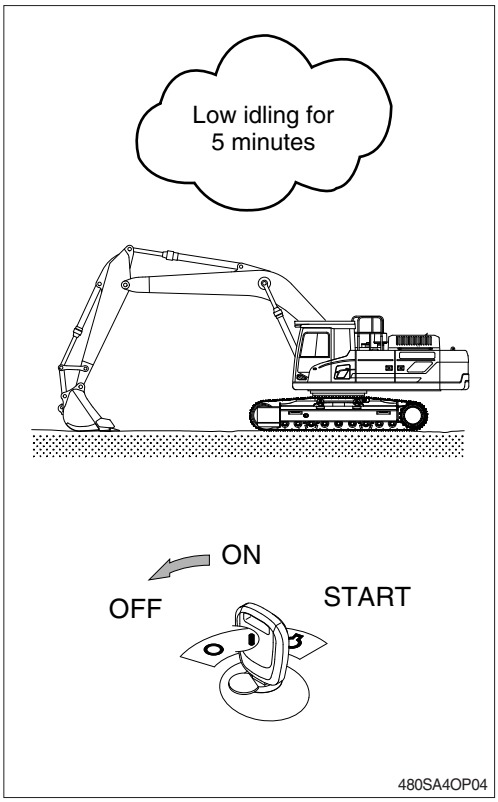
(1) Lower the bucket to the ground then put all the levers in the neutral position.

(2) Run the engine at low idle for about 5 minutes.

(3) Return the key of starting switch to the OFF position.

(4) Remove the key to prevent other people using the machine and the safety knob.

(5) Lock the cab door.



4. MODE SELECTION SYSTEM

1) STRUCTURE OF MECHATRONICS SYSTEM

CAPO, Computer Aided Power Optimization system, is the name of mode selection system developed by HD Hyundai Construction Equipment.

※ **Please refer to chapter 3, cluster for below modes setting.**

(1) Power mode

Power mode designed for various work loads supports high performance and reduces fuel consumption.

- · P mode : Heavy duty power
- · S mode : Standard power
- · E mode : Economy power

(2) Work mode

One of the two work modes can be selected for the optimal work condition of the machine operation.

① General work mode (bucket)

When key switch is turned ON, this mode is selected automatically.

② Option work mode

· Breaker, crusher

It controls the pump flow and system pressure for the optimal operation of breaker or crusher.

220S4OP31A

1 Power mode switch
2 Work mode switch
3 User mode switch
4 Travel mode switch
5 Auto idle mode switch
6 LCD

(3) User mode

① User mode is useful for setting the user preperable power quickly.
(engine speed, power shift and idle speed)

② There are two methods for use of user mode.

a. In operation screen

User mode switch is used to memorize the current machine operating status and activate the memorized user mode.
Refer to page 3-13.

b. In menu

Engine high idle rpm, auto idle rpm and pump torque (power shift) can be modulated and memorized separately in menu status.

- Each memory mode has a initial setting which is mid-range of max engine speed, power shift and auto idle speed.

220S4OP32A

- High idle rpm, auto idle rpm and EPPR pressure can be adjusted and memorized in the U-mode.

※ **Refer to the page 3-19 for setting the user mode (available on U mode only).**

· LCD segment vs parameter setting

Step (▮)	Engine speed (rpm)	Idle speed (rpm)	Power shift (bar)
1	1400	800	0
2	1450	850	2
3	1500	900	4
4	1550	950	7
5	1600	1000 (auto decel)	10
6	1650	1050	13
7	1700	1100	16
8	1750	1150	19
9	1800	1200	22
10	1850	1250	25

※One touch decel & low idle : 800 rpm

220S4OP33A

(4) Travel mode

: Low speed traveling.

: High speed traveling.

(5) Auto idle mode

Pilot lamp ON : Auto idle function is activated.

Pilot lamp OFF : Auto idle function is canceled.

(6) Monitoring system

Information of machine performance as monitored by the MCU can be displayed on the LCD. Refer to the page 3-22.

(7) Self diagnostic system

① **MCU** (Machine Control Unit)

The MCU diagnoses machine status and problems and displays fault code in the cluster (fault code detected by MCU is composed of HCESPN and FMI).

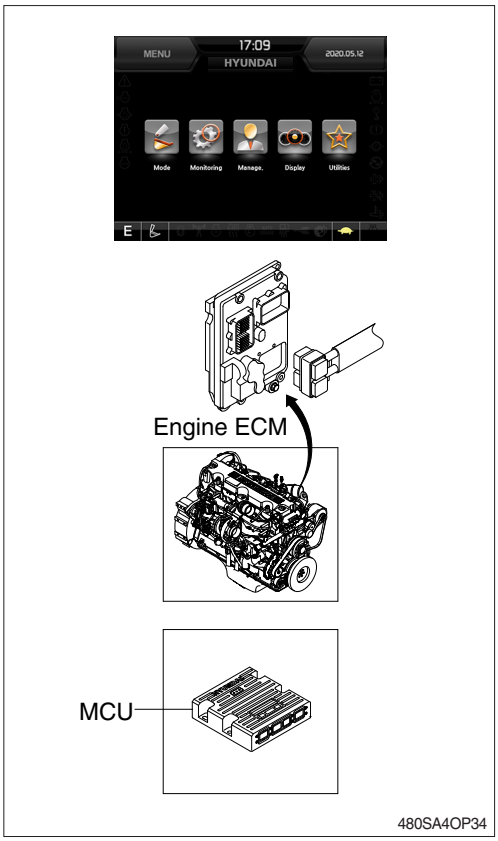
② **Engine ECM** (Electronic Control Module)

If the engine or relevant system has problem, engine ECM detects and displays on the LCD as fault codes (this code is composed of SPN and FMI).

※ **Refer to the page 3-22 for LCD display.**

(8) Anti-restart system

The system protects the starter from inadvertent restarting after the engine is already operational.



480SA4OP34

2) HOW TO OPERATE MODE SELECTION SYSTEM

(1) When start key switch is turned ON

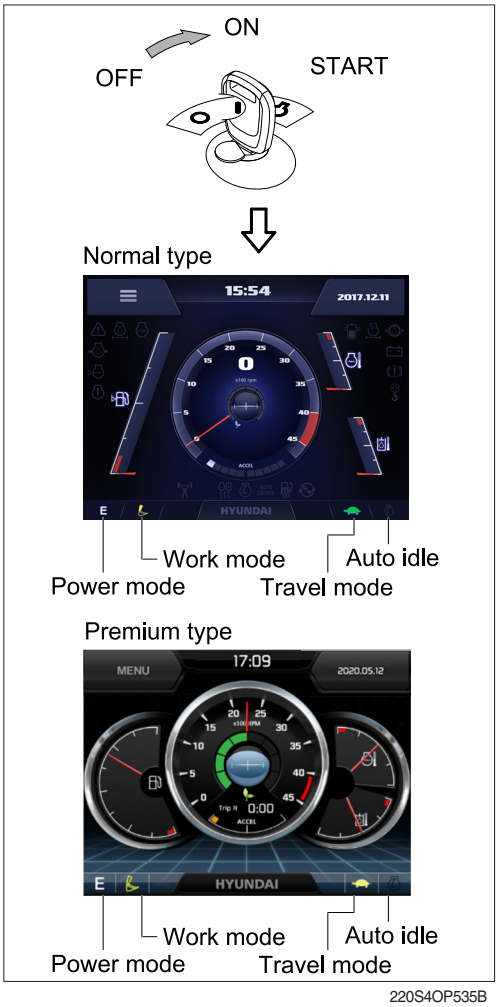
① When start key switch is turned on, the cluster turns on and buzzer sounds for 4 seconds. Information including gauges and engine speed will be displayed on the LCD.

② Initial default mode settings are displayed in the cluster.

Mode		Status
Power mode	E	ON
Work mode		ON
Travel mode	Low ( )	ON
Auto idle		ON

※ **These setting can be changed at U mode.**

③ Self-diagnostic function can be carried out from this point.



220S4OP535B

(2) After engine start

① When the engine is started, rpm display indicates low idle, 800 rpm.

② If coolant temperature is below 30˚C, the warming up pilot lamp lights up. After 4 seconds the engine speed increases to 1400 rpm automatically to warm up the machine.

· After 2-3 minutes, you can select any mode depending on job requirement.

480SA4OP535

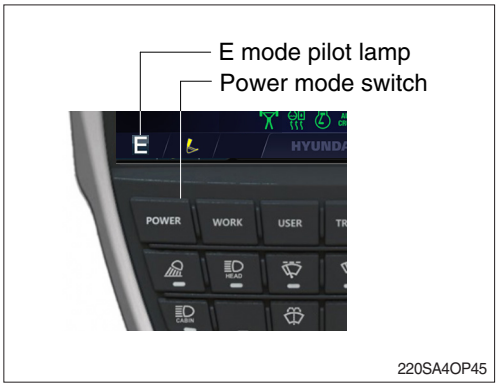
3) SELECTION OF POWER MODE

(1) E mode

The multimodal dial is set to 10 and the auto idle mode is canceled.

Engine rpm	Effect
1500	Variable power control in proportion to lever stroke (improvement in fuel efficiency) ※ Same power as S mode in full lever operation.

※ When the multimodal dial is located below 9 the engine speed decreases about 50~100 rpm per dial set.



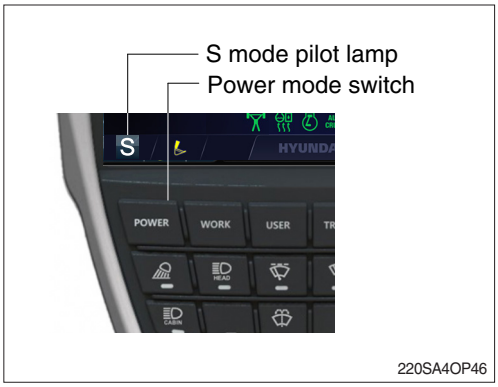
220SA4OP45

(2) S mode

The multimodal dial is set to 10 and the auto idle mode is canceled.

Engine rpm	Effect
1600	Standard power

※ When the multimodal dial is located below 9 the engine speed decreases about 50~100 rpm per dial set.



220SA4OP46

(3) P mode

The multimodal dial is set to 10 and the auto idle mode is canceled.

Engine rpm	Effect
1700	Approximately 120 % of power and speed available than S mode.

※ **When the multimodal dial is located below 9 the engine speed decreases about 50~100 rpm per dial set.**

220SA4OP47

5. OPERATION OF THE WORKING DEVICE

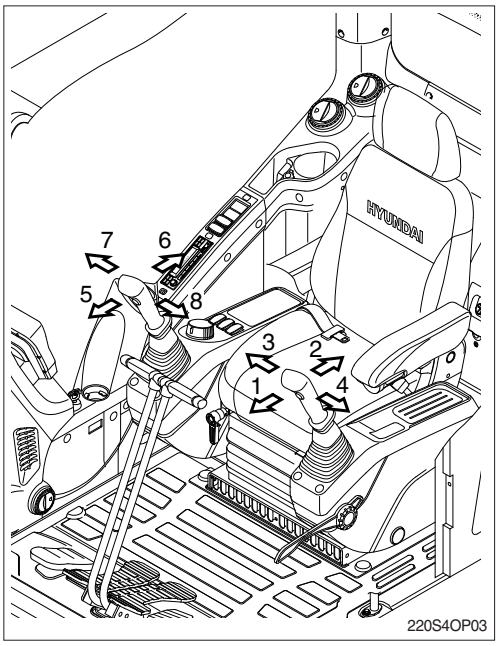
※ Confirm the operation of control lever and working device.

1) Left control lever controls arm and swing.

2) Right control lever controls boom and bucket.

3) When you release the control lever, control lever returns to neutral position automatically.

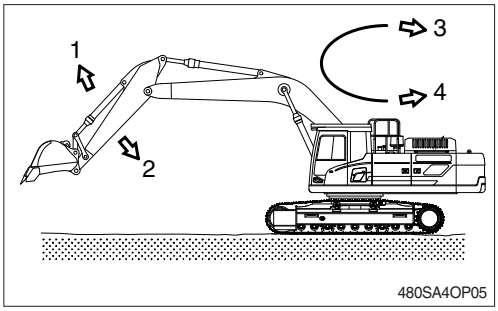
※ When operating swing, consider the swing distance by inertia.



220S4OP03

※ Left control lever

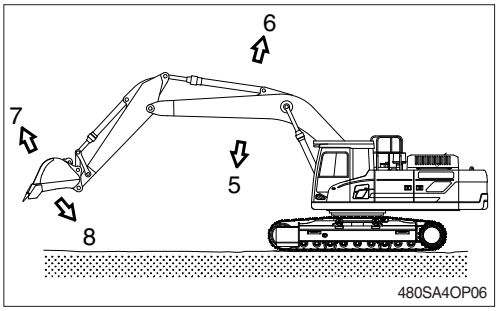
1 Arm roll-out
2 Arm roll-in
3 Swing right
4 Swing left



480SA4OP05

※ Right control lever

5 Boom lower
6 Boom raise
7 Bucket roll-out
8 Bucket roll-in



480SA4OP06

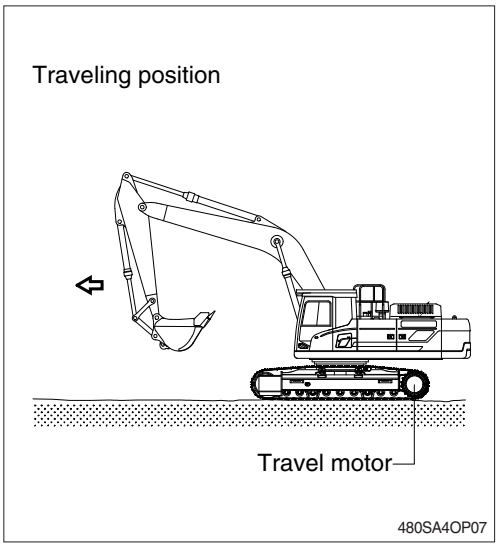
6. TRAVELING OF THE MACHINE

1) BASIC OPERATION

(1) Traveling position

The trave motor is in the rear and the working device is forward.

⚠ Be careful as the traveling direction will be the opposite when the machine is rotated 180˚.



(2) Traveling operation

It is possible to travel by either travel lever or pedal.

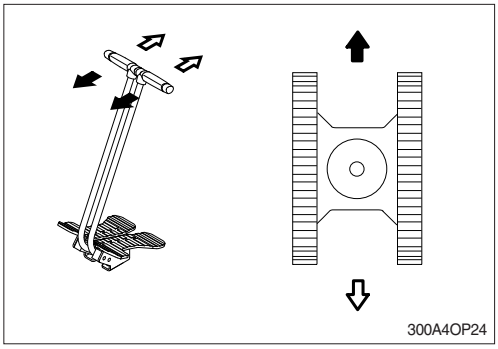
※ Do not travel continuously for a long time.

※ Reduce the engine speed and travel at a low speed when traveling on uneven ground.

(3) Forward and backward traveling

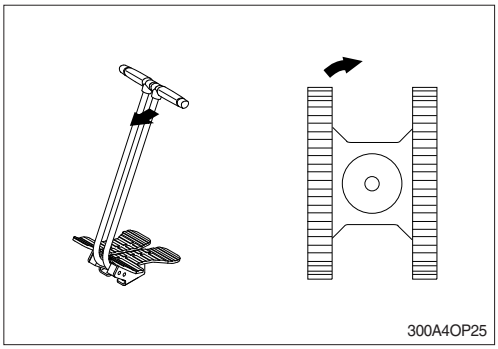
When the left and right travel levers or pedals are pushed at the same time, the machine will travel forward or backward depending on your selection.

※ The speed can be controlled by the operation stroke of lever or pedal and change of direction will be controlled by difference of the left and right stroke.



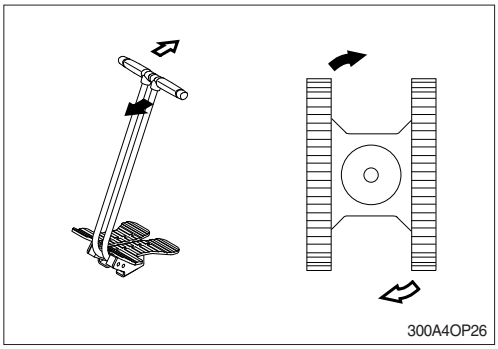
(4) Pivot turning

Operating only one side of lever or pedal makes the change of direction possible by moving only one track.



(5) Counter rotation

It is to rotate the undercarriage (only) while not advancing the machine forward or backward. This is accomplished by moving the travel levers and or pedals in the opposite direction of each other.



2) TRAVELING ON A SLOPE

(1) Make sure that the travel lever is properly maneuvered by confirming the travel motor is in the right location.

(2) Maintain the bucket 20 to 30 cm (1 ft) from the ground so that it can be used as a brake in the event of an emergency.

(3) If the machine starts to slide or loses stability, lower the bucket immediately as it will help slow or stop the machine.

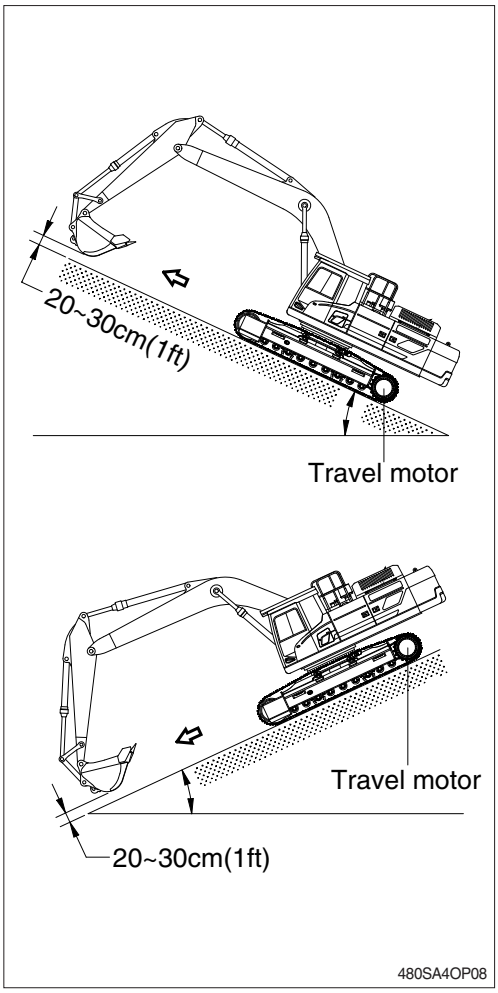
(4) When parking on a slope, use the bucket as a brake.

※ **Machine cannot travel effectively on a slope when the oil temperature is low. Do the warming-up operation when it is going to travel on a slope.**

⚠ **Be careful when working on slopes. It may cause the machine to lose its balance and turn over. Serious injury or death colud occur.**

⚠ **Be sure to keep the travel speed switch on the LOW (turtle mark) while traveling on a slope.**

⚠ **Be sure to keep the swing lock/fine switch on the LOCK while traveling on a slope (if equipped).**



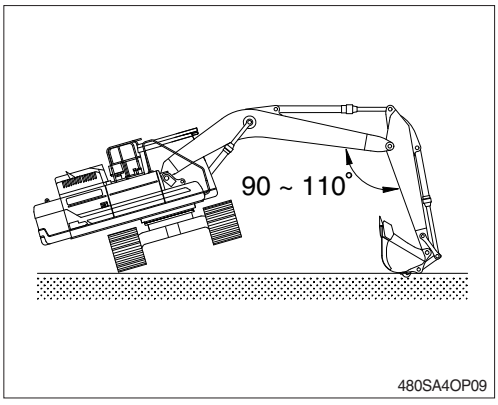
3) TRAVELING ON SOFT GROUND

※ **If possible, avoid operating on soft ground.**

(1) Move forward as far as machine can move.

(2) Take care not to go beyond the depth where towing is impossible on soft ground.

(3) When driving becomes impossible, lower bucket and use boom and arm to pull the machine. Operate boom, arm, and travel lever at the same time to avoid the machine sinking.



4) TOWING THE MACHINE

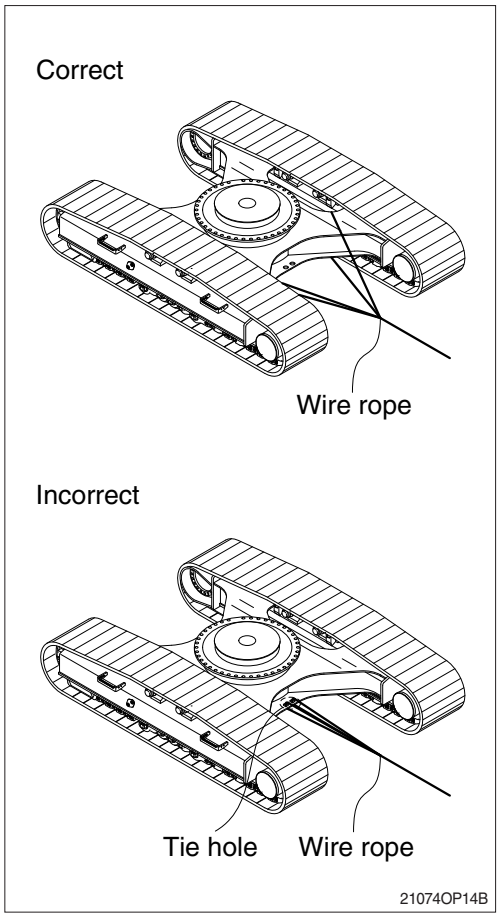
Tow the machine as follows when it can not move on its own.

(1) Tow the machine after hooking the wire rope to the frame as shown in the upper right illustration.

(2) Hook the wire rope to the frame and put a support under each part of wire rope to prevent damage.

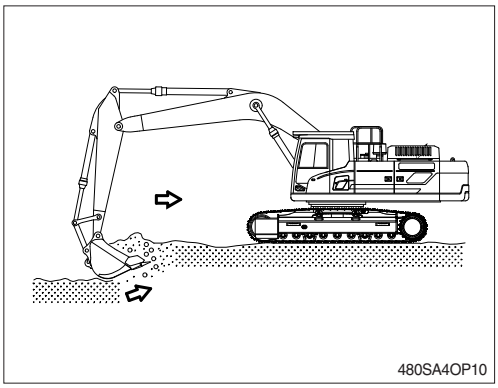
※ **Never tow the machine using only the tie hole, because this may break.**

⚠ **Make sure no personnel are standing close to the tow rope as serious injury or death could occur if it breaks.**

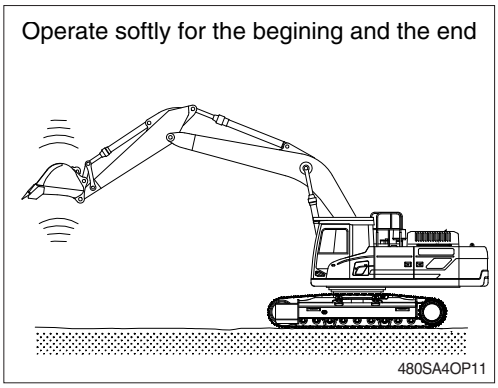


7. EFFICIENT WORKING METHOD

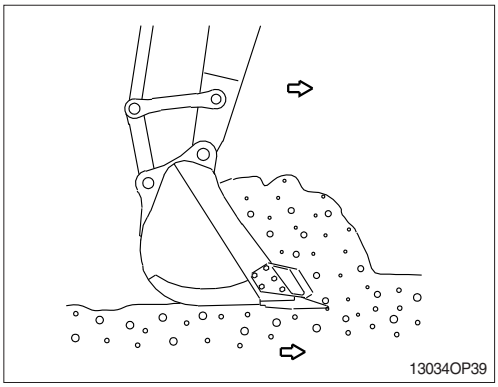
1) Do the digging work by arm.
   Use the pulling force of arm for digging and use together with the digging force of the bucket if necessary.



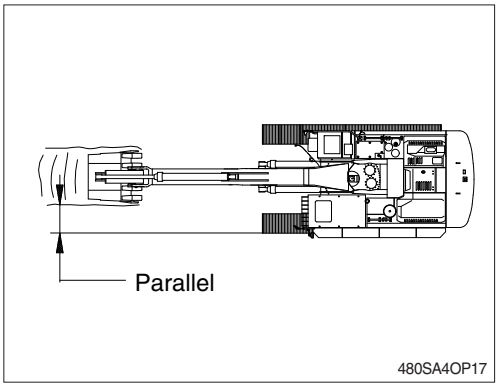
2) When lowering and raising the boom operate softly for the beginning and the end.
   In particularly, sudden stops while lowering the boom may cause damage to the machine.



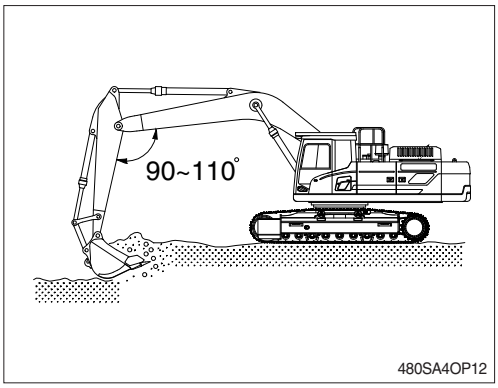
3) The digging resistance and wearing of tooth can be reduced by putting the end of bucket tooth to the digging direction.



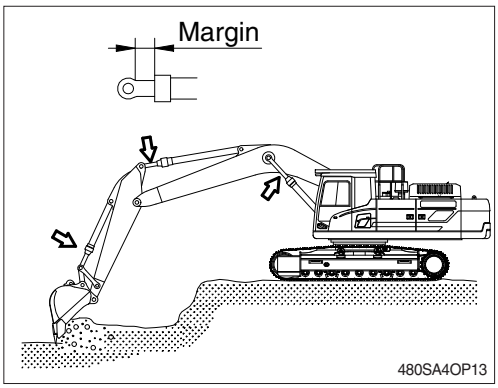
4) Set the tracks parallel to the line of the ditch to be excavated when digging ditch. Do not swing while digging.



5) Dig slowly while keeping the angle of boom and arm at a 90-110˚ when maximum digging force is required.

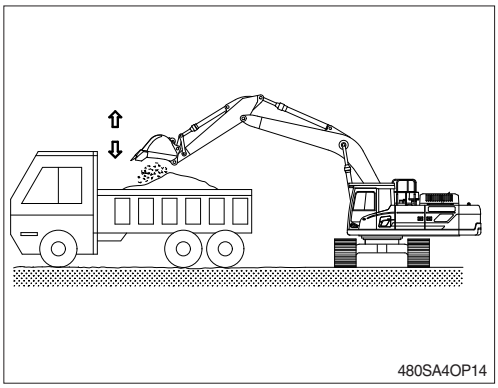


6) Leave a small margin of cylinder stroke to prevent damage of cylinder when working with the machine.

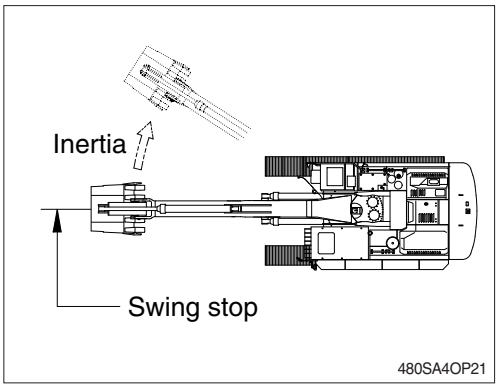


7) Keep the bucket to the dumping position and the arm horizontal when dumping the soil from the bucket.
Operate bucket lever 2 or 3 times when hard to dump.

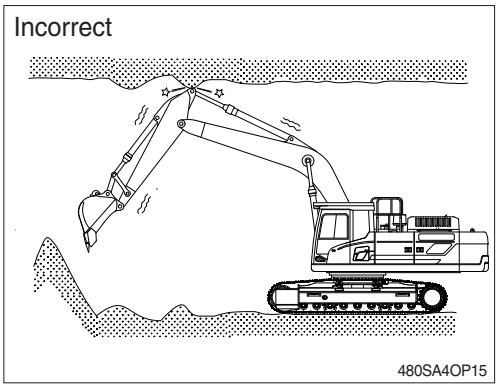
※ **Do not use the impact of bucket tooth when dumping.**



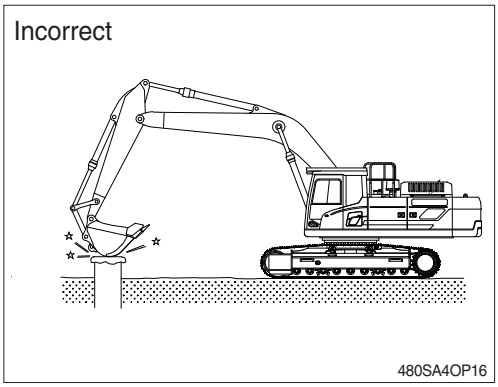
8) Operate stop of swing considering the swing slip distance is created by inertia after neutralizing the swing lever.



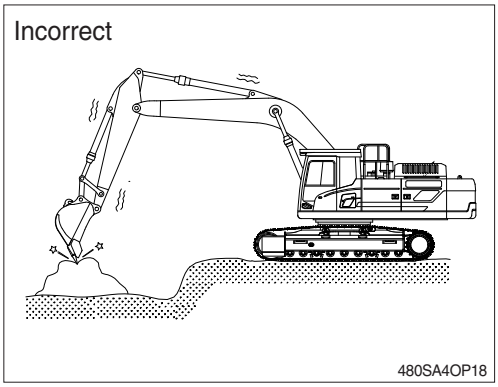
9) If the excavation is in an underground location or in a building, make sure that there is adequate overhead clearance and that there is adequate ventilation.



10) Do not use the dropping force of the work equipment for digging.
The machine can be damaged by the impact.



11) Do not use the bucket to crack hard objects like concrete or rocks.
This may break a tooth or pin, or bend boom.



12) NEVER CARRY OUT EXCESSIVE OPERATIONS

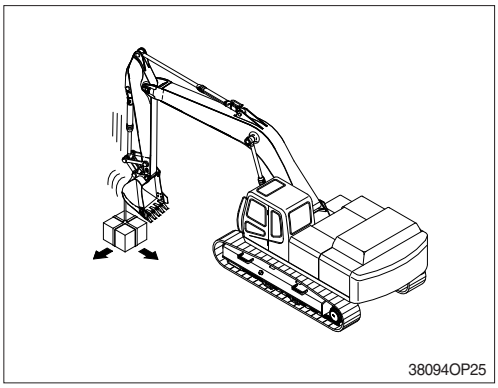
Operation exceeding machine performance may result in accident or failure, causing serious injury or death.

Carry out lifting operation within specified load limit.

Never carry out operations which may damage the machine such as overload or over-impact-load.

Never travel while carrying a load.

If you need an overload warning device installed for object handling procedure, please contact your local HD Hyundai Construction Equipment distributor.



12) BUCKET WITH HOOK

When carrying out lifting work, the special lifting hook is necessary.

The following operations are prohibited.

- Lifting loads with a wire rope fitted around the bucket teeth.
- Lifting loads with the wire rope wrapped directly around the boom or arm.

When performing lifting operation, securely hook the wire rope onto the special lifting hook.

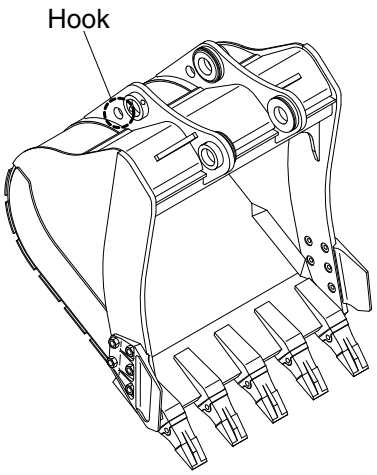
When performing lifting operation, never raise or lower a person.

Due to the possible danger of the load falling or of collision with the load, no persons shall be allowed in the working area.

Before performing lifting operation, designate an operation supervisor.
Always execute operation according to their instructions.

- Execute operating methods and procedures under their direction.
- Select a person responsible for signaling. Operate only on signals given by such person.

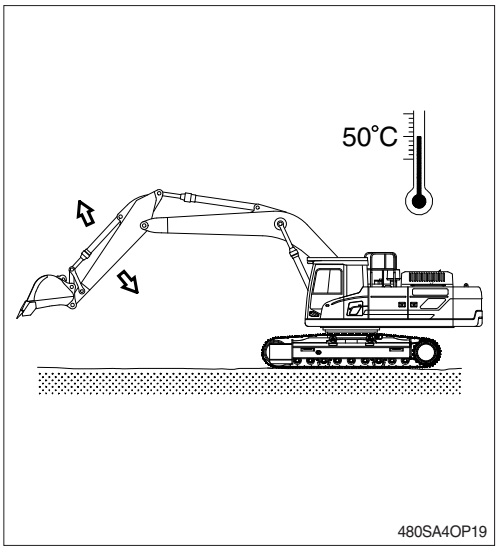
Never leave the operator's seat while lifting a load.



290F4OP42

8. OPERATION IN THE SPECIAL WORK SITES

1) OPERATING THE MACHINE IN A COLD WEATHER



(1) Use proper engine oil and fuel for the weather.

(2) Fill the required amount of antifreeze in the coolant.

(3) Refer to the starting engine in cold weather. Start the engine and extend the warming up operation.

(4) Be sure to open the heater cock when using the heater.

(5) Always keep the battery completely charged.

※ **Discharged batteries will freeze more easily than fully charged.**

(6) Clean the machine and park on wood plates.

2) OPERATION IN SANDY OR DUSTY WORK SITES

(1) Inspect air cleaner element frequently. Clean or replace element more frequently if warning lamp ligts up and buzzer sounds simultaneously, regardless of inspection period.

※ **Replace the inner and outer element after 4 times of cleaning.**

(2) Inspect radiator, oil cooler and condenser frequently, and keep cooling fins clean.

(3) Prevent sand or dust from getting into fuel tank and hydraulic tank during refilling.

(4) Prevent sand or dust from penetrating into hydraulic circuit by tightly closing breather cap of hydraulic oil tank. Replace hydraulic oil filter and air breather element frequently. Also, replace the fuel filter frequently.

(5) Keep all lubricated parts, such as pins and bushings, clean at all times.

(6) If the air conditioner and heater filters clog, the heating or cooling capacity will drop. Clean or replace the filter element more frequently.

(7) Clean electrical components, especially the starting motor and alternator, to avoid accumulation of dust.

3) SEA SHORE OPERATION

(1) Prevent ingress of salt by securely tightening plugs, cocks and bolts of each part.

(2) Wash machine after operation to remove salt residue.
Pay special attention to electrical parts, hydraulic cylinders and track tension cylinder to prevent corrosion.

(3) Inspection and lubrication must be carried out more frequently.
Supply sufficient grease to replace all old grease in bearings which have been submerged in water for a long time.

4) OPERATION IN MUD, WATER OR RAIN WORK SITES

(1) Perform a walk around inspection to check for any loose fittings, obvious damage to the machine or any fluid leakage.

(2) After completing operations, clean mud, rocks or debris from the machine. Inspect for damage, cracked welds or loosened parts.

(3) Perform all daily lubrication and service.

(4) If the operations were in salt water or other corrosive materials, make sure to flush the affected equipment with fresh water.

5) OPERATION IN ROCKY WORK SITES

(1) Check for damage to the undercarriage and for looseness, flaws, wear and damage in bolts and nuts.

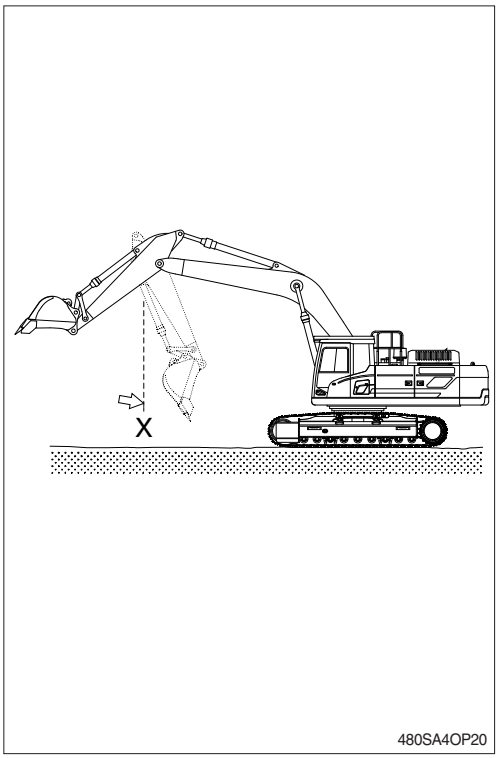
(2) Loosen the track tension slightly when working in such areas.

(3) Do not turn the undercarriage directly over the sharp edge rock.

9. NORMAL OPERATION OF EXCAVATOR

The following may occur during operation due to the nature of a hydraulic excavator.

1) When rolling in the arm, the roll-in movement stops momentary at point X in the picture shown, then recovers speed again after passing point X. This is because movement by the arm weight is faster than the speed of oil flow into the cylinder.
2) When lowering the boom, you may hear continuous sound. This is caused by oil flow in the valve.
3) Overloaded movement will produce sound caused by the relief valves, which are for the protection of the hydraulic systems.
4) When the machine is swinging or stopped, a noise near the swing motor may be heard. The noise is generated when the brake valve relieves.



10. ATTACHMENT LOWERING (when engine is stopped)

1) On machines equipped with an accumulator, for a short time (within 1 minute) after the engine is stopped, the attachment will lower under its own weight when the attachment control lever is shifted to LOWER. This happens only when the starting switch is ON and the safety knob is the in the UNLOCK position. After the engine is stopped, set the safety knob to the LOCK position.

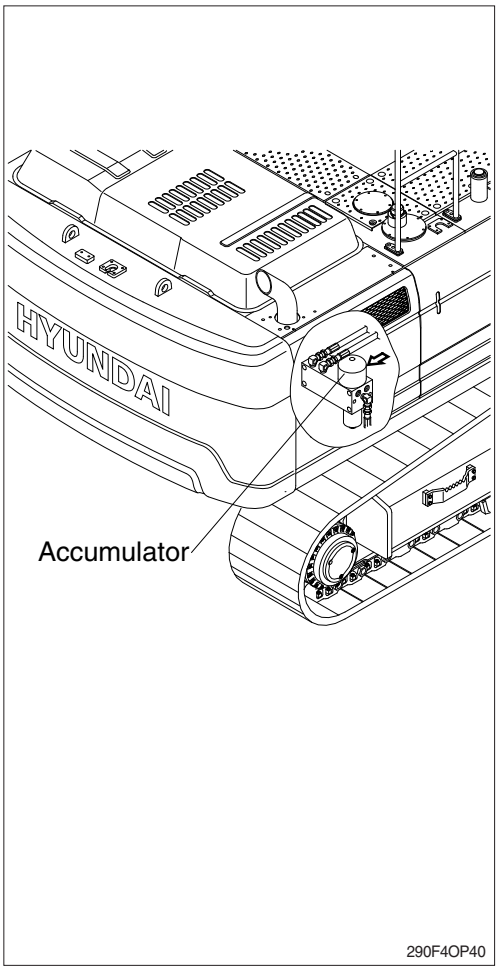
⚠ **Be sure no one is under or near the attachment before lowering the boom. Failure to comply could result in serious injury or death.**

2) The accumulator is filled with high-pressure nitrogen gas, and it is extremely dangerous if it is handled in the wrong way. Always observe the following precautions.

⚠ **Never make any hole in the accumulator, expose it to flames or fire.**

⚠ **Do not weld anything to the accumulator.**

※ **When carrying out disassembly or maintenance of the accumulator, or when disposing of the accumulator, it is necessary to release the gas from the accumulator.**
A special air bleed valve is necessary for this operation, so please contact your HD Hyundai Construction Equipment distributor.



11. STORAGE

When storing the machine for longer than 1 month, follow these procedures:

1) BEFORE STORAGE

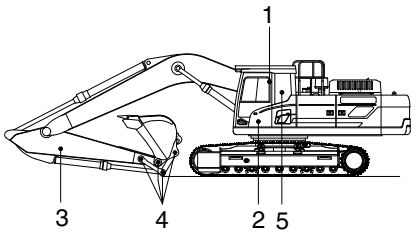
(1) Cleaning the machine

Clean the machine. Check and adjust tracks. Grease each lubrication part.

(2) Lubrication position of each part

Change all oil.

※ **Be particularly careful when you reuse the machine. As oil can be diluted during storage. Apply an anticorrosive lubricant on the exposed part of piston rod of cylinder and in places where the machine rusts easily.**



1 Lubricating manifold (5EA)
2 Boom cylinder pin (2EA)
3 Lubricating manifold (4EA)
4 Arm and bucket (8EA)
5 Boom rear bearing center (1EA)

480SA4OP22

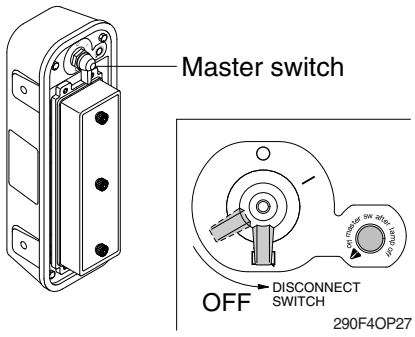
(3) Master switch

Turn OFF the master switch mounted electric box and store the machine.

⚠ **Turn OFF the master switch after the lamp gose OFF.**

⚠ **It may cause severe failure of aftertreatment device. Because aftertreatment system still is working while the lamp lights up.**

(4) Be sure to mix anticorrosive antifreezing solution in the radiator.



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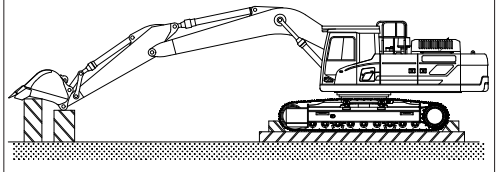
(5) Prevention of dust and moisture

Keep machine dry. Store the machine setting wood on the ground.

※ **Cover exposed part of piston rod on cylinder.**

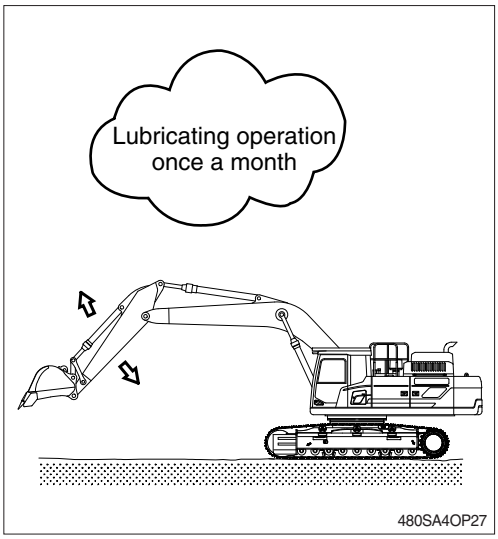
※ **Lower the bucket to the ground and set a support under track.**



480SA4OP23

2) DURING STORAGE

Start engine and move the machine and work equipment once a month and apply lubrication to each part.



※ Check the level of engine oil and coolant and fill if required when starting engine.

※ Clean the anticorrosive on the piston rod of cylinder.

※ Operate the machine such as traveling, swing and work equipment operation to make sure enough lubrication of all functional components.

※ BATTERY

① Once a month, start the engine for 15 minutes (or use a charger) to charge the battery.

② Every 2 months, check the battery voltage and keep battery voltage over 25.08V.

③ If the machine stock period is over 6 months, disconnect the battery negative (-) terminal.

3) AFTER STORAGE

Carry out the following procedure when taking out of a long time storage.

(1) Wipe off the anticorrosive lubricant on the hydraulic piston rod.

(2) Completely fill fuel tank, lubricate and add oil.

(3) When storage period is over 6 months

If the machine stock period is over 6 months, carry out the following procedure.

This procedure is to drain condensation water for the **swing reduction gear** durability.

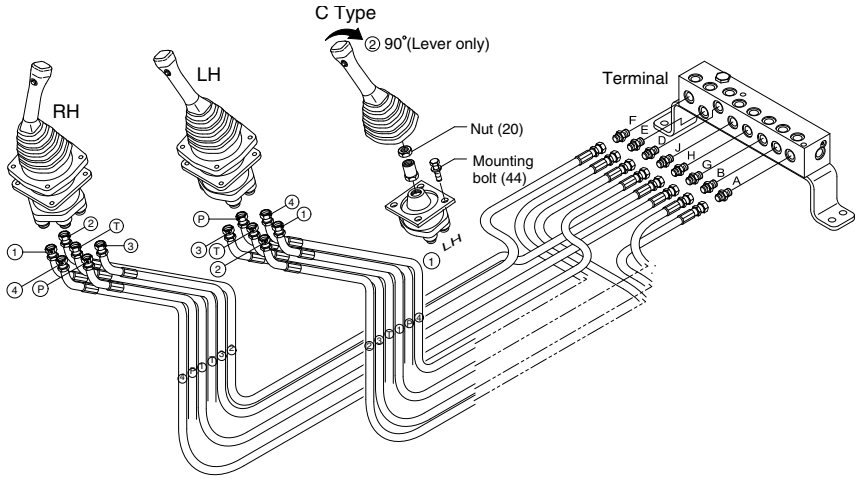
※ Remove the drain port plug and drain the water until the gear oil comes out and then tighten the drain plug.

※ Refer to the service instruction, section 6 for the drain plug location.

※ If the machine is stored without carrying out the monthly lubricating operation, consult your HD Hyundai Construction Equipment dealer for service.

12. RCV LEVER OPERATING PATTERN

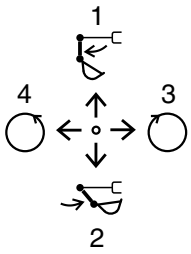
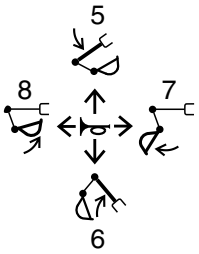
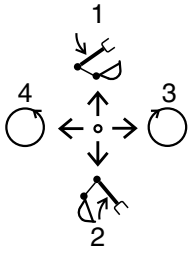
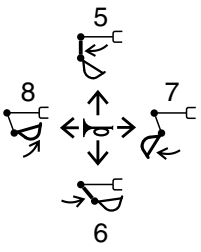
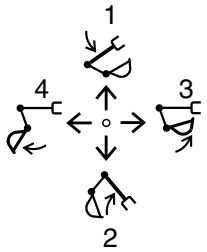
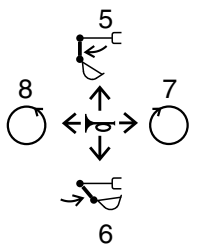
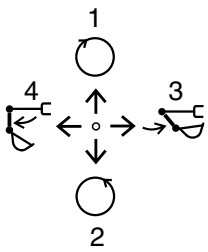
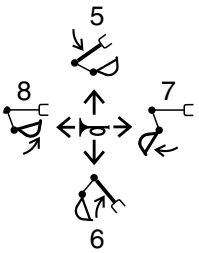
1) PATTERN CHANGE VALVE NOT INSTALLED (standard)



※ Whenever a change is made to the machine control pattern, also exchange the pattern label in the cab to match the new pattern.

※ The hose modification works must be carried out between RCV lever and terminal block (Not between terminal block and MCV).

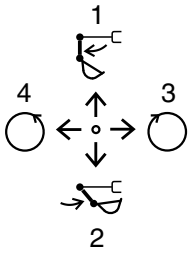
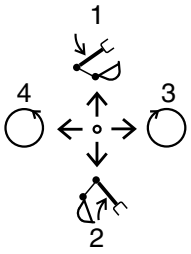
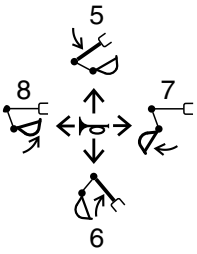
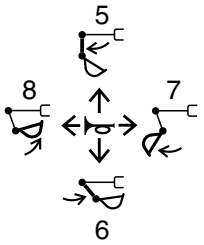
480SA4OP41

Pattern	Operation		Control function		Hose connection (port)		
	Left RCV lever	Right RCV lever			RCV lever	Change of Terminal block	
						From	To
ISO Type HD Hyundai Construction Equipment			Left	1Arm out	②	D	-
				2Arm in	④	E	-
				3Swing right	③	B	-
				4Swing left	①	A	-
			Right	5Boom lower	④	J	-
				6Boom raise	②	H	-
				7Bucket out	①	G	-
				8Bucket in	③	F	-
A Type			Left	1Boom lower	②	D	J
				2Boom raise	④	E	H
				3Swing right	③	B	-
				4Swing left	①	A	-
			Right	5Arm out	④	J	D
				6Arm in	②	H	E
				7Bucket out	①	G	-
				8Bucket in	③	F	-
B Type			Left	1Boom lower	②	D	J
				2Boom raise	④	E	H
				3Bucket in	③	B	F
				4Bucket out	①	A	G
			Right	5Arm out	④	J	D
				6Arm in	②	H	E
				7Swing right	①	G	B
				8Swing left	③	F	A
C Type			Left	① Loosen the RCV lever mounting bolt (44) and rotate lever assy 90˚ counterclockwise; then install. ② To put lever in correct position, disassemble nut (20) and rotate only lever 90˚ clockwise.			
			Right	Same as ISO type			

2) PATTERN CHANGE VALVE INSTALL (option)

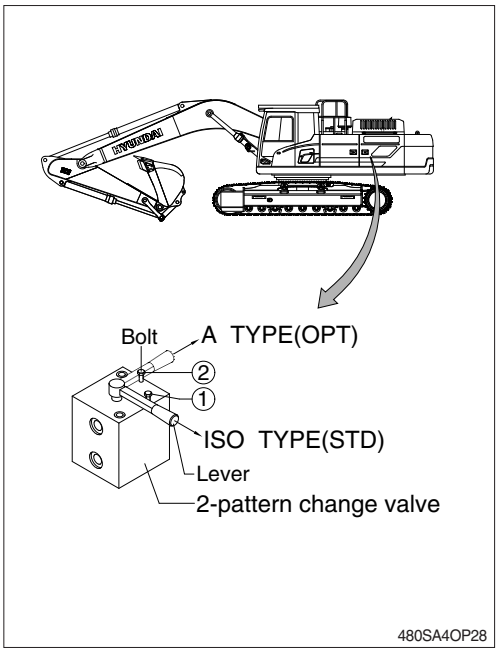
※ If the machine is equipped with the pattern change valve, the machine operation pattern can be easily changed.

※ Whenever a change is made to the machine control pattern also exchange the pattern label in the cab to match the new pattern.

Operation	ISO type	A type
Left RCV lever		
Right RCV lever		

(1) The machine control pattern can be changed from the "ISO type" to "A type" by changing the position of the lever.

⚠ Before starting the machine, check the lever position of pattern change valve and actual operating of attachment.



(2) Change of operating pattern

① Loosen bolt.

② Move lever to the "ISO" or "A" position.

③ After the lever is set, tighten the bolt in order to secure the lever.

· Position ① for "ISO" pattern.

· Position ② for "A" pattern.

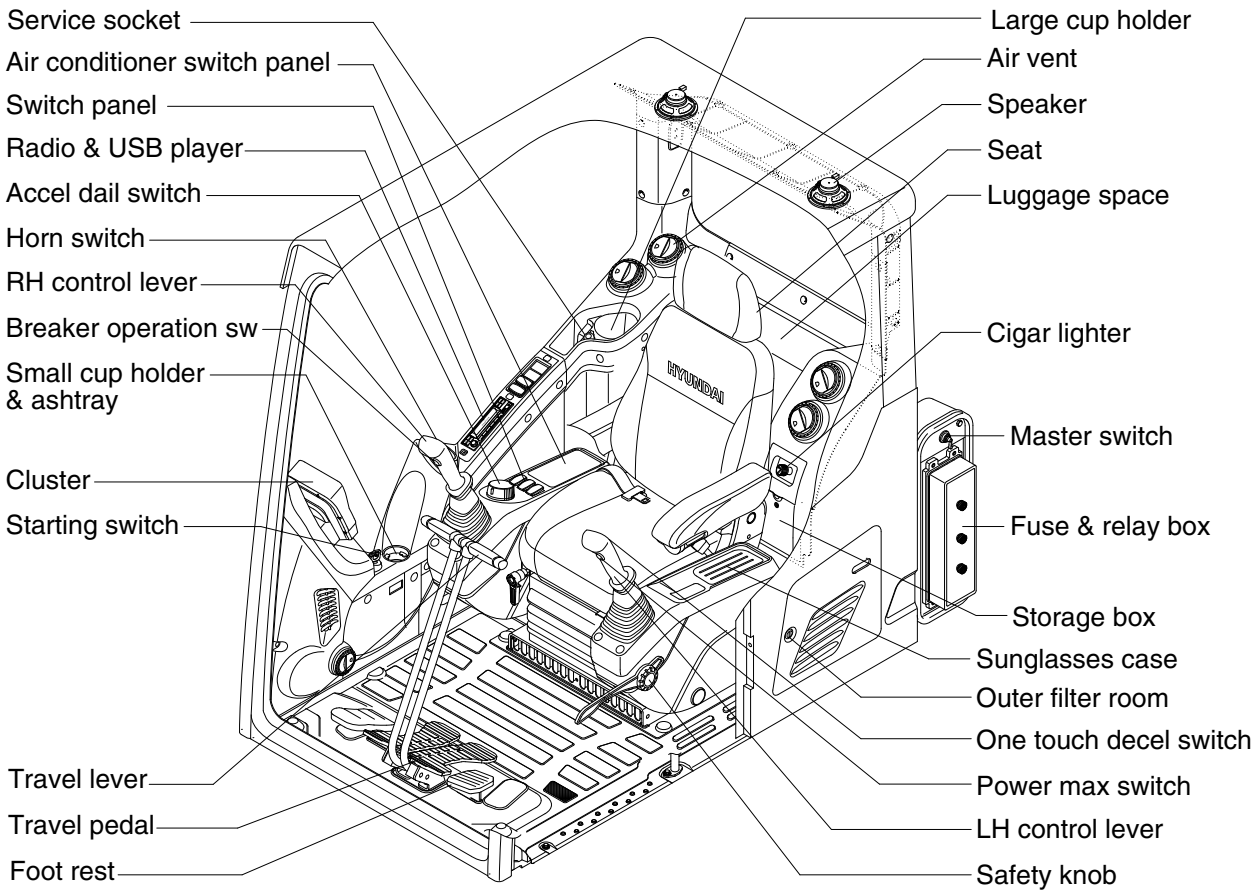
1. CAB DEVICES

1) The ergonomically designed console box and suspension type seat provide the operator with comfort.

2) ELECTRONIC MONITOR SYSTEM

(1) The centralized electronic monitor system allows the status and conditions of the machine to be monitored at a glance.

(2) It is equipped with a safety warning system for early detection of machine malfunction.



400S3CD01

2. CLUSTER

1) STRUCTURE

The cluster consists of LCD and switches as shown below. The LCD is to warn the operator in case of abnormal machine operation or conditions for the appropriate operation and inspection.

The LCD is to set and display for modes, monitoring and utilities with the switches.

The switches or touch screen are to set the machine operation modes.

※ **The cluster installed on this machine does not entirely guarantee the condition of the machine. Daily inspection should be performed according to chapter 6, Maintenance.**

※ **When the cluster provides a warning immediately check the problem, and perform the required action.**

Normal type

220S3CD501A

Premium type

220S3CD01B

※ **The warning lamp pops up and/or blinks and the buzzer sounds when the machine has a problem. The warning lamp blinks until the problem is cleared. Refer to page 3-6 for details.**

2) GAUGE

(1) Operation screen

When you first turn starting switch ON, the operation screen will appear.

Normal type

220S3CD551A

Premium type

Default

Option

220S3CD151A

1	RPM / Speed gauge	5	Tripmeter display
2	Engine coolant temperature gauge	6	Eco guage
3	Hydraulic oil temperature gauge	7	Accel dial gauge
4	Fuel level gauge		

※ Operation screen type can be set by the screen type menu of the display (premium type). Refer to page 3-30 for details.

(2) RPM / Speed gauge

Normal type

Premium type

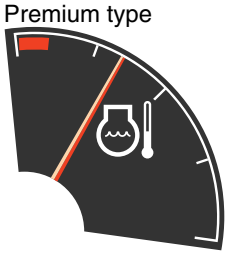
220S3CD549

① This displays the engine speed.

(3) Engine coolant temperature gauge

Normal type

Premium type



220S3CD553

① This gauge indicates the temperature of coolant.
- White range : 40-113˚C (104-235˚F)
- Red range : Above 113˚C (235˚F)

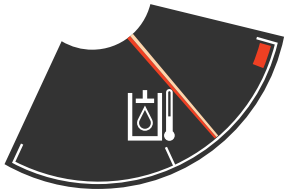
② If the indicator is in the red range or lamp pops up and the buzzer sounds, turn OFF the engine and check the engine cooling system.

※ If the gauge indicates the red range or lamp blinks in red even though the machine is in the normal condition range, check the electric device as this can be caused by poor connection of sensor.

(4) Hydraulic oil temperature gauge

Normal type

Premium type



220S3CD554

① This gauge indicates the temperature of hydraulic oil.
- White range : 40-100˚C (104-212˚F)
- Red range : Above 100˚C (212˚F)

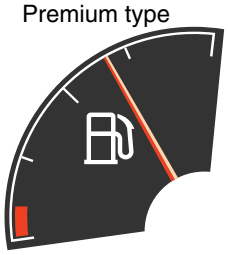
② If the indicator is in the red range or lamp pops up and the buzzer sounds reduce the load on the system. If the gauge stays in the red range, stop the machine and check the cause of the problem.

※ If the gauge indicates the red range or lamp blinks in red even though the machine is in the normal condition range, check the electric device as this can be caused by poor connection of electricity or sensor.

(5) Fuel level gauge

Normal type

Premium type



220S3CD555

① This gauge indicates the amount of fuel in the fuel tank.
② Fill the fuel when in the red range, or lamp pops up and the buzzer sounds.
※ **If the gauge indicates the red range or lamp blinks in red even though the machine is on the normal condition range, check the electric device as this can be caused by poor connection of electricity or sensor.**

(6) Tripmeter display

290F3CD56

① This displays the engine the tripmeter.
※ **Refer to page 3-31 for details.**

(7) Eco gauge

290F3CD58

① This gauge indicates the fuel consumption rate and machine load status so that the operators can operate the machine efficient in regards to fuel consumption.
② Fuel consumption rate or machine load is higher if the number of segments are increased.
③ The color of Eco gauge indicates operation status.
- White : Idle operation
- Green : Economy operation
- Yellow : Non-economy operation at a medium level.
- Red : Non-economy operation at a high level.

(8) Accel dial gauge

290F3CD59

① This gauge indicates the level of accel dial.

3) WARNING LAMPS

Normal type

400SA3CD503

Premium type

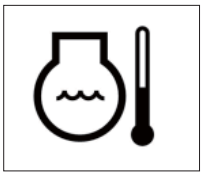
400SA3CD03

※ **Warning lamps and buzzer**

Warnings	When error happened	Lamps and buzzer
All warning lamps except below	Warning lamp pops up on the center of the LCD and the buzzer sounds	· The pop-up warning lamp moves to the original position, blinks and the buzzer stops when; - the buzzer stop switch AUTO IDLE Buzzer Stop is pushed - the lamp of the LCD is touched
	Warning lamp pops up on the center of the LCD and the buzzer sounds	※ **Refer to page 3-7 for details.**

※ **Refer to page 3-13 for the buzzer stop switch** AUTO IDLE Buzzer Stop **.**

(1) Engine coolant temperature warning lamp



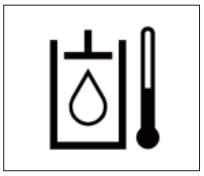
290F3CD61

① Engine coolant temperature warning is indicated in 2 steps.
- 100˚C over : The lamp pops up and the buzzer sounds.
- 107˚C over : The lamp pops up and the buzzer sounds.

② The pop-up , lamps move to the original position and blinks when the buzzer stop switch AUTO IDLE Buzzer Stop is pushed. The buzzer will stop and , lamps will blink.

③ Check the cooling system when the lamps keep blink.

(2) Hydraulic oil temperature warning lamp



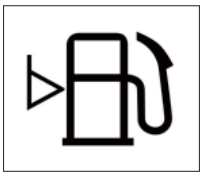
290F3CD62

① Hydraulic oil temperature warning is indicated in 2 steps.
- 100˚C over : The lamp pops up and the buzzer sounds.
- 105˚C over : The lamp pops up and the buzzer sounds.

② The pop-up , lamps move to the original position and blinks when the buzzer stop switch AUTO IDLE Buzzer Stop is pushed. The buzzer will stop and , lamps will blink.

③ Check the hydraulic oil level and hydraulic cooling system.

(3) Fuel level warning lamp



290F3CD63

① This warning lamp pops up and the buzzer sounds when the fuel level is below 136 ℓ (35.9 U.S. gal).

② Fill the fuel immediately after the lamp blinks.

(4) Emergency warning lamp

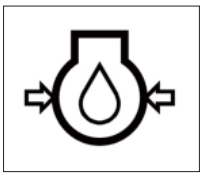
290F3CD64

① This warning lamp pops up and the buzzer sounds when each of the below warnings occurs.
- Engine coolant overheating (over 107˚C)
- Hydraulic oil overheating (over 105˚C)
- MCU input voltage abnormal
- Cluster communication data error
- Engine ECM communication data error

※ The pop-up warning lamp moves to the original position and blinks when the buzzer stop switch AUTO IDLE Buzzer Stop is pushed. The buzzer will stop.

② When this warning lamp blinks, machine must be checked and serviced immediately.

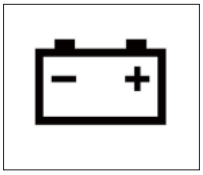
(5) Engine oil pressure warning lamp



290F3CD65

① This warning lamp pops up and the buzzer sounds when the engine oil pressure is low.
② If the lamp blinks, shut OFF the engine immediately. Check oil level.

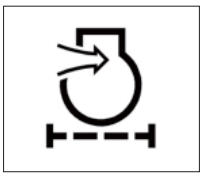
(6) Battery charging warning lamp



290F3CD67

① This warning lamp pops up and the buzzer sounds when the battery charging voltage is low.
② Check the battery charging circuit when this lamp blinks.

(7) Air cleaner warning lamp



290F3CD68

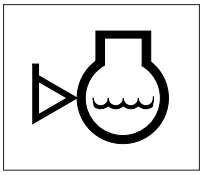
① This warning lamp pops up and the buzzer sounds when the air cleaner is clogged.
② Check, clean or replace filter.

(8) Overload warning lamp (opt)

290F3CD69

① When the machine is overloaded, the overload warning lamp pops up and the buzzer sounds when the overload switch is ON. (if equipped)
② Reduce the machine load.

(9) Coolant level warning lamp



760F3CD58

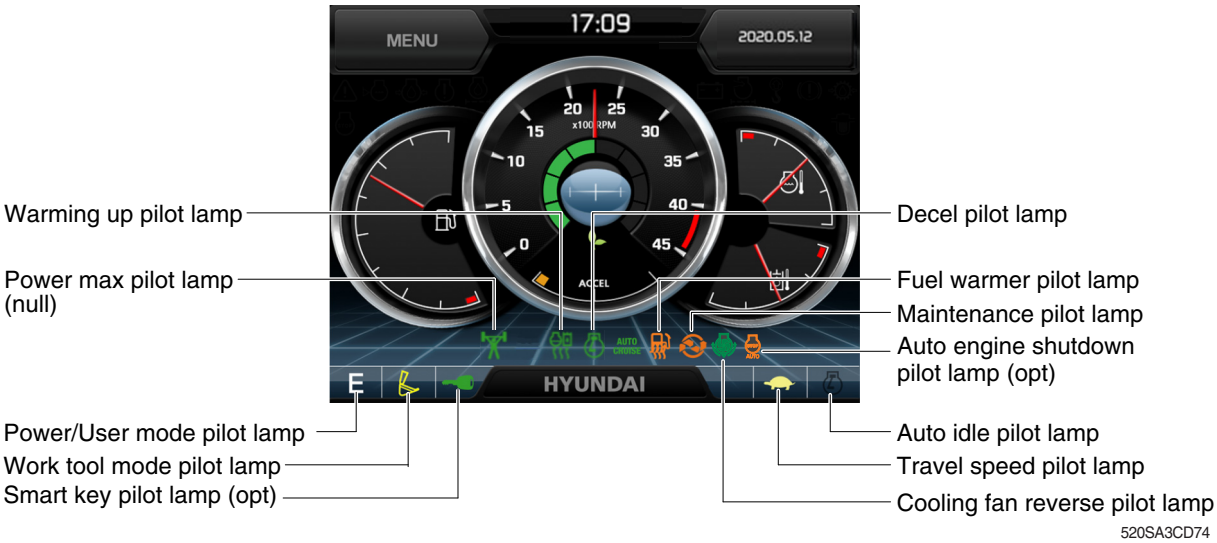
① This warning lamp indicates lack of coolant.
② Check and refill coolant.

4) PILOT LAMPS

Normal type

520SA3CD574

Premium type



520SA3CD74

(1) Mode pilot lamps

No	Mode	Pilot lamp	Selected mode
1	Power mode	P	Heavy duty power work mode
		S	Standard power mode
		E	Economy power mode
2	User mode	U	User preferable power mode
3	Work tool mode		General operation - IPC speed mode
			General operation - IPC balance mode
			General operation - IPC efficiency mode
			Breaker operation mode
			Crusher operation mode
4	Travel mode		Low speed traveling
			High speed traveling
5	Auto idle mode		Auto idle

(2) Power max pilot lamp (null)

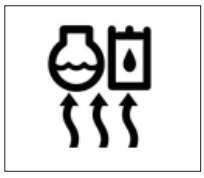
290F3CD78

① The lamp will be ON when pushing power max switch on the LH RCV lever.

② The power max function operates for a max period of 8 seconds.

※ **Refer to page 3-35 for power max function.**

(3) Warming up pilot lamp



290F3CD80

① This lamp lights up when the coolant temperature is below 30˚C (86˚F).

② The automatic warming up is cancelled when the engine coolant temperature is above 30˚C (86˚F), or when 10 minutes have passed since starting the engine.

(4) Decel pilot lamp

290F3CD81

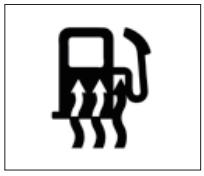
① Operating one touch decel switch on the RCV lever makes the lamp light up.

② Also, the lamp will light up. And engine speed will be reduced automatically to save fuel when all levers and pedals are in the neutral position, and the auto idle function is selected.

※ **One touch decel is not available when the auto idle pilot lamp is turned ON.**

※ **Refer to page 3-35.**

(5) Fuel warmer pilot lamp



290F3CD82

① This lamp lights up when the coolant temperature is below 10˚C (50˚F) or the hydraulic oil temperature 20˚C (68˚F).

② The automatic fuel warming is cancelled when the engine coolant temperature is above 60˚C (140˚F), and the hydraulic oil temperature is above 45˚C (113˚F) since the start switch was ON position.

(6) Maintenance pilot lamp

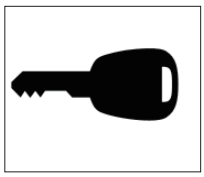
290F3CD83

① This lamp lights up when consumable parts are in need of replacement. It means that the change or replacement interval of parts is 30 hours from the required change interval.

② Check the message in maintenance information of main menu. Also, this lamp lights up for 3 minutes when the start switch is switched to the ON position.

※ **Refer to page 3-24.**

(7) Smart key pilot lamp (premium type, opt)



290F3CD214

① This lamp lights up when the engine is started by the start button.

② This lamp is red when the a authentication fails, it will be green when it authentication is successful.

※ **Refer to page 3-25.**

(8) Auto engine shutdown pilot lamp (premium type, opt)

220A3CD202A

① This lamp lights up when the auto engine shutdown is activated

※ **Refer to page 3-21.**

(9) Cooling fan reverse pilot lamp

480A3CD205

① This lamp lights up when the cooling fan reverse function is activated.

※ **Refer to page 3-21.**

5) SWITCHES

Normal type

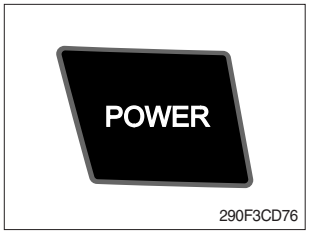
220S3CD586A

Premium type

220S3CD86B

※ When some of the switches are selected, the pilot lamps are displayed on the LCD. Refer to the page 3-9 for details.

(1) Power mode switch



① This switch is to select the machine power mode and when pressed, the power mode pilot lamp will be displayed on the section of the monitor.
- P : Heavy duty power work.
- S : Standard power work.
- E : Economy power work.

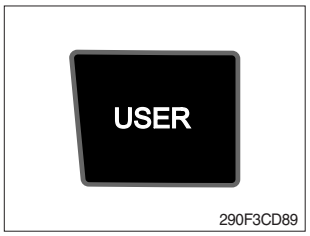
② The pilot lamp changes E → S → P → E in this order.

(2) Work mode switch

① This switch is to select the machine work mode, which shifts from general operation mode to optional attachment operation mode.
- : General operation mode
- : Breaker operation mode (if equipped)
- : Crusher operation mode (if equipped)
- Not installed : Breaker or crusher is not installed.

※ Refer to the page 2-7 for details.

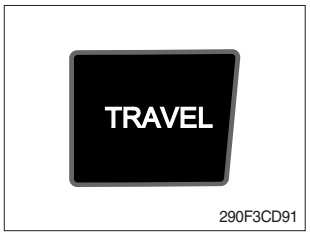
(3) User mode switch



① This switch is used to select between user mode and general power mode.
- U : User mode
- P/S/E : General power mode

② Refer to the page 3-19 for another set of user mode.

(4) Travel speed switch

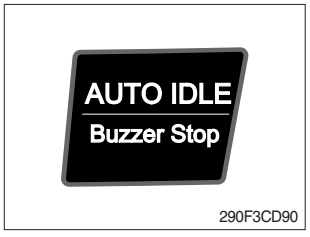


① This switch is used to select the travel speed alternatively.
- : Low speed
- : High speed

※ Do not change the setting of the travel speed switch while machine is moving. Machine stability may be adversely affected

⚠ Serious injury or death can result from sudden changes in machine stability.

(5) Auto idle/ buzzer stop switch



① This switch is used to activate or cancel the auto idle function.
- Pilot lamp ON : Auto idle function is activated.
- Pilot lamp OFF : Auto idle function is cancelled.

② The buzzer sounds when the machine has a problem.
In this case, push this switch and buzzer stops, but the warning lamp blinks until the problem is cleared.

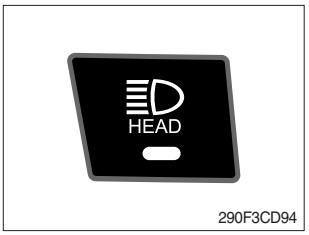
(6) Escape/Camera switch

① This switch is used to return to the previous menu or parent menu.
② In the operation screen, pushing this switch will display the view of the camera on the machine (if equipped).
Please refer to page 3-31 for the camera.
③ If the camera is not installed, this switch is used only ESC function.

(7) Work light switch

① This switch is used to operate the work light.
② The pilot lamp lights up when this switch is pressed.

(8) Head light switch



① This switch is used to operate the head light.
② The pilot lamp lights up when this switch is pressed.

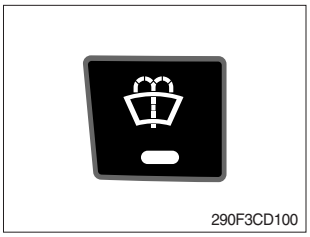
(9) Intermittent wiper switch

① This switch is used to wipe operates intermittently.
② The pilot lamp lights up when this switch is pressed.

(10) Wiper switch

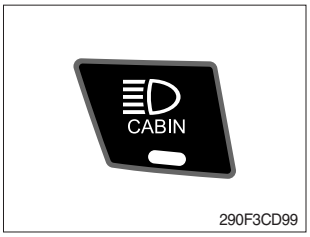
① This switch is used to operate the wiper.
② Note that the wiper will self-park when switched off.
③ The pilot lamp lights up when this switch is pressed.
※ If the wiper does not operate with the switch in ON position, turn the switch OFF immediately. Check the cause. If the switch remains ON, motor failure can result.

(11) Washer switch



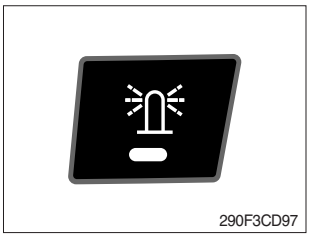
① Washer liquid is sprayed and the wiper is operated only when this switch is pressed.
② The pilot lamp lights up when this switch is pressed.

(12) Cab light switch



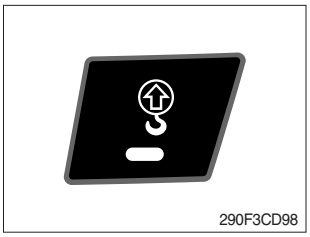
① This switch turns on the cab light.
② The pilot lamp lights up when this switch is pressed.

(13) Beacon switch



① This switch activates the rotary light on the cab.
② The pilot lamp lights up when this switch is pressed.

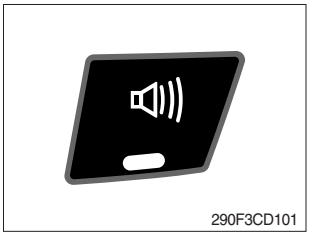
(14) Overload switch



① When this switch is activated, buzzer makes sound and overload warning lamp lights up in the event that the machine is or becomes in an overloaded situation.
② When the switch is inactivated, buzzer stops and warning lamp goes off.

⚠ Overloading the machine could impact the machines stability which could result in tipover hazard. A tipover hazard could result in serious injury or death. Always activate the overload warning device before you handle or lift objects.

(15) Travel alarm switch



① This switch is to activate travel alarm function surrounding when the machine travels.
- ON : The travel alarm function is activated.
- OFF : The travel alarm function is not activated.

(16) Main menu quick touch switch

① This switch is to activate the main menu in the cluster.

※ Refer to the page 3-17.

6) MAIN MENU

※ On the operation screen, tap MENU to access the main menu screen.
On the sub menu screen, you can tap the menu bar to access functions or applications.

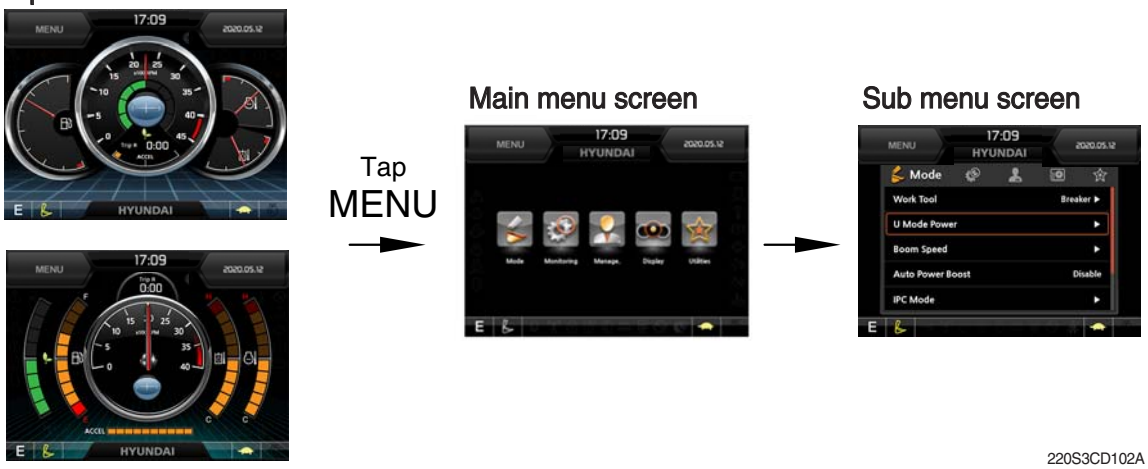
Normal type

Operation screen

220S3CD502A

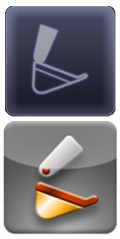
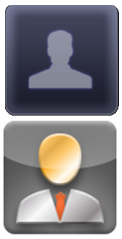
Premium type

Operation screen



220S3CD102A

(1) Structure

No	Main menu	Sub menu	Description
1	 Mode 220S3CD103	Work mode U mode power Boom speed (null) Auto power boost IPC mode Auto engine shutdown (opt) Initial mode Cooling fan reverse mode Emergency mode	Breaker, Crusher, Not installed User mode only Boom speed Enable, Disable Speed mode, Balance mode, Efficiency mode One time, Always, Disable Key on initial mode / initial work mode Auto, Manual Switch function
2	 Monitoring 220S3CD104	Active fault Logged fault Delete logged fault Monitoring	MCU, AAVM (opt) MCU, AAVM (opt) All logged fault delete, Initialization canceled Machine information, Switch status, Output status,
3	 Management 220S3CD105	Fuel rate information Maintenance information Machine security Machine information Contact Clinometer Update	General record, Hourly, Daily, Mode record Replacement, Change interval oils and filters ESL mode setting, Password change Model, MCU, Monitor RMCU, Relay drive unit, AAVM (opt) A/S phone number, A/S phone number change Clinometer setting Cluster, ETC device
4	 Display 220S3CD106	Display item Clock Brightness Unit setup Language selection Screen type★	Engine speed, Tripmeter A, Tripmeter B, Tripmeter C Clock Manual, Auto Temperature, Pressure, Flow, Distance, Date format Korean, English, ETC A type, B type
5	 Utilities 220S3CD107	Tripmeter Camera setting AUX Manual	3 kinds (A, B, C) Number of active, Display order, AAVM (opt)★

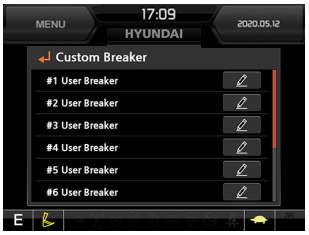
★ : premium type

(2) Mode setup

※ Illustrations are based on the premium type cluster.

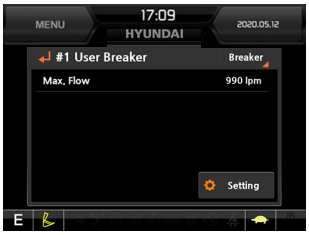
① Work mode

220S3CD108A



220S3CD253A

A



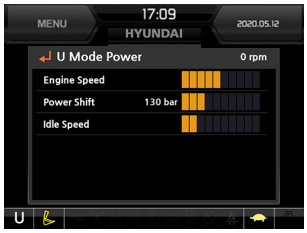
220S3CD254A

B

· Select installed optional attachment
  - A : It can set the user's attachment.
    It is available in setting #1~#10.
  - B : Max flow - Set the maximum flow for the attachment.

② U mode power

220S3CD111A



220S3CD112A

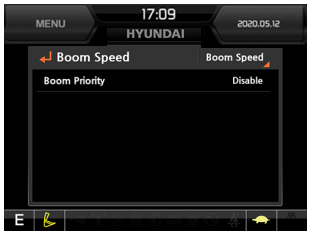
· Engine high idle rpm, auto idle rpm and pump torque (power shift) can be modulated and memorized separately in U-mode.
· U-mode can be activated by user mode switch.

Step (▮)	Engine speed (rpm)	Idle speed (rpm)	Power shift (bar)
1	1400	800	0
2	1450	850	2
3	1500	900	4
4	1550	950	7
5	1600	1000 (auto decel)	10
6	1650	1050	13
7	1700	1100	16
8	1750	1150	19
9	1800	1200	22
10	1850	1250	25

※ One touch decel & low idle : 800 rpm

③ Boom speed (null)

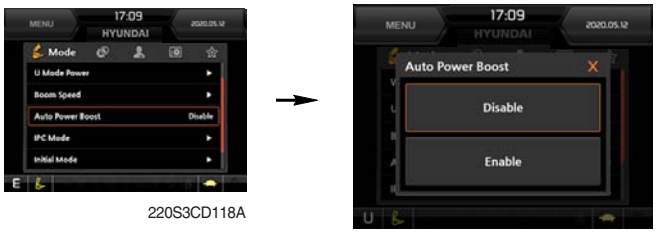
220S3CD113A



220S3CD115A

· **Boom speed**
  - Boom priority function can be activated or cancelled
    Enable - Boom up speed is automatically adjusted as working conditions by the MCU.
    Disable - Normal operation

④ Auto power boost

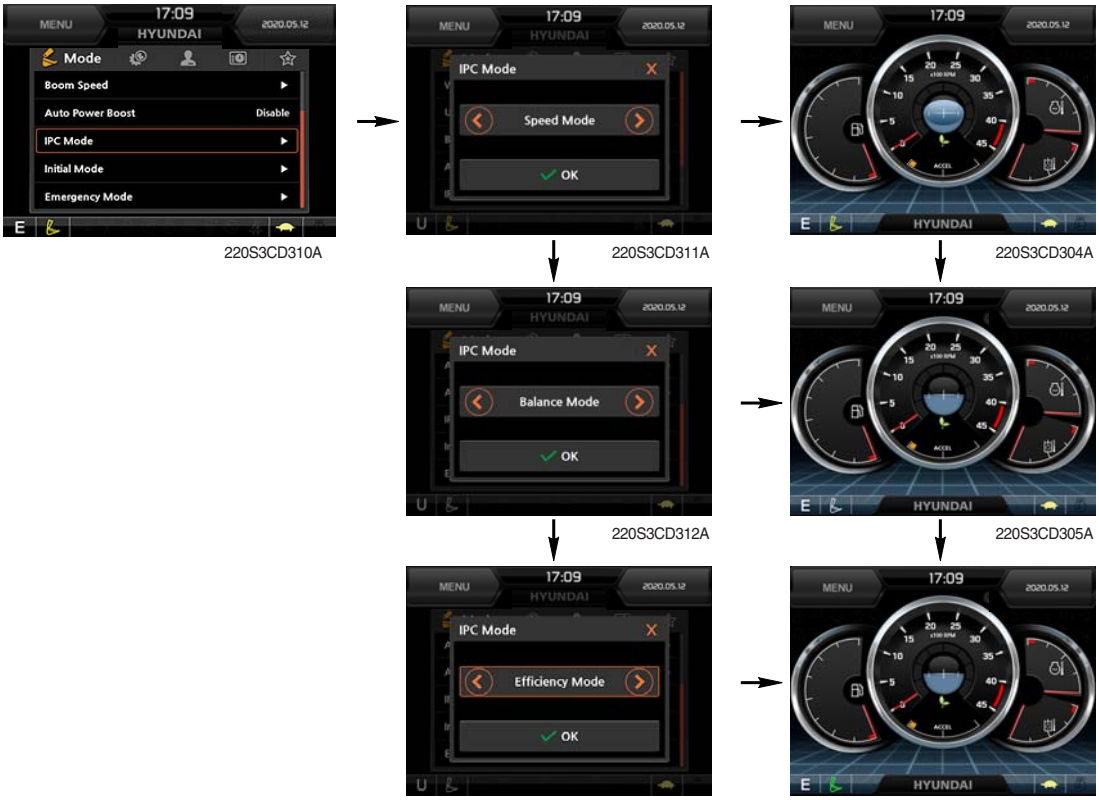


220S3CD118A

220S3CD117A

· The power boost function can be activated or cancelled.
Enable - The digging power is automatically increased as working conditions by the MCU.
It is operated max 8 seconds, then goes off for a period or 1 second and then activates again for 8 seconds and continues this cycle.
Disable - Not operated.

⑤ IPC mode



220S3CD310A
220S3CD311A
220S3CD304A
220S3CD312A
220S3CD305A
220S3CD313A
220S3CD306A

· The IPC mode can be selected by this menu.
- Speed mode
- Balance mode (default)
- Efficiency mode

⑥ Automatic engine shutdown (option)

220S3CD91A

220S3CD92A

220S3CD93A

· The automatic engine shutdown function can be set by this menu.
  - One time
  - Always
  - Disable
  - Wait time setting : Max 40 minutes, min 2 minutes

⑦ Initial mode

220S3CD122A

220S3CD119A

· **Key on initial mode**
  - Selected the power mode is activated when the engine is started.

Key on initial work mode
  - Not installed
  - Last setting
  - Work mode

⑧ Cooling fan reverse mode

520SA3CD314

520SA3CD315

520SA3CD316

· Automatic : Rotate the fan with reverse direction by preset cycle.
  - Interval : 30 minutes ~ 5 hours
  - Time : 30 seconds ~ 5 minutes
· Manual : Rotate the fan with reverse direction while pressing the Execute button.

※ **Default : interval (60 minutes), time (120 seconds)**

⑨ Emergency mode

220S3CD248A

220S3CD249A

- This mode can be used when the switches are abnormal on the cluster.
- The cluster switches can be selected by touching each icon.

(3) Monitoring

① Active fault

220S3CD120A

220S3CD125A

· The active faults of the MCU can be checked by this menu.

② Logged fault

220S3CD128A

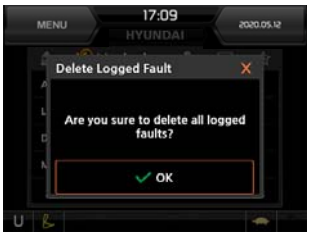
220S3CD124A

· The logged faults of the MCU can be checked by this menu.

③ Delete logged fault

220S3CD134A

220S3CD126A



220S3CD127A

· The logged faults of the MCU can be deleted by this menu.

④ Monitoring

220S3CD172A

220S3CD188A

220S3CD189A

· The machine status such as the engine rpm, oil temperature, voltage and pressure etc. can be checked by this menu (Analog input).
· The switch status or output status can be confirmed by this menu (Digital input & Digital output).
· The activated switch or output pilot lamps ● will light up.

(4) Management

① Fuel rate information

220S3CD14A

220S3CD15A

A

· **General record (A)**

- Average fuel rate (left) (from "Reset" to now)
  Fuel consumption divided by engine run time (service meter time).
- A days fuel used (right)
  Fuel consumption from 24:00 (or "Reset" time) to now (MCU real time).

220S3CD16A

B

· **Hourly record (B)**

- Hourly fuel rates for past 12 hours (service meter time).
- No record during key-off time.
- One step shift to the right for every one hour.
- Automatic deletion of data from 12 hours and earlier.
- "Reset" deletes all hourly records.

220S3CD17A

C

· **Daily record (C)**

- Daily fuel consumption for past seven days (MCU real time).
- No record during key-off time.
- One step shift to the right at 24:00 for every day.
- Automatically deletes data from 7 days and earlier.
- All daily records deletion by "Reset".

220S3CD18A

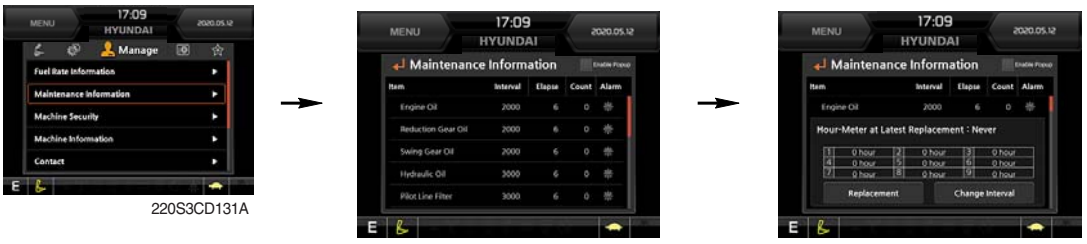
D

· **Mode record (D)**

- Average fuel rate for each power mode/accel dial (at least 7) from "Reset" till present.
- No record during idle.
- All records can be deleted by "Reset".

220S3CD19A

② Maintenance information



220S3CD131A

220S3CD132A

220S3CD133A

- Alarm lamp (●) is ON when oil or filter needs to be changed or replaced.
- Replacement : The elapsed time will be reset to zero (0).
- Change interval : The change intervals can be changed in hour increments of 50.

※ **Refer to section, Maintenance chart for further information of maintenance interval.**

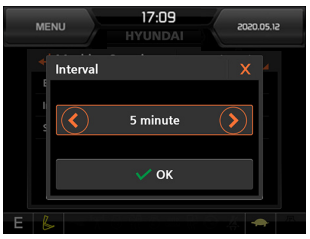
③ Machine security

220S3CD190A

220S3CD135A

220S3CD136A

220S3CD137A



220S3CD138A

· **ESL mode setting**

- ESL : Engine Starting Limit
- ESL mode is desingned to be a theft deterrent or will prevent the unauthorized operation of the machine.
- When you Enable the ESL mode, the password will be required when the starting switch is turned to the on position.
- **Machine security**

  Disable : ESL function is disabled and password is not required to start engine.

  Enable (always) : The password is required whenever the operator starts engine.
- **Interval** : The password is required when the operator starts engine first. But the operator can restart the engine within the interval time without inputting the password. The interval time can be set to a maximum 4 hours.

※**Default password : 00000**+✔

※**Password length : (5~10 digits)**+✔

- **Smart key** (option) : Refer to next page.

· **Password change**

- The password is 5~10 digits.

220S3CD190A

220S3CD140A

220S3CD135A

Enter the current password

220S3CD143A

Enter the new password again

220S3CD142A

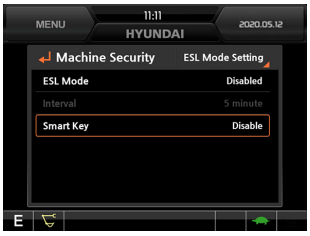
Enter the new password

※ **Before first use, please set user password and owner password in advance for machine security.**

- Smart key

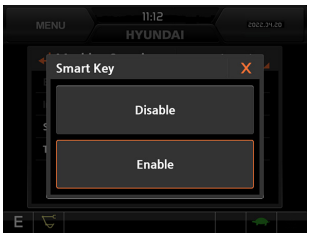
220S3CD190A

220S3CD135A



235F3CD001

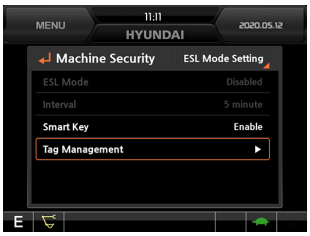
- Smart key is registered when equipped with optional smart key. If smart key is not inside of the cabin, authentication process fails and the password is needed.
- Tag management menu is activated when the Smart key menu is Enabled.
  You can register and delete the tags.



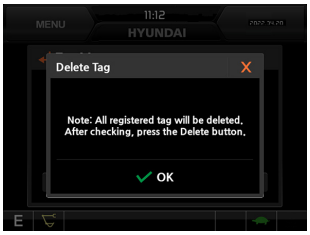
235F3CD002

- Tag management

- When registering a tag : Only the tag you want to register must be in the cabin.
- When deleting a tag : All registered tags are deleted.

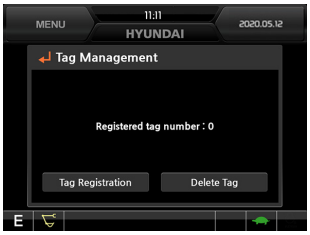


235F3CD003



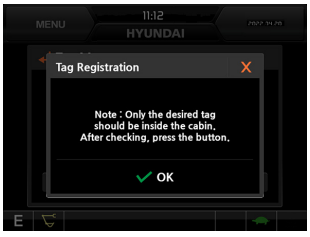
235F3CD006

Deleting



235F3CD004

Registering

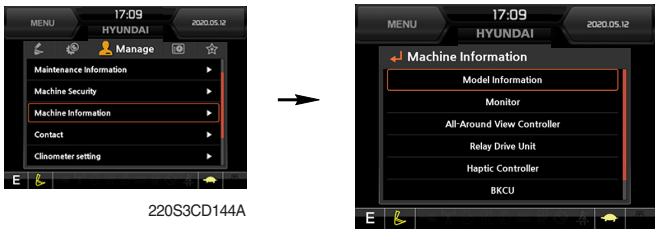


235F3CD005

※ Engine Starting Condition

Case	ESL Mode	Smart Key	Condition
1	Disable	Disable	- With registered tag : Engine can be started without password input. - Without registered tag : Engine can be started without password input.
2	Disable	Enable	If Smart Key is enabled, ESL Mode is automatically enabled. This Case 2 work the same as the Case 4.
3	Enable	Disable	- With registered tag : Engine can be started with password input. - Without registered tag : Engine can be started with password input.
4	Enable	Enable	- With registered tag : Engine can be started without password input. - Without registered tag : Engine can be started with password input.

④Machine Information



220S3CD144A

220S3CD145A

· This can confirm the identification of the model information (ECU), MCU, monitor, switch controller, RMCU, relay driver unit, AAVM (opt).

⑤ Contact (A/S phone number)

220S3CD146A

220S3CD147A

220S3CD148A

Enter the new A/S phone number

⑥ Service menu

220S3CD149A

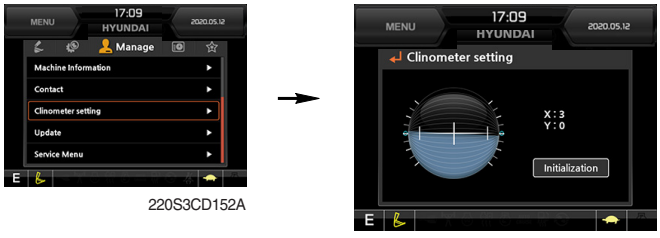
220S3CD150B

220S3CD251A

※ This menu can be used only HCE service man and can not be accessible by the owner and the operator.

· Power shift (standard/option) : Power shift pressure can be set by option menu.
· Operating hours : Operating hours since the machine line out can be checked by this menu.
· Breaker mode pump acting (null)
· EPPR current level (attach flow EPPR 1 & 2)
· Overload pressure : 100 ~ 350 bar

⑦ Clinometer



220S3CD152A

220S3CD153A

· When the machine is on the flatland, if you touch "initialization" on cluster, the values of X, Y will reset to "O".
· You can confirm tilt of machine in cluster's operating screen.

⑧ Update (cluster & ETC devices)

220S3CD67A

220S3CD135A

220S3CD280A

- ETC devices and cluster can be updated through CAN 2 network.
- Insert USB memory stick or SD card which includes program files, start download.

220S3CD290A

220S3CD281A

220S3CD291A

220S3CD282A

220S3CD299A

220S3CD292A

220S3CD283A

220S3CD298A

220S3CD293A

220S3CD284A

220S3CD297A

220S3CD294A

220S3CD285A

220S3CD296A

220S3CD295A

(5) Display

① Display item

220S3CD154A

220S3CD155A

220S3CD156A

· The center display type of the LCD can be selected by this menu.
· The engine speed or the tripmeter menu (A,B,C) is displayed on the center display.

② Clock

220S3CD157A

220S3CD158A

· The first row of boxes indicate Year/Month/Day.
· The second row shows the current time. (0:00~23:59)

③ Brightness

220S3CD159A

220S3CD160A

220S3CD139A

220S3CD141A

220S3CD191A

220S3CD192A

· If "Auto" is chosen, brightness for day and night can be set accordingly. Also by using the bar in lower side, users can define which an operation interval belongs to day and night. (in bar figure, white area represents night time while orange shows day time)

④ Unit

220S3CD161A

220S3CD182A

220S3CD183A

220S3CD186A

220S3CD162A

220F3CD193A

- Temperature : ˚C ↔ ˚F
- Pressure : bar ↔ MPa ↔ kgf/cm^2
- Volume : ℓ ↔ gal
- Flow : lpm ↔ gpm
- Distance : km ↔ mile
- Date format : yy/mm/dd ↔ mm/dd/yy ↔ dd-mm-yy

⑤ Language

220S3CD163A

220S3CD164A

- User can select preferable language and all displays are changed to the selected language.

⑥ Screen type (premium type)

220S3CD165A

A Type (Default) 220S3CD166A

220S3CD156A

B Type (Option) 220S3CD174A

220S3CD167A

(6) Utilites

① Tripmeter

220S3CD168A

220S3CD169A

- A maximum of 3 kinds of tripmeters can be used at the same time.
- Each tripmeter can be turned on by choosing "Start". it also can be turned off by choosing "Stop".
- If the tripmeter icon is activated in the operation screen, it can be controlled directly there.

② Camera setting

- If the rear camera is not installed on the machine, set disable.
- If the rear camera is installed on the machine, set enable.

220S3CD225A

220S3CD255A

220S3CD256A

- In the operation screen, rear camera screen shows up when ESC/CAM switch is pushed.

220S3CD222A

290F3CD221

③ AAVM (Advanced Around View Monitoring, premium type, opt)

· The AAVM switches of the cluster consist of ESC/CAM and AUTO IDLE/Buzzer stop.

220S3CD244A

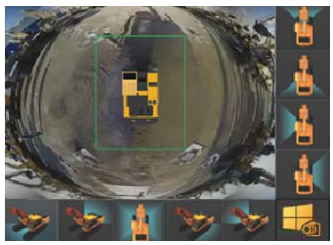
- **Escape switch**

· Activates AAVM mode from the beginning if AAVM is installed.

· While in the AAVM mode, select the ESC switch to return to the home screen.

220S3CD156A

Home screen



AAVM mode

235SA3CD222A

- **Buzzer stop switch**

· AAVM mode detects surrounding pedestrians or objects and the warning buzzer sounds.

· User can turn OFF the warning sound by pressing buzzer stop switch.

290F3CD246A

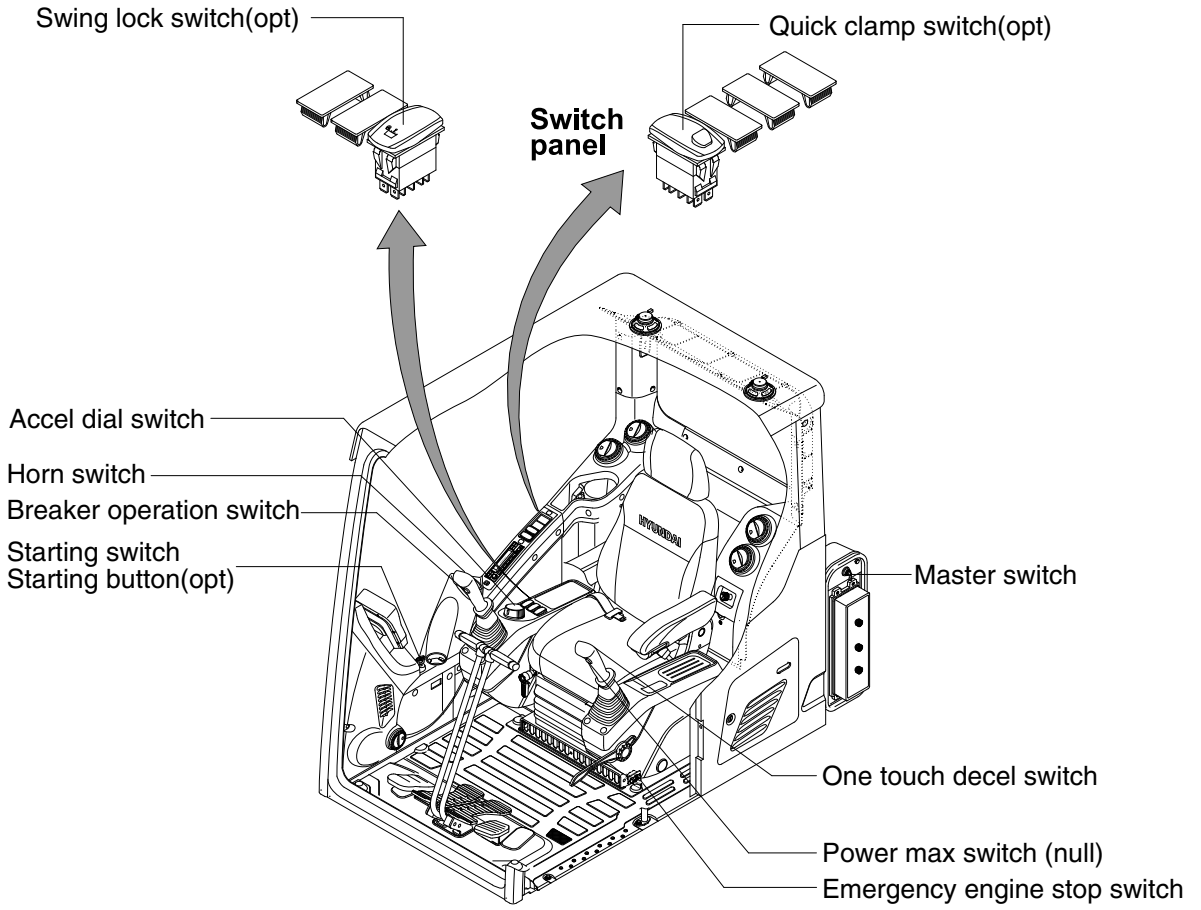
· When a worker/pedestrian reaches the green line, which is an external danger area equipped on the cluster, warning buzzer sounds and it displays a green rectangular box recognizing the worker/pedestrian.
Stop work immediately. Stop the buzzer by pressing the buzzer stop switch. Then resume work after you confi rm that the area is safe and clear of workers/objects.

290F3CD247A

· When a worker/pedestrian reaches the red line, which is an external danger area equipped on the cluster, warning buzzer sounds and it displays a red rectangular box recognizing the worker/pedestrian.
Stop work immediately. Stop the buzzer by pressing the buzzer stop switch. Then resume work after you confirm that the area is safe and clear of workers/objects.

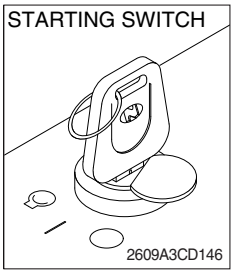
⚠ Failure to comply may result in serious injury or death.

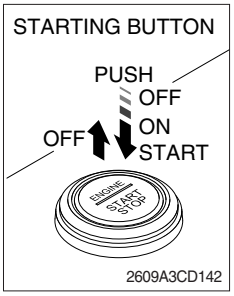
※ In AAVM mode, a touch screen of the LCD is available only.



480SA3CD32

1) STARTING SWITCH & STARTING BUTTON (OPT)





Starting button with smart key tag (opt)

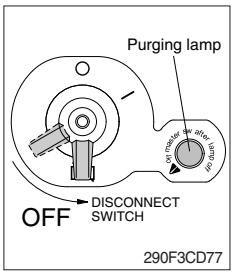
(1) There are three positions, OFF, ON and START.
- ◯ (OFF) : No of electrical circuits activate.
- | (ON) : All the systems of machine operate.
- ◯ (START) : Use when starting the engine.
  Release key immediately after starting.

※ If you turn ON the starting switch in cold weather, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature. Start the engine in 1~2 minutes after turning ON the starting switch. More time may be required according to ambient temperature.

※ Starting switch contoller tries engine starting at least 3 seconds even if switch is released after driver's start trial (key switch : start position / starting button : long push) to prevent short-time cranking (which can not starting engine). If no-start conditions (unlock safety knob) are resolved (lock safety knob) during the 3 seconds of engine starting attempt, engine can be started.

※ Key must be in the ON position with engine running to maintain electrical and hydraulic function and prevent serious machine damage.

2) MASTER SWITCH



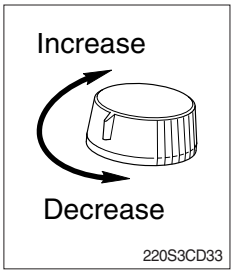
(1) This switch is used to shut off the entire electrical system.

(2) I : The battery remains connected to the electrical system.
O : The battery is disconnected from the electrical system.

※ **Never turn the master switch to O (OFF) with the engine running. Engine and electrical system damage could result.**

※ **Turn OFF the master switch after purging lamp gose OFF.**

3) ACCEL DIAL SWITCH

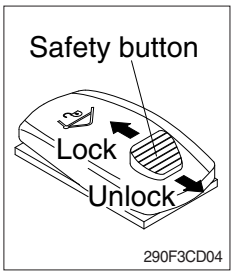


(1) There are 10 dial setting.

(2) Setting 1 is low idle and setting 10 is high idle.

- By rotating the accel dial to right : Engine speed increases.
- By rotating the accel dial to left : Engine speed decreases.

4) QUICK CLAMP SWITCH (option)



(1) This switch is used to engage or disengage the moving hook on quick clamp.

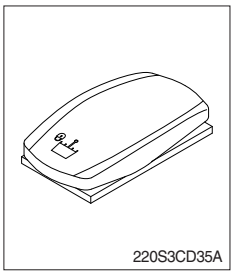
※ **Refer to the page 8-6 for details.**

5) AIR COMPRESSOR SWITCH (option)

(1) This switch is used to activate the air compressor.

(2) The pilot lamp lights up when this switch is activated.

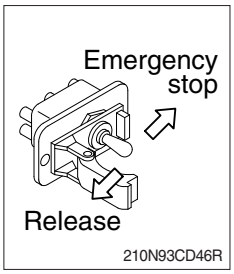
6) SWING LOCK SWITCH (option)



(1) This switch is used to lock the swing parking brake.

(2) Swing control is not available when this switch is activated.

7) EMERGENCY ENGINE STOP SWITCH

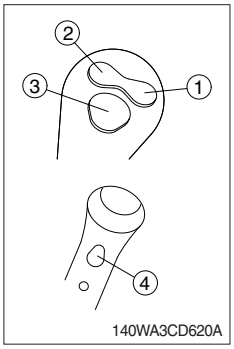


(1) This switch is used to stop the engine in the event of an emergency.

※ **Be sure to return the emergency switch to the release or run position before trying to restart the engine.**

8) LH RCV LEVER SWITCH

(1) Button type



The switches on the LH RCV lever is function as below.

① None

② None

③ One touch decel switch

a. This switch is used to actuate the deceleration function quickly.

b. The engine speed is increased to previous setting value by pressing the switch again or operating state (working/travel).

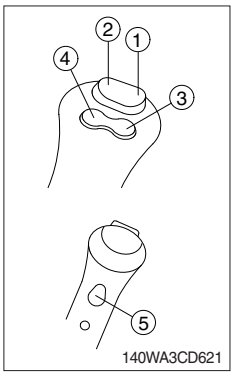
④ Power max switch

a. This switch activates power max function.
When this switch is pressed and held, hydraulic power of work equipment will be increased to approx 110 percent for a period of 8 seconds.

b. After 8 seconds, function is cancelled automatically even if the switch remains pressed.

※ **Do not use for craning purposes.**

(2) Proportional type (option)



The switches on the LH RCV lever is function as below.

① CW rotating switch

When this switch is pressed, the clockwise rotating will operate.

② CCW rotating switch

When this switch is pressed, the counterclockwise rotating will operate.

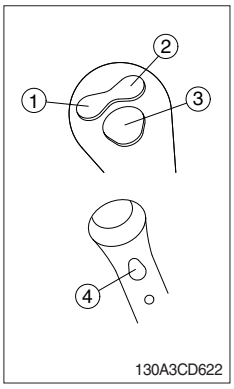
③ One touch decel switch : Refer to (1)-③ above.

④ None.

⑤ Power max switch : Refer to (1)-④ above.

9) RH RCV LEVER SWITCH

(1) Button type



The switches on the RH RCV lever is function as below.

① None

② None

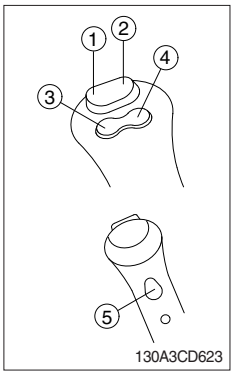
③ Horn switch

When this switch is pressed, the horn will sound.

④ Breaker switch

When this switch is pressed, the breaker will only operate when the breaker operation mode is selected.

(2) Proportional type (option)



The switches on the RH RCV lever is function as below.

① 2-way clamp switch

When this switch is pressed, the clamp will only operate when the crusher operation mode is selected.

② 2-way release switch

When this switch is pressed, the release or breaker will operate when the crusher operation mode or breaker operation mode is selected.

③ Quick clamp switch

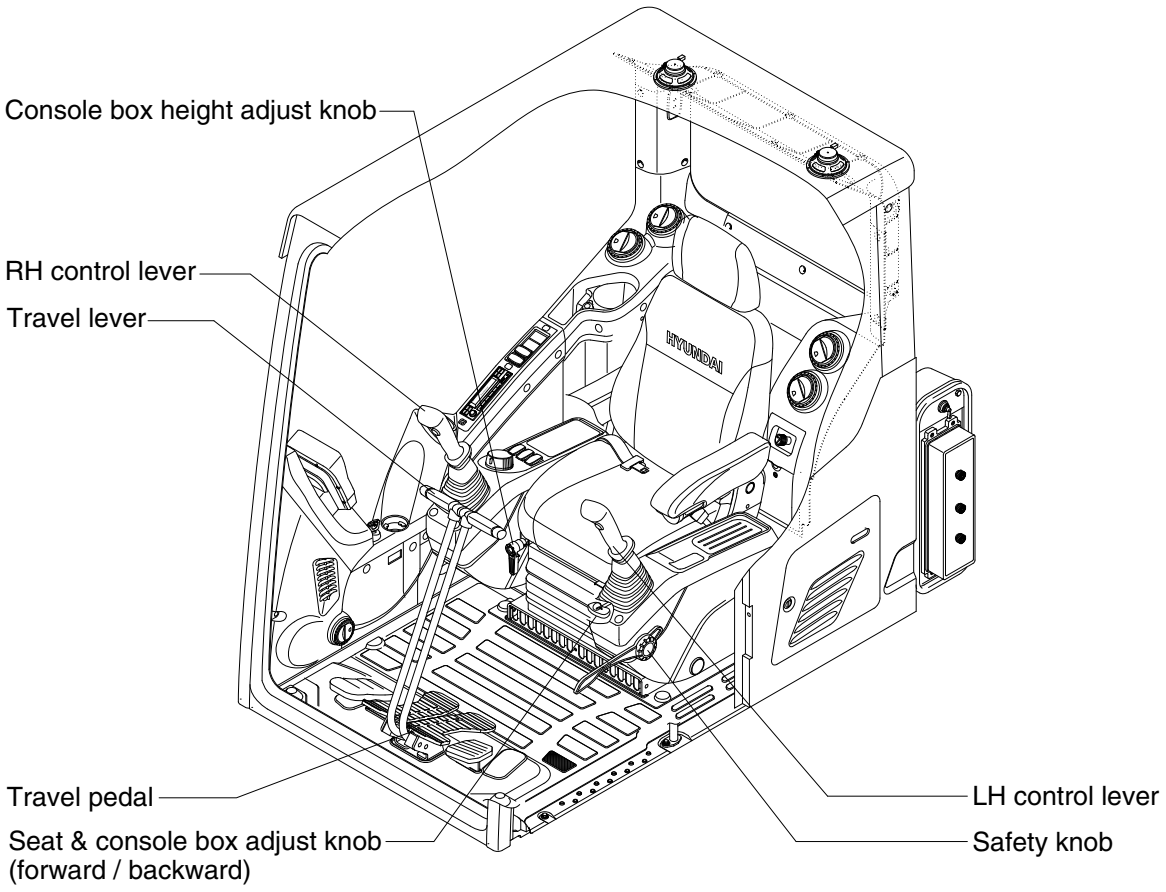
This switch is used to engage or disengage the moving hook on quick clamp.

Refer to the page 8-6.

④ Horn switch : Refer to (1)-③ previous page.

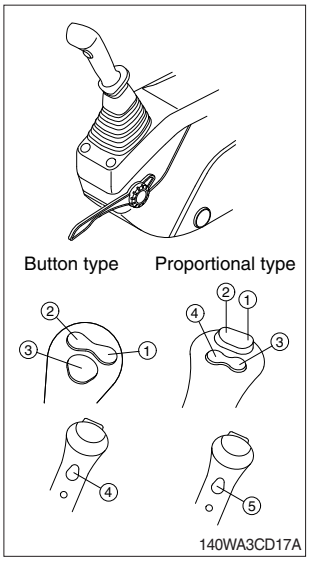
⑤ Breaker switch : Refer to (1)-④ previous page.

4. LEVERS AND PEDALS



220S3CD36

1) LH CONTROL LEVER



(1) This joystick is used to control the swing and the arm.

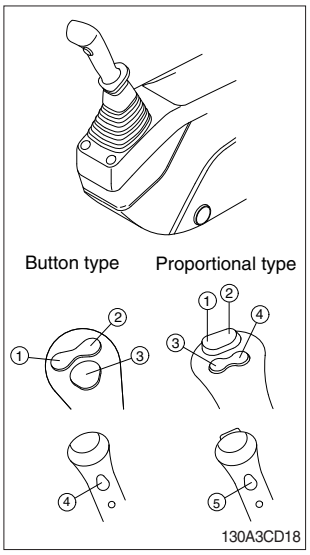
※ Refer to operation of working device in chapter 2 for details.

(2) The switch functions are as below.

No.	Button type	Proportional type (opt)
①	N.A	Rotating-CW
②	N.A	Rotating-CCW
③	One touch decel	One touch decel
④	Power max	N.A
⑤	-	Power max

※ Refer to page 3-35 for the details of the switch function.

2) RH CONTROL LEVER



(1) This joystick is used to control the boom and the bucket.

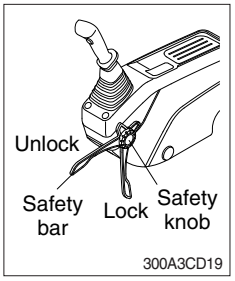
※ **Refer to operation of working device in chapter 2 for details.**

(2) The switch functions are as below.

No.	Button type	Proportional type (opt)
①	N.A	2-way clamp
②	N.A	2-way release
③	Horn	N.A
④	Breaker	Horn
⑤	-	Breaker

※ **Refer to page 3-36 for the details of the switch function.**

3) SAFETY KNOB



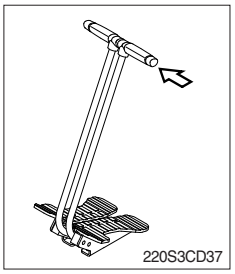
(1) All control levers and pedals are disabled from operation by locating the safety knob to the LOCK position as shown.

※ **Be sure to turn the safety knob to the LOCK position when entering or leaving the operators seat/cabin.**

(2) The machine is operational by turning the safety knob to the UNLOCK position.

※ **Do not use the safety bar for a handle when getting on or off the machine.**

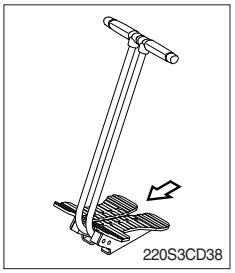
4) TRAVEL LEVER



(1) This lever is mounted on travel pedal and used for traveling by hand. The operation principle is same as the travel pedal.

(2) Refer to traveling of the machine in chapter 2 for details.

5) TRAVEL PEDAL

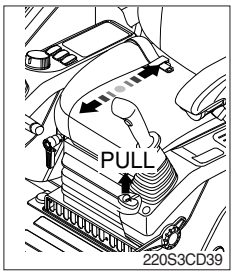


(1) This pedal is used to move the machine forward or backward.

(2) If left side pedal is pressed, left track will move.
If right side pedal is pressed, right track will move.

(3) Refer to traveling of machine in chapter 2 for details.

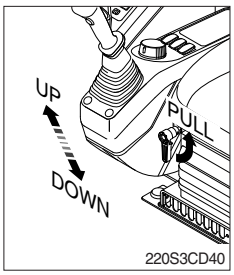
6) SEAT AND CONSOLE BOX ADJUST KNOB (forward/backward)



(1) This knob is used to move the seat and console box to fit the contours of the operator's body.

(2) Pull the knob to adjust forward or backward over 150 mm (5.9").

7) CONSOLE BOX (CONTROL LEVER) HEIGHT ADJUST KNOB



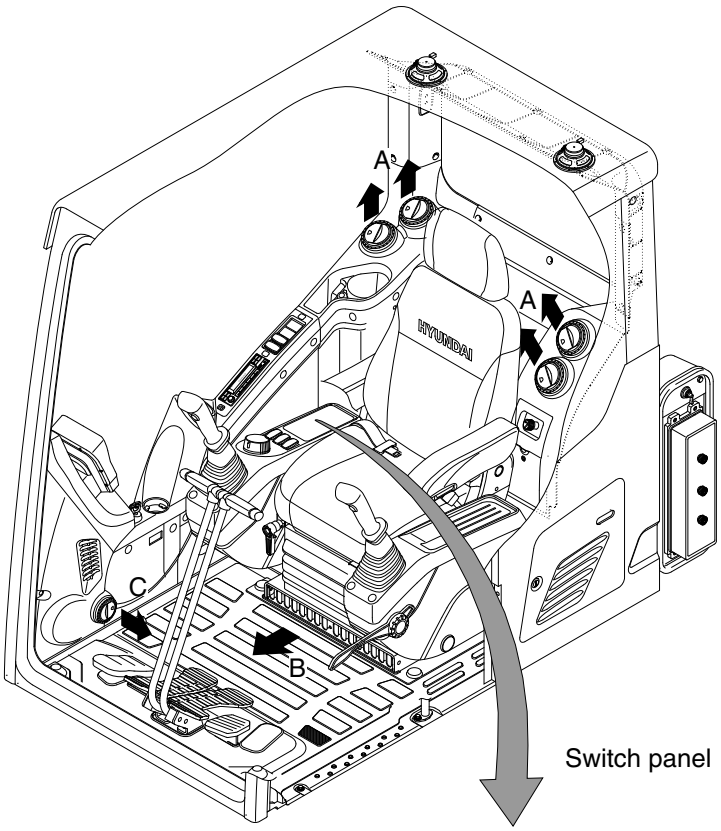
(1) This knob is used to move the LH and RH control levers to fit the contours of the operator's body.

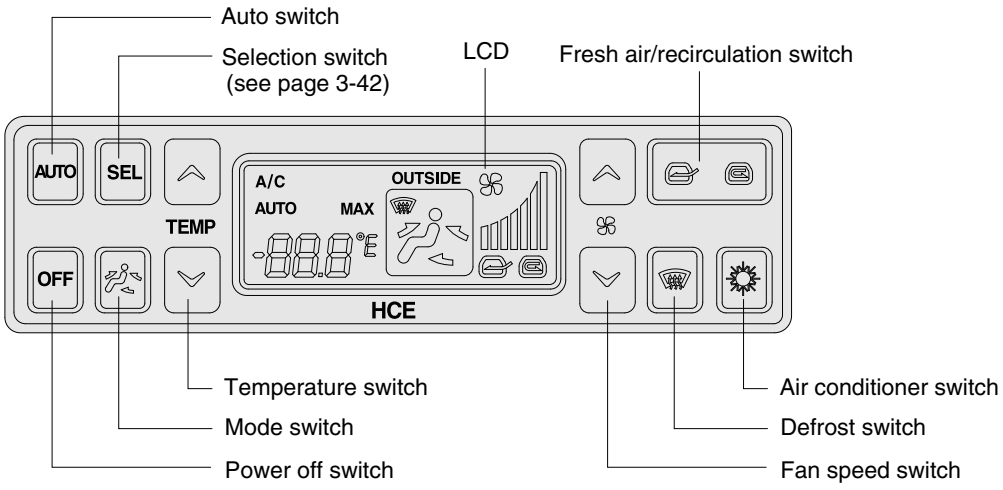
(2) The control levers can be moved upward and downward at 45° over 80 mm (2.4").

5. AIR CONDITIONER AND HEATER

Full auto air conditioner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration, sensing ambient and cabin inside temperature.

· **Location of air flow ducts**





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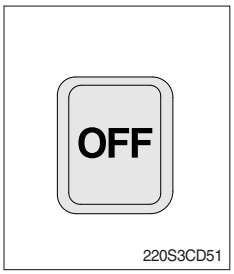
1) POWER OFF SWITCH

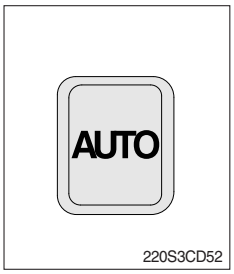


(1) This switch turns the system ON and OFF.
Just before powering OFF, set values are stored.

(2) Default setting values

Function	Air conditioner	In/outlet	LCD	Temperature	Mode
Value	OFF	Inlet	OFF	Previous sw OFF	Previous sw OFF

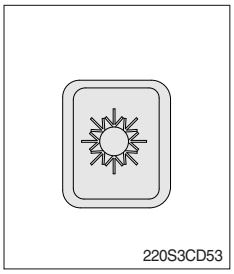
2) AUTO SWITCH



(1) Turn the starting switch to ON position, LCD lights ON.
Auto air conditioner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.

(2) This switch can restart system after system OFF.

3) AIR CONDITIONER SWITCH

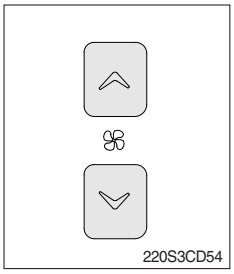


(1) This switch turns the compressor ON/OFF.

(2) In accordance with the temperature sensed by duct (evaporator) sensor, compressor turns ON or OFF automatically.

※ Air conditioner operates to remove vapor and drains water through a drain hose. Water can be sprayed into the cab in case that the drain cock at the ending point of drain hose has a problem. In this case, exchange the drain cock.

4) FAN SPEED SWITCH

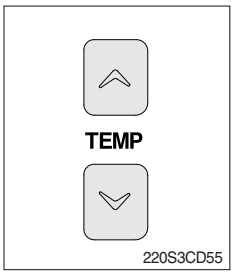


(1) Fan speed is controlled automatically by set temperature.

(2) This switch controls fan speed manually.
- There are 5 steps (OFF, 1 ~ 4 speed) to control fan speed.
- The maximum step or the minimum step beeps 5 times.

(3) This switch makes the system ON.

5) TEMPERATURE CONTROL SWITCH



(1) Setting temperature indication (17~32˚C, scale : 0.5˚C)

(2) Max cool and max warm beeps 5 times.

(3) The max cool or the max warm position operates as following table.

Temperature	Compressor	Fan speed	In/Outlet	Mode
Max cool	ON	Max (Hi)	Recirculation	Vent
Max warm	OFF	Auto (Hi)	Fresh	Foot

(4) Temperature unit can be changed between celsius (˚C) and fahrenheit (˚F)

① Default status (˚C)

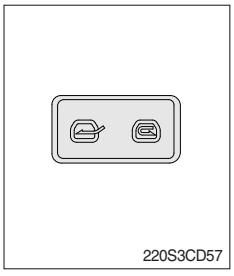
② Push Up/Down temperature control switch simultaneously more than 5 second displayed temperature unit change (˚C → ˚F)

6) MODE SWITCH

(1) Operating this switch, it beeps and displays symbol of each mode in the following order. (Vent → B/L → Foot → Mix → Vent)

Mode switch		Vent	B/L	Foot	Mix
Outlet	A	●	●		
	B		●	●	●
	C				●

7) FRESH AIR/RECIRCULATION SWITCH



(1) It is possible to change the air-inlet method.

① Fresh air ( )

Inhaling air from the outside.

※ Check out the fresh air filter periodically to keep a good efficiency.

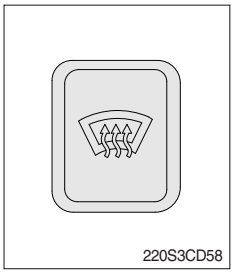
② Air recirculation ( )

It recycles the heated or cooled air to increase the energy efficiency.

※ Change air occasionally when using recirculation for a long periods of time.

※ Check condition of fresh air filter and recirculation filter periodically to maintain good efficiency of the system.

8) DEFROST SWITCH

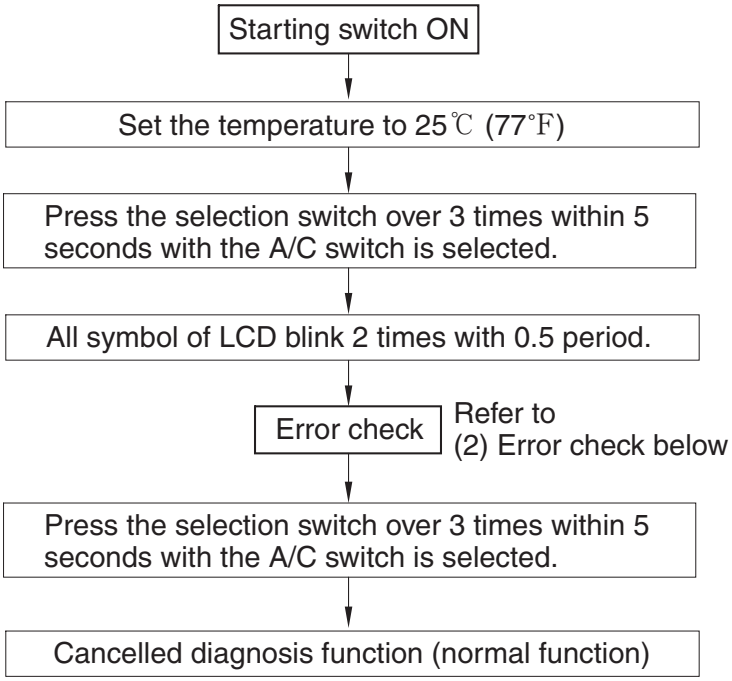


(1) This switch makes the defrost mode operating.

(2) When defroster mode operating, fresh air/recirculation switch turns to fresh air mode and air conditioner switch turns ON.

9) SELF DIAGNOSIS FUNCTION

(1) Procedure



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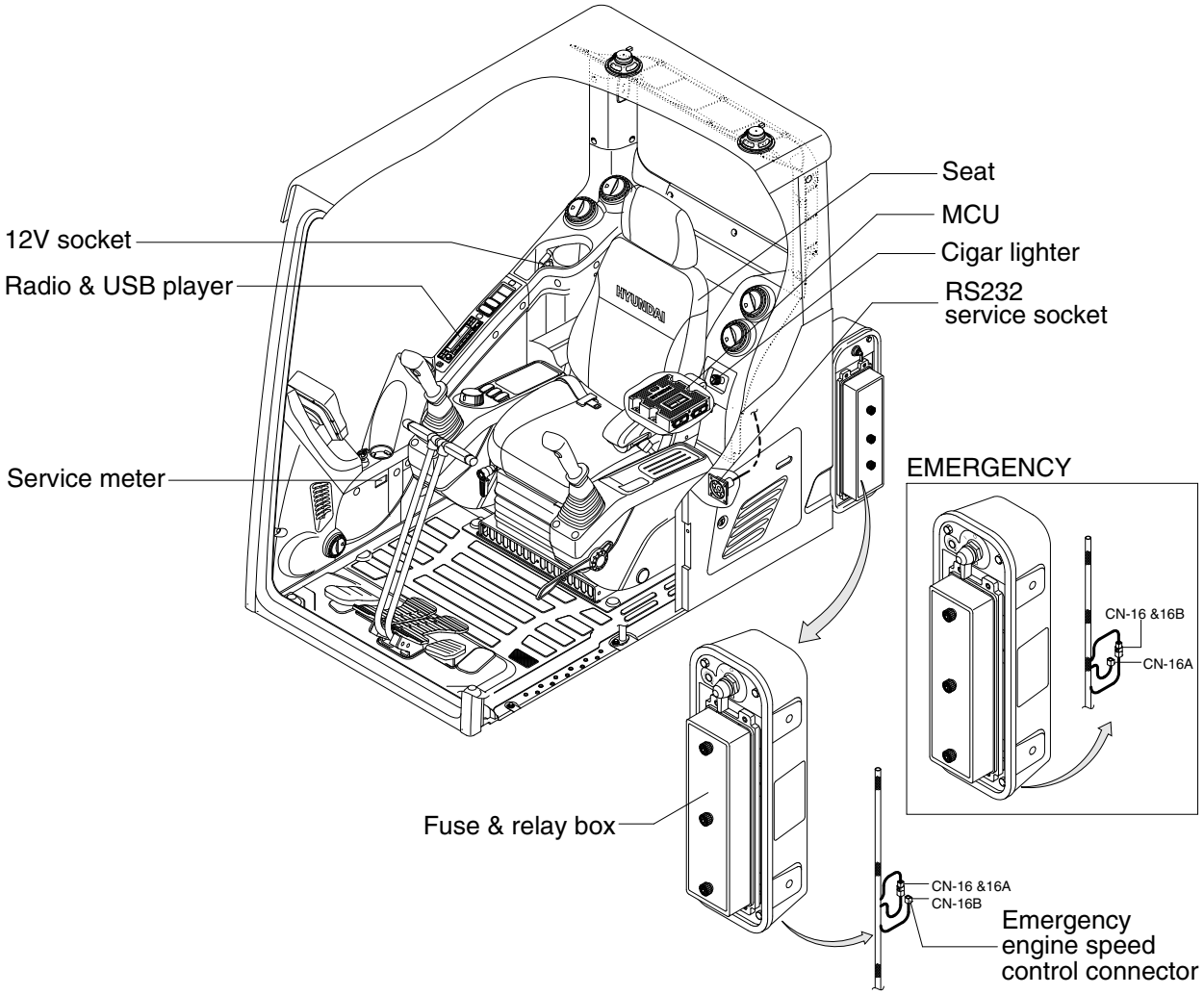
(2) Error check

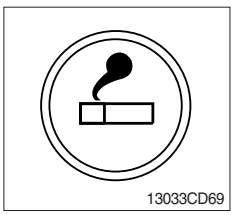
- If normal, display E0.
- The corresponding error code flickers on the setup temperature display panel, the other symbol will turn OFF.
- Error code flickers every 0.5 second.
- If error code is more than two, each code flickers 2 times in sequence.
- Up and down the error codes by prossing the temperature control switch.
- Error code

Error code	Description	Error code	Description
E0	Normal	E5	Duct sensor short
E1	Incar sensor short	E6	Duct sensor open
E2	Incar sensor open	E11	DPS open
E3	Ambient sensor short	E12	Mode actuator fail
E4	Ambient sensor open	E13	Mix actuator fail

6. OTHERS



1) CIGAR LIGHTER



(1) This can be used when the engine starting switch is ON.

(2) The lighter can be used when it springs out in a short while after being pressed down.

※ **Service socket**

Use cigar lighter socket when you need emergency power.
Do not use the lighter exceeding 24 V, 100 W.

2) RADIO AND USB PLAYER (WITH BLUETOOTH)

9403CD100

■FRONT PANEL PRESENTATION

1 ····· Power ON/OFF, Volume UP/DOWN button

2 ····· Manual UP/DOWN Tuning, File search, SEL button

3 ····· Mode button, Audio mute button

4 ····· Call & Pair button

5 ····· Call end button

6 ····· Station preset 1
DIS ····· Display button

7 ····· Station preset 2

8 ····· Station preset 3
RPT ····· Repeat play button

9 ····· Station preset 4
RDM ····· Random play button

10 ····· Station preset 5
DIR- ····· Directory down button

11 ····· Station preset 6
DIR+ ····· Directory up button

12 ····· Scan play button (SCAN)
Best station memory (BSM) button

13 ····· Auto tune up, Seek up button

14 ····· Auto tune down, Track down button

15 ····· USB connector

16 ····· AUX IN Jack

17 ····· MIC hole

RADIO AND USB PLAYER (WITHOUT BLUETOOTH)

9403CD101

■FRONT PANEL PRESENTATION

1 ····· Power ON/OFF, Volume UP/DOWN button

2 ····· Manual UP/DOWN Tuning, File search, SEL button

3 ····· Mode button, Audio mute button

4 ····· Radio seek up button

5 ····· Radio seek down button

6 ····· Station preset 1
DIS ····· Display button

7 ····· Station preset 2

8 ····· Station preset 3
RPT ····· Repeat play button

9 ····· Station preset 4
RDM ····· Random play button

10 ····· Station preset 5
DIR- ····· Directory down button

11 ····· Station preset 6
DIR+ ····· Directory up button

12 ····· Scan play button (SCAN)
Best station memory (BSM) button

13 ····· Track up button

14 ····· Track down button

15 ····· USB connector

16 ····· AUX IN Jack

■GENERAL

(1) Power and volume button

① Power ON / OFF button

Press power button (1) to turn the unit on or off.

② Volume UP/DOWN control knob

Turn VOL knob (1) right to increase the volume level.
Turn VOL knob (1) left to decrease the volume.
After 5 seconds the display will return to the previous display mode.

③ Initial volume level set up

I-VOL is the volume level the unit will play at when it is next turned on. To adjust the I-VOL level, press and hold VOL button (1) for longer than 2 seconds. The current volume level displays on the display panel.
Then turn button (1) right or left to set the volume level as the I-VOL level.

④ Clock ON/OFF control

The CLOCK was default at off status. To turn CLOCK ON, press and hold VOL button (1) for longer than 2 seconds to display I-VOL, then short press VOL again, turn VOL knob while CLOCK OFF display, then the CLOCK ON will be displayed.

※ Due to time tolerance, the clock display on the Audio unit might have slight difference.

⑤ Clock adjustment

With CLOCK ON selected, press VOL knob again after CLOCK ON display, the hour will blink, turn VOL knob right or left to adjust hour.
Simply press VOL again, the minute will blink, turn VOL knob to adjust minute. Then press VOL again to confirm the clock once finished.

(2) Menu Selection

① This button can adjust the effect of the sound and other things.
Each time you press this button (2), LCD displays as follows :

BAS → TREB → BAL L=R → FAD F=R → EQ → LOUD ON → BEEP 2ND

On each setting, the level can be controlled by turning TUNE knob (2). When the last adjustment is made, after 5 seconds, the display will automatically return to the previous display mode.

② Bass control

To adjust the bass tone level, first select the bass mode by pressing SEL button (2) repeatedly until BASS appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the bass level as desired. The bass level will be shown on the display panel from a minimum of BASS-7 to a maximum of BASS+7.

③ Treble control

To adjust the treble tone level, first select the treble mode by pressing SEL button (2) repeatedly until TREB appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the treble level as desired. The treble level will be shown on the display panel from a minimum of TREB -7 to a maximum of TREB +7.

④ Balance control

To adjust the left-right speaker balance, first select the balance mode by pressing SEL button (2) repeatedly until BAL indication appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the balance as desired. The balance position will be shown by the bars on the display panel from BAL 10R (full right) to BAL 10L (full left).

⑤ Fader control

To adjust the front-rear speaker balance, first select the fader mode by pressing SEL button (2) repeatedly until FADER indication appears on the display panel. Then turn knob (2) right or left within 5 seconds to adjust the front-rear speaker level as desired. The fader position will be shown by the bars on the display panel from FAD 10F (full front) to FAD 10R (full rear).

⑥ EQ control

You can select an equalizer curve for 4 music types (CLASSIC, POP, ROCK, JAZZ). Press button (2) until EQ is displayed, then turn knob (2) right or left to select the desired equalizer curve. Each time you turn the knob, LCD displays as follows :

EQ OFF → CLASSIC → POP → ROCK → JAZZ

※ When the EQ mode is activated, the BASS and TREBLE modes are not displayed.

⑦ **Loud control**

When listening to music at low volume levels, this feature will boost the bass and treble response. This action will compensate for the reduction in bass and treble performance experienced at low volume.

To select the loudness feature, press button (2) until LOUD is displayed, then turn knob (2) right or left to activate or deactivate loudness.

⑧ **Beep control**

To adjust the BEEP mode, first select the BEEP mode by pressing button (2) repeatedly until BEEP indication appears on the display panel. Then turn knob (2) left or right within 5 seconds to select BEEP 2ND, BEEP OFF or BEEP ON.

- BEEP 2ND : You will only hear the beep sound when the buttons are held down for more than 2 seconds.
- BEEP OFF : You can not hear the sound beep when you press the buttons.
- BEEP ON : You can hear the beep sound each time you press the buttons.

(3) Mute control

① Press and hold MUTE button (3) for over 2 seconds to mute sound output and MUTE ON will blink on the LCD. Press the button again to cancel MUTE function and resume to normal playing mode.

(4) Mode selection

① Repeat press MODE button (3) to switch between FM1, FM2, AM, USB, AUX, BT MUSIC.

※ If there is no USB, AUX, Bluetooth Phone connected, it would not display USB, AUX, BT when you press button (3).

■RADIO

(1) Mode button

① Repeat press MODE button to select FM1, FM2 or AM.

(2) Manual tuning button

① To manually tune to a radio station, simply turn encoder TUNE (2) left or right to increase or decrease the radio frequency.

(3) Auto tuning button

① To automatically select a radio station, simply press Seek up or Track down button.

(4) Station preset button

① In radio mode, pressing buttons (6) to (11) will recall the radio stations that are memorized. To store desired stations into any of the 6 preset memories, in either the AM or FM bands, use the following procedure :

a. Select the desired station.
b. Press and hold one of the preset buttons for more than 2 seconds to store the current station into preset memory. Six stations can be memorized on each of FM1, FM2, and AM.

(5) Preset scan (PS) / Best station memory (BSM) button

① Press BSM button (12) momentarily to scan the 6 preset stations stored in the selected band. When you hear your desired station, press it again to listen to it.
Press BSM button (12) for longer than 2 seconds to activate the Best Station Memory feature which will automatically scan and enter each station into memory.

※ If you have already set the preset memories to your favorite stations, activating the BSM tuning feature will erase those stations and enter into the new ones. This BSM feature is most useful when travelling in a new area where you are not familiar with the local stations.

■USB PLAYER

(1) USB playback

① The unit was equipped with a front USB jack and also a rear USB Jack.
With a USB device plugged in the front USB jack, it will be detected as front USB mode. And with a USB device plugged in the rear USB jack, it will be detected as rear USB. To get to a USB mode, press MODE (3) button momentarily or insert the USB device in front or rear USB jack.

※ If there are no mp3 or wma files in USB device, it will revert to the previous mode after displaying NO FILE.

(2) Track Up / Down button

① Press SEEK up (13) or TRACK down (14) to select the next or previous track. Press and hold the buttons to advance the track rapidly in the forward or backward direction.

(3) MP3 directory / File searching

① Button (2) is used to select a particular directory and file in the device. Turn button (2) right or left to display the available directories. Press button (2) momentarily when the desired directory is displayed, then turn button (2) right or left again to display the tracks in that directory. Press button (2) to begin playback when the desired file is displayed.

(4) Directory Up / Down button

① During MP3/WMA playback, simply press DIR- button (10) to select the previous directory (if available in the device); simply press DIR+ button (11) to select the next directory (if available in the device).

※ If the USB device does not contain directories, it would play MP3/WMA tracks at 10- file when you press DIR- button (10), and play MP3/WMA tracks at 10+ file when you press DIR+ (11) button.

(5) Track Scan Play (SCAN) button

- SCAN playback : Simply press SCAN (12) button to play the first 10 seconds of each track.
- SCAN folder : Press and hold SCAN button for longer than 2 seconds to scan play the tracks in current folder.
- SCAN off : Simply press it again to cancel SCAN feature.

(6) Track Repeat Play (RPT) button

- REPEAT playback : Simply press RPT (8) button to play current track repeatedly.
- REPEAT folder : Press and hold RPT for longer than 2 seconds to repeat play the tracks in current folder.
- REPEAT off : Simply press it again to cancel REPEAT feature.

(7) Track Random Play (RDM) button

- RANDOM playback : Simply press RDM (9) button to play the tracks in the device in a random sequence.
- RANDOM folder : Press and hold RDM button for longer than 2 seconds to randomy play the tracks in the current folder.
- RANDOM off : Simply press it again to cancel RANDOM feature.

(8) ID3 v2 (DISP)

① While a MP3 file is playing, press DISP button (6) to display ID3 information. Repeat push DISP button (6) to show directory name / file name and album name / performer / title.

※ If the MP3 disc does not have any ID3 information, it will show NO ID3.

* USB Information and Notice

a. Playback FILE SYSTEM and condition allowance.
   - FAT, FAT12, FAT16 and FAT32 in the file system.
   - V1.1, V2.2 and V2.3 in the TAG (ID3) version.

b. Display up to 32 characters in the LCD display.

c. No support any of MULTI-CARD Reader.

d. No high speed playback but only playing with normal full speed.

※ DRM files in the USB may cause malfunction to playback in the radio unit.

※ In temperatures below -10℃ (14°F), the audio unit with USB hook up may be affected and not play well.

■AUX OPERATION

It is possible to connect your portable media player to the audio system for playback of the audio tracks via the cab speakers.

To get the best results when connecting the portable media to the audio system, follow these steps :

- Use a 3.5 mm stereo plug cable to connect the media player headphone socket at each end as follows.
- Adjust the portable media player to approximately 3/4 volume and start playback.
- Press the MODE button (3) on the audio unit to change into AUX mode.
- The volume and tone can now be adjusted on the audio unit to the desired level.

※ The audio quality of your media player and the audio tracks on it may not be of the same sound quality as the audio system is CD Player.

※ If the sound of the media player is too low compared with the radio or CD, increase the volume of the player.

※ If the sound of the media player is too loud and/or distorted, decrease the volume of the player.

※ When in AUX mode, only the Volume, Bass, Treble, EQ and Mode functions of the audio unit can be used.

■BLUETOOTH (if equipped)

(1) Using a bluetooth wireless connection

① Your audio unit supports bluetooth wireless technology. You can set up a wireless link with bluetooth cellular phone.

② Continue to pair the cellular phone with the audio unit. Within a few moments the two should be able to connect.

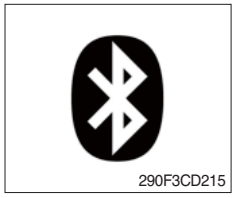
※ Since this audio unit is on standby to connect with your cellular phone via bluetooth wireless technology, using this audio unit without running the engine can result in battery drainage.

※ This audio units phone call reception is on standby when ignition switch is set to ACC OFF or ON.

※ The line-of-sight distance between this audio unit and your cellular phone must be 10 meters or less for sending and receiving voice and data via bluetooth wireless technology. However the transmission distance may become shorter than the estimated distance depending on the environment where it is being used.

※ Digital Noise & Echo suppression system provides the best sound clarity with little or no distortion (Echo & side tone will happen depending on cellular phone or service network).

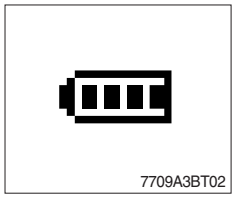
※ To ensure the quality of calling, you should select a proper bluetooth VR level. This audio unit is already equipped with the best bluetooth VR level.



a. Bluetooth icon

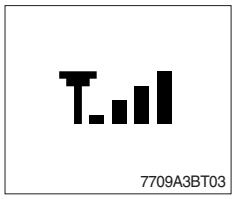
It will blink while establishing the bluetooth pairing.

It will light up after a bluetooth device connected.



b. Battery icon

It indicates the battery status of the connected bluetooth device.



c. Single strength icon

It indicates the signal strength of the connected bluetooth device.

(2) Pairing in hands free modes

① Press and hold CALL button (4) for 2 seconds until you hear beep sound, then PAIR STR will appear on the display.

② For the next procedure, go to cellular phone pairing mode.

③ If it is in pairing status with audio unit and cellular phone, PAIRING will show on the display.

④ If you want to exit pairing mode, press CALL END button (5) briefly while pairing, then it will show PAIR CLR on the display.

⑤ Bluetooth Icon and PAIR OK appear on the display when pairing is successful.

(3) Cellular phone pairing mode

① Browse your cellular phone menu and find the connectivity or bluetooth connection section.

② Select search for a new handsfree device function and allow the phone to find the mobile.

③ HYUNDAI should appear on your cellular phone screen.

④ Press connect menu among the handsfree option on your cellular phone.

⑤ The cellular phone should prompt for a pin code. Insert the pin code 1234.

⑥ The cellular phone should confirm that it has established a new paired connection.

⑦ Close the menu. The pairing is now completed. It appears PAIR FAIL on the display for 3 seconds.

※ Each cellular phone type has distinct phone menu so you may need to refer to your manufactures instruction for the correct procedure on how to connect a new bluetooth device.

※ Please retry the pairing instruction if HYUNDAI does not appear on the cellular phone screen.

※ Please select authorized, if there is authorized menu in the menu of bluetooth connection in your cellular phone.

※ Once the bluetooth pairing is completed between your cellular phone and this audio unit, both units will be automatically recognized on its paring like when you turn on the key in your car even though the audio unit is turned off.

※ This audio unit can store up to 6 phones pairings. If the memory is full, the first stored paired phone will be deleted.

※ The connecting priority will be given to the last connected cellular phone.

※ If you want to change the connecting priority, try to connect this audio unit from the cellular phone you want.

(4) Bluetooth connection and disconnection

① When established bluetooth connection is made between this audio unit and the cellular phone, bluetooth icon on the display appears and then the display shows HF/AV CONN when handsfree & AV profile is connected.


9403CD118

② To disconnect bluetooth link
Press and hold CALL END button (5) for 2 seconds, it shows DIS CON and bluetooth Icon disappears on the display.


9403CD117

③ To connect bluetooth link
Press CALL button (4) briefly, it blinks bluetooth Icon on the display while bluetooth is being connected. If the connection is completed, bluetooth Icon displays on the display.

※ When your cellular phone battery is at low charge, the bluetooth connection may occasionally be lost. To maintain good connectivity ensure that your phone battery is adequately charged.

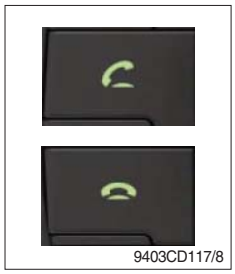
※ In case of failure of bluetooth pairing :
- **Delete item in paired list on your phone.**
- **Reset both phone by power off/on and the audio unit by ACC off/on.**

※ Connecting priority of handsfree profile is higher than headset profile.

※ The headset mode does not support caller ID, reject call and call Transfer.

(5) Using the audio unit as a handsfree device

① When the audio unit is ringing, it shows CALL and follows with the phone number ********** on the display.


9403CD117/8

② To accept call
Press CALL button (4), ANSWER CALL followed by TALKING will show in the display.

③ To end call
To end call, press CALL END button (5), REJECT appears on the display.

※ If reject call is activated in your phone, then your cellular phone does not support reject call function.

(6) Audio transfer between the audio unit and phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.

① Press CALL button (4) briefly during conversation, it appears CALL TRANS on the display. To switch back to the audio unit, press button (4) briefly during private conversation, then it appears CALL TRANS on the display again.

※ This function will be a cause of disconnection of bluetooth link in some nokia phones, but do not worry, just press button (4) during private conversation, then switch back to the audio unit automatically.

※ The quality of calling between cellular phone and audio unit is better than calling between one audio unit and another one.

(7) Last call number dialing

① Press CALL button (4) briefly, it appears CALL TO on the display, then simply press CALL button once again, it would make the last call with phone number displayed on LCD.
If Reject call is activated in your phone, then your cellular phone does not support Reject Call function.

※ If you are using SAMSUNG phone, then you may need to press send button once more. With the first press of button it should show contact list in your phone, then if you press again you should be ready to make the last call.

(8) To make a call by cellular phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.

① The audio unit will be activated automatically when you make a call with cellular phone.
② When you make a call processing by cellular phone, it shows CALLING on the display.
③ When you receive a call, the phone number ******** appears on the display.

(9) Using the audio unit as bluetooth music

The audio unit supports A2DP (Audio Advanced Distribution Profile) and AVRCP (Audio Video Remote Control Profile), and both profiles are available to listen music at the audio unit via cellular phone which is supporting the two profiles above.

① To play music, search the menu on your cellular phone as below :
i.e : Menu→ File manager→ Music→ Option→ Play via bluetooth.
It appears BT MP3 on the display.

② During BT MP3 playing, you could select the previous or next track by pressing SEEK up or TRACK down button on audio unit or operate via your cellular phone.

③ To stop music, press button (5) briefly and it will automatically switch into the previous mode.

④ To resume music playing, press the play button on your cellular phone.

※ This function may be different depending on cellular phone. Please follow the cellular phone menu. Some types of phones need to pair once more for bluetooth MP3 connection.

※ This function will be caused to disconnect A2DP, AVRCP depends on cellular phone.

※ Information about songs (e.g.: the elapsed playing time, song title, song index, etc.) cannot be displayed on this audio unit.

■RESET AND PRECAUTIONS

(1) Reset function

Interfering noise or abnormal compressed files in the MP3 disc or USB instrument may cause intermittent operation (or unit frozen/locking up). It is strongly recommended to use appropriate USB storage to not cause any malfunction to the audio unit. In the unlikely event that the player fails to operate correctly, try to reset unit by any of following two methods.

① press and hold 

simultaneously for about 5 seconds. (without Bluetooth)

② Press and hold 


simultaneously for about 5 seconds. (with Bluetooth)

※ Take out the fuse for the audio system in the vehicle once and then plug it back in.

※ It will be necessary to re-enter the radio preset memories as these will have been erased when the microprocessor was reset.

After resetting the player, ensure all functions are operating correctly.

(2) Precautions

When the inside of the cab is very cold and the player is used shortly after switching on the heater, moisture may form on the disc or the optical parts of the player and proper playback may not be possible.

If moisture forms on the optical parts of the player, do not use the player for about one hour. The condensation will disappear naturally allowing normal operation.

① Operation voltage : 9~32 volts DC, negative

② Output power : 40 watts maximum (20 watts x 2 channels)

③ Tuning range

Area	Band	Frequency range	Step
USA	FM	87.5~107.9 MHZ	200K
	AM	530~1710 KHZ	10K
EUROPE	FM	87.5~108.0 MHZ	50K
	AM	522~1620 KHZ	9K
ASIA	FM	87.5~108.0 MHZ	100K
	AM	531~1602 KHZ	9K
LATIN	FM	87.5~107.9 MHZ	100K
	AM	530~1710 KHZ	10K

● AREA Selection :

- To select an area, press and hold related buttons at FM1 band for about 3 seconds.
- USA Area: Press and hold mode + 1DIS buttons for 3 seconds
- EUROPE Area: Press and hold mode + 2 buttons for 3 seconds
- ASIA Area: Press and hold mode + 3RPT buttons for 3 seconds
- LATIN Area: Press and hold mode + 4RDM buttons for 3 seconds.

④ USB version : USB 1.1

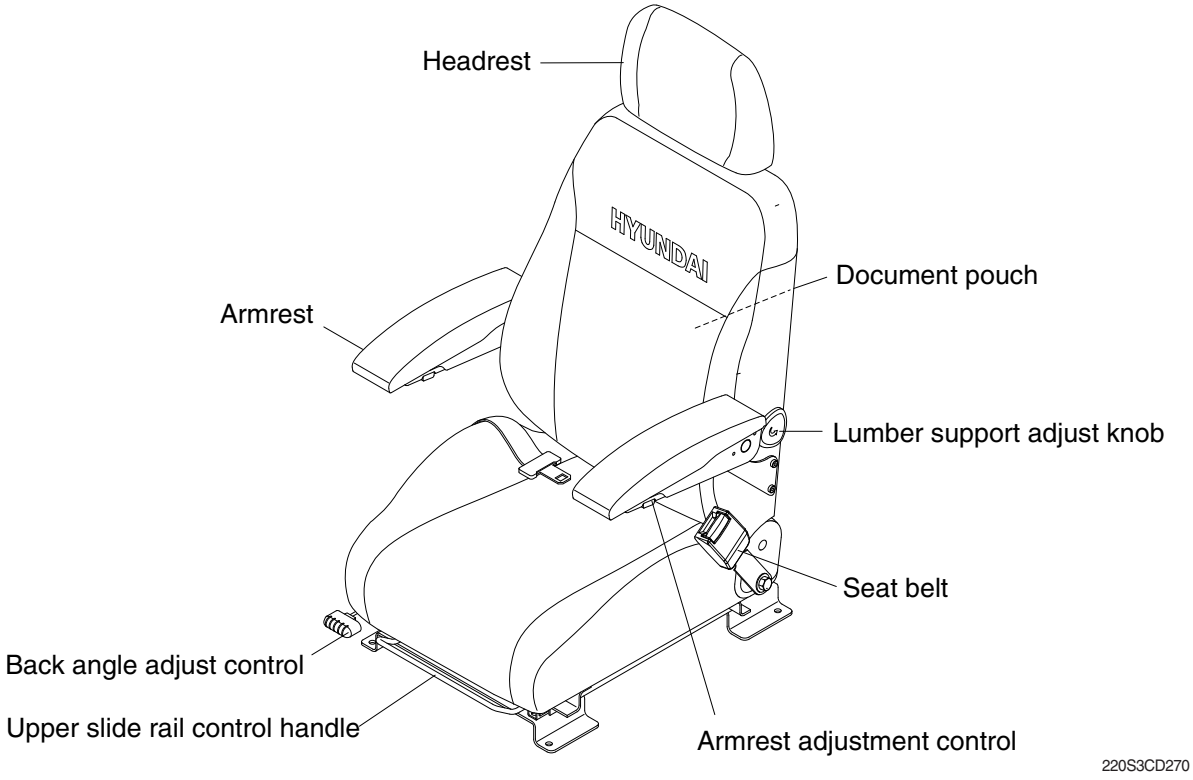
⑤ Bluetooth version : V2.1

⑥ Bluetooth supported profile :

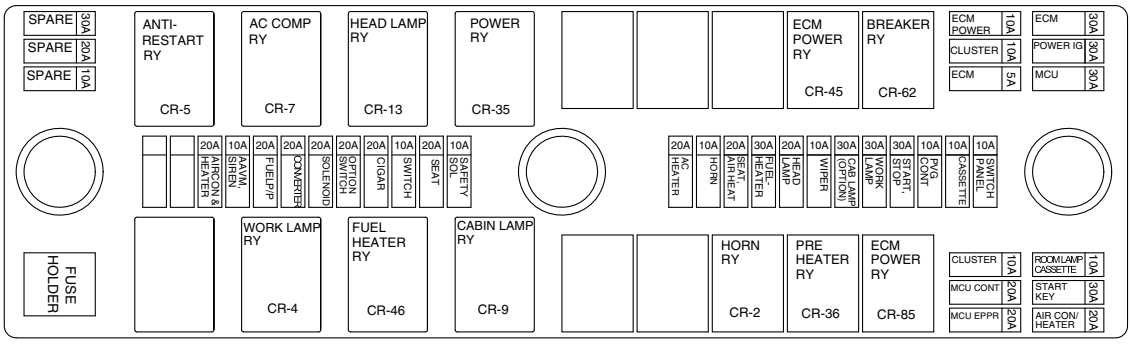
- A2DP : Advanced Audio Distribution Profile
- AVRCP : Audio/Video Remote Control Profile
- HFP : Hands-Free Profile

3) SEAT

The seat is adjustable to fit the contours of the operator's body. It will reduce operator fatigue due to long work hours and enhance work efficiency.



4) FUSE & RELAY BOX



400SA3FR01

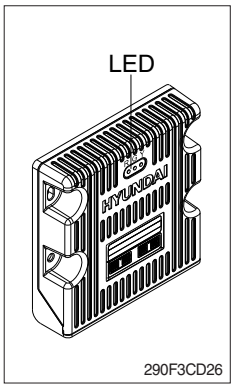
(1) The fuses protect the electrical parts and wiring from burning out.

(2) The fuse box cover indicates the capacity of each fuse and which circuit it protects.

※ **When replacing a fuse or relay, always use one of the same capacity.**

⚠ **Before replacing a fuse, be sure to turn OFF the starting switch.**

5) MCU



290F3CD26

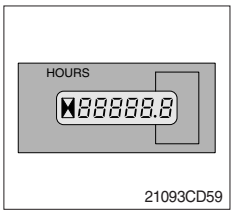
(1) To match the pump absorption torque with the engine torque, MCU varies EPPR valve output pressure, which controls pump discharge volume whenever engine speed drops and provides feedback, under the reference rpm of each mode set.

(2) Three LED lamps on the MCU display as below.

LED lamp	Trouble	Service
G is turned ON	Normal	-
G and R are turned ON	Trouble on MCU	· Change the MCU
G and Y are turned ON	Trouble on serial communication line	· Check if serial communication lines between controller and cluster are disconnected
Three LED's are turned OFF	Trouble on MCU power	· Check if the input power wire (24 V, GND) of controller is disconnected · Check the fuse

G : green, R : red, Y : yellow

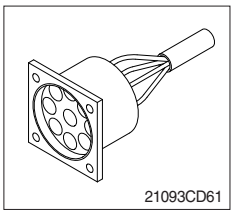
6) SERVICE METER



(1) This meter shows the total operation hours of the machine.

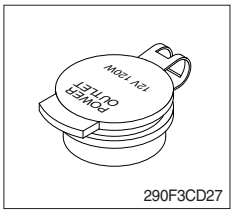
(2) Always ensure the operating condition of the meter during the machine operation. Inspect and service the machine based on hours as indicated in chapter 6, maintenance.

7) RS232 SERVICE SOCKET CONNECTOR



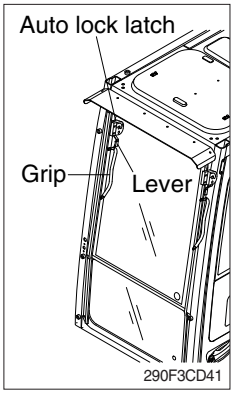
(1) MCU communicates the machine data with Laptop computer through the RS232 service socket.

8) 12V SOCKET



(1) Utilize the power of 12 V as you need and do not exceed 12 V, 30 W.

9) UPPER WINDSHIELD

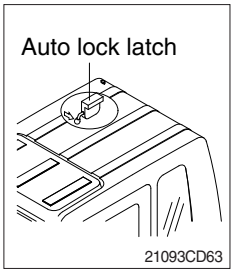


(1) Perform the following procedure in order to open the upper windshield.

① Pull both levers with hold both grips that are located at the top of the windshield frame and push the windshield upward.

② Hold both grips and pull back into the lock position until auto lock latch is engaged, then release the grips.

⚠ When working, without having locked the windshield by the auto lock (by pushing the windshield to the rear untill it's completely fixed), please be careful as it can cause personal injury if the windshield is not fixed or falls off.

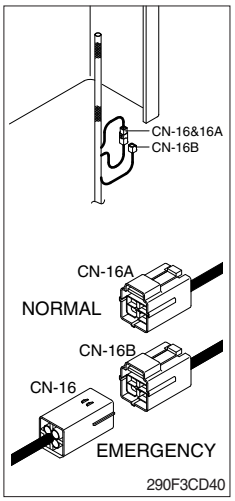


(2) Perform the following procedure in order to close the upper windshield.

① Pull the lever of the auto lock latch in order to release the auto lock latch.

② Steps in the reverse order to close the upper windshield.

10) EMERGENCY ENGINE SPEED CONTROL CONNECTOR



(1) When the CAN communication between the ECM and the MCU is abnormal due to malfunction, change the CN-16 connection from CN-16A to CN-16B and then control the engine speed by rotating the multimodal module of the jog dial module.

※ Never connect connector CN-16 with CN-16B when MCU is in normal operation.

※ Make repair as soon as possible.

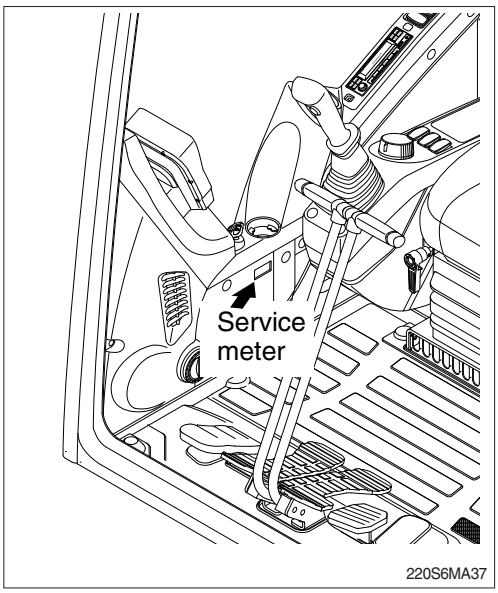
1. INSTRUCTION

1) INTERVAL OF MAINTENANCE

(1) Inspect and service machine as described on page 4-11.

(2) Shorten intervals of inspection and service depending on site conditions. (such as dusty area, quarry, sea shore and etc.)

(3) Practice the entire related details at the same time when the service interval is doubled.
For example, in case of 100 hours, carry out all the maintenance「Each 100 hours, each 50 hours and daily service」 at the same time.



2) PRECAUTION

(1) Do not perform maintenance on the machine until you have read the operator's manual and are familiar with the machine.

(2) Daily inspection should be performed according to section, Maintenance check list.

(3) Engine and hydraulic components have been pre-set from the factory.
Do not allow unauthorized personnel to reset them.

(4) Drain the used oil and coolant (always in separate containers). Handle and dispose of the waste per regulation of each province/country as well as any local laws.

⚠ Hot oil and hot components can cause serious injury or death. Do not allow hot oil or hot components to contact skin. Failure to comply may result in serious injury or death.

△ Accumulated grease and oil on the machine is a fire hazard. Remove any coating/film of fuel, oil or grease by steam cleaning the machine with high pressure water. Preform this at minimum of 1000 hours.

△ Inspect the engine compartment for any trash build up. Remove any trash build up from the engine compartment.

(5) Ask your local dealer or HD Hyundai Construction Equipment for the maintenance advice if unknown.

3) PROPER MAINTENANCE

(1) Replace and repair of parts

It is required to replace the wearable and consumable parts such as bucket tooth, side cutter, filter and etc., regularly. Replace damaged or worn parts before or at the required time to maintain machine performance.

(2) Always use only HD Hyundai Construction Equipment genuine parts.

(3) Use the recommended oil.

(4) Do not perform repairs while the machine is running. Stop the engine when you fill the oil.

(5) Always wear protective goggles, protective gloves and other personal protective equipment.

(6) Clean around the inlet of oil tank before adding oil.

(7) Drain oil when the temperature of oil is warm.

(8) Relieve hydraulic system of pressure before repairing the hydraulic system.

(9) Confirm if cluster has any warnings present after completion of service.

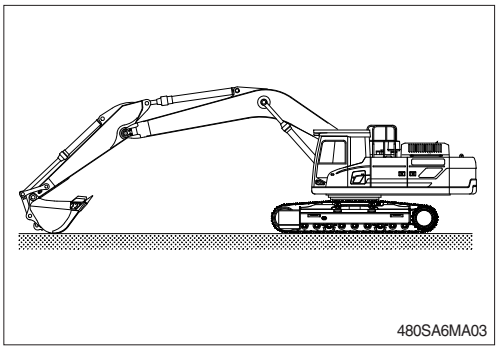
(10) For more detail information of maintenance, please contact your local HD Hyundai Construction Equipment dealer.

※ **Read chapter 1 of this manual for safety instructions prior to performing any maintenance on the machine.**

4) RELIEVING THE PRESSURE IN THE HYDRAULIC SYSTEM

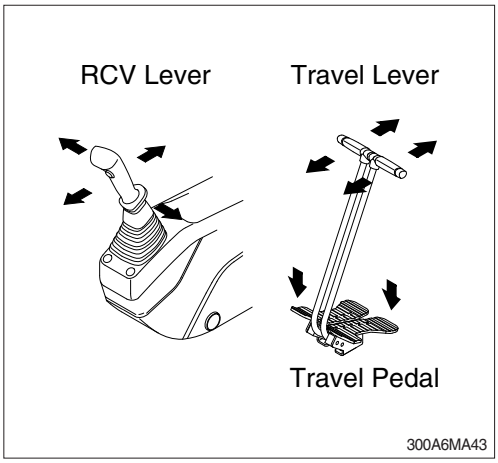
※ **Spewing of oil can cause an severe personal injury. Before you loosen hydraulic cap or any hydraulic line on the machine, always make sure machine of off, cooled down and that pressure is relived of the hydraulic system.**

(1) Place machine in the position shown and stop engine.

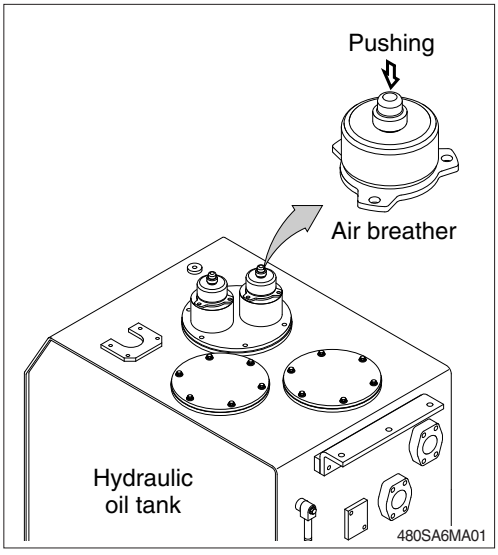


(2) Set the safety knob completely in the UNLOCK position. Refer to section Levers and pedals. Operate the control levers and pedals fully to the front, rear, left and right, to release the pressure in the hydraulic circuit.

※ **This does not completely release the pressure, so when servicing hydraulic component, loosen the connections slowly and do not stand in the direction where the oil may shoot out.**



(3) Relieve the pressure in the tank by pushing the top of the air breather.



5) PRECAUTION WHEN INSTALLING HYDRAULIC HOSES OR PIPES

(1) Be particularly careful that the joint of hose, pipe and functioning item are not damaged. Avoid contamination.

(2) Assemble after cleaning the hose, pipe and joint of functioning item.

(3) Use genuine parts.

(4) Do not install hose in a twisted, bent or crimped way.

(5) Always maintain the specified torque.

6) PERIODIC REPLACEMENT OF PARTS

(1) Perform periodic maintenance of the machine to prolong its useful life. This will assure and allow you to use the machine safely for a long time.
It is recommended to replace any parts related to safety (as needed), not only for safety but in order to maintain performance as well.

(2) These parts can shorten the life of the machine. The life span of such parts cannot be viewed visually and judged by the operator.

(3) Repair or replace if any abnormality of these parts is found even before the recommended replacement interval.

<table>
<tr><th colspan="3">Periodical replacement of safety parts</th><th>Interval</th></tr>
<tr><td colspan="2" rowspan="2">Engine</td><td>Fuel hose (tank-engine)</td><td rowspan="2">Every
2 years</td></tr>
<tr><td>Heater hose
(heater-engine)</td></tr>
<tr><td rowspan="6">Hydraulic system</td><td rowspan="3">Main circuit</td><td>Pump suction hose</td><td rowspan="3">Every
2 years</td></tr>
<tr><td>Pump delivery hose</td></tr>
<tr><td>Swing hose</td></tr>
<tr><td rowspan="3">Working device</td><td>Boom cylinder line hose</td><td rowspan="3">Every
2 years</td></tr>
<tr><td>Arm cylinder line hose</td></tr>
<tr><td>Bucket cylinder line hose</td></tr>
</table>

※ Replace O-ring and gasket at the same time when replacing the hose.
Replace clamp at the same time if the hose clamp is cracked when checking and replacing the hose.

2. TIGHTENING TORQUE

Use following table for unspecified torque.

1) BOLT AND NUT

(1) Coarse thread

Bolt size	8.8T		10.9T		12.9T	
	kgf · m	lbf · ft	kgf · m	lbf · ft	kgf · m	lbf · ft
M 6×1.0	0.8 ~ 1.2	5.8 ~ 8.6	1.2 ~ 1.8	8.7 ~ 13.0	1.5 ~ 2.1	10.9 ~ 15.1
M 8×1.25	2.0 ~ 3.0	14.5 ~ 21.6	2.8 ~ 4.2	20.3 ~ 30.4	3.4 ~ 5.0	24.6 ~ 36.1
M10×1.5	4.0 ~ 6.0	29.0 ~ 43.3	5.6 ~ 8.4	40.5 ~ 60.8	6.8 ~ 10.0	49.2 ~ 72.3
M12×1.75	6.8 ~ 10.2	50.0 ~ 73.7	9.6 ~ 14.4	69.5 ~ 104	12.3 ~ 16.5	89.0 ~ 119
M14×2.0	10.9 ~ 16.3	78.9 ~ 117	16.3 ~ 21.9	118 ~ 158	19.5 ~ 26.3	141 ~ 190
M16×2.0	17.9 ~ 24.1	130 ~ 174	25.1 ~ 33.9	182 ~ 245	30.2 ~ 40.8	141 ~ 295
M18×2.5	24.8 ~ 33.4	180 ~ 241	34.8 ~ 47.0	252 ~ 340	41.8 ~ 56.4	302 ~ 407
M20×2.5	34.9 ~ 47.1	253 ~ 340	49.1 ~ 66.3	355 ~ 479	58.9 ~ 79.5	426 ~ 575
M22×2.5	46.8 ~ 63.2	339 ~ 457	65.8 ~ 88.8	476 ~ 642	78.9 ~ 106	570 ~ 766
M24×3.0	60.2 ~ 81.4	436 ~ 588	84.6 ~ 114	612 ~ 824	102 ~ 137	738 ~ 991
M30×3.5	120 ~161	868 ~ 1164	168 ~ 227	1216 ~ 1641	202 ~ 272	1461 ~ 1967

(2) Fine thread

Bolt size	8.8T		10.9T		12.9T	
	kgf · m	lbf · ft	kgf · m	lbf · ft	kgf · m	lbf · ft
M 8×1.0	2.1 ~ 3.1	15.2 ~ 22.4	3.0 ~ 4.4	21.7 ~ 31.8	3.6 ~ 5.4	26.1 ~ 39.0
M10×1.25	4.2 ~ 6.2	30.4 ~ 44.9	5.9 ~ 8.7	42.7 ~ 62.9	7.0 ~ 10.4	50.1 ~ 75.2
M12×1.25	7.3 ~ 10.9	52.8 ~ 78.8	10.3 ~ 15.3	74.5 ~ 110	13.1 ~ 17.7	94.8 ~ 128
M14×1.5	12.4 ~ 16.6	89.7 ~ 120	17.4 ~ 23.4	126 ~ 169	20.8 ~ 28.0	151 ~ 202
M16×1.5	18.7 ~ 25.3	136 ~ 182	26.3 ~ 35.5	191 ~ 256	31.6 ~ 42.6	229 ~ 308
M18×1.5	27.1 ~ 36.5	196 ~ 264	38.0 ~ 51.4	275 ~ 371	45.7 ~ 61.7	331 ~ 446
M20×1.5	37.7 ~ 50.9	273 ~ 368	53.1 ~ 71.7	384 ~ 518	63.6 ~ 86.0	460 ~ 622
M22×1.5	51.2 ~ 69.2	370 ~ 500	72.0 ~ 97.2	521 ~ 703	86.4 ~ 116	625 ~ 839
M24×2.0	64.1 ~ 86.5	464 ~ 625	90.1 ~ 121	652 ~ 875	108 ~ 146	782 ~ 1056
M30×2.0	129 ~ 174	933 ~ 1258	181 ~ 245	1310 ~ 1772	217 ~ 294	1570 ~ 2126

2) PIPE AND HOSE (FLARE type)

Thread size (PF)	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

3) PIPE AND HOSE (ORFS type)

Thread size (UNF)	Width across flat (mm)	kgf · m	lbf · ft
9/16-18	19	4	28.9
11/16-16	22	5	36.2
13/16-16	27	9.5	68.7
1-3/16-12	36	18	130
1-7/16-12	41	21	152
1-11/16-12	50	35	253

4) FITTING

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

5) TIGHTENING TORQUE OF MAJOR COMPONENT

(1) HX500LT3

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt (FR, bracket)	M14 × 2.0	18.4 ± 2.0	133 ± 14.5
2		Engine mounting bolt (RR, bracket)	M14 × 2.0	18.4 ± 2.0	133 ± 14.5
3		Engine mounting bolt (frame)	M22 × 2.5	69.6 ± 7.0	503 ± 50.6
4		Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
5		Coupling mounting socket bolt	M20 × 2.5	46.5 ± 2.5	336 ± 18.1
6		Main pump coupling plate mounting bolt	M10 × 1.5	8.3 ± 1.7	59.8 ± 12.3
7		Fuel tank mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
8	Hydraulic system	Main pump mounting bolt	M10 × 1.5	6.7 ± 1.0	48.5 ± 7.2
9		Main control valve mounting nut	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
10		Hydraulic oil tank mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
11		Turning joint mounting bolt, nut	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
12	Power train system	Swing motor mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
13		Swing bearing upper part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
14		Swing bearing lower part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
15		Travel motor mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
16		Sprocket mounting bolt	M20 × 2.5	57.9 ± 6.0	419 ± 43.4
17	Under carriage	Upper roller mounting bolt, nut	M24 × 3.0	100 ± 10	723 ± 72.3
18		Lower roller mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
19		Track tension cylinder mounting bolt	M22 × 1.5	87.2 ± 12.5	631 ± 90.4
20		Track shoe mounting bolt, nut	M24 × 3.0	140 ± 14	1012 ± 101
21		Track guard mounting bolt	M24 × 3.0	100 ± 15	723 ± 108
22	Others	Counterweight mounting bolt	M42 × 3.0	390 ± 40	2821 ± 289
23		Cab mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7
24		Operator's seat mounting bolt	M 8 × 1.25	4.05 ± 0.8	29.3 ± 5.8
25		Under cover mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7

※ For tightening torque of engine and hydraulic components, see engine maintenance guide and service manual.

(2) HX520LT3

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt (FR, bracket)	M14 × 2.0	18.4 ± 2.0	133 ± 14.5
2		Engine mounting bolt (RR, bracket)	M14 × 2.0	18.4 ± 2.0	133 ± 14.5
3		Engine mounting bolt (frame)	M22 × 2.5	69.6 ± 7.0	503 ± 50.6
4		Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
5		Coupling mounting socket bolt	M20 × 2.5	46.5 ± 2.5	336 ± 18.1
6		Main pump coupling plate mounting bolt	M10 × 1.5	8.3 ± 1.7	59.8 ± 12.3
7		Fuel tank mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
8	Hydraulic system	Main pump mounting bolt	M10 × 1.5	6.7 ± 1.0	48.5 ± 7.2
9		Main control valve mounting nut	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
10		Hydraulic oil tank mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
11		Turning joint mounting bolt, nut	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
12	Power train system	Swing motor mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
13		Swing bearing upper part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
14		Swing bearing lower part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
15		Travel motor mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
16		Sprocket mounting bolt	M20 × 2.5	57.9 ± 6.0	419 ± 43.4
17	Under carriage	Upper roller mounting bolt, nut	M16 × 2.0	29.7 ± 3.0	215 ± 21.7
18		Lower roller mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
19		Track tension cylinder mounting bolt	M22 × 1.5	87.2 ± 12.5	631 ± 90.4
20		Track shoe mounting bolt, nut	M24 × 3.0	140 ± 14	1012 ± 101
21		Track guard mounting bolt	M24 × 3.0	100 ± 15	723 ± 108
22		Adjustable track gauge bolt	M33 × 3.5	220 ± 20	1590 ± 145
23	Others	Counterweight mounting bolt	M42 × 3.0	390 ± 40	2821 ± 289
24		Center frame support & lower track mounting bolt	M33 × 3.5	220 ± 20	1591 ± 145
25		Cab mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7
26		Operator's seat mounting bolt	M 8 × 1.25	4.05 ± 0.8	29.3 ± 5.8
27		Under cover mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7

※ For tightening torque of engine and hydraulic components, see engine maintenance guide and service manual.

3. FUEL, COOLANT AND LUBRICANTS

1) NEW MACHINE

New machine used and filled with following lubricants.

Description	Specification
Engine oil (API CH-4)	SAE 15W-40, ★SAE 5W-40
Hydraulic oil	HD Hyundai Construction Equipment genuine long life (ISO VG 32, VG 46, VG 68) Conventional hydraulic oil (ISO VG 15★)
Swing and travel reduction gear	SAE 80W-90 (GL-4/GL-5)
Grease	Lithium base grease NLGI No. 2
Fuel	ASTM D975-No. 2
Coolant (DCA4)	ASTM D6210 Mixture of 50% ethylene glycol base antifreeze and 50% water. Mixture of 60% ethylene glycol base antifreeze and 40% water.★

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Material
DCA4 : Brand name of Chemical Additive
manufactured by the Cummins Fleetguard Co.

★Cold region
Russia, CIS, Mongolia

※ Refer to page 7-37 for further information of recommended oils.

4. MAINTENANCE CHECK LIST

1) DAILY SERVICE BEFORE STARTING

Check items	Service	Page
Visual check		
· Charge air piping	Check	4-27
· Cooling fan	Check	4-28
· Air intake piping	Check	-
· Air cleaner dust ejection valve	Check	-
· Crankcase breather tube	Check	-
Fuel tank	Check, Refill	4-32
Hydraulic oil level	Check, Add	4-41
Engine oil level	Check, Add	4-19
Radiator coolant level	Check, Add	4-21
Control panel & pilot lamp	Check, Clean	4-52
Fuel pre-filter element (water)	Check, Drain	4-33
Fan belt tension and damage	Check, Adjust	4-28, 29
Air cleaner (oil bath, option)	Check, Adjust, Add	4-31
★ Attachment pin and bushing	Lubricate	4-51
· Boom cylinder tube end		
· Boom foot		
· Boom cylinder rod end		
· Arm cylinder tube end		
· Arm cylinder rod end		
· Boom + Arm connecting		
· Bucket cylinder tube end		

★ **Lubricate every 10 hours or daily for initial 100 hours.**

2) EVERY 50 HOURS SERVICE

Check items	Service	Page
Fuel tank (water, sediment)	Drain	4-32
Track tension	Check, Adjust	4-47
Swing reduction gear oil	Check, Add	4-44
Attachment pin and bushing	Lubricate	4-51
· Bucket cylinder rod end		
· Bucket + Arm connecting		
· Bucket control link + Arm		
· Bucket control rod		

3) INITIAL 50 HOURS SERVICE

Check items	Service	Page
Bolts & Nuts	Check, Tight	4-8
· Sprocket mounting bolts		
· Upper roller mounting bolt		
· Lower roller mounting bolt		
· Travel motor mounting bolts		
· Swing motor mounting bolts		
· Swing bearing mounting bolts		
· Engine mounting bolts		
· Counterweight mounting bolts		
· Turning joint locating bolts		
· Track shoe mounting bolts and nuts		
· Track guard mounting bolts		
· Hydraulic pump mounting bolts		
· Under cover mounting bolts		

4) EVERY 200 HOURS SERVICE

Check items	Service	Page
★ Hydraulic oil return filter	Replace	4-43
★ Pilot line filter element	Replace	4-43

★ Replace 2 filters for continuous hydraulic breaker operation only.

5) INITIAL 250 HOURS SERVICE

Check items	Service	Page
Engine oil	Change	4-19, 20
Engine oil filter	Replace	4-19, 20
Fuel pre-filter element	Replace	4-33
Fuel filter element	Replace	4-35
Pilot line filter element	Replace	4-43
Hydraulic oil return filter	Replace	4-43
Swing reduction gear oil	Change	4-44
Travel reduction gear oil	Change	4-46

6) EVERY 250 HOURS SERVICE

Check items	Service	Page
Charge air piping	Check	4-27
Charge air cooler	Check	4-27
Battery (voltage), battery cable and connections	Check, Clean	4-52
Swing bearing grease	Lubricate	4-45
Bolts & Nuts	Check, Tight	4-8
· Sprocket mounting bolts		
· Upper roller mounting bolt		
· Lower roller mounting bolt		
· Travel motor mounting bolts		
· Swing motor mounting bolts		
· Swing bearing mounting bolts		
· Engine mounting bolts		
· Counterweight mounting bolts		
· Turning joint locating bolts		
· Track shoe mounting bolts and nuts		
· Track guard mounting bolts		
· Hydraulic pump mounting bolts		
· Under cover mounting bolts		
Attachment pin and bushing	Lubricate	4-51
· Boom cylinder tube end		
· Boom foot		
· Boom cylinder rod end		
· Arm cylinder tube end		
· Arm cylinder rod end		
· Boom + Arm connecting		
· Bucket cylinder tube end		

7) EVERY 500 HOURS SERVICE

Check items	Service	Page
Engine oil*	Change	4-19, 20
Engine oil filter*	Replace	4-19, 20
Fuel pre-filter element	Replace	4-33
Fuel filter element	Replace	4-34
Radiator, cooler fin and charge air cooler	Check, Clean	4-27
Aircon and heater outer filter	Replace	4-55
Aircon and heater inner filter	Replace	4-55
Air cleaner element (primary)*1	Check, Clean	4-30

* If you use high sulfur containing fuel above than 0.5% or use low grade of engine oil reduce change interval.

*1 When working in dusty environments, more frequent cleaning is highly recommended.

8) EVERY 1000 HOURS SERVICE

Check items	Service	Page
Drive belt, cooling fan	Check	4-28
Cooling fan belt tensioner	Check	4-29
Travel motor reduction gear oil	Change	4-46
Swing reduction gear oil	Change	4-44
Swing gear and pinion grease	Change	4-45
Hydraulic oil return filter	Replace	4-43
Pilot line filter element	Replace	4-43
Hydraulic oil air breather element	Replace	4-43

9) EVERY 2000 HOURS SERVICE

Check items	Service	Page
Engine cleaning	Clean	4-36
Vibration damper (rubber)	Check	4-37
Vibration damper (viscous)	Check	4-39
Coolant, cooling system and antifreeze★2	Change, Flush	4-21, 22, 23, 24, 25, 26
Hydraulic oil★2	Change	4-42
Hydraulic oil suction strainer	Check, Clean	4-42
Air cleaner element (primary, safety)★3	Replace	4-30
Air cleaner (oil bath, option)	Disassemble, Clean, Replace	4-31
RCV lever	Check, Lubricate	4-46
Hoses, fittings, clamps (fuel, coolant, hydraulic)	Check, Retighten, Replace	-

★2 Conventional

★3 When working in dusty environments, more frequent replacing is highly recommended.

※ Change hydraulic oil every 600 hours of continuous hydraulic breaker operation.

10) EVERY 4000 HOURS SERVICE

Check items	Service	Page
Fuel tank air breather element	Replace	4-32

11) EVERY 5000 HOURS SERVICE

Check items	Service	Page
Overhead set (shop inspection)	Adjust	4-38, 39, 40
Hydraulic oil★4	Change	4-42

★4 HD Hyundai Construction Equipment genuine long life

※ Change hydraulic oil every 1000 hours of continuous hydraulic breaker operation.

12) EVERY 5000 HOURS SERVICE

Check items	Service	Page
Coolant, cooling system and antifreeze★4	Change, Flush	4-21, 22, 23, 24, 25, 26

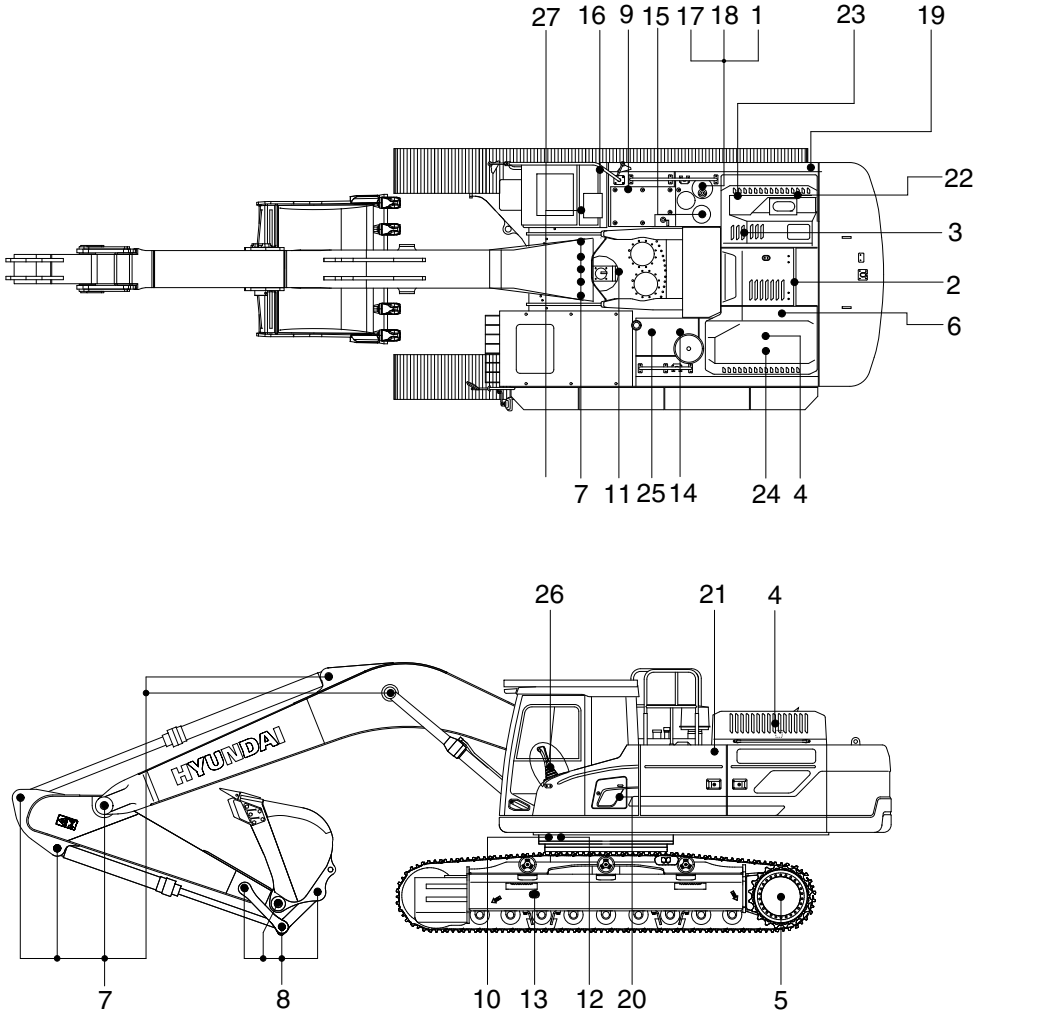
★4 HD Hyundai Construction Equipment genuine long life

13) WHEN REQUIRED

Whenever you have trouble with the machine, you must perform the service of related items, system by system.

Check items	Service	Page
Fuel system		
· Fuel tank	Drain or Clean	4-32
· Fuel pre-filter element	Replace	4-33
· Fuel filter element	Replace	4-34
· Fuel filler pump filter	Clean, Replace	4-40
· Fuel tank air breather element	Replace	4-32
Engine lubrication system		
· Engine oil	Change	4-19, 20
· Engine oil filter	Replace	4-19, 20
Engine cooling system		
· Radiator coolant	Add or Change	4-21, 22, 23, 24, 25, 26
· Radiator	Clean or Flush	4-21, 22, 23, 24, 25, 26
· Charge air cooler	Check, Clean	4-27
Engine air system		
· Air cleaner element (primary)	Clean or Replace	4-30
· Air cleaner element (safety)	Replace	4-30
· Air cleaner (oil bath, option)	Check, Clean, Replace	4-31
Hydraulic system		
· Hydraulic oil	Add or Change	4-41, 42
· Hydraulic oil return filter	Replace	4-43
· Pilot line filter element	Replace	4-43
· Hydraulic tank air breather element	Replace	4-43
· Hydraulic oil suction strainer	Clean	4-43
· RCV lever	Lubricate	4-46
Undercarriage		
· Track tension	Check, Adjust	4-47
Bucket		
· Tooth	Replace	4-49
· Side cutter	Replace	4-49
· Linkage	Adjust	4-49
· Bucket assy	Replace	4-48
Air conditioner and heater		
· Outer filter	Replace	4-55
· Inner filter	Replace	4-55

5. MAINTENANCE CHART



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Caution

1. Service intervals are based on the hour meter reading.
2. The number of each item shows the lubrication point on the machine.
3. Stop engine while filling oil and do not allow any open flames near the machine.

Service interval	No.	Description		Service action	Oil symbol	Capacity ℓ (U.S.gal)	Service points No.
10 Hours or daily	1	Hydraulic oil level		Check, Add	HO	275 (72.6)	1
	2	Engine oil level	HX500LT3 : -#00252 HX520LT3 : -#00265	Check, Add	EO	34.0 (9.0)	1
			HX500LT3 : #00253- HX520LT3 : #00266-			42.5 (11.2)	
	4	Radiator coolant		Check, Add	C	43 (11.4)	1
	6	Fan belt tension and damage		Check, Adjust	-	-	1
	7	Attachment pin & bushing★		Check, Lubricate	PGL	-	12
	9	Fuel tank		Check, Refill	DF	660 (174)	1
	21	Air cleaner (oil bath, option)		Check, Clean, Add	EO	5 (1.3)	1
	22	Fuel pre-filter element (water)		Check, Drain	-	-	1

★ For initial 100 hours

※ **Oil symbol**

Please refer to the recommended lubricants for specification.

DF : Diesel fuel GO : Gear oil HO : Hydraulic oil C : Coolant

PGL : Grease EO : Engine oil

Service interval	No.	Description		Service action	Oil symbol	Capacity ℓ (U.S.gal)	Service points No.
50 Hours or weekly	8	Bucket linkage pins		Check, Lubricate	PGL	-	8
	9	Fuel tank (water, sediment)		Check, Drain	-	-	1
	11	Swing reduction gear oil		Check, Add	GO	7.0 (1.8)×2	2
	13	Track tension		Check, Adjust	PGL	-	2
250 Hours	4	Charge air cooler and piping		Check	-	-	1
	4	Cooling fan		Check	-	-	1
	7	Attachment pins & bushings		Check, Lubricate	PGL	-	12
	10	Swing bearing grease		Check, Add	PGL	-	2
	14	Battery voltage, battery cable and connections		Check, Replace	-	-	1
Initial 250 Hours	2	Engine oil level	HX500LT3 : -#00252 HX520LT3 : -#00265	Change	EO	34.0 (9.0)	1
			HX500LT3 : #00253- HX520LT3 : #00266-			42.5 (11.2)	
	3	Engine oil filter		Replace	-	-	1
	5	Travel reduction gear oil		Change	GO	12.5 (3.3)×2	2
	11	Swing reduction gear oil		Change	GO	7.0 (1.8)×2	2
	15	Hydraulic oil return filter		Replace	-	-	1
	19	Pilot line filter element		Replace	-	-	1
	22	Fuel pre-heater element		Replace	-	-	1
	23	Fuel filter element		Replace	-	-	1
500 Hours	2	Engine oil level	HX500LT3 : -#00252 HX520LT3 : -#00265	Change	EO	34.0 (9.0)	1
			HX500LT3 : #00253- HX520LT3 : #00266-			42.5 (11.2)	
	3	Engine oil filter		Replace	-	-	1
	20	Aircon & heater outer filter		Replace	-	-	1
	20	Aircon & heater inner filter		Replace	-	-	1
	21	Air cleaner element (primary)		Check, Clean	-	-	1
	22	Fuel pre-filter element		Replace	-	-	1
	23	Fuel filter element		Replace	-	-	1
	24	Radiator, charge air cooler		Check, Clean	-	-	2
	25	Oil cooler		Check, Clean	-	-	1
1000 Hours	5	Travel reduction gear oil		Change	GO	12.5 (3.3)×2	2
	6	Drive belt, cooling fan hub		Check, Replace	-	-	2
	6	Cooling fan belt tensioner		Check, Replace	-	-	1
	11	Swing reduction gear oil		Change	GO	7.0 (1.8)×2	2
	12	Swing gear and pinion grease		Change	PGL	14.0 kg (31 lb)	1
	15	Hydraulic oil return filter		Replace	-	-	1
	17	Hydraulic tank air breather element		Replace	-	-	1
	19	Pilot line filter element		Replace	-	-	1

※ Oil symbol

Please refer to the recommended lubricants for specification.

DF : Diesel fuel GO : Gear oil HO : Hydraulic oil C : Coolant

PGL : Grease EO : Engine oil

Service interval	No.	Description	Service action	Oil symbol	Capacity ℓ (U.S.gal)	Service points No.
2000 Hours	1	Hydraulic oil★1	Change	HO	275 (72.6)	1
	2	Engine cleaning	Clean	-	-	1
	2	Vibration damper (rubber)	Check, Replace	-	-	4
	2	Vibration damper (viscous)	Check, Replace	-	-	4
	4	Coolant, cooling system and antifreeze★1	Change	C	43 (11.4)	1
	18	Hydraulic oil suction strainer	Check, Clean	-	-	1
	21	Air cleaner element (primary, safety)	Replace	-	-	2
	21	Air cleaner (oil bath, option)	Disassemble, Clean, Replace	EO	5 (1.3)	1
	26	RCV lever	Check, Lubricate	PGL	-	2
	-	Hoses, fittings, clamps (fuel, coolant, hydraulic)	Check, Retighten, Replace	-	-	-
5000 Hours	1	Hydraulic oil★2	Change	HO	275 (72.6)	1
	2	Overhead set (shop inspection)	Adjust	-	-	1
6000 Hours	4	Coolant, cooling system and antifreeze★2	Change	C	43 (11.4)	1
As required	20	Aircon & heater outer filter	Replace	-	-	1
	20	Aircon & heater inner filter	Clean, Replace	-	-	1
	21	Air cleaner element (primary)	Clean, Replace	-	-	1
	21	Air cleaner element (safety)	Replace	-	-	1
	21	Air cleaner (oil bath, option)	Check, Clean, Replece	EO	5 (1.3)	1
	27	Fuel filler pump filter	Clean, Replace	-	-	1

★1 Conventional ★2 HD Hyundai Construction Equipment genuine long life

※ Oil symbol

Please refer to the recommended lubricants for specification.

DF : Diesel fuel GO : Gear oil HO : Hydraulic oil C : Coolant

PGL : Grease EO : Engine oil

1) CHECK ENGINE OIL LEVEL

Check the oil level with the machine on flat ground before starting engine.

(1) Pull out the dipstick and wipe with a clean cloth.

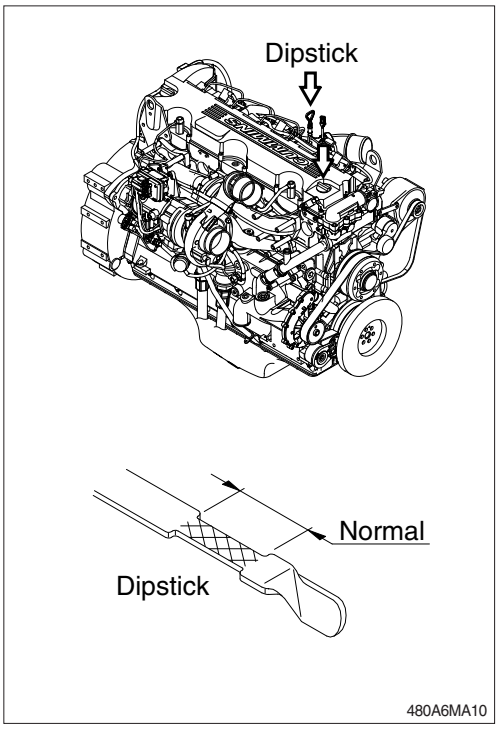
(2) Check the oil level by inserting the dipstick completely into the hole and pulling out again.

(3) If oil level is LOW, add oil and then check again.

※ **If the oil is contaminated or diluted, change the oil regardless of the regular change interval.**

※ **Check oil level after engine has been stopped for 15 minutes.**

⚠ **Do not operate unless the oil level is in the normal range.**



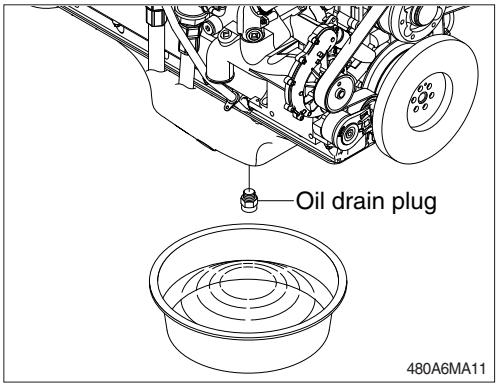
2) REPLACEMENT OF ENGINE OIL AND OIL FILTER

(1) Operate the engine until the coolant temperature reaches 60˚C (140˚F). Shut off the engine.

(2) Remove the oil drain plug. Drain the oil immediately to be sure all the oil and suspended contaminants are removed from the engine.

※ **A drain pan with a capacity of 40 liters (10.6 U.S. gallons) will be adequate.**

※ **Dispose of the waste oil in accordance with local regulations.**

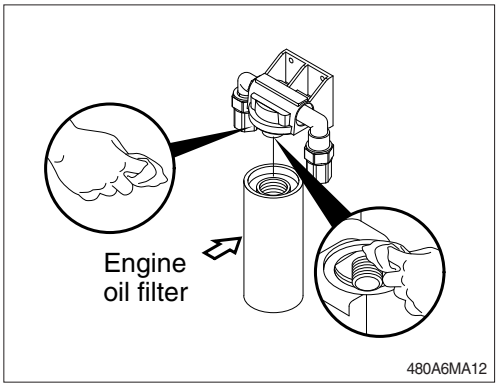


(3) Clean the area around the lubricating oil filter head.

(4) Use oil filter wrench to remove the oil filter.

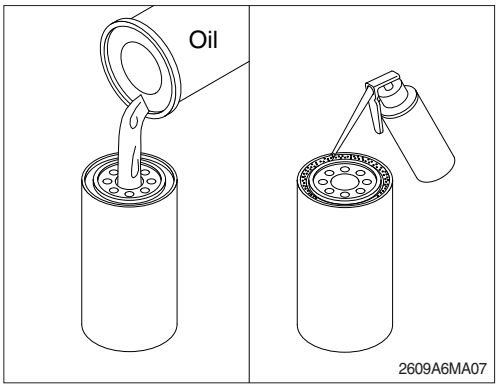
(5) Clean the gasket surface of oil filter head.

※ **The O-ring can stick on the filter head. Be sure it is removed before installing the new filter.**



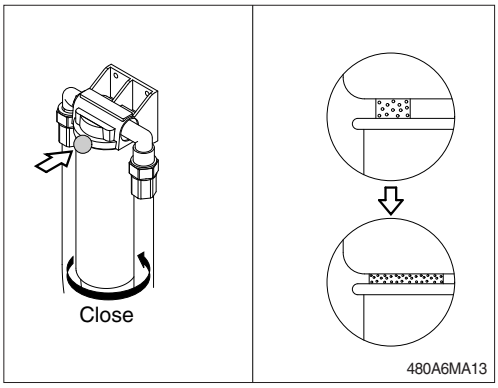
(6) Apply a light film of lubricating oil to the gasket sealing surface before installing the filters.

※ **Fill the filters with clean lubricating oil.**



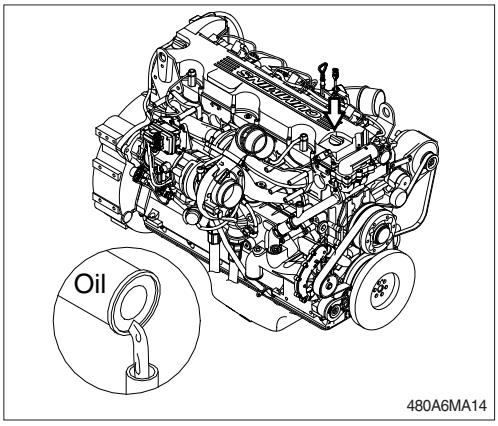
(7) Install the filter to the filter head.
Tighten the filter until the gasket contacts the filter head surface.
Tighten 3/4 to 1 turn after the gasket makes contact with the filter head.

※ **Mechanical over-tightening may distort the threads or damage the filter element seal.**

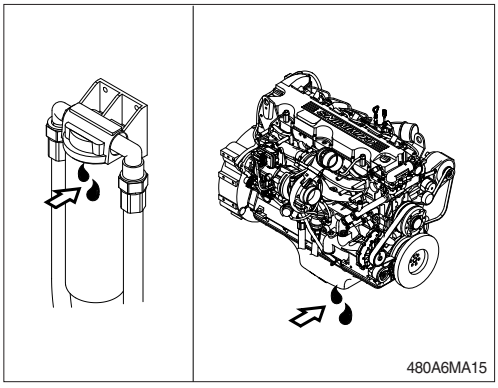


(8) Clean and check the lubricating oil drain plug threads and sealing surface.
Install the lubricating oil pan drain plug.

(9) Fill the engine with clean oil to the proper level.
· Quantity : 34 ℓ (9.0 U.S.gallons)



(10) Operate the engine at low idle and inspect for leaks at the filters and the drain plug.
Shut the engine off and check the oil level with the dipstick. Allow 15 minutes for oil to drain down before checking.



3) CHECK RADIATOR COOLANT

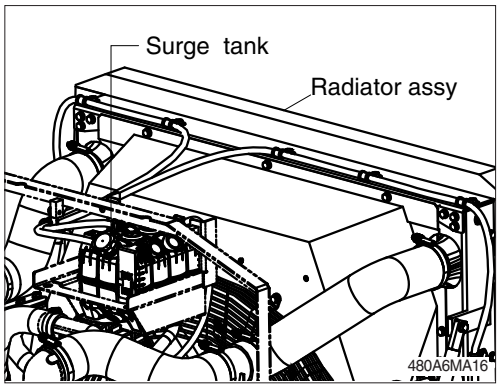
(1) Check if the level of coolant in surge tank is between MAX and MIN.

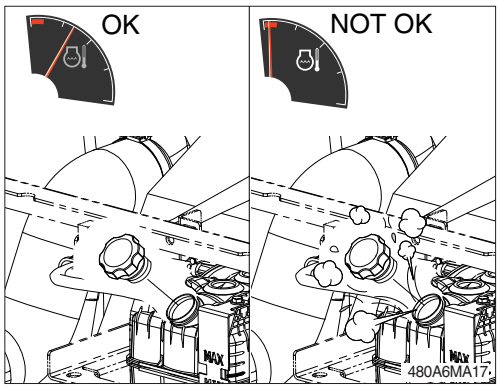
(2) Add the mixture of antifreeze and water after removing the cap of the surge tank if coolant is not sufficient.

(3) Replace gasket of surge cap when it is damaged.

⚠ **Hot coolant can spray out if surge tank cap is removed while engine is hot. Remove the cap after the engine has cooled down.**

※ **Do not add cold coolant to a hot engine ; engine castings can be damaged. Allow the engine to cool to below 50°C (120°F) before adding coolant.**





4) COOLANT TEST STRIPS INSTRUCTIONS

(1) Pre-test instruction

Recommended testing frequency - at every coolant filter change interval.

① Collect coolant sample from the radiator drain valve.
- Do not collect from the coolant recovery or overflow system
- Coolant must be between 10~54℃ when tested
- Room temperature is best.

② For accurate results, test must be completed within 75 seconds.
- Follow recommended test times. Use a stopwatch.

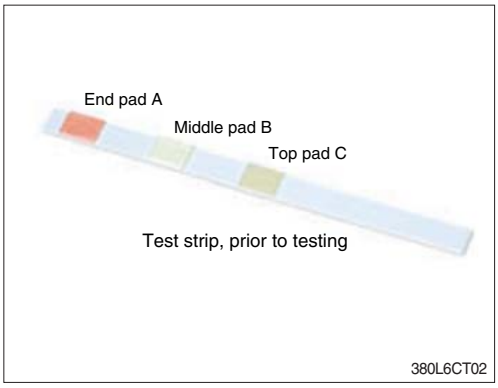
③ Record and track results.

380L6CT01

(2) Test instruction

① Remove one strip from bottle and replace cap immediately.
Do not touch the pads on the end of the strip. Discard kit if nitrite test pads of unused strips have turned brown.

② Dip strip for 1 second in coolant sample, remove, and shake strip briskly to remove excess liquid.



380L6CT02

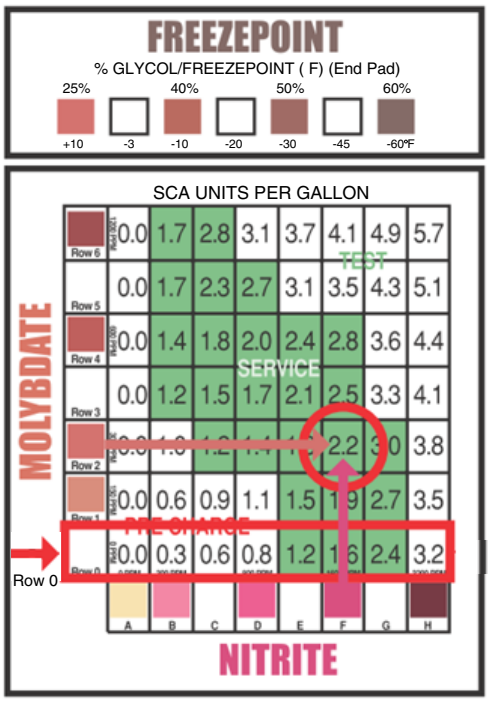
③ 45 seconds after dipping strip, compare results to color chart and record in the following order:

for DCA4:

④ All three readings must be completed no later than 75 seconds after dipping strip.

⑤ If uncertain about the color match, pick the low numbered block.
ex.) If nitrite color is not F, use column E.

⑥ Determine where the molybdate level intersect the nitrite level on the chart. The amount of SCA units per gallon in the cooling system is given where the molybdate row intersect the nitrite column.



380L6CT03

(3) Maintenance actions based on results

① Above normal

ABOVE NORMAL - Do not replace the coolant filter or add DCA4 liquid until additive concentration falls below 3 units per gallon.

- Test at every subsequent coolant filter change interval.

② Normal

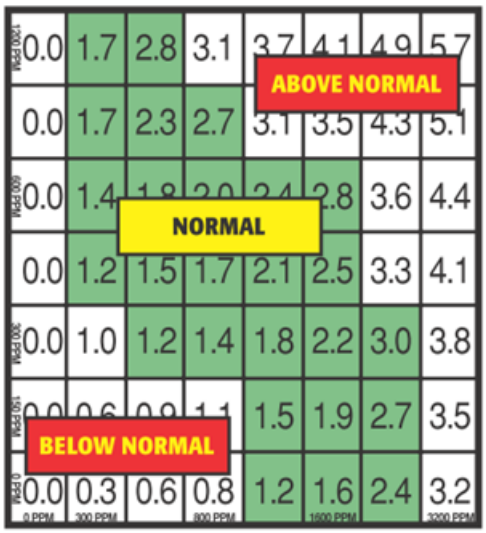
NORMAL - Continue to replace the coolant filter at your normal interval.

③ Below normal

BELOW NORMAL - Replace the coolant filter and add 1 pint of additive per each 4 gallons of coolant.

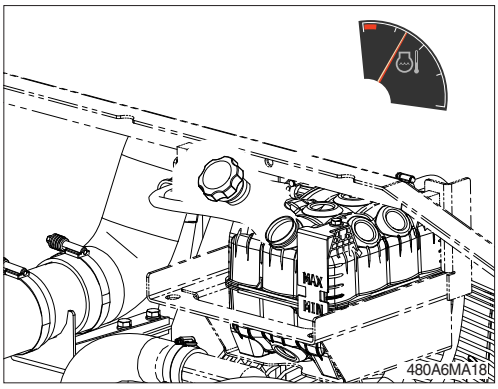
- Replace the coolant filter and add 40 cc of additive per each 1 liter of coolant.

※ If you need part number of Test kit or DCA4, please see Parts Manual.



380L6CT04

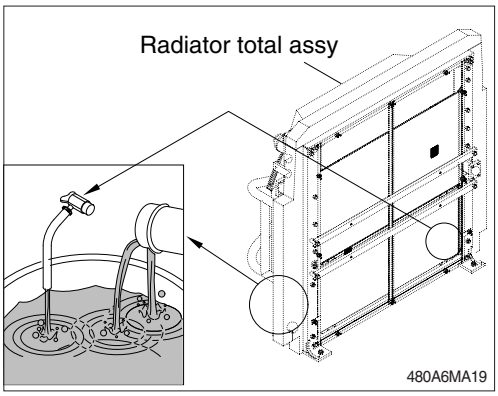
5) FLUSHING AND REFILLING OF RADIATOR



(1) Change coolant

⚠ Avoid prolonged and repeated skin contact with used antifreeze. Such prolonged and repeated contact can cause skin disorders or other bodily injury.
Avoid excessive contact-wash thoroughly after contact.
Keep out of reach is made of children.

※ Protect the environment : Handling and disposal of used antifreeze can be subject to federal, state, and local law regulation.
Use authorized waste disposal facilities, including civic amenity sites and garages providing authorized facilities for the receipt of used antifreeze.
If in doubt, contact your local authorities for guidance as to proper handling of used antifreeze.



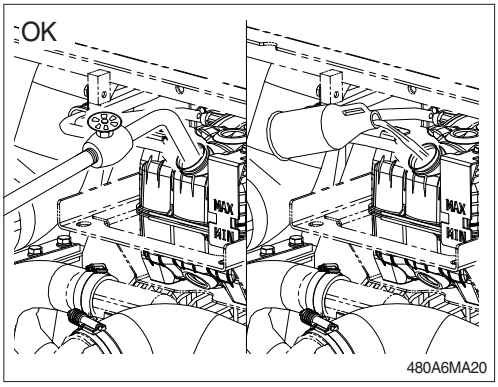
⚠ Wait until the temperature is below 50˚C (122˚F) before removing the coolant system pressure cap.
Failure to do so can cause personal injury from heated coolant spray.
Drain the cooling system by opening the drain valve on the radiator and opening the drain valve on the bottom of the engine oil cooler housing.
A drain pan with a capacity of 50 liters (13.2 U.S. gallons) will be adequate.

(2) Flushing of cooling system

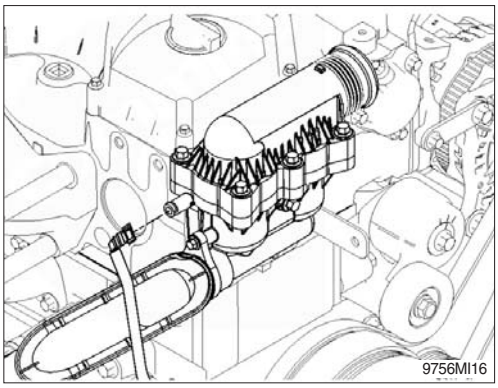
① Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).

※ Use 0.5kg (1.0 pound) of sodium carbonate for every 23 liters (6.0 U.S. gallons) of water.

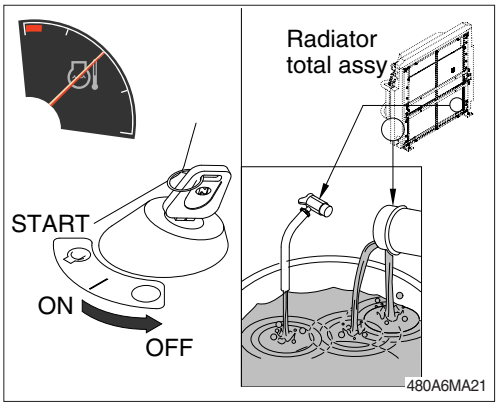
※ Do not install the surge tank cap. The engine is to be operated without the cap for this process.



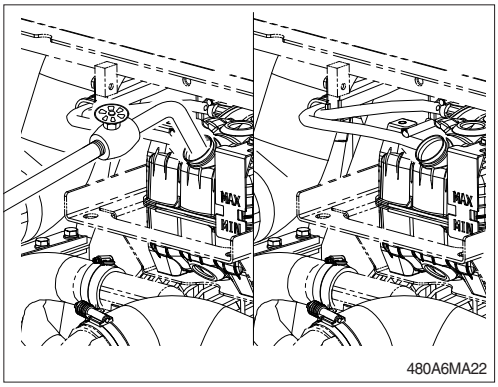
※ During filling, air must be vented from the engine coolant passages.
The system must be filled slowly to prevent air locks or serious engine damage can result. Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.
※ This provides adequate venting for a fill rate of 19 ℓ (5.0 U.S. gallons) per minute.



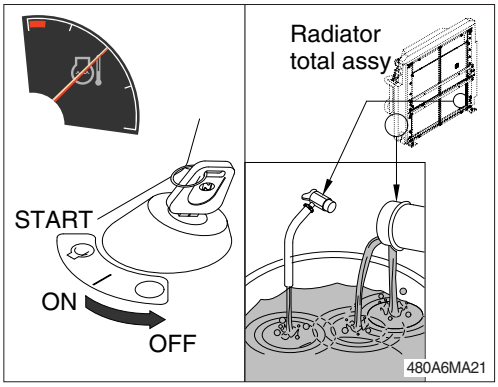
② Operate the engine for 5 minutes with the coolant temperature above 80˚C (176˚F) .
Shut the engine off, and drain the cooling system.



③ Fill the cooling system with clean water.
※ Be sure to vent the engine and aftercooler for complete filling.
※ Do not install the surge tank cap or the new coolant filter.



④ Operate the engine for 5 minutes with the coolant temperature above 80˚C (176˚F) .
Shut the engine off, and drain the cooling system.
※ If the water being drained is still dirty, the system must be flushed again until the water is clean.

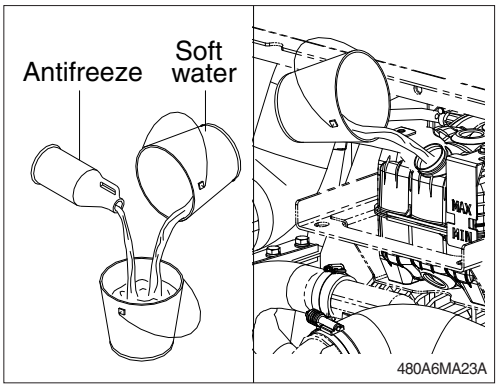


(3) Cooling system filling

① Use a mixture of 50 percent soft water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to page 7-37.
Cooling capacity (engine only) : 14.4 ℓ
(3.8 U.S.gallons)

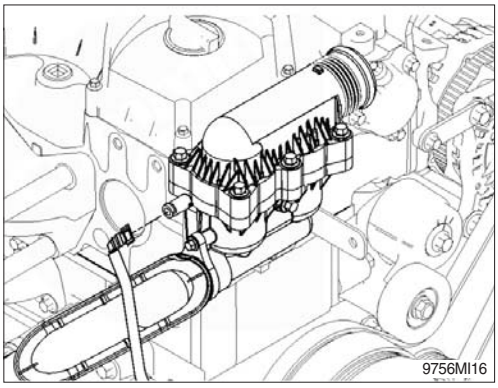
※ **Never use water alone for coolant.**
This can result in damage from corrosion.

※ **Do not use hard water such as river water or well water.**



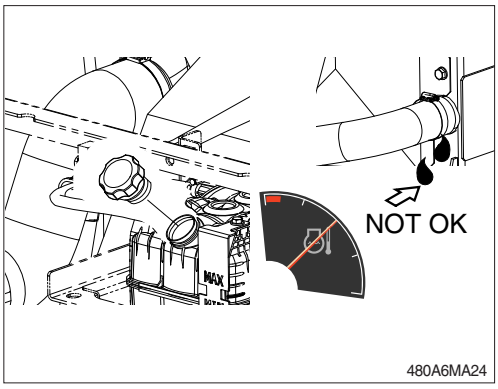
② The system has a maximum fill rate of 19 liters (5.0 U.S. gallons) per minute.
Do not exceed this fill rate.

※ **The system must be filled slowly to prevent air locks.**
During filling, air must be vented from the engine coolant passage.
Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.



③ Install the surge tank cap. Operate the engine until it reaches a temperature 80˚C (176˚F), and check for coolant leaks.
Check the coolant level again to make sure the system is full of coolant after allow engine to cool.

※ **If the gasket of the surge tank cap is damaged, discard the old filler cap and install a new cap.**

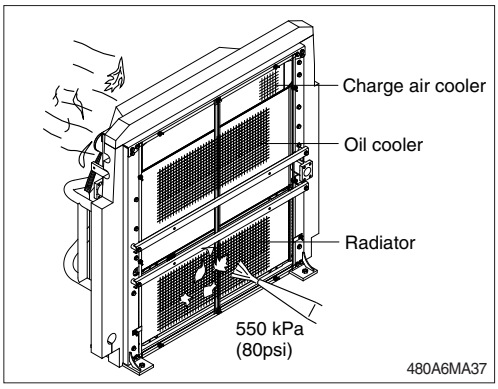


6) CLEAN RADIATOR AND OIL COOLER

Check, and if necessary, clean and dry outside of radiator and oil cooler. After working in a dusty place, clean radiator more frequently.

(1) Visually inspect the radiator for clogged radiator fins.

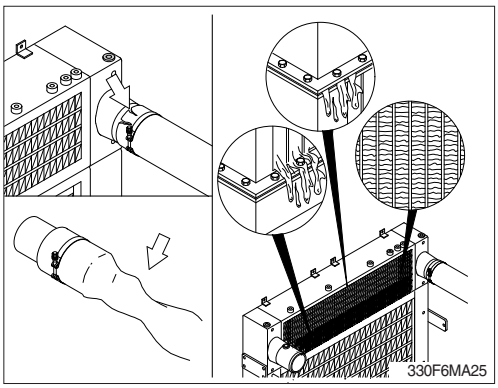
(2) Use 550 kPa (80 psi) air pressure to blow the dirt and debris from the fins.
Blow the air in the opposite direction of the fan air flow.



(3) Visually inspect the radiator for bent or broken fins.

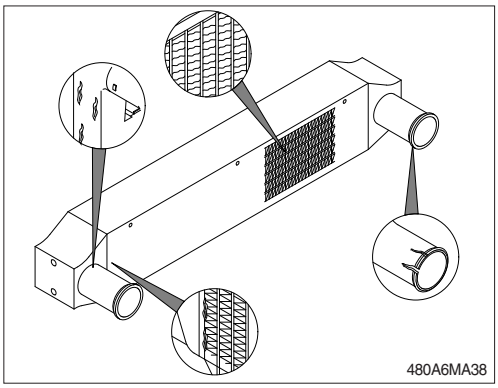
※ **If the radiator must be replaced due to bent or broken fins which can cause the engine to overheat, refer to the manufacturer's replacement procedures.**

(4) Visually inspect the radiator for core and gasket leaks.



7) CHECK CHARGE AIR COOLER

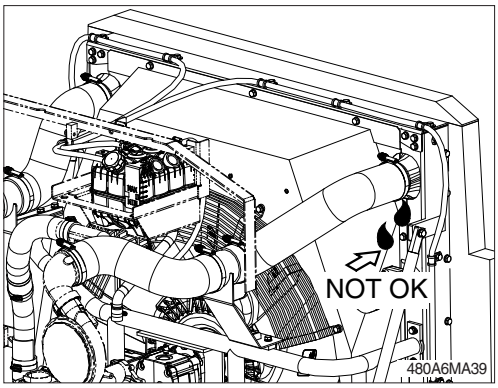
Inspect the charge air cooler for dirt and debris blocking the fins. Check for cracks, holes, or other damage. If damage is found, please contact your local HD Hyundai Construction Equipment distributor.



8) CHARGE AIR PIPING

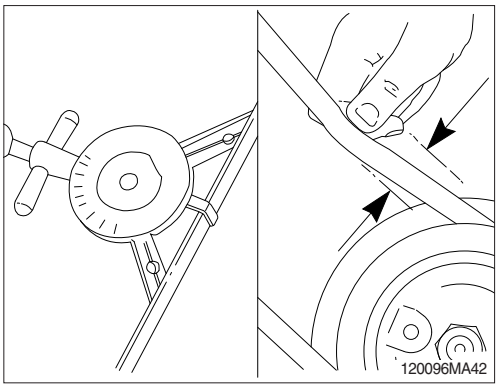
(1) Inspect the charge air piping and hoses for leaks, holes, cracks, or loose connections.

(2) Tighten the hose clamps if necessary.

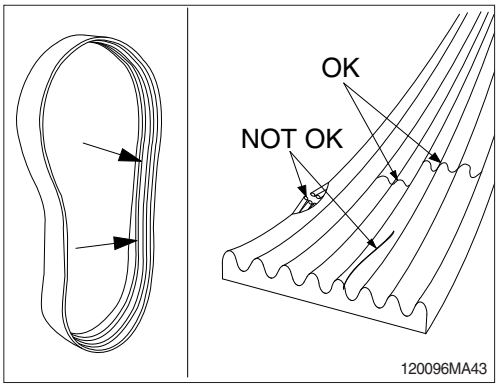


9) FAN BELT

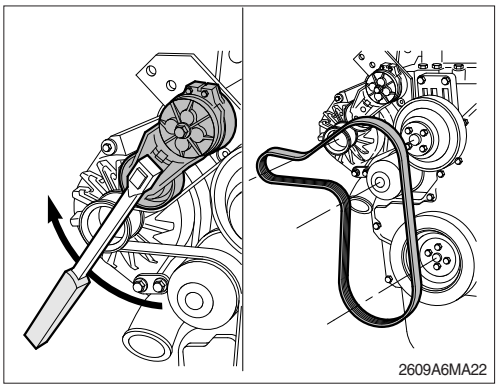
(1) A deflection method can be used to check belt tension by applying 11.3 kgf (25 lbf) of force between the pulleys on V-belts. If the deflection is more than one belt thickness per foot of pulley center distance, the belt tension must be adjusted.



(2) Inspect the fan belt for damage.
① Transverse (across the belt) cracks are acceptable.
② Longitudinal (direction of belt ribs) cracks that intersect with transverse cracks are not acceptable.



(3) Inspect the idle and drive pulleys for wear or cracks.

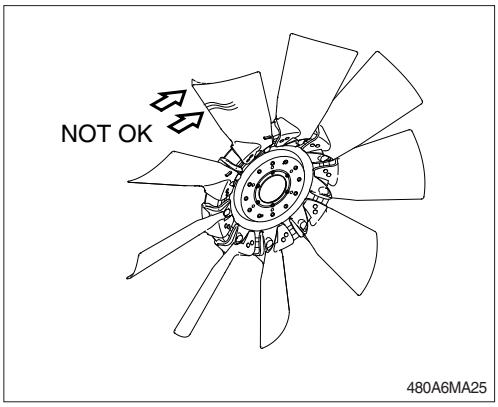


10) INSPECTION OF COOLING FAN

⚠ Serious injury can result from a fan blade failure. Never pull or pry on the fan. This can damage the fan blade and cause fan failure.

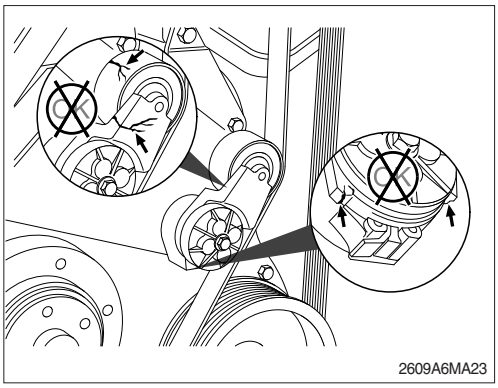
※ Rotate the crankshaft by using the engine bearing gear.

※ A visual inspection of the cooling fan is required daily.
Check for cracks, loose rivets, and bent or loose blades.
Check the fan to make sure it is securely mounted. Tighten the capscrews if necessary.
Replace any fan that is damaged.

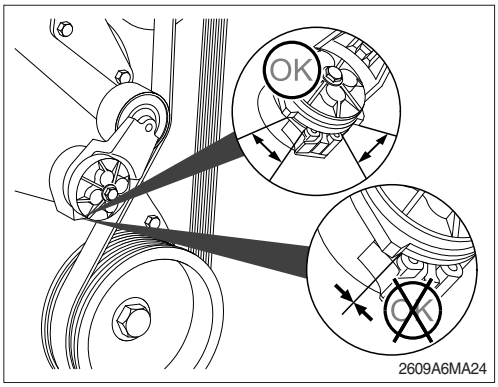


11) FAN BELT TENSIONER

(1) With the engine stopped, check the tensioner arm, pulley, and stops for cracks. If any cracks are found, the tensioner must be replaced.

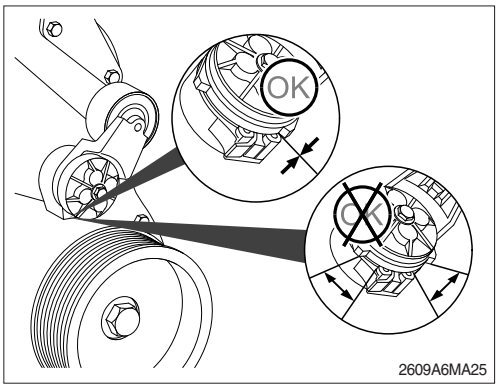


(2) With the belt installed, verify that neither tensioner arm stop is in contact with the spring case stop.
After replacing the belt, if the tensioner arm stops are still in contact with the spring case stop, replace the tensioner.

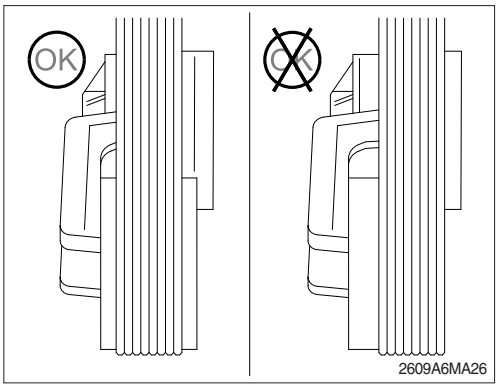


(3) With the belt removed, verify that the tensioner arm stop is in contact with the spring case stop.
If these two are not touching, the tensioner must be replaced.

※ **After replacing the belt, if the tensioner arm stop is still in contact with the spring case stop, the tensioner must be replace.**



(4) Check the location of the drive belt on the belt tensioner pulley. The belt should be centered on, or close to the middle of the pulley. Misaligned belts, either too far forward or backward, can cause belt wear, belt roll-offs, or increase uneven tensioner bushing wear.



12) CLEANING OF AIR CLEANER ELEMENT

(1) Primary element

① Open the cover and remove the element.

② Clean the inside of the body.

※ **Do not clean the filter element by striking or hitting the filter against any object to shake the debris from the filter element.**

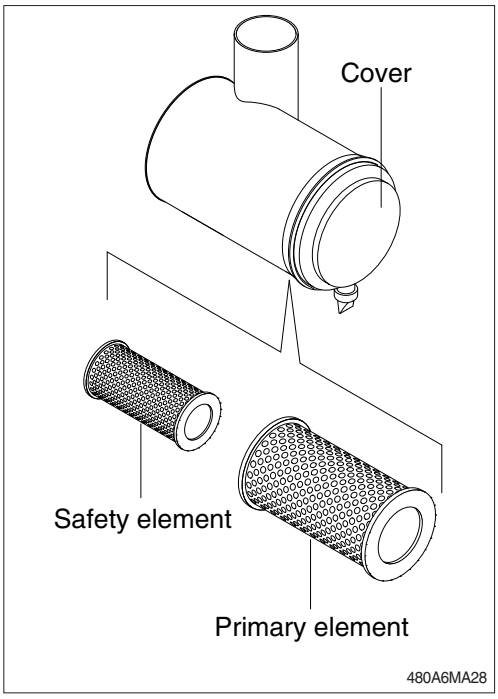
③ Clean the element with pressurized air.

· Remove the dust inside of the element by the pressurized air (below 3 kgf/cm^2, 40 psi) forward and backward equally.

④ Visually inspect for cracks or damage of element by putting a light bulb inside of the element.

⑤ Insert element and tighten the clamps.

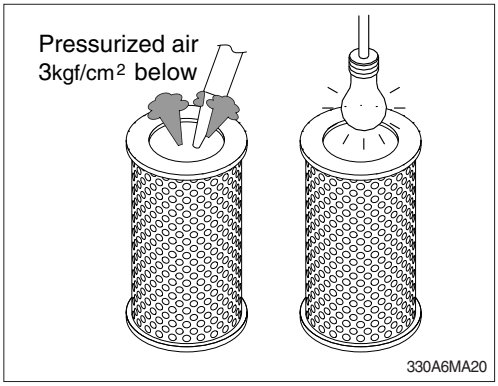
※ **Replace the primary element after 4 cleanings.**



(2) Safety element

※ **Replace the safety element only when the primary element is cleaned 4 times.**

※ **Always replace the safety element. Never attempt to reuse the safety element by cleaning the element.**



13) AIR CLEANER (OIL BATH, OPTION)

※ In harsh working condition, the filter element must be inspected and cleaned daily or change the oil.

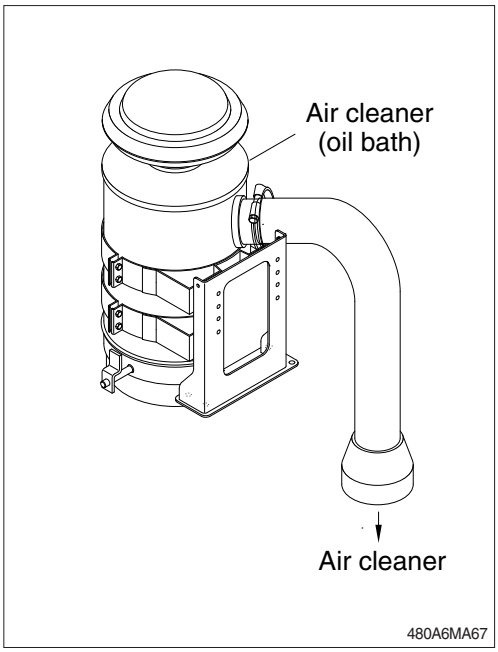
※ Failure to manage filters can cause degradation. If the filter is clogged, engine damage and power loss will occur.

※ In order to ensure the filtration efficiency of oil bath, it is recommended to replace a set of metal elements every year.

※ The maximum ash capacity of the filter element is approximately to 14 kg (31 lb).

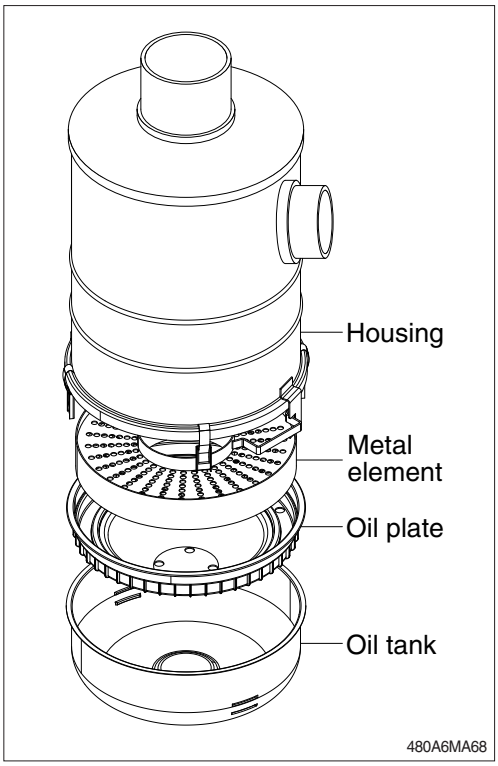
(1) Check air cleaner

Check the inside and outside of the air cleaner. If filled the dust in the cup about half, clean the cup.



(2) Cleaning and replacement of filter element

① Disassemble as shown the illustration.
② Check the filter element with the light.
③ Clean or change the filter elment if necessary. Immerse the filter element in diesel for 20 to 30 minutes, take out the filter element and then wash is with diesel to remove the remaining dust on the filter element.
④ Use commpressed air to dry completely.
⑤ Check the housing.
⑥ Check the lower body of the air cleaner and center tube everytime when the oil tank is serviced. Replace any broken, cracked or missing part.
⑦ After serviced, assemble oil tank with oil plate and fill the engine oil (3~5 ℓ / 0.8~1.3 U.S. gal) in the guide line. Frequently check whether the oil tank buckle for looseness.



14) FUEL TANK

※ Remove the strainer of the fuel tank and clean it if contaminated.

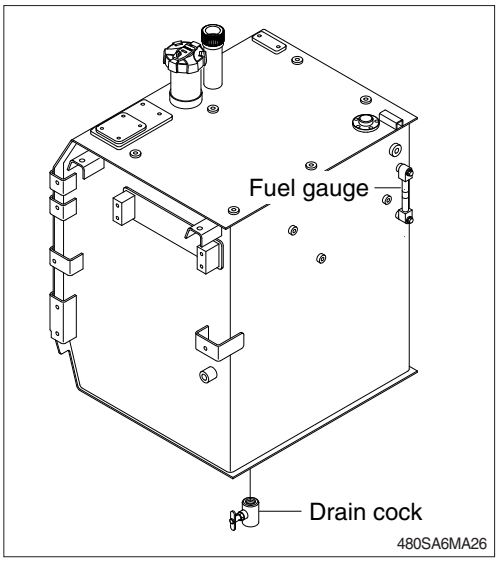
(1) Fill fuel tank fully to minimize water condensation, and check the fuel level gauge before starting the machine.

(2) Drain the water and sediment in the fuel tank by opening the drain cock.

※ Be sure to LOCK the cap of fuel tank.

※ Remove the strainer of the fuel tank and clean it if contaminated.

⚠ Stop the engine when refueling.
All lights and flames shall be kept at a safe distance while refueling.



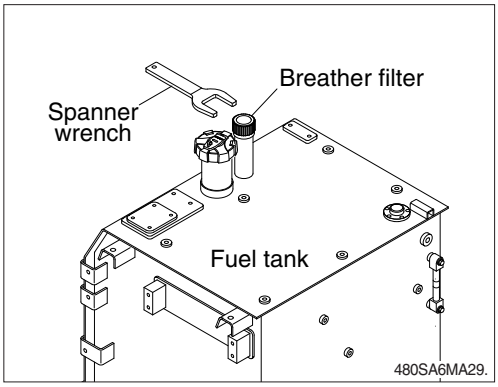
15) REPLACEMENT OF FUEL TANK BREATHER FILTER

(1) Stop the engine.

(2) Remove the breather filter using the special spanner wrench and dispose it in accordance with environmental regulations.

(3) Replace the filter with a new one.

· Tightening torque : 0.95 kgf·m (6.9 lbf·ft)



16) FUEL PRE-FILTER ELEMENT

※ Inspect or drain the collection bowl of water daily and replace the element every 500 hours.

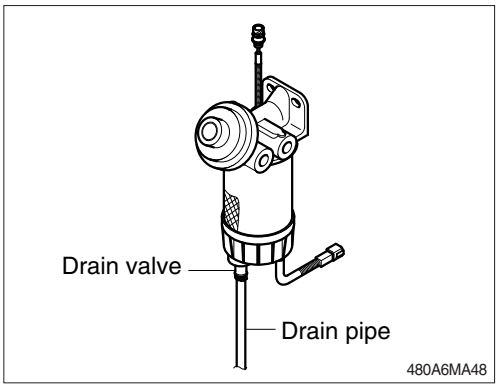
(1) Drain water

① Open bowl drain valve to evacuate water.

② Close drain valve.

※ Do not overtighten drain valve.

※ Please inspect and drain water frequently for remain water volume to be less than 1/3 volume of a collection bowl.



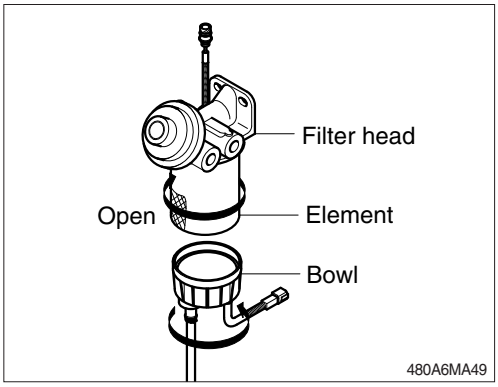
(2) Replace element

① Drain the unit of fuel. Follow "Drain water" instructions above.

② Remove element and bowl from filter head.

※ The bowl is reusable, do not damage or discard.

③ Separate element from bowl. Clean bowl and seal gland.

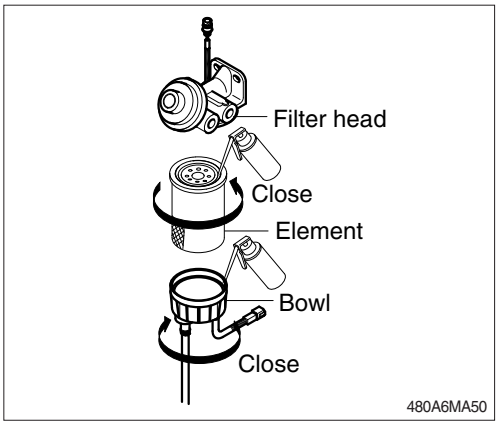


④ Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.

⑤ Attach bowl to new element firmly by hand.

⑥ Lubricate new element seal and place in element top gland.

⑦ Attach the element and bowl to the head.



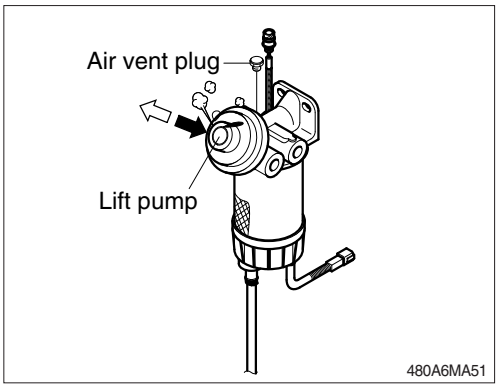
(3) Air bleeding

① Loosen air vent plug at the outlet of fuel pre-filter.

② Hand-prime the lift pump repeatedly until air bubbles comes out from air vent hole completely.

③ Tighten the air vent plug.

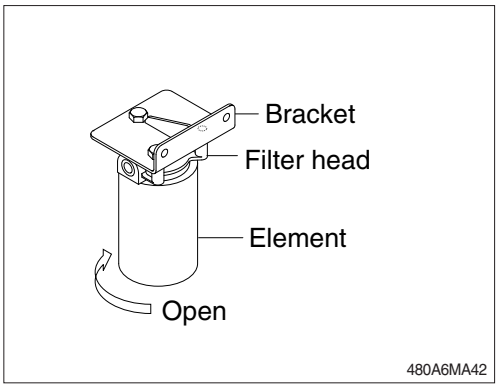
⚠ The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel. Do not loosen any fittings while the engine is running. Failure to comply may result in serious injury or death. Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to decrease.



17) REPLACEMENT OF FUEL FILTER ELEMENT

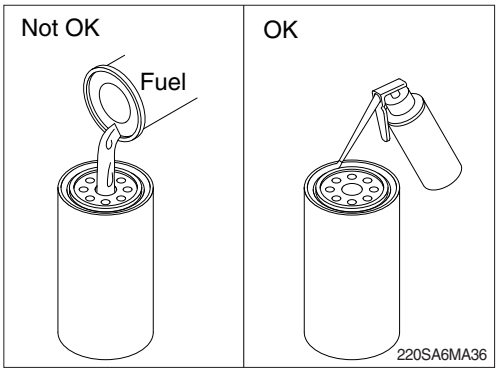
(1) Clean the area around the filter head, remove the filter with a fuel filter wrench and clean the O-ring surface.

※ **Make sure O-ring does not stick to filter head. Remove O-ring with screwdriver if necessary.**



(2) Lubricate the O-ring of fuel filter with clean engine oil.

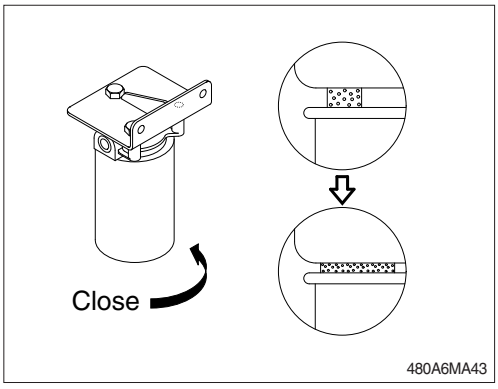
※ **Do not pre-fill the fuel filter with fuel. The system must be primed after the fuel filter is installed. Pre-filling the fuel filter can result in debris entering the fuel system and anmaging fuel system components.**



(3) Install the filter on the filter head.

※ **Tighten the filter until the gasket contacts the filter head surface and tighten the filter an additional 3/4 turn more after contacts the filter head.**

※ **Mechanical overtightening can distort the threads or damage the filter element seal.**



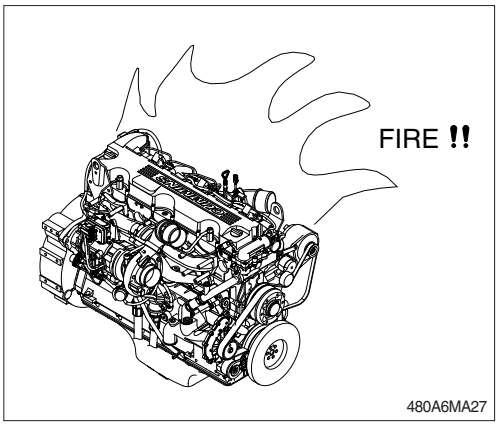
(4) Prime the low pressure system of the fuel system after fuel filter installation

※ **It is not necessary to vent air from the high pressure system before starting the engine.**

⚠ **The fuel pump high-pressure fuel lines and fuel rail contain very high-pressure fuel. Never loosen any fittings while the engine is running. Personal injury and property damage can result.**

18) LEAKAGE OF FUEL

⚠ Use care when cleaning the fuel hose, injection pump, fuel filter and other connections as the leakage from these part can cause fire.



19) ENGINE CLEANING

⚠ When using a steam cleaner, wear safety glasses or a face shield, as well as protective clothing. Hot steam can cause serious personal injury.

※ Turn OFF the master switch mounted electric box.

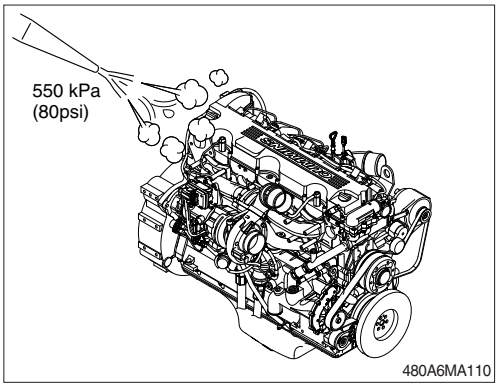
※ Spraying high pressure steam near or into electrical components can cause damage.

(1) Steam is the recommended method of cleaning a dirty engine or a piece of equipment.

(2) Protect all electrical components, openings, and wiring from the full force of the spray nozzle.

(3) Components to protect include, but are not limited to the following:

- Electrical components and connectors
- Wiring harnesses
- Electronic control module (ECM) and connectors.
- Belts and hoses
- Bearings (ball or taper roller)



△ Soap, solvent, or water ingress into air intake system can cause engine damage.

△ Do not directly spray or allow soap, solvent, or water to enter any passages, ports, or cowlings that lead to the engine air intake system.

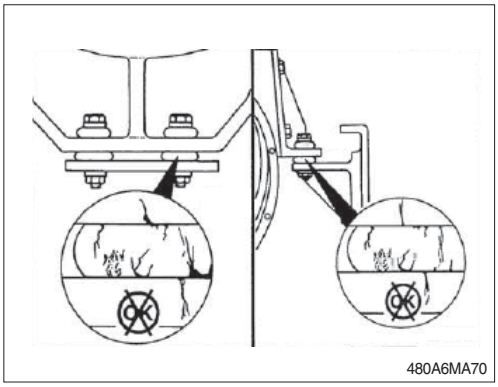
20) VIBRATION DAMPER AND VISCOUS

※ **Damaged engine mounts and brackets can cause engine misalignment. Drivetrain component damage can result in excessive vibration complaints.**

(1) Inspect all rubber-cushioned mounts for cracks and other damage. Look for interfence or contact between metal components.

(2) Inspect all mounting brackets for cracks and damaged bolt holes.

(3) Replace any damaged parts as necessary.
Damaged engine mounts, brackets, and mounting hardware can cause the engine to move out of alignment and damage the driveline conponents in the machine.
This can result in vibration complaints.



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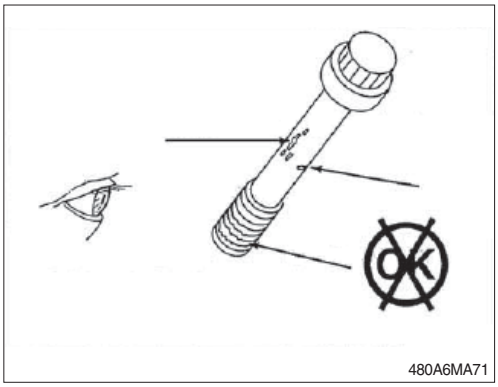
(4) Inspect the capscrew for the following.

① Damaged threads
② Rust or corrosion-caused pitting.
③ Nicked, bent, stretched, or galled.

※ **The capscrew must be replaced if it has any of the listed damages.**



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21) OVERHEAD SET ADJUSTMENT

※ **These procedures are performed at repair shop.**

※ **Service tools**

- Cummins barring tool, p/no. 4919092
- Feeler gauge, p/no, 3163172, 3163171

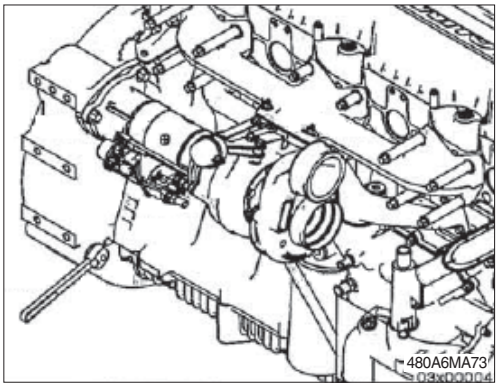
(1) Preparatory steps

① Disconnect the batteries.
② Remove the open crankcase ventilation hose.
③ Remove the fuel injector supply lines.
④ Remove the rocker lever cover and gasket.

(2) Adjust

※ **For ambient air temperatures of 30˚C (86˚F) and below, allow the engine to cool for 1.5 hours prior to checking or setting the valve lash.**

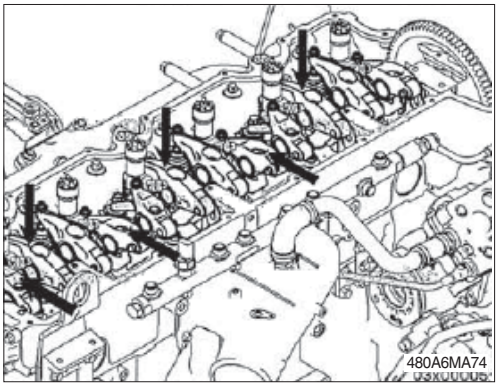
For ambient air temperatures above 30˚C (86˚F), allow the engine to cool for 2.5 hours prior to checking or setting the valve lash.



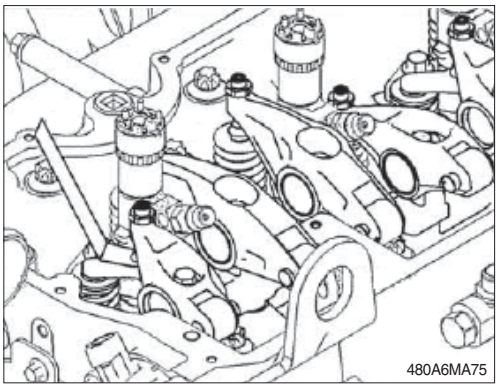
① Use the barring tool to rotate the crankshaft until the number 1 cylinder is at top dead center (TDC). The barring port can be found on the bottom of the flywheel housing.

② Top dead center (TDC) for the number 1 cylinder can be found by lining up the hole in the vibrations damper and the lubricating pump housing. The rockers for the number 1 cylinder must be free to move. If the rockers for the number 6 cylinder are free to move, the crankshaft must be rotated 360 degrees.

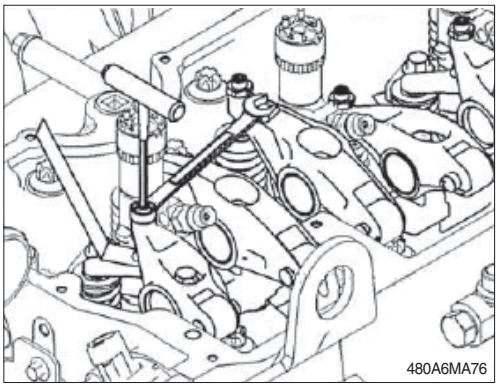
③ With the engine in this position, lash can be measured on the following rocker levers.
- Exhaust valve of cylinders 1, 3 and 5
- Intake valve of cylinders 1, 2 and 4



※ **Checking the overhead setting is usually performed as part of a troubleshooting procedure, and resetting is not required during checks, as long as the lash measurements are within specifications.**



※ **The clearance is correct when some resistance is "felt" when the feeler gauge is slipped between the crosshead and the rocker lever socket.**



④ Measure lash by inserting a feeler gauge between the valve and the rocker lever socket. If the lash measurement is out of specification, loosen the locknut, and adjust the lash to naminal specifications. Use feeler gauge 3163172 and 3163171 to measure the lash.

- Intake valve lash (normal) 0.36 ± 0.08 mm [0.014 ± 0.003 in]
- Exhaust valve lash (normal) 0.69 ± 0.08 mm [0.027 ± 0.003 in]

⑤ Tighten the locknut and measure the lash again.

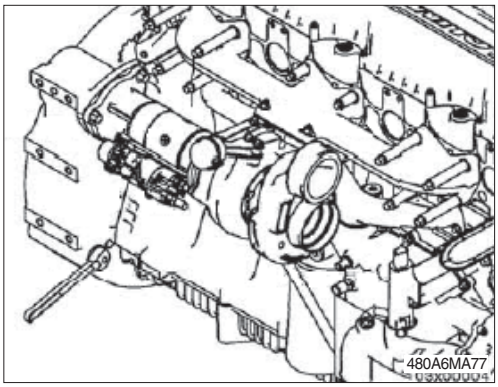
⚠ **Engine damage can occur if the running clearance is not within specifications.**

· Tightening value : 2.9 kgf·m (20.7 lbf·ft)

⑥ Use barring tool, to rotate the crankshaft 360 degrees.

⑦ Following the same steps and specifications as previously stated, measure lash for the following rocker levers.
(E = exhaust, I = Intake)

- Exhaust valve of cylinders 2, 4 and 6
- Intake valve of cylinders 3, 5 and 6
- Reset if out of spenification.



(3) Finishing steps

① Install the gasket and rocker lever cover.
② Install the fuel injector supply lines.
③ Install the crankcase ventilation hose.
④ Connect the batteries.
⑤ Operate the engine and check for leaks.

22) FUEL FILLER PUMP FILTER

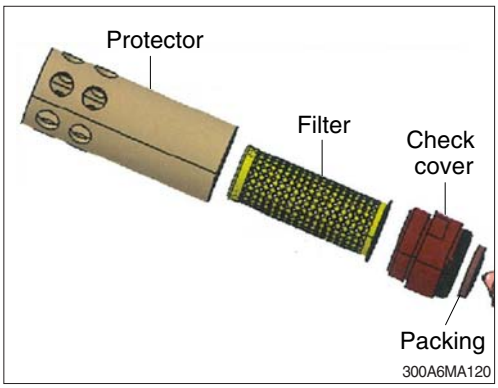
Clean the filter periodically as followings.

(1) Clean the filter when it is required by visual inspection.

(2) Replace the filter when it is permanently damaged.

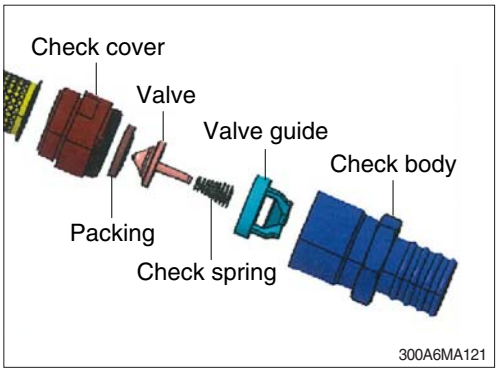
※ Clean with fuel or compressed, water should not be mixed.

※ The structure can be loosened by hand.



(3) Check valve

① Except for maintenance, the check valve must have been equipped to the hose at all times.
② Clean or replace check valve when foreign material is found in valve.



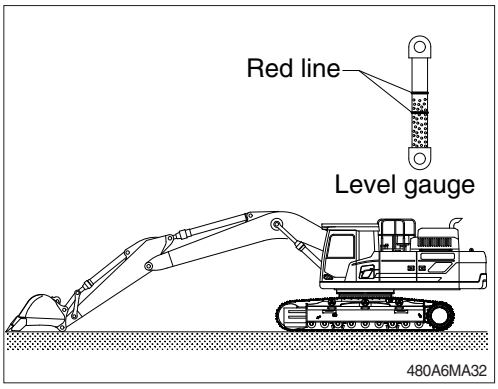
23) HYDRAULIC OIL CHECK

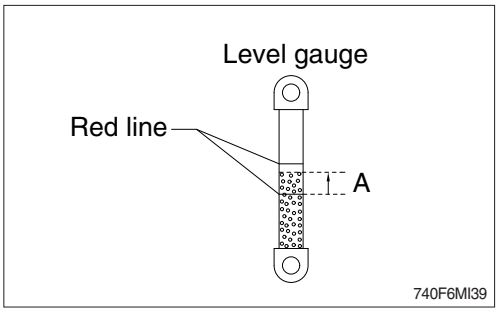
(1) Position the machine as shown in the illustration on the right. Please stop the engine and wait for about 5 minutes.

(2) Check the oil level at the level gauge of hydraulic oil tank.

(3) The oil level is normal if the oil is between the red lines. The oil level depends on the temperature of the hydraulic oil. Refer to the height (A) in the below table to check the level gauge.

Temperature (℃)	Height A (mm)
0	15
10	25
20	30
30	35
40	40





※ Refer to page 3-22 for checking the temperature of the hydraulic oil.

※ Add the hydraulic oil, if necessary.

24) FILLING HYDRAULIC OIL

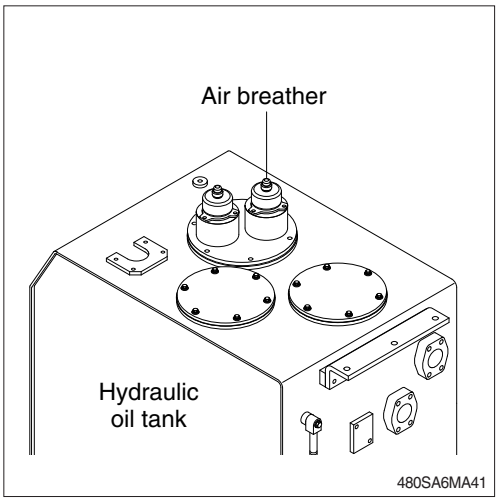
(1) Position the machine like the hydraulic oil check. Then stop engine.

(2) Relieve the pressure in the tank by pushing the top of the air breather.

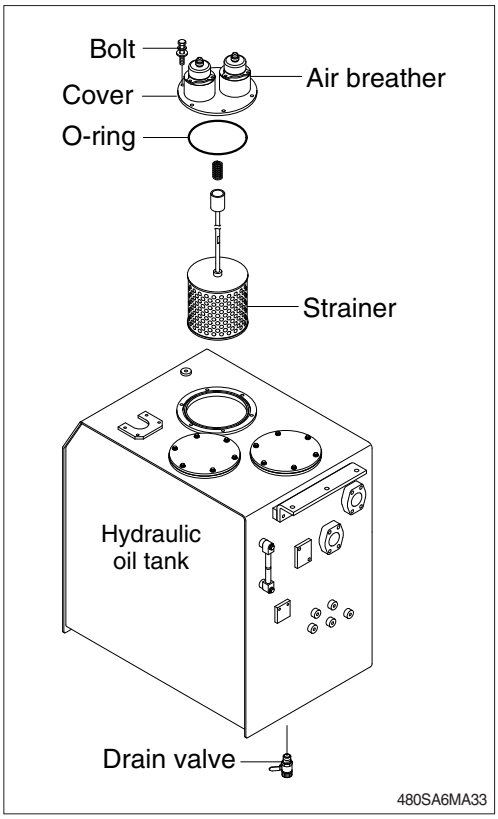
(3) Remove the breather on the top of oil tank and fill the oil to the specified level.

(4) Start engine after filling and operate the work equipment several times.

(5) Check the oil level at the level check position after engine stops.



25) CHANGE HYDRAULIC OIL



(1) Position the machine like the hydraulic oil check. Then stop engine.

(2) Relieve the pressure in the tank by pushing the top of the air breather.

(3) Remove the cover.
· Tightening torque : 6.9±1.4 kgf · m
(50±10 lbf · ft)

(4) Prepare a suitable container with a capacity of 500 ℓ (132 U.S.gal).

(5) To drain the oil open the drain valve at the bottom of the oil tank.

(6) Close the drain valve and fill proper amount of recommended oil.

(7) Put the breather in the right position.

(8) To bleed air hydraulic pump loosen the air breather at top of hydraulic pump assembly.

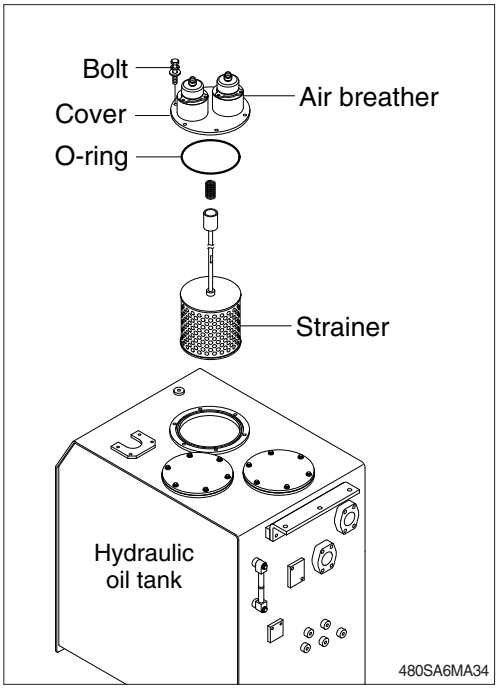
(9) Start engine and run continually. Release the air by full stroke of each control lever.

※ In case of injecting HBHO (HD Hyundai Construction Equipment Bio Hydraulic Oil) to machines that have formerly used different hydraulic oil, the proportion of residual oil must not exceed 2 %

※ Do not mix any other Bio oil, use only HBHO as bio oil. If changing to Bio oil, contact your local-HD Hyundai Construction Equipment dealer.

26) CLEAN SUCTION STRAINER

Clean suction strainer as follows.



(1) Remove the cover.
· Tightening torque : 6.9±1.4 kgf · m
(50±10 lbf · ft)

(2) Pull out the strainer in the tank.

(3) Wash the suction strainer with gasoline or cleaning oil, (mineral spirits).

(4) Replace the suction strainer if it is damaged.

(5) Assemble with reverse order of disassembly.
Be sure to install a new O-ring and reinsert in the oil tank.

※ Loosen bolts on the cover slowly as the cover as spring force applied. This will prevent cover from popping off without notice.

27) REPLACEMENT OF RETURN FILTER

Replace return filter as follows.

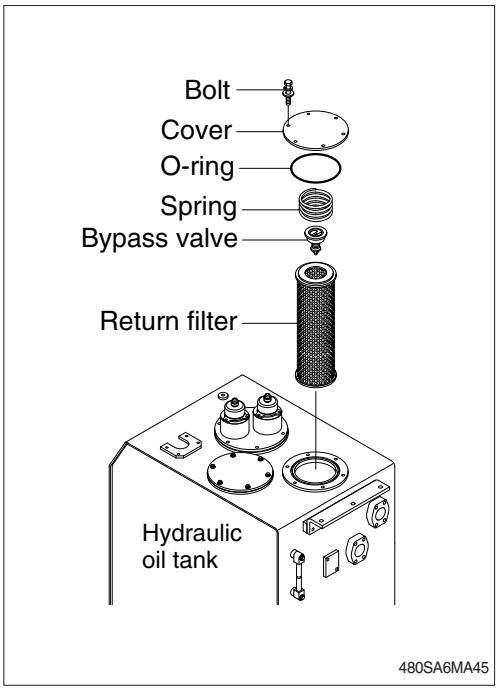
(1) Remove the cover.

(2) Remove the spring, by-pass valve and return filter in the tank.

(3) Replace the element with new one.

(4) Reassemble by reverse order of disassembly.

· Tightening torque : 6.9±1.4 kgf · m
(50±10 lbf · ft)



28) REPLACEMENT OF ELEMENT IN HYDRAULIC TANK AIR BREATHER ELEMENT

(1) Relieve the pressure in the tank by pushing the top of the air breather.

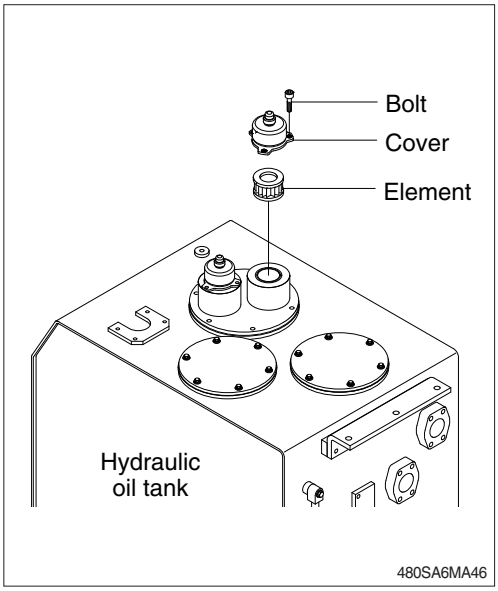
(2) Remove the cover.

(3) Remove the snap ring and pull out the filter element.

(4) Replace the filter element new one.

(5) Reassemble by reverse order of disassembly.

· Tightening torque : 4.05±0.8 kgf · m
(29.3±5.8 lbf · ft)



29) REPLACEMENT OF PILOT LINE FILTER ELEMENT

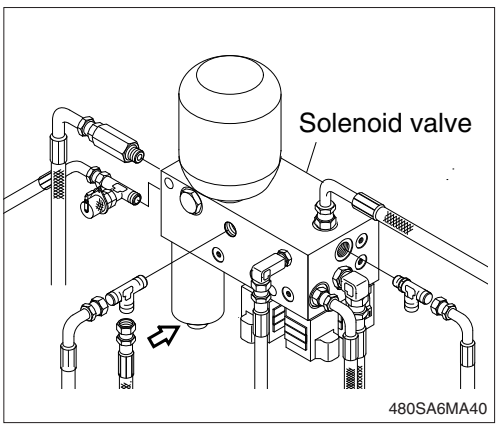
(1) Loosen the nut positioned on the filter body.

(2) Pull out the filter element and clean filter housing.

(3) Install the new element and tighten using specified torque.

· Tightening torque : 2.5 kgf · m (18.1 lbf · ft)

※ **Change cartridge after initial 250 hours of operation. Thereafter, change cartridge every 1000 hours.**



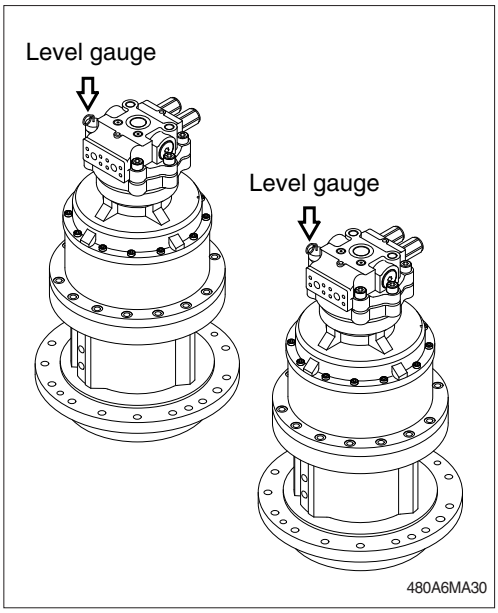
30) CHECK THE SWING REDUCTION GEAR OIL

(1) Pull out the dipstick and clean it.

(2) Insert it again.

(3) Pull out one more time to check the oil level and fill the oil if the level is not sufficient.

※ **Check the oil level by inserting the dipstick completely into the hole.**



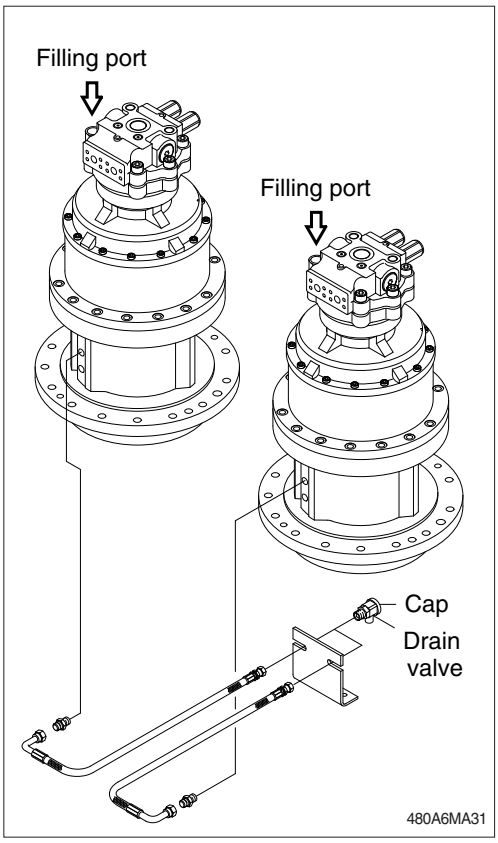
31) CHANGE SWING REDUCTION GEAR OIL

(1) Raise the temperature of oil by swinging the machine and park the machine on the flat ground.

(2) Prepare a proper container with a capacity of 20 ℓ (5.3 U.S.gal)

(3) Open the cap and loosen the drain valve.

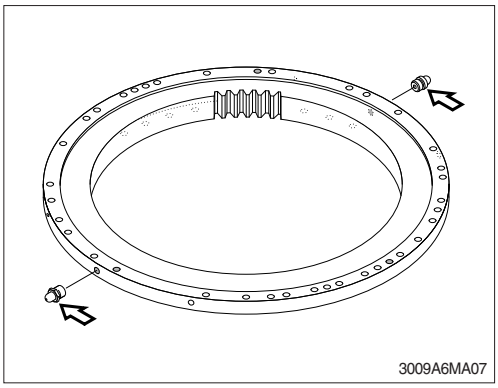
(4) Clean around the valve and close the drain valve and cap.
Fill proper amount of recommended oil.
· Amount of oil : 7.0 ℓ (1.8 U.S.gal) × 2



32) LUBRICATE SWING BEARING GREASE

(1) Grease at 2 fitting.

※ Lubricate every 250 hours.



33) SWING GEAR AND PINION GREASE

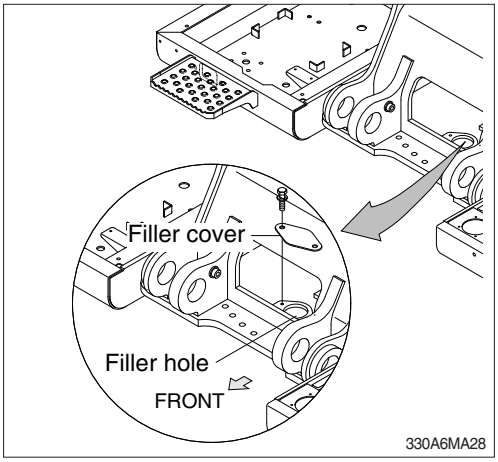
(1) Drain old grease

① Remove under cover of lower frame.

② Remove drain cover of lower frame.

③ Remove filler cover of upper frame.

④ Operate full turn (360˚) of swing several times.



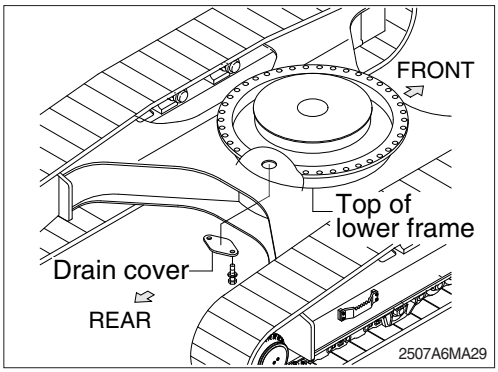
(2) Refill new grease

① Install drain cover.

② Fill with new grease.

③ Install filler cover.

· Capacity : 14.0 kg (31.0 lb)

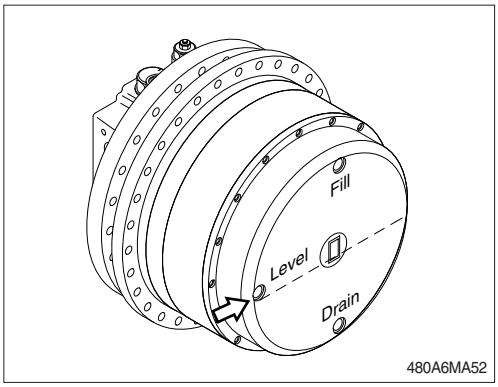


34) CHECK THE TRAVEL REDUCTION GEAR OIL

(1) Position the travel motor as shown in the illustration and make sure the machine is on flat ground.

(2) Loosen the level plug and check the oil level.
If the level is at the hole of the plug, it is normal.
Fill the oil if it is not sufficient.

· Tightening torque : 10±1.0 kgf · m
(72.3±7.2 lbf · ft)



35) CHANGE OF THE TRAVEL REDUCTION GEAR OIL

(1) Raise the temperature of the oil by operating the machine first.

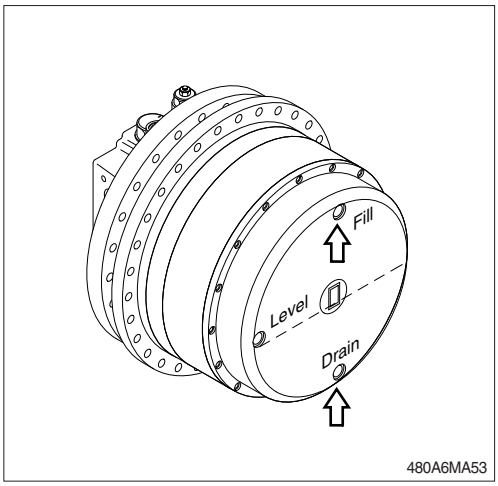
(2) Position the travel motor as shown in the illustration and make sure the machine is on flat ground.

(3) Loosen the fill plug and then the drain plug.

(4) Drain the oil to adequate container with a capacity of 15 ℓ (4.0 U.S.gal)

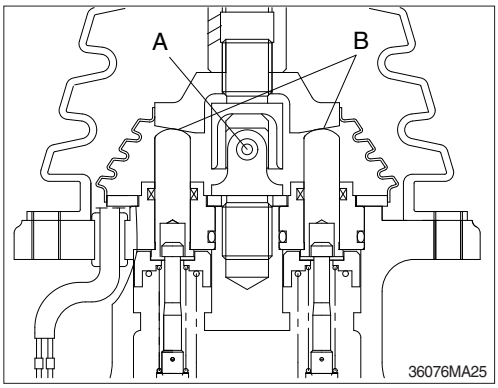
(5) Tighten the drain plug and fill specified amount of oil at filling port.

(6) Tighten the fill plug and travel slowly to check if there is any leakage of oil.
- Amount of oil : 12.5 ℓ (3.3 U.S.gal) × 2
- Tightening torque : 10 ± 1.0 kgf · m
  (72.3 ± 7.2 lbf · ft)



36) LUBRICATE RCV LEVER

Remove the bellows and with a grease gun grease the joint part (A) and sliding parts (B).



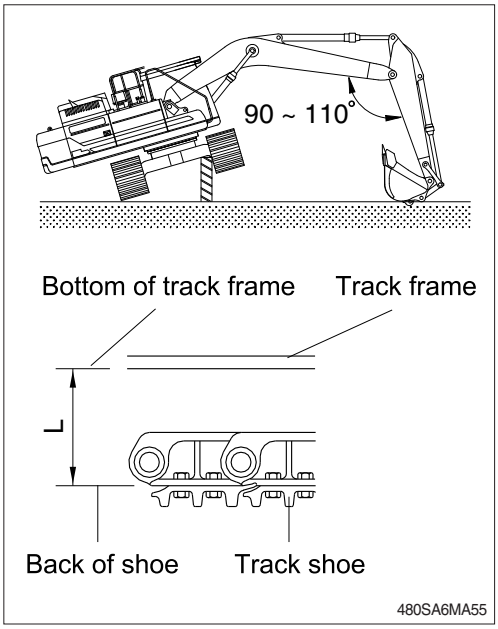
37) ADJUSTMENT OF TRACK TENSION

※ Serious injury or death can result from grease under pressure. Keep face, hands and body away from the nipple and valve.

※ It is important to adjust the tension of track properly to extend the life of track and traveling components.

※ The wear of pins and bushings on the undercarriage will vary with the working conditions and soil properties.
It is thus necessary to continually inspect the track tension so as to maintain the standard tension on it.

(1) Raise the chassis with the boom and arm as shown in the illustration.



(2) Measure the distance between bottom of track frame on track center and back of shoe.

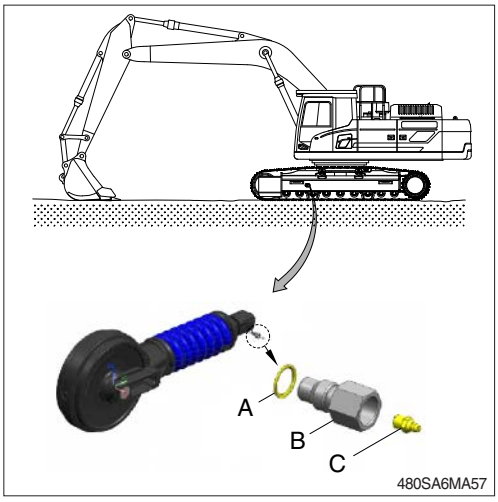
※ Remove mud by rotating the track before measuring.

(3) If the tension is tight, loosen the valve (B) gradually to drain the grease, but not more than one turn.
If the tension is loose, fill the grease through grease nipple (C) using a grease gun.

(4) When the proper track tension is obtained, close grease valve (B) but do not tighten excessively as the fitting may be damaged.
· Valve tightening torque : 13 kgf·m (94 lb·ft)

Working condition	Length (L)	
General	390~420 mm	15.4~16.5"
Swamp	420~460 mm	16.5~18.1"
Sand, Mud, Pebbles	About 460 mm	About 18.1"

※ Remove the mud and sand on the assembly face in order to prevent damage to seal (A) before assembling grease valve (B).
If seal (A) is damaged, replace with a new one and assemble.



⚠ Personal injury or death can result from grease under pressure.
Keep face, hands and body away from the nipple and valve.

⚠ When loosening the grease valve (B), do not loosen more than one turn as there is danger of a spring coming out of valve (B) because of the high pressure inside.

※ When the grease does not drained smoothly, move the machine to forward and backward a short distance.
If the track tension is loose even after the grease is charged to the maximum, change the pins and bushings as they are worn seriously.

38) REPLACEMENT OF BUCKET

△ When knocking the pin in with a hammer, metal particles may fly and cause serious injury, particularly if they get into your eyes. When carrying out this operation, always wear goggles, helmet, gloves, and other protective equipment.

※ When the bucket is removed, place it in a stable condition.

※ When performing joint work, make sure to signals clearly to each other and work carefully for safety's sake.

(1) Lower the bucket on the ground as shown in the illustration on the right.

(2) Lock the safety knob to the LOCK position.

(3) Remove the stopper bolts(1) and nuts(2), then remove pins(3, 4) and remove the bucket.

※ When removing the pins, place the bucket so that it is in light contact with the ground.

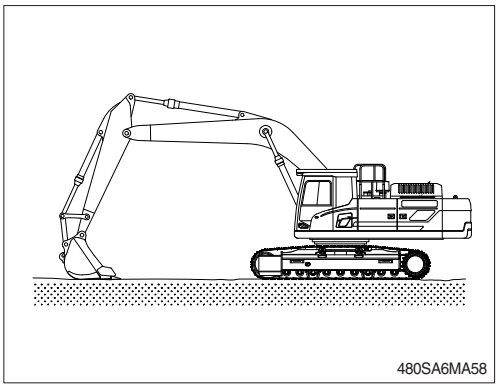
※ If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins.

※ After removing the pins, make sure that they do not become contaminated with sand or mud and that the seals of bushings on both sides do not become damaged.

(4) Align the arm with holes (A) and the link with holes (B), then coat with grease and install pins (3, 4)

※ When installing the bucket, the O-rings are easily damaged, so fit the O-rings on the boss of the bucket as shown in the picture.
After hitting the pin, move the O-ring down to the regular groove.

(5) Install the stopper bolt (1) and nuts (2) for each pin, then grease the pin.
· Tightening torque : 100±15 kgf · m
(723±108 lbf · ft)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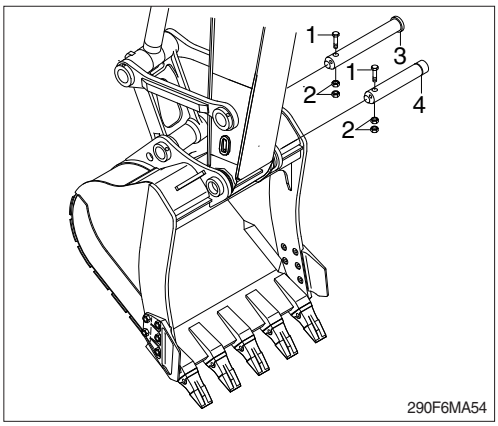

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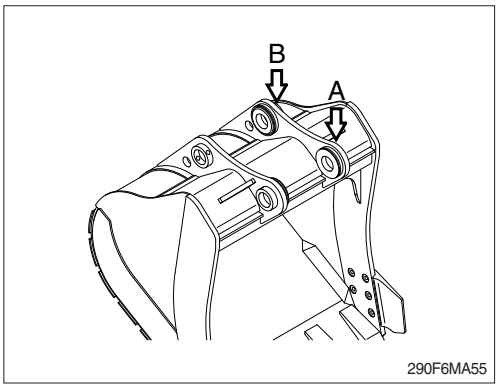

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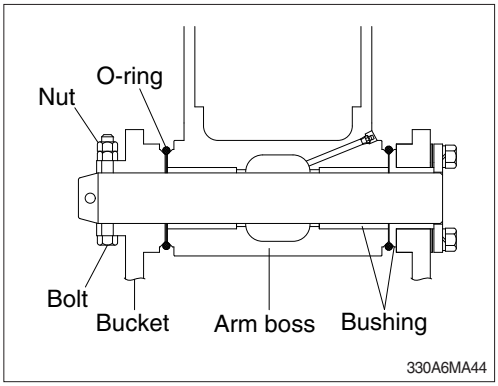

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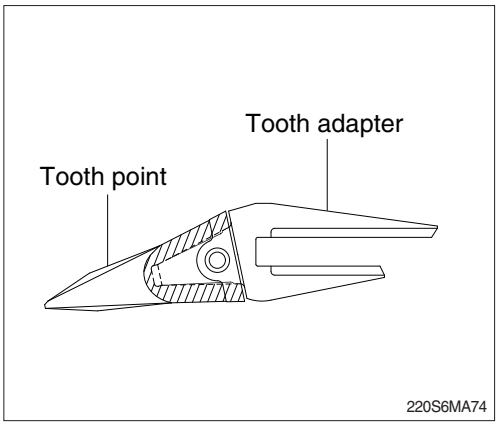
39) REPLACEMENT OF BUCKET TOOTH

(1) Timing of replacement

① Check wearing condition as shown in the illustration and replace tooth point before adapter starts to wear.

② In case of excessive use and tooth adapter has worn excessively, replacement may become impossible.



(2) Instructions for replacement

① Pull out pin by striking pin with punch or hammer, avoiding damage to lock washer.

② Remove dust and mud from surface of tooth adapter by using knife.

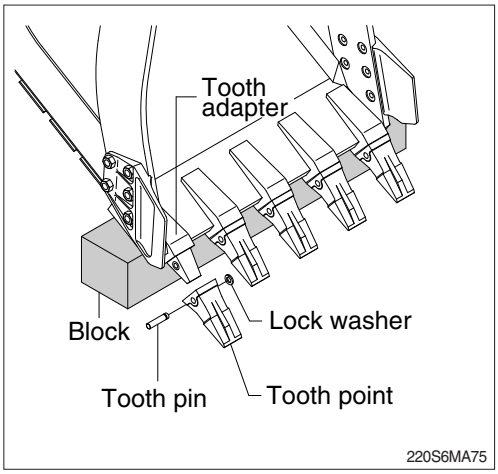
③ Place lock washer in its proper place, and fit tooth tip to adapter.

④ Insert pin until lock washer is positioned at tooth point groove.

⚠ Serious injury or death can result from bucket falling.

⚠ Block the bucket before changing tooth points or side cutters.

⚠ The operator should wear clothes and personal protection gear that are appropriate for the work environment. Protects the eyes from dust, particles and airborne materials with a protection gear like goggle.



40) ADJUSTMENT OF BUCKET CLEARANCE

(1) Lower the bucket on the ground as shown in the illustration.

(2) Swing to the left and keep arm boss in contact with the left bucket ear.

(3) Lock the safety knob to the LOCK position and stop the engine.

(4) Measure the clearance (A) between bucket and arm boss. This is the total clearance.

(5) Adjusting

① Loosen bolt (2), and remove washer (3), plate (1) and shim (4).

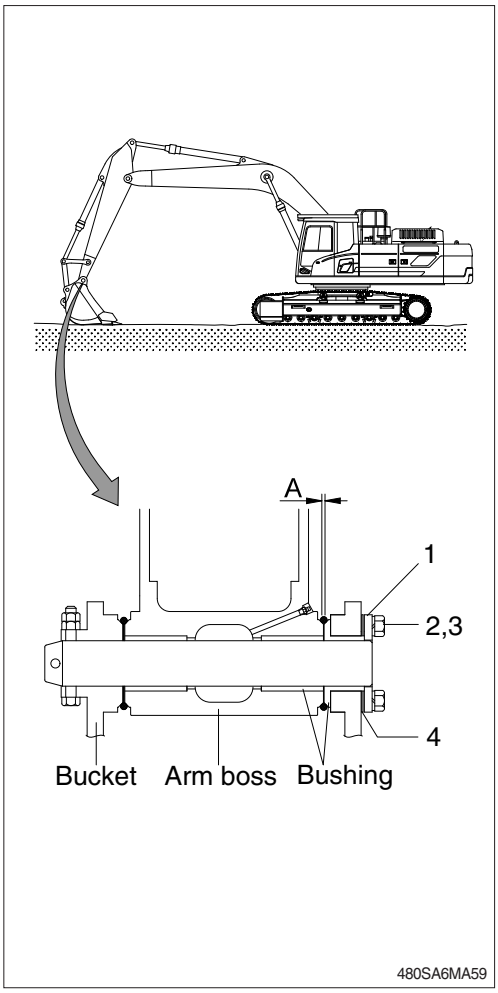
② Remove the shim equivalent value with measuring value.

③ Assemble the parts in the reverse order of removal.

· Tightening torque : 140±15 kgf · m
(1013±108 lbf · ft)

· Normal clearance : 0.5 ~ 1.0 mm
(0.02 ~ 0.04 in)

※ If the bucket is not adjusted correctly, noise and vibration will occur. This will also cause damage to O-ring and bushings prematurely.



41) LUBRICATE PIN AND BUSHING

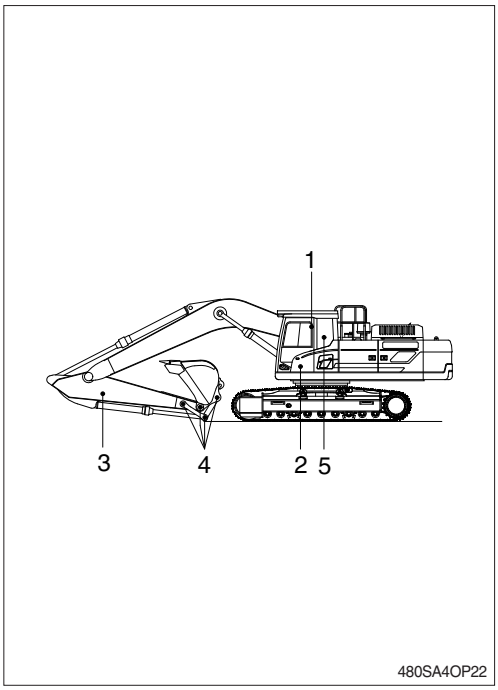
(1) Lubricate to each pin of working device

Lubricate the grease to the grease nipple according to the lubricating interval.

No.	Description	Qty
1	Lubrication manifold at boom	5
2	Boom cylinder pin (head)	2
3	Lubricating manifold	3
4	Bucket cylinder pin (head, rod)	2
	Bucket link (control rod)	2
	Arm and bucket connection pin	1
	Arm and control rod connection pin	1
	Arm and control link connection pin	1
5	Boom rear bearing center★	1

※ Shorten lubricating interval when working in water or dusty places.

★ Not required : If necessary, lubricate the grease.



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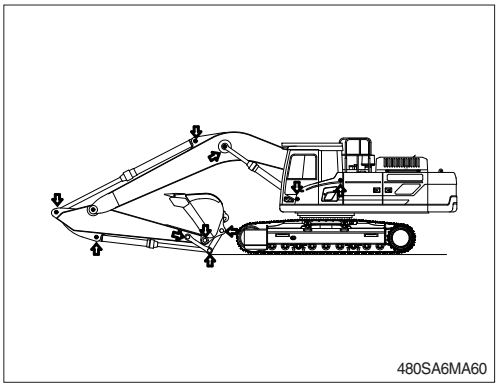
(2) Dust seals are mounted on the rotating part of working device to extend the lubricating interval.

※ Mount the lip so it is facing outside when replacing dust seals.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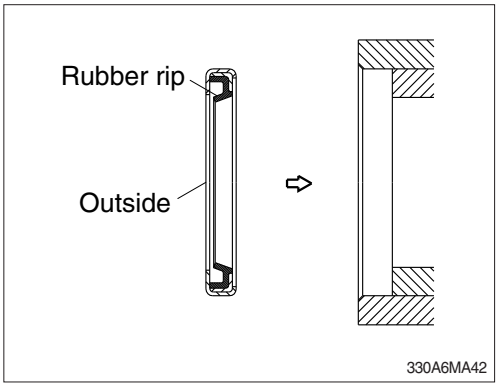
※ If it is assembled in wrong direction, it will cause fast wear of pin and bushing, and create noise and vibration during operation.

※ Install seal in the same manner as shown in the illustration. Use a plastic hammer to lightly and evenly tap the seal into place.



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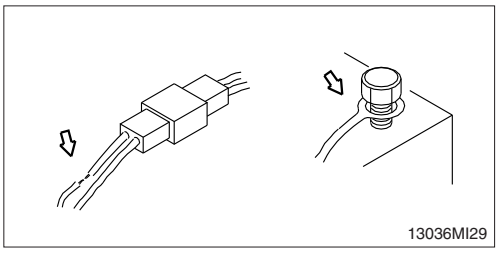
7. ELECTRICAL SYSTEM

1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



2) BATTERY

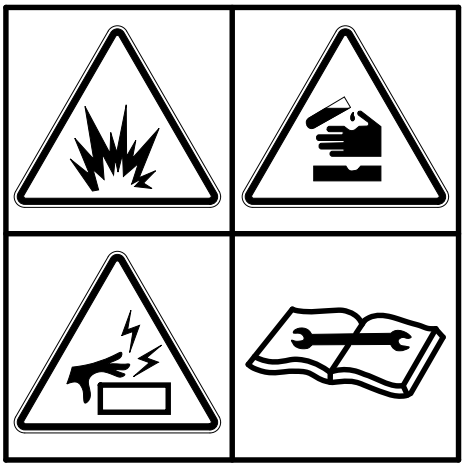
(1) Clean

① Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

⚠ Battery gas can explode. Keep sparks and flames away from batteries.

⚠ Always wear protective glasses when working with batteries.

⚠ Do not stain clothes or skin with electrolyte as it is acid.
Be careful not to get the electrolyte in eyes.
If eyes are affected, flush with clean water or eye solution and seek immediate medical attention.



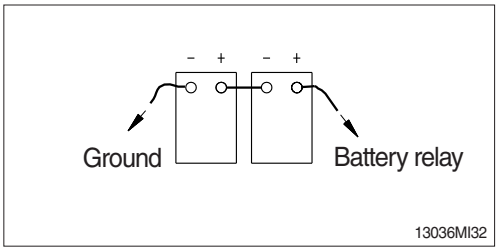
(2) Recycle

Never discard a battery.
Always return used batteries to one of the following locations.

- A battery supplier
- An authorized battery collection facility
- Recycling facility

(3) Method of removing the battery cable

Remove the cable from the ground connection first (⊖ terminal side) and reconnect it last when reassembling.



3) STARTING THE ENGINE WITH A BOOSTER CABLE

Follow these procedures when starting.

(1) Connection of booster cable

※ Use the same capacity of battery for starting.

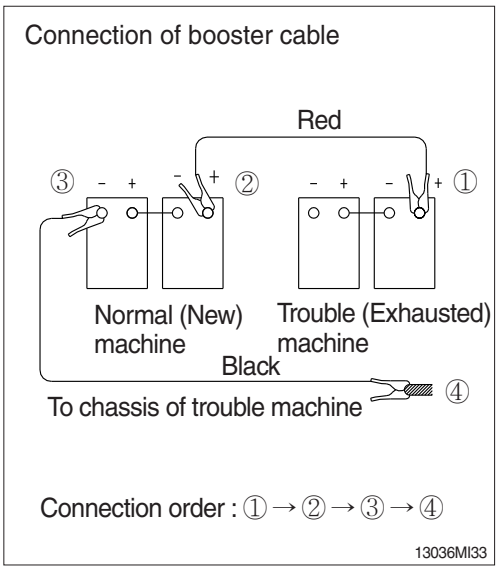
① Make sure that the starting switches of the normal machine and trouble machine are both in the OFF position.

② Connect the red terminal of booster cable to the battery (+) terminal between exhausted and new battery.

③ Connect the black terminal of the booster cable between new battery (-) terminal and chassis of trouble machine.

※ Make and maintain a firm connection.

※ Sparks will occur slightly when making the final connection.

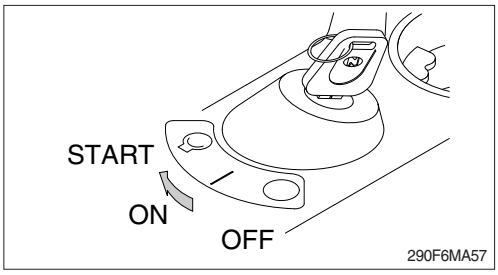


(2) Starting the engine

① Start the engine of the normal machine and keep it running at high idle.

② Start engine of the troubled machine with starting switch.

③ If you can not start it with the first attempt, try again after 2 minutes.



(3) Taking off the booster cable

① Take off the booster cable (black).

② Take off the booster cable (red) connected to the (+) terminal.

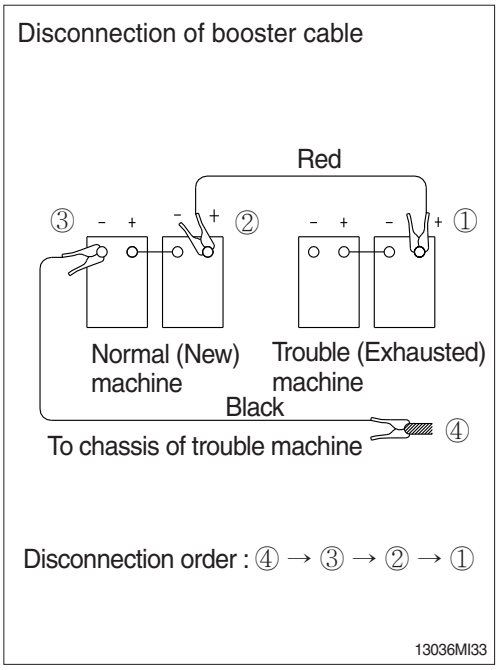
③ Run engine at high idle until charging of the exhausted battery is complete.

⚠ Explosive gas is generated while using the battery or charging it. Keep any flames away and be careful not to cause a spark.

※ Charge the battery in a well ventilated area.

※ Place the machine on the earth or concrete. Avoid charging the machine on any steel or steel plates.

※ Do not connect (+) terminal and (-) terminal when connecting booster cable because it will be shorted.



4) WELDING REPAIR

Before welding, follow the below procedure.

(1) Shut off the engine and remove the key.

(2) Disconnect ground cable from battery by master switch.

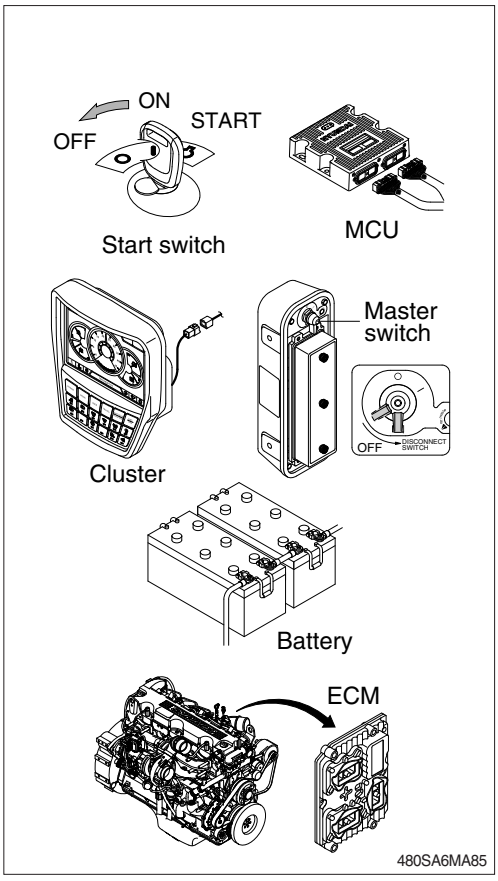
(3) Before carrying out any electric welding on the machine, the battery cables should be disconnected and the connectors pulled out of the electronic control units (MCU, ECM, cluster etc).

(4) Connect the earth (ground) lead of the welding equipment as close to the welding point as possible.

※ **Remove all paint to ensure a solid ground is achieved.**

※ **Do not weld or use cutting torch on pipes or tubes that contain flammable fluids. Clean them thoroughly with nonflammable solvent before welding or cutting on them.**

⚠ **Do not attempt to weld before carrying out the above.**
If not, it will cause serious damage to electric system.



5) BATTERY CABLE AND CONNECTIONS

⚠ **Batteries can emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries.**

(1) Remove and inspect the battery cables and connections for cracks or corrosion.

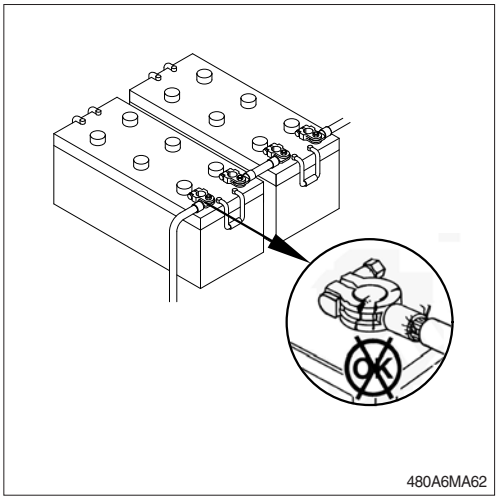
(2) Replace broken terminals, connectors, or cables.

(3) If the connections are corroded, use a battery brush or wire brush to clean the connections.

(4) Make sure all debris are removed from the connecting surfaces.

(5) Install the cables and tighten the battery connections.

(6) Coat the terminals with grease to prevent corrosion.

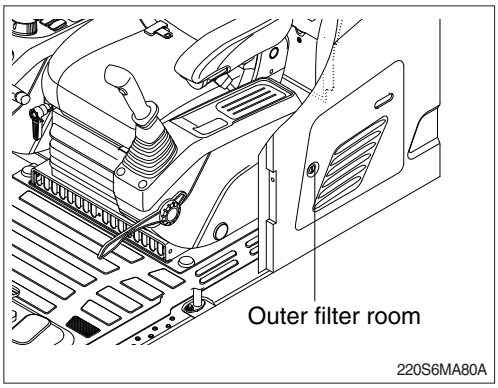


8. AIR CONDITIONER AND HEATER

1) CLEANING AND REPLACEMENT OF OUTER FILTER

※ **Always stop the engine before servicing.**

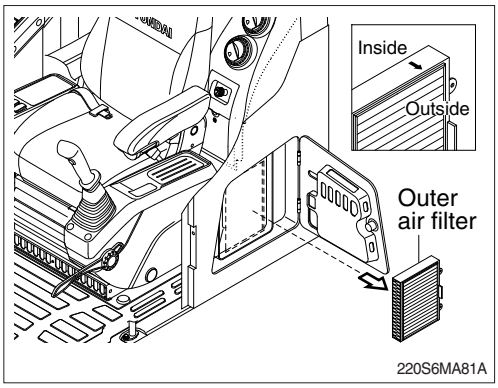
(1) Open the outer filter room.



(2) Remove the outer filter.

※ **When installing a filter, be careful not to install the filter in the wrong direction.**

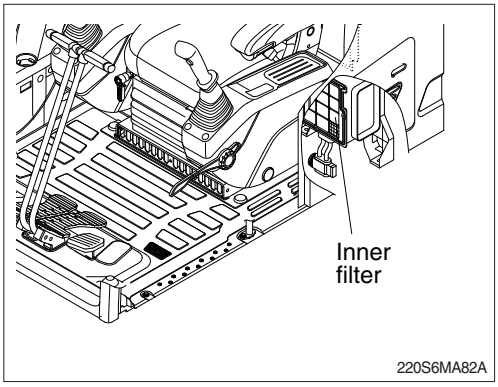
(3) If the filter is damaged or badly contaminated, use a new filter.



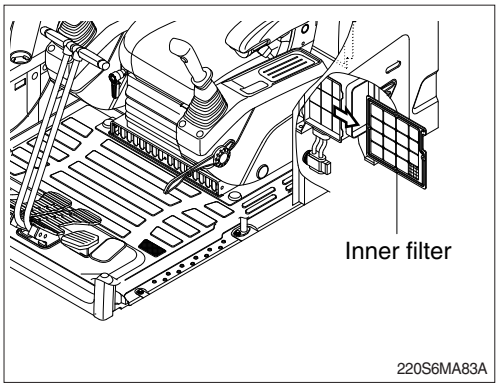
2) CLEANING AND REPLACEMENT OF INNER FILTER

※ **Always stop the engine before servicing.**

(1) Move seat and console box forward by using the adjust knob.

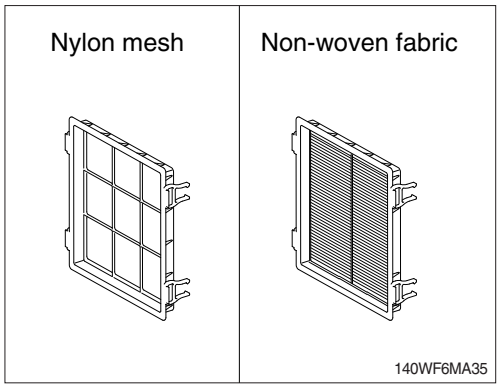


(2) Remove the inner filter.



(3) Check the inner filter type.

(4) Non-woven fabric type (if equipped)
- If the filter is damaged or badly contaminated, use a new filter.

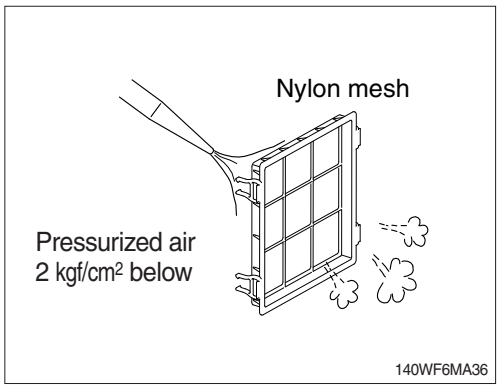


(5) Clean the inner filter using pressurized air (below 2 kgf/cm², 28 psi) or washing with water.

△ **When using pressurized air, be sure to wear safety glasses.**

※ **Dry off after washing with water.**

(6) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.



3) PRECAUTIONS FOR USING AIR CONDITIONER

(1) When using the air conditioner for a long time, open the window once every one hour or ventilate by using the fresh air function.

(2) Be careful not to overcool the cab.

(3) The cab is properly cooled if the operator feels cool when entering from outside (about 5˚C lower than the outside temperature).

4) CHECK DURING SEASON

Ask the service center for replenishment of refrigerant or other maintenance service so that the cooling performance does not wear prematurely.

5) CHECK DURING OFF-SEASON

Operate the air conditioner 2 or 3 times a month (each time for a few minutes) to avoid loss of oil film in the compressor.

6) REFRIGERANT

(1) Equipment contains fluorinated greenhouse gas.

Model	Type	Quantity	GWP : 1430
HX500/520 LT3	HFC-134a	0.80 kg (1.87 lb)	CO_2 eq. : 1.14t

※ GWP

Global warming potential (GWP) is a measure of how much heat a gas traps in the atmosphere relative to that of carbon dioxide (CO2). GWP is calculated in terms of the 100-year warming potential of 1 kg of a greenhouse gas relative to 1 kg of CO2.

(2) Environmental precautions

The air conditioning system of the machine is filled with HFC-134a refrigerant at the factory.
HFC-134a refrigerant is a flourinated greenhouse gas and contributes to global warming.
Do not release refrigerant into the environment.

(3) Safety precautions

Work on the air conditioning system must only be performed by a qualified service technician.
Do not attempt to preform work on the air conditioning system.
Wear safety goggles, chemical resistant gloves and appropriate personal protective equipment to protect bare skin when there is a risk of contact with refrigerant.

(4) Action in case of exposure

① Eye contact / Limited skin contact
Rinse with warm water and apply a light bandage. Seek medical attention immediately.

② Extensive skin contact
Rinse with warm water and carefully heat the area with warm water or warm clothing.
Seek medical attention immediately.

③ Inhalation
Leave the area and find fresh air. Seek medical attention immediately.

1. PREPARATION FOR TRANSPORTATION

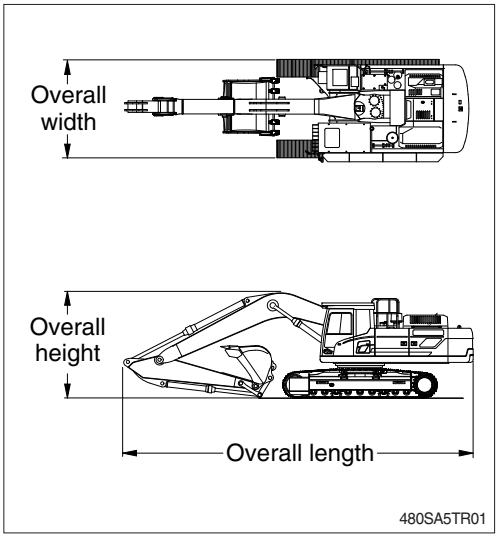
1) When transporting the machine, observe the various road rules, road transportation vehicle laws and vehicle limit ordinances, etc.

2) Select proper trailer after confirming the weight and dimension from chapter 7, Specification.

3) Check the whole route such as the road width, the height of bridge and limit of weight etc., which will be passed.

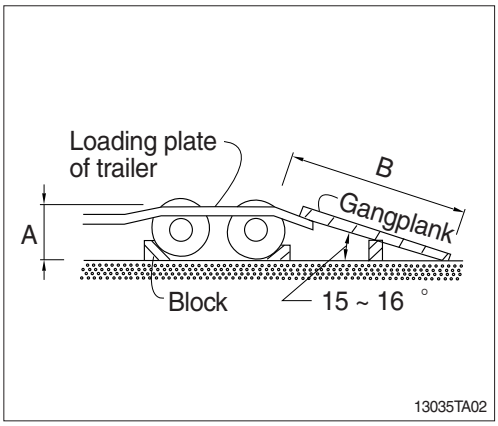
4) Get permission from the related authority if necessary.

5) Prepare suitable capacity of trailer to support the machine.



6) Prepare gangplank for safe loading referring to the below table and illustration.

A	B
1.0	3.65 ~ 3.85
1.1	4.00 ~ 4.25
1.2	4.35 ~ 4.60
1.3	4.75 ~ 5.00
1.4	5.10 ~ 5.40
1.5	5.50 ~ 5.75



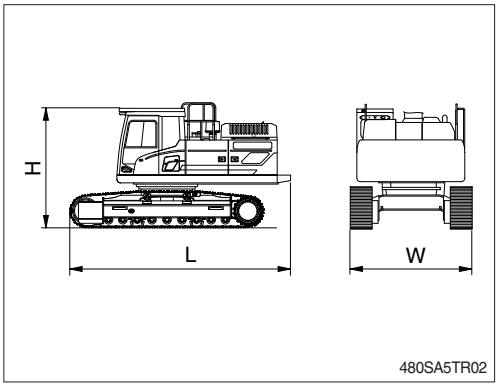
2. DIMENSION AND WEIGHT

1) HX500LT3

(1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6215 (20' 5")
H	Height	mm (ft-in)	3240 (10' 8")
W	Width	mm (ft-in)	3340 (10' 11")
Wt	Weight	kg (lb)	

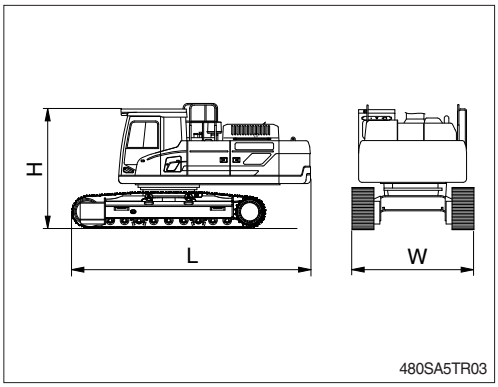
※ With 600 mm (24") triple grouser shoes and without counterweight.



Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6500 (21' 4")
H	Height	mm (ft-in)	3240 (10' 8")
W	Width	mm (ft-in)	3340 (10' 11")
Wt	Weight	kg (lb)	

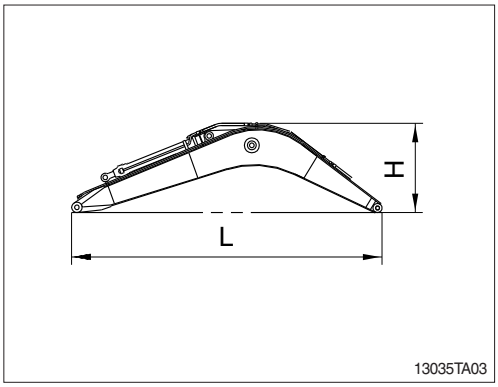
※ With 600 mm (24") triple grouser shoes and 10200 kg (22490 lb) counterweight.



(2) Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6840 (22' 5")
H	Height	mm (ft-in)	1835 (6' 0")
W	Width	mm (ft-in)	824 (2' 8")
Wt	Weight	kg (lb)	4380 (9660)

※ 6.55 m (21' 6") boom with arm cylinder (including piping and pins).



Boom assembly

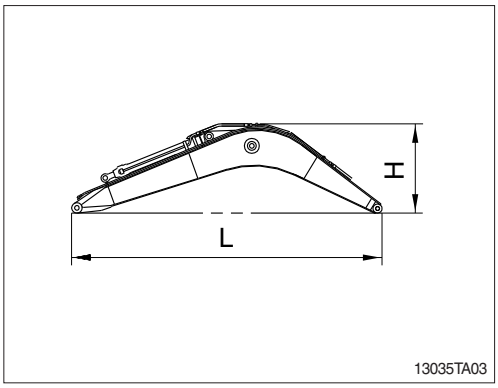
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	7350 (24' 1")
H	Height	mm (ft-in)	1720 (5' 8")
W	Width	mm (ft-in)	824 (2' 8")
Wt	Weight	kg (lb)	4420 (9740)

※ 7.06 m (23' 2") boom with arm cylinder (including piping and pins).

Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	9290 (30' 6")
H	Height	mm (ft-in)	1745 (5' 9")
W	Width	mm (ft-in)	824 (2' 8")
Wt	Weight	kg (lb)	5170 (11400)

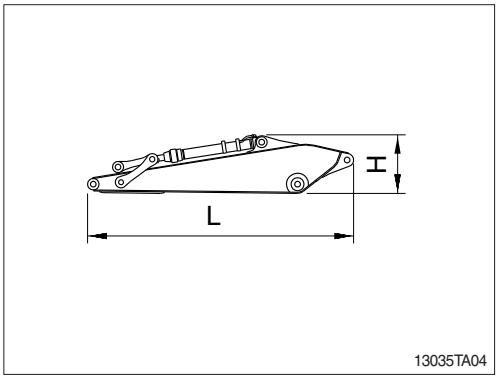
※ 9.00 m (29' 6") boom with arm cylinder (including piping and pins).



(3) Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	3785 (12' 5")
H	Height	mm (ft-in)	1280 (4' 2")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2430 (5360)

※ 2.55 m (8' 4") arm with bucket cylinder (including linkage and pins).



Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4160 (13' 8")
H	Height	mm (ft-in)	1295 (4' 3")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2630 (5800)

※ 2.90 m (9' 6") arm with bucket cylinder (including linkage and pins).

Arm assembly

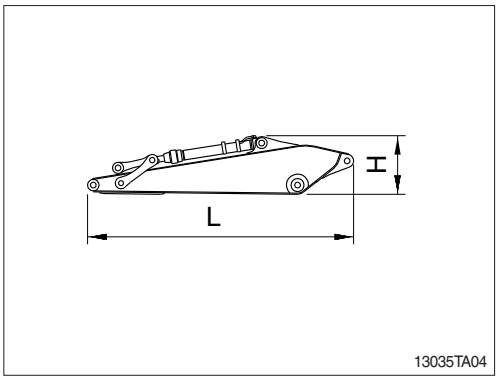
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4660 (15' 3")
H	Height	mm (ft-in)	1280 (4' 2")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2650 (5840)

※ 3.38 m (11' 0") arm with bucket cylinder (including linkage and pins).

Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	5275 (17' 4")
H	Height	mm (ft-in)	1065 (3' 6")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2700 (5950)

※ 4.00 m (13' 1") arm with bucket cylinder (including linkage and pins).



Arm assembly

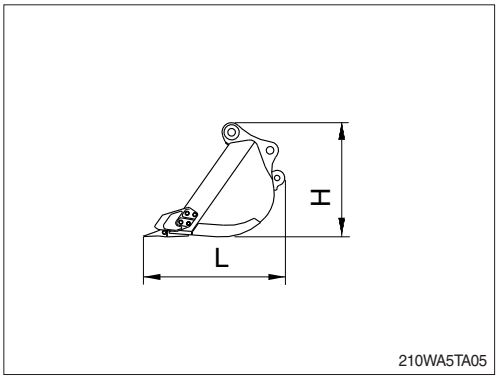
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	7305 (24' 0")
H	Height	mm (ft-in)	1110 (3' 8")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	3260 (7190)

※ 6.00 m (19' 8") arm with bucket cylinder (including linkage and pins).

(4) Bucket assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1955 (6' 5")
H	Height	mm (ft-in)	1720 (5' 8")
W	Width	mm (ft-in)	1685 (5' 6")
Wt	Weight	kg (lb)	2020 (4450)

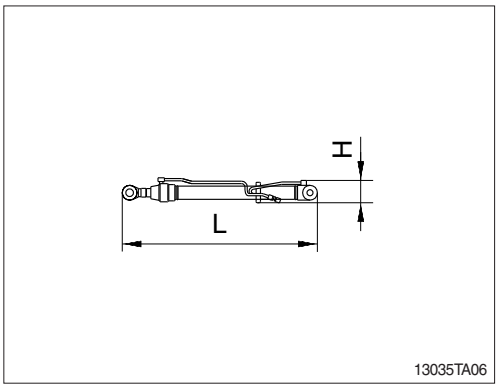
※ 2.20 m^3 (2.88 yd^3) SAE heaped bucket (including tooth and side cutters).



(5) Boom cylinder

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2470 (8' 1")
H	Height	mm (ft-in)	325 (1' 1")
W	Width	mm (ft-in)	503 (1' 8")
Wt	Weight	kg (lb)	571 (1260)

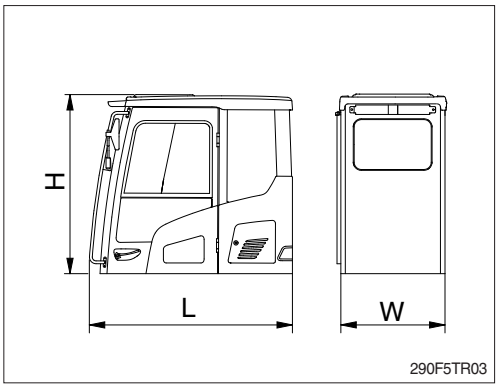
※ Including piping.



(6) Cab assembly

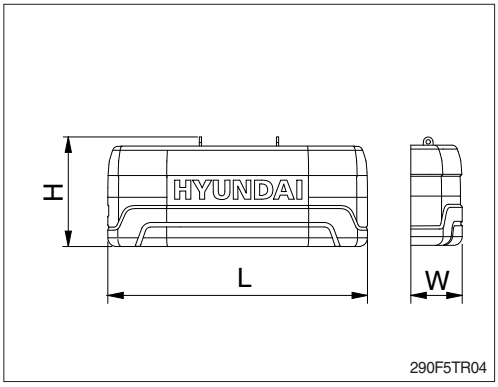
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1950 (6' 5") [2070 (6' 9")]
H	Height	mm (ft-in)	1780 (5' 10") [1822 (6' 0")]
W	Width	mm (ft-in)	1104 (3' 7") [1126 (3' 8")]
Wt	Weight	kg (lb)	495 (1090) [650 (1430)]

[ ] : with FOG GUARD



(7) Counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
H	Height	mm (ft-in)	1250 (4' 1")
W	Width	mm (ft-in)	850 (2' 9")
Wt	Weight	kg (lb)	9200 (20280)
			9700 (21380)
			10200 (22490)
			10700 (23590)
			11700 (25790)

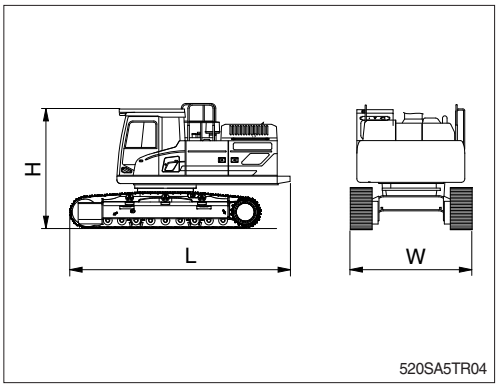


2) HX520LT3

(1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6215 (20' 5")
H	Height	mm (ft-in)	3385 (11' 1")
W	Width	mm (ft-in)	2980 (9' 9")
Wt	Weight	kg (lb)	

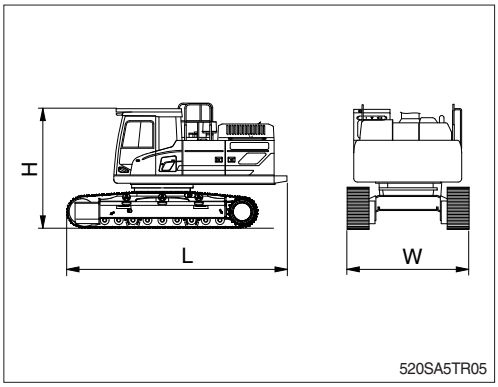
※ With 600 mm (24") triple grouser shoes and without counterweight.



Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6500 (21' 4")
H	Height	mm (ft-in)	3385 (11' 1")
W	Width	mm (ft-in)	2980 (9' 9")
Wt	Weight	kg (lb)	

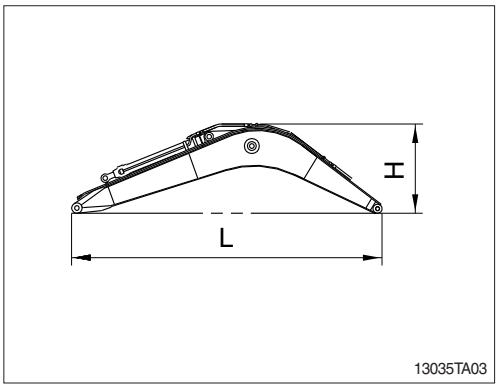
※ With 600 mm (24") triple grouser shoes and 10700 kg (23590 lb) counterweight.



(2) Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6840 (22' 5")
H	Height	mm (ft-in)	1835 (6' 0")
W	Width	mm (ft-in)	824 (2' 8")
Wt	Weight	kg (lb)	4380 (9660)

※ 6.55 m (21' 6") boom with arm cylinder (including piping and pins).



Boom assembly

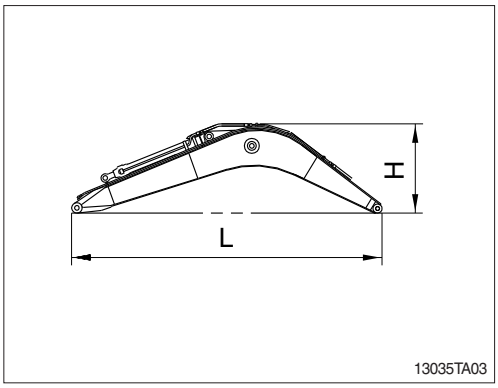
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	7350 (24' 1")
H	Height	mm (ft-in)	1720 (5' 8")
W	Width	mm (ft-in)	824 (2' 8")
Wt	Weight	kg (lb)	4420 (9740)

※ 7.06 m (23' 2") boom with arm cylinder (including piping and pins).

Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	9290 (30' 6")
H	Height	mm (ft-in)	1745 (5' 9")
W	Width	mm (ft-in)	824 (2' 8")
Wt	Weight	kg (lb)	5170 (11400)

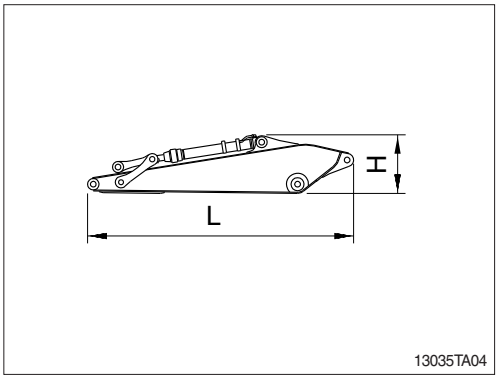
※ 9.00 m (29' 6") boom with arm cylinder (including piping and pins).



(3) Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	3785 (12' 5")
H	Height	mm (ft-in)	1280 (4' 2")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2450 (5400)

※ 2.55 m (8' 4") arm with bucket cylinder (including linkage and pins).



Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4160 (13' 8")
H	Height	mm (ft-in)	1295 (4' 3")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2650 (5840)

※ 2.90 m (9' 6") arm with bucket cylinder (including linkage and pins).

Arm assembly

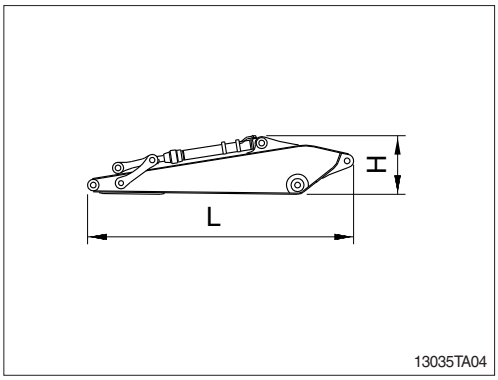
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4660 (15' 3")
H	Height	mm (ft-in)	1280 (4' 2")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2670 (5890)

※ 3.38 m (11' 0") arm with bucket cylinder (including linkage and pins).

Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	5275 (17' 4")
H	Height	mm (ft-in)	1065 (3' 6")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	2730 (6020)

※ 4.00 m (13' 1") arm with bucket cylinder (including linkage and pins).



Arm assembly

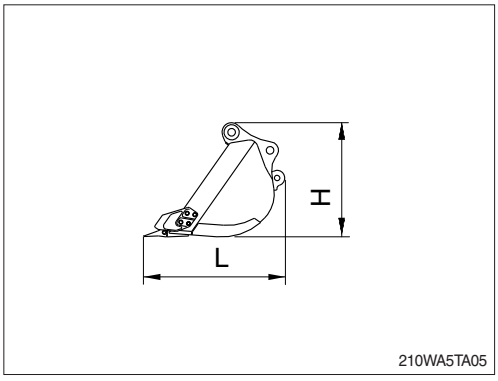
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	7305 (24' 0")
H	Height	mm (ft-in)	1110 (3' 8")
W	Width	mm (ft-in)	470 (1' 7")
Wt	Weight	kg (lb)	3260 (7190)

※ 6.00 m (19' 8") arm with bucket cylinder (including linkage and pins).

(4) Bucket assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1955 (6' 5")
H	Height	mm (ft-in)	1720 (5' 8")
W	Width	mm (ft-in)	1685 (5' 6")
Wt	Weight	kg (lb)	2020 (4450)

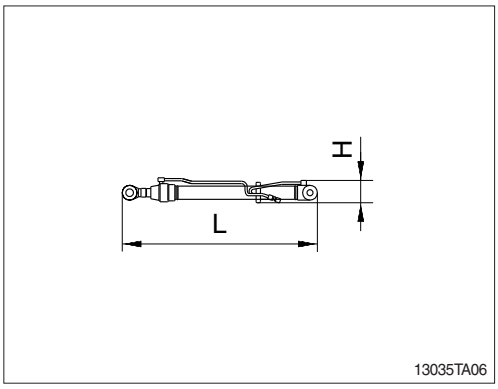
※ 2.20 m^3 (2.88 yd^3) SAE heaped bucket (including tooth and side cutters).



(5) Boom cylinder

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2470 (8' 1")
H	Height	mm (ft-in)	325 (1' 1")
W	Width	mm (ft-in)	503 (1' 8")
Wt	Weight	kg (lb)	571 (1260)

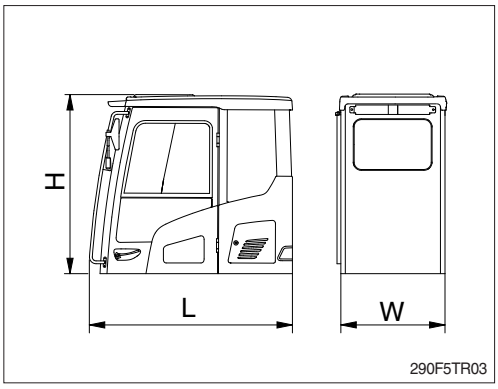
※ Including piping.



(6) Cab assembly

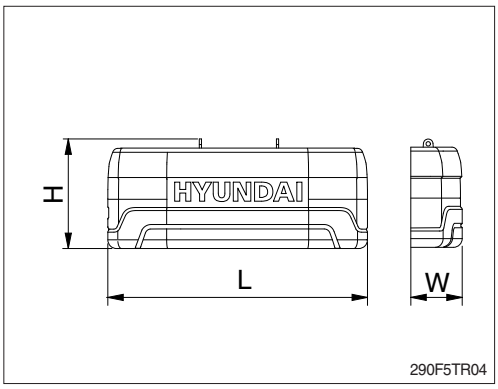
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1950 (6' 5") [2070 (6' 9")]
H	Height	mm (ft-in)	1780 (5' 10") [1822 (6' 0")]
W	Width	mm (ft-in)	1104 (3' 7") [1126 (3' 8")]
Wt	Weight	kg (lb)	495 (1090) [650 (1430)]

[ ] : with FOG GUARD



(7) Counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
H	Height	mm (ft-in)	1250 (4' 1")
W	Width	mm (ft-in)	850 (2' 9")
Wt	Weight	kg (lb)	10200 (22490)
			10700 (23590)
			11700 (25790)

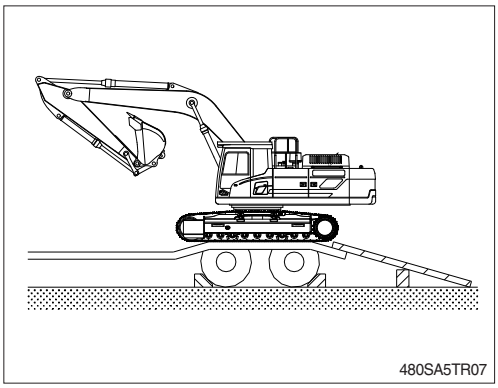


3. LOADING THE MACHINE

1) Load and unload the machine on flat ground.

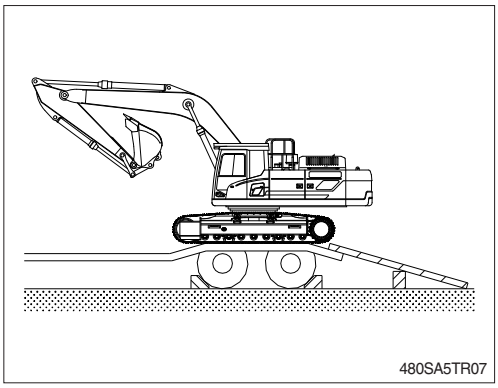
2) Use the gangplank with sufficient length, width, thickness and gradient.

3) Place the swing lock/fine switch to the LOCK position (if equipped) before fixing the machine at the bed of trailer and confirm if the machine is parallel to the bed of trailer.
   Keep the travel motor in the rear when loading and in the front when unloading.

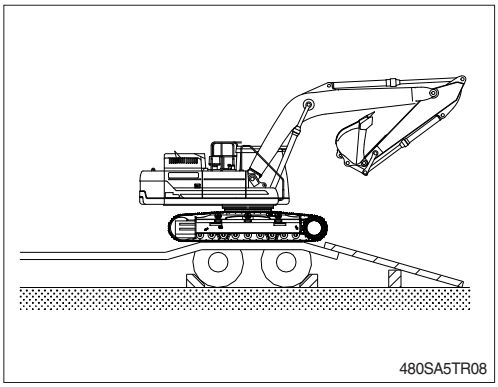


4) Do the following after loading the machine to the trailer.

(1) Stop loading when the machine is located horizontally with the rear wheel of trailer.



(2) Place the swing lock/fine switch to the LOCK position (if equipped) after swinging the machine 180°.



(3) Lower the working equipment gently after the location is determined.

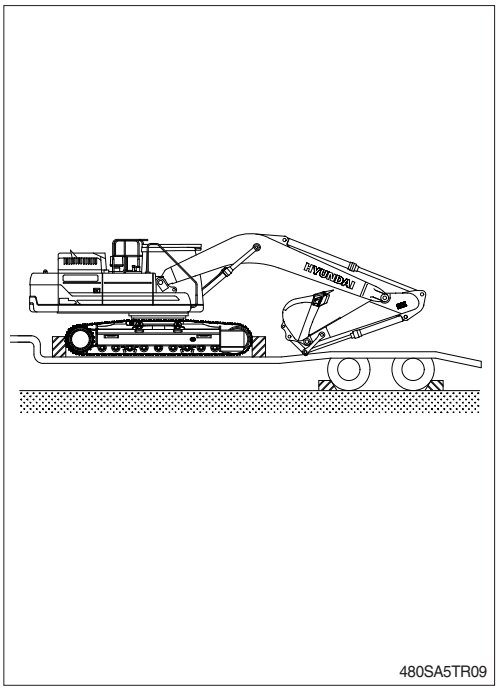
※ **Place rectangular timber under the bucket cylinder to prevent the damage of it during transportation.**

⚠ **Be sure to keep the travel speed switch on the LOW (turtle mark) while loading and unloading the machine.**

⚠ **Avoid using the working equipment for loading and unloading as it will be very dangerous.**

⚠ **Do not operate any other device when loading.**

⚠ **Be careful as to the boundaries of loading plate or trailer as the balance of machine will abruptly change.**



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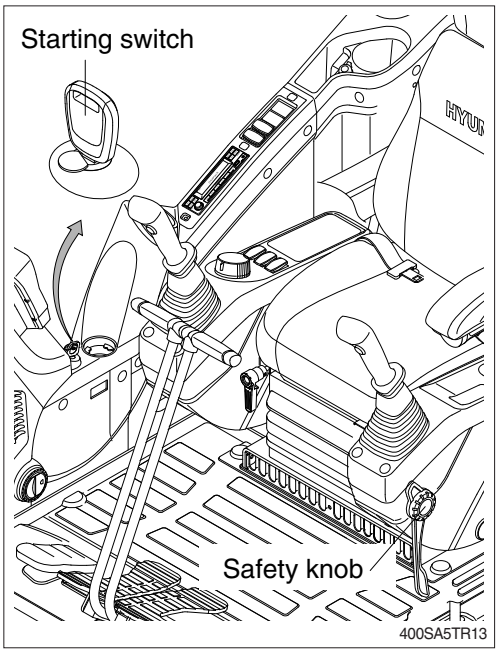
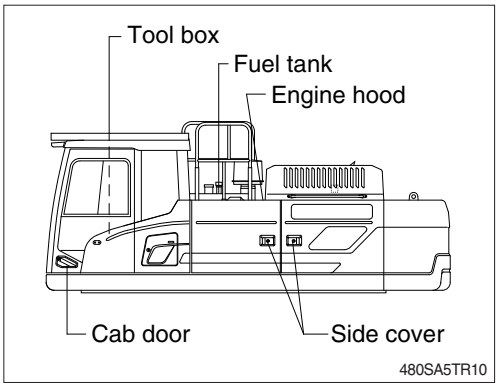
4. FIXING THE MACHINE

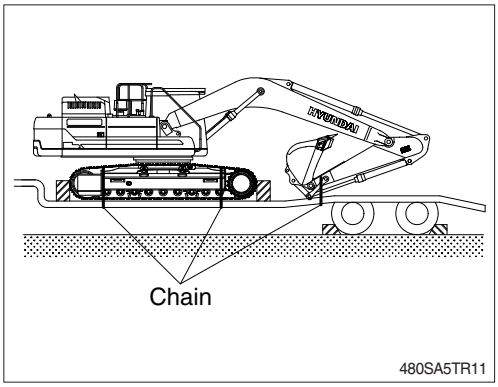
1) Lower down the working device on the loading plate of trailer.
2) Keep the safety knob in the LOCK position.
3) Turn OFF all the switches and remove the key.



4) Secure all locks.



5) Place timbers behind the tracks, secure the machine to trailer with chains or straps which are in good condition and approved for the weight which they will be securing, to prevent the machine from moving in any direction.



5. LOADING AND UNLOADING BY CRANE

⚠ The wrong hoisting method or installation of lifting device can cause serious injury, death, or damage to the machine.

1) Check the weight, length, width and height of the machine referring to chapter 7, Specification when you are going to hoist the machine.

2) Use approved lifting device and ensure distance between lifting device and machine to avoid con tact between the two.

※ **Remove any parts (footboard, etc) that may be damaged by contact with the lifting device before lifting.**

3) Place rubber plates at lifting points to avoid any damage to the machine.

4) Place crane in the proper place.

5) Install approvd lifting device as shown in the illustration.

6) Use stay between the wire rope and the machine to prevent damage to the rope or machine.
Set the lifting angle of the wire rope to 30°~ 40°.

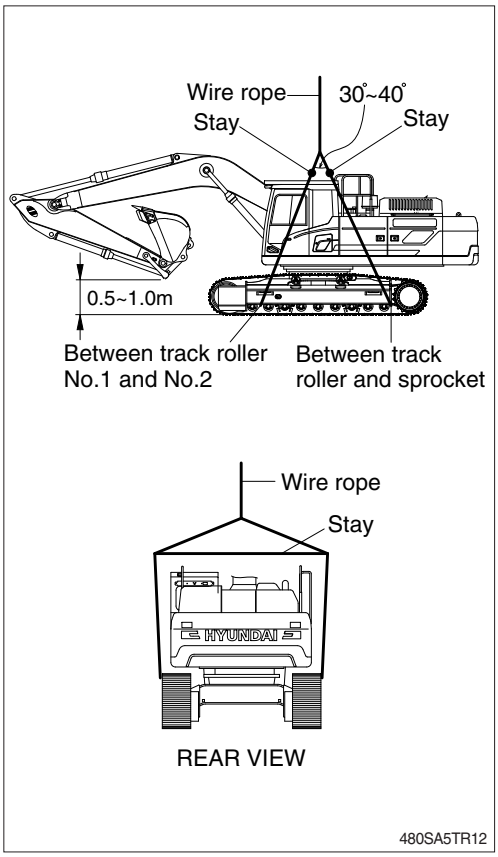
7) After the machine comes off the ground, check the hook condition and the lifting posture, and then lift slowly.

⚠ Ensure that lifting device is free form any damage and is approved for the weight being lifted and supported.

⚠ Place the safety knob to LOCK position to prevent the machine from moving when hoisting the machine.

⚠ Do not load abruptly.

⚠ Keep area clear of any and all personnel.



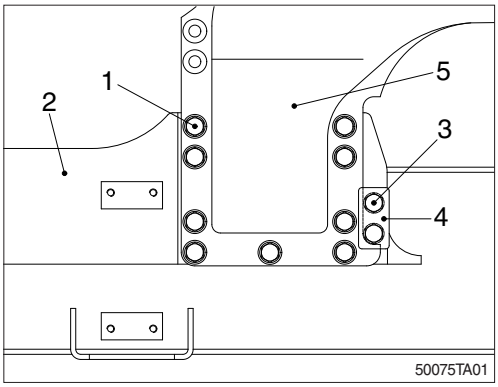
6. ADJUSTABLE TRACK GAUGE (HX520LT3 ONLY)

1) LOWER TRACK RETRACTION

⚠ Do not retract the track gauge except transporting purpose.

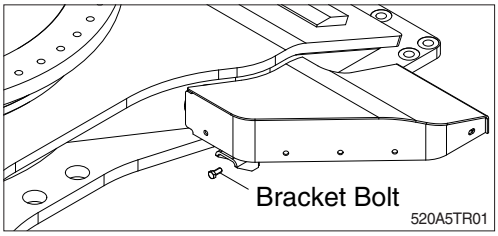
(1) Remove nine bolts (1), and spacers from lower track (2) to the retracted.

※ **Do not loosen two bolts (3) on guide (4).**



(2) Remove the bracket bolt from the center frame.

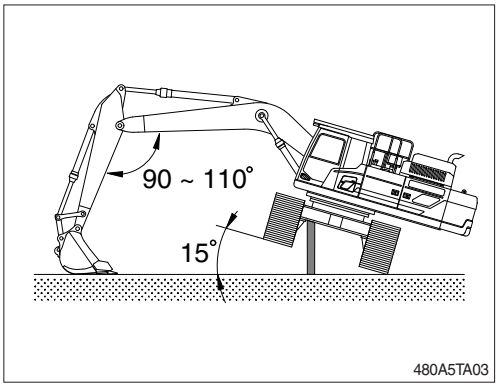
※ **This applies from machine serial No. HX520LT3 #0209.**



(3) Turn superstructure so that it is perpendicular to lower track to be retracted. Raise lower track to approximately 15 degree from ground using a jack. Lower track should slide by its own weight and hit against the stop.

※ **If lower track does not slide in this condition, allow lower track that is not contraction ground to move back and forth slowly.**

⚠ The arm must be set at 90~110˚.
Never set it at an angle less than 90˚.



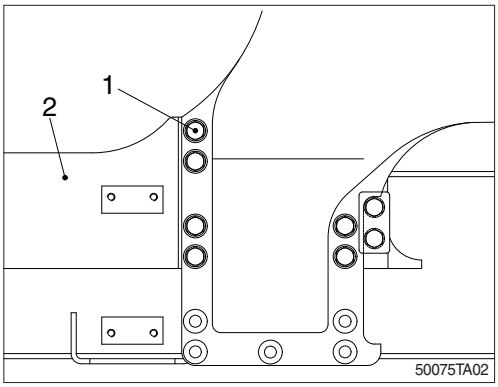
(4) After lower track (2) has slid into place, lower superstructure to ground.
Install six spacers and bolts (1).

※ **Tighten bolts to 220±20 kgf · m (1590±145 lbf · ft)**

※ **Repeat procedure at opposite side center frame support.**

(5) After the bolts for one side frame are fastened, repeat steps 1 thru 4 for opposite side frame.

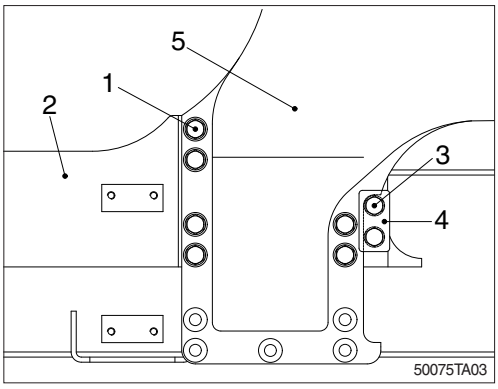
(6) Store remaining bolts, spacers with machine.



2) FRAME EXTENSION

(1) Remove six bolts (1), and spacers from lower track (2) to be extended.

※ **Do not loosen two bolts (3) on guide (4).**



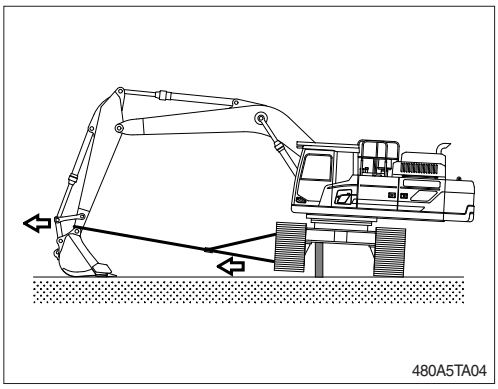
(2) Turn superstructure so that it is perpendicular to lower track to be extended.

※ **Do not attach cable on side frame step.**

(3) Attach one end of cable on arm and the other end on lower track.
Connect it with an appropriate holding device on both ends.

(4) Raise lower track slightly with jack and block. Extend arm gradually to side frame out until it hits stop.

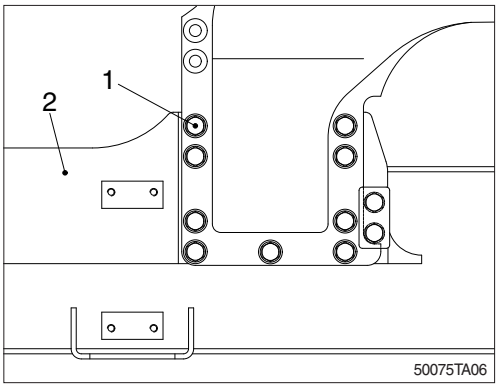
(5) After lower track has slid into place, lower superstructure to ground.
Remove cable.



(6) Install nine spacers and bolts (1).

※ **Tighten bolts to 220±20 kgf·m (1590±145 lbf·ft)**

※ **Repeat procedure at opposite track frame support.**

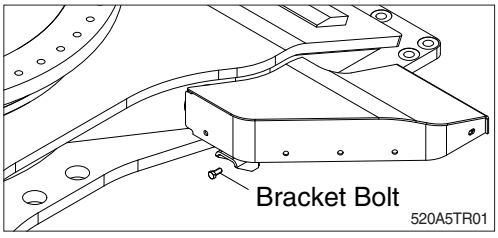


(7) Install the bracket bolts.

※ **Tightening torque : 29.7 kgf·m (215 lbf·ft)**

※ **This applies from machine serial No. HX520LT3 #0209.**

(8) After the bolts for one side frame are fastened repeat steps 1 thru 7 for other side frame.



1. ENGINE

※ **This guide is not intended to cover every condition, however many of the more common possibilities are listed.**

Trouble	Service	Remark
The engine oil pressure lamp lights up when engine speed is raised after completion of warm up.	· Add the oil to the specified level. · Replace the oil filter cartridge. · Check oil leakage from the pipe or the joint. · Replace the monitor.	
Steam is emitted from the top part of the radiator (the pressure valve). Coolant level warning lamp lights up.	· Supply coolant and check leakage. · Adjust fan belt tension. · Wash out inside of cooling system. · Clean or repair the radiator fin. · Check the thermostat. · Tighten the radiator cap firmly or replace the cap itself. · Replace the monitor.	
The engine does not start when the starting motor is turned over.	· Confirm fuel supply. · Repair where air is leaking into fuel system. · Check the injection pump or the nozzle. · Check the valve clearance. · Check engine compression. · In cold weather, check if fuel warmer system is working normal.	Refer to the pages 3-33 and 2-4.
Exhaust gas is white or blue.	· Adjust to specified oil quantity. · Replace with specified fuel.	
Exhaust gas occasionally turns black.	· Clean or replace the air cleaner element. · Check the nozzle. · Check engine compression. · Clean or replace the turbocharger.	
Combustion noise occasionally changes to breathing sound.	· Check the nozzle.	
Unusual combustion noise or mechanical noise.	· Confirm fuel quality. · Check over-heating · Replace the muffler. · Adjust valve clearance.	

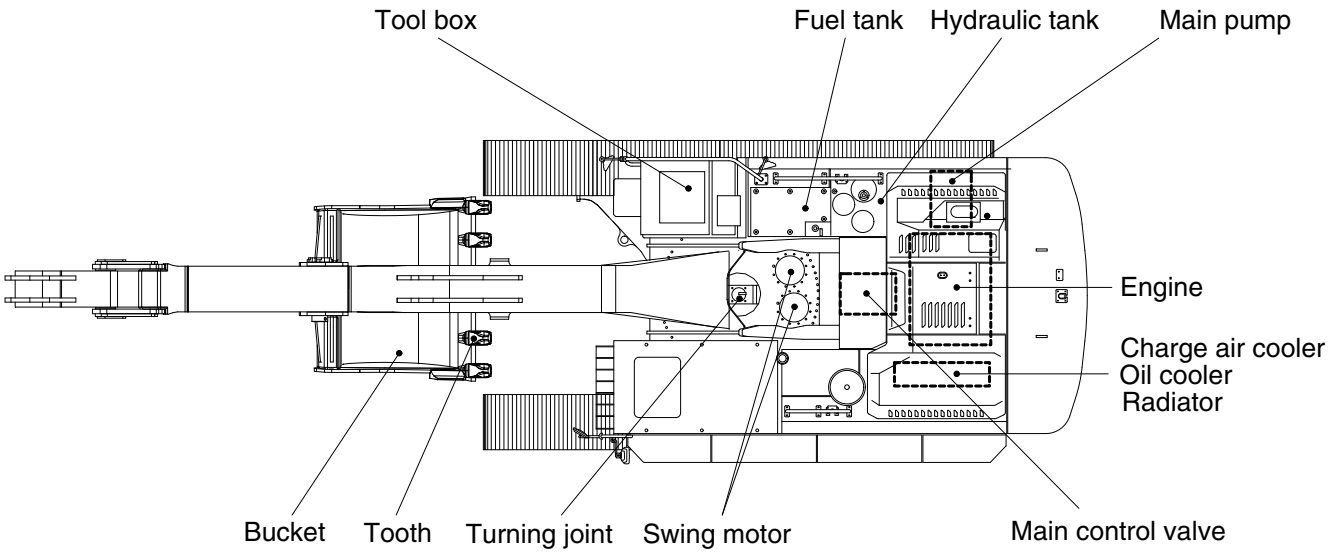
2. ELECTRICAL SYSTEM

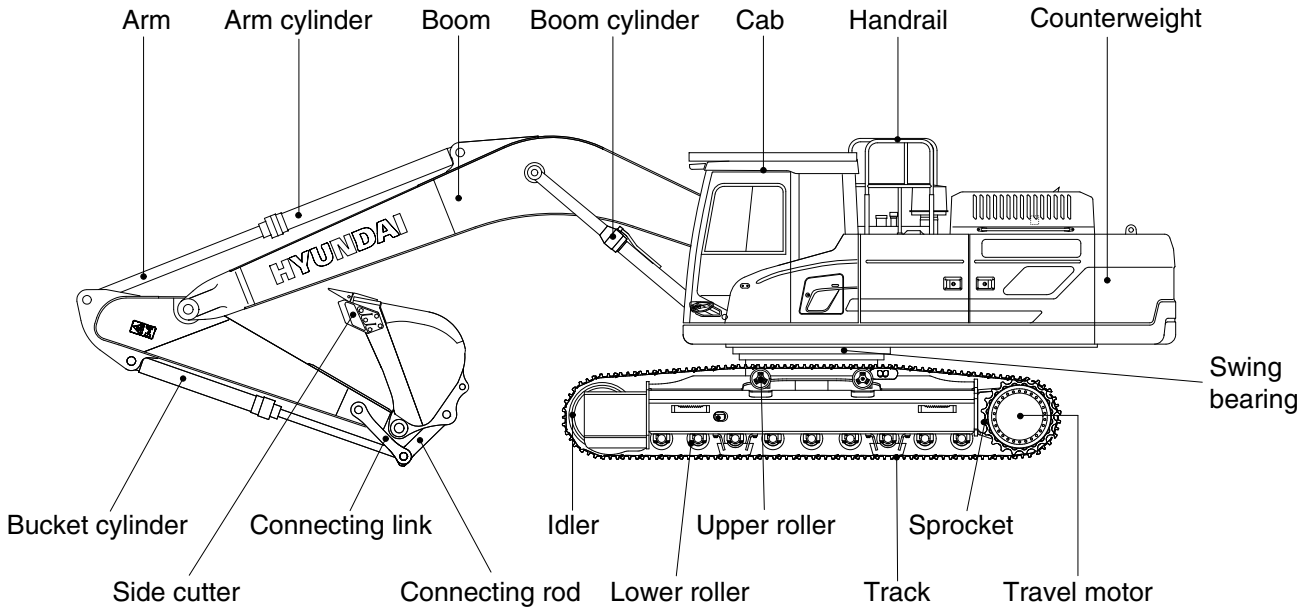
Trouble	Service	Remark
Work lamp does not glow brightly or flickers even when engine runs at high idle.	· Check for loose terminals and open-circuit wiring. · Adjust belt tension.	
Battery charging lamp does not go out even when engine runs at high speed.	· Check the alternator. · Check and repair wiring.	
Unusual noise is emitted from the alternator.	· Check the alternator.	
Starting motor does not turn when starting switch is turned ON.	· Check and repair the wiring. · Charge the battery. · Check the starting motor. · Check the safety relay.	
The pinion of the starting motor keeps going in and out.	· Charge the battery. · Check the safety relay.	
Starting motor turns the engine sluggishly.	· Charge the battery. · Check the starting motor.	
The starting motor disengages before the engine starts up.	· Check and repair the wiring. · Charge the battery.	
The engine warming up lamp does not go ON.	· Check and repair wiring. · Check the monitor.	
The engine oil pressure lamp does not light up when engine is stationary (when the starting switch is in ON position.)	· Check the monitor. · Check the caution lamp switch.	
Battery charging lamp does not light up when the engine is stationary. (when the starting switch is in ON position.)	· Check the monitor. · Check and repair the wiring.	

3. OTHERS

Trouble	Service	Remark
Track slips out of place. Excessive wear of the sprocket.	· Adjust tension of track.	
Bucket either rises slowly or not at all.	· Add oil to specified level.	
Slow speed of travel, swing, boom, arm and bucket.	· Add oil to specified level.	
Unusual noise emitted from pump.	· Clean the hydraulic tank strainer.	
Excessive oil temperature rise of hydraulic oil.	· Clean and check the oil cooler. · Adjust fan belt tension. · Add oil to specified level.	

1. MAJOR COMPONENT

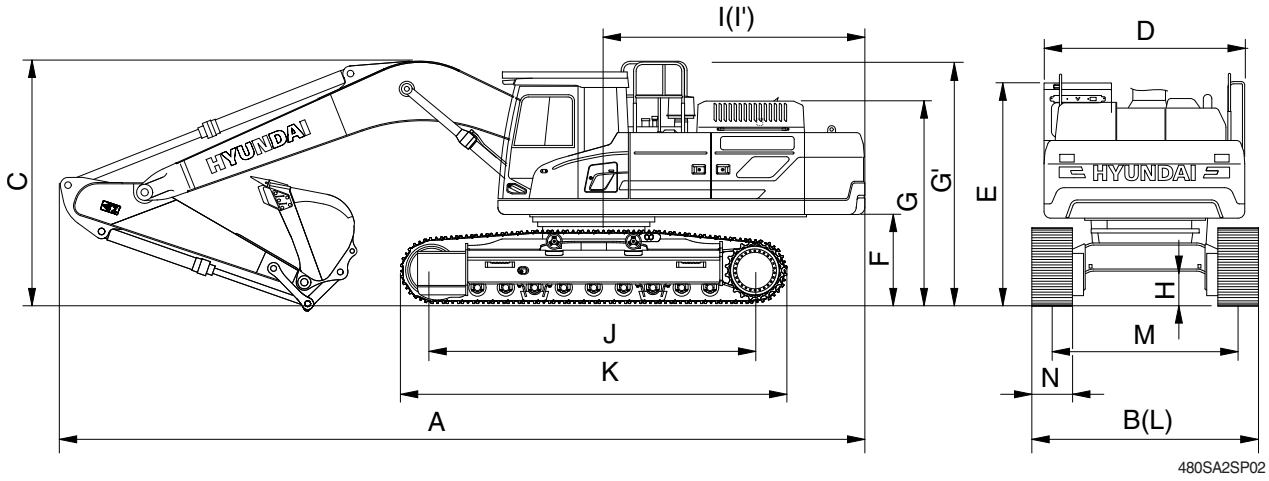




480SA2SP01

2. SPECIFICATIONS

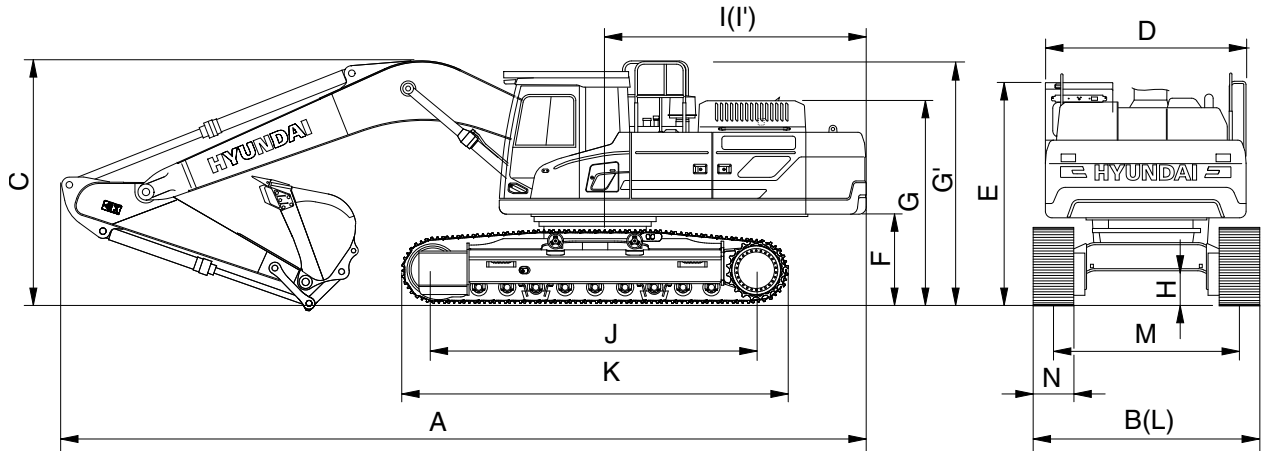
1) HX500LT3 (1/2)



480SA2SP02

Description		Unit		Specification			
		m (ft-in)	Boom	7.06 (23' 2")			
			Arm	3.38 (11' 1")	2.90 (9' 6")	4.00 (13' 1")	2.55 (8' 4")
		mm (in)	Shoe	600 (24)			
Operating weight		kg (lb)		48860 (107720)	48790 (107560)	48850 (107700)	48620 (107190)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)		2.20 (2.88)	2.20 (2.88)	2.20 (2.88)	2.20 (2.88)
Overall length	A	mm (ft-in)		12210 (40' 1")	12220 (40' 1")	12160 (39' 11")	12150 (39' 10")
Overall width	B			3340 (10' 11")	3340 (10' 11")	3340 (10' 11")	3340 (10' 11")
Overall height of boom	C			3790 (12' 5")	3850 (12' 8")	3850 (12' 8")	3890 (12' 9")
Superstructure width	D			2980 (9' 9")	2980 (9' 9")	2980 (9' 9")	2980 (9' 9")
Overall height of cab	E			3240 (10' 8")	3240 (10' 8")	3240 (10' 8")	3240 (10' 8")
Ground clearance of counterweight	F			1370 (4' 6")	1370 (4' 6")	1370 (4' 6")	1370 (4' 6")
Overall height of engine hood	G			3140 (10' 4")	3140 (10' 4")	3140 (10' 4")	3140 (10' 4")
Overall height of handrail	G'			3610 (11' 10")	3610 (11' 10")	3610 (11' 10")	3610 (11' 10")
Minimum ground clearance	H			585 (1' 11")	585 (1' 11")	585 (1' 11")	585 (1' 11")
Rear-end distance	I			3745 (12' 3")	3745 (12' 3")	3745 (12' 3")	3745 (12' 3")
Rear-end swing radius	I'			3800 (12' 6")	3800 (12' 6")	3800 (12' 6")	3800 (12' 6")
Distance between tumblers	J			4470 (14' 8")	4470 (14' 8")	4470 (14' 8")	4470 (14' 8")
Undercarriage length (without grouser)	K			5416 (17' 9")	5416 (17' 9")	5416 (17' 9")	5416 (17' 9")
Undercarriage length (with grouser)	K			5490 (18' 0")	5490 (18' 0")	5490 (18' 0")	5490 (18' 0")
Undercarriage width	L			3340 (10' 11")	3340 (10' 11")	3340 (10' 11")	3340 (10' 11")
Track gauge	M			2740 (9' 0")	2740 (9' 0")	2740 (9' 0")	2740 (9' 0")
Track shoe width, standard	N			600 (24")	600 (24")	600 (24")	600 (24")
Travel speed (low/high)		km/hr (mph)		3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)
Swing speed		rpm		8.8	8.8	8.8	8.8
Gradeability		Degree (%)		35 (70)	35 (70)	35 (70)	35 (70)
Ground pressure		kgf/cm^2 (psi)		0.85 (12.1)	0.85 (12.1)	0.85 (12.1)	0.84 (12.0)
Max traction force		kg (lb)		39674 (87466)	39674 (87466)	39674 (87466)	39674 (87466)

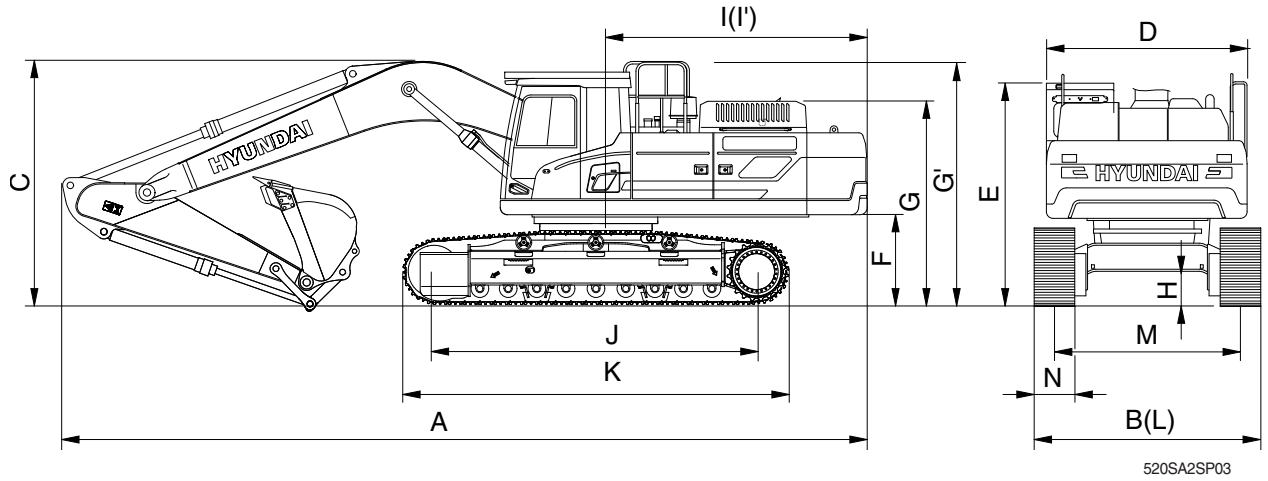
2) HX500LT3 (2/2)



480SA2SP02

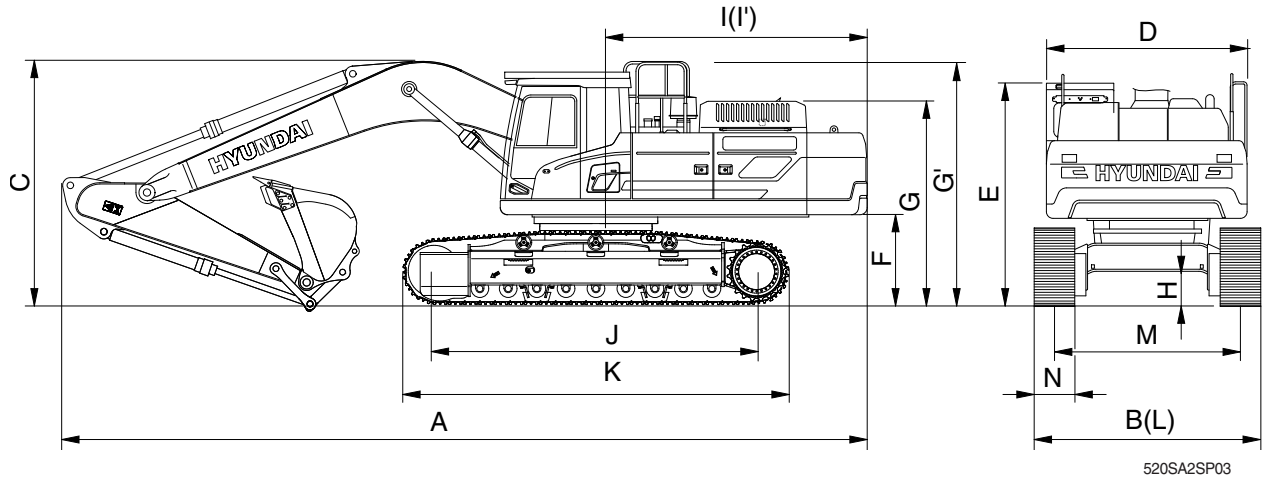
Description		Unit		Specification	
		m (ft-in)	Boom	6.55 (21' 6")	9.00 (29' 6")
			Arm	2.55 (8' 4")	6.00 (19' 8")
		mm (in)	Shoe	600 (24)	
Operating weight		kg (lb)		48430 (106770)	49690 (109550)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)		2.20 (2.88)	1.38 (1.80)
Overall length	A	mm (ft-in)		11680 (38' 4")	14070 (46' 2")
Overall width	B			3340 (10' 11")	3340 (10' 11")
Overall height of boom	C			3790 (12' 5")	3970 (13' 0")
Superstructure width	D			2980 (9' 9")	2980 (9' 9")
Overall height of cab	E			3240 (10' 8")	3240 (10' 8")
Ground clearance of counterweight	F			1370 (4' 6")	1370 (4' 6")
Overall height of engine hood	G			3140 (10' 4")	3140 (10' 4")
Overall height of handrail	G'			3610 (11' 10")	3610 (11' 10")
Minimum ground clearance	H			585 (1' 11")	585 (1' 11")
Rear-end distance	I			3745 (12' 3")	3745 (12' 3")
Rear-end swing radius	I'			3800 (12' 6")	3800 (12' 6")
Distance between tumblers	J			4470 (14' 8")	4470 (14' 8")
Undercarriage length (without grouser)	K			5416 (17' 9")	5416 (17' 9")
Undercarriage length (with grouser)	K			5490 (18' 0")	5490 (18' 0")
Undercarriage width	L			3340 (10' 11")	3340 (10' 11")
Track gauge	M			2740 (9' 0")	2740 (9' 0")
Track shoe width, standard	N			600 (24")	600 (24")
Travel speed (low/high)		km/hr (mph)		3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)
Swing speed		rpm		8.8	8.8
Gradeability		Degree (%)		35 (70)	35 (70)
Ground pressure		kgf/cm^2 (psi)		0.84 (12.0)	0.86 (12.3)
Max traction force		kg (lb)		39674 (87466)	39674 (87466)

3) HX520LT3 (1/2)



Description		Unit		Specification			
		m (ft-in)	Boom	7.06 (23' 2")			
			Arm	3.38 (11' 1")	2.90 (9' 6")	4.00 (13' 1")	2.55 (8' 4")
		mm (in)	Shoe	600 (24)			
Operating weight		kg (lb)		51390 (113300)	51320 (113140)	51380 (113270)	51140 (112740)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)		2.20 (2.88)	2.20 (2.88)	2.20 (2.88)	2.20 (2.88)
Overall length	A	mm (ft-in)		12200 (40' 0")	12210 (40' 1")	12160 (39' 11")	12150 (39' 10")
Overall width (transport position)	B			2980 (9' 9")	2980 (9' 9")	2980 (9' 9")	2980 (9' 9")
Overall width (working position)	B			3540 (11' 7")	3540 (11' 7")	3540 (11' 7")	3540 (11' 7")
Overall height of boom	C			3830 (12' 7")	3890 (12' 9")	3850 (12' 8")	3980 (13' 1")
Superstructure width	D			2980 (9' 9")	2980 (9' 9")	2980 (9' 9")	2980 (9' 9")
Overall height of cab	E			3385 (11' 1")	3385 (11' 1")	3385 (11' 1")	3385 (11' 1")
Ground clearance of counterweight	F			1445 (4' 9")	1445 (4' 9")	1445 (4' 9")	1445 (4' 9")
Overall height of engine hood	G			3140 (10' 4")	3140 (10' 4")	3140 (10' 4")	3140 (10' 4")
Overall height of handrail	G'			3600 (11' 10")	3600 (11' 10")	3600 (11' 10")	3600 (11' 10")
Minimum ground clearance	H			780 (2' 7")	780 (2' 7")	780 (2' 7")	780 (2' 7")
Rear-end distance	I			3745 (12' 3")	3745 (12' 3")	3745 (12' 3")	3745 (12' 3")
Rear-end swing radius	I'			3800 (12' 6")	3800 (12' 6")	3800 (12' 6")	3800 (12' 6")
Distance between tumblers	J			4470 (14' 8")	4470 (14' 8")	4470 (14' 8")	4470 (14' 8")
Undercarriage length (transport position)	K			5416 (17' 9")	5416 (17' 9")	5416 (17' 9")	5416 (17' 9")
Undercarriage length (working position)	K			5490 (18' 0")	5490 (18' 0")	5490 (18' 0")	5490 (18' 0")
Undercarriage width (transport position)	L			2980 (9' 9")	2980 (9' 9")	2980 (9' 9")	2980 (9' 9")
Undercarriage width (working position)	L			3540 (11' 7")	3540 (11' 7")	3540 (11' 7")	3540 (11' 7")
Track gauge (transport position)	M			2380 (7' 10")	2380 (7' 10")	2380 (7' 10")	2380 (7' 10")
Track gauge (working position)	M			2940 (9' 8")	2940 (9' 8")	2940 (9' 8")	2940 (9' 8")
Track shoe width, standard	N			600 (24")	600 (24")	600 (24")	600 (24")
Travel speed (low/high)		km/hr (mph)		3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)
Swing speed		rpm		8.8	8.8	8.8	8.8
Gradeability		Degree (%)		35 (70)	35 (70)	35 (70)	35 (70)
Ground pressure		kgf/cm^2 (psi)		0.89 (12.7)	0.89 (12.7)	0.89 (12.7)	0.89 (12.6)
Max traction force		kg (lb)		39674 (87466)	39674 (87466)	39674 (87466)	34100 (87466)

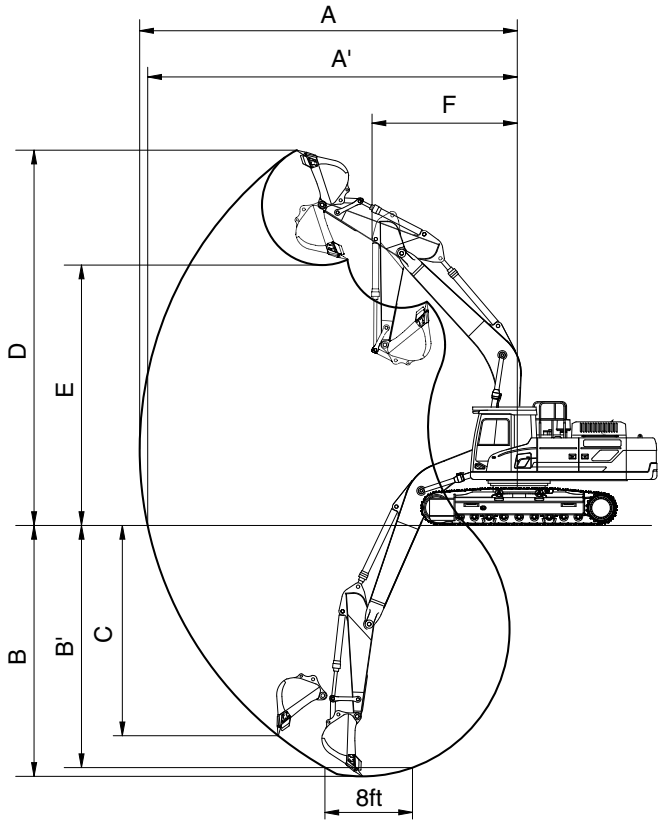
4) HX520LT3 (2/2)



Description		Unit		Specification			
		m (ft-in)	Boom	6.55 (21' 6")			9.00 (29' 6")
			Arm	3.38 (11' 1")	2.90 (9' 6")	2.55 (8' 4")	6.00 (19' 8")
		mm (in)	Shoe	600 (24)			
Operating weight		kg (lb)		51200 (112880)	51130 (112720)	50960 (112350)	52200 (115080)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)		2.20 (2.88)	2.20 (2.88)	2.20 (2.88)	1.38 (1.80)
Overall length	A	mm (ft-in)		11680 (38' 4")	11690 (38' 4")	11650 (38' 3")	14080 (46' 2")
Overall width (transport position)	B			2980 (9' 9")	2980 (9' 9")	2980 (9' 9")	2980 (9' 9")
Overall width (working position)	B			3540 (11' 7")	3540 (11' 7")	3540 (11' 7")	3540 (11' 7")
Overall height of boom	C			3920 (12' 10")	3970 (13' 0")	3900 (12' 10")	3970 (13' 0")
Superstructure width	D			2980 (9' 9")	2980 (9' 9")	2980 (9' 9")	2980 (9' 9")
Overall height of cab	E			3385 (11' 1")	3385 (11' 1")	3385 (11' 1")	3385 (11' 1")
Ground clearance of counterweight	F			1445 (4' 9")	1445 (4' 9")	1445 (4' 9")	1445 (4' 9")
Overall height of engine hood	G			3140 (10' 4")	3140 (10' 4")	3140 (10' 4")	3140 (10' 4")
Overall height of handrail	G'			3600 (11' 10")	3600 (11' 10")	3600 (11' 10")	3600 (11' 10")
Minimum ground clearance	H			770 (2' 6")	770 (2' 6")	770 (2' 6")	770 (2' 6")
Rear-end distance	I			3745 (12' 3")	3745 (12' 3")	3745 (12' 3")	3745 (12' 3")
Rear-end swing radius	I'			3800 (12' 6")	3800 (12' 6")	3800 (12' 6")	3800 (12' 6")
Distance between tumblers	J			4470 (14' 8")	4470 (14' 8")	4470 (14' 8")	4470 (14' 8")
Undercarriage length (transport position)	K			5416 (17' 9")	5416 (17' 9")	5416 (17' 9")	5416 (17' 9")
Undercarriage length (working position)	K			5490 (18' 0")	5490 (18' 0")	5490 (18' 0")	5490 (18' 0")
Undercarriage width (transport position)	L			2980 (9' 9")	2980 (9' 9")	2980 (9' 9")	2980 (9' 9")
Undercarriage width (working position)	L			3540 (11' 7")	3540 (11' 7")	3540 (11' 7")	3540 (11' 7")
Track gauge (transport position)	M			2380 (7' 10")	2380 (7' 10")	2380 (7' 10")	2380 (7' 10")
Track gauge (working position)	M			2940 (9' 8")	2940 (9' 8")	2940 (9' 8")	2940 (9' 8")
Track shoe width, standard	N			600 (24")	600 (24")	600 (24")	600 (24")
Travel speed (low/high)		km/hr (mph)		3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)	3.2/5.2 (2.0/3.2)
Swing speed		rpm		8.8	8.8	8.8	8.8
Gradeability		Degree (%)		35 (70)	35 (70)	35 (70)	35 (70)
Ground pressure		kgf/cm^2 (psi)		0.89 (12.6)	0.89 (12.6)	0.89 (12.6)	0.91 (12.9)
Max traction force		kg (lb)		39674 (87466)	39674 (87466)	39674 (87466)	34100 (87466)

3. WORKING RANGE AND DIGGING FORCE

1) HX500LT3 (1/2)

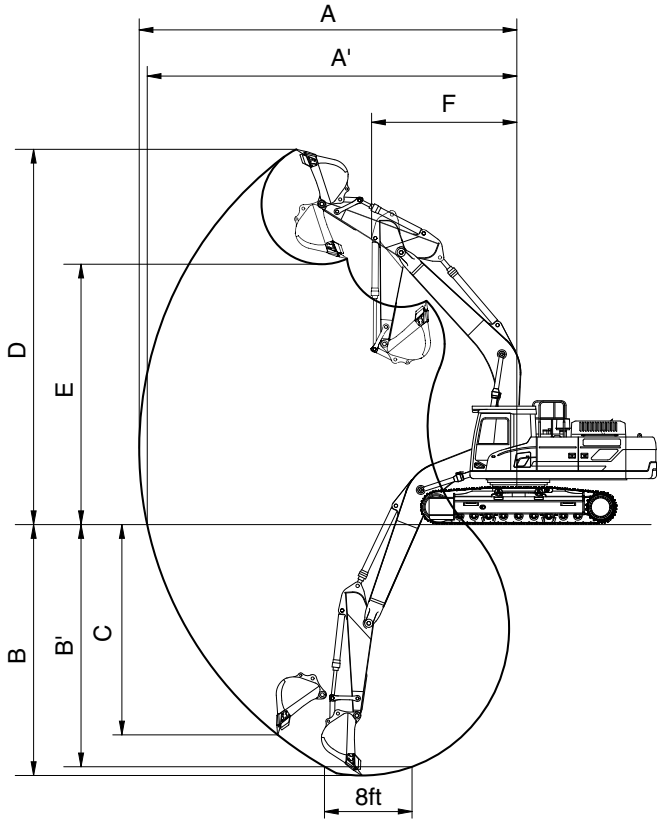


480SA2SP05

Description	m (ft-in)	Boom	7.06 (23' 2")			
		Arm	2.55 (8' 4")	2.90 (9' 6")	3.38 (11' 1")	4.00 (13' 1")
Max digging reach	mm (ft-in)	A	11410 (37' 5")	11670 (38' 3")	12060 (39' 7")	12610 (41' 4")
Max digging reach on ground		A'	11190 (36' 9")	11460 (37' 7")	11850 (38' 11")	12410 (40' 9")
Max digging depth		B	6900 (22' 8")	7250 (23' 9")	7730 (25' 4")	8350 (27' 5")
Max digging depth (8 ft level)		B'	6730 (22' 1")	7090 (23' 3")	7590 (24' 11")	8220 (27' 0")
Max vertical wall digging depth		C	5280 (17' 4")	5710 (18' 9")	5490 (18' 0")	6170 (20' 3")
Max digging height		D	11070 (36' 4")	11090 (36' 5")	11060 (36' 3")	11330 (37' 2")
Max dumping height		E	7600 (24' 11")	7630 (25' 0")	7710 (25' 4")	7920 (26' 0")
Min swing radius		F	4820 (15' 10")	4880 (16' 0")	4870 (16' 0")	4630 (15' 2")
Bucket digging force	kN	SAE	212.8 [231.0]	212.8 [231.0]	212.8 [231.0]	212.8 [231.0]
	kgf		21700 [23560]	21700 [23560]	21700 [23560]	21700 [23560]
	lbf		47840 [51941]	47840 [51941]	47840 [51941]	47840 [51941]
	kN	ISO	247.1 [268.3]	247.1 [268.3]	247.1 [268.3]	247.1 [268.3]
	kgf		25200 [27360]	25200 [27360]	25200 [27360]	25200 [27360]
	lbf		55556 [60318]	55556 [60318]	55556 [60318]	55556 [60318]
Arm digging force	kN	SAE	235.4 [255.6]	218.7 [237.4]	198.1 [215.1]	173.6 [188.5]
	kgf		24000 [26060]	22300 [24210]	20200 [21930]	17700 [19220]
	lbf		52911 [57452]	49163 [53374]	44533 [48347]	39022 [42373]
	kN	ISO	246.1 [267.2]	227.5 [247.0]	205.0 [222.5]	179.5 [194.9]
	kgf		25100 [27250]	23200 [25190]	20900 [22690]	18300 [19870]
	lbf		55336 [60076]	51147 [55534]	46077 [50023]	40345 [43806]

[ ] : Power boost

2) HX500LT3 (2/2)

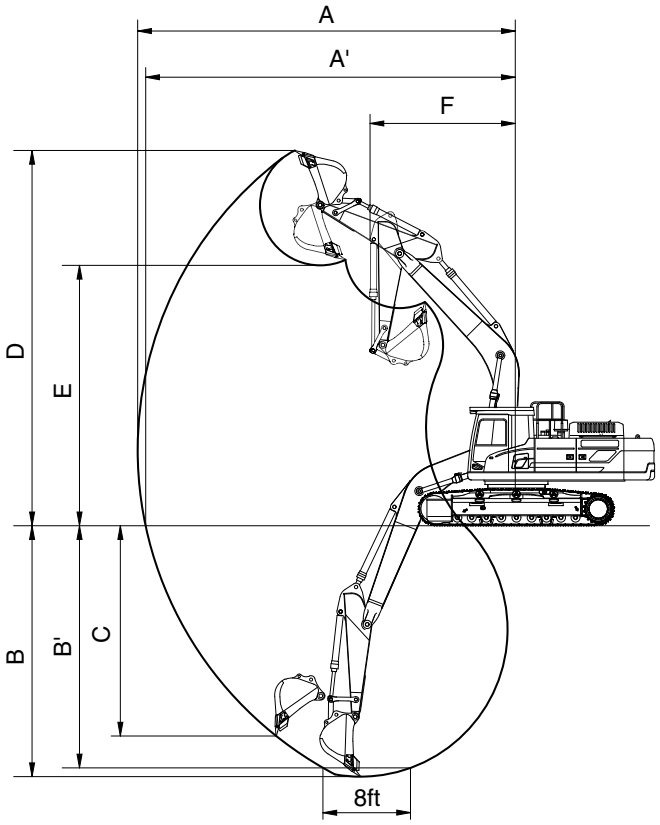


480SA2SP05

Description	m (ft-in)	Boom	6.55 (21' 6")	9.00 (29' 6")
		Arm	2.55 (8' 4")	6.00 (19' 8")
Max digging reach	mm (ft-in)	A	10870 (35' 8")	16110 (52' 10")
Max digging reach on ground		A'	10640 (34' 11")	15950 (52' 4")
Max digging depth		B	6460 (21' 2")	11710 (38' 5")
Max digging depth (8 ft level)		B'	6290 (20' 8")	11620 (38' 1")
Max vertical wall digging depth		C	4840 (15' 11")	8660 (28' 5")
Max digging height		D	10670 (35' 0")	13100 (43' 0")
Max dumping height		E	7210 (23' 8")	9800 (32' 2")
Min swing radius		F	4440 (14' 7")	5630 (18' 6")
Bucket digging force	kN	SAE	240.3 [260.9]	212.8 -
	kgf		24500 [26600]	21700 -
	lbf		54013 [58643]	47840 -
	kN	ISO	279.5 [303.4]	247.1 -
	kgf		28500 [30940]	25200 -
	lbf		62832 [68211]	55556 -
Arm digging force	kN	SAE	235.4 [255.6]	127.5 -
	kgf		24000 [26060]	13000 -
	lbf		52911 [57452]	28660 -
	kN	ISO	246.1 [267.2]	130.4 -
	kgf		25100 [27250]	13300 -
	lbf		55336 [60076]	29321 -

[ ] : Power boost

3) HX520LT3 (1/2)

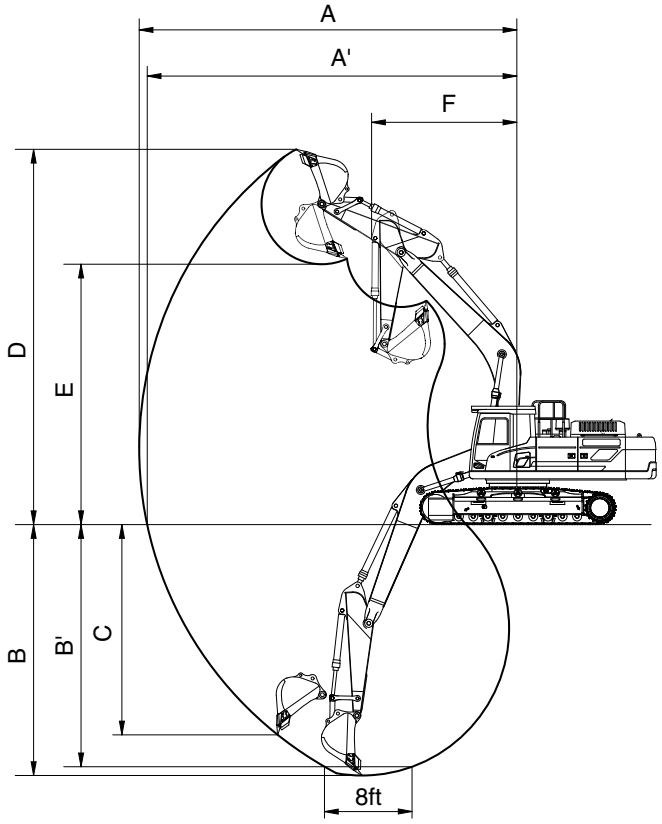


520SA2SP06

Description	m (ft-in)	Boom	7.06 (23' 2")			
		Arm	2.55 (8' 4")	2.90 (9' 6")	3.38 (11' 1")	4.00 (13' 1")
Max digging reach	mm (ft-in)	A	11410 (37' 5")	11670 (38' 3")	12060 (39' 7")	12610 (41' 4")
Max digging reach on ground		A'	11170 (36' 8")	11440 (37' 6")	11840 (38' 10")	12400 (40' 8")
Max digging depth		B	6820 (22' 5")	7170 (23' 6")	7650 (25' 1")	8270 (27' 2")
Max digging depth (8 ft level)		B'	6650 (21' 10")	7010 (23' 0")	7510 (24' 8")	8140 (26' 8")
Max vertical wall digging depth		C	5200 (17' 1")	5630 (18' 6")	5410 (17' 9")	6090 (20' 0")
Max digging height		D	11150 (36' 7")	11170 (36' 8")	11140 (36' 7")	11410 (37' 5")
Max dumping height		E	7680 (25' 2")	7710 (25' 4")	7790 (25' 7")	8000 (26' 3")
Min swing radius		F	4820 (15' 10")	4880 (16' 0")	4870 (16' 0")	4630 (15' 2")
Bucket digging force	kN	SAE	240.3 [260.9]	240.3 [260.9]	240.3 [260.9]	240.3 [260.9]
	kgf		24500 [26600]	24500 [26600]	24500 [26600]	24500 [26600]
	lbf		54013 [58643]	54013 [58643]	54013 [58643]	54013 [58643]
	kN	ISO	279.5 [303.4]	279.5 [303.4]	279.5 [303.4]	279.5 [303.4]
	kgf		28500 [30940]	28500 [30940]	28500 [30940]	28500 [30940]
	lbf		62832 [68211]	62832 [68211]	62832 [68211]	62832 [68211]
Arm digging force	kN	SAE	235.4 [255.6]	218.7 [237.4]	198.1 [215.1]	173.6 [188.5]
	kgf		24000 [26060]	22300 [24210]	20200 [21930]	17700 [19220]
	lbf		52911 [57452]	49163 [53374]	44533 [48347]	39022 [42373]
	kN	ISO	246.1 [267.2]	227.5 [247.0]	205.0 [222.5]	179.5 [194.9]
	kgf		25100 [27250]	23200 [25190]	20900 [22690]	18300 [19870]
	lbf		55336 [60076]	51147 [55534]	46077 [50023]	40345 [43806]

[ ] : Power boost

4) HX520LT3 (2/2)



520SA2SP06

Description	m (ft-in)	Boom	6.55 (21' 6")			9.00 (29' 6")
		Arm	2.55 (8' 4")	2.90 (9' 6")	3.38 (11' 1")	6.00 (19' 8")
Max digging reach	mm (ft-in)	A	10870 (35' 8")	11130 (36' 6")	11520 (37' 10")	16110 (52' 10")
Max digging reach on ground		A'	10610 (34' 10")	10890 (35' 9")	11280 (37' 0")	15940 (52' 4")
Max digging depth		B	6380 (20' 11")	6730 (22' 1")	7210 (23' 8")	11550 (37' 11")
Max digging depth (8 ft level)		B'	6210 (20' 4")	6570 (21' 7")	7070 (23' 2")	11450 (37' 7")
Max vertical wall digging depth		C	4760 (15' 7")	4820 (15' 10")	4990 (16' 4")	8580 (28' 2")
Max digging height		D	10760 (35' 4")	10710 (35' 2")	10740 (35' 3")	13180 (43' 3")
Max dumping height		E	7290 (23' 11")	7320 (24' 0")	7400 (24' 3")	9880 (32' 5")
Min swing radius		F	4440 (14' 7")	4450 (14' 7")	4490 (14' 9")	5630 (18' 6")
Bucket digging force	kN	SAE	240.3 [260.9]	240.3 [260.9]	240.3 [260.9]	212.8 -
	kgf		24500 [26600]	24500 [26600]	24500 [26600]	21700 -
	lbf		54013 [58643]	54013 [58643]	54013 [58643]	47840 -
	kN	ISO	279.5 [303.4]	279.5 [303.4]	279.5 [303.4]	247.1 -
	kgf		28500 [30940]	28500 [30940]	28500 [30940]	25200 -
	lbf		62832 [68211]	62832 [68211]	62832 [68211]	55556 -
Arm digging force	kN	SAE	235.4 [255.6]	218.7 [237.4]	198.1 [215.1]	127.5 -
	kgf		24000 [26060]	22300 [24210]	20200 [21930]	13000 -
	lbf		52911 [57452]	49163 [53374]	44533 [48347]	28660 -
	kN	ISO	246.1 [267.2]	227.5 [247.0]	205.0 [222.5]	130.4 -
	kgf		25100 [27250]	23200 [25190]	20900 [22690]	13300 -
	lbf		55336 [60076]	51147 [55534]	46077 [50023]	29321 -

[ ] : Power boost

4. WEIGHT

Item	HX500LT3		HX520LT3	
	kg	lb	kg	lb
Upperstructure assembly				
· Main frame weld assembly	4313	9508	4313	9508
· Engine assembly	860	1896	860	1896
· Main pump assembly	194	428	194	428
· Main control valve assembly	421	928	421	928
· Swing motor assembly	667	1470	667	1470
· Hydraulic oil tank WA	418	922	418	922
· Fuel tank WA	376	829	376	829
· Counterweight	9700	21385	10700	23589
· Cab assembly	495	1092	495	1092
Lower chassis assembly				
· Track frame weld assembly	6600	14550	7888	17390
· Swing bearing	719	1585	719	1585
· Travel motor assembly (2EA)	1264	2787	1264	2787
· Turning joint	96	212	96	212
· Sprocket (2EA)	188	415	188	415
· Track recoil spring (2EA)	653	1440	653	1440
· Idler (2EA)	639	1408	639	1408
· Upper roller (HX500LT3 - 4EA / HX520LT3 - 6EA)	351	774	244	538
· Lower roller (18EA)	1579	3481	1531	3375
· Track-chain assembly (600 mm triple grouser shoe) (2EA)	5534	12200	5534	12200
· Track-chain assembly (700 mm triple grouser shoe) (2EA)	6054	13347	6054	13347
· Track-chain assembly (800 mm triple grouser shoe) (2EA)	6584	14515	6584	14515
· Track-chain assembly (900 mm triple grouser shoe) (2EA)	7092	15635	7092	15635
· Track-chain assembly (600 mm double grouser shoe) (2EA)	5566	12271	5566	12271
· Track-chain assembly (600 mm HD triple grouser shoe) (2EA)	5714	12597	5714	12597
Front attachment assembly				
· 7.06 m boom assembly	3640	8025	3640	8025
· 3.38 m arm assembly	1845	4067	1845	4067
· 2.20 m^3 SAE heaped bucket	2020	4453	2020	4453
· Boom cylinder assembly (2EA)	1142	2518	1142	2518
· Arm cylinder assembly	591	1303	591	1303
· Bucket cylinder assembly	366	807	366	807
· Bucket control linkage total	519	1144	519	1144

※ This information is different with operating and transportation weight because it is not including harness, pipe, oil, fuel so on.

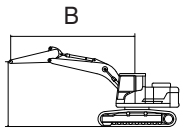
※ Refer to Transportation for actual weight information and Specifications for operating weight.

5. LIFTING CAPACITIES

1) HX500LT3

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX500LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6550	2550	9200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
9.0 m (29.5 ft)	kg									*13880	*13880	5.79
	lb									*30600	*30600	(19.0)
7.5 m (24.6 ft)	kg					*13190	*13190			*12600	10960	7.22
	lb					*29080	*29080			*27780	24160	(23.7)
6.0 m (19.7 ft)	kg					*13980	*13980	*12410	10200	*12070	8900	8.12
	lb					*30820	*30820	*27360	22490	*26610	19620	(26.6)
4.5 m (14.8 ft)	kg			*20370	*20370	*15430	13870	*12960	9900	*11830	7840	8.67
	lb			*44910	*44910	*34020	30580	*28570	21830	*26080	17280	(28.4)
3.0 m (9.8 ft)	kg					*16960	13100	*13650	9520	*11730	7320	8.94
	lb					*37390	28880	*30090	20990	*25860	16140	(29.3)
1.5 m (4.9 ft)	kg					*17890	12510	*14120	9190	*11690	7170	8.94
	lb					*39440	27580	*31130	20260	*25770	15810	(29.3)
0.0 m (0.0 ft)	kg			*21030	18620	*17850	12210	*14030	8990	*11620	7390	8.69
	lb			*46360	41050	*39350	26920	*30930	19820	*25620	16290	(28.5)
-1.5 m (-4.9 ft)	kg	*15060	*15060	*21280	18720	*16720	12170	*13030	8970	*11390	8070	8.15
	lb	*33200	*33200	*46910	41270	*36860	26830	*28730	19780	*25110	17790	(26.7)
-3.0 m (-9.8 ft)	kg	*20530	*20530	*17830	*17830	*14160	12360			*10720	9590	7.26
	lb	*45260	*45260	*39310	*39310	*31220	27250			*23630	21140	(23.8)

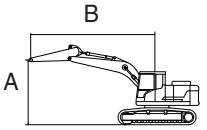
Note 1. Lifting capacity are based on ISO 10567.
2. Lifting capacity of the HX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
3. The Lift-point is bucket pivot mounting pin on the arm (without bucket mass).
4. *Indicates load limited by hydraulic capacity.

※ Lifting capacities are based upon a standard machine conditions.
Lifting capacities will vary with different work tools, ground conditions and attachments.
The difference between the weight of a work tool attachment must be subtracted.
Consult with your local HD Hyundai Construction Equipment dealer regarding the lifting capacities for specific work tools and attachments.

⚠ Failure to comply to the rated load can cause serious injury, death, or property damage. Make adjustments to the rated load as necessory for non-standard configurations.

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX500LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6550	2900	9200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg											*11820	*11820	6.19
	lb											*26060	*26060	(20.3)
7.5 m (24.6 ft)	kg							*11250	10350			*10890	10250	7.54
	lb							*24800	22820			*24010	22600	(24.7)
6.0 m (19.7 ft)	kg					*13340	*13340	*11880	10240			*10600	8420	8.41
	lb					*29410	*29410	*26190	22580			*23370	18560	(27.6)
4.5 m (14.8 ft)	kg			*19300	*19300	*14830	13940	*12520	9900			*10710	7450	8.94
	lb			*42550	*42550	*32690	30730	*27600	21830			*23610	16420	(29.3)
3.0 m (9.8 ft)	kg			*22770	19820	*16450	13110	*13290	9480	*11400	7190	*11180	6950	9.20
	lb			*50200	43700	*36270	28900	*29300	20900	*25130	15850	*24650	15320	(30.2)
1.5 m (4.9 ft)	kg			*19910	18720	*17560	12450	*13870	9110	*11500	7020	*11210	6800	9.20
	lb			*43890	41270	*38710	27450	*30580	20080	*25350	15480	*24710	14990	(30.2)
0.0 m (0.0 ft)	kg			*23720	18390	*17760	12080	*13950	8870			*11220	6970	8.96
	lb			*52290	40540	*39150	26630	*30750	19550			*24740	15370	(29.4)
-1.5 m (-4.9 ft)	kg	*16270	*16270	*21890	18420	*16900	11980	*13220	8800			*11120	7550	8.44
	lb	*35870	*35870	*48260	40610	*37260	26410	*29150	19400			*24520	16640	(27.7)
-3.0 m (-9.8 ft)	kg	*22850	*22850	*18760	18700	*14740	12120	*10960	8970			*10700	8850	7.58
	lb	*50380	*50380	*41360	41230	*32500	26720	*24160	19780			*23590	19510	(24.9)
-4.5 m (-14.8 ft)	kg			*13560	*13560	*10150	*10150					*9330	*9330	6.27
	lb			*29890	*29890	*22380	*22380					*20570	*20570	(20.6)

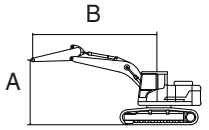
Note 1. Lifting capacity are based on ISO 10567.
2. Lifting capacity of the HX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
3. The Lift-point is bucket pivot mounting pin on the arm (without bucket mass).
4. *Indicates load limited by hydraulic capacity.

※ Lifting capacities are based upon a standard machine conditions.
Lifting capacities will vary with different work tools, ground conditions and attachments.
The difference between the weight of a work tool attachment must be subtracted.
Consult with your local HD Hyundai Construction Equipment dealer regarding the lifting capacities for specific work tools and attachments.

⚠ Failure to comply to the rated load can cause serious injury, death, or property damage. Make adjustments to the rated load as necessory for non-standard configurations.

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX500LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	2550	9200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg											*12380	*12380	6.60
	lb											*27290	*27290	(21.6)
7.5 m (24.6 ft)	kg							*11560	10350			*11490	9480	7.87
	lb							*25490	22820			*25330	20900	(25.8)
6.0 m (19.7 ft)	kg					*13640	*13640	*11840	10150			*11100	7900	8.71
	lb					*30070	*30070	*26100	22380			*24470	17420	(28.6)
4.5 m (14.8 ft)	kg					*15260	13570	*12560	9760	*11060	7350	*10910	7050	9.22
	lb					*33640	29920	*27690	21520	*24380	16200	*24050	15540	(30.3)
3.0 m (9.8 ft)	kg					*16820	12750	*13340	9340	*11320	7160	*10840	6610	9.47
	lb					*37080	28110	*29410	20590	*24960	15790	*23900	14570	(31.1)
1.5 m (4.9 ft)	kg					*17670	12180	*13860	8990	*11470	6980	*10810	6490	9.48
	lb					*38960	26850	*30560	19820	*25290	15390	*23830	14310	(31.1)
0.0 m (0.0 ft)	kg					*17570	11930	*13880	8790	*11210	6880	*10770	6650	9.24
	lb					*38740	26300	*30600	19380	*24710	15170	*23740	14660	(30.3)
-1.5 m (-4.9 ft)	kg			*20510	18440	*16560	11900	*13170	8750			*10610	7190	8.74
	lb			*45220	40650	*36510	26230	*29030	19290			*23390	15850	(28.7)
-3.0 m (-9.8 ft)	kg	*19190	*19190	*17720	*17720	*14510	12070	*11260	8900			*10150	8340	7.92
	lb	*42310	*42310	*39070	*39070	*31990	26610	*24820	19620			*22380	18390	(26.0)
-4.5 m (-14.8 ft)	kg			*13240	*13240	*10610	*10610					*8830	*8830	6.66
	lb			*29190	*29190	*23390	*23390					*19470	*19470	(21.9)

Note 1. Lifting capacity are based on ISO 10567.
2. Lifting capacity of the HX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
3. The Lift-point is bucket pivot mounting pin on the arm (without bucket mass).
4. *Indicates load limited by hydraulic capacity.

※ Lifting capacities are based upon a standard machine conditions.
Lifting capacities will vary with different work tools, ground conditions and attachments.
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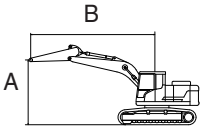
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX500LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	2900	9200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg											*11510	*11510	6.97
	lb											*25380	*25380	(22.9)
7.5 m (24.6 ft)	kg							*10980	10420			*10810	8910	8.19
	lb							*24210	22970			*23830	19640	(26.9)
6.0 m (19.7 ft)	kg					*13030	*13030	*11370	10180			*10500	7480	8.99
	lb					*28730	*28730	*25070	22440			*23150	16490	(29.5)
4.5 m (14.8 ft)	kg			*19780	*19780	*14660	13630	*12140	9760	*10690	7330	*10370	6690	9.49
	lb			*43610	*43610	*32320	30050	*26760	21520	*23570	16160	*22860	14750	(31.1)
3.0 m (9.8 ft)	kg					*16310	12750	*12980	9300	*11040	7100	*10340	6280	9.74
	lb					*35960	28110	*28620	20500	*24340	15650	*22800	13850	(31.9)
1.5 m (4.9 ft)	kg					*17350	12110	*13600	8910	*11280	6890	*10360	6140	9.74
	lb					*38250	26700	*29980	19640	*24870	15190	*22840	13540	(32.0)
0.0 m (0.0 ft)	kg			*14480	*14480	*17470	11780	*13750	8670	*11190	6760	*10380	6270	9.51
	lb			*31920	*31920	*38510	25970	*30310	19110	*24670	14900	*22880	13820	(31.2)
-1.5 m (-4.9 ft)	kg			*21210	18090	*16700	11700	*13230	8580	*10370	6760	*10320	6740	9.02
	lb			*46760	39880	*36820	25790	*29170	18920	*22860	14900	*22750	14860	(29.6)
-3.0 m (-9.8 ft)	kg	*21630	*21630	*18580	18360	*14930	11830	*11720	8690			*10040	7730	8.23
	lb	*47690	*47690	*40960	40480	*32910	26080	*25840	19160			*22130	17040	(27.0)
-4.5 m (-14.8 ft)	kg			*14450	*14450	*11610	*11610					*9130	*9130	7.04
	lb			*31860	*31860	*25600	*25600					*20130	*20130	(23.1)

Note 1. Lifting capacity are based on ISO 10567.
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3. The Lift-point is bucket pivot mounting pin on the arm (without bucket mass).
4. *Indicates load limited by hydraulic capacity.

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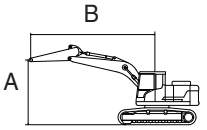
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX500LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	3380	9200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg							*9510	*9510			*9450	*9450	7.51
	lb							*20970	*20970			*20830	*20830	(24.6)
7.5 m (24.6 ft)	kg							*10350	*10350			*8950	8240	8.65
	lb							*22820	*22820			*19730	18170	(28.4)
6.0 m (19.7 ft)	kg							*10850	10330	*9990	7610	*8830	7020	9.41
	lb							*23920	22770	*22020	16780	*19470	15480	(30.9)
4.5 m (14.8 ft)	kg			*18480	*18480	*14010	13910	*11700	9900	*10330	7420	*8960	6310	9.89
	lb			*40740	*40740	*30890	30670	*25790	21830	*22770	16360	*19750	13910	(32.5)
3.0 m (9.8 ft)	kg					*15810	13010	*12650	9420	*10790	7160	*9350	5930	10.12
	lb					*34860	28680	*27890	20770	*23790	15790	*20610	13070	(33.2)
1.5 m (4.9 ft)	kg					*17100	12290	*13410	9000	*11150	6930	9870	5800	10.13
	lb					*37700	27090	*29560	19840	*24580	15280	21760	12790	(33.2)
0.0 m (0.0 ft)	kg			*17130	*17130	*17540	11870	*13740	8710	*11240	6750	*9970	5900	9.91
	lb			*37770	*37770	*38670	26170	*30290	19200	*24780	14880	*21980	13010	(32.5)
-1.5 m (-4.9 ft)	kg	*12220	*12220	*22260	18060	*17080	11720	*13470	8580	*10790	6690	*10000	6290	9.44
	lb	*26940	*26940	*49070	39820	*37650	25840	*29700	18920	*23790	14750	*22050	13870	(31.0)
-3.0 m (-9.8 ft)	kg	*20690	*20690	*19920	18260	*15660	11780	*12340	8610			*9900	7100	8.69
	lb	*45610	*45610	*43920	40260	*34520	25970	*27210	18980			*21830	15650	(28.5)
-4.5 m (-14.8 ft)	kg	*19790	*19790	*16250	*16250	*12920	12050	*9580	8890			*9390	8790	7.57
	lb	*43630	*43630	*35830	*35830	*28480	26570	*21120	19600			*20700	19380	(24.8)

Note 1. Lifting capacity are based on ISO 10567.
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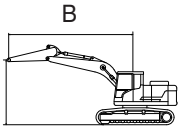
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX500LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	4000	9200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)														At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		10.5 m (34.4 ft)		Capacity		Reach
																		m (ft)
9.0m	kg															*7340	*7340	8.24
29.5ft	lb															*16180	*16180	(27.0)
7.5m	kg											*8410	7900			*7010	*7010	9.29
24.6ft	lb											*18540	17420			*15450	*15450	(30.5)
6.0m	kg									*10200	*10200	*9450	7800			*6930	6450	10.01
19.7ft	lb									*22490	*22490	*20830	17200			*15280	14220	(32.8)
4.5m	kg							*13140	*13140	*11140	10130	*9910	7580			*7030	5860	10.46
14.8ft	lb							*28970	*28970	*24560	22330	*21850	16710			*15500	12920	(34.3)
3.0m	kg					*20800	20410	*15100	13370	*12210	9630	*10480	7300	*8720	5690	*7320	5530	10.68
9.8ft	lb					*45860	45000	*33290	29480	*26920	21230	*23100	16090	*19220	12540	*16140	12190	(35.0)
1.5m	kg					*20070	18940	*16700	12570	*13140	9170	*10990	7030	9410	5560	*7820	5410	10.68
4.9ft	lb					*44250	41760	*36820	27710	*28970	20220	*24230	15500	20750	12260	*17240	11930	(35.0)
0.0m	kg					*19100	18270	*17520	12050	*13700	8820	*11260	6820			*8600	5480	10.47
0.0ft	lb					*42110	40280	*38620	26570	*30200	19440	*24820	15040			*18960	12080	(34.4)
-1.5m	kg			*12230	*12230	*23290	18100	*17450	11800	*13710	8630	*11110	6710			*9540	5790	10.03
-4.9ft	lb			*26960	*26960	*51350	39900	*38470	26010	*30230	19030	*24490	14790			*21030	12760	(32.9)
-3.0m	kg	*14130	*14130	*18540	*18540	*21430	18190	*16470	11770	*12980	8600	*10210	6720			*9570	6420	9.33
-9.8ft	lb	*31150	*31150	*40870	*40870	*47250	40100	*36310	25950	*28620	18960	*22510	14820			*21100	14150	(30.6)
-4.5m	kg			*23840	*23840	*18340	*18340	*14340	11950	*11120	8740					*9360	7670	8.30
-14.8ft	lb			*52560	*52560	*40430	*40430	*31610	26350	*24520	19270					*20640	16910	(27.2)
-6.0m	kg					*13350	*13350	*10290	*10290							*8450	*8450	6.78
-19.7ft	lb					*29430	*29430	*22690	*22690							*18630	*18630	(22.3)

Note 1. Lifting capacity are based on ISO 10567.

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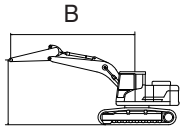
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX500LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		9000	6000	10700	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)																		At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		10.5 m (34.4 ft)		12.0 m (39.4 ft)		13.5 m (44.3 ft)		Capacity		Reach
																						m (ft)
10.5m	kg																			*4060	*4060	11.51
34.4ft	lb																			*8950	*8950	(37.7)
9.0m	kg															*4870	*4870			*3950	*3950	12.46
29.5ft	lb															*10740	*10740			*8710	*8710	(40.9)
7.5m	kg													*5930	*5930	*5620	5150			*3940	*3940	13.17
24.6ft	lb													*13070	*13070	*12390	11350			*8690	*8690	(43.2)
6.0m	kg													*6270	*6270	*5810	5000	*4500	3900	*3990	3770	13.69
19.7ft	lb													*13820	*13820	*12810	11020	*9920	8600	*8800	8310	(44.9)
4.5m	kg									*8790	*8790	*7540	*7540	*6680	6130	*6060	4800	*5520	3790	*4110	3480	14.02
14.8ft	lb									*19380	*19380	*16620	*16620	*14730	13510	*13360	10580	*12170	8360	*9060	7670	(46.0)
3.0m	kg					*17920	*17920	*12630	*12630	*9890	9810	*8240	7430	*7130	5780	*6350	4580	*5750	3650	*4300	3290	14.18
9.8ft	lb					*39510	*39510	*27840	*27840	*21800	21630	*18170	16380	*15720	12740	*14000	10100	*12680	8050	*9480	7250	(46.5)
1.5m	kg					*9790	*9790	*14170	12320	*10870	9040	*8880	6930	*7550	5450	*6610	4360	*5890	3510	*4580	3190	14.19
4.9ft	lb					*21580	*21580	*31240	27160	*23960	19930	*19580	15280	*16640	12020	*14570	9610	*12990	7740	*10100	7030	(46.5)
0.0m	kg					*9020	*9020	*15100	11450	*11570	8440	*9370	6520	*7880	5170	*6810	4170	*5960	3400	*4970	3170	14.03
0.0ft	lb					*19890	*19890	*33290	25240	*25510	18610	*20660	14370	*17370	11400	*15010	9190	*13140	7500	*10960	6990	(46.0)
-1.5m	kg	*4710	*4710	*6130	*6130	*10400	*10400	*15390	10970	*11920	8030	*9650	6210	*8060	4950	*6890	4020	*5910	3310	*5510	3230	13.70
-4.9ft	lb	*10380	*10380	*13510	*13510	*22930	*22930	*33930	24180	*26280	17700	*21270	13690	*17770	10910	*15190	8860	*13030	7300	*12150	7120	(45.0)
-3.0m	kg	*7100	*7100	*8690	*8690	*12720	*12720	*15140	10770	*11890	7820	*9660	6030	*8040	4810	*6790	3930			*5880	3400	13.20
-9.8ft	lb	*15650	*15650	*19160	*19160	*28040	*28040	*33380	23740	*26210	17240	*21300	13290	*17730	10600	*14970	8660			*12960	7500	(43.3)
-4.5m	kg	*9580	*9580	*11500	*11500	*15760	*15760	*14400	10760	*11470	7750	*9360	5960	*7750	4770	*6400	3930			*5950	3710	12.50
-14.8ft	lb	*21120	*21120	*25350	*25350	*34740	*34740	*31750	23720	*25290	17090	*20640	13140	*17090	10520	*14110	8660			*13120	8180	(41.0)
-6.0m	kg	*12310	*12310	*14730	*14730	*16720	*16720	*13140	10920	*10590	7830	*8650	6010	*7060	4830					*5980	4240	11.55
-19.7ft	lb	*27140	*27140	*32470	*32470	*36860	*36860	*28970	24070	*23350	17260	*19070	13250	*15560	10650					*13180	9350	(37.9)
-7.5m	kg			*18050	*18050	*13990	*13990	*11240	11230	*9120	8040	*7360	6190							*5870	5160	10.31
-24.6ft	lb			*39790	*39790	*30840	*30840	*24780	24760	*20110	17730	*16230	13650							*12940	11380	(33.8)
-9.0m	kg					*10190	*10190	*8390	*8390	*6720	*6720									*5410	*5410	8.62
-29.5ft	lb					*22470	*22470	*18500	*18500	*14820	*14820									*11930	*11930	(28.3)

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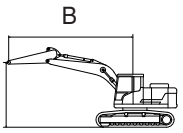
2) HX520LT3

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX520LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6550	2550	10200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
9.0 m (29.5 ft)	kg									*13740	*13740	5.92
	lb									*30290	*30290	(19.4)
7.5 m (24.6 ft)	kg					*13220	*13220			*12550	12490	7.29
	lb					*29150	*29150			*27670	27540	(23.9)
6.0 m (19.7 ft)	kg					*14060	*14060	*12430	11850	*12050	10280	8.17
	lb					*31000	*31000	*27400	26120	*26570	22660	(26.8)
4.5 m (14.8 ft)	kg			*20650	*20650	*15550	*15550	*13010	11530	*11820	9140	8.70
	lb			*45530	*45530	*34280	*34280	*28680	25420	*26060	20150	(28.5)
3.0 m (9.8 ft)	kg					*17050	15340	*13700	11140	*11730	8600	8.94
	lb					*37590	33820	*30200	24560	*25860	18960	(29.3)
1.5 m (4.9 ft)	kg					*17930	14760	*14130	10820	*11690	8480	8.93
	lb					*39530	32540	*31150	23850	*25770	18700	(29.3)
0.0 m (0.0 ft)	kg			*21780	*21780	*17810	14470	*14000	10630	*11610	8770	8.66
	lb			*48020	*48020	*39260	31900	*30860	23440	*25600	19330	(28.4)
-1.5 m (-4.9 ft)	kg	*16090	*16090	*21090	*21090	*16590	14440	*12900	10620	*11370	9630	8.10
	lb	*35470	*35470	*46500	*46500	*36570	31830	*28440	23410	*25070	21230	(26.6)
-3.0 m (-9.8 ft)	kg	*20140	*20140	*17510	*17510	*13900	*13900			*10640	*10640	7.18
	lb	*44400	*44400	*38600	*38600	*30640	*30640			*23460	*23460	(23.6)

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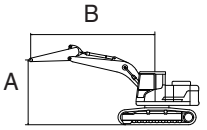
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX520LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6550	2900	10200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg lb											*11720 *25840	*11720 *25840	6.31 (20.7)
7.5 m (24.6 ft)	kg lb							*11790 *25990	*11790 *25990			*10850 *23920	*10850 *23920	7.61 (25.0)
6.0 m (19.7 ft)	kg lb					*13430 *29610	*13430 *29610	*11920 *26280	11890 26210			*10600 *23370	9740 21470	8.45 (27.7)
4.5 m (14.8 ft)	kg lb			*19570 *43140	*19570 *43140	*14950 *32960	*14950 *32960	*12570 *27710	11530 25420			*10730 *23660	8700 19180	8.97 (29.4)
3.0 m (9.8 ft)	kg lb			*22960 *50620	*22960 *50620	*16550 *36490	15350 33840	*13340 *29410	11110 24490	*11410 *25150	8470 18670	*11190 *24670	8180 18030	9.21 (30.2)
1.5 m (4.9 ft)	kg lb			*19880 *43830	*19880 *43830	*17610 *38820	14700 32410	*13890 *30620	10740 23680	*11490 *25330	8300 18300	*11210 *24710	8050 17750	9.19 (30.2)
0.0 m (0.0 ft)	kg lb			*23620 *52070	22030 48570	*17730 *39090	14340 31610	*13920 *30690	10510 23170			*11210 *24710	8300 18300	8.93 (29.3)
-1.5 m (-4.9 ft)	kg lb	*17060 *37610	*17060 *37610	*21710 *47860	*21710 *47860	*16790 *37020	14250 31420	*13120 *28920	10450 23040			*11100 *24470	9030 19910	8.39 (27.5)
-3.0 m (-9.8 ft)	kg lb	*22460 *49520	*22460 *49520	*18470 *40720	*18470 *40720	*14520 *32010	14410 31770	*10680 *23550	10650 23480			*10650 *23480	10630 23440	7.51 (24.6)
-4.5 m (-14.8 ft)	kg lb			*13060 *28790	*13060 *28790	*9620 *21210	*9620 *21210					*9150 *20170	*9150 *20170	6.15 (20.2)

Note 1. Lifting capacity are based on ISO 10567.
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Lifting capacities will vary with different work tools, ground conditions and attachments.
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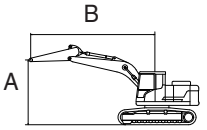
⚠ Failure to comply to the rated load can cause serious injury, death, or property damage. Make adjustments to the rated load as necessory for non-standard configurations.

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX520LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	2550	10200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg											*12280	*12280	6.71
	lb											*27070	*27070	(22.0)
7.5 m (24.6 ft)	kg							*11560	*11560			*11450	10870	7.94
	lb							*25490	*25490			*25240	23960	(26.1)
6.0 m (19.7 ft)	kg					*13750	*13750	*11890	11790			*11080	9170	8.75
	lb					*30310	*30310	*26210	25990			*24430	20220	(28.7)
4.5 m (14.8 ft)	kg					*15380	*15380	*12620	11390	*11070	8630	*10910	8250	9.25
	lb					*33910	*33910	*27820	25110	*24410	19030	*24050	18190	(30.3)
3.0 m (9.8 ft)	kg					*16910	14980	*13390	10960	*11340	8430	*10840	7800	9.48
	lb					*37280	33030	*29520	24160	*25000	18580	*23900	17200	(31.1)
1.5 m (4.9 ft)	kg					*17700	14430	*13880	10620	*11470	8260	*10810	7690	9.47
	lb					*39020	31810	*30600	23410	*25290	18210	*23830	16950	(31.1)
0.0 m (0.0 ft)	kg					*17530	14190	*13850	10420	*11160	8170	*10760	7930	9.21
	lb					*38650	31280	*30530	22970	*24600	18010	*23720	17480	(30.2)
-1.5 m (-4.9 ft)	kg			*20350	*20350	*16450	14180	*13080	10390			*10600	8600	8.69
	lb			*44860	*44860	*36270	31260	*28840	22910			*23370	18960	(28.5)
-3.0 m (-9.8 ft)	kg	*18970	*18970	*17470	*17470	*14320	*14320	*11040	10570			*10090	10010	7.84
	lb	*41820	*41820	*38510	*38510	*31570	*31570	*24340	23300			*22240	22070	(25.7)
-4.5 m (-14.8 ft)	kg			*12820	*12820	*10190	*10190					*8660	*8660	6.55
	lb			*28260	*28260	*22470	*22470					*19090	*19090	(21.5)

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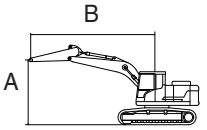
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX520LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	2900	10200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg											*11430	*11430	7.08
	lb											*25200	*25200	(23.2)
7.5 m (24.6 ft)	kg							*10990	*10990			*10780	10230	8.26
	lb							*24230	*24230			*23770	22550	(27.1)
6.0 m (19.7 ft)	kg					*13130	*13130	*11410	*11410	*10500	8770	*10480	8700	9.04
	lb					*28950	*28950	*25150	*25150	*23150	19330	*23100	19180	(29.7)
4.5 m (14.8 ft)	kg			*20070	*20070	*14790	*14790	*12200	11390	*10710	8610	*10370	7850	9.52
	lb			*44250	*44250	*32610	*32610	*26900	25110	*23610	18980	*22860	17310	(31.2)
3.0 m (9.8 ft)	kg					*16410	14990	*13040	10920	*11060	8370	*10340	7420	9.74
	lb					*36180	33050	*28750	24070	*24380	18450	*22800	16360	(32.0)
1.5 m (4.9 ft)	kg					*17390	14350	*13630	10540	*11290	8160	*10370	7300	9.73
	lb					*38340	31640	*30050	23240	*24890	17990	*22860	16090	(31.9)
0.0 m (0.0 ft)	kg			*15060	*15060	*17450	14030	*13740	10300	*11160	8040	*10380	7500	9.48
	lb			*33200	*33200	*38470	30930	*30290	22710	*24600	17730	*22880	16530	(31.1)
-1.5 m (-4.9 ft)	kg			*21050	*21050	*16610	13970	*13170	10230			*10310	8080	8.98
	lb			*46410	*46410	*36620	30800	*29030	22550			*22730	17810	(29.5)
-3.0 m (-9.8 ft)	kg	*21360	*21360	*18340	*18340	*14760	14120	*11550	10350			*10000	9300	8.16
	lb	*47090	*47090	*40430	*40430	*32540	31130	*25460	22820			*22050	20500	(26.8)
-4.5 m (-14.8 ft)	kg			*14070	*14070	*11280	*11280					*9020	*9020	6.93
	lb			*31020	*31020	*24870	*24870					*19890	*19890	(22.7)

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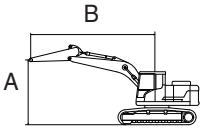
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX520LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	3380	10200	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg							*10020	*10020			*9400	*9400	7.61
	lb							*22090	*22090			*20720	*20720	(25.0)
7.5 m (24.6 ft)	kg							*10370	*10370			*8930	*8930	8.71
	lb							*22860	*22860			*19690	*19690	(28.6)
6.0 m (19.7 ft)	kg							*10900	*10900	*10010	8900	*8830	8170	9.46
	lb							*24030	*24030	*22070	19620	*19470	18010	(31.0)
4.5 m (14.8 ft)	kg			*18770	*18770	*14140	*14140	*11770	11530	*10360	8690	*8980	7420	9.92
	lb			*41380	*41380	*31170	*31170	*25950	25420	*22840	19160	*19800	16360	(32.5)
3.0 m (9.8 ft)	kg					*15920	15240	*12710	11050	*10820	8440	*9390	7020	10.13
	lb					*35100	33600	*28020	24360	*23850	18610	*20700	15480	(33.2)
1.5 m (4.9 ft)	kg					*17160	14530	*13450	10620	*11170	8200	*9890	6910	10.12
	lb					*37830	32030	*29650	23410	*24630	18080	*21800	15230	(33.2)
0.0 m (0.0 ft)	kg			*17510	*17510	*17540	14120	*13750	10340	*11230	8030	*9970	7060	9.88
	lb			*38600	*38600	*38670	31130	*30310	22800	*24760	17700	*21980	15560	(32.4)
-1.5 m (-4.9 ft)	kg	*12800	*12800	*22130	21700	*17010	13980	*13420	10210	*10720	7980	*10000	7550	9.40
	lb	*28220	*28220	*48790	47840	*37500	30820	*29590	22510	*23630	17590	*22050	16640	(30.8)
-3.0 m (-9.8 ft)	kg	*21350	*21350	*19710	*19710	*15510	14060	*12210	10260			*9880	8550	8.62
	lb	*47070	*47070	*43450	*43450	*34190	31000	*26920	22620			*21780	18850	(28.3)
-4.5 m (-14.8 ft)	kg	*19320	*19320	*15920	*15920	*12650	*12650					*9320	*9320	7.47
	lb	*42590	*42590	*35100	*35100	*27890	*27890					*20550	*20550	(24.5)

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Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX520LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		7060	4000	10200	600	-	-	-	-	-

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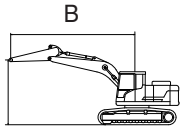

Lift-point height (A)		Lift-point radius (B)												At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		10.5 m (34.4 ft)		Capacity		Reach
																m (ft)
9.0 m	kg													*7310	*7310	8.33
(29.5 ft)	lb													*16120	*16120	(27.3)
7.5 m	kg									*8630	*8630			*6990	*6990	9.35
(24.6 ft)	lb									*19030	*19030			*15410	*15410	(30.7)
6.0 m	kg							*10230	*10230	*9440	9080			*6930	*6930	10.05
(19.7 ft)	lb							*22550	*22550	*20810	20020			*15280	*15280	(33.0)
4.5 m	kg					*13240	*13240	*11180	*11180	*9910	8840			*7050	6870	10.48
(14.8 ft)	lb					*29190	*29190	*24650	*24650	*21850	19490			*15540	15150	(34.4)
3.0 m	kg			*20970	*20970	*15180	*15180	*12230	11230	*10470	8550	*8810	6710	*7350	6520	10.69
(9.8 ft)	lb			*46230	*46230	*33470	*33470	*26960	24760	*23080	18850	*19420	14790	*16200	14370	(35.1)
1.5 m	kg			*19680	*19680	*16710	14760	*13130	10760	*10960	8270	*9440	6570	*7860	6410	10.67
(4.9 ft)	lb			*43390	*43390	*36840	32540	*28950	23720	*24160	18230	*20810	14480	*17330	14130	(35.0)
0.0 m	kg			*19280	*19280	*17450	14230	*13650	10410	*11200	8060			*8670	6520	10.45
(0.0 ft)	lb			*42510	*42510	*38470	31370	*30090	22950	*24690	17770			*19110	14370	(34.3)
-1.5 m	kg	*12650	*12650	*23060	21630	*17320	13990	*13600	10210	*11010	7950			*9490	6900	9.99
(-4.9 ft)	lb	*27890	*27890	*50840	47690	*38180	30840	*29980	22510	*24270	17530			*20920	15210	(32.8)
-3.0 m	kg	*19040	*19040	*21120	*21120	*16250	13970	*12810	10190	*10030	7970			*9500	7680	9.27
(-9.8 ft)	lb	*41980	*41980	*46560	*46560	*35830	30800	*28240	22470	*22110	17570			*20940	16930	(30.4)
-4.5 m	kg	*23210	*23210	*17930	*17930	*14030	*14030	*10830	10360					*9250	9210	8.21
(-14.8 ft)	lb	*51170	*51170	*39530	*39530	*30930	*30930	*23880	22840					*20390	20300	(26.9)
-6.0 m	kg			*12760	*12760	*9770	*9770							*8240	*8240	6.65
(-19.7 ft)	lb			*28130	*28130	*21540	*21540							*18170	*18170	(21.8)

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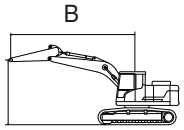
Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX520LT3	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		9000	6000	11700	600	-	-	-	-	-

· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)																		At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		10.5 m (34.4 ft)		12.0 m (39.4 ft)		13.5 m (44.3 ft)		Capacity		Reach
																						m (ft)
10.5m	kg																			*4050	*4050	11.58
34.4ft	lb																			*8930	*8930	(38.0)
9.0m	kg															*4970	*4970			*3950	*3950	12.52
29.5ft	lb															*10960	*10960			*8710	*8710	(41.1)
7.5m	kg													*5950	*5950	*5630	*5630			*3940	*3940	13.22
24.6ft	lb													*13120	*13120	*12410	*12410			*8690	*8690	(43.4)
6.0m	kg													*6290	*6290	*5830	*5830	*4580	*4580	*3990	*3990	13.71
19.7ft	lb													*13870	*13870	*12850	*12850	*10100	*10100	*8800	*8800	(45.0)
4.5m	kg									*8870	*8870	*7590	*7590	*6720	*6720	*6080	5700	*5580	4570	*4120	*4120	14.03
14.8ft	lb									*19550	*19550	*16730	*16730	*14820	*14820	*13400	12570	*12300	10080	*9080	*9080	(46.0)
3.0m	kg					*18150	*18150	*12750	*12750	*9970	*9970	*8290	*8290	*7160	6840	*6370	5480	*5760	4430	*4320	4030	14.19
9.8ft	lb					*40010	*40010	*28110	*28110	*21980	*21980	*18280	*18280	*15790	15080	*14040	12080	*12700	9770	*9520	8880	(46.5)
1.5m	kg					*9590	*9590	*14260	*14260	*10930	10670	*8920	8210	*7580	6510	*6620	5260	*5900	4300	*4610	3930	14.18
4.9ft	lb					*21140	*21140	*31440	*31440	*24100	23520	*19670	18100	*16710	14350	*14590	11600	*13010	9480	*10160	8660	(46.5)
0.0m	kg					*9080	*9080	*15140	13710	*11610	10080	*9400	7800	*7900	6230	*6820	5070	*5960	4180	*5000	3920	14.01
0.0ft	lb					*20020	*20020	*33380	30230	*25600	22220	*20720	17200	*17420	13730	*15040	11180	*13140	9220	*11020	8640	(46.0)
-1.5m	kg	*4880	*4880	*6310	*6310	*10540	*10540	*15390	13250	*11930	9680	*9660	7500	*8070	6010	*6890	4920	*5900	4100	*5560	4020	13.67
-4.9ft	lb	*10760	*10760	*13910	*13910	*23240	*23240	*33930	29210	*26300	21340	*21300	16530	*17790	13250	*15190	10850	*13010	9040	*12260	8860	(44.9)
-3.0m	kg	*7270	*7270	*8890	*8890	*12910	*12910	*15110	13060	*11880	9470	*9650	7320	*8030	5880	*6770	4840			*5880	4230	13.16
-9.8ft	lb	*16030	*16030	*19600	*19600	*28460	*28460	*33310	28790	*26190	20880	*21270	16140	*17700	12960	*14930	10670			*12960	9330	(43.2)
-4.5m	kg	*9770	*9770	*11720	*11720	*16010	*16010	*14330	13060	*11420	9420	*9320	7260	*7710	5840	*6360	4840			*5960	4610	12.44
-14.8ft	lb	*21540	*21540	*25840	*25840	*35300	*35300	*31590	28790	*25180	20770	*20550	16010	*17000	12870	*14020	10670			*13140	10160	(40.8)
-6.0m	kg	*12520	*12520	*14980	*14980	*16550	*16550	*13030	*13030	*10510	9500	*8580	7320	*6980	5910					*5970	5250	11.48
-19.7ft	lb	*27600	*27600	*33030	*33030	*36490	*36490	*28730	*28730	*23170	20940	*18920	16140	*15390	13030					*13160	11570	(37.6)
-7.5m	kg			*17690	*17690	*13760	*13760	*11070	*11070	*8990	*8990	*7230	*7230							*5850	*5850	10.20
-24.6ft	lb			*39000	*39000	*30340	*30340	*24410	*24410	*19820	*19820	*15940	*15940							*12900	*12900	(33.5)
-9.0m	kg					*9860	*9860	*8140	*8140	*6490	*6490									*5350	*5350	8.48
-29.5ft	lb					*21740	*21740	*17950	*17950	*14310	*14310									*11790	*11790	(27.8)

Note 1. Lifting capacity are based on ISO 10567.

2. Lifting capacity of the HX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.

3. The Lift-point is bucket pivot mounting pin on the arm (without bucket mass).

4. *Indicates load limited by hydraulic capacity.

※ Lifting capacities are based upon a standard machine conditions.
Lifting capacities will vary with different work tools, ground conditions and attachments.
The difference between the weight of a work tool attachment must be subtracted.
Consult with your local HD Hyundai Construction Equipment dealer regarding the lifting capacities for specific work tools and attachments.

⚠ Failure to comply to the rated load can cause serious injury, death, or property damage. Make adjustments to the rated load as necessory for non-standard configurations.

6. BUCKET SELECTION GUIDE

1) HX500LT3

(1) 9200 kg counterweight

General bucket

Heavy duty
(with side cutter)

Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO					
						Recommendation					
	SAE Heaped	CECE heaped	Without side cutter			6.55 m (21' 6") Boom		7.06 m (23' 2") Boom			
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4") Arm	2.90 m (9' 6") Arm	2.55 m (8' 4") Arm	2.90 m (9' 6") Arm	3.38 m (11' 1') Arm	4.00 m (13' 1') Arm
General bucket	1.38 (1.80)	1.24 (1.62)	1130 (44.5)	1640 (3620)	4	●	●	●	●	●	●
	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2020 (4450)	5	●	●	●	◐	◐	■
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	2425 (5350)	6	■	■	▲	▲	▲	X
Heavy duty	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2325 (5130)	5	●	●	◐	◐	■	■
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2615 (5770)	5	■	■	■	▲	▲	X
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	2860 (6310)	6	■	▲	▲	▲	X	X
Rock heavy duty	2.20 (2.88)	2.11 (2.76)	1600 (63.0)	2605 (5740)	5	●	●	◐	◐	■	-
	2.43 (3.18)	0.76 (0.99)	1745 (68.7)	2730 (6020)	5	◐	◐	■	■	▲	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2970 (6550)	5	■	■	▲	▲	▲	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	3235 (7130)	6	▲	▲	▲	X	X	-

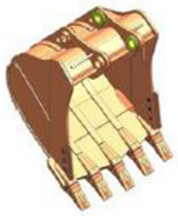
● Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less
◐ Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less
■ Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less
▲ Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less
X Not recommended
- Not available

※ These recommendations are for general conditions and average use.
Work tools and ground conditions have effects on machine performance.
Select an optimum combination according to the working conditions and the type of work that is being done.
Consult with your local HD Hyundai Construction Equipment dealer for information on selecting the correct boom−arm−bucket combination.

(2) 9700 kg counterweight

General bucket

Heavy duty
(with side cutter)



Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO					
						Recommendation					
	SAE Heaped	CECE heaped	Without side cutter			6.55 m (21' 6") Boom		7.06 m (23' 2") Boom			
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	3.38 m (11' 1') Arm	4.00 m (13' 1') Arm
General bucket	1.38 (1.80)	1.24 (1.62)	1130 (44.5)	1640 (3620)	4	●	●	●	●	●	●
	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2020 (4450)	5	●	●	●	◐	◐	■
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	2425 (5350)	6	■	■	■	▲	▲	X
Heavy duty	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2325 (5130)	5	●	●	●	◐	◐	■
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2615 (5770)	5	◐	■	■	■	▲	▲
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	2860 (6310)	6	■	▲	▲	▲	X	X
Rock heavy duty	2.20 (2.88)	2.11 (2.76)	1600 (63.0)	2605 (5740)	5	●	●	◐	◐	■	-
	2.43 (3.18)	0.76 (0.99)	1745 (68.7)	2730 (6020)	5	●	◐	◐	■	■	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2970 (6550)	5	■	■	■	▲	▲	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	3235 (7130)	6	■	▲	▲	X	X	-

● Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less
◐ Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less
■ Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less
▲ Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less
X Not recommended
- Not available

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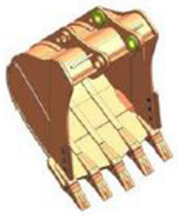
(3) 10200 kg counterweight

General bucket

Heavy duty
(with side cutter)



Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO					
						Recommendation					
	SAE Heaped	CECE heaped	Without side cutter			6.55 m (21' 6") Boom		7.06 m (23' 2") Boom			
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	3.38 m (11' 1') Arm	4.00 m (13' 1') Arm
General bucket	1.38 (1.80)	1.24 (1.62)	1130 (44.5)	1640 (3620)	4	●	●	●	●	●	●
	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2020 (4450)	5	●	●	●	●	◐	◐
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	2425 (5350)	6	◐	■	■	■	▲	▲
Heavy duty	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2325 (5130)	5	●	●	●	◐	◐	■
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2615 (5770)	5	◐	◐	■	■	▲	▲
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	2860 (6310)	6	■	■	▲	▲	▲	X
Rock heavy duty	2.20 (2.88)	2.11 (2.76)	1600 (63.0)	2605 (5740)	5	●	●	●	◐	◐	-
	2.43 (3.18)	0.76 (0.99)	1745 (68.7)	2730 (6020)	5	●	◐	◐	■	■	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2970 (6550)	5	◐	■	■	▲	▲	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	3235 (7130)	6	■	▲	▲	▲	X	-

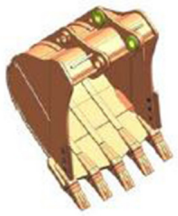
●	Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less
◐	Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less
■	Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less
▲	Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less
X	Not recommended
-	Not available

※ These recommendations are for general conditions and average use.
Work tools and ground conditions have effects on machine performance.
Select an optimum combination according to the working conditions and the type of work that is being done.
Consult with your local HD Hyundai Construction Equipment dealer for information on selecting the correct boom−arm−bucket combination.

(4) 10700 kg counterweight

General bucket

Heavy duty
(with side cutter)



Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO						
						Recommendation						
	SAE Heaped	CECE heaped	Without side cutter			6.55 m (21' 6") Boom		7.06 m (23' 2") Boom				9.00 m (29' 6") Boom
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	3.38 m (11' 1') Arm	4.00 m (13' 1') Arm	6.00 m (19' 8') Arm
General bucket	1.38 (1.80)	1.24 (1.62)	1130 (44.5)	1640 (3620)	4	●	●	●	●	●	●	▲
	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2020 (4450)	5	●	●	●	●	◐	◐	-
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	2425 (5350)	6	◐	■	■	■	▲	▲	-
Heavy duty	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2325 (5130)	5	●	●	●	●	◐	■	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2615 (5770)	5	◐	◐	■	■	■	▲	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	2860 (6310)	6	■	■	▲	▲	▲	X	-
Rock heavy duty	2.20 (2.88)	2.11 (2.76)	1600 (63.0)	2605 (5740)	5	●	●	●	◐	◐	-	-
	2.43 (3.18)	0.76 (0.99)	1745 (68.7)	2730 (6020)	5	●	●	◐	◐	■	-	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2970 (6550)	5	◐	◐	■	■	▲	-	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	3235 (7130)	6	■	■	▲	▲	▲	-	-

● Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less
◐ Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less
■ Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less
▲ Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less
X Not recommended
- Not available

※ These recommendations are for general conditions and average use.
Work tools and ground conditions have effects on machine performance.
Select an optimum combination according to the working conditions and the type of work that is being done.
Consult with your local HD Hyundai Construction Equipment dealer for information on selecting the correct boom−arm−bucket combination.

2) HX520LT3

(1) 10200 kg counterweight

General bucket

Heavy duty
(with side cutter)

Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO					
						Recommendation					
	SAE Heaped	CECE heaped	Without side cutter			6.55 m (21' 6") Boom		7.06 m (23' 2") Boom			
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4") Arm	2.90 m (9' 6") Arm	2.55 m (8' 4") Arm	2.90 m (9' 6") Arm	3.38 m (11' 1") Arm	4.00 m (13' 1") Arm
General bucket	1.00 (1.31)	0.90 (1.18)	910 (37.0)	1424 (3140)	3	●	●	●	●	●	●
	1.38 (1.18)	1.24 (1.62)	1130 (44.5)	1640 (3620)	4	●	●	●	●	●	●
	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2020 (4450)	5	●	●	●	●	●	◐
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2295 (5060)	5	●	●	◐	◐	■	■
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	2425 (5350)	6	●	◐	◐	■	■	▲
Heavy duty	2.43 (3.18)	2.11 (2.76)	1745 (68.7)	2445 (5390)	5	●	●	●	●	◐	■
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	2860 (6310)	6	◐	■	■	■	▲	▲
Rock heavy duty	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2605 (5740)	5	●	●	●	●	●	-
	2.43 (3.18)	2.11 (2.76)	1745 (68.7)	2730 (6020)	5	●	●	●	◐	◐	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2970 (6550)	5	●	◐	◐	■	■	-
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	3115 (6870)	6	◐	◐	■	■	▲	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	3235 (7130)	6	◐	■	■	▲	▲	-
Rock heavy duty (special)	1.81 (2.37)	1.50 (1.96)	1325 (52.2)	2685 (5920)	4	●	●	●	●	●	-
	2.70 (3.53)	2.39 (3.13)	1760 (69.3)	2755 (6070)	5	●	●	◐	◐	■	-
	3.00 (3.92)	2.76 (3.61)	1955 (77.0)	3040 (6700)	6	◐	◐	■	■	▲	-

● Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less

◐ Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less

■ Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less

▲ Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less

X Not recommended

\- Not available

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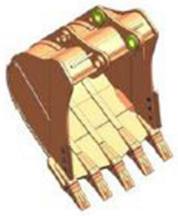
(2) 10700 kg counterweight

General bucket

Heavy duty
(with side cutter)



Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO					
						Recommendation					
	SAE Heaped	CECE heaped	Without side cutter			6.55 m (21' 6") Boom		7.06 m (23' 2") Boom			
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4") Arm	2.90 m (9' 6") Arm	2.55 m (8' 4") Arm	2.90 m (9' 6") Arm	3.38 m (11' 1") Arm	4.00 m (13' 1") Arm
General bucket	1.00 (1.31)	0.90 (1.18)	910 (37.0)	1424 (3140)	3	●	●	●	●	●	●
	1.38 (1.18)	1.24 (1.62)	1130 (44.5)	1640 (3620)	4	●	●	●	●	●	●
	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2020 (4450)	5	●	●	●	●	●	●
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2295 (5060)	5	●	●	◐	◐	◐	■
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	2425 (5350)	6	●	◐	◐	■	■	▲
Heavy duty	2.43 (3.18)	2.11 (2.76)	1745 (68.7)	2445 (5390)	5	●	●	●	●	◐	◐
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	2860 (6310)	6	◐	◐	■	■	▲	▲
Rock heavy duty	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2605 (5740)	5	●	●	●	●	●	-
	2.43 (3.18)	2.11 (2.76)	1745 (68.7)	2730 (6020)	5	●	●	●	●	◐	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2970 (6550)	5	●	◐	◐	◐	■	-
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	3115 (6870)	6	◐	◐	■	■	■	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	3235 (7130)	6	◐	■	■	■	▲	-
Rock heavy duty (special)	1.81 (2.37)	1.50 (1.96)	1325 (52.2)	2685 (5920)	4	●	●	●	●	●	-
	2.70 (3.53)	2.39 (3.13)	1760 (69.3)	2755 (6070)	5	●	●	◐	◐	■	-
	3.00 (3.92)	2.76 (3.61)	1955 (77.0)	3040 (6700)	6	◐	◐	■	■	■	-

● Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less
◐ Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less
■ Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less
▲ Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less
X Not recommended
- Not available

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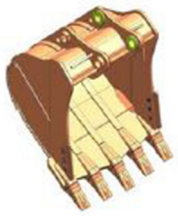
(3) 11700 kg counterweight

General bucket

Heavy duty
(with side cutter)



Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO						
						Recommendation						
	SAE Heaped	CECE heaped	Without side cutter			6.55 m (21' 6") Boom		7.06 m (23' 2") Boom				9.00 m (29' 6") Boom
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	2.55 m (8' 4') Arm	2.90 m (9' 6') Arm	3.38 m (11' 1') Arm	4.00 m (13' 1') Arm	6.00 m (19' 8') Arm
General bucket	1.00 (1.31)	0.90 (1.18)	910 (37.0)	1424 (3140)	3	●	●	●	●	●	●	●
	1.38 (1.18)	1.24 (1.62)	1130 (44.5)	1640 (3620)	4	●	●	●	●	●	●	◐
	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2020 (4450)	5	●	●	●	●	●	●	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2295 (5060)	5	●	●	●	●	◐	■	-
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	2425 (5350)	6	●	●	◐	◐	■	■	-
Heavy duty	2.43 (3.18)	2.11 (2.76)	1745 (68.7)	2445 (5390)	5	●	●	●	●	●	◐	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	2860 (6310)	6	●	◐	◐	■	■	▲	-
Rock heavy duty	2.20 (2.88)	1.93 (2.52)	1600 (63.0)	2605 (5740)	5	●	●	●	●	●	X	-
	2.43 (3.18)	2.11 (2.76)	1745 (68.7)	2730 (6020)	5	●	●	●	●	●	X	-
	2.79 (3.65)	2.46 (3.22)	1795 (70.7)	2970 (6550)	5	●	●	◐	◐	◐	X	-
	3.00 (3.92)	2.64 (3.45)	1905 (75.0)	3115 (6870)	6	●	◐	◐	■	■	X	-
	3.20 (4.19)	2.82 (3.69)	2015 (79.3)	3235 (7130)	6	◐	◐	■	■	■	X	-
Rock heavy duty (special)	1.81 (2.37)	1.50 (1.96)	1325 (52.2)	2685 (5920)	4	●	●	●	●	●	X	-
	2.70 (3.53)	2.39 (3.13)	1760 (69.3)	2755 (6070)	5	●	●	●	◐	◐	X	-
	3.00 (3.92)	2.76 (3.61)	1955 (77.0)	3040 (6700)	6	●	◐	◐	◐	■	X	-

●	Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less
◐	Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less
■	Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less
▲	Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less
X	Not recommended
-	Not available

※ These recommendations are for general conditions and average use.
Work tools and ground conditions have effects on machine performance.
Select an optimum combination according to the working conditions and the type of work that is being done.
Consult with your local HD Hyundai Construction Equipment dealer for information on selecting the correct boom−arm−bucket combination.

7. UNDERCARRIAGE

1) TYPES OF SHOES

Model	Description	Unit		Triple grouser										Double grouser	
	width	mm	(in)	600	(24)	700	(28)	800	(32)	900	(36)	600 HD	(24)	600	(24)
HX500LT3	Operating weight	kg	(lb)	48860	107720	49580	109310	50110	110470	50620	111600	49250	108580	49100	108250
	Ground pressure	kgf/cm²	(psi)	0.85	(12.1)	0.74	(10.5)	0.65	(9.3)	0.59	(8.3)	0.86	(12.2)	0.85	(12.1)
	Overall width	mm	(ft-in)	3340	(10' 11")	3440	(11' 3")	3540	(11' 7")	3640	(11' 11")	3340	(10' 11")	3340	(10' 11")
	Link quantity	EA		53		53		53		53		53		53	
HX520LT3	Operating weight	kg	(lb)	51390	113300	52120	114900	52650	116070	53160	117200	51780	114160	51630	113820
	Ground pressure	kgf/cm²	(psi)	0.89	(12.7)	0.78	(11.0)	0.69	(9.7)	0.62	(8.8)	0.90	(12.8)	0.90	(12.7)
	Overall width	mm	(ft-in)	3540	(11' 7")	3640	(11' 11")	3740	(12' 3")	3840	(12' 7")	3540	(11' 7")	3540	(11' 7")
	Link quantity	EA		53		53		53		53		53		53	

2) SELECTION OF TRACK SHOE

Suitable track shoes should be selected according to operating conditions.

Method of selecting shoes

Confirm the category from the list of applications in **table 2**, then use **table 1** to select the shoe. Wide shoes (categories B and C) have limitations on applications. Before using wide shoes, check the precautions, then investigate and study the operating conditions to confirm if these shoes are suitable.

Select the narrowest shoe possible to meet the required flotation and ground pressure. Application of wider shoes than recommendations will cause unexpected problem such as bending of shoes, crack of link, breakage of pin, loosening of shoe bolts and the other various problems.

Table 1

Track shoe	Specification	Category
600 mm triple grouser	Standard	A
700 mm triple grouser	Option	B
800 mm triple grouser	Option	C
900 mm triple grouser	Option	C
600 mm double grouser	Option	A

Table 2

Category	Applications	Precautions
A	Rocky ground, river beds, normal soil	· Travel at low speed on rough ground with large obstacles such as boulders or fallen trees or a wide range of general civil engineering work
B	Normal soil, soft ground	· These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees · Travel at high speed only on flat ground · Travel slowly at low speed if it is impossible to avoid going over obstacles
C	Extremely soft ground (swampy ground)	· Use the shoes only in the conditions that the machine sinks and it is impossible to use the shoes of category A or B · These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees · Travel at high speed only on flat ground · Travel slowly at low speed if it is impossible to avoid going over obstacles

8. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Maker / Model	CUMMINS / X12
Type	4-cycle, turbocharged, charge air cooled, electronic controlled diesel engine
Cooling method	Water cooled
Number of cylinders and arrangement	6 cylinders, in-line
Firing order	1-5-3-6-2-4
Combustion chamber type	Direct injection type
Cylinder bore × stroke	132 × 144 mm (5.2" × 5.67")
Displacement	11.8 ℓ (720 cu in)
Compression ratio	17 : 1
Gross power	335 Hp (250 kW) at 2100 rpm
Net power	330 Hp (246 kW) at 2100 rpm
Max. pHXower	370 Hp (276 kW) at 1800 rpm
Peak Torque	1674 N·m (1235 lbf·ft) at 1400 rpm
Engine oil quantity	34 ℓ (9 U.S. gal)
Wet weight	860 kg (1896 lb)
Starter motor	24 V-7.5 kW
Alternator	24 V-110 A

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 225 cc/rev
Maximum pressure	330 kgf/cm^2 (4690 psi) [360 kgf/cm^2 (5120 psi)]
Rated oil flow	2 × 405 ℓ/min (107 U.S. gpm/89.1 U.K. gpm)
Rated speed	1800 rpm

[ ] : Power boost

3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	13.7 cc/rev
Maximum pressure	40 kgf/cm^2 (570 psi)
Rated oil flow	24.7 ℓ /min (6.5 U.S. gpm/5.4 U.K. gpm)

4) MAIN CONTROL VALVE

Item		Specification
Type		9 spools
Operating method		Hydraulic pilot system
Main relief valve pressure		330 kgf/cm^2 (4690 psi) [360 kgf/cm^2 (5120 psi)]
Port relief valve pressure	Boom	400 kgf/cm^2 (5690 psi)
	Arm	400 kgf/cm^2 (5690 psi)
	Bucket	400 kgf/cm^2 (5690 psi)

[ ] : Power boost

5) SWING MOTOR

Item		Specification
Type		Two fixed displacement axial piston motor
Capacity		142.8 cc/rev
Relief pressure		285 kgf/cm^2 (4054 psi)
Braking system		Automatic, spring applied hydraulic released
Braking torque		63 kgf · m (456 lbf·ft)
Brake release pressure	Cranking	20.9 kgf · m (151 lbf·ft)
	Full stroke	35.5 kgf · m (257 lbf·ft)
Reduction gear type		2 - stage planetary

6) TRAVEL MOTOR (Type 1, 2)

Item	Specification
Type	Variable displacement axial piston motor
Capacity	281.7/175.9 cc/rev
Relief pressure	360 kgf/cm^2 (5120 psi)
Braking system	Auto matic, spring applied hydraulic released
Braking torque	119.7 kgf · m (866 lbf · ft)
Brake release pressure	11.3~15.7 kgf/cm^2 (161~223 psi)
Reduction gear type	2-stage planetary

7) CYLINDER

Item			Specification
Boom cylinder	Bore dia × Stroke		Ø170 × 1580 mm
	Cushion		Extend only
Arm cylinder	Bore dia × Stroke		Ø190 × 1850 mm
	Cushion		Extend and retract
Bucket cylinder	Bore dia × Stroke	HX500LT3	Ø160 × 1360 mm
		HX500LT3★ HX520LT3	Ø170 × 1360 mm
	Cushion		Extend only

※ Discoloration of cylinder rod can occur when the friction reduction additive of lubrication oil spreads on the rod surface.

※ Discoloration does not cause any harmful effect on the cylinder performance.

★ Only for 6.55 m (21' 6") boom and 2.55 m (8' 4") arm.

9. RECOMMENDED OILS

HD Hyundai Construction Equipment genuine lubricating oils have been developed to offer the best performance and service life for your equipment. These oils have been tested according to the specifications of HD Hyundai Construction Equipment and, therefore, will meet the highest safety and quality requirements.

We recommend that you use only HD Hyundai Construction Equipment genuine lubricating oils and grease officially approved by HD Hyundai Construction Equipment.

Service point	Kind of fluid		Capacity ℓ (U.S. gal)	Ambient temperature ˚C (˚F)
				-50 (-58) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86) 40 (104)
Engine oil pan	Engine oil	HX500LT3 : -#00252 HX520LT3 : -#00265	34.0 (9.0)	★SAE 5W-40 SAE 30 SAE 10W
		HX500LT3 : #00253- HX520LT3 : #00266-	42.5 (11.2)	SAE 10W SAE 10W-30 SAE 15W-40
Swing drive	Gear oil		7.0 (1.8)×2	★SAE 75W-90
Final drive			12.5 (3.3)×2	SAE 80W-90
Hydraulic tank	Hydraulic oil		Tank : 275 (72.6) System : 499 (132)	★ISO VG 15 ISO VG 32 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel		660 (174)	★ASTM D975 NO.1 ASTM D975 NO.2
Fitting (grease nipple)	Grease		As required	★NLGI NO.1 NLGI NO.2
Radiator (reservoir tank)	Mixture of antifreeze and soft water★1		43.0 (11.4)	Ethylene glycol base permanent type (50 : 50) ★Ethylene glycol base permanent type (60 : 40)

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Material
DEF : Diesel Exhaust Fluid DEF compatible with AdBlue®

★ : Cold region (Russia, CIS, Mongolia)
★1 : Soft water
City water or distilled water

※ Using any lubricating oils other than HD Hyundai Construction Equipment genuine products may lead to a deterioration of performance and cause damage to major components.

※ Do not mix HD Hyundai Construction Equipment genuine oil with any other lubricating oil as it may result in damage to the systems of major components.

※ Do not use any engine oil other than that specified above, as it may clog the diesel particulate filter(DPF).

※ For HD Hyundai Construction Equipment genuine lubricating oils and grease for use in regions with extremely low temperatures, please contact your local HD Hyundai Construction Equipment dealers.

1. SELECTING HYDRAULIC BREAKER

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

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

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

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

2. CIRCUIT CONFIGURATION

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

2) Set proper breaker pressure on load relief valve.

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

3) The pressure of the HX500LT3/520LT3 system is 330 kgf/cm² (4980 psi).

4) Adjusting oil quantity

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

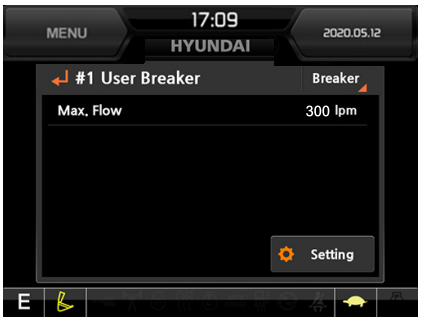
· Setting oil quantity (300 lpm)

Flow set

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

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

Oil quantity setting



480SA8CD25

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

※ **Keep the pressure pulsation of pump below 60 kgf/cm² (853 psi) by installing the accumulator.**

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

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

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

9) Select the size of pipe required considering the amount of back pressure.

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

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

3. MAINTENANCE

1) MAINTENANCE OF HYDRAULIC OIL AND FILTER

(1) A machine with hydraulic breaker can cause the hydraulic oil to become severely contaminated.

(2) Therefore machine may go down if not maintained properly.

(3) Inspect and maintain hydraulic oil, hydraulic oil return filter and pilot line filter element.

2) RELEASING THE PRESSURE IN BREAKER CIRCUIT

When breaker operating is finished, stop engine and push pedal or switch for breaker to release pressure in breaker circuit.
If you allow pressure to remain on the system, the lifetime of the diaphragm in the accumulator will be shortened.

3) Be careful to prevent contamination by dust, sand etc.
If such pollution becomes mixed into the oil, the pump's moving parts will wear abnormally, shorten lifetime and become damaged. This could also contaminate the entire hydraulic system.

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

Service interval unit : hours

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

★1 : Conventional hydraulic oil

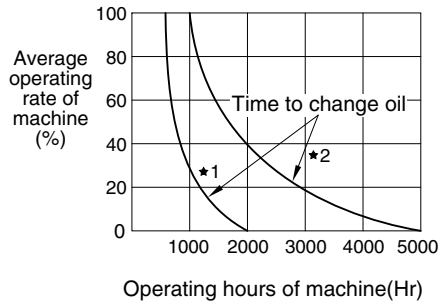
★2 : HD Hyundai Construction Equipment genuine long life hydraulic oil

● **Replace following filter at same time**

· Hydraulic oil return filter : 1 EA

· Pilot line filter element : 1 EA

Hyd oil change guide for hydraulic breaker



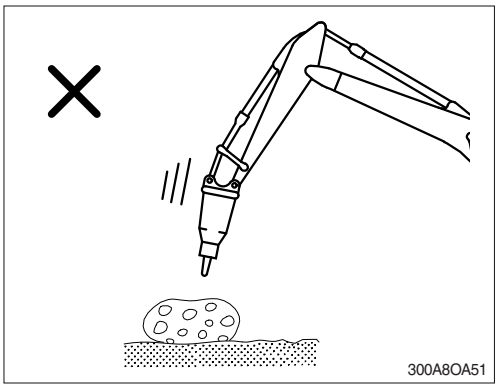
★1 : Conventional hydraulic oil

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

4. PRECAUTIONS WHILE OPERATING THE BREAKER

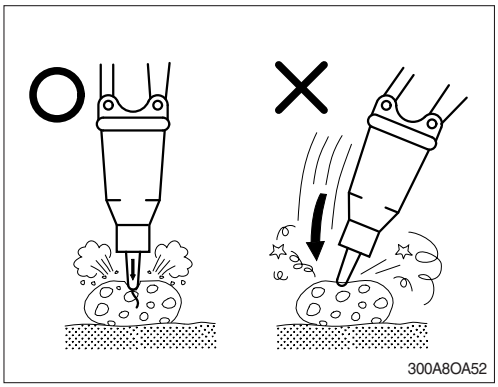
DO NOT BREAK ROCK WHILE LOWERING

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



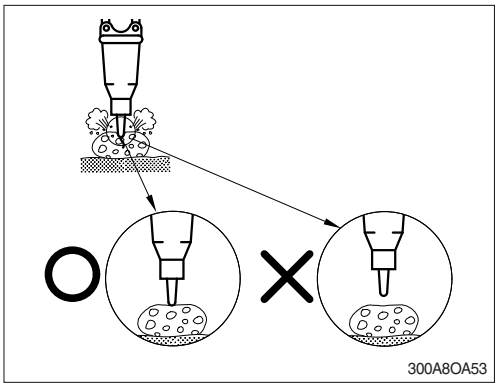
DIRECTION OF THRUST

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

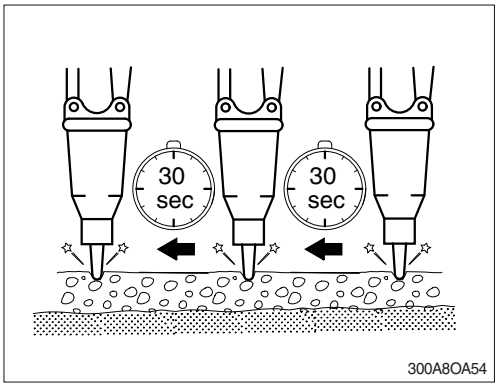


PROPER THRUST

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

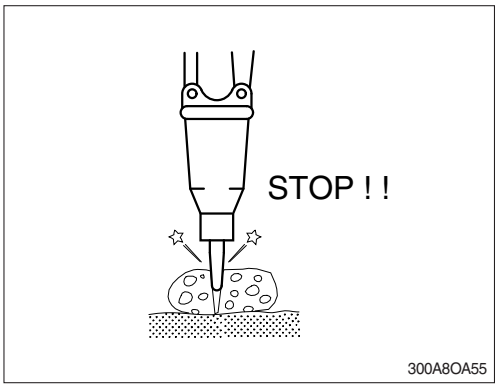


Move the impact point from the edge to the interior. Never try to break off a too large block, if the object has not broken within 30 seconds. The object should be broken up piece by piece in small blocks. Large distance steps will not improve working results.
Operating the breaker longer than 30 seconds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



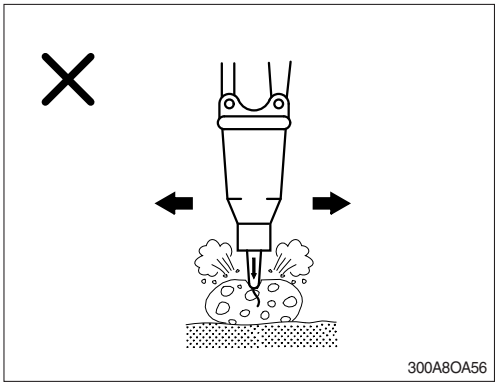
BLANKS THRUST

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



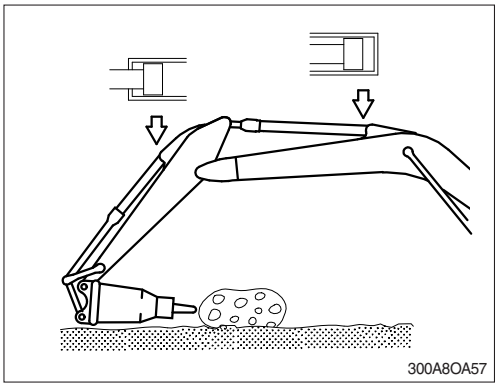
DO NOT MOVE MACHINE OR BREAKER WHILE STRIKING

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



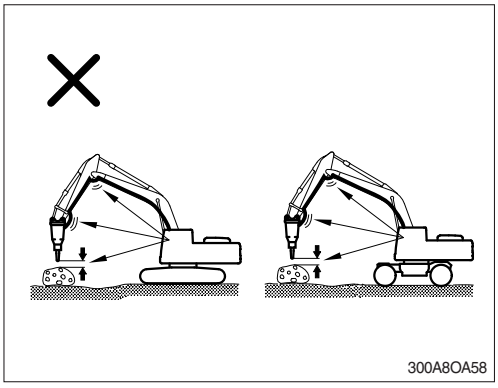
OPERATE BREAKER WITH A GAP IN EXCESS OF 100 mm (4 inches) FROM THE END OF THE STROKE TIP

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



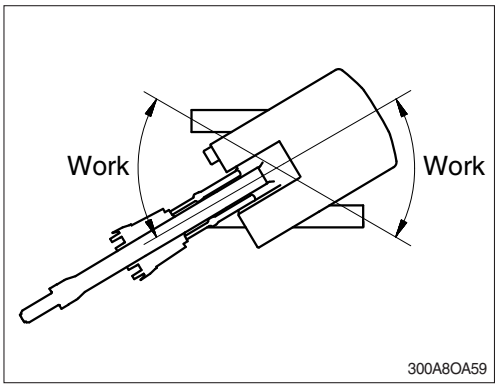
STOP THE OPERATION IMMEDIATELY IF HOSES VIBRATE EXCESSIVELY

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

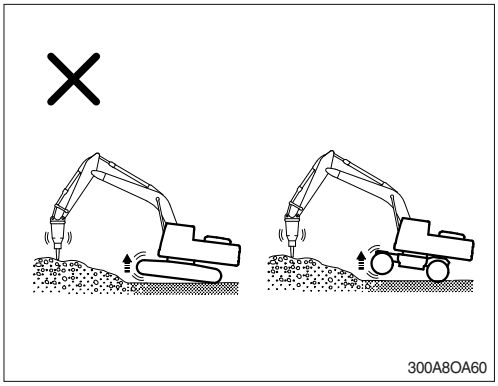


DO NOT WORK WHILE IN A SWING STATE

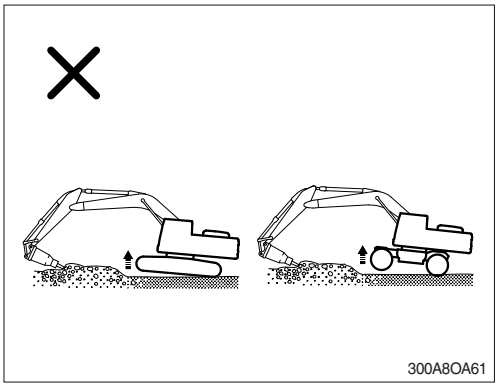
Do not work while swinging the upper structure. It cause oil leakage of the bend in the track shoe and rollers.



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

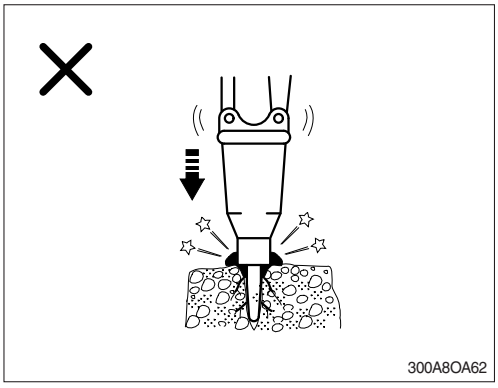


Do not extend the bucket cylinder fully and thrusting to raise the machine off the ground.



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

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



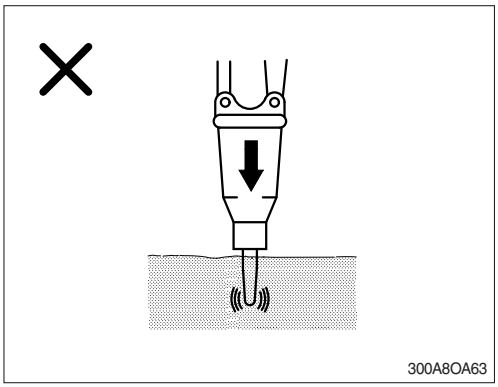
NEVER DRIVE THE CHISEL INTO THE GROUND

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

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

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

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

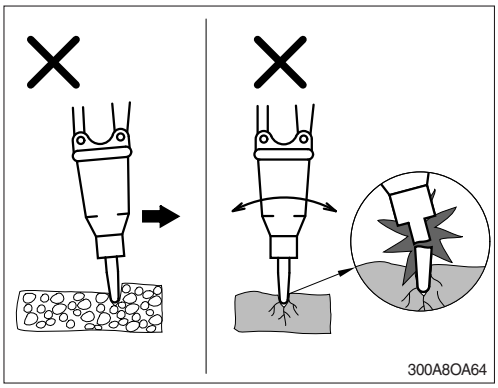


NEVER USE AS A LEVER

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

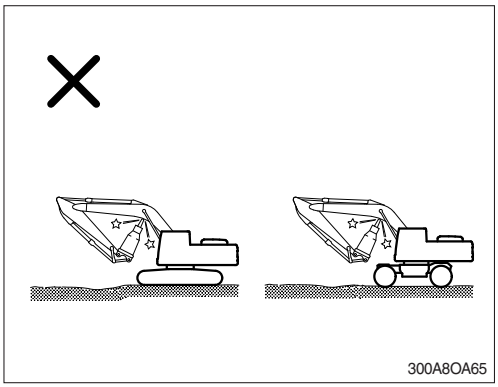
Under any circumstances, operating in this way is not permitted.

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



TAKE CARE OF CHISEL AND BOOM INTERFACE

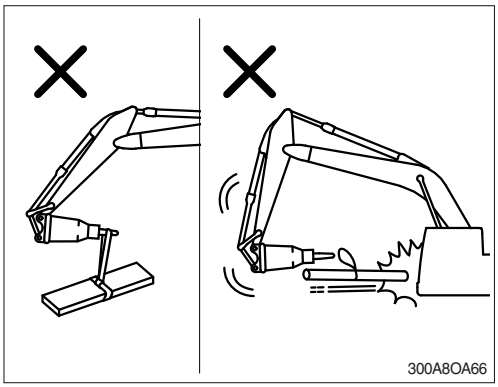
Be aware of clearance between breaker tip and the underside of boom as shown.



NEVER USE FOR LIFT OR TRANSPORT PURPOSES

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

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

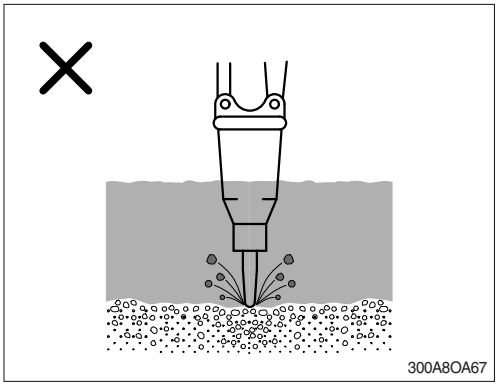


NEVER USE THE HYDRAULIC BREAKER UNDER WATER

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

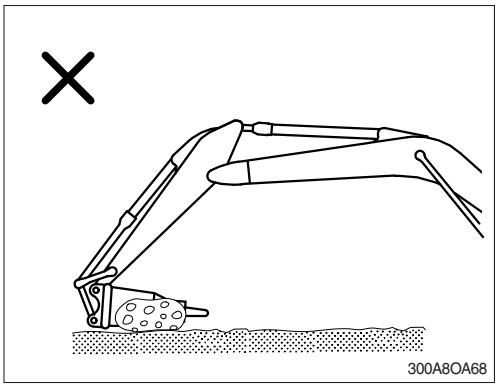
To operate the breaker under water, compressed air must be supplied into the breaker, into the impact chamber of the front-head, prior to use.

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



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

This may damage the operation device and swing system.

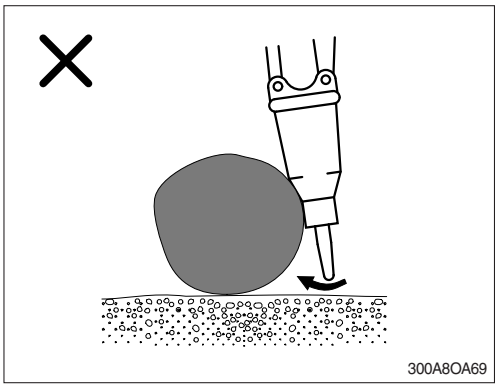


NEVER USE THE CHISEL OR HYDRAULIC BREAKER TO MOVE ROCKS OR OTHER OBJUCTS

The hydraulic breaker is not designed for this usage.

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

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

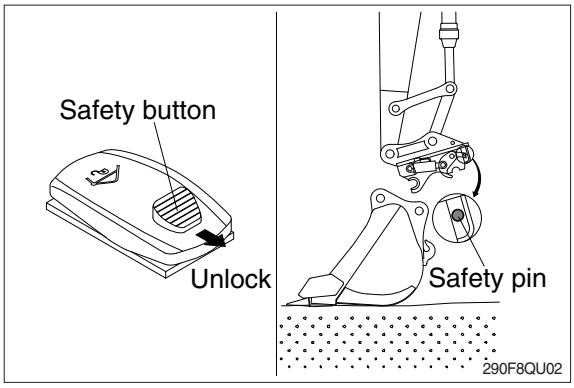


5. QUICK CLAMP

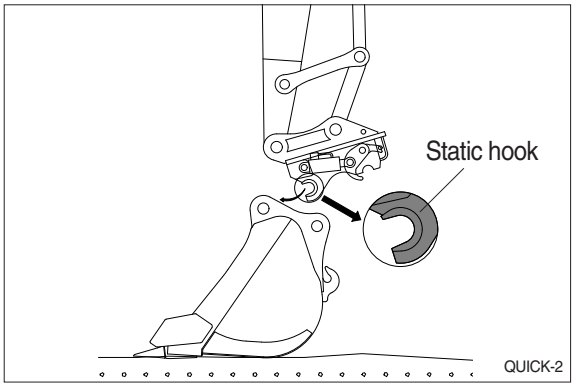
1) FIXING BUCKET WITH QUICK CLAMP

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

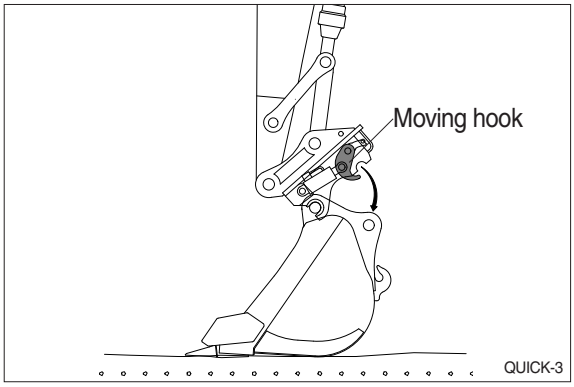
(2) Pulling safety button, press the quick clamp switch to unlock position. Then, the moving hook is placed in the release position.



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

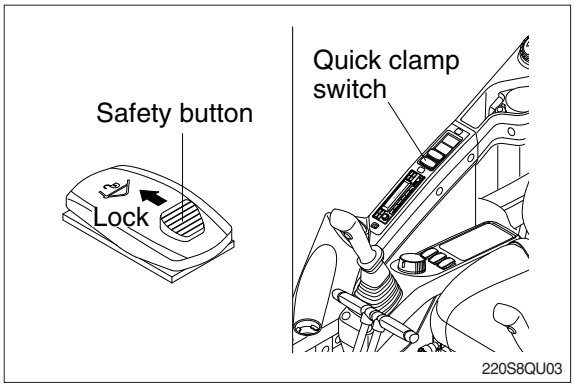


(4) Operate RCV lever to bucket-in position. Then, the moving hook is coupled with the bucket link pin.
Make sure that the moving hook is completely contacted with bucket link pin.

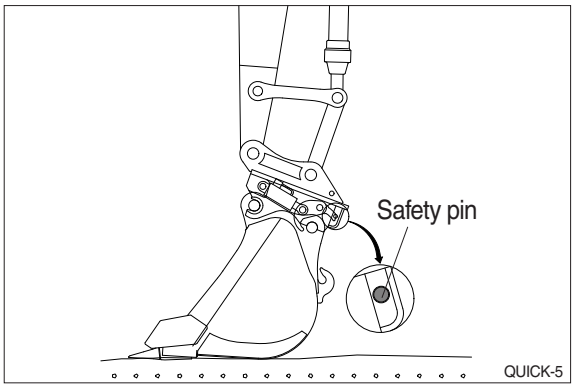


(5) Push safety button to lock position.
Operate RCV lever to bucket-in position.

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



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

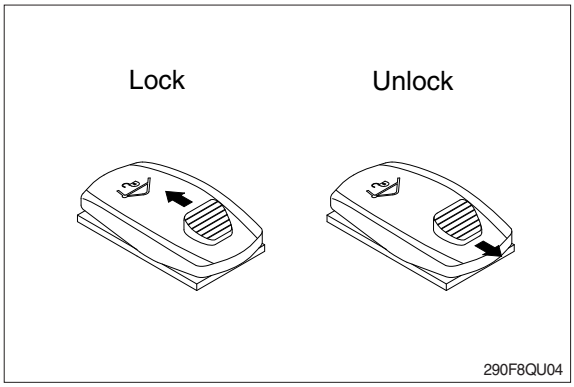


2) REMOVE BUCKET FROM QUICK CLAMP

Removing procedure is reverse of fixing.

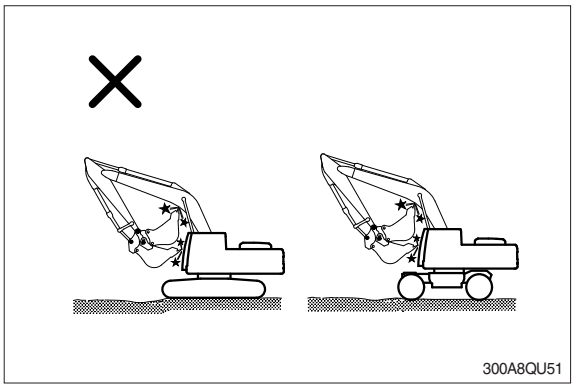
3) PRECAUTION OF USING QUICK CLAMP

⚠ **When operating the machine with quick clamp, confirm that the quick clamp switch is in the LOCK position and safety pin of moving hook is inserted. Operating the machine with quick clamp switch unlocked and without safety pin of moving hook can cause the bucket to drop off and could result in personal injury, death, machine damage or property damage.**



⚠ **Be careful of the operating the machine which is equipped with quick clamp. The bucket may hit cab, boom and boom cylinders when it reaches the vicinity of them as shown in the illustration.**

HD Hyundai Construction Equipment will not be responsible for any injury, death or damage in the event that the coupler, attachment and safety pin are not installed correctly.



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