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### **1. EC DECLARATION OF CONFORMITY**

1.We hereby declare that the following machine comply with the machine directive 2006/42/EC, EMC-directive 2004/108/EC, Non-road mobile machinery emission directive 97/68/EC (amended by 2002/88/EC, 2004/26/EC, 2006/105/EC) and noise emission 2000/14/EC (amended by 2005/88/EC).

Excavator	Model : Serial Nr. :	****** ***
2. Manufacturer	Hyundai Heavy Industries Co. L 1 Chonha-Dong, Dong-Ku Ulsan The republic of Korea	td.
Authorized representative : Owner of the technical file for machine production. (TCF : Technical Construction File)	Hyundai Heavy Industries Eu Vossendal 11 2440 Geel Belgium	urope N.V.
3.Harmonized European directives :EN474-	1:2006 +A1:2009, EN474-5: 2 EN ISO 12100-2:2003, EN IS EN ISO 6683:2008, EN ISO EN ISO 3744:2009, EN 982: EN ISO 2860:2008, EN ISO	006, EN ISO 12100-1:2003, SO 2867:2008, EN ISO 7096:2008, 2860:2008, EN ISO 6682:2008, 1996+A1:2008, EN ISO 3457:2008 7096:2008, ISO 5006: 2006
4.Noise level :		
Certain n° :	e13*2000/14*2005/88*0059	*08
Date :	2009-06-17	
Conformity assessment procedure :	Attachment VIII following the extended with "Information o Rheinland.	periodical inspection on technical n the scope of delivery" by TÜV
Authorized entity :	Société Nationale de Certific CE0499 11, route de Luxem 5230 Sandweiler Luxemburg	ation et d'Homologation s.à r.l bourg
Engine power :	*** kW	
Guaranteed sound power level :	*** dB (A)	
5.Remarks		
****		
Managing Director		
Geel, Belgium **/**/****		

### 2. DISCLAIMER

▲ THIS TRANSLATION IS BASED UPON THE ORIGINAL ENGLISH OPERATION AND MAINTE-NANCE MANUAL. THE ENGLISH VERSION SHALL PREVAIL OVER THE TRANSLATION IN CASE OF ANY LE-GAL DISPUTE.

0-2

### 3. FOREWORD

This manual contains a number of instructions and safety recommendations regarding driving, handling, lubrication, maintenance, inspection and adjustment of the excavator.

The manual is to promote safety maintenance and enhance machine performance.

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

If you sell the machine, be sure to give this manual to the new owners.

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 Hyundai distributor for those items you require.

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

Some actions involved in operation and maintenance of the machine can cause a serious accident, if they are not done in a manner described in this manual.

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.

- 2) **Inspect** the jobsite and **follow** the safety recommendations in the **safety hints** section before operating the machine.
- Use genuine Hyundai spare parts for the replacement of parts.
   We expressly point out that Hyundai will not accept any responsibility for defects resulting from nongenuine parts or non workmanlike repair.
   In such cases Hyundai 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 Hyundai or your Hyundai distributor for the latest available information for your machine or for questions regarding information in this manual.

### **4. 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.

Hyundai 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.

### **5. EC REGULATION APPROVED**

- Noise levels (EN474-1: 2006 and 2000/14/EC) are as follows: Lwa: 106 dB (EU only) Lpa: 73 dB
- The value of vibrations transmitted by the operator's seat are lower than the standard value of EN474-1: 2006 and 2002/44/EC.



## 6. TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

Machine serial no.	
Engine serial no.	
Manufacturing year	
Manufacturer Address	Hyundai Heavy Industries co., Ltd 1000, Bangeojinsunhwan-doro, Dong-Ku Ulsan 682-792, Korea
Distributor for USA Address	Hyundai Heavy Industries USA, Inc. 6100 Atlantic Boulevard Norcross LGA 30071 U.S.A
Distributor for Europe Address	Hyundai Heavy Industries Europe N.V. Vossendaal 11 2440 Geel Belgium
Dealer Address	

### 7. SAFETY LABELS

#### 1) LOCATION

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



31

32

16 No step

15

#### 2) DESCRIPTION

There are several specific warning labels on this machine. Please become familiarized with all warning labels.

47

Locking - clamp

Noise level (LWA)

Replace any safety labels that are damaged or missing.

#### (1) AIR CLEANER FILTER (Item 1)

Shearing - engine hood

This warning label is positioned on the air cleaner cover.

Periodic and proper inspection, cleaning and change of elements extend the engine life time and maintain the good performance of the engine.



Extra control ideogram for crusher operation (R520LC-9 DM only)

21070FW01

#### (2) TURBOCHARGER COVER (Item 2)

This warning label is positioned on the turbocharger cover.

A Do not touch the turbocharger as it may cause severe burns.



21070FW02

#### (3) RADIATOR CAP (Item 3)

This warning label is positioned on the radiator.

A Never open the filler cap while the engine is running or at high coolant temperature.



#### (4) FUELING (Item 4)

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

A Stop the engine when refueling. All lights or flames shall be kept at a safe distance while refueling.



21070FW04

#### (5) BATTERY ACCIDENT (Item 5)

This warning label is positioned on the battery cover.

- ▲ Electrolyte containing sulfuric acid causes severe burns. Avoid being in contact with skin, eyes or clothes. In the event of accident flush with sufficient water, and call a physician immediately.
- 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.
- A Extinguish all smoking materials and open flames before checking the battery.
- ▲ Do not use matches, lighters or torches as a light source near the battery for the probable presence of explosive gas.



36070FW05

- **A** Do not allow unauthorized personnel to change the battery or to use booster cables.
- A For safety from electric shock, do not touch the battery terminal with a wet hand.
- (6) HIGH PRESSURE HOSE (Item 6)

This warning label is positioned on the screen plate.

- A Escaping fluid under pressure can penetrate the skin causing serious injury.
- **\* Study the service manual before service job.**





#### (7) HYDRAULIC OIL LEVEL (Item 7)

This warning label is positioned on the screen plate.

- A Place the bucket on the ground whenever you are servicing the hydraulic system.
- \* Check oil level on the level gauge.
- \* Refill the recommended hydraulic oil up to specified level if necessary.



21070FW07

#### (8) HYDRAULIC OIL LUBRICATION (Item 8)

This warning label is positioned on the top of the hydraulic oil tank.

- \* Do not mix different brands of oil.
- A Never open the filler cap while the engine is running or at high hydraulic oil temperature.
- A Loosen the cap slowly and release the internal pressure completely.



14070FW08

#### (9) KEEP CLEAR (Item 9)

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

- A To prevent serious personal injury or death keep clear or machine swing radius.
- \* Do not deface of remove this label from the machine.



21090FW09

#### (10) LIFTING EYE (Item 10)

This warning label is positioned on the counterweight.

- ▲ Do not lift the machine by using lifting eyes on the counterweight or the lifting eyes may be subject to overload causing its breaking and possible personal injury.
- See page 5-13 for proper lifting method of the machine.



#### (11) KEEP CLEAR - SIDE (Item 13)

This warning label is positioned on the side of the LH rear side cover.

- A Keep clear of machine swing radius to prevent serious personal injury or death.
- A Do not deface or remove this label from the machine.



21070FW13

#### (12) STAY FIX (Item 14)

This warning label is positioned on the side cover.

- A Be sure to support the stay when the door needs to be opened.
- A Be careful that the opened door may be closed by the external or natural force like strong wind.



21070FW14

#### (13) SHEARING - ENGINE HOOD (Item 15)

This warning label is positioned on the engine hood.

- A Don't open the engine hood when the engine is running.
- A Don't touch the exhaust pipe as it may cause severe burns.



#### (14) NO STEPPING - ENGINE HOOD/COUNTER-WEIGHT (Item 16)

This warning label is positioned on the engine hood and counterweight.

 $\bigtriangleup$  Don't step on the engine hood or counterweight.



21070FW16

#### (15) TRANSPORTING (Item 17)

This warning label is positioned right side of upper frame.

- A Study the operator's manual, if provided, before transporting the machine and tie down arm and track to the carrier with lashing wire.
- \* See page 5-12 for details.



14070FW17

#### (16) CONTROL IDEOGRAM (Item 19)

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

- ▲ Check the machine control pattern for conformance to the pattern on this label. If not, change the label to match the pattern before operating the machine.
- A Failure to do so could result in injury or death.
- \* See page 4-29 for details.

(17) CONTROL IDEOGRAM (only for R520LC-9 DM) (Item 19)

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

- ▲ Check the machine control pattern for conformance to the pattern on this label. If not, change the label to match the pattern before operating the machine.
- A Failure to do so could result in injury or death.
- \* See page 4-29 for details.



36070FW19



#### (18) REFERENCE OPERATOR MANUAL (Item 20)

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

A Read the operator's manual carefully before starting and operating machine.



21070FW22

#### (19) MAX HEIGHT (Item 20)

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

▲ Serious injury or death can result from contact with electric lines. Keep the minimum distance considering the supply voltage (see table page 1-8) to avoid an electric shock by merely coming into the vicinity of electric lines.



21070FW23

#### (20) INTERFERENCE (Item 20)

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

- A Be careful to operate a machine equipped with quick clamp or extensions.
- A The bucket may hit the cab, boom or boom cylinders when it reaches vicinity of them.



29090FW01

#### (21) SAFETY FRONT WINDOW (Item 22)

This warning label is positioned on both side windows of the cab.

A Be careful that the front window may be promptly closed.



#### (22) EMERGENCY EXIT (Item 23)

This warning label is positioned on the inside of rear window.

- \* The rear window serves as an emergency exit.
- \* To remove rear window, pull the ring and push out the glass.



21070FW25

#### (23) AIR CONDITIONER FILTER (Item 24)

This warning label is positioned on the air conditioner cover.

\* Periodic and proper inspection, cleaning and changing of filters extend the air conditioner's life time and maintain good performance.



21070FW26

#### (24) SAFETY LEVER (Item 25)

This warning label is positioned on the cover of the safety lever.

A Before you get off the machine be sure to place the safety lever in the LOCKED position.



30007A1FW07A

#### (25) REDUCTION GEAR GREASE (Item 30)

This warning label is located in the front of the upper frame.

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



#### (26) CLAMP - LOCKING (Item 31)

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

- A Serious injury or death can result from dropping bucket.
- ▲ Operating the machine with the quick clamp switch unlocked or without safety pin of moving hook can cause the bucket to drop off.
- **\*** Not applicable for R520LC-9 DM.



14070FW60

#### (27) TIE (Item 35)

This warning label is positioned on the lower frame.

- A Never tow the machine using tie hole as it may break.
- **A** See page 4-16 for details.



4507A0FW02

#### (28) KEEP CLEAR - BOOM/ARM (Item 36)

This warning label is positioned on both sides of the arm.

- A Serious injury or death can result from falling of the attachment.
- A To prevent serious injury or death, keep clear the underneath of attachment.



#### (29) ECU CONNECTOR (Item 37)

This warning label is positioned on the side of the battery box.

**WARNING:** 

Before carrying out any electric welding on this machine, follow the below-mentioned procedure:

- pull the connector out of all electric control units,
- connect the ground lead of the welding equipment as close to the welding point as possible.
- \* See page 6-43 for details.

#### (30) **FALLING** (Item 38)

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

- A Falling is one of the major causes of personal injury.
- A Be careful of slippery conditions on the platforms, steps and handrails when standing on the machine.





14070FW30

#### (31) TURBOCHARGER (Item 40)

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

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

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.

7807AFW20

#### (32) REFLECTING (Item 41)

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

- A To prevent serious personal injury or death, stay clear of machine swing radius.
- A Do not deface or remove this label from the machine.



#### (33) ACCUMULATOR (Item 42)

This warning 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.
- A Never make any hole in the accumulator expose it to flame or fire.
- A 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 Hyundai distributor.

#### (34) RCV LEVER PATTERN (Item 43)

This warning label is positioned on the LH support.

- ▲ Check the machine control pattern for conformance to pattern on this label. If not, change label to match pattern before operating machine.
- A Failure to do so could result in injury or death.
- \* See page 4-13 for details.
- \* Not applicable for R520LC-9 DM.

1107A0FW46



#### (35) MACHINE CONTROL PATTERN (Item 44)

This warning label is positioned on the oil cooler screen.

- ▲ Check the machine control pattern for conformance to pattern on this label. If not, change label to match pattern before operating machine.
- A Failure to do so could result in injury or death.
- \* Not applicable for R520LC-9 DM.



38090FW01A

#### (36) SWING GREASE (Item 45)

This warning label is positioned in the front of swing ring gear.

\* See page 6-34 for details.



38090FW04

#### (37) BATTERY POSITION (Item 46)

This warning label is positioned on the right side of the tool box.



### **8. MACHINE DATA PLATE**



- 1 Equipment
- 3 Serial number
- 5 Engine power

- 2 Model name
- Operating weight
- 6 Manufacturing year
- **\*\*** The machine serial number is assigned to this particular machine and should be used when requesting information or ordering service parts for this machine from your authorized HYUNDAI dealer.

The machine serial number is also stamped on the frame.

4

### **1. DIRECTION**

The direction of this manual indicates forward, backward, right and left on the standard of operator when the travel motor is in the rear and machine is on the traveling direction.



### 2. SERIAL NUMBER

Give the following information when you order parts or the machine is out of order:

 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.

- Digging work
- Loading work
- Smoothing work
- Ditching work
- Demolition work (R520LC-9 DM only)

**\*\*** Please refer to Efficient working method on page 4-17 for more details.

#### 4. SYMBOLS

▲ Important safety hint.

- riangle Indicates matters which can cause the great loss on the machine or the surroundings.
- **\*** Indicates the useful information for operator.

### SAFETY HINTS

### **1. BEFORE OPERATING THE MACHINE**

Think safety first.

In special situations, wear protective clothing including a safety helmet, safety shoes, gloves, safety glasses and ear protection as required by the job condition.

Almost every accident is caused by disregarding the simple and fundamental safety hints.

Be sure to understand thoroughly all about the operator's manual before operating the machine. Proper care is your responsibility.

Fully understand the details and process of the construction before starting the work.

If you find anything dangerous on the job, consult with the job supervisor for the preventive measures before operating the machine.

Do not operate when tired, or after drinking alcoholic beverages or any type of drugs.









Check daily according to the operation manual. Repair damaged parts and tighten loosened bolts.



Check for leakage of engine oil, hydraulic oil, fuel and coolant.

Keep the machine clean, clean the machine regularly.



Do not operate the machine if it requires repairs. Operate after complete repair.



13031SH07

Be prepared if a fire starts.

Keep a fire extinguisher handy and emergency numbers for a fire department near your telephone.



# PROTECTION AGAINST FALLING OR FLYING OBJECTS

If there is any danger of falling or flying objects hitting the operator, install protective guards in place to protect the operator as required for each particular situation.

Be sure to close the front window before commencing work.

Make sure to keep all persons other than the operator outside the range of falling or flying objects.

In case you need top guard, front guard and FOPS (Falling object protective structure), please contact your Hyundai distributor in Europe.

#### UNAUTHORIZED MODIFICATION

Any modification made without authorization from Hyundai can create hazards.



Before making a modification, consult your Hyundai distributor. Hyundai will not be responsible for any injury or damage caused by any unauthorized modification.

#### PREPARE FOR EMERGENCY

Only in case of emergency, use the installed hammer for breaking the windshield of the cab, and then exit carefully.

Have a fire extinguisher and first aid kit ready for emergencies such as fires or accidents.

Learn how to use the fire extinguisher.

Be sure you know the phone numbers of persons you should contact in case of an emergency.



#### **EMERGENCY LOWERING OF CABIN**

In emergency case, the cabin, when in tilted position, can be lowered without engine nor hydraulic power by turning the indicated screw 22.5° clockwise (CW).





#### **ROTATING BEACON**

When you operate a machine on a road or beside a road, a rotating beacon is required to avoid any traffic accident.

Please contact your Hyundai distributor to install it.

#### **PRECAUTIONS FOR ATTACHMENTS**

When installing and using an optional attachment, read the instruction manual for the attachment and the information related to attachments in this manual. Do not use attachments that are not authorized by HyBeacon

undai or your Hyundai distributor. Use of unauthorized attachments could create a safety problem and adversely affect the proper operation and useful life of the machine.

Any injuries, accidents, product failures resulting from the use of unauthorized attachments are not the responsibility of Hyundai.

The stability of this machine is enough to be used for general work. When you operate this machine, allow for the lifting capacity tables. If you want to use other special applications (not covered in this manual), you have to attach additional counterweight or be cautious while running the machine.

#### SAFETY RULES

Only trained and authorized personnel can operate and maintain the machine.

Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.

When working with another operator or a person on worksite traffic duty, be sure all personnel understand all hand signals that are to be used.

#### SAFETY FEATURES

Be sure all guards and covers are in their proper position. Have guards and covers repaired if damaged. Use safety features such as safety lock and seat belts properly.

Never remove any safety features. Always keep them in good operating condition.

Improper use of safety features could result in serious bodily injury or death.

#### MACHINE CONTROL PATTERN

Check the machine control pattern for conformance to pattern on label in cab.

If the label and machine control pattern are not corresponding, change the label to match the pattern before operating the machine.

Failure to do so could result in injury.

#### **CALIFORNIA PROPOSITION 65**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

This product contains or emits chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

Battery posts, terminals and related accessories contain lead and lead compounds.

WASH HANDS AFTER HANDLING!

#### LOADING MACHINE

Do not load the machine with the lifting eyes on the counterweight.

A The wrong loading method can result in serious body injury or death.



13031SH55

### 2. DURING THE OPERATION

Use the handle and footstep when getting on or off the machine.

Do not jump on or off the machine.



Do not use the inner door handrail to climb into or get out of the machine. The door can come loose and you can be injured.



Sound the horn to warn nearby personnel before operating the machine.

Remove all the obstacles like frost on the window before operating the machine for the good visibility.



Operate carefully to make sure all personnel or obstacles are clear within the working range of the machine. Place safety guards if necessary.



When using the work equipment, pay attention to job site.



Always wear the safety belt during the operation of the machine.



Provide proper ventilation when operating engine in a closed area to avoid the danger of exhaust gases.





Check the locations of underground gas pipes or water line and secure the safety before operation. The operating near the electrical lines is very dangerous.

 Supply voltage
 Min safe separation

 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)





If the machine touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the machine until turning off the electric current. Jump off the machine without contacting the machine when you need to get off.



Watch out for obstacles.

Be particularly careful to check the machine clearance during the swing.







Avoid operating on a cliff or soft ground as there is danger of rolling over.

Make sure to get off easily as keeping the track at a right angle and putting the travel motor into the backward position when working on a cliff or soft ground inevitably.

Operate for the lifting work considering the capacity of machine, weight and width of the load.

Be careful not to lift exceeding the machine capacity as it can be the cause of machine damage and safety accident.





The operation on a slope is dangerous.

Avoid operating the machine on a slope of over 10 degree.

#### ▲ For R520LC-9 DM only:

Do not operate this machine on a sloped area. It causes instability of the machine while operating.

Always place this machine on a flat hard surface before starting operation.

Operate the machine after making ground flat when operation is required on a slope.





The swing on the slope can be danger of rolling over. Do not operate to swing the machine with the bucket loaded on a slope since the machine may lose its balance under such an instance.



#### ▲ For R520LC-9 DM mandatory: Before operating this machine, you have to extend the track chains to the maximum width.



Avoid parking and stopping on a slope.

Lower the bucket to the ground and block the track when parking.

### ▲ For R520LC-9 DM only:

Parking of the machine is only allowed on flat ground.

Lower the attachment by first lowering the end arm, then lower the inner arm and finally lower the extension/base boom.

Lower the tiltable cabin in a horizontal position before leaving or getting out of the cabin.

Avoid traveling in a cross direction on a slope as it can cause the danger of rolling over and sliding.

### A For R520LC-9 DM only:

Never travel with the boom fully extracted (upright position) on any slope!





Traveling on a slope is dangerous.

Be sure to operate slowly when traveling down a slope and maintain the bucket at a height of 20-30 cm (1 ft) above the ground so that it can be used as brake in an emergency.

20~30 CM

Steering of the machine while traveling on a slope is dangerous.

When an inevitable turning of direction is required, turn on the flat and solid ground.



The engine angularity limits are 35 degree. Do not operate by more than the engine limits in any case.

### ▲ For R520LC-9 DM only:

You cannot operate the machine on a slope! The machine must be positioned on a flat and hard surface before the base boom is lifted. 30° 30015H288

Before traveling the machine, sound the horn to warn nearby personnel.

Operate forward and backward correctly with confirming the location of the travel motor.



Slow down when traveling through obstacles or uneven ground.



When working on soft ground, place mats or wood boards on the ground to prevent the machine sinking.

When operating 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 carrier roller. 13031SH31



For R520LC-9 DM only:

Only travel with the machine when the end and middle arm are fully folded and the extension/ base boom is either in an upward position (for small travel distances / repositioning) or in a horizontal position (for travelling from and to the jobsite or for loading and unloading onto a transport vehicle).



Do not retract the track gauge except for transporting purposes.



#### MOUNTING AND DISMOUNTING

**Never** jump on or off the machine. **Never** get on or off a moving machine.

When mounting or dismounting, always face the machine and use the handrails, machine or track frame steps, and track shoes. Additional track frame steps can be fitted for wider optional shoes. Contact your Hyundai distributor for further information.

Do not hold any control levers when getting on or off the machine.

Ensure safety by always maintaining at least threepoint contact of hands and feet with the handrails, steps or track shoes.

Always remove any oil or mud from the handrails, steps and track shoes. If they are damaged, repair them and tighten any loose bolts.

If grasping the door handrail when mounting or dismounting or moving on the track, open and lock the door securely in the open position. Otherwise the door may move suddenly, causing you to lose balance and fall.

Do not use the inner door handrail to climb into or get out of the machine. The door can come loose and you can be injured.

#### **KEEP RIDERS OFF MACHINE**

Riders on a machine are subject to injury such as being struck by objects and being thrown off the machine. Only allow the operator on the machine. Keep riders off.



#### For R520LC-9 DM only:

Mounting and dismounting into the machine is only allowed when the cabin is in the fully down (horizontal) position.

### **3. DURING THE MAINTENANCE**

Stop the engine immediately when the trouble of the machine is found.

Inspect immediately the cause of trouble such as vibration, overheating and trouble in the cluster then repair.



Park on a flat place and stop the engine for inspecting and repairing. Properly indicate that the machine is not operational (Remove the start key).

Extreme care shall be taken during maintenance work. Parts may require additional safeguarding.

Do not remove the radiator cap from hot engine. Open the cap after the engine cools, below 50°C (122°F) to prevent personal injury from heated coolant spray or steam.



13031SH34

Do not work below the machine.

Be sure to work with proper safety supports. Do not depend on the hydraulic cylinders to hold up the equipment and attachment.


There is the danger of fire in fuel and oil. Store in cool and dry area, away from any open flames.



Do not touch the exhaust pipe as it may cause severe burns.



Do not open the engine hood and covers while the engine is running.



Be careful of not hitting the edges when you service engine.



Be careful that the front window may be promptly closed.

Be sure to support the stay, when the side door needs to be opened.

Be careful that the open side door may closed by the external or natural force like strong wind.

The antislip protection should be replaced if they have become worn or have been printed over. Be sure to free of oil, water and grease etc.

Be careful of not touching slip, fall down etc., when you work at the upper frame to service engine and/or other component.

**HIGH PRESSURE GAS** 

Contains high pressure gas. To avoid explosion and personal injury, do not expose to fire, do not weld, do not drill. Relieve the pressure before discharging.

#### LIFT EYES CAN FAIL

The lift eyes of the tank can fail when lifting the tank containing fluids which can result in possible personal injury. Drain the tank of all fluids before lifting.



13031SH43





## 4. PARKING

When leaving the machine after parking, lower the bucket to the ground completely and put the safety lever at parking position then remove the key. Lock the cab door.

Park the machine in the flat and safe place.





Hope you can work easily and safely observing safety rules.

For safe operation, observe all safety rules.



Parking of the machine is only allowed on flat ground. Lower the attachment by first lowering the end arm, then lower the inner arm and finally lower the extension/base boom.

Lower the tiltable cabin in a horizontal position before leaving or getting out of the cabin.



## **1. MAJOR COMPONENTS**

#### 1) R480/520LC-9



#### 2) R520LC-9 DM



Attachment Idler

Connecting rod

Carrier roller

Track roller

Attachment

cylinder

End arm

End arm cylinder

52092SP01

Track

Sprocket

## 2. SPECIFICATIONS

### 1) R480LC-9 [7.06 m (23' 2") BOOM, 3.38 m (11' 1") ARM]



Description		Unit	Specification	
Operating weight		kg (lb)	48100 (106040)	
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	2.15 (2.81)	
Overall length	A		12060 (39' 7")	
Overall width, with 600 mm shoe	В		3340 (10' 11")	
Overall height	С		3730 (12' 3")	
Superstructure width	D		2980 (9' 9")	
Overall height of cab	E		3190 (10' 6")	
Ground clearance of counterweight	F		1295 (4' 3")	
Engine cover height	Igine cover height     G       nimum ground clearance     H       ear-end distance     I       ear-end swing radius     I'       stance between tumblers     J       indercarriage length     K		2770 (9' 1")	
Minimum ground clearance			555 (1' 10")	
Rear-end distance			3695 (12' 1")	
Rear-end swing radius			3750 (12' 4")	
Distance between tumblers			4470 (14' 8")	
Undercarriage length			5462 (17' 11")	
Undercarriage width	L		3340 (10' 11")	
Track gauge	М		2740 (8' 12")	
Track shoe width, standard	N		600 (24")	
Travel speed (low/high)		km/hr (mph)	3.2/5.0 (2.0/3.1)	
Swing speed		rpm	9.0	
Gradeability		degree (%)	35 (70)	
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.83 (11.80)	
Max traction force		kg (lb)	38500 (84800)	

## 2) R480-9 [7.06 m (23' 2") BOOM, 3.38 m (11' 1") ARM]



Description		Unit	Specification	
Operating weight		kg (lb)	46900 (103400)	
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	2.15 (2.81)	
Overall length	A		12060 (39' 7")	
Overall width, with 600 mm shoe	В		3340 (10' 11")	
Overall height	С	]	3730 (12' 3")	
Superstructure width	D		2980 (9' 9")	
Overall height of cab	E		3190 (10' 6")	
Ground clearance of counterweight	F		1295 (4' 3")	
Engine cover height	gine cover height G		2770 (9' 1")	
inimum ground clearance H		mm (ft-in)	555 (1' 10")	
Rear-end distance	ear-end distance		3695 (12' 1")	
ar-end swing radius I'			3750 (12' 4")	
Distance between tumblers	istance between tumblers J ndercarriage length K		4040 (13' 3")	
Undercarriage length			5032 (16' 6")	
Undercarriage width	L		3340 (10' 11")	
Track gauge	М		2740 (8' 12")	
Track shoe width, standard	N		600 (24")	
Travel speed (low/high)		km/hr (mph)	3.2/5.0 (2.0/3.1)	
Swing speed		rpm	9.0	
Gradeability		degree (%)	35 (70)	
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.89 (12.66)	
Max traction force		kg (lb)	38500 (84800)	

## 3) R520LC-9 [7.06 m (23' 2") BOOM, 3.38 m (11' 1") ARM]



<sup>48092</sup>SP03

Description		Unit	Specification	
Operating weight	kg (lb)	51000 (112430)		
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	2.15 (2.81)	
Overall length	А		12060 (39' 7")	
Overall width, with 600 mm shoe (transport position/working po- sition)	erall width, with 600 mm shoe (transport position/working po- on)		2990/3540 (9' 10"/11' 7")	
Overall height	С		3850 (12' 8")	
Superstructure width	D		2980 (9' 9")	
Overall height of cab	Е		3400 (11' 2")	
Ground clearance of counterweight	F		1500 (4' 11")	
Engine cover height	G		2980 (9' 9")	
Minimum ground clearanceHRear-end distanceIRear-end swing radiusI'Distance between tumblersJ		mm (ft-in)	770 (2' 6")	
			3695 (12' 1")	
			3750 (12' 4")	
			4470 (14' 8")	
Undercarriage length	К		5460 (17' 11")	
Undercarriage width (transport position/working position)	L		2990/3540 (9' 10"/11' 7")	
Track gauge (transport position/working position)	М		2380/2940 (7' 10"/9' 8")	
Track shoe width, standard	Ν		600 (24")	
Travel speed (low/high)	km/hr (mph)	3.2/5.0 (2.0/3.1)		
Swing speed	rpm	9.0		
Gradeability		degree (%)	35 (70)	
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.88 (12.51)	
Max traction force		kg (lb)	38500 (84800)	

## 4) R520LC-9 [6.55 m (21' 6") BOOM, 2.4 m (7' 10") ARM]



Description	Unit	Specification		
Operating weight	kg (lb)	50820 (112040)		
Bucket capacity (SAE heaped), standard	m <sup>3</sup> (yd <sup>3</sup> )	2.15 (2.81)		
Overall length	A			
verall width, with 600 mm shoe (transport position/working po- tion)			2990/3540 (9' 10"/11' 7")	
Overall height	С		4100 (13' 5")	
Superstructure width	D		2980 (9' 9")	
Overall height of cab	Е		3400 (11' 2")	
Ground clearance of counterweight		1500 (4' 11")		
Engine cover height		2980 (9' 9")		
Minimum ground clearance     H       Rear-end distance     I       Rear-end swing radius     I'       Distance between tumblers     J		mm (ft-in)	770 (2' 6")	
			3695 (12' 1")	
			3750 (12' 4")	
			4470 (14' 8")	
Undercarriage length K			5460 (17' 11")	
Undercarriage width (transport position/working position)	L		2990/3540 (9' 10"/11' 7")	
Track gauge (transport position/working position)	М		2380/2940 (7' 10"/9' 8")	
Track shoe width, standard	Ν		600 (24")	
Travel speed (low/high)	km/hr (mph)	3.2/5.0 (2.0/3.1)		
Swing speed	rpm	9.0		
Gradeability	degree (%)	35 (70)		
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.88 (12.51)	
Max traction force		kg (lb) 38500 (84800)		

## 5) R520LC-9 [9.00 m (29' 6") BOOM, 5.85 m (19' 2") ARM]



<sup>48092</sup>SP03

Description		Unit	Specification	
Operating weight	kg (lb)	52410 (115540)		
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	2.15 (2.81)	
Overall length	А		13800 (45' 3")	
Overall width, with 600 mm shoe (transport position/working position)	erall width, with 600 mm shoe (transport position/working po- on)		2990/3540 (9' 10"/11' 7")	
Overall height	С		5190 (17' 0")	
Superstructure width	D		2980 (9' 9")	
Overall height of cab	Е		3400 (11' 2")	
Ground clearance of counterweight	F		1500 (4' 11")	
Engine cover height	Engine cover height G			
Minimum ground clearance       H         Rear-end distance       I         Rear-end swing radius       I'         Distance between tumblers       J		mm (ft-in)	770 (2' 6")	
			3695 (12' 1")	
			3750 (12' 4")	
			4470 (14' 8")	
Undercarriage length	К		5460 (17' 11")	
Undercarriage width (transport position/working position)	L		2990/3540 (9' 10"/11' 7")	
Track gauge (transport position/working position)	М		2380/2940 (7' 10"/9' 8")	
Track shoe width, standard	Ν		600 (24")	
Travel speed (low/high)		km/hr (mph)	3.2/5.0 (2.0/3.1)	
Swing speed	rpm	9.0		
Gradeability		degree (%)	35 (70)	
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.91 (12.94)	
Max traction force		kg (lb)	38500 (84800)	

## 6) R520LC-9 [10.0 m (32' 10") BOOM, 6.85 m (22' 6") ARM]



<sup>48092</sup>SP03

Description		Unit	Specification	
Operating weight	kg (lb)	53130 (117130)		
Bucket capacity (SAE heaped), standard		m <sup>3</sup> (yd <sup>3</sup> )	2.15 (2.81)	
Overall length	А		14620 (47' 12")	
Overall width, with 600 mm shoe (transport position/working position)	rerall width, with 600 mm shoe (transport position/working po- on)		2990/3540 (9' 10"/11' 7")	
Overall height	С		5860 (19' 3")	
Superstructure width	D		2980 (9' 9")	
Overall height of cab	Е		3400 (11' 2")	
Ground clearance of counterweight	F		1500 (4' 11")	
Engine cover height	Engine cover height G			
Minimum ground clearanceHRear-end distanceIRear-end swing radiusI'Distance between tumblersJ		mm (ft-in)	770 (2' 6")	
			3695 (12' 1")	
			3750 (12' 4")	
			4470 (14' 8")	
Undercarriage length	Undercarriage length K		5460 (17' 11")	
Undercarriage width (transport position/working position)	L		2990/3540 (9' 10"/11' 7")	
Track gauge (transport position/working position)	М		2380/2940 (7' 10"/9' 8")	
Track shoe width, standard	Ν		600 (24")	
Travel speed (low/high)	km/hr (mph)	3.2/5.0 (2.0/3.1)		
Swing speed	rpm	9.0		
Gradeability		degree (%)	35 (70)	
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	0.92 (13.08)	
Max traction force		kg (lb)	38500 (84800)	

# **7) R520LC-9 DM** [4.12 m (13' 6") BASE BOOM, 9.9 m (32' 6") EXTENSION BOOM, 2.72 m (8' 11") MIDDLE ARM, 8.00 m (26' 3") END ARM]



Description		Unit	Specification	
Operating weight		kg (lb)	58700 (129410)	
Overall length	А		18100 (39900)	
Overall width, with 600 mm shoe (transport position/working po- sition)	В		2940 / 3540 (6480 / 7800)	
Overall height	С		3500 (7715)	
Superstructure width	D		2980 (9' 9")	
Overall height of cab	Е		3400 (11' 2")	
Ground clearance of counterweight	Ground clearance of counterweight F			
Engine cover height	G		2980 (9' 9")	
Minimum ground clearance		mm (ft-in)	770 (2' 6")	
Rear-end distance	l ľ		3695 (12' 1")	
Rear-end swing radius			3750 (12' 4")	
Distance between tumblers			4470 (14' 8")	
Undercarriage length	К		5460 (17' 11")	
Undercarriage width (transport position/working position)	L		2990 / 3540 (9' 10" / 11' 7")	
Track gauge (transport position/working position)	М		2380 / 2940 (7' 10" / 9' 8")	
Track shoe width, standard	Ν		600 (24")	
Travel speed (low/high)		km/hr (mph)	5.0 / 3.2	
Swing speed		rpm	9.0	
Gradeability		degree (%)	35	
Ground pressure (600 mm shoe)		kgf/cm <sup>2</sup> (psi)	1.01 (14.36)	
Max traction force		kg (lb)	38500 (82000)	

## 3. WORKING RANGE

### 1) R480LC-9 [7.06 m (23' 2") BOOM]



48092SP04

Description		2.40 m (7' 10") arm	2.90 m (9' 6") arm	3.38 m (11' 1") arm	4.00 m (13' 1") arm
Max digging reach	Α	11160 mm (36' 7")	11550 mm (37' 11")	12100 mm (39' 8")	12660 mm (41' 6")
Max digging reach on ground	A'	10940 mm (35'11")	11340 mm (37' 2")	11900 mm (39' 1")	12470 mm (40' 11")
Max digging depth	В	6850 mm (22' 6")	7350 mm (24' 1")	7810 mm (25' 8")	8450 mm (27' 9")
Max digging depth (8 ft level)	В'	6670 mm (21' 11")	7190 mm (23' 7")	7670 mm (25' 2")	8320 mm (27' 4")
Max vertical wall digging depth	С	5960 mm (19' 7")	5930 mm (19' 5")	6590 mm (21' 7")	7170 mm (23' 6")
Max digging height	D	10560 mm (34' 8")	10530 mm (34' 7")	10980 mm (36' 0")	11210 mm (36' 9")
Max dumping height	Е	7120 mm (23' 4")	7180 mm (23' 7")	7620 mm (25' 0")	7820 mm (25' 8")
Min swing radius	F	5090 mm (16' 8")	4910 mm (16' 1")	4780 mm (15' 8")	4910 mm (16' 1")
	SAE	216.7 [236.4] kN	219.7 [239.6] kN	220.7 [240.7] kN	222.6 [242.9] kN
		22100 [24110] kgf	22400 [24440] kgf	22500 [24550] kgf	22700 [24760] kgf
Ducket diaging force		48720 [53150] lbf	49380 [53870] lbf	49600 [54110] lbf	50040 [54590] lbf
Bucket digging force		251.1 [273.9] kN	254.0 [277.1] kN	255.0 [278.2] kN	256.9 [280.3] kN
	ISO	25600 [27930] kgf	25900 [28250] kgf	26000 [28360] kgf	26200 [28580] kgf
		56440 [61570] lbf	57100 [62290] lbf	57320 [62530] lbf	57760 [63010] lbf
		276.6 [301.7] kN	224.6 [245.0] kN	191.2 [208.6] kN	170.6 [186.2] kN
	SAE	28200 [30760] kgf	22900 [24980] kgf	19500 [21270] kgf	17400 [18980] kgf
Arm around force		62170 [67820] lbf	50490 [55080] lbf	42990 [46900] lbf	38360 [41850] lbf
		290.3 [316.7] kN	234.4 [255.7] kN	199.1 [217.2] kN	176.5 [192.6] kN
	ISO	29600 [32290] kgf	23900 [26070] kgf	20300 [22150] kgf	18000 [19640] kgf
		65260 [71190] lbf	52690 [57480] lbf	44750 [48820] lbf	39680 [43290] lbf

## 2) R480LC-9 [6.55 m (21' 6") BOOM]



48092SP04

Description		2.40 m (7' 10") arm
Max digging reach	А	10610 mm (34'10")
Max digging reach on ground	A'	10370 mm (34' 0")
Max digging depth	В	6370 mm (20'11")
Max digging depth (8 ft level)	B'	6190 mm (20' 4")
Max vertical wall digging depth	С	5400 mm (17' 9")
Max digging height	D	10170 mm (33' 4")
Max dumping height	Е	6750 mm (22' 2")
Min swing radius	F	4620 mm (15' 2")
		216.7 [236.4] kN
	SAE	22100 [24110] kgf
Dualat diaging force		48720 [53150] lbf
bucket digging force		251.1 [273.9] kN
	ISO	25600 [27930] kgf
		56440 [61570] lbf
		276.6 [301.7] kN
	SAE	28200 [30760] kgf
Arm around force		62170 [67820] lbf
		290.3 [316.7] kN
	ISO	29600 [32290] kgf
		65260 [71190] lbf

## 3) R480LC-9 [9.00 m (29' 6") BOOM]



48092SP04

Description		5.85 m (19' 2") arm
Max digging reach	А	16350 mm (53' 8")
Max digging reach on ground	A'	16200 mm (53' 2")
Max digging depth	В	11560 mm (37' 11")
Max digging depth (8 ft level)	B'	11460 mm (37' 7")
Max vertical wall digging depth	С	10320 mm (33' 10")
Max digging height	D	13840 mm (45' 5")
Max dumping height	Е	10440 mm (34' 3")
Min swing radius	F	5940 mm (19' 6")
		189.3 kN
	SAE	19300 kgf
Duslost dimeira facea		42550 lbf
Bucket digging force		217.7 kN
	ISO	22200 kgf
		48940 lbf
		107.9 kN
	SAE	11000 kgf
A we around former		24250 lbf
		110.3 kN
	ISO	11250 kgf
		24800 lbf

## 4) R520LC-9 [7.06 m (23' 2") BOOM]



48092SP05

Description		2.40 m (7' 10") arm	2.90 m (9' 6") arm	3.38 m (11' 1") arm	4.00 m (13' 1") arm
Max digging reach	А	11140 mm (36' 7")	11530 mm (37' 10")	12080 mm (39' 8")	12640 mm (41' 6")
Max digging reach on ground	A'	10890 mm (35' 9")	11290 mm (37' 0")	11840 mm (38' 10")	12420 mm (40' 9")
Max digging depth	В	6610 mm (21' 8")	7110 mm (23' 4")	7590 mm (24' 11")	8210 mm (26' 11")
Max digging depth (8 ft level)	B'	6430 mm (21' 1")	6940 mm (22' 9")	7440 mm (24' 5")	8080 mm (26' 6")
Max vertical wall digging depth	С	4880 mm (16' 0")	4780 mm (15' 8")	5470 mm (17' 11")	5980 mm (19' 7")
Max digging height	D	10640 mm (34' 11")	10610 mm (34' 10")	11080 mm (36' 4")	11290 mm (37' 0")
Max dumping height	Е	7290 mm (23' 11")	7350 mm (24' 1")	7760 mm (25' 6")	7980 mm (26' 2")
Min swing radius	F	5110 mm (16' 9")	4910 mm (16' 1")	4830 mm (15'10")	4910 mm (16' 1")
Duelost diseries force	SAE	247.1 [269.6] kN	251.1[273.9] kN	253.0 [276.0] kN	253.0 [276.0] kN
		25200 [27490] kgf	25600 [27930] kgf	25800 [28150] kgf	25800 [28150] kgf
		55560 [60610] lbf	56440 [61570] lbf	56880 [62050] lbf	56880 [62050] lbf
Bucket digging force		286.4 [312.4] kN	290.3 [316.7] kN	292.2 [318.8] kN	292.2 [318.8] kN
	ISO	29200 [31850] kgf	29600 [32290] kgf	29800 [32510] kgf	29800 [32510] kgf
		64370 [70220] lbf	65260 [71190] lbf	65700 [71670] lbf	65700 [71670] lbf
		278.5 [303.8] kN	225.6 [246.1] kN	192.2 [209.7] kN	171.6 [187.2] kN
	SAE	28400 [30980] kgf	23000 [25090] kgf	19600 [21380] kgf	17500 [19090] kgf
Arm around force		62610 [68300] lbf	50710 [55320] lbf	43210 [47140] lbf	38580 [42090] lbf
		291.3 [317.7] kN	235.4 [256.8] kN	200.1 [218.2] kN	177.5 [193.6] kN
	ISO	29700 [32400] kgf	24000 [26180] kgf	20400 [22250] kgf	18100 [19750] kgf
		65480 [71430] lbf	52910 [57720] lbf	44970 [49060] lbf	39900 [43530] lbf

## 5) R520LC-9 [6.55 m (21' 6") BOOM]



48092SP05

Description		2.40 m (7' 10") arm
Max digging reach	Α	10590 mm (34' 9")
Max digging reach on ground	A'	10320 mm (33' 10")
Max digging depth	В	6130 mm (20' 1")
Max digging depth (8 ft level)	В'	5950 mm (19' 6")
Max vertical wall digging depth	С	4390 mm (14' 5")
Max digging height	D	10260 mm (33' 8")
Max dumping height	Е	6920 mm (22' 8")
Min swing radius	F	4650 mm (15' 3")
		247.1 [269.6] kN
	SAE	25200 [27490] kgf
Duelet dissing force		55560 [60610] lbf
Bucket digging force		286.4 [312.4] kN
	ISO	29200 [31850] kgf
		64370 [70220] lbf
		278.5 [303.8] kN
	SAE	28400 [30980] kgf
Arra around fores		62610 [68300] lbf
		291.3 [317.7] kN
	ISO	29700 [32400] kgf
		65480 [71430] lbf

## 6) R520LC-9 [9.00 m (29' 6") BOOM]



Description		5.85 m (19' 2") arm
Max digging reach	Α	16280 mm (53' 5")
Max digging reach on ground	A'	16100 mm (52' 10")
Max digging depth	В	11380 mm (37' 4")
Max digging depth (8 ft level)	B'	11280 mm (37' 0")
Max vertical wall digging depth	С	10070 mm (33' 0")
Max digging height	D	13930 mm (45' 8")
Max dumping height	Е	10530 mm (34' 7")
Min swing radius	F	5940 mm (19' 6")
		212.8 kN
	SAE	21700 kgf
Duelet dissing form		47840 lbf
Bucket digging force		251.1 kN
	ISO	25600 kgf
		56440 lbf
		107.9 kN
	SAE	11000 kgf
Arm around force		24250 lbf
		110.8 kN
	ISO	11300 kgf
		24910 lbf

## 7) R520LC-9 [10.0 m (32' 10") BOOM]



Description		6.85 m (22' 6") arm
Max digging reach	Α	18170 mm (59' 7")
Max digging reach on ground	A'	18010 mm (59' 1")
Max digging depth	В	13010 mm (42' 8")
Max digging depth (8 ft level)	В'	12930 mm (42' 5")
Max vertical wall digging depth	С	11740 mm (38' 6")
Max digging height	D	15150 mm (49' 9")
Max dumping height	Е	11760 mm (38' 7")
Min swing radius	F	6510 mm (21' 4")
		213.8 kN
	SAE	21800 kgf
Duelest display forms		48060 lbf
Bucket digging force		252.0 kN
	ISO	25700 kgf
		56660 lbf
		95.1 kN
	SAE	9700 kgf
A way a way of factor		21380 lbf
Arm crowd force		98.1 kN
	ISO	10000 kgf
		22050 lbf

#### \* R520LC-9 Demolition Working Range

- -. 13.67 m BOOM
- -. 2.72 m Mid. ARM
- -. 8.0 m End ARM
- -. 14.2 Ton C/W (STD. 10.7 Ton + ADD. 3.5 Ton)
- -. Max. Allowable Crusher Weight : 2800 Kg



Description		R520LC-9 High Reach Demolition			
Boom length		13750 mm			
Middle arm length		2720 mm			
End arm	_	8000 mm			
Maximum working reach	14880 mm				
Maximum working height	В	26087 mm			

## 4. WEIGHT

### 1) ROBEX 480LC-9

		R480	LC-9	R480-9		
	em	kg	lb	kg	lb	
Upperstructure assembly		20000	44090	←	←	
Main frame weld assembly		4430	9770	←	←	
Engine assembly		940	2070	←	←	
Main pump assembly		190	420	←	←	
Main control valve assembly		420	930	←	←	
Swing motor assembly		230	510	←	←	
Hydraulic oil tank assembly		450	990	←	←	
Fuel tank assembly		270	600	←	←	
Counterrusialat	7.06 m boom	9200	20280	←	←	
Counterweight	9.0 m boom	10700	23590	←	←	
Cab assembly		490	1080	←	←	
Lower chassis assembly		19000	41890	17800	39240	
Track frame weld assembly		7060	15570	6600	14550	
Swing bearing		720	1590	←	←	
Travel motor assembly		440	970	←	←	
Turning joint		50	110	←	←	
Track recoil spring		310	310 680 ←		←	
Idler		250	550	←	←	
Carrier roller		40	90	←	←	
Track roller		80	180	←	←	
Track-chain assembly (600 mm	standard triple grouser shoe)	2700	5950	2500	5510	
Front attachment assembly (7.0 SAE heaped bucket)	96 m boom, 3.38 m arm, 2.15 m <sup>3</sup>	9100	20060	←	←	
7.06 m boom assembly		3260	7190	←	←	
6.55 m boom assembly		3180	7010	←	←	
9.0 m boom assembly		4050	8930	←	←	
3.38 m arm assembly		1630	3590	←	←	
2.15 m <sup>3</sup> SAE heaped bucket		1740	3840	←	←	
Boom cylinder assembly		830	1830	←	←	
Arm cylinder assembly		630	1390	←	←	
Bucket cylinder assembly		300	660	←	<i>←</i>	
Bucket control rod assembly		155	340	←	←	

## 2) R520LC-9

litere	R520	LC-9
item	kg	lb
Upperstructure assembly	17630	38870
Main frame weld assembly	4430	9770
Engine assembly	940	2070
Main pump assembly	190	420
Main control valve assembly	420	930
Swing motor assembly	230	510
Hydraulic oil tank assembly	450	990
Fuel tank assembly	270	600

ltere	Item         7.06 m boom         mbly       9.0 m boom         mbly       assis assembly         ck frame	R520	LC-9		
Item	Item          7.06 m boom         9.0 m boom         ssembly         e         oport         embly         embly         embly         embly         embly         embly         g         embly (600 mm standard triple grouser shoe)         easembly (7.06 m boom, 3.38 m arm, 2.15 m <sup>3</sup> SAE heaped bucket)         sembly         sembly         sembly         mbly         sembly         sembly <t< td=""></t<>				
Country winter	7.06 m boom	10200	22500		
Counterweight	9.0 m boom	10700	23590		
Cab assembly		490	1080		
Lower chassis assembly		24100	53130		
Lower track frame		2130	4700		
Center frame support		8070	17790		
Swing bearing		720	1590		
Travel motor assembly		440	970		
Turning joint		50	110		
Track recoil spring		310	680		
Idler	250	550			
Carrier roller	40	90			
Track roller		80	180		
Track-chain assembly (600 mm standard triple grouser shoe)		2700	5850		
Front attachment assembly (7.06 m boom, 3.38 m arm, 2.15 m <sup>2</sup>	<sup>3</sup> SAE heaped bucket)	9270	20440		
7.06 m boom assembly		3260	7190		
6.55 m boom assembly		3180	7010		
9.0 m boom assembly		4060	8950		
10.0 m boom assembly		4470	9850		
3.38 m arm assembly		1610	3550		
2.15 m <sup>3</sup> SAE heaped bucket		1740	3840		
Boom cylinder assembly		830	1830		
Arm cylinder assembly		630	1390		
Bucket cylinder assembly		380	840		
Bucket control rod assembly		180	400		

## 3) R520LC-9 DM

ltom	R520L0	C-9 DM
	kg	lb
Upperstructure assembly	22750	50150
Main frame weld assembly	4430	9770
Engine assembly	940	2070
Main pump assembly	190	420
Main control valve assembly	420	930
Swing motor assembly	230	510
Hydraulic oil tank assembly	450	990
Fuel tank assembly	270	600
Counterweight	14200	31300
Cab assembly	490	1080
Lower chassis assembly	24100	53130
Lower track frame	2130	4700
Center frame support	8070	17790
Swing bearing	720	1590
Travel motor assembly	440	970
Turning joint	50	110
Track recoil spring	310	680
Idler	250	550
Carrier roller	40	90
Track roller	80	180

litere	R520L0	C-9 DM	
liem	kg	lb	
Track-chain assembly (600 mm standard triple grouser shoe)	2700	5950	
Front attachment assembly (4.12 m base boom, 9.9 m extension boom, 2.72 m middle arm, 8.0 end arm)	11850	26120	
4.12 m base boom assembly	2310	5090	
9.9 m extension boom assembly	4200	9260	
2.72 m middle arm assembly	1100	2420	
8.0 m end arm assembly	1460	3220	
Boom cylinder assembly	1740	3840	
Arm cylinder assembly (middle arm)	525	1160	
Arm cylinder assembly (end arm)	270	600	
Bucket cylinder assembly (crusher)	230	510	
Bucket control rod assembly	180	400	
Standard crusher	1850	4080	

## **5. LIFTING CAPACITIES**

#### 1) ROBEX 480LC-9

- 6.55 m (21' 6") boom, 2.40 m (7' 10") arm equipped with 2.15 m<sup>3</sup> (SAE heaped) bucket and 600 (1) mm (24") triple grouser shoe and 9200 kg (20280 lb) counterweight.
- 🗗:
  - Rating over-front

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• 🖙 :
          Rating over-side or 360 degree
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					Load r	adius				At max. reach			
Load po	oint	3.0 m	(10 ft)	4.5 m (15 ft)		6.0 m (20 ft)		7.5 m	(25 ft)	Capa	acity	Reach	
height				ľ		ľ		ŀ		ŀ		m (ft)	
6.0 m	kg					*12480	*12480	*11020	9310	*9470	6570	9.15	
(20 ft)	lb					*27510	*27510	*24290	20530	*20880	14480	(30.0)	
4.5 m (15 ft)	kg			*18440	*18440	*13960	13040	*11650	9010	*9440	5790	9.65	
	lb			*40650	*40650	*30780	28750	*25680	19860	*20810	12760	(31.7)	
3.0 m (10 ft)	kg					*15580	12220	*12420	8610	*9470	5410	9.86	
	lb					*34350	26940	*27380	18980	*20880	11930	(32.3)	
1.5 m	kg					*16700	11550	*13000	8240	*9510	5340	9.80	
(5 ft)	lb					*36820	25460	*28660	18170	*20970	11770	(32.2)	
Ground	kg			*22790	17330	*16900	11170	*13090	8000	*9480	5590	9.47	
line	lb			*50240	38210	*37260	24630	*28860	17640	*20900	12320	(31.1)	
-1.5 m	kg	*25320	*25320	*20990	17370	*16060	11060	*12360	7920	*9240	6280	8.83	
(-5 ft)	lb	*55820	*55820	*46270	38290	*35410	24380	*27250	17460	*20370	13850	(29.0)	
-3.0 m	kg	*21780	*21780	*17910	17670	*13920	11190			*8390	7800	7.79	
(-10 ft)	lb	*48020	*48020	*39480	38960	*30690	24670			*18500	17200	(25.6)	
-4.5 m	kg			*12770	*12770								
(-15 ft)	lb			*28150	*28150								

Note

Lifting capacities are based on SAE J1097 and ISO 10567. 1.

- Lifting capacity of the ROBEX series does not exceed 75% of tipping load with the machine on firm, 2. level ground or 87% of full hydraulic capacity.
- З. The load point is a hook located on the back of the bucket.
- \* indicates load limited by hydraulic capacity. 4.
- 7.06 m (23' 2") boom, 3.38 m (11' 1") arm equipped with 2.15 m<sup>3</sup> (SAE heaped) bucket and 600 (2) mm (24") triple grouser shoe and 9200 kg (20280 lb) counterweight.

					At max. reach									
Load point height		3.0 m (10 ft)		4.5 m (15 ft)		6.0 m (20 ft)		7.5 m (25 ft)		9.0 m (30 ft)		Capacity		Reach
		ľ		G		ľ		ľ		ľ		U		m (ft)
6.0 m	kg							*9220	*9220	*8240	6740	*7490	4800	10.75
(20 ft)	lb							*20330	*20330	*18170	14860	*16150	10580	(35.3)
4.5 m	kg					*12140	*12140	*10130	9050	*8910	6530	*7530	4320	11.17
(15 ft)	lb					*26760	*26760	*22330	19950	*19640	14400	*16600	9520	(36.6)
3.0 m	kg			*19830	18930	*14060	12170	*11170	8540	*9450	6260	7470	4070	11.35
(10 ft)	lb			*43720	41730	*31000	26830	*24630	18830	*20830	13800	16470	8970	(37.2)
1.5 m	kg			*22320	17460	*15610	11360	*12080	8080	*9940	5990	7420	4010	11.30
(5 ft)	lb			*49210	38490	*34410	25040	*26630	17810	*21910	13210	16360	8840	(37.1)
Ground	kg			*22800	16860	*16390	10850	*12610	7730	*10190	5790	7670	4140	11.02
line	lb			*50270	37170	*36130	23920	*27800	17040	*22470	12760	16910	9130	(36.2)

					At max. reach									
Load point height		3.0 m (10 ft)		4.5 m (15 ft)		6.0 m (20 ft)		7.5 m (25 ft)		9.0 m (30 ft)		Capacity		Reach
		ľ		ŀ		ľ		ľ				ľ		m (ft)
-1.5 m	kg	*18070	*18070	*21950	16730	*16290	10610	*12600	7550	*10010	5680	*7770	4500	10.49
(-5 ft)	lb	*39840	*39840	*48390	36880	*35910	23390	*27780	16640	*22070	12520	*17130	9920	(34.4)
-3.0 m	kg	*24350	*24350	*20080	16870	*15280	10610	*11850	7530			*7590	5240	9.66
(-10 ft)	lb	*53680	*53680	*44270	37190	*33690	23390	*26120	16600			*16730	11550	(31.7)
-4.5 m	kg	*22100	*22100	*16990	*16990	*13120	10820	*9890	7710			*6910	6720	8.43
(-15 ft)	lb	*48720	*48720	*37460	*37460	*28920	23850	*21800	17000			*15230	14820	(27.7)
-6.0 m (-20 ft)	kg			*11930	*11930	*8900	*8900							
	lb			*26300	*26300	*19620	*19620							

9.0 m (29' 6") boom, 5.85 m (19' 2") arm equipped with 1.38 m<sup>3</sup> (SAE heaped) bucket and 600 (3) mm (24") triple grouser shoe and 10700 kg (23590 lb) counterweight.

							Load	radius						At max. reach			
Load po	int	3.0 m	(10 ft)	5.0 m	(15 ft)	7.0 m	(25 ft)	9.0 m	(30 ft)	11.0 m	(35 ft)	13.0 m	(45 ft)	Cap	acity	Reach	
heigh	t		₽₽₽	Ð		ľ		Ð	⋳⋕⋬	ŀ		ŀ	╔╋╸	ľ		m (ft)	
10.0 m	kg													*4310	3590	13.54	
(35 ft)	lb													*9500	7910	(44.4)	
8.0 m	kg											*2660	*2660	*4240	2910	14.55	
(25 ft)	lb											*5860	*5860	*9350	6420	(47.7)	
6.0 m	kg									*5190	*5190	*4250	3640	*4230	2490	15.20	
(20 ft)	lb									*11440	*11440	*9370	8020	*9330	5490	(49.9)	
4.5 m	kg							*6800	*6800	*5710	4950	*4990	3450	*4270	2240	15.55	
(15 ft)	lb							*14990	*14990	*12590	10910	*11000	7610	*9410	4940	(51.0)	
2.0 m	kg			*16010	16000	*10420	9730	*7780	6520	*6260	4560	*5280	3230	*4320	2110	15.61	
(5 ft)	lb			*35300	35270	*22970	21450	*17150	14370	*13800	10050	*11640	7120	*9520	4650	(51.2)	
Ground	kg			*16790	14290	*11730	8750	*8570	5940	*6720	4210	*5510	3020	*4390	2110	15.38	
line	lb			*37020	31500	*25860	19290	*18890	13100	*14820	9280	*12150	6660	*9680	4650	(50.5)	
-2.0 m	kg	*10920	*10920	*17330	13650	*12300	8170	*9000	5540	*6970	3950	*5550	2880	*4450	2250	14.87	
(-5 ft)	lb	*24070	*24070	*38210	30090	*27120	18010	*19840	12210	*15370	8710	*12240	6350	*9810	4960	(48.8)	
-4.0 m	kg	*14070	*14070	*17370	13550	*12100	7950	*8940	5340	*6850	3820	*4730	2830	*4450	2560	14.02	
(-15 ft)	lb	*31020	*31020	*38290	29870	*26680	17530	*19710	11770	*15100	8420	*10430	6240	*9810	5640	(46.0)	
-6.0 m	kg	*17730	*17730	*15490	13780	*11110	7980	*8260	5340	*6160	3850			*4320	3160	12.76	
(-20 ft)	lb	*39090	*39090	*34150	30380	*24490	17590	*18210	11770	*13580	8490			*9520	6970	(41.9)	
-8.0 m	kg	*17880	*17880	*12400	*12400	*9090	8270	*6620	5560					*3820	*3820	10.94	
(-25 ft)	lb	*39420	*39420	*27340	*27340	*20040	18230	*14590	12260					*8420	*8420	(35.9)	
-10.0 m	kg					*5220	*5220										
(-35 ft)	lb					*11510	*11510										

#### 2) ROBEX 520LC-9

6.55 m (21' 6") boom, 2.40 m (7' 10") arm equipped with 2.15 m<sup>3</sup> (SAE heaped) bucket and 600 (1) mm (24") triple grouser shoe and 10200 kg (22490 lb) counterweight.

ont

• E Rating over-side or 360 degree

					Load	radius				At	max. read	h
Load po	oint	3.0 m	(10 ft)	4.5 m (15 ft)		6.0 m	(20 ft)	7.5 m	(25 ft)	Cap	acity	Reach
heigh	t	ľ		ľ								m (ft)
7.5 m	kg									*9680	9450	8.27
(25 ft)	lb									*21340	20830	(27.1)
6.0 m	kg					*12520	*12520	*10940	10930	*9510	7850	9.07
(20 ft)	lb					*27600	*27600	*24120	24100	*20970	17310	(29.8)

					Load ı	radius				At	max. read	h
Load po	oint	3.0 m	(10 ft)	4.5 m	(15 ft)	6.0 m	(20 ft)	7.5 m	(25 ft)	Cap	acity	Reach
heigh	t	ł	╔╋╋	ŀ		ŀ		ł		ŀ		m (ft)
4.5 m	kg			*18820	*18820	*14060	*14060	*11610	10610	*9480	7010	9.53
(15 ft)	lb			*41490	*41490	*31000	*31000	*25600	23390	*20900	15450	(31.3)
3.0 m	kg					*15650	14400	*12390	10200	*9510	6620	9.71
(10 ft)	lb					*34500	31830	*27320	22490	*20970	14590	(31.9)
1.5 m	kg					*16660	13790	*12920	9840	*9540	6600	9.62
(5 ft)	lb					*36730	30400	*28480	21690	*21030	14550	(31.6)
Ground	kg			*22490	21060	*16730	13430	*12920	9610	*9500	6960	9.26
line	lb			*49580	46430	*36880	29610	*28480	21190	*20940	15340	(30.4)
-1.5 m	kg	*25000	*25000	*20550	*20550	*15740	13350	*12050	9550	*9220	7870	8.59
(-5 ft)	lb	*55120	*55120	*45300	*45300	*34700	29430	*26570	21050	*20330	17350	(28.2)
-3.0 m	kg	*20980	*20980	*17260	*17260	*13380	*13380			*8260	*8260	7.49
(-10 ft)	lb	*46250	*46250	*38050	*38050	*29500	*29500			*18210	*18210	(24.6)
-4.5 m	kg			*11720	*11720							
(-15 ft)	lb			*25840	*25840							

#### Note

- 1. Lifting capacities are based on SAE J1097 and ISO 10567.
- 2. Lifting capacity of the ROBEX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.
- 3. The load point is a hook located on the back of the bucket.
- 4. \* indicates load limited by hydraulic capacity.
- (2) 7.06 m (23' 2") boom, 3.38 m (11' 1") arm equipped with 2.15 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 10200 kg (22490 lb) counterweight.

				_		Load	radius	_		_		At	max. rea	ich
Load po	int	3.0 m	(10 ft)	4.5 m	(15 ft)	6.0 m	(20 ft)	7.5 m	(25 ft)	9.0 m	(30 ft)	Сар	acity	Reach
height	l	ľ		ŀ		ľ		ľ			⋳⋕⋬	ľ		m (ft)
7.5 m	kg											*7510	6700	10.00
(25 ft)	lb											*16560	14770	(32.8)
6.0 m	kg							*9190	*9190	*8380	7980	*7470	5810	10.66
(20 ft)	lb							*20260	*20260	*18470	17590	*16470	12810	(35.0)
4.5 m	kg			*16290	*16290	*12260	*12260	*10120	*10120	*8830	7750	*7510	5290	11.05
(15 ft)	lb			*35910	*35910	*27030	*27030	*22310	*22310	*19470	17090	*16560	11660	(36.3)
3.0 m	kg			*20110	*20110	*14150	*14150	*11160	10110	*9380	7470	*7590	5040	11.20
(10 ft)	lb			*44330	*44330	*31200	*31200	*24600	22290	*20680	16470	*16730	11110	(36.7)
1.5 m	kg			*22300	21040	*15600	13560	*12020	9640	*9840	7200	*7680	5000	11.13
(5 ft)	lb			*49160	46390	*34390	29890	*26500	21250	*21690	15870	*16930	11020	(36.5)
Ground	kg			*22570	20490	*16260	13060	*12490	9310	*10050	7000	*7750	5190	10.82
line	lb			*49760	45170	*35850	28790	*27540	20530	*22160	15430	*17090	11440	(35.5)
-1.5 m	kg	*19050	*19050	*21590	20400	*16040	12850	*12390	9130	*9790	6900	*7740	5670	10.26
(-5 ft)	lb	*42000	*42000	*47600	44970	*35360	28330	*27320	20130	*21580	15210	*17060	12500	(33.7)
-3.0 m	kg	*25420	*25420	*19580	*19580	*14900	12870	*11510	9130			*7520	6620	9.40
(-10 ft)	lb	*56040	*56040	*43170	*43170	*32850	28370	*25380	20130			*16580	14590	(30.8)
-4.5 m	kg	*21120	*21120	*16290	*16290	*12560	*12560	*9330	*9330			*6750	*6750	8.11
(-15 ft)	lb	*46560	*46560	*35910	*35910	*27690	*27690	*20570	*20570			*14880	*14880	(26.6)
-6.0 m	kg			*10870	*10870									
(-20 ft)	lb			*23960	*23960									

							Load	radius						A	t max. read	h
Load point l	hoight	3.0 m	(10 ft)	5.0 m	(15 ft)	7.0 m	(25 ft)	9.0 m	(30 ft)	11.0 m	n (35 ft)	13.0 m	(45 ft)	Cap	acity	Reach
Load point	leight			Ð		ľ	⋳	Ð	⋳	ľ				F		m (ft)
10.0 m	kg													*4210	3970	13.66
(35 ft)	lb													*9280	8750	(44.8)
8.0 m	kg									*4750	*4750	*2800	*2800	*4140	3270	14.63
(25 ft)	lb									*10470	*10470	*6170	*6170	*9130	7210	(48.0)
6.0 m	kg									*5130	*5130	*4310	4110	*4130	2840	15.25
(20 ft)	lb									*11310	*11310	*9500	9060	*9110	6260	(50.0)
4.0 m	kg					*8700	*8700	*6790	*6790	*5650	5520	*4910	3900	*4170	2580	15.57
(15 ft)	lb					*19180	*19180	*14970	*14970	*12460	12170	*10820	8600	*9190	5690	(51.1)
2.0 m	kg			*16120	*16120	*10440	*10440	*7740	7260	*6190	5110	*5190	3670	*4230	2470	15.60
(5 ft)	lb			*35540	*35540	*23020	*23020	*17060	16010	*13650	11270	*11440	8090	*9330	5450	(51.2)
Ground	kg			*16710	16170	*11660	9800	*8490	6670	*6630	4760	*5400	3460	*4290	2490	15.35
line	lb			*36840	35650	*25710	21610	*18720	14700	*14620	10490	*11900	7630	*9460	5490	(50.4)
-2.0 m	kg	*11290	*11290	*17600	15570	*12130	9250	*8870	6270	*6840	4500	*5410	3320	*4340	2660	14.80
(-5 ft)	lb	*24890	*24890	*38800	34330	*26740	20390	*19550	13820	*15080	9920	*11930	7320	*9570	5860	(48.6)
-4.0 m	kg	*14480	*14480	*16990	15500	*11860	9040	*8750	6090	*6680	4380	*4170	3290	*4330	3030	13.91
(-15 ft)	lb	*31920	*31920	*37460	34170	*26150	19930	*19290	13430	*14730	9660	*9190	7250	*9550	6680	(45.6)
-6.0 m	kg	*18200	*18200	*15010	*15010	*10780	9100	*8000	6110	*5900	4430			*4180	3740	12.60
(-20 ft)	lb	*40120	*40120	*33090	*33090	*23770	20060	*17640	13470	*13010	9770			*9220	8250	(41.3)
-8.0 m	kg	*16860	*16860	*11770	*11770	*8630	*8630	*6210	*6210					*3610	*3610	10.71
(-25 ft)	lb	*37170	*37170	*25950	*25950	*19030	*19030	*13690	*13690					*7960	*7960	(35.1)

(3) 9.0 m (29' 6") boom, 5.85 m (19' 2") arm equipped with 1.38 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 10700 kg (23590 lb) counterweight.

# 10.0 m (32' 10") boom, 6.85 m (22' 6") arm equipped with 1.38 m<sup>3</sup> (SAE heaped) bucket and 600 mm (24") triple grouser shoe and 11700 kg (25790 lb) counterweight.

								Load	radius							At	max. rea	ch
Load po	int	3.0 m	(10 ft)	5.0 m	(15 ft)	7.0 m	(25 ft)	9.0 m	(30 ft)	11.0 m	n (35 ft)	13.0 m	ı (45 ft)	15.0 m	(50 ft)	Cap	acity	Reach
height	t	Ð		ľ	⊫	ľ	⋐₽₽	U		ľ		U		ľ	⋐⋣₽	ľ	⋐⋣₽	m (ft)
10.0 m (35 ft)	kg Ib											*3340	*3340			*3040	2900	15.81
8.0 m	kg											*3490	*3490	*2300	*2300	*3000	2420	16.65
(25 π)	lb											*7690	*7690	*5070	*5070	*6610	5340	(54.6)
6.0 m	kg											*3740	*3740	*3300	3040	*2990	2100	17.19
(20 ft)	lb											*8250	*8250	*7280	6700	*6590	4630	(56.4)
4.0 m	kg							*5930	*5930	*4810	*4810	*4060	*4060	*3540	2870	*3020	1900	17.47
(15 ft)	lb							*13070	*13070	*10600	*10600	*8950	*8950	*7800	6330	*6660	4190	(57.3)
2.0 m	kg			*14880	*14880	*9450	*9450	*6850	*6850	*5360	5230	*4400	3750	*3720	2680	*3060	1810	17.49
(5 ft)	lb			*32800	*32800	*20830	*20830	*15100	*15100	*11820	11530	*9700	8270	*8200	5910	*6750	3990	(57.4)
Ground	kg			*12470	*12470	*10620	9810	*7600	6700	*5830	4780	*4680	3460	*3860	2510	*3110	1800	17.27
line	lb			*27490	*27490	*23410	21630	*16760	14770	*12850	10540	*10320	7630	*8510	5530	*6860	3970	(56.7)
-2.0 m	kg	*8960	*8960	*13180	*13180	*11160	9140	*8040	6210	*6120	4440	*4840	3240	*3880	2380	*3160	1900	16.79
(-5 ft)	lb	*19750	*19750	*29060	*29060	*24600	20150	*17730	13690	*13490	9790	*10670	7140	*8550	5250	*6970	4190	(55.1)
-4.0 m	kg	*11310	*11310	*15270	15220	*11080	8850	*8090	5940	*6160	4240	*4800	3120	*3630	2340	*3180	2130	16.02
(-15 ft)	lb	*24930	*24930	*33660	33550	*24430	19510	*17840	13100	*13580	9350	*10580	6880	*8000	5160	*7010	4700	(52.6)
-6.0 m	kg	*13970	*13970	*14710	*14710	*10410	8830	*7710	5870	*5850	4180	*4430	3100			*3140	2540	14.92
(-20 ft)	lb	*30800	*30800	*32430	*32430	*22950	19470	*17000	12940	*12900	9220	*9770	6830			*6920	5600	(49.0)
-8.0 m	kg	*17110	*17110	*12500	*12500	*9080	9040	*6780	5990	*5030	4290					*2940	*2940	13.40
(-25 ft)	lb	*37720	*37720	*27560	*27560	*20020	19930	*14950	13210	*11090	9460					*6480	*6480	(44.0)
-10.0 m	kg			*9190	*9190	*6830	*6830	*4970	*4970							*2340	*2340	11.26
(-35 ft)	lb			*20260	*20260	*15060	*15060	*10960	*10960							*5160	*5160	(36.9)

#### 3) R520LC-9 DM

This machine is designed for a maximum top weight attachment (including quick coupler weight) of 2.8 metric ton.



## 6. BUCKET SELECTION GUIDE

#### 1) ROBEX 480LC-9

#### (1) GENERAL BUCKET



							Recomm	nendation		
Сар	acity	Wi	dth	Weight		7.06 m (23	8' 2") boom		6.55 m (21' 5") boom	9.0 m (29' 6") boom
SAE hea- ped	CECE heaped	Without side cutter	With side cutter		2.4 m (7' 10") arm	2.9 m (9' 6") arm	3.38 m (11' 1") arm	4.0 m (13' 1") arm	2.4 m (7' 10") arm	5.85 m (19' 2") arm
1.00 m <sup>3</sup>	0.90 m <sup>3</sup>	915 mm	1065 mm	1210 kg						
(1.30 yd <sup>3</sup> )	(1.18 yd <sup>3</sup> )	(36.0")	(41.9")	(2700 lb)						
1.38 m <sup>3</sup>	1.20 m <sup>3</sup>	1100 mm	1250 mm	1360 kg						
(1.80 yd <sup>3</sup> )	(1.57 yd <sup>3</sup> )	(43.3")	(49.2")	(3000 lb)						
1.84 m <sup>3</sup>	1.60 m <sup>3</sup>	1420 mm	1570 mm	1590 kg						
(2.41 yd <sup>3</sup> )	(2.09 yd <sup>3</sup> )	(55.9")	(61.8")	(3510 lb)						
2.15 m <sup>3</sup>	1.85 m <sup>3</sup>	1610 mm	1760 mm	1740 kg						
(2.81 yd <sup>3</sup> )	(2.40 yd <sup>3</sup> )	(63.4")	(69.3")	(3840 lb)						
2.79 m <sup>3</sup>	2.40 m <sup>3</sup>	2020 mm	2170 mm	2100 kg						
(3.65 yd <sup>3</sup> )	(3.14 yd <sup>3</sup> )	(79.5")	(85.4")	(4630 lb)						
3.03 m <sup>3</sup>	2.60 m <sup>3</sup>	2170 mm	2320 mm	2140 kg						
(3.96 yd <sup>3</sup> )	(3.40 yd <sup>3</sup> )	(85.4")	(91.3")	(4720 lb)						



Applicable for materials with density of 2000  $kgf/m^3$  (3370  $lbf/yd^3)$  or less

Applicable for materials with density of 1600 kgf/m<sup>3</sup> (2700 lbf/yd<sup>3</sup>) or less

Applicable for materials with density of 1100 kgf/m<sup>3</sup> (1850 lbf/yd<sup>3</sup>) or less

#### (2) ROCK-HEAVY DUTY BUCKET



● 2.20 m<sup>3</sup>, ● 2.43 m<sup>3</sup> SAE heaped bucket

						R	ecommendati	on	
Сар	acity	Wi	dth	Weight		7.06 m (23	3' 2") boom		6.55 m (21' 5") boom
SAE hea- ped	CECE heaped	Without side cutter	With side cutter		2.4 m (7' 10") arm	2.9 m (9' 6") arm	3.38 m (11' 1") arm	4.0 m (13' 1") arm	2.4 m (7' 10") arm
● 2.20 m <sup>3</sup>	1.80 m <sup>3</sup>	1810 mm		2255 kg					
(2.88 yd <sup>3</sup> )	(2.35 yd <sup>3</sup> )	(71.3")	-	(4970 lb)					
● 2.43 m <sup>3</sup>	2.10 m <sup>3</sup>	1860 mm		2330 kg					
(3.18 yd <sup>3</sup> )	(2.75 yd <sup>3</sup> )	(73.2")	-	(5140 lb)					

#### Rock-heavy duty bucket



Applicable for materials with density of 2000 kgf/m<sup>3</sup> (3370 lbf/yd<sup>3</sup>) or less Applicable for materials with density of 1600 kgf/m<sup>3</sup> (2700 lbf/yd<sup>3</sup>) or less

Applicable for materials with density of 1100 kgf/m<sup>3</sup> (1850 lbf/yd<sup>3</sup>) or less

#### 2) ROBEX 520LC-9

#### (1) GENERAL BUCKET



							Recomm	endation		
Сар	acity	Wi	dth	Weight		7.06 m (23	' 2") boom		6.55 m (21' 5") boom	9.0 m (29' 6") boom
SAE hea- ped	CECE heaped	Without side cutter	With side cutter		2.4 m (7' 10") arm	2.9 m (9' 6") arm	3.38 m (11' 1") arm	4.0 m (13' 1") arm	2.4 m (7' 10") arm	5.85 m (19' 2") arm
1.38 m <sup>3</sup>	1.25 m <sup>3</sup>	995 mm	1145 mm	1420 kg						
(1.80 yd <sup>3</sup> )	(1.63 yd <sup>3</sup> )	(39.2")	(45.1")	(3130 lb)						
1.65 m <sup>3</sup>	1.48 m <sup>3</sup>	1140 mm	1290 mm	1520 kg						
(2.16 yd <sup>3</sup> )	(1.94 yd <sup>3</sup> )	(44.9")	(50.8")	(3350 lb)						
1.84 m <sup>3</sup>	1.65 m <sup>3</sup>	1245 mm	1395 mm	1630 kg						
(2.41 yd <sup>3</sup> )	(2.16 yd <sup>3</sup> )	(49.0")	(54.9")	(3590 lb)						
2.15 m <sup>3</sup>	1.92 m <sup>3</sup>	1415 mm	1565 mm	1740 kg						
(2.81 yd <sup>3</sup> )	(2.51 yd <sup>3</sup> )	(55.7")	(61.6")	(3840 lb)						
2.79 m <sup>3</sup>	2.47 m <sup>3</sup>	1760 mm	1910 mm	1960 kg						
(3.65 yd <sup>3</sup> )	(3.23 yd <sup>3</sup> )	(69.3")	(75.2")	(4320 lb)						
3.03 m <sup>3</sup>	2.67 m <sup>3</sup>	1890 mm	2040 mm	2090 kg						
(3.96 yd <sup>3</sup> )	(3.49 yd <sup>3</sup> )	(74.4")	(80.3")	(4610 lb)						
3.20 m <sup>3</sup>	2.82 m <sup>3</sup>	1980 mm	2130 mm	2205 kg						
(4.19 yd <sup>3</sup> )	(3.69 yd <sup>3</sup> )	(78.0")	(83.9")	(4860 lb)						
★ 1.00 m <sup>3</sup>	0.90 m <sup>3</sup>	915 mm	1065 mm	1210 kg						
(1.30 yd <sup>3</sup> )	(1.18 yd <sup>3</sup> )	(36.0")	(41.9")	(2700 lb)						

							Recomm	endation		
Сар	acity	Wi	dth	Weight		7.06 m (23	8' 2") boom		6.55 m (21' 5") boom	9.0 m (29' 6") boom
SAE hea- ped	CECE heaped	Without side cutter	With side cutter	-	2.4 m (7' 10") arm	2.9 m (9' 6") arm	3.38 m (11' 1") arm	4.0 m (13' 1") arm	2.4 m (7' 10") arm	5.85 m (19' 2") arm
★ 1.38 m <sup>3</sup>	1.20 m <sup>3</sup>	1100 mm	1250 mm	1360 kg						
(1.80 yd <sup>3</sup> )	(1.57 yd <sup>3</sup> )	(43.3")	(49.2")	(3000 lb)						

#### $\bigstar$ 5.85 m and 6.85 m arm only

(2)

Oup	uony			Weight		7.06 m (23	' 2") boom		(21' 5") boom	(29' 6") boom
SAE hea- ped	CECE heaped	Without side cutter	With side cutter		2.4 m (7' 10") arm	2.9 m (9' 6") arm	3.38 m (11' 1") arm	4.0 m (13' 1") arm	2.4 m (7' 10") arm	5.85 m (19' 2") arm
★ 1.38 m <sup>3</sup>	1.20 m <sup>3</sup>	1100 mm	1250 mm	1360 kg						
(1.80 yd <sup>3</sup> )	(1.57 yd <sup>3</sup> )	(43.3")	(49.2")	(3000 lb)						

Applicable for materials with density of 2000 kgf/m<sup>3</sup> (3370 lbf/yd<sup>3</sup>) or less Applicable for materials with density of 1600 kgf/m<sup>3</sup> (2700 lbf/yd<sup>3</sup>) or less Applicable for materials with density of 1100 kgf/m<sup>3</sup> (1850 lbf/yd<sup>3</sup>) or less

HEAVY DUTY AND ROCK-HEAVY DUTY BUCKET

3.20 m <sup>3</sup> SAE heaped bucket

A A A A	AC BAR	ABB AND -
♦ 2.20 m <sup>3</sup> SAE heaped bucket	I.80 m <sup>3</sup> SAE heaped bucket	③ 3.20 m <sup>3</sup> SAE heaped buck

					Recommendation				
Capacity		Width		Weight	7.06 m (23' 2") boom				6.55 m (21' 5") boom
SAE hea- ped	CECE heaped	Without side cutter	With side cutter		2.4 m (7' 10") arm	2.9 m (9' 6") arm	3.38 m (11' 1") arm	4.0 m (13' 1") arm	2.4 m (7' 10") arm
♦ 2.20 m <sup>3</sup>	1.80 m <sup>3</sup>	1840 mm		2170 kg					
(2.88 yd <sup>3</sup> )	(2.35 yd <sup>3</sup> )	(72.4")	-	(4780 lb)					
● 1.80 m <sup>3</sup>	1.50 m <sup>3</sup>	1560 mm		2090 kg					
(2.35 yd <sup>3</sup> )	(1.96 yd <sup>3</sup> )	(61.4")	-	(4610 lb)					
● 3.20 m <sup>3</sup>	2.80 m <sup>3</sup>	2095 mm		2900 kg					
(4.19 yd <sup>3</sup> )	(3.66 yd <sup>3</sup> )	(82.5")	-	(6390 lb)					

Heavy duty bucket

Rock-heavy duty bucket



Applicable for materials with density of 2000 kgf/m<sup>3</sup> (3370 lbf/yd<sup>3</sup>) or less



### 7. UNDERCARRIAGE

#### 1) ROBEX 480LC-9

#### (1) TRACKS

X-leg type center frame is integrally welded with reinforced box-section track frames. The design includes dry tracks, lubricated rollers, idlers, sprockets, hydraulic track adjusters with shock absorbing springs and assembled track-type tractor shoes with triple grousers.

#### (2) **TYPES OF SHOES**

	Shapes		Triple grouser					
Model								
	Shoe width	mm (in)	600 (24)	700 (28)	750 (30)	800 (32)	900 (36)	
R480-9	Operating weight	kg (lb)	46900 (103400)	47440 (104590)	47710 (105180)	47980 (105780)	48520 (106970)	
	Ground pres- sure	kgf/cm <sup>2</sup> (psi)	0.89 (12.66)	0.77 (10.95)	0.73 (10.38)	0.68 (9.67)	0.61 (8.67)	
	Overall width	mm (ft-in)	3340 (10' 11")	3440 (11' 3")	3490 (11' 5")	3540 (11' 7")	3640 (11' 11")	
	Shoe width	mm (in)	600 (24)	700 (28)	750 (30)	800 (32)	900 (36)	
R480LC-9	Operating weight	kg (lb)	48100 (106040)	48640 (107230)	48910 (107830)	49180 (108420)	49720 (109610)	
	Ground pres- sure	kgf/cm <sup>2</sup> (psi)	0.83 (11.80)	0.72 (10.24)	0.68 (9.67)	0.64 (9.10)	0.57 (8.11)	
	Overall width	mm (ft-in)	3340 (10' 11")	3440 (11' 3")	3490 (11' 5")	3540 (11' 7")	3640 (11' 11")	

#### (3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

ltem	Quantity
Carrier rollers	2EA
Track rollers	9EA
Track shoes	53EA

#### (4) 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	А
700 mm triple grouser	Option	В
750 mm triple grouser	Option	В
800 mm triple grouser	Option	С

Track shoe	Specification	Category
900 mm triple grouser	Option	С

*	Та	bl	e	2
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Category	Applications	Precautions
А	Rocky ground, river beds, nor- mal soil	<ul> <li>Travel at low speed on rough ground with large obstacles such as boulders or fallen trees</li> </ul>
		<ul> <li>These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees</li> </ul>
B	Normal soil, soft ground	<ul> <li>Travel at high speed only on flat ground</li> </ul>
		Travel slowly at low speed if it is impossible to avoid going over obstacles
С		<ul> <li>Use the shoes only in the conditions that the machine sinks and it is impossible to use the shoes of category A or B</li> </ul>
	Extremely soft ground (Swampy ground)	<ul> <li>These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees</li> </ul>
		<ul> <li>Travel at high speed only on flat ground</li> </ul>
		Travel slowly at low speed if it is impossible to avoid going over obstacles

#### 2) ROBEX 520LC-9

#### (1) TRACKS

X-leg type center frame is integrally welded with reinforced box-section track frames. The design includes dry tracks, lubricated rollers, idlers, sprockets, hydraulic track adjusters with shock absorbing springs and assembled track-type tractor shoes with triple grousers.

#### (2) **TYPES OF SHOES**

		Triple grouser				Double grouser		
Model	Shapes							
R520LC-9	Shoe width	mm (in)	600 (24)	700 (28)	750 (30)	800 (32)	600 (24)	700 (28)
	Operating weight	kg (lb)	51000 (112430)	51540 (113630)	51810 (114220)	52080 (114820)	51000 (112430)	51540 (113630)
	Ground pressure	kgf/cm <sup>2</sup> (psi)	0.88 (12.51)	0.76 (10.81)	0.72 (10.24)	0.67 (9.53)	0.88 (12.51)	0.76 (10.81)
	Overall width	mm (ft-in)	3540 (11' 7")	3640 (11' 11")	3690 (12' 1")	3740 (12' 3")	3540 (11' 7")	3640 (11' 11")

#### (3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

ltem	Quantity
Carrier rollers	3EA
Track rollers	9EA
Track shoes	53EA

#### (4) 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	А
600 mm double grouser	Option	А
700 mm triple grouser, double grouser	Option	В
750 mm triple grouser	Option	В
800 mm triple grouser	Option	С

#### **% Table 2**

Category	Applications	Precautions
A	Rocky ground, river beds, nor- mal soil	<ul> <li>Travel at low speed on rough ground with large obstacles such as boulders or fallen trees</li> </ul>
_		<ul> <li>These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees</li> </ul>
В	Normal soil, soft ground	<ul> <li>Travel at high speed only on flat ground</li> </ul>
		Travel slowly at low speed if it is impossible to avoid going over obstacles
С		<ul> <li>Use the shoes only in the conditions that the machine sinks and it is impossible to use the shoes of category A or B</li> </ul>
	Extremely soft ground (Swampy ground)	<ul> <li>These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees</li> </ul>
		<ul> <li>Travel at high speed only on flat ground</li> </ul>
		Travel slowly at low speed if it is impossible to avoid going over obstacles

## 8. SPECIFICATIONS FOR MAJOR COMPONENTS

#### 1) ENGINE

Item	Specification
Model	Cummins QSM 11
Туре	4-cycle turbocharged charger air cooled diesel engine
Cooling method	Water cooling
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	125 × 147.1 mm (4.92" × 5.79")
Piston displacement	10800 cc (659 cu in)
Compression ratio	16.3:1
Rated gross horse power (SAE J1995)	362 Hp at 1900 rpm (357 Hp / 266 kW at 1900 rpm)
Maximum torque	170.6 kgf • m (1234 lbf • ft) at 1400 rpm
Engine oil quantity	37.85 ℓ (10 U.S. gal)
Dry weight	942 kg (2077 lb)
Low idling speed	1900 ± 50 rpm
High idling speed	950 ± 100 rpm
Rated fuel consumption	161.8 g/Hp • hr at 1900 rpm
Starting motor	Delco Remy 42MT (24 V-7.2 kW)
Alternator	Delco Remy (24 V-50 A)
Battery	2 × 12 V × 200 Ah

#### 2) MAIN PUMP

ltem	Specification		
Туре	Variable displacement tandem axis piston pumps		
Capacity	2 × 200 cc/rev		
Maximum pressure	330 kgf/cm <sup>2</sup> (4690 psi) [360 kgf/cm <sup>2</sup> (5120 psi)]		
Rated oil flow	2 × 360 ℓ /min (95.1 U.S. gpm/79.2 U.K. gpm)		
Rated speed	1800 rpm		

[]: Power boost

#### 3) GEAR PUMP

ltem	Specification		
ype Fixed displacement gear pump single stage			
Capacity	15 cc/rev		
Maximum pressure	40 kgf/cm <sup>2</sup> (570 psi)		
Rated oil flow	27 ℓ /min (7.1 U.S. gpm/5.9 U.K. gpm)		

#### 4) MAIN CONTROL VALVE

ltem	Specification		
Туре	9 spools		
Operating method	Hydraulic pilot system		
Main relief valve pressure	330 kgf/cm <sup>2</sup> (4690 psi) [360 kgf/cm <sup>2</sup> (5120 psi)]		
Overload relief valve pressure	380 kgf/cm <sup>2</sup> (5400 psi)		

#### 5) SWING MOTOR

ltem	Specification	
Туре	Fixed displacement axial piston motor	
Capacity	151 cc/rev	
Relief pressure	285 kgf/cm <sup>2</sup> (4050 psi)	
Braking system	Automatic, spring applied hydraulic released	
Braking torque	59 kgf • m (427 lbf • ft)	
Brake release pressure	33-50 kgf/cm <sup>2</sup> (470-711 psi)	
Reduction gear type	2-stage planetary	

#### 6) TRAVEL MOTOR

ltem	Specification		
Туре	Variable displacement axial piston motor		
Relief pressure	345 kgf/cm <sup>2</sup> (4910 psi)		
Capacity (max / min)	160/100 cc/rev		
Reduction gear type	3-stage planetary		
Braking system Automatic, spring applied hydraulic released			
Brake release pressure 17-50 kgf/cm <sup>2</sup> (242-711 psi)			
Braking torque	103 kgf • m (745 lbf • ft)		

#### 7) CYLINDER

Item		Specification	
Boom cylinder	Bore dia × Rod dia × Stroke	ø 170 × ø 115 × 1570 mm	
	Cushion	Extend only	
Arm cylinder	Bore dia × Rod dia × Stroke	ø 190 × ø 130 × 1820 mm	
	Cushion	Extend and retract	
Bucket cylinder	Bore dia × Rod dia × Stroke	ø 160 × ø 110 × 1370 mm (R480LC-9)	
		ø 160 × ø 115 × 1370 mm (R520LC-9)	
	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.

#### 8) SHOE

	ltem	Width	Ground pressure	Link quan- tity	Overall width
R480-9	Standard	600 mm (24")	0.89 kgf/cm <sup>2</sup> (12.66 psi)	48	3340 mm (10' 11")
	Option	700 mm (28")	0.77 kgf/cm <sup>2</sup> (10.95 psi)	48	3440 mm (11' 3")
		750 mm (30")	0.73 kgf/cm <sup>2</sup> (10.38 psi)	48	3490 mm (11' 5")
		800 mm (32")	0.68 kgf/cm <sup>2</sup> (9.67 psi)	48	3540 mm (11' 7")
		900 mm (36")	0.61 kgf/cm <sup>2</sup> (8.67 psi)	48	3640 mm (11' 11")
R480LC-9	Standard	600 mm (24")	0.83 kgf/cm <sup>2</sup> (11.80 psi)	53	3340 mm (10' 11")
	Option	700 mm (28")	0.72 kgf/cm <sup>2</sup> (10.24 psi)	53	3440 mm (11' 3")
		750 mm (30")	0.68 kgf/cm <sup>2</sup> (9.67 psi)	53	3490 mm (11' 5")
		800 mm (32")	0.64 kgf/cm <sup>2</sup> (9.10 psi)	53	3540 mm (11' 7")
		900 mm (36")	0.57 kgf/cm <sup>2</sup> (8.11 psi)	53	3640 mm (11' 11")
	Item	Width	Ground pressure	Link quan- tity	Overall width
-----------	----------	----------------	--------------------------------------	--------------------	-------------------
	Standard	★ 600 mm (24")	0.88 kgf/cm <sup>2</sup> (12.51 psi)	53	3540 mm (11' 7")
		★ 700 mm (28")	076 kgf/cm <sup>2</sup> (10.81 psi)	53	3640 mm (11' 11")
DECON O O		★ 750 mm (30")	0.72 kgf/cm <sup>2</sup> (10.24 psi)	53	3690 mm (12' 1")
R520LC-9	Option	★ 800 mm (32")	0.67 kgf/cm <sup>2</sup> (9.53 psi)	53	3740 mm (12' 3")
		☆ 600 mm (24")	0.88 kgf/cm <sup>2</sup> (12.51 psi)	53	3540 mm (11' 7")
		☆ 700 mm (28")	0.76 kgf/cm <sup>2</sup> (10.81 psi)	53	3640 mm (11' 11")

★ Triple grouser

 $\stackrel{\wedge}{\leadsto} \quad \text{Double grouser}$ 

# 9) BUCKET

		Capac	sity	Tooth	Wi	dth
	em	SAE heaped	CECE heaped	quantity	Without side cutter	With side cutter
	Standard	2.15 m <sup>3</sup> (2.81 yd <sup>3</sup> )	1.85 m <sup>3</sup> (2.40 yd <sup>3</sup> )	5	1610 mm (63.4")	1760 mm (69.3")
		1.00 m <sup>3</sup> (1.30 yd <sup>3</sup> )	0.90 m <sup>3</sup> (1.18 yd <sup>3</sup> )	3	915 mm (36.0")	1065 mm (47.6")
		1.38 m <sup>3</sup> (1.80 yd <sup>3</sup> )	1.20 m <sup>3</sup> (1.57 yd <sup>3</sup> )	4	1100 mm (43.3")	1250 mm (49.2")
		1.65 m <sup>3</sup> (2.16 yd <sup>3</sup> )	1.44 m <sup>3</sup> (1.88 yd <sup>3</sup> )	5	1350 mm (55.9")	1500 mm (59.1")
		• 1.80 m <sup>3</sup> (2.35 yd <sup>3</sup> )	1.50 m <sup>3</sup> (1.96 yd <sup>3</sup> )	5	1560 mm (61.4")	-
		1.84 m <sup>3</sup> (2.41 yd <sup>3</sup> )	1.60 m <sup>3</sup> (2.09 yd <sup>3</sup> )	5	1420 mm (55.9")	1570 mm (61.8")
R480LC-9	Onting		1.80 m <sup>3</sup> (2.35 yd <sup>3</sup> )	5	1810 mm (71.3")	-
	Option	• 2.20 m <sup>3</sup> (2.88 yd <sup>3</sup> )	1.80 m <sup>3</sup> (2.35 yd <sup>3</sup> )	5	1810 mm (71.3")	-
		• 2.43 m <sup>3</sup> (3.18 yd <sup>3</sup> )	2.10 m <sup>3</sup> (2.75 yd <sup>3</sup> )	5	1860 mm (73.2")	-
		2.56 m <sup>3</sup> (3.35 yd <sup>3</sup> )	2.20 m <sup>3</sup> (2.90 yd <sup>3</sup> )	6	1870 mm (73.6")	2020 mm (79.5")
		2.79 m <sup>3</sup> (3.65 yd <sup>3</sup> )	2.40 m <sup>3</sup> (3.14 yd <sup>3</sup> )	7	2020 mm (79.5")	2170 mm (85.4")
		3.03 m <sup>3</sup> (3.96 yd <sup>3</sup> )	2.60 m <sup>3</sup> (3.40 yd <sup>3</sup> )	7	2170 mm (85.4")	2320 mm (91.3")
		• 3.20 m <sup>3</sup> (4.19 yd <sup>3</sup> )	2.80 m <sup>3</sup> (3.66 yd <sup>3</sup> )	5	2080 mm (81.9")	-
	Standard	2.15 m <sup>3</sup> (2.81 yd <sup>3</sup> )	1.92 m <sup>3</sup> (2.51 yd <sup>3</sup> )	5	1415 mm (55.7")	1565 mm (61.6")
		1.38 m <sup>3</sup> (1.80 yd <sup>3</sup> )	1.25 m <sup>3</sup> (1.63 yd <sup>3</sup> )	4	995 mm (39.2")	1145 mm (45.1")
		1.65 m <sup>3</sup> (2.16 yd <sup>3</sup> )	1.48 m <sup>3</sup> (1.94 yd <sup>3</sup> )	5	1140 mm (44.9")	1290 mm (50.8")
		1.84 m <sup>3</sup> (2.41 yd <sup>3</sup> )	1.65 m <sup>3</sup> (2.16 yd <sup>3</sup> )	5	1245 mm (49.0")	1395 mm (54.9")
		2.56 m <sup>3</sup> (3.35 yd <sup>3</sup> )	2.27 m <sup>3</sup> (2.97 yd <sup>3</sup> )	5	1635 mm (64.4")	1785 mm (70.3")
		2.79 m <sup>3</sup> (3.65 yd <sup>3</sup> )	2.47 m <sup>3</sup> (3.23 yd <sup>3</sup> )	5	1760 mm (69.3")	1910 mm (75.2")
		3.03 m <sup>3</sup> (3.96 yd <sup>3</sup> )	2.67 m <sup>3</sup> (3.49 yd <sup>3</sup> )	6	1890 mm (74.4")	2040 mm (80.3")
		3.20 m <sup>3</sup> (4.19 yd <sup>3</sup> )	2.82 m <sup>3</sup> (3.69 yd <sup>3</sup> )	7	1980 mm (78.0")	2130 mm (83.9")
R520LC-9	Option	3.60 m <sup>3</sup> (4.71 yd <sup>3</sup> )	3.17 m <sup>3</sup> (4.15 yd <sup>3</sup> )	7	2200 mm (86.6")	2350 mm (92.5")
		★ 1.00 m <sup>3</sup> (1.30 yd <sup>3</sup> )	0.90 m <sup>3</sup> (1.18 yd <sup>3</sup> )	3	915 mm (36.0")	1065 mm (47.6")
		★ 1.38 m <sup>3</sup> (1.80 yd <sup>3</sup> )	1.20 m <sup>3</sup> (1.57 yd <sup>3</sup> )	5	1100 mm (43.3")	1250 mm (49.2")
			1.80 m <sup>3</sup> (2.35 yd <sup>3</sup> )	5	1840 mm (71.3")	-
		• 1.80 m <sup>3</sup> (2.35 yd <sup>3</sup> )	1.50 m <sup>3</sup> (1.96 yd <sup>3</sup> )	5	1560 mm (61.4")	-
		• 2.20 m <sup>3</sup> (2.88 yd <sup>3</sup> )	1.80 m <sup>3</sup> (2.35 yd <sup>3</sup> )	5	1835 mm (72.2")	-
		• 2.43 m <sup>3</sup> (3.18 yd <sup>3</sup> )	2.10 m <sup>3</sup> (2.75 yd <sup>3</sup> )	5	1885 mm (74.2")	-
		• 3.20 m <sup>3</sup> (4.19 yd <sup>3</sup> )	2.80 m <sup>3</sup> (3.66 yd <sup>3</sup> )	7	2095 mm (82.5")	-

★ 5.85 m, 6.85 m arm only

Heavy duty bucket

Rock - heavy duty bucket

# 9. RECOMMENDED OILS

Use only oils listed below. Do not mix different brand oil. Please use HYUNDAI genuine oil and grease.

		Capacity				Amb	ent temp	erature °	C( °F)		
Service point	Kind of fluid	ℓ (U.S. gal)	-50	-30	-2	20 -	10	0 1	10 2	20 3	0 40
			(-58)	(-22)	) (-	4) (	14) (	32) (5	50) (6	38) (86 	3) (104)
					*	SAE 5W	/-40	1			
									SA	E 30	
Engine	Engino oil	25 (0.2)				CVE	= 10\\/				
oil pan		33 (9.2)				JAL	_ 10vv		_		<u> </u>
Swing drive Gear oil							5	6AE 10W-	30		
								SAE 1	5W-40		
Swing drive		$5.0 \times 2$			*5	SAE 75V	V-90				
	Gear oil	(1.3 ~ 2 )							_		
Final drive		$5.0 \times 2$						SAE 8	30W-90	1	
		(1.3×2)									
		Tank:					/G 15				
	draulic tank Hydraulic oil (69.2) ISO VG 46	ĺ									
Hydraulic tank Hydraulic		ulic oil (69.2)						ISO VG	46		
		System:									
		(100)							SO VG 6	8	
				★A	STM D	)975 NC	).1				ĺ
Fuel tank	Diesel fuel	621 (164)						1			Ĺ
								AST	M D975	NO.2	
Fitting						★NL(	GI NO.1		1		ĺ
(grease nipple)	Grease	As required						NLG			L
									110.2		
	Mixture of										
Radiator	antifreeze	50 (13.2)			E	thylene	glycol ba	ase perma	anent typ	e (50 : 50	)
(reservoir tank)	and soft		★Ethy	lene gl	ycol base p	permanent t	ype (60 : 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
- ★ : Cold region Russia, CIS, Mongolia
- \*1 : Soft water City water or distilled water

# **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.



# 2. CLUSTER

#### 1) STRUCTURE

The cluster consists of the LCD and switches as illustrated below. The LCD warns the operator in case of abnormal machine operations or conditions for the appropriate operation and inspection. The LCD also sets and displays the modes, the monitoring and the switches utilities.

The switches 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 the daily checklist on page 6-10.
- When the cluster provides a warning immediately check the problem and perform the required action.



3 See page 3-11

See page 3-6 See page 3-9

\* The warning lamp pops up and/or blinks and the buzzer sounds when the machine has a problem.

6

The warning lamp blinks until the problem is cleared. Refer to page 3-4 for details.

# 2) GAUGES



- ① Engine coolant temperature gauge
- 2 Hydraulic oil temperature gauge
- ③ Fuel level gauge
- ④ RPM / Tripmeter display
- The operation screen type can be set by the screen type menu of the display.
   Refer to page 3-22 for details.

#### (2) Engine coolant temperature gauge

(1)



- This gauge indicates the temperature of the coolant.
  - White range : 40-105°C (104-221°F)
  - Red range : Above 105°C (221°F)
- If the indicator is in the red range or the lamp blinks in red, turn OFF the engine and check the engine cooling system.
- \* If the gauge indicates the red range or the Hamp blinks in red even though the machine is in a normal condition, check the electric device as it can be caused by a poor electricity or sensor connection.

#### (3) Hydraulic oil temperature gauge



21093CD07E

#### (4) Fuel level gauge



21093CD07F

- ① This gauge indicates the temperature of the hydraulic oil.
  - White range : 40-105°C (104-221°F)
  - Red range : Above 105°C (221°F)
- If the indicator is in the red range or the lamp blinks in red, 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 the 🖾 lamp blinks in red even though the machine is in a normal condition, check the electric device as it can be caused by a poor electricity or sensor connection.
- ① This gauge indicates the amount of fuel in the fuel tank.
- <sup>(2)</sup> Fill the fuel when the gauge is in the red range or when the lamp blinks in red.
- \* If the gauge indicates the red range or the 🕮 lamp blinks in red even though the machine is in a normal condition, check the electric device as it can be caused by a poor electricity or sensor connection.

## (5) RPM / Tripmeter display



- ① This display shows the engine speed or the tripmeter.
- \* Refer to page 3-20 for details.

## 3) WARNING LAMPS



\* Each warning lamp on the top of the LCD pops up on the center of LCD and the buzzer sounds when each warning happens. The pop-up warning lamp moves to its original position and blinks when the select switch is pushed. Then the buzzer stops sounding. Refer to page 3-10 for details on the select switch.

#### (1) Engine coolant temperature warning lamp



- The engine coolant temperature warning is indicated in two steps:
   Over 100°C : the lamp blinks and the buzzer sounds.
  - Over 105°C
    - : the  $\hat{(1)}$  lamp pops up on the center of the

LCD and the buzzer sounds.

21093CD08A

2 The A pop-up lamp moves to the original position and blinks when the select switch is pushed. Also, the buzzer stops and the all lamp keeps blinking.

③ Check the cooling system when the lamp remains ON.

# (2) Hydraulic oil temperature warning lamp



- ① The hydraulic oil temperature warning is indicated in two steps:
  - Over 100°C : the 🖾 lamp blinks and the buzzer sounds.
  - Over 105°C : the lamp pops up on the center of the LCD and the buzzer sounds.

21093CD08C

- The (1) pop-up lamp moves to the original position and blinks when the select switch is pushed. Also, the buzzer stops and the [3] lamp keeps blinking.
- ③ Check the hydraulic oil level and the hydraulic oil cooling system.

(2)

# (3) Fuel level warning lamp



- ① This warning lamp blinks and the buzzer sounds when the level of fuel is below 61 ℓ (16.1 U.S. gal).
- 2 Fill the fuel immediately when the lamp blinks.

21093CD08B

### (4) Emergency warning lamp



- This lamp pops up and the buzzer sounds when the below warnings occur.
  - engine coolant overheating (over 105°C)
  - hydraulic oil overheating (over 105°C)
  - pump EPPR circuit abnormal or open
  - attachment flow EPPR circuit abnormal or open
  - MCU input voltage abnormal
  - accel dial circuit abnormal or open
  - cluster communication data error
  - engine ECM communication data error
    - \* The pop-up warning lamp moves to the original position and blinks when the select switch is pushed. The buzzer stops sounding. This is same as following warning lamps.
- 2 When this warning lamp blinks, the machine must be checked and serviced immediately.

# (5) Engine oil pressure warning lamp



- ① This lamp blinks when the engine oil pressure is low.
- ② If the lamp blinks, shut off the engine immediately. Check the oil level.

#### (6) Check engine warning lamp



21093CD33

- This lamp blinks when the communication between the MCU and the engine ECM on the engine is abnormal, or if the cluster received any fault code from engine ECM.
- ② Check the communication line between the MCU and the engine ECM.

If the communication line is OK, then check the fault codes on the cluster.



③ This lamp blinks when "Engine check water in fuel" is displayed in the message box. Check the water separator.

# (7) Battery charging warning lamp



- ① This lamp blinks when the battery charging voltage is low.
- 2 Check the battery charging circuit when this lamp blinks.

### (8) Air cleaner warning lamp



- ① This lamp blinks when the filter of air cleaner is clogged.
- 2 Check the filter and clean or replace it.

#### (9) Overload warning lamp (Option)



- ① When the machine is overloaded, the overload warning lamp blinks when the overload switch (if equipped) is ON.
- 2 Reduce the machine load.

# 4) PILOT LAMPS



21093CD09

# (1) Pilot lamp modes

No.	Mode	Pilot lamp	Selected mode
		Ρ	Heavy duty power work mode
1	Power mode	S	Standard power mode
		Ε	Economy power mode
2	User mode	U	User preferable power mode
		B	General operation mode
3	Work mode		Breaker operation mode
			Crusher operation mode
	Travel mode		Low speed traveling
4	Travermode	<b>*</b>	High speed traveling
5	Auto idle mode	$\bigcirc$	Auto idle
6	Work tool mode		Oil flow level of breaker or crusher mode
7	Message display		"Setting is completed" display after selection

# (2) Power max pilot lamp



1 When you push the power max switch on the LH RCV lever, the lamp will light on.

Turning the start key switch to the ON position starts the preheat-

- 2 The power max function is operated maximum 8 seconds.
- **\*** Refer to page 3-30 for the power max function.

Start the engine after this lamp is OFF.

ing in cold weather.

# (3) Preheat pilot lamp



21093CD39

1

2

# (4) Warming-up pilot lamp



- 1 This lamp is turned ON 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, or when 10 minutes have passed since starting the engine.

### (5) Decel pilot lamp



\* Refer to page 3-29.

#### (6) Fuel warmer pilot lamp



21093CD43

#### (7) Maintenance pilot lamp



- ① The decel pilot lamp will light on when you push the one-touch decel switch on the RCV lever.
- ② Also, the lamp will turn on and the engine speed will be lowered automatically to save fuel consumption when all levers and pedals are at neutral position, and the auto idle function is selected.
- \* The one-touch decel function is not available when the auto idle pilot lamp is turned ON.
- This lamp is turned on when the coolant temperature is below 10°C (50°F).
- ② The automatic fuel warming is cancelled when the engine coolant temperature is above 10°C, or when 30 minutes have passed since the start switch was in the ON position.
- This lamp will turn on when the consuming parts need to be changed or replaced. This means that the change or replacement interval of the consuming parts remains below 30 hours.
- ② Check the message in the maintenance information of the main menu. Also, this lamp lights on for 3 minutes when the start switch is in the ON position.

## **5) SWITCHES**



21093CD45

 When the switches are selected, the pilot lamps are displayed on the LCD. Refer to page 3-6 for details.

#### (1) Power mode switch



(2) Work mode switch



- ① This switch selects the machine power mode. The selected power mode pilot lamp is displayed on the pilot lamp position.
  - P : heavy duty power work
  - S : standard power work
  - E : economy power work
- (2) The pilot lamp changes in this order:  $E \rightarrow S \rightarrow P \rightarrow E$
- ① This switch selects the machine work mode, which shifts from the general operation mode to the 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 page 4-8 for details.

#### (3) User mode switch



(4) Select switch

① This switch is used to memorize the current machine operating status in the MCU and activate the memorized user mode.

- Memory : push more than 2 seconds
- Action : push within 2 seconds
- Cancel : push this switch once more within 2 seconds
- 2 Refer to page 3-12 for another set of user mode.
- ① This switch selects or changes the menu and input value.
- 2 Knob push
  - Long (over 2 sec) : return to the operation screen
  - Medium (0.5~2 sec) : return to the previous screen
  - Short (below 0.5 sec) : select menu
- ③ Knob rotation

This knob changes menu and input value.

- Right turning : down direction / Increase input value
- Left turning : up direction / Decreased input value

# (5) Auto idle/Buzzer stop switch

21093CD45E

- AUTO IDLE Buzzer Stop 21093CD45F
- This switch activates or cancels the auto idle function.
- Pilot lamp ON : auto idle function is activated
- Pilot lamp OFF : auto idle function is cancelled

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

# (6) Travel speed control switch



This switch selects the travel speed alternatively.

- 👍 : high speed
- 🚗 : low speed

# (7) Escape/Camera switch



- ① This switch is used to return to the previous menu or parent menu.
- In the operation screen, pushing this switch will display the view of the camera on the machine (if equipped).
   Please refer to page 3-23 for the camera.
- ③ If the camera is not installed, only the ESC function of this switch can be used.



1

### 6) MAIN MENU



# \* Please refer to Select switch on page 3-10 for the selection and change of menu and input value.

# (1) Structure

No.	Main menu	Submenu	Description
		Work tool	Breaker, Crusher, Not installed
	R.A	U mode power	User mode only
		Boom/arm speed	Boom speed, Arm speed
I		Auto power boost	Enable, Disable
	Mode	Initial mode	Default, U mode
	21093CD64D	Cluster switch (back-up)	Switch function
		Active fault	MCU, Engine ECM
		Logged fault	MCU, Engine ECM
0	Ų	Delete logged fault	Delete all logged faults, Initialization cancelled
2		Monitoring (analog)	Machine information
	Monitoring	Monitoring (digital)	Switch status, Output status
	21093CD04E	Operating hours	Operating hours for each mode
		Maintenance information	Replacement, Change interval oils and filters
		Machine security	ESL mode setting, Password change
3		Machine information	Cluster, MCU, Engine, Machine
	Management	A/S phone number	A/S phone number, A/S phone number change
	21093CD64F	Service menu	Power shift, Hourmeter, Replacement history, Update
		Display item	Engine speed, Tripmeter A, Tripmeter B, Tripmeter C
		Clock	Clock
4		Brightness	Manual, Auto
4	Display	Unit	Temperature, Pressure, Flow, Date format
	Display	Language	Korean, English, Chinese
	21093CD64G	Screen type	A type, B type
		Tripmeter	3 kinds (A, B, C)
		DMB	DMB select, DAB select, Channel scan, Exit
5		Entertainment	Play MP4, codec.
	Utilities	Camera setting	Basic direction, Display switching, Full screen
	21093CD64H	Message box	Record for fault, attachment etc.

# (2) Mode setup

# 1 Work tool



- A : Select one installed optional attachment
- B : Max flow ("Max flow") Set the maximum flow for the attachment Flow level ("Flow level") - Reduce the operating flow from maximum flow Breaker - Max 7 steps, reduced 10 lpm each step Crusher - Max 4 steps, reduced 20 lpm each step
- \* The flow level is displayed with the work mode pilot lamp.

# ② U mode power



-Step (	Engine speed (rpm)	Idle speed (rpm)	Power shift (bar)
1	1450	700	0
2	1500	750	3
3	1550	800	6
4	1600	850	9
5	1650	900	12
6	1700	One-touch decel low idle (950)	16
7	1750	Auto decel rpm (1000)	20
8	1800	1050	26
9	1850	1100	32
10	1900	1150	38

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

# ③ Boom/arm speed



# Boom speed

- Control type

Manual ("Manual") - Boom up speed is fixed as set steps.

Auto ("Auto") - Boom up speed is automatically adjusted as working conditions by the MCU.

# • Arm speed

- Regeneration ("Regeneration") Arm regeneration function can be activated or cancelled. Enable ("Enable") - Arm in speed is up.
  - Disable ("Disable") Fine operation.

# 4 Auto power boost



- The power boost function can be activated or cancelled.
- Enable ("Enable") The digging power is automatically increased as working conditions by the MCU. It is operated for 8 seconds maximum.
- Disable ("Disable") Not operated.

# 5 Initial mode



- Default ("Default") The initial power mode is set to the E mode when the engine is started.
- U mode ("U mode") The initial power mode is set to the U mode when the engine is started.
- 6 Cluster switch (back-up)



- The cluster switch can be selected and changed in this menu when the switches on the cluster are functioning abnormally.
- In order to exit the cluster switch mode, please put the cursor on the ESC/CAM switch by turning the select switch and then push the select switch.
- In the cluster switch mode, all other switches except the select switch do not work.

# (3) Monitoring

# 1 Active fault



• The active faults of the MCU or engine ECM can be checked in this menu.

# 2 Logged fault



• The logged faults of the MCU or engine ECM can be checked in this menu.

# ③ Delete logged fault



• The logged faults of the MCU or engine ECM can be deleted in this menu.

# (4) Monitoring (analog)



• The machine status such as the engine rpm, oil temperature, voltage and pressure etc. can be checked in this menu.

# **(5)** Monitoring (digital)



- The switch status or output status can be confirmed by this menu.
- The activated switch or output pilot lamps are turned ON (+).
- 6 Operating hours

M     Active Faat       O     Logood Faat       Deteids Logood Faat     Logood Faat       M     Monetring Actived       Monetring Actived     Logood Faat       Monetring Actived     Logood Faat       C     Depreding Hours       E     Logood Faat       210930CD66Q	Operating Hours         Operating Hours           P Mode         100           S Mode         100           High speed Travel Mode         500           S Mode         100           High speed Travel Mode         520           W Thode(Braiker)         4.16           ATT Mode(Cruster)         6.20
	E 🞉 🛛 🕅 8 8 🖉 👄
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• The operating hour of each mode can be confirmed in this menu.

#### (4) Management

# Maintenance information



No.	ltem	Interval
1	Engine oil	500
2	Final gear oil	1000
3	Swing gear oil	1000
4	Hydraulic oil	5000
5	Pilot line filter	1000
6	Drain filter	1000
7	Hydraulic oil return filter	1000
8	Engine oil filter	500
9	Fuel filter	500
10	Prefilter	500
11	Hydraulic tank breather	250
12	Air cleaner (inner)	500
13	Radiator coolant	2000

No.	Item	Interval
14	Swing gear pinion grease	1000

# 2 Machine security



## ESL mode setting

- ESL: Engine Starting Limit
- The ESL mode is designed as a theft deterrent and will prevent the unauthorized operation of the machine.
- If the ESL mode is enabled ("Enable"), a password will be required when the start switch is turned on.
- Legend:
  - Disabled ("Disabled"): the ESL function is not selected.
  - Enable (always) ("Enable (always)"): the password is required whenever the operator start engine.
  - Enable (interval) ("Enable (interval)"): the password is required when the operator starts the engine first. But the operator can restart the engine within an interval time without inputting the password.



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 Image.

 Machine
 ESL. Mode Setting

 Service Main
 ESL. Mode Setting

 21093CD67U
 Enter the current password

The interval time can be set at a maximum of 4 hours.

### Password change

- The password is 5~10 digits.







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The new password is stored in the MCU.

Enter the new password again

# 3 Machine information

▲ & & = = Manage. (0 9 & 0 0)	$\triangle$	+ + + DIECK	Manag	e. 🕕	9	
M Maintenance Information Machine Information Als Phone Number Service Menu E La C C C C C C C C C C C C C C C C C C C	 E	Machine Inf Cluster Date Version S/N MCU Date Version S/N	ormation : 13 Aug 2008 : 1.3 : 08H35-001 : 30 Dec 2007 : 0.2 : 1234567891	Engine Maker Type S/N Machine Model S/N		Basic Info. Cummins-98 TSS456789A S0677389A R210LC-9 9234567891
	E 윩		M @ 00	Auto cause		a 🔶
						21093CD670

• This screen displays information on the cluster, MCU, engine and machine.



- Legend:
  - "Power shift (standard/option)": the power shift pressure can be set in the "Option" submenu.
  - "Hourmeter": the operating hours since the machine line-out can be checked in this menu.
  - "Replacement history": the replacement history of the MCU and cluster can be checked in this menu.
  - "Update": Firmware can be upgraded in this menu (the USB port is located under the cluster).

# (5) Display ① Display item



• The center display type of the LCD can be selected in this menu.

• The engine speed or each of the tripmeters (A,B,C) is displayed on the center display. ② Clock



- The first line's three spots "\*\*/\*\*/ represent Month/Day/Year.
- The second line shows the current time (0:00~23:59).

# **③ Brightness**



If "Auto" is chosen, brightness for day and night can be set up differently. Also by using the bar in lower side, users can define which time intervals belong to day and night (in bar figure, the gray area represents night time while white shows day time).

④ Unit



- Temperature ("Temperature") : °C ↔ °F
- Pressure ("Pressure"): bar  $\leftrightarrow$  MPa  $\leftrightarrow$  kgf/cm<sup>2</sup>
- Flow ("Flow") : lpm ↔ gpm
- Date format ("Date format"):  $yy/mm/dd \leftrightarrow mm/dd/yy \leftrightarrow dd-mm-yy$

# <sup>(5)</sup> Language



• The user can select the preferred language. All displays will change to the selected language. (6) Screen type



# (6) Utilities

# 1 Tripmeter



- Maximum 3 kinds of tripmeters can be used at the same time.
- Each tripmeter can be turned on by choosing "Start" while 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 DMB** 



- DMB select ("DMB select"): TV channel can be selected in this menu.
- DAB select ("DAB select"): Audio channel can be selected in this menu.
- Channel scan ("Channel scan"): This menu can be used other region for TV/Audio.
- Exit ("Exit"): Exit DMB menu

### ③ Entertainment

- Play a MP4 or codec files of external hard disk through the USB port.
- The USB port is located under the cluster.



# (4) Camera setting



- Three cameras can be installed on the machine.
- The display order can be set in this menu.



- If the camera was not equipped, this menu is not useful.
- In the operation screen, if the ESC/CAM switch is pushed, the first ordered display camera will be viewed.
- Turning the select switch in clockwise direction, the next ordered will be shown and in counter-clockwise direction, the previously ordered will be shown.
- The display screen will be enlarged when you push the select switch.
- <sup>(5)</sup> Message box

		M	Messag	e Box		
			Message	ALC: NO. 12817	Date	Time
			1.Memory	of Information for U Mode	2010.11.30	05 10
Serang			2.Deletion	of Logged Fault	2009.09.29	05: 20
ge Box			4 Change	of Machine Security Condition	2007.07.25	07:30
		1	5.Out of	Service for ATT Tool	2007.06.22	09:5
	and the second		6.Pump E	PPR Circuit is abnormal	2007.05.20	10:0
A STATE OF A	and the second se		7.ATT To	of EPPR Circuit is abnormal	2007.04.15	11; 1
210	93CD69Q	1				
210						
210	93CD69Q	*	7.411 10	of EPPPR Circuit is abnormal	2007.04.15	T

• The history of the machine operating status can be checked in this menu.

# **3. SWITCHES**





There are three positions: OFF, ON and START.

- (OFF) : none of the electrical circuits activate.
  (ON) : all systems of the machine operate.
- (START) : use when starting the engine.

Release the 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 take according to ambient temperature.
- \* The key must be in the ON position with the engine running to maintain electrical and hydraulic functions and prevent serious machine damage.

# 2) MASTER SWITCH



(2)

# 3) ACCEL DIAL SWITCH



## 4) MAIN LIGHT SWITCH



# 5) WIPER SWITCH



- (1) This switch is used to shut off the entire electrical system.
  - : the battery remains connected to the electrical system.
    - $\bigcirc$  : the battery is disconnected from the electrical system.
    - $\ast$  Never turn the master switch to  $\bigcirc$  (OFF) with the engine running. Engine and electrical system damage could result.
- (1) There are 10 dial settings.
- (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

This switch operates the headlight and work light.

- When you press the switch once, the headlight and the first pilot lamp turn on.
- When you press the switch once more, the work light and the second pilot lamp turn on.
- Press the switch again to return to a first step position.
- Press the switch more than one second to turn off the lights.

This switch operates the wiper.

- When you press the switch once, the wiper operates intermittently and the 1st pilot lamp lights ON.
- When you press the switch once more, the wiper operates low speed and the 2nd pilot lamp lights ON.
- Press the switch again to return to a first step position.
- Press the switch more than one second to turn off the wiper.

# 6) WASHER SWITCH



- (1) The washer liquid is sprayed and the wiper is operated only while pressing this switch.
- (2) The pilot lamp is turned ON when operating this switch.

# 7) TRAVEL ALARM SWITCH



- (1) This switch activates the travel alarm function, which sounds when the machine travels forward or backwards.
- (2) When this switch is pressed, the alarm operates only when the machine is traveling.

# 8) CAB LIGHT SWITCH (Option)



(1) This switch turns ON the cab light.

# 9) OVERLOAD SWITCH (Option)



- (1) When this switch turned ON, the buzzer sounds and the overload warning lamp lights ON in case that the machine is overloaded.
- (2) When the overload switch is turned OFF, the buzzer stops and the warning lamp goes out.

# 10) QUICK COUPLER SWITCH (Option)



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

\* See page 8-6 for details.

# (2) For R520LC-9 DM only:

This switch is replaced by a normal toggle switch which activates the boom tilting angle warning system.

# 11) BEACON SWITCH (Option)



- (1) This switch turns on the rotary light on the cab.
- (2) The indication lamp is turned on when operating this switch.

# 12) BOOM TILTING ANGLE WARNING SWITCH (R520LC-9 DM only)



- (1) This switch activates the boom tilting angle warning system.
- (2) The safe tilting zone is 20° down measured from a 90° boom vertical position.
  - A WARNING: Working beyond this range is prohibited and indicated by an acoustic and visual alarm in the cabin.

# 13) HEATED SEAT SWITCH (Option)



- (1) This switch is used to heat the seat.
- $(2) \qquad \text{When the switch is pressed, the below indicator lamp is turned ON.}$ 
  - Heater ON: 10 ± 3.5°C
  - Heater OFF: 20 ± 3°C

# 14) HORN SWITCH



(1) This switch is located at the top of the right-hand side control lever. The horn sounds when the switch is pressed.

# 15) CRUSHER OPENING/CLOSING SWITCH (R520LC-9 DM only)



- (1) This switch activates the opening and closing of the crusher jaws.
  - R : crusher is open
  - L : crusher is closed

# **16) BREAKER OPERATION SWITCH**



(1) When this switch is pushed, the breaker operates only when the breaker operation mode is selected.

# **17) ONE-TOUCH DECEL SWITCH**



- (1) This switch is used to actuate the deceleration function quickly.
- (2) The engine speed is increased to the previous setting value when the switch is pressed again.
- (3) The one-touch decel function is only available when the auto idle pilot lamp is turned off.

## **18) POWER MAX SWITCH**



- This switch activates the power max function. When this switch is kept pressed, hydraulic power of the work equipment will be increased to approximately 110% during 8 seconds.
- (2) After 8 seconds, the function is cancelled automatically even if the switch is still pressed.
- **A** Do not use the power max switch for craning purposes!

## 19) CRUSHER ROTATION SWITCH (R520LC-9 DM only)



- (1) This switch activates the rotation of the crusher:
  - R : rotates the crusher counterclockwise
  - L : rotates the crusher clockwise
  - A Check with decal 97QB-37200.

# 4. LEVERS AND PEDALS



52093CD03

# 1) LH CONTROL LEVER



- (1) This joystick is used to control the swing and the arm.
- (2) Refer to page 4-13 for details.

# 2) RH CONTROL LEVER



- (1) This joystick is used to control the boom and the bucket.
- (2) For R520LC-9 DM only: This joystick is used to control the boom and the crusher.
- (3) Refer to page 4-13 for details.

# **3) SAFETY LEVER**



# 4) TRAVEL LEVER

- (1) All control levers and pedals are disabled from operation by locating the lever to lock position as shown.
  - \* Be sure to lower the lever to LOCK position when leaving from operator's seat.
- By pulling the lever to UNLOCK position, the machine is operational.
   \* Do not use the safety lever as handle when getting on or off the machine.
- (1) This lever is mounted on the travel pedal and used for traveling by hand. The operation principle is same as the travel pedal.
- (2) Refer to page 4-14 for details.
- 5) TRAVEL PEDAL



21093CD48D

- (1) This pedal is used to move the machine forward or backwards.
- (2) If the left side pedal is pressed, the left track will move. If the right side pedal is pressed, the right track will move.
- (3) Refer to page 4-14 for more details.

# 6) PEDAL RIGHT (R)



- (1) This pedal is used to tilt the cabin backwards (max 30° tilt).
  - 1 Pushing the pedal backwards tilts the cabin backwards.
  - 2 Pushing the pedal forward tilts the cabin forward.





- (1) This pedal is used to move the middle arm in or out.
  - ① Pushing the pedal backwards moves the middle arm in
  - 0 Pushing the pedal forward moves the middle arm out
    - \* Only move the middle arm out when the base/extension boom are in the safety working range of the machine (max 25° downwards angle from perpendicular position to the ground).

# 8) SEAT AND CONSOLE BOX ADJUST LEVER



- This lever is used to move the seat and console box to fit the contours of the operator's body.
- (2) Pull the lever to adjust forward or backward over 170 mm (6.7").

# 9) ADJUSTING LEVER



- (1) This lever is used to move the LH and RH control lever to fit the contours of the operator's body.
- (2) The control lever can be moved upward and downward over 30 mm (1.2").

# 5. FULL AUTO AIR CONDITIONER AND HEATER (Standard)

The 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.

- $\, \ast \,$  Refer to page 3-38 for the semi auto air conditioner and heater.
- Location of air flow ducts


# 1) POWER OFF SWITCH



# 2) AUTO SWITCH



 This switch turns off the system and the LED. Just before the power switches OFF, the 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

- (1) Turn the starting switch to the ON position. The LCD lights on. The automatic air conditioner and heater system automatically keeps the optimal condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.
- (2) This switch can restart the system after the system was turned off.

# 3) AIR CONDITIONER SWITCH (Compressor switch)



# 4) FAN SPEED SWITCH



- (1) This switch turns on the compressor and the LCD.
- (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.
- (1) Fan speed is controlled automatically by set temperature.
- (2) This switch controls fan speed manually.
  - There are 8 up/down steps to control fan speed.
  - The maximum step or the minimum step beeps 5 times.
- (3) This switch turns the system on.

# 5) TEMPERATURE CONTROL SWITCH



- (1) Setting temperature indication (17–32°C, Scale: 1°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	Max (Hi)	Fresh	Foot

- (4) Temperature unit can be changed between celsius (°C) and Fahrenheit (°F).
  - ① Default status (°C).
  - ② Push the up/down temperature control switch simultaneously more than 5 seconds to change the displayed temperature unit (°C→°F).

#### 6) MODE SWITCH



(1) Operating this switch, it beeps and displays symbol of each mode in order. (Vent  $\rightarrow$  Vent/Foot $\rightarrow$  Foot $\rightarrow$  Foot/Def  $\rightarrow$  Vent)

		Vent	Vent/Foot	Foot	Foot/Def
Mode switch		<b>j</b> -	<b>,</b>	<b>/</b> .	<b>#j</b> _
	А	•	•		
Outlet	В		•	•	•
	С				•

(2) When defroster switch operating, FRESH AIR/AIR RECIRCULATION switch turns to FRESH AIR mode and air conditioner switch turns on.

#### 7) FRESH AIR/AIR RECIRCULATION SWITCH



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

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 time.
- \* Check out the recirculation filter periodically to keep a good efficiency.

#### 8) SELF-DIAGNOSIS FUNCTION

#### (1) Procedure



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#### (2) Error check

- The corresponding error code blinks on the setup temperature display panel, the other symbol will turn off.
- The error code blinks every 0.5 seconds.
- If there are more than two error codes, each code blinks 2 times in sequence.
- Error codes

Error code	Description	Error code	Description
11	Ambient sensor	16	Mode actuator 1
12	Cabin inside sensor	17	Mode actuator 2
14	Duct (evaporator) sensor	18	Intake actuator
15	Temp actuator		

#### (3) Fail safe function

Error description	Fail safe function
Cabin inside sensor (11)	25°C alternate value control
Ambient sensor (12)	20°C alternate value control
Duct (evaporator) sensor (14)	1°C alternate value control
Tomp actuator (15)	If opening amount is 0%, the alternate value is 0%
	If not, the alternate value is 100%
Mode actuator 1, 2 (16, 17)	The alternate value is Vent

# 6. SEMI AUTO AIR CONDITIONER AND HEATER (Option)

Semi auto air conditioner and heater is equipped for pleasant operation against outside temperature and defrost on window glass.

- Refer to page 3-34 for auto air conditioner and heater.
- Location of air flow ducts



21093CD53

# 1) POWER SWITCH



(1) This switch turns the system and the LED simultaneously on or off.

#### (2) Default setting values

Function	Air condition- er	Fan speed	Temperature	Outlet	Inlet
Value	OFF	1	Max cool	Face	Recirculation

# 2) AIR CONDITIONER SWITCH (Compressor switch)



- (1) Operating this switch turns the compressor and the LED simultaneously ON or OFF.
- (2) In accordance with the evaporator temperature, compressor turns on or off automatically without changing LED state.
- \* Air conditioner operates to remove vapor and drains water through a drain hose. Water can be sprayed into the cab in case that the vacuum valve of drain hose has a problem. In this case, exchange the vacuum valve.

# 3) FAN SPEED SWITCH



- (1) It is possible to control the fan to four steps.
- (2) The first step or the fourth step gives 5 times beeps.

# 4) TEMPERATURE CONTROL SWITCH



- (1) There are 9 steps to control temperature from max cool to max warm controlled up and down by 1 step.
- (2) Max cool and max warm arouse 5 times beeps.
- (3) For the max warm or the max cool it's better to be configured as following table.

Temperature	Air conditioner	Fan speed	Outlet	Inlet
Max cool	ON	4	Face	Recirculation
Max warm	OFF	3	Foot	Fresh

# 5) OUTLET CHANGE OVER SWITCH



(1) There are four steps of air flow.

Switch position		Mode			
		X	*	た	
	А			•	
Outlet	В	٠		•	•
	С				•

- (2) When defroster switch operating, INLET switch turns to FRESH mode and air conditioner switch turns ON.
- (3) In case of heating range (5~Max warm), air conditioner won't turns ON.

# 6) INLET CHANGE OVER SWITCH

21073CD49

Fresh 💭

Recirculation

オ



Inhaling air from the outside to pressurize cab inside.

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

# 2 Recirculation

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

- \* Change air occasionally when using recirculation for a long time.
- \* Check out the recirculation filter periodically to keep a good efficiency.
- (2) Recirculation function operates when the system is off but it can be changed whenever needed.

# 7. OTHERS



32093CD03

#### 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 shortly after being pressed down.
- Service socket
   Use cigar lighter socket when you need emergency power.
   Do not use the lighter exceeding 24V, 100W.

#### 2) HANDSFREE



The handsfree set allows you to dial a call or to have a conversation without holding your handset. Use the remote controller when making and answering a call or ring off.

#### (1) Mobile phone storage box



The mobile phone can be stored when you're calling handsfree.

#### (2) USB socket



This socket is used to charge the mobile phone.

# (3) Private call jack socket



- ① This can be used to protect your privacy when you're calling by using ear phone.
- 2 The mobile phone must be connected to the handsfree jack socket.

# (4) Handsfree jack socket



- ① Connect the jack cable when you're calling handsfree.
- 2 Use the special adapter when the jack cable is not interchangeable.
- ③ Check the jack type of the mobile phone before use.

# (5) Indicator lamp



This lamp is turned ON when the handsfree mode is selected.

#### (6) Service socket



Utilize the power of 12 V as your need and do not exceed power of 12 V, 30 W.

# **3) REMOTE CONTROLLER**



21093CD52

# (1) Power and volume switch

1



# 2 This switch is turned to right, the handsfree volume is increased

over 7 steps.

This switch is used to turn the audio or handsfree on or off.

- ③ If it is turned to left, volume will be decreased.
- \* This switch adjusts the audio volume when the audio mode is selected.

# (2) Mode change button



# (3) Call button



- ① This button is to select the handsfree mode or audio mode.
  - Lamp on
     : handsfree mode ("TEL MUTE" displayed ON audio LCD)
  - Lamp off : audio mode

- ① This button is used to answer a call, last number redial, ring off.
- ② For calling, press the button over 0.5 sec within 3 seconds until the beep sounds.
- $\ast\,$  This can be used when the starting switch is ON.

# (4) Handsfree MIC



# (5) Seek button



# ① This MIC transfers user voice to receiver of the call when making a call by handsfree.

- ① If this button is pressed, the radio automatically stops at the next frequency of broadcasting for your listening.
- Press to turn a station of a higher frequency or v to a lower frequency.

# (6) Mute button



① Short press this button to mute or cancel the mute (silence) while broadcasting.

# (7) Mode button



- ① Press the mode button to select the desired mode.
- $\textcircled{2} \qquad \mathsf{FM1} \to \mathsf{FM2} \to \mathsf{AM} \to \mathsf{CD} \to \mathsf{MP3} \to \mathsf{FM1}$
- **\*** The LCD displays each mode.

# 4) RADIO AND MP3 USB PLAYER

# (1) BASIC FUNCTIONS



2209S3CD70

- 1 Power (PWR) button
- 2 Volume/Sound setting button
- 3 Mode selection button

# ① Power (PWR) button

- 4 Radio (FM/AM) selection button
- 5 USB slot
- 6 AUX terminal
- a. Press the PWR button to turn on the audio. While the audio is operating, press the button to turn the power off.

## <sup>(2)</sup> Volume/Sound setting button a. Volume (VOL) button

2209S3CD70A



1 Turn the VOL button clockwise to increase the volume and counterclockwise to decrease the volume.

# b. Sound setting



- Press the SELECT button to conduct sound setting. Each press of the button will change the sound setting in the following order. BASS  $\rightarrow$  MIDDLE  $\rightarrow$  TREBLE  $\rightarrow$  BALANCE  $\rightarrow$  EQ  $\rightarrow$  BEEP
- 2 After selecting the desired setting, turn the SELECT button clockwise/counter-clockwise to adjust the sound setting value.

#### 3 BASS adjustment

1

Turn the SELECT button clockwise to increase the bass and counter-clockwise to decrease the bass. BASS can be adjusted from max +10/min -10. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

# 4 MIDDLE adjustment

Turn the SELECT button clockwise to increase the middle and counter-clockwise to decrease the middle. MIDDLE can be adjusted from max +10/min -10. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

#### 5 TREBLE adjustment

Turn the SELECT button clockwise to increase the treble and counter-clockwise to decrease the treble. TREBLE can be adjusted from max +10/min -10. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

#### 6 Left/Right BALANCE adjustment

Turn the SELECT button clockwise to increase the right-side speaker volume and counter-clockwise to increase the left-side speaker volume. BALANCE can be adjusted from 10L/10R. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

# 7 EQ (EQUALIZER) adjustment

Turn the SELECT button clockwise/counter-clockwise to select the desired EQ. EQ settings are as shown below.

 $Cls \ (classic) \rightarrow Pop \rightarrow Rock \rightarrow Jazz \rightarrow off$ 

If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

# \* Upon selecting EQ, the BASS, MIDDLE and TREBLE values will be turned off. The BASS, MIDDLE, TREBLE values can be set only when EQ Off is selected.

#### 8 BEEP sound adjustment

Turn the SELECT button clockwise/counter-clockwise to the beep sound ON/OFF. If there are no adjustments for 3 seconds, the changes will be saved and the previous mode will be restored.

# **③ MODE selection button**



- a. Press the MODE button to change to RADIO/USB/AUX/iPod modes. However, the mode can be selected only when the respective media is connected.
- b. If iPod is connected to the audio, the mode will change in the following order.
   RADIO → iPod → USB (handfree)

c. If USB or AUX is connected to the audio, the mode will change in the following order.

 $RADIO \rightarrow USB \text{ (front)} \rightarrow USB \text{ (handfree)} \rightarrow AUX$ 

- **\*\* USB and AUX mode will operate only when corresponding devices are connected.**
- \* When connecting iPod, AUX and front USB cannot be connected.
- \* The iPod is connected to the USB in the machine handfree.

# **<u>A Radio (FM/AM)</u>** selection button



a. Each press of the FM/AM button will change the radio mode in the following order.

 $\mathsf{FM1} \to \mathsf{FM2} \to \mathsf{FM3} \to \mathsf{AM}$ 

b. Preset memory of up to FM: 18 stations, AM: 6 stations.

# (5) USB slot

Connects USB to play USB music files.

# 6 AUX terminal

The AUX terminal connects AUX cable to play AUX music files.

#### (2) RADIO



1 Radio (FM/AM) selection button

- 2 TRACK/SEEK button
- 3 Broadcast manual search (FLDR) button

# 4 LCD display

- 5 BSM (Best Station Memory) button
- 6 Saving broadcast frequencies to PRESET numbers

# ① Radio (FM/AM) selection button



a. Each press of the FM/AM button will change the radio mode in the following order.

 $\mathsf{FM1} \to \mathsf{FM2} \to \mathsf{FM3} \to \mathsf{AM}$ 

b. In addition, pressing the FM/AM button when the starting switch is in ON state will turn the power on and activate the radio.

#### c. Setting regional Radio Frequency

North America Frequency

Press the FM/AM and Preset 1 button simultaneously to set frequency in accordance to the North America Frequency settings. "nA" will become displayed on the LCD for one second.

FM: 87.7 ~ 107.9 MHz (200 KHz)

AM: 530 ~ 1710 KHz (10 KHz)

Local/Middle East/Asia Frequency

Press the FM/AM and Preset 2 button simultaneously to set frequency in accordance to the Local/Middle East/Asia

Frequency settings. "InT" will become displayed on the LCD for one second.

FM: 87.5 ~ 108 MHz (100 KHz)

AM: 531 ~ 1602 KHz (9 KHz)

#### Europe Frequency

Press the FM/AM and Preset 3 button simultaneously to set frequency in accordance to the North America Frequency settings. "Eu" will become displayed on the LCD for one second.

FM: 87.5 ~ 108 MHz (50 KHz) MW: 531 ~ 1602 KHz (9 KHz)

LW: 153 ~ 279 KHz (1 KHz)

#### 2 TRACK/SEEK button



a. As buttons used to automatically search broadcasts, pressing the button will automatically search and stop at a frequency with superior reception.

TRACK  $\land$ : Searches frequencies higher than current frequency. SEEK  $\lor$ : Searches frequencies lower than current frequency.

When frequencies cannot be properly found due to weak broadcast reception, try using manual FLDR button (Refer to manual FLDR button explanation below).

# ③ Broadcast manual search (FLDR) button



As button used to search frequencies manually, a press of the SEEK step (refer to note below) will change the frequency.
 Pressing and holding the button will continue changing the frequency.
 Releasing the button will stop the search at the current frequency.

FLDR  $\wedge:$  Searches frequencies higher than current frequency FLDR  $\vee:$  Searches frequencies lower than current frequency

\* SEEK STEP: FM-100KHz, AM-9KHz.

#### (4) LCD display



a. The currently received broadcast frequency info and status are displayed.

# **<u>⑤ BSM (Best Station Memory) button</u>**



- a. Press and hold the BSM button to listen to the presets saved in FM BAND FM1, FM2, and FM3 or AM BAND AM for 5 seconds each. When you find a station you wish to listen to, press the BSM button again to receive the selected broadcast.
- Shortly press the BSM button to automatically save frequencies with superior reception in presets (1REW~6INFO). The BSM feature will save AM frequencies in AM mode and FM frequencies in FM mode.

#### <sup>(6)</sup> Saving broadcast frequencies to PRESET numbers

#### **\*** Up to 18 FM broadcasts and 6 AM broadcasts can be saved.

1 2 3
4 5 6
21093CD76

- a. Use the auto/manual search buttons to find the desired frequency.
- b. Select the preset button (1REW~ 6INFO) to which you wish to save the selected frequency. Press and hold the preset button.
- c. The frequency will be saved to the preset button to a sound of a beep. The saved frequency number will be displayed on the LCD DISPLAY (However, the beep will not sound if the beep function has been turned off in sound setting).
- d. After saving is complete, pressing the preset button will play the corresponding broadcast frequency.
- \* No beep sound signifies that the preset has not been saved. In this case, try again from the first step (However, the beep will not sound if the beep function has been turned off in sound setting).

#### (3) USB CONNECTION



2209S3CD72

1 USB selection button

2 TRACK UP/SEEK DOWN button

3 FLDR UP/DOWN button

- 7 Scroll (SCR) button
- 8 View music info (INFO) button
- 9 Scan button (BSM)

- 4 FF/REW button
- 5 RPT/FOLDER RPT button
- 6 RDM/FOLDER RDM button

- 10 Finding and playing file (SELECT) button
- 11 LCD display
- Operates only when a USB is connected. Connecting a USB to the audio will automatically convert to USB mode.
- Connecting the USB when the starting switch is in ON state will turn the power on and automatically play the songs within the USB.

# $\underline{0}$ USB selection button



- a. While playing a different mode, press the MODE button to convert to USB mode. Connecting a USB to the audio will automatically convert to USB mode even if another mode is playing and automatically play the songs within the USB.
- b. If the USB is connected to both the front USB and handfree, then MODE is converted in the following order.
   RADIO → USB (front) → USB (handfree)

# 2 TRACK UP/SEEK DOWN button



a. While playing USB, press the TRACK ∧ button to play the beginning of the next song.
 Press the SEEK ∨ button to return to the beginning of the current song. Press the button again to play the beginning of the previous song.

# ③ FLDR UP/DOWN button

a.

b.



# ④ FF/REW button



If there are more than 2 folders in the USB, pressing the FLDR

If there are no folders in the USB, then pressing the button will

UP/ DOWN button will move to the previous or next folder.

move up/down within the folder in 10 file increments.

a. While a USB is operating, press and hold the FF button to fastforward the song. When fast-forward is complete, the next song will properly play from the beginning even if you continue holding the button. Press and hold the REW button to rewind the song. When rewind is complete, the current song will properly play from the beginning even if you continue holding the button. Shortly pressing the buttons will not operate the FF/REW.

# **⑤ RPT/FOLDER RPT button**



- a. While music is playing, shortly press the RPT button to repeat the currently playing song.
- b. (RPT function) Press and hold the RTP button to sequentially repeat all songs within the current folder (FOLDER RPT, however, music files in the USB must be saved in folder format).

# **6 RDM/FOLDER RDM button**



- a. While music is playing, shortly press the RDM button to randomly play the songs in the current folder. (RDM)
- b. While music is playing, press and hold the RDM button to randomly play the songs in the current folder (FOLDER RDM, however, music files in the USB must be saved in folder format).

# **O Scroll (SCR) button**



a. Press the SCR button to turn ON/OFF the scroll function which scrolls the file name of the currently playing song on the LCD from right to left.

# <sup>(8)</sup> View music info (INFO) button



a. Each time the INFO button is pressed, the info on the currently playing song will be displayed in the following order. FILE NAME  $\rightarrow$  TITLE  $\rightarrow$  ARTIST  $\rightarrow$  ALBUM  $\rightarrow$  DIR

# Scan button (BSM)



- a. While music is playing, shortly press the BSM button to scan each song within the USB for 10 seconds in sequential order. (SCN)
- b. Press and hold the BSM button to scan each song within the current folder for 10 seconds in sequential order (FOLDER SCN, however, music files in the USB must be saved in folder format).

# Image: The second se

a.



- While USB is playing, press and hold the SELECT button for over 3 seconds to enter FILE BROWER mode and search for desired files.
- b. After entering FILE BROWSER mode, turn the SELECT button left/ right to find the desired folder. After finding the folder, press the SELECT button to select the folder. Turn the SELECT button left/ right to find the desired song and press the SELECT button to play.
- c. If there are no adjustments for 3 seconds after pressing the SELECT button, the function will be turned off and the USB play screen will be displayed.

# ULCD display

F-USB MP3 01 Cr FILE	
2209S3CD71F	

(4) iPOD CONNECTION

- R-USB: Displays USB is connected to the handfree
  - RPT: Displays that repeat function is turned on
  - $\bullet \mathrel{\,{\scriptstyle{\unrhd}}}$  RPT: Displays that folder repeat function is turned on

· F-USB: Displays USB is connected to the Audio Front

• RDM: Displays that random play is turned on

Displays the info of the currently playing song.

- PDM: Displays that folder random play is turned on
- SCR: Displays that SCROLL is turned on



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- 1 iPod selection button
- 2 TRACK UP/SEEK DOWN button
- 3 FF/REW button

- 5 Random play (RDM) button
- 6 Scroll (SCR) button
- 7 View music info (INFO) button

4 Repeat (RPT) button

- 8 Finding and playing file (SELECT) button
- Operates only when an iPod is connected. Connecting an iPod to the audio will automatically convert to iPod mode. Connecting the USB when the starting switch is in ON state will turn the power on and automatically play the songs within the iPod.
- The iPod cable is supplied separately.

# 1 iPod selection button



a. While playing a different mode, press the MODE button to convert to iPod mode. Connecting an iPod to the audio will automatically convert to iPod mode even if another mode is playing and automatically play the songs within the iPod.

# **② TRACK UP/SEEK DOWN button**



# ③ FF/REW button



- a. While playing music, press the TRACK ∧ button to play the beginning of the next song.
   Press the SEEK ∨ button to return to the beginning of the current song. Press the button again to play the beginning of the previous song.
- a. While an iPod is operating, press and hold the FF button to fastforward the song.
- b. When fast-forward is complete, the next song will properly play from the beginning even if you continue holding the button. Press and hold the REW button to rewind the song.
- c. When rewind is complete, the current song will properly play from the beginning even if you continue holding the button.
- d. Shortly pressing the buttons will not operate the FF/REW.

# ④ Repeat (RPT) button



a. While music is playing, press the RPT button to repeat the currently playing song.

# **5** Random play (RDM) button



a. While music is playing, press the RDM button to randomly play the songs.

# 6 Scroll (SCR) button



a. Displays the file name of the currently playing song on the LCD. Here, the SCR button turns the file name SCROLL ON/OFF.

# **View music info (INFO) button**



a. Each time the INFO button is pressed, the info on the currently playing song will be displayed in order of ARTIST  $\rightarrow$  ALBUM  $\rightarrow$  TI-TLE.

# <sup>(8)</sup> Finding and playing file (SELECT) button



- a. While iPod is playing, press and hold the SELECT button for over 3 seconds to enter CATEGORY mode and search for desired files.
- b. After entering CATEGORY mode, turn the SELECT button left/ right to find the desired category.
- c. Category will be displayed in the following order. PLAYLISTS  $\rightarrow$  ARTISTS  $\rightarrow$  ALBUMS  $\rightarrow$  GENRES  $\rightarrow$  SONGS  $\rightarrow$ COMPOSERS  $\rightarrow$  AUDIOBOOKS  $\rightarrow$  PODCACSTS
- d. After finding the category, press the SELECT button to select the category. Turn the SELECT button left/right to find the desired song and press the SELECT button to play.
- e. If there are no adjustments for 3 seconds after pressing the SELECT button, the function will be turned off and the iPod play screen will be displayed.

# (5) AUX CONNECTION



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- Operates only when an external device is connected to AUX. Connecting an AUX device to the audio using the AUX cable will automatically convert to AUX mode.
- When an external device is connected, only the PWR, FM/AM, MODE, and VOL buttons can be operated.
- Settings can be made only through the external device connected to AUX.
- The AUX cable is supplied separately.

# 1 Connecting an external device using the AUX cable

- a. While playing a different mode, press the MODE button to convert to AUX mode.
- b. If an external device is connected to the Audio through the AUX terminal, AUX mode will automatically be converted and play music from AUX. Connecting the AUX when the starting switch is in ON state will turn the power on and automatically play the songs within the AUX.





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#### (1) Forward/Backward adjustment (A)

- Pull lever A to adjust seat forward or backward.
- 2 The seat can be moved forward and backward over 140 mm (5.5") in 13 steps.

#### (2) Height/weight adjustment (B)

- ① Turn the handle to adjust seat upward or downward.
  - If you turn the handle clockwise, the seat is moved upward and the weight is increased.

If the handle is turned counterclockwise, the seat is moved downward and the weight is decreased.

- Method of changing direction (up/down)
  First pull the handle to outside.
  - Then rotate 180° and release the handle.

# (3) Reclining adjustment (C)

Pull lever C to adjust the seat backrest.

#### (4) Armrest adjustment (E)

This can be adjusted by pushing the button E to right and left.

- (5) Headrest adjustment (D) This is adjustable vertically to fit operator's requirements over 60 mm (2.4").
- (6) Seat cushion tilt adjustment (F)Pull lever F to adjust seat cushion tilting angle.

#### (7) Seat cushion length adjustment (G)

- \* 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.
- A Pull lever G to adjust the seat cushion forward or backward.
- Always check the condition of the seat belt and mounting hardware before operating the machine.
- A Replace the seat belt at least once every three years, regardless of appearance.

## 6) FUSE & RELAY BOX



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- (1) The fuses protect the electrical parts and wiring from burning out.
- (2) The fuse box cover indicates the capacity of each fuse and circuit it protects.
  - **\*** Replace a fuse with another of the same capacity.

**A** Before replacing a fuse, be sure to turn OFF the starting switch.





- (1) To match the engine torque with the pump absorption torque, the MCU varies the EPPR valve output pressure, which controls the pump discharge amount whenever the feedbacked engine speed drops under the reference rpm of each mode set.
- (2) Three LED lamps on the MCU display as below.

LED lamp	Trouble	Service
G <sup>*1</sup> is turned ON	Normal	-
G and R <sup>*2</sup> are turned ON	Trouble on MCU	Change the MCU
G and $Y^{*3}$ are turned ON	Trouble on serial communi- cation line	Check if the serial commu- nication lines between the controller and cluster are disconnected
Three LED are turned OFF	Trouble on MCU power	<ul> <li>Check if the input power wire (24 V, GND) of con- troller is disconnected</li> <li>Check the fuse</li> </ul>
<sup>*1</sup> : Green <sup>*2</sup> : Red <sup>*3</sup> : Yellow		

## 8) EMERGENCY ENGINE STARTING CONNECTOR



# 9) SERVICE METER



#### (1) Emergency start

- ① If the MCU is removed, the engine does not start.
- Before starting the engine, connect the connector CN-16 with 16B.
- (2) Emergency speed control
  - When the CAN communication between the ECM and the MCU is abnormal due to a MCU malfunction, change the CN-16 connection from CN-16A to CN-16B and then control the engine speed by rotating the accel dial switch.
    - \* Never connect connector CN-16 with CN-16B when the MCU is in normal operation.

- (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 Section 6, Maintenance.

#### 10) RS232 & J1939 SERVICE SOCKET



- (1) MCU communicates the machine data with Laptop computer through RS232 service socket.
- (2) ECM communicates the engine data with cummins INSITE adapter through J1939 service socket.
  - ① ECM fault code check
  - 2 ECM program change
  - ③ Engine data monitoring & test

## **11) UPPER WINDSHIELD**



- (1) Perform the following procedure in order to open the upper windshield.
  - ① Pull both levers while holding both grips that are located at the top of the windshield frame and push the windshield upward.
  - ② Hold both grips and back into the lock position until auto lock latch is engaged, then release the lever locked position.



- (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 Reverse above step ① and ② in order to close the upper windshield.

# **1. SUGGESTION FOR NEW MACHINE**

- 1) It takes about 100 operation hours to enhance its designed performance.
- 2) Operate according to below three steps and avoid excessive operation for the initial 100 hours.

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

- Excessive operation may deteriorate the potential performance of machine and shorten lifetime of the machine.
- 3) Be careful during the initial 100 hours operation
- (1) Check daily for the level and leakage of coolant, engine oil, hydraulic oil and fuel.
- (2) Check regularly the lubrication and fill grease daily all lubrication points.
- (3) Tighten bolts.
- (4) Warm up the machine fully before operation.
- (5) Check the gauges occasionally during the operation.
- (6) Check if the machine is operating normally during operation.
- 4) Replace followings after initial 250 hours of operation

Checking items	Hours
Engine oil	
Engine oil filter element	
Fuel filter	050
Prefilter	
Hydraulic oil return filter element	250
Hydraulic oil tank drain filter cartridge	
Line filter element	
Travel reduction gear oil	



# 2. CHECK BEFORE STARTING THE ENGINE

 Look around the machine and under the machine to check for loosen nut or bolts, collection of dirt, or leakage of oil, fuel or coolant and check the condition of the work equipment and hydraulic system. Check also loosen wiring, and collection of dust at places which reach high temperature.

\* Refer to the daily check on page 6-10.

- 2) Adjust seat to fit the contours of the operator's body for the pleasant operation.
- 3) Adjust the rear view mirror.



# **3. STARTING AND STOPPING THE ENGINE**

#### 1) CHECK INDICATOR LIGHTS

- (1) Check if all the operating levers are in the neutral position.
- (2) Turn the starting switch to the ON position. The buzzer sounds for 4 seconds and the Hyundai logo is displayed on the cluster.
  - \* If the ESL mode is enabled, enter the password to start the engine.
  - If the password has failed 5 times, please wait 30 minutes before reattempting to enter the password.
  - \* See page 3-17.
- (3) After the initialization of the cluster, the operating screen is displayed on the LCD (1).

Also, the self-diagnostic function is carried out.



# 2) STARTING ENGINE IN NORMAL TEMPER-ATURE

- Sound the horn to warn the surroundings after checking if personnel or obstacles are in the area.
- (1) Turn the starting switch to START position to start the engine.
  - If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.
- (2) Release the starting switch instantly after the engine starts to avoid possible damage to the starting motor.



# 3) STARTING ENGINE IN COLD WEATHER

- Sound horn to warn surroundings after checking if there are obstacles in the area.
- \* Replace the engine oil and fuel referring to recommended oils at page 2-35.
- \* Fill the anti-freeze solution to the coolant as required.
- If you turn ON the starting switch, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature.
- (1) Check if all the levers are in the neutral position.
- (2) Turn the accel dial switch to low idle position.
- (3) Turn the starting switch to the ON position, and wait 1~2 minutes. More time may take according to ambient temperature.
- (4) Wait for five minutes to warm up the engine after the preheating pilot lamp off, and than turn the starting switch to the START position to start the engine.
- 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 the warming up automatically starts.
- Do not operate the working devices, or convert the operation mode into other mode during the warming up.



#### 4) INSPECTION AFTER ENGINE START

Inspect and confirm the following after engine starts.

- (1) Is the level gauge of hydraulic oil tank in the normal level?
- (2) Are there leakages of oil or water?
- (3) Are all the warning lamps OFF (1–9)?
- (4) Are the water temperature gauge (10) and hydraulic temperature gauge (11) indicators in the operating range?
- (5) Are 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 control panel, stop the engine immediately and correct problem as required.

#### 5) WARMING UP OPERATION

- The most suitable temperature for the hydraulic oil is about 50°C (122°F).
  It can cause serious trouble in the hydraulic system by sudden operation when the hydraulic oil temperature is below 25°C (77°F).
  Then temperature must be raised to at least 25°C (77°F) before starting work.
- (1) Run the engine at low idling for 5 minutes.
- (2) Speed up the idling and run the engine at midrange speed.
- (3) Operate bucket lever for 5 minutes.
  - \* Do not operate anything except bucket lever.
- (4) Run the engine at the high speed and operate the bucket lever and arm lever for 5–10 minutes.
  - \* Operate only the bucket lever and arm lever.
- (5) This warming up operation will be completed by operation of all cylinders several times, and 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 particularly if the engine has overheated, do not abruptly stop it but run it at medium speed to allow it to cool gradually, then stop it.
- (1) Lower the bucket to the ground then put all levers in the neutral position.
- (2) Run the engine at low idling speed 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 LOCK safety lever.
- (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 Hyundai.

#### \* Please refer to page 3-12 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.

- General work mode (bucket) When the key switch is turned on, this mode is selected automatically.
- Work tool mode (breaker, crusher) It controls the pump flow and system pressure for the optimal operation of breaker or crusher.



# (3) User mode

- The user mode is useful for setting the user preferable power quickly (engine speed, power shift and idle speed).
- ② There are two methods for use of user mode.
  - a. In operation screen

The user mode switch is used to memorize the current machine operating status and activate the memorized user mode. See page 3-10.

#### b. In menu

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

- 1 Each memory mode has a initial set which are midrange of max engine speed, power shift and auto idle speed.
- 2 High idle rpm, auto idle rpm and EPPR pressure can be adjusted and memorized in the U mode.
  - Refer to page 3-12 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	1450	700	0
2	1500	750	3
3	1550	800	6
4	1600	850	9
5	1650	900	12
6	1700	One-touch decel low idle (950)	16
7	1750	Auto decel rpm (1000)	20
8	1800	1050	26
9	1850	1100	32
10	1900	1150	38

# (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 cancelled.

#### (6) Monitoring system

Information of machine performance as monitored by the CPU controller can be displayed on the **LCD.** Refer to page 3-11.



#### (7) Self-diagnostic system

#### ① MCU (Machine Control Unit)

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

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

If the engine or relevant system has a problem, the engine ECM detects and displays it on the **LCD** as fault codes (these codes are composed of SPN and FMI).

- **\*\*** Consult Hyundai or your Hyundai dealer for details.
- **\*** Refer to page 3-11 for the LCD display.

#### (8) Anti-restart system

The system protects the starter from inadvertent restarting when the engine is already operational.
# 2) HOW TO OPERATE THE MODE SELECTION SYSTEM

#### (1) When start key is turned on

- When start key switch is turned on, the cluster turns on and buzzer sounds for 4 seconds. And then main information as gauges and engine speed are displayed on LCD.
- ② Initial default mode settings are displayed in the cluster.

Мс	Status	
Power mode	E	ON
Work mode	B	ON
Travel mode	Low (	ON
Auto decel	Ē	ON

#### \* These settings can be changed in U mode.

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

#### (2) After starting the engine

- When the engine is started, the rpm display indicates low idle, 950 ± 100 rpm.
- If the coolant temperature is below 30°C, the warming up pilot lamp lights on and after 4 seconds the engine speed increases to 1000 ± 100 rpm automatically to warm up the machine.
  - After 2-3 minutes, you can select any mode depending on the job requirement.





#### **3) POWER MODE SELECTION**

#### (1) E mode

The accel dial is set 10 and the auto idle mode is cancelled.

Engine rpm	Effect
1650 ± 50	Variable power control in proportion to lev- er stroke (improvement in fuel efficiency) % Same power as S mode in full lever op- eration.

When the accel dial is located below 9 the engine speed decreases about 50-100 rpm per dial set.

#### (2) S mode

The accel dial is set 10 and the auto idle mode is cancelled.

Engine rpm	Effect
1750 ± 50	Standard power

When the accel dial is located below 9 the engine speed decreases about 50-100 rpm per dial set.





#### (3) P mode

The accel dial is set 10 and the auto idle mode is cancelled.

Engine rpm	Effect
1750 ± 50	Approximately 120 % available of the S mode power and speed.

When the accel dial is located below 9 the engine speed decreases about 50-100 rpm per dial set.



# **5. OPERATION OF 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, it returns to neutral position automatically.
- \* When operating swing, consider the swing distance by inertia.



### Left control lever

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



#### Right control lever

- 5 Boom lower
- 6 Boom raise
- 7 Bucket roll-out
- 8 Bucket roll-in
- Right control lever (for R520LC-9 DM)
  - 7 Crusher roll-out
  - 8 Crusher roll-in



# **6. TRAVELING OF THE MACHINE**

#### 1) BASIC OPERATION

#### (1) Traveling position

It is the position which the traveling motor is in the rear and the working device is forward.

\* Be careful as the traveling direction will be reversed when the whole machine is swinged 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 lever or pedal are pushed at the same time, the machine will travel forward or backward.

\* 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 make the change of direction possible by moving only one track.



#### (5) Counter rotation

It is to change the direction at the original place by moving the right and left track. Both side of lever or pedal are operated to the other way at the same time.



#### 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) Lower the bucket 20 to 30 cm (1 ft) to the ground so that it can be used as a brake in an emergency.
- (3) If the machine starts to slide or loses stability, lower the bucket immediately and brake the machine.
- (4) When parking on a slope, use the bucket as a brake and place blocks behind the tracks to prevent sliding.

#### (5) For R520LC-9 DM only:

- It is not allowed to travel with this machine on a slope.
- It is not allowed to travel with the machine when the boom and arm are in the fully upward position.
- ③ Travelling over small distances is only allowed if the middle arm and end arm are in the folded position.
- ④ Travelling over larger distances (to and from the jobsite or loading or unloading for transport) is only allowed when the total front attachement is folded and in an almost horizontal position.



- Machine cannot travel effectively on a slope when the oil temperature is low. Do the warmingup operation when it is going to travel on a slope.
- A Be careful when working on slopes. It may cause the machine to lose its balance and turn over.
- A Be sure to keep the travel speed switch on LOW (turtle mark) while traveling on a slope.

#### 3) TRAVELING ON SOFT GROUND

#### **\*** If possible, avoid to operate 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.
- 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.
   (Not applicable for R520LC-9 DM)

#### 4) TOWING THE MACHINE

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

- (1) Tow the machine by other machine after hook the wire rope to the frame as shown in picture at right.
- (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.
- A Make sure no personnel are standing close to the tow rope.





# 7. EFFICIENT WORKING METHOD (R480LC-9, R480-9 and R520LC-9 only)

 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.

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

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

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







21074OP17

Parallel

5) Dig slowly with keeping the angle of boom and arm, 90-110 degree when maximum digging force is required.

- 6) Operate leaving a small safety margin of cylinder stroke to prevent damage of cylinder when working with the machine.
- 38094OP13
- 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) Do not use the dropping force of the work equipment for digging.The machine can be damaged by the impact.



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



## 11) NEVER CARRY OUT EXCESSIVE OPERA-TIONS

Operation exceeding machine performance may result in accident or failure.

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.

In case you need installing an overload warning device for object handling procedure, please contact your Hyundai 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 his instructions.

- Execute operating methods and procedures under his 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.



## 8. EFFICIENT WORKING METHOD (R520LC-9 DM only)

- 1) Raise the base/extension boom up to reach the safety working range (20° down from perpendicular position; 5° warning range [sound and rotating beacon in cabin])
- 2) When the base/extension boom is within the safety range, the middle arm can be moved up fully.
- 3) Finally the end arm can be moved up; the full working range of the attachment is within the full stretch of the end arm cylinder.

**A** It is forbidden to pull any material by using the front attachment (crusher/shear).

- 4) To lower the front attachment work:
  - (1) Fold the end arm fully in
  - (2) Fold the middle arm fully in
  - (3) Lay the base/extension boom down on the ground cautiously. Be carefull not to damage the full front attachment.
  - Always raise and lower the front attachment when the upperstructure is in line with the undercarriage.

## 9. OPERATION IN SPECIAL WORK SITES

#### 1) OPERATING THE MACHINE IN COLD WEATHER

- (1) Use proper engine oil and fuel for the weather.
- (2) Fill the required amount of antifreeze in the coolant.
- (3) 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 the wood plates.

#### 2) OPERATION IN SANDY OR DUSTY WORK SITES

- Inspect air cleaner element frequently. Clean or replace element more frequently, if warning lamp comes ON and buzzer sounds simultaneously, regardless of inspection period.
   \* Replace the inner and outer element after 6 times of cleaning.
- (2) Inspect radiator 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 frequently.
- (5) Keep all lubricated part, such as pins and bushings, clean at all times.
- (6) If the air conditioner and heater filters clogged, the heating or cooling capacity will drop. Clean or replace the filter element more frequently.

#### 3) SEA SHORE OPERATION

- (1) Prevent ingress of salt by securely tightening plugs, cocks and bolts of each part.
- Wash machine after operation to remove salt residue.
   Pay special attention to electrical parts and hydraulic cylinders 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 walkaround 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.

# **10. NORMAL OPERATION OF EXCAVATOR**

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

 When rolling in the arm, the roll-in movement stops momentarily at point X in the picture shown, then recovers speed again after passing point X.

> The reason for this phenomenon is that movement by the arm weight is faster than the speed of oil flow into the cylinder.

 When lowering the boom, one may hear continuous sound.
 This is assured by sil flow in the volve.

This is caused by oil flow in the valve.

- Overloaded movement will produce sound caused by the relief valves, which are for the protection of the hydraulic systems.
- 4) When the machine is started swing or stopped, a noise near the swing motor may be heard. The noise is generated when the brake valve relieves.



# **11. NORMAL OPERATION OF EXCAVATOR** (R520LC-9 DM only)

- 1) Raise the base/extension boom up to reach the safety working range (20° down from perpendicular position; 5° warning range [sound and rotating beacon in cabin])
- 2) When the base/extension boom is within the safety range, the middle arm can be moved up fully.
- 3) Finally the end arm can be moved up; the full working range of the attachment is within the full stretch of the end arm cylinder.

**A** It is forbidden to pull any material by using the front attachment (crusher/shear).

- 4) To lower the front attachment work:
  - (1) Fold the end arm fully in
  - (2) Fold the middle arm fully in
  - (3) Lay the base/extension boom down on the ground cautiously. Be carefull not to damage the full front attachment.
  - Always raise and lower the front attachment when the upperstructure is in line with the undercarriage.

# 12. ATTACHMENT LOWERING (When engine is stopped)

 On machines equipped with an accumulator (within 2 minutes) after the engine is stopped, the attachment can be lowered under its own weight when the attachment control lever is shifted to LOWER. This only happens when the starting switch is ON and the safety lever is in the UNLOCK position. After the engine is stopped, set the safety lever to the LOCK position.

#### A Be sure no one is under or near the attachment before lowering the boom.

- 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.
  - A Never make any hole in the accumulator expose it to flame or fire.
  - A 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 Hyundai distributor.



# **13. STORAGE**

Maintain the machine taking care of following to prevent the deterioration of machine when storing the machine for a long time, over 1 month.

## 1) CLEANING THE MACHINE

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

## 2) LUBRICATION POSITION OF EACH PART Change all oils.

\* 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.



#### 3) MASTER SWITCH

Turn OFF the master switch mounted in the battery box and store the machine.

 Be sure to mix anticorrosive antifreezing solution in the radiator.



5) PREVENTION OF DUST AND MOISTURE Keep machine dry. Store the machine setting wood on the ground.

- \* Cover exposed part of piston rod of cylinder.
- \* Lower the bucket to the ground and set a support under track.



#### 6) 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.



# **14. RCV LEVER OPERATING PATTERN**



### 1) PATTERN CHANGE VALVE NOT INSTALLED (standard)

	Operation		Control function		Hose connection (Port)		n (Port)
Pattern	Left RCV lever Right RCV lever				RCV	Change nal b	of termi- lock
					lever	From	То
ISO type				1 Arm out	2	D	-
	1	5	1 - 4	2 Arm in	4	Е	-
			Lett	3 Swing right	3	В	-
	$4$ $\uparrow$ $3$			4 Swing left	1	А	-
	$\bigcirc \leftarrow \downarrow \rightarrow \bigcirc$	AN G	Right	5 Boom lower	4	J	-
	2			6 Boom raise	2	Н	-
				7 Bucket out	1	F	-
Hyundai				8 Bucket in	3	G	-
A type				1 Boom lower	2	D	J
	1	5 •	Left	2 Boom raise	4	Е	Н
				3 Swing right	3	В	-
	$4$ $\uparrow$ $3$			4 Swing left	1	А	-
	$\bigcirc \leftarrow \circ \rightarrow \bigcirc$			5 Arm out	4	J	D
	A TO	6		6 Arm in	2	Н	Е
	2 6		Right	7 Bucket out	1	G	-
			8 Bucket in	3	F	-	

	Operation		- Control function		Hose connection (Port)		
Pattern Left RCV lever		Right RCV lever			RCV	Change of termi- nal block	
		-			level	From	То
<b>B</b> type				1 Boom lower	2	D	J
	1	5_	l off	2 Boom raise	4	Е	н
			Leit	3 Bucket in	3	В	F
	4 + 3 = 8 + 7		4 Bucket out	1	А	G	
	Ve V 7		Right	5 Arm out	4	J	D
2	(m			6 Arm in	2	Н	E
	2			7 Swing right	1	G	В
				8 Swing left	3	F	А
<b>C</b> type	1	5		<ol> <li>Loosen the RCV lever tate lever assy 90° count</li> </ol>	mounting	bolt (43) wise; ther	and ro- 1 install.
	$\frac{4}{14}$ $\uparrow$ $\frac{3}{14}$		Leit	<ul> <li>To put lever in correct position, disassemble nut</li> <li>(22) and rotate only lever 90° clockwise.</li> </ul>		ole nut	
	O 2	6	Right	Same a	s <b>ISO</b> type	e	

#### 2) PATTERN CHANGE VALVE INSTALLED (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	B type	C type
Left RCV lever	$4 \Leftrightarrow 3 \\ 4 \Leftrightarrow 3 \\ 2 \\ 2 \\ 2 \\ 3 \\ 2 \\ 3 \\ 2 \\ 3 \\ 3 \\$	$ \begin{array}{c} 1 \\ 4 \\ 4 \\ 4 \\ 2 \\ 7 \\ 2 \\ 7 \\ 2 \\ 7 \\ 2 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7 \\ 7$	$ \begin{array}{c} 1 \\ 1 \\ 1 \\ 2 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4$	$\begin{array}{c}1\\0\\4\\$
Right RCV lever			$ \overset{5}{\overset{5}{\overset{5}{\overset{5}{\overset{5}{\overset{5}{\overset{5}{\overset{5}$	5 Y ← 1 → √ 5 6

 The machine control pattern can easily be changed from the "ISO" type to the "A" type, "B" type or "C" type by changing the position of the lever.

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

#### 2) Change of operating pattern

#### - A type

- (1) Loosen the wing bolt.
- (2) Move lever from the "ISO" type to "A", "B" or "C" type position.
- (3) After the lever is set, tighten the bolt in order to secure the lever.
- B type
  - (1) Loosen bolt (1) or bolt (2).
  - (2) Move lever to the "ISO" or "A" position.
  - (3) After setting to secure lever.
    - Bolt (1) for "ISO" pattern
    - Bolt (2) for "A" pattern



# **15. SWITCHING HYDRAULIC ATTACHMENT CIRCUIT**

- 1) The combined hydraulic attachment circuit is capable of providing single action or double action.
- 2) The position of the 3-way valve selects the single action hydraulic attachment circuit or the double action hydraulic attachment circuit.
- Before you change the flow mode of hydraulic attachment circuit, place the machine in the servicing position as shown. Stop the engine.



- - One way flow (Hydraulic breaker)
     Position the manual lever parallel to the piping (<sup>B</sup>)
  - (2) Two way flow (Clamshell or shear) Position the manual lever perpendicular to the piping (<sup>©</sup>).



# **16. INSTALLATION AND REMOVAL OF THE DEMOLITION FRONT** (for R520LC-9 DM only)

- \* The R520LC-9 DM is designed so to be used as a standard excavator with the backhoe attachment installed or as a high-reach demolition excavator with the high-reach demolition attachment installed.
- A Installing or removing the demolition front may only be done with the cabin in a horizontal position.

#### 1) INSTALLATION OF THE HIGH-REACH DEMOLITION BOOM

- \*
- Perform this procedure on a flat and level surface.
- Make sure to have suitable containers available to collect hydraulic oil when opening, maintaining, inspecting, testing, adjusting or repairing components containing hydraulic oil.
- Dispose drained fluids according to local regulations and mandates.
- (1) Have the engine running and move the machine inline with the attachment in the supporting cradle.
- (2) Move the base boom side pins in the extension boom hooks slowly. Raise the attached boom until both pin holes are aligned.
- (3) Install the support pins and tighten the security screws.
- (4) Connect the hydraulic hoses one by one and tighten them as necessary. Start first with the lower row, then proceed with the upper row.



(5) After connecting the hydraulic lines vent the hydraulic system by running the engine on high RPM and by slowly operating the functions by using full stroke of the joystick and pedals.

A If some functions don't operate, stop the engine and check for line connections or leakages. If necessary remove the trapped air from the hydraulic lines.

- (6) Install the suitable demolition attachment (see proper installation manual).
  - A The heavy extension boom can fall when not correctly installed. Before moving the attached extension boom, make sure that all relevant persons take the necessary safety distance.

#### 2) REMOVAL OF THE HIGH-REACH DEMOLITION BOOM

- \*
- Perform this procedure on a flat and level surface.
- Make sure to have suitable containers available to collect hydraulic oil when opening, maintaining, inspecting, testing, adjusting or repairing components containing hydraulic oil.
- Dispose drained fluids according to local regulations and mandates.

- 1. Place the supporting craddle (1) on a flat and level surface.
- 2. Fully retract the middle arm cylinder and the end arm cylinder. Fully extend the buck-et cylinder.
  - Make sure that the demolition attachment is removed from the end arm properly.
- 3. Align and park the machine in front of the supporting craddle.



- 4. Position the boom (2) while maintaining proper clearance to the craddle.
- 5. Lower the boom until the extension boom pins are properly supported by the craddle.
- 6. Move the end arm outwards until the supporting bracket reaches the ground and the extension boom is properly supported in a 3-point stable position.
- Loosen the safety bolts and remove the support pins.
   If supporting pins are stuck, move the base

boom up or down slowly while hammering the pins.

 Stop the engine, operate both joysticks and the middle arm operating pedal to relieve the pressure from the hydraulic lines, then disconnect the hydraulic lines. First take the upper lines, then loosen the lower lines.

#### A Please take care of the above note!

- 9. Restart the engine and slowly lower the base boom in order to final detach the extension arm.
- 10. Move the machine back to free up the attachment.
- 11. Fasten the extension boom safely to the craddle.





# **17. INSTALLATION/REMOVAL OF STANDARD BACKHOE FRONT**

Use the same workflow as described for the demolition front.



# TRANSPORTATION

# **1. PREPARATION FOR TRANSPORTATION**

- 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 Section 2, Specifications.
- Check the whole route such as the road width, the height of bridge and limit of weight and etc., which will be passed.
- 4) Get the 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	В
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) R480LC-9

#### (1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6426 (21' 1")
Н	Height	mm (ft-in)	3190 (10' 6")
W	Width	mm (ft-in)	3340 (10' 11")
Wt	Weight	kg (lb)	39000 (85980)

 With 600 mm (24") triple grouser shoes and 9200 kg (20280 lb) counterweight.

#### (2) Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	7290 (23' 11")
н	Height	mm (ft-in)	1710 (5' 7")
W	Width	mm (ft-in)	830 (2' 9")
Wt	Weight	kg (lb)	4110 (9060)

% 7.06 m (23' 2") boom with arm cylinder (Included piping and pins).

#### (3) Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4600 (15' 1")
н	Height	mm (ft-in)	1010 (3' 4")
W	Width	mm (ft-in)	620 (2' 0")
Wt	Weight	kg (lb)	2420 (5340)

 $\,$  3.38 m (11' 0") arm with bucket cylinder (Included linkage and pins).

#### (4) Bucket assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2090 (6' 10")
н	Height	mm (ft-in)	1240 (4' 1")
W	Width	mm (ft-in)	1760 (5' 6")
Wt	Weight	kg (lb)	1740 (3840)

%~ 2.15 m³ (2.81 yd³) SAE heaped bucket (Included tooth and side cutters).









# (5) Boom cylinder

_				
	Mark	Description	Unit	Specification
	L	Length	mm (ft-in)	2260 (7' 5")
ſ	н	Height	mm (ft-in)	305 (1' 0")
ſ	W	Width	mm (ft-in)	477 (1' 7")
ſ	Wt	Weight	kg (lb)	415 (910) × 2

\* Included piping.

#### (6) Cab assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1980 (6' 5")
н	Height	mm (ft-in)	1686 (5' 6")
W	Width	mm (ft-in)	1000 (3' 3")
Wt	Weight	kg (lb)	490 (1080)





## (7) Counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
н	Height	mm (ft-in)	1148 (3' 9")
W	Width	mm (ft-in)	798 (2' 7")
Wt	Weight	kg (lb)	9200 (20280)



# 2) R520LC-9

#### (1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6190 (20' 4")
н	Height	mm (ft-in)	3400 (11' 2")
W	Width	mm (ft-in)	2990 (9' 10")
Wt	Weight	kg (lb)	31530 (69510)

% With 600 mm (24") triple grouser shoes.

**%** Remove the catwalk for transport.



#### (2) Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	7290 (23' 11")
н	Height	mm (ft-in)	1710 (5' 7")
W	Width	mm (ft-in)	830 (2' 9")
Wt	Weight	kg (lb)	4140 (9130)

%~ 7.06 m (23' 2") boom with arm cylinder (Included piping and pins).

#### (3) Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4660 (15' 3")
н	Height	mm (ft-in)	1060 (3' 6")
W	Width	mm (ft-in)	620 (2' 0")
Wt	Weight	kg (lb)	2560 (5640)

<sup>% 3.38</sup> m (11' 1") arm with bucket cylinder (Included linkage and pins).

#### (4) Bucket assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2090 (6' 10")
н	Height	mm (ft-in)	1240 (4' 1")
W	Width	mm (ft-in)	1760 (5' 6")
Wt	Weight	kg (lb)	1740 (3840)

※ 2.15 m<sup>3</sup> (2.81 yd<sup>3</sup>) SAE heaped bucket (Included tooth and side cutters).

#### (5) Boom cylinder

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2260 (7' 5")
н	Height	mm (ft-in)	305 (1' 0")
W	Width	mm (ft-in)	477 (1' 7")
Wt	Weight	kg (lb)	415 (910) × 2

**%** Included piping.









#### (6) Cab assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1980 (6' 5")
н	Height	mm (ft-in)	1686 (5' 6")
W	Width	mm (ft-in)	1000 (3' 3")
Wt	Weight	kg (lb)	490 (1080)



#### (7) Counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
н	Height	mm (ft-in)	1148 (3' 9")
W	Width	mm (ft-in)	798 (2' 7")
Wt	Weight	kg (lb)	10200 (22490)



#### (8) Counterweight (Option)

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
н	Height	mm (ft-in)	1148 (3' 9")
W	Width	mm (ft-in)	798 (2' 7")
Wt	Weight	kg (lb)	10700 (23590)

※ 9.0 m boom, 5.85 m arm only

#### (9) Boom assembly (Option)

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6780 (22' 3")
Н	Height	mm (ft-in)	1840 (6' 0")
W	Width	mm (ft-in)	830 (2' 9")
Wt	Weight	kg (lb)	4050 (8930)

% 6.55 m (21' 6") boom with arm cylinder (Included piping and pins).





#### (10) Boom assembly (Option)

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	9230 (30' 3")
н	Height	mm (ft-in)	1850 (6' 1")
w	Width	mm (ft-in)	830 (2' 9")
Wt	Weight	kg (lb)	4930 (10870)

 $<sup>\,\,</sup>$  % 9.00 m (29' 6") boom with arm cylinder (Included piping and pins).

#### (11) Boom assembly (Option)

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	10230 (33' 7")
Н	Height	mm (ft-in)	1960 (6' 5")
W	Width	mm (ft-in)	830 (2' 9")
Wt	Weight	kg (lb)	5350 (11790)

<sup>%~</sup> 10.0 m (32' 10") boom with arm cylinder (Included piping and pins).

#### (12) Arm assembly (Option)

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	3810 (12' 6")
Н	Height	mm (ft-in)	1205 (3' 11")
W	Width	mm (ft-in)	620 (2' 0")
Wt	Weight	kg (lb)	2460 (5420)

 $\,\,\%\,$  2.4 m (7' 10") arm with bucket cylinder (Included linkage and pins).

#### (13) Arm assembly (Option)

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	7100 (23' 4")
Н	Height	mm (ft-in)	1055 (3' 6")
W	Width	mm (ft-in)	620 (2' 0")
Wt	Weight	kg (lb)	3130 (6900)

% 5.85 m (19' 2") arm with bucket cylinder (Included linkage and pins).









#### (14) Arm assembly (Option)

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	8100 (26' 7")
Н	Height	mm (ft-in)	1060 (3' 6")
W	Width	mm (ft-in)	620 (2' 0")
Wt	Weight	kg (lb)	3440 (7580)

<sup>% 6.85</sup> m (22' 6") arm with bucket cylinder (Included linkage and pins).

#### 3) R520LC-9 DM

#### (1) Base machine

Mark	Description	Unit	Spec	cification
Ĕ.	Length	mm (ft-in)	7800 (25' 7")	
Н	Height	mm (ft-in)	3485 (11' 5")	
347	146-146	(11:-)	Extended	3540 (11' 6")
VV	wiath	mm (tt-in)	Retracted	2990 (9' 8")
Wt	Weight	kg (lb)	48030 (105890)	

\* With 600 mm (24") triple grouser shoes.

\* Remove the catwalk for transport.

#### (2) Base boom

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4420(14'6")
H	Height	mm (ft-in)	1455(4'9")
W	Width	mm (ft-in)	825(2'8")
Wt	Weight	kg (lb)	2302 (5075)

% 9.9 m (32' 6") boom with arm cylinder (Included piping and pins).

#### (3) Extension boom assembly

Mark	Description	Unit	Specification
Ľ	Length	mm (ft-in)	10190 (33' 5")
Н	Height	mm (ft-in)	1460 (4' 9")
W	Width	mm (ft-in)	730 (2' 5")
Wt	Weight	kg (lb)	4196 (9250)

9.9 m (32' 6") boom with arm cylinder (Included piping and pins).









#### (4) Middle arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2970 (9' 9")
Н	Height	mm (ft-in)	1160 (3' 10")
W	Width	mm (ft-in)	510 (1' 8")
Wt	Weight	kg (lb)	1093 (2410)



% 2.72 m (8' 11") arm with bucket cylinder (Included linkage and pins).

#### (5) End arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	8190 (26' 10")
н	Height	mm (ft-in)	1190 (3' 11")
W	Width	mm (ft-in)	500 (1' 8")
Wt	Weight	kg (lb)	1454 (3205)



#### 8.0 m (26' 3") arm with bucket cylinder (Included linkage and pins).

#### (6) Counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
н	Height	mm (ft-in)	1148 (3' 9")
W	Width	mm (ft-in)	798 (2' 7")
Wt	Weight	kg (lb)	14200 (31300)



# (7) Extra counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
н	Height	mm (ft-in)	190 (0' 6")
W	Width	mm (ft-in)	911 (2' 9")
Wt	Weight	kg (lb)	2500 (5510)



# **3. LOADING THE MACHINE**

- 1) Load and unload the machine on a flat ground.
- 2) Use a gangplank with sufficient length, width, thickness and gradient.
- Place the swing lock lever to the LOCK position before fixing the machine at the bed of trailer and confirm if the machine parallels 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.
  - Stop loading when the machine is located horizontally with the rear wheel of trailer.





(2) Pull the swing lock lever (LOCK) after swinging the machine 180 degree.



- (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 since it will be very dangerous.
  - A Do not operate any other device when loading.
  - A Be careful on the boundary place of loading plate or trailer as the balance of machine will abruptly be changed on the point.


## **4. FIXING THE MACHINE**

4)

Secure all locks.

- 1) Lower down the working device on the loading plate of trailer.
- 2) Keep the safety lever on the LOCK position.
- 3) Turn OFF all the switches and remove the key.





5) Place timber underneath the track and fix firmly with wire rope to prevent the machine from

moving forward, backward, right or left.



## **5. LOADING AND UNLOADING BY CRANE**

- Check the weight, length, width and height of the machine referring to Section 2, Specifications when you are going to hoist the machine.
- 2) Use long wire rope and stay to keep the distance with the machine as it should avoid touching with the machine.
- 3) Put a rubber plate contact with wire rope and machine to prevent damage.
- 4) Place crane on the proper place.
- 5) Install the wire rope and stay like the illustration.
- A Make sure wire rope is proper size.
- A Place the safety lever to LOCK position to prevent the machine from moving when hoisting the machine.
- A The wrong hoisting method or installation of wire rope can cause damage to the machine.
- **A** Do not load abruptly.
- A Keep area clear of personnel.



## 6. DISASSEMBLING FOR TRANSPORTATION (R520LC-9 only)

#### 1) DISCONNECTING HYDRAULIC HOSES AND LINES

- (1) Position the machine on flat, firm and level ground.
- (2) Retract the bucket cylinder and arm cylinder completely.
- (3) Lower the boom to the ground as shown.
- (4) Stop the engine.
- (5) Move the safety lever down to lock the system securely.

#### \* Refer to page 3-32 for details.



- (6) Turn the engine start switch to ON position. Do not start the engine.
- (7) Pull up the safety lever, Move the left and right operating levers, respectively to the full extension in all directions to remove internal pressure from the hydraulic circuits.
- (8) Turn the start switch to OFF position.
- (9) Release internal pressure in the hydraulic tank through the air breather of the hydraulic tank.
- (10) Disconnect hoses and lines.

\* Treat oil in an environmentally safe way.

- (11) Dismantle the components (boom, arm, counterweight etc.)
- A Immediately after operating the machine, the hot hydraulic oil can cause severe burns to unprotected skin.
- A These may be residual hydraulic pressure can remain in the hydraulic system. Serious injury may result if this residual pressure is not released before any service is done on the hydraulic system.

#### 2) DISASSEMBLING ATTACHMENT

- \* Follow the procedure for disconnecting the hydraulic hoses and lines before disassembling the components.
- (1) Bucket and arm with bucket cylinder Use cable sheaths to protect the lifting cable from being damaged by the edges of the arm.

Protect piston rod and the cylinder tube.



#### (2) Boom with arm cylinder

Use cable sheaths to protect the lifting cable from being damaged by the edges of the boom.

Secure piston rod of the arm cylinder to the cylinder tube.



#### 3) COUNTERWEIGHT REMOVAL AND INSTALLATION

#### (1) Counterweight removal

- Position the machine on flat, firm and level ground, free from any obstruction or interference.
- ② Keep the service position.
- ③ Push down the safety locking lever securely. Move the safety lever down to lock the system securely.

#### \* Refer to page 3-32 for details.

- ④ As shown in the illustration, connect the lifting cables or slings with sufficient strength for the counterweight at the lifting eye correctly.
- 5 Disassemble four bolts.
- 6 Lift the counterweight enough.
- ⑦ Place the counterweight onto suitable support.

#### (2) Counterweight installation

① Carry out installation in the reverse order to removal.

• Tightening torque : 390 ± 40 kgf • m (2820 ± 290 lbf • ft)

- A Move the safety locking lever down to lock the system securely (see safety locking system on page 3-32) and attach a warning tag (i.e. "Do not start the engine") to the left-side operating lever.
- A Personal injury or death can occur from a counterweight falling during installation. Do not allow personnel to move under or around the counterweight during the installation.
- A Use certified cables and shackles of adequate load rating. Improper lifting can allow the load to shift and cause injury or death.



## 7. ADJUSTABLE TRACK GAUGE (R520LC-9 only)

#### 1) LOWER TRACK RETRACTION

#### **A** 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) Turn superstructure so that it is perpendicular to lower track to be retracted. Raise lower track to approximately 15° 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°.
- (3) 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.
- (4) After the bolts for one side frame are fastened, repeat steps 1 through 3 for opposite side frame.
- (5) 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 (2).
  - \* Tighten bolts to 220 ± 20 kgf m (1590 ± 145 lbf • ft)
  - Repeat procedure at opposite track frame support.
- (7) After the bolts for one side frame are fastened repeat steps 1 through 6 for other side frame.



## **1. INSTRUCTION**

#### 1) MAINTENANCE INTERVAL

- (1) You may inspect and service the machine by the period as described at page 6-10 based on hour meter at cluster.
- (2) Shorten the inspection and service interval depending on site condition (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) Start to maintenance after you have the full knowledge of machine.
- (2) The monitor installed on this machine does not entirely guarantee the condition of the machine. Daily inspection should be performed according to the maintenance checklist on page 6-10.
- (3) Engine and hydraulic components have been preset in the factory. Do not allow unauthorized personnel to reset them.
- (4) Ask to your local dealer or Hyundai for the maintenance advice if unknown.
- (5) Drain the used oil and coolant in a container and handle according to the method of handling for industrial waste to meet with regulations of each province or country.

#### 3) PROPER MAINTENANCE

#### (1) Replacing and repairing 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 at proper time to keep the performance of machine.

- (2) Use genuine parts.
- (3) Use the recommended oil.
- (4) Remove dust or water around the inlet of oil tank before supplying oil.
- (5) Drain oil when the temperature of oil is warm.
- (6) Do not repair anything while operating the engine.Stop the engine when you fill the oil.

- (7) Relieve the hydraulic system of pressure before repairing the hydraulic system.
- (8) Confirm if the cluster is in the normal condition after completion of service.
- (9) For more detailed information on maintenance, please contact your local Hyundai dealer.

#### 4) RELIEVING THE PRESSURE IN THE HYDRAULIC SYSTEM

- Spouting of oil can cause the accident when loosening the cap or hose right after the operating of machine as the machine or oil is on the high pressure on the condition.
   Be sure to relieve the pressure in the system before repairing hydraulic system.
- Place machine in parking position, and stop the engine.



- (2) Set the safety lever completely in the release position, 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 serving hydraulic component, loosen the connections slowly and do not stand in the direction where the oil spurt out.



(3) Loosen the cap and 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 assemble the hose in the condition of twisted or sharp radius.
- (5) Keep the specified tightening torque.

#### 6) PERIODICAL REPLACEMENT OF SAFETY PARTS

It is desirable to do periodic maintenance the machine for using the machine safely for a long time.
 However, recommend to replace regularly the parts related safety not only safety but maintain satisfied performance.

(2) These parts can cause the disaster of life and material as the quality changes by passing time and it is worn, diluted, and gets fatigued by using repeatedly. These are the parts which the operator can not judge the remained lifetime of them by visual inspection.

(3) Repair or replace if an abnormality of these parts is found even before the recommended replacement interval.

Periodical replacement of safety parts			Interval
Engine		Fuel hose (tank-engine)	Even Over
		Heater hose (heater-engine)	Every 2 years
		Pump suction hose	
	Main circuit	Pump delivery hose	Every 2 years
		Swing hose	
Hydraulic system		Boom cylinder line hose	
	Working device	Arm cylinder line hose	Every 2 years
		Bucket cylinder line hose	

- \* 1. Replace the O-ring and gasket at the same time when replacing the hose.
  - 2. Replace clamp at the same time if the hose clamp is cracked when checking and replacing the hose.

# 2. TIGHTENING TORQUE

Use the following tables for unspecified torque.

## 1) BOLT AND NUT

## (1) Coarse thread

Dalkaina	8	8T 10T		т
Bolt size	kgf ∙ m	lbf • ft	kgf ∙ m	lbf • ft
M6 × 1.0	0.85–1.25	6.15–9.04	1.14–1.74	8.2–12.6
M8 × 1.25	2.0-3.0	14.5–21.7	2.73–4.12	19.7–29.8
M10 × 1.5	4.0-6.0	28.9–43.4	5.5–8.3	39.8–60
M12 × 1.75	7.4–11.2	53.5–79.5	9.8–15.8	71–114
M14 × 2.0	12.2–16.6	88.2–120	16.7–22.5	121–167
M16 × 2.0	18.6–25.2	135–182	25.2–34.2	182–247
M18 × 2.5	25.8–35.0	187–253	35.1–47.5	254–343
M20 × 2.5	36.2-49.0	262–354	49.2–66.6	356–482
M22 × 2.5	48.3-63.3	350–457	65.8–98.0	476–709
M24 × 3.0	62.5-84.5	452-611	85.0–115	615–832
M30 × 3.5	124–168	898-1214	169–229	1223–1655
M36 × 4.0	174–236	1261-1703	250–310	1808–2242

#### (2) Fine thread

Dellection	8	т	10T		
Bolt size	kgf ∙ m	lbf • ft	kgf ∙ m	lbf • ft	
M8 × 1.0	2.2-3.4	15.9–24.6	3.0-4.4	21.7–31.8	
M10 × 1.2	4.5–6.7	32.5–48.5	5.9–8.9	42.7–64.4	
M12 × 1.25	7.8–11.6	56.4-83.9	10.6–16.0	76.7–116	
M14 × 1.5	13.3–18.1	96.2–131	17.9–24.1	130–174	
M16 × 1.5	19.9–26.9	144–195	26.6–36.0	192–260	
M18 × 1.5	28.6-43.6	207–315	38.4–52.0	278–376	
M20 × 1.5	40.0–54.0	289–391	53.4–72.2	386–522	
M22 × 1.5	52.7-71.3	381–516	70.7–95.7	511–692	
M24 × 2.0	67.9–91.9	491–665	90.9–123	658–890	
M30 × 2.0	137–185	990–1339	182–248	1314–1796	
M36 × 3.0	192–260	1390–1880	262-354	1894–2562	

## 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	130.2
1"	41	21	151.9
1-1/4"	50	35	253.2

## 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

Thread size (UNF)	Width across flat (mm)	kgf ∙ m	lbf • ft
13/16-16	27	9.5	68.7
1-3/16-12	36	18	130.2
1-7/16-12	41	21	151.9
1-11/16-12	50	35	253.2

#### 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	130.2
1"	41	21	151.9
1-1/4"	50	35	253.2

#### 5) TIGHTENING TORQUE OF MAJOR COMPONENTS

#### (1) R480LC-9

Na	No		Delt size	Torque		
INO.		Descriptions		kgf ∙ m	lbf • ft	
1		Engine mounting bolt, nut	M20 × 2.5	46.4 ± 4.0	336 ± 29	
2	Frankra	Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5	
3	Engine	Coupling mounting socket bolt	M20 × 2.5	46 ± 2.0	333 ± 14.5	
4		Main pump housing mounting bolt	M10 × 1.5	$4.8 \pm 0.3$	35 ± 2.2	
5		Main pump mounting bolt	M20 × 2.5	$44 \pm 6.6$	318 ± 47.7	
6		Main control valve mounting nut	M20 × 2.5	57.9 ± 8.7	419 ± 62.9	
7	Hydraulic sys-	Fuel tank mounting bolt	M20 × 2.5	45 ± 5.1	$325 \pm 36.8$	
8		Hydraulic oil tank mounting bolt	M20 × 2.5	45 ± 5.1	$325 \pm 36.8$	
9		Turning joint mounting bolt, nut	M16 × 2.0	29.7 ± 4.5	215 ± 32.5	
10		Swing motor mounting bolt	M20 × 2.5	$58.4 \pm 6.4$	422 ± 46.2	
11		Swing bearing upper part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3	
12	Power train	Swing bearing lower part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3	
13	l	Travel motor mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9	
14		Sprocket mounting bolt	M20 × 2.5	57.9 ± 6.0	419 ± 43.4	
15		Carrier roller mounting bolt, nut	M16 × 2.0	29.7 ± 3.0	$215 \pm 21.7$	
16		Track roller mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3	
17	Undercarriage	Track tension cylinder mounting bolt	M22 × 1.5	87.2 ± 12.5	631 ± 90	
18		Track shoe mounting bolt, nut	M24 × 3.0	$140 \pm 5.0$	1012 ± 36	
19		Track guard mounting bolt	M24 × 3.0	100 ± 15	723 ± 108	
20		Counterweight mounting bolt	M42 × 3.0	$390 \pm 40$	2821 ± 289	
21	Others	Cab mounting bolt	M12 × 1.75	$12.8 \pm 3.0$	92.6 ± 21.7	
22		Operator's seat mounting bolt	M8 × 1.25	$4.05 \pm 0.8$	29.3 ± 5.8	

# \* Refer to the engine maintenance guide and service manual for the tightening torque of the engine and hydraulic components.

#### (2) R520LC-9

	Na		Dallada	Torque		
INO.		Descriptions		kgf ∙ m	lbf • ft	
1	Engine mounting bolt, nut		M20 × 2.5	$46.4 \pm 4.0$	336 ± 29	
2	Freedore	Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5	
3	Engine	Coupling mounting socket bolt	M20 × 2.5	46 ± 2.0	333 ± 14.5	
4		Main pump housing mounting bolt	M10 × 1.5	$4.8 \pm 0.3$	35 ± 2.2	
5		Main pump mounting bolt	M20 × 2.5	$44 \pm 6.6$	318 ± 47.7	
6		Main control valve mounting nut	M20 × 2.5	57.9 ± 8.7	419 ± 62.9	
7	Hydraulic sys-	Fuel tank mounting bolt	M20 × 2.5	45 ± 5.1	$325 \pm 36.8$	
8		Hydraulic oil tank mounting bolt	M20 × 2.5	45 ± 5.1	$325 \pm 36.8$	
9	Turning joint mounting bolt, nut		M16 × 2.0	29.7 ± 4.5	215 ± 32.5	
10		Swing motor mounting bolt	M20 × 2.5	$58.4 \pm 6.4$	422 ± 46.2	
11	Power train	Swing bearing upper part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3	
12		Swing bearing lower part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3	
13	Gyötern	Travel motor mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9	
14		Sprocket mounting bolt	M20 × 2.5	77.4 ± 7.0	560 ± 50.6	
15		Carrier roller mounting bolt, nut	M16 × 2.0	29.7 ± 3.0	215 ± 21.7	
16		Track roller mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3	
17	Undercarriage	Track tension cylinder mounting bolt	M22 × 1.5	87.2 ± 12.5	631 ± 90	
18		Track shoe mounting bolt, nut	M24 × 3.0	$140 \pm 5.0$	1012 ± 36	
19		Track guard mounting bolt	M24 × 3.0	100 ± 15	723 ± 108	
20		Counterweight mounting bolt	M42 × 3.5	390 ± 40	2821 ± 289	
21	Others	Center frame support & lower track mounting bolt	M33 × 3.5	220 ± 20	1591 ± 145	
22	Others	Cab mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7	
23		Operator's seat mounting bolt	M8 × 1.25	$4.05 \pm 0.8$	29.3 ± 5.8	

\* Refer to the engine maintenance guide and service manual for the tightening torque of the engine and hydraulic components.

# 3. FUEL, COOLANT AND LUBRICANTS

## 1) NEW MACHINE

New machine used and filled with following lubricants.

Description	Specification
Engine oil	SAE 10W-30 (API CH-4)
Hydraulic oil	Hyundai genuine long life hydraulic oil (ISO VG 46, VG 68) Coventional hydraulic oil (ISO VG 15, *cold region )
Swing and travel reduction gear	SAE 80W-90 (API GL-5)
Grease	Lithium base grease NLGI No. 2
Fuel	ASTM D975-No. 2
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water.

SAE : Society of Automotive Engineers

★Cold region

API : American Petroleum Institute

Russia, CIS, Mongolia

**ISO** : International Organization for Standardization

NLGI : National Lubricating Grease Institute

**ASTM** : American Society of Testing and Material

## 2) RECOMMENDED OILS

## Use only oils listed below. Do not mix different brand oil. Please use HYUNDAI genuine oil and grease.

		Capacity	Ambient temperature °C( °F)								
Service point	Kind of fluid	ℓ (U.S. gal)	-50	-30	-20	-10	0	10	20	30	40
			(-58)	(-22)	(-4)	(14)	(32)	(50)	(68)	(86)	(104)
					★SAE 5	W-40					
									SVE 30		
Engine											
oil pan	Engine oil	35 (9.2)			S	4E 10W		_			
							SAE 10V	/-30			
									<u>^</u>		
							SAE	1500-4	0		
Swing drive		5.0×2						_			
Swing drive	Cooroil	(1.3×2)		7	SAE 7	5W-90	- [	_			
Final drive	Gear OI	5.0×2					SAE	80W-9	0		
Final drive		(1.3×2)							-		
		Topk:									
		262			★ISO	VG 15					
		(69.2)									_
Hydraulic tank	Hydraulic oil	System:					ISO V	G 46			
		380									
		(100)						ISO V	G 68		
				★ASTN	1 D975 N	IO.1					
Fuel tank	Diesel fuel	621 (164)									
							A5		75 NU.2	<u> </u>	
Fittina					★N	LGI NO.1					
(grease nipple)	Grease	As required							)		
									-		
	Mixture of										
Radiator	antifreeze	EQ (10 Q)			Ethyler	ne glycol	base pern	nanent	type (50	: 50)	
(reservoir tank)	and soft water <sup>★1</sup>	50 (13.2)	★Ethy	lene glycol ba	se permane	nt type (60 : 4	0)				

- 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
- \* : Cold region Russia, CIS, Mongolia
- \*1 : Soft water City water or distilled water

# **4. MAINTENANCE CHECKLIST**

## 1) DAILY SERVICE BEFORE STARTING

Check items	Service	Page
Visual check		
Fuel tank	check, refill	6-25
Hydraulic oil level	check, add	6-28
Engine oil level	check, add	6-17
Coolant level	check, add	6-19
Control panel & pilot lamp	check, clean	6-40
Prefilter	check, drain	6-26
Fan belt tension	check, adjust	6-23
★ Attachment pin and bushing	lubricate	6-38
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		

 $\star$  Lubricate every 10 hours or daily for initial 100 hours.

## 2) EVERY 50 HOURS SERVICE

Check items	Service	Page
Fuel tank (water, sediment)	drain	6-25
Track tension	check, adjust	6-34
Swing reduction gear oil	check, add	6-32
Swing reduction gear grease	check, add	6-32
Bucket linkage pin	lubricate	6-38
Bucket cylinder rod end		
Bucket + arm connecting		
Bucket control link + arm		
Bucket control rod		

## 3) INITIAL 50 HOURS SERVICE

Check items	Service	Page
Engine oil	change	6-17 ~ 6-19
Engine oil filter	replace	6-17 ~ 6-19
Prefilter (water, element)	replace	6-26
Fuel filter	replace	6-25
Bolts & Nuts	check, tighten	6-5 ~ 6-6
Sprocket mounting bolts		
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		

Check items	Service	Page
Hydraulic pump mounting bolts		

Service the above items only for the new machine, and thereafter keep the normal service interval.

#### 4) EVERY 200 HOURS SERVICE

Check items	Service	Page
★ Return filter	replace	6-30
★ Pilot line filter	replace	6-31
★ Drain filter cartridge	replace	6-31

★ Replace 3 filters for continuous hydraulic breaker operation only.

#### 5) INITIAL 250 HOURS SERVICE

Check items	Service	Page
Pilot line filter	replace	6-31
Hydraulic return filter	replace	6-30
Drain filter cartridge	replace	6-31
Swing reduction gear oil	change	6-32
Swing reduction gear grease	check, add	6-33

#### 6) EVERY 250 HOURS SERVICE

Check items	Service	Page
★ Engine oil	change	6-17 ~ 6-19
★ Engine oil filter	replace	6-17 ~ 6-19
Battery (voltage)	check, add	6-40
Aircon & heater fresh filter	check	6-43
Air breather element	replace	6-31
Swing bearing grease	lubricate	6-33
Bolts & Nuts	check, tighten	6-5 ~ 6-6
Sprocket mounting bolts		
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		
Hydraulic pump mounting bolts		
Attachment pin and bushing	lubricate	6-38
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		

★ If you use high sulfur containing fuel above than 0.5% or use low grade of engine oil reduce change interval.

#### 7) INITIAL 500 HOURS SERVICE

Check items	Service	Page
Travel reduction gear oil	change	6-34

Service the above item only for the new machine, and thereafter keep the normal service interval.

#### 8) EVERY 500 HOURS SERVICE

Check items	Service	Page
Radiator, cooler fin and charge air cooler	check, clean	6-22
☆ Air cleaner element (Primary)	check, clean	6-24
Fuel filter element	replace	6-25
Prefilter	change	6-26
Water filter (corrosion resistor)	replace	6-27

 $\gtrsim$  Clean the primary element only after 500 hours operation or when the air cleaner warning lamp blinks. Replace primary element and safety element after 4 times cleanings of primary element.

#### 9) EVERY 1000 HOURS SERVICE

Check items	Service	Page
Travel motor reduction gear oil	change	6-33
Swing reduction gear oil	change	6-32
Swing reduction gear grease	change	6-32
Grease in swing gear and pinion	change	6-33
Hydraulic oil return filter	replace	6-29
Drain filter cartridge	replace	6-31
Pilot line filter	replace	6-31

#### 10) EVERY 2000 HOURS SERVICE

Check items	Service	Page
Coolant	change	6-19 ~ 6-22
Hydraulic tank suction strainer	check, clean	6-30
Hydraulic oil <sup>*1</sup>	change	6-29
<sup>*1</sup> : Conventional hydraulic oil		

% Change oil every 600 hours of continuous hydraulic breaker operation.

#### 11) EVERY 5000 HOURS SERVICE

Check items	Service	Page
Hydraulic oil <sup>*1</sup>	change	6-29
<sup>*1</sup> : Hyundai genuine long life hydraulic oil		

#### $\,\,\%\,$ Change oil every 1000 hours of continuous hydraulic breaker operation.

#### **12) WHEN REQUIRED**

Check items	Service	Page
Fuel system		
Fuel tank	drain or clean	6-25
Prefilter	clean or replace	6-26
Fuel filter element	replace	6-25
Engine lubrication system		
Engine oil	change	6-17 ~ 6-19
Engine oil filter	replace	6-17 ~ 6-19
Engine cooling system		
Coolant	add or change	6-19 ~ 6-22
Radiator	clean or flush	6-19 ~ 6-22
Charge air cooler	check	6-23
Water filter (corrosion resistor)	replace	6-27

Check items	Service	Page
Engine air system		
Air cleaner element	replace	6-24
Hydraulic system		
Hydraulic oil	add or change	6-29
Return filter	replace	6-29
Drain line filter	replace	6-31
Pilot line filter	replace	6-31
Element of breather	replace	6-31
Suction strainer	clean	6-30
Undercarriage		
Track tension	check, adjust	6-34
Bucket		
Tooth	replace	6-36
Side cutter	replace	6-35
• Linkage	adjust	6-35
Bucket assy	replace	6-35
Air conditioner and heater		
Fresh air filter	clean, replace	6-43
Recirculation filter	clean	6-44

## **5. MAINTENANCE CHART**

#### 1) R480LC-9, R520LC-9





48096MA01

#### 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 use no open flames.
- (4) For other details, refer to the service manual.





52096MA10

#### 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 use no open flames.
- (4) For other details, refer to the service manual.

Service in- terval	No.	Description	Service action	Oil symbol	Capacity	Number of service points
10 hours or daily	1	Hydraulic oil level	check, add	НО	262 (69.2)	1
	2	Engine oil level	check, add	EO	35 (9.2)	1
	4	Radiator coolant	check, add	С	45 (12)	1
	5	Prefilter (water, element)	check, clean	-	-	1
	6	Fan belt tension and damage	check, adjust	-	-	1
	9	Fuel tank	check, refill	DF	621 (164)	1
*1: Conventional hydraulic oil						
If the second s Second second sec						

Service in- terval	No.	Description	Service action	Oil symbol	Capacity <b>£</b> (U.S. gal)	Number of service points
50 hours or weekly	8	Bucket linkage pin	check, add	PGL	-	6
	9	Fuel tank (water, sediment)	check, clean	-	-	1
	11	Swing reduction gear case	check, add	GO	5.0 (1.3)	2
	12	Swing reduction gear grease	check, add	PGL	1.2 (0.3)	2
	14	Track tension	check, adjust	PGL	-	2
	2	Engine oil	change	EO	38 (10)	1
	3	Engine oil filter	replace	-	-	1
	7	Attachment pins & bushing	check, add	PGL	-	11
250 hours	10	Swing bearing grease	check, add	PGL	-	2
	15	Battery (voltage)	check, clean	-	-	1
	18	Air breather element	replace	-	-	1
	21	Airco & heater/fresh air filter	check, clean	-	-	1
	5	Prefilter	replace	-	-	1
	22	Air cleaner element (primary)	check, clean	-	-	1
500 hours	23	Fuel filter element	replace	-	-	1
	24	Radiator, oil cooler, charge air cooler	check, clean	-	-	3
	26	Water filter (corrosion resistor)	replace	-	-	1
	6	Fan belt tensioner	check, replace	-	-	1
	11	Swing reduction gear case	change	GO	5.0 (1.3)	1
	12	Swing reduction gear grease	replace	PGL	1.2 (0.3)	1
1000	13	Swing gear and pinion grease	change	PGL	15.4 kg (34 lb)	1
hours	16	Hydraulic oil return filter	replace	-	-	2
	17	Drain filter cartridge	replace	-	-	1
	20	Pilot line filter element	replace	-	-	1
	25	Travel reduction gear case	change	GO	5.0 (1.3)	2
	1	Hydraulic oil <sup>*1</sup>	change	НО	262 (69.2)	1
2000 hours	4	Radiator coolant	change	С	45 (12)	1
	19	Hydraulic oil suction strainer	check, clean	-	-	1
5000 hours	1	Hydraulic oil <sup>*2</sup>	change	НО	262 (69.2)	1
As re- quired	21	Air conditioner & heater fresh air filter	replace	-	-	1
	21	Air conditioner & heater recirculation fil- ter	clean, replace	-	-	1
	22	Air cleaner element (primary, safety)	replace	-	-	2
<sup>1</sup> : Conventional hydraulic oil						

## \* Oil symbols

Please refer to the recommended lubricants for specification.

DF	: Diesel fuel	GO	: Gea

HO : Hydraulic oil

GO : Gear oil C : Coolant PGL : Grease EO : Engine oil

## **6. SERVICE INSTRUCTION**

#### 1) CHECK ENGINE OIL LEVEL

Check the oil level with the machine on a 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 the 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.
- A Do not operate unless the oil level is in the normal range.

#### 2) REPLACEMENT OF ENGINE OIL AND OIL FIL-TER

- (1) Warm up the engine.
- (2) Open the drain cock and allow the oil to drain.
  - ※ A drain pan with a capacity of 40 ℓ (10.6
     U.S. gallons) will be adequate.



Dipstick

- (3) Clean around the filter head, remove the filter with a filter wrench and clean the gasket surface.
  - Wrench size: 120 mm (4.72 in)
  - \* The O-ring can stick on the filter head. Make sure it is removed before installing the new filter.



(4) Apply a light film of lubricating oil to the gasket sealing surface before installing the filters.
 **※ Fill the filters with clean lubricating oil.**



- (5) Install the filter to the filter head.
  - Mechanical over-tightening may distort the threads or damage the filter element seal.
    - Install the filter as specified by the filter manufacturer.



(6) Fill the engine with clean oil to the proper level.
Quantity: 38 ℓ (10 U.S. gallons)



 (7) 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 COOLANT

- (1) Check if the level of coolant in reservoir tank is between FULL and LOW.
- (2) Add the mixture of antifreeze and water after removing the cap of the reservoir tank if coolant is not sufficient.
- (3) Be sure to add the coolant by opening the cap of radiator when coolant level is below LOW.
- (4) Replace gasket of radiator cap when it is damaged.
- A Hot coolant can spray out if radiator cap is removed while engine is hot. Remove the cap after the engine has cooled down.





#### 4) FLUSHING AND REFILLING OF RADIATOR

#### (1) Change coolant

- Avoid prolonged and repeated skin contact with used antifreeze. Such prolonged repeated contact can cause skin disorders or other bodily injury.
   Avoid excessive contact. Wash thoroughly after contact.
   Keep out of reach 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.

A 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 removing the plug in the bottom of the water inlet. A drain pan with a capacity of  $50 \ \ell$  (13 U.S. gallons) will be adequate in most applications.

#### (2) Flushing of cooling system

- Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).
  - W Use 0.5 kg (1.0 pound) of sodium carbonate for every 23 liters (6.0 U.S. gallons) of water.
  - \* Do not install the radiator cap. The engine is to be operated without the cap for this process.







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 radiator 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

 Use a mixture of 50 percent water and 50 percent ethylene glycol antifreeze to fill the cooling system.

Coolant capacity (engine only): 10.4 ℓ (2.7 U.S. gallons).

\* Use the correct amount of DCA4 corrosion inhibitor to protect the cooling system.



Install the pressure 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.



#### 5) 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.
- 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.





#### 6) 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 Hyundai distributor.



#### 7) FAN BELT TENSION

- (1) Use the belt tension gauge to measure the belt tension.
  - Fan belt tension : 11.3 kg (25 lb)
- (2) Turn the idler pulley adjusting screw (A) clockwise to increase the belt tension.
- (3) Tighten the idler pulley shaft lockout (B) tightening torque:
   19.4 kgf • m (140 lb • ft)





(4) Inspect the drive for damage.



(5) Inspect the drive belt, tension bearing and fan hub.



#### 8) INSPECTION OF COOLING FAN

- A Personal 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 barring 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.

#### 9) CLEANING OF AIR CLEANER

#### (1) **Primary element**

- Loosen the wing nut and remove the element.
- 2 Clean the inside of the body.
- ③ Clean the element with pressurized air.
  - Remove the dust inside of the element by the pressurized air (below 3 kgf/cm<sup>2</sup>, 40 psi) forward and backward equally.
- ④ Inspect for cracks or damage of element by putting a light bulb inside of the element.
- 5 Insert element and tighten wing nut.
- \* Replace the primary element after 4 times cleanings.





- (2) Safety element
  - Replace the safety element only when the primary element is cleaned for the 4 times.
  - Always replace the safety element. Never attempt to reuse the safety element by cleaning the element.



#### 10) FUEL TANK

- (1) Fill fuel fully when system the operation to minimize water condensation, and check it with fuel 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.
  - A Stop the engine when refueling. All lights and flames shall be kept at a safe distance while refueling.

#### **11) REPLACEMENT OF FUEL FILTER**

- (1) Clean around the filter head, remove the filter and clean the gasket surface.
- (2) Replace the O-ring.
- (3) Fully fill fuel in the new filter.
- (4) Apply engine oil on the gasket of filter when mounting, and tighten 1/2 to 3/4 turn more after the gasket touches the filter head.
- (5) Relieve the air after mounting.
  - \* Check for fuel leakage after the engine starts.
  - \* If air is in the fuel system, the engine will not start. Start engine after bleeding the air according to the method of bleeding air.





#### **12) FUEL/WATER SEPARATOR**

- Drain the water and sediment from the separator daily.
- Shut off the engine.
- Use your hand to open the drain valve.
- Turn the valve counterclockwise 3-1/2 complete turns until the valve drops down 1".
- Drain the filter sump of water until clear fuel is visible.
  - Do not overtighten the valve.
     Overtightening can damage the threads.
- Push the valve up and turn the valve clockwise to close the drain valve.



#### **13) PREFILTER**

\* 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.



#### (2) Replace element

- ① Drain the unit of fuel. Follow "Drain water" instructions above.
- 2 Remove element, fuel warmer 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, fuel warmer and bowl to the head.

#### 14) CORROSION RESISTOR (COOLANT FILTER)

- ▲ Do not remove the radiator cap from a hot engine. Wait until the coolant temperature is below 50°C (120°F) before removing the radiator cap. Heated coolant spray or steam can cause personal injury.
- (1) Remove the radiator cap.



- (3) Remove and discard the filter.Clean the coolant filter head gasket's surface.
  - A small amount of coolant can leak when servicing the filter with the shutoff valve in the OFF position. To avoid personal injury, avoid contact with hot coolant.







- (4) Apply a thin film of clean engine oil to the gasket sealing surface before installing the new filter.
  - If the filter canister is damaged in any way, do not use it. Dents or scrapes can lead to a rupture or premature failure of the filter.



- (5) Install a new filter on the filter head.Tighten the filter until the gasket contacts the filter head surface.
- (6) Tighten the filter an additional 1/2 to 3/4 of a turn.
  - Mechanical overtightening can distort the filter threads or damage the filter head.



- (7) Turn the valve to the ON position, and install the radiator cap.
- (8) Operate the engine and check for leaks.
  - \* The valve must be in the ON position to prevent engine damage.



#### 15) LEAKAGE OF FUEL

▲ Be careful and clean the fuel hose, injection pump, fuel filter and other connections as the leakage from these part can cause fire.



#### **16) HYDRAULIC OIL CHECK**

- (1) Stop the engine after retract the arm and bucket cylinders, then lower the boom and set the bucket on the ground at a flat location as in the illustration.
- (2) Check the oil level at the level gauge of hydraulic oil tank.
- (3) The oil level is normal if between the red lines.



#### **17) FILLING HYDRAULIC OIL**

- (1) Stop the engine to the position of level check.
- (2) Loosen the cap and 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.



#### **18) CHANGE HYDRAULIC OIL**

- (1) Lower the bucket on the ground pulling the arm and bucket cylinder to the maximum.
- (2) Loosen the cap and 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.
- (5) To drain the oil loosen the drain plug at the bottom of the oil tank.
- (6) Fill proper amount of recommended oil.
- (7) Put the breather in the right position.
- (8) To bleed the air from the hydraulic pump, loosen the air breather at the top of the hydraulic pump assembly.
- (9) Start engine and run continually. Release the air by full stroke of each control lever.



#### **19) CLEAN SUCTION STRAINER**

Clean suction strainer as follows paying attention to the cause to be kept during oil filling.

- (1) Remove the cover on the top of the oil tank.
  - Tightening torque :  $6.9 \pm 1.4 \text{ kgf} \cdot \text{m}$ (50 ± 10 lbf • ft)
- (2) Pull out the strainer in the tank.
- (3) Wash the foreign material on the suction strainer with gasoline or cleaning oil.
- (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 the bolt slowly at the cover can be spring out by the spring when removing it.



#### 20) REPLACE RETURN FILTER

Replace as follows paying attention to the cause to be kept during the replacement.

(1) Remove the cover.

- (2) Remove the spring, by-pass valve, and return filter in the tank.
- (3) Replace the element with new one.


### 21) REPLACEMENT OF ELEMENT IN HYDRAUL-IC TANK BREATHER

- (1) Loosen the cap and relieve the pressure in the tank by pushing the top of the air breather.
- (2) Loosen the lock nut and remove the cover.
- (3) Pull out the filter element.
- (4) Replace the filter element with the new one.
- (5) Apply oil on the O-ring and reassemble by reverse order of disassembly.
  - Tightening torque : 0.2–0.3 kgf m (1.4–2.1 lbf • ft)



### 22) REPLACEMENT OF DRAIN FILTER CAR-TRIDGE

Clean the dust around filter and replace with new one after removing the cartridge.

- \* Tighten about 2/3 turn more after the gasket of cartridge contacts seal side of filter body for mounting.
- \* Change cartridge after initial 250 hours of operation. Thereafter, change cartridge every 1000 hours.

### 23) REPLACEMENT OF PILOT LINE FILTER

- (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.
  - \* Change cartridge after initial 250 hours of operation. Thereafter, change cartridge every 1000 hours.





### 24) CHECK 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.



### **25) CHANGE SWING REDUCTION GEAR OIL**

- Raise the temperature of oil by swinging the machine before replacing the oil and park the machine on the flat ground.
- (2) Prepare into a proper container.
- (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 : 5.0 ℓ

(1.3 U.S. gal)

## 26) LUBRICATE BEARING OF OUTPUT SHAFT IN REDUCTION GEAR

- (1) Remove the air vent plug.
- (2) Lubricate NLGI No. 2 with a grease gun until new grease comes out from air vent port.

<ul> <li>Amount of oil</li> </ul>	: 1.2 ℓ
	0.3 U.S. gal





### **27) LUBRICATE SWING BEARING**

- (1) Grease at 3 fittings.
- ※ Lubricate every ₽6<sup>⊕</sup> hours.



### **28) SWING GEAR AND PINION**

### (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: 15.4 kg (34 lb)



### 29) CHECK THE TRAVEL REDUCTION GEAR OIL

- Operate the machine to the position of drain plug down to the flat ground.
- 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.
   Amount of oil: 5.0 ℓ (1.3 U.S. gal)



## 30) CHANGE THE TRAVEL REDUCTION GEAR OIL

- (1) Raise the temperature of the oil by traveling machine first.
- (2) Stop when the position of the drain plug is down.
- (3) Loosen the level plug and then the drain plug.
- (4) Drain the oil to adequate container.
- (5) Tighten the drain plug and fill specified amount of oil at filling port.
- (6) Tighten the level plug and travel slowly to check if there is any leakage of oil.

### **31) LUBRICATE RCV LEVER**

Remove the bellows and with a grease gun grease the joint part (A) and sliding parts (B).





### **32) ADJUSTMENT OF TRACK TENSION**

- It is important to adjust the tension of track properly to extend the lifetime of track and traveling device.
- 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.
- (2) Measure the distance between bottom of track frame on track center and track of shoe.
  - Remove mud by rotating the track before measuring.

Working condition	Leng	th (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"



(3) If the tension is tight, drain the grease in the grease nipple and if the tension is loose, charge the grease.

- A Personal injury or death can result from grease under pressure.
- A When loosening the grease nipple, do not loosen more than one turn as there is a danger of a spring coming out of the nipple because of the high pressure inside.
- When the grease is drained, move the track forward and backward slightly. If the track tension is loose even after the grease is charged to the maximum, change the pins and bushings as there are worn seriously.

### **33) REPLACEMENT OF BUCKET**

- A 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 signals to each other and work carefully for safety's sake.
- (1) Lower the bucket on the ground as the picture shown in the right.
- (2) Lock the safety lever to the LOCK position and stop the engine.





- (3) Remove the stopper bolts (1) and nuts (2), then remove pins (3, 4) and remove the bucket.
  - $\ast\,$  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 get contaminated with sand or mud and that the seals of bushing on both sides do not get 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 knocking 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.



### 34) REPLACEMENT OF BUCKET TOOTH

### (1) Timing of replacement

- Check wearing condition as shown in the illustration and replace tooth tip before adapter starts to wear.
- ② If excessively used, the tooth adapter may have worn out, and replacement may become impossible.



### (2) Instructions for replacement

- Pull out pin by striking pin with punch or hammer, avoiding damage to locking washer.
- ② Remove dust and mud from the tooth adapter surface with a knife.
- ③ Place locking rubber in its proper place, and fit tooth tip to adapter.
- ④ Insert pin until locking washer is positioned at tooth pin groove.
- A Personal injury can result from bucket falling.
- A Block the bucket before changing tooth tips or side cutters.



### **35) ADJUSTMENT OF BUCKET CLEARANCE**

- (1) Lower the bucket on the ground as the picture shown in the right.
- (2) Swing to the left and keep the arm boss to be contact to the bucket left.
- (3) Lock the safety lever to the LOCK position andstop the engine.
- (4) Measure the clearance (A) between bucket and arm boss. This is the total clearance.

### (5) Adjusting

- 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
     29.6 ± 3.2 kgf m
     (214.0 ± 23.1 lbf ft)
  - Normal clearance
     0.5-1.0 mm
     (0.02-0.04 in)
  - \* If the bucket is not adjusted correctly, noise and vibration created during operation, and damaged Oring, pin and bushing quickly.



### 36) 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	2
3	Boom and arm connection pin	1
4	Arm cylinder pin (Rod side)	1
	Bucket cylinder pin (Head, rod)	2
_	Bucket link (Control rod)	3
5	Arm and control link connection pin	1
	Arm and bucket connection pin	1
6	Boom rear bearing center	1

- Shorten the lubricating interval when working in water or on dusty sites.
- (2) Dust seals are mounted on the rotating part of working device to extend the lubricating interval.
  - Mount the lip to be faced outside when replace the dust seal.





- If it is assembled in wrong direction, it will cause fast wear of pin and bushing, and create noise and vibration during operation.
- \* Assemble the seal same direction with picture and use with plastic hammer when replace.



## 37) LUBRICATE PIN AND BUSHING (R520LC-9 DM only)

(1) Lubricate to each pin of working device Lubricate the grease to the grease nipple according to the lubricating interval.

No.	Description	Qty
1	Boom foot pin	2
2	Boom cylinder	2
3	Middle arm cylinder	1
4	Middle arm boss	2
5	End arm cylinder	1
6	End arm boss	1
7	Crusher cylinder	1



- If the equipment has been run in water, the front attachment should be greased on a 10 hour/daily basis.
  - Position the machine as shown above and lower the front attachment on the ground and stop the engine.
  - Press the grease fitting and inject the grease gun on the marked point.
  - After the injection, clean off the old grease that has been purged.

### 7. ELECTRICAL SYSTEM

### 1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



### 2) BATTERY

- (1) Clean
  - Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.
  - A 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.
     Wash with clean water and go to the doctor if it enters the eyes.
- (2) Recycle

Never discard a battery.

Always return used batteries to one of the following locations:

- a battery supplier
- an authorized battery collection facility
- a 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.





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### 3) STARTING THE ENGINE WITH A BOOS-TER CABLE

Keep following order when you are going to start engine using booster cable.

### (1) Connecting the booster cable

- **\*** Use the same capacity of battery for starting.
- Make sure that the starting switches of the normal machine and trouble machine are both at 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 to the battery (-) terminal between exhausted and new battery.



### **\*** Keep firmly all connections, the spark will be caused when connecting finally.

### (2) Starting the engine

- Starting the engine of the normal machine and keep it to run at high idle.
- ② Start engine of the trouble machine with starting switch.
- ③ If you can not start it by one time, restart the engine after 2 minutes.

### (3) Disconnecting the booster cable

- 1) Take off the booster cable (black).
- ② Take off the booster cable (red) connected to the (+) terminal.
- ③ Run engine with high idle until charging the exhausted battery by alternator, fully.
- ▲ Explosive gas is generated while using the battery or charging it. Keep away flame and be careful not to cause the spark.
- \* Charge the battery in the well ventilated place.
- \* Place the machine on the earth or concrete. Avoid charging the machine on the steel plate.





Do not connect (+) terminal and (-) terminal when connecting booster cable because it will be shorted.

### (4) Welding repair

Before start to welding, follow the below procedure.

- Shut off the engine and remove the starting switch.
- 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 (Cluster etc).
- ④ Connect the earth (ground) lead of the welding equipment as close to the welding point as possible.
- \* Do not weld or flame cut on pipes or tubes that contain flammable fluids. Clean them thoroughly with nonflammable solvent before welding or flame cutting on them.
- A Do not attempt to welding work before carry out the above. If not, it will cause serious damage at the electric system.



### 8. AIR CONDITIONER AND HEATER

1) CLEAN AND REPLACE OF FRESH AIR FIL-TER

### **\*** Always stop the engine before servicing.

(1) Move seat and console box to arrow direction using the adjust lever.



- (2) Remove the fresh air filter.
  - \* When installing a filter, be careful not to change the filter direction.



- (3) Clean the filter using pressurized air (Below 2 kgf/cm<sup>2</sup>, 28 psi).
  - riangle When using pressurized air, be sure to wear safety glasses.
- (4) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.



### 2) **CLEAN AND REPLACE OF INNER FILTER \*** Always stop the engine before servicing.

(1) Move seat and console box to arrow direction using the adjust lever.

(2) Remove recirculation filter.

- (3) Clean the recirculation filter using a pressurized air (Below 2 kgf/cm<sup>2</sup>, 28 psi) or washing with water.
  - $\triangle$  When using pressurized air, be sure to wear safety glasses.
  - \* Dry off after washing with water.
- (4) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.



Recirculation filter

#### 3) PRECAUTIONS FOR USING AIR CONDITIONER

- When using the air conditioner for a long time, open the window once every one hour. (1)
- (2) Be careful not to overcool the cab.
- The cab is properly cooled if the operator feels cool when entering there from outside (3) (About 5°C lower than the outside temperature).
- (4) When cooling, change air occasionally.

#### **CHECK DURING SEASON** 4)

Ask the service center for replenishment of refrigerant or other maintenance service so that the cooling performance is not damaged.







### 5) CHECK DURING OFF-SEASON

Operate the air conditioner 2 or 3 times a month (each for a few minutes) to avoid loss of oil film in the compressor.

## 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 ON	Add the oil to the specified level.	
when engine speed is raised after com- pletion of warm up.	Replace the oil filter cartridge.	
	<ul> <li>Check oil leakage from the pipe or the joint.</li> </ul>	
	Replace the monitor.	
Steam is emitted from the top part of the	<ul> <li>Supply the coolant and check leakage.</li> </ul>	
radiator (the pressure valve).	<ul> <li>Adjust fan belt tension.</li> </ul>	
	<ul> <li>Wash out inside of cooling system.</li> </ul>	
	Clean or repair the radiator fin.	
	Check the thermostat.	
	• Tighten the radiator cap firmly or replace the packing of it.	
	Replace the monitor.	
The engine does not start when the start-	Add fuel.	
ing motor is turned over.	<ul> <li>Repair where air is leaking into fuel system.</li> </ul>	
	Check the injection pump or the nozzle.	
	Check the valve clearance.	
	Check engine compression pressure.	
	<ul> <li>In cold weather, check if the fuel warmer system is working correctly.</li> </ul>	Refer to pages 3-25 and 4-4.
Exhaust gas is white or blue.	<ul> <li>Adjust to specified oil quantity.</li> </ul>	
	Replace with specified fuel.	
Exhaust gas occasionally turns black.	• Clean or replace the air cleaner element.	
	Check the nozzle.	
	Check engine compression pressure.	
	Clean or replace the turbocharger.	
Combustion noise occasionally changes to breathing sound.	Check the nozzle.	
Unusual combustion noise or mechani-	Check with specified fuel.	
cal noise.	Check over-heating.	
	Replace the muffler.	
	Adjust valve clearance.	

## 2. ELECTRICAL SYSTEM

Trouble	Service	Remark
Lamp does not glow brightly even when engine runs at high speed. I amp blinks while engine runs.	Check for loose terminals and open-cir- cuit wiring.	
	Adjust belt tension.	
Battery charging lamp does not go out	Check the alternator.	
even when engine runs at high speed.	Check and repair wiring.	
Unusual noise is emitted from the alterna- tor.	Check the alternator.	
Starting motor does not turn when start-	<ul> <li>Check and repair the wiring.</li> </ul>	
ing switch is turned ON.	Charge the battery.	
	<ul> <li>Check the starting motor.</li> </ul>	
	Check the safety relay.	
The pinion of the starting motor keeps go-	Charge the battery.	
ing in and out.	Check the safety relay.	
Starting motor turns the engine sluggishly.	Charge the battery.	
	Check the starting motor.	
The starting motor disengages before	Check and repair the wiring.	
the engine starts up.	Charge the battery.	
The engine warming up lamp does not	Check and repair wiring.	
go ON.	Check the monitor.	
The engine oil pressure lamp does not	Check the monitor.	
light up when engine is stationary (when the starting switch is in ON position).	Check the caution lamp.	
Battery charging lamp does not light up	Check the monitor.	
when the engine is stationary (when the starting switch is in ON position).	Check and repair the wiring.	

## 3. OTHERS

Trouble	Trouble	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 hydraul-	Clean the oil cooler.	
ic oil.	Adjust fan belt tension.	
	<ul> <li>Add oil to specified level.</li> </ul>	

## HYDRAULIC BREAKER AND QUICK CLAMP

### **1. SELECTING THE HYDRAULIC BREAKER**

- 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 applying a breaker to the machine, consult your local Hyundai dealer 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 230 bar.
- 3) The pressure of the ROBEX480/520LC-9 system is 330 kgf/cm<sup>2</sup> (4700 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.
  - Flow level : Reduce the operating flow from maximum flow.
    - Breaker: Max 7 steps, reduced 10 lpm each step.



Oil quantity setting

48098HB02

- (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.
- 5) The accumulator should be used to the breaker charging and return line. If the accumulator is not used, it will be damage as the input wave is delivered.
  - Keep the pressure pulsation of pump below 60 kgf/cm<sup>2</sup> (853 psi) by installing the accumulator.
- 6) Do not connect the breaker return line to the main control, but connect to the return line front of the cooler.
- 7) Do not connect the breaker return line to drain lines, such as of swing motor, travel motor or pump, otherwise they should be damaged.
- 8) One of spool of the main control valve should be connected to the tank.
- 9) Select the size of pipe laying considering the back pressure.
- 10) Shimless tube should be used for the piping. The hose and seal should be used Hyundai genuine parts.
- 11) Weld the bracket for pipe clamp to prevent damage caused by vibration.

### **3. MAINTENANCE**

### 1) MAINTENANCE OF HYDRAULIC OIL AND FILTER

- (1) As machine with an hydraulic breaker provides the hydraulic oil becomes severely contaminated.
- (2) So, unless frequently maintained, the machine may easily go out of order.
- (3) Inspect and maintain hydraulic oil and 3 kinds of filter elements in particular, in order to prolong machine life.

Service interval			unit: hours
Attachment	Operating rate	Hydraulic oil	Filter element
	4000/	600 <sup>*1</sup>	
Breaker	100%	1000 <sup>*2</sup>	200
*1: Conventional hydraulic oil	•	•	

<sup>\*2</sup>: Hyundai genuine long life hydraulic oil

### Replace the following filters at the same time:

- Hydraulic return filter: 1EA
- Pilot line filter: 1EA
- Drain filter cartridge: 1EA

### 2) RELEASE THE PRESSURE IN BREAKER CIRCUIT

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

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

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

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

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

Average operating 60 Time to change oil rate of (%) 200 3000 4000 5000 Operating hours of machine(Hr)

Hyd oil change guide for hydraulic breaker

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### **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.



### 2) DO NOT USE BREAKER TO CARRY BRO-KEN STONE OR ROCK BY SWING OPER-ATING

This may damage the operation device and swing system.



### 3) OPERATE BREAKER WITH A GAP IN EX-CESS OF 100 mm (4 in) FROM THE END OF THE STROKE TIP

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



### 4) IF THE HYDRAULIC HOSES VIBRATE EX-CESSIVELY

If the machine used in this condition continuously this will effect badly on the machine such as loosening bolt, oil leakage, damage of pump pipe and etc.



5) DO NOT CONTINUE TO WORKING OVER ONE MINUTE AT SAME POSITION OF BOOM AND ARM

This will increase the temperature of the oil, and cause problem in the accumulator and seals.



### 6) 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.



## 7) DO NOT WORK WHILE SWING STATE

Do not work while swing position of superstructure.

It cause the band of track shoe, oil leakage of roller.



### 8) TAKE CARE OF CHISEL AND BOOM INTER-FACE

Make sure of the arm and bucket control lever operation.



### **5. QUICK CLAMP**

### 1) FIXING BUCKET WITH QUICK CLAMP

- (1) Before fixing bucket, remove safety pin of the moving hook.
- (2) Pulling safety button, press the quick clamp switch to unlock position. Then, the moving hook is placed on release position.



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



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



(5) Press the safety button to the 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 BEFORE USING QUICK CLAMP
  - A When operating the machine with a quick clamp, confirm that the quick clamp switch is in the LOCK position and the safety pin of moving hook is inserted.

Operating the machine with the quick clamp switch unlocked and without the safety pin of moving hook can cause the bucket to drop off and cause accidents.

- LOCK UNLOCK
- A Serious injury or death can result from this accident.
- A Be careful to operate the machine equipped with quick clamp. The bucket may hit cab, boom and boom cylinders when it reaches vicinity of them.
- ※ Hyundai will not be responsible for any injury or damage in case that safety pin is not installed properly.



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