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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 "98/37/EEC".

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.

3. 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 non-genuine 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.

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.

EC REGULATION APPROVED

· Noise level (EN474-1 ANNEX4.10 and 2000/14/EC) are as followings.

LWA : 102dB(EU only)

101dB(EU only) : LOW NOISE

LPA : 72dB

· The value of vibrations transmitted by the operator's seat are lower than standard value of (EN474-1 ANNEX 4.3.1.3)

CE

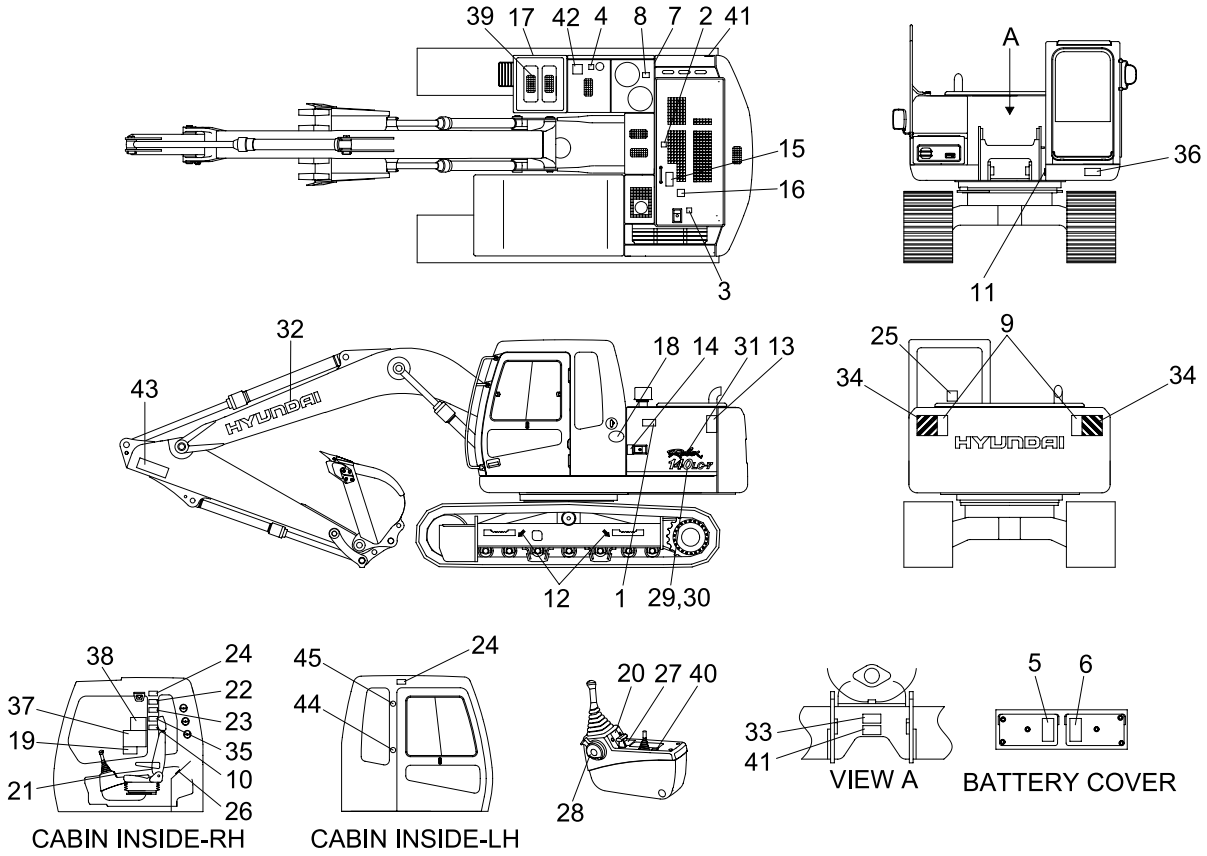
TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

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 U.S.A Address	Hyundai Heavy Industries U.S.A, Inc 6100 Atlantic Boulevard Norcross GA 30071 U.S.A
Distributor for Europe Address	Hyundai Heavy Industries Europe N. V. Vossendal 11 2240 Geel Belgium
Dealer Address	

SAFETY LABELS

1. LOCATION

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



1	Air cleaner filter	16	No step-engine hood	31	Logo(ROBEX)
2	Turbo charger cover	17	Transporting	32	Trade mark(Boom)
3	Radiator cap	18	Low emission engine	33	Grease-reduction gear
4	Fueling	19	Control ideogram	34	Keep clear-work area
5	Battery corrosive	20	Control ideogram(LH)	35	Interference
6	Battery explosion(-#1000)	21	Control ideogram(RH)	36	Noise level LWA
7	Hydraulic oil level	22	Ref operator manual	37	Service instruction
8	Hydraulic oil lub	23	Max height	38	Lifting chart
9	Keep clear	24	Safety front window	39	Step tread
10	Clamp-locking	25	Alternate exit	40	Control ideogram-Dozer
11	Name plate	26	Air conditioner filter	41	Hose-pressure(#1001-)
12	Slinging ideogram	27	Console box tilting	42	Falling(#1001-)
13	Side keep clear	28	Safety lever	43	Keep clear-Boom/Arm(#1001-)
14	Stay fix	29	Model name(LH)	44	Hammer(#1001-)
15	Shearing-engine hood	30	Model name(RH)	45	Fire extinguisher(#1001-)

2. DESCRIPTION

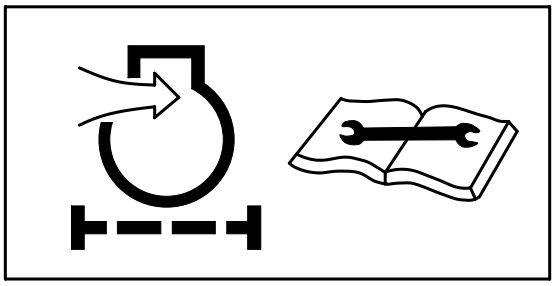
There are several specific warning labels on this machine please become familiarized with all warning labels.

Replace any safety label that is damaged, or missing.

1) AIR CLEANER FILTER(Item 1)

This warning label is positioned on the air cleaner cover.

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

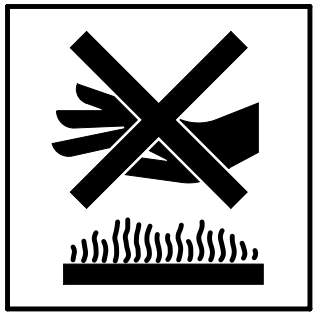


21070FW01

2) TURBO CHARGER COVER(Item 2)

This warning label is positioned on the turbo charger cover.

⚠ **Do not touch turbo charger or it may cause severe burn.**



21070FW02

3) RADIATOR CAP(Item 3)

This warning label is positioned on the radiator.

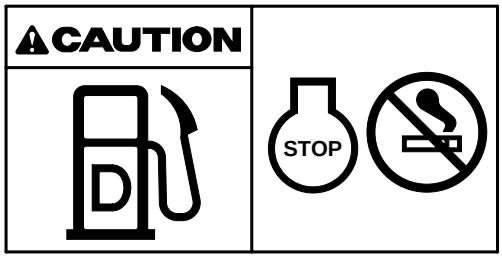
⚠ **Never open the filler cap while engine running or at high coolant temperature.**

14070FW03

4) FUELING(Item 4)

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

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



21070FW04

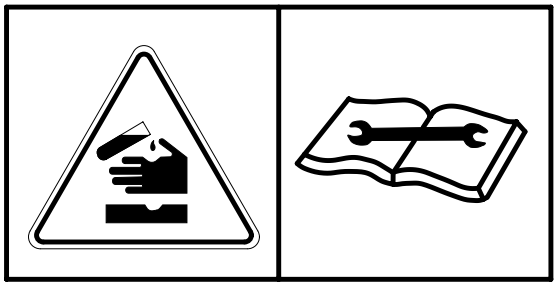
5) BATTERY CORROSIVE(Item 5, -#1000)

This warning label is positioned on the battery cover.

⚠ **Electrolyte containing sulfuric acid cause severe burns. Avoid being in contact with skin, eyes or clothes. In the event of accident flush with sufficient water, 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 accmulated in the battery.



21070FW05

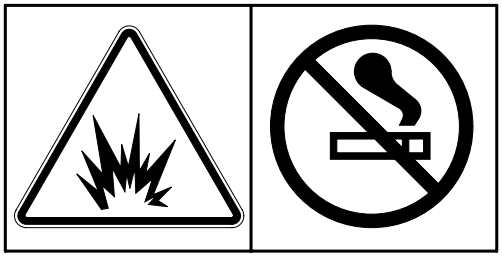
6) BATTERY EXPLOSION(Item 6, -#1000)

This warning label is positioned on the battery cover.

⚠ **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.**

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



21070FW06

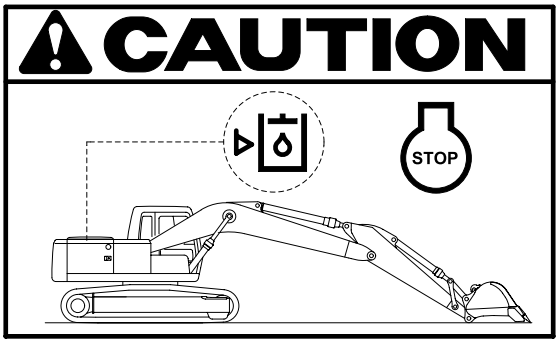
7) HYDRAULIC OIL LEVEL(Item 7)

This warning label is positioned on the left side of hydraulic oil level.

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

※ **Check oil level on the level gauge.**

※ **Refill the recommended hydraulic oil up to specified level if necessary.**



14070FW07

8) HYDRAULIC OIL LUBRICATION(Item 8)

This warning label is positioned on the right side of air breather.

※ **Do not mix with different brand oils.**

⚠ **Never open the filler cap while engine running or at high coolant temperature.**

⚠ **Loosen the cap slowly and release internal pressure completely.**

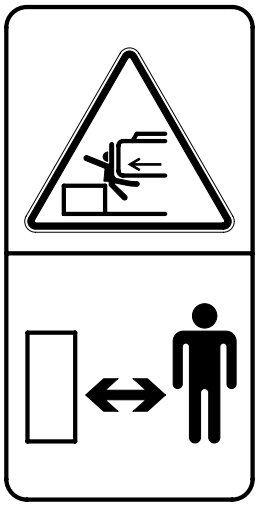
14070FW08

9) KEEP CLEAR(Item 9)

This warning label is positioned on the counterweight.

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

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



21070FW28

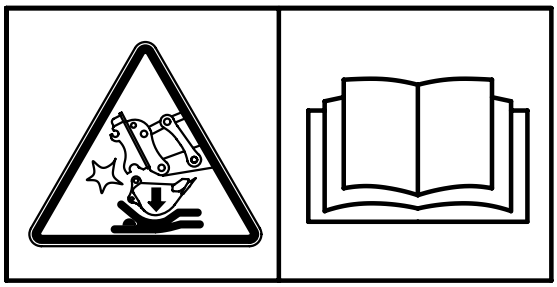
10) CLAMP-LOCKING(Item 10)

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

⚠ **Serious injury or death can result from dropping bucket.**

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

※ **See page 8-6 for details.**



14070FW60

11) SIDE KEEP CLEAR(Item 13)

This warning label is positioned on the side of counterweight.

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

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

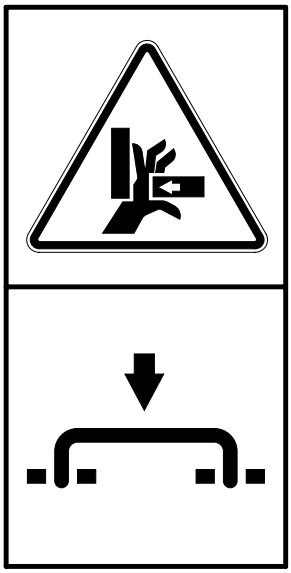
21070FW13

12) STAY FIX(Item 14)

This warning label is positioned on the side cover.

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

⚠ **Be careful that the opened door may be closed by the external or natural force like strong wind.**



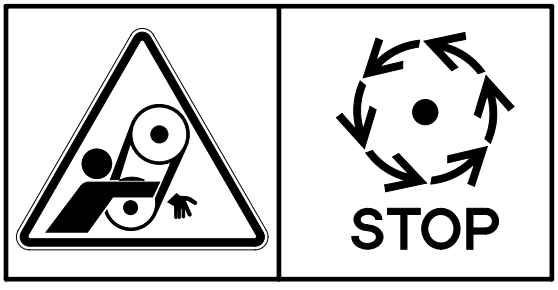
21070FW14

13) SHEARING-ENGINE HOOD(Item 15)

This warning label is positioned on the engine hood.

⚠ **Don't open the engine hood during the engine's running.**

⚠ **Don't touch exhaust pipe or it may cause severe burn.**



21070FW15

14) NO STEP-ENGINE HOOD(Item 16)

This warning label is positioned on the engine hood.

△ **Don't step on the engine hood.**

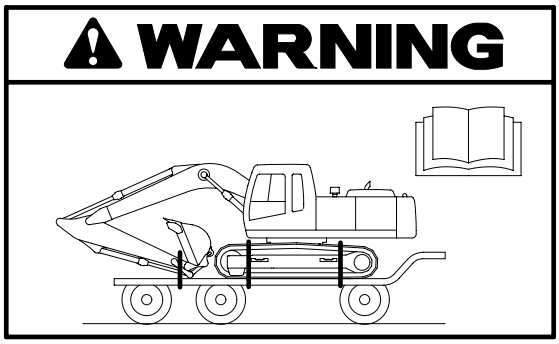
21070FW15

15) TRANSPORTING(Item 17)

This warning label is positioned right side of upper frame.

⚠ **Study the operator's manual before transporting the machine, if provided and tie down arm and track to the carrier with lashing wire.**

※ **See page 5-6 for details.**



14070FW17

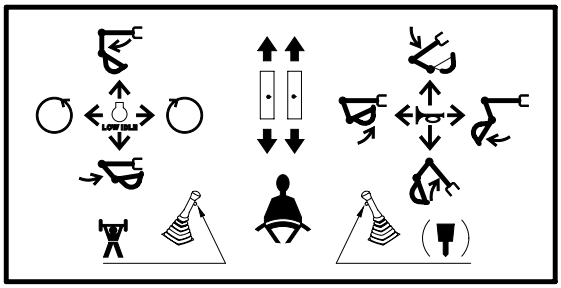
16) CONTROL IDEOGRAM(Item 19)

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

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

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

※ **See page 4-13 for details.**



290071FW19

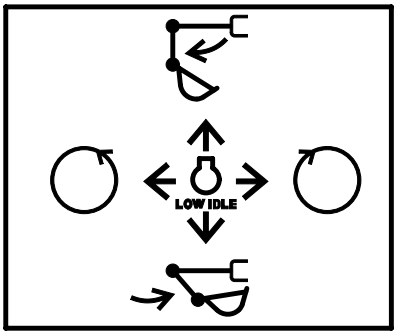
17) CONTROL IDEOGRAM-LH(Item 20)

This warning label is positioned on the LH console box.

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

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

※ **See page 4-13 for details.**



290070FW20

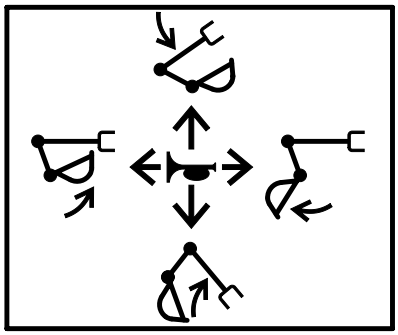
18) CONTROL IDEOGRAM-RH(Item 21)

This warning label is positioned on the RH console box.

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

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

※ **See page 4-13 for details.**

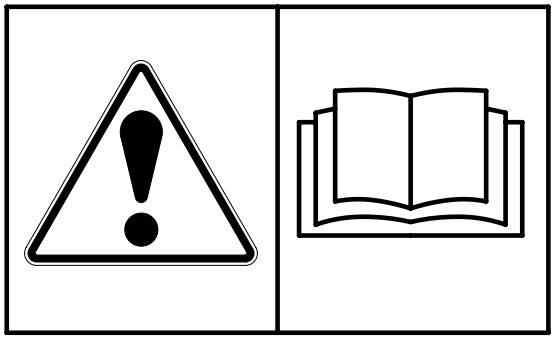


21070FW21

19) REF OPERATOR MANUAL(Item 22)

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

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



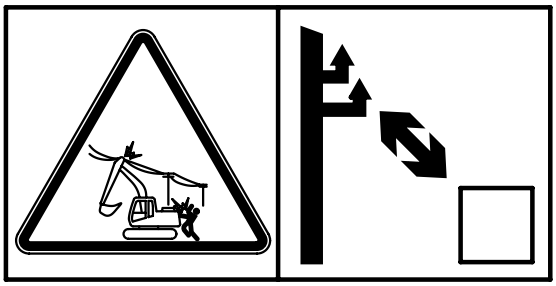
21070FW22

20) MAX HEIGHT(Item 23)

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

⚠ **Serious injury or death can result from contact with electric lines.**

An electric shock being received by merely coming into the vicinity of an electric lines, the minimum distance should be kept considering the supply voltage as page 1-7.

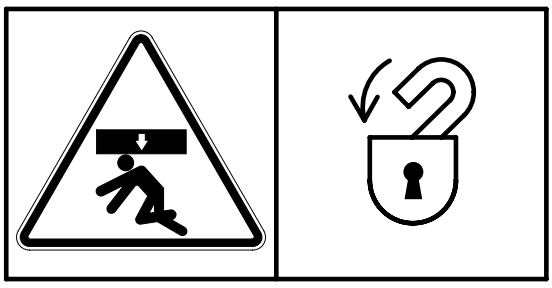


14070FW23

21) SAFETY FRONT WINDOW(Item 24)

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

⚠ **Be careful that the front window may be promptly closed.**



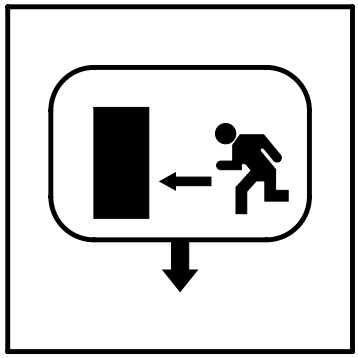
21070FW24

22) ALTERNATE EXIT(Item 25)

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

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

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

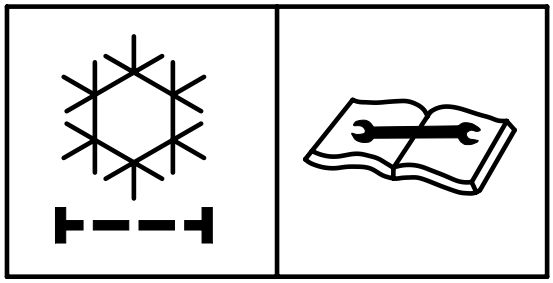


21070FW24

23) AIR CONDITIONER FILTER(Item 26)

This warning label is positioned on the air conditioner cover up.

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

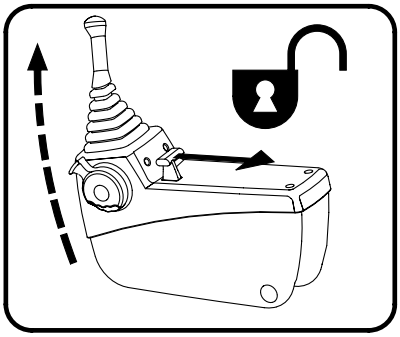


21070FW26

24) CONSOLE BOX TILTING(Item 27)

This warning label is positioned on the LH console box.

※ **Before you get off the machine be sure to tilt the LH console box.**

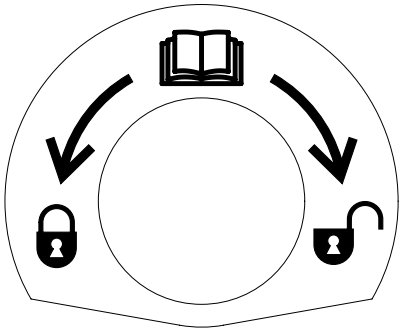


21070FW27

25) SAFETY LEVER(Item 28)

This warning label is positioned on the cover safety.

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



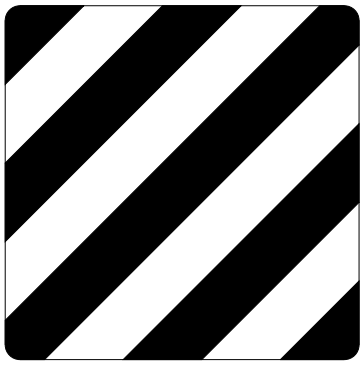
21070FW28

26) KEEP CLEAR-WORK AREA(Item 34)

This warning label is positioned counterweight.

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

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



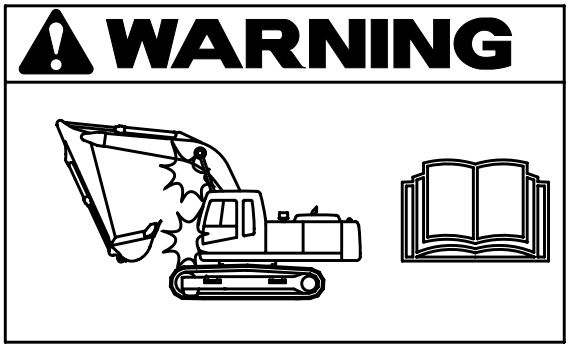
21070FW34

27) INTERFERENCE(Item 35)

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

⚠ **Be careful to operate machine equipped with quick clamp or extensions.**

⚠ **Bucket may hit cab or boom, boom cylinders when it reached vicinity of them.**



14070FW62

28) BATTERY(Item 5, #1001-)

This warming label is positioned on the battery cover.

⚠ **Electrolyte containing sulfuric acid cause severe burns. Avoid being in contact with skin, eyes or clothes. In the event of accident flush with sufficient water, call a physician immediately.**

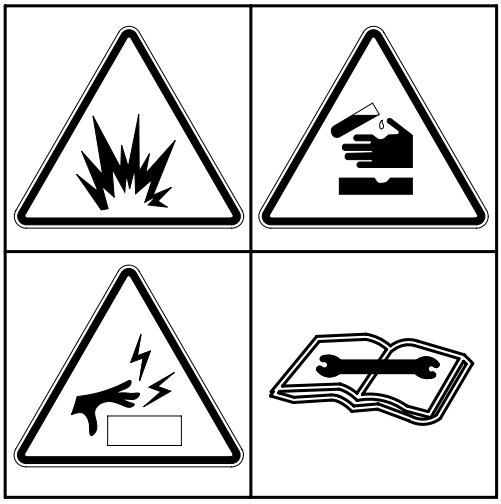
※ **Maintain the electrolyte at the recommended level. Add distilled water to the battery only when starting up, never when shutting down. With electrolyte at proper level, less space may cause the gases to be accmulated in the battery.**

⚠ **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.**

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

⚠ **To prevent serious personal injury or death, do net handle the battery with wet hands.**



14070FW28

29) HOSE-PRESSURE(Item 41, #1001-)

This warning label is positioned on the screen plate.

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

※ **Study the service manual before service job.**

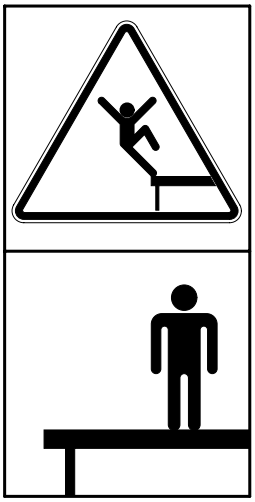
14070FW29

30) FALLING(Item 42, #1001-)

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

⚠ **Falling is one of the major cause of personal injury.**

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



14070FW30

31) KEEP CLEAR-BOOM/ARM(Item 43, #1001-)

This warning label is positioned on both side of the boom.

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

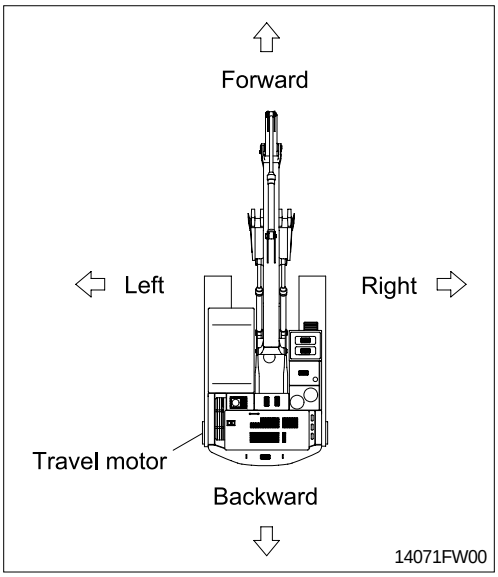
⚠ **To prevent serious injury or death, keep clear the underneath of attachment.**

14070FW31

GUIDE

1. DIRECTION

The direction of this manual indicate 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.

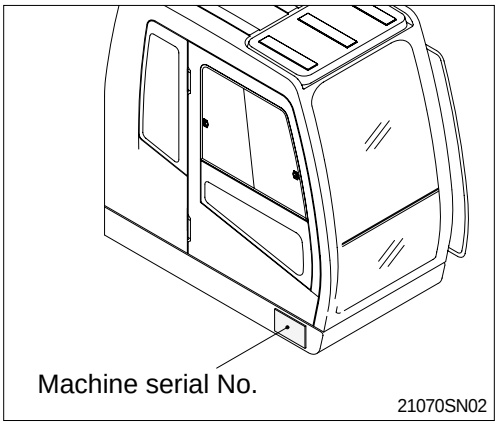


2. SERIAL NUMBER

Inform following when you order parts or the machine is out of order.

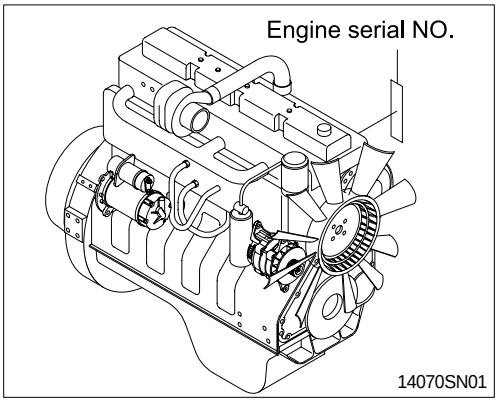
1) MACHINE SERIAL NUMBER

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



2) ENGINE SERIAL NUMBER

The numbers are located on the engine name plate.



3. SYMBOLS

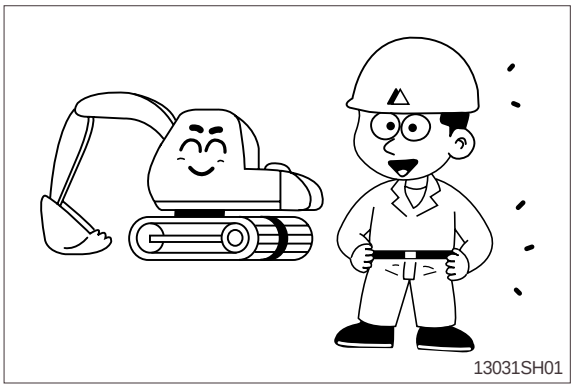
⚠ Important safety hint.

△ It indicates matters which can cause the great loss on the machine or the surroundings.

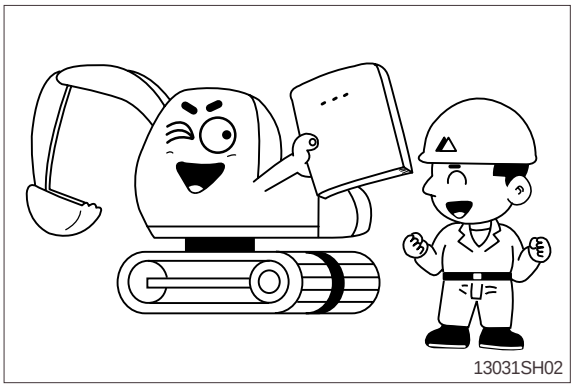
※ It indicates the useful information for operator.

1. BEFORE OPERATING THE MACHINE

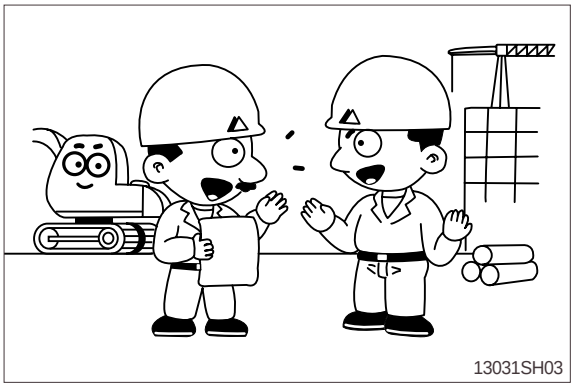
Think-safety first.
In special situation, wear protective clothing including a safety helmet, safety shoes, gloves, safety glasses and ear protection as required by the job condition.
Almost every accident are caused by disregarding the simple and fundamental safety hints.


13031SH01

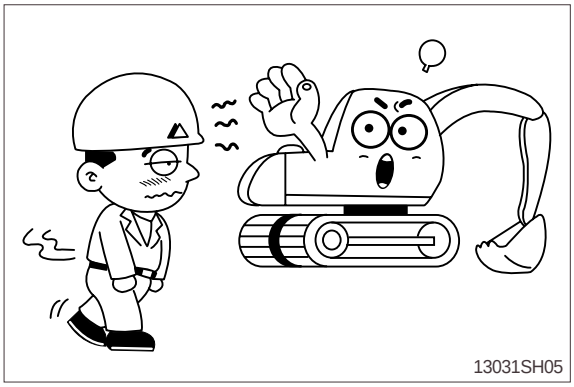
Be sure to understand thoroughly all about the operator's manual before operating the machine.
Proper care is your responsibility.


13031SH02

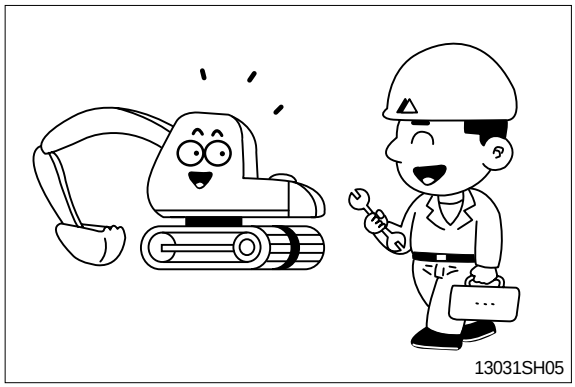
Fully understand the details and process of the construction before starting the work.
If you find anything dangerous on the job, consult with the job supervisor for the preventive measures before operating the machine.


13031SH03

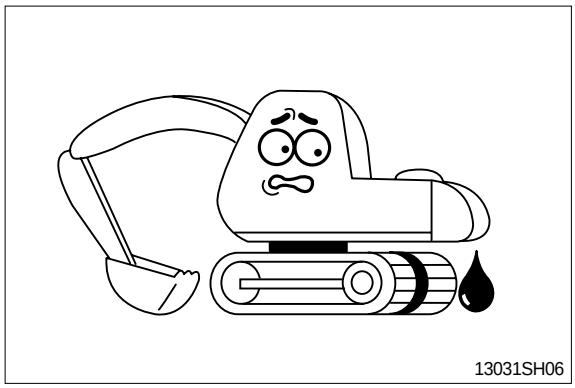
Do not operate when tired, or after drinking alcoholic beverages, or any type of drugs.


13031SH05

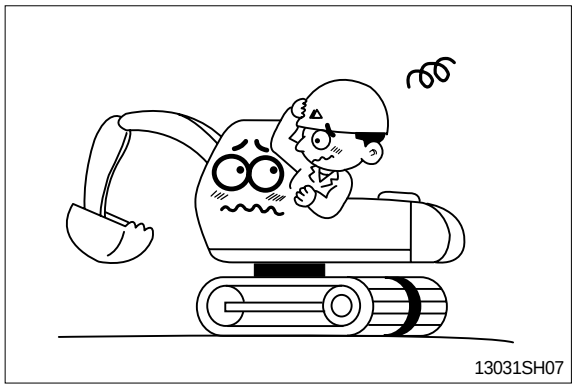
Check daily according to the operation manual.
Repair the damaged parts and tighten the loosened bolts.


13031SH05

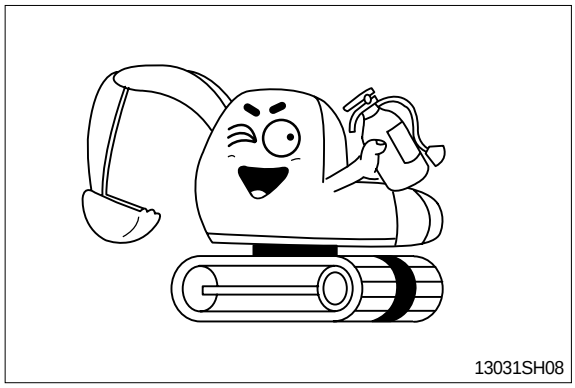
Check for leakage of engine oil, hydraulic oil, fuel and coolant.
Keep machine clean, clean machine regularly.


13031SH06

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.

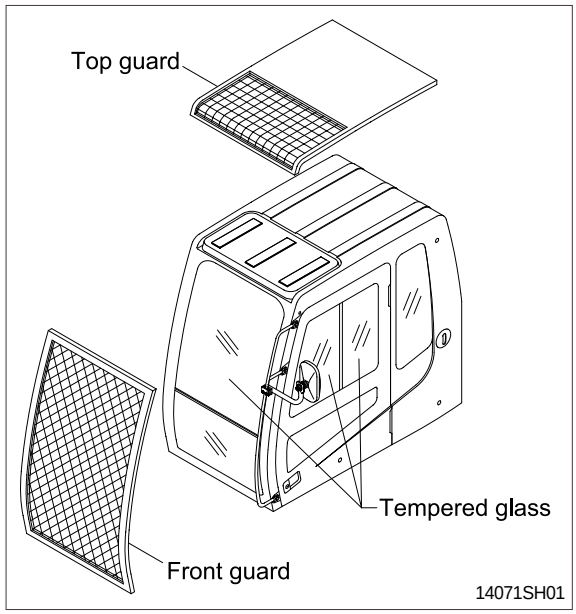

13031SH08

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 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 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.

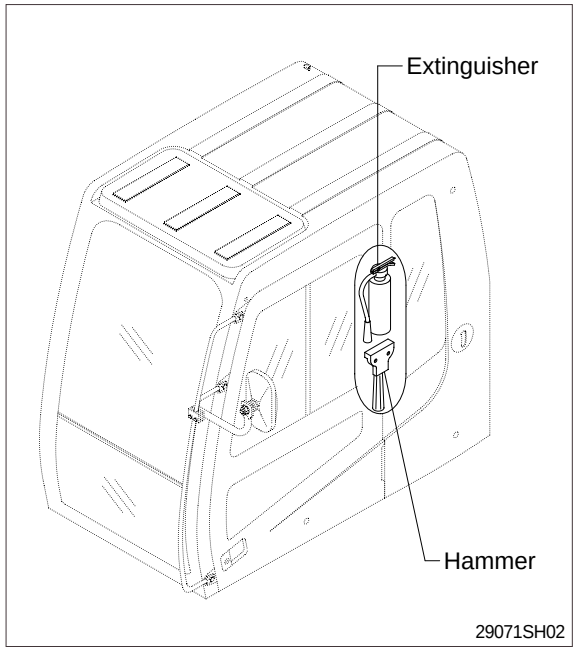
PREPARE FOR EMERGENCY

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.

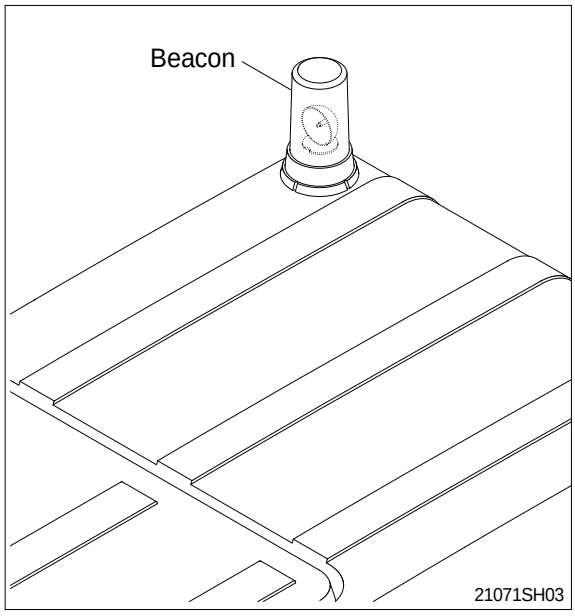
Be sure you know the phone numbers of persons you should contact in case of an emergency.



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 Hyundai 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 will not the responsibility of Hyundai.

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

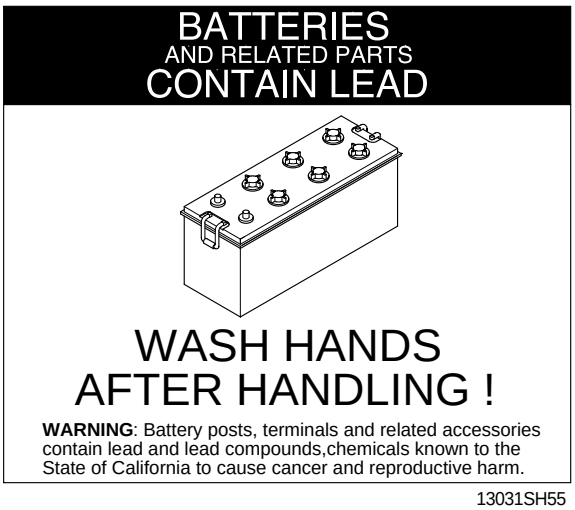
Check machine control pattern for conformance to pattern on label in cab.
If not, change label to match pattern before operating machine.
Failure to do so could result in injury.

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.

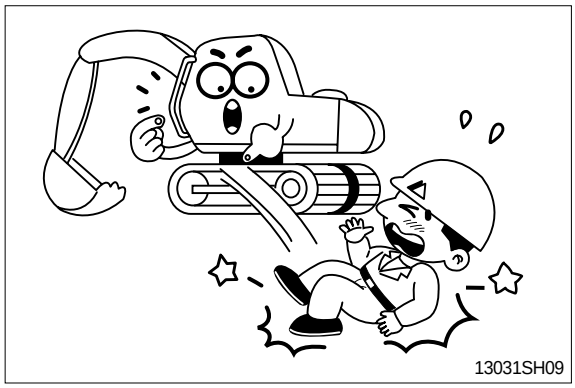
Battery posts, terminals and related accessories contain lead and lead compounds.
WASH HANDS AFTER HANDLING



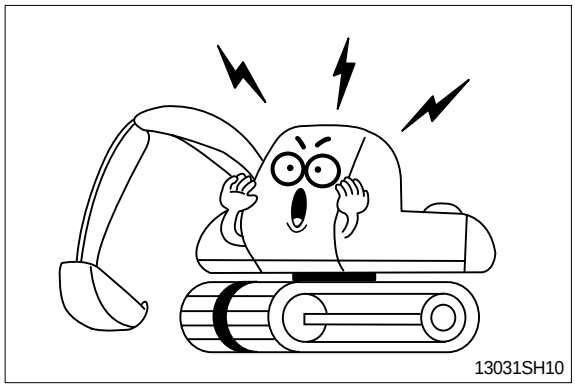
13031SH55

2. DURING OPERATING THE MACHINE

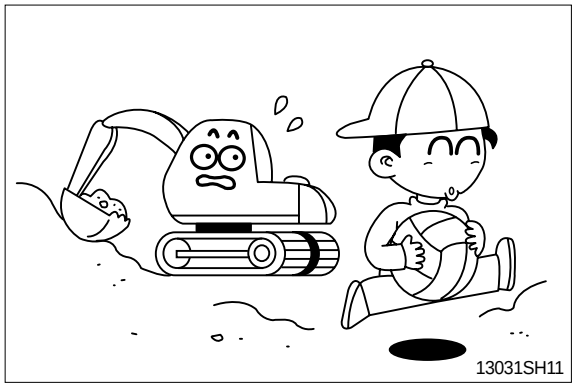
Use the handle and footstep when getting on or off the machine.
Do not jump on or off the machine.



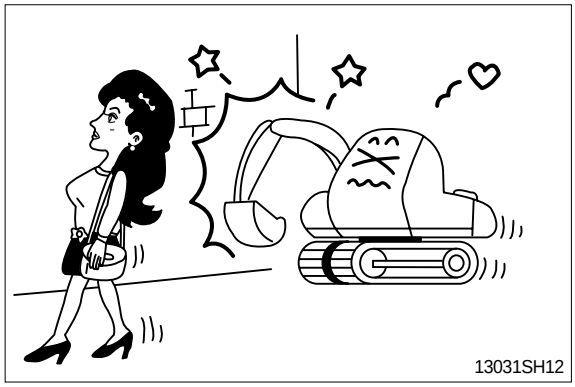
Sound the horn to warn nearby personnel before operating the machine.
Remove all the obstacles like frost on the window before operating the machine for the good visibility.



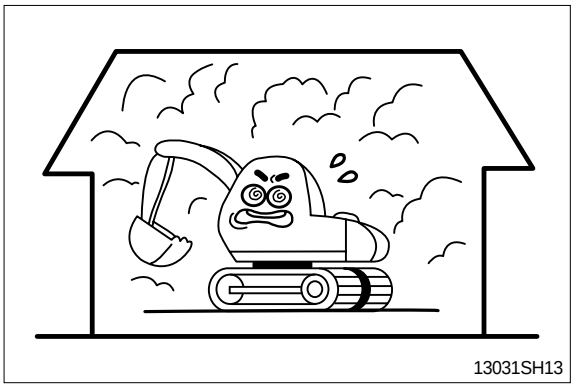
Operate carefully to make sure all personnel or obstacles are clear within the working range of the machine.
Place safety guards if necessary.



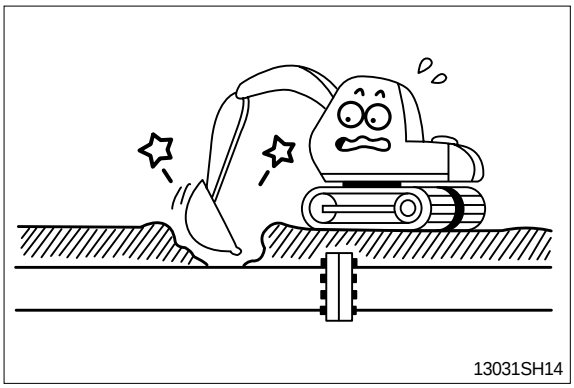
When using the work equipment, pay attention to job site.



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

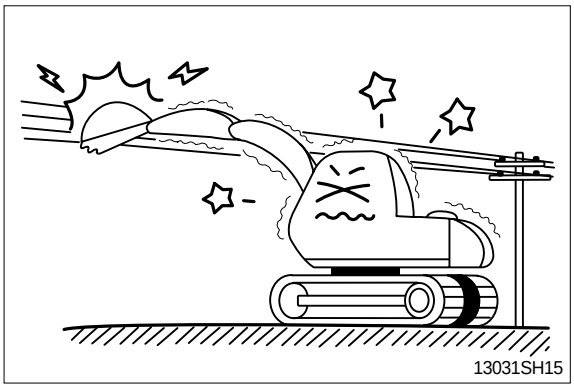

13031SH13

Check the locations of underground gas pipes or water line and secure the safety before operation.

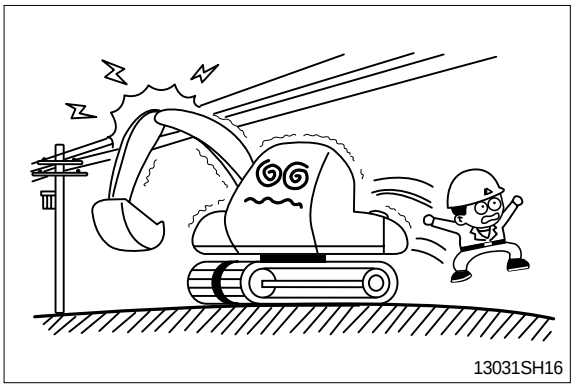

13031SH14

The operating near the electrical lines is very dangerous.
Operate within safe working range permitted as below.

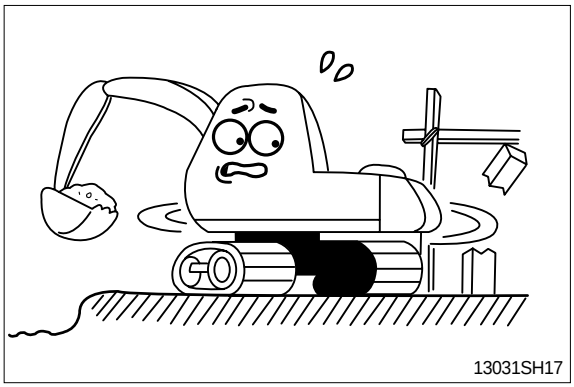
Supply voltage	Min safe separation
6.6kV	3m(10ft)
33.0kV	4m(13ft)
66.0kV	5m(16ft)
154.0kV	8m(26ft)
275.0kV	10m(33ft)


13031SH15

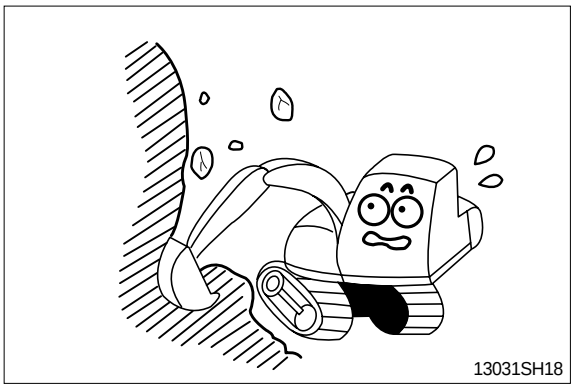
If the machine touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the machine until turning off the electric current. Jump off the machine do not contact the machine when you need to get off.


13031SH16

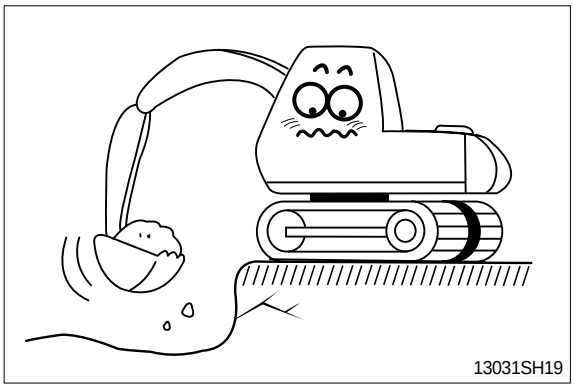
Watch out for obstacles.
Be particularly careful to check the machine clearance during the swing.



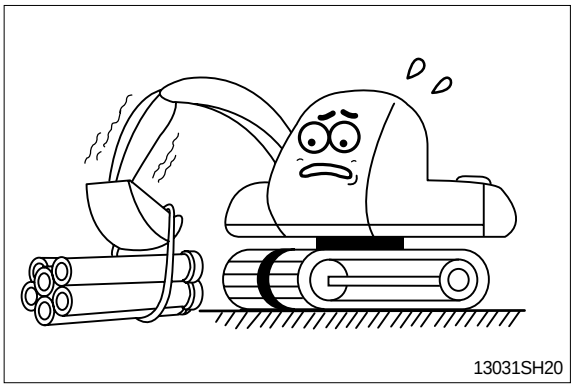
When using the machine as breaker or working in a place where stones may fall down, cab roof guard and head guard should be provided for proper protection.



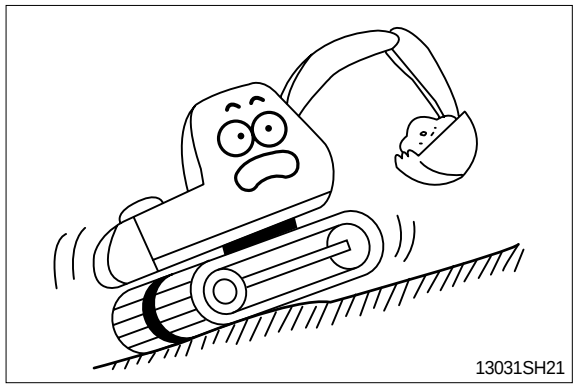
Avoid operating on a cliff or soft ground as there is danger of rolling over.
Make to get off easily as keeping the track at a right angle and putting the travel motor into the backward position when working on a cliff or soft ground inevitably.



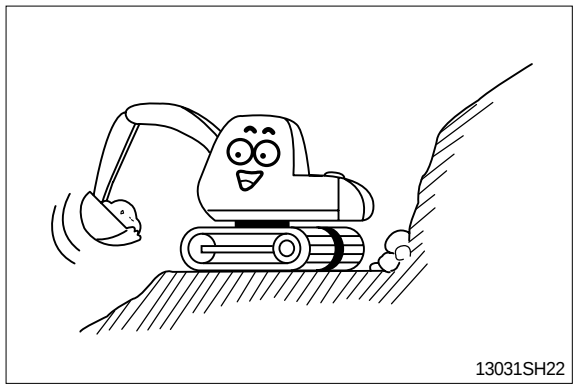
Operate for the lifting work considering the capacity of machine, weight and width of the load.
Be careful not to lift exceeding the machine capacity as it can be the cause of machine damage and safety accident.



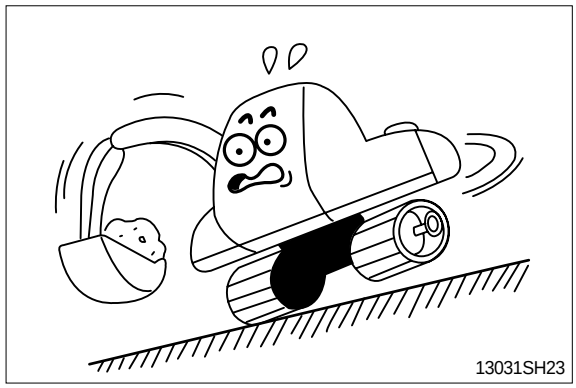
The operation on a slope is dangerous.
Avoid operating the machine on a slope of over 10 degree.



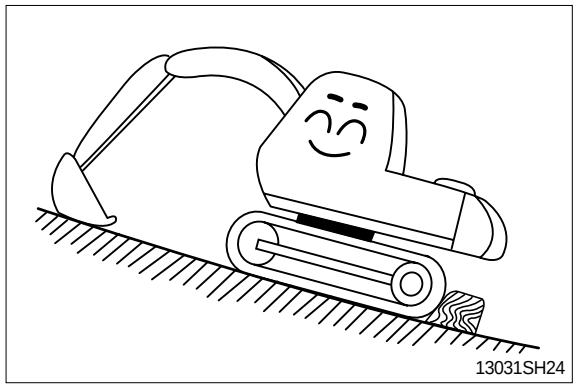
Operate the machine after making ground flat when operation is required on a slope.



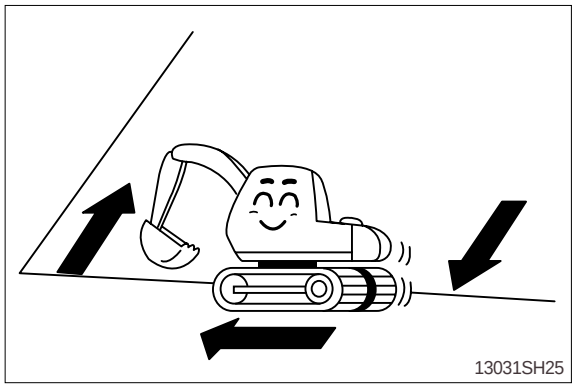
The swing on the slope can be danger of rolling over.
Do not operate to swing the machine with the bucket loaded on a slope since the machine may lose its balance under such an instance.



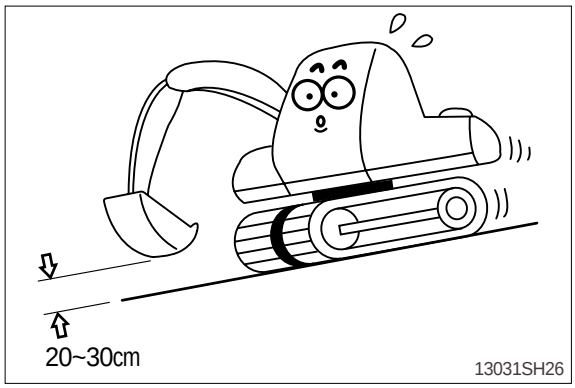
Avoid parking and stopping on a slope.
Lower the bucket to the ground and block the track when parking.



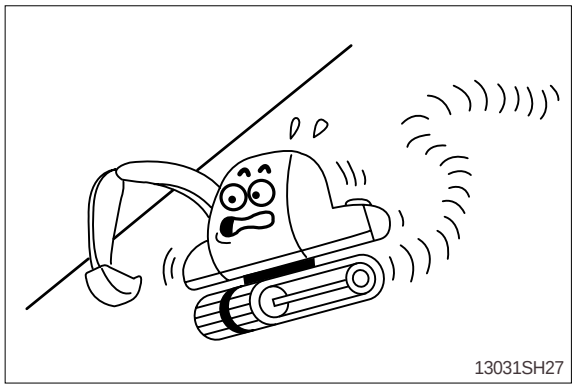
Avoid traveling in a cross direction on a slope as it can cause the danger of rolling over and sliding.



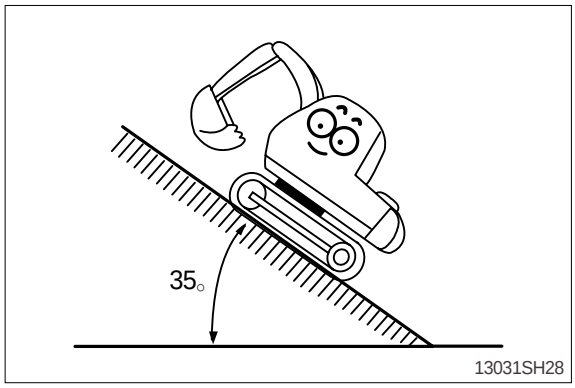
Traveling on a slope is dangerous.
Be sure to operate slowly when traveling down a slope and maintain the bucket at a height of 20~30㎝(1ft) above the ground so that it can be used as brake in an emergency.



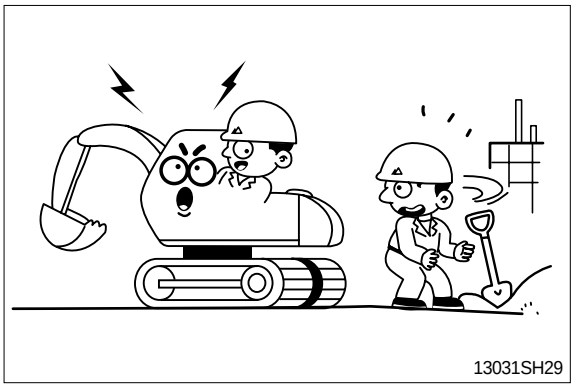
Steering of the machine while traveling on a slope is dangerous.
When an inevitable turning of direction is required, turn on the flat and solid ground.



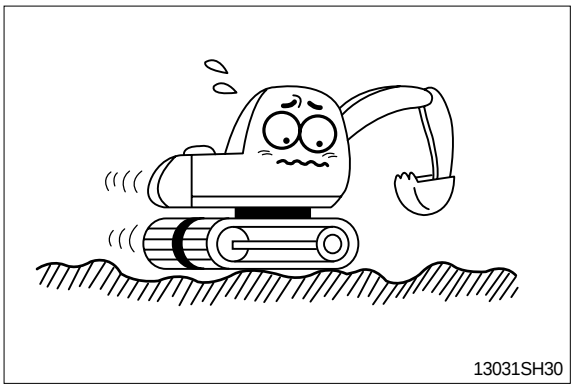
The engine angularity limits are 35 degree.
Do not operate by more than the engine limits in any case.



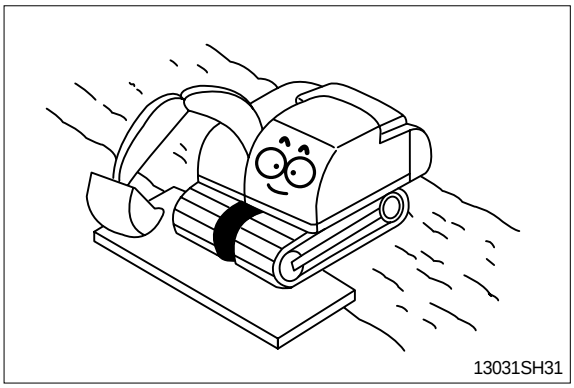
Before traveling the machine, sound the horn to warn nearby personnel.
Operate forward and backward correctly with confirming the location of the travel motor.


13031SH29

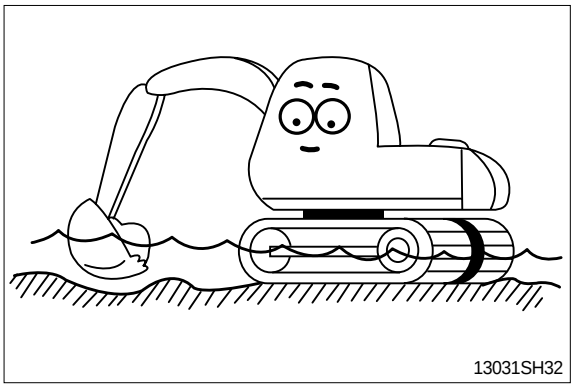
Slow down when traveling through obstacles or uneven ground.


13031SH30

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


13031SH31

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.


13031SH32

MOUNTING AND DISMOUNTING

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

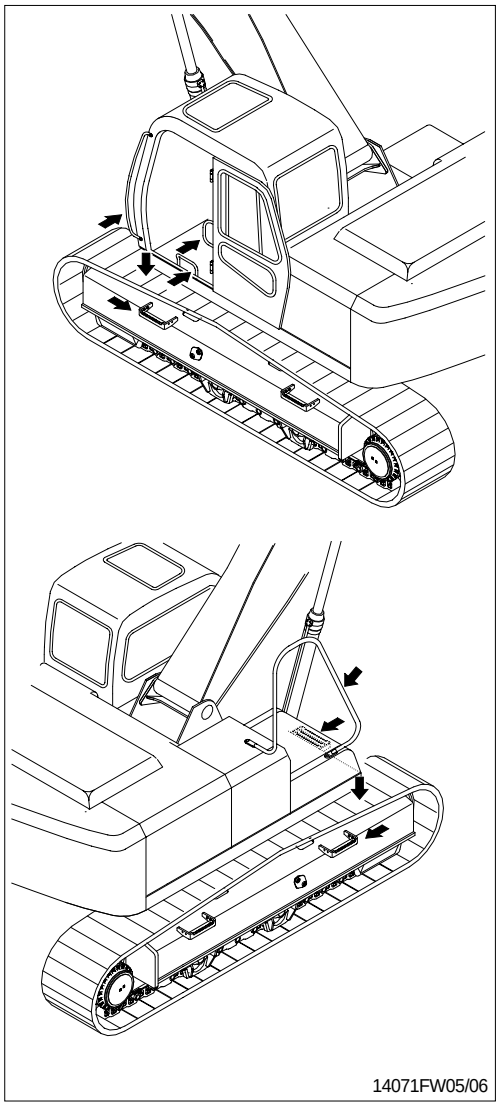
When mounting or dismounting, always face the machine and use the handrails, machine or track frame steps, and track shoes. Additional track frame step can be fitted for wider optional shoe. In this case please contact your Hyundai distributor.

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

Ensure safety by always maintaining at least three-point 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.

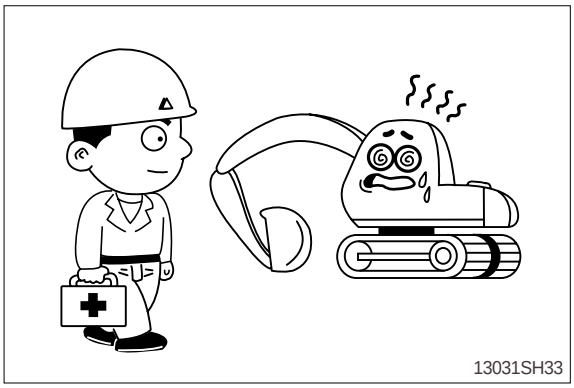
If grasping the door handrail when mounting or dismounting or moving on the track, open and lock the door securely in the open position. Otherwise, the door may move suddenly, causing you to lose balance and fall.



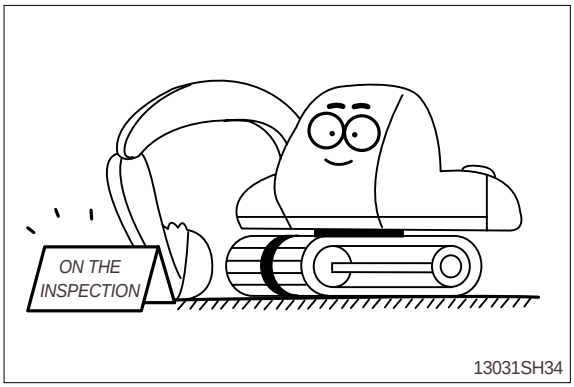
14071FW05/06

3. DURING 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.

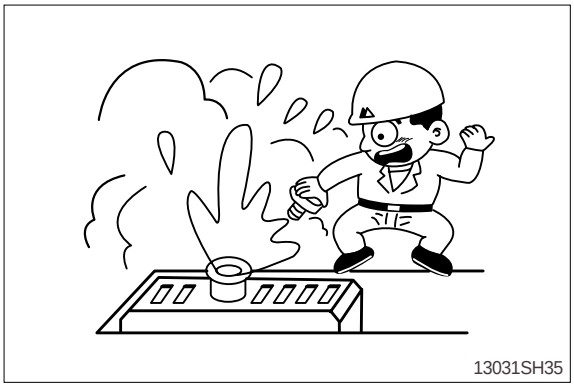

13031SH33

Park on a flat place and stop the engine for inspecting and repairing. Properly TAG machine is not operational. (Remove start key)
Extreme care shall be taken during maintenance work. Parts may require additional safe guarding.

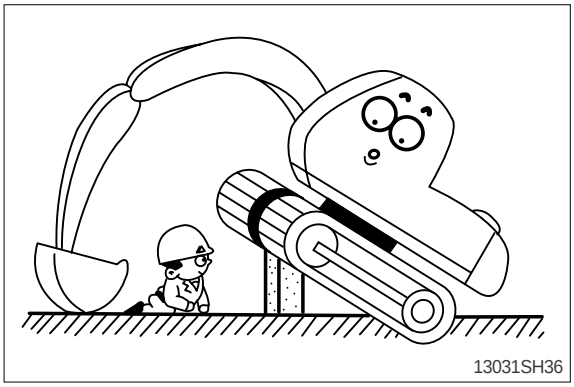


13031SH34

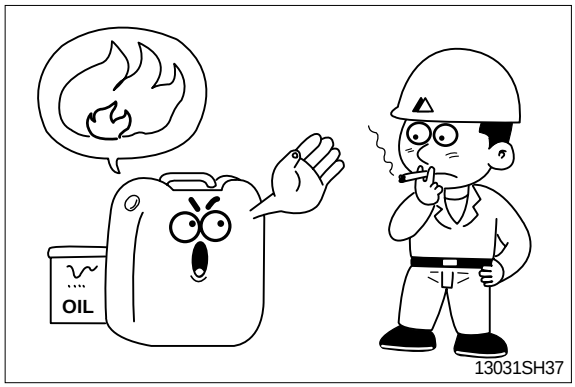
Do not remove the radiator cap from hot engine.
Open the cap after the engine is cool, below 50° C(112°F) to prevent personal injury from heated coolant spray or steam.


13031SH35

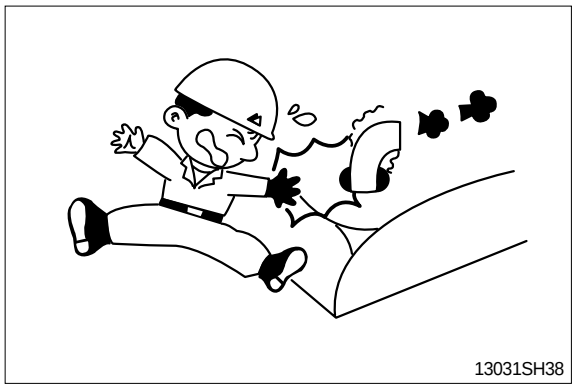
Do not work below the machine.
Be sure to work with proper safety supports.
Do not depend on the hydraulic cylinders to hold up the equipment and attachment.


13031SH36

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

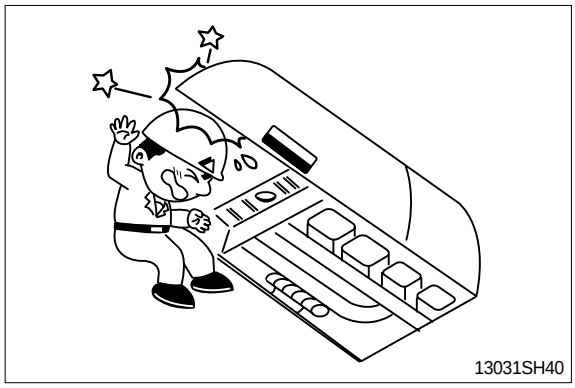


Do not touch exhaust pipe, or may cause severe burn.

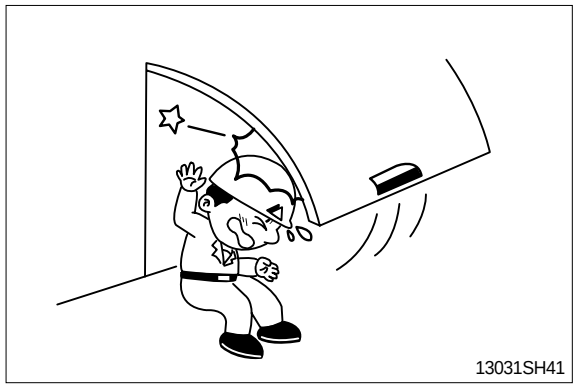


Do not open the engine hood and covers during the engine is running.

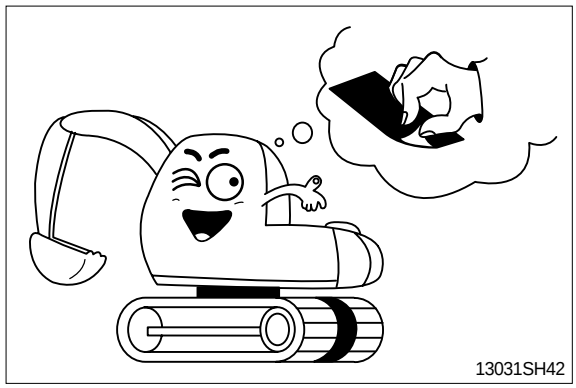
Be careful of not hitting the edges when you service engine.



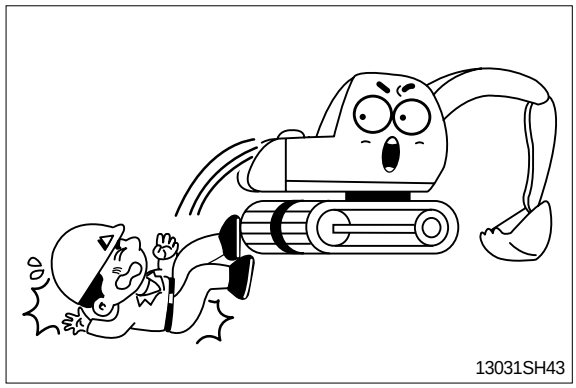
Be careful that the front window may be promptly closed.
Be sure to support stay, when the side door needs to be opened.
Be careful that the open side door may closed by the external or national force like strong wind.


13031SH41

The antislip protection should be replaced if they have become worn or have been printed over.

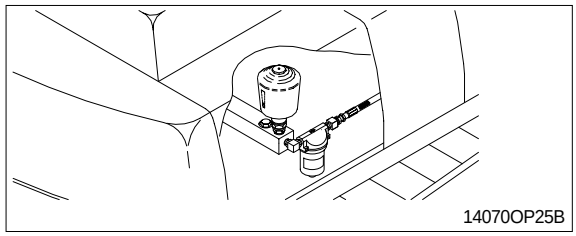

13031SH42

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


13031SH43

HIGH PRESSURE GAS

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

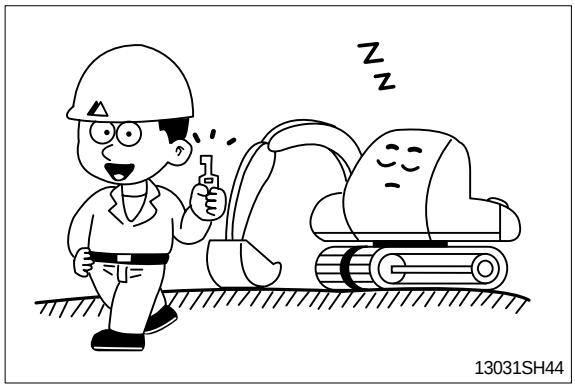

14070OP25B

LIFT EYES CAN FAIL

Lift eyes or tank can fail when lifting tank containing fluids resulting in possible personal injury. Drain tank of all fluids before lifting.

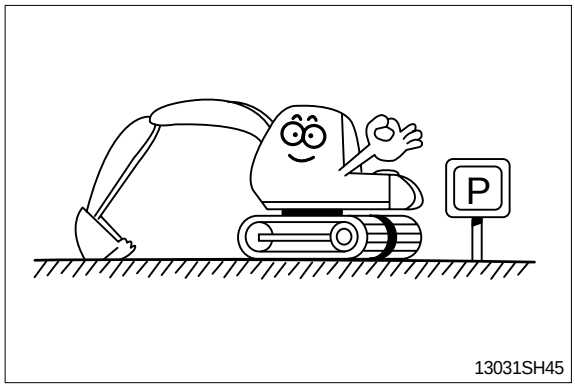
4. PARKING

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.



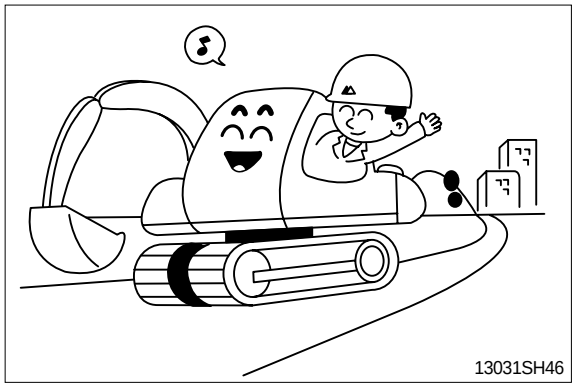
13031SH44

Park the machine in the flat and safe place.

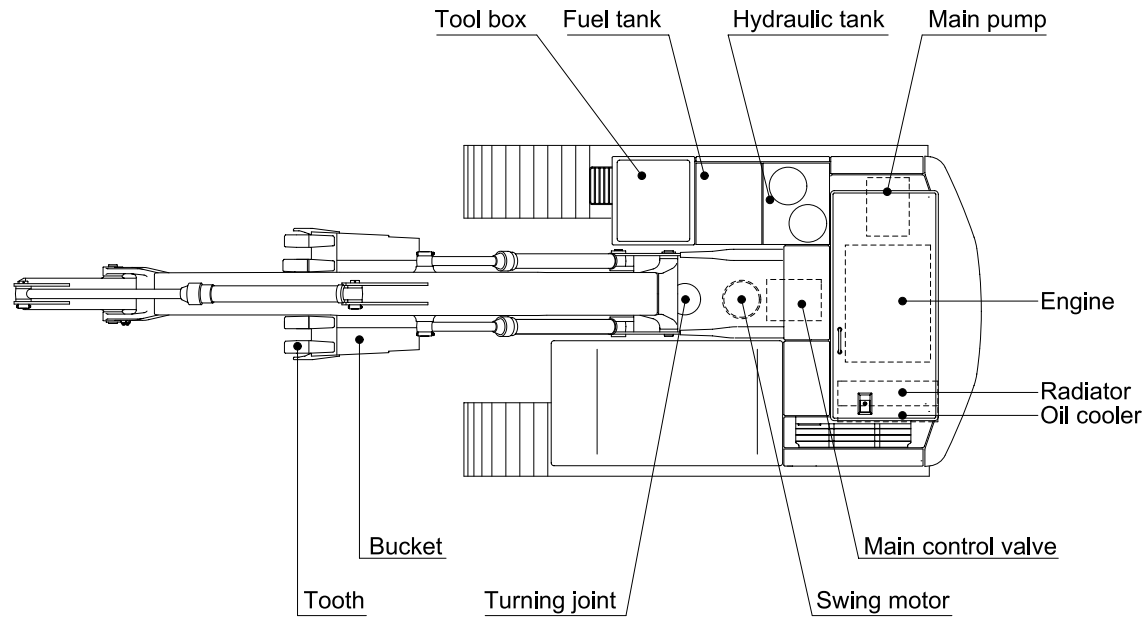


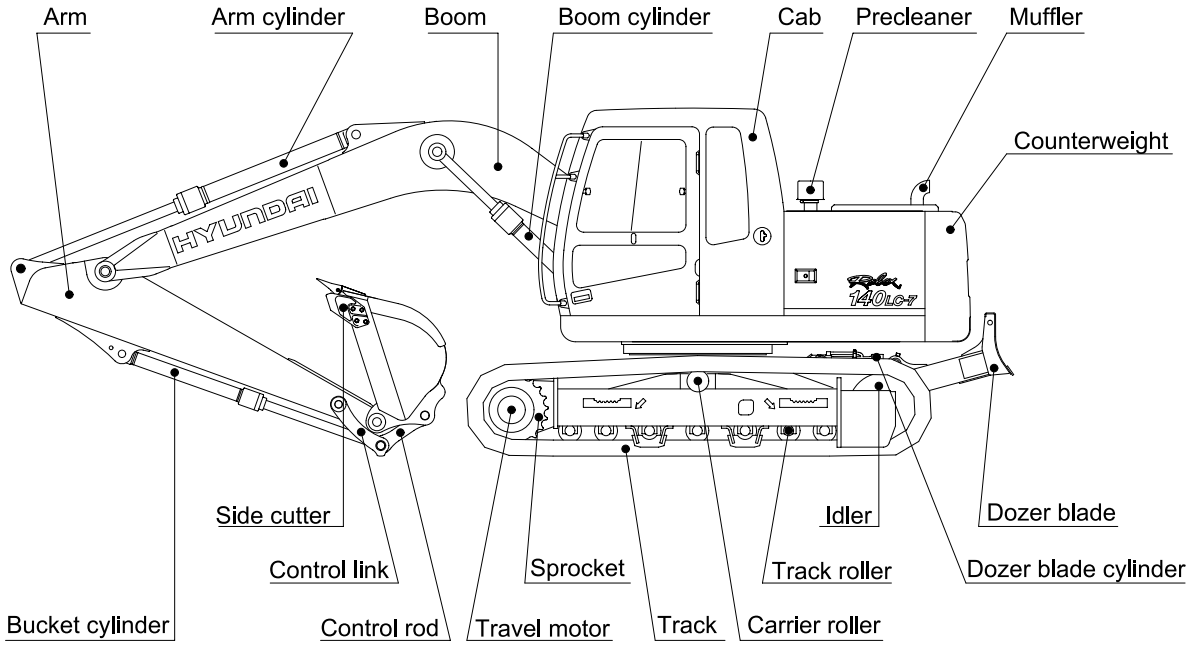
13031SH45

Hope you can work easily and safely observing safety rules.
For safe operation, observe all safety rules.


13031SH46

1. MAJOR COMPONENT

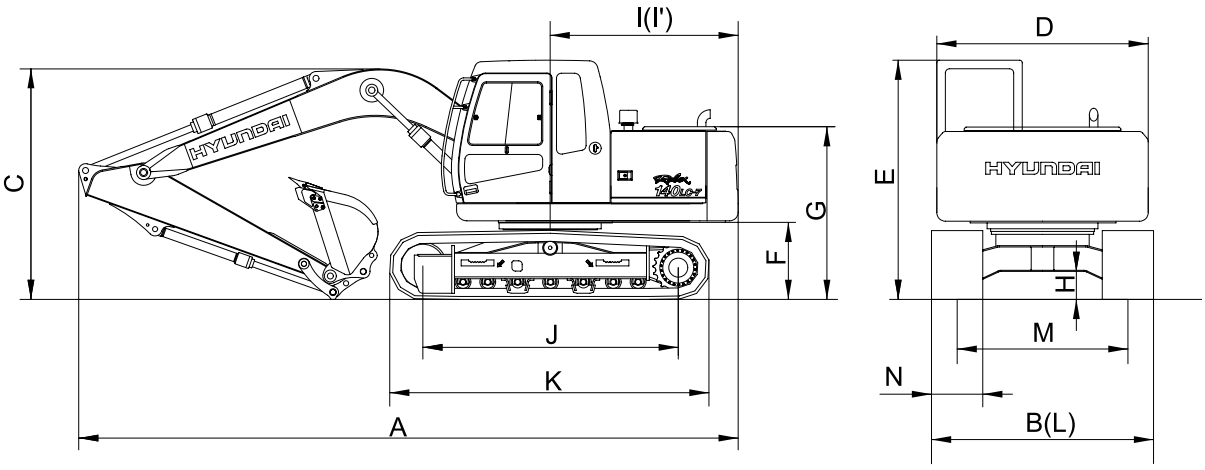




14072SP00D

2. SPECIFICATIONS

1) R140LC-7

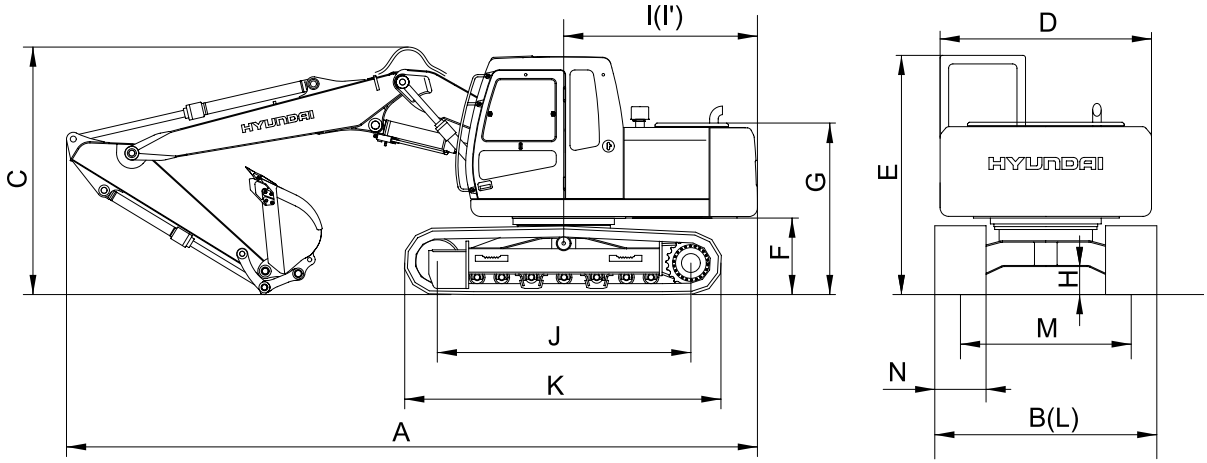


14072SP01

Description		Unit	Specification
Operating weight		kg(lb)	13980(30860)
Bucket capacity(PCSA heaped), standard		$m^3(yd^3)$	0.58(0.76)
Overall length	A	mm(ft-in)	7800(25' 7")
Overall width, with 600mm shoe	B		2600(8' 6")
Overall height	C		2760(9' 1")
Superstructure width	D		2500(8' 2")
Overall height of cab	E		2820(9' 3")
Ground clearance of counterweight	F		935(3' 1")
Engine cover height	G		2037(6' 8")
			*2200(7' 2")
Minimum ground clearance	H		440(1' 5")
Rear-end distance	I		2285(7' 6")
Rear-end swing radius	I'		2310(7' 7")
Distance between tumblers	J		3000(9'10")
Undercarriage length	K		3750(12' 4")
Undercarriage width	L		2600(8' 6")
Track gauge	M		2000(6' 7")
Track shoe width, standard	N		600(24")
Travel speed(Low/high)		km/hr(mph)	3.3/5.5(2.1/3.4)
Swing speed		rpm	13.6
Gradeability		Degree(%)	35(70)
Ground pressure(600mm shoe)		$kgf/cm^2(psi)$	0.36(5.12)

* : TIER II

2) R140LC-7, 2-PIECE BOOM

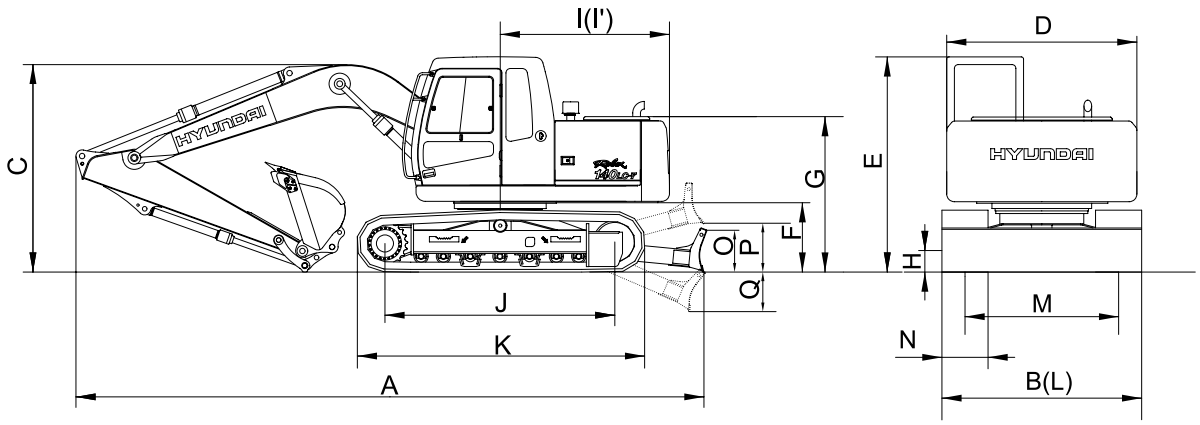


14072SP01A

Description		Unit	Specification
Operating weight		kg(lb)	13980(30860)
Bucket capacity(PCSA heaped), standard		$m^3(yd^3)$	0.58(0.76)
Overall length	A	mm(ft-in)	8120(26' 8")
Overall width, with 600mm shoe	B		2600(8' 6")
Overall height	C		2940(9' 8")
Superstructure width	D		2500(8' 2")
Overall height of cab	E		2820(9' 3")
Ground clearance of counterweight	F		935(3' 1")
Engine cover height	G		2037(6' 8")
			*2200(7' 2")
Minimum ground clearance	H		440(1' 5")
Rear-end distance	I		2285(7' 6")
Rear-end swing radius	I'		2310(7' 7")
Distance between tumblers	J		3000(9'10")
Undercarriage length	K		3750(12' 4")
Undercarriage width	L		2600(8' 6")
Track gauge	M		2000(6' 7")
Track shoe width, standard	N		600(24")
Travel speed(Low/high)		km/hr(mph)	3.3/5.5(2.1/3.4)
Swing speed		rpm	13.6
Gradeability		Degree(%)	35(70)
Ground pressure(600mm shoe)		$kgf/cm^2(psi)$	0.36(5.12)

* : TIER II

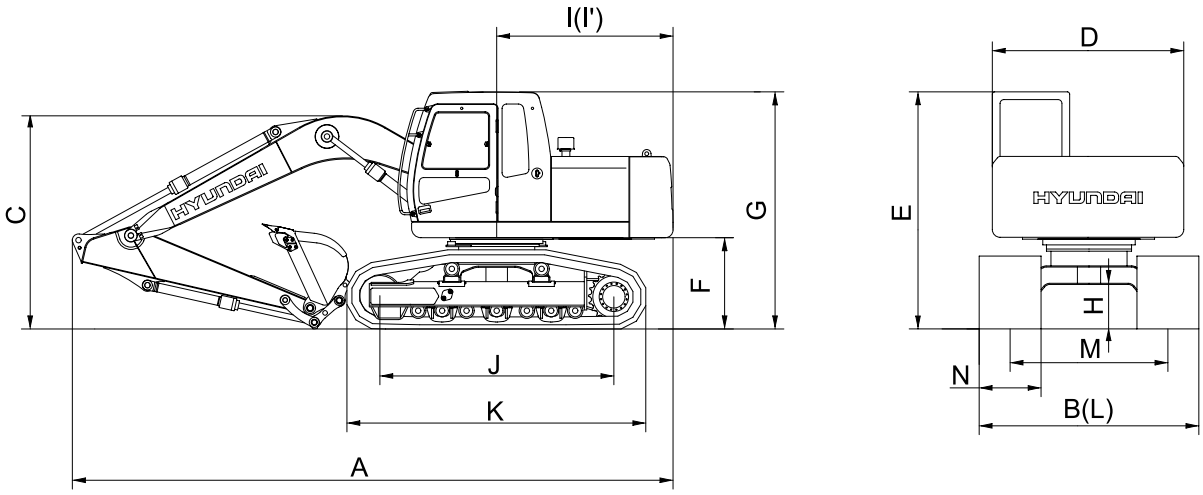
3) R140LCD-7



14072SP01D

Description		Unit	Specification
Operating weight		kg(lb)	14800(32630)
Bucket capacity(PCSA heaped), standard		$m^3(yd^3)$	0.58(0.76)
Overall length	A	mm(ft-in)	8210(26'11")
Overall width, with 600mm shoe	B		2600(8' 6")
Overall height	C		2760(9' 1")
Superstructure width	D		2500(8' 2")
Overall height of cab	E		2820(9' 3")
Ground clearance of counterweight	F		935(3' 1")
Engine cover height	G		2037(6' 8")
Minimum ground clearance	H		440(1' 5")
Rear-end distance	I		2285(7' 6")
Rear-end swing radius	I'		2310(7' 7")
Distance between tumblers	J		3000(9'10")
Undercarriage length	K		3750(12' 4")
Undercarriage width	L		2600(8' 6")
Track gauge	M		2000(6' 7")
Track shoe width, standard	N		600(24")
Height of blade	O		550(1'10")
Ground clearance of blade up	P		625(2' 1")
Depth of blade down	Q		515(1' 8")
Travel speed(Low/high)		km/hr(mph)	3.3/5.5(2.1/3.4)
Swing speed		rpm	13.6
Gradeability		Degree(%)	35(70)
Ground pressure(600mm shoe)		$kgf/cm^2(psi)$	0.38(5.40)

4) R140LCM-7



14072SP01M

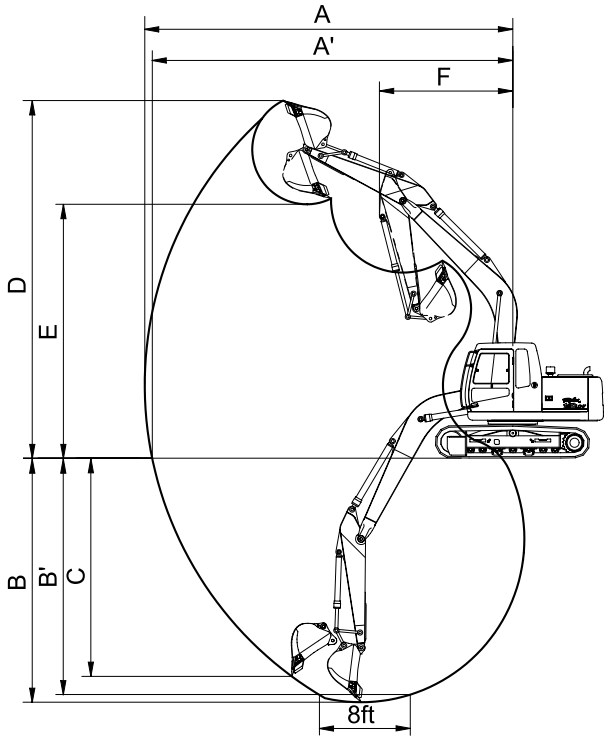
Description		Unit	Specification
Operating weight		kg(lb)	16880(37210)
Bucket capacity(PCSA heaped), standard		$m^3(yd^3)$	0.58(0.76)
Overall length	A	mm(ft-in)	7770(25' 6")
Overall width, with 800mm shoe	B		2910(9' 7")
Overall height	C		2810(9' 3")
Superstructure width	D		2500(8' 2")
Overall height of cab	E		3080(10' 1")
Ground clearance of counterweight	F		1195(3'11")
Engine cover height	G		2300(7' 6")
			*2460(8' 1")
Minimum ground clearance	H		600(2' 0")
Rear-end distance	I		2310(7' 7")
Rear-end swing radius	I'		2280(7' 6")
Distance between tumblers	J		3030(9' 6")
Undercarriage length	K		3860(12' 8")
Undercarriage width	L		2910(9' 7")
Track gauge	M		2040(6' 8")
Track shoe width, standard	N		800(32")
Travel speed(Low/high)		km/hr(mph)	2.5/4.1(1.5/2.5)
Swing speed		rpm	13.6
Gradeability		Degree(%)	35(70)
Ground pressure(800mm shoe)		$kgf/cm^2(psi)$	0.32(4.55)

* : TIER II

3. WORKING RANGE

1) R140LC/LCD-7

(1) 4.60m(15' 1") boom

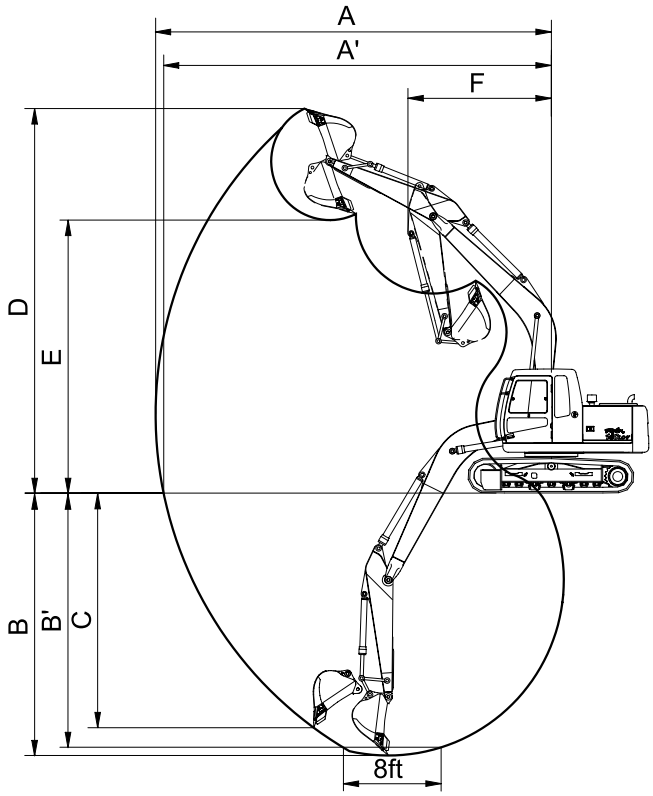


14072SP04

Description		1.90m(6' 3") Arm	2.10m(6' 11") Arm	2.50m(8' 2") Arm	3.00m(9' 10") Arm
Max digging reach	A	7750mm(25' 5")	7920mm(26' 0")	8340mm(27' 4")	8800mm(28'10")
Max digging reach on ground	A'	7600mm(24'11")	7780mm(25' 6")	8200mm(26'11")	8670mm(28' 5")
Max digging depth	B	5000mm(16' 5")	5200mm(17' 1")	5600mm(18' 4")	6100mm(20' 0")
Max digging depth (8ft level)	B'	4730mm(15' 6")	4950mm(16' 3")	5390mm(17' 8")	5910mm(19' 5")
Max vertical wall digging depth	C	4460mm(14' 8")	4590mm(15' 1")	5120mm(16'10")	5660mm(18' 7")
Max digging height	D	8060mm(26' 5")	8140mm(26' 8")	8520mm(27'11")	8730mm(28' 8")
Max dumping height	E	5630mm(18' 6")	5710mm(18' 9")	6080mm(19'11")	6280mm(20' 7")
Min swing radius	F	2620mm(8' 7")	2680mm(8'10")	2620mm(8' 7")	2660mm(8' 8")
Bucket digging force	SAE	83.4[91]kN	83.4[91]kN	83.4[91]kN	83.4[91]kN
		8500[9270]kgf	8500[9270]kgf	8500[9270]kgf	8500[9270]kgf
		18740[20440]lbf	18740[20440]lbf	18740[20440]lbf	18740[20440]lbf
	ISO	96.1[104.8]kN	96.1[104.8]kN	96.1[104.8]kN	96.1[104.8]kN
		9800[10690]kgf	9800[10690]kgf	9800[10690]kgf	9800[10690]kgf
		21610[23570]lbf	21610[23570]lbf	21610[23570]lbf	21610[23570]lbf
Arm crowd force	SAE	74.5[81.3]kN	71.6[78.1]kN	61.8[67.4]kN	53.9[59.0]kN
		7600[8290]kgf	7300[7960]kgf	6300[6870]kgf	5500[6020]kgf
		16760[18280]lbf	16090[17550]lbf	13890[15150]lbf	12130[13270]lbf
	ISO	78.5[85.6]kN	75.5[82.4]kN	64.7[70.6]kN	56.9[62.1]kN
		8000[8730]kgf	7700[8400]kgf	6600[7200]kgf	5800[6330]kgf
		17640[19240]lbf	16980[18520]lbf	14550[15870]lbf	12790[13950]lbf

[ ] : Power boost

(2) 4.10m(13' 5") boom

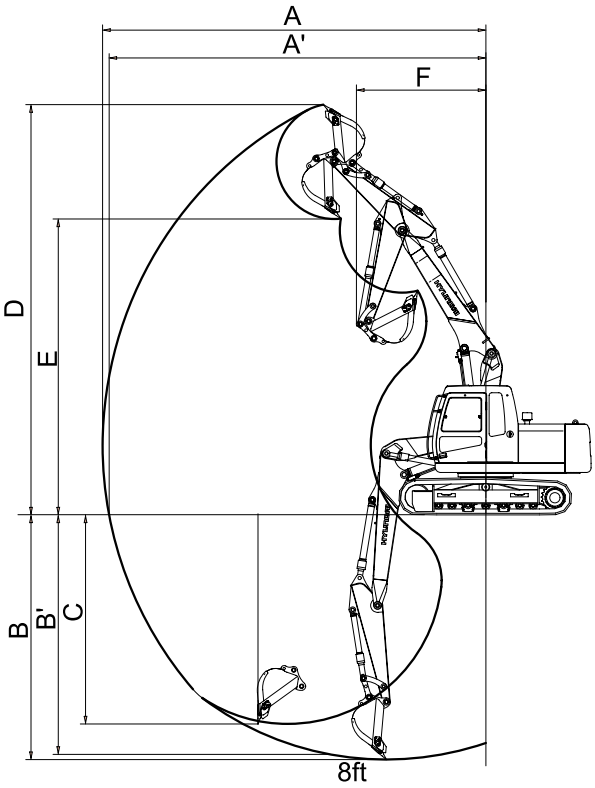


14072SP04

Description		1.90m(6' 3") Arm	2.10m(6' 11") Arm
Max digging reach	A	7250mm(23' 9")	7420mm(24' 4")
Max digging reach on ground	A'	7100mm(23' 4")	7270mm(23'10")
Max digging depth	B	4570mm(15' 0")	4770mm(15' 8")
Max digging depth (8ft level)	B'	4310mm(14' 2")	4520mm(14'10")
Max vertical wall digging depth	C	4090mm(14' 5")	4220mm(13'10")
Max digging height	D	7660mm(25' 2")	7730mm(25' 4")
Max dumping height	E	5220mm(17' 2")	5290mm(17' 4")
Min swing radius	F	2350mm(7' 9")	2470mm(8' 1")
Bucket digging force	SAE	83.4[91]kN	83.4[91]kN
		8500[9270]kgf	8500[9270]kgf
		18740[20440]lbf	18740[20440]lbf
	ISO	96.1[104.8]kN	96.1[104.8]kN
		9800[10690]kgf	9800[10690]kgf
		21610[23570]lbf	21610[23570]lbf
Arm crowd force	SAE	74.5[81.3]kN	71.6[78.1]kN
		7600[8290]kgf	7300[7960]kgf
		16760[18280]lbf	16090[17550]lbf
	ISO	78.5[85.6]kN	75.5[82.4]kN
		8000[8730]kgf	7700[8400]kgf
		17640[19240]lbf	16980[18520]lbf

[ ] : Power boost

(3) 4.90m(16' 1") 2-piece boom



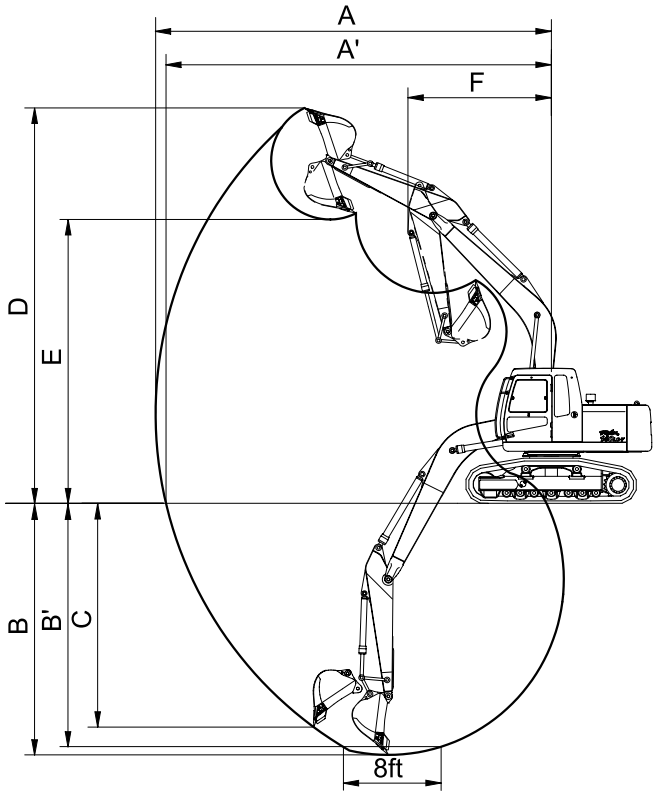
14072SP04A

Description		1.90m(6' 3") Arm	2.10m(6' 11") Arm	2.50m(8' 2") Arm
Max digging reach	A	8140mm(26' 8")	8310mm(27' 3")	8720mm(28' 7")
Max digging reach on ground	A'	8000mm(26' 3")	8180mm(26'10")	8590mm(28' 2")
Max digging depth	B	5140mm(16'10")	5340mm(17' 6")	5740mm(18'10")
Max digging depth (8ft level)	B'	5020mm(16' 6")	5220mm(17' 2")	5630mm(18' 6")
Max vertical wall digging depth	C	4380mm(14' 4")	4560mm(15' 0")	5000mm(16' 5")
Max digging height	D	8770mm(28' 9")	8870mm(29' 1")	9230mm(30' 3")
Max dumping height	E	6280mm(20' 7")	6390mm(21' 0")	6740mm(22' 1")
Min swing radius	F	2660mm(8' 9")	2800mm(9' 2")	2670mm(8' 9")
Bucket digging force	SAE	83.4[91]kN	83.4[91]kN	83.4[91]kN
		8500[9270]kgf	8500[9270]kgf	8500[9270]kgf
		18740[20440]lbf	18740[20440]lbf	18740[20440]lbf
	ISO	96.1[104.8]kN	96.1[104.8]kN	96.1[104.8]kN
		9800[10690]kgf	9800[10690]kgf	9800[10690]kgf
		21610[23570]lbf	21610[23570]lbf	21610[23570]lbf
Arm crowd force	SAE	74.5[81.3]kN	71.6[78.1]kN	61.8[67.4]kN
		7600[8290]kgf	7300[7960]kgf	6300[6870]kgf
		16760[18280]lbf	16090[17550]lbf	13890[15150]lbf
	ISO	78.5[85.6]kN	75.5[82.4]kN	64.7[70.6]kN
		8000[8730]kgf	7700[8400]kgf	6600[7200]kgf
		17640[19240]lbf	16980[18520]lbf	14550[15870]lbf

[ ] : Power boost

2) R140LCM-7

(1) 4.6m(15' 1") boom



14072SP04M

Description		1.90m(6' 3") Arm	2.10m(6' 11") Arm	2.50m(10' 6") Arm	3.00m(9' 10") Arm
Max digging reach	A	7750mm(25' 5")	7920mm(26' 0")	8340mm(27' 4")	8800mm(28'10")
Max digging reach on ground	A'	7540mm(24' 9")	7720mm(25' 4")	8130mm(26' 8")	8600mm(28' 3")
Max digging depth	B	4700mm(15' 5")	4900mm(16' 1")	5300mm(17' 5")	5800mm(19' 0")
Max digging depth (8ft level)	B'	4440mm(14' 7")	4650mm(15' 3")	5100mm(16' 9")	5620mm(18' 5")
Max vertical wall digging depth	C	4180mm(13' 9")	4310mm(14' 2")	4840mm(15'11")	5380mm(17' 8")
Max digging height	D	8340mm(27' 4")	8410mm(27' 7")	8740mm(28' 8")	9010mm(29' 7")
Max dumping height	E	5900mm(19' 4")	5980mm(19' 7")	6300mm(20' 8")	6560mm(21' 6")
Min swing radius	F	2620mm(8' 7")	2680mm(8'10")	2620mm(8' 7")	2660mm(8' 9")
Bucket digging force	SAE	83.4[91]kN	83.4[91]kN	83.4[91]kN	83.4[91]kN
		8500[9270]kgf	8500[9270]kgf	8500[9270]kgf	8500[9270]kgf
		18740[20440]lbf	18740[20440]lbf	18740[20440]lbf	18740[20440]lbf
	ISO	96.1[104.8]kN	96.1[104.8]kN	96.1[104.8]kN	96.1[104.8]kN
		9800[10690]kgf	9800[10690]kgf	9800[10690]kgf	9800[10690]kgf
		21610[23570]lbf	21610[23570]lbf	21610[23570]lbf	21610[23570]lbf
Arm crowd force	SAE	74.5[81.3]kN	71.6[78.1]kN	61.8[67.4]kN	53.9[59.0]kN
		7600[8290]kgf	7300[7960]kgf	6300[6870]kgf	5500[6020]kgf
		16760[18280]lbf	16090[17550]lbf	13890[15150]lbf	12130[13270]lbf
	ISO	78.5[85.6]kN	75.5[82.4]kN	64.7[70.6]kN	56.9[62.1]kN
		8000[8730]kgf	7700[8400]kgf	6600[7200]kgf	5800[6330]kgf
		17640[19240]lbf	16980[18520]lbf	14550[15870]lbf	12790[13950]lbf

[ ] : Power boost

4. WEIGHT

Item	R140LC-7		R140LCD-7	
	kg	lb	kg	lb
Upperstructure assembly	5630	12420	←	
Main frame weld assembly	1100	2410	←	
Engine assembly	330	730	←	
Main pump assembly	70	120	←	
Main control valve assembly	80	180	←	
Swing motor assembly	130	260	←	
Hydraulic oil tank assembly	180	390	←	
Fuel tank assembly	140	300	←	
Counterweight	2200	4850	←	
Cab assembly	310	680	←	
Lower chassis assembly	5340	11760	6160	13580
Track frame weld assembly	1590	3510	1840	4060
Swing bearing	190	410	←	
Travel motor assembly	480	1060	←	
Turning joint	50	120	←	
Track recoil spring	210	460	←	
Idler	250	550	←	
Carrier roller	40	90	←	
Track roller	490	1080	←	
Track-chain assembly(600㎜ standard triple grouser shoe)	2030	4480	←	
Dozer blade assembly	-		550	1220
Front attachment assembly(4.6m boom, 2.5m arm, 0.58㎥ PCSA heaped bucket)	2420	5330	←	
4.6m boom assembly	880	1940	←	
2.5m arm assembly	440	970	←	
0.58㎥ PCSA heaped bucket	480	1060	←	
Boom cylinder assembly	260	570	←	
Arm cylinder assembly	160	350	←	
Bucket cylinder assembly	110	240	←	
Bucket control rod assembly	90	200	←	
Dozer blade cylinder assembly	-		50	120

Item	R140LCM-7	
	kg	lb
Upperstructure assembly	5630	12420
Main frame weld assembly	1100	2410
Engine assembly	330	730
Main pump assembly	70	120
Main control valve assembly	80	180
Swing motor assembly	130	260
Hydraulic oil tank assembly	180	390
Fuel tank assembly	140	300
Counterweight	2200	4850
Cab assembly	310	680
Lower chassis assembly	8700	19180
Track frame weld assembly	2180	4810
Swing bearing	190	410
Travel motor assembly	305	670
Turning joint	50	120
Tension cylinder assembly	280	620
Idler assembly	320	710
Carrier roller assembly	200	440
Track roller assembly	700	1540
Track-chain assembly(800㎜ standard triple grouser shoe)	2740	6040
Front attachment assembly(4.6m boom, 2.5m arm, 0.58m^3 PCSA heaped bucket)	2420	5330
4.6m boom assembly	880	1940
2.5m arm assembly	440	970
0.58m^3 PCSA heaped bucket	480	1060
Boom cylinder assembly	260	570
Arm cylinder assembly	160	350
Bucket cylinder assembly	110	240
Bucket control rod assembly	90	200

5. LIFTING CAPACITIES

1) R140LC-7

(1) 4.60m(15' 1") boom, 1.90m(6' 3") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

• : Rating over-front • : Rating over-side or 360 degree

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg					*3160	*3160			*2910	2370	5.95
	lb					*6970	*6970			*6420	5220	(19.5)
4.5m (15ft)	kg					*3330	*3330			2840	1770	6.90
	lb					*7340	*7340			6260	3900	(22.6)
3.0m (10ft)	kg			*5940	*5940	*4140	3530	3500	2180	2490	1530	7.37
	lb			*13100	*13100	*9130	7780	7720	4810	5490	3370	(24.2)
1.5m (5ft)	kg			*8030	6070	*5130	3280	3390	2080	2400	1460	7.45
	lb			*17700	13380	*11310	7230	7470	4590	5290	3220	(24.4)
Ground Line	kg			*8200	5840	5230	3120	3310	2010	2530	1530	7.17
	lb			*18080	12870	11530	6880	7300	4430	5580	3370	(23.5)
-1.5m (-5ft)	kg	*6840	*6840	*8910	5850	5170	3070			2980	1820	6.48
	lb	*15080	*15080	*19640	12900	11400	6770			6570	4010	(21.3)
-3.0m (-10ft)	kg	*11210	*11210	*7580	6000	*5000	3140			*3380	2700	5.15
	lb	*24710	*24710	*16710	13230	*11020	6920			*7450	5950	(16.9)

Note 1. Lifting capacity 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) 4.60m(15' 1") boom, 2.10m(6' 11") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg					*2930	*2930			*2780	2240	6.17
	lb					*6460	*6460			*6130	4940	(20.2)
4.5m (15ft)	kg					*3140	*3140	*2650	2260	2720	1700	7.09
	lb					*6920	*6920	*5840	4980	6000	3750	(23.3)
3.0m (10ft)	kg			*5510	*5510	*3950	3550	*3390	2190	2400	1470	7.54
	lb			*12150	*12150	*8710	7830	*7470	4830	5290	3240	(24.7)
1.5m (5ft)	kg			*8230	6130	*4980	3290	*3390	2080	2310	1400	7.62
	lb			*18140	13510	*10980	7250	*7470	4590	5090	3090	(25.0)
Ground Line	kg			*8240	5830	5220	3110	3300	2000	2420	1460	7.35
	lb			*18560	12850	11510	6860	7280	4410	5340	3220	(24.1)
-1.5m (-5ft)	kg	*6510	*6510	*9020	5810	5140	5140	3270	1970	2820	1720	6.68
	lb	*14350	*14350	*19890	12810	11330	11330	7210	4340	6220	3790	(21.9)
-3.0m (-10ft)	kg	*10480	*10480	*7840	5930	*5180	5180			*3400	2470	5.41
	lb	*23100	*23100	*17280	13070	*11420	11420			*7500	5450	(17.7)

(3) 4.60m(15' 1") boom, 2.50m(8' 2") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg									*2580	1940	6.69
	lb									*5690	4300	(21.9)
4.5m (15ft)	kg							*2710	2290	2460	1520	7.53
	lb							*5970	5050	5420	3350	(24.7)
3.0m (10ft)	kg			*4670	*4670	*3570	*3570	*3140	2210	2190	1330	7.95
	lb			*10300	*10300	*7970	*7870	*6920	4870	4830	2930	(26.1)
1.5m (5ft)	kg			*7530	6300	*4670	3330	3410	2100	2110	1260	8.03
	lb			*16600	13890	*10300	7340	7520	4630	4650	2780	(26.3)
Ground Line	kg			*8620	5870	5240	3120	3300	1990	2200	1310	7.77
	lb			*19000	12940	11550	6880	7280	4390	4850	2890	(25.5)
-1.5m (-5ft)	kg	*5750	*5950	*9180	5780	5130	3030	3240	1950	2520	1520	7.15
	lb	*12680	*12680	*20240	12740	11310	6680	7140	4300	5560	3350	(23.5)
-3.0m (-10ft)	kg	*8800	*8800	*8320	5860	5150	3050			*3250	2060	6.01
	lb	*19400	*19400	*18340	12920	11350	6720			*7170	4540	(19.7)
-4.5m (-15ft)	kg			*5950	*5950							
	lb			*13120	*13120							

Note 1. Lifting capacity 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.

(4) 4.60m(15' 1") boom, 3.00m(9' 10") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

Load point height		Load radius										At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		7.5m(25ft)		Capacity		Reach
														m(ft)
6.0m (20ft)	kg lb							*1810 *3990	*1810 *3990			*2320 *5110	1680 3700	7.25 (23.8)
4.5m (15ft)	kg lb							*2420 *5340	2330 5140			2200 4850	1340 2950	8.02 (26.3)
3.0m (10ft)	kg lb					*3050 *6720	*3050 *6720	*2790 *6150	2240 4940	*1580 *3480	1450 3200	1970 4340	1180 2600	8.41 (27.6)
1.5m (5ft)	kg lb			*6540 *14420	6520 14370	*4210 *9280	3390 7470	*3340 *7360	2110 4650	*2110 *4650	1400 3090	1910 4210	1120 2470	8.49 (27.9)
Ground Line	kg lb			*8610 *18980	5940 13100	*5230 *11530	3140 6920	3290 7250	1990 4390	*2000 *4410	1350 2980	1970 4340	1160 2560	8.25 (27.1)
-1.5m (-5ft)	kg lb	*5250 *11570	*5250 *11570	*9200 *20280	5750 12680	5110 11270	3000 6610	3210 7080	1910 4210			2220 4890	1310 2890	7.67 (25.2)
-3.0m (-10ft)	kg lb	*7680 *16930	*7680 *16930	*8740 *19270	5760 12700	5090 11220	2980 6570	3210 7080	1920 4230			2830 6240	1710 3770	6.64 (21.8)
-4.5m (-15ft)	kg lb	*11270 *24850	*11270 *24850	*7040 *15520	5950 13120	*4460 *9830	3100 6830							

Note 1. Lifting capacity 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) R140LC-7, 2-PIECE BOOM

(1) 4.90m(16' 1") 2-piece boom, 1.90m(6' 3") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm(24") triple grouser shoe.

- : Rating over-front
- : Rating over-side or 360 degree

Load point height		Load radius						At max. reach		
		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
										m(ft)
6.0m (20ft)	kg			*2730	*2730			*2620	2030	6.45
	lb			*6020	*6020			*5780	4480	(21.2)
4.5m (15ft)	kg			*3070	*3070	*2920	2230	2550	1550	7.32
	lb			*6770	*6770	*6440	4920	5620	3420	(24.0)
3.0m (10ft)	kg	*6070	*6070	*3930	3450	*3230	2140	2260	1350	7.76
	lb	*13380	*13380	*8660	7610	*7120	4720	4980	2980	(25.5)
1.5m (5ft)	kg			*4920	3170	3350	2020	2180	1290	7.84
	lb			*10850	6990	7390	4450	4810	2840	(25.7)
Ground Line	kg	*5350	*5350	5130	3000	3250	1930	2280	1350	7.57
	lb	*11790	*11790	11310	6610	7170	4250	5030	2980	(24.8)
-1.5m (-5ft)	kg	*8700	5680	5080	2960	3230	1910	2650	1580	6.93
	lb	*19180	12520	11200	6530	7120	4210	5840	3480	(22.7)
-3.0m (-10ft)	kg	*7700	5840	5170	3030					
	lb	*16980	12870	11400	6680					

Note 1. Lifting capacity 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) 4.90m(16' 1") 2-piece boom, 2.10m(6' 11") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm(24") triple grouser shoe.

Load point height		Load radius						At max. reach		
		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
										m(ft)
6.0m (20ft)	kg			*2530	*2530			*2520	1920	6.67
	lb			*5580	*5580			*5560	4230	(21.9)
4.5m (15ft)	kg			*2890	*2890	*2790	2250	2440	1490	7.51
	lb			*6370	*6370	*6150	4960	5380	3280	(24.6)
3.0m (10ft)	kg	*5620	*5620	*3750	3480	*3120	2150	2170	1290	7.93
	lb	*12390	*12390	*8270	7670	*6880	4740	4780	2840	(26.0)
1.5m (5ft)	kg			*4770	3180	3350	2020	2100	1230	8.01
	lb			*10520	7010	7390	4450	4630	2710	(26.3)
Ground Line	kg	*5630	5610	5120	2990	3240	1930	2190	1280	7.76
	lb	*12410	12370	11290	6590	7140	4250	4830	2820	(25.5)
-1.5m (-5ft)	kg	*8800	5630	5050	2930	3210	1890	2510	1490	7.13
	lb	*19400	12410	11130	6460	7080	4170	5530	3280	(23.4)
-3.0m (-10ft)	kg	*7910	5770	5120	2990					
	lb	*17440	12720	11290	6590					

(3) 4.90m(16' 1") 2-piece boom, 2.50m(8' 2") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm(24") triple grouser shoe.

Load point height		Load radius										At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		7.5m(25ft)		Capacity		Reach
														m(ft)
6.0m (20ft)	kg							*2150	*2150			*2340	1680	7.17
	lb							*4740	*4740			*5160	3700	(23.5)
4.5m (15ft)	kg					*2520	*2520	*2510	2290			2210	1330	7.95
	lb					*5560	*5560	*5530	5050			4870	2930	(26.1)
3.0m (10ft)	kg			*4770	*4770	*3400	*3400	*2880	2180	*1720	1410	1990	1170	8.35
	lb			*10520	*10520	*7500	*7500	*6350	4810	*3790	3110	4390	2580	(27.4)
1.5m (5ft)	kg			*6780	6010	*4480	3230	3370	2040	2310	1360	1920	1110	8.42
	lb			*14950	13250	*9880	7120	7430	4500	5090	3000	4230	2450	(27.6)
Ground Line	kg			*5900	5640	5140	3000	3240	1920	*2100	1320	2000	1160	8.18
	lb			*13010	12430	11330	6610	7140	4230	*4630	2910	4410	2560	(26.8)
-1.5m (-5ft)	kg	*4660	*4660	*8160	5590	5040	2910	3180	1870			2260	1320	7.59
	lb	*10270	*10270	*17990	12320	11110	6420	7010	4120			4980	2910	(24.9)
-3.0m (-10ft)	kg			*8290	5690	5060	2940	3220	1900					
	lb			*18280	12540	11160	6480	7100	4190					

Note 1. Lifting capacity 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.

3) R140LCD-7

(1) 4.60m(15' 1") boom, 1.9m(6' 3") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

-  : Rating over-front
-  : Rating over-side or 360 degree

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg					*3160	*3160			*2910	2510	5.95
	lb					*6970	*6970			*6420	5530	(19.5)
4.5m (15ft)	kg					*3330	*3330			*3000	1890	6.90
	lb					*7340	*7340			*6610	4170	(22.6)
3.0m (10ft)	kg			*5940	*5940	*4140	3720	*3520	2310	2720	1630	7.37
	lb			*13100	*13100	*9130	8200	*7760	5090	6000	3590	(24.2)
1.5m (5ft)	kg			*8030	6410	*5130	3470	3690	2220	2620	1560	7.45
	lb			*17700	14130	*11310	7650	8140	4890	5780	3440	(24.4)
Ground Line	kg			*8200	6180	5670	3310	3610	2140	2760	1640	7.17
	lb			*18080	13620	12500	7300	7960	4720	6080	3620	(23.5)
-1.5m (-5ft)	kg	*6840	*6840	*8910	6190	5620	3260			3250	1940	6.48
	lb	*15080	*15080	*19640	13650	12390	7190			7170	4280	(21.3)
-3.0m (-10ft)	kg	*11210	*11210	*7580	6340	*5000	3330			*3380	2860	5.15
	lb	*24710	*24710	*16710	13980	*11020	7340			*7450	6310	(16.9)

Note 1. Lifting capacity 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) 4.60m(15' 1") boom, 2.10m(6' 11") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg					*2930	*2930			*2780	2370	6.17
	lb					*6460	*6460			*6130	5220	(20.2)
4.5m (15ft)	kg					*3140	*3140	*2650	2390	*2880	1810	7.09
	lb					*6920	*6920	*5840	5270	*6350	3990	(23.3)
3.0m (10ft)	kg			*5510	*5510	*3950	3740	*3390	2320	2620	1570	7.54
	lb			*12150	*12150	*8710	8250	*7470	5110	5780	3460	(24.7)
1.5m (5ft)	kg			*8230	6470	*4980	3480	3690	2220	2530	1500	7.62
	lb			*18140	14260	*10980	7670	8140	4890	5580	3310	(25.0)
Ground Line	kg			*8420	6170	5660	3300	3600	2130	2650	1570	7.35
	lb			*18560	13600	12480	7280	7940	4700	5840	3460	(24.1)
-1.5m (-5ft)	kg	*6510	*6510	*9020	6150	5590	3230	3570	2110	3080	1830	6.68
	lb	*14350	*14350	*19890	13560	12320	7120	7870	4650	6790	4030	(21.9)
-3.0m (-10ft)	kg	*10480	*10480	*7840	6270	*5180	3290			*3400	2620	5.41
	lb	*23100	*23100	*17280	13820	*11420	7250			*7500	5780	(17.7)

(3) 4.60m(15' 1") boom, 2.50m(8' 2") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg									*2580	2060	6.69
	lb									*5690	4540	(21.9)
4.5m (15ft)	kg							*2710	2430	*2670	1620	7.53
	lb							*5970	5360	*5890	3570	(24.7)
3.0m (10ft)	kg			*4670	*4670	*3570	*3570	*3140	2340	2400	1420	7.95
	lb			*10300	*10300	*7870	*7870	*6920	5160	5290	3130	(26.1)
1.5m (5ft)	kg			*7530	6640	*4670	3520	*3620	2230	2320	1360	8.03
	lb			*16600	14640	*10300	7760	*7980	4920	5110	3000	(26.3)
Ground Line	kg			*8620	6210	*5520	3310	3590	2130	2420	1410	7.77
	lb			*19000	13690	*12170	7300	7910	4700	5340	3110	(25.5)
-1.5m (-5ft)	kg	*5750	*5750	*9180	6120	5580	3220	3540	2080	2760	1630	7.15
	lb	*12680	*12680	*20240	13490	12300	7100	7800	4590	6080	3590	(23.5)
-3.0m (-10ft)	kg	*8800	*8800	*8320	6200	*5450	3240			*3250	2190	6.01
	lb	*19400	*19400	*18340	13670	*12020	7140			*7170	4830	(19.7)
-4.5m (-15ft)	kg			*5950	*5950							
	lb			*13120	*13120							

Note 1. Lifting capacity 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.

(4) 4.60m(15' 1") boom, 3.00m(9' 10") arm equipped with 0.58m³(PCSA heaped) bucket and 600mm (24") triple grouser shoe.

Load point height		Load radius										At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		7.5m(25ft)		Capacity		Reach
														m(ft)
6.0m (20ft)	kg							*1810	*1810			*2320	1780	7.25
	lb							*3990	*3990			*5110	3920	(23.8)
4.5m (15ft)	kg							*2420	*2420			2400	1430	8.02
	lb							*5340	*5340			5290	3150	(26.3)
3.0m (10ft)	kg					*3050	*3050	*2790	2370	*1580	1550	2170	1260	8.41
	lb					*6720	*6720	*6150	5220	*3480	3420	4780	2780	(27.6)
1.5m (5ft)	kg			*6540	*6540	*4210	3580	*3340	2240	*2110	1500	2100	1210	8.49
	lb			*14420	*14420	*9280	7890	*7360	4940	*4650	3310	4630	2670	(27.9)
Ground Line	kg			*8610	6280	*5230	3330	3590	2120	*2000	1450	2170	1250	8.25
	lb			*18980	13850	*11530	7340	7910	4670	*4410	3200	4780	2760	(27.1)
-1.5m (-5ft)	kg	*5250	*5250	*9200	6090	5560	3200	3510	2050			2440	1410	7.67
	lb	*11570	*11570	*20280	13430	12260	7050	7740	4520			5380	3110	(25.2)
-3.0m (-10ft)	kg	*7680	*7680	*8740	6100	5530	3180	3510	2050			3090	1830	6.64
	lb	*16930	*16930	*19270	13450	12190	7010	7740	4520			6810	4030	(21.8)
-4.5m (-15ft)	kg	*11270	*11270	*7040	6290	*4460	3290							
	lb	*24850	*24850	*15520	13870	*9830	7250							

Note 1. Lifting capacity 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.

4) R140LCM-7

(1) 4.60m(15' 1") boom, 1.90m(6' 3") arm equipped with 0.58m³(PCSA heaped) bucket and 800mm (32") triple grouser shoe.

-  : Rating over-front
-  : Rating over-side or 360 degree

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg									*2630	2230	6.87
	lb									*5800	4920	(22.5)
4.5m (15ft)	kg					*2880	*2880	*2890	2740	*2730	1810	7.63
	lb					*6350	*6350	*6370	6040	*6020	3990	(25.0)
3.0m (10ft)	kg			*5200	*5200	*3800	*3800	*3250	2650	2580	1630	7.99
	lb			*11460	*11460	*8380	*8380	*7170	5840	5690	3590	(26.2)
1.5m (5ft)	kg			*7960	7390	*4880	3940	*3740	2530	2530	1590	8.01
	lb			*17550	16290	*10760	8690	*8250	5580	5580	3510	(26.3)
Ground Line	kg	*3550	*3550	*8720	7030	*5660	3750	3890	2440	2670	1670	7.70
	lb	*7830	*7830	*19220	15500	*12480	8270	8580	5380	5890	3680	(25.3)
-1.5m (-5ft)	kg	*6180	*6180	*9150	6980	*5870	3680	3850	2400	3100	1950	7.00
	lb	*13620	*13620	*20170	15390	*12940	8110	8490	5290	6830	4300	(23.0)
-3.0m (-10ft)	kg	*9400	*9400	*8100	7090	*5320	3720			*3260	2700	5.74
	lb	*20720	*20720	*17860	15630	*11730	8200			*7190	5950	(18.8)

Note 1. Lifting capacity 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) 4.60m(15' 1") boom, 2.10m(6' 11") arm equipped with 0.58m³(PCSA heaped) bucket and 800mm (32") triple grouser shoe.

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg									*2620	2220	6.87
	lb									*5780	4890	(22.5)
4.5m (15ft)	kg					*2870	*2870	*2880	2730	*2720	1810	7.63
	lb					*6330	*6330	*6350	6020	*6000	3990	(25.0)
3.0m (10ft)	kg			*5190	*5190	*3780	*3780	*3240	2640	2580	1620	7.99
	lb			*11440	*11440	*8330	*8330	*7140	5820	5690	3570	(26.2)
1.5m (5ft)	kg			*7950	7380	*4870	3930	*3730	2520	2530	1580	8.01
	lb			*17530	16270	*10740	8660	*8220	5560	5580	3480	(26.3)
Ground Line	kg	*3560	*3560	*8730	7020	*5650	3740	3870	2430	2670	1660	7.70
	lb	*7850	*7850	*19250	15480	*12460	8250	8530	5360	5890	3660	(25.3)
-1.5m (-5ft)	kg	*6190	*6190	*9130	6970	*5860	3660	3830	2390	3090	1940	7.00
	lb	*13650	*13650	*20130	15370	*12920	8070	8440	5270	6810	4280	(23.0)
-3.0m (-10ft)	kg	*9410	*9410	*8090	7070	*5310	3700			*3250	2700	5.74
	lb	*20750	*20750	*17840	15590	*11710	8160			*7170	5950	(18.8)

(3) 4.60m(15' 1") boom, 2.50m(8' 2") arm equipped with 0.58m³(PCSA heaped) bucket and 800mm (32") triple grouser shoe.

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg									*2600	2200	6.87
	lb									*5730	4850	(22.5)
4.5m (15ft)	kg					*2840	*2840	*2850	2710	*2690	1790	7.63
	lb					*6260	*6260	*6280	5970	*5930	3950	(25.0)
3.0m (10ft)	kg			*5160	*5160	*3750	*3750	*3210	2610	2560	1600	7.99
	lb			*11380	*11380	*8270	*8270	*7080	5750	5640	3530	(26.2)
1.5m (5ft)	kg			*7920	7350	*4840	3710	*3700	2500	2510	1560	8.01
	lb			*17460	16200	*10670	8620	*8160	5510	5530	3440	(26.3)
Ground Line	kg	*3580	*3580	*8750	6990	*5620	3710	3850	2400	2650	1640	7.70
	lb	*7890	*7890	*19290	15410	*12390	8180	8490	5290	5840	3620	(25.3)
-1.5m (-5ft)	kg	*6220	*6220	*9110	6940	*5830	3640	3810	2370	3070	1920	7.00
	lb	*13710	*13710	*20080	15300	*12850	8020	8400	5220	6770	4230	(23.0)
-3.0m (-10ft)	kg	*9430	*9430	*8060	7050	*5280	3680			*3230	2680	5.74
	lb	*20790	*20790	*17770	15540	*11640	8110			*7120	5910	(18.8)

Note 1. Lifting capacity 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.

(4) 4.60m(15' 1") boom, 3.00m(9' 10") arm equipped with 0.58m³(PCSA heaped) bucket and 800mm (32") triple grouser shoe.

Load point height		Load radius								At max. reach		
		1.5m(5ft)		3.0m(10ft)		4.5m(15ft)		6.0m(20ft)		Capacity		Reach
												m(ft)
6.0m (20ft)	kg									*2550	2170	6.87
	lb									*5620	4780	(22.5)
4.5m (15ft)	kg					*2790	*2790	*2800	2670	*2650	1750	7.63
	lb					*6150	*6150	*6170	5890	*5840	3860	(25.0)
3.0m (10ft)	kg			*5100	*5100	*3700	*3700	*3160	2570	2520	1560	7.99
	lb			*11240	*11240	*8160	*8160	*6970	5670	5560	3440	(26.2)
1.5m (5ft)	kg			*7860	7300	*4790	3860	*3650	2450	2470	1520	8.01
	lb			*17330	16090	*10560	8510	*8050	5400	5450	3350	(26.3)
Ground Line	kg	*3630	*3630	*8780	6940	*5560	3670	3800	2360	2610	1610	7.70
	lb	*8000	*8000	*19360	15300	*12260	8090	8380	5200	5750	3550	(25.3)
-1.5m (-5ft)	kg	*6260	*6260	*9050	6880	*5780	3590	3760	2320	3040	1890	7.00
	lb	*13800	*13800	*19950	15170	*12740	7910	8290	5110	6700	4170	(23.0)
-3.0m (-10ft)	kg	*9470	*9470	*8000	6990	*5220	3630			*3190	2640	5.74
	lb	*20880	*20880	*17640	15410	*11510	8000			*7030	5820	(18.8)

Note 1. Lifting capacity 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.

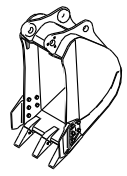
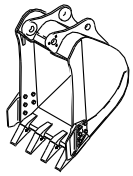
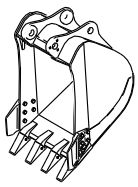
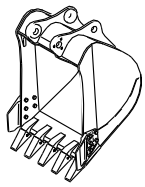
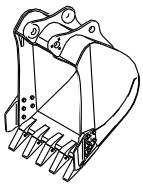
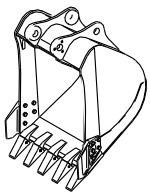
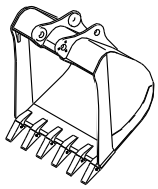
3. The load point is a hook located on the back of the bucket.

4. *indicates load limited by hydraulic capacity.

6. BUCKET SELECTION GUIDE

1) R140LC/LCD-7

(1) General bucket

						
0.23m³ SAE heaped bucket	0.40m³ SAE heaped bucket	0.46m³ SAE heaped bucket	0.52m³ SAE heaped bucket	※ 0.58m³ SAE heaped bucket	0.65m³ SAE heaped bucket	0.71m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation			
					4.6m(15' 1") boom			
SAE heaped	CECE heaped	Without side cutter	With side cutter		1.9m arm (6' 3")	2.1m arm (6' 11")	2.5m arm (8' 2")	3.0m arm (9' 10")
0.23m³ (0.30yd³)	0.2m³ (0.26yd³)	520mm (20.5")	620mm (24.4")	335kg (740lb)				
0.40m³ (0.52yd³)	0.35m³ (0.46yd³)	760mm (29.9")	860mm (33.9")	410kg (900lb)				
0.46m³ (0.60yd³)	0.4m³ (0.52yd³)	850mm (33.5")	950mm (37.4")	435kg (960lb)				
0.52m³ (0.68yd³)	0.45m³ (0.59yd³)	935mm (36.8")	1035mm (40.8")	460kg (1010lb)				
※ 0.58m³ (0.76yd³)	0.5m³ (0.65yd³)	1030mm (40.6")	1130mm (44.5")	480kg (1060lb)				
0.65m³ (0.85yd³)	0.55m³ (0.72yd³)	1110mm (43.7")	1210mm (47.6")	500kg (1100lb)				
0.71m³ (0.93yd³)	0.6m³ (0.78yd³)	1205mm (47.4")	-	540kg (1190lb)				

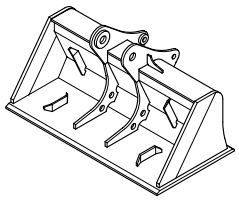
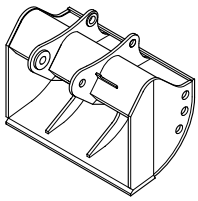
※ : Standard bucket

Applicable for materials with density of 2000kg/m³ (3370lb/yd³) or less

Applicable for materials with density of 1600kg/m³ (2700lb/yd³) or less

Applicable for materials with density of 1100kg/m³ (1850lb/yd³) or less

(2) Special bucket

Slope finishing bucket	Ditch cleaning bucket
	
0.55m³ SAE heaped bucket	★0.45m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation			
					4.6m (15' 1") boom			
SAE heaped	CECE heaped	Without side cutter	With side cutter		1.9m arm (6' 3")	2.1m arm (6' 11")	2.5m arm (8' 2")	3.0m arm (9' 10")
★0.45m³ (0.59yd³)	0.40m³ (0.52yd³)	1520mm (59.8")	-	410kg (900lb)				
0.55m³ (0.72yd³)	0.45m³ (0.59yd³)	1800mm (70.9")	-	585kg (1290lb)				

: Slope finishing bucket
★ : Ditch cleaning bucket

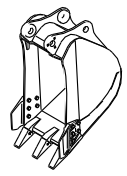
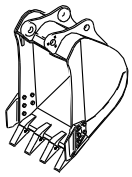
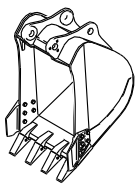
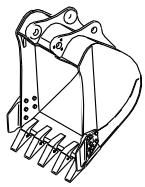
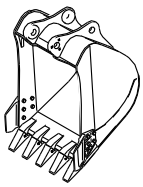
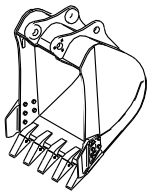
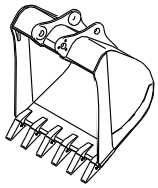
Applicable for materials with density of 2000kgf/m³ (3370lbf/yd³) or less

Applicable for materials with density of 1600kgf/m³ (2700lbf/yd³) or less

Applicable for materials with density of 1100kgf/m³ (1850lbf/yd³) or less

2) R140LC-7, 2-PIECE BOOM

(1) General bucket

						
0.23m³ SAE heaped bucket	0.40m³ SAE heaped bucket	0.46m³ SAE heaped bucket	0.52m³ SAE heaped bucket	※0.58m³ SAE heaped bucket	0.65m³ AE heaped bucket	0.71m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation		
					4.9m(16' 1") 2-piece boom		
SAE heaped	CECE heaped	Without side cutter	With side cutter		1.9m arm (6' 3")	2.1m arm (6' 11")	2.5m arm (8' 2")
0.23m³ (0.30yd³)	0.2m³ (0.26yd³)	520mm (20.5")	620mm (24.4")	335kg (740lb)			
0.40m³ (0.52yd³)	0.35m³ (0.46yd³)	760mm (29.9")	860mm (33.9")	410kg (900lb)			
0.46m³ (0.60yd³)	0.4m³ (0.52yd³)	850mm (33.5")	950mm (37.4")	435kg (960lb)			
0.52m³ (0.68yd³)	0.45m³ (0.59yd³)	935mm (36.8")	1035mm (40.8")	460kg (1010lb)			
※0.58m³ (0.76yd³)	0.5m³ (0.65yd³)	1030mm (40.6")	1130mm (44.5")	480kg (1060lb)			
0.65m³ (0.85yd³)	0.55m³ (0.72yd³)	1110mm (43.7")	1210mm (47.6")	500kg (1100lb)			
0.71m³ (0.93yd³)	0.6m³ (0.78yd³)	1205mm (47.4")	-	540kg (1190lb)			

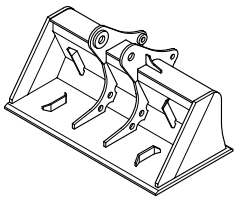
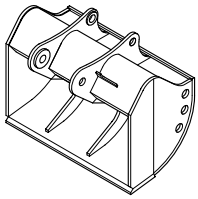
※ : Standard bucket

Applicable for materials with density of 2000kg/m³ (3370lb/yd³) or less

Applicable for materials with density of 1600kg/m³ (2700lb/yd³) or less

Applicable for materials with density of 1100kg/m³ (1850lb/yd³) or less

(2) Special bucket

Slope finishing bucket	Ditch cleaning bucket
	
0.55m³ SAE heaped bucket	★0.45m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation		
					4.9m (16' 1") 2-piece boom		
SAE heaped	CECE heaped	Without side cutter	With side cutter		1.9m arm (6' 3")	2.1m arm (6' 11")	2.5m arm (8' 2")
★0.45m³ (0.59yd³)	0.40m³ (0.52yd³)	1520mm (59.8")	-	410kg (900lb)			
0.55m³ (0.72yd³)	0.45m³ (0.59yd³)	1800mm (70.9")	-	585kg (1290lb)			

: Slope finishing bucket
★ : Ditch cleaning bucket

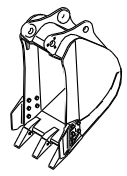
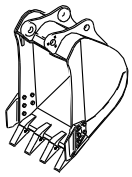
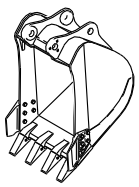
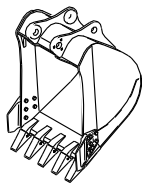
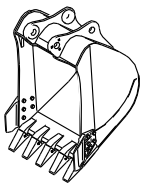
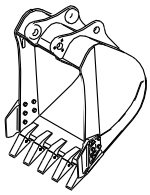
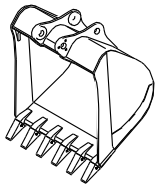
Applicable for materials with density of 2000kgf/m³ (3370lbf/yd³) or less

Applicable for materials with density of 1600kgf/m³ (2700lbf/yd³) or less

Applicable for materials with density of 1100kgf/m³ (1850lbf/yd³) or less

3) R140LCM-7

(1) General bucket

						
0.23m³ SAE heaped bucket	0.40m³ SAE heaped bucket	0.46m³ SAEA heaped bucket	0.52m³ SAE heaped bucket	※0.58m³ SAE heaped bucket	0.65m³ SAE heaped bucket	0.71m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation			
					4.6m(15' 1") boom			
SAE heaped	CECE heaped	Without side cutter	With side cutter		1.9m arm (6' 3")	2.1m arm (6' 11")	2.5m arm (8' 2")	3.0m arm (9' 10")
0.23m³ (0.30yd³)	0.2m³ (0.26yd³)	520mm (20.5")	620mm (24.4")	335kg (740lb)				
0.40m³ (0.52yd³)	0.35m³ (0.46yd³)	760mm (29.9")	860mm (33.9")	410kg (900lb)				
0.46m³ (0.60yd³)	0.4m³ (0.52yd³)	850mm (33.5")	950mm (37.4")	435kg (960lb)				
0.52m³ (0.68yd³)	0.45m³ (0.59yd³)	935mm (36.8")	1035mm (40.8")	460kg (1010lb)				
※0.58m³ (0.76yd³)	0.5m³ (0.65yd³)	1030mm (40.6")	1130mm (44.5")	480kg (1060lb)				
0.65m³ (0.85yd³)	0.55m³ (0.72yd³)	1110mm (43.7")	1210mm (47.6")	500kg (1100lb)				
0.71m³ (0.93yd³)	0.6m³ (0.78yd³)	1205mm (47.4")	-	540kg (1190lb)				

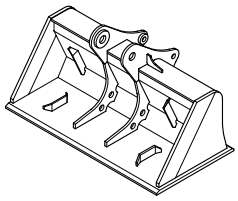
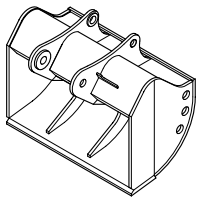
※ : Standard bucket

Applicable for materials with density of 2000kg/m³ (3370lb/yd³) or less

Applicable for materials with density of 1600kg/m³ (2700lb/yd³) or less

Applicable for materials with density of 1100kg/m³ (1850lb/yd³) or less

(2) Special bucket

Slope finishing bucket	Ditch cleaning bucket
	
0.55m³ SAE heaped bucket	★0.45m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation		
					4.9m (16' 1") 2piece boom		
SAE heaped	CECE heaped	Without side cutter	With side cutter		1.9m arm (6' 3")	2.1m arm (6' 11")	2.5m arm (8' 2")
★0.45m³ (0.59yd³)	0.40m³ (0.52yd³)	1520mm (59.8")	-	410kg (900lb)			
0.55m³ (0.72yd³)	0.45m³ (0.59yd³)	1800mm (70.9")	-	585kg (1290lb)			

: Slope finishing bucket
★ : Ditch cleaning bucket

Applicable for materials with density of 2000kgf/m³ (3370lbf/yd³) or less

Applicable for materials with density of 1600kgf/m³ (2700lbf/yd³) or less

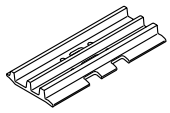
Applicable for materials with density of 1100kgf/m³ (1850lbf/yd³) or less

7. UNDERCARRIAGE

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

Model	Shapes		Triple grouser		
					
R140LC-7	Shoe width	mm(in)	500(20)	※600(24)	700(28)
	Operating weight	kg(lb)	13770(30360)	13980(30860)	14190(31290)
	Ground pressure	kgf/cm²(psi)	0.43(6.11)	0.36(5.12)	0.32(4.55)
	Overall width	mm(ft-in)	2500(8' 2")	2600(8' 6")	2700(8' 10")
R140LCD-7	Shoe width	mm(in)	500(20)	600(24)	-
	Operating weight	kg(lb)	14590(32160)	14800(32630)	-
	Ground pressure	kgf/cm²(psi)	0.45(6.40)	0.38(5.40)	-
	Overall width	mm(ft-in)	2500(8' 2")	2600(8' 6")	-
R140LCM-7	Shoe width	mm(in)	800(32)	-	-
	Operating weight	kg(lb)	16880(37210)	-	-
	Ground pressure	kgf/cm²(psi)	0.32(4.55)	-	-
	Overall width	mm(ft-in)	2840(9' 4")	-	-

※ : Standard

3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

Item	Quantity	
	R140LC/LCD-7	R140LCM-7
Carrier rollers	1EA	2EA
Track rollers	7EA	7EA
Track shoes	46EA	47EA

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
600mm triple grouser	Standard	A
500mm triple grouser	Option	A
700mm triple grouser	Option	B
800mm triple grouser	R140LCM-7 ONLY	B

※ Table 2

Category	Applications	Precautions
A	Rocky ground, river beds, normal soil	· Travel at low speed on rough ground with large obstacles such as boulders or fallen trees
B	Normal soil, soft ground	· These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees · Travel at high speed only on flat ground · Travel slowly at low speed if it is impossible to avoid going over obstacles

8. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Model	Cummins B3.9-C *4BTAA
Type	4-cycle turbocharged diesel engine *Charge air cooled
Cooling method	Water cooling
Number of cylinders and arrangement	4 cylinders, in-line
Firing order	1-3-4-2
Combustion chamber type	Direct injection type
Cylinder bore × stroke	102 × 120mm
Piston displacement	3900cc(238cu in)
Compression ratio	17.8 : 1 *18 : 1
Rated gross horse power(SAE J1995)	107Hp (80kW) at 2100rpm
	*115Hp (86kW) at 2100rpm
Maximum torque	46.2kgf · m(334lbf · ft) at 1500rpm
	*47.7kgf · m(345lbf · ft) at 1500rpm
Engine oil quantity	9.5 ℓ (2.5U.S. gal) *15.3 ℓ (4.0U.S. gal)
Dry weight	329kg(726lb) *317kg
High idling speed	2350 ± 50rpm
Low idling speed	950 ± 100rpm *850 ± 100rpm
Rated fuel consumption	167.8g/Hp · hr at 2100rpm *162g/Hp · hr at 2100rpm
Starting motor	Nippon denso(24V-4.5kW)
Alternator	Delco Remy 24V-50A
Battery	2 × 12V × 80Ah

* : TIER II

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 62cc/rev
Maximum pressure	330kgf/cm^2 (4690psi)[360kgf/cm^2 (5120psi)]
Rated oil flow	2 × 130 ℓ/min (34.3U.S. gpm/ 28.6U.K. gpm)
Rated speed	2100rpm

[ ]: Power boost

3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15cc/rev
Maximum pressure	35kgf/cm^2(500psi)
Rated oil flow	31.5 ℓ /min(8.3U.S. gpm/7.0U.K. gpm)

4) MAIN CONTROL VALVE

Item	Specification
Type	10 spools
Operating method	Hydraulic pilot system
Main relief valve pressure	330kgf/cm^2(4690psi) [360kgf/cm^2(5120psi)]
Overload relief valve pressure	380kgf/cm^2(5400psi)

[ ]: Power boost

5) SWING MOTOR

Item	Specification
Type	Fixed displacement axial piston motor
Capacity	64.3cc/rev
Relief pressure	240kgf/cm^2(3410psi)
Braking system	Automatic, spring applied hydraulic released
Braking torque	25kgf · m(180lbf · ft)
Brake release pressure	30~50kgf/cm^2(426~710psi)
Reduction gear type	2 - stage planetary
Swing speed	13.6rpm

6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement axial piston motor
Relief pressure	330kgf/cm^2(4690psi)
Capacity(max / min)	90.3/56cc/rev
Reduction gear type	2-stage planetary
Braking system	Automatic, spring applied hydraulic released
Brake release pressure	6.0kgf/cm^2(85psi)
Braking torque	40.6kgf · m(294lbf · ft)

7) REMOTE CONTROL VALVE

Item		Specification
Type		Pressure reducing type
Operating pressure	Minimum	6.5kgf/cm²(92psi)
	Maximum	26kgf/cm²(370psi)
Single operation stroke	Lever	61mm(2.4in)
	Pedal	123mm(4.84in)

8) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	Ø105× Ø75× 1075mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	Ø115× Ø80× 1188mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	Ø100× Ø70× 855mm
	Cushion	Extend only
Dozer cylinder(Option)	Bore dia × Rod dia × Stroke	Ø100× Ø70× 270mm
	Cushion	-

※ 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.

9) SHOE

Item		Width	Ground pressure	Link quantity	Overall width
R140LC-7	Standard	600mm(24")	0.36kgf/cm²(5.12psi)	46	2600mm(8' 6")
	Option	500mm(20")	0.43kgf/cm²(6.11psi)	46	2500mm(8' 2")
		700mm(28")	0.32kgf/cm²(4.55psi)	46	2700mm(8' 10")
R140LCD-7	Option	500mm(20")	0.45kgf/cm²(6.40psi)	46	2500mm(8' 2")
		600mm(24")	0.38kgf/cm²(5.40psi)	46	2600mm(8' 6")
R140LCM-7	Option	800mm(32")	0.32kgf/cm²(4.55psi)	47	2840mm(9' 4")

10) BUCKET

Item		Capacity		Tooth quantity	Width	
		PCSA heaped	CECE heaped		Without side cutter	With side cutter
R140LC-7	Standard	※ 0.58m³(0.76yd³)	0.50m³(0.65yd³)	5	1030mm(40.6")	1130mm(44.5")
	Option	0.23m³(0.30yd³)	0.20m³(0.26yd³)	3	520mm(20.5")	620mm(24.4")
		0.40m³(0.52yd³)	0.35m³(0.46yd³)	4	760mm(29.9")	860mm(33.9")
		0.46m³(0.60yd³)	0.40m³(0.52yd³)	4	850mm(33.5")	950mm(37.4")
		0.52m³(0.68yd³)	0.45m³(0.59yd³)	5	935mm(36.8")	1035mm(40.8")
		0.65m³(0.85yd³)	0.55m³(0.72yd³)	5	1110mm(43.7")	1210mm(47.6")
		0.71m³(0.93yd³)	0.60m³(0.78yd³)	6	1205mm(47.4")	-
		★0.45m³(0.59yd³)	0.40m³(0.52yd³)	-	1520mm(59.8")	-
		锹0.55m³(0.72yd³)	0.45m³(0.59yd³)	-	1800mm(70.9")	-

锹 : Slope finishing bucket
★ : Ditch cleaning bucket

9. RECOMMENDED OILS

Use only oils listed below or equivalent.
Do not mix different brand oil.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C (°F) -20 (-4) / -10 (14) / 0 (32) / 10 (50) / 20 (68) / 30 (86) / 40 (104)
Engine oil pan	Engine oil	9.5(2.5) 15.3(4.0) TIER II	SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Swing drive	Grease	0.35(0.1)	NLGI NO.1 NLGI NO.2
Swing drive	Gear oil	2.5(0.7)	SAE 85W-140
Final drive		3.0×2 (0.8×2)	
Hydraulic tank	Hydraulic oil	Tank; 124(32.8) System; 210(55.5)	ISO VG 32 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel	270(71.0)	ASTM D975 NO.1 ASTM D975 NO.2
Fitting (Grease nipple)	Grease	As required	NLGI NO.1 NLGI NO.2
Radiator (Reservoir tank)	Mixture of antifreeze and water 50 : 50	21.8(5.8)	Ethylene glycol base permanent type

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

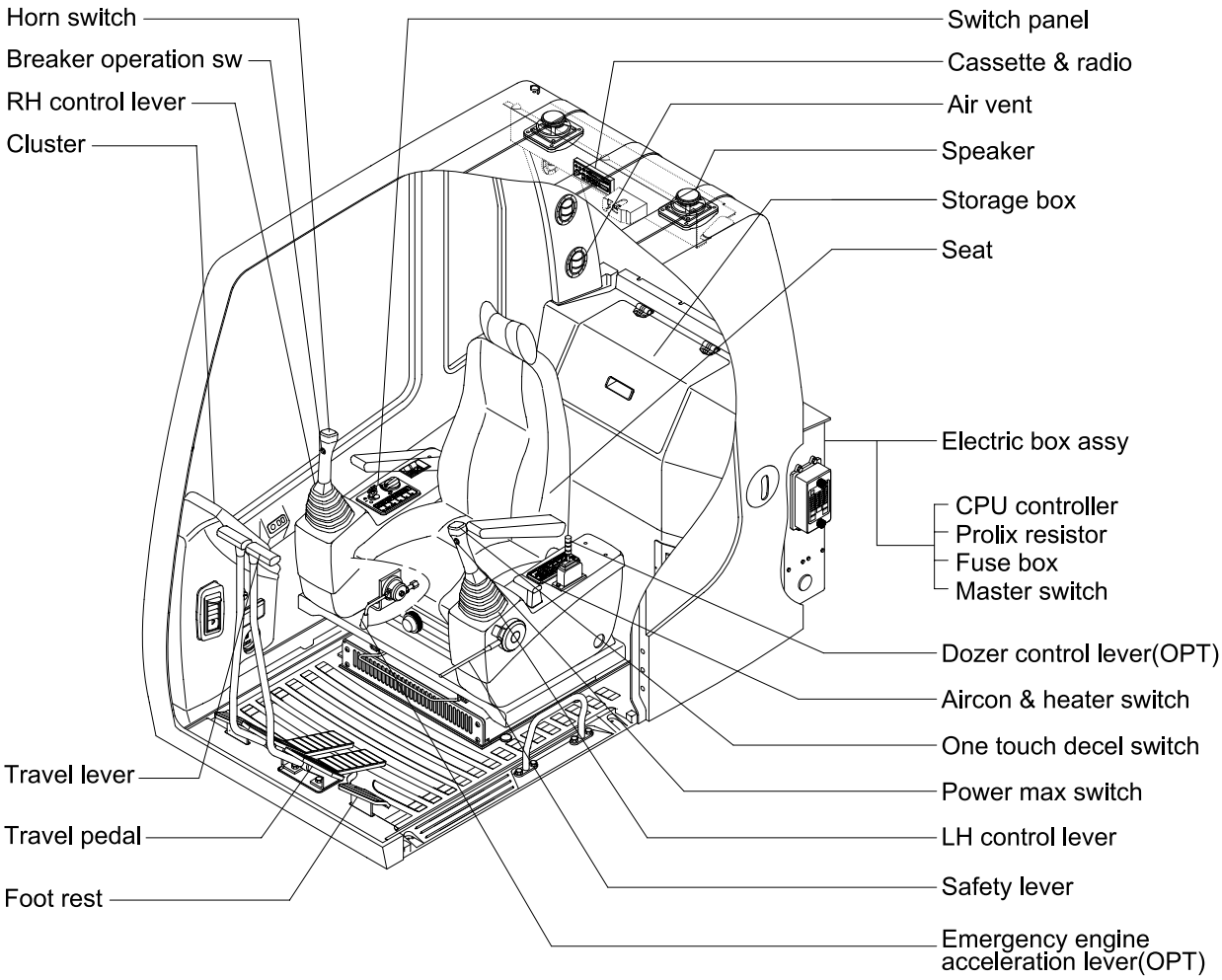
1. CAB DEVICES

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.



14073CD01M

2. CLUSTER

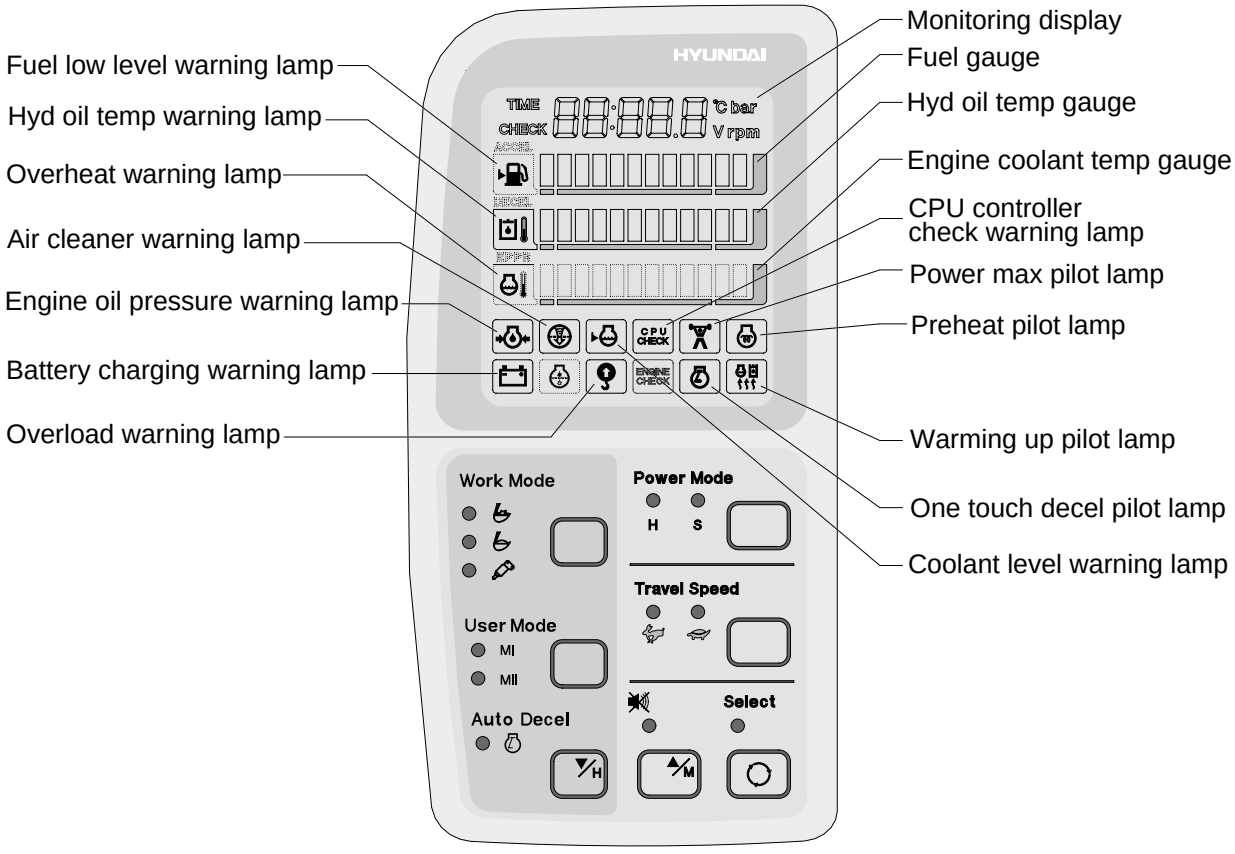
1) MONITOR PANEL

The gauges panel consists of gauges and monitors as shown below, to warn the operator in case of abnormal machine operation or conditions for the appropriate operation and inspection.

- Gauges : Indicate operating status of the machine.
- Warning lamp : Indicate abnormality of the machine(Red).
- Pilot lamp : Indicate operating status of the machine(Amber).

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

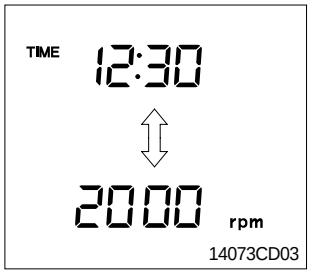
※ When the monitor provides a warning immediately check the problem, and perform the required action.



14073CD02

※ The warming lamp lights ON and the buzzer sounds when the machine has a problem. In this case, press the buzzer stop switch and buzzer stop, but the warming lamp lights until the problem is cleared.

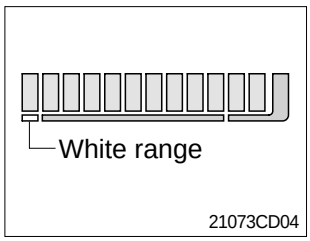
(1) Monitoring display



① This displays the current time and machine information such as engine rpm, coolant/hydraulic oil temperature, hydraulic oil pressure and also error codes.

※ **Refer to the page 4-11 for details.**

(2) Fuel gauge

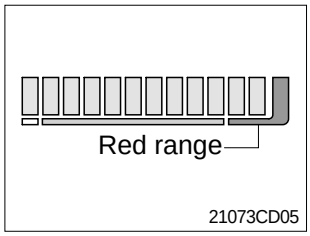


① This gauge indicates the amount of fuel in the fuel tank.

② Fill the fuel when the white range or warning lamp ⛽ blinks.

※ **If the gauge illuminates the white range or warning lamp ⛽ blinks even though the machine is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.**

(3) Hydraulic oil temperature gauge



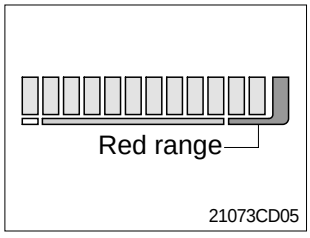
① This indicates the temperature of coolant.
- White range : 30°C(86°F) below
- Green range : 30-105 °C(86-221°F)
- Red range : 105°C(221°F) above

② The green range illuminates when operating.

③ Keep idling engine at low speed until the green range illuminates, before operation of machine.

④ When the red range illuminates, reduce the load on the system. If the gauge stays in the red range, stop the machine and check the cause of the problem.

(4) Engine coolant temperature gauge



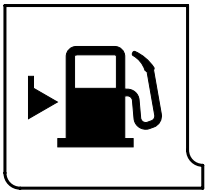
① This indicates the temperature of coolant.
- White range : 30°C(86°F) below
- Green range : 30-105 °C(86-221°F)
- Red range : 105°C(221°F) above

② The green range illuminates when operating.

③ Keep idling engine at low speed until the green range illuminates, before operation of machine.

④ When the red range illuminates, turn OFF the engine, check the radiator and engine.

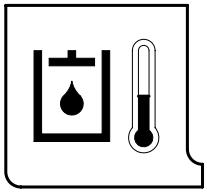
(5) Fuel low level warning lamp



21073CD04A

① This lamp blinks and the buzzer sounds when the level of fuel is below 30 ℓ (7.9U.S. gal).
② Fill the fuel immediately when the lamp blinks.

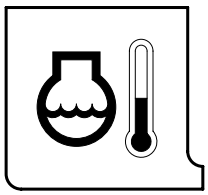
(6) Hydraulic oil temperature warning lamp



21073CD05A

① This warning lamp operates and the buzzer sounds when the temperature of hydraulic oil is over 105 ℃(221 ℉) .
② Check the hydraulic oil level when the lamp blinks.
③ Check for debris between oil cooler and radiator.

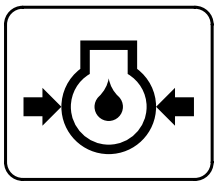
(7) Overheat warning lamp



21073CD06A

① This lamp blinks and the buzzer sounds when the temperature of coolant is over the normal temperature 110℃(230℉) .
② Check the cooling system when the lamp blinks.

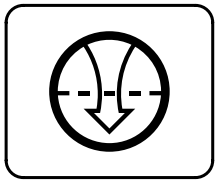
(8) Engine oil pressure warning lamp



21073CD07

① This lamp blinks and the buzzer sounds after starting the engine because of pressure.
② If the lamp blinks during engine operation, shut OFF engine immediately. Check oil level.

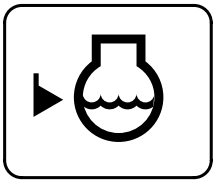
(9) Air cleaner warning lamp



21073CD08

① This lamp is operated by the vacuum caused inside when the filter of air cleaner is clogged which supply air to the engine.
② Check the filter and clean or replace it when the lamp blinks.

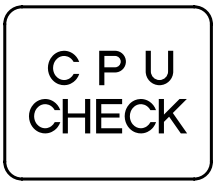
(10) Coolant level warning lamp



21073CD09

① This lamp blinks and the buzzer sounds when the coolant is below LOW in the reservoir tank of radiator.
② Check the reservoir tank when the lamp blinks.

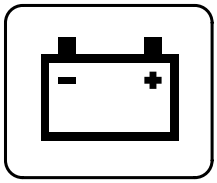
(11) CPU controller check warning lamp



21073CD10

① Communication problem with CPU controller makes the lamp blinks and the buzzer sounds.
② With lamp blinks all of the lamp on the cluster LCD will be OFF.

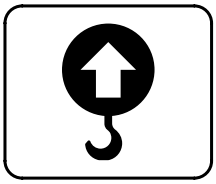
(12) Battery charging warning lamp



21073CD13

① This lamp blinks and the buzzer sounds when the starting switch is ON, it is turned OFF after starting the engine.
② Check the battery charging circuit when this lamp blinks, during engine operation.

(13) Overload warning lamp



21073CD15

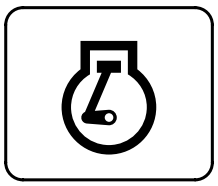
① When the machine is overload, the overload warning lamp blinks during the overload switch ON.

(14) Power max pilot lamp

21073CD11

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

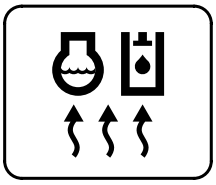
(15) One touch decel pilot lamp



21073CD17

① Operating auto decel or one touch decel makes the lamp ON.
② The lamp will be ON when pushing one touch decel switch on the LH RCV lever.

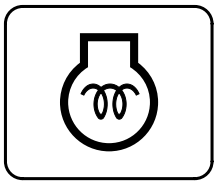
(16) Warming up pilot lamp



21073CD18

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.

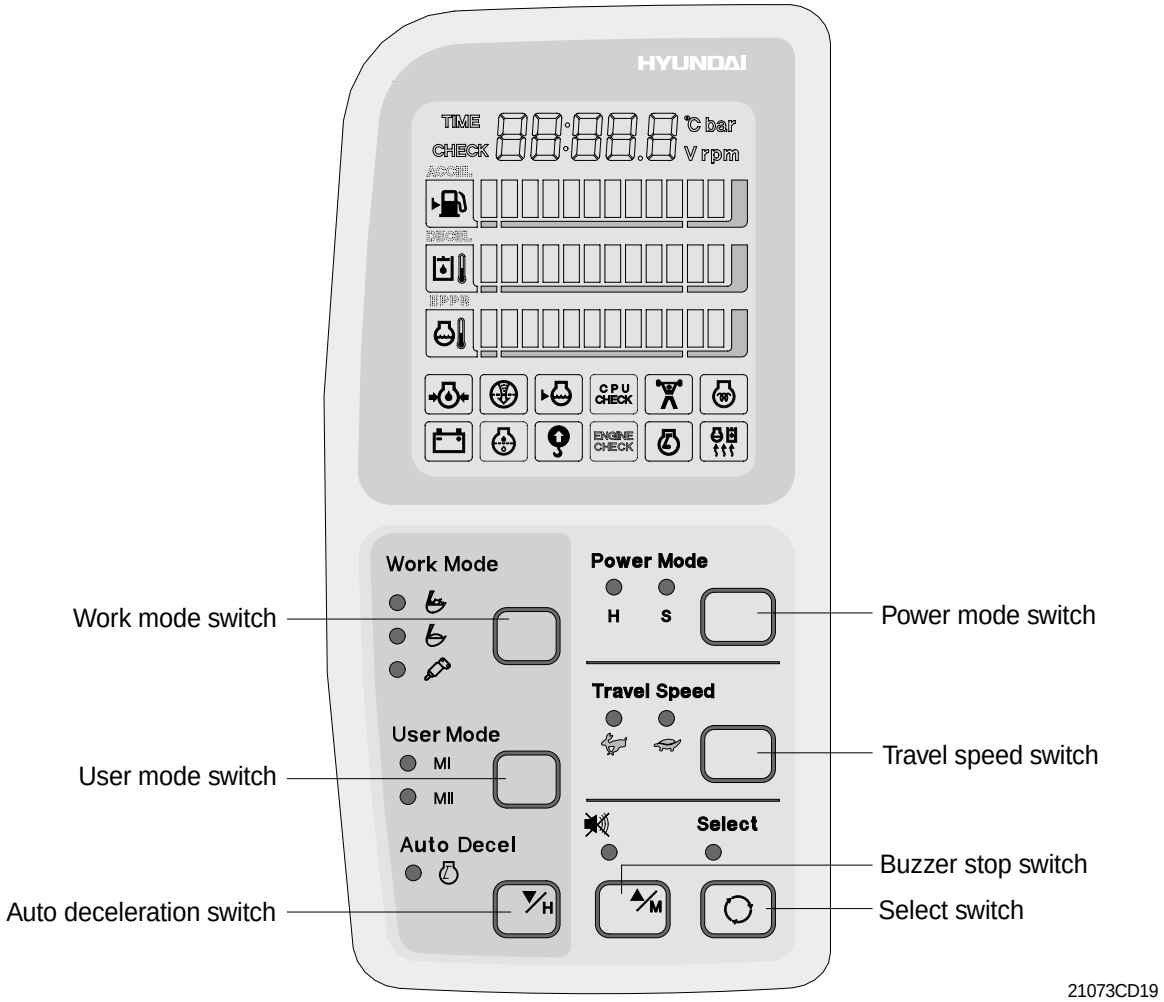
(17) Preheat pilot lamp



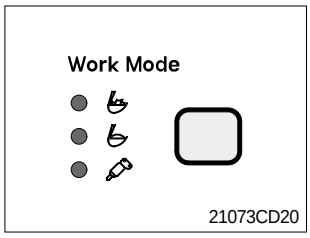
21073CD12

① This lamp is turned ON when the preheating function is actuated in cold weather.
② Start the engine as this lamp is OFF.

2) SWITCH PANEL



(1) Work mode switch

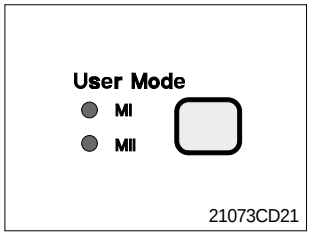


① This switch is to select the machine operation mode, which shifts from general operation mode to heavy operation mode and breaker mode in a raw by pressing the switch.

- : Heavy duty work mode
- : General work mode
- : Breaker operation mode

※ **Refer to the page 4-7 for details.**

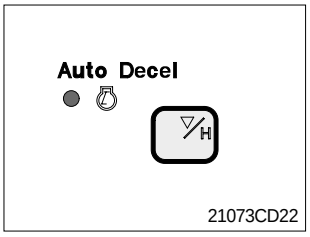
(2) User mode switch



① This switch is to select the memory sets, at which you can change the engine and pump power and memorize it into MI and MII mode for your preference.

※ **Refer to the page 4-7 for details.**

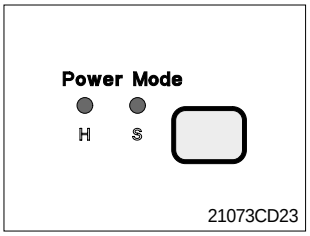
(3) Auto deceleration switch



① This switch is used to actuate the auto deceleration function so the engine speed is lowered automatically when all control levers and pedals are at neutral position to save the fuel.
- Light ON : Auto deceleration function is selected.
- Light OFF : Auto deceleration function is cancelled so that the engine speed increased to previous setting value.

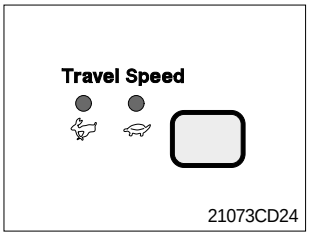
② Operating the auto deceleration function makes the decel indicate lamp on the LCD panel ON.

(4) Power mode switch



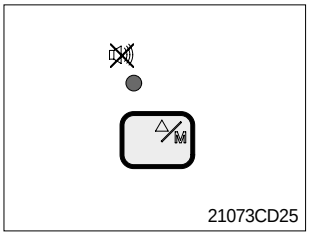
① The lamp of selected mode is turned ON by pressing the switch(▭), when selecting the mode to use.
- H : This is used for high power work.
- S : This is used for standard power work.

(5) Travel speed control switch



① This switch is to control the travel speed which is changed to high speed(Rabbit mark) by pressing the switch and low speed(Turtle mark) by pressing again.

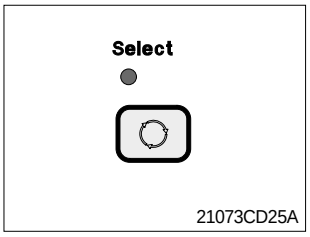
(6) Buzzer stop switch



① When the starting switch is turned ON first, normally the alarm buzzer sounds for 5 seconds during lamp check operation.

② The red lamp lights ON and the buzzer sounds when the machine has a problem.
In this case, press this switch and buzzer stops, but the red lamp lights until the problem is cleared.

(7) Select switch



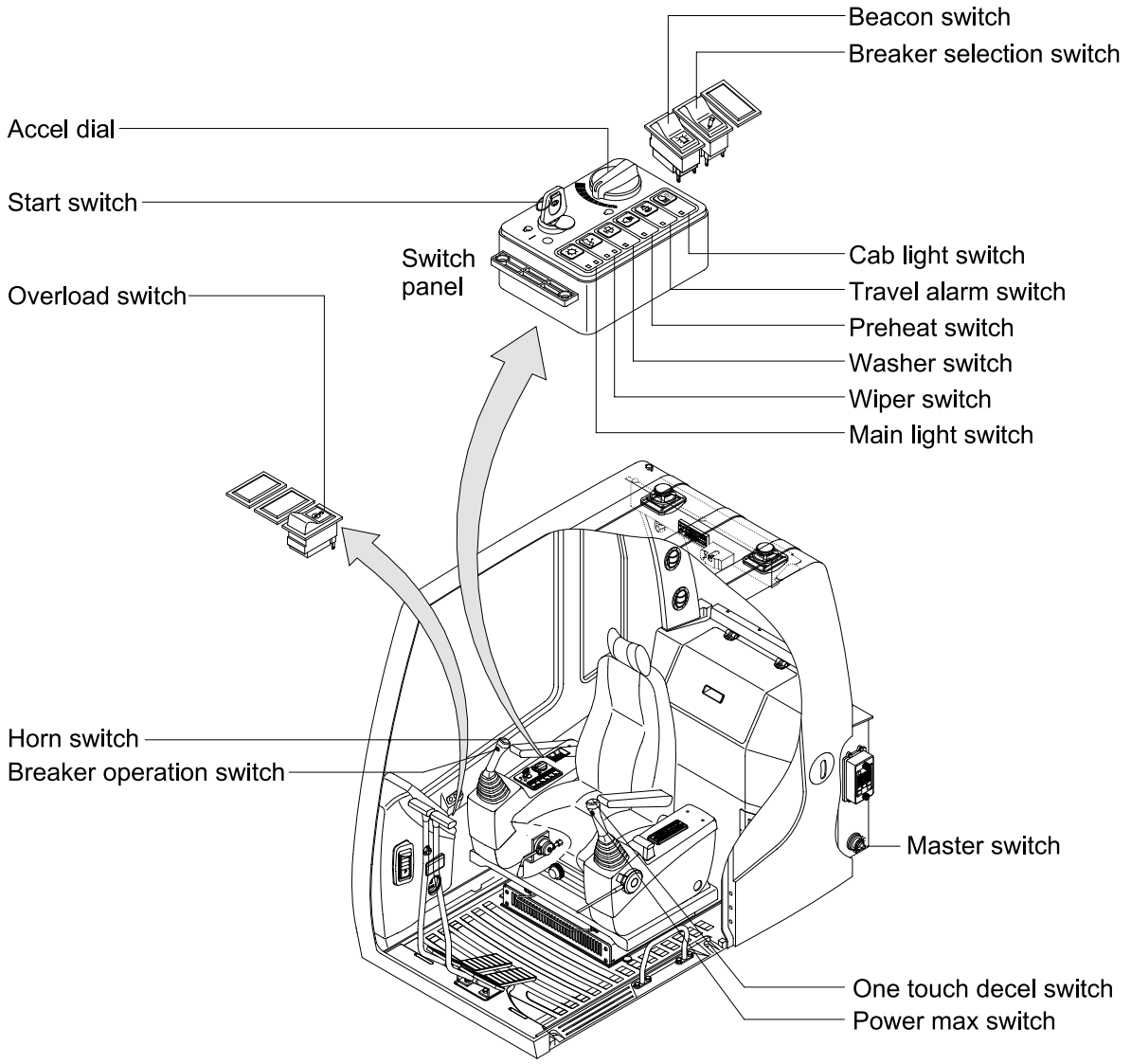
① This switch is used to select the monitor display function.

※ Refer to the page 4-11 for details.

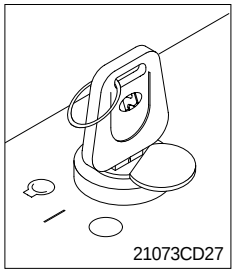
② If the switch is pressed for 3 seconds in time display mode, it is selected time adjusting function, as below.
- Hour by auto decel switch
- Minute by buzzer stop switch.

③ After time set, the switch is pressed, it is returned clock.

3. SWITCHES



1) STARTING SWITCH

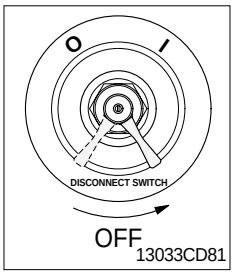


(1) There are three positions, OFF, ON and START.

- ◯ (OFF) : None of electrical circuits activate.
- | (ON) : All the systems of machine operate.
- ⏻ (START) : Use when starting the engine. Release key immediately after starting.

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

2) MASTER SWITCH

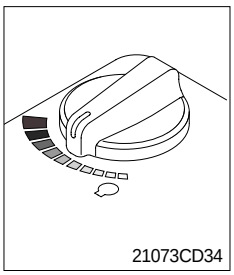


(1) This switch is used to shut off the entire electrical system.

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

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

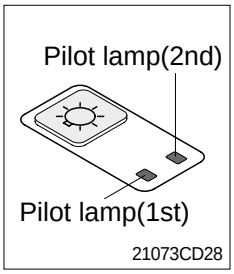
3) ACCEL DIAL SWITCH



(1) There are 10 dial setting.

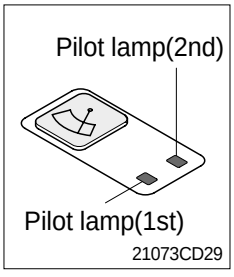
(2) Setting 1 is low idle(Turtle) and setting 10 is high idle(Rabbit).
- By rotating the accel dial to right : Engine speed increases
- By rotating the accel dial to left : Engine speed decreases

4) MAIN LIGHT SWITCH



(1) This switch use to operates the head light and work light by two step.
- First step : Head light comes ON.
- Second step : Work light comes ON.

5) WIPER SWITCH

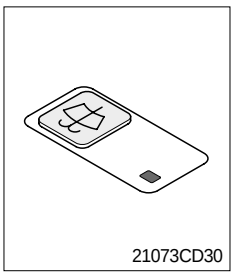


(1) This switch use to operates wiper and washer by two step.
- First step : The wiper operates(Intermittent)
- Second step : The wiper operates(Low speed)

※ **Wiper motor doesn't operate with front sliding door open.**

※ **If wiper does not operate with the switch in the ON position, turn the switch off immediately. Check the cause. If the switch remains ON, motor failure can result.**

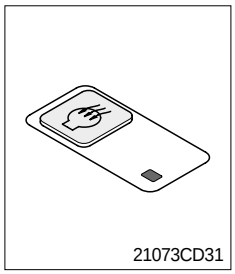
6) WASHER SWITCH



(1) The washer liquid is sprayed and the wiper is operated only while pressing this switch.

(2) The indicator lamp is turned ON when operating this switch.

7) PREHEAT SWITCH

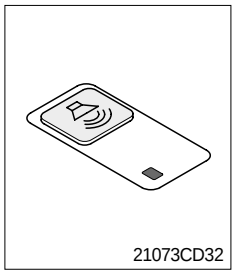


(1) This switch is used for starting the engine in cold weather. If pressed, preheated the intake air to get easier engine starting.

※ **Never hold the push button switch in for more than 5 seconds, as this can damage the electric valve solenoid.**

(2) The indicator lamp is turned ON when operating this switch.

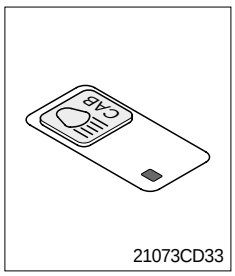
8) TRAVEL ALARM STOP SWITCH



(1) This switch is the signal to alarm surrounding when the machine travels to forward and backward.

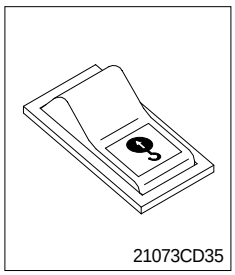
(2) On pressing this switch, the alarm operates only when the machine is traveling.

9) CAB LIGHT SWITCH(Option)



(1) This switch turns ON the cab light on the cab.

10) OVERLOAD SWITCH



(1) When this switch turned ON, buzzer makes sound and overload warning lamp comes ON in case that the machine is overload.

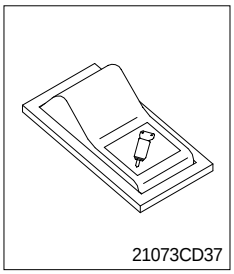
(2) When turn OFF buzzer stops and warning lamp goes out.

11) QUICK CLAMP SWITCH(Option)

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

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

12) BREAKER SELECTION SWITCH(Option)



(1) This switch is used to select breaker.

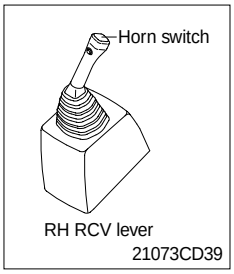
※ The breaker operates only when this switch is selected.

13) BEACON SWITCH(Option)

(1) This switch turns ON the rotary light on the cab.

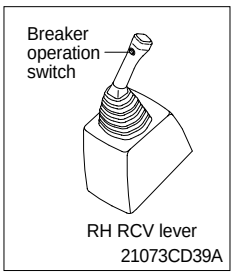
(2) The below indicator lamp is turned ON when operating this switch.

14) HORN SWITCH



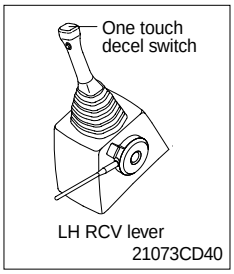
(1) This switch is at the top of right side control lever.
On pressing, the horn sounds.

15) BREAKER OPERATION SWITCH



(1) On pressing this switch, the breaker operates only when the breaker selection switch on the switch panel is selected.

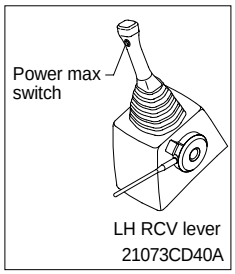
16) ONE TOUCH DECEL SWITCH



(1) This switch is used to actuate the deceleration function quickly.

(2) The engine speed is increased to previous setting value by pressing the switch again.

17) POWER MAX SWITCH

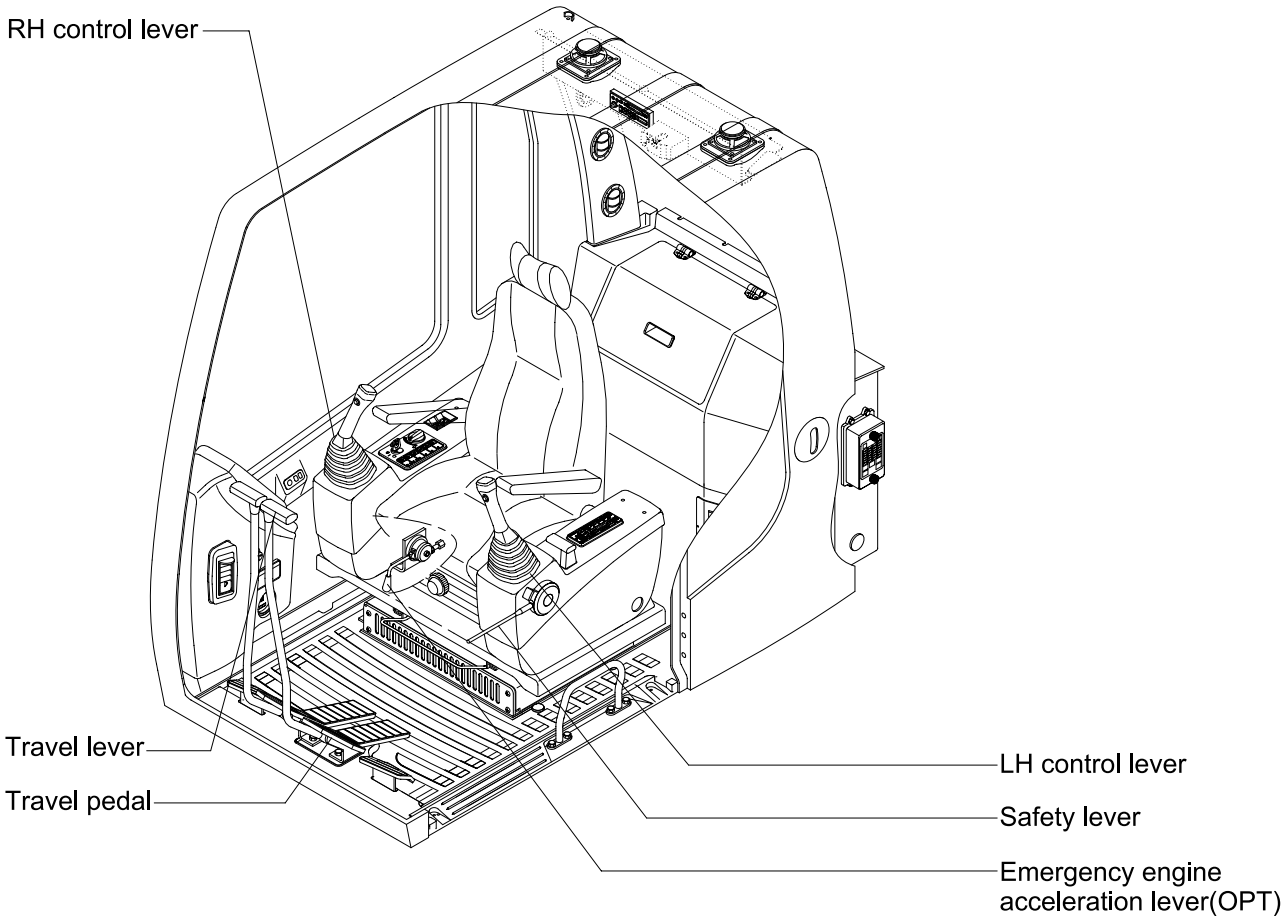


(1) This switch activate power max function.
When this switch is kept pressed, hydraulic power of work equipment will increased approx 110 percent during 8 seconds.

(2) After 8 seconds, function is cancelled automatically even switch is keep pressed.

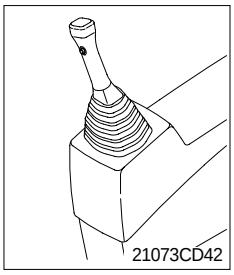
※ **Don not use for craning purposes.**

4. LEVERS AND PEDALS



32073CD41

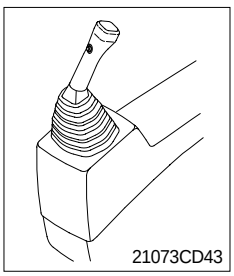
1) LH CONTROL LEVER



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

(2) Refer to **operation of working device** in chapter 4 for details.

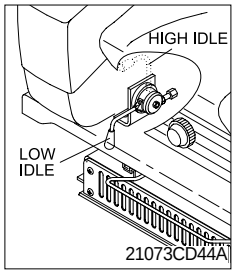
2) RH CONTROL LEVER



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

(2) Refer to **operation of working device** in chapter 4 for details.

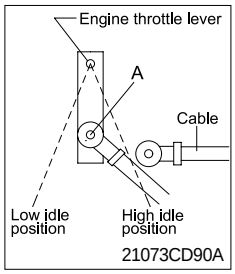
3) ENGINE ACCELERATION LEVER FOR EMERGENCY(Option)



(1) This lever is used to increase or reduce the rotation speed of engine when the abnormality is occurred in CPU controller .
Connect the resistor with frame harness.
Refer to the 3-26 page for connection of prolix resistor.

(2) Move the lever up to increase engine RPM.
Move the lever down to decrease engine RPM.
When stopping the engine, turn the key to OFF and move the acceleration lever completely down.

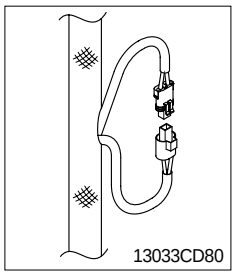
※ METHOD OF CONNECTING EMERGENCY ENGINE ACCELERATION LEVER(Option)



(1) Open engine hood and disconnect rod from throttle lever at a A point.

(2) Connect emergency engine acceleration cable to throttle lever at A point.

4) EMERGENCY ENGINE STARTING CONNECTOR

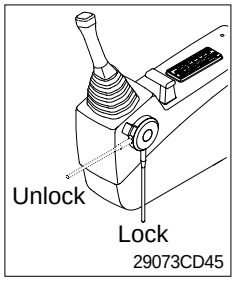


(1) If the CPU controller is removed, the engine does not start.

(2) Before starting the engine, connect the connector CN-92 A with B.

※ Do not connect these connectors when the CPU is not removed.

5) SAFETY LEVER



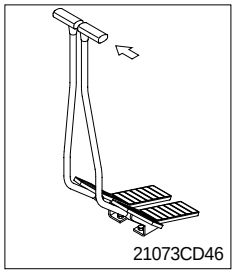
(1) All control levers and pedals are disabled from operation by pulling the lever to lock position as shown.

※ Be sure to keep the lever to LOCK position when leaving from operator's seat.

(2) By pushing lever to UNLOCK position, machine is operational.

※ Do not use the safety lever for handle when getting on or off the machine.

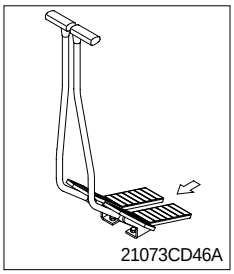
6) TRAVEL LEVER



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

(2) Refer to **traveling of the machine** in chapter 4 for details.

7) TRAVEL PEDAL

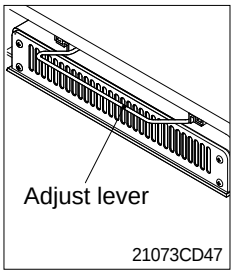


(1) This pedal is used to move the machine forward or backward.

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

(3) Refer to **traveling of machine** in chapter 4 for details.

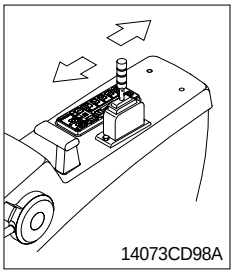
8) SEAT AND CONSOLE BOX ADJUST LEVER



(1) 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㎜(6.7").

9) DOZER CONTROL LEVER(Option)



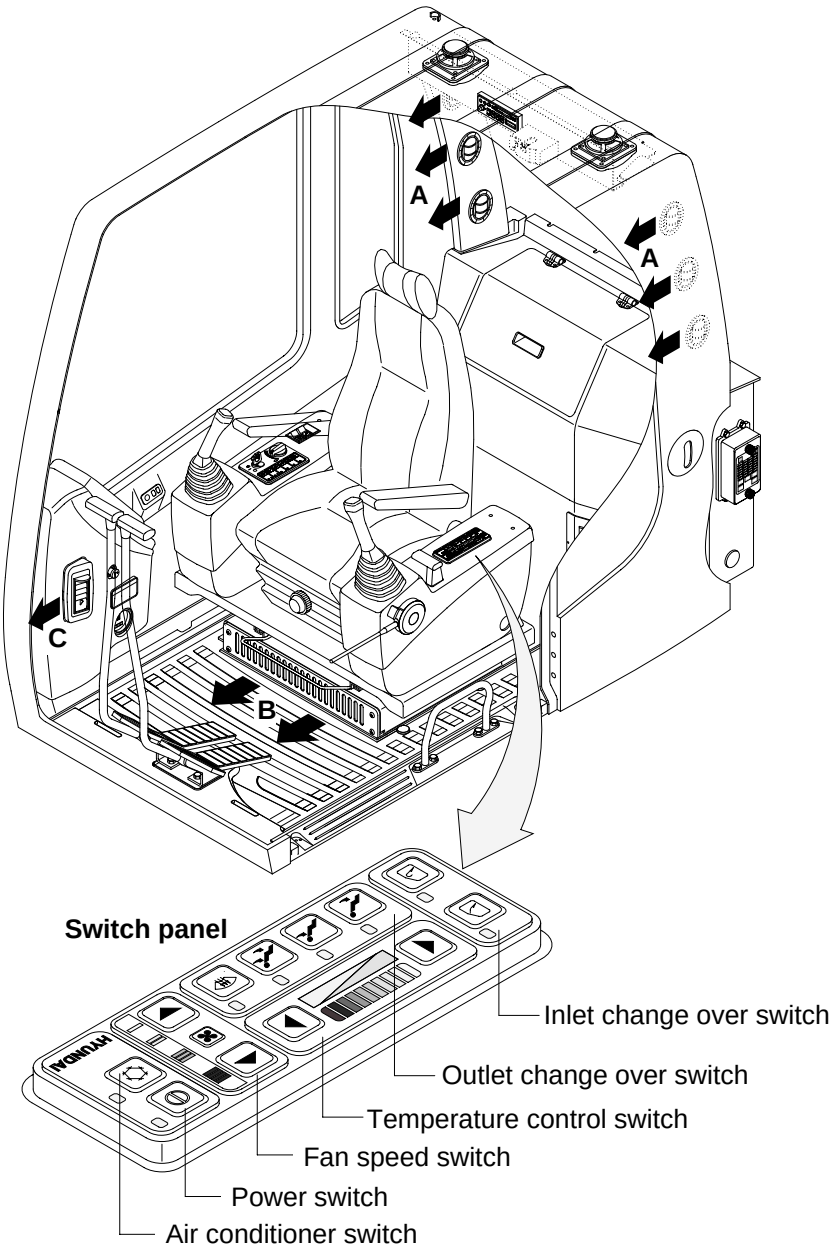
(1) This lever is used to operate the dozer blade.

(2) If the lever is pushed forward, the dozer blade will be going down.
And the lever is pulled back, the dozer blade will be going up.

5. AIR CONDITIONER AND HEATER

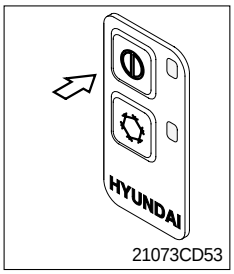
Air conditioner and heater are equipped for pleasant operation against outside termperature and defrost on window glass.

· **Location of air flow ducts**



36073CD48

1) POWER SWITCH

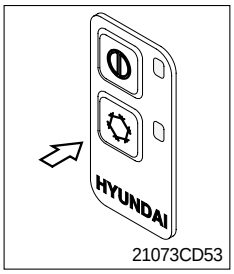


(1) This switch makes the system and the LED simultaneously ON or OFF.

(2) Default setting values

Function	Air conditioner	Fan speed	Temperature	Outlet	Inlet
Value	OFF	1	Max cool	Face	Recirculation

2) AIR CONDITIONER SWITCH(Compressor switch)

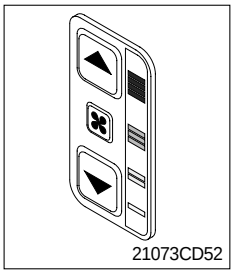


(1) Operating this switch turns the compressor and the LED simultaneously on or off.

(2) In accordance with the evaporator temperature, compressor turns on or off automatically without changing LED stare.

※ **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.

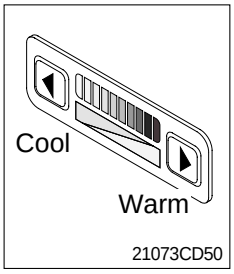
3) FAN SPEED SWITCH



(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



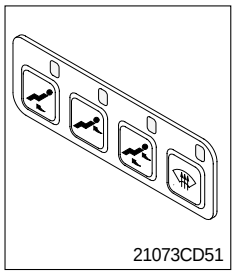
(1) There are 9 steps to control temperature from max cool to max warm controlled up and down by 1 step.

(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



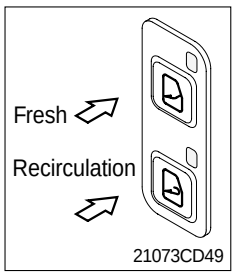
(1) There are four steps of air flow.

Switch position		Mode			
Outlet	A		●	●	
	B	●		●	●
	C				●

(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



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

① **Fresh**

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.**

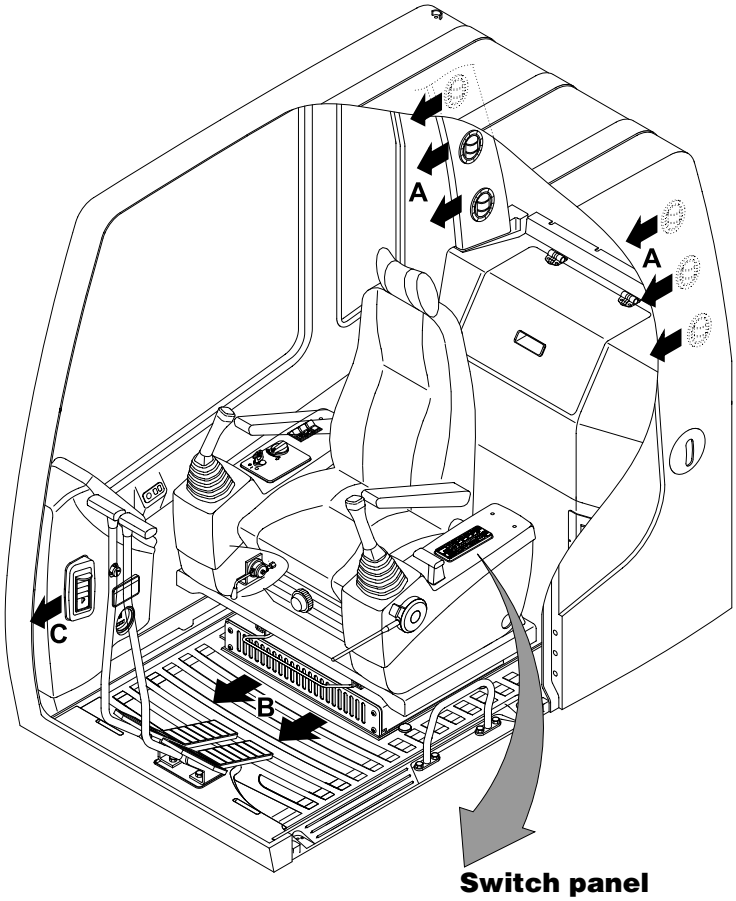
※ **Check out the recirculation filter periodically to keep a good efficiency.**

(2) Recirculation function operates when the system is OFF but it can be changed whenever needed.

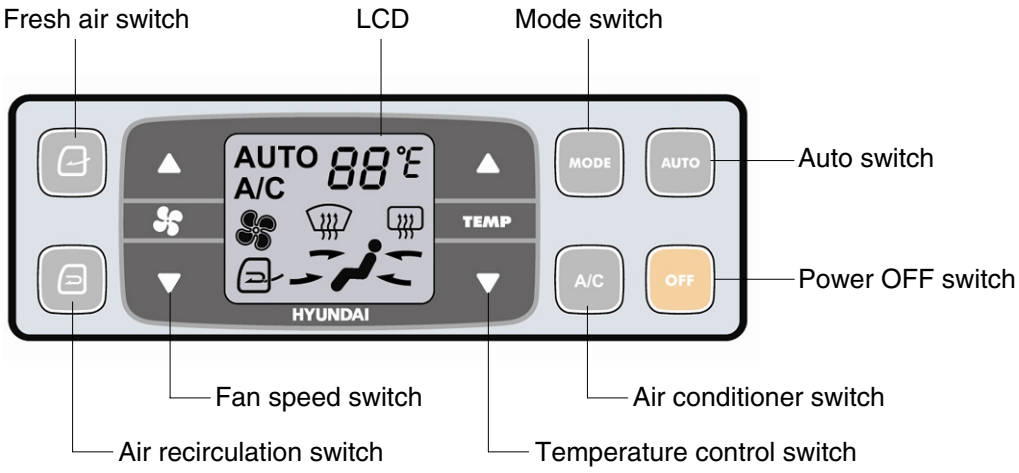
■ AUTO AIR CONDITIONER AND HEATER(OPTION)

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

· Location of air flow ducts

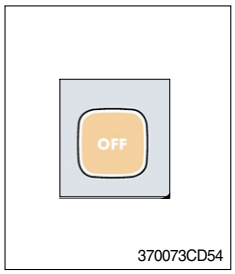


Switch panel



11073CD49

1) POWER OFF SWITCH

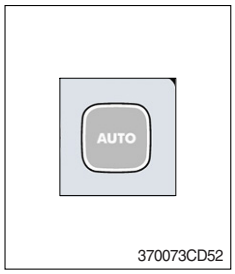


(1) This switch makes the system and the LED OFF.
Just before the power OFF, setted values are stored.

(2) Default setting values

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

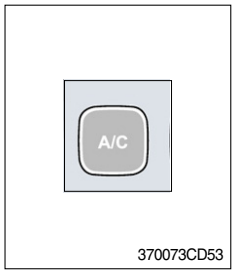
2) AUTO SWITCH



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

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

3) AIR CONDITIONER SWITCH(Compressor switch)

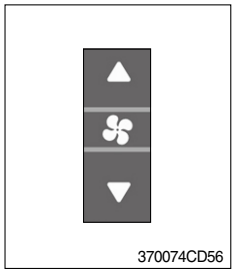


(1) This switch turns the compressor and the LCD ON.

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

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

4) FAN SPEED SWITCH

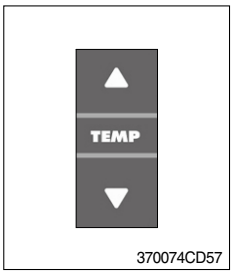


(1) Fan speed is controlled automatically by setted temperature.

(2) This switch controlls 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 makes the system ON.
▲ : First step(AUTO)
▼ :First step(Manually)

5) TEMPERATURE CONTROL SWITCH



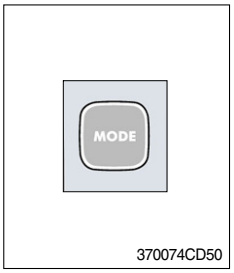
(1) Setting temperature indication(17~32℃, Scale : 1℃)

(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

6) MODE SWITCH



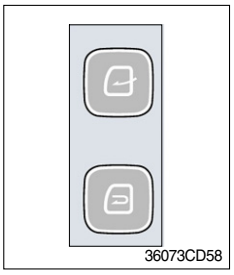
(1) Operating this switch, it beeps and displays symbol of each mode in order.(Vent → B/L → Foot → Def → Vent)

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

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

(3) When this switch ON, the system operates with previous configuration.

7) FRESH AIR/AIR RECIRCULATION SWITCH



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

① **Fresh air( )**

Inhaling air from the outside.

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

② **Air recirculation( )**

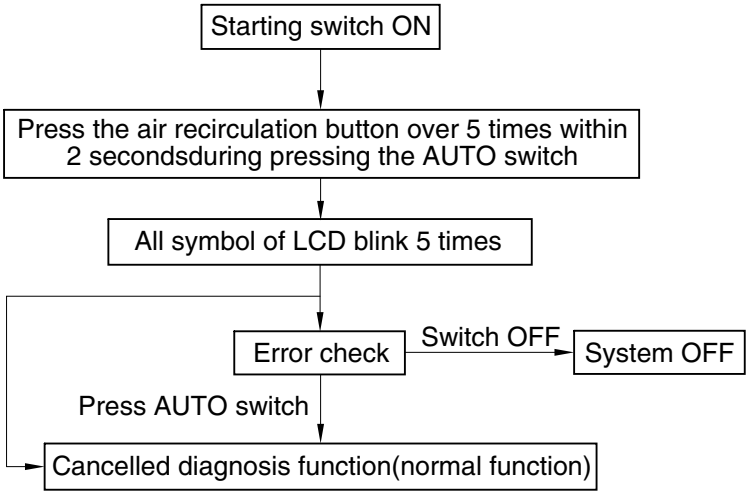
It recycles the heated or cooled air to increase the energy efficiency.

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

※ **Check out the recirculation filter periodically to keep a good efficiency.**

8) SELF DIAGNOSIS FUNCTION

(1) Procedure



3607A3CD69

(2) Error check

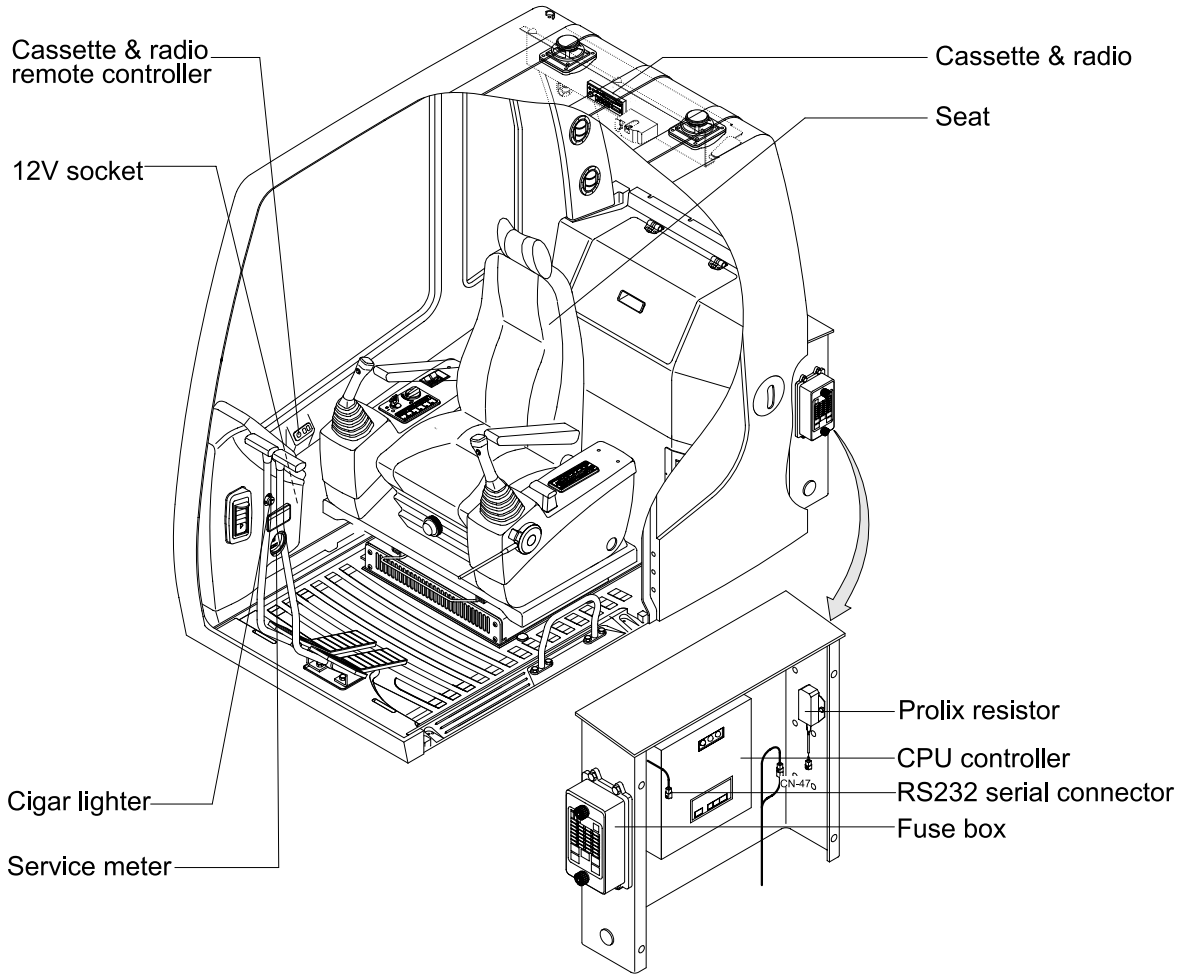
- The corresponding error code flickers on the setup temperature display panel, the other symbol will turn OFF.
- Error code flickers every 0.5 second.
- If error code is more than two, each code flickers 2 times in sequence.
- Error code

Error code	Description	Error code	Description
11	Ambient sensor	14	Duct(evaporator) sensor
12	Cabin inside sensor	15	Temp actuator
13	Coolant temp sensor	16	Mode actuator

(3) Fail safe function

Error description	Fail safe function
Ambient sensor(11)	25℃ alternate value control
Cabin inside sensor(12)	20℃ alternate value control
Coolant temp snesor(13)	More than 10 minutes after engine start up, the alternate vaule is ON
Duct(evaporator) snesor(14)	1℃ alternate value control
Temp actuator(15)	If opening amount is 0%, the alternate value is 0%
	If not, the alternate value is 100%
Mode actuator(16)	The alternate value is Vent

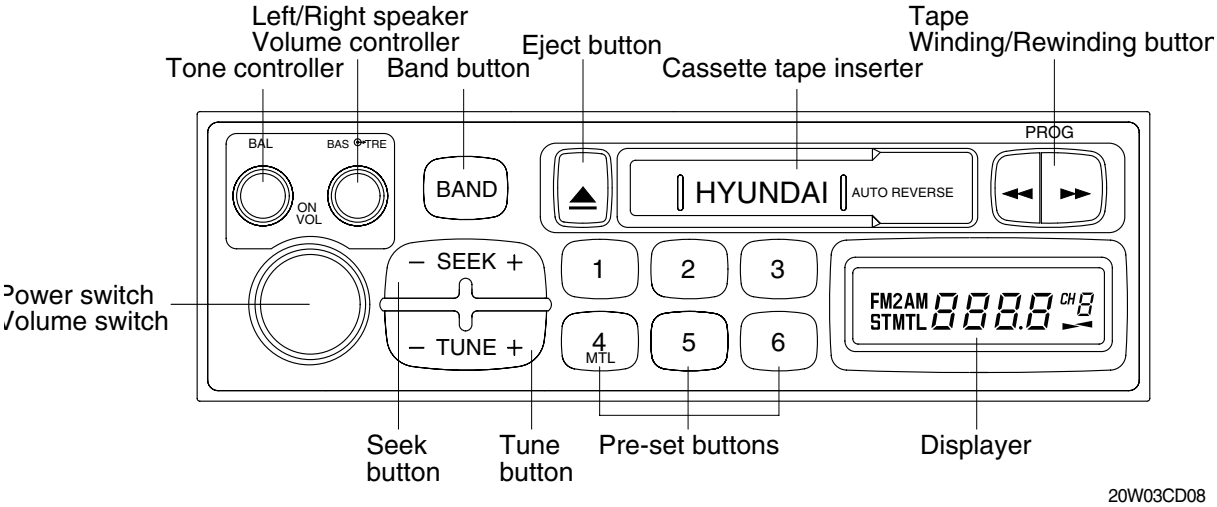
6. OTHERS



32073CD54

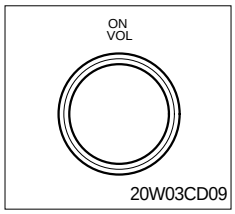
1) CASSETTE AND RADIO(~#2078)

High performance audio system is equipped for pleasant operation.



20W03CD08

(1) Power and volume switch

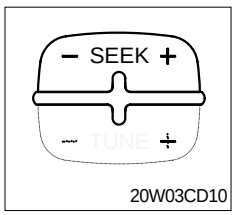


① This switch is turned to right, power will be turned ON and the sound is increased.

② If it is turned to left, volume will be decreased and power will be turned OFF.

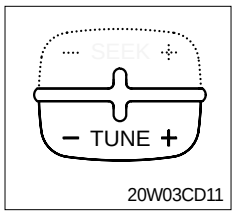
※ The volume controller of the cassette radio does not operate when turning ON the remote controller power.

(2) Seek button



① If this seek button is pressed, the radio automatically stops at the next frequency of broadcasting for your listening.

(3) Tune button



① Whenever you press " **+** " button, higher channels are selected.

② Whenever you press " - " button, lower channels are selected.

③ **General**

AM band : Frequency changes in 9kHz between 531 to 1602kHz.

FM band : Frequency changes in 0.1MHz between 87.5 to 108.0MHz.

④ **America**

AM band : Frequency changes in 10kHz between 530 to 1710kHz.

FM band : Frequency changes in 0.2MHz between 87.9 to 107.9MHz.

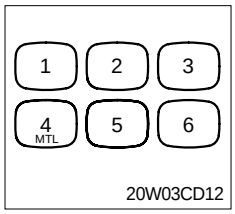
⑤ **Europe**

LW band : Frequency changes in 9kHz between 153 to 279kHz.

MW band : Frequency changes in 9kHz between 522 to 1620kHz.

FM band : Frequency changes in 0.05MHz between 87.5 to 108.0MHz.

(4) Pre - set button

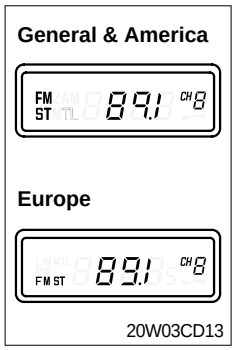


① You can immediately listen to the station by pressing pre-set button for which broadcasting station is pre-set.

② How to set broadcasting in memory.

- You can pre-set 6 stations each AM/FM band.
- When you want the station to be set in memory, press selected pre-set button for more than 2 seconds.

(5) Displayer



① **General and America**

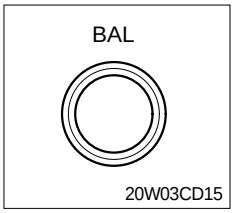
· When radio is turned ON, stereo, AM, FM, FM2, MTL and reception frequency are displayed.

② **Europe**

· When radio is turned ON, stereo, LW, MW, FM, FM2, MTL and reception frequency are displayed.

③ When cassette tape is played, indicator arrow(◄ , ►) are displayed.

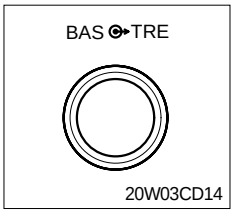
(6) Left/Right speaker volume button



① If balance button is pressed, it will spring out.
Volume of right and left speakers will be adjusted by turning the button to right or left.

② It will be fixed by pressing again after adjustment.

(7) Tone button



① **BASS tone**

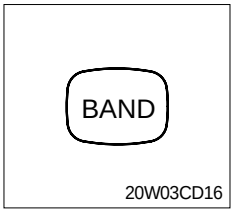
If tone button is pressed, it will spring out.
If it is turned to right, BASS tone is increased, and if it is turned to left, BASS tone is decreased.

② **TREBLE tone**

You can adjust the TREBLE tone by pull out the button.
If it is turned to right, TREBLE tone is increased, and if it is turned to left, TREBLE tone is decreased.

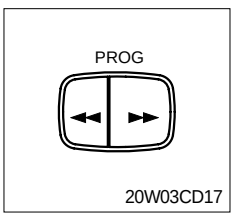
③ It will be fixed by pressing again after adjustment.

(8) Band button



① You can listen to broadcasting on AM or FM band by pressing this band selection button.

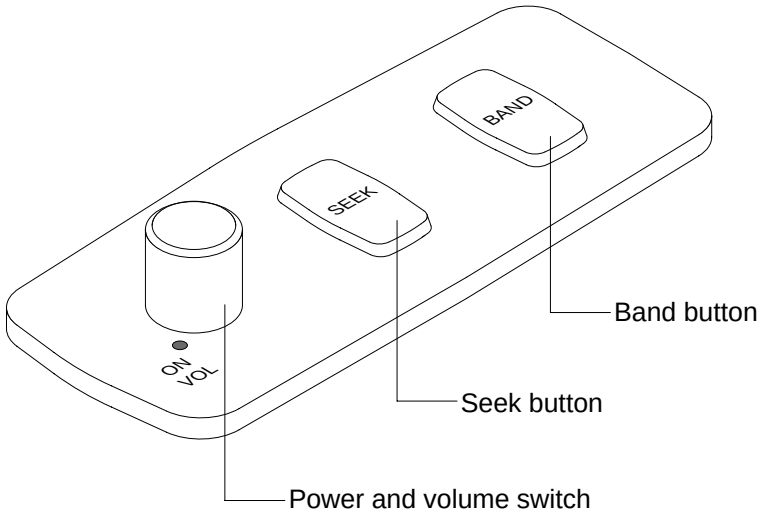
(9) Tape winding/Rewinding button



① If you press this button once while the tape is playing the direction will be reversed.

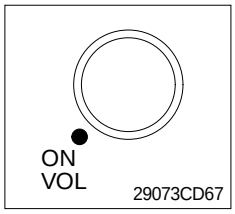
② If you press one of these buttons the tape will be winding fast or rewinding, and if you press another button on a certain point, the tape will be played.

2) REMOTE CONTROLLER(Cassette and radio)



29073CD62

(1) Power and volume switch

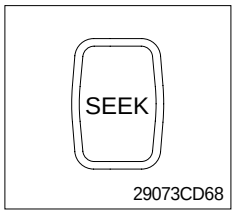


① This switch is turned to right, power will be turned ON and the sound is increased.

② If it is turned to left, volume will be decreased and power will be turned OFF.

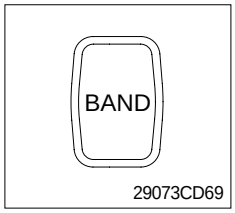
※ This switch does not operate when turning ON the cassette radio power.

(2) Seek button



① If this seek button is pressed, the radio automatically stops at the next frequency of broadcasting for your listening.

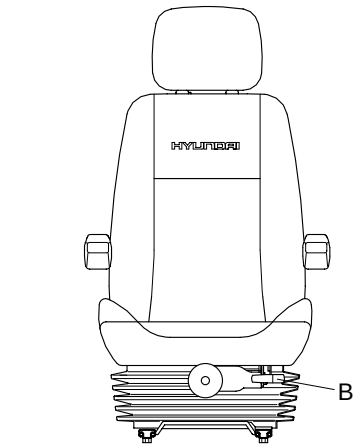
(3) Band button

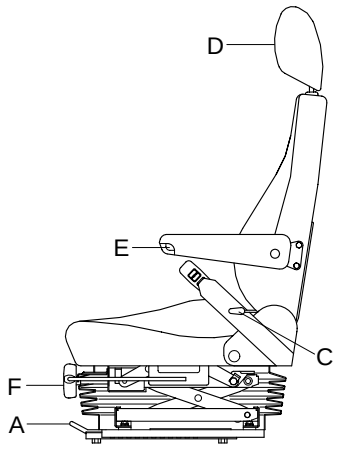


① You can listen to broadcasting on AM or FM band by pressing this band selection button.

3) SEAT

The seat is adjustable to fit the contours of the operator's body. It will reduce operator fatigue due to long work hours and enhance work efficiency.





95W33CD16

(1) Forward/Backward adjustment(A)

① Pull lever A to adjust seat forward or backward.

② The seat can be moved forward and backward over 170㎜(6.7") in 9 steps.

(2) Upward/Downward adjustment(B)

① Pull lever B to adjust seat upward or downward.

② Forward or backward side adjustment only can be made, tilting to one side, by moving lever B respectively.

(3) Reclining adjustment(C)

Pull lever C to adjust seat back rest.

(4) Arm rest adjustment(E)

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

(5) Head rest adjustment (D)

This is adjustable vertically to fit operator's requirements.

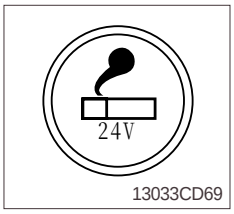
(6) Cushion adjustment (F)

Adjust the handle to the operator's weight.

⚠ Always check the condition of the seat belt and mounting hardware before operating the machine.

⚠ Replace the seat belt at least once every three years, regardless of appearance.

4) CIGAR LIGHTER



13033CD69

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

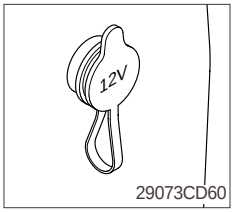
(2) The lighter can be used when it springs out in a short while after being pressed down.

※ **Service socket**

Use cigar lighter socket when you need emergency power.

Do not use the lighter exceeding 24V, 100W.

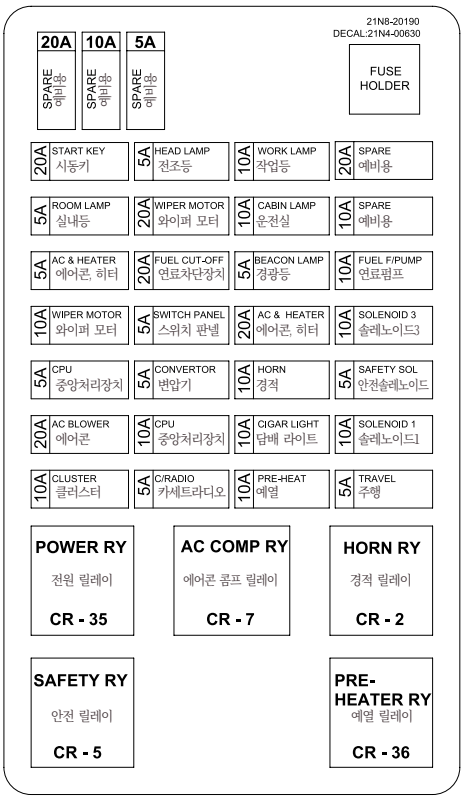
5) 12V SOCKET(Option)



29073CD60

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

6) FUSE BOX



14073CD55

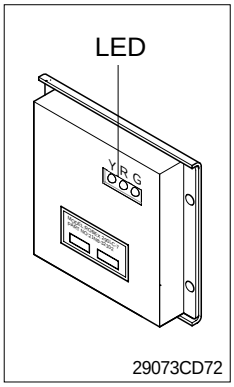
(1) The fuses protect the electrical parts and wiring from burning out.

(2) The fuse box cover indicates the capacity of each fuse and circuit it protects.

※ **Replace a fuse with another of the same capacity.**

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

7) CPU CONTROLLER



29073CD72

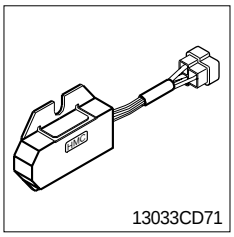
(1) To match the engine torque with the pump absorption torque, CPU controller varies EPPR valve output pressure, which control pump discharge amount whenever feedbacked engine speed drops under the reference rpm of each mode set.

(2) Three LED lamps on the CPU controller display as below.

LED lamp	Trouble	Service
G is turned ON	Normal	-
G and R are turned ON	Trouble on CPU or ROM	· Change the controller
G and Y are turned ON	Trouble on serial communication line	· Check if serial communication lines between controller and cluster are disconnected
Three LED are turned OFF	Trouble on CPU controller power	· Check if the input power wire (24V, GND) of controller is disconnected · Check the fuse

G : green, R : red, Y : yellow

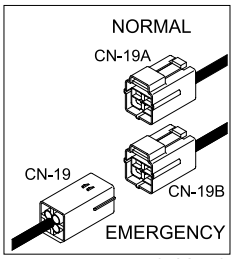
8) PROLIX RESISTOR(Option)



(1) This resistor is used to continuous working with emergency engine acceleration lever by connecting to frame harness in case of malfunction of the CPU controller.

※ **UP TO #0254 : CN-47**
#0255 AND UP : Normal : CN-19 TO CN-19A
Emergency : CN-19 TO CN-19B

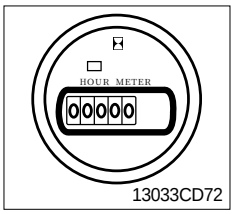
※ **In this case the machine can be operated with equivalent pump power to S mode.**



(2) Keep this resistor disconnected when the CPU controller is normal operation.

※ **Never connect this resistor to frame harness when CPU controller is in normal operation.**

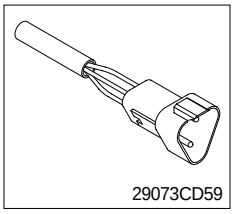
9) SERVICE METER



(1) This meter shows the total operation hours of the machine.

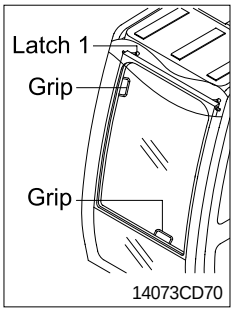
(2) Always ensure the operating condition of the meter during the machine operation. Inspect and service the machine based on hours as indicated in chapter 6, **maintenance.**

10) RS232 SERIAL PORT

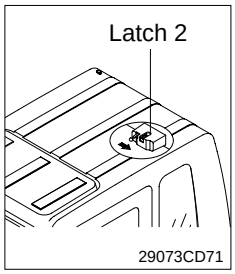


(1) CPU controller communicates the machine date with Lap top computer through RS232 connector.

11) UPPER WINDSHIELD



(1) Perform the following procedure in order to open the upper
① windshield.
② Release both latches(1) in order to release the upper windshield. Hold both grips that are located at the bottom of the windshield frame and at the top of the windshield frame push the windshield upward.
③ Hold both grips that are provided on the windshield frame and back into the storage position until auto lock latch(2) is engaged, move the levers of both latches(1) into the locked position. Push the levers toward the rear of the cab in order to hold the windshield in storage position.

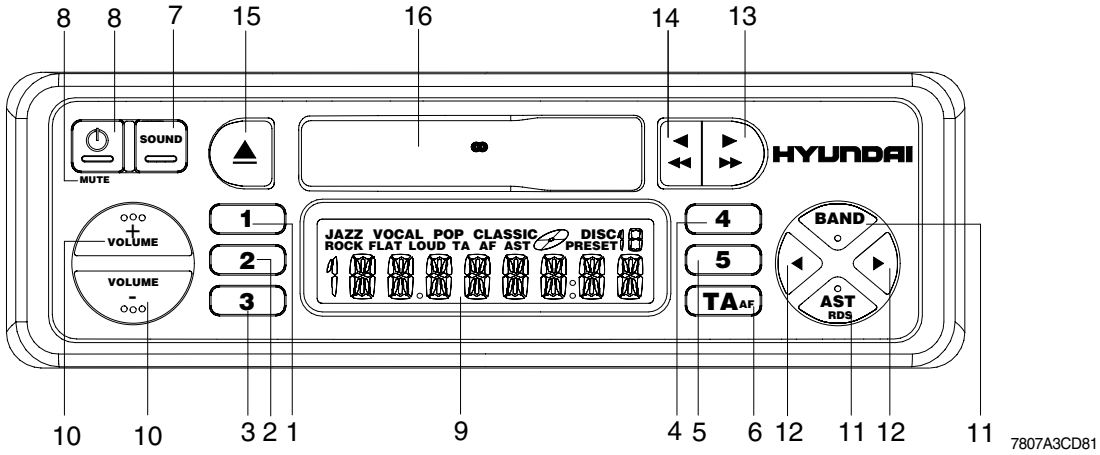


(2) Perform the following procedure in order to close the upper windshield.

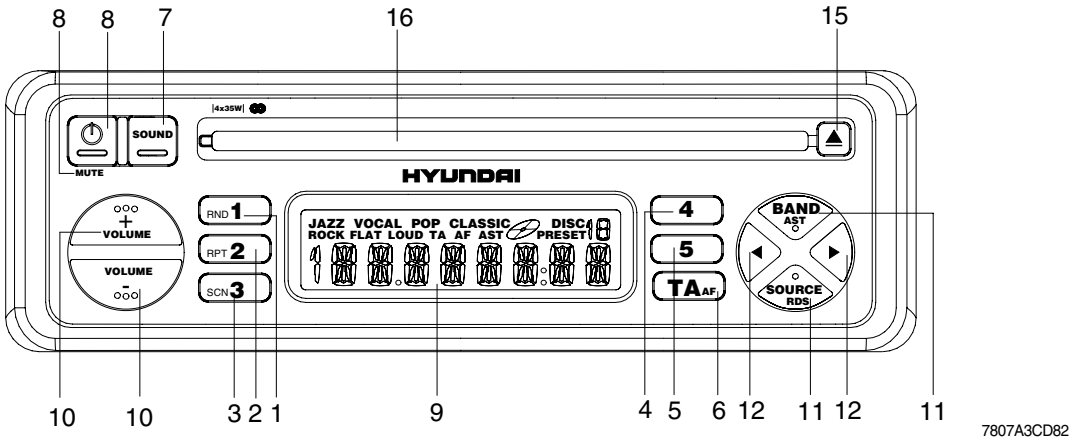
① Move the lever of the auto lock latch(2) in the direction of the arrow in order to release the auto lock latch.

② Reverse step ① through step ③ in order to close the upper windshield.

12) RADIO AND CASSETTE(Standard, #2079~)



RADIO AND CD PLAYER(Option)

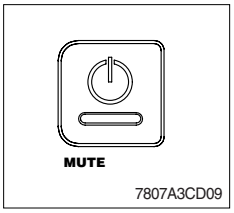


■ FRONT PANEL PRESENTATION

1 [1] ····· Preset button 1
RND ····· CD random playback on/off
2 [2] ····· Preset button 2
RPT ····· CD repeat track on/off
3 [3] ····· Preset button 3
SCN ····· CD's track scan
4 [4] ····· Preset button 4
5 [5] ····· Preset button 5
6 [TA AF] ····· Short press : TA on/off
Long press : AF on/off
7 SOUND ····· Select sound/audio styles
8 ⏻ ····· Short press : power on
Long press : power off
MUTE ····· Short press : To mute or cancel mute.
9 ····· Display
10 ····· Volume knob : Press up/down to adjust the volume ; adjust selected audio mode
11 SOURCE ·· Short press : Change source(Radio/CD)
RDS ····· Long press : RDS on/off
BAND ····· Short press : To select band
AST ····· Long press : Autostore(CD)
Short press : Autostore(Cassette)
12 ◄► ····· **Tuner mode**
Short press : Auto search up/down
Long press : Manual search up/down
Cassette mode : No function
CD mode
Short press : Next/previous track
Long press : Fast forward or fast rewind
13 ▶▶ ····· Fast forward(cassette deck)
14 ◀◀ ····· Fast rewind(cassette deck)
15 ▲ ····· Disc eject(CD)
Eject cassette
16 ····· CD opening / Cassette opening

■ AUDIO

(1) Power and mute button



① **POWER ON/OFF**

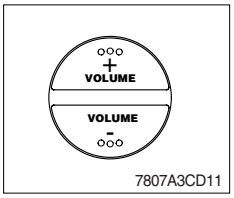
Press ⏻ to switch on the set. Press ⏻ for more than 2 seconds to switch off the set.

② **MUTE**(Silence)

Short press ⏻ key to mute or cancel the mute(silence).

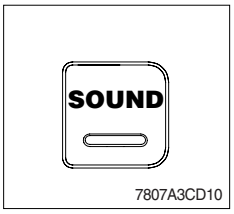
※ The silence period may be interrupted by ALARM announcement or traffic announcement messages(If TA is switched on).

(2) Volume button



① Press the volume button up/down to adjust the volume.
Please make sure you can still hear the traffic(horns, sirens..).

(3) Sound button



① **SOUND**

Whether you listen to Jazz, Vocal, Pop, Classic or Rock music, the SOUND button is the perfect setting for your choice.

· Press SOUND then the sound button to select BASS-Treb for your own sound style, or adjust the settings with the volume up/down buttons to select one of the pre define sound styles:

- BASE -TRE : Your own settings of bass and treble.
- FLAT : Original
- JAZZ : Jazz music
- VOCAL : Speech
- POP : Pop music
- CLASSIC : Classical music
- ROCK : Rock music

② **AUDIO SETTING**

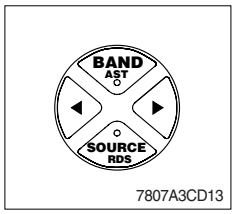
· Press SOUND to select desired audio mode.

· Adjust the settings with the volume up/down buttons :

- Sound style : BASS-TRE, FLAT, JAZZ, VOCAL, POP, CLASSIC, ROCK
- BASS : Low notes
- TREBLE : High notes
- BALANCE : Left-right
- FADER : Rear-front
- LOUD : OFF, LOW, MID, HIGH

· Press the volume button to adjust the selected audio mode.
After 5 seconds the display goes back to the last mode of operation.
Adjustment of Bass and Treble settings is only possible when BASS-TRE is selected as the sound style.

(4) Source button

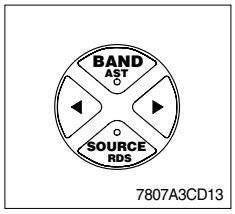


① Press SOURCE to select the desired source :
- TUNER
- CD

※ Products with cassette mechanism will change source to cassette only when a tape is inserted.

■ RADIO

(1) Wave band / Automatic search button



① WAVEBAND

· Press BAND to select the desired band:

FM I → FM II → FM AST → MW I → MWAST(AMAST) → LW → FM I

② AUTOMATIC SEARCH

Use search tuning to automatically search for a station.

· Press ◄ to tune a station of a lower frequency or ► to a higher frequency.

· To search for another station, press the key again.

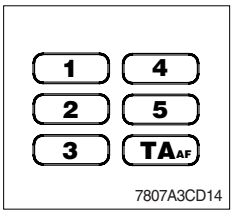
③ MANUAL TUNING(If you know the frequency of the required station)

· **To switch to manual tuning :**
Long press the search button ◄ or ► for more than 2 seconds will switch the tuning to manual tuning.

· Then press ◄ to tune to a station of a lower frequency or ►to a higher frequency.

· When keys are released, a time-out start to count. After 5 seconds time-out, display 'Auto' for one second and return to automatic search.

(2) Preselected button



Preselected stations

① Manually storing stations in a preset

Five stations per band can be stored and recalled using the preset keys(1 to 5).

Tune in to the desired station.

- Press the desired preset key(1 to 5) for more than 2 seconds to
- store the current tuned station.

When storing an FM station, the current program station name and the AF mode are stored on the preset(Some stations use alternating program service name).

② Recalling a preset

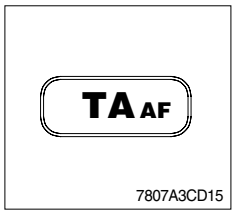
Press the desired preset key(1 to 5) to recall the stored station.

③ Automatically storing stations(AUTO-STORE)

You can automatically store 5 strongest FM stations on the FM AST band or 5 strongest MW(AM) stations on the MW(AM) AST band. When you use Auto store, the new stations replace any stations previously stored in the FM AST band or the MW(AM) AST band.

- Press AST to activate autostore.
- The set gives a beep and then mutes.
- When it has finished, you hear a beep followed by the station stored on preset 1.
- Sometimes it may not be possible to find 5 stations.

■ RADIO DATA SYSTEM(RDS) ON FM



More and more stations broadcasts RDS informations in order to offer you many advantages including:

(1) Program service name(PS)

Allows the radio to display the name of the station instead of its frequency.

(2) Automatic returning(AF)

The set remains tuned to the current station by continually searching the best alternative frequency for best reception.

You can switch AF off.

- Activate/Deactivate AF

This set continuously search for other alternative frequencies for the tuned radio station and automatically selects the best frequency for reception. Long press (TA AF) for more than 2 second to activate/ deactivate AF.

(3) Alarm messages(PTY ALARM)

This set automatically receives emergency messages made by the broadcaster.

- During the messages the display shows 'ALARM' and the station-name alternately.

(4) Traffic announcements(TA)

You can activate the TA modes to give priority so as to hear traffic announcements related to these subjects(even if you play a cassettes/CD or mute the set).

- Activate/Deactivate TA

- Short press BAND to select an FM band.
- Press (TA AF) to activate/deactivate TA.

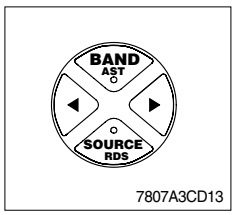
- If you activate TA mode

- You will hear the traffic announcements when broadcast by station(even if you play a cassette/CD or mute the set).
- If the tuned station does not enable the reception of traffic announcements, the display shows 'NO TA'. The radio automatically searches and appropriate station.

- Interrupting traffic announcement mode

If you do not wish to continue listening to a particular traffic announcement

- Short press (TA AF) key to interrupt traffic announcement without switching off the mode
- The set will return to the previous operating mode.

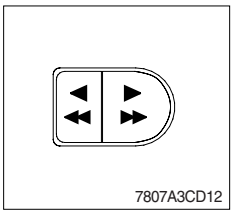


※ **You can switch off RDS features if not required.**

- Long press RDS key to switch off RDS.
- All RDS related features e.g., TA, etc...will be deactivated when RDS is switch off.

■ CASSETTE PLAYER

(1) Winding/Rewinding button



※ Only use good quality cassettes.

※ To avoid possible tape damage always take out the cassette after use. Protect your cassettes. Put them back in their boxes immediately after use.

※ Never expose cassettes to heat or direct sunlight.

① Play back

Slide the cassette, with the open side to the right into the cassette opening. Playback starts.

The direction of playback is shown by indicator ►.

② Stopping playback(▲)

- To stop playback, Press the ▲ button fully home.
- The unit will switch over to radio reception.
- The cassette is partially ejected.

③ Reverse(before the end of the tape)

Press the ◄◄ and ►► buttons at the same time halfway in.

④ Fast rewind / Fast forward(◄◄ or ►►)

The direction of fast winding depends on the direction of play indicated on the display.

Display during playback	Action	Key to press
►	Fast forward	►►
►	Fast rewind	◄◄
◄	Fast forward	◄◄
◄	Fast rewind	►►

During fast forward or rewind the radio resumes. If you continue fast winding until the end of the tape, play back restarts automatically.

⑤ To stop fast winding

To stop fast winding before the end of the tape, press the key which is not pressed(◄◄ or ►►). Playback is then resumed.

⑥ End of the tape

At the end of the tape, playback continues in the revers direction.

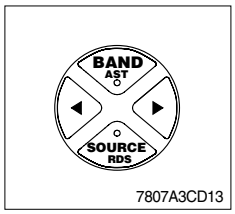
⑦ Maintenance

After extended use of the cassette player, dust, contamination or grime can accumulate on the playback head.

This results in diminishing high-note reproduction. This can be remedied using a cleaning cassette(one or twice a month) and playing it through like an ordinary cassette.

■ CD PLAYER

(1) Winding / Rewinding button



① CD playback

This CD player is suitable only for 12㎝ disc, do not use irregular shaped CD.

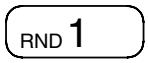
- Slide the disc into the slot with label facing upwards. Playback starts.
- If a disc is already inserted :
  Press SOURCE to select CD as the source.
  Playback starts.

② Previous / Next track(◄ or ►)

- Short press the ◄ or ► button to select the desired track.
- Playback resume with the chosen track.

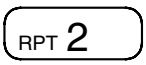
③ Fast rewind / Fast forward(◄ or ►)

- Long press the ◄ or ► button for more than 2 seconds to quickly move rewind or forward through the disc.
- Normal play back resumes when you release the button.



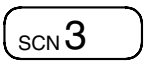
④ Random track playback

- Press **RND** to activate / deactivate random track playback.



⑤ Repeat track

- Press **RPT** to activate / deactivate repeat current track.



⑥ Scan track

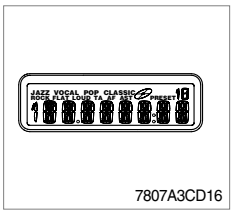
The scan function enables you to listen to the first few seconds of each track.

- Press **SCN** to activate / deactivate scan track.

⑦ Disc eject

- Press ▲ to eject the disc.

■ RADIO SETTING



(1) AMERICA

Press ⏻ , No. 1 and No. 4 buttons at the same time. Set up completes displaying " AMERICA".

(2) SOUTH AMERICA

Press ⏻ , No. 2 and No. 5 buttons at the same time. Set up completes displaying " SOUTH".

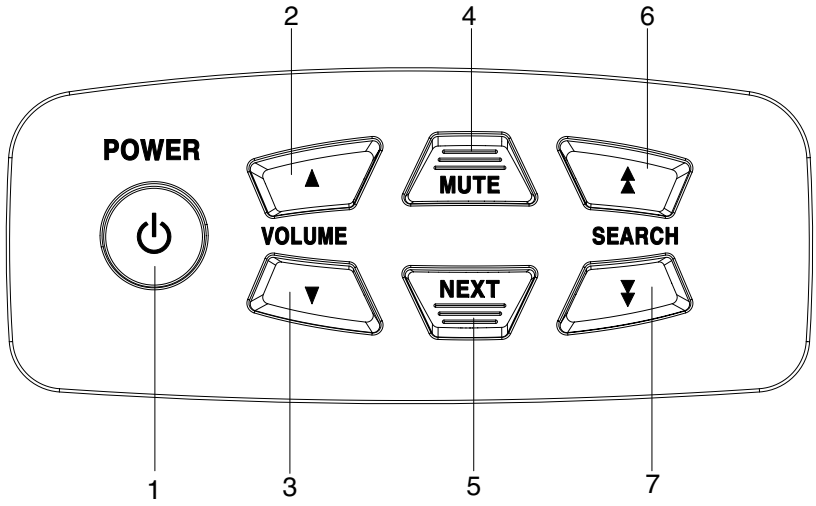
(3) ASIA

Press ⏻ , No. 1 and No. 5 buttons at the same time. Set up completes displaying " ASIA".

(4) EUROPE

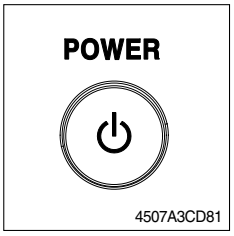
Press power, No. 2 and No. 4 buttons at the same time. Set up completes displaying " EUROP".

13) REMOTE CONTROLLER



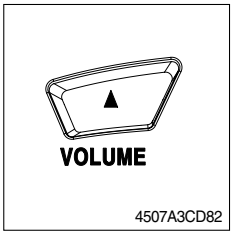
4507A3CD90

(1) Power ON/OFF button



① Press ⏻ to switch ON the set. Press ⏻ for more than 2seconds to switch OFF the set.

(2) Volume button(up)



- Short press : Volume up one step
- Long press : Volume up continuous

(3) Volume button(down)

- Short press : Volume down one step
- Long press : Volume down continuous.

(4) Source & mute button

- Short press : Change source(Radio/CD)
- Long press : To mute or cancel mute.

(5) Next button

① Tuner mode
- Short press : Preset up
- Long press : Band up

② Cassette mode
- Short press : Reverse(before the end of the tape)
- Long press : No function

③ CD mode
- Short press : Track 1
- Long press : Scan track

(6) Search button(up)

① Tuner mode
- Short press : Search up one step
- Long press : Search up continuous

② Cassette & CD mode
- Short press : Next track
- Long press : Fast forward

(7) Search button(down)

① Tuner mode
- Short press : Search down one step
- Long press : Search down continuous

② Cassette & CD mode
- Short press : Previous track
- Long press : Fast rewind

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.

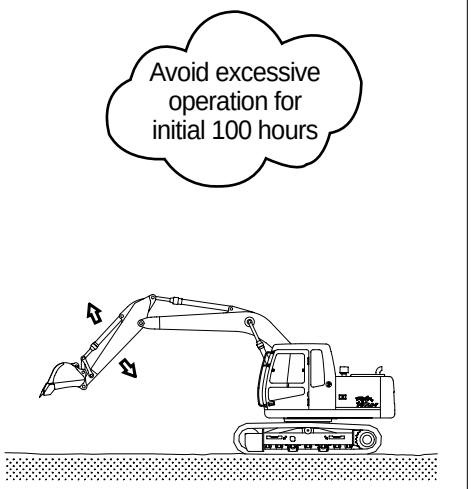
(4) Warm up the machine fully before operation.

(5) Check the gauges occasionally during the operation.

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

4) Replace followings after initial 50 hours of operation

Checking items	Service
Engine oil	Replace
Engine oil filter element	
Hydraulic oil return filter element	
Hydraulic oil tank drain filter cartridge	
Line filter element	
Fuel filter	



14074OP01

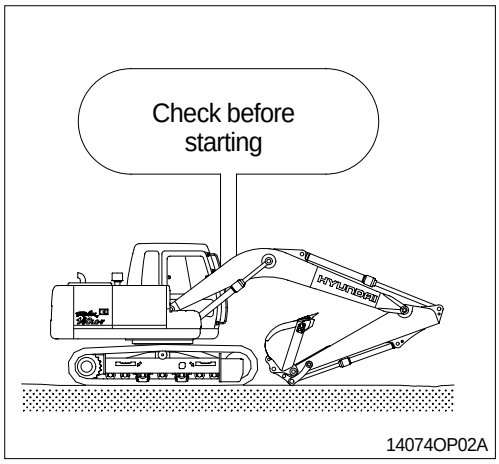
2. CHECK BEFORE STARTING THE ENGINE

1) 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 the chapter 6, maintenance.**

2) Adjust seat to fit the contours of the operator's body for the pleasant operation.

3) Adjust the rear view mirror.



14074OP02A

3. STARTING AND STOP THE ENGINE

1) CHECK INDICATOR LIGHTS

(1) Check if all the operating lever is on the neutral position.

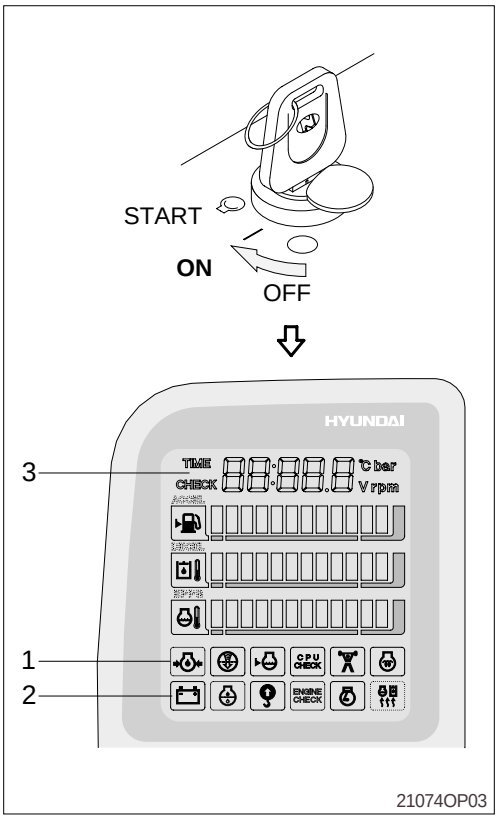
(2) Turn the starting switch to the ON position, and check following.

① If all the lamps light ON and buzzer sounding for 5 seconds.

② After lamp check **CL : 1.4** , the version of cluster program, is displayed on **Monitoring display(3)** for 2 seconds and the cluster returns to default.

③ Only below lamps will light ON and all the other lights will turn OFF.

- Engine oil pressure warning lamp(1)
- Battery charging warning lamp(2)



21074OP03

2) STARTING ENGINE IN NORMAL TEMPERATURE

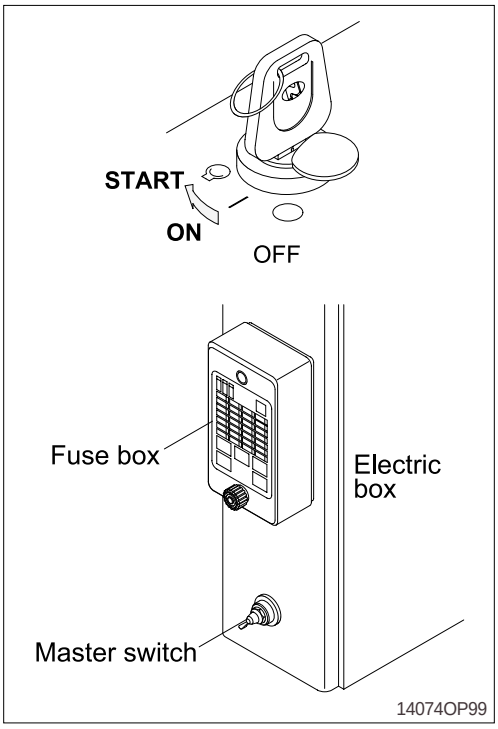
※ **Sound the horn to warn the surroundings after checking if personnel or obstacles are in the area.**

(1) Turn the starting switch to START position to crank the engine.

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

(2) Make sure that the reset button for the circuit breaker remains depressed.

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



14074OP99

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.**

(1) Check if all the levers are in the neutral position.

(2) Turn the starting switch to ON position, and wait the preheat pilot lamp OFF.

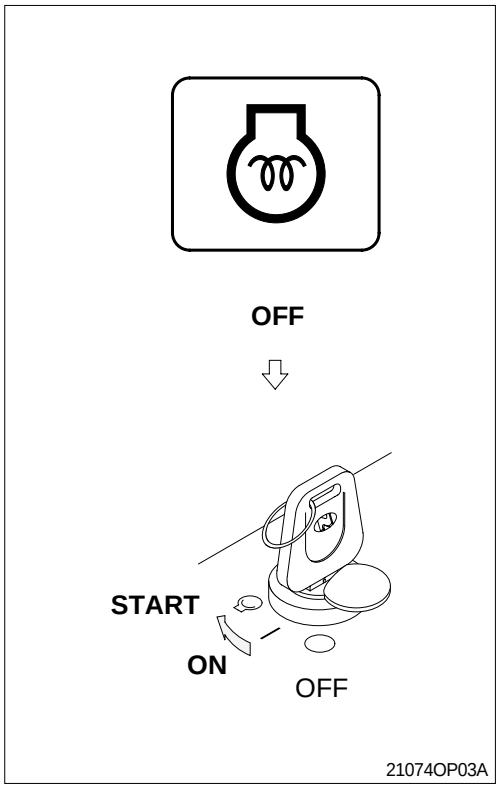
(3) Start the engine by turning the starting switch to the START position after the preheat pilot lamp OFF

※ **If necessary use the preheat switch.**

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

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

(5) The operation for the warming up machine is automatic.



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(1-7)?

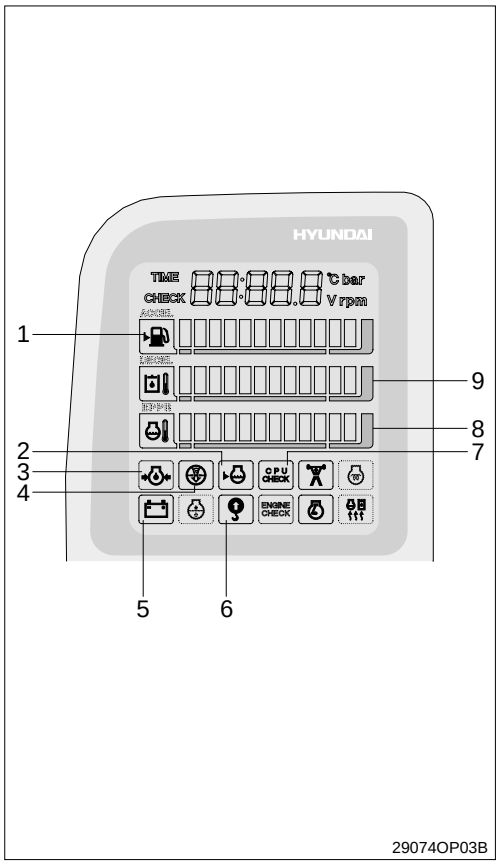
(4) Is the indicator of water temperature gauge(8) and hydraulic temperature gauge(9) in the green zone?

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

(6) Are the sound and vibration normal?

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

※ **If there are problems in the 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(112°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 mid-range speed.

(3) Operate bucket lever for 5 minutes.

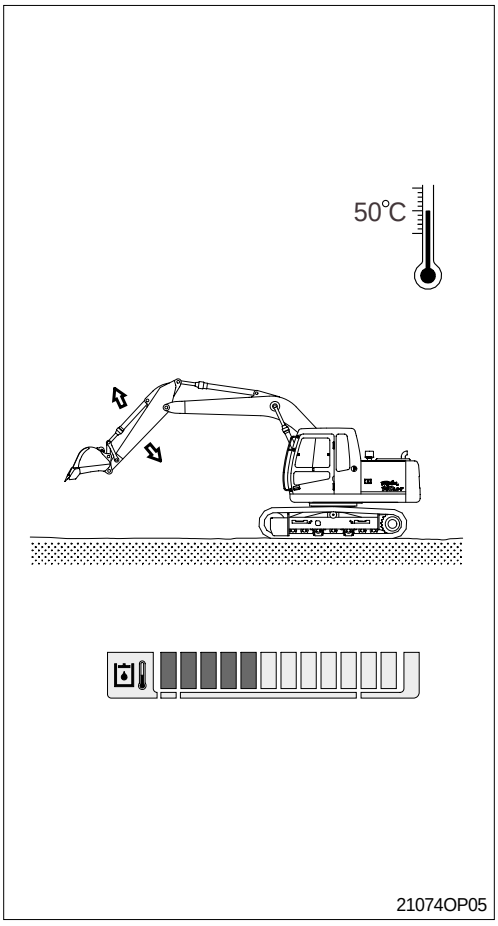
※ **Do not operate anything except bucket lever.**

(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 warming-up operation during winter.**



6) TO STOP THE ENGINE

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

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

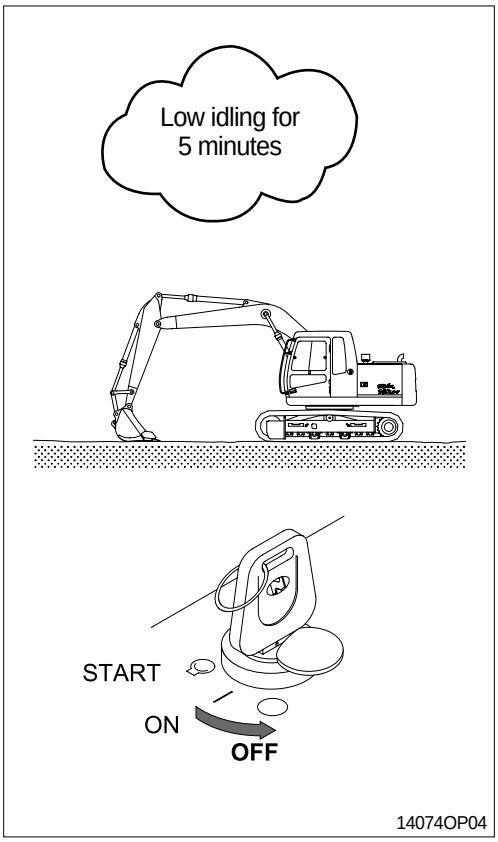
(1) Down the bucket on the ground then put all the levers in the neutral position.

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

(3) Return the start key to the OFF position.

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

(5) Lock the cab door.



4. MODE SELECTION SYSTEM

1) STRUCTURE OF CAPO SYSTEM

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

(1) Work mode

3 work modes can be selected for the optimal work speed of the machine operation.

① **Heavy duty work mode**

Boom-up and Arm-in operations are faster than general work mode.

② **General work mode**

When key switch is turned ON, this mode is selected automatically and swing operation speed is faster than heavy duty work mode.

③ **Breaker operation mode**

It sets the pump flow to the optimal operation of breaker by activating the max flow cut-off solenoid.

(2) Power mode

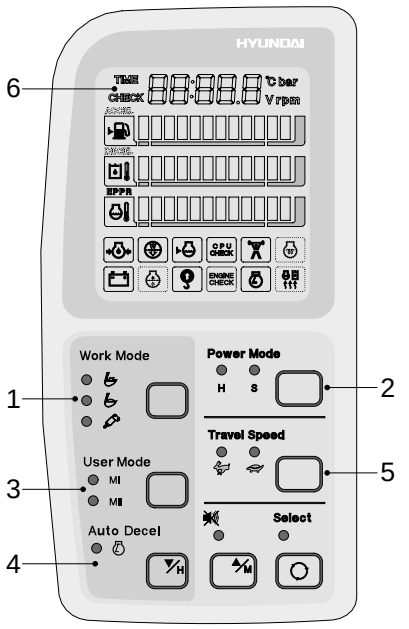
Power mode designed for various work loads maintains high performance and reduces fuel consumption.

- H mode : High power
- S mode : Standard power

(3) User mode

Through 2 memory sets of MI and MII, you can change the engine and pump power and memorize it for your preference.

- MI : Memory mode 1
- MII : Memory mode 2

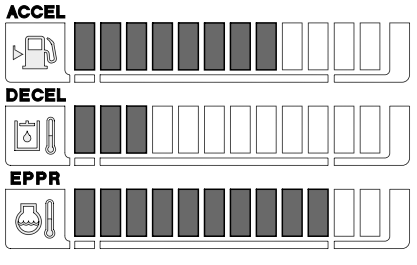


29074OP03C

1 Work mode
2 Power mode
3 User mode
4 Auto decel mode
5 Travel mode
6 Monitoring display

How to modulate the memory set

① Each memory mode has a initial set which are mid-range of max engine speed, auto decel rpm, and EPPR valve input current.
When you select MI or MII, cluster LCD displays.



21074OP03G

② To change the engine high idle speed, press the USER mode switch and SELECT switch at the same time and then ACCEL blinks at 0.5 seconds interval.
- By pressing ▲ or ▼ switch, ▮ will increase or decrease.

③ To change DECEL rpm, press the USER mode switch and SELECT switch once more and then DECEL blinks at 0.5 seconds interval.
- By pressing ▲ or ▼ switch, ▮ will increase or decrease.

④ To change EPPR current, press the USER mode switch and SELECT switch once more and then EPPR blinks at 0.5 seconds interval.
- By pressing ▲ or ▼ switch, ▮ will increase or decrease.

· LCD segment vs parameter setting

Segment (▮)	ACCEL (rpm)	DECEL (rpm)	EPPR (mA)
1	High idle-900	Low idle(950)	150
2	High idle-800	1050	200
3	High idle-700	1100	250
4	High idle-600	1150	300
5	High idle-500	Decel rpm(1200)	350
6	High idle-400	1250	400
7	High idle-300	1300	450
8	High idle-200	1350	500
9	High idle-100	1400	550
10	High idle	1500	600

⑤ To memorize the final setting, press the USER mode switch and SELECT switch one more time.

⑥ The user mode displays of Accel, Decel, EPPR return to previous on (Fuel, Hyd-temp, Coolant-temp) instantly.

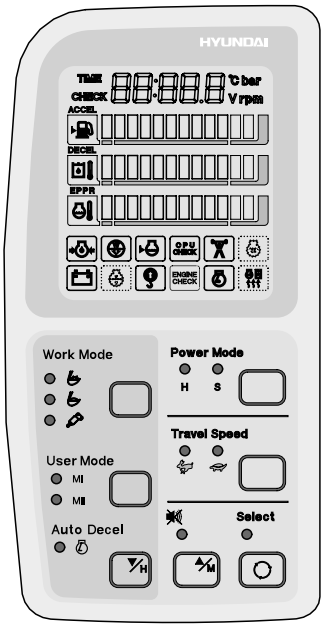
(4) Auto decel mode

Engine quick deceleration.

(5) Travel mode

: Low speed traveling.

: High speed traveling.



29074OP03H

(6) Monitoring system

Information of machine performance as monitored by the CPU controller can be displayed on the **monitoring display**.

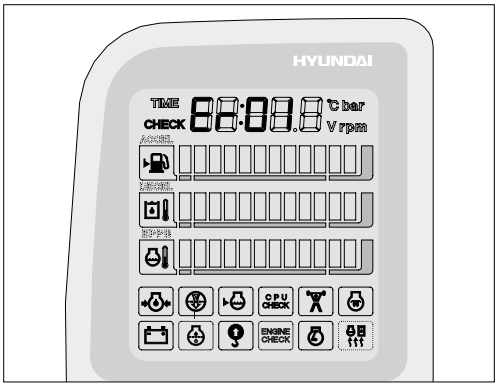
※ **Refer to 4-10 page for details.**

(7) Self diagnostic system

The CPU controller diagnoses problems in the CAPO system caused by electric parts' malfunction and by open or short circuit, which are displayed on the **monitoring display** as error codes.

(8) Anti-restart system

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



14073CD98

2) HOW TO OPERATE MODE SELECTION SYSTEM

(1) When start key is turned ON

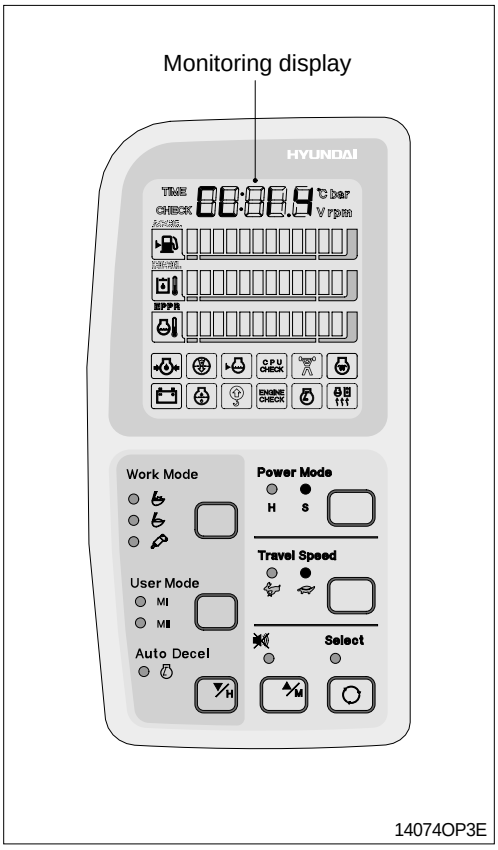
① When start key is turned ON, all illumination lamps are ON and all lamps are OFF automatically after 5 seconds. But a battery charging warning lamp and an engine oil pressure warning lamp keep turned ON until engine starting.

② After lamp check **CL : 1.4** , the version of cluster program, is displayed on **Monitoring display** for 2 seconds.

③ After the version of program is displayed, the cluster returns to default. Exactly engine rpm, battery charging warning lamp and engine oil pressure warning lamp are turned ON and S mode, auto decel, low travel speed(Turtle mark) are displayed.

④ In default condition self-diagnostic function including trouble detecting of electric system can be carried out.

※ **Refer to 4-10 page for details.**



14074OP3E

(2) After engine start

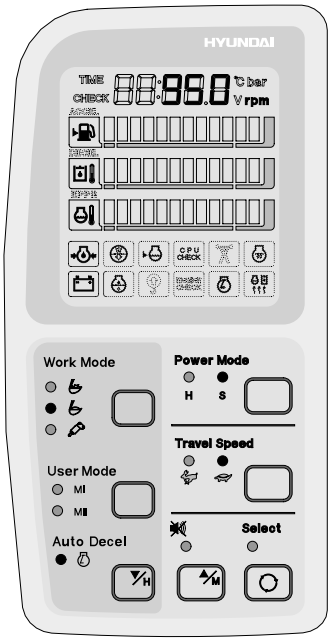
① When the engine is started, three lamps are ON as below.

Mode		Status
Work mode		ON
Power mode	S	ON
Travel mode	Low( )	ON
Auto decel mode		ON

- In this condition, tachometer indicates low idle, 950±100rpm.
- If coolant temperature is below 30℃, after 10 seconds the engine speed increases to 1200 ±100rpm automatically to warm up the machine.
- After 2-3 minutes, you can select any mode depending on job requirement.

② Self-diagnostic function can be carried out the same as start key is ON.

※ **Refer to 4-10 page for details.**



14074OP03K

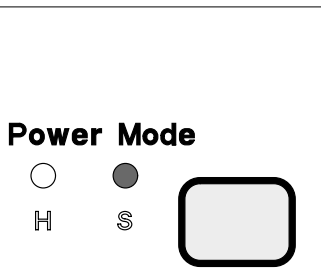
3) SELECTION OF POWER MODE

(1) S mode

When the accel dial is at setting 10 and auto decel mode is cancelled and S mode is selected.

Engine rpm	Effect
2100 ± 50	Same power as **non** mode type machine.

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



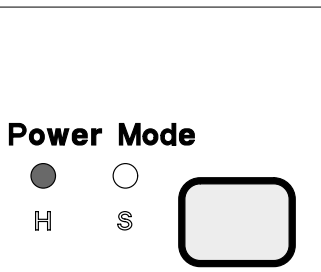
21073CD23A

(2) H mode

When the accel dial is at setting 10 and auto decel mode is cancelled and H mode is selected.

Engine rpm	Effect
2250±50	Approximately 110% of power and speed available than **non** mode type machine or **S** mode.

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



21073CD23B

4) MONITORING DISPLAY

Information of machine performance as monitored by the CPU controller can be displayed on the cluster when the operator selects a display mode by touching **SELECT** switch alone or with **BUZZER STOP** switch on the cluster as below.

Display group	How to select display mode			Name	Display on the cluster
	Group selection	Display mode selection			
Group 0 (Default)	Way 1 Key switch **ON** or **START** Way 2 Touch **AUTO DECEL** switch while pressing **BUZZER STOP** at group 1~4.	Initial		Engine rpm	950 rpm
		Touch **SELECT** 1 time		Time	TIME 12:30
		Touch **SELECT** 2 times		Power shift pressure (EPPR valve)	EP: 10 bar
		Touch **SELECT** 3 times		CPU model & version	14:C5.0
		Touch **SELECT** 4 times	Option (Only when a pressure sensor is installed)	Front pump pressure	P 1: 100 bar
		Touch **SELECT** 5 times		Rear pump pressure	P2:200 bar
		Touch **SELECT** 6 times		Pilot pressure	P3:30 bar
Group 1 (Volt, temp, EPPR press, version)	Touch **SELECT** switch **once** while pressing **BUZZER STOP.** In this group **SELECT** LED **ON**	Default		Battery voltage(V)	b:24.8 v
		Touch **SELECT** 1 time		Potentiometer voltage(V)	Po: 2.5 v
		Touch **SELECT** 2 times		Accel dial voltage(V)	dL: 3.8 v
		Touch **SELECT** 3 times		Hydraulic oil temperature(°C)	Hd: 50 ℃
		Touch **SELECT** 4 times		Coolant temperature(°C)	Ct: 85 ℃
Group 2 (Error code)	Touch **SELECT** switch **twice** while pressing **BUZZER STOP.** In this group **BUZZER STOP** LED blinks	Default		Current error	CHECK Er: 03
		Touch **SELECT** 1 time		Recorded error (Only key switch ON)	TIME Er: 03
		Press down(▼) & **SELECT** at the same time		Recorded error deletion (Only key switch ON)	TIME Er: 00
Group 3 (Switch input)	Touch **SELECT** switch **3 times** while pressing **BUZZER STOP.** In this group **SELECT** LED blinks at 0.5sec interval	Default		Pump prolix switch	PP:on or oFF
		Touch **SELECT** 1 time		Auto decel pressure switch	dP:on or oFF
		Touch **SELECT** 2 times		Power boost switch	Pb:on or oFF
		Touch **SELECT** 3 times		Travel oil pressure switch	oP:on or oFF
		Touch **SELECT** 4 times		One touch decel switch	od:on or oFF
		Touch **SELECT** 5 times		Travel alarm switch	br:on or oFF
		Touch **SELECT** 6 times		Preheat switch	PH:on or oFF

Display group	How to select display mode		Name	Display on the cluster
	Group selection	Display mode selection		
Group 4 (Output)	Touch **SELECT** switch **4 times** while pressing **BUZZER STOP.** In this group **SELECT** LED blinks at 1sec interval	Default	Hourmeter	Ho:on or oFF
		Touch **SELECT** 1 time	Neutral relay (Anti-restart relay)	nr:on or oFF
		Touch **SELECT** 2 times	Travel speed solenoid	tS:on or oFF
		Touch **SELECT** 3 times	Power boost solenoid (2-stage relief solenoid)	PS:on or oFF
		Touch **SELECT** 4 times	Boom priority solenoid	bS:on or oFF
		Touch **SELECT** 5 times	Travel alarm	AU:on or oFF
		Touch **SELECT** 6 times	Max flow cut off solenoid	FS:on or oFF
		Touch **SELECT** 7 times	Preheat relay	PA:on or oFF

※ By touching **SELECT** switch once while pressing **BUZZER STOP**, display group shifts.
Example : Group 0 → 1 → 2 → 3 → 4 → 0

5. OPERATION OF WORKING DEVICE

※ Confirm the operation of control lever and working device.

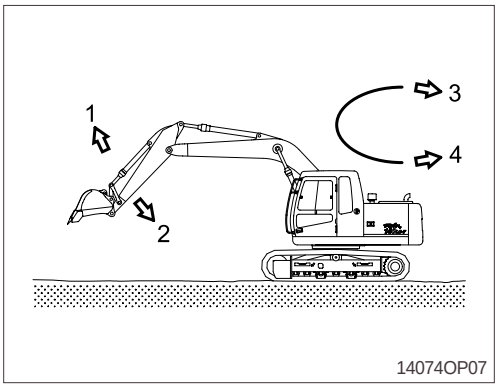
1) Left control lever controls arm and swing.
2) Right control lever controls boom and bucket.
3) When you release the control lever, control lever returns to neutral position automatically.

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

14074OP06D

※ Left control lever

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



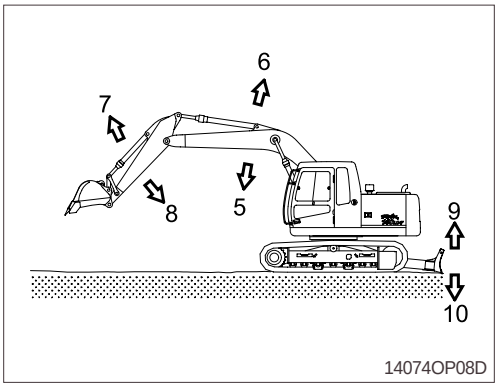
14074OP07

※ Right control lever

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

※ Dozer control lever

9 Dozer blade up
10 Dozer blade down



14074OP08D

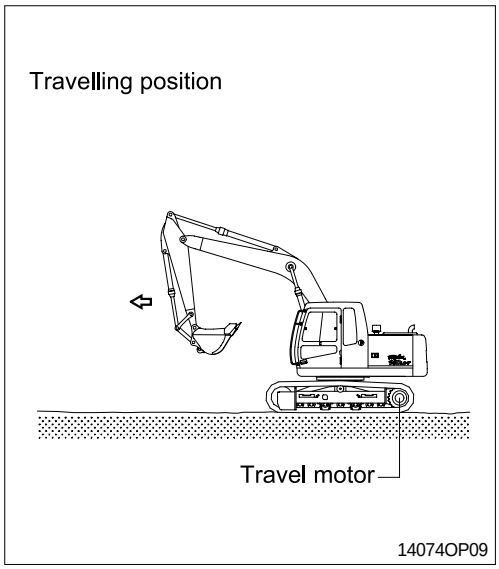
6. TRAVELING OF THE MACHINE

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 degree.**



(2) Traveling operation

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

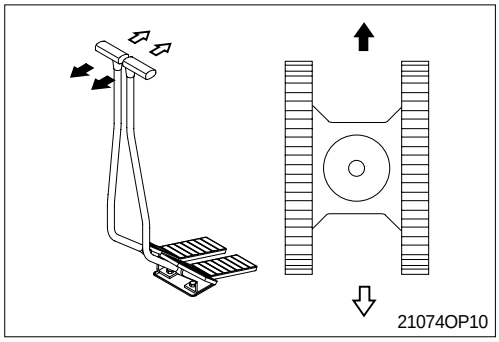
※ **Do not travel continuously for a long time.**

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

(3) Forward and backward traveling

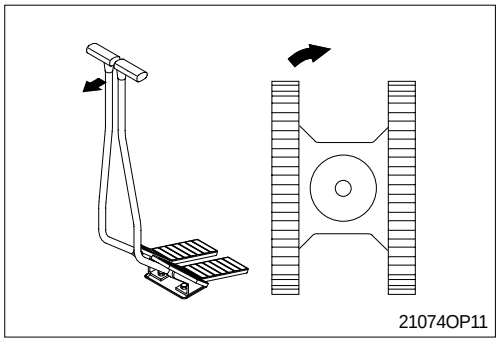
When the left and right travel lever or pedal are pushed at the same time, the machine will travel forward or backward.

※ **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.**



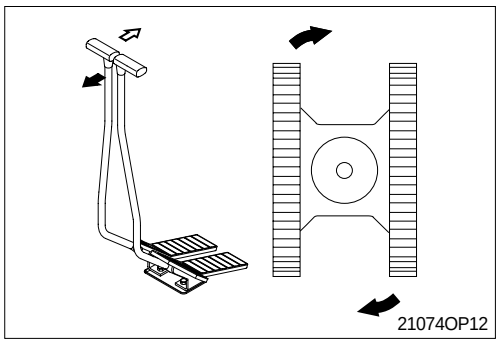
(4) Pivot turning

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㎝(1ft) to the ground so that it can be used as a brake in an emergency.

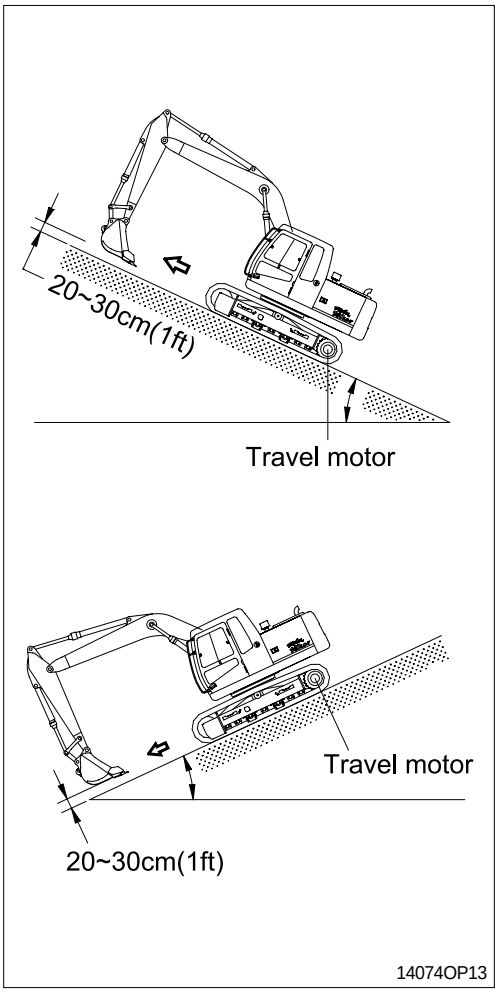
(3) If the machine starts to slide or loses stability, lower the bucket immediately and brake the machine.

(4) When parking on a slope, use the bucket as a brake and place blocks behind the tracks to prevent sliding.

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

⚠ Be careful when working on slopes. It may cause the machine to lose its balance and turn over.

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



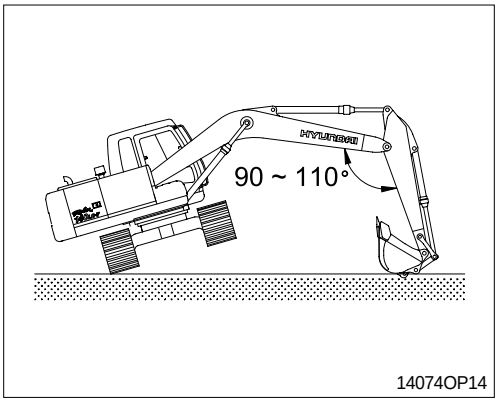
3) TRAVELING ON SOFT GROUND

※ 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.

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



4) TOWING THE MACHINE

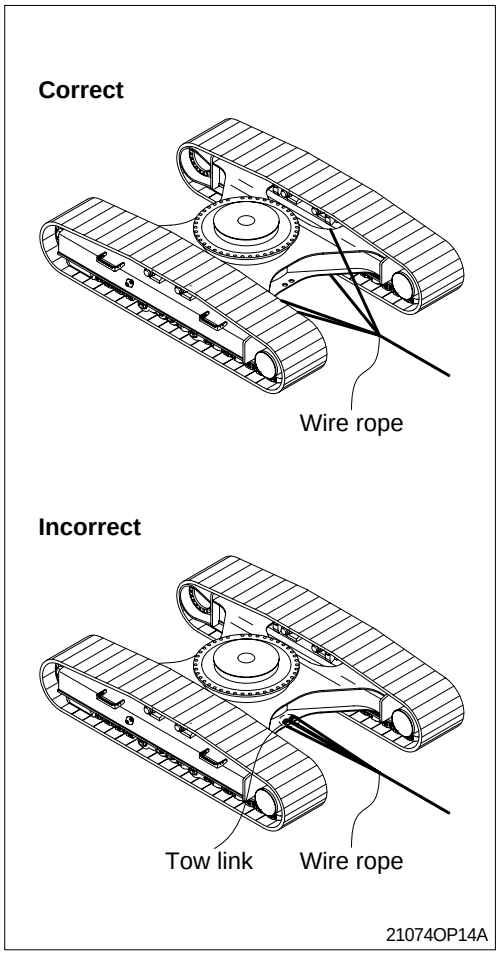
Tow the machine as follows when it can not move on it's own.

(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.

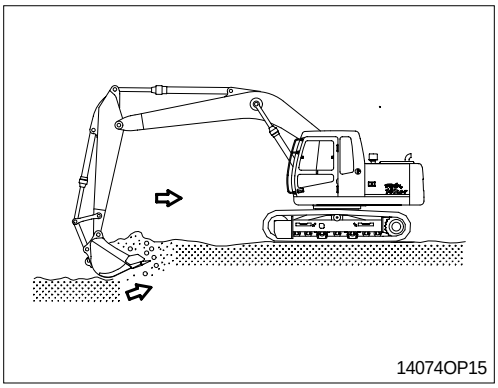
※ **Never tow the machine using only the tow link, because this may break.**

⚠ **Make sure no personnel are standing close to the tow rope.**

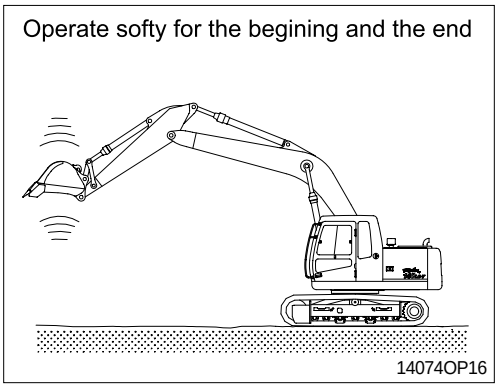


7. EFFICIENT WORKING METHOD

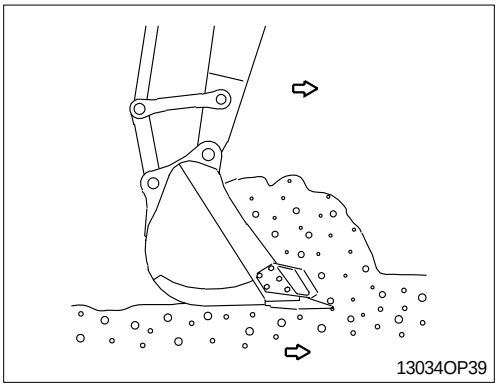
1) Do the digging work by arm.
   Use the pulling force of arm for digging and use together with the digging force of the bucket if necessary.



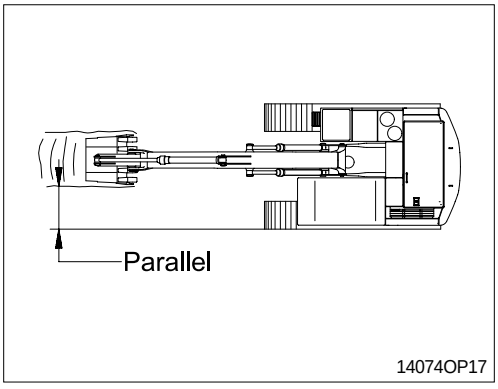
2) When lowering and raising the boom operate softly for the beginning and the end.
   In particularly, sudden stops while lowering the boom may cause damage to the machine.



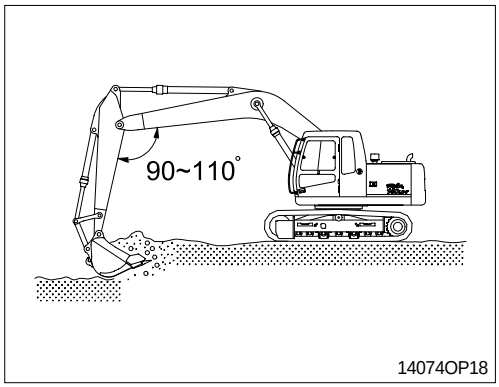
3) The digging resistance and wearing of tooth can be reduced by putting the end of bucket tooth to the digging direction.



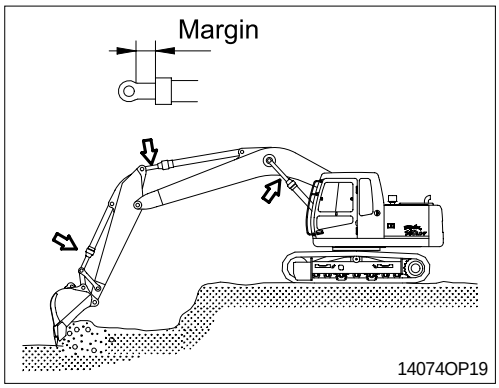
4) Set the tracks parallel to the line of the ditch to be excavated when digging ditch. Do not swing while digging.



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

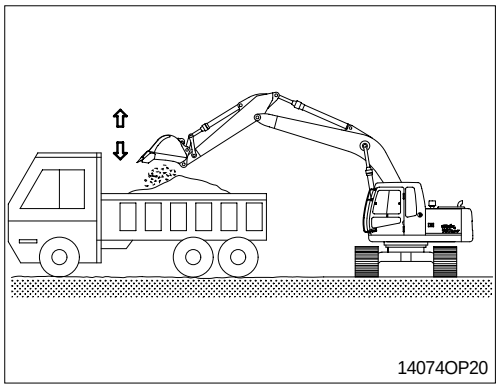


6) Operate leaving a small safety margin of cylinder stroke to prevent damage of cylinder when working with the machine.

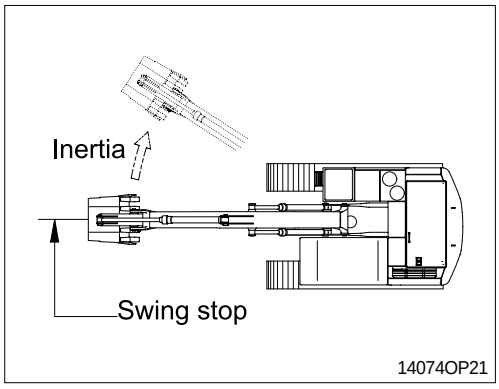


7) Keep the bucket to the dumping position and the arm horizontal when dumping the soil from the bucket.
   Operate bucket lever 2 or 3 times when hard to dump.

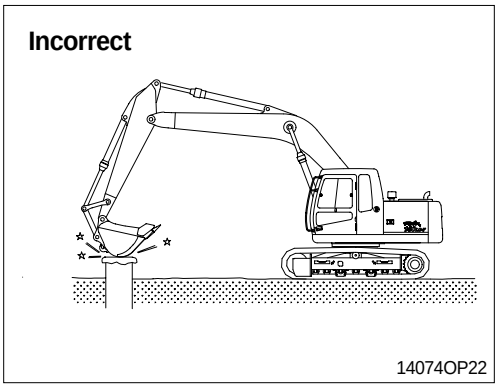
※ **Do not use the impact of bucket tooth when dumping.**



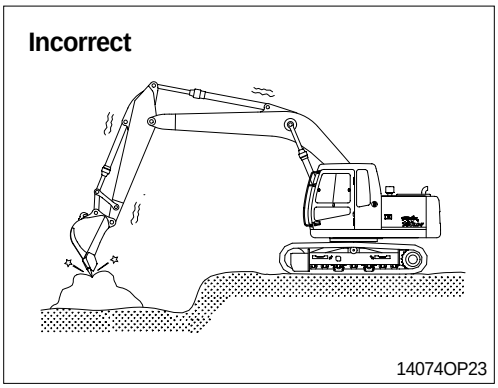
8) Operate stop of swing considering the swing slip distance is created by inertia after neutralizing the swing lever.



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



10) 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 OPERATIONS

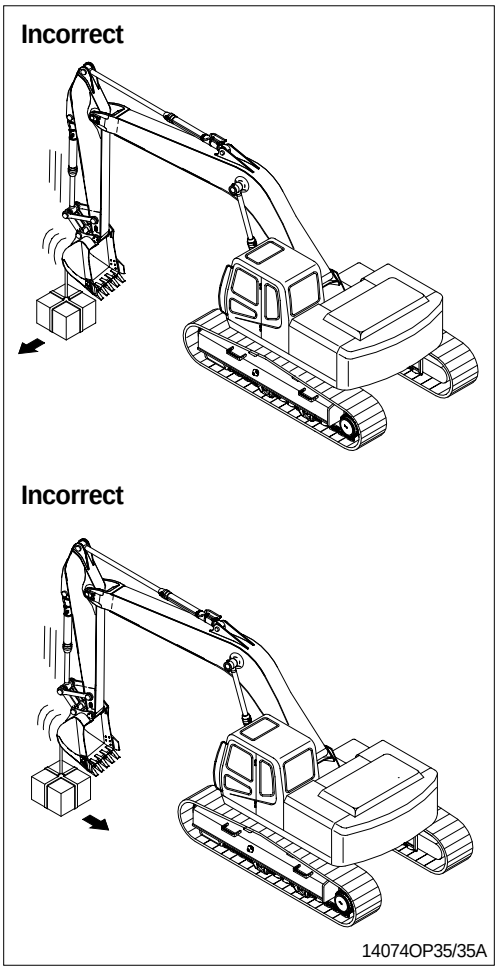
Operation exceeding machine performance may result in accident or failure.

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 over load warning device for object handling procedure, please contact 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.

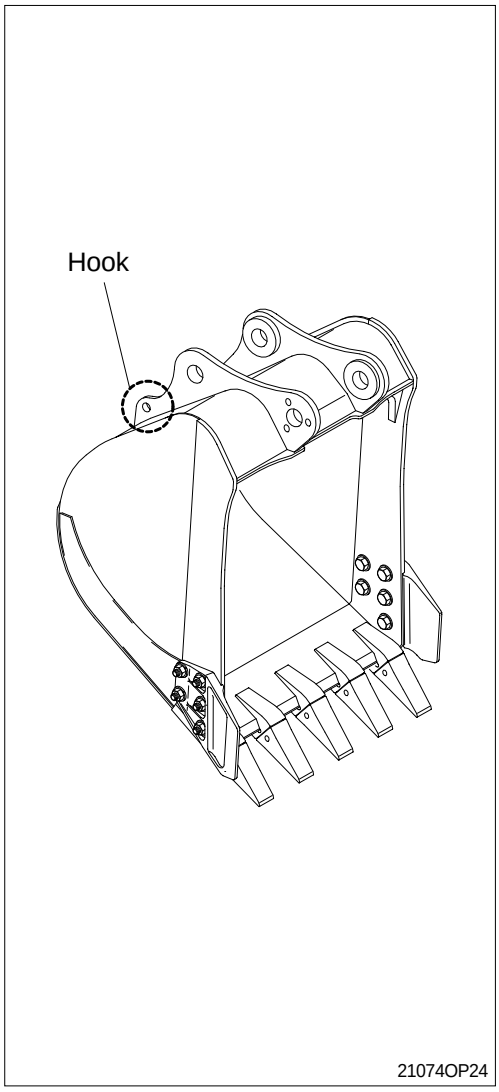
When performing lifting operation, never raise or lower a person.

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. OPERATION IN THE SPECIAL WORK SITES

1) OPERATION THE MACHINE IN A COLD WEATHER

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

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

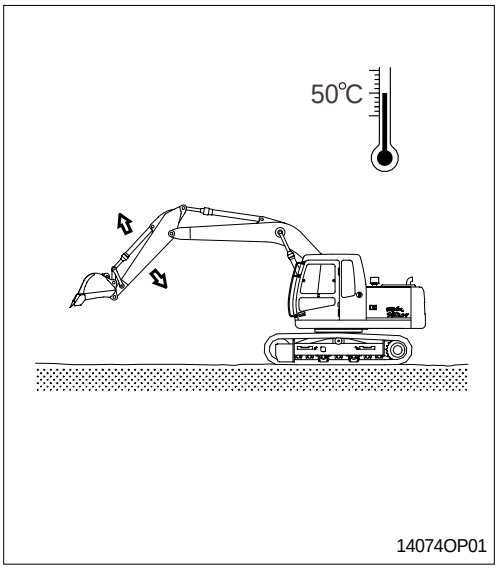
(3) Refer to the starting engine in cold weather.
Start the engine and extend the warming up operation.

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

(5) Always keep the battery completely charged.

※ **Discharged batterys 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

(1) 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.

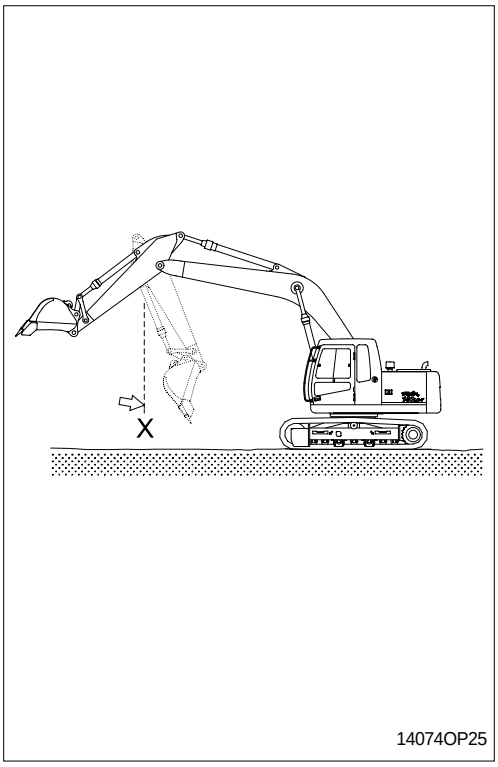
(2) Wash machine after operation to remove salt residue.
Pay special attention to electrical parts and hydraulic cylinders to prevent corrosion.

(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.

9. NORMAL OPERATION OF EXCAVATOR

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

1) When rolling in the arm, the roll-in movement stop momentary 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.
2) When lowering the boom, one may hear continuous sound.
   This is caused by oil flow in the valve.
3) Overloaded movement will produce sound caused by the relief valves, which are for the protection of the hydraulic systems.
4) When the machine is started swing or stopped, a noise near the swing motor may be heard. The noise is generated when the brake valve relieves.



10. ATTACHMENT LOWERING(When engine is stopped)

1) On machines equipped with an accumulator, for a short time(within 2 minutes) after the engine is stopped, the attachment will lower under its own weight when the attachment control lever is shifted to LOWER. That is happen only starting switch ON position and safety lever UNLOCK position. After the engine is stopped, set the safety lever to the LOCK position.

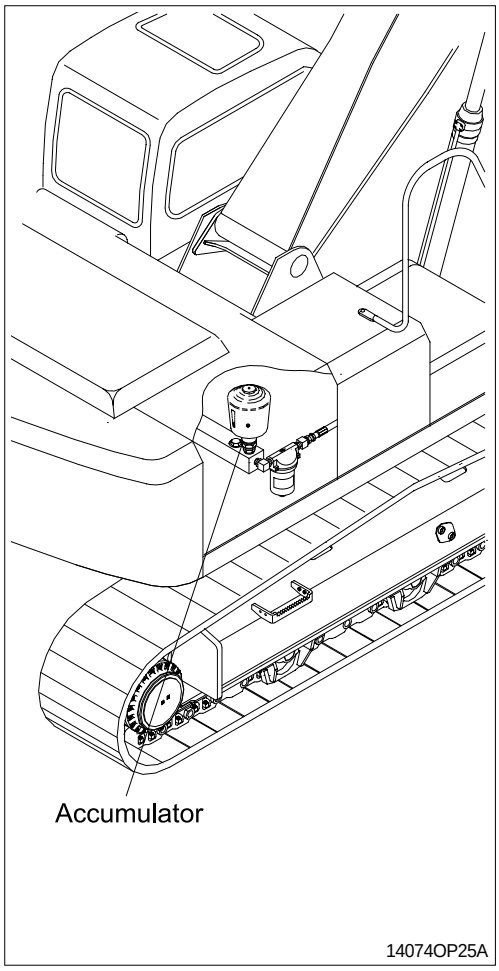
⚠ **Be sure no one is under or near the attachment before lowering the boom.**

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

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

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

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



11. 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.

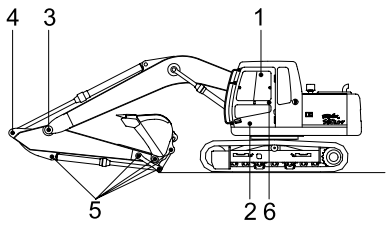
2) LUBRICATION POSITION OF EACH PART

Change all oil.

※ Be particularly careful when you reuse the machine.

As oil can be diluted during storage.

Apply an anticorrosive lubricant on the exposed part of piston rod of cylinder and in places where the machine rusts easily.



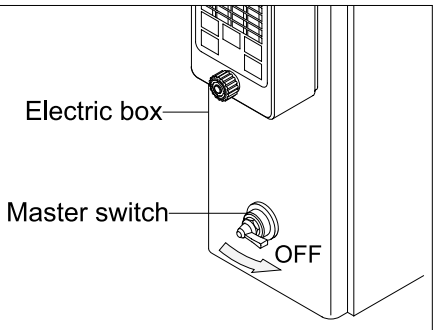
1 Lubricating manifold(5EA)
2 Boom cylinder pin(2EA)
3 Boom and arm connection pin(1EA)
4 Arm cylinder pin(rod side, 1EA)
5 Arm and bucket(7EA)
6 Boom rear bearing center(1EA)

14074OP26

3) MASTER SWITCH

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

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



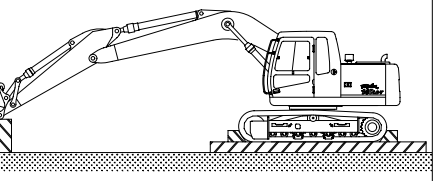
14074OP30

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.



14074OP27

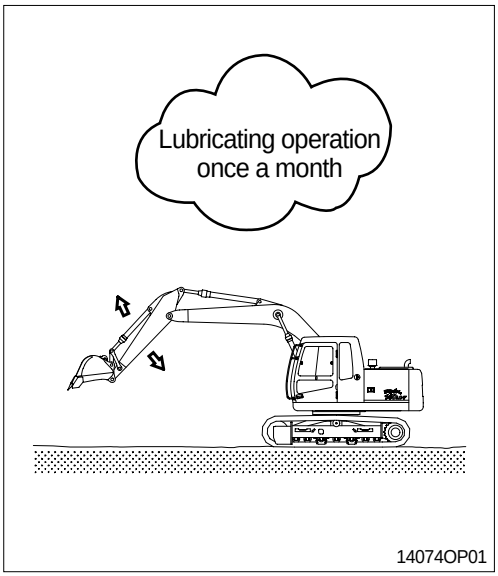
6) DURING STORAGE

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

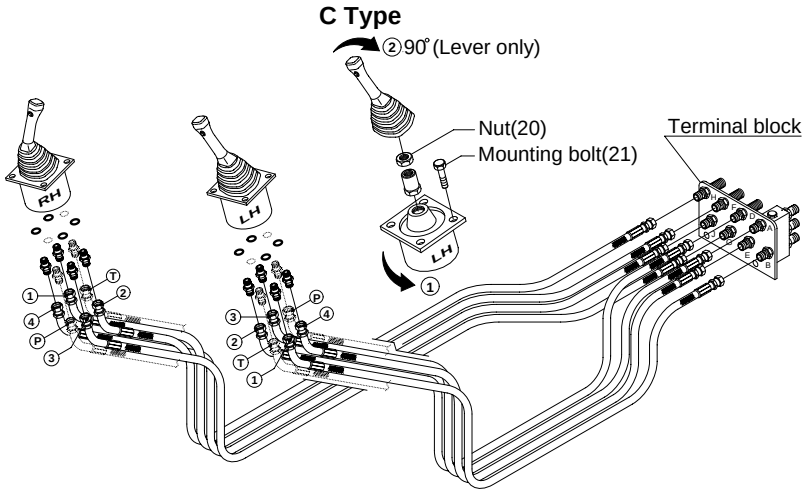
※ Check the level of engine oil and coolant and fill if required when starting engine.

※ 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.

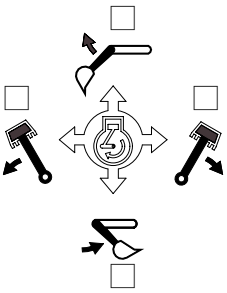
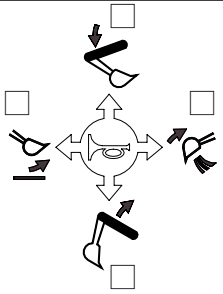
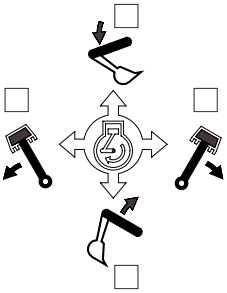
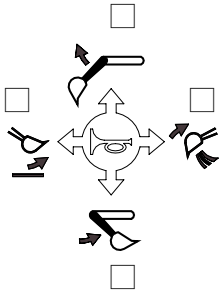
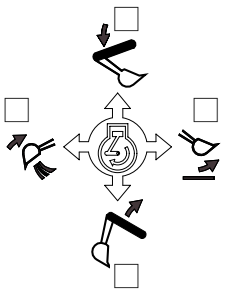
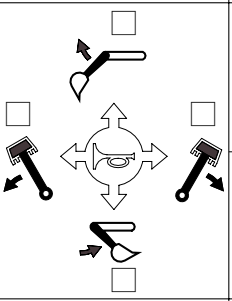
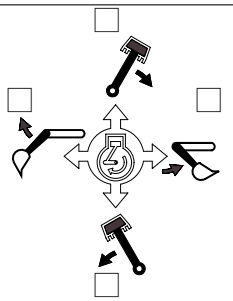
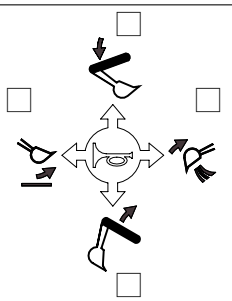


12. RCV LEVER OPERATING PATTERN



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

29074OP28

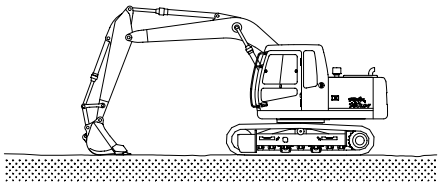
Pattern	Operation		Control function		Hose connection(Port)		
	Left	Right			RCV lever	Change of MCV port	
						From	To
ISO Type Hyundai			Left	☐ Arm out	②	D	-
				☐ Arm in	④	E	-
				☐ Swing right	③	A	-
				☐ Swing left	①	B	-
			Right	☐ Boom lower	④	J	-
				☐ Boom raise	②	H	-
				☐ Bucket out	①	F	-
				☐ Bucket in	③	G	-
A Type			Left	☐ Boom lower	②	D	J
				☐ Boom raise	④	E	H
				☐ Swing right	③	A	-
				☐ Swing left	①	B	-
			Right	☐ Arm out	④	J	D
				☐ Arm in	②	H	E
				☐ Bucket out	①	F	-
				☐ Bucket in	③	G	-
B Type			Left	☐ Boom lower	②	D	J
				☐ Boom raise	④	E	H
				☐ Bucket in	③	A	G
				☐ Bucket out	①	B	F
			Right	☐ Arm out	④	J	D
				☐ Arm in	②	H	E
				☐ Swing right	①	F	A
				☐ Swing left	③	G	B
C Type			Left	① Loosen the RCV lever mounting bolt(21) and rotates lever assy 90。 counterclockwise; then install. ② To put lever in correct position, disassemble nut(20) and rotates only lever 90。 clockwise.			
			Right	Same as **ISO** type			

13. SWITCHING HYDRAULIC ATTACHMENT CIRCUIT

1) The combined hydraulic attachment circuit is capable of providing single action or double action.

2) The position of 3 way valve selects the single action hydraulic attachment circuit or the double action hydraulic attachment circuit.

3) Before you change the flow mode of hydraulic attachment circuit, place the machine in the servicing position as shown. Stop the engine.

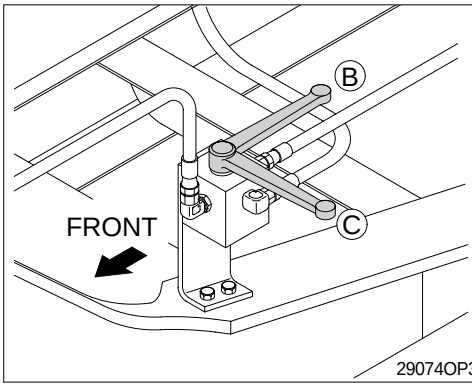


14074OP04

4) Use the manual lever to turn the 3 way valve. Make sure that you fully turn the valve until the valve stops.

(1) One way flow(Hydraulic breaker)
Position the manual lever parallel to the piping (Ⓑ).

(2) Two way flow(Clamshell or shear)
Position the manual lever perpendicular to the piping(Ⓒ).



29074OP36

1. PREPARATION FOR TRANSPORTATION

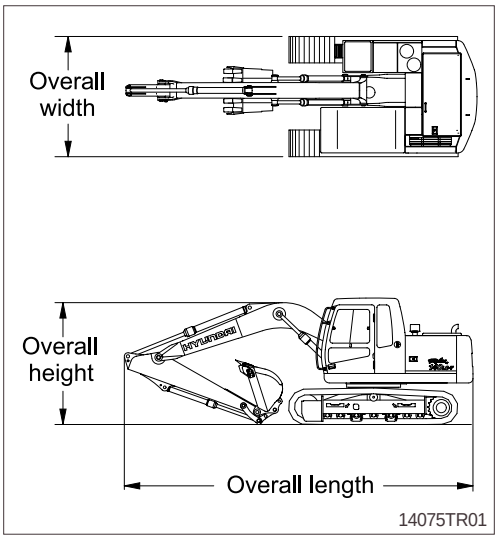
1) When transporting the machine, observe the various road rules, road transportation vehicle laws and vehicle limit ordinances, etc.

2) Select proper trailer after confirming the weight and dimension from the chapter 2, specification.

3) Check the whole route such as the road width, the height of bridge and limit of weight and etc., which will be passed.

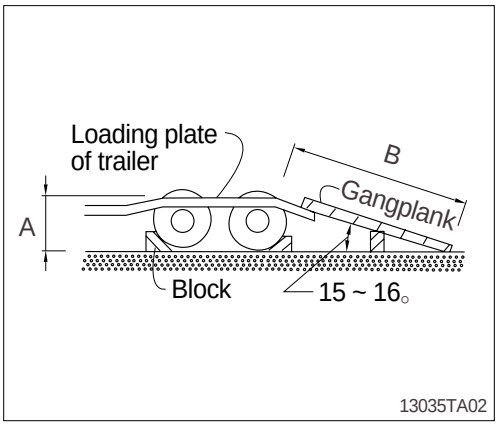
4) Get the permission from the related authority if necessary.

5) Prepare suitable capacity of trailer to support the machine.



6) Prepare gangplank for safe loading referring to the below table and illustration.

A	B
1.0	3.65 ~ 3.85
1.1	4.00 ~ 4.25
1.2	4.35 ~ 4.60
1.3	4.75 ~ 5.00
1.4	5.10 ~ 5.40
1.5	5.50 ~ 5.75

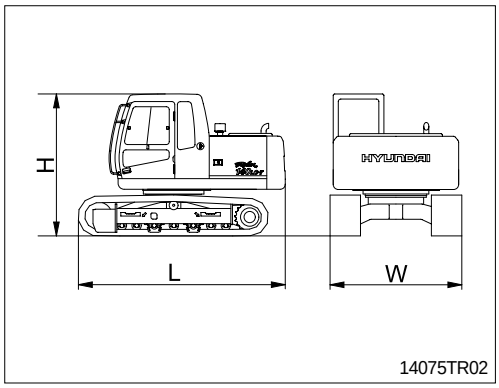


2. DIMENSION AND WEIGHT

1) BASE MACHINE(STD)

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	4160(13' 8")
H	Height	mm(ft-in)	2820(9' 3")
W	Width	mm(ft-in)	2600(8' 6")
Wt	Weight	kg(lb)	11600(25580)

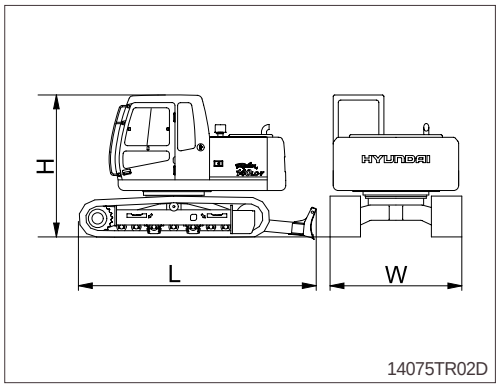
※ With 600mm(24") triple grouser shoes and 2200kg (4850lb) counterweight.



2) BASE MACHINE(Dozer blade)

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	4570(14'12")
H	Height	mm(ft-in)	2820(9' 3")
W	Width	mm(ft-in)	2600(8' 6")
Wt	Weight	kg(lb)	12420(27390)

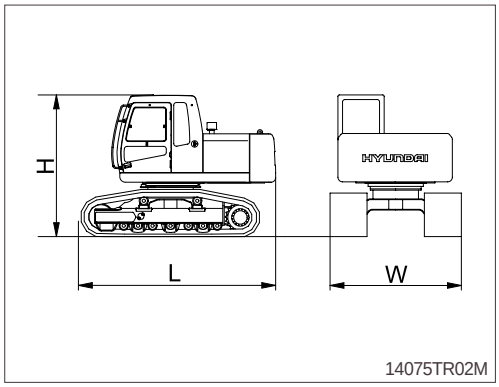
※ With 600mm(24") triple grouser shoes and 2200kg (4850lb) counterweight.



3) BASE MACHINE(R140LCM-7)

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	4240(13' 9")
H	Height	mm(ft-in)	2820(9' 3")
W	Width	mm(ft-in)	2910(9' 7")
Wt	Weight	kg(lb)	14460(31880)

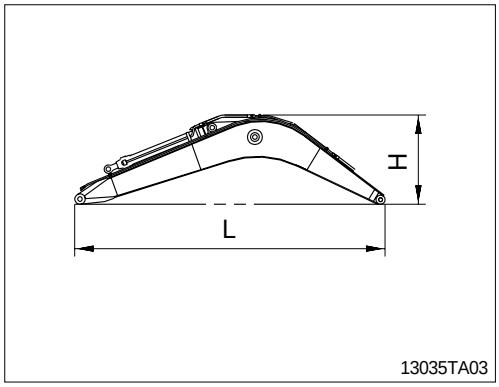
※ With 800mm(32") triple grouser shoes and 2200kg (4850lb) counterweight.



4) BOOM ASSEMBLY

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	4760(15' 7")
H	Height	mm(ft-in)	1340(4' 5")
W	Width	mm(ft-in)	520(1' 8")
Wt	Weight	kg(lb)	1020(2250)

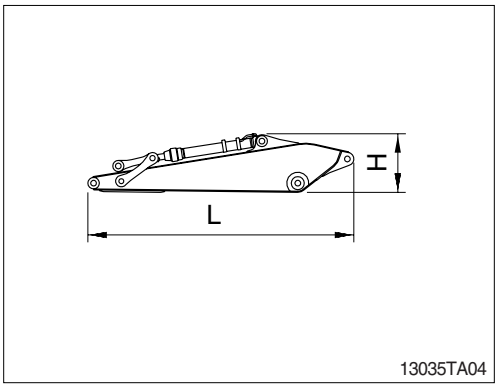
※ 4.6m(15' 1") boom with arm cylinder(Included piping and pins).



5) ARM ASSEMBLY

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	3260(10' 8")
H	Height	mm(ft-in)	740(2' 5")
W	Width	mm(ft-in)	380(1' 3")
Wt	Weight	kg(lb)	620(1370)

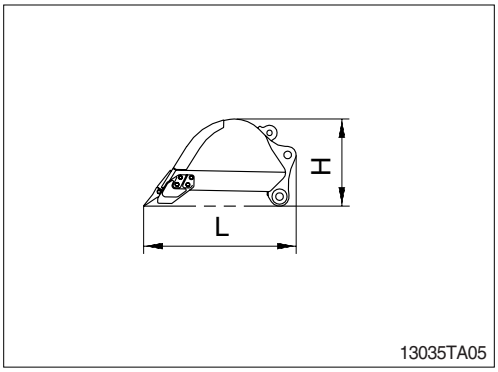
※ 2.50m(8' 2") arm with bucket cylinder(Included linkage and pins).



6) BUCKET ASSEMBLY

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	1400(4' 7")
H	Height	mm(ft-in)	800(2' 7")
W	Width	mm(ft-in)	1130(3' 8")
Wt	Weight	kg(lb)	480(1060)

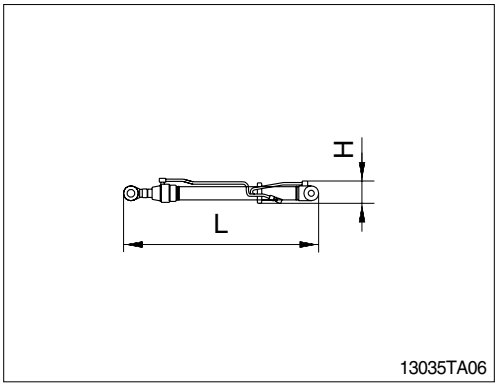
※ 0.58m³(0.76yd³) PCSA heaped bucket(Included tooth and side cutters).



7) BOOM CYLINDER

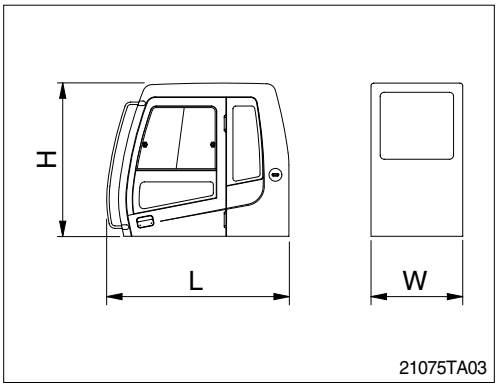
Mark	Description	Unit	Specification
L	Length	mm(ft-in)	1760(5' 9")
H	Height	mm(ft-in)	210(0' 8")
W	Width	mm(ft-in)	310(1' 0")
Wt	Weight(2EA)	kg(lb)	260(570)

※ Included piping.



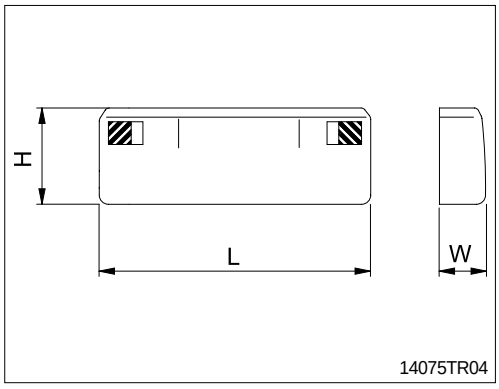
8) CAB ASSEMBLY

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	1962(6' 4")
H	Height	mm(ft-in)	1676(5' 5")
W	Width	mm(ft-in)	1288(4' 2")
Wt	Weight	kg(lb)	310(680)



9) COUNTERWEIGHT

Mark	Description	Unit	Specification
L	Length	mm(ft-in)	2475(8' 1")
H	Height	mm(ft-in)	1050(3' 5")
W	Width	mm(ft-in)	450(1' 6")
Wt	Weight	kg(lb)	2200(4830)

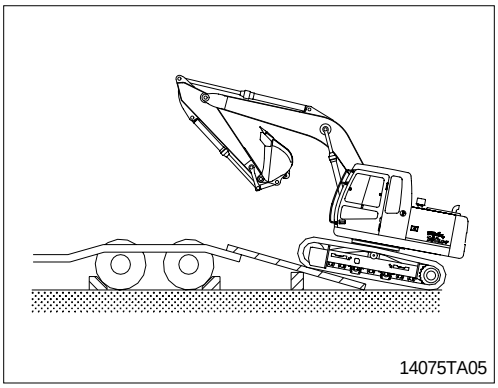


3. LOADING THE MACHINE

1) Load and unload the machine on a flat ground.

2) Use the gangplank with sufficient length, width, thickness and gradient.

3) 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.



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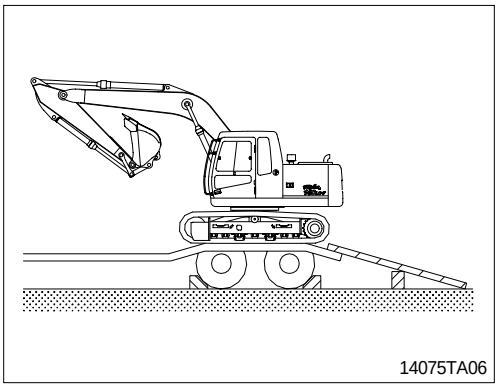
4) Do the following after loading the machine to the trailer.

(1) Stop loading when the machine is located horizontally with the rear wheel of trailer.



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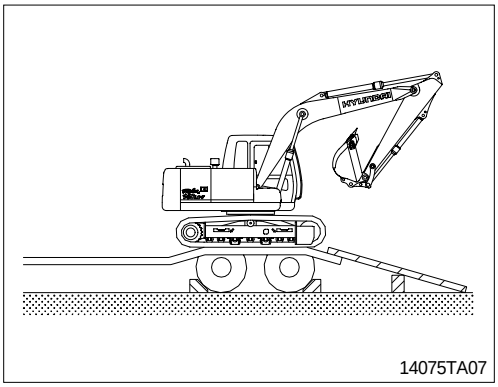
(2) Place the swing lock lever to the LOCK position after the swing the machine 180 degree.



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(3) Lower the working equipment gently after the location is determined.

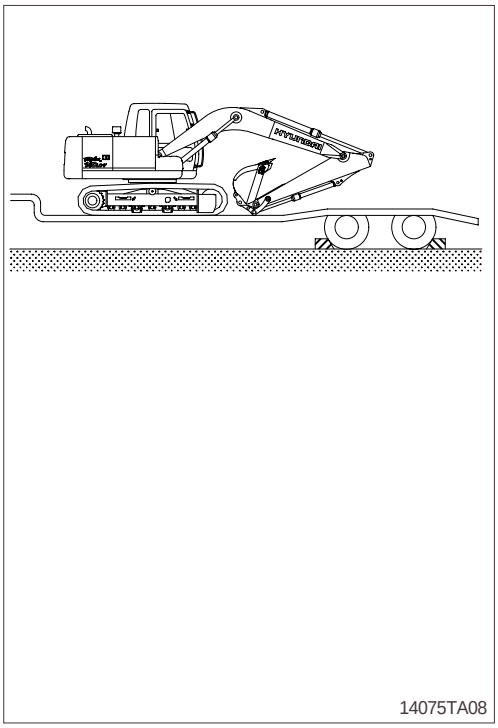
※ **Place rectangular timber under the bucket cylinder to prevent the damage of it during transportation.**

⚠ **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.**

⚠ **Do not operate any other device when loading.**

⚠ **Be careful on the boundary place of loading plate or trailer as the balance of machine will abruptly be changed on the point.**



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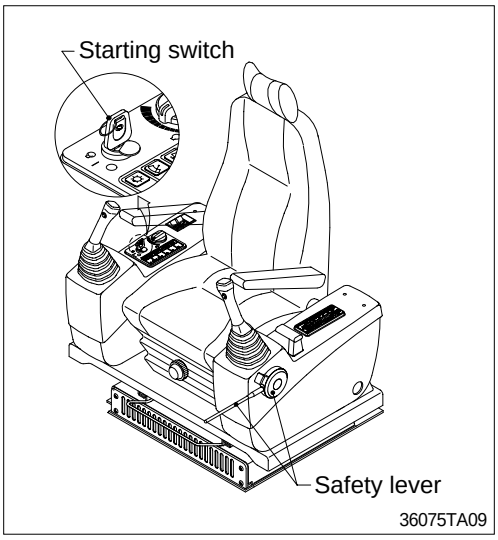
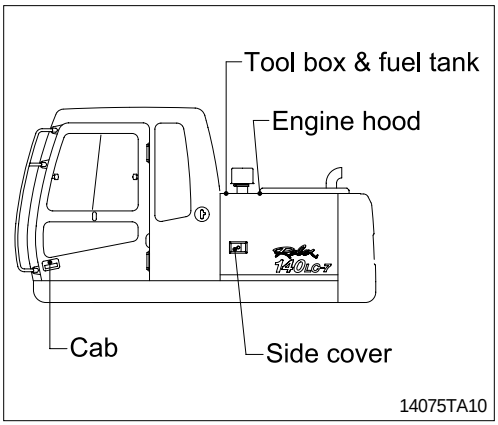
4. FIXING THE MACHINE

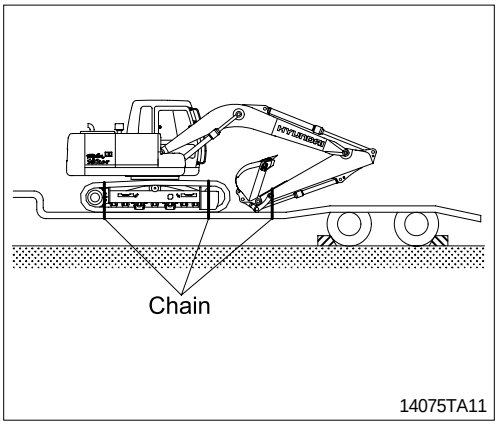
1) Lower down the working device on the loading plate of trailer.
2) Keep the safety lever on the LOCK position.
3) Turn OFF all the switches and remove the key.



4) Secure all locks.



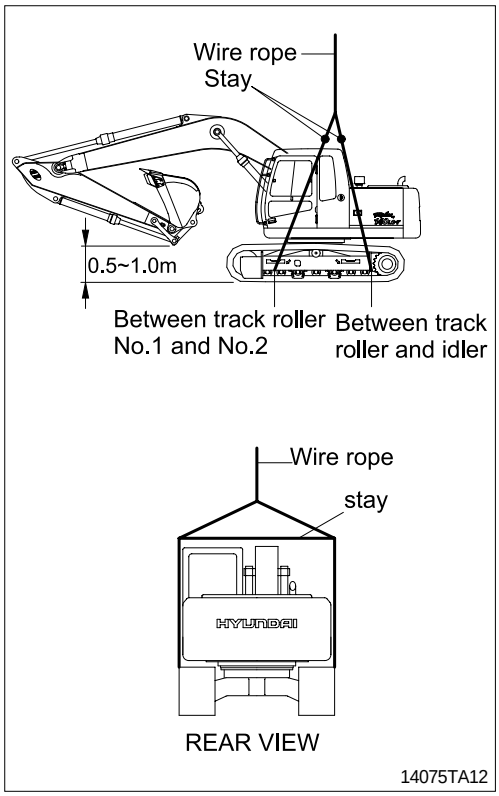
5) Place timber underneath of the track and fix firmly with wire rope to prevent the machine from moving forward, backward, right or left.



5. LOADING AND UNLOADING BY CRANE

1) Check the weight, length, width and height of the machine referring to the chapter 2, specification 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.

⚠ **Make sure wire rope is proper size.**
⚠ **Place the swing lock lever and safety lever to LOCK position to prevent the machine moving when hoisting the machine.**
⚠ **The wrong hoisting method or installation of wire rope can cause damage to the machine.**
⚠ **Do not load abruptly.**
⚠ **Keep area clear of personnel.**



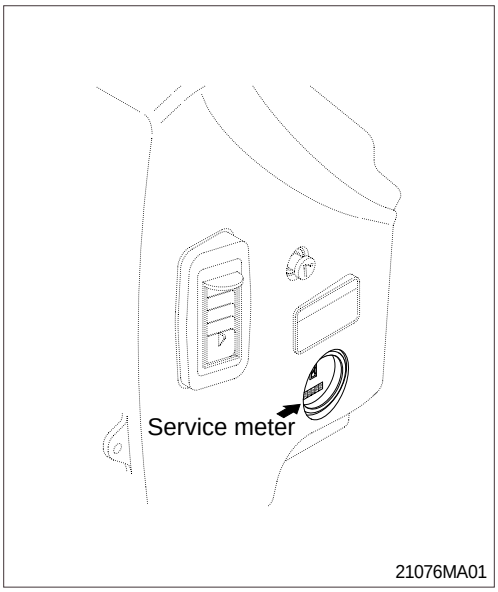
1. INSTRUCTION

1) INTERVAL OF MAINTENANCE

(1) You may inspect and service the machine by the period as described at page 6-11 based on service meter at cluster support.

(2) Shorten the interval of inspect and service 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 100hours, carry out all the maintenance「Each 100hours, 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 clause 4, maintenance check list.

(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) Replace and repair of parts

It is required to replace the wearable and consumable parts such as bucket tooth, side cutter, filter and etc., regularly.

Replace damaged or worn parts at proper time to keep the performance of machine.

(2) Use genuine parts.

(3) Use the recommended oil.

(4) Remove the 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 hydraulic system of the pressure before repairing the hydraulic system.

(8) Confirm if the cluster is in the normal condition after completion of service.

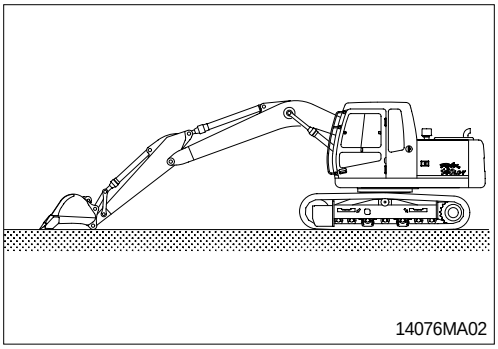
(9) For more detail information of maintenance, please contact local Hyundai dealer.

※ **Be sure to start the maintenance after fully understand the chapter 1, safety hints.**

4) RELIEVING THE PRESSURE IN THE HYDRAULIC SYSTEM

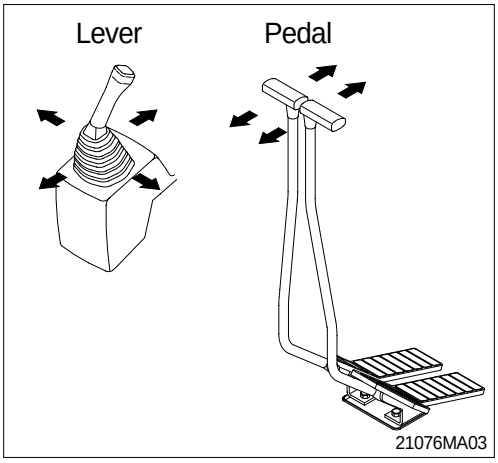
※ Spouting of oil can cause the accident when loosening the cap or hose right after the operating of machine as the machine or oil is on the high pressure on the condition.
Be sure to relieve the pressure in the system before repairing hydraulic system.

(1) Place machine in parking position, and stop the engine.

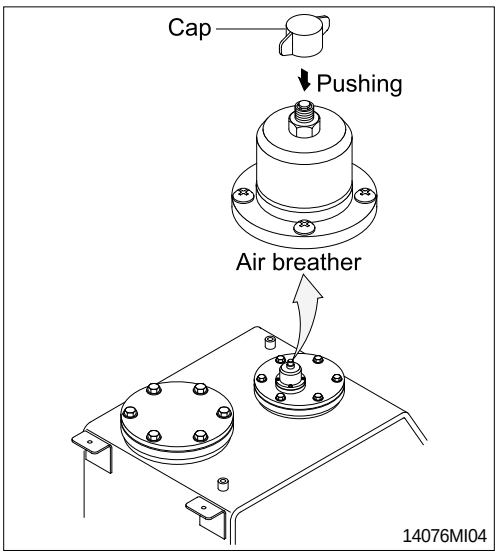


(2) Set the safety lever completely in the release position, operate the control levers and pedals fully to the front, rear, left and right, to release the pressure in the hydraulic circuit.

※ 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 tighten torque.

6) PERIODICAL REPLACEMENT OF SAFETY PARTS

(1) 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)	Every 2 years
		Heater hose (heater-engine)	
Hydraulic system	Main circuit	Pump suction hose	Every 2 years
		Pump delivery hose	
		Swing hose	
	Working device	Boom cylinder line hose	Every 2 years
		Arm cylinder line hose	
		Bucket cylinder line hose	

※1. Replace 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 following table for unspecified torque.

1) BOLT AND NUT

(1) Coarse thread

Bolt size	8T		10T	
	kgf · m	lbf · ft	kgf · m	lbf · ft
M 6 × 1.0	0.85 ~ 1.25	6.15 ~ 9.04	1.14 ~ 1.74	8.2 ~ 12.6
M 8 × 1.25	2.0 ~ 3.0	14.5 ~ 21.7	2.7 ~ 4.1	19.5 ~ 29.7
M10 × 1.5	4.0 ~ 6.0	28.9 ~ 43.4	5.5 ~ 8.3	39.8 ~ 60.0
M12 × 1.75	7.4 ~ 11.2	53.5 ~ 81.0	9.8 ~ 15.8	70.9 ~ 114
M14 × 2.0	12.2 ~ 16.6	88.2 ~ 120	16.7 ~ 22.5	121 ~ 163
M16 × 2.0	18.6 ~ 25.2	135 ~ 182	25.2 ~ 34.2	182 ~ 247
M18 × 2.0	25.8 ~ 35.0	187 ~ 253	35.1 ~ 47.5	254 ~ 344
M20 × 2.5	36.2 ~ 49.0	262 ~ 354	49.2 ~ 66.6	356 ~ 482
M22 × 2.5	48.3 ~ 63.3	349 ~ 458	65.8 ~ 98.0	476 ~ 709
M24 × 3.0	62.5 ~ 84.5	452 ~ 611	85.0 ~ 115	615 ~ 832
M30 × 3.0	124 ~ 168	898 ~ 1214	169 ~ 229	1223 ~ 1656
M36 × 4.0	174 ~ 236	1261 ~ 1704	250 ~ 310	1808 ~ 2242

(2) Fine thread

Bolt size	8T		10T	
	kgf · m	lbf · ft	kgf · m	lbf · ft
M 8 × 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

Thread size	Width across flat(mm)	kgf · m	lbf · ft
1/4"	19	3	21.7
3/8"	22	4	28.9
1/2"	27	5	36.2
3/4"	36	12	86.8
1"	41	14	101

3) 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	6	43.4
3/4"	36	13	94.0
1"	41	15	109

4) TIGHTENING TORQUE OF MAJOR COMPONENT

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt, nut	M20 × 2.5	55 ± 3.5	398 ± 25.3
2		Radiator mounting bolt	M12 × 1.75	12.8 ± 3	92.5 ± 21.6
3		Coupling mounting socket bolt	M16 × 2.0	22 ± 1	159 ± 7.2
4		Main pump housing mounting bolt	M10 × 1.5	6.9 ± 0.3	49.9 ± 2.2
5	Hydraulic system	Main pump mounting socket bolt	M16 × 2.0	22.1 ± 2.4	160 ± 17.4
6		Main control valve mounting bolt	M12 × 1.75	12.8 ± 3	92.5 ± 21.6
7		Fuel tank mounting bolt	M20 × 2.5	45 ± 5.1	325 ± 36.9
8		Hydraulic oil tank mounting bolt	M20 × 2.5	45 ± 1	325 ± 7.2
9		Turning joint mounting bolt, nut	M12 × 1.75	12.3 ± 1.3	88.9 ± 9.4
10	Power train system	Swing motor mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
11		Swing bearing upper part mounting bolt	M18 × 2.5	41.3 ± 6.2	299 ± 44.8
12		Swing bearing lower part mounting bolt	M16 × 1.5	31.3 ± 4.7	226 ± 34
13		Travel motor mounting bolt	M16 × 2.0	23 ± 2.5	166 ± 18.1
14		Sprocket mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
15	Under carriage	Carrier roller mounting bolt, nut	M16 × 2.0	23 ± 2.5	166 ± 18.1
16		Track roller mounting bolt	M16 × 2.0	29.6 ± 3.2	214 ± 23.1
17		Track tension cylinder mounting bolt	M16 × 2.0	21.9 ± 3.3	158 ± 23.9
18		Track shoe mounting bolt, nut	5/8 - 18UNF	42 ± 4	304± 28.9
19	Others	Counter weight mounting bolt	M27 × 3.0	140 ± 15	1013 ± 108
20		Cab mounting bolt	M12 × 1.75	12.2 ± 1.3	88.2 ± 9.4
21		Operator's seat mounting bolt	M 8 × 1.25	2.5 ± 0.5	18.1 ± 3.6

※ For tightening torque of engine and hydraulic components, see engine maintenance guide and service manual.

3. FUEL, COOLANT AND LUBRICANTS

1) NEW MACHINE

New machine used and filled with following lubricants.

Description	Specification
Engine oil	SAE 15W-40(API CF-4)
Hydraulic oil	ISO VG 46(SAE 10W)
Travel reduction gear	SAE 85W-140(APIGL-5)
Swing reduction gear	SAE 85W-140(API GL-5)
	Lithium base grease NLGI No. 2
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
API : American Petroleum Institute
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 or equivalent.

Do not mix different brand oil.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C (°F) -20 (-4) / -10 (14) / 0 (32) / 10 (50) / 20 (68) / 30 (86) / 40 (104)
Engine oil pan	Engine oil	9.5(2.5) 15.3(4.0) TIER II	SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Swing drive	Grease	0.35(0.1)	NLGI NO.1 NLGI NO.2
Swing drive	Gear oil	2.5(0.7)	SAE 85W-140
Final drive		3.0×2 (0.8×2)	
Hydraulic tank	Hydraulic oil	Tank; 124(32.8) System; 210(55.5)	ISO VG 32 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel	270(71.0)	ASTM D975 NO.1 ASTM D975 NO.2
Fitting (Grease nipple)	Grease	As required	NLGI NO.1 NLGI NO.2
Radiator (Reservoir tank)	Mixture of antifreeze and water 50 : 50	21.8(5.8)	Ethylene glycol base permanent type

4. MAINTENANCE CHECK LIST

1) DAILY SERVICE BEFORE STARTING

Check items	Service	Page
Visual check		
Fuel tank	Check, Refill	6-25
Hydraulic oil level	Check, Add	6-29
Engine oil level	Check, Add	6-18
Coolant level	Check, Add	6-20
Control panel & pilot lamp	Check, Clean	6-39
Water separator	Check, Drain	6-26
Fan belt tension	Check, Adjust	6-24

2) EVERY 50 HOURS SERVICE

Check items	Service	Page
Fuel tank	Drain	6-25
Track tension	Check, Adjust	6-34
Swing bearing	Lubricate	6-32
Swing reduction gear oil	Check, Add	6-32
Lubricate 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		
· Bucket cylinder rod end		
· Arm + Bucket connecting		
· Arm + Link, Bucket control		
· Bucket control rod		

3) INITIAL 50 HOURS SERVICE

Check items	Service	Page
Engine oil	Change	6-18, 19
Engine oil filter	Replace	6-18, 19
Pilot line filter	Replace	6-31
Hydraulic return filter	Replace	6-30
Drain filter cartridge	Replace	6-31
Fuel filter	Replace	6-26
Bolts & Nuts	Check, Tight	6-8
· 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		

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

4) EVERY 100 HOURS SERVICE

Check items	Service	Page
★ Return filter	Replace	6-30
★ Pilot line filter	Replace	6-31
★ Element in hydraulic tank breather	Replace	6-31
★ Drain filter cartridge	Replace	6-31

★ Replace 4 filters for continuous hydraulic breaker operation only.

5) EVERY 250 HOURS SERVICE

Check items	Service	Page
★ Engine oil	Change	6-18, 19
★ Engine oil filter	Replace	6-18, 19
Battery electrolyte	Check, Add	6-39
Hydraulic oil return filter	Replace	6-30
Drain filter cartridge	Replace	6-31
☆ Swing reduction gear oil	Change	6-32
☆ Swing reduction grease	Check, Add	6-32
Pilot line filter	Replace	6-31
Element in hydraulic tank breather	Replace	6-31
Bolts & Nuts	Check, Tight	6-8
· 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		

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

☆ Change oil and add grease after initial 250 hours of operation.

6) EVERY 500 HOURS SERVICE

Check items	Service	Page
Radiator and cooler fin	Inspect, Clean	6-23
★Air cleaner element(Primary)	Check, Clean	6-25
Fuel filter	Replace	6-26
Travel reduction gear oil	Check, Add	6-33
☆Travel reduction gear oil	Change	6-33

★ 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.

☆ Change oil after initial 500 hours of operation.

7) 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 grease	Refill	6-32
Grease in swing gear and pinion	Change	6-33

8) EVERY 2000 HOURS SERVICE

Check items	Service	Page
Hydraulic tank		
★ · Oil	Change	6-29
· Suction strainer	Check, Clean	6-30
Coolant	Change	6-20, 21, 22, 23

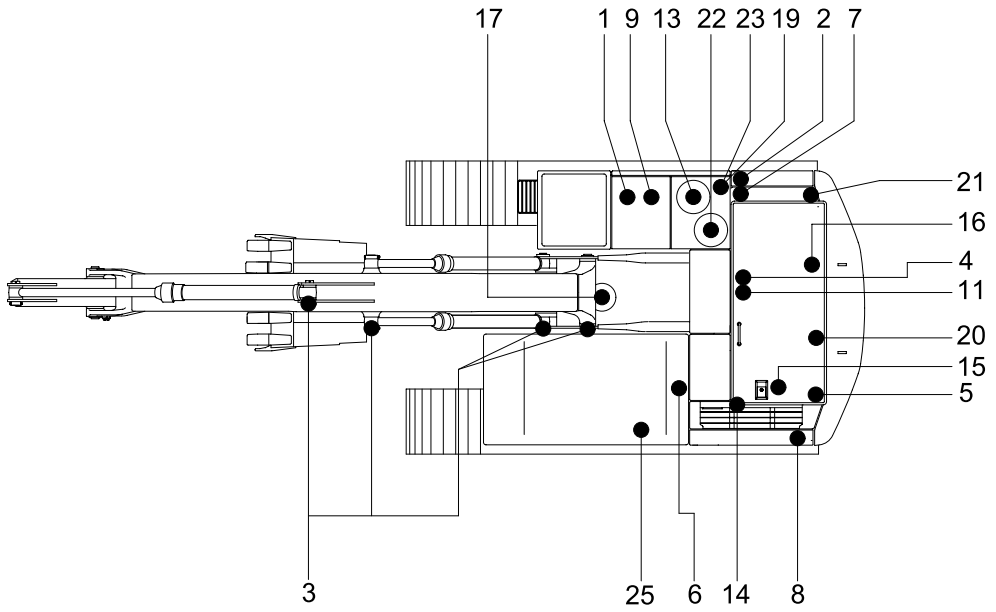
★Change oil every 600 hours of continuous hydraulic breaker operation.

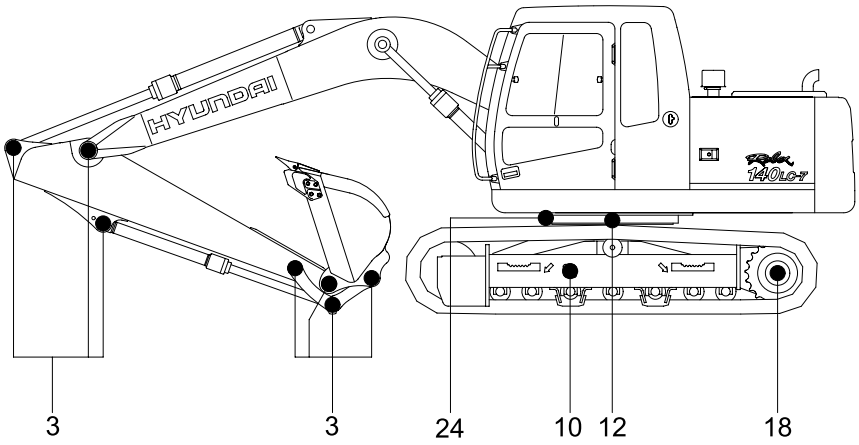
9) WHEN REQUIRED

Whenever you have trouble in the machine, you must perform the service of related items, system by system.

Check items	Service	Page
Fuel system		
· Fuel tank	Drain or Clean	6-25
· Water separator	Drain or Replace	6-26
· Fuel filter	Replace	6-26
Engine lubrication system		
· Engine oil	Change	6-18, 19
· Engine oil filter	Replace	6-18, 19
Engine cooling system		
· Coolant	Add or Change	6-20, 21, 22, 23
· Radiator	Clean or Flush	6-20, 21, 22, 23
Engine air system		
· Air cleaner element	Replace	6-25
Hydraulic system		
· Hydraulic oil	Add or Change	6-29
· Return filter	Replace	6-30
· 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	6-36
· Linkage	Adjust	6-37
· Bucket assy	Replace	6-35
Air conditioner and heater		
· Fresh filter	Clean, Replace	6-42
· Recirculation filter	Clean	6-43

5. MAINTENANCE CHART





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Caution

1. Service intervals are based on the hour meter reading.
2. The number of each item shows the lubrication point on the machine.
3. Stop engine while filling oil, and use no open flames.
4. For other details, refer to the service manual.

Service interval	No.	Description	Service action	Oil symbol	Capacity ℓ (U.S.gal)	Service points No.
10 Hours or daily	1	Fuel tank	Check, Refill	DF	270(71.0)	1
	2	Hydraulic oil level	Check, Add	HO	124(32.8)	1
	4	Engine oil level	Check, Add	EO	9.5(2.5)	1
	5	Radiator coolant	Check, Add	C	21.8(5.8)	1
	6	Control panel & pilot lamp	Check, Clean	-	-	1
	7	Water separator	Check, Drain	-	-	2
50 Hours or weekly	3	Attachment pins	Check, Add	PGL	-	17
	9	Fuel tank strainer and drain	Check, Clean	-	-	1
	10	Track tension	Check, Adjust	PGL	-	2
	12	Swing bearing grease	Check, Add	PGL	-	3
	17	Swing drive grease	Check, Add	PGL	0.35(0.1)	1
250 Hours	4	Engine oil level(-#1000)	Change	EO	9.5(2.5)	1
	8	Battery(Electrolyte)	Check, Add	-	-	2
	11	Engine oil filter(-#1000)	Replace	-	-	1
	13	Hydraulic oil return filter	Replace	-	-	1
	21	Line filter element	Replace	-	-	1
	22	Drain filter cartridge	Replace	-	-	2
	23	Air breather element	Replace	-	-	1
500 Hours	4	Engine oil level(#1001-)	Change	EO	15.3(4.0)	1
	11	Engine oil filter(#1001-)	Replace	-	-	1
	14	Air cleaner element(Primary)	Clean	-	-	2
	15	Radiator and cooler fin	Check, Clean	-	-	1
	16	Fuel filter element	Replace	-	-	2
	18	Final drive gear case	Check, Add	GO	3.0(0.8)	2
1000 Hours	17	Swing drive gear oil	Change	GO	2.5(0.7)	1
	17	Swing drive grease	Check, Add	PGL	0.35(0.1)	1
	18	Final drive gear case	Change	GO	3.0(0.8)	2
	20	Fan belt tension and damage	Check, Adjust	-	-	1
	24	Swing gear and pinion	Change	PGL	4.4(1.2)	1
2000 Hours	2	Hydraulic oil level	Change	HO	124(32.8)	1
	5	Radiator coolant	Change	C	21.8(5.8)	1
	19	Hydraulic oil suction strainer	Check, Clean	-	-	1
As required	25	Air conditioner filters	Check, Clean	-	-	2

※ **Oil symbol**

Please refer to the recommended lubricants for specification.

DF : Diesel fuel GO : Gear oil

HO : Hydraulic oil C : Coolant

PGL : Grease EO : Engine oil

1) CHECK ENGINE OIL LEVEL

Check the oil level with the machine on a flat ground before starting engine.

(1) Pull out the dipstick and wipe with a clean cloth.

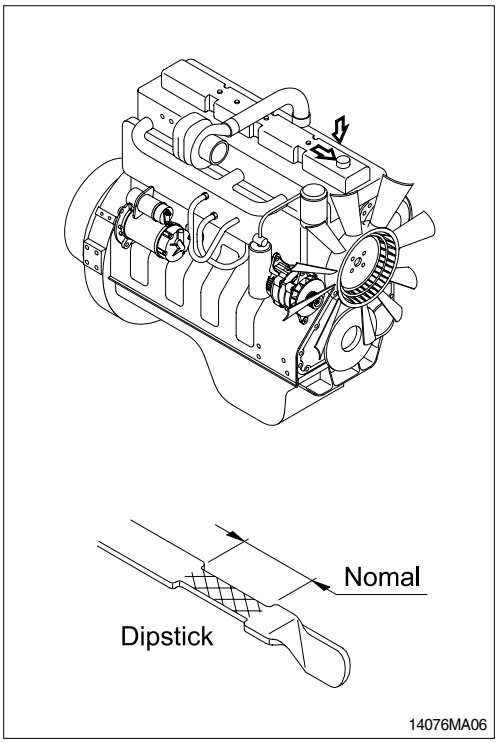
(2) Check the oil level by inserting the dipstick completely into the hole and pulling out again.

(3) If oil level is LOW, add oil and then check again.

※ **If the oil is contaminated or diluted, change the oil regardless of the regular change interval.**

※ **Check oil level after engine has been stopped for 15 minutes.**

⚠ **Do not operate unless the oil level is in the normal range.**

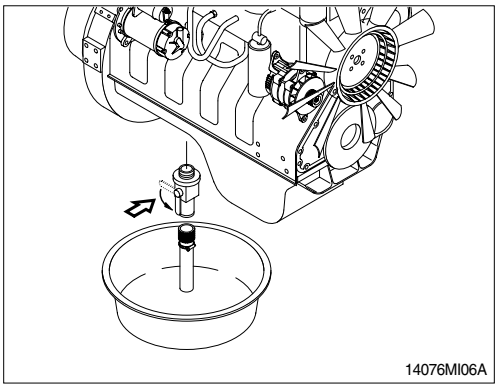


2) REPLACEMENT OF ENGINE OIL AND OIL FILTER

(1) Warm up the engine.

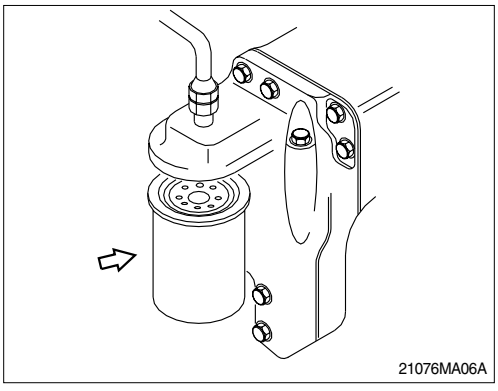
(2) Turn the lever to open position.

※ **A drain pan with a capacity of 23 liters(6U.S. gallons) will be adequate.**



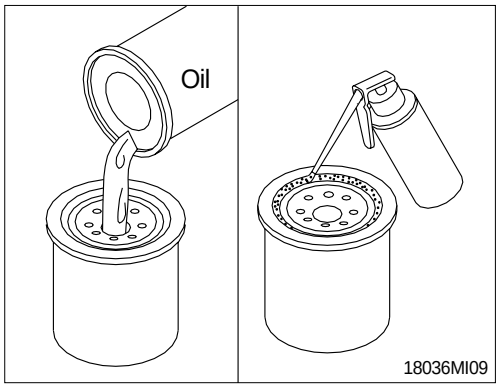
(3) Clean around the filter head, remove the filter and clean the gasket surface.

· Wrench size : 90 ~ 95mm(3.5~3.8in)



(4) Apply a light film of lubricating oil to the gasket sealing surface before installing the filters.

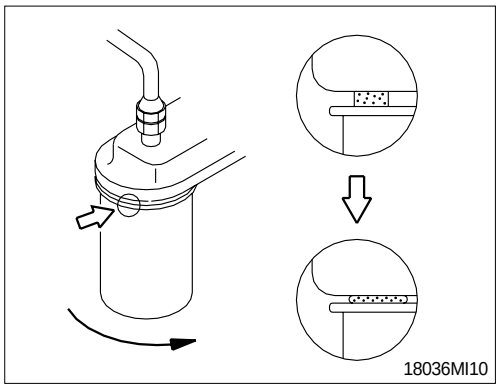
※ **Fill the filters with clean lubricating oil.**



(5) Install the filter to the filter head.

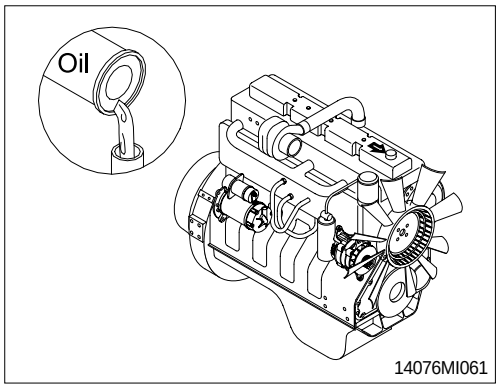
※ **Mechanical over-tightening may distort the threads or damage the filter element seal.**

· Install the filter as specified by the filter manufacturer.

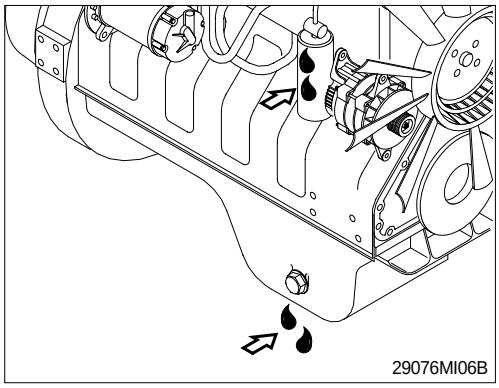


(6) Fill the engine with clean oil to the proper level.

· Quantity : 9.5 ℓ (2.5U.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 15minutes for oil to drain down before checking.



3) CHECK COOLANT

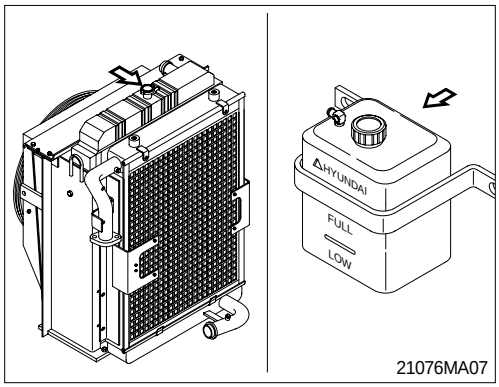
(1) Check if the level of coolant in reservoir tank is between FULL and LOW.

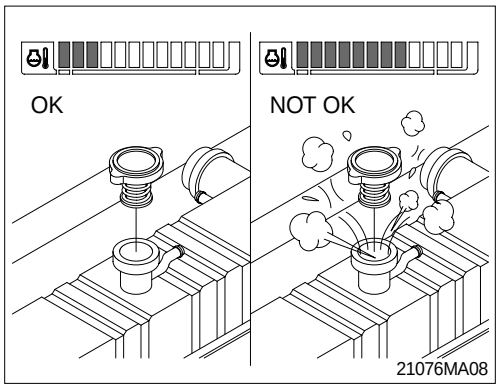
(2) Add the mixture of antifreeze and water after removing the cap of the reservoir tank if coolant is not sufficient.

(3) Be sure to use the reservoir empty, add the coolant by opening the cap of radiator.

(4) Replace gasket of radiator cap when it is damaged.

⚠ **Hot coolant can spray out if radiator cap is removed while engine is hot. Remove the cap after the engine has cooled down.**



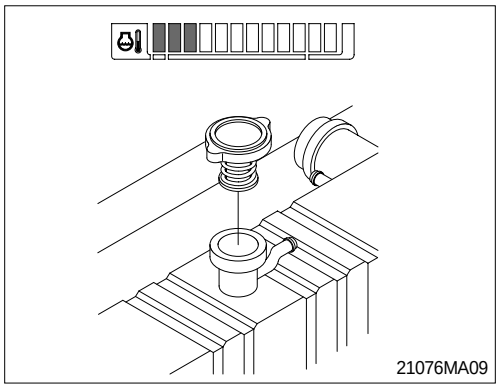


4) FLUSHING AND REFILLING OF RADIATOR

(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.

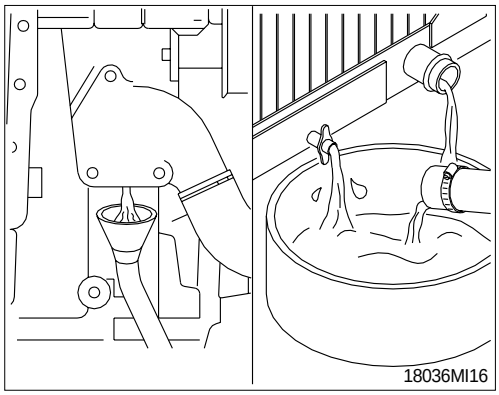
※ **Protect the environment : Handling and disposal of used antifreeze can be subject to federal, state, and local law regulation.**
Use authorized waste disposal facilities, including civic amenity sites and garages providing authorized facilities for the receipt of used antifreeze.
If in doubt, contact your local authorities for guidance as to proper handling of used antifreeze.



⚠ **Wait until the temperature is below 50°C (120°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 40 liters(10U.S.gallons) will be adequate in most applications.

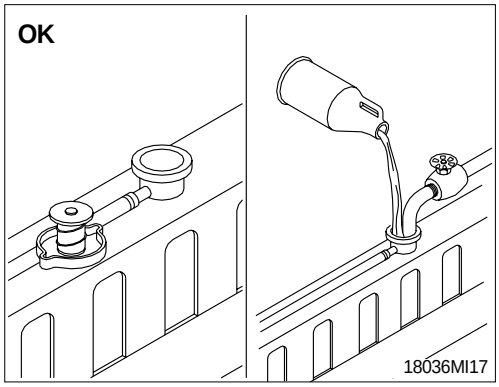


(2) Flushing of cooling system

① Fill the system with a mixture of sodium carbonate and water(or a commercially available equivalent).

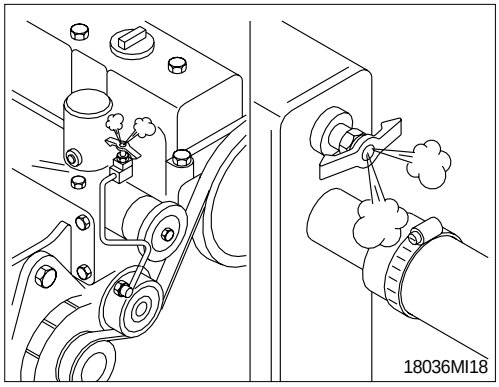
※ Use 0.5kg(1.0pound) of sodium carbonate for every 23 liters(6.0U.S. gallons) of water.

※ Do not install the radiator cap. The engine is to be operated without the cap for this process.



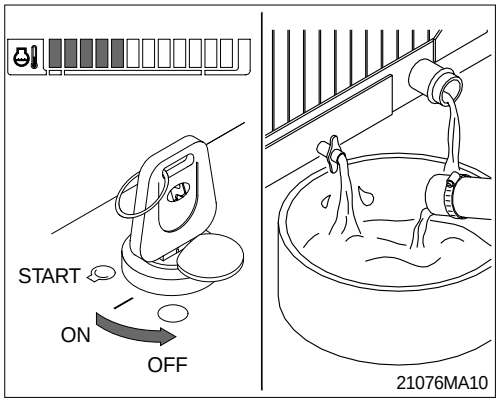
※ During filling, air must be vented from the engine coolant passages. Open the engine venting petcock.

The system must be filled slowly to prevent air locks. Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.



② Operate the engine for 5 minutes with the coolant temperature above 80°C(176°F) .

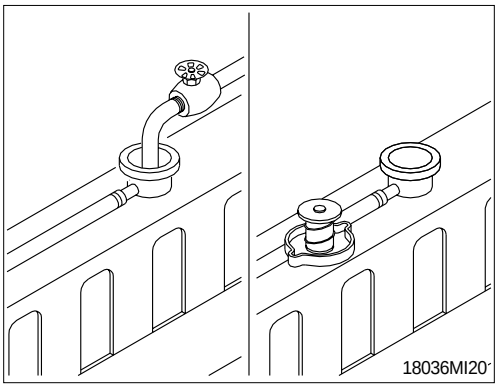
Shut the engine off, and drain the cooling system.



③ Fill the cooling system with clean water.

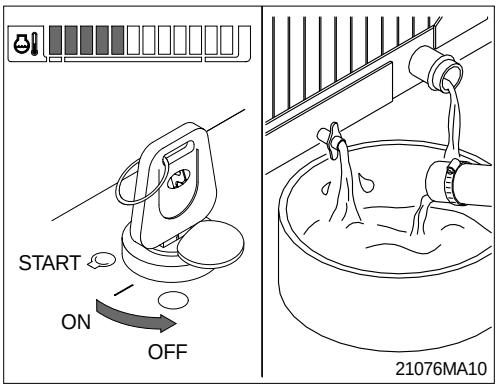
※ **Be sure to vent the engine and aftercooler for complete filling.**

※ **Do not install the radiator cap or the new coolant filter.**



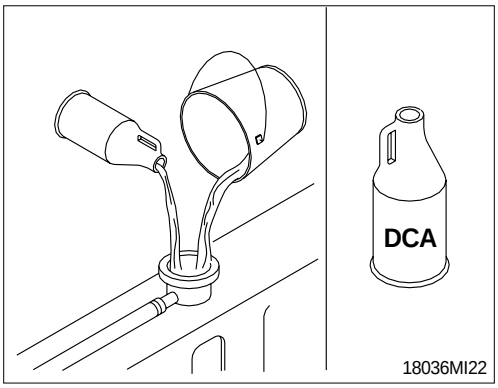
④ Operate the engine for 5 minutes with the coolant temperature above 80。C(176。F) .
Shut the engine off, and drain the cooling system.

※ **If the water being drained is still dirty, the system must be flushed again until the water is clean.**



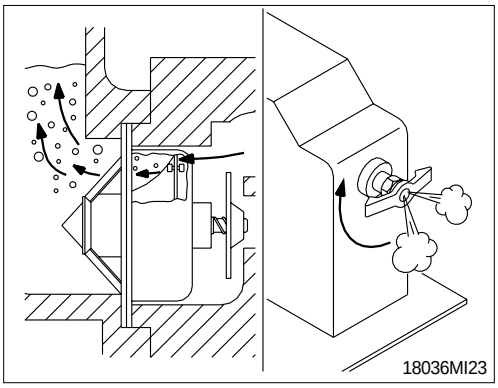
(3) Cooling system filling

① Use a mixture of 50 percent water and 50 percent ethylene glycol antifreeze to fill the cooling system.
Coolant capacity(engine only) : 8.3ℓ (2.2U.S. gallons)

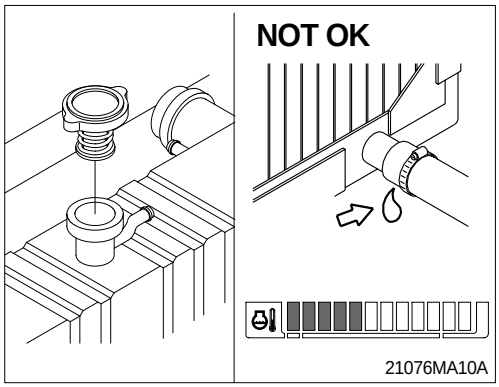


② The system has a maximum fill rate of 14 liters(3.5U.S. gallons) per minute.
Do not exceed this fill rate.

※ **The system must be filled slowly to prevent air locks.**
During filling, air must be vented from the engine coolant passage.
Be sure to open the petcock.
Then add mixture to bring the level to the top.



③ 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.

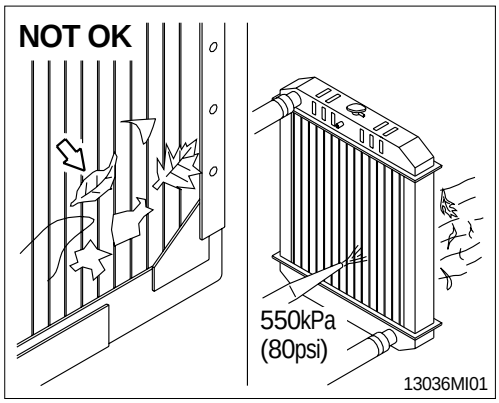


5) CLEAN RADIATOR AND OIL COOLER

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.

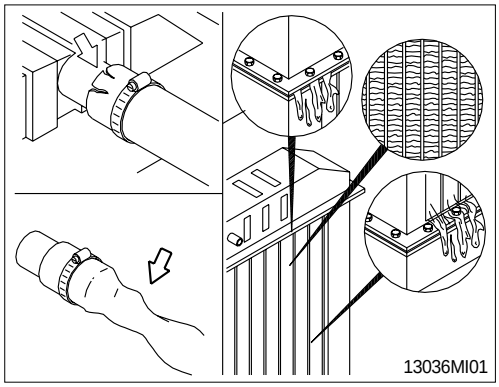
(2) Use 550kPa(80psi) air pressure to blow the dirt and debris from the fins.
Blow the air in the opposite direction of the fan air flow.



(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.**

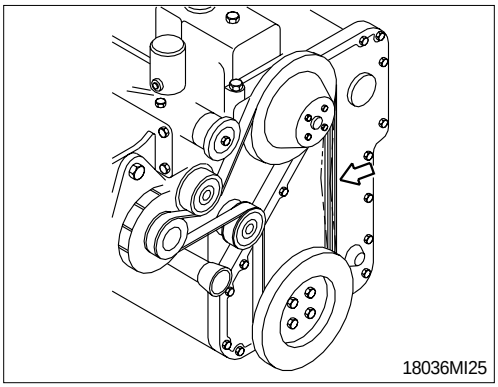
(4) Visually inspect the radiator for core and gasket leaks.



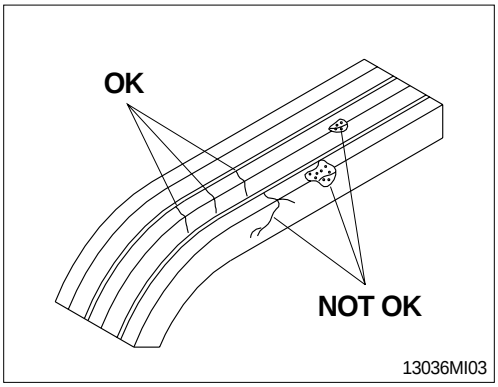
6) FAN BELT TENSION

(1) Measure the belt deflection at the longest span of the belt.

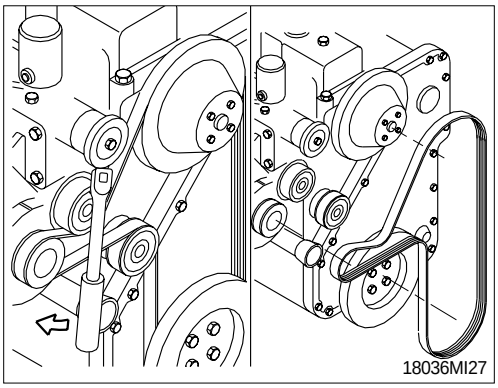
· Maximum deflection : 9.5 - 12.7㎜
(3/8 to 1/2inch)



(2) Inspect the drive for damage.



(3) Inspect the drive belt, tension bearing and fan hub.



7) INSPECTION OF COOLING FAN

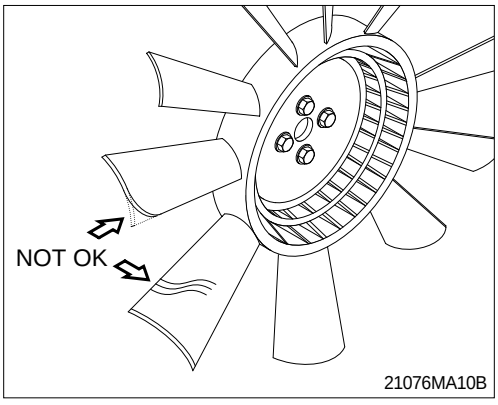
⚠ **Personal injury can result from a fan blade failure. Never pull or pry on the fan. This can damage the fan blade and cause fan failure.**

※ **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.



8) CLEANING OF AIR CLEANER

(1) Primary element

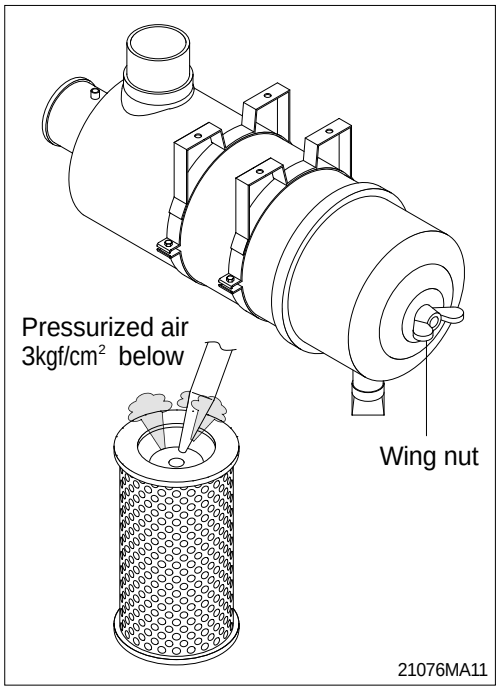
① Loosen the wing nut and remove the element.
② Clean the inside of the body.
③ Clean the element with pressurized air.
· Remove the dust inside of the element by the pressurized air(Below 3kgf/cm², 40psi) forward and backward equally.
④ Inspect for cracks or damage of element by putting a light bulb inside of the element.
⑤ Insert element and tighten wing nut.

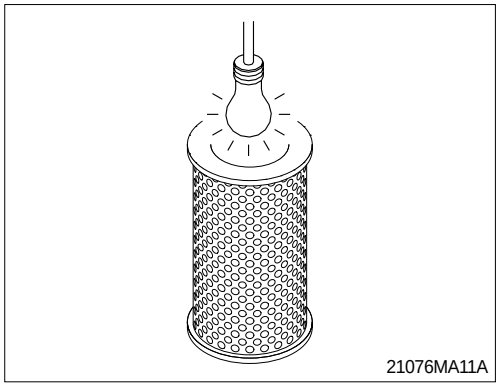
※ Replace the primary element after 4 times cleanings.

(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.





9) FUEL TANK

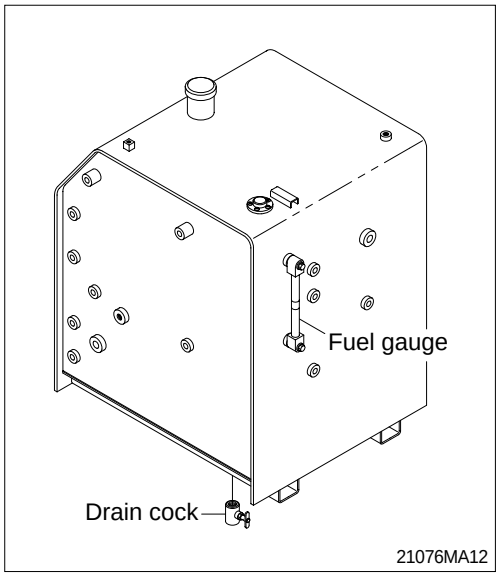
(1) Fill fuel fully when system the operation to minimize water condensation, and check it with fuel gauge before starting the machine.

(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.

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



10) WATER SEPARATOR(~#1916)

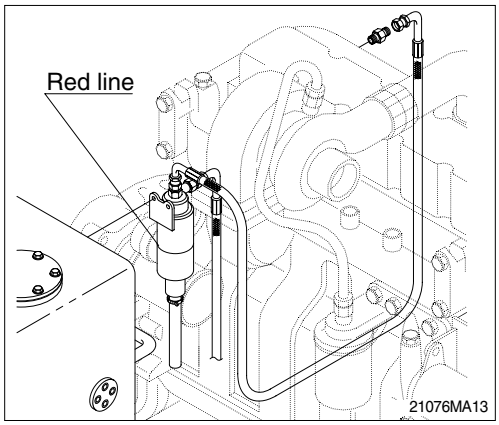
(1) Drain the water and sediment by loosening the drain plug.

(2) Retighten the drain plug.

(3) Check for leakage.

※ **Drain the water if it reaches the red line regardless of the service interval.**

※ **Bleed the air if the air is mingled on the fuel line when draining water.**



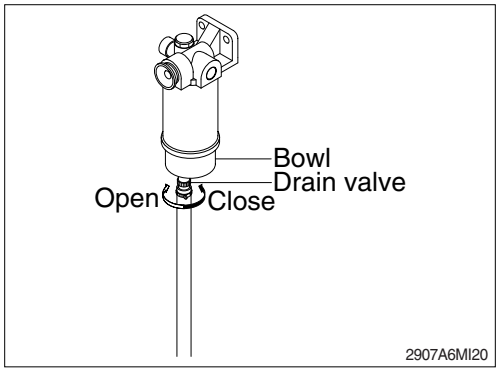
10A) PREFILTER(#1917~)

※ **Inspect or drain the collection bowl of water daily and replace the element every 500hours.**

(1) Drain water

① Open bowl drain valve to evacuate water.

② Close drain valve.



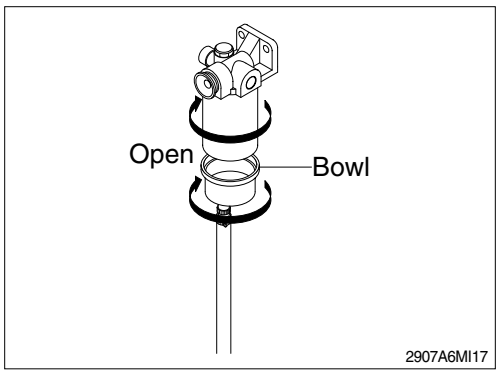
(2) Replace element

① Drain the unit of fuel. Follow "Drain water" instructions above.

② Remove element / bowl from filter head.

※ The bowl is reusable, do not damage or discard.

③ Separate element from bowl. Clean bowl and seal gland.

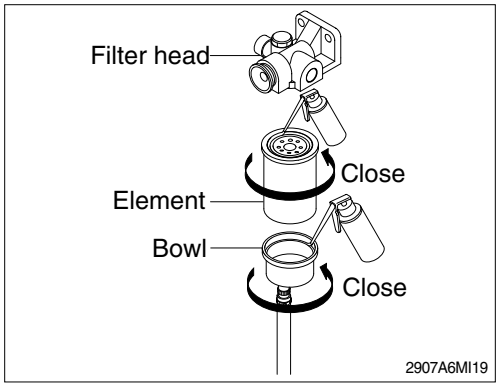


④ Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.

⑤ Attach bowl to new element firmly by hand.

⑥ Lubricate new element seal and place in element top gland.

⑦ Attach the element and bowl to the head.



11) REPLACEMENT OF FUEL FILTER

(1) Clean around the filter head, remove the filter and clean the gasket surface.
  · Wrench size : 90~95mm(3.5~3.8in)

(2) Replace the O-ring.

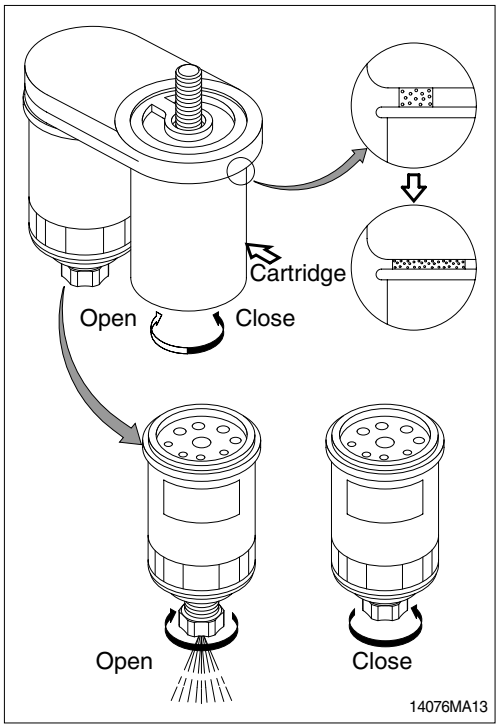
(3) Fully fill fuel in the new filter.

(4) Apply engine oil on the gasket of filter when mounting, and tighten 3/4 to 1 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.**



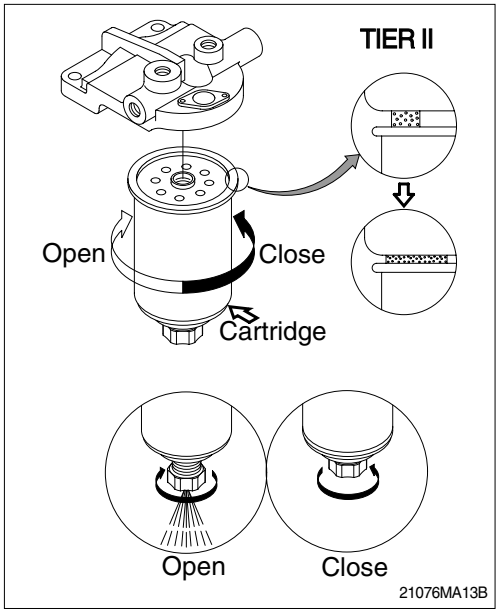
FUEL WATER SEPARATOR

- 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 4 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.

※ **If more then 2 ozs is drained, refilling of the filter is required to prevent hard starting. Refer to low pressure lines and fuel filter venting clause 12)-(2).**

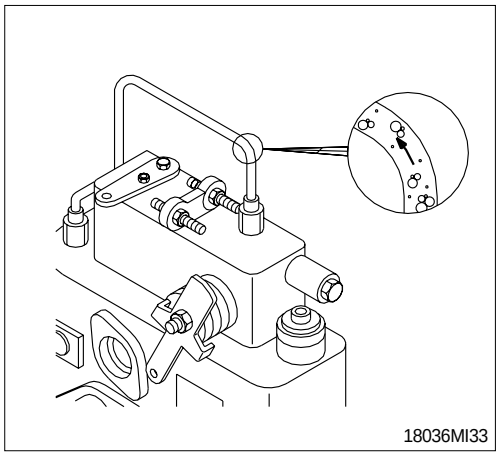


12) BLEEDING THE FUEL SYSTEM

(1) Controlled venting is provided at the injection pump through the fuel drain manifold. Small amounts of air introduced by changing the filters or injection pump supply line will be vented automatically, if the fuel filter is changed in accordance with the instructions.

※ **However, manual bleeding will be required if :**

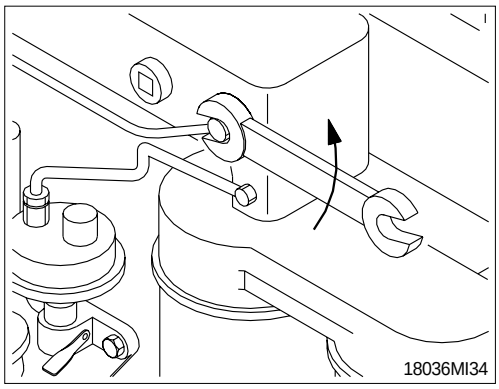
- **The fuel filter is not filled prior to installation.**
- **Injection pump is replaced.**
- **High pressure fuel lines are replaced.**



(2) Venting the low pressure lines and fuel filter

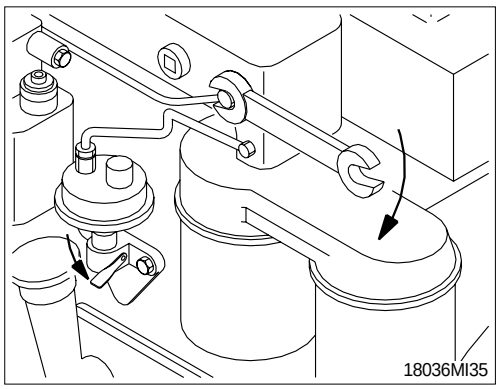
① Open the bleed screw.

· Wrench size : 8㎜



② Operate the hand lever until the fuel flowing from the fitting is free of air.
Tighten the bleed screw.

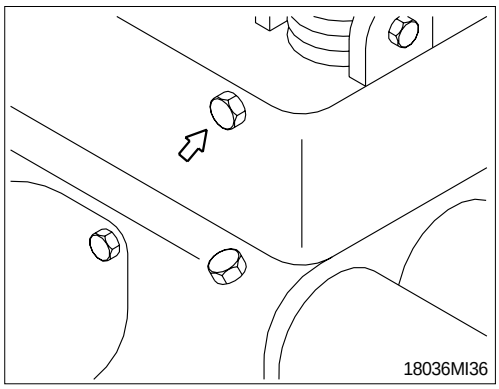
· Torque : 0.97kgf · m(7lbf · ft)



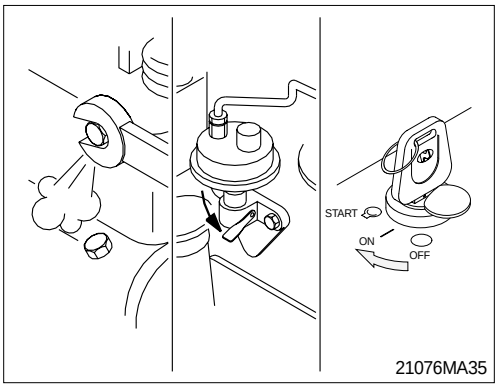
(3) Venting at the injection pumps

① Bleed the Lucas CAV pump in this illustration.

· Wrench size : 8㎜



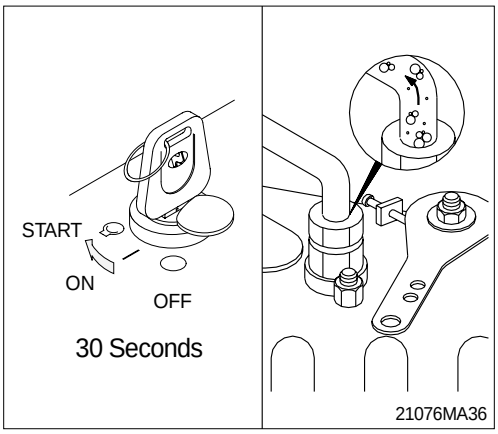
② Air/fuel can be pumped from this location with the hand lever on the lift pump if the fuel solenoid valve is energized.



③ Air can be vented from both pumps through the fuel drain manifold line by operating the starting motor.

※ **When using the starting motor to vent the system, do not engage it for more than 30 seconds at a time : wait 2 minutes between engagements.**

※ **It is necessary to put the engine in the RUN position. Because the engine may start, be sure to follow all the safety precautions. Use the normal engine starting procedure.**



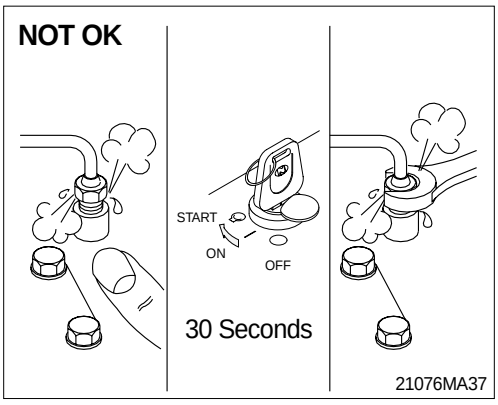
(4) Venting the high pressure lines

⚠ **The pressure of the fuel in the line is sufficient to penetrate the skin and cause serious bodily harm.**

① Loosen the fittings at the injectors, and crank the engine to allow entrapped air to bleed from the lines. Tighten the fittings.

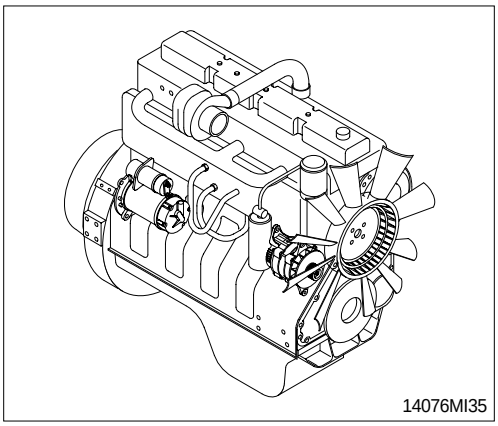
· Wrench size :17㎜

② Start the engine and vent one line at a time until the engine runs smoothly.



13) 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.**

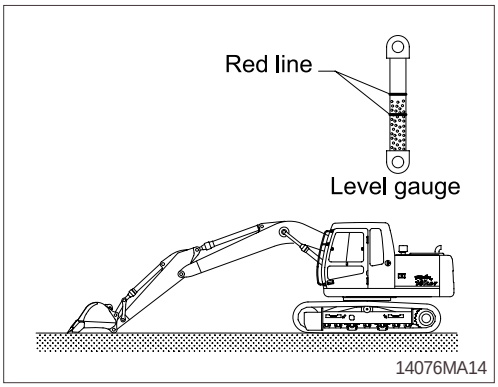


14) HYDRAULIC OIL CHECK

(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.



15) FILLING HYDRAULIC OIL

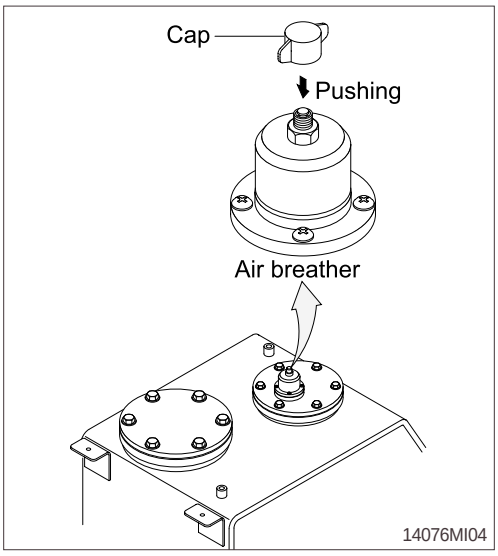
(1) Stop the engine to the position of level check.

(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.
- Tightening torque : 1.44±0.3kgf · m (10.4±2.1lbf · ft)

(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.



16) 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±1.4kgf · m (50±10lbf · ft)

(4) Prepare a suitable container.

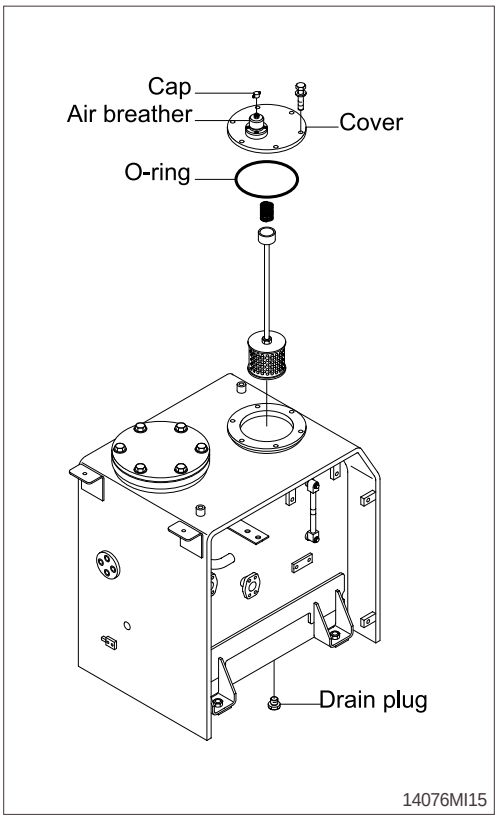
(5) To drain the oil loosen the drain plug at the bottom of the oil tank.

(6) Fill proper amount of recommended oil.

(7) Put the breather in the right position.

(8) Bleed air hydraulic pump loosen the air breather at top of hydraulic pump assembly.

(9) Start engine and run continually. Release the air by full stroke of each control lever.



17) CLEAN SUCTION STRAINER

Clean suction strainer as follows paying attention to the cause to be kept during oil filling.

(1) Remove the cover.
- Tightening torque : 6.9±1.4kgf · m (50±10lbf · ft)

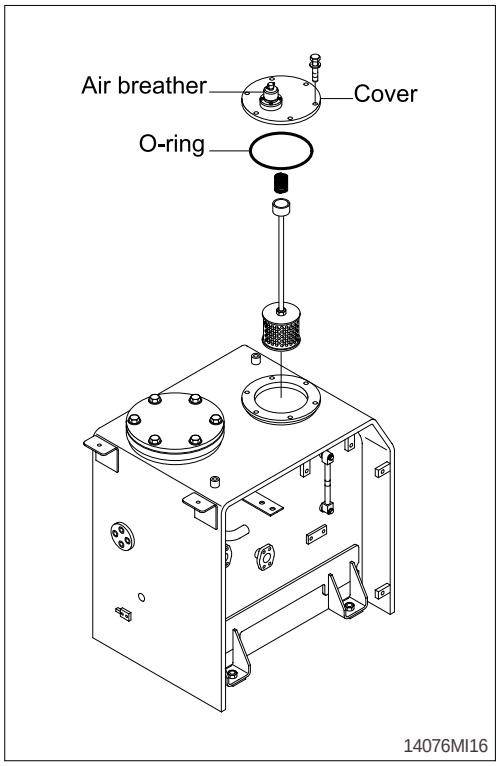
(2) Pull out the strainer in the tank.

(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.**



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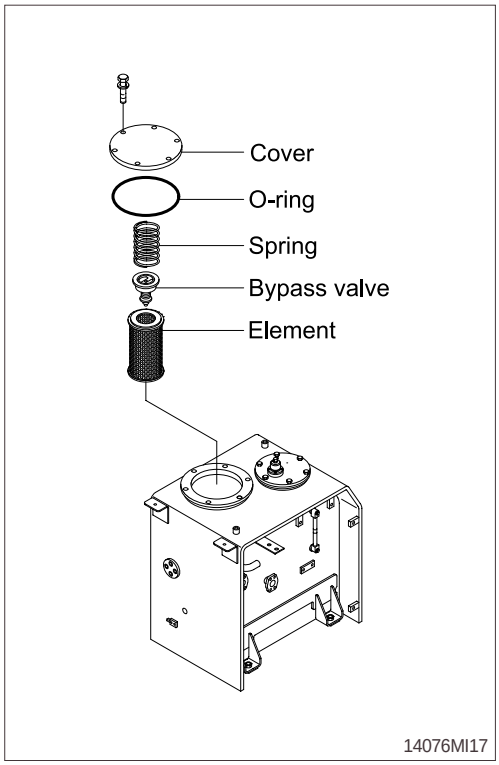
18) REPLACEMENT OF RETURN FILTER

Replace as follows paying attention to the cause to be kept during the replacement.

(1) Remove the cover.
- Tightening torque : 6.9±1.4kgf · m (50±10lbf · ft)

(2) Remove the spring, by-pass valve, and return filter in the tank.

(3) Replace the element with new one.



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19) REPLACEMENT OF ELEMENT IN HYDRAULIC TANK BREATHER

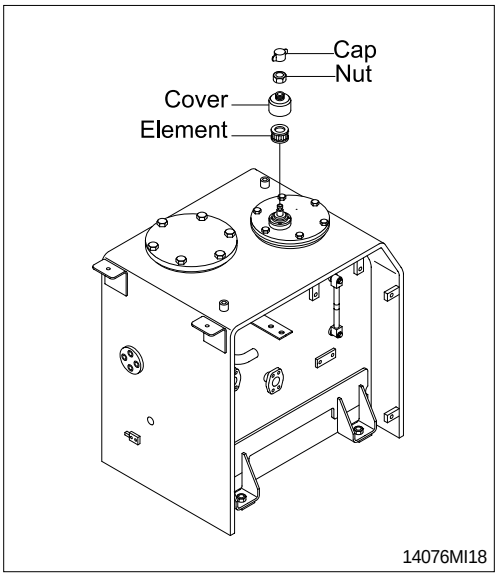
(1) Loosen the cap and relieve the pressure in the tank by pushing the top of the air breather.

(2) Loosen the lock nut and remove the cover.

(3) Pull out the filter element.

(4) Replace the filter element new one.

(5) Reassemble by reverse order of disassembly.
- Tightening torque : 0.2~0.3kgf · m
  (1.4~2.1lbf · ft)

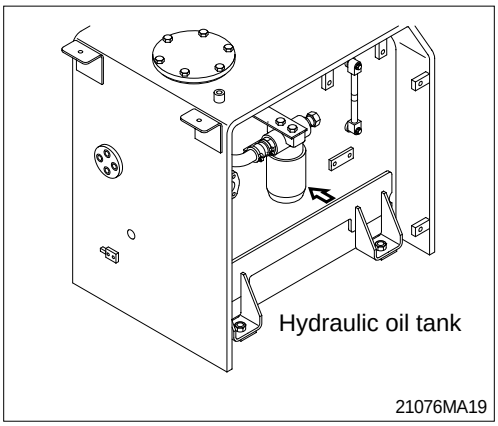


20) REPLACE OF DRAIN FILTER CARTRIDGE

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 50 hours of operation. Thereafter, change cartridge every 250 hours.**



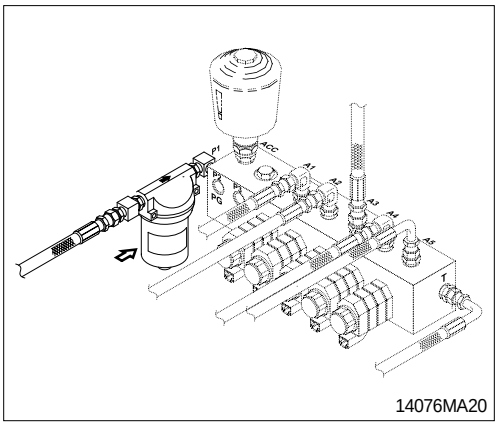
21) REPLACE OF PILOT LINE FILTER

(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 50 hours of operation. Thereafter, change cartridge every 250 hours.**

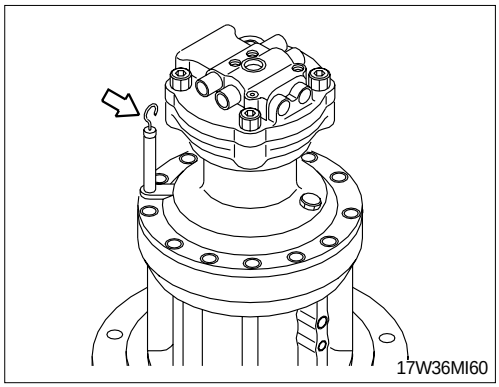


22) CHECK THE SWING REDUCTION GEAR OIL

(1) Pull out the dipstick and clean it.

(2) Insert it again.

(3) Pull out one more time to check the oil level and fill the oil if the level is not sufficient.



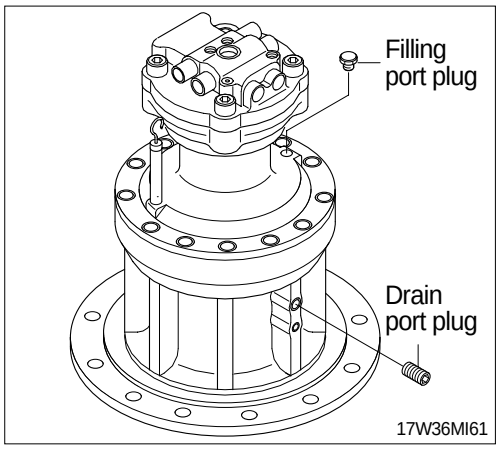
23) CHANGE SWING REDUCTION GEAR OIL

(1) Raise the temperature of oil by swinging the machine before replace the oil and park the machine on the flat ground.

(2) Loosen the plug of the drain port.

(3) Drain into a proper container.

(4) Wash the drain plug and reinstall it with sealing tape.
Fill proper amount of recommended oil.
· Amount of oil : 2.5ℓ (0.7U.S.gal)



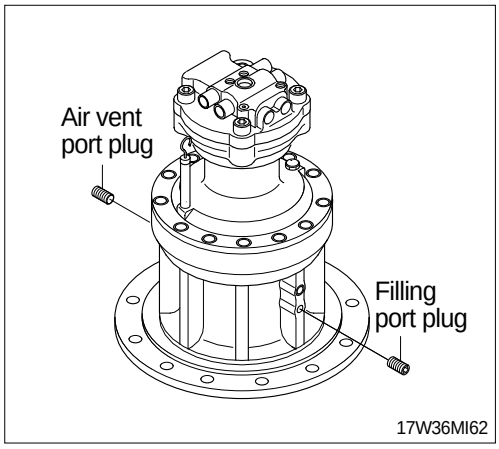
24) LUBRICATE BEARING OF OUTPUT SHAFT IN REDUCTION GEAR

(1) Remove air vent plug.

(2) Remove grease fill plug and install grease fitting at that place.

(3) Lubricate NLGI No.2 with grease gun until comes out new grease from air vent port.

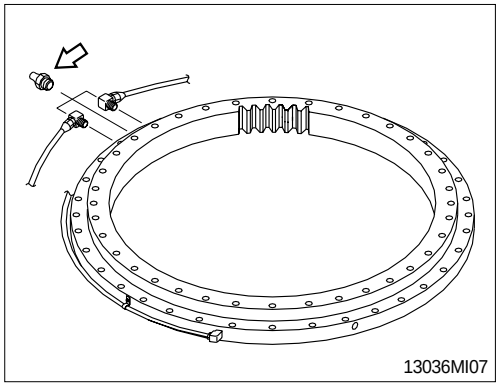
※ **Lubricate every 1000 hours.**



25) LUBRICATE SWING BEARING

(1) Grease at 3 fitting.

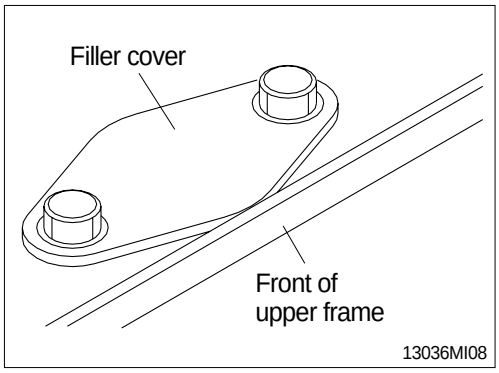
※ **Lubricate every 50 hours.**



26) SWING GEAR AND PINION

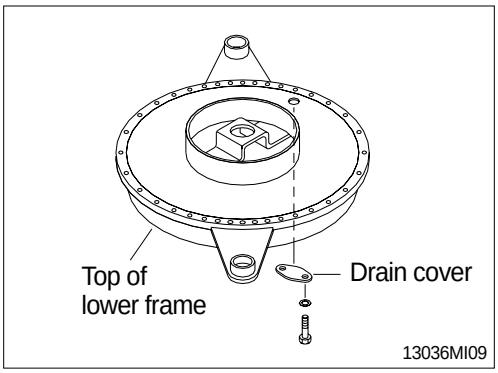
(1) Drain old grease

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

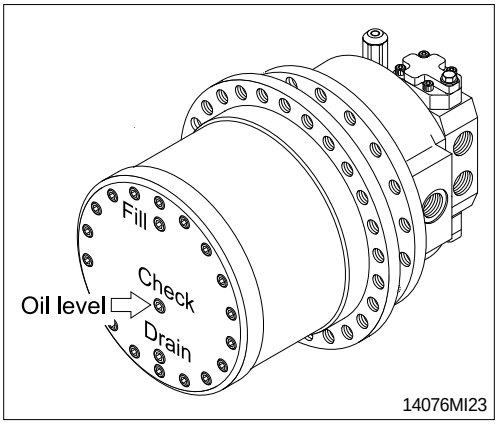
① Install drain cover.
② Fill with new grease.
③ Install filler cover.
· Capacity : 3.9kg(8.6lb)



27) CHECK THE TRAVEL REDUCTION GEAR OIL

(1) Operate the machine to the position of drain plug down to the flat ground.

(2) Loosen the level plug and check the oil level. If the level is at the hole of the plug, it is normal. Fill the oil if it is not sufficient.



28) CHANGE OF THE TRAVEL REDUCTION GEAR OIL

(1) Raise the temperature of the oil by traveling machine first.

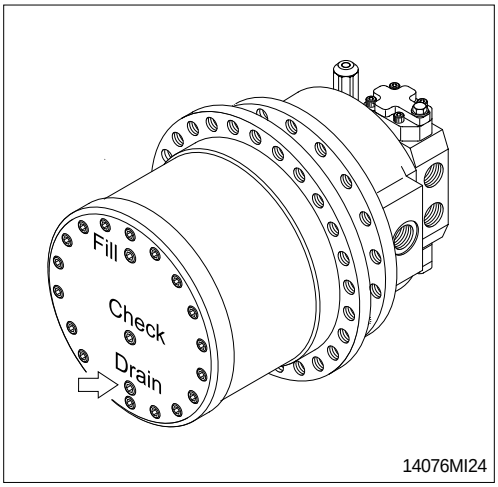
(2) Stop when the position of the drain plug is down.

(3) Loosen the level plug and then the drain plug.

(4) Drain the oil to adequate container.

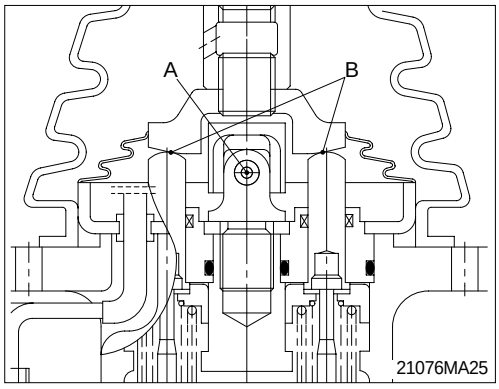
(5) Tighten the drain plug and fill specified amount of oil at filling port.

(6) Tighten the level plug and travel slowly to check if there is any leakage of oil.



29) LUBRICATE RCV LEVER

Remove the bellows and with a grease gun grease the joint part(A) and sliding parts(B).



30) ADJUSTMENT OF TRACK TENSION

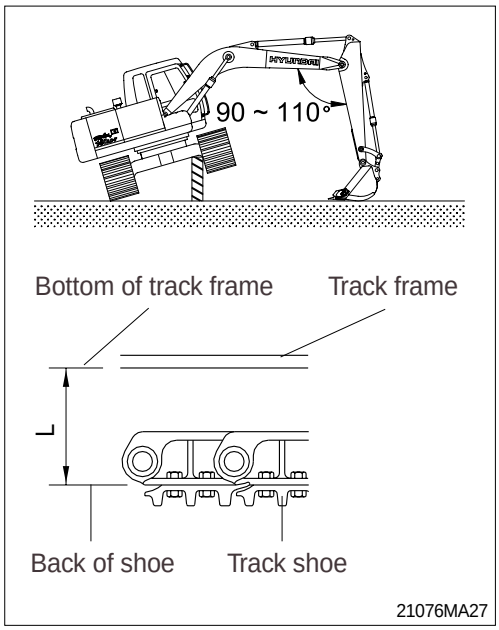
※ It is important to adjust the tension of track properly to extend the lifetime of track and traveling device.

※ 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 with rotating the track before measuring.



(3) If the tension is tight, drain the grease in the grease nipple and if the tension is loose, charge the grease.

⚠ Personal injury or death can result from grease under pressure.

⚠ 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 to the 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.

Length(L)	
270~300mm	10.6~11.8"

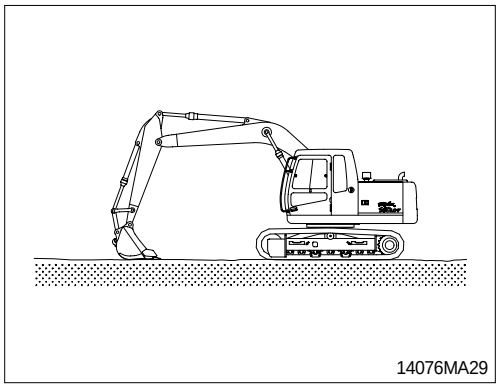
31) REPLACEMENT OF BUCKET

△ **When knocking the pin in with a hammer, metal particles may fly and cause serious injury, particularly if they get into your eyes. When carrying out this operation, always wear goggles, helmet, gloves, and other protective equipment.**

※ **When the bucket is removed, place it in a stable condition.**

※ **When performing joint work, make sure 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.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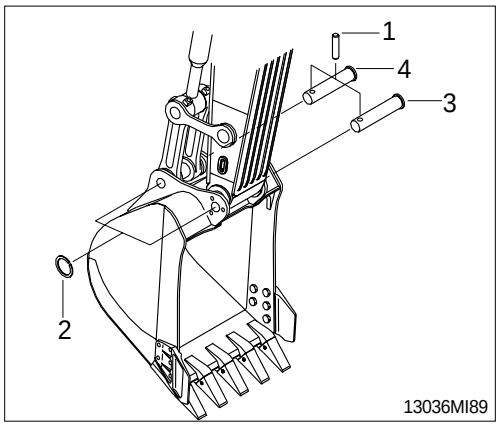
(2) Lock the safety lever to the LOCK position and stop the engine.

(3) Remove the spring(2) and stop pin(1), then remove pins(3, 4) and remove the bucket.

※ **When removing the pins, place the bucket so that it is in light contact with the ground.**

※ **If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins.**



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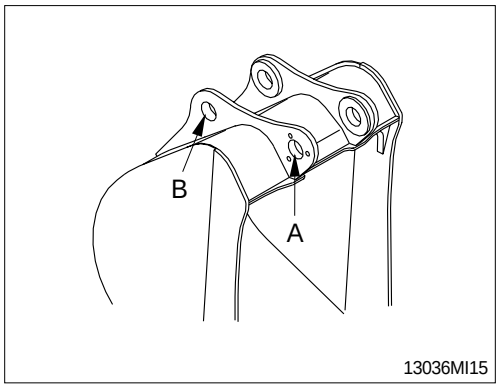
※ **After remove the pins, make sure that they do not become contaminated with sand or mud and that the seals of bushing on both sides do not become damaged.**

(4) Align the arm with holes(A) and the link with holes(B), then coat with grease and install pins(3, 4)



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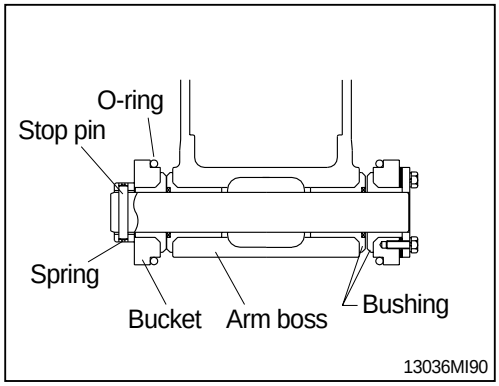
※ **When installing the bucket, the O-rings are easily damaged, so fit the O-rings on the boss of the bucket as shown in the picture. After knocking the pin, move the O-ring down to the regular groove.**

(5) Install the spring(2) and stop pin(1) for each pin, then grease the pin.



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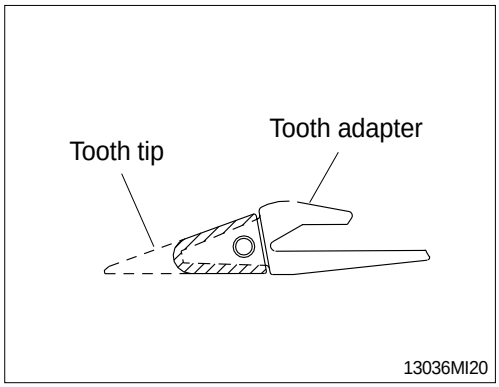
32) REPLACEMENT OF BUCKET TOOTH

(1) Timing of replacement

① Check wearing condition as shown in the illustration and replace tooth tip before adapter starts to wear.

② If excessive use, tooth adapter has worn out, replacement may become impossible.



(2) Instructions for replacement

① Pull out pin by striking pin with punch or hammer, avoiding damage to locking washer.

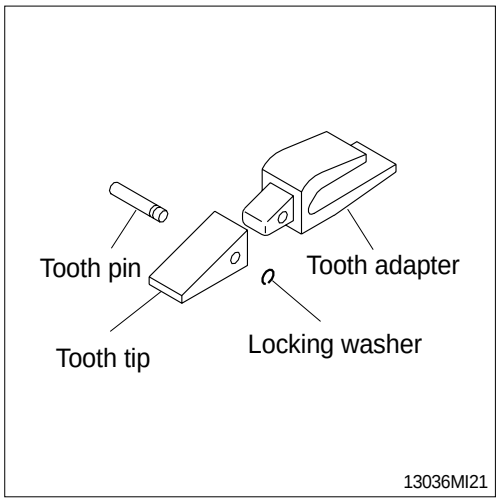
② Remove dust and mud from surface of tooth adapter by using knife.

③ Place locking washer in its proper place, and fit tooth tip to adapter.

④ Insert pin until locking washer is positioned at tooth pin groove.

⚠ Personal injury can result from bucket falling.

⚠ Block the bucket before changing tooth tips or side cutters.



33) 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 and stop the engine.

(4) Measure the clearance(A) between bucket and arm boss. This is the total clearance.

(5) Adjusting

① Loosen bolt(2), and remove washer(3), plate(1) and shim(4).

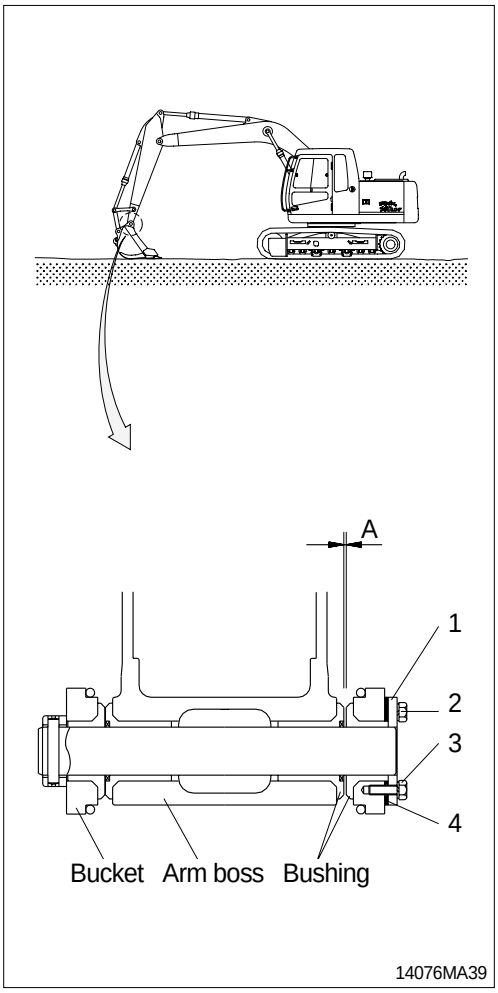
② Remove the shim equivalent value with measuring value.

③ Assemble the parts in the reverse order of removal.

· Tightening torque : 29.6±3.2kgf · m
(214.0±23.1lbf · ft)

· Normal clearance : 0.5 ~ 1.0mm
(0.02 ~ 0.04in)

※ If the bucket is not adjusted correctly, noise and vibration created during operation, and damaged O-ring, pin and bushing quickly.



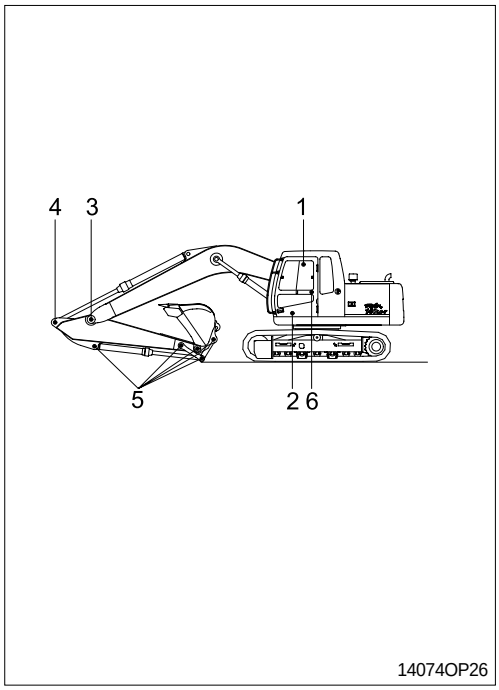
34) LUBRICATE PIN AND BUSHING

(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	2
4	Arm cylinder pin(Rod side)	1
5	Bucket cylinder pin(Head, rod)	2
	Bucket link(Control rod)	3
	Arm and control link connection pin	1
	Arm and bucket connection pin	1
6	Boom rear bearing center	1

※ Shorten lubricating interval when working in the water or dusty place.



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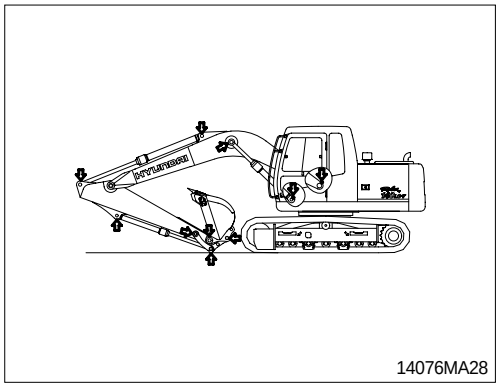
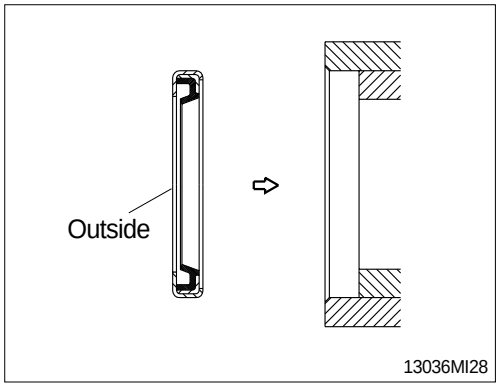
(2) Dust seals are mounted on the rotating part of working device to extend the lubricating interval.

※ Mount the lip to be faced outside when replace the dust seal.


14076MA28

※ 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.



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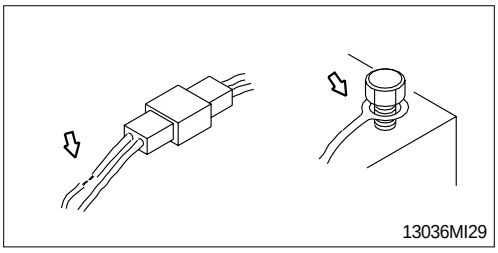
7. ELECTRICAL SYSTEM

1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



2) BATTERY

(1) Check and repair

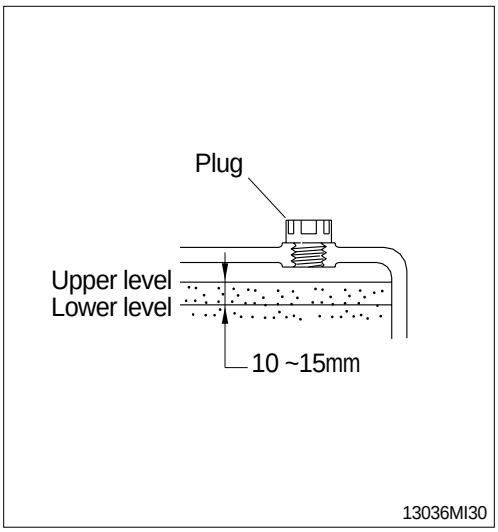
① Check the electrolyte level and fill with distilled water to the prescribed level as necessary.

② Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

⚠ 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.

※ Remove the fire and spark around battery.

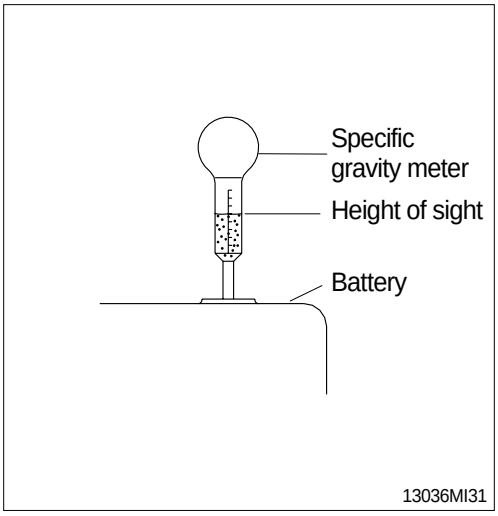


(2) Specific gravity of battery

Judge the charging rate of battery by the specific gravity. The specific gravity changes by the ambient temperature.

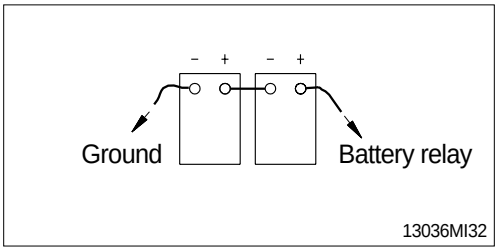
Check the charging rate by referring to the chart below.

Temperature / Charging rate	20°C	10°C	-10°C
100%	1.26	1.27	1.28
90%	1.24	1.25	1.26
80%	1.22	1.23	1.24
75%	1.21	1.22	1.23



Method of removing the battery cable

Remove the cable from the ground connection first(⊖ terminal side) and reconnect it last when reassembling.



3) STARTING THE ENGINE WITH A BOOSTER CABLE

Keep following order when you are going to start engine using booster cable.

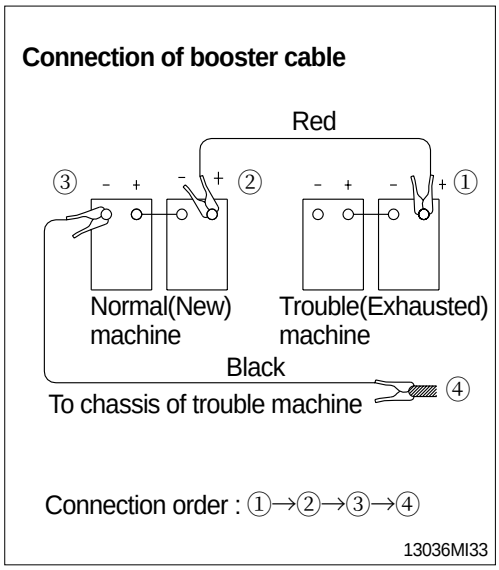
(1) Connection of booster cable

※ Use the same capacity of battery for starting.

① Connect the red terminal of booster cable to the battery (+) terminal between exhausted and new battery.

② Connect the black terminal of the booster cable to the battery (-) terminal between exhausted and new battery.

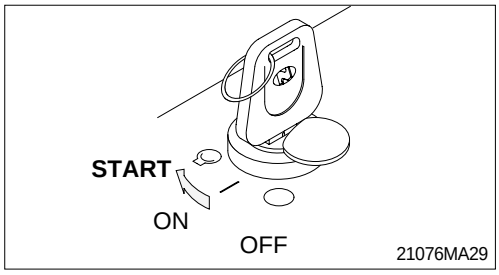
※ Keep firmly all connection, the spark will be caused when connecting finally.



(2) Starting the engine

① Start engine with starting switch.

② If you can not start it by one time, restart the engine after 2 minutes.



(3) Taking off the booster cable

① Take off the booster cable(black).

② Take off the booster cable(red) connected to the (+) terminal.

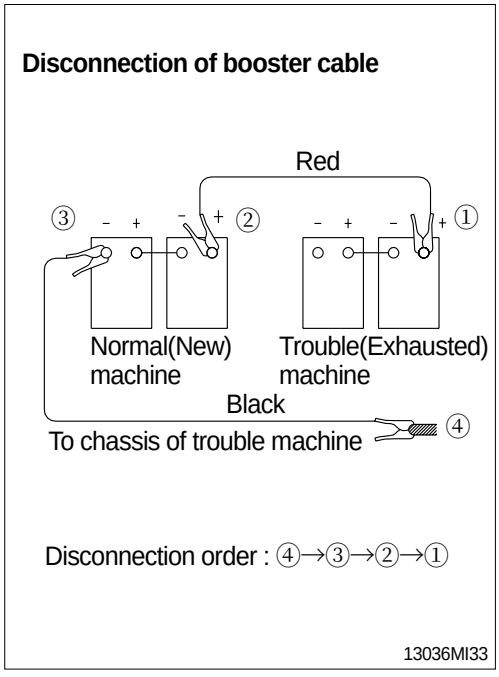
③ Run engine with high idle until charging the exhausted battery by alternator, fully.

⚠ 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.

① Shut off the engine and remove the starting switch.

② Disconnect ground cable from battery by master switch.

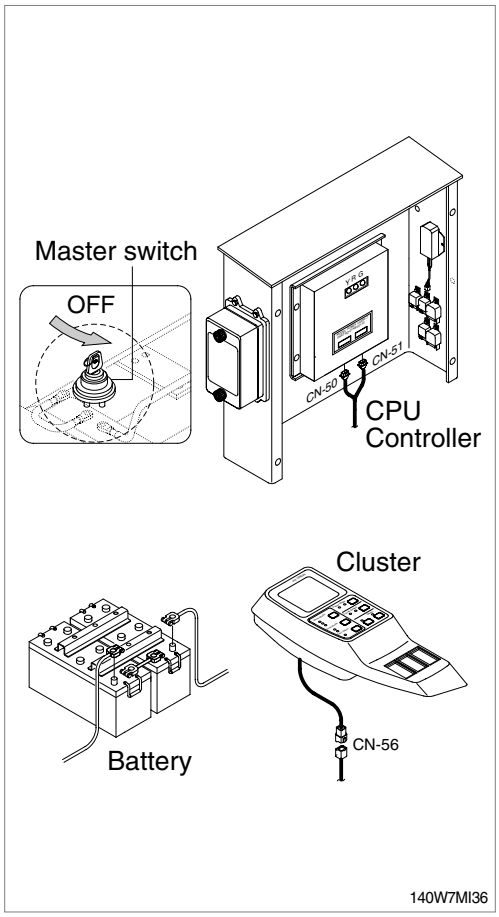
③ Before carrying out any electric welding on the machine, the battery cables should be disconnected and the connectors pulled out of the electronic control units(CPU, cluster etc).

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.**

⚠ **Do not attempt to welding work before carry out the above.**

If not, it will caused serious damage at electric CAPO system.

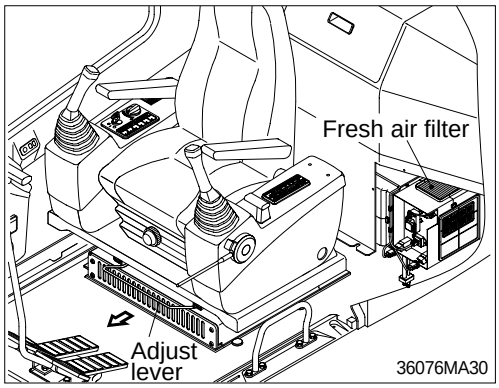


8. AIR CONDITIONER AND HEATER

1) CLEAN AND REPLACE OF FRESH AIR FILTER

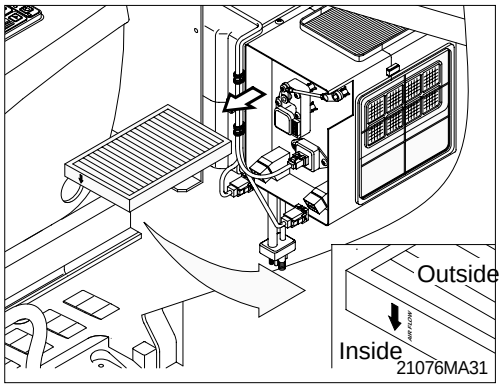
※ **Always stop the engine before servicing.**

(1) Move seat and console box to arrow direction using the adjust lever.



(2) Remove the outer filter.

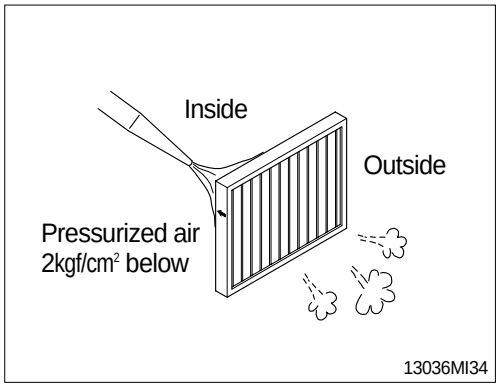
※ **When installing a filter, be careful not to change the filter direction.**



(3) Clean the filter using a pressurized air(Below 2kgf/cm^2, 28psi).

△ **When using pressurized air, be sure to wear safety glasses.**

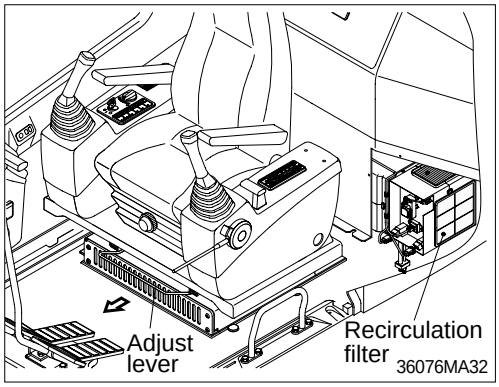
(4) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.



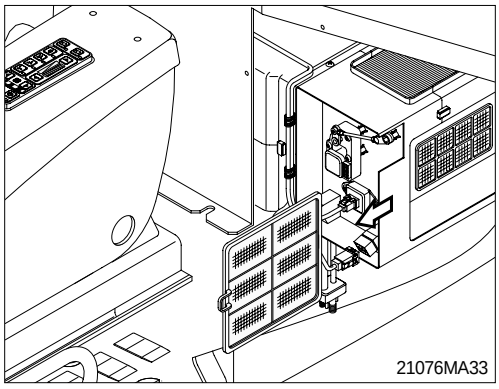
2) CLEAN AND REPLACE OF RECIRCULATION FILTER

※ **Always stop the engine before servicing.**

(1) Move seat and console box to arrow direction using the adjust lever.



(2) Remove recirculation filter.

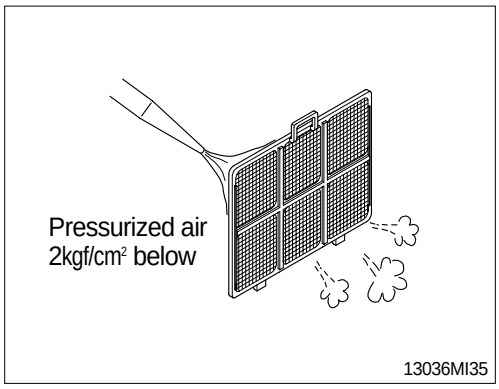


(3) Clean the recirculation filter using a pressurized air (Below 2kgf/cm^2, 28psi) or washing with water.

△ **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.



3) PRECAUTIONS FOR USING AIR CONDITIONER

(1) When using the air conditioner for a long time, open the window once every one hour.

(2) Be careful not to overcool the cab.

(3) The cab is properly cooled if the operator feels cool when entering there from outside(About 5$_{\circ}$C lower than the outside temperature).

(4) When cooling, change air occasionally.

4) CHECK DURING SEASON

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 conditions, however many of the more common possibilities are listed.

Trouble	Service	Remark
The engine oil pressure lamp lights ON when engine speed is raised after completion of warm up.	· Add the oil to the specified level. · Replace the oil filter cartridge. · Check oil leakage from the pipe or the joint. · Replace the monitor.	
Steam is emitted from the top part of the radiator(The pressure valve). Coolant level warning lamp lights ON.	· Supply the coolant and check leakage. · Adjust fan belt tension. · Wash out inside of cooling system. · Clean or repair the radiator fin. · Check the thermostat. · Tighten the radiator cap firmly or replace the packing of it. · Replace the monitor.	
The engine does not start when the starting motor is turned over.	· Add fuel. · Repair where air is leaking into fuel system. · Check the injection pump or the nozzle. · Check the valve clearance. · Check engine compression pressure.	
Exhaust gas is white or blue.	· Adjust to specified oil quantity. · Replace with specified fuel.	
Exhaust gas occasionally turns black.	· Clean or replace the air cleaner element. · Check the nozzle. · Check engine compression pressure. · Clean or replace the turbocharger.	
Combustion noise occasionally changes to breathing sound.	· Check the nozzle.	
Unusual combustion noise or mechanical noise.	· Check with specified fuel. · 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. Lamp flickers while engine runs.	· Check for loose terminals and open-circuit wiring. · Adjust belt tension.	
Battery charging lamp does not go out even when engine runs at high speed.	· Check the alternator. · Check and repair wiring.	
Unusual noise is emitted from the alternator.	· Check the alternator.	
Starting motor does not turn when starting switch is turned ON.	· Check and repair the wiring. · Charge the battery. · Check the starting motor. · Check the safety relay.	
The pinion of the starting motor keeps going in and out.	· Charge the battery. · Check the safety relay.	
Starting motor turns the engine sluggishly.	· Charge the battery. · Check the starting motor.	
The starting motor disengages before the engine starts up.	· Check and repair the wiring. · Charge the battery.	
The engine warming up lamp does not go ON.	· Check and repair wiring. · Check the monitor.	
The engine oil pressure lamp does not light up when engine is stationary(When the starting switch is in ON position.)	· Check the monitor. · Check the caution lamp switch.	
Battery charging lamp does not light up when the engine is stationary. (When the starting switch is in ON position.)	· Check the monitor. · Check and repair the wiring.	

3. OTHERS

Trouble	Service	Remark
Track slip out of place. Excessive wear of the sprocket.	· Adjust tension of track.	
Bucket either rises slowly or not at all.	· Add oil to specified level.	
Slow speed of travel, swing, boom, arm and bucket.	· Add oil to specified level.	
Unusual noise emitted from pump.	· Clean the hydraulic tank strainer.	
Excessive oil temperature rise of hydraulic oil.	· Clean the oil cooler. · Adjust fan belt tension. · Add oil to specified level.	

1. SELECTING 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 apply a breaker to the machine, consult your local dealer of Hyundai 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.

3) The pressure of the ROBEX140LC-7 system is 330kgf/cm^2(4700psi).

4) Adjusting oil quantity

(1) Use the breaker mode from work mode. Default oil flow quantity is 110lpm at 2100rpm. Use accel dial switch to control the oil flow quantity.

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

Oil quantity according to engine rpm

Engine rpm	Oil flow ℓ/min	Oil flow U.S.gpm
2000	105	27.7
1900	100	26.4
1800	94	24.8
1700	89	23.5

※Relief pressure : 200kgf/cm^2

5) The accumulator should be used to the breaker charging and return line.

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

※ If the accumulator is not used, it will be damage as the input wave is delivered.

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) Shipless 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 4 kinds of filter elements in particular, in order to prolong machine life.

(4) Replace when the breaker work is used for short time according to the standard of right graph.

2) RELEASE THE PRESSURE IN BREAKER CIRCUIT

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

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

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

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

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

Service interval

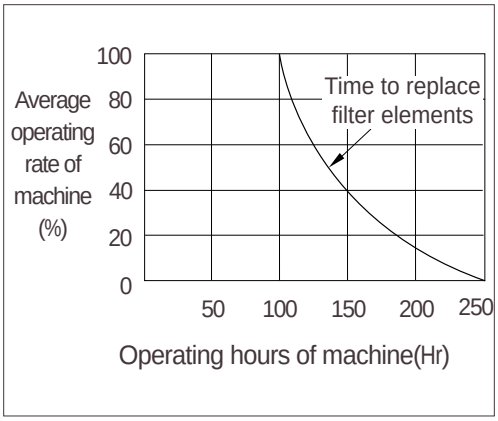
unit : hours

Attachment	Operating rate	Hydraulic oil	Filter element
Bucket	100%	2,000	250
Breaker	100%	600	100

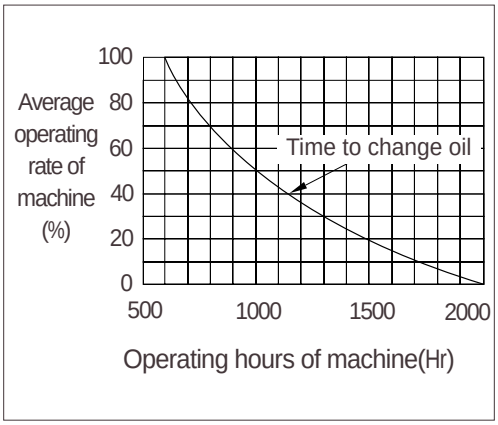
● **Replace following filter same time**

- Hydraulic return filter : 1EA
- Pilot line filter : 1EA
- Element in hydraulic tank breather : 1EA
- Drain filter cartridge : 1EA

Filter replace guide for hydraulic breaker

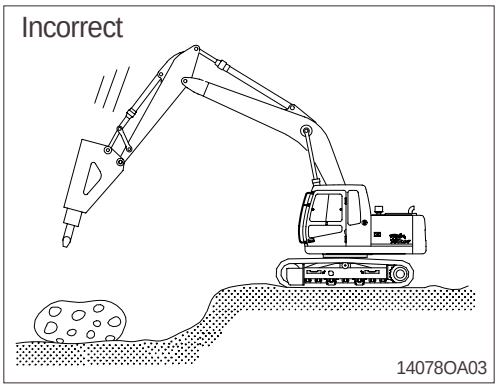


Oil change guide for hydraulic breaker

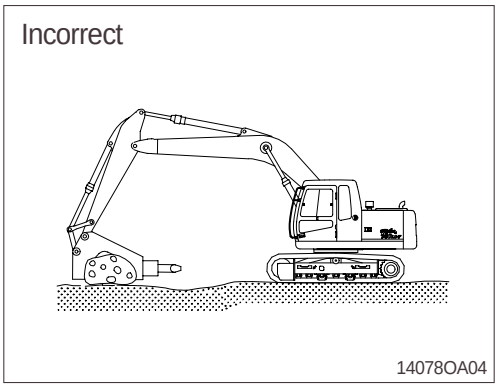


4. PRECAUTIONS WHILE OPERATING THE BREAKER

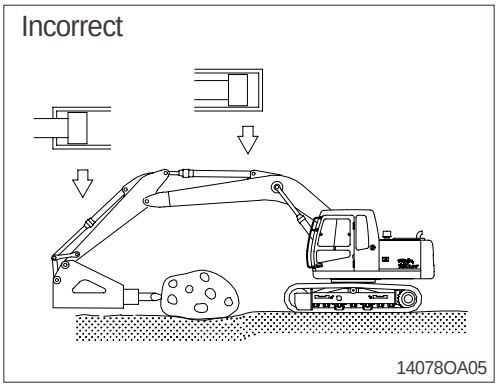
1) **DO NOT BREAK ROCK WHILE LOWERING**
As the breaker is heavy in comparison with bucket, it must be operated slowly.
If breaker is rapidly pushed down, working device may be damaged.



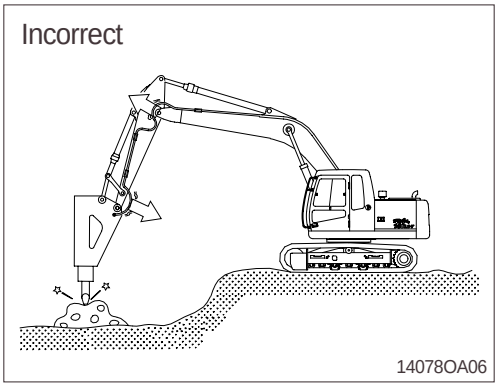
2) **DO NOT USE BREAKER TO CARRY BROKEN STONE OR ROCK BY SWING OPERATING**
This may damage the operation device and swing system.



3) **OPERATE BREAKER WITH A GAP IN EXCESS OF 100mm(4 inches) FROM THE END OF THE STROKE TIP**
If breaker is operated with the end tip, the cylinder may be damaged.

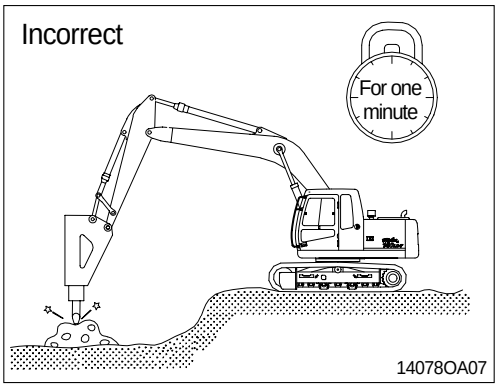


4) **IF THE HYDRAULIC HOSES VIBRATE EXCESSIVELY**
If the machine used in this condition continuously this will effect badly on the machine such as loosening bolt, oil leakage, damage of pump pipe and etc.



5) DO NOT CONTINUE TO WORKING OVER ONE MINUTE AT SAME POSITION OF BOOM AND ARM

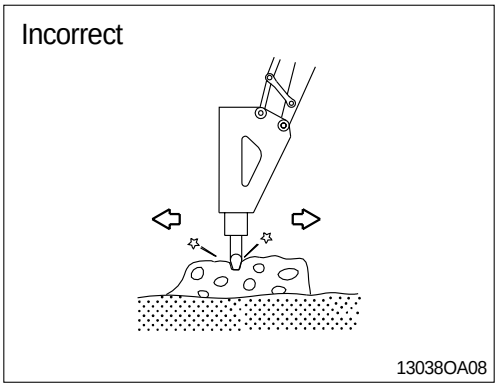
This will increase the temperature of the oil, and cause problem in the accumulator and seals.



6) DO NOT MOVE MACHINE OR BREAKER WHILE STRIKING

Do not move hammer while striking.

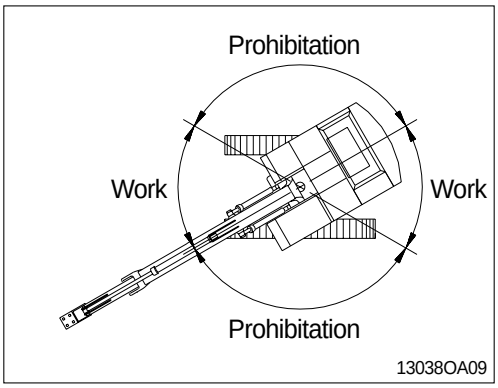
This will cause damage to the working device and the swing system.



7) DO NOT WORK WHILE SWING STATE

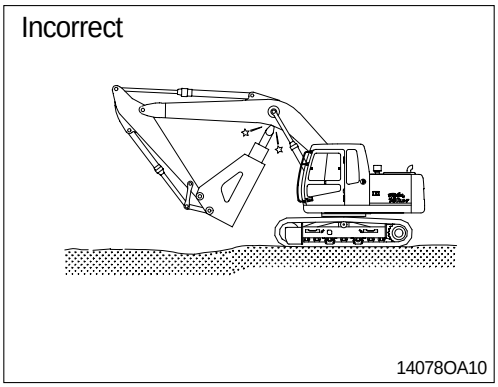
Do not work while swing position of superstructure.

It cause the band of track shoe, oil leakage of roller.



8) TAKE CARE OF CHISEL AND BOOM INTERFACE

Make sure of the arm and bucket control lever operation.

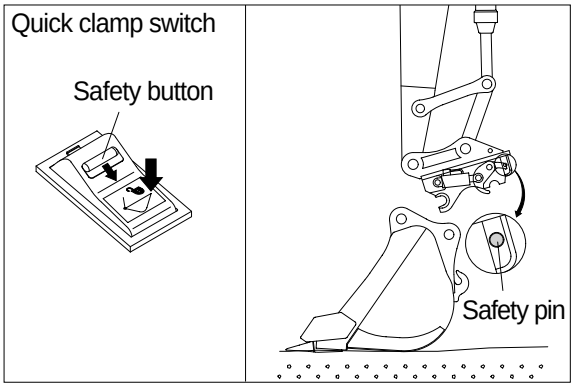


5. QUICK CLAMP

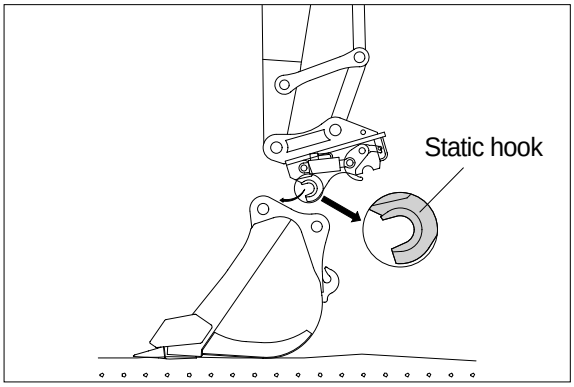
1) FIXING BUCKET WITH QUICK CLAMP

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

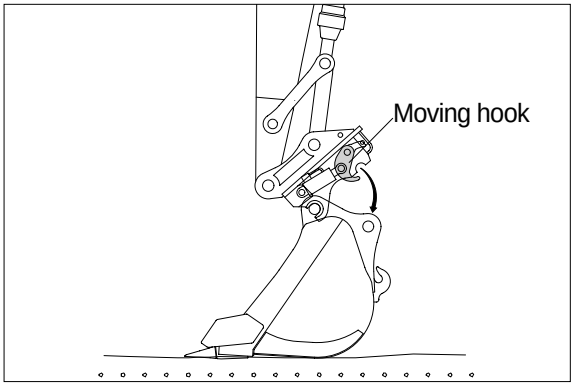
(2) Pulling safety button, press the quick clamp switch to unlock position. Then, the moving hook is placed on release position.



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

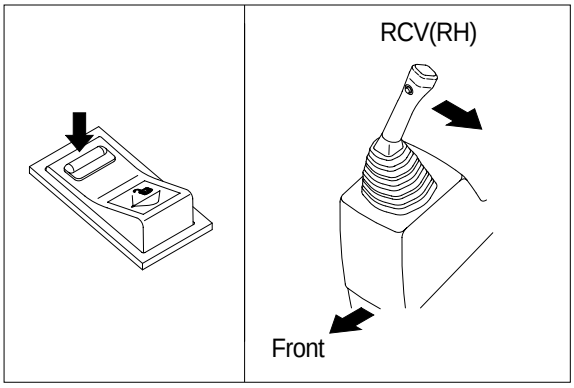


(4) Operate RCV lever to bucket-in position. Then, the moving hook is coupled with the bucket link pin.
Make sure that the moving hook is completely contacted with bucket link pin.

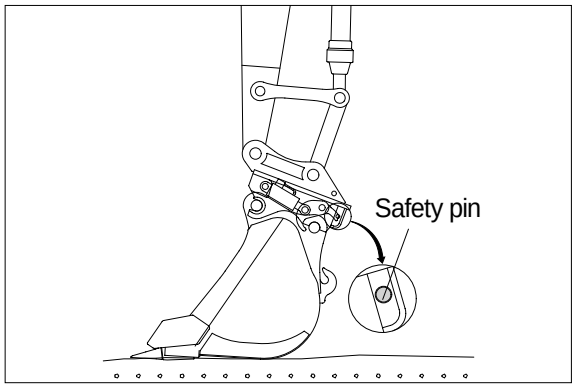


(5) Press quick clamp switch to lock position.
Operate RCV lever to bucket-in position.

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

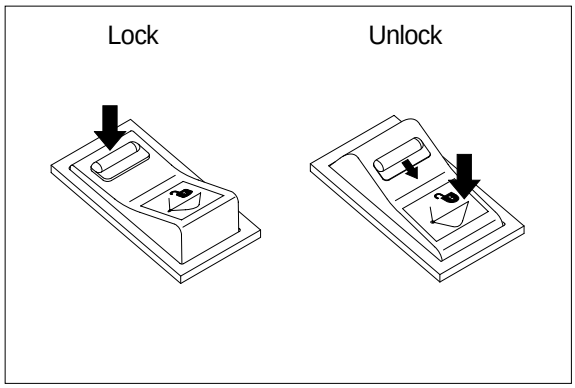
3) PRE-CAUTION OF USING QUICK CLAMP.

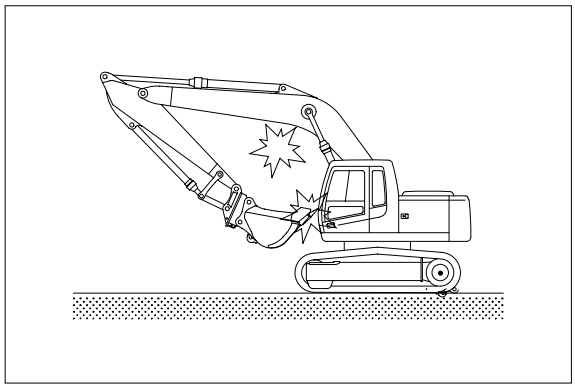
⚠ When operating the machine with quick clamp, confirm that the quick clamp switch is lock position and safety pin of moving hook is inserted. Operating the machine with quick clamp switch unlocked and without safety pin of moving hook can cause the bucket to drop off and bring about the accident.

⚠ Serious injury or death can result from this accident.

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

※ HYUNDAI will not be responsible for any injury or damage in case that safety pin is not installed properly.





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