CONTENTS

FOREWORD

This manual contains a number of instructions and safety recommendations regarding driving, handling, lubrication, maintenance, inspection and adjustment of the excavator.
The manual is to promote safety maintenance and enhance machine performance.

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

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

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

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

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

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

   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.

   Some illustrations in this manual show details or attachments that can be different from your machine. Covers and guards might have been removed for illustrative purposes.

2. **Inspect** the jobsite and **follow** the safety recommendations in the **safety hints** section before operating the machine.

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

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

EMISSION-RELATED COMPONENTS WARRANTY (USA AND CANADA ONLY)

HD Hyundai Construction Equipment shall have obligation under the EPA (Environmental Protection Agency) regulation of warranty about Emission-related components. This warranty shall exist for 3,000 hours or five years, whichever occurs first.
Naturally, this warranty does not cover to damage arising from accident, misuse or negligence, use of non-HD Hyundai Construction Equipment parts, or from alterations not authorized by HD Hyundai Construction Equipment.

※ Emission-related components according to the EPA regulation.

1. Air-induction system.
2. Fuel system.
3. Ignition system.
4. Exhaust gas recirculation systems.
5. After treatment devices.
6. Crankcase ventilation valves.
7. Sensors.
8. Electronic control units.

BEFORE SERVICING THIS MACHINE

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

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

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

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

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

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

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

All personnel must remain alert to potential hazards.

Work within your level of training and skill.

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

Use your common sense.

※ How to set the language of cluster

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

※ Please refer to the page 3-27 for the cluster.

EC REGULATION APPROVED

· Noise level (EN474-1 : 2006 and 2000/14/EC) are as followings.

LWA : 104dB (EU only)

LPA : 72dB

· The value of vibrations transmitted by the operator's seat are lower than standard value of (EN474-1 : 2006 and 2002/44/EC)

CE

EC Declaration of Conformity

(Original instruction)

This declaration of conformity is issued under the sole responsibility of manufacturer:

HD HYUNDAI CONSTRUCTION EQUIPMENT CO., LTD.
477 Bundangsuseo-ro, Bundang-gu,
Seongnam-si, Gyeonggi-do 13553, Korea

HD Hyundai Construction Equipment Europe N.V located at Hyundailaan 4, 3980 Tessenderlo, Belgium, as authorized representative in the European Community is authorized to compile the technical construction file and declares that the product:

Type:	*********
Model:	******
Serial number (PIN):	**********

is in conformity with the relevant provisions of the Community harmonization legislation:

2006/42/EC - Machinery directive
2014/30/EU - Electromagnetic compatibility directive
2000/14/EC - Noise emission outdoor equipment directive
2002/44/EU - Exposure of workers to vibration risks directive
their amendments, and other applicable directives.

EMC (2014/30/EU)

Certificate number:	**********
Date:	DD/MM/YYYY
Notified body:	**********

Noise levels (2000/14/EC)

Certificate number:	**********
Date:	DD/MM/YYYY
Conformity assessment proc.:	Annex VIII Full Quality Assurance
Notified body:	**********
	**********
Measured sound power level:	nnn.n dB(A)
Guaranteed sound power level:	nnn.n dB(A)

Engine information

Manufacturer :	*********
Engine model name:	********
Type-approval number:	**********
Stage (Regulation) :	STAGE ** (**/**/**)
Gross Power (SAE J1995):	***kW / ****rpm
Net Power (SAE J1349):	***kW / ****rpm

Harmonized standards, other technical standards and specifications applied:

EN 474-1:2006+A*:**** (EMM - Safety - Part 1); EN 474-3:2006+A*:**** (EMM - Safety - Part 3); EN ISO 3471:2008 (EMM - ROPS: Lateral/Vertical/Longitudinal loads); EN ISO 3449:2008 (EMM - FOPS: Level II cabin); ISO 2631-1:1997 & ISO 2631-1:1997/Amd1 :2010 (Whole-body vibration); EN ISO 5349-1:2001 &EN ISO 5349-2:2001 & EN ISO 5349-2:2001/A1:2015 (Hand-arm vibration)

****
Managing Director

Place, date of issue:	Tessenderlo Belgium, DD MM YYYY

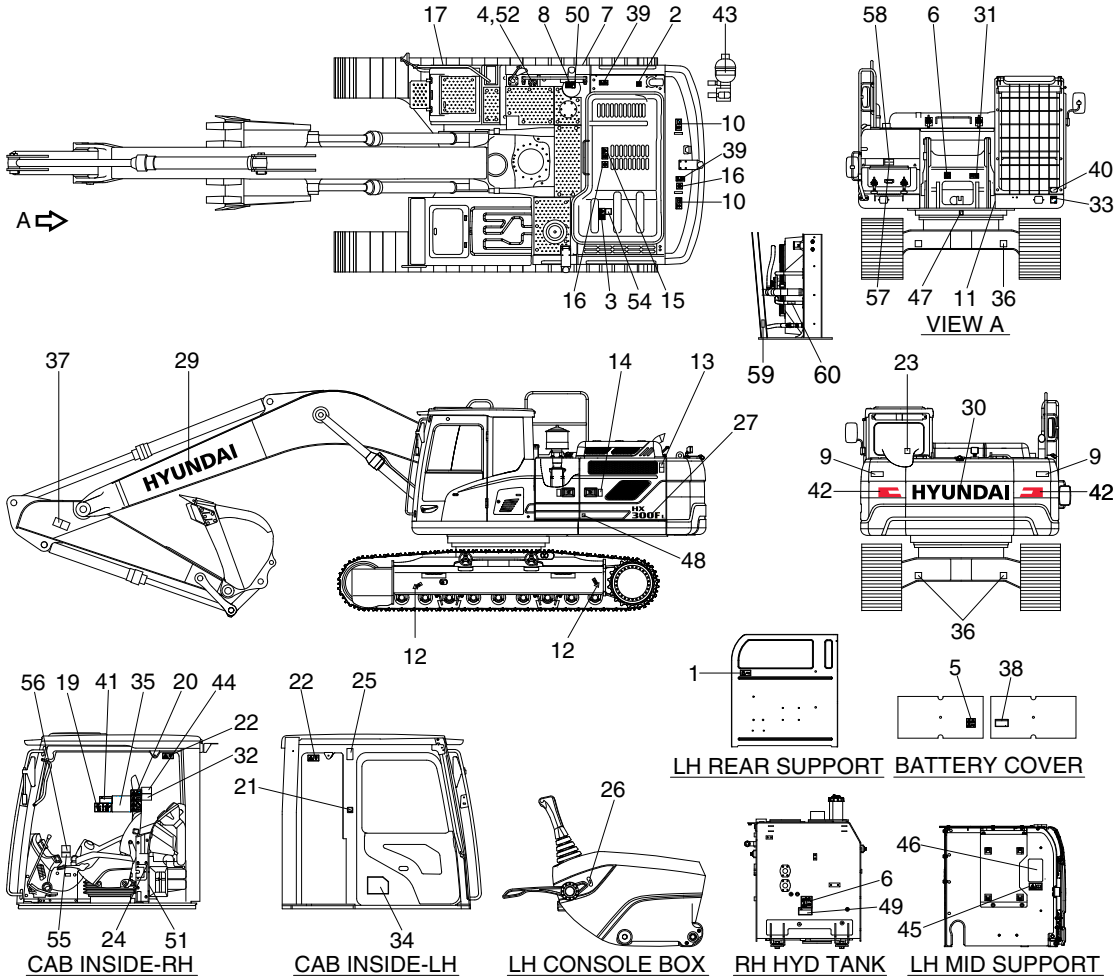
TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

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

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.



290F0SL01

1	Air cleaner filter	21	Hammer	41	Caution (water separator, turbocharger)
2	Turbocharger cover	22	Safety front window	42	Reflecting
3	Radiator cap	23	Safety rear window	43	Accumulator
4	Fueling	24	Air conditioner filter	44	M/control pattern change valve
5	Battery accident	25	ROPS plate	45	M/control pattern change-w/o valve
6	High pressure hose	26	Safety knob	46	M/control pattern change-w/valve
7	Hydraulic oil level	27	Model name	47	Swing bearing grease
8	Hydraulic oil lub	29	Trade mark (boom)	48	Battery position
9	Keep clear-rear	30	Trade mark (CWT)	49	Lubrication oil
10	Lifting eye	31	Reduction gear grease	50	Fuel shut off
11	Name plate	32	Clamp locking	51	MCU/ECM connector
12	Slinging ideogram	33	Noise level LWA	52	Ultra low sulfur diesel
13	Keep clear-side	34	Service instruction	54	Surge tank
14	Stay fix	35	Lifting chart	55	Key off caution
15	Engine hood shearing	36	Tie	56	RCV lever
16	No step	37	Keep clear-boom/arm	57	Diesel exhaust fluid
17	Transporting	38	Electric welding	58	DEF/AdBlue® fill-up
19	M/control pattern	39	Falling	59	Refrigerant
20	Ref operator's manual	40	FOPS FOG plate	60	Use handrail

2. DESCRIPTION

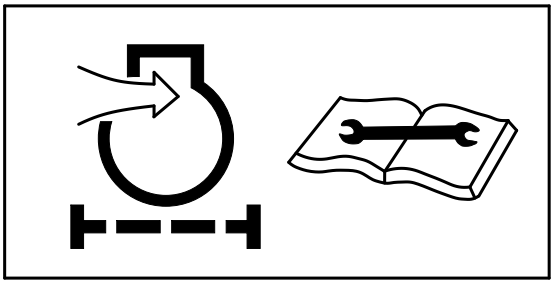
There are several specific warning labels on this machine please become familiarized with all warning labels.

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

1) AIR CLEANER FILTER (item 1)

This warning label is positioned on the left side of the rear support.

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



21070FW01

2) TURBOCHARGER COVER (item 2)

This warning label is positioned on the turbocharger cover.

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

21070FW02

3) RADIATOR CAP (item 3)

This warning label is positioned on the radiator.

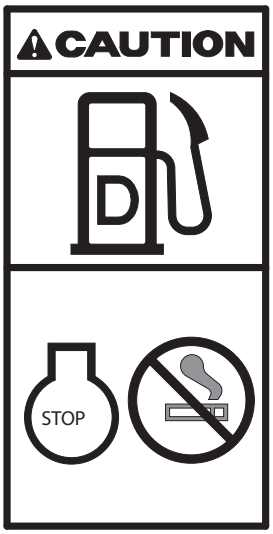
⚠ **Never open the filler cap while engine running or at high coolant temperature. Hot coolant can cause serious burns, injury or death.**

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.**



290F0FW02

5) BATTERY ACCIDENT (item 5)

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.

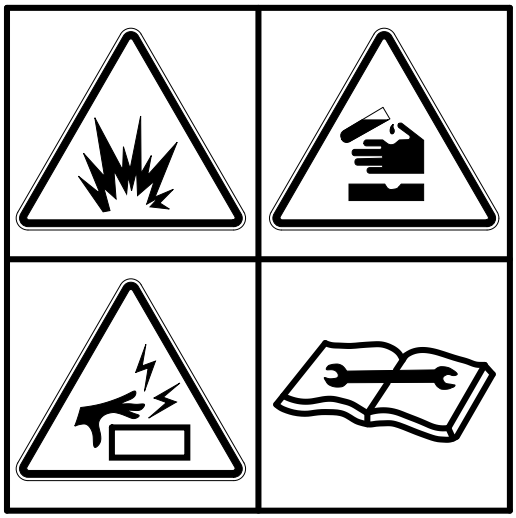
With electrolyte at proper level, less space may cause the gases to be accumulated in the battery.

⚠ 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.

⚠ For safety from electric shock, do not battery terminal with a wet hand.



36070FW05

6) HIGH PRESSURE HOSE (item 6)

This warning label is positioned on the right side of the hydraulic tank.

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

⚠ Avoid the hazard by relieving pressure before disconnecting hydraulic lines or other lines.

※ See the maintenance section for details.

14070FW29

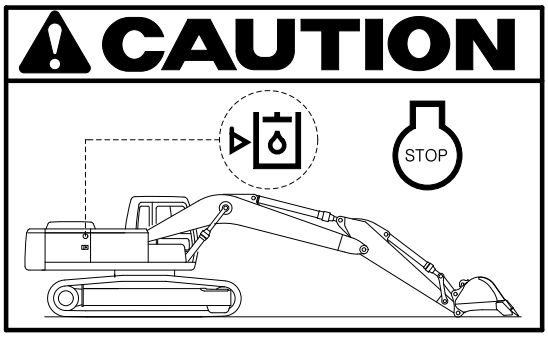
7) HYDRAULIC OIL LEVEL (item 7)

This warning label is positioned on the screen plate.

⚠ 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.



21070FW07

8) HYDRAULIC OIL LUBRICATION (item 8)

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

※ Do not mix with different brand oils.

⚠ Never open the filler cap while high temperature.

⚠ Loosen the cap slowly and release internal pressure completely.

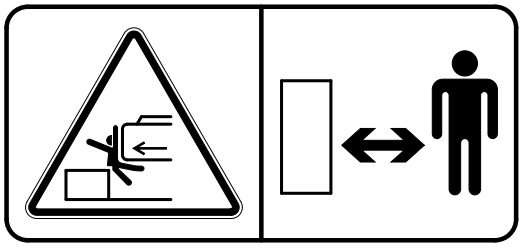
14070FW08

9) KEEP CLEAR-REAR (item 9)

This warning label is positioned on the rear of counterweight.

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

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



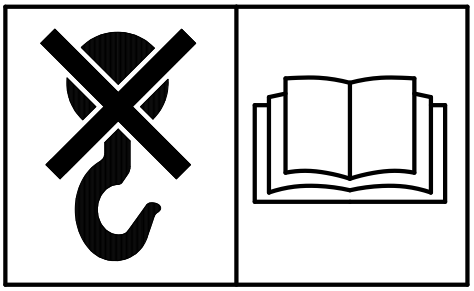
21090FW09

10) LIFTING EYE (item 10)

This warning label is positioned on the counterweight.

⚠ Do not lift the machine by using lifting eyes on the counterweight or the lifting eyes may be subject to overload causing its breaking and possible personal injury.

※ See page 5-9 for proper lifting method of the machine.



21070FW10

11) KEEP CLEAR-SIDE (item 13)

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

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

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

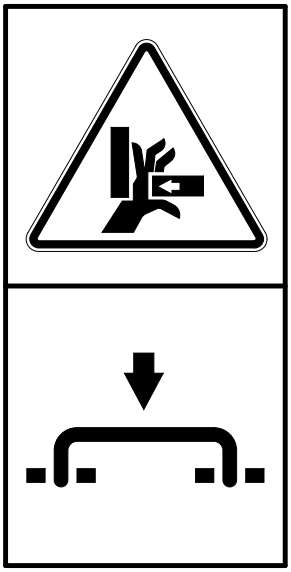
21070FW13

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.



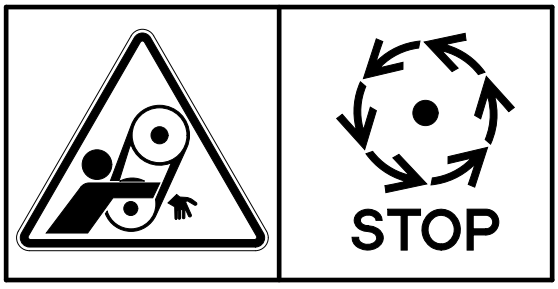
21070FW14

13) ENGINE HOOD SHEARING (item 15)

This warning label is positioned on the engine hood.

⚠ Don't open the engine hood during the engine's running. Stay clear of rotating parts.

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



21070FW15

14) **NO STEP** (item 16)

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

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

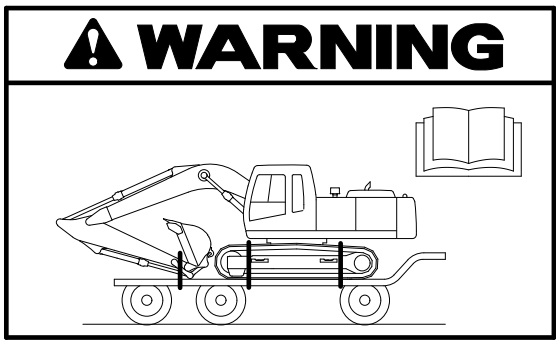
21070FW16

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 5-8 for details.



14070FW17

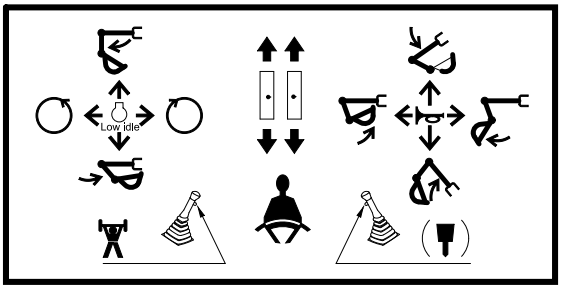
16) **MACHINE CONTROL PATTERN** (item 19)

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 4-12 for details.



36070FW19

17) REF OPERATOR'S MANUAL (item 20)

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

(1) Ref operator manual

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

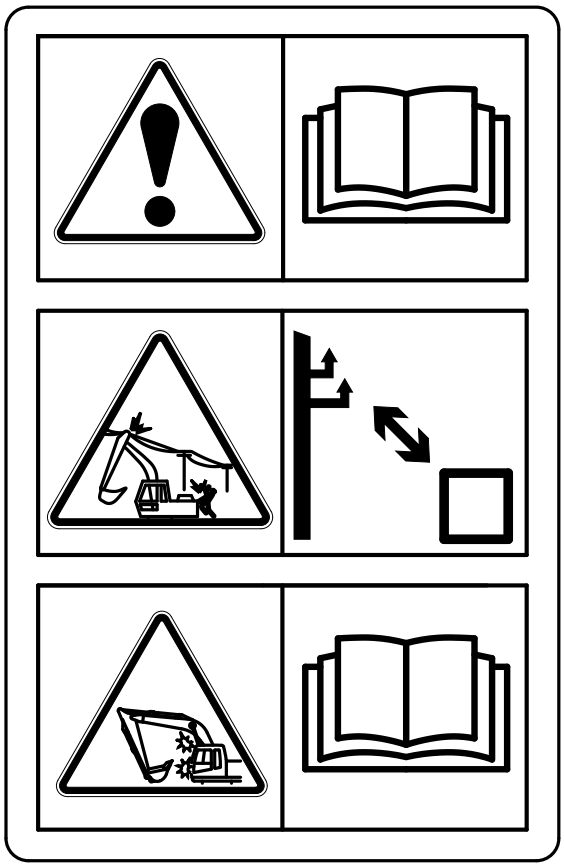
⚠ Do not operate this machine unless you have read and understand the instructions and warnings in this manual.
Failure to follow the instructions or warnings could result in injury or death.

(2) Max height

⚠ 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.

(3) Interference

⚠ 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.



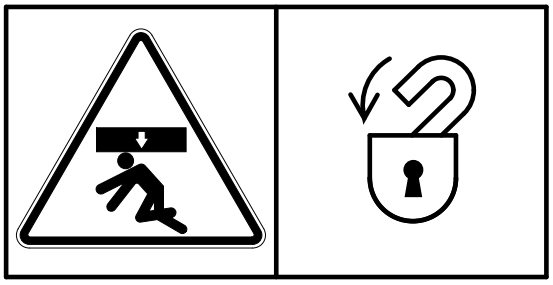
2609A0SL05

18) SAFETY FRONT WINDOW (item 22)

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

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

※ See page 3-70 for details.



21070FW24

19) **SAFETY REAR WINDOW** (item 23)

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

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

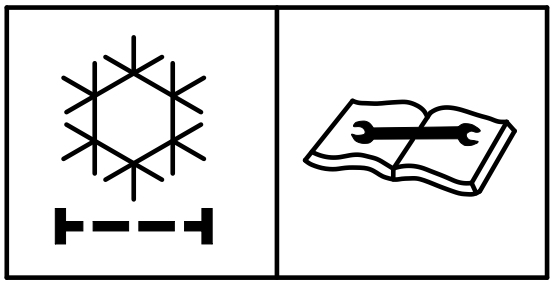
※ **To remove rear window, pull the ring and push out the glass.**

2609A0SL02

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

This warning label is positioned on the air conditioner cover.

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

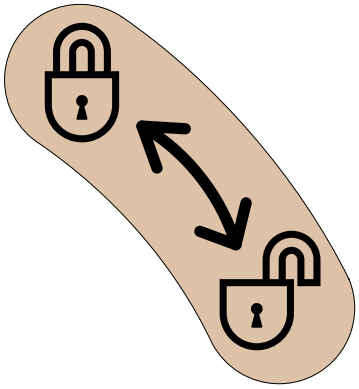


21070FW26

21) **SAFETY KNOB** (item 26)

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

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

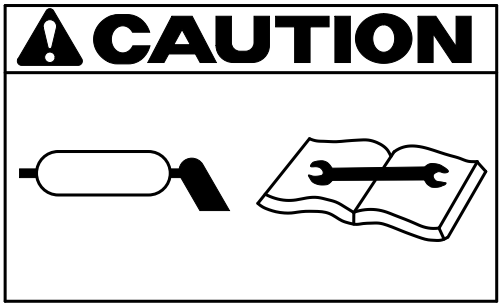


30007A1FW07A

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

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

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



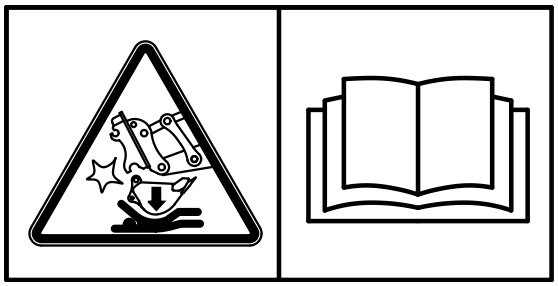
21070FW35

23) **CLAMP LOCKING** (item 32)

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.**



14070FW60

24) **TIE** (item 36)

This warning label is positioned on the lower frame.

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

⚠ **See page 4-15 for detail.**

4507A0FW02

25) **KEEP CLEAR-BOOM/ARM** (item 37)

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

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

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

14070FW31

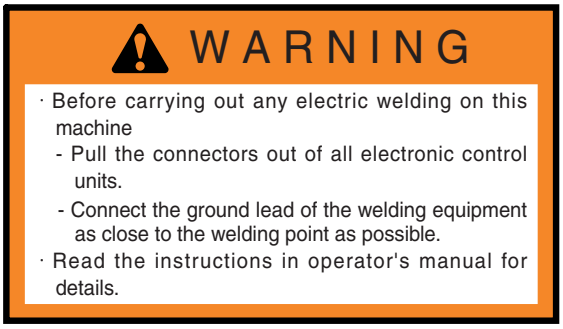
26) **ELECTRIC WELDING** (item 38)

This warning label is positioned on the battery cover.

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

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

※ **See page 6-45 for detail.**



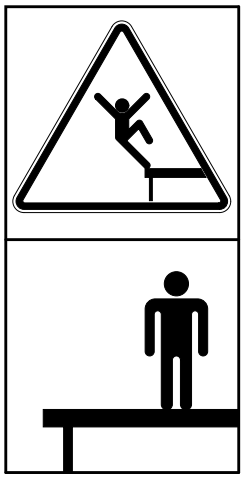
7807AFW20

27) **FALLING** (item 39)

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.**



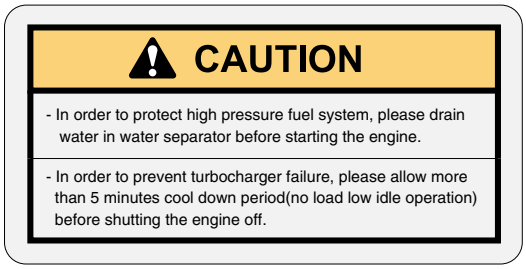
14070FW30

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

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

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

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



120090SL02

29) **REFLECTING** (item 42)

This warning label is positioned on the rear 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.**

290F0FW01

30) **ACCUMULATOR** (item 43)

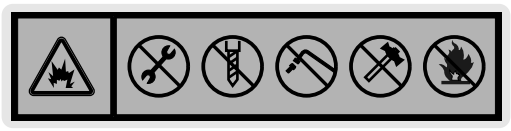
This warning label is positioned on the accumulator of the solenoid valve.

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

⚠ **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 HD Hyundai Construction Equipment distributor.**



1107A0FW46

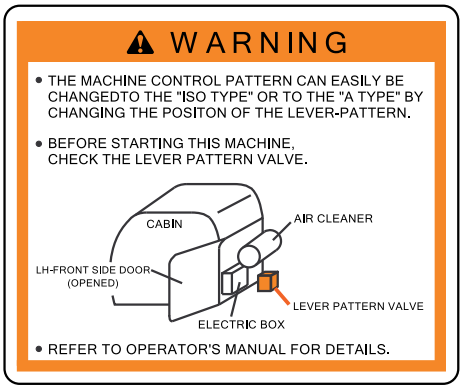
31) **MACHINE CONTROL PATTERN CHANGE VALVE** (item 44)

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

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

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

※ **See page 4-27 for detail.**



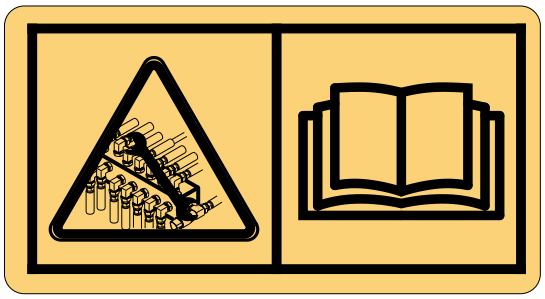
2609A0SL11

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

This warning label is positioned on the LH support of cowl.

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

※ **See page 4-26 for detail.**



14W90FW47

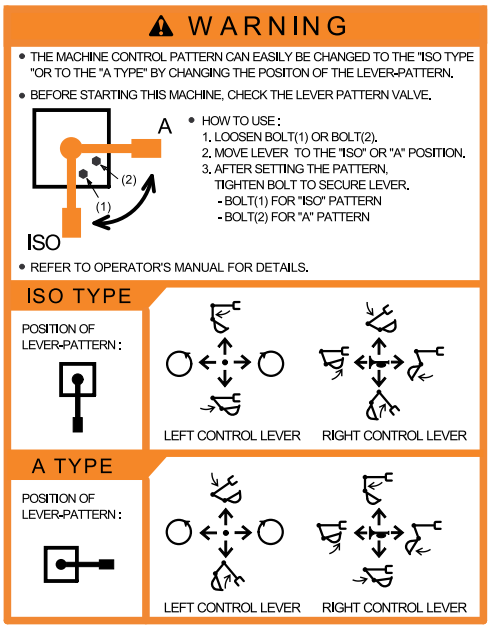
33) **MACHINE CONTROL PATTERN CHANGE-W/VALVE** (item 46)

This warning label is positioned on the LH support of cowl.

⚠ **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 4-27 for details.**

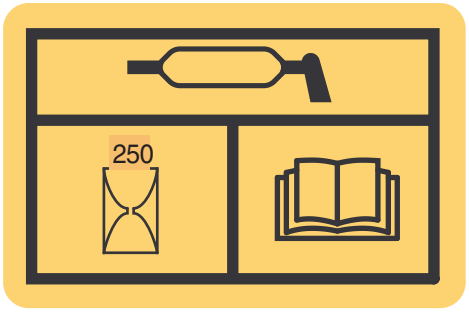


38090FW01A

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

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

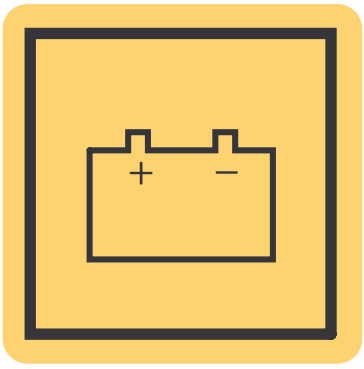
※ **See page 6-36 for details.**



38090FW02

35) **BATTERY POSITION** (item 48)

This warning label is positioned left inside of side cover.



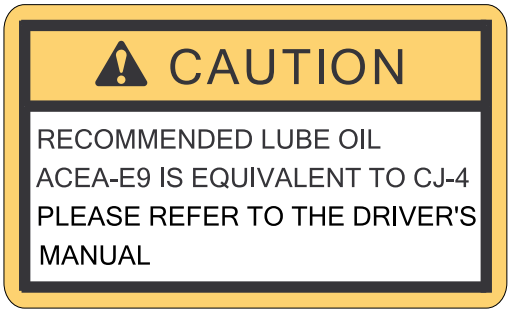
38090FW03

36) **LUBRICATION OIL** (item 49)

This warning label is positioned on the right side of the hydraulic tank.

※ **Recommended lubrication oil ACEA-E9 is equivalent to API CJ-4.**

※ **See page 6-9 for details.**



290F0SL03

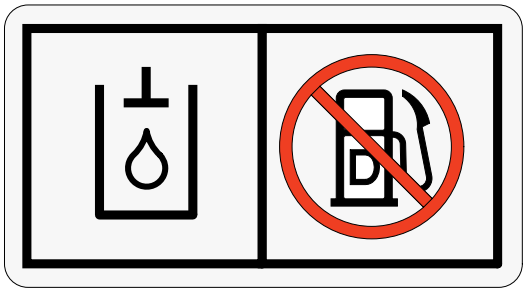
37) **FUEL SHUT OFF** (item 50)

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

※ **Fill only the hydraulic oil.**

※ **Do not fill the diesel fuel.**

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



140WH90FW51

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

This warning label is positioned on the low cover of the air conditioner in the cab.

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

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

※ **See page 3-69 for details.**

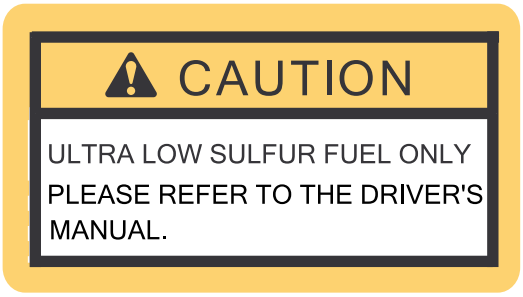
235Z90FW52

39) **ULTRA LOW SULFUR DIESEL** (item 52)

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

※ **Use ultra low sulfur fuel only.**

※ **Ultra low sulfur fuel**
sulfur content ≤ 15 ppm



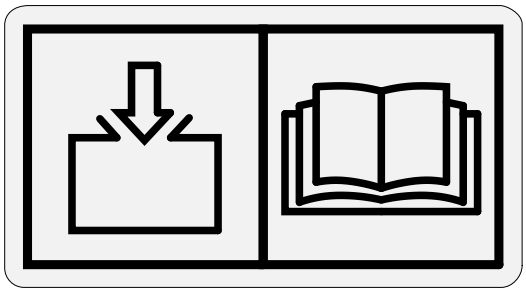
2609A0SL03

40) **SURGE TANK** (item 54)

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

This system must be filled slowly to prevent air locks.

※ **Fill rate ≤ 11 lpm**



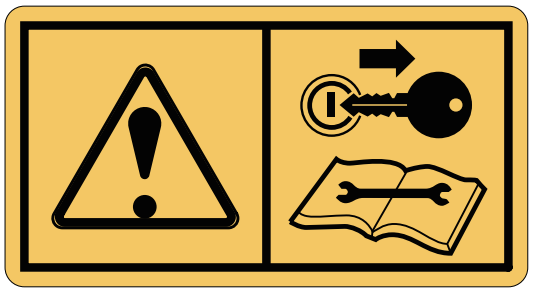
3009A0FW54

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

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

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

Extreme care shall be taken during maintenance work.



290F0FW05

42) **RCV LEVER** (item 56)

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

※ **When you work by moving the seat to the front of cab, it is possible to take place interference between cluster and RCV lever at specific position.**

To prevent this interference, handle below works.

(1) Rotate cluster.

(2) Adjust seat position for up-and-downward using seat height adjuster knob in suspension.

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

(4) Push back console and seat position using seat and console box adjust knob between LH console box and seat cushion.

290F0FW04

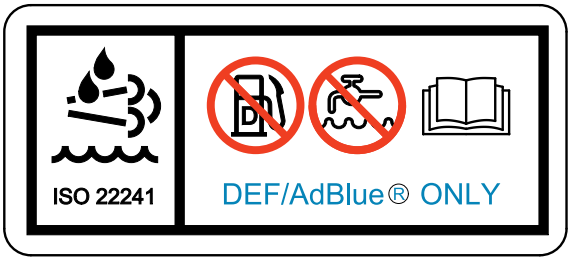
43) **DIESEL EXHAUST FLUID** (item 57)

This warning label is positioned on the front of DEF/AdBlue® tank.

※ **Fill only the DEF/AdBlue® (Diesel Exhaust Fluid, standardised as ISO 22241).**

Aqueous urea solution made with 32.5% high-purity urea and 67.5% deionized water.

※ **Do not fill the diesel fuel.**



290F0SL04

44) **DEF/AdBlue® FILL-UP** (item 58)

This warning label is positioned on the front of DEF/AdBlue® tank.

※ **Warning lamp turns on when the tank is completely filled with DEF/AdBlue®. After turning light on, do not pour DEF/AdBlue® any more. Otherwise DEF/AdBlue® tank may freeze and burst in winter season.**

※ **Fill the tank with DEF/AdBlue® after key on and then turn off the start key.**

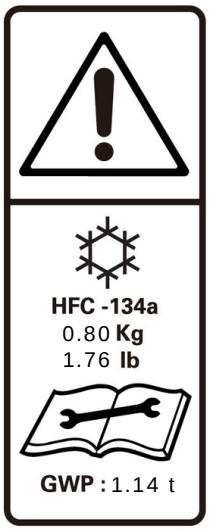
330F0SL02

45) **REFRIGERANT** (item 59)

This warning label is positioned on the right side of engine hood.

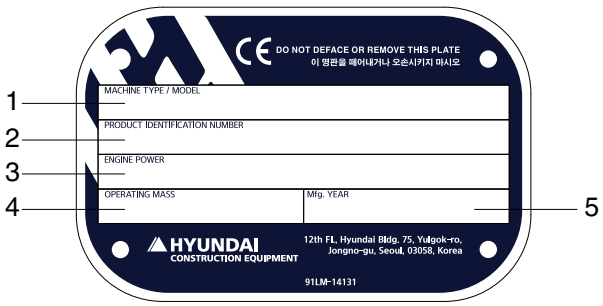
⚠ **Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.**

※ **Refer to the page 6-48.**



260F0FW30

MACHINE DATA PLATE



FOR EU ONLY

FOR FOPS/FOG

ROPS

290F0FW06

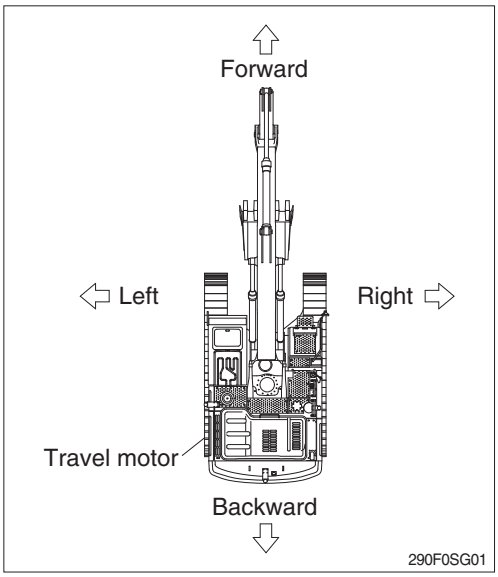
1	Machine type / model	2	Product identification number	3	Engine power
4	Operating mass	5	Manufacturing year	6	Maximum certified weight

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

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.

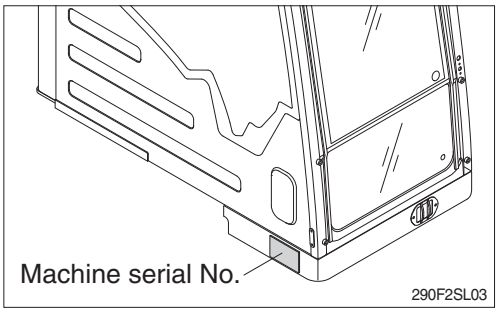


2. SERIAL NUMBER

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

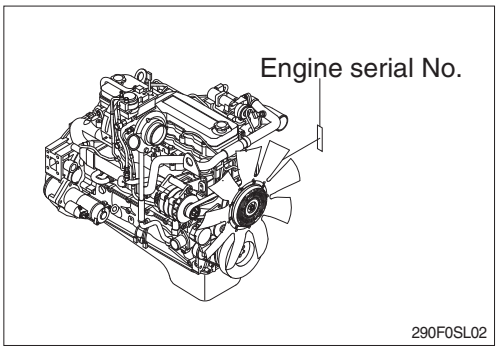
1) MACHINE SERIAL NUMBER

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



2) ENGINE SERIAL NUMBER

The numbers are located on the engine name plate.



3. INTENDED USE

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

- Digging work
- Loading work
- Smoothing work
- Ditching work

※ Please refer to the section 4 (efficient working method) further details.

4. SYMBOLS

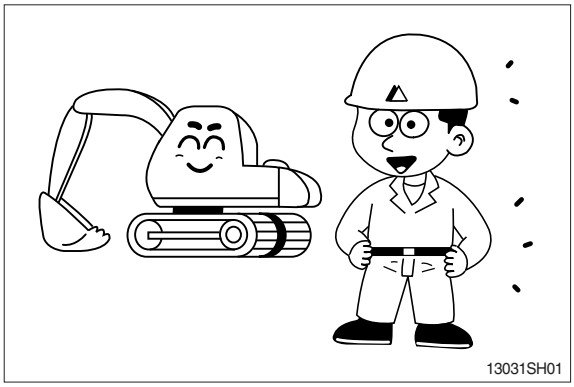
⚠ Important safety hint.

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

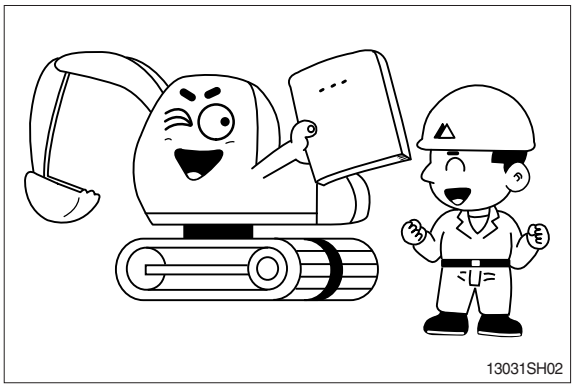
※ It indicates the useful information for operator.

1. BEFORE OPERATING THE MACHINE

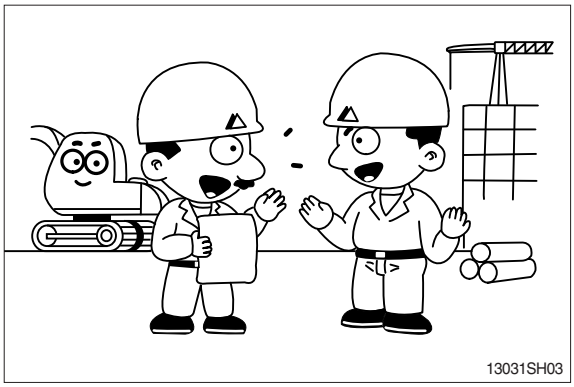
Think-safety first.
In special situation, wear protective clothing including a safety helmet, safety shoes, gloves, safety glasses and ear protection as required by the job condition.
Almost every accident is caused by disregarding the simple and fundamental safety hints.


13031SH01

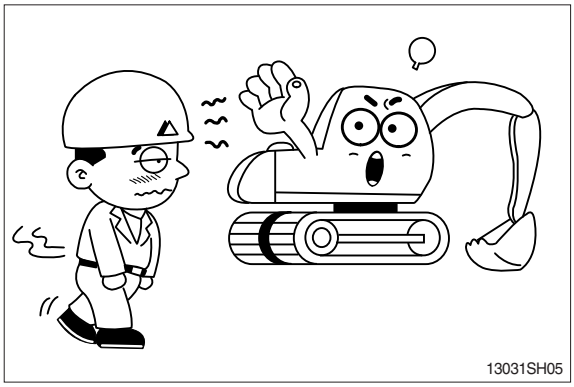
Be sure to understand thoroughly all about the operator's manual before operating the machine.
Proper care is your responsibility.


13031SH02

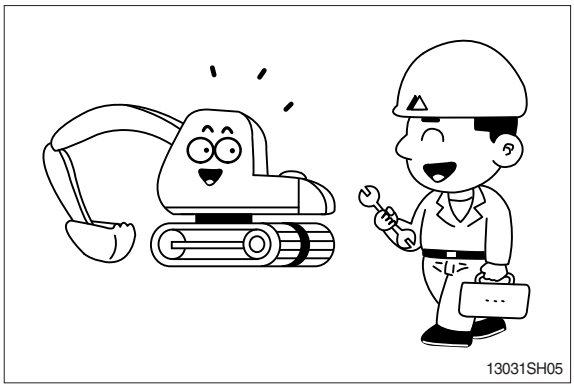
Fully understand the details and process of the construction before starting the work.
If you find anything dangerous on the job, consult with the job supervisor for the preventive measures before operating the machine.


13031SH03

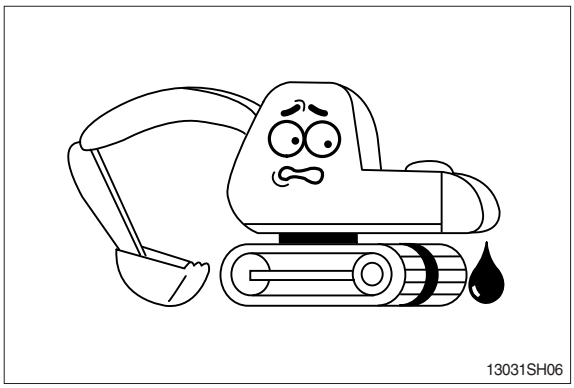
Do not operate when tired, or after drinking alcoholic beverages or any type of drugs.


13031SH05

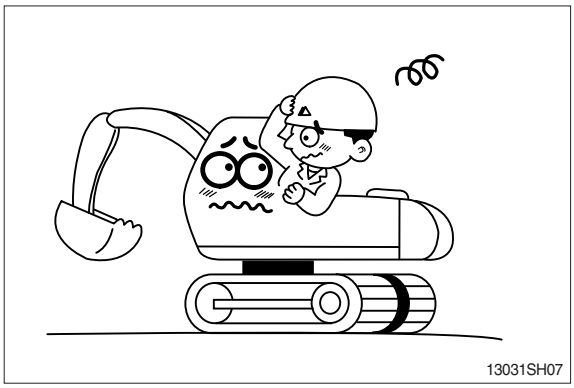
Check daily according to the operation manual.
Repair the damaged parts and tighten the loosened bolts.



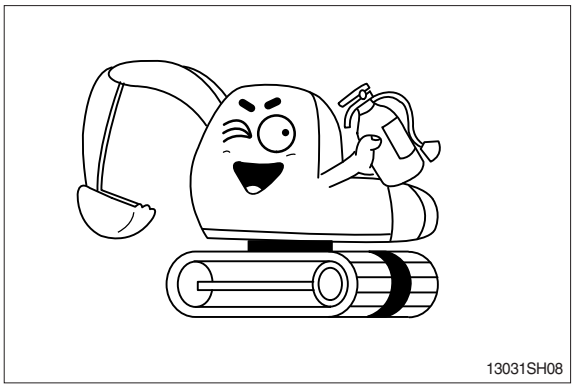
Check for leakage of engine oil, hydraulic oil, fuel and coolant.
Keep machine clean, clean machine regularly.



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



Be prepared if a fire starts.
Keep a fire extinguisher handy and emergency numbers for a fire department near your telephone.

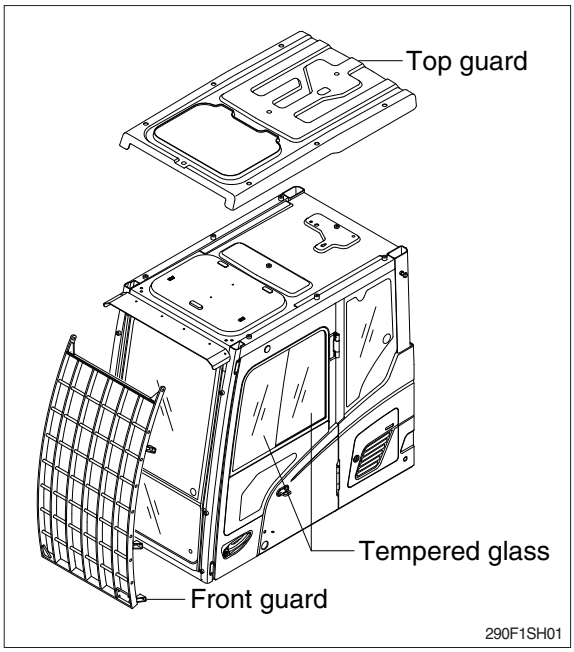


PROTECTION AGAINST FALLING OR FLYING OBJECTS

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

Be sure to close the front window before commencing work.

Make sure to keep all persons other than 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 HD Hyundai Construction Equipment distributor.



UNAUTHORIZED MODIFICATION

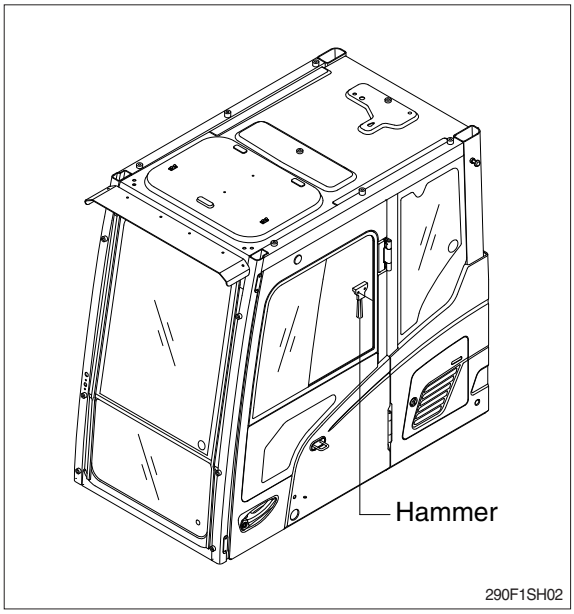
Any modification made without authorization from HD Hyundai Construction Equipment can create hazards.

Before making a modification, consult your HD Hyundai Construction Equipment distributor. HD Hyundai Construction Equipment 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.

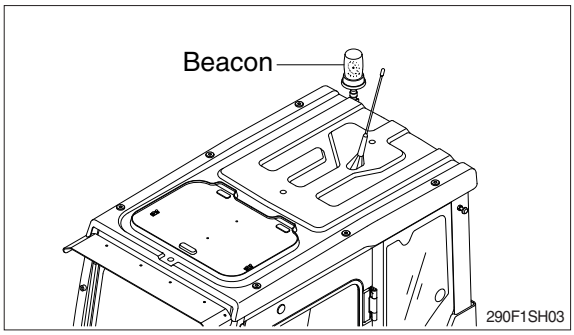
Be sure you know the phone numbers of persons you should contact in case of an emergency.



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

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

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

SAFETY RULES

Only trained and authorized personnel can operate and maintain the machine.
Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
When working with another operator or a person on worksite traffic duty, be sure all personnel understand all hand signals that are to be used.

SAFETY FEATURES

Be sure all guards and covers are in their proper position. Have guards and covers repaired if damaged.
Use safety features such as safety lock and seat belts properly.
Never remove any safety features. **Always** keep them in good operating condition.
Improper use of safety features could result in serious bodily injury or death.

MACHINE CONTROL PATTERN

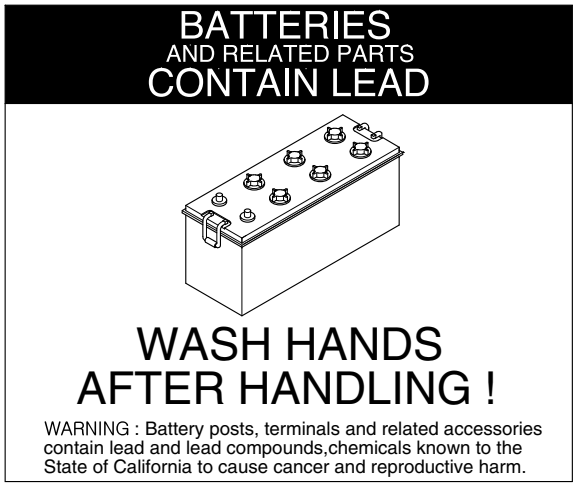
Check machine control pattern for conformance to pattern on label in cab.
If not, change label to match pattern before operating machine.
Failure to do so could result in injury.

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

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

⚠ The wrong loading method can result in serious bodily injury or death.

FIRE PREVENTION AND EXPLOSION PREVENTION

Regeneration

The exhaust gas temperatures during regeneration will be elevated. Follow proper fire prevention instructions and use the disable regeneration function when appropriate.

General

All fuels, most lubricants, and some coolant mixtures are flammable.

To minimize the risk of fire or explosion, the following actions are recommended.

Always perform a Walk-Around Inspection, which may help you identify a fire hazard.
Do not operate a machine when a fire hazard exists. Contact your dealer for service.

3001SH01

Understand the use of the primary exit and alternative exit on the machine.

Do not operate a machine with a fluid leak. Repair leaks and clean up fluids before resuming machine operation. Fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire. A fire may cause personal injury or death.

Do not weld on or drill holes in the engine cover. Flammable material such as leaves, twigs, papers, trash may accumulate in engine compartment.

Remove flammable material such as leaves, twigs, papers, trash and so on. These items may accumulate in the engine compartment or around other hot areas and hot parts on the machine.

Keep the access doors to major machine compartments closed and access doors in working condition in order to permit the use of fire suppression equipment, in case a fire should occur.

Clean all accumulations of flammable materials such as fuel, oil, and debris from the machine.

Do not operate the machine near any flame.

Keep shields in place. Exhaust shields (if equipped) protect hot exhaust components from oil spray or fuel spray in a break in a line, in a hose, or in a seal. Exhaust shields must be installed correctly.

Do not weld or flame cut on tanks or lines that contain flammable fluids or flammable material. Empty and purge the lines and tanks. Then clean the lines and tanks with a nonflammable solvent prior to welding or flame cutting. Ensure that the components are properly grounded in order to avoid unwanted arcs.

Dust that is generated from repairing nonmetallic hoods or fenders may be flammable and/or explosive. Repair such components in a ventilated area away from open flames or sparks. Use suitable Personal Protection Equipment (PPE).

Inspect all lines and hoses for wear or deterioration. Replace damaged lines and hoses. The lines and the hoses should have adequate support and secure clamps. Tighten all connections to the recommended torque. Damage to the protective cover or insulation may provide fuel for fires.

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

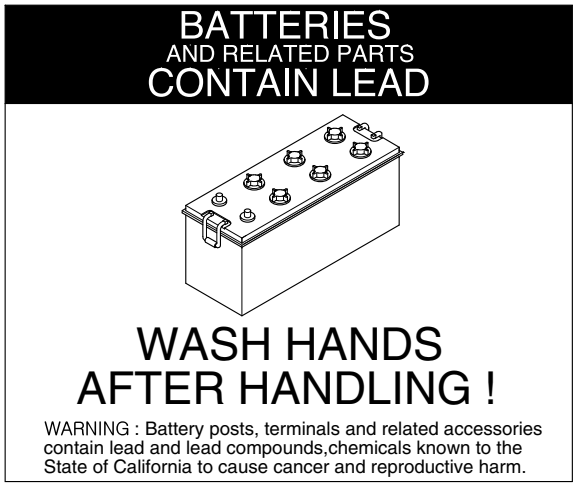
Check machine control pattern for conformance to pattern on label in cab.
If not, change label to match pattern before operating machine.
Failure to do so could result in injury.

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

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

⚠ The wrong loading method can result in serious bodily injury or death.

Store fuels and lubricants in properly marked containers away from unauthorized personnel. Store oily rags and flammable materials in protective containers. Do not smoke in areas that are used for storing flammable materials.

3001SH02

Use caution when you are fueling a machine.
Do not smoke while you are fueling a machine. Do not fuel a machine near open flames or sparks. Always stop the engine before fueling. Fill the fuel tank outdoors. Properly clean areas of spillage.

Never store flammable fluids in the operator compartment of the machine.

3001SH03

Battery and battery cables

The following actions are recommended to minimize the risk of fire or an explosion related to the battery.

3001SH04

Do not operate a machine if battery cables or related parts show signs of wear or damage. Contact your dealer for service.

Follow safe procedures for engine starting with jump-start cables. Improper jumper cable connections can cause an explosion that may result in injury.

Do not charge a frozen battery. This action may cause an explosion.

Gases from a battery can explode. Keep any open flames or sparks away from the top of a battery. Do not smoke in battery charging areas.

Never check the battery charge by placing a metal object across the terminal posts. Use a voltmeter in order to check the battery charge.

Daily inspect battery cables that are in areas that are visible. Inspect cables, clips, straps, and other restraint for damage. Replace any damaged parts. Check for signs of the following, which can occur over time due to use and environmental factors :

- Fraying
- Abrasion
- Cracking
- Discoloration
- Cuts on the insulation of the cable
- Fouling
- Corroded terminals, damaged terminals, and loose terminals

Replace damaged battery cable (s) and replace any related parts. Eliminate any fouling, which may have caused insulation failure or related component damage or wear. Ensure that all components are reinstalled correctly.

An exposed wire on the battery cable may cause a short ground if the exposed area comes into contact with a grounded surface. A battery cable short produces heat from the battery current, which may be a fire hazard.

An exposed wire on the ground cable between the battery and the disconnect switch may cause the disconnect switch to be bypassed if the exposed area comes into contact with a grounded surface. This action may result in an unsafe condition for servicing the machine. Repair components or replace components before servicing the machine.

⚠ Fire on a machine can result in personal injury or death. Exposed battery cables that come into contact with a grounded connection can result in fires. Replace cables and related parts that show signs of wear or damage. Contact your HD Hyundai Construction Equipment dealer.

Wiring

Check electrical wires daily. If any of the following conditions exist, replace parts before you operate the machine.

- Fraying
- Signs of abrasion or wear
- Cracking
- Discoloration
- Cuts on insulation
- Other damage

Make sure that all clamps, guards, clips, and straps are reinstalled correctly. This action will help to prevent vibration, rubbing against other parts, and excessive heat during machine operation.

Attaching electrical wiring to hoses and tubes that contain flammable fluids or combustible fluids should be avoided.

Consult your HD Hyundai Construction Equipment dealer for repair or for replacement parts.

Keep wiring and electrical connections free of debris.

Lines, Tubes, and Hoses

Do not bend high-pressure lines. Do not strike high-pressure lines. Do not install any lines that are bent or damaged. Use the appropriate backup wrenches in order to tighten all connections to the recommended torque.

Check lines, tubes, and hoses carefully. Wear Personal Protection Equipment (PPE) in order to check for leaks. Always use a board or cardboard when you check for a leak. Leaking fluid that is under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. A pin hole leak can cause severe injury. If fluid is injected into your skin, you must get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.

Replace the affected parts if any of the following conditions are present :

- End fittings are damaged or leaking.
- Outer coverings are chafed or cut.
- Wires are exposed.
- Outer coverings are swelling or ballooning.
- Flexible parts of the hoses are kinked.
- Outer covers have exposed embedded armoring.
- End fittings are displaced.

Make sure that all clamps, guards, and heat shields are installed correctly. During machine operation, this action will help to prevent vibration, rubbing against other parts, excessive heat, and failure of lines, tubes, and hoses.

Do not operate a machine when a fire hazard exists. Repair any lines that are corroded, loose, or damaged. Leaks may provide fuel for fires. Consult your HD Hyundai Construction Equipment dealer for repair or for replacement parts.

Ether

Ether (if equipped) is commonly used in cold weather applications. Ether is flammable and poisonous.

Do not spray ether manually into an engine if the machine is equipped with a thermal starting aid for cold weather starting.

Use ether in ventilated areas. Do not smoke while you are replacing an ether cylinder or while you are using an ether spray.

Do not store ether cylinders in living areas or in the operator compartment of a machine. Do not store ether cylinders in direct sunlight or in temperatures above 49˚C(120.2 ˚F). Keep ether cylinders away from unauthorized personnel.

Fire Extinguisher

As an additional safety measure, keep a fire extinguisher on the machine.

Be familiar with the operation of the fire extinguisher. Inspect the fire extinguisher and service the fire extinguisher regularly. Follow the recommendations on the instruction plate.

Consider installation of an aftermarket Fire Suppression System, if the application and working conditions warrant the installation.

Fire Safety

※ Locate secondary exits and how to use the secondary exits before you operate the machine.
※ Locate fire extinguishers and how to use a fire extinguisher before you operate the machine.

If you find that you are involved in a machine fire, your safety and that of others on site is the top priority. The following actions should only be performed if the actions do not present a danger or risk to you and any nearby people. At all times you should assess the risk of personal injury and move away to a safe distance as soon as you feel unsafe.
Move the machine away from nearby combustible material such as fuel/oil stations, structures, trash, mulch and timber.

Lower any implements and turn off the engine as soon as possible. If you leave the engine running, the engine will continue to feed a fire. The fire will be fed from away damaged hoses that are attached to the engine or pumps.

If possible, turn the battery disconnect switch to the OFF position. Disconnecting the battery will remove the ignition source in the event of an electrical short. Disconnecting the battery will eliminate a second ignition source if electrical wiring is damaged by the fire, resulting in a short circuit.

Notify emergency personnel of the fire and your location.

If your machine is equipped with a fire suppression system, follow the manufacturers procedure for activating the system.

※ Fire suppression systems need to be regularly inspected by qualified personnel. You must be trained to operate the fire suppression system.

Use the on-board fire extinguisher and use the following procedure :

1. Pull the pin.
2. Aim the extinguisher or nozzle at the base of the fire.
3. Squeeze the handle and release the extinguishing agent.
4. Sweep the extinguisher from side to side across the base of the fire until the fire is out.

Remember, if you are unable to do anything else, shut off the machine before exiting. By shutting off the machine, fuels will not continue to be pumped into the fire.
If the fire grows out of control, be aware of the following risks :

- Tires on wheeled machines pose a risk of explosion as tires burn. Hot shrapnel and debris can be thrown great distances in an explosion.
- Tanks, accumulators, hoses, and fittings can rupture in a fire, spraying fuels and shrapnel over a large area.

Remember that nearby all of the fluids on the machine are flammable, including coolant and oils. Additionally, plastics, rubbers, fabrics, and resins in fiberglass panels are also flammable.

Fire extinguisher Location

Make sure that a fire extinguisher is available. Be familiar with the operation of the fire extinguisher. Inspect the fire extinguisher and service the fire extinguisher. Obey the recommendations on the instruction plate.

Mount the fire extinguisher in the accepted location per local regulations.

If your machine is equipped with a ROPS structure, strap the mounting plate to the ROPS in order to mount the fire extinguisher. If the weight of the fire extinguisher exceeds 4.5 kg (10 lb), mount the fire extinguisher near the bottom of the ROPS. Do not mount the fire extinguisher at the upper one-third area on the ROPS.

Do not weld the ROPS structure in order to install the fire extinguisher. Also, do not drill holes in the ROPS structure in order to mount the fire extinguisher on the ROPS.

Consult your HD Hyundai Construction Equipment dealer for the proper procedure for mounting the fire extinguisher.

THE EUROPEAN UNION PHYSICAL AGENTS (VIBRATION) DIRECTIVE 2002/44/EC

Vibration Data for Earth-moving Machines

Information Concerning Hand/Arm Vibration Level

When the machine is operated according to the intended use, the hand/arm vibration of this machine is below 2.5 m/s^2.

Information Concerning Whole Body Vibration Level

The highest root mean square value of weighted acceleration to which the whole body is subjected, is less than 0.5 m/s^2.

This section provides vibration data and a method for estimating the vibration level for earth moving machines.

Vibration levels are influenced by many different parameters. Many items are listed below.

- Operator training, behavior, mode and stress
- Job site organization, preparation, environment, weather and material
- Machine type, quality of the seat, quality of the suspension system, attachments and condition of the equipment

It is not possible to get precise vibration levels for this machine. The expected vibration levels can be estimated with the information in below Table in order to calculate the daily vibration exposure. A simple evaluation of the machine application can be used.

Estimate the vibration levels for the three vibration directions. For typical operating conditions, use the average vibration levels as the estimated level. With an experienced operator and smooth terrain, subtract the Scenario Factors from the average vibration level. For aggressive operations and severe terrain, add the Scenario Factors to the average vibration level in order to obtain the estimated vibration level.

※ **All vibration levels are in meter per second squared.**

ISO Reference Table A – Equivalent vibration levels of whole body vibration emission for earthmoving equipment.

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

ISO Reference Table A – Equivalent vibration levels of whole body vibration emission for earthmoving equipment.

Machine family	Machine kind	Typical operating condition	Vibration Levels			Scenario Factors		
			X axis	Y axis	Z axis	X axis	Y axis	Z axis
Loader	skid steer loader (tracks)	V-shaped motion	1.21	1.00	0.82	0.30	0.84	0.32
	Wheel backhoe loader	Excavating	0.28	0.26	0.20	0.09	0.16	0.06
	Wheel loader	Load and carry motion	0.84	0.81	0.52	0.23	0.20	0.14
		Mining application	1.27	0.97	0.81	0.47	0.31	0.47
		Transfer movement	0.76	0.91	0.49	0.33	0.35	0.17
		V-shape motion	0.99	0.84	0.54	0.29	0.32	0.14

※ **Refer to "ISO/TR 25398 Mechanical Vibration-Guideline for the assessment of exposure to whole body vibration of ride on operated earthmoving machines" for more information about vibration. This publication uses data that is measured by international institutes, organizations and manufacturers. This document provides information about the whole body exposure of operators of earthmoving equipment.**

Guidelines for Reducing Vibration Levels on Earthmoving Equipment

Properly adjust machines. Properly maintain machines. Operate machines smoothly. Maintain the conditions of the terrain. The following guidelines can help reduce the whole body vibration level :

1. Use the right type and size of machine, equipment, and attachments.
2. Maintain machines according to the manufacturer's recommendations.
   a. Tire pressures
   b. Brake and steering systems
   c. Controls, hydraulic system and linkages
3. Keep the terrain in good condition.
   a. Remove any large rocks or obstacles.
   b. Fill any ditches and holes.
   c. Provide machines and schedule time in order to maintain the conditions of the terrain.
4. Use a seat that meets "ISO 7096". Keep the seat maintained and adjusted.
   a. Adjust the seat and suspension for the weight and the size of the operator.
   b. Inspect and maintain the seat suspension and adjustment mechanisms.
5. Perform the following operations smoothly.
   a. Steer
   b. Brake
   c. Accelerate
   d. Shift the gears.
6. Move the attachments smoothly.
7. Adjust the machine speed and the route in order to minimize the vibration level.
   a. Drive around obstacles and rough terrain.
   b. Slow down when it is necessary to go over rough terrain.
8. Minimize vibrations for a long work cycle or a long travel distance.
   a. Use machines that are equipped with suspension systems.
   b. Use the ride control system on machines.
   c. If no ride control system is available, reduce speed in order to prevent bounce.
   d. Haul the machines between workplaces.
9. Less operator comfort may be caused by other risk factors. The following guidelines can be effective in order to provide better operator comfort:
   a. Adjust the seat and adjust the controls in order to achieve good posture.
   b. Adjust the mirrors in order to minimize twisted posture.
   c. Provide breaks in order to reduce long periods of sitting.
   d. Avoid jumping from the cab
   e. Minimize repeated handling of loads and lifting of loads.
   f. Minimize any shocks and impacts during sports and leisure activities.

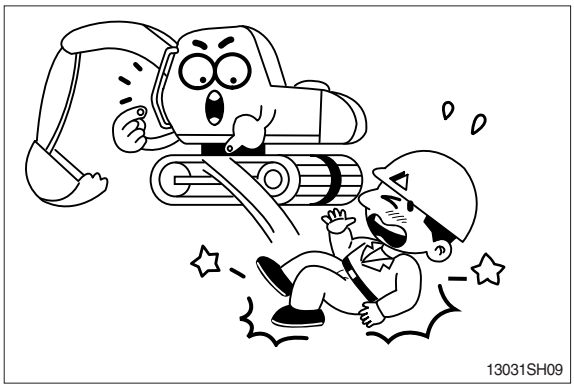
Sources

The vibration information and calculation procedure is based on "ISO/TR 25398 Mechanical Vibration-Guideline for whole body vibration exposure of operators of earthmoving equipment. The method is based on measured vibration emission under real working conditions for all machines.

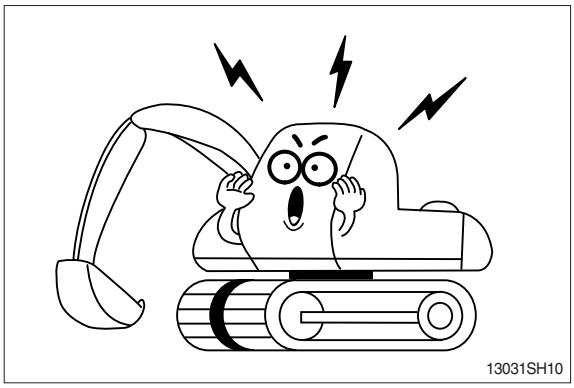
You should check the original directive. This document summarizes part of the content of the applicable law. This document is not meant to substitute the original sources. Other parts of these documents are based on information from the United Kingdom Health and Safety Executive.

2. DURING OPERATING THE MACHINE

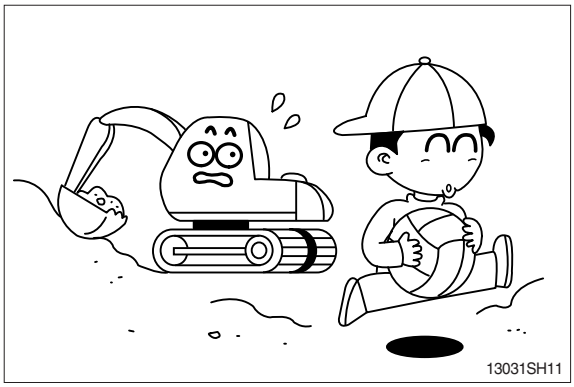
Use the handle and footstep when getting on or off the machine.
Do not jump on or off the machine.



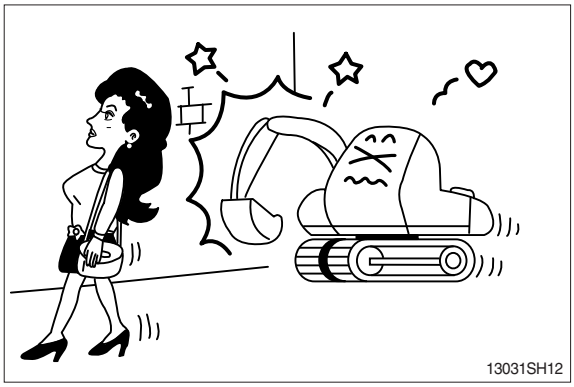
Sound the horn to warn nearby personnel before operating the machine.
Remove all the obstacles like frost on the window before operating the machine for the good visibility.



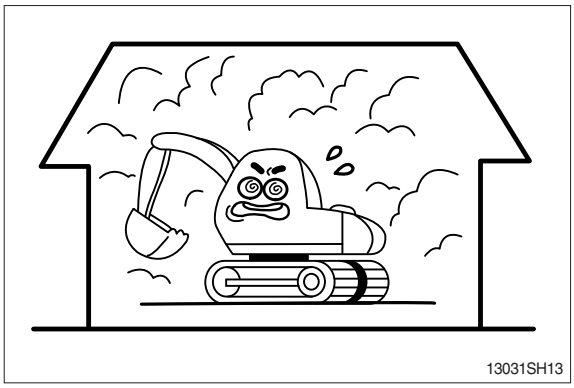
Operate carefully to make sure all personnel or obstacles are clear within the working range of the machine.
Place safety guards if necessary.



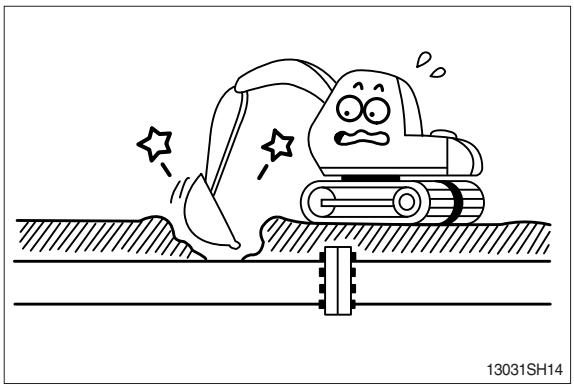
When using the work equipment, pay attention to job site.



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

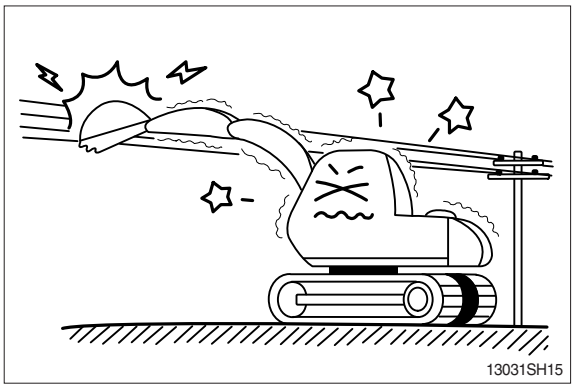


Check the locations of underground gas pipes or water line and secure the safety before operation.

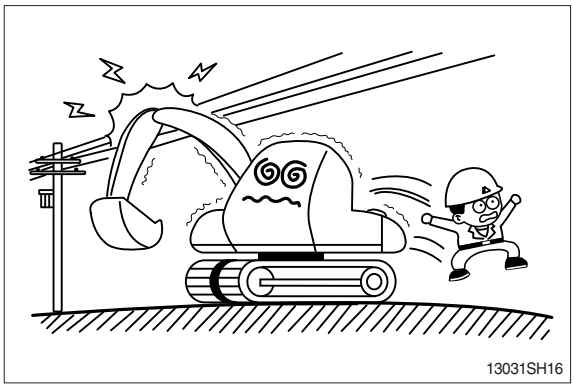


The operating near the electrical lines is very dangerous.
Operate within safe working range permitted as below.

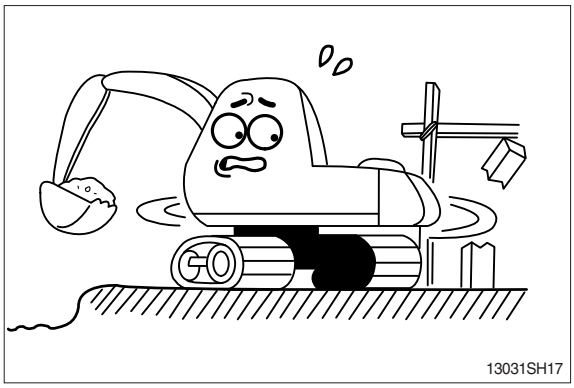
Supply voltage	Min safe separation
6.6 kV	3m (10 ft)
33.0 kV	4m (13 ft)
66.0 kV	5m (16 ft)
154.0 kV	8m (26 ft)
275.0 kV	10m (33 ft)



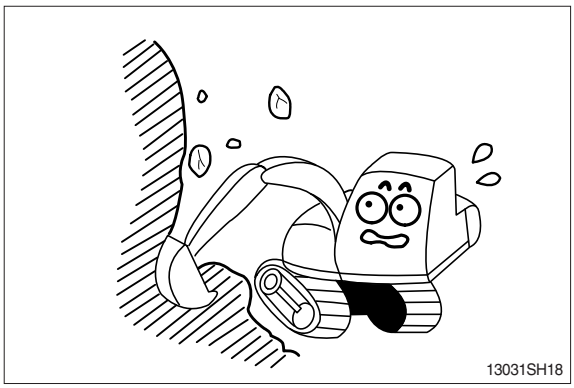
If the machine touches the electric power lines, keep sitting on the operator's seat and make sure the personnel on the ground not to touch the machine until turning off the electric current. Jump off the machine without contacting the machine when you need to get off.



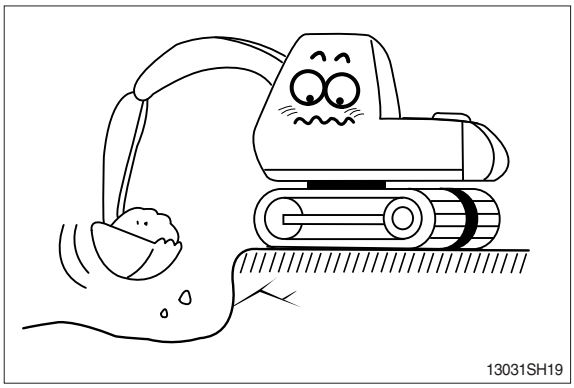
Watch out for obstacles.
Be particularly careful to check the machine clearance during the swing.



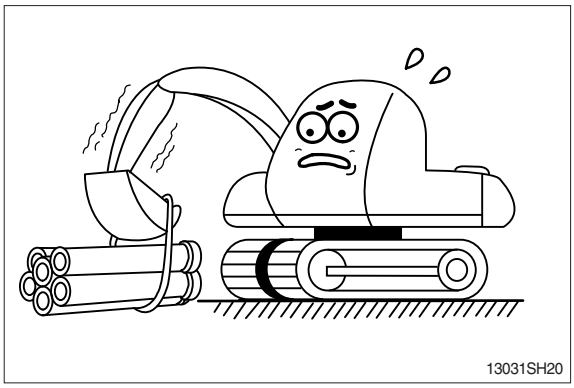
When using the machine as breaker or working in a place where stones may fall down, cab roof guard and head guard should be provided for proper protection.



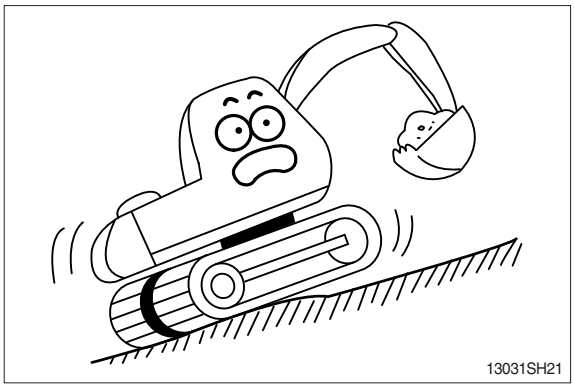
Avoid operating on a cliff or soft ground as there is danger of rolling over.
Make sure to get off easily as keeping the track at a right angle and putting the travel motor into the backward position when working on a cliff or soft ground inevitably.



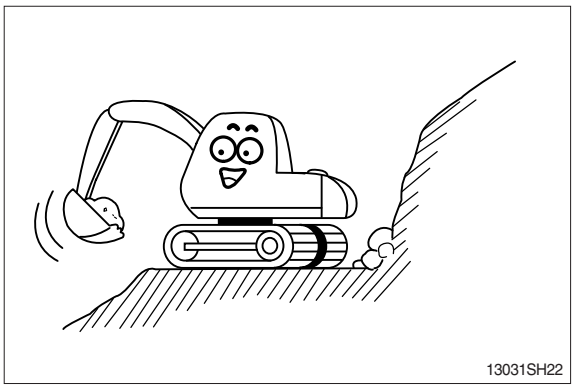
Operate for the lifting work considering the capacity of machine, weight and width of the load.
Be careful not to lift exceeding the machine capacity as it can be the cause of machine damage and safety accident.



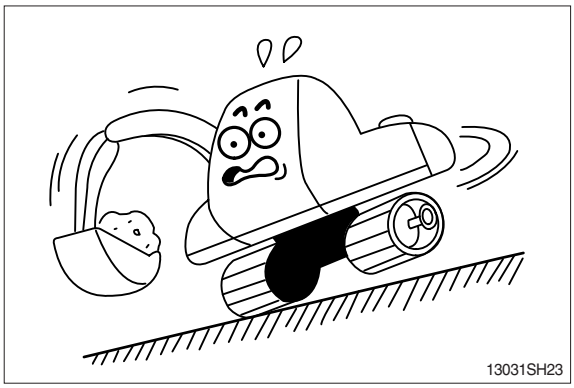
The operation on a slope is dangerous.
Avoid operating the machine on a slope of over 10 degree.



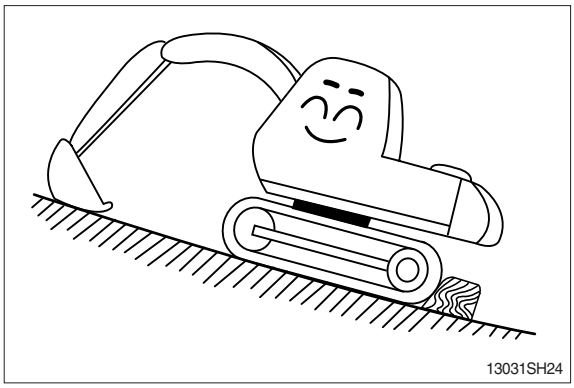
Operate the machine after making ground flat when operation is required on a slope.



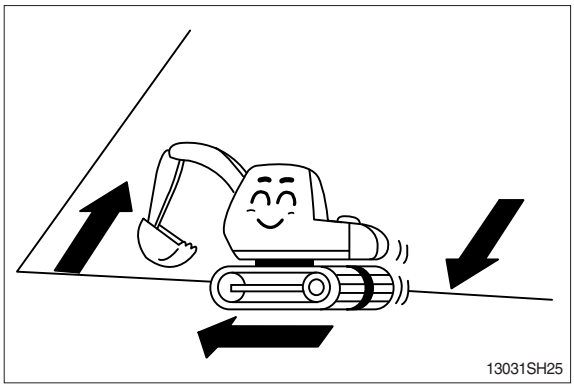
The swing on the slope can be danger of rolling over.
Do not operate to swing the machine with the bucket loaded on a slope since the machine may lose its balance under such an instance.



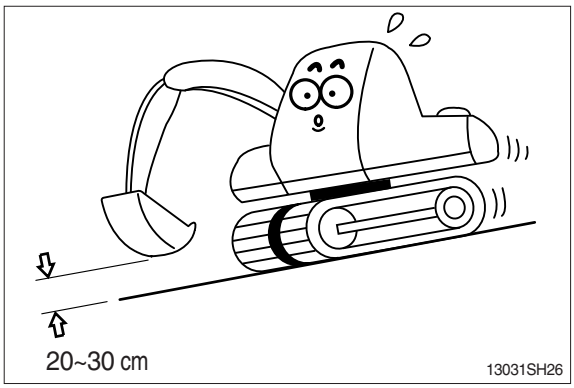
Avoid parking and stopping on a slope.
Lower the bucket to the ground and block the track when parking.



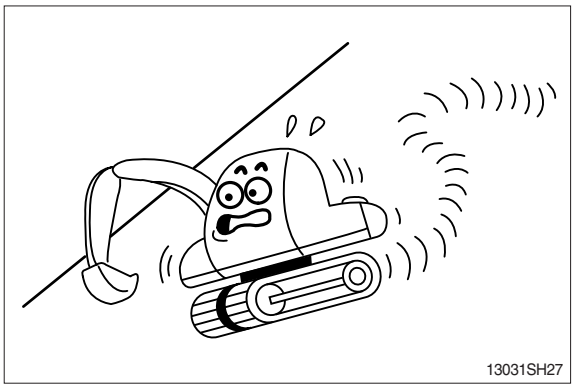
Avoid traveling in a cross direction on a slope as it can cause the danger of rolling over and sliding.



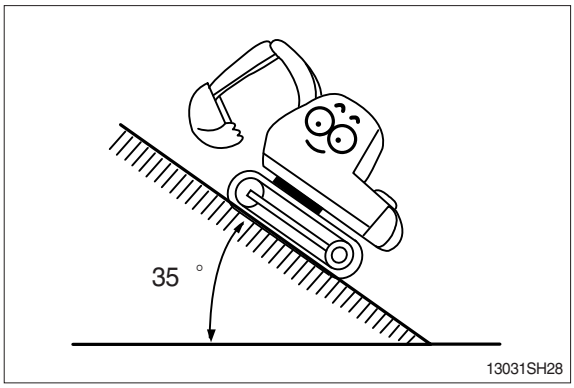
Traveling on a slope is dangerous.
Be sure to operate slowly when traveling down a slope and maintain the bucket at a height of 20~30 ㎝ (1 ft) above the ground so that it can be used as brake in an emergency.



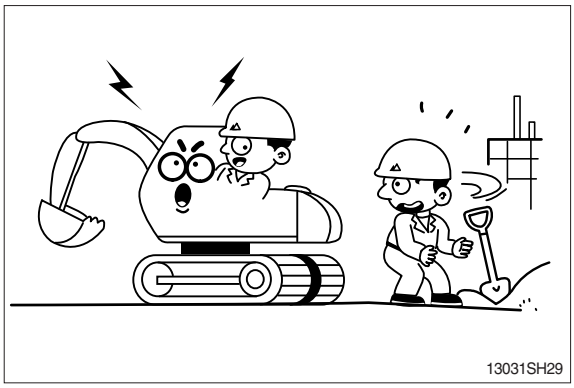
Steering of the machine while traveling on a slope is dangerous.
When an inevitable turning of direction is required, turn on the flat and solid ground.



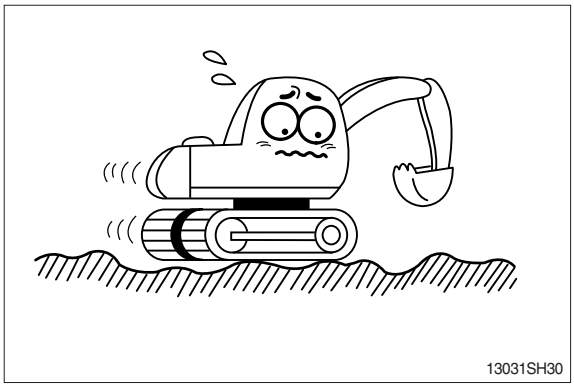
The engine angularity limits are 35 degree.
Do not operate by more than the engine limits in any case.



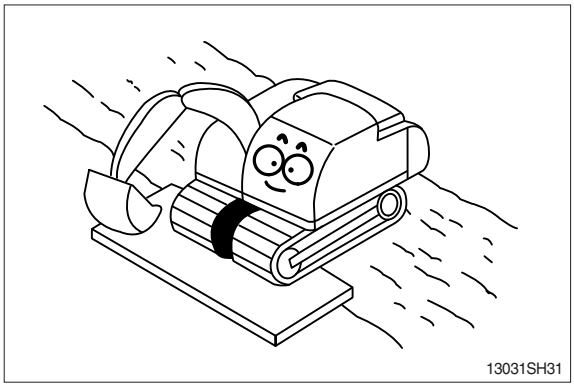
Before traveling the machine, sound the horn to warn nearby personnel.
Operate forward and backward correctly with confirming the location of the travel motor.



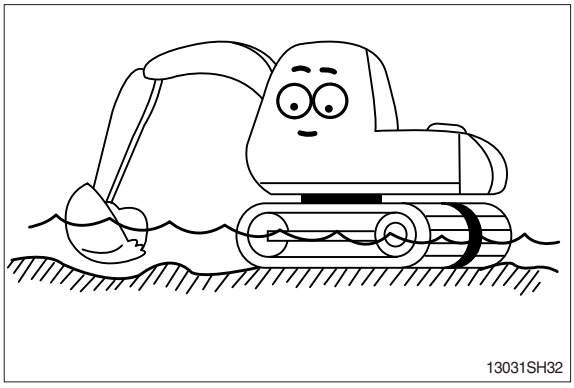
Slow down when traveling through obstacles or uneven ground.



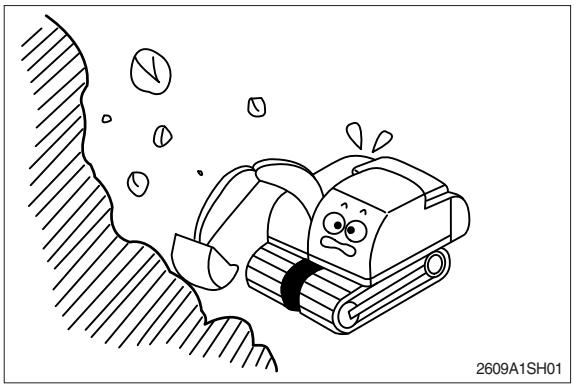
When working on soft ground, place mats or wood boards on the ground to prevent the machine sinking.



When operating in water or when crossing shallow, check the bed soil condition and depth and flow speed of water, then proceed taking care that water is not above carrier roller.



This machine has ROPS / FOG with option.
Do not attempt to repair a rollover protective structure (ROPS) after an accident.
Repaired structures do not provide the original structure and protection.
Test and approved as a protective CAB according to ROPS and FOG standard.
Meets : ISO 10262 / 3449 / 12117-2
SAE J1356 / JISO 3449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MOUNTING AND DISMOUNTING

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

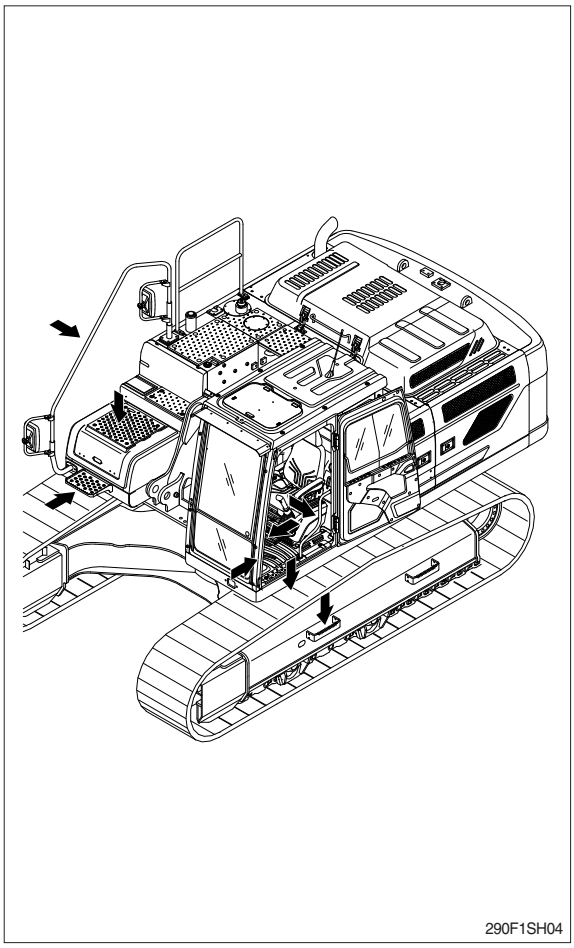
When mounting or dismounting, always face the machine and use the handrails, machine or track frame steps, and track shoes. Additional track frame step can be fitted for wider optional shoe. In this case please contact your HD Hyundai Construction Equipment distributor.

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.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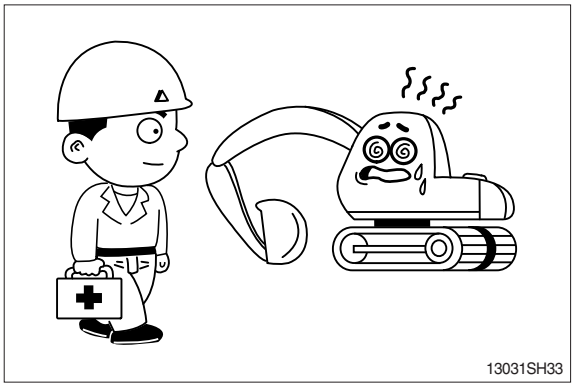
KEEP RIDERS OFF MACHINE

Riders on a machine are subject to injury such as being struck objects and being thrown off the machine.

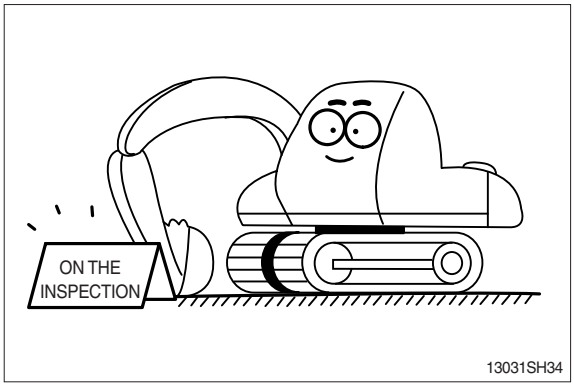
Only allow the operator on the machine. Keep riders off.

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 guard.



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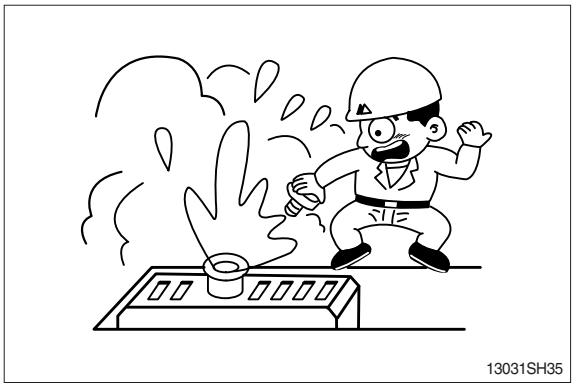
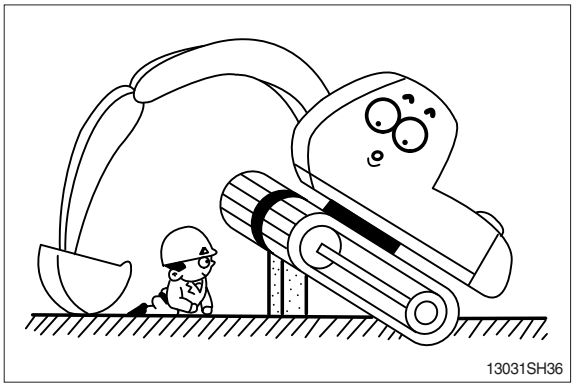
Do not remove the radiator cap from hot engine.
Open the cap after the engine cools, below 50 °C (122 °F) to prevent personal injury from heated coolant spray or steam.


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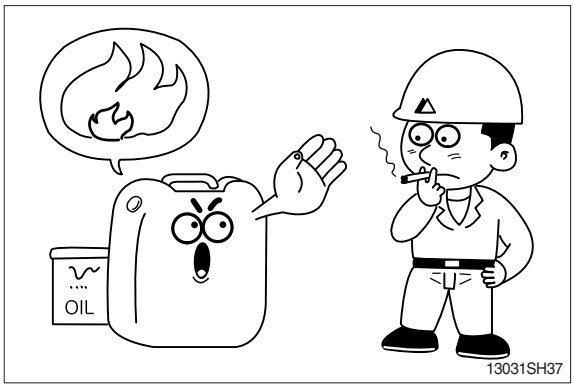
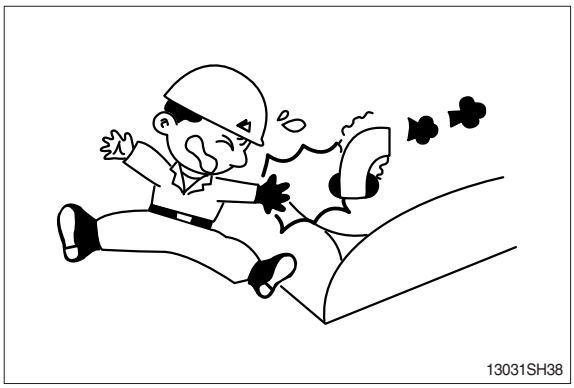
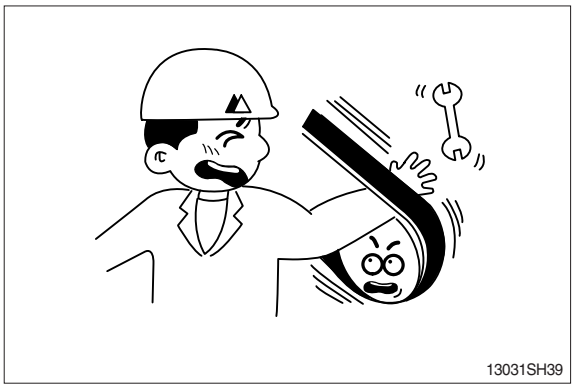
There is the danger of fire in fuel and oil.
Store in cool and dry area, away from any open flames.



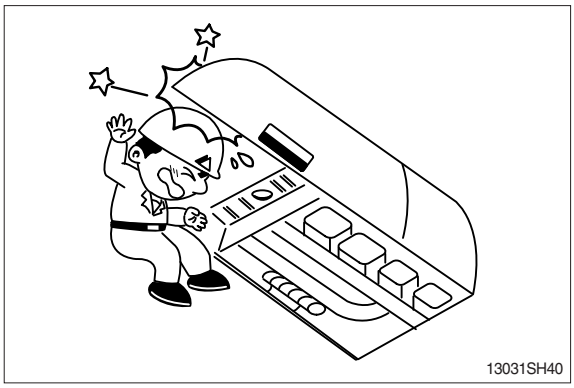
Do not touch exhaust pipe, or may cause severe burn.



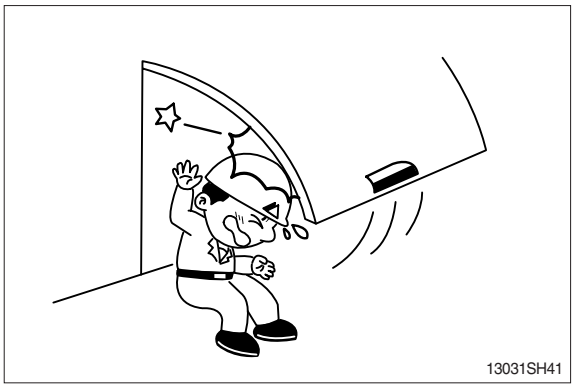
Do not open the engine hood and covers while the engine is running.



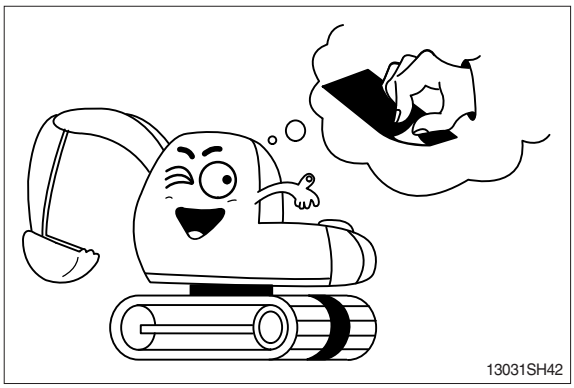
Be careful of not hitting the edges when you service engine.



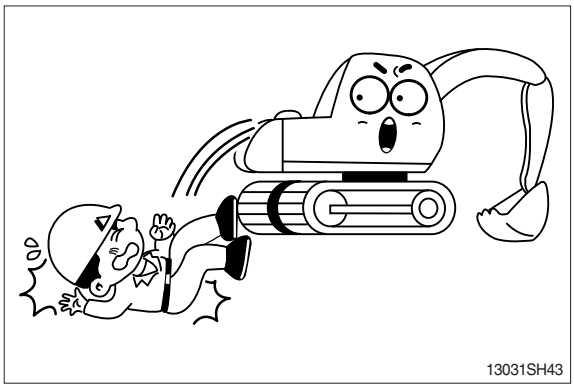
Be careful that the front window may be promptly closed.
Be sure to support stay, when the side door needs to be opened.
Be careful that the open side door may closed by the external or natural force like strong wind.


13031SH41

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

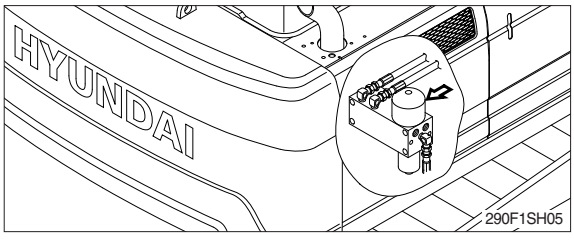

13031SH42

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.



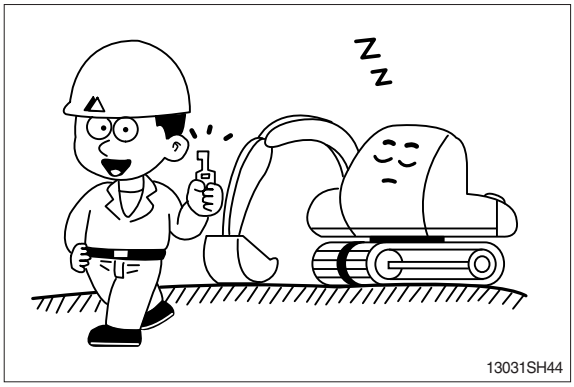
290F1SH05

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.

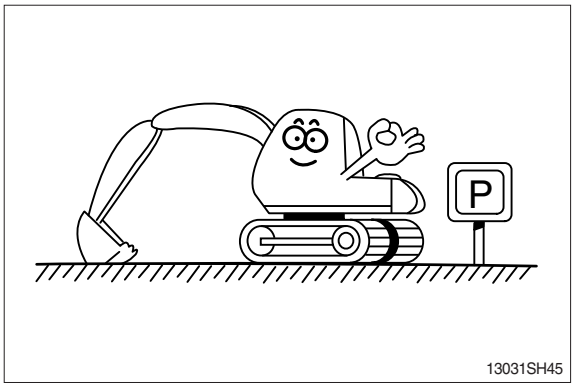
4. PARKING

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



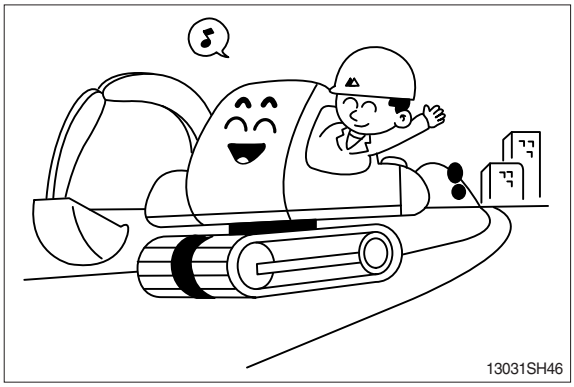
13031SH44

Park the machine in the flat and safe place.

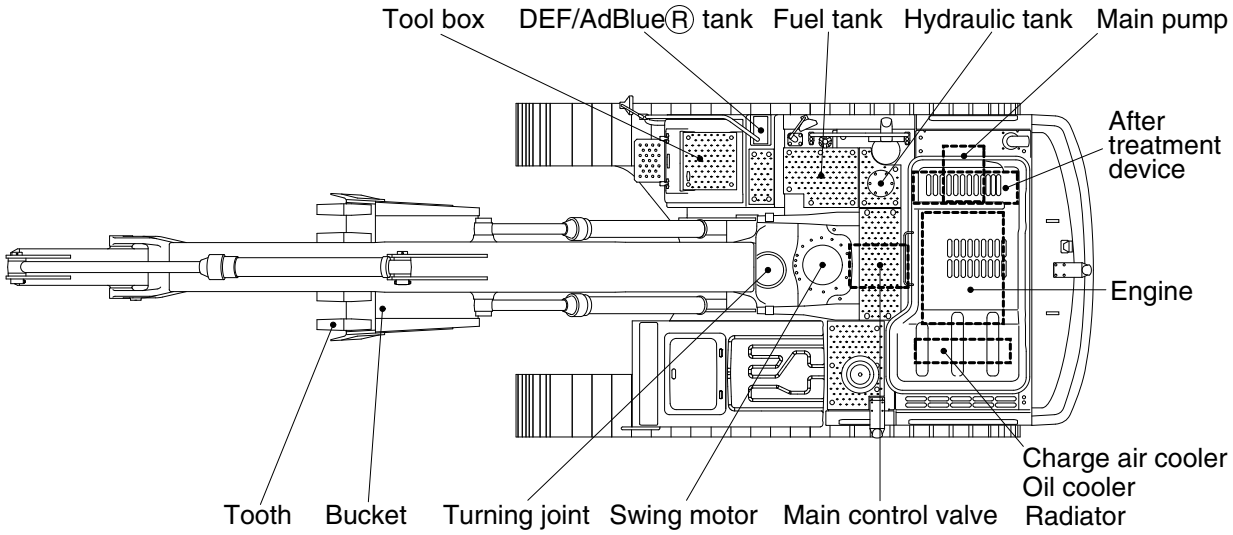


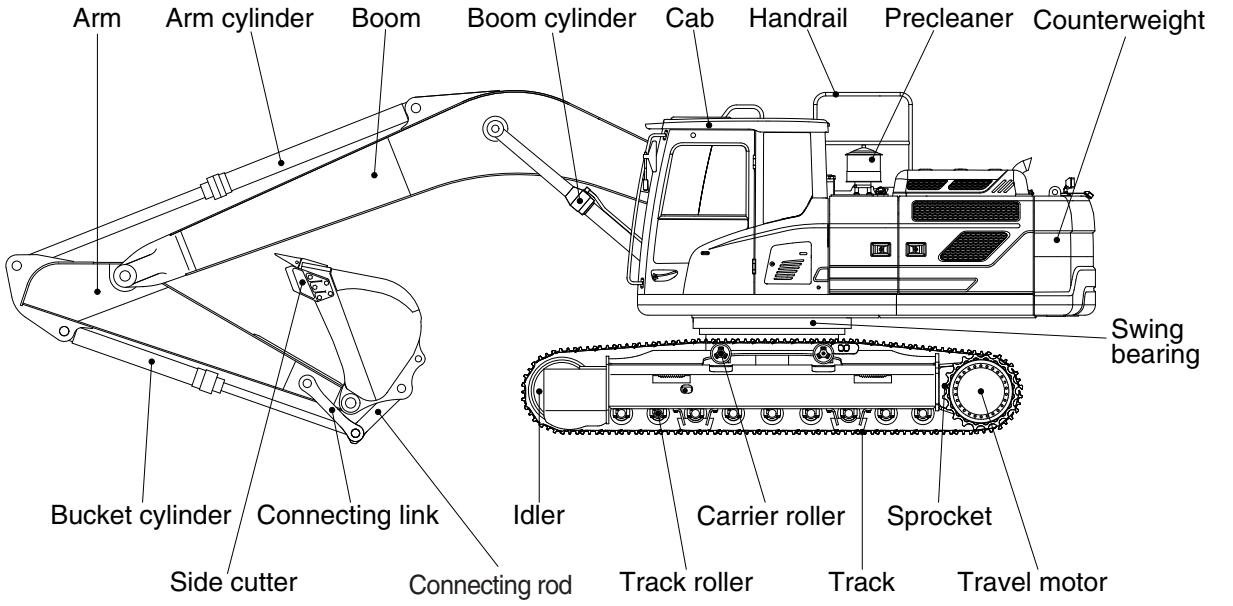
13031SH45

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


13031SH46

1. MAJOR COMPONENT



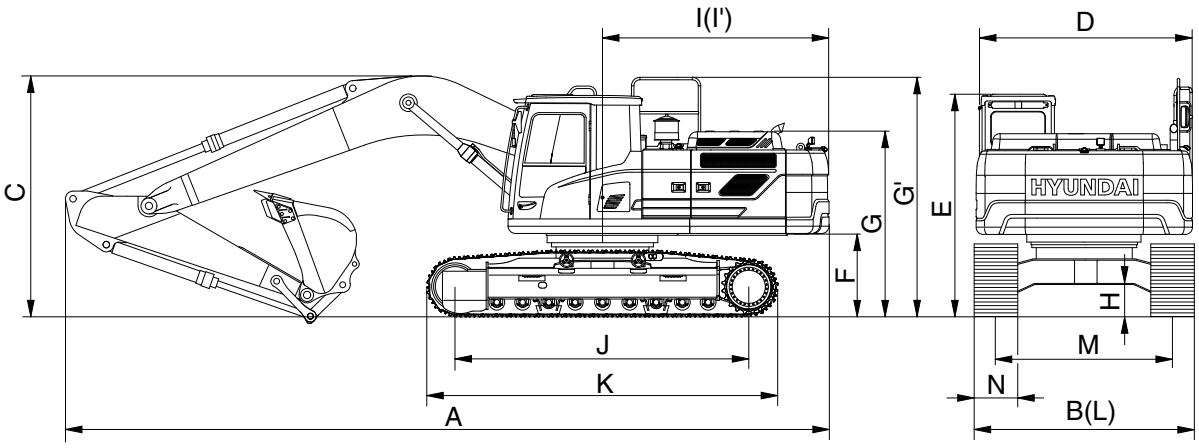


290F2SP01

2. SPECIFICATIONS

1) HX300 L

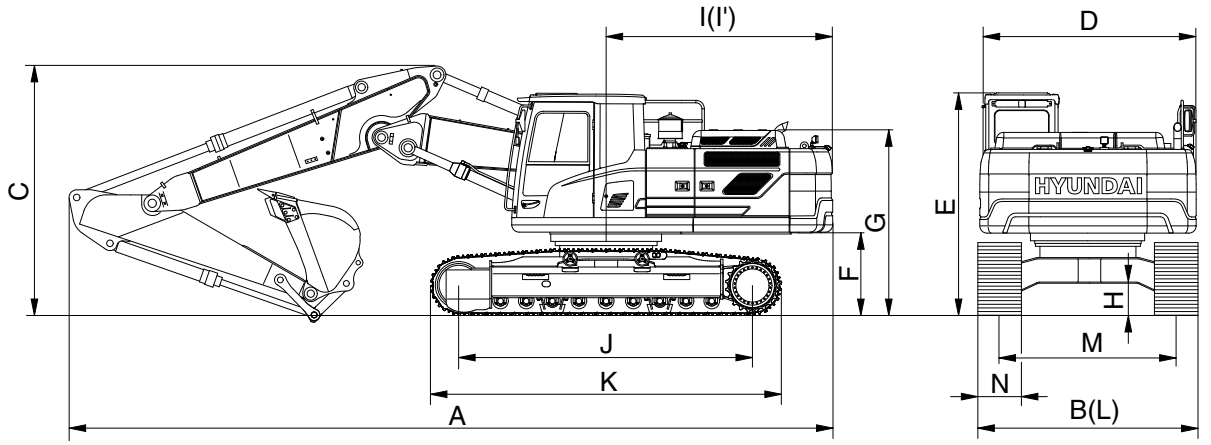
· 6.25 m (20' 6") BOOM and 3.05 m (10' 0") ARM



290F2SP02

Description		Unit	Specification
Operating weight		kg (lb)	30200 (66580)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	1.27 (1.66)
Overall length	A	mm (ft-in)	10560 (34' 8")
Overall width, with 600 mm shoe	B		3200 (10' 6")
Overall height of boom	C		3290 (10' 10")
Superstructure width	D		2980 (9' 9")
Overall height of cab	E		3130 (10' 3")
Ground clearance of counterweight	F		1185 (3' 9")
Overall height of engine hood	G		2600 (8' 6")
Overall height of handrail	G'		3335 (10' 11")
Minimum ground clearance	H		500 (1' 8")
Rear-end distance	I		3120 (10' 3")
Rear-end swing radius	I'		3210 (10' 6")
Distance between tumblers	J		4030 (13' 3")
Undercarriage length	K		4885 (16' 0")
Undercarriage width	L		3200 (10' 6")
Track gauge	M		2600 (8' 6")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.3/5.9 (2.1/3.7)
Swing speed		rpm	10.2
Gradeability		Degree (%)	35 (70)
Ground pressure (600 mm shoe)		kgf/cm^2 (psi)	0.58 (8.25)
Max traction force		kg (lb)	26500 (58420)

· 6.25 m (20' 6") 2-PIECE BOOM and 3.05 m (10' 0") ARM

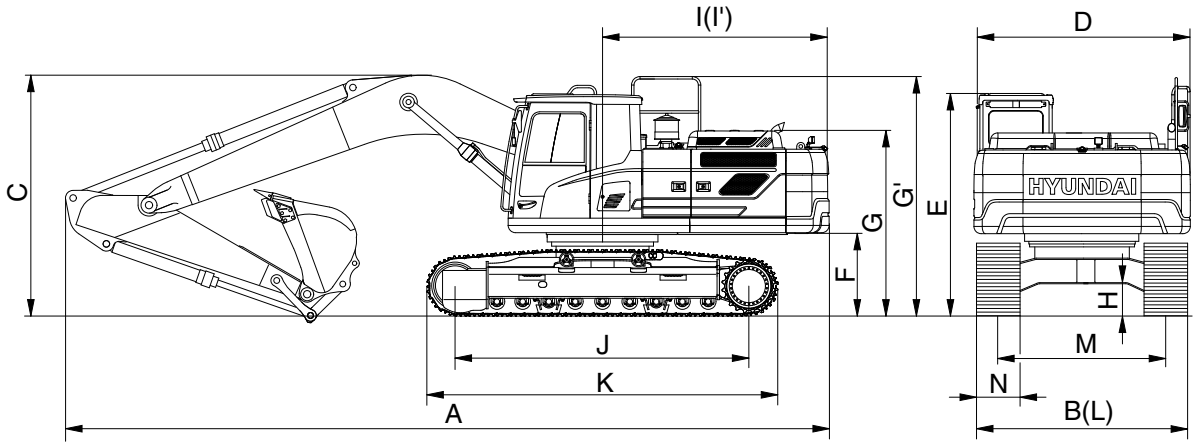


290F2SP02A

Description		Unit	Specification
Operating weight		kg (lb)	33210 (73220)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	1.27 (1.66)
Overall length	A	mm (ft-in)	10640 (34' 9")
Overall width, with 600 mm shoe	B		3200 (10' 6")
Overall height of boom	C		3270 (11' 0")
Superstructure width	D		2980 (9' 9")
Overall height of cab	E		3130 (10' 3")
Ground clearance of counterweight	F		1185 (3' 9")
Overall height of engine hood	G		2600 (8' 6")
Overall height of handrail	G'		3335 (10' 11")
Minimum ground clearance	H		500 (1' 8")
Rear-end distance	I		3120 (10' 3")
Rear-end swing radius	I'		3210 (10' 6")
Distance between tumblers	J		4030 (13' 3")
Undercarriage length	K		4885 (16' 0")
Undercarriage width	L		3200 (10' 6")
Track gauge	M		2600 (8' 6")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.3/5.9 (2.1/3.7)
Swing speed		rpm	10.2
Gradeability		Degree (%)	35 (70)
Ground pressure (600 mm shoe)		kgf/cm^2 (psi)	0.64 (9.10)
Max traction force		kg (lb)	26500 (58420)

2) HX300 NL

· 6.25 m (20' 6") BOOM and 3.05 m (10' 0") ARM

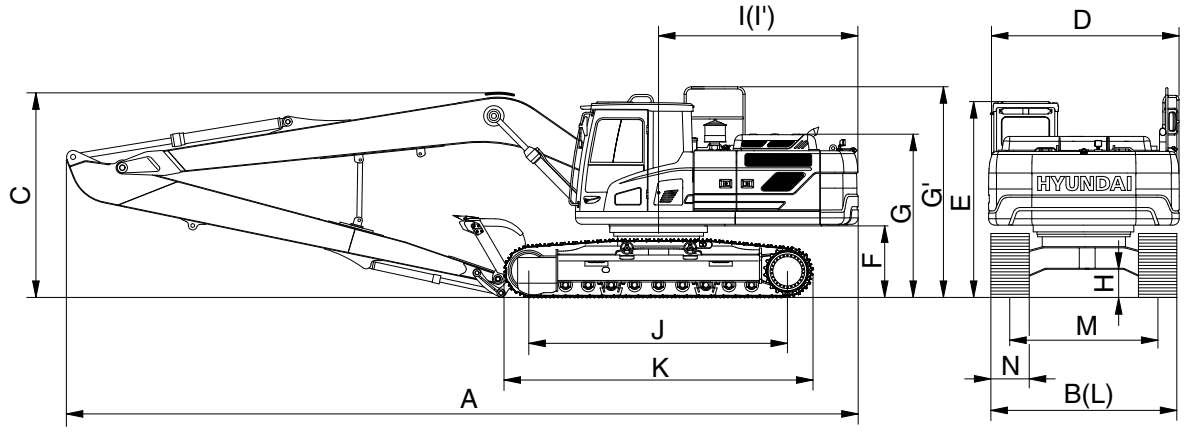


290F2SP03

Description		Unit	Specification
Operating weight		kg (lb)	30000 (66140)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	1.27 (1.66)
Overall length	A	mm (ft-in)	10560 (34' 8")
Overall width, with 600 mm shoe	B		2990 (9' 10")
Overall height of boom	C		3290 (10' 10")
Superstructure width	D		2980 (9' 9")
Overall height of cab	E		3130 (10' 3")
Ground clearance of counterweight	F		1185 (3' 9")
Overall height of engine hood	G		2600 (8' 6")
Overall height of handrail	G'		3335 (10' 11")
Minimum ground clearance	H		500 (1' 8")
Rear-end distance	I		3120 (10' 3")
Rear-end swing radius	I'		3210 (10' 6")
Distance between tumblers	J		4030 (13' 3")
Undercarriage length	K		4885 (16' 0")
Undercarriage width	L		2990 (9' 10")
Track gauge	M		2390 (7' 10")
Track shoe width, standard	N		600 (24")
Travel speed (low/high)		km/hr (mph)	3.3/5.9 (2.1/3.7)
Swing speed		rpm	10.2
Gradeability		Degree (%)	35 (70)
Ground pressure (600 mm shoe)		kgf/cm^2 (psi)	0.58 (8.25)
Max traction force		kg (lb)	26500 (58420)

3) HX300 L LONG REACH

· 10.2 m (33' 6") BOOM and 7.85 m (25' 9") ARM

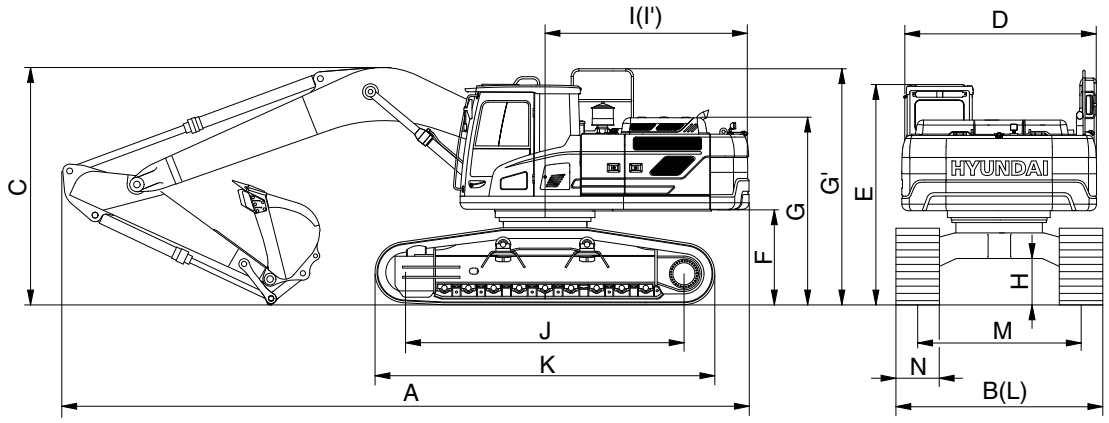


290F2SP04

Description		Unit	Specification
Operating weight		kg (lb)	33070 (72910)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	0.52 (0.68)
Overall length	A	mm (ft-in)	14560 (47' 9")
Overall width, with 800 mm shoe	B		3400 (11' 2")
Overall height of boom	C		3560 (11' 8")
Superstructure width	D		2980 (9' 9")
Overall height of cab	E		3130 (10' 3")
Ground clearance of counterweight	F		1185 (3' 9")
Overall height of engine hood	G		2600 (8' 6")
Overall height of handrail	G'		3335 (10' 11")
Minimum ground clearance	H		500 (1' 8")
Rear-end distance	I		3120 (10' 3")
Rear-end swing radius	I'		3210 (10' 6")
Distance between tumblers	J		4030 (13' 3")
Undercarriage length	K		4885 (16' 0")
Undercarriage width	L		3400 (11' 2")
Track gauge	M		2600 (8' 6")
Track shoe width, standard	N		800 (31' 5")
Travel speed (low/high)		km/hr (mph)	3.3/5.9 (2.1/3.7)
Swing speed		rpm	10.2
Gradeability		Degree (%)	35 (70)
Ground pressure (800 mm shoe)		kgf/cm^2 (psi)	0.48 (6.83)
Max traction force		kg (lb)	26500 (58420)

4) HX300 L HIGH WALKER

· 6.25 m (20' 6") BOOM and 3.05 m (10' 0") ARM



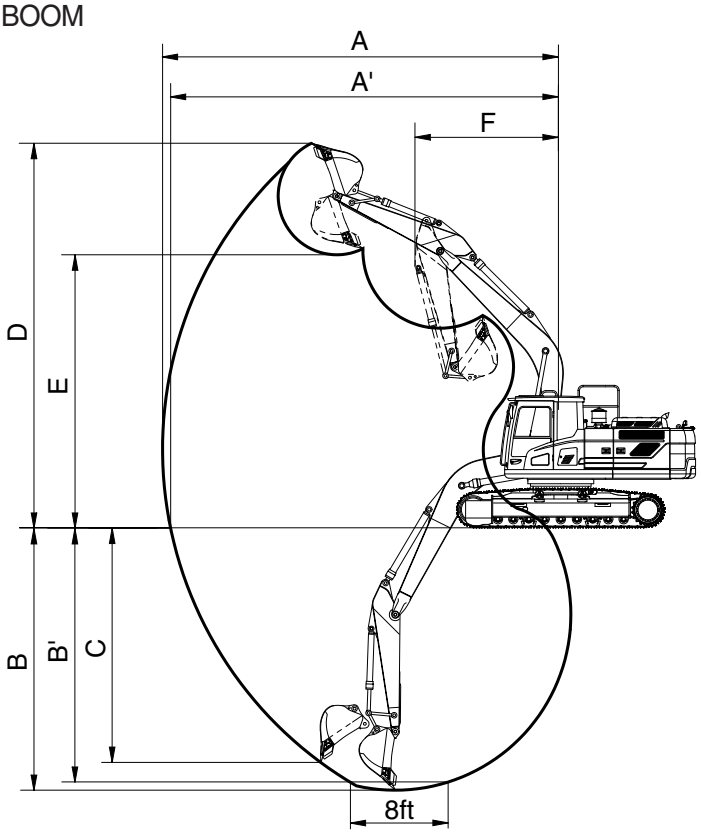
290F2SP05

Description		Unit	Specification
Operating weight		kg (lb)	33040 (72840)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	1.27 (1.66)
Overall length	A	mm (ft-in)	10430 (34' 3")
Overall width, with 600 mm shoe	B		3470 (11' 5")
Overall height of boom	C		3350 (11' 0")
Superstructure width	D		2980 (9' 9")
Overall height of cab	E		3400 (11' 2")
Ground clearance of counterweight	F		1500 (4' 11")
Overall height of engine hood	G		2910 (9' 7")
Overall height of handrail	G'		3650 (12' 0")
Minimum ground clearance	H		765 (2' 6")
Rear-end distance	I		3120 (10' 3")
Rear-end swing radius	I'		3200 (10' 6")
Distance between tumblers	J		4030 (13' 3")
Undercarriage length	K		4950 (16' 3")
Undercarriage width	L		3470 (11' 5")
Track gauge	M		2870 (9' 5")
Track shoe width, standard	N		600 (23' 6")
Travel speed (low/high)		km/hr (mph)	3.3/5.9 (2.1/3.7)
Swing speed		rpm	10.2
Gradeability		Degree (%)	35 (70)
Ground pressure (600 mm shoe)		kgf/cm^2 (psi)	0.64 (9.10)
Max traction force		kg (lb)	26500 (58420)

3. WORKING RANGE

1) HX300 L/NL

· 6.25 m (20' 6") BOOM

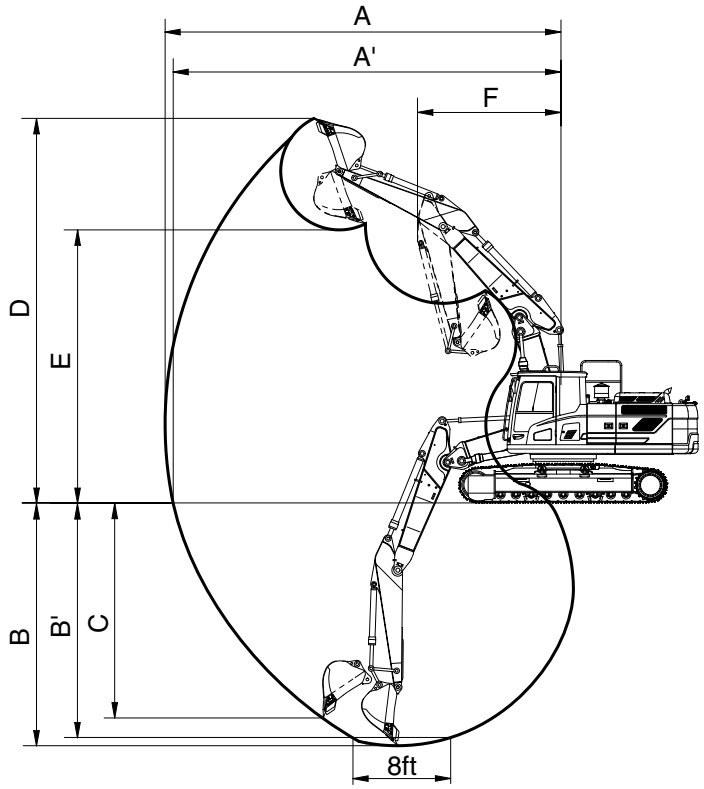


290F2SP06

Description		2.10m (6' 11") Arm	2.50 m (8' 2") Arm	3.05 m (10' 0") Arm	3.75 m (12' 4") Arm
Max digging reach	A	10020 mm (32' 10")	10280 mm (33' 9")	10820 mm (35' 6")	11400 mm (37' 5")
Max digging reach on ground	A'	9820 mm (32' 3")	10080 mm (33' 1")	10620 mm (34' 10")	11220 mm (36' 10")
Max digging depth	B	6440 mm (21' 2")	6840 mm (22' 5")	7390 mm (24' 3")	8090 mm (26' 7")
Max digging depth (8 ft level)	B'	6240 mm (20' 6")	6630 mm (21' 9")	7200 mm (23' 7")	7920 mm (26' 0")
Max vertical wall digging depth	C	6000 mm (19' 8")	5850 mm (19' 2")	6380 mm (20' 11")	7080 mm (23' 3")
Max digging height	D	10040 mm (32' 11")	10000 mm (32' 10")	10160 mm (33' 4")	10360 mm (34' 0")
Max dumping height	E	6940 mm (22' 9")	7030 mm (23' 1")	7110 mm (23' 4")	7310 mm (24' 0")
Min swing radius	F	4400 mm (14' 5")	4300 mm (14' 1")	4250 mm (13' 11")	4200 mm (13' 9")
Bucket digging force	SAE	168.7 [183.1] kN	168.7 [183.1] kN	168.7 [183.1] kN	168.7 [183.1] kN
		17200 [18670] kgf	17200 [18670] kgf	17200 [18670] kgf	17200 [18670] kgf
		37920 [41170] lbf	37920 [41170] lbf	37920 [41170] lbf	37920 [41170] lbf
	ISO	192.2 [208.7] kN	192.2 [208.7] kN	192.2 [208.7] kN	192.2 [208.7] kN
		19600 [21280] kgf	19600 [21280] kgf	19600 [21280] kgf	19600 [21280] kgf
		43210 [46910] lbf	43210 [46910] lbf	43210 [46910] lbf	43210 [46910] lbf
Arm digging force	SAE	180.4 [195.9] kN	156.9 [170.4] kN	131.4 [142.7] kN	114.7 [124.6] kN
		18400 [19980] kgf	16000 [17370] kgf	13400 [14550] kgf	11700 [12700] kgf
		40570 [44050] lbf	35270 [38290] lbf	29540 [32070] lbf	25790 [28000] lbf
	ISO	190.3 [206.6] kN	163.8 [177.8] kN	136.3 [148] kN	119.6 [129.9] kN
		19400 [21060] kgf	16700 [18130] kgf	13900 [15090] kgf	12200 [13250] kgf
		42770 [46440] lbf	36820 [39980] lbf	30640 [33270] lbf	26900 [29210] lbf

[ ] : Power boost

· 6.25 m (20' 6") 2-PIECE BOOM

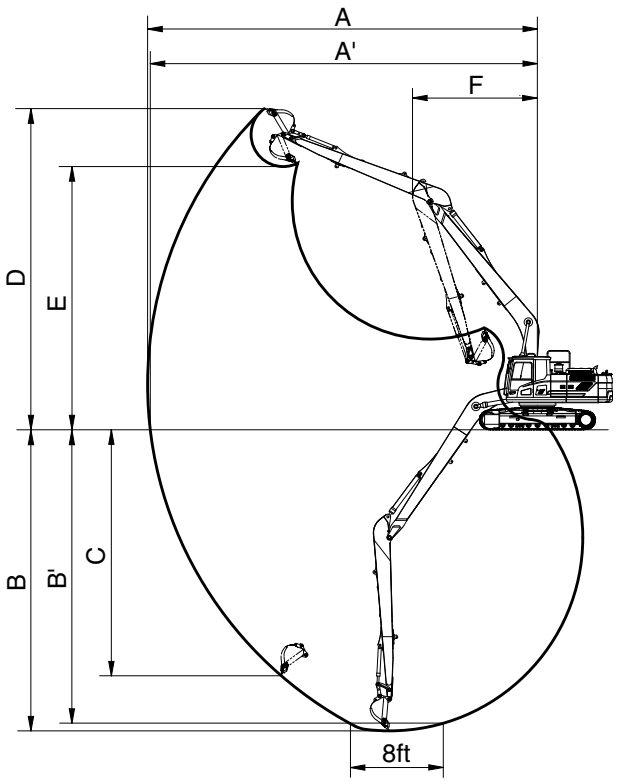


290F2SP06A

Description		2.10m (6' 11") Arm	2.50 m (8' 2") Arm	3.05 m (10' 0") Arm	3.75 m (12' 4") Arm
Max digging reach	A	10060 mm (33' 0")	10340 mm (33' 9")	10860 mm (35' 6")	11480 mm (37' 7")
Max digging reach on ground	A'	9850 mm (32' 3")	10140 mm (33' 3")	10670 mm (35' 0")	11300 mm (37' 1")
Max digging depth	B	5930 mm (19' 5")	6280 mm (20' 6")	6820 mm (22' 4")	7490 mm (24' 6")
Max digging depth (8 ft level)	B'	5930 mm (19' 5")	6330 mm (20' 8")	6910 mm (22' 7")	7630 mm (25' 0")
Max vertical wall digging depth	C	5010 mm (16' 4")	5210 mm (17' 1")	5780 mm (19' 0")	6450 mm (21' 2")
Max digging height	D	11540 mm (37' 9")	11680 mm (38' 3")	12090 mm (40' 4")	12550 mm (41' 2")
Max dumping height	E	8310 mm (27' 3")	8440 mm (27' 7")	8850 mm (29' 0")	9320 mm (30' 6")
Min swing radius	F	3180 mm (10' 4")	2900 mm (9' 5")	2630 mm (8' 6")	2850 mm (9' 4")
Bucket digging force	SAE	168.7 [183.1] kN	168.7 [183.1] kN	168.7 [183.1] kN	168.7 [183.1] kN
		17200 [18670] kgf	17200 [18670] kgf	17200 [18670] kgf	17200 [18670] kgf
		37920 [41170] lbf	37920 [41170] lbf	37920 [41170] lbf	37920 [41170] lbf
	ISO	192.2 [208.7] kN	192.2 [208.7] kN	192.2 [208.7] kN	192.2 [208.7] kN
		19600 [21280] kgf	19600 [21280] kgf	19600 [21280] kgf	19600 [21280] kgf
		43210 [46910] lbf	43210 [46910] lbf	43210 [46910] lbf	43210 [46910] lbf
Arm digging force	SAE	180.4 [195.9] kN	156.9 [170.4] kN	131.4 [142.7] kN	114.7 [124.6] kN
		18400 [19980] kgf	16000 [17370] kgf	13400 [14550] kgf	11700 [12700] kgf
		40570 [44050] lbf	35270 [38290] lbf	29540 [32070] lbf	25790 [28000] lbf
	ISO	190.3 [206.6] kN	163.8 [177.8] kN	136.3 [148] kN	119.6 [129.9] kN
		19400 [21060] kgf	16700 [18130] kgf	13900 [15090] kgf	12200 [13250] kgf
		42770 [46440] lbf	36820 [39980] lbf	30640 [33270] lbf	26900 [29210] lbf

2) HX300 L LONG REACH

· 10.2 m (33' 6") BOOM

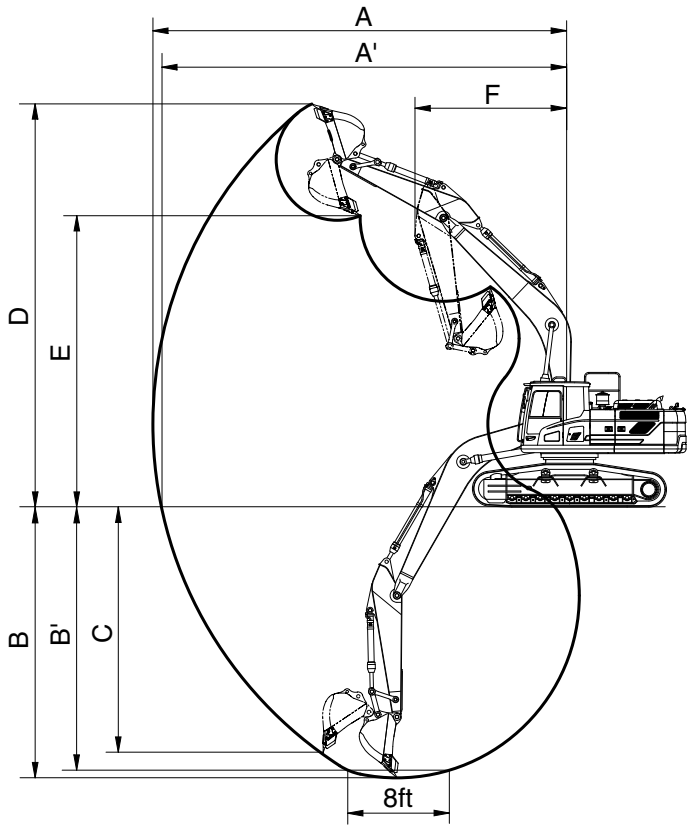


290F2SP07

Description		7.85 m (25' 9") Arm
Max digging reach	A	18510 (60' 9")
Max digging reach on ground	A'	18400 (60' 4")
Max digging depth	B	14820 (48' 7")
Max digging depth (8 ft level)	B'	14690 (48' 2")
Max vertical wall digging depth	C	12020 (39' 5")
Max digging height	D	14500 (47' 7")
Max dumping height	E	12190 (40' 0")
Min swing radius	F	6250 (20' 6")
Bucket digging force	SAE	70 kN
		7100 kgf
		15650 lbf
	ISO	80 kN
		8200 kgf
		18080 lbf
Arm crowd force	SAE	47.1 kN
		4800 kgf
		10580 lbf
	ISO	48.1 kN
		4900 kgf
		10800 lbf

3) HX300 L HIGH WALKER

· 6.25 m (20' 6") BOOM



290F2SP08

Description		2.10 m (6' 11") Arm	2.50 m (8' 2") Arm	3.05 m (10' 0") Arm	3.75 m (12' 4") Arm
Max digging reach	A	10020 mm (32' 10")	10280 mm (33 ' 9")	10790 mm (35' 5")	11400 mm (37' 5")
Max digging reach on ground	A'	9750 mm (32' 0")	10020 mm (32' 10")	10530 mm (34' 7")	11160 mm (36' 7")
Max digging depth	B	6140 mm (20' 2")	6540 mm (21' 5")	7090 mm (23' 3")	7790 mm (25' 7")
Max digging depth (8 ft level)	B'	5930 mm (19' 5")	6330 mm (20' 9")	6910 mm (22' 8")	7630 mm (25' 0")
Max vertical wall digging depth	C	5700 mm (18' 8")	5560 mm (18' 3")	6090 mm (20' 0")	6790 mm (22' 3")
Max digging height	D	10320 mm (33' 10")	10270 mm (33' 8")	10440 mm (34' 3")	10660 mm (35' 0")
Max dumping height	E	7240 mm (23' 9")	7170 mm (23' 6")	7400 mm (24' 3")	7610 mm (25' 0")
Min swing radius	F	4400 mm (14' 5")	4300 mm (14' 1")	4250 mm (13' 11")	4200 mm (13' 9")
Bucket digging force	SAE	168.7 [183.1] kN	168.7 [183.1] kN	168.7 [183.1] kN	168.7 [183.1] kN
		17200 [18670] kgf	17200 [18670] kgf	17200 [18670] kgf	17200 [18670] kgf
		37920 [41170] lbf	37920 [41170] lbf	37920 [41170] lbf	37920 [41170] lbf
	ISO	192.2 [208.7] kN	192.2 [208.7] kN	192.2 [208.7] kN	192.2 [208.7] kN
		19600 [21280] kgf	19600 [21280] kgf	19600 [21280] kgf	19600 [21280] kgf
		43210 [46910] lbf	43210 [46910] lbf	43210 [46910] lbf	43210 [46910] lbf
Arm digging force	SAE	180.4 [195.9] kN	156.9 [170.4] kN	131.4 [142.7] kN	114.7 [124.6] kN
		18400 [19980] kgf	16000 [17370] kgf	13400 [14550] kgf	11700 [12700] kgf
		40570 [44050] lbf	35270 [38290] lbf	29540 [32070] lbf	25790 [28000] lbf
	ISO	190.3 [206.6] kN	163.8 [177.8] kN	136.3 [148] kN	119.6 [129.9] kN
		19400 [21060] kgf	16700 [18130] kgf	13900 [15090] kgf	12200 [13250] kgf
		42770 [46440] lbf	36820 [39980] lbf	30640 [33270] lbf	26900 [29210] lbf

[ ] : Power boost

4. WEIGHT

1) HX300 L, HX300 NL

Item	HX300 L		HX300 NL	
	kg	lb	kg	lb
Upperstructure assembly				
· Main frame weld assembly	2720	6000	←	←
· Engine assembly	520	1150	←	←
· Aftertreatment assy	94	210	←	←
· Main pump assembly	140	310	←	←
· Main control valve assembly	220	490	←	←
· Swing motor assembly	350	770	←	←
· Hydraulic oil tank assembly	270	600	←	←
· Fuel tank assembly	235	520	←	←
· Counterweight	5200	11460	←	←
· Cab assembly	490	1080	←	←
Lower chassis assembly				
· Track frame weld assembly	3750	8270	3550	7830
· Swing bearing	435	960	←	←
· Travel motor assembly	360	790	←	←
· Turning joint	54	120	←	←
· Sprocket	83	180	←	←
· Track recoil spring	225	500	←	←
· Idler	260	570	←	←
· Carrier roller	35	80	←	←
· Track roller	56	120	←	←
· Track-chain assembly (600 mm standard triple grouser shoe)	1880	4150	←	←
Front attachment assembly				
· 6.25 m boom assembly	2280	5030	←	←
· 3.05 m arm assembly	1040	2290	←	←
· 1.27 m^3 SAE heaped bucket	1100	2430	←	←
· Boom cylinder assembly	270	600	←	←
· Arm cylinder assembly	360	790	←	←
· Bucket cylinder assembly	220	490	←	←
· Bucket control linkage total	110	240	←	←

※ This information is different with operating and transportation weight because it is not including harness, pipe, oil, fuel so on.

※ Refer to Transportation for actual weight information and Specifications for operating weight.

2) HX300 L LONG REACH

Item	HX300 L LONG REACH	
	kg	lb
Upperstructure assembly		
· Main frame weld assembly	2720	6000
· Engine assembly	520	1150
· Aftertreatment assy	94	210
· Main pump assembly	140	310
· Main control valve assembly	220	490
· Swing motor assembly	350	770
· Hydraulic oil tank assembly	270	600
· Fuel tank assembly	235	520
· Counterweight	7000	15450
· Cab assembly	490	1080
Lower chassis assembly		
· Track frame weld assembly	3750	8270
· Swing bearing	435	960
· Travel motor assembly	360	790
· Turning joint	54	120
· Sprocket	83	180
· Track recoil spring	225	500
· Idler	260	570
· Carrier roller	35	80
· Track roller	56	120
· Track-chain assembly (800 mm standard triple grouser shoe)	2350	5180
Front attachment assembly		
· 10.2 m boom assembly	2980	6570
· 7.85 m arm assembly	1340	2960
· 0.52 m^3 SAE heaped bucket	460	1010
· Boom cylinder assembly	270	600
· Arm cylinder assembly	360	790
· Bucket cylinder assembly	140	310
· Bucket control linkage total	110	240

※ This information is different with operating and transportation weight because it is not including harness, pipe, oil, fuel so on.

※ Refer to Transportation for actual weight information and Specifications for operating weight.

3) HX300 L HIGH WALKER

Item	HX300 L HIGH WALKER	
	kg	lb
Upperstructure assembly		
· Main frame weld assembly	2720	6000
· Engine assembly	520	1150
· Aftertreatment assy	94	210
· Main pump assembly	140	310
· Main control valve assembly	220	490
· Swing motor assembly	350	770
· Hydraulic oil tank assembly	270	600
· Fuel tank assembly	235	520
· Counterweight	5200	11460
· Cab assembly	490	1080
Lower chassis assembly		
· Track frame weld assembly	5825	12840
· Swing bearing	435	960
· Travel motor assembly	360	790
· Turning joint	54	120
· Sprocket	83	180
· Track recoil spring	225	500
· Idler	260	570
· Carrier roller	35	80
· Track roller	56	120
· Track-chain assembly (600 mm standard triple grouser shoe)	1880	4150
Front attachment assembly		
· 6.25 m boom assembly	2280	5030
· 3.05 m arm assembly	1040	2290
· 1.27 m^3 SAE heaped bucket	1100	2430
· Boom cylinder assembly	270	600
· Arm cylinder assembly	360	790
· Bucket cylinder assembly	220	490
· Bucket control linkage total	110	240

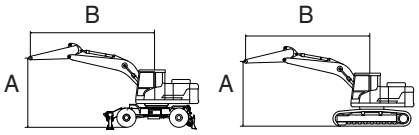
※ This information is different with operating and transportation weight because it is not including harness, pipe, oil, fuel so on.

※ Refer to Transportation for actual weight information and Specifications for operating weight.

5. LIFTING CAPACITIES

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3050	5200	600	-	-	-	-	-

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



Lift-point height (A)		Lift-point radius (B)												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5 m (24.6 ft)	kg													*4410	*4410	7.38
	lb													*9720	*9720	(24.2)
6.0 m (19.7 ft)	kg									*6490	5820			*4220	*4220	8.30
	lb									*14310	12830			*9300	*9300	(27.2)
4.5 m (14.8 ft)	kg					*9450	*9450	*7760	*7760	*6980	5650			*4210	*4210	8.86
	lb					*20830	*20830	*17110	*17110	*15390	12460			*9280	*9280	(29.1)
3.0 m (9.8 ft)	kg					*12510	11510	*9210	7550	*7720	5430	*5490	4080	*4350	3980	9.14
	lb					*27580	25380	*20300	16640	*17020	11970	*12100	8990	*9590	8770	(30.0)
1.5 m (4.9 ft)	kg					*14900	10740	*10550	7150	8220	5210	*6190	3990	*4640	3870	9.17
	lb					*32850	23680	*23260	15760	18120	11490	*13650	8800	*10230	8530	(30.1)
Ground Line	kg					*15940	10420	11290	6890	8050	5060			*5160	3960	8.94
	lb					*35140	22970	24890	15190	17750	11160			*11380	8730	(29.3)
-1.5 m (-4.9 ft)	kg	*7650	*7650	*11100	*11100	*15950	10360	11170	6790	7980	4990			*6050	4270	8.44
	lb	*16870	*16870	*24470	*24470	*35160	22840	24630	14970	17590	11000			*13340	9410	(27.7)
-3.0 m (-9.8 ft)	kg	*13100	*13100	*17910	*17910	*15100	10470	11230	6830	8060	5060			*7770	4970	7.61
	lb	*28880	*28880	*39480	*39480	*33290	23080	24760	15060	17770	11160			*17130	10960	(25.0)
-4.5 m (-14.8 ft)	kg			*18100	*18100	*13040	10770	*9550	7070					*8810	6620	6.32
	lb			*39900	*39900	*28750	23740	*21050	15590					*19420	14590	(20.7)

Note 1. Lifting capacity are based on SAE J1097 and ISO 10567.

2. Lifting capacity of the HX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.

3. The Lift-point is bucket pivot mounting pin on the arm (without bucket mass).

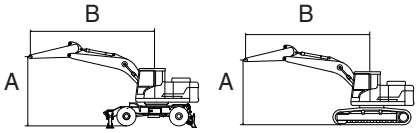
4. *Indicates load limited by hydraulic capacity.

※ Lifting capacities are based upon a standard machine conditions.
Lifting capacities will vary with different work tools, ground conditions and attachments.
The difference between the weight of a work tool attachment must be subtracted.
Consult your HD Hyundai Construction Equipment dealer regarding the lifting capacities for specific work tools and attachments.

⚠ Failure to comply to the rated load can cause possible personal injury or property damage.
Make adjustments to the rated load as necessory for non-standard configurations.

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2100	5200	600	-	-	-	-	-

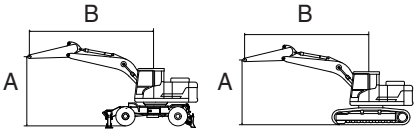
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
7.5 m (24.6 ft)	kg					*7670	*7670			*7890	7410	6.40
	lb					*16910	*16910			*17390	16340	(21.0)
6.0 m (19.7 ft)	kg					*7900	*7900			*7790	5740	7.44
	lb					*17420	*17420			*17170	12650	(24.4)
4.5 m (14.8 ft)	kg					*8950	7830	*7930	5580	7640	4950	8.06
	lb					*19730	17260	*17480	12300	16840	10910	(26.5)
3.0 m (9.8 ft)	kg					*10270	7420	8420	5400	7100	4570	8.37
	lb					*22640	16360	18560	11900	15650	10080	(27.5)
1.5 m (4.9 ft)	kg					*11350	7110	8240	5230	6970	4470	8.40
	lb					*25020	15670	18170	11530	15370	9850	(27.6)
Ground Line	kg					11340	6950	8130	5140	7230	4610	8.16
	lb					25000	15320	17920	11330	15940	10160	(26.8)
-1.5 m (-4.9 ft)	kg			*15530	10610	11330	6940	8170	5170	8030	5100	7.60
	lb			*34240	23390	24980	15300	18010	11400	17700	11240	(24.9)
-3.0 m (-9.8 ft)	kg	*18440	*18440	*14030	10810	*10600	7090			*9060	6220	6.66
	lb	*40650	*40650	*30930	23830	*23370	15630			*19970	13710	(21.9)
-4.5 m (-14.8 ft)	kg			*10580	*10580					*8760	*8760	5.12
	lb			*23320	*23320					*19310	*19310	(16.8)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2500	5200	600	-	-	-	-	-

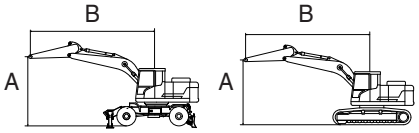
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
7.5 m (24.6 ft)	kg					*6980	*6980			*6760	*6760	6.74
	lb					*15390	*15390			*14900	*14900	(22.1)
6.0 m (19.7 ft)	kg					*7380	*7380	*7170	5740	*6440	5430	7.74
	lb					*16270	*16270	*15810	12650	*14200	11970	(25.4)
4.5 m (14.8 ft)	kg			*10660	*10660	*8470	7900	*7530	5610	*6420	4710	8.34
	lb			*23500	*23500	*18670	17420	*16600	12370	*14150	10380	(27.4)
3.0 m (9.8 ft)	kg			*13720	11240	*9850	7470	*8180	5410	*6640	4360	8.64
	lb			*30250	24780	*21720	16470	*18030	11930	*14640	9610	(28.3)
1.5 m (4.9 ft)	kg					*11040	7120	8230	5220	6640	4250	8.67
	lb					*24340	15700	18140	11510	14640	9370	(28.4)
Ground Line	kg			*16170	10470	11310	6920	8100	5100	6850	4360	8.43
	lb			*35650	23080	24930	15260	17860	11240	15100	9610	(27.7)
-1.5 m (-4.9 ft)	kg	*11150	*11150	*15780	10490	11260	6870	8080	5090	7530	4770	7.89
	lb	*24580	*24580	*34790	23130	24820	15150	17810	11220	16600	10520	(25.9)
-3.0 m (-9.8 ft)	kg	*19830	*19830	*14550	10660	*10980	6980			*9000	5700	6.99
	lb	*43720	*43720	*32080	23500	*24210	15390			*19840	12570	(22.9)
-4.5 m (-14.8 ft)	kg	*15970	*15970	*11820	11040					*9210	8150	5.55
	lb	*35210	*35210	*26060	24340					*20300	17970	(18.2)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3750	5200	600	-	-	-	-	-

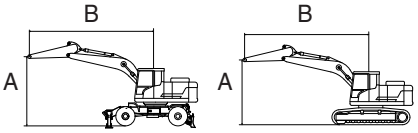
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5 m (24.6 ft)	kg									*5120	*5120			*3490	*3490	8.14
	lb									*11290	*11290			*7690	*7690	(26.7)
6.0 m (19.7 ft)	kg									*5700	*5700			*3370	*3370	8.97
	lb									*12570	*12570			*7430	*7430	(29.4)
4.5 m (14.8 ft)	kg							*6830	*6830	*6290	5730	*5230	4220	*3380	*3380	9.50
	lb							*15060	*15060	*13870	12630	*11530	9300	*7450	*7450	(31.2)
3.0 m (9.8 ft)	kg					*10960	*10960	*8340	7690	*7110	5480	6380	4100	*3490	*3490	9.76
	lb					*24160	*24160	*18390	16950	*15670	12080	14070	9040	*7690	*7690	(32.0)
1.5 m (4.9 ft)	kg					*13740	10950	*9850	7220	*7970	5220	6240	3970	*3720	3480	9.79
	lb					*30290	24140	*21720	15920	*17570	11510	13760	8750	*8200	7670	(32.1)
Ground Line	kg			*6810	*6810	*15380	10430	*10980	6890	8030	5030	6120	3860	*4110	3530	9.58
	lb			*15010	*15010	*33910	22990	*24210	15190	17700	11090	13490	8510	*9060	7780	(31.4)
-1.5 m (-4.9 ft)	kg	*7070	*7070	*10570	*10570	*15920	10250	11100	6720	7900	4910	*5710	3820	*4750	3760	9.11
	lb	*15590	*15590	*23300	*23300	*35100	22600	24470	14820	17420	10820	*12590	8420	*10470	8290	(29.9)
-3.0 m (-9.8 ft)	kg	*11090	*11090	*15460	*15460	*15540	10270	11080	6690	7900	4910			*5900	4270	8.35
	lb	*24450	*24450	*34080	*34080	*34260	22640	24430	14750	17420	10820			*13010	9410	(27.4)
-4.5 m (-14.8 ft)	kg	*15990	*15990	*20280	*20280	*14140	10480	*10510	6830					*8250	5350	7.19
	lb	*35250	*35250	*44710	*44710	*31170	23100	*23170	15060					*18190	11790	(23.6)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	Long reach	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		10200	7850	7000	800	-	-	-	-	-

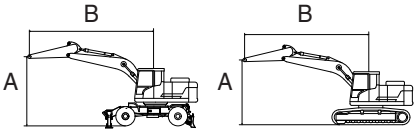
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)																						At max. reach		
		-0.5 m (-1.6 ft)		1.0 m (3.3 ft)		2.5m (8.2ft)		4.0m (13.1ft)		5.5m (18.0ft)		7.0m (23.0ft)		8.5m (27.9ft)		10.0m (32.8ft)		11.5m (37.7ft)		13.0m (42.7ft)		14.5m (47.6ft)		16.0m (52.5ft)		Capacity		Reach
12.4 m	kg																							*780	*780	13.80
40.7 ft	lb																							*1720	*1720	(45.3)
10.9 m	kg																					*940	*940			*750	*750	14.82
35.8 ft	lb																					*2070	*2070			*1650	*1650	(48.6)
9.4 m	kg																					*1270	*1270			*730	*730	15.63
30.8 ft	lb																					*2800	*2800			*1610	*1610	(51.3)
7.9 m	kg																			*1740	*1740	*1500	*1500	*900	*900	*720	*720	16.25
25.9 ft	lb																			*3840	*3840	*3310	*3310	*1980	*1980	*1590	*1590	(53.3)
6.4 m	kg																			*1940	*1940	*1700	*1700	*1190	*1190	*730	*730	16.72
21.0 ft	lb																			*4280	*4280	*3750	*3750	*2620	*2620	*1610	*1610	(54.9)
4.9 m	kg																	*2390	*2390	*2200	*2200	*1910	*1910	*1400	*1400	*750	*750	17.04
16.1 ft	lb																	*5270	*5270	*4850	*4850	*4210	*4210	*3090	*3090	*1650	*1650	(55.9)
3.4 m	kg													*3960	*3960	*3400	*3400	*2950	*2950	*2570	*2570	*2160	*2160	*1590	*1590	*770	*770	17.23
11.2 ft	lb													*8730	*8730	*7500	*7500	*6500	*6500	*5670	*5670	*4760	*4760	*3510	*3510	*1700	*1700	(56.5)
1.9 m	kg							*3290	*3290	*7670	*7670	*5730	*5730	*4660	*4660	*3990	*3990	*3550	3270	*3070	2680	*2440	2220	*1740	*1740	*820	*820	17.28
6.2 ft	lb							*7250	*7250	*16910	*16910	*12630	*12630	*10270	*10270	*8800	*8800	*7830	7210	*6770	5910	*5380	4890	*3840	*3840	*1810	*1810	(56.7)
0.4 m	kg							*2340	*2340	*5890	*5890	*6680	6100	*5310	4730	*4450	3780	*3890	3080	*3490	2550	*2760	2120	*1850	1780	*870	*870	17.20
1.3 ft	lb							*5160	*5160	*12990	*12990	*14730	13450	*11710	10430	*9810	8330	*8580	6790	*7690	5620	*6080	4670	*4080	3920	*1920	*1920	(56.4)
-1.1 m	kg			*1200	*1200	*1430	*1430	*2500	*2500	*4840	*4840	*7420	5680	*5860	4420	*4870	3550	*4200	2920	*3720	2430	*3050	2040	*1880	1720	*950	*950	16.98
-3.6 ft	lb			*2650	*2650	*3150	*3150	*5510	*5510	*10670	*10670	*16360	12520	*12920	9740	*10740	7830	*9260	6440	*8200	5360	*6720	4500	*4140	3790	*2090	*2090	(55.7)
-2.6 m	kg			*1780	*1780	*2070	*2070	*2980	*2980	*4860	*4860	*7950	5400	*6290	4190	*5210	3380	*4460	2790	3810	2330	*3240	1970	*1750	1680	*1050	*1050	16.63
-8.5 ft	lb			*3920	*3920	*4560	*4560	*6570	*6570	*10710	*10710	*17530	11900	*13870	9240	*11490	7450	*9830	6150	8400	5140	*7140	4340	*3860	3700	*2310	*2310	(54.6)
-4.1 m	kg	*2400	*2400	*2390	*2390	*2750	*2750	*3620	*3620	*5330	*5330	*8260	5250	*6590	4060	5370	3260	4430	2690	3740	2260	3210	1930	*1350	*1350	*1180	*1180	16.12
-13.5 ft	lb	*5290	*5290	*5270	*5270	*6060	*6060	*7980	*7980	*11750	*11750	*18210	11570	*14530	8950	11840	7190	9770	5930	8250	4980	7080	4250	*2980	*2980	*2600	*2600	(52.9)
-5.6 m	kg	*2930	*2930	*3040	*3040	*3470	*3470	*4380	*4380	*6070	*6070	*8390	5190	6640	3990	5300	3200	4380	2640	3700	2230	*2790	1910			*1360	*1360	15.46
-18.4 ft	lb	*6460	*6460	*6700	*6700	*7650	*7650	*9660	*9660	*13380	*13380	*18500	11440	14640	8800	11680	7050	9660	5820	8160	4920	*6150	4210			*3000	*3000	(50.7)
-7.1 m	kg	*3510	*3510	*3740	*3740	*4270	*4270	*5260	*5260	*7080	*7080	*8340	5210	6640	3980	5290	3190	4370	2640	3710	2230	*1810	*1810			*1620	*1620	14.61
-23.3 ft	lb	*7740	*7740	*8250	*8250	*9410	*9410	*11600	*11600	*15610	*15610	*18390	11490	14640	8770	11660	7030	9630	5820	8180	4920	*3990	*3990			*3570	*3570	(47.9)
-8.6 m	kg			*4500	*4500	*5160	*5160	*6320	*6320	*8410	7540	*8090	5300	*6590	4040	5330	3230	4410	2680	*3260	2290					*2030	*2030	13.53
-28.2 ft	lb			*9920	*9920	*11380	*11380	*13930	*13930	*18540	16620	*17840	11680	*14530	8910	11750	7120	9720	5910	*7190	5050					*4480	*4480	(44.4)
-10.1 m	kg			*5360	*5360	*6190	*6190	*7620	*7620	*9570	7770	*7590	5460	*6220	4160	*5180	3330	*4330	2780							*2750	2600	12.18
-33.1 ft	lb			*11820	*11820	*13650	*13650	*16800	*16800	*21100	17130	*16730	12040	*13710	9170	*11420	7340	*9550	6130							*6060	5730	(40.0)
-11.6 m	kg					*7430	*7430	*9330	*9330	*8440	8110	*6740	5700	*5510	4360	*4480	3520									*4200	3350	10.44
-38.1 ft	lb					*16380	*16380	*20570	*20570	*18610	17880	*14860	12570	*12150	9610	*9880	7760									*9260	7390	(34.2)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	2-PIECE BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2100	7500	600	-	-	-	-	-

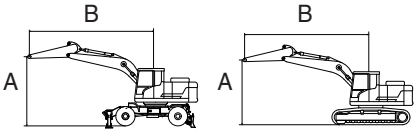
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg			*12270	*12270							*11940	*11940	4.58
	lb			*27050	*27050							*26320	*26320	(15.0)
7.5 m (24.6 ft)	kg			*11390	*11390	*9440	*9440					*9270	8880	6.35
	lb			*25110	*25110	*20810	*20810					*20440	19580	(20.8)
6.0 m (19.7 ft)	kg			*12450	*12450	*9540	*9540					*8140	6890	7.41
	lb			*27450	*27450	*21030	*21030					*17950	15190	(24.3)
4.5 m (14.8 ft)	kg					*10460	9350	*8100	6690			*7640	5960	8.05
	lb					*23060	20610	*17860	14750			*16840	13140	(26.4)
3.0 m (9.8 ft)	kg					*12000	8910	*8540	6510			*7520	5520	8.38
	lb					*26460	19640	*18830	14350			*16580	12170	(27.5)
1.5 m (4.9 ft)	kg					13540	8580	*9090	6340			*7690	5410	8.42
	lb					29850	18920	*20040	13980			*16950	11930	(27.6)
Ground Line	kg					13360	8410	*9510	6240			*8200	5580	8.19
	lb					29450	18540	*20970	13760			*18080	12300	(26.9)
-1.5 m (-4.9 ft)	kg			*14820	12810	*11970	8410	*8830	6280			*8300	6140	7.66
	lb			*32670	28240	*26390	18540	*19470	13850			*18300	13540	(25.1)
-3.0 m (-9.8 ft)	kg					*9040	8590							
	lb					*19930	18940							

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	2-PIECE BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2500	7500	600	-	-	-	-	-

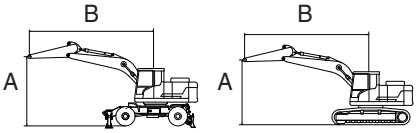
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg lb			*9800 *21610	*9800 *21610							*9000 *19840	*9000 *19840	5.09 (16.7)
7.5 m (24.6 ft)	kg lb			*9870 *21760	*9870 *21760	*8870 *19550	*8870 *19550					*7750 *17090	*7750 *17090	6.73 (22.1)
6.0 m (19.7 ft)	kg lb	*11920 *26280	*11920 *26280	*11130 *24540	*11130 *24540	*9100 *20060	*9100 *20060	*7570 *16690	6860 15120			*7290 *16070	6500 14330	7.73 (25.4)
4.5 m (14.8 ft)	kg lb			*14530 *32030	*14530 *32030	*9990 *22020	9430 20790	*7780 *17150	6730 14840			*7040 *15520	5670 12500	8.35 (27.4)
3.0 m (9.8 ft)	kg lb					*11470 *25290	8970 19780	*8260 *18210	6520 14370			*6960 *15340	5260 11600	8.67 (28.4)
1.5 m (4.9 ft)	kg lb					*13240 *29190	8590 18940	*8850 *19510	6330 13960			*7140 *15740	5140 11330	8.71 (28.6)
Ground Line	kg lb			*17730 *39090	12640 27870	13330 29390	8380 18470	*9350 *20610	6200 13670			*7460 *16450	5270 11620	8.48 (27.8)
-1.5 m (-4.9 ft)	kg lb			*15730 *34680	12680 27950	*12400 *27340	8340 18390	*9480 *20900	6190 13650			*8400 *18520	5750 12680	7.97 (26.1)
-3.0 m (-9.8 ft)	kg lb			*12570 *27710	*12570 *27710	*9980 *22000	8460 18650					*7450 *16420	6810 15010	7.10 (23.3)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	2-PIECE BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3050	7500	600	-	-	-	-	-

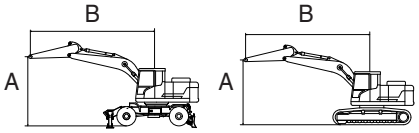
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg			*8820	*8820	*5960	*5960					*5620	*5620	6.06
	lb			*19440	*19440	*13140	*13140					*12390	*12390	(19.9)
7.5 m (24.6 ft)	kg			*8660	*8660	*8280	*8280					*4990	*4990	7.46
	lb			*19090	*19090	*18250	*18250					*11000	*11000	(24.5)
6.0 m (19.7 ft)	kg			*9630	*9630	*8600	*8600	*7100	6940			*4740	*4740	8.37
	lb			*21230	*21230	*18960	*18960	*15650	15300			*10450	*10450	(27.5)
4.5 m (14.8 ft)	kg			*13240	*13240	*9450	*9450	*7410	6770			*4690	*4690	8.93
	lb			*29190	*29190	*20830	*20830	*16340	14930			*10340	*10340	(29.3)
3.0 m (9.8 ft)	kg			*17310	13700	*10880	9020	*7930	6530	*6360	4950	*4810	4770	9.21
	lb			*38160	30200	*23990	19890	*17480	14400	*14020	10910	*10600	10520	(30.2)
1.5 m (4.9 ft)	kg			*18670	12890	*12670	8590	*8570	6300	*6580	4850	*5090	4670	9.24
	lb			*41160	28420	*27930	18940	*18890	13890	*14510	10690	*11220	10300	(30.3)
Ground Line	kg			*18290	12560	13280	8330	*9140	6140	*5760	4800	*5590	4790	9.01
	lb			*40320	27690	29280	18360	*20150	13540	*12700	10580	*12320	10560	(29.6)
-1.5 m (-4.9 ft)	kg	*12160	*12160	*16670	12520	*12820	8230	9440	6080			*6450	5170	8.51
	lb	*26810	*26810	*36750	27600	*28260	18140	20810	13400			*14220	11400	(27.9)
-3.0 m (-9.8 ft)	kg			*13870	12670	*10860	8300	*7840	6180			*7310	6000	7.69
	lb			*30580	27930	*23940	18300	*17280	13620			*16120	13230	(25.2)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 NL	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2100	5200	600	-	-	-	-	-

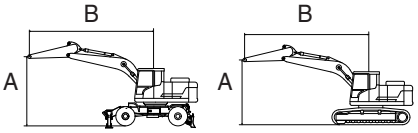
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
7.5 m (24.6 ft)	kg					*7690	7600			*7920	6780	6.40
	lb					*16950	16760			*17460	14950	(21.0)
6.0 m (19.7 ft)	kg					*7930	7480			*7810	5250	7.44
	lb					*17480	16490			*17220	11570	(24.4)
4.5 m (14.8 ft)	kg					*8980	7140	*7950	5100	7610	4520	8.06
	lb					*19800	15740	*17530	11240	16780	9960	(26.5)
3.0 m (9.8 ft)	kg					*10300	6750	8380	4930	7070	4170	8.37
	lb					*22710	14880	18470	10870	15590	9190	(27.5)
1.5 m (4.9 ft)	kg					*11390	6450	8200	4770	6940	4070	8.40
	lb					*25110	14220	18080	10520	15300	8970	(27.6)
Ground Line	kg					11290	6300	8100	4680	7200	4200	8.16
	lb					24890	13890	17860	10320	15870	9260	(26.8)
-1.5 m (-4.9 ft)	kg			*15560	9510	11280	6290	8130	4710	7990	4640	7.60
	lb			*34300	20970	24870	13870	17920	10380	17610	10230	(24.9)
-3.0 m (-9.8 ft)	kg	*18480	*18480	*14060	9700	*10630	6430			*9090	5650	6.66
	lb	*40740	*40740	*31000	21380	*23440	14180			*20040	12460	(21.9)
-4.5 m (-14.8 ft)	kg			*10610	10150					*8790	8490	5.12
	lb			*23390	22380					*19380	18720	(16.8)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 NL	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2500	5200	600	-	-	-	-	-

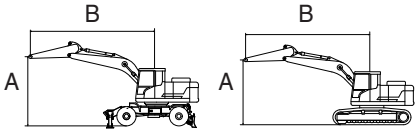
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
7.5 m (24.6 ft)	kg					*7020	*7020			*6800	6430	6.67
	lb					*15480	*15480			*14990	14180	(21.9)
6.0 m (19.7 ft)	kg					*7360	*7360	*7200	5260	*6460	5040	7.68
	lb					*16230	*16230	*15870	11600	*14240	11110	(25.2)
4.5 m (14.8 ft)	kg			*10530	*10530	*8420	7240	*7520	5150	*6430	4350	8.30
	lb			*23210	*23210	*18560	15960	*16580	11350	*14180	9590	(27.2)
3.0 m (9.8 ft)	kg			*13560	10180	*9790	6830	*8170	4950	*6650	4010	8.61
	lb			*29890	22440	*21580	15060	*18010	10910	*14660	8840	(28.3)
1.5 m (4.9 ft)	kg					*10990	6480	8210	4770	6640	3890	8.65
	lb					*24230	14290	18100	10520	14640	8580	(28.4)
Ground Line	kg			*16130	9400	11280	6280	8080	4650	6840	3980	8.42
	lb			*35560	20720	24870	13850	17810	10250	15080	8770	(27.6)
-1.5 m (-4.9 ft)	kg	*10890	*10890	*15780	9410	11220	6230	8050	4630	7490	4340	7.90
	lb	*24010	*24010	*34790	20750	24740	13730	17750	10210	16510	9570	(25.9)
-3.0 m (-9.8 ft)	kg	*19890	18990	*14600	9570	*11030	6320			8990	5170	7.02
	lb	*43850	41870	*32190	21100	*24320	13930			19820	11400	(23.0)
-4.5 m (-14.8 ft)	kg	*16160	*16160	*11970	9920					*9240	7290	5.60
	lb	*35630	*35630	*26390	21870					*20370	16070	(18.4)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 NL	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3050	5200	600	-	-	-	-	-

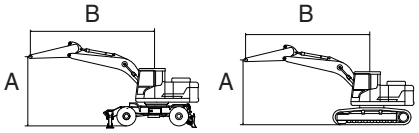
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5 m	kg													*4420	*4420	7.38
(24.6 ft)	lb													*9740	*9740	(24.2)
6.0 m	kg									*6510	5330			*4230	*4230	8.30
(19.7 ft)	lb									*14350	11750			*9330	*9330	(27.2)
4.5 m	kg					*9480	*9480	*7790	7320	*7010	5170			*4220	3910	8.86
(14.8 ft)	lb					*20900	*20900	*17170	16140	*15450	11400			*9300	8620	(29.1)
3.0 m	kg					*12540	10370	*9240	6870	*7750	4950	*5510	3720	*4360	3620	9.14
(9.8 ft)	lb					*27650	22860	*20370	15150	*17090	10910	*12150	8200	*9610	7980	(30.0)
1.5 m	kg					*14940	9640	*10580	6480	8190	4740	*6210	3630	*4660	3520	9.17
(4.9 ft)	lb					*32940	21250	*23320	14290	18060	10450	*13690	8000	*10270	7760	(30.1)
Ground	kg					*15980	9320	11240	6230	8020	4590			*5180	3600	8.94
Line	lb					*35230	20550	24780	13730	17680	10120			*11420	7940	(29.3)
-1.5 m	kg	*7670	*7670	*11120	*11120	*15990	9270	11120	6130	7950	4530			*6070	3880	8.44
(-4.9 ft)	lb	*16910	*16910	*24520	*24520	*35250	20440	24520	13510	17530	9990			*13380	8550	(27.7)
-3.0 m	kg	*13120	*13120	*17920	*17920	*15130	9370	11170	6180	8030	4600			*7790	4520	7.61
(-9.8 ft)	lb	*28920	*28920	*39510	*39510	*33360	20660	24630	13620	17700	10140			*17170	9960	(25.0)
-4.5 m	kg			*18140	*18140	*13070	9660	*9580	6410					*8830	6000	6.32
(-14.8 ft)	lb			*39990	*39990	*28810	21300	*21120	14130					*19470	13230	(20.7)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 NL	MONO BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3750	5200	600	-	-	-	-	-

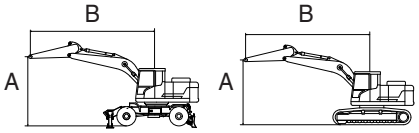
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5 m	kg									*5040	*5040			*3520	*3520	8.08
(24.6 ft)	lb									*11110	*11110			*7760	*7760	(26.5)
6.0 m	kg									*5710	5450			*3390	*3390	8.93
(19.7 ft)	lb									*12590	12020			*7470	*7470	(29.3)
4.5 m	kg							*6790	*6790	*6280	5270	*5140	3870	*3390	*3390	9.46
(14.8 ft)	lb							*14970	*14970	*13850	11620	*11330	8530	*7470	*7470	(31.0)
3.0 m	kg					*10810	10800	*8290	7040	*7090	5020	6370	3750	*3500	3270	9.74
(9.8 ft)	lb					*23830	23810	*18280	15520	*15630	11070	14040	8270	*7720	7210	(31.9)
1.5 m	kg					*13610	9890	*9790	6580	*7940	4770	6230	3620	*3730	3180	9.77
(4.9 ft)	lb					*30000	21800	*21580	14510	*17500	10520	13730	7980	*8220	7010	(32.1)
Ground	kg			*6790	*6790	*15290	9370	*10930	6250	8010	4580	6110	3520	*4110	3210	9.57
Line	lb			*14970	*14970	*33710	20660	*24100	13780	17660	10100	13470	7760	*9060	7080	(31.4)
-1.5 m	kg	*6950	*6950	*10490	*10490	*15870	9180	11070	6080	7880	4460	*5730	3470	*4740	3420	9.11
(-4.9 ft)	lb	*15320	*15320	*23130	*23130	*34990	20240	24410	13400	17370	9830	*12630	7650	*10450	7540	(29.9)
-3.0 m	kg	*10970	*10970	*15340	*15340	*15540	9190	11040	6050	7870	4450			*5860	3870	8.36
(-9.8 ft)	lb	*24180	*24180	*33820	*33820	*34260	20260	24340	13340	17350	9810			*12920	8530	(27.4)
-4.5 m	kg	*15830	*15830	*20350	18580	*14200	9380	*10570	6170					*8250	4830	7.22
(-14.8 ft)	lb	*34900	*34900	*44860	40960	*31310	20680	*23300	13600					*18190	10650	(23.7)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 NL	2-PIECE BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2100	7500	600	-	-	-	-	-

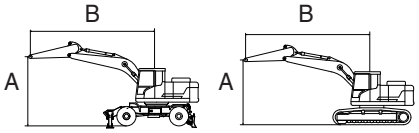
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg			*12270	*12270							*11940	*11940	4.58
	lb			*27050	*27050							*26320	*26320	(15.0)
7.5 m (24.6 ft)	kg			*11390	*11390	*9440	9020					*9270	8160	6.35
	lb			*25110	*25110	*20810	19890					*20440	17990	(20.8)
6.0 m (19.7 ft)	kg			*12450	*12450	*9540	8920					*8140	6330	7.41
	lb			*27450	*27450	*21030	19670					*17950	13960	(24.3)
4.5 m (14.8 ft)	kg					*10460	8560	*8100	6140			*7640	5470	8.05
	lb					*23060	18870	*17860	13540			*16840	12060	(26.4)
3.0 m (9.8 ft)	kg					*12000	8130	*8540	5960			*7520	5060	8.38
	lb					*26460	17920	*18830	13140			*16580	11160	(27.5)
1.5 m (4.9 ft)	kg					13470	7810	*9090	5790			*7690	4940	8.42
	lb					29700	17220	*20040	12760			*16950	10890	(27.6)
Ground Line	kg					13280	7650	*9510	5700			*8200	5100	8.19
	lb					29280	16870	*20970	12570			*18080	11240	(26.9)
-1.5 m (-4.9 ft)	kg			*14820	11540	*11970	7650	*8830	5740			*8300	5610	7.66
	lb			*32670	25440	*26390	16870	*19470	12650			*18300	12370	(25.1)
-3.0 m (-9.8 ft)	kg					*9040	7820							
	lb					*19930	17240							

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 NL	2-PIECE BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2500	7500	600	-	-	-	-	-

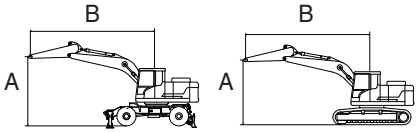
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg			*9800	*9800							*9000	*9000	5.09
	lb			*21610	*21610							*19840	*19840	(16.7)
7.5 m (24.6 ft)	kg			*9870	*9870	*8870	*8870					*7750	7540	6.73
	lb			*21760	*21760	*19550	*19550					*17090	16620	(22.1)
6.0 m (19.7 ft)	kg	*11920	*11920	*11130	*11130	*9100	9010	*7570	6300			*7290	5970	7.73
	lb	*26280	*26280	*24540	*24540	*20060	19860	*16690	13890			*16070	13160	(25.4)
4.5 m (14.8 ft)	kg			*14530	13250	*9990	8640	*7780	6180			*7040	5200	8.35
	lb			*32030	29210	*22020	19050	*17150	13620			*15520	11460	(27.4)
3.0 m (9.8 ft)	kg					*11470	8190	*8260	5970			*6960	4810	8.67
	lb					*25290	18060	*18210	13160			*15340	10600	(28.4)
1.5 m (4.9 ft)	kg					*13240	7820	*8850	5780			*7140	4690	8.71
	lb					*29190	17240	*19510	12740			*15740	10340	(28.6)
Ground Line	kg			*17730	11370	13250	7610	*9350	5660			*7460	4820	8.48
	lb			*39090	25070	29210	16780	*20610	12480			*16450	10630	(27.8)
-1.5 m (-4.9 ft)	kg			*15730	11410	*12400	7570	*9480	5650			*8400	5250	7.97
	lb			*34680	25150	*27340	16690	*20900	12460			*18520	11570	(26.1)
-3.0 m (-9.8 ft)	kg			*12570	11610	*9980	7690					*7450	6220	7.10
	lb			*27710	25600	*22000	16950					*16420	13710	(23.3)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 NL	2-PIECE BOOM	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3050	7500	600	-	-	-	-	-

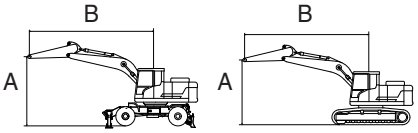
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)										At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
														m (ft)
9.0 m (29.5 ft)	kg			*8820	*8820	*5960	*5960					*5620	*5620	6.06
	lb			*19440	*19440	*13140	*13140					*12390	*12390	(19.9)
7.5 m (24.6 ft)	kg			*8660	*8660	*8280	*8280					*4990	*4990	7.46
	lb			*19090	*19090	*18250	*18250					*11000	*11000	(24.5)
6.0 m (19.7 ft)	kg			*9630	*9630	*8600	*8600	*7100	6380			*4740	*4740	8.37
	lb			*21230	*21230	*18960	*18960	*15650	14070			*10450	*10450	(27.5)
4.5 m (14.8 ft)	kg			*13240	*13240	*9450	8720	*7410	6210			*4690	4670	8.93
	lb			*29190	*29190	*20830	19220	*16340	13690			*10340	10300	(29.3)
3.0 m (9.8 ft)	kg			*17310	12390	*10880	8240	*7930	5970	*6360	4530	*4810	4360	9.21
	lb			*38160	27320	*23990	18170	*17480	13160	*14020	9990	*10600	9610	(30.2)
1.5 m (4.9 ft)	kg			*18670	11600	*12670	7820	*8570	5750	*6580	4430	*5090	4270	9.24
	lb			*41160	25570	*27930	17240	*18890	12680	*14510	9770	*11220	9410	(30.3)
Ground Line	kg			*18290	11290	13200	7560	*9140	5590	*5760	4370	*5590	4370	9.01
	lb			*40320	24890	29100	16670	*20150	12320	*12700	9630	*12320	9630	(29.6)
-1.5 m (-4.9 ft)	kg	*12160	*12160	*16670	11250	*12820	7470	9380	5540			*6450	4710	8.51
	lb	*26810	*26810	*36750	24800	*28260	16470	20680	12210			*14220	10380	(27.9)
-3.0 m (-9.8 ft)	kg			*13870	11400	*10860	7540	*7840	5630			*7310	5470	7.69
	lb			*30580	25130	*23940	16620	*17280	12410			*16120	12060	(25.2)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	High walker	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2100	5200	600	-	-	-	-	-

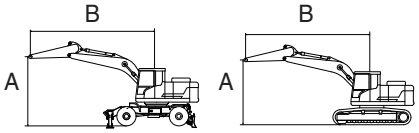
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
7.5 m (24.6 ft)	kg					*7620	*7620			*7860	*7860	6.56
	lb					*16800	*16800			*17330	*17330	(21.5)
6.0 m (19.7 ft)	kg					*8010	*8010	*7770	6890	*7790	6850	7.53
	lb					*17660	*17660	*17130	15190	*17170	15100	(24.7)
4.5 m (14.8 ft)	kg					*9110	*9110	*7990	6790	*7880	6010	8.11
	lb					*20080	*20080	*17610	14970	*17370	13250	(26.6)
3.0 m (9.8 ft)	kg					*10410	9090	*8570	6610	7930	5620	8.38
	lb					*22950	20040	*18890	14570	17480	12390	(27.5)
1.5 m (4.9 ft)	kg					*11420	8790	*9110	6450	7860	5550	8.37
	lb					*25180	19380	*20080	14220	17330	12240	(27.4)
Ground Line	kg					*11860	8650	9120	6370	8230	5790	8.08
	lb					*26150	19070	20110	14040	18140	12760	(26.5)
-1.5 m (-4.9 ft)	kg			*15320	13370	*11600	8660			*8890	6470	7.47
	lb			*33770	29480	*25570	19090			*19600	14260	(24.5)
-3.0 m (-9.8 ft)	kg	*17960	*17960	*13650	13610	*10240	8850			*9070	8030	6.47
	lb	*39590	*39590	*30090	30000	*22580	19510			*20000	17700	(21.2)
-4.5 m (-14.8 ft)	kg			*9580	*9580							
	lb			*21120	*21120							

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	High walker	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	2500	5200	600	-	-	-	-	-

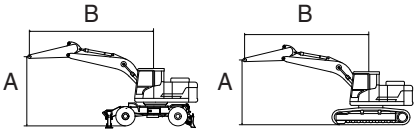
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)								At max. reach		
		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		Capacity		Reach
												m (ft)
7.5 m (24.6 ft)	kg					*6980	*6980			*6690	*6690	6.89
	lb					*15390	*15390			*14750	*14750	(22.6)
6.0 m (19.7 ft)	kg					*7490	*7490	*7190	6970	*6420	*6420	7.82
	lb					*16510	*16510	*15850	15370	*14150	*14150	(25.7)
4.5 m (14.8 ft)	kg			*11050	*11050	*8640	*8640	*7600	6830	*6440	5730	8.38
	lb			*24360	*24360	*19050	*19050	*16760	15060	*14200	12630	(27.5)
3.0 m (9.8 ft)	kg					*10000	9140	*8270	6620	*6700	5360	8.64
	lb					*22050	20150	*18230	14590	*14770	11820	(28.3)
1.5 m (4.9 ft)	kg			*13480	13350	*11140	8800	*8890	6440	*7230	5290	8.63
	lb			*29720	29430	*24560	19400	*19600	14200	*15940	11660	(28.3)
Ground Line	kg			*16080	13200	*11730	8620	9070	6330	7800	5480	8.35
	lb			*35450	29100	*25860	19000	20000	13960	17200	12080	(27.4)
-1.5 m (-4.9 ft)	kg	*12560	*12560	*15600	13250	*11680	8590	9080	6330	8650	6060	7.77
	lb	*27690	*27690	*34390	29210	*25750	18940	20020	13960	19070	13360	(25.5)
-3.0 m (-9.8 ft)	kg	*19340	*19340	*14230	13450	*10720	8720			*9050	7360	6.81
	lb	*42640	*42640	*31370	29650	*23630	19220			*19950	16230	(22.3)
-4.5 m (-14.8 ft)	kg	*15100	*15100	*11130	*11130					*9180	*9180	5.26
	lb	*33290	*33290	*24540	*24540					*20240	*20240	(17.2)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	High walker	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3050	5200	600	-	-	-	-	-

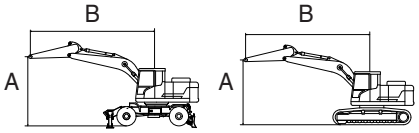
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
																m (ft)
7.5 m	kg									*4470	*4470			*4360	*4360	7.52
(24.6 ft)	lb									*9850	*9850			*9610	*9610	(24.7)
6.0 m	kg									*6530	*6530			*4210	*4210	8.38
(19.7 ft)	lb									*14400	*14400			*9280	*9280	(27.5)
4.5 m	kg					*9830	*9830	*7940	*7940	*7070	6870			*4220	*4220	8.90
(14.8 ft)	lb					*21670	*21670	*17500	*17500	*15590	15150			*9300	*9300	(29.2)
3.0 m	kg					*12850	*12850	*9390	9210	*7820	6640	*5540	5040	*4380	*4380	9.14
(9.8 ft)	lb					*28330	*28330	*20700	20300	*17240	14640	*12210	11110	*9660	*9660	(30.0)
1.5 m	kg					*15040	13430	*10670	8820	*8550	6420	*5980	4940	*4700	*4700	9.13
(4.9 ft)	lb					*33160	29610	*23520	19440	*18850	14150	*13180	10890	*10360	*10360	(30.0)
Ground	kg					*15910	13140	*11480	8580	9020	6280			*5260	4980	8.87
Line	lb					*35080	28970	*25310	18920	19890	13850			*11600	10980	(29.1)
-1.5 m	kg	*8460	*8460	*12060	*12060	*15810	13110	*11680	8500	8970	6230			*6230	5430	8.33
(-4.9 ft)	lb	*18650	*18650	*26590	*26590	*34860	28900	*25750	18740	19780	13730			*13730	11970	(27.3)
-3.0 m	kg	*13970	*13970	*19190	*19190	*14830	13250	*11120	8560					*8140	6400	7.44
(-9.8 ft)	lb	*30800	*30800	*42310	*42310	*32690	29210	*24520	18870					*17950	14110	(24.4)
-4.5 m	kg			*17350	*17350	*12530	*12530	*8990	8860					*8840	8750	6.06
(-14.8 ft)	lb			*38250	*38250	*27620	*27620	*19820	19530					*19490	19290	(19.9)

Model	Type	Boom	Arm	Counterweight	Shoe	Wheel	Dozer		Outrigger	
HX300 L	High walker	Length [mm]	Length [mm]	weight [kg]	width [mm]	width [mm]	Front	Rear	Front	Rear
		6250	3750	5200	600	-	-	-	-	-

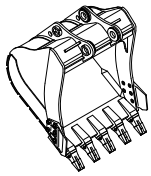
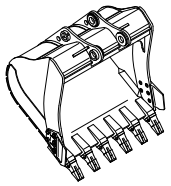
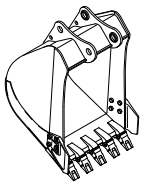
· : Rating over-front · : Rating over-side or 360 degree



Lift-point height (A)		Lift-point radius (B)												At max. reach		
		1.5 m (4.9 ft)		3.0 m (9.8 ft)		4.5 m (14.8 ft)		6.0 m (19.7 ft)		7.5 m (24.6 ft)		9.0 m (29.5 ft)		Capacity		Reach
7.5 m (24.6 ft)	kg									*5310	*5310			*3470	*3470	8.26
	lb									*11710	*11710			*7650	*7650	(27.1)
6.0 m (19.7 ft)	kg									*5760	*5760	*3580	*3580	*3360	*3360	9.05
	lb									*12700	*12700	*7890	*7890	*7410	*7410	(29.7)
4.5 m (14.8 ft)	kg							*7020	*7020	*6390	*6390	*5370	5180	*3380	*3380	9.53
	lb							*15480	*15480	*14090	*14090	*11840	11420	*7450	*7450	(31.3)
3.0 m (9.8 ft)	kg					*11350	*11350	*8550	*8550	*7220	6690	*6530	5050	*3510	*3510	9.76
	lb					*25020	*25020	*18850	*18850	*15920	14750	*14400	11130	*7740	*7740	(32.0)
1.5 m (4.9 ft)	kg					*13980	13630	*10000	8890	*8060	6430	*6990	4920	*3760	*3760	9.75
	lb					*30820	30050	*22050	19600	*17770	14180	*15410	10850	*8290	*8290	(32.0)
Ground Line	kg			*7380	*7380	*15440	13140	*11060	8570	*8730	6240	6890	4820	*4180	*4180	9.51
	lb			*16270	*16270	*34040	28970	*24380	18890	*19250	13760	15190	10630	*9220	*9220	(31.2)
-1.5 m (-4.9 ft)	kg	*7640	*7640	*11270	*11270	*15840	12980	*11550	8410	8880	6140	*4870	4790	*4870	4790	9.00
	lb	*16840	*16840	*24850	*24850	*34920	28620	*25460	18540	19580	13540	*10740	10560	*10740	10560	(29.5)
-3.0 m (-9.8 ft)	kg	*11750	*11750	*16400	*16400	*15340	13030	*11380	8410	*8830	6150			*6140	5490	8.19
	lb	*25900	*25900	*36160	*36160	*33820	28730	*25090	18540	*19470	13560			*13540	12100	(26.9)
-4.5 m (-14.8 ft)	kg	*16870	*16870	*19650	*19650	*13760	13280	*10210	8580					*8320	7000	6.96
	lb	*37190	*37190	*43320	*43320	*30340	29280	*22510	18920					*18340	15430	(22.8)

6. BUCKET SELECTION GUIDE

1) GENERAL BUCKET

		
1.27, 1.50 m³ SAE heaped bucket	1.73, 1.85 m³ SAE heaped bucket	★0.52 m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation							
					6.25 m (20' 6") boom				2-Piece boom			10.2 m (33' 6") boom
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.1 m arm (6' 11")	2.5 m arm (8' 2")	3.05 m arm (10' 0")	3.75 m arm (12' 4")	2.1 m arm (6' 11")	2.5 m arm (8' 2")	3.05 m arm (10' 0")	7.85 m arm (25' 9")
1.27 m³ (1.66 yd³)	1.11 m³ (1.45 yd³)	1325 mm (52.2")	1410 mm (55.5")	1100 kg (2430 lb)	○	○	○	⊙	○	○	○	
1.50 m³ (1.96 yd³)	1.30 m³ (1.70 yd³)	1515 mm (59.6")	1600 mm (63.0")	1180 kg (2600 lb)	○	○	⊙	●	○	○	○	
1.73 m³ (2.26 yd³)	1.51 m³ (1.98 yd³)	1605 mm (63.2")	1690 mm (66.5")	1280 kg (2820 lb)	⊙	⊙	●	●	○	○	⊙	
1.85 m³ (2.42 yd³)	1.61 m³ (2.11 yd³)	1700 mm (66.9")	1780 mm (70.1")	1330 kg (2930 lb)	⊙	●	●	●	○	⊙	⊙	
★0.52 m³ (0.68 yd³)	0.45 m³ (0.59 yd³)	945 mm (37.2")	1020 mm (40.2")	460 kg (1010 lb)								⊙

★ : Long reach bucket

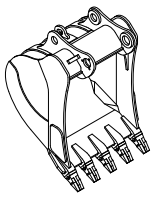
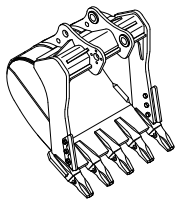
○ Applicable for materials with density of 2000 kgf/m³ (3370 lbf/yd³) or less

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

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

※ These recommendations are for general conditions and average use.
Work tools and ground conditions have effects on machine performance.
Select an optimum combination according to the working conditions and the type of work that is being done.
Consult your HD Hyundai Construction Equipment dealer for information on selecting the correct boom−arm−bucket combination.

2) HEAVY DUTY AND ROCK-HEAVY DUTY BUCKET

	
◈1.27 m³ SAE ◈1.46 m³ SAE heaped bucket	◆1.33 m³ SAE ◆1.50 m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation						
					6.25 m (20' 6") boom				2-Piece boom		
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.1 m arm (6' 11")	2.5 m arm (8' 2")	3.05 m arm (10' 0")	3.75 m arm (12' 4")	2.1 m arm (6' 11")	2.5 m arm (8' 2")	3.05 m arm (10' 0")
◈1.27 m³ (1.66 yd³)	1.11 m³ (1.45 yd³)	1380 mm (54.3")	-	1290 kg (2840 lb)	○	○	⊙	⊙	○	○	○
◈1.46 m³ (1.91 yd³)	1.28 m³ (1.67 yd³)	1535 mm (60.4")	-	1380 kg (3040 lb)	⊙	⊙	⊙	●	○	○	○
◆1.33 m³ (1.74 yd³)	1.16 m³ (1.52 yd³)	1420 mm (55.9")	-	1470 kg (3240 lb)	⊙	⊙	⊙	●	○	○	○
◆1.50 m³ (1.96 yd³)	1.30 m (1.70 yd³)	1550 mm (61.0")	-	1550 kg (3420 lb)	⊙	⊙	●	●	○	○	●

◈ : Heavy duty bucket
◆ : Rock-Heavy duty bucket

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

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

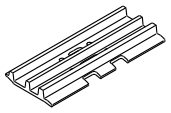
● Applicable for materials with density of 1100 kgf/m³ (1850 lbf/yd³) or less

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			
						
HX300 L	Shoe width	mm (in)	600 (24)	700 (28)	800 (32)	900 (36)
	Operating weight	kg (lb)	30200 (66580)	30770 (67840)	31150 (68670)	31530 (69510)
	Ground pressure	kgf/cm^2 (psi)	0.58 (8.25)	0.51 (7.25)	0.45 (6.40)	0.41 (5.83)
	Overall width	mm (ft-in)	3200 (10' 6")	3300 (10' 10")	3400 (11' 1")	3500 (11' 5")
HX300 NL	Shoe width	mm (in)	600 (24)	-	-	-
	Operating weight	kg (lb)	30000 (66140)	-	-	-
	Ground pressure	kgf/cm^2 (psi)	0.58 (8.25)	-	-	-
	Overall width	mm (ft-in)	2990 (9'10")	-	-	-
HX300 L LONG REACH	Shoe width	mm (in)	-	-	800 (32)	-
	Operating weight	kg (lb)	-	-	33070 (72910)	-
	Ground pressure	kgf/cm^2 (psi)	-	-	0.48 (6.83)	-
	Overall width	mm (ft-in)	-	-	3400 (11' 2")	-
HX300 L HIGH WALKER	Shoe width	mm (in)	600 (24)	700 (28)	800 (32)	★710 (28)
	Operating weight	kg (lb)	33040 (72840)	33610 (74100)	33990 (74930)	34520 (76100)
	Ground pressure	kgf/cm^2 (psi)	0.64 (9.10)	0.56 (7.96)	0.49 (6.97)	0.56 (7.96)
	Overall width	mm (ft-in)	3470 (11' 5")	3570 (11' 9")	3670 (12' 0")	3580 (11' 9")

★ : Double grouser

3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

Item	Quantity
Carrier rollers	2 EA
Track rollers	9 EA
Track shoes	48 EA

4) SELECTION OF TRACK SHOE

Suitable track shoes should be selected according to operating conditions.

Method of selecting shoes

Confirm the category from the list of applications in **table 2**, then use **table 1** to select the shoe. Wide shoes (categories B and C) have limitations on applications. Before using wide shoes, check the precautions, then investigate and study the operating conditions to confirm if these shoes are suitable.

Select the narrowest shoe possible to meet the required flotation and ground pressure. Application of wider shoes than recommendations will cause unexpected problem such as bending of shoes, crack of link, breakage of pin, loosening of shoe bolts and the other various problems.

※ Table 1

Track shoe	Specification	Category
600 mm triple grouser	Standard	A
700 mm triple grouser	Option	B
710 mm double grouser	Option	B
800 mm triple grouser	Option	C
900 mm triple grouser	Option	C
800 mm triple grouser (long reach)	Standard	C

※ 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
C	Extremely soft ground (swampy ground)	· Use the shoes only in the conditions that the machine sinks and it is impossible to use the shoes of category A or B · These shoes cannot be used on rough ground with large obstacles such as boulders or fallen trees · Travel at high speed only on flat ground · Travel slowly at low speed if it is impossible to avoid going over obstacles

8. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Model	Cummins QSB6.7
Type	4-cycle turbocharged, charge air cooled diesel engine
Cooling method	Water cooling
Number of cylinders and arrangement	6 cylinders, in-line
Firing order	1-5-3-6-2-4
Combustion chamber type	Direct injection type
Cylinder bore × stroke	107 × 124 mm (4.21" × 4.88")
Piston displacement	6700 cc (409 cu in)
Compression ratio	17.3 : 1
Rated net horse power (SAE J1349)	230 Hp at 1950 rpm (171 kW at 1950 rpm)
Rated gross horse power (SAE J1995)	242 Hp at 1950 rpm (180 kW at 1950 rpm)
Maximum torque	100.9 kgf · m (729.8 lbf · ft) at 1500 rpm
Engine oil quantity	23.1 ℓ (6.1 U.S. gal)
Wet weight	520 kg (1146 lb)
High idling speed	1950 ± 50 rpm
Low idling speed	800 ± 100 rpm
Rated fuel consumption	152.1 g/Hp · hr at 1950 rpm
Starting motor	Denso 24 V-4.8 kW
Alternator	Denso 24 V-95 A
Battery	2 × 12 V × 160 Ah

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 140 cc/rev
Maximum pressure	350 kgf/cm^2 (4980 psi) [380 kgf/cm^2 (5400 psi)]
Rated oil flow	2 × 273 ℓ/min (72.1 U.S. gpm / 60.1 U.K. gpm)

[ ] : Power boost

3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15 cc/rev
Maximum pressure	40 kgf/cm^2 (570 psi)
Rated oil flow	29.25 ℓ /min (7.7 U.S. gpm/6.4 U.K. gpm)

4) MAIN CONTROL VALVE

Item		Specification
Type		10 spools
Operating method		Hydraulic pilot system
Main relief valve pressure		350 kgf/cm^2 (4980 psi) [380 kgf/cm^2 (5400 psi)] *1 350 kgf/cm^2 (4980 psi) [Not applied power boost]
Port relief valve pressure	Boom	400 kgf/cm^2 (5690 psi)
	Arm	400 kgf/cm^2 (5690 psi), *1 250 kgf/cm^2 (3560 psi)
	Bucket	400 kgf/cm^2 (5690 psi), *1 270 kgf/cm^2 (3840 psi)

[ ] : Power boost *1 : Long reach only

5) SWING MOTOR

Item	Specification
Type	Axial piston motor
Capacity	156.9 cc/rev
Relief pressure	300 kgf/cm^2 (4270 psi)
Braking system	Automatic, spring applied hydraulic released
Braking torque	84.4 kgf · m (610 lbf · ft) over
Brake release pressure	36.6 kgf/cm^2 (519 psi) below
Reduction gear type	2 - stage planetary

6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement axial piston motor
Capacity	282.6/156.9 cc/rev
Relief pressure	350 kgf/cm^2 (4980 psi)
Braking system	Automatic, spring applied hydraulic released
Braking torque	134 kgf · m (969 lbf · ft)
Brake release pressure	17 kgf/cm^2 (242 psi)
Reduction gear type	2-stage planetary

7) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Stroke	Ø140 × 1465 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Stroke	Ø150 × 1765 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Stroke	Ø135 × 1185 mm
	Cushion	Extend only
Bucket cylinder (long reach)	Bore dia × Stoke	Ø100 × 870 mm
	Cushion	Extend and retract

※ Discoloration of cylinder rod can occur when the friction reduction additive of lubrication oil spreads on the rod surface.

※ Discoloration does not cause any harmful effect on the cylinder performance.

8) SHOE

Item		Width	Ground pressure	Link quantity	Overall width
HX300 L	Standard	600 mm (24")	0.58 kgf/cm² (8.25 psi)	48	3200 mm (10' 6")
	Option	700 mm (28")	0.51 kgf/cm² (7.25 psi)	48	3300 mm (10' 10")
		800 mm (32")	0.45 kgf/cm² (6.40 psi)	48	3400 mm (11' 1")
		900 mm (36")	0.41 kgf/cm² (5.83 psi)	48	3500 mm (11' 5")
HX300 NL	Standard	600 mm (24")	0.58 kgf/cm² (8.25 psi)	48	2990 mm (9' 10")
HX300 L LONG REACH	Standard	800 mm (32")	0.48 kgf/cm² (6.83 psi)	48	3400 mm (11' 2")
HX300 L HIGH WALKER	Standard	600 mm (24")	0.64 kgf/cm² (9.10 psi)	48	3470 mm (11' 5")
	Option	700 mm (28")	0.56 kgf/cm² (7.96 psi)	48	3570 mm (11' 9")
		800 mm (32")	0.49 kgf/cm² (6.97 psi)	48	3670 mm (12' 0")
		★710 mm (28")	0.56 kgf/cm² (7.96 psi)	48	3580 mm (11' 9")

★ : Double grouser

9) BUCKET

Item	Capacity		Tooth quantity	Width	
	SAE heaped	CECE heaped		Without side cutter	With side cutter
HX300 L HX300 NL H/WALKER	1.27 m³ (1.66 yd³)	1.11 m³ (1.45 yd³)	5	1325 mm (52.2")	1410 mm (55.5")
	◈1.27 m³ (1.66 yd³)	1.11 m³ (1.45 yd³)	5	1380 mm (54.3")	-
	◈1.46 m³ (1.91 yd³)	1.28 m³ (1.67 yd³)	5	1535 mm (60.4")	-
	◆1.33 m³ (1.74 yd³)	1.16 m³ (1.52 yd³)	5	1420 mm (55.9")	-
	◆1.50 m³ (1.96 yd³)	1.30 m³ (1.70 yd³)	5	1550 mm (61.0")	-
	1.50 m³ (1.96 yd³)	1.30 m³ (1.70 yd³)	5	1515 mm (59.6")	1600 mm (63.0")
	1.73 m³ (2.26 yd³)	1.51 m³ (1.98 yd³)	6	1605 mm (63.2")	1690 mm (66.5")
	1.85 m³ (2.42 yd³)	1.61 m³ (2.11 yd³)	6	1700 mm (66.9")	1780 mm (70.1")
LONG REACH	0.52 m³ (0.68 yd³)	0.45 m³ (0.59 yd³)	5	945 mm (37.2")	1020 mm (40.2")

◈ : Heavy duty bucket

◆ : Rock-Heavy duty bucket

9. RECOMMENDED OILS

HD Hyundai Construction Equipment genuine lubricating oils have been developed to offer the best performance and service life for your equipment. These oils have been tested according to the specifications of HD Hyundai Construction Equipment and, therefore, will meet the highest safety and quality requirements.
We recommend that you use only HD Hyundai Construction Equipment genuine lubricating oils and grease officially approved by HD Hyundai Construction Equipment.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature ˚C(˚F) -50 (-58) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86) 40 (104)
Engine oil pan	Engine oil	24.4 (6.4)	★SAE 5W-40 SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
DEF/ AdBlue® tank	Mixture of urea and deionized water	42.5 (11.2)	ISO 22241, High-purity urea + deionized water (32.5:67.5)
Swing drive	Gear oil	11 (2.91)	★SAE 75W-90
Final drive		7.8×2 (2.1×2)	SAE 80W-90
Hydraulic tank	Hydraulic oil	Tank : 190 (50) System : 330 (87)	★ISO VG 15 ISO VG 32 ISO VG 46, HBHO VG 46★3 ISO VG 68
Fuel tank	Diesel fuel★1	500 (132)	★ASTM D975 NO.1 ASTM D975 NO.2
Fitting (grease nipple)	Grease	As required	★NLGI NO.1 NLGI NO.2
Radiator (reservoir tank)	Mixture of antifreeze and soft water★2	40 (10.6)	Ethylene glycol base permanent type (50 : 50) ★Ethylene glycol base permanent type (60 : 40)

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Material
DEF : Diesel Exhaust Fluid, DEF compatible with AdBlue®

★ : Cold region (Russia, CIS, Mongolia)
★1 : Ultra low sulfur diesel
- sulfur content ≤ 15 ppm
★2 : Soft water
City water or distilled water
★3 : HD Hyundai Construction Equipment Bio Hydraulic Oil

※ Using any lubricating oils other than HD Hyundai Construction Equipment genuine products may lead to a deterioration of performance and cause damage to major components.
※ Do not mix HD Hyundai Construction Equipment genuine oil with any other lubricating oil as it may result in damage to the systems of major components.
※ Do not use any engine oil other than that specified above, as it may clog the diesel particulate filter(DPF).
※ For HD Hyundai Construction Equipment genuine lubricating oils and grease for use in regions with extremely low temperatures, please contact HD Hyundai Construction Equipment dealers.

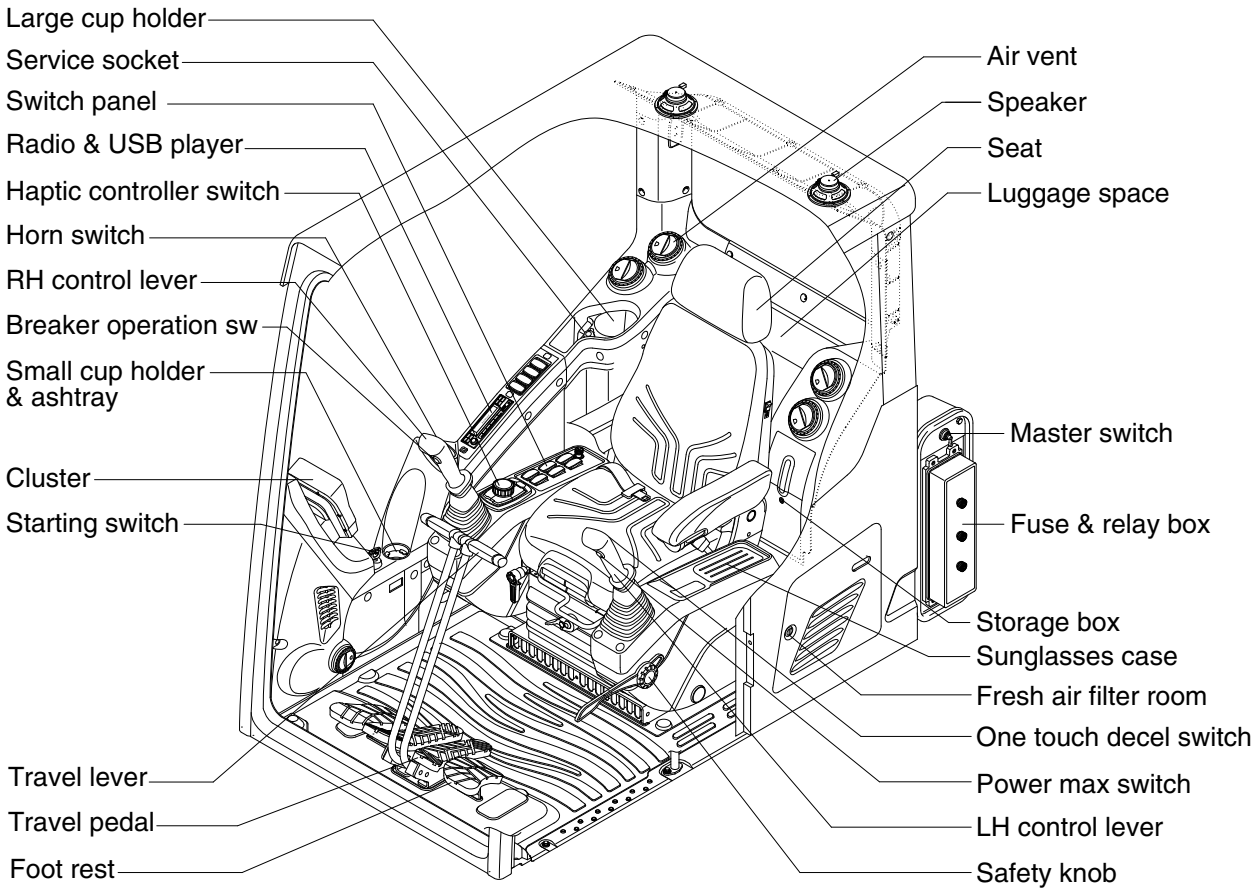
1. CAB DEVICES

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.



290F3CD01

2. CLUSTER

1) STRUCTURE

The cluster consists of LCD and switches as shown below. The LCD is to warn the operator in case of abnormal machine operation or conditions for the appropriate operation and inspection. Also, The LCD is to set and display for modes, monitoring and utilities with the switches.

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

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

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

290F3CD01A

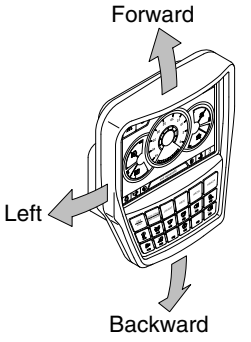
※ The warning lamp pops up and/or blinks and the buzzer sounds when the machine has a problem.

The warning lamp blinks until the problem is cleared. Refer to page 3-6 for details.

※ This cluster is adjustable.

· Vertical (forward/backward) : each 15°

· Horizontal (left only) : 8°



290F3CD47

2) GAUGE

(1) Operation screen

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

Default

Option

290F3CD51A

1	RPM / Speed gauge	5	DEF/AdBlue® level gauge
2	Engine coolant temperature gauge	6	Tripmeter display
3	Hydraulic oil temperature gauge	7	Eco guage
4	Fuel level gauge	8	Accel dial gauge

※ Operation screen type can be set by the screen type menu of the display.
Refer to page 3-27 for details.

(2) RPM / Speed gauge

290F3CD49

① This display the engine speed.

(3) Engine coolant temperature gauge

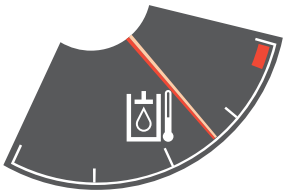
290F3CD53

① This gauge indicates the temperature of coolant.
- White range : 40-107˚C (104-225˚F)
- Red range : Above 107˚C (225˚F)

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

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

(4) Hydraulic oil temperature gauge



290F3CD54

① This gauge indicates the temperature of hydraulic oil.
- White range : 40-105˚C(104-221˚F)
- Red range : Above 105˚C(221˚F)

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

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

(5) Fuel level gauge

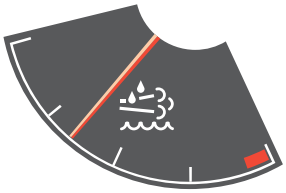
290F3CD55

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

② Fill the fuel when the red range, or lamp pops up and the buzzer sounds.

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

(6) DEF/AdBlue® Level gauge



290F3CD57

① This gauge indicates the amount of liquid in the DEF/AdBlue® tank.

② Fill the DEF/AdBlue® when the red range, or lamp pops up and the buzzer sounds.

③ Do not pour DEF/AdBlue® any more when the DEF/AdBlue® fill up warning lamp lights ON.

※ Refer to page 3-11.

※ If the gauge indicates the red range or lamp blinks in red 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.

(7) Tripmeter display

290F3CD56

① This displays the engine the tripmeter.

※ Refer to page 3-29 for details.

(8) Eco gauge

290F3CD58

① This gauge indicates the fuel consumption rate and machine load status. So that operators can be careful with fuel economy.

② The fuel consumption rate or machine load is higher, the number of segment is increased.

③ The color of Eco gauge indicates operation status.

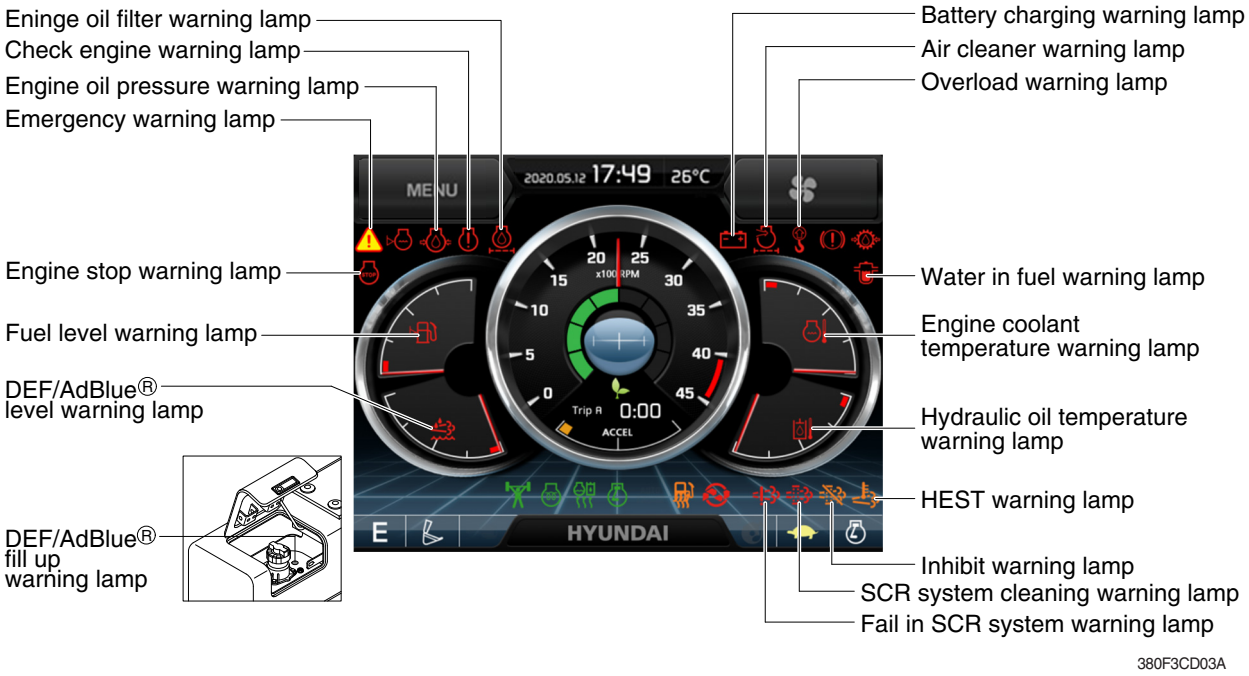
- White : Idle operation
- Green : Economy operation
- Yellow : Non-economy operation at a medium level.
- Red : Non-economy operation at a high level.

(9) Accel dial gauge

290F3CD59

① This gauge indicates the level of accel dial.

3) WARNING LAMPS

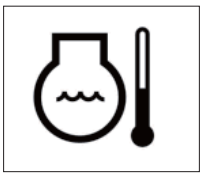


※ **Warning lamps and buzzer**

Warnings	When error happened	Lamps and buzzer
All warning lamps except below	Warning lamp pops up on the center of the LCD and the buzzer sounds	· The pop-up warning lamp moves to the original position and blinks, and the buzzer stops when ; - the buzzer stop switch AUTO IDLE Buzzer Stop is pushed - the knob of the haptic controller is pushed - the lamp of the LCD is touched
	Warning lamp pops up on the center of the LCD and the buzzer sounds	· The pop-up warning lamp moves to the original position and light ON or blinks, and the buzzer stops when ; - the buzzer stop switch AUTO IDLE Buzzer Stop is pushed - the knob of the haptic controller is pushed - the lamp of the LCD is touched ※ **Refer to page 3-11 for details.**
	Warning lamp pops up on the center of the LCD and the buzzer sounds	· The pop-up warning lamp moves to the original position and lights ON, and the buzzer stops when 2 seconds elapsed.
	Warning lamp pops up on the center of the LCD and the buzzer sounds	· The pop-up warning lamp moves to the original position and blinks, and the buzzer stops when 2 seconds elapsed.
	Warning lamp pops up on the center of the LCD and the buzzer sounds	※ **Refer to page 3-7 for details.**

※ **Refer to page 3-16 for the buzzer stop switch** AUTO IDLE Buzzer Stop **and page 3-57 for the haptic controller.**

(1) Engine coolant temperature warning lamp



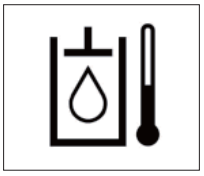
290F3CD61

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

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

③ Check the cooling system when the lamps keep blink.

(2) Hydraulic oil temperature warning lamp



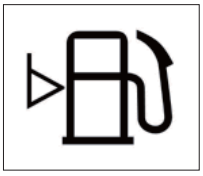
290F3CD62

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

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

③ Check the hydraulic oil level and hydraulic oil cooling system.

(3) Fuel level warning lamp



290F3CD63

① This warning lamp pops up and the buzzer sounds when the level of fuel is below 55 ℓ (14.5 U.S. gal).

② Fill the fuel immediately when the lamp blinks.

(4) Emergency warning lamp

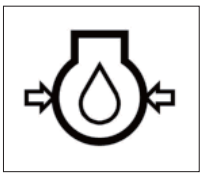
290F3CD64

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

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

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

(5) Engine oil pressure warning lamp



290F3CD65

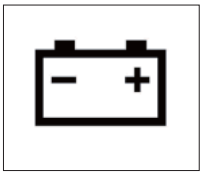
① This warning lamp pops up and the buzzer sounds when the engine oil pressure is low.
② If the lamp blinks, shut OFF the engine immediately. Check oil level.

(6) Check engine warning lamp

290F3CD66

① This warning lamp pops up and the buzzer sounds when the communication between MCU and engine ECM on the engine is abnormal, or if the cluster received specific fault code from engine ECM.
② Check the communication line between them.
If the communication line is OK, then check the fault codes on the cluster.

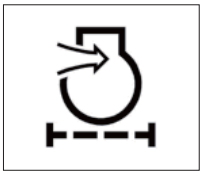
(7) Battery charging warning lamp



290F3CD67

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

(8) Air cleaner warning lamp



290F3CD68

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

(9) Overload warning lamp (opt)

290F3CD69

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

(10) Engine stop warning lamp

290F3CD252

① This warning lamp pops up and the buzzer sounds when 30 minutes elapsed with empty condition of the DEF/AdBlue® tank, stop the engine immediately and check the DEF/AdBlue® tank.

② Fill the DEF/AdBlue® immediately in the DEF/AdBlue® tank.

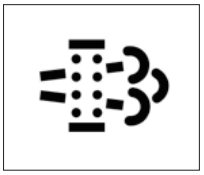
※ **Refer to page 3-11.**

③ This lamp pops up and the buzzer sounds when the stationary SCR system cleaning is not performed.

※ **Refer to page 3-9.**

※ **Please contact your HD Hyundai Construction Equipment service center or local dealer.**

(11) SCR (selective catalytic reduction) system cleaning warning lamp

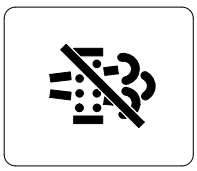


290F3CD70

① This warning lamp lights ON or blinks when the SCR system cleaning is needed as table below.

Warning lamp			Description
SCR 	Check engine 	Stop engine 	
Off	Off	Off	· Automatic SCR system cleaning
Blink	Off	Off	· The status of a manual (stationary) SCR system cleaning when the SCR system cleaning switch has been activated. ※ **Refer to page 3-10.**
On	On	Off	· The aftertreatment SCR system needs to be cleaned immediately. · Engine power will be reduced automatically if action is not taken. ※ The SCR system cleaning can be accomplished by : - Changing to more challenging duty cycle. - Performing a manual SCR system cleaning.
On	On	On	· These lamps will be ON when a stationary (manual) SCR system cleaning is not performed. · Stop the engine immediately. · Please contact your HD Hyundai Construction Equipment service center or local dealer.

(12) SCR system cleaning inhibit warning lamp

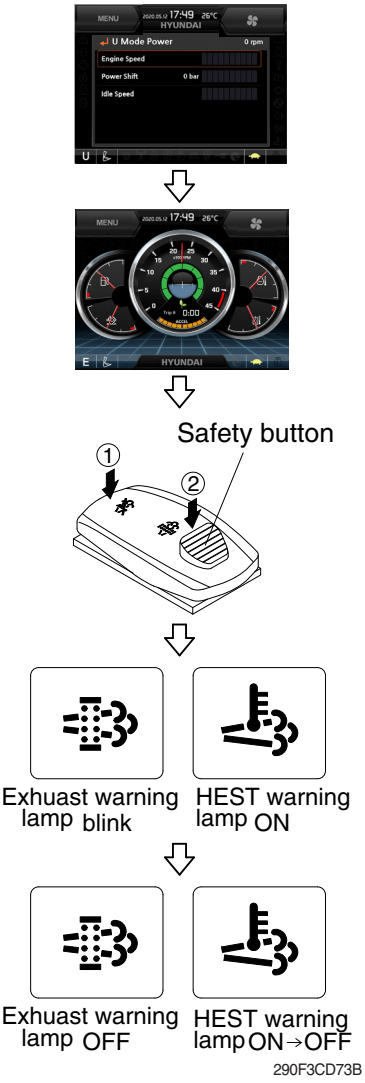


2609A3CD20

① This warning lamp indicates, when illuminated, the SCR system cleaning switch is pushed inhibit position, therefore automatic and manual SCR system cleaning can not occur.

※ **Refer to the page 3-36 for the SCR system cleaning switch.**

※ Manual SCR system cleaning



※ Manual SCR system cleaning applies if the machine is in a fireproof area.

※ To stop a manual SCR system cleaning before it has completed, set to the SCR system cleaning switch to the inhibit position or turn OFF the engine.

① Stop and park the machine.

② Pull the safety button and push the switch to position ② to initiate the manual SCR system cleaning.

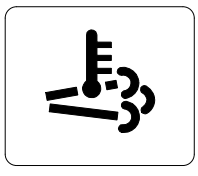
※ Refer to the page 3-36 for the SCR system cleaning switch operation.

※ The engine speed may increase to 950~1050 rpm and SCR system cleaning begins and it will take approximately 20~60 minutes.

③ The SCR system cleaning warning lamp will blink and HEST warning lamp will light ON during the SCR system cleaning is operating.

④ The SCR system cleaning and/or HEST warning lamp will light OFF when the SCR system cleaning is completed.

(13) HEST (High exhaust system temperature) **warning lamp**



① This warning lamp indicates, when illuminated, that exhaust temperatures are high due to SCR system cleaning.

② The lamp will also illuminate during a manual SCR system cleaning.

③ When this lamp is illuminated, be sure the exhaust pipe outlet is not directed at any surface or material that can melt, burn, or explode.

⚠ When this lamp is illuminated, the exhaust gas temperature could reach 800˚C [1500˚F], which is hot enough to ignite or melt common materials, and to burn people.

※ The lamp does not signify the need for any kind of equipment or engine service; It merely alerts the equipment operator to high exhaust temperatures. It will be common for the lamp to illuminate on and off during normal equipment operation as the engine completes SCR system cleaning.

(14) DEF/AdBlue® level warning lamp

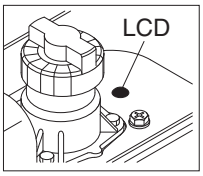
290F3CD257

① This warning lamp indicates when ON or blinking, that the DEF/AdBlue® level is low as table below.

※ It is recommended that the DEF/AdBlue® tank be filled completely full of the DEF/AdBlue® in order to correct any fault conditions.

Warning lamp			Description
DEF/AdBlue® level 	Check engine 	Stop engine 	
On	Off	Off	· The DEF/AdBlue® level has fallen below the initial warning level (10%).
Blink	Off	Off	· The DEF/AdBlue® level has fallen below the critical warning level (5%).
Blink	On	Off	· The DEF/AdBlue® level has fallen below the initial derate level (2.5%). · The engine power will be limited automatically.
Blink	On	On	· This is happened when 30 minutes elapsed with empty conditions (0%) of the DEF/AdBlue® tank. · The engine will enter the final derate level which may include low idle lock or engine shutdown with restart limitations. · In order to remove the final derate, the DEF/AdBlue® tank must be filled to above 10 persent gauge reading.

(15) DEF/AdBlue® fill up warning lamp



290F3CD272

① This lamp lights ON when the DEF/AdBlue® tank is completely filled with DEF/AdBlue®.

※ Fill the tank with the DEF/AdBlue® after start switch ON and then turn OFF the start switch.

※ Do not pour DEF/AdBlue® any more when this lamp lights ON. Otherwise DEF/AdBlue® tank may freeze and burst in winter season.

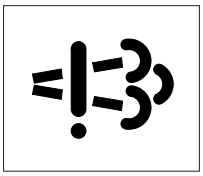
(16) Water in fuel warning lamp

210WF3CD02

① This warning lamp pops up and the buzzer sounds when the water separator is full of water or malfunctioning.

※ When this lamp blinks, stop the machine and spill water out of the separator.

(17) Fail in SCR system warning lamp



300A3CD15

① This warning lamp indicates there are faults related to SCR system.

② The lamp lights ON when each of the below warnings is happened.

a. Low DEF/AdBlue® level

b. Poor quality of DEF/AdBlue®

c. Tempering or malfunction in the aftertreatment system

③ Once the lamp lights ON, the engine will derate shortly.

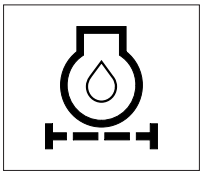
※ **Please contact your HD Hyundai Construction Equipment service center or local dealer.**

Warning lamp		Torque reduction
	Time	
On	Fault detected	-
On	After 2 h 30 min	· Torque is reduced to 50% of the highest torque.
Blink	After 3 h 45 min	· Torque is reduced to 40% of the highest torque.
Blink rapidly	After 4 hours	· Torque is reduced to 0% (low idling) of the hightest torque within 2~10 min.

※ **If a new fault occurs within 40 hours of operation since the first fault, the warning lamp will come ON. After 3 hours of operation, the warning lamp will blink rapidly and torque will be reduced to 0% (low idling) within 2~10 min.**

※ **Once the fault has been remedied and the engine control unit has received an indication that it is working, torque returns to the normal level.**

(18) Eninge oil filter warning lamp

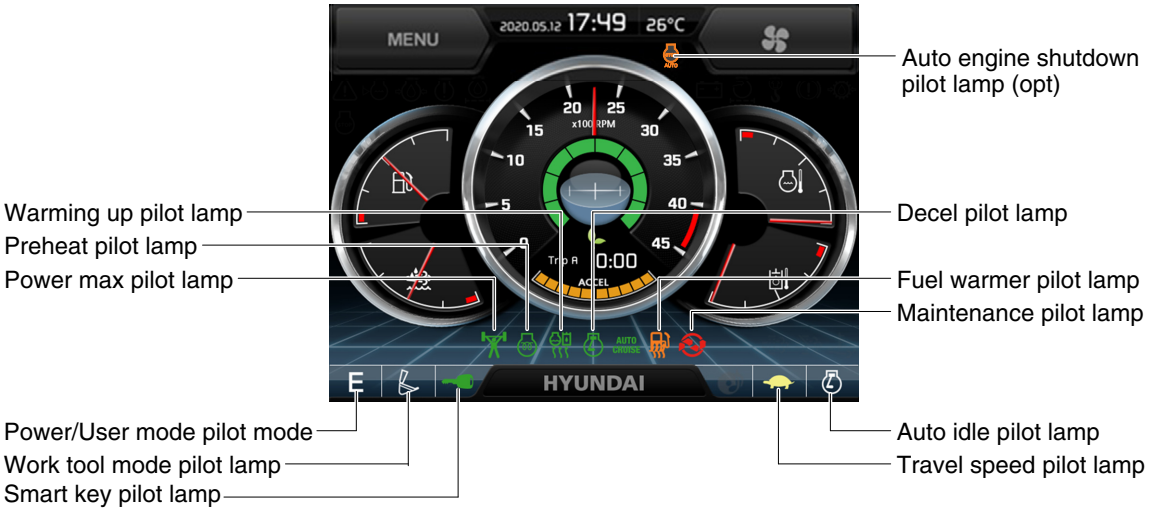


300A3CD306

① This warning lamp pops up and the buzzer sounds when the filter of eninge oil is clogged.

② Check the filter and clean or replace it.

4) PILOT LAMPS



290F3CD74A

(1) Mode pilot lamps

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

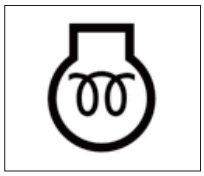
(2) Power max pilot lamp

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

② The power max function is operated maximum 8 seconds.

※ **Refer to the page 3-38 for power max function.**

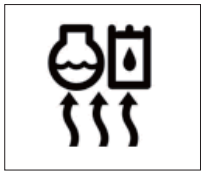
(3) Preheat pilot lamp



290F3CD79

① Turning the start key switch ON position starts preheating in cold weather.
② Start the engine after this lamp is OFF.

(4) Warming up pilot lamp



290F3CD80

① This lamp is turned ON when the coolant temperature is below 30˚C(86˚F).
② The automatic warming up is cancelled when the engine coolant temperature is above 30˚C, or when 10 minutes have passed since starting the engine.

(5) Decel pilot lamp

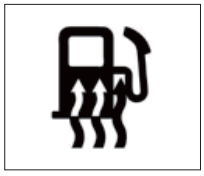
290F3CD81

① Operating one touch decel switch on the RCV lever makes the lamp ON.
② Also, the lamp will be ON and engine speed will be lowered automatically to save fuel consumption when all levers and pedals are at neutral position, and the auto idle function is selected.

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

※ Refer to the page 3-38.

(6) Fuel warmer pilot lamp



290F3CD82

① This lamp is turned ON when the coolant temperature is below 10˚C(50˚F) or the hydraulic oil temperature 20˚C(68˚F).
② The automatic fuel warming is cancelled when the engine coolant temperature is above 60˚C, and the hydraulic oil temperature is above 45˚C since the start switch was ON position.

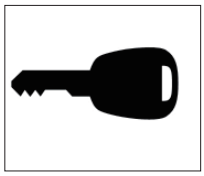
(7) Maintenance pilot lamp

290F3CD83

① This lamp will be ON when the consuming parts are needed to change or replace. It means that the change or replacement interval of the consuming parts remains below 30 hours.
② Check the message in maintenance information of main menu. Also, this lamp lights ON for 3 minutes when the start switch is ON position.

※ Refer to the page 3-23.

(8) Smart key pilot lamp (opt)



290F3CD214

① This lamp is ON when the engine is started by the start button.
② This lamp is red when the a authentication fails, green when succeeds.
※ **Refer to the page 3-24.**

(9) Auto engine shutdown pilot lamp (opt)

220A3CD202A

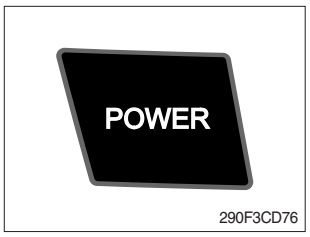
① This lamp is turned ON when the auto engine shutdown is activated
※ **Refer to the page 3-21-1.**

5) SWITCHES

290F3CD86A

※ **When some of the switches are selected, the pilot lamps are displayed on the LCD. Refer to the page 3-12 for details.**

(1) Power mode switch

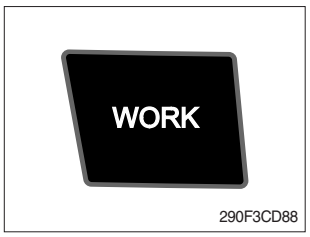


290F3CD76

① This switch is to select the machine power mode and selected power mode pilot lamp is displayed on the pilot lamp position.
- P : Heavy duty power work.
- S : Standard power work.
- E : Economy power work.

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

(2) Work mode switch

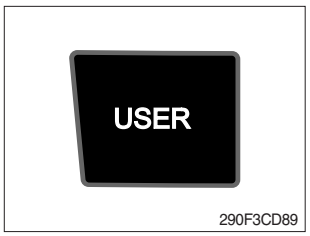


290F3CD88

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

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

(3) User mode switch



① This switch is used to memorize the current machine operating status in the MCU and activate the memorized user mode.
- Memory : Automatically saved after key OFF.
- Action : Push this switch.
- Cancel : Push this switch once more.

② Refer to the page 3-20 for another set of user mode.

(4) Travel speed switch

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

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

⚠ Personal injury can result from sudden changes in machine stability.

(5) Auto idle/ buzzer stop switch

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

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

(6) Escape/Camera switch

① This switch is used to return to the previous menu or parent menu.

② In the operation screen, pushing this switch will display the view of the camera on the machine (if equipped).
Please refer to page 3-29 for the camera.

③ If the camera is not installed, this switch is used only ESC function.

(7) Work light switch

① This switch is used to operate the work light.

② The pilot lamp is turned ON when operating the switch.

(8) Head light switch

① This switch is used to operate the head light.
② The pilot lamp is turned ON when operating the switch.

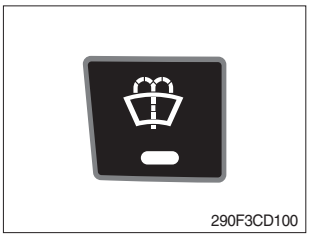
(9) Intermittent wiper switch

① This switch is used to wipe operates intermittently.
② The pilot lamp is turned ON when operating the switch.

(10) Wiper switch

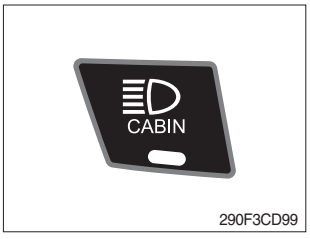
① This switch is used to operate the window wiper.
② Note that the wiper will self-park when switched off.
③ The pilot lamp is turned ON when operating the switch.
※ If the wiper does not operate with the switch in ON position, turn the switch OFF immediately. Check the cause. If the switch remains ON,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

(11) Washer switch



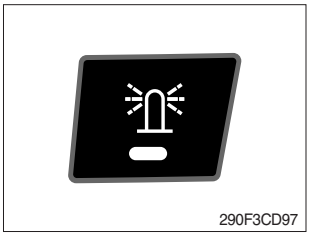
① The washer liquid is sprayed and the wiper is operated only while pressing this switch.
② The pilot lamp is turned ON when operating the switch.

(12) Cab light switch



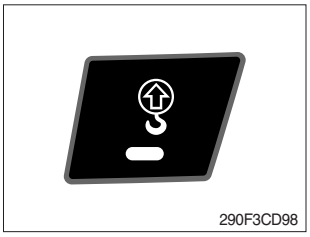
① This switch turns ON the cab light on the cab.
② The pilot lamp is turned ON when operating the switch.

(13) Beacon switch (opt)



① This switch turns ON the rotary light on the cab.
② The pilot lamp is turned ON when operating the switch.

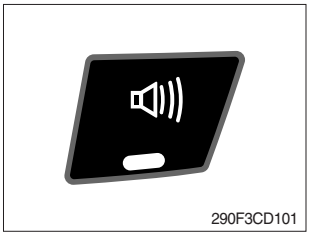
(14) Overload switch (opt)



① When this switch turned ON, buzzer makes sound and overload warning lamp comes ON in case that the machine is overload.
② When it turned OFF, buzzer stops and warning lamp goes out.

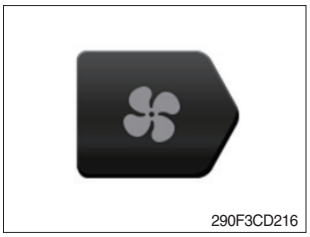
⚠ Overloading the machine could impact the machines stability which could result in tipover hazard. A tipover hazard could result in serious injury or death. Always activate the overload warning device before you handle or lift objects.

(15) Travel alarm switch



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

(16) Air conditioner quick touch switch



① This switch used to select air conditioner control mode.
※ **Refer to the page 3-31.**

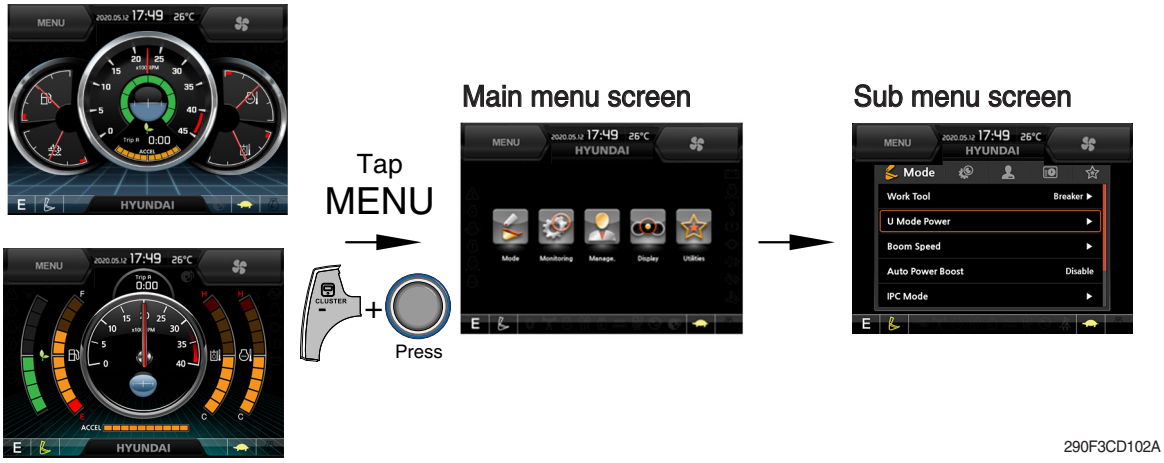
(17) Main menu quick touch switch

① This switch is to activate the main menu in the cluster.
※ **Refer to the page 3-19.**

6) MAIN MENU

※ You can select or set the menu by the haptic controller or touch screen.
On the operation screen, tap MENU to access the main menu screen.
On the sub menu screen, you can tap the menu bar to access functions or applications.

· Operation screen



290F3CD102A

※ Please refer to the haptic controller, page 3-57 for selection and change of menu and input value.

(1) Structure

No	Main menu	Sub menu	Description
1	 Mode 290F3CD103	Work mode Work tool U mode power Boom/Arm speed Auto power boost IPC mode Auto engine shutdown (option) Initial mode Emergency mode	Breaker, Crusher, Lifting Mode, Not installed Breaker, Crusher, Not installed User mode only Boom speed, Arm speed Enable, Disable Speed mode, Balance mode, Efficiency mode One time, Always, Disable Key on initial mode, Accel initial mode / step Switch function
2	 Monitoring 290F3CD104	Active fault Logged fault Delete logged fault Monitoring	MCU, Engine ECM, Air conditioner, AAVM (option) MCU, Engine ECM, Air conditioner, AAVM (option) All logged fault delete, Initialization canceled Machine information, Switch status, Output status
3	 Management 290F3CD105	Fuel rate information Maintenance information Machine security Machine information Contact Service menu Clinometer Update	General record, Hourly, Daily, Mode record Replacement, Change interval oils and filters ESL mode setting, Password change Model, MCU, Monitor, Haptic / switch controller, RMCU, Relay drive unit, FATC, AAVM (option) A/S phone number, A/S phone number change Power shift, Operating hour, Breaker mode pump acting, EPPR current level, Overload pressure Clinometer setting Cluster, ETC device
4	 Display 290F3CD106	Display item Clock Brightness Unit setup Language selection Screen type	Engine speed, Tripmeter A, Tripmeter B, Tripmeter C Clock Manual, Auto Temperature, Pressure, Flow, Distance, Date format Korean, English, Chinese, ETC A type, B type
5	 Utilities 290F3CD107	Tripmeter Camera	3 kinds (A, B, C) Camera on/off, AAVM (option)

(2) Mode setup

① Work tool

210WF3CD108A

290F3CD253A

A

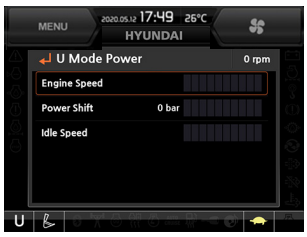
290F3CD254A

B

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

② U mode power

210WF3CD111A



290F3CD112A

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

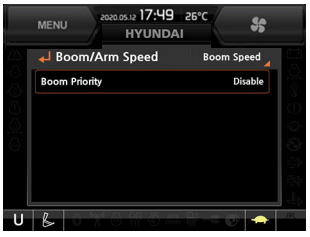
Step (▮)	Engine speed (rpm)	Idle speed (rpm)	Power shift (bar)
1	1300	700	0
2	1400	750	3
3	1500	800	6
4	1600	850	9
5	1700	900	12
6	1800	950	16
7	1850	1000	20
8	1900	1050	26
9	1950	1100 (auto decel)	32
10	2000	1150	38

※One touch decel & low idle : 1000 rpm

③ Boom/Arm speed

210WF3CD113A

290F3CD114A

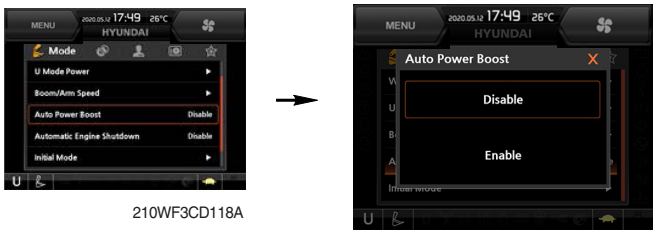


290F3CD115A

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

· **Arm speed**
  - Arm regeneration function can be activated or cancelled.
    Enable - Arm in speed is up.
    Disable - Normal operation.

④ Auto power boost



210WF3CD118A

290F3CD117A

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

⑤ IPC mode

290F3CD310A

290F3CD311A

290F3CD304A

290F3CD312A

290F3CD305A

290F3CD313A

290F3CD306A

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

· This mode is applied only general operation mode of the work tool mode.

※ Please update the cluster programs if this mode is not displayed in the mode setup menu. Refer to the page 3-25-1.

⑥ Automatic engine shutdown (option)

210WF3CD11A

210WF3CD12A

210WF3CD13A

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

⑦ Initial mode

290F3CD122A

290F3CD119A

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

· **Accel initial mode**
  - Last setting value
  - User setting value

· **Accel initial step**
  - 0~9 step

⑧ Emergency mode

290F3CD248A

290F3CD249A

· This mode can be use when the switches are abnormal on the cluster.
· The cluster switches will be selected by touched each icon.

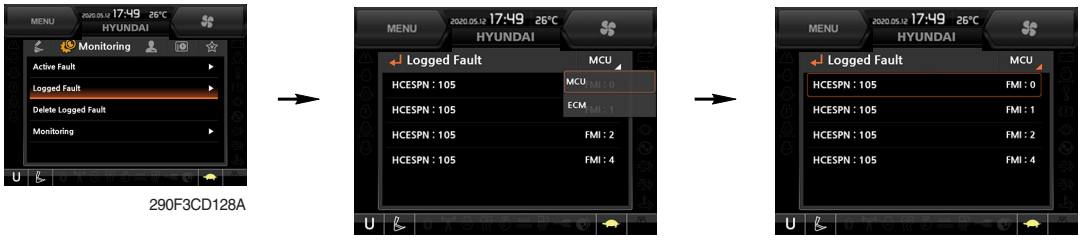
(3) Monitoring

① Active fault

290F3CD120A　290F3CD121A　290F3CD125A

· The active faults of the MCU, engine ECM or air conditioner can be checked by this menu.

② Logged fault



290F3CD128A　290F3CD123A　290F3CD124A

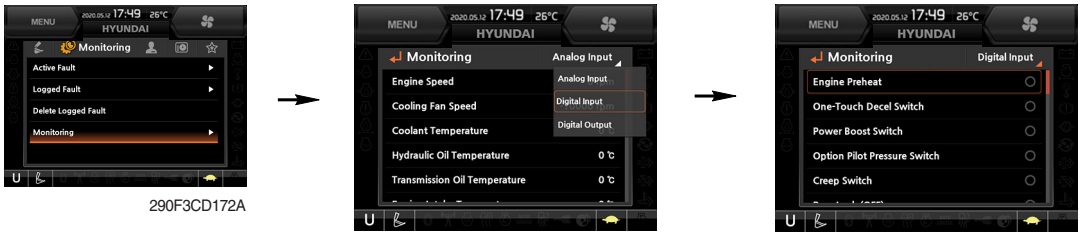
· The logged faults of the MCU, engine ECM or air conditioner can be checked by this menu.

③ Delete logged fault

290F3CD134A

· The logged faults of the MCU, engine ECM or air conditioner can be deleted by this menu.

④ Monitoring



290F3CD172A　290F3CD188A　290F3CD189A

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

(4) Management

① Fuel rate information

210WF3CD14A

210WF3CD15A

A

B

C

D

210WF3CD16

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

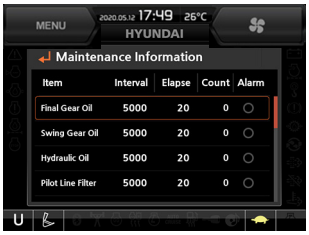
· **Hourly record (B)**
- Hourly fuel rates for past 12 hours (service meter time).
- No record during key-off time.
- One step shift to the right for every one hour.
- Automatic deletion for 12 hours earlier data.
- All hourly records deletion by "Reset".

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

· **Mode record (D)**
- Average fuel rate for each power mode/accel dial (at least 7) from "Reset" to now.
- No record during idle.
- All mode records deletion by "Reset".

② Maintenance information

210WF3CD131A



290F3CD132A

290F3CD133A

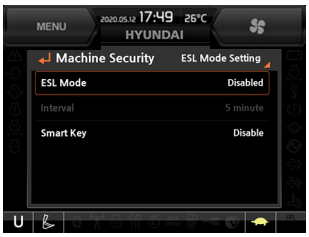
- Alarm lamp (●) is ON when oil or filter needs to be changed or replaced.
- Replacement : The elapsed time will be reset to zero (0).
- Change interval : The change or replace interval can be changed in the unit of 50 hours.

※ **Refer to the maintenance chart for further information of maintenance interval.**

③ Machine security

210WF3CD190B

290F3CD135B



290F3CD136A

· **ESL mode setting**

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

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

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

※**Default password : 00000 +** ✔

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

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

290F3CD137A

290F3CD138A

· **Password change**

- The password is 5~10 digits.

210WF3CD190A

290F3CD140B

290F3CD135C

Enter the current password

290F3CD142B

Enter the new password

290F3CD143B

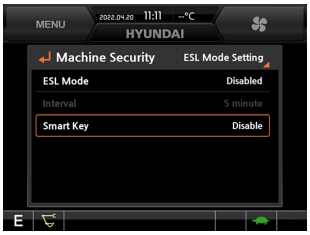
Enter the new password again

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

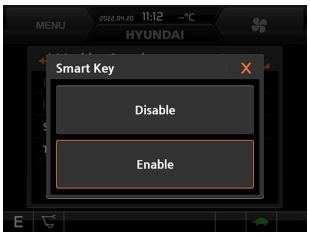
- Smart key

210WF3CD190A

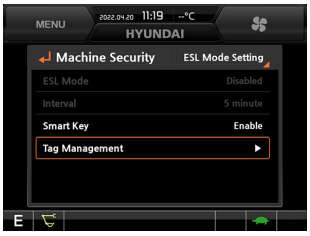
290F3CD135C



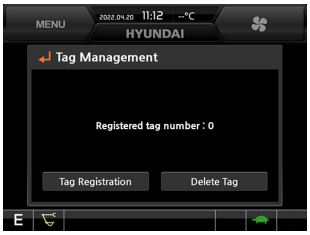
290F3CD001



290F3CD002

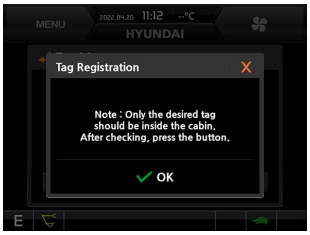


290F3CD003



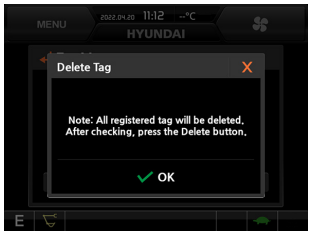
290F3CD004

Registering



290F3CD005

Deleting



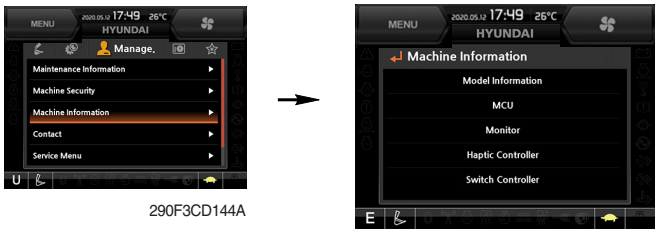
290F3CD006

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

- Tag management

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

④ Machine Information

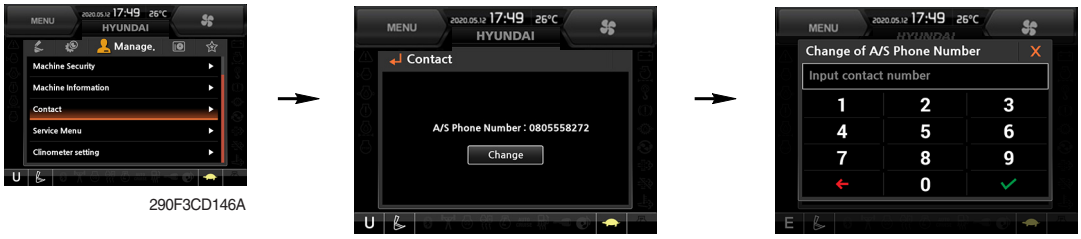


290F3CD144A

290F3CD145A

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

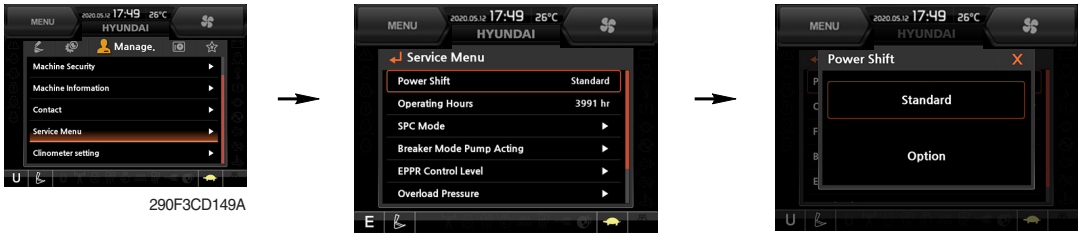
⑤ Contact (A/S phone number)



290F3CD146A

Enter the new A/S phone number

⑥ Service menu



290F3CD149A

290F3CD250A

290F3CD251A

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

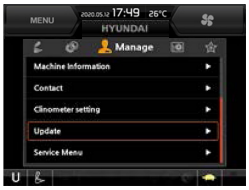
⑦ Clinometer

290F3CD252A

290F3CD253A

· When the machine is on the flatland, if tap the "initialization", the values of X, Y reset "0".
· You can confirm tilt of machine in cluster's operating screen.

⑧ Update (cluster & ETC devices)

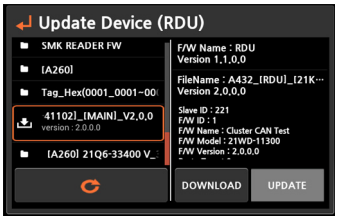


210WF3CD17A

210WF3CD18A

210WF3CD19A

380F3CD04A



380F3CD06

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

(5) Display

① Display item

290F3CD154A

290F3CD155A

290F3CD156A

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

② Clock

290F3CD157A

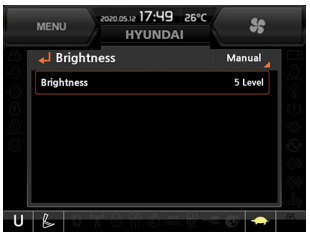
290F3CD158A

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

③ Brightness

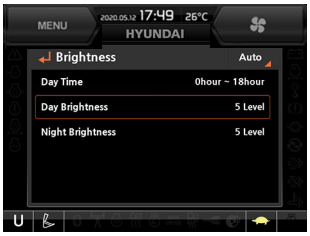
290F3CD159A

290F3CD160A

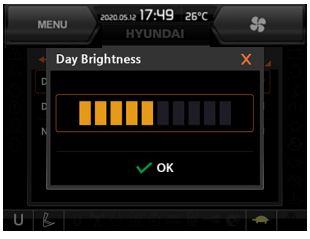


290F3CD139A

290F3CD141A



290F3CD191A



290F3CD192

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

④ Unit

290F3CD161A

210WF3CD162A

290F3CD193A

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

⑤ Language

290F3CD163A

290F3CD164A

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

⑥ Screen type

290F3CD165A

A Type (Default) 290F3CD166A

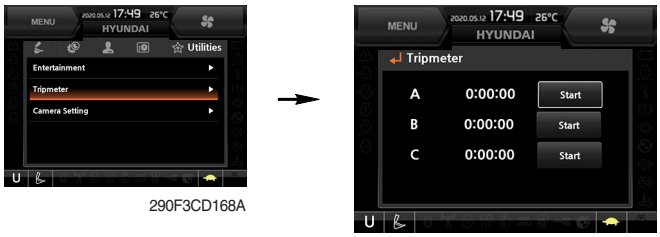
290F3CD156B

B Type (Option) 290F3CD194A

290F3CD167B

(6) Utilities

① Tripmeter



290F3CD168A

290F3CD169A

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

② Camera setting

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

290F3CD200A

290F3CD255A

290F3CD256A

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

290F3CD156A

290F3CD221

④ **AAVM** (All Around View Monitoring, option)

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

290F3CD244A

- **Escape button**

· It will enter into the AAVM mode from the beginning screen if the AAVM is installed.

· While in the AAVM mode, select the ESC button to return to the beginning screen.

290F3CD156C

The beginning screen

AAVM mode

290F3CD222

- **Buzzer stop button**

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

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

290F3CD246A

· When the worker or pedestrian go to the green line (radius 5 m), an external danger area of equipping on the cluster screen, the warning buzzer sounds and it displays the blue rectangular box for the recognition of the worker and pedestrian.
At this time, the operator should stop work immediately, and stop the buzzer by pressing the buzzer stop button. And then, please work after you check whether the danger factors are solved.

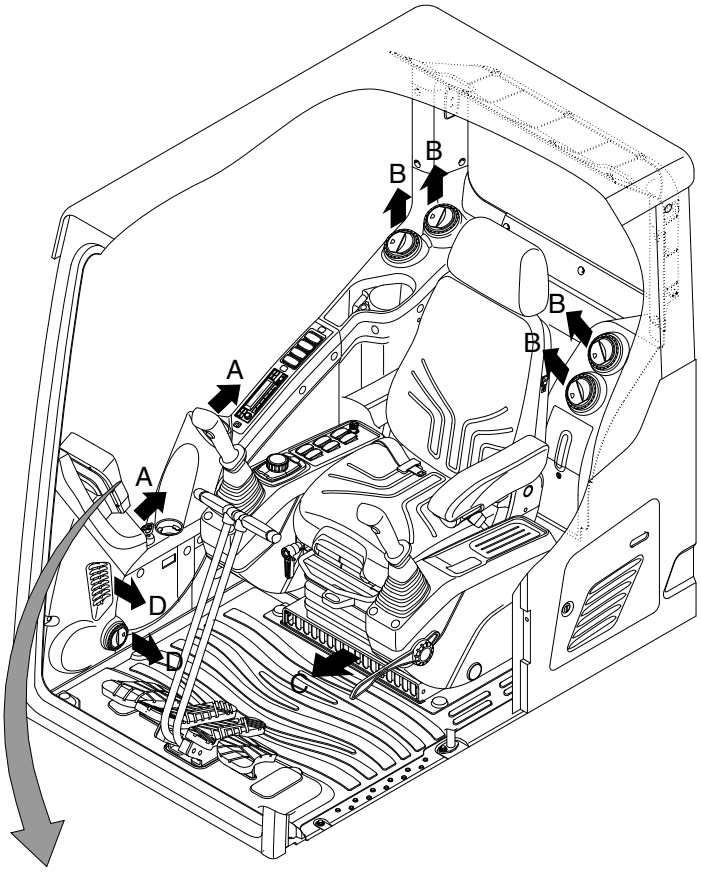
· When the worker or pedestrian go inside of red line (radius 3 m), an internal danger area of equipping on the cluster screen, the warning buzzer sounds and it displays the red rectangular box for the recognition of the worker and pedestrian.
At this time, the operator should stop work immediately, and stop the buzzer by pressing the buzzer stop button. And then, please work after you check whether the danger factors are solved.

※ In AAVM mode, a touch screen of the LCD is available only. The multimodal dial of the haptic controller is not available.

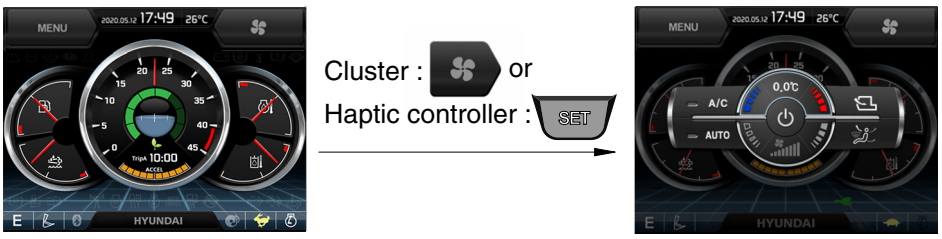
7) AIR CONDITIONER AND HEATER

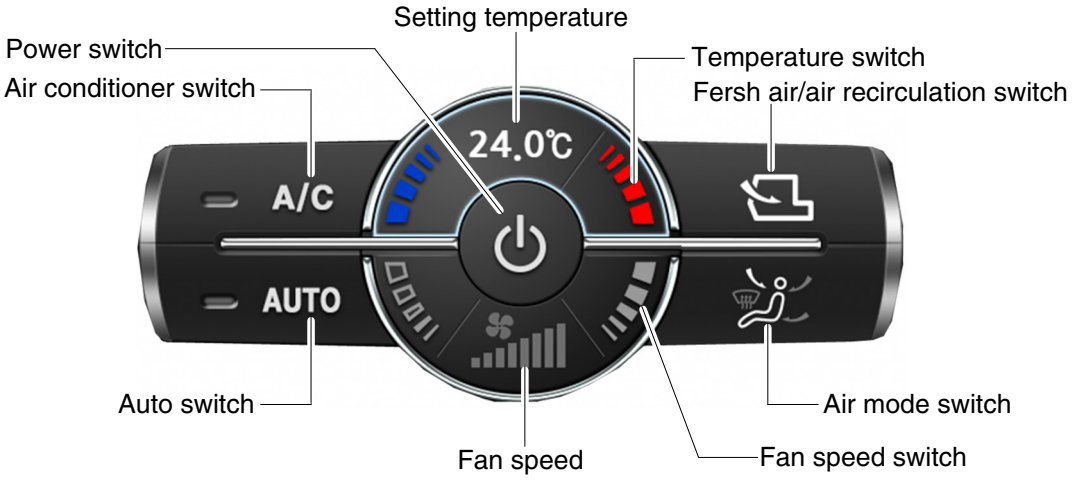
Full auto air conditioner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.

· **Location of air flow ducts**



Cluster LCD





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※ **Haptic controller : Refer to page 3-57.**

(1) Power switch

① This switch makes the system ON/OFF.
Just before the power OFF, set values are stored.
② Default setting values

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

(2) Air conditioner switch

① This switch turns the compressor ON/OFF.
※ 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.

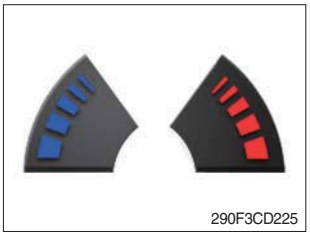
(3) Auto switch

① Auto air conditiner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.

(4) Setting temperature

① Display the temperature setting out.

(5) Temperature switch

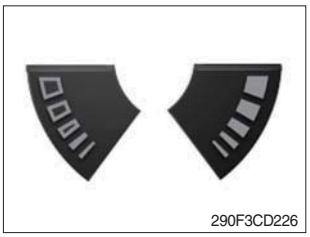


① Setting temperature indication
· Lo (17˚C), 17.5~31.5˚C, Hi (32˚C)
② Max cool and max warm beeps 5 times.
③ The max cool or the max warm position operates as following table.

Temperature	Compressor	Fan speed	In/outlet	Mode
Max cool	ON	Hi (8 step)	Recirculation	Face
Max warm	OFF	Hi (7 step)	Fresh	Def/Foot

④ Temperature unit can be changed between celsius (˚C) and fahrenheit (˚F)
a. Default status (˚C)
b. Push Up/Down temperature switch simultaneously more than 5 second displayed temperature unit change (˚C → ˚F)

(6) Fan speed switch



① Fan speed is controlled automatically by setted temperature.
② This switch controls fan speed manually.
- There are 8 up/down steps to control fan speed.
- The maximum step or the minimum step beeps 5 times.

(7) Fan speed

① Steps 1 through 8 to display the amount of wind.

(8) Fresh air/air recirculation switch

① It is possible to change the air-inlet method.
a. **Fresh air ( )**
Inhaling air from the outside.
b. **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 fresh air filter and the recirculation filter periodically to keep a good efficiency.**

(9) Air mode switch

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

Mode switch		Face	Face/Rear	Face/Rear/Foot	Foot	Def/Foot
Outlet	A	●	●	●		
	B		●	●		
	C			●	●	●
	D					●

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

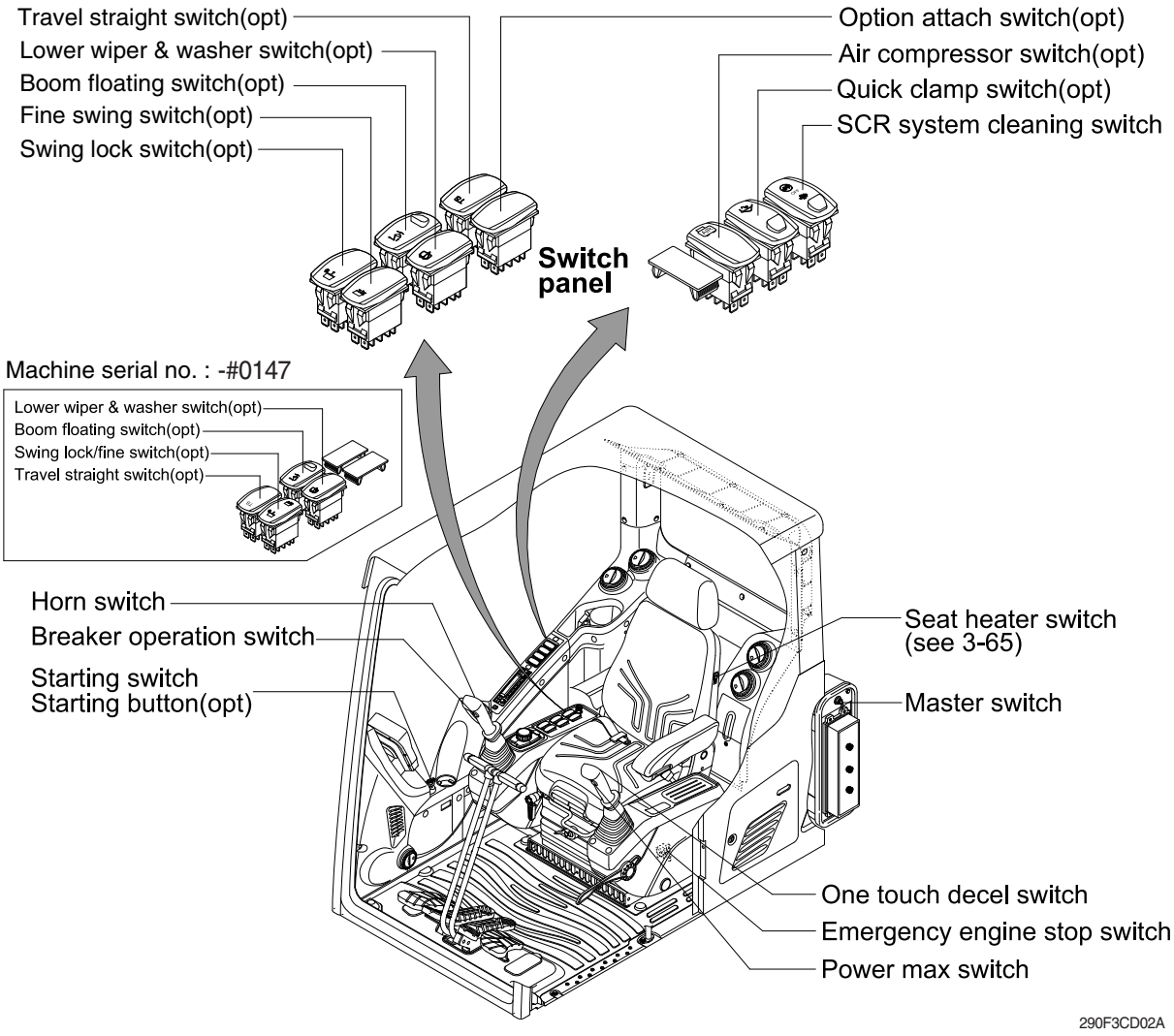
8) SELF DIAGNOSIS FUNCTION

(1) Diagnostic methods : Diagnostic information window, select

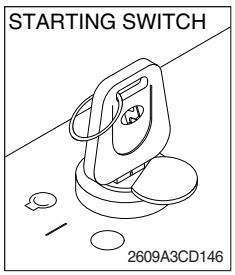
(2) Diagnostic indication (Displays fault)

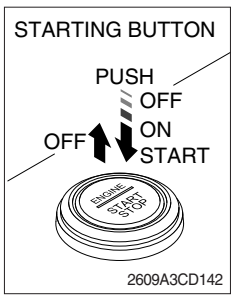
Fault code	Description	Fail safe function
F01	Ambient temperature sensor open	20˚C alternate value control
F02	Ambient temperature sensor short	
F03	Cab inside temperature sensor open	25˚C alternate value control
F04	Cab inside temperature sensor short	
F05	Evaporate temperature sensor open	0˚C alternate value control
F06	Evaporate temperature sensor short	
F07	Null	-
F08	Null	-
F09	Mode 1 actuator open/short	The alternate value is face
F10	Mode 1 actuator drive circuit malfunction	If not, the alternate value is Def/Foot
F11	Intake actuator open/short	The alternate value is air recirculation
F12	Intake actuator drive circuit malfunction	The alternate fresh air
F13	Temperature actuator open/short	If opening amount is 0 %, the alternate value is 0 %
F14	Temperature actuator drive circuit malfunction	If not, the alternate value is 100 %
F15	Null	-
F16	Null	-

3. SWITCHES



1) STARTING SWITCH & STARTING BUTTON (OPT)





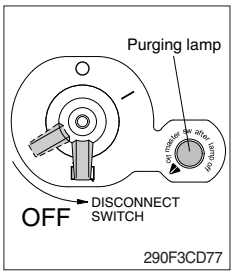
Starting button with smart key tag (opt)

(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.

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

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

2) MASTER SWITCH



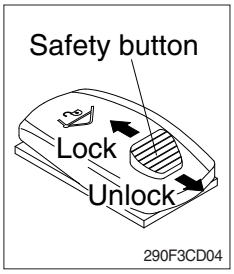
(1) This switch is used to shut off the entire electrical system.

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

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

※ **Off the master switch after purging lamp OFF.**

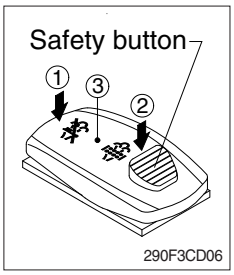
3) QUICK CLAMP SWITCH (option)



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

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

4) SCR (selective catalytic reduction) SYSTEM CLEANING SWITCH



(1) This switch is used to select the SCR system cleaning.

(2) Inhibit position (①)

① The inhibit position disallows any automatic or manual SCR system cleaning.

② This may be used by operator to prevent SCR system cleaning when the machine is operating in a hazardous environment is concerned about high temperature.

③ It is strongly recommended that this position is only activated when high temperatures may cause a hazardous condition.

(3) Auto position (③)

This position will initiate a automatic SCR system cleaning.

(4) Manual position (②)

① This position will only initiate a manual SCR system cleaning when the machine is in non-mission condition, engine must run at low idle speed and SCR system levels are high enough to allow cleaning.

② HEST lamp will be illuminated during the entire SCR system cleaning.

※ **Refer to the page 3-10 for ditails.**

※ **This switch can be move to the manual position (②) only when the safety button is pulled to backward.**

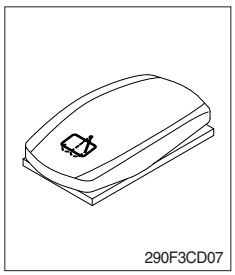
※ **Also, this switch return to the auto position when released the manual position (②).**

5) AIR COMPRESSOR SWITCH (option)

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

(2) The indicator lamp is turned on when operating the switch.

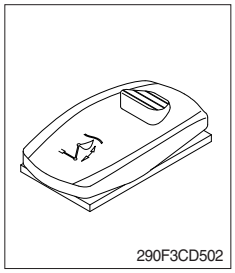
6) LOWER WIPER AND WASHER SWITCH (option)



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

(2) The pilot lamp is turned ON when operating the switch.

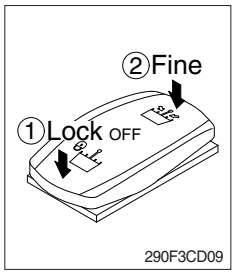
7) BOOM FLOATING SWITCH (option)



(1) This mode is used to smooth boom operation.

(2) Rod and head of boom cylinder are connected to the tank at the same time. So boom can be moved by the ground shape though only arm operation.

8) SWING LOCK / FINE SWITCH (option, -#0147)



(1) OFF position

Normal operation.

(2) Lock position (①)

In this position, the swing parking brake is locked and swing control is not available by shut off the swing pilot pressure to the swing spool.

(3) Fine position (②)

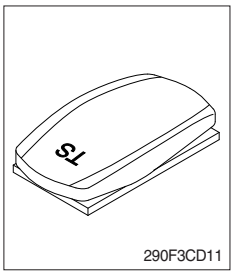
① In this position, the swing parking brake is released.

② Swing control improves during deceleration of a swing because the swing is allowed the drift instead of stopping abruptly.

⚠ If the machine is operating on a slope with the switch in this position, swing motion may became uncontollable which could result in property damage, personal injury or death.

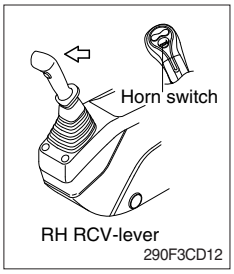
Do not use this position when the machine is operating on a slope.

9) TRAVEL STRAIGHT SWITCH (option)



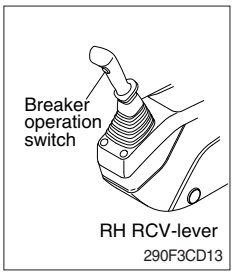
(1) When the travel straight switch is in the ON position, the machine will travel straight by use of only the left pedal or the left lever.

10) HORN SWITCH



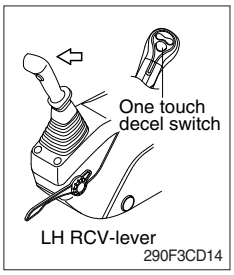
(1) This switch is at the top of right side control lever.
On pressing, the horn sounds.

11) BREAKER OPERATION SWITCH



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

12) ONE TOUCH DECEL SWITCH

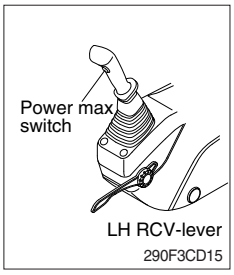


(1) This switch is used to actuate the deceleration function quickly.

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

(3) One touch decel function is available only when the auto idle pilot lamp is turned OFF.

13) POWER MAX SWITCH

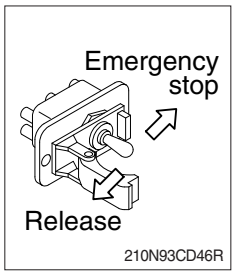


(1) This switch activate power max function.
When this switch is kept pressed, hydraulic power of work equipment will be increased to approx 110 percent during 8 seconds.

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

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

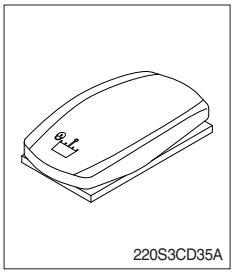
14) EMERGENCY ENGINE STOP SWITCH



(1) This switch is used to emergency stop the engine.

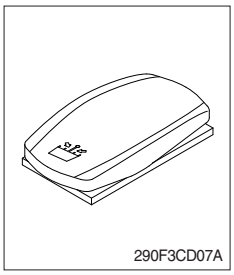
※ **Be sure to keep the emergency switch on the release position when restart the engine.**

15) SWING LOCK SWITCH (option, #0148-)



(1) When the switch is pressed ON position, the swing parking brake is locked and swing control is not available by shut off the swing pilot pressure to the swing spool.

16) FINE SWING SWITCH (option, #0148-)



(1) When the switch is pressed ON position, fine swing valve is operated and swing parking brake is released with below condition.

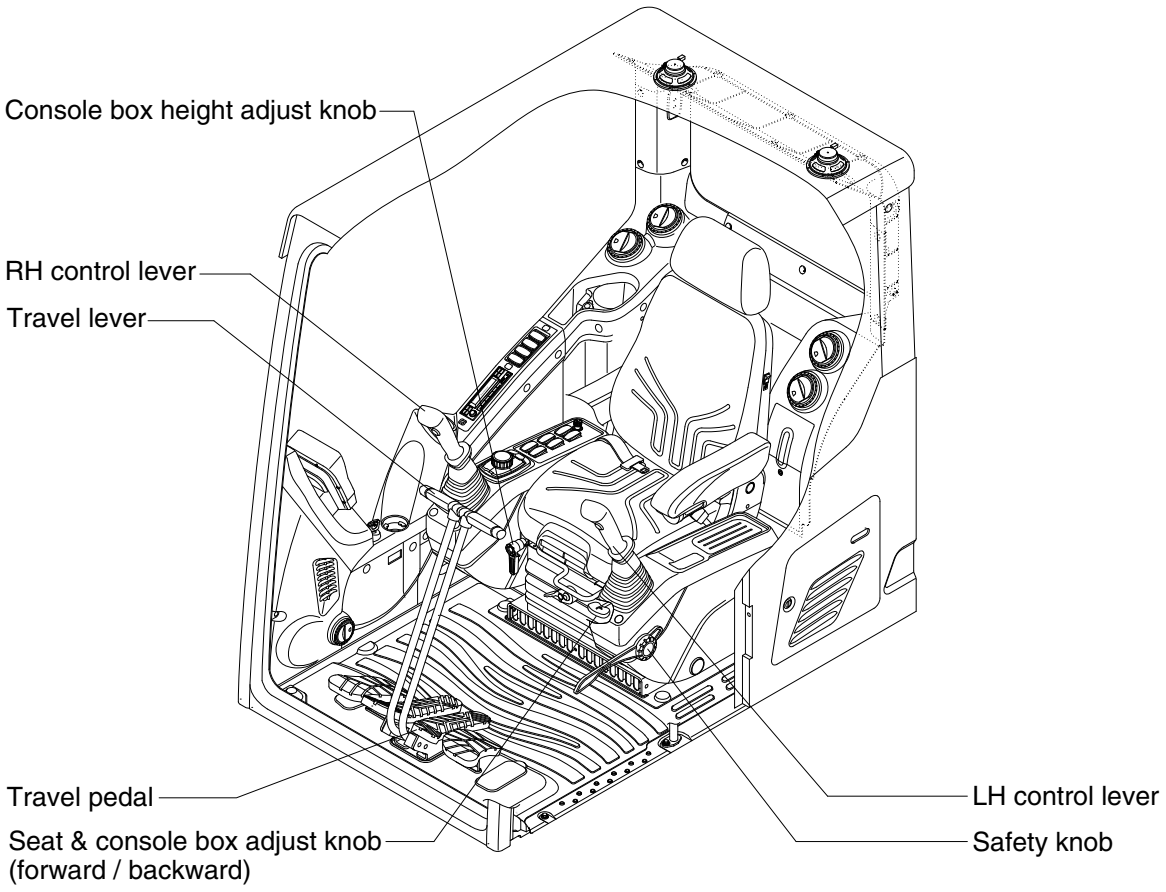
① Swing lever operated
Enhanced soft swing is implement to allow smooth start and stop.

② Boom up lever operated
Further control is possible by allowing free spins in lifting operation for offset loads.

③ Travel lever operated
Reduces the shaking of an object that is lifted.

⚠ **If the machine is operating on a slope with the switch in this position, swing motion may become uncontrollable which could result in property damage, personal injury or death. Do not use this position when the machine is operating on a slope.**

4. LEVERS AND PEDALS



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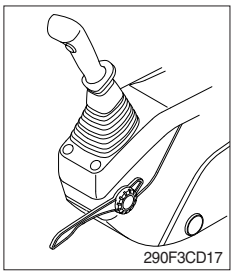
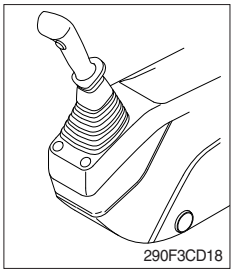
1) LH CONTROL LEVER



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

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

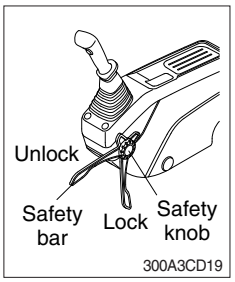
2) RH CONTROL LEVER



(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) SAFETY KNOB



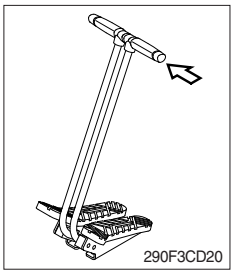
(1) All control levers and pedals are disabled from operation by locating the safety knob to the LOCK position as shown.

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

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

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

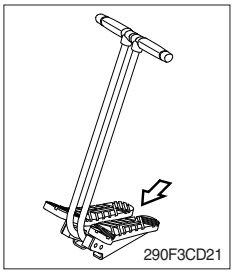
4) TRAVEL LEVER



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

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

5) TRAVEL PEDAL

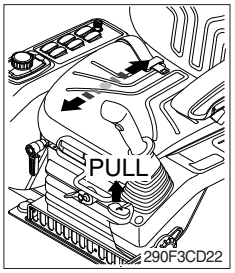


(1) This pedal is used to move the machine forward or backward.

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

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

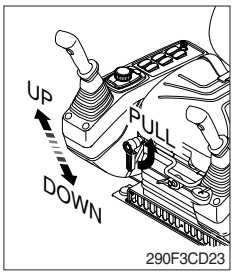
6) SEAT AND CONSOLE BOX ADJUST KNOB (forward/backward)



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

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

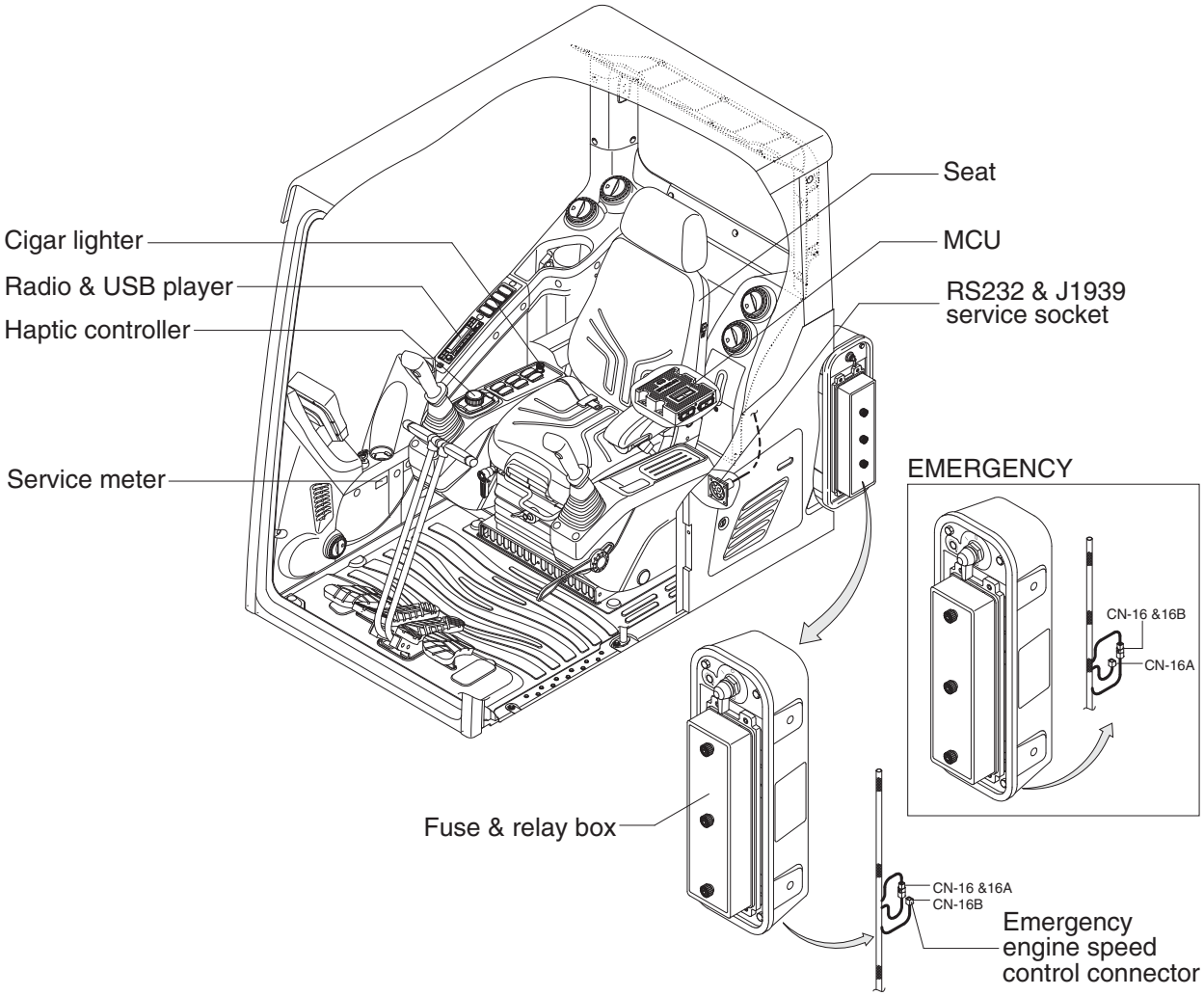
7) CONSOLE BOX (CONTROL LEVER) HEIGHT ADJUST KNOB



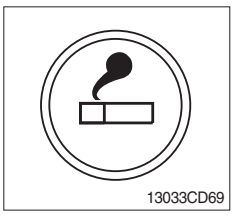
(1) This knob is used to move the LH and RH control levers to fit the contours of the operator's body.

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

5. OTHERS



1) CIGAR LIGHTER



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

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

※ **Service socket**

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

2) RADIO AND USB PLAYER : MACHINE SERIAL NO.: -#1811

■BASIC FUNCTIONS

75793CD62-2

■FRONT PANEL PRESENTATION

1 SEL ····· Audio selection button

····· Audio selection knob

2 ····· Power and volume button

3 MODE ····· Mode button
(select RADIO / USB / AUX)

4 ····· UP / DOWN tuning button

5 1 ····· Preset memory button 1
DISP ····· ID3 v2 display

6 2 ····· Preset memory button 2
SCN ····· File scan

7 3 ····· Preset memory button 3
RPT ····· Repeat play selector

8 4 ····· Preset memory button 4
RDM ····· Random play selector

9 5 ····· Preset memory button 5
D- ····· Directory down

10 6 ····· Preset memory button 6
D+ ····· Directory up

11 ····· Aux function

12 BSM ····· Preset scan (PS)
Best station memory (BSM)

13 MUTE ····· Audio mute button

14 AM/FM ····· AM / FM button (radio)

15 ····· Send

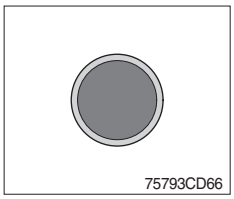
16 ····· End

17 MIC ····· MIC (microphone)

18 AUX ····· Aux connector

■GENERAL

(1) Power and volume button



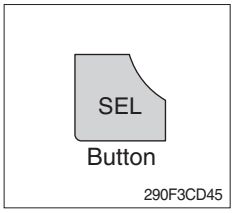
① **Power ON/OFF button**

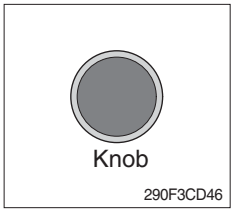
Press power button to turn the unit ON or OFF shortly.
When the power is ON, the previous mode (last memory) will appear.

② **Volume up / down control**

Turn volume up / down button right to increase the volume level. The level will be shown in VOLUME xx on the LCD display. Turn it left to decrease the volume level. After 5 seconds of volume indication, display will return to the previous mode.

(2) Sound function selection button/knob (audio selection)





① This button is to adjust the sound. Each time you press SEL button shortly, LCD displays each mode as follows :

BASS → TREBLE → BAL → LOUD → EQ → BASS

※ When this button is pressed, LCD display shows selected function for 5 seconds and then returns back to the previous mode. On selected function, level can be controlled by turning this button. The display will automatically return to normal indication in 5 seconds after the last adjustment is made or when another function is activated.

② **Bass control**

To adjust the bass level, first select the bass mode by pressing the SEL button until BASS indication appears on the LCD display. Within 5 seconds of choosing the bass mode, turn selection knob right / left to adjust the bass level as desired.
The bass level will be shown on the LCD display from a minimum of BASS –10 to a maximum of BASS +10.
The display will automatically return to the normal indication in 5 seconds after the last adjustment or when another function is activated.

③ **Treble control**

To adjust the treble level, first select the treble mode by pressing the SEL button until TREBLE indication appears on the LCD display. Within 5 seconds of choosing the treble mode, turn selection knob right / left to adjust the treble level as desired.
The treble level will be shown on the LCD display from a minimum of TREBLE -10 to a maximum of TREBLE +10.
The display will automatically return to the normal indication in 5 seconds after the last adjustment or when another function is activated.

④ **Balance control**

To adjust the left-right speaker balance, first select the balance mode by pressing the SEL button until the BAL indication appears on the LCD display.

Within 5 seconds of choosing the balance mode, turn selection knob right / left to adjust the balance as desired.

The balance position will be shown on the LCD display from BAL 10L (full left) to BAL 10R (full right).

When the volume level between the left and right speakers is equal, BAL L=R will be shown on the LCD display panel.

The display will automatically return to the normal indication in 5 seconds after the last adjustment or when another function is activated.

⑤ **Loud control**

When listening to music at low volume levels, this feature will boost the bass and treble response.

This action will compensate for the reduction in bass and treble performance experienced at low volume.

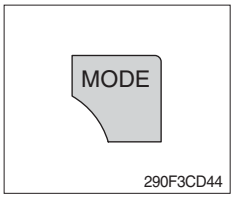
To select the loudness feature, press SEL button until LOUD ON or LOUD OFF is displayed, then turn selection knob left or right to activate or deactivate loudness.

⑥ **Equalizer (EQ)**

You can select an equalizer curve designed for 4 music types (POP, ROCK, CLASSIC, JAZZ).

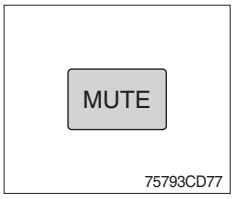
To select the desired curve, first select the EQ mode by pressing SEL button until the "EQ OFF" indication appears on the display panel. Within 5 seconds of choosing the EQ mode, turn selection knob to select an equalizer curve as desired.

(3) Mode button



① Press mode button to select RADIO / USB / AUX / BT audio.

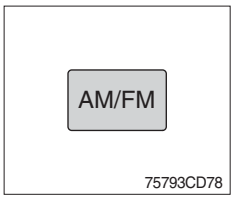
(4) Audio mute button



① Press mute button momentarily to mute volume and MUTE mark will blink on the LCD display.
Press the button again to return to the mode in use before the mute mode was activated.

■RADIO

(1) AM / FM / LW band selector

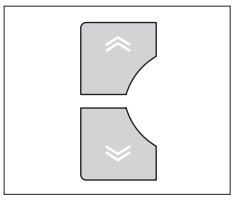


① Each time this button is pressed, the radio button is changed.
Each time this button is pressed, LCD displays each band as follows :

FM1 → FM2 → FM3 → AM → LW → FM1

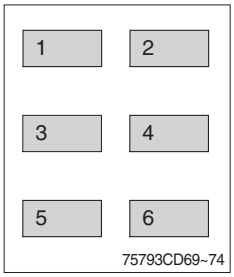
※ LW band is only available for Europe.

(2) Up / down tuning



① To automatically select a radio station, momentarily press the up tune seek button ⩓ or down tune seek button ⩔ for less than 3 seconds to search for the closest radio station.
To manually select a radio station, press the up tuning & down tuning button for longer than 3 seconds.
The radio frequency will move up or down step by step each time you press button.

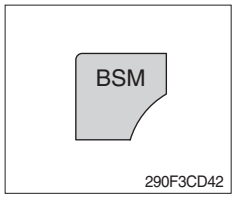
(3) Station pre-set button



① Pressing these buttons shortly will recall your favorite pre-set radio stations.
To store your favorite stations into any of the 6 pre-set memories in each band (AM/FM/LW), use the following procedure :

a. Turn the radio ON and select the desired band.
b. Select the first station to be pre-set using the manual up/ down or automatic seek tuning control button.
c. Press the chosen pre-set button to store your selected station into and continue to hold it in. The beep sound will be momentarily heard and the pre-set number will apear on the LCD display indicating that the station is now set into that pre-set memory position and can be recalled at any time, by pressing that pre-set button.

(4) Pre-set scan (PS) / Best station memory (BSM) button



① **Pre-set scan (PS)**

Press BSM button shortly to scan the 6 pre-set station stored the memories on each band (AM/FM/LW).

The unit will stop at each pre-set station (the pre-set number on the LCD display will flash during pre-set scan operation) and remain on the selected frequency. Press the button momentarily again to remain on the station currently being heard.

② **Best station memory (BSM)**

Pressing BSM button for longer than 2 seconds will activate the BSM tuning feature which will automatically scan and enter each station into memory.

If you have already set the pre-set memories to your favorite stations, activating the BSM tuning feature will erase those stations and enter the new ones.

This BSM feature is most useful when traveling in a new area where you are not familiar with the local stations.

■USB PLAYER

75793CD81-1

(1) USB function

① Connect a USB device if you want to listen to MP3 file in a USB device.

② It will automatically play MP3 file in the USB device and the LCD display will show “READING USB”.

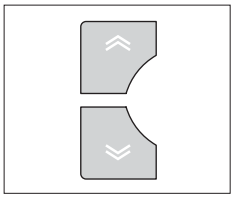
※ If there are no files on USB device, playback will revert back to the previous mode after displaying “NO FILE”.

(2) AUX function

① If you want to listen to music of a external audio device, connect a external audio device through AUX cable.

② Change AUX mode by pressing MODE button.
If audio file of Audio device is playing, you can listen to music through speaker.

(3) File selection & cue / review button



290F3CD43

① **File selection function**

This button is used to select file up / down.

Each time the forward file select ⩓ is pressed, file number is increased.

Each time the backward file select ⩔ is pressed, file number is decreased.

② **Cue / review functions**

High-speed audible search of file on a USB can be made by this button (the cue and review functions).

Press and hold the cue button ⩓ to advance rapidly in the forward direction or the review button ⩔ to advance rapidly in the backward direction.

(4) MP3 directory / file searching

① The D-, D+ button is used to select a particular directory and file.

Press and hold for more than 3 seconds while playing MP3 file.

Turn right / left the selection knob to search the directory. Press the button when you find the wanted directory.

For example, the directory search generally changes in two methods depending on the order of writing as follows.

· Method 1 : ROOT→Dir01→Dir02→Dir03→Dir04→Dir05→Dir06→Dir07→ROOT

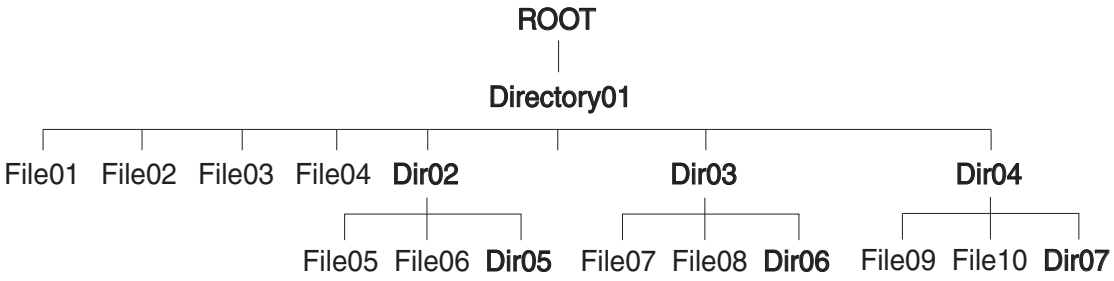
· Method 2 : ROOT→Dir01→Dir02→Dir05→Dir03→Dir06→Dir04→Dir07→ROOT

If you want to search the file in the located directory, turn right / left the selection knob consecutively. Press the button when you find the wanted file. The unit will then play the selected file.

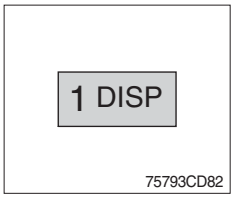
For instance, the file search changes in Dir01 as follows.

File01 → File02 → File03 → File04 → File01

※ MP3 directory / file configuration



(5) ID3 v2 display

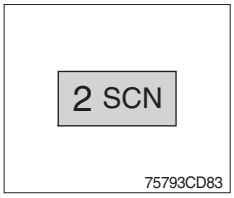


① Disp button is used to change the display information.
While playing an MP3 file, you can change the file information shown on the LCD display.
Each time you press DISP (display), the display changes to show the following.

※ If the MP3 disc does not have any ID3 information, the display will show NO ID3 on LCD display.

Directory name / file name (normal mode)
↓
Album name / performer / title
↓
File number / elapsed time
↓
Directory name / file name (normal mode)

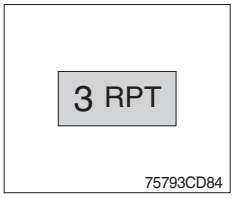
(6) File scan (SCN)



① During USB play, press SCN button to play the first 10 seconds of each file on the whole file on the USB (SCN mark will appear on the LCD display).
When a desired file is reached, press the SCN button again to cancel the function.
The unit will then play the selected file.

※ In case of playing MP3 file, when the SCN (scan) button is pressed and held for longer than 2 seconds, the SCN mark will blink on the LCD display and all files in the selected directory will be introduced until the file scan mode is cancelled by pressing the SCN button again or by activating the random or repeat functions.

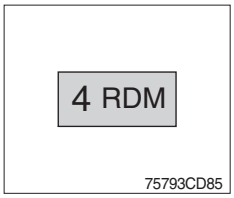
(7) Repeat play selector (RPT)



① During USB play, press RPT button to play the selected file repeatedly (RPT will appear on the LCD display).
Play of the file will continue to repeat until this button is pressed again and the RPT disappears from the LCD display.

※ In case of playing MP3 file, when the RPT button is pressed and held longer than 2 seconds, the RPT mark will blink on the LCD display and play all files in the selected directory and will be repeated until the directory repeat mode is cancelled by pressing the repeat button again or by activating the scan or random functions (RPT mark will disappear from LCD display).

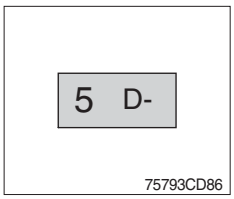
(8) Random play selector (RDM)



① During USB play, press RDM button to play the files on the USB in a random shuffled order (RDM will appear on the LCD display). The file select function will also select file in the random order instead of the normal process.
The random play mode can be cancelled by this button again.

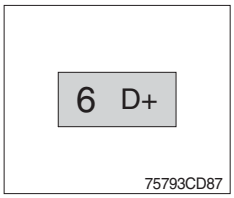
※ In case of MP3 file, when the random button is pressed and held longer than 2 seconds, the RDM mark will blink on the LCD display and play all files in directory randomly until the directory random mode is cancelled by pressing the random button again or by activating the scan or repeat functions (RDM mark will disappear from LCD display).

(9) Directory down



① Press D- button briefly while playing MP3. The previous directory is located each time you press this button.

(10) Directory up



① Press D+ button briefly while playing MP3 . The next directory is located each time you press this button.

※ If the MP3 file does not have a directory, the unit play MP3 at 10-file intervals.

※ If any MP3 file does not exist in USB, this button can not operate.

■BLUETOOTH

(1) Introduce

The bluetooth radio supports bluetooth wireless technology. Bluetooth technology provides a wireless link between a bluetooth mobile phone or bluetooth music player and the HD Hyundai Construction Equipment bluetooth radio.

The bluetooth radio features a hands-free system so that you may talk on the telephone without taking your eyes off the road or your hands off the wheel. A microphone built into the front of the radio receives your voice and the calling party can be heard through the speakers.

Additionally, a bluetooth music player can be wirelessly connected to be the bluetooth radio and playback music tracks in high quality sound through the speakers. Many bluetooth mobile phones include a music player and can provide both hands-free calling and music playback.

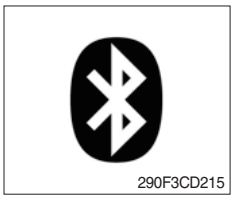
Check your mobile phone owner's manual for details.

※ When the starting switch is in the ON position, the bluetooth radio is on standby to connect with your mobile phone even if the radio is switched off. The machine battery may therefore become drained if the ignition switch remains in the ON position for an extended period of time.

※ Bluetooth technology uses low power radio transmission to connect to your bluetooth mobile phone or bluetooth music player. As radio signal strength reduces over distance, the quality of sound performance during phone calls and music playback may become poor if the distance between the radio and device widens. It is recommended that the mobile phone or music player is kept inside the cab for best results.

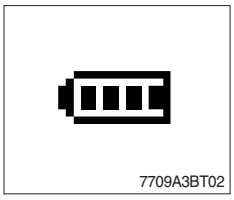
※ As a bluetooth wireless connection can extend to 10 meters, your bluetooth device may automatically connect to the bluetooth radio even if the device is not in the machine.

※ The bluetooth radio uses the latest digital noise & echo suppression system to provide the best sound clarity with little or no distortion, but in some conditions there may be some echo and noise experienced. It is recommended to keep the car windows closed during hands-free calls for best results.


290F3CD215

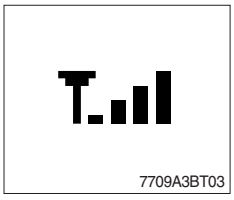
① Bluetooth indicator

The bluetooth logo is displayed when a bluetooth device is connected, and not displayed, when no bluetooth device is connected. If the bluetooth mobile phone is connected but the connection is not of satisfactory quality, the bluetooth logo is not displayed.


7709A3BT02

② Battery strength indicator

This is an indication of your mobile phone battery condition. If your mobile phone is unable to transmit battery condition level, the indicator is not displayed.


7709A3BT03

③ Single level indicator

This is an indication of the mobile phone network signal strength in your current location. If your mobile phone is not able to transmit signal level, the indicator is not displayed.

(2) Bluetooth function

① Pairing a bluetooth mobile phone or music player

A bluetooth connection must first be established between your bluetooth mobile phone or bluetooth music player and the bluetooth radio. The first step to connecting the bluetooth radio and bluetooth device is to introduce or "Pair" the bluetooth radio and bluetooth device together.

It is recommended that you have the instruction manual for your bluetooth mobile phone or music player with you during the pairing process described below to understand how to set your device to pair with the bluetooth radio.

※ It is recommended that all other bluetooth devices other than mobile phones are switched off during the registration or pairing process.

a. Connection method

a) Press SEND button for 2 seconds in any mode, **PAIRING** appears on the bluetooth radio display.
b) Browse your mobile phone or music player menu to find the **SETTINGS** or **CONNECTIVITY** section to find the bluetooth connection section.
c) Find the command that may be called search for bluetooth device or discovery mode so that your bluetooth device can locate all the bluetooth devices within range that may be connected.
d) After the search is complete, **HHI AUDIO** should appear on your mobile phone or music player screen.
e) Select **CONNECT** or **SELECT** on your mobile phone or music player.
f) The mobile phone or music player should now prompt you top enter a PIN code. Enter 0000 into your bluetooth device and select OK.
g) The mobile phone or music player should confirm that it has established a new paired connection with the bluetooth radio.
h) The connecting process is now complete.
i) If the connecting process is successful, the bluetooth logo appears on the radio display and paired phone name (e.g. Samsung or LG) and **CONNECTED** appear on the display for 2 seconds.
j) Your bluetooth device is now ready for use with the bluetooth radio.
k) If the pairing failed, **FAIL** appears on the bluetooth radio display.

※ (a) The bluetooth radio allows a maximum of 6 bluetooth devices to be paired.
(b) Bluetooth technology only allows one phone to be connected to your bluetooth radio at one time.
(c) If a bluetooth music player is to be connected together with a mobile phone, refer to the page 3-55, PLAYING MUSIC USING BLUETOOTH AUDIO.
(d) Bluetooth connection with a mobile phone is normally established using the Hands-Free Profile (HFP). However, in some cases, the connection may use Head Set Profile (HSP) and some functions may not be available.
(e) As each mobile phone or music player brand and model has a different menu structure and control names, you may need to refer to the user manual of your bluetooth device for the correct procedure to connect to another bluetooth device.
(f) Once the bluetooth pairing is complete, automatic connection between mobile phone and the bluetooth radio is possible whenever the starting switch is switched ON.
The mobile phone must be set to automatically connect to the bluetooth radio to allow this automatic connection.

(g) The bluetooth radio will give connection priority to the last connected mobile phone.
(h) It is recommended that all other bluetooth devices other than mobile phones are switched off during the registration or pairing process.

② Disconnecting a bluetooth device

If you need to disconnect your bluetooth mobile phone or music player with the bluetooth radio, follow the steps below.

a. Press END button for 2 seconds in any mode.
b. When the bluetooth connection is lost, bluetooth logo disappears and the previously connected device name (e.g. Samsung or LG) and **DISCONNECTED** appear on the display.

③ Select a bluetooth device

The bluetooth radio can pair up to 6 bluetooth devices. A previously paired mobile phone or music player can be selected for connection using the method described below. Refer to the table 2-1 for examples.

Preset No.	Bluetooth device name (for example)
1	Samsung
2	LG
3	Apple
4	Motorola
5	EMPTY
6	EMPTY

Table 2-1

a. Press SEND button, to select **BLUETOOTH** mode.
b. Press SEL button. **SELECT PHONE** will appear on the display.
c. Turn selection knob, until **SELECT PHONE** is displayed.
d. When **SELECT PHONE** appears on the display, press SEL button.
e. Press the preset button to display the name of the bluetooth device name of the mobile phones or music players previously paired. You may also turn selection knob to display the paired devices.

· Each time you turn or selection knob, the LCD displays as follows :

SAMSUNG → LG → APPLE → MOTOROLA → BACK → SAMSUNG

f. If the bluetooth mobile phone name is Samsung as in the example of table 2-1, then **Samsung** appears on the display. When preset button [1] is pressed or selection knob is turned 1 click to the right.
g. Once the name of the bluetooth device you wish to connect is displayed, in this example **Samsung**, press SEL button to have the Samsung device connected.
h. If the connection is successful, the bluetooth logo appears on the display and paired phone name **Samsung** and **CONNECTED** appears on the display for 2 seconds.

④ **Deleting a previously paired bluetooth device**

If you no longer need to use a paired bluetooth device with the bluetooth radio, it can be deleted. It is from the registration assignment for another mobile phone.
Refer to the example of paired devices shown table 2-1.

a. Press SEND button, to select **BLUETOOTH** mode.
b. Press SEL button and **SELECT PHONE** appears on the display.
c. Turn selection knob, until **DELETE PHONE** is displayed.
d. When **DELETE PHONE** appears on the display, press SEL button.
e. Press the preset button to display the name of the bluetooth device name of the mobile phones or music players previously paired. You may also turn selection knob to display the paired devices.
f. Once the name of the bluetooth device you wish to delete is displayed, in this example **Samsung**, press SEL button to have the Samsung device deleted.
g. The display will then show **DELETE NO** or if selection knob is turned, **DELETE OK** on the display.
h. To confirm your wish to delete the selected device, when **DELETE OK** appears on the display press SEL button.
i. If the bluetooth device being deleted (in this example) was connected, the display will show previous paired phone name “Samsung” and DISCONNECTED.
j. In the example above, the number of paired devices is now reduced to 3, leaving 3 vacant memory locations for additional devices. Table 2-2 shows the example.

Preset No.	Bluetooth device name (for example)
1	LG
2	Apple
3	Motorola
4	EMPTY
5	EMPTY
6	EMPTY

Table 2-2

⑤ **Basic telephone operation**

a. Using the bluetooth radio for hands-free calls

a) When an INCOMING call arrives at the bluetooth radio via your connected bluetooth mobile phone, **INCOMING CALL** appears on the display for 3 seconds then the calling telephone number is shown.
b) Press SEND button to answer the INCOMING call. **HANDSFREE** appears on the display.
c) To end the call, press END button and the call will end and **END CALL** is displayed.
d) If you wish to reject an INCOMING call, press END button.
e) To make an OUTGOING call use the keypad of the connected bluetooth mobile phone to enter a number and press the **OFF-HOOK** (SEND) button on your mobile phone.
f) **OUTGOING CALL** is displayed on the bluetooth radio and the call continues in hands-free mode.
g) The call can be ended by pressing END button the **ON-HOOK** (END) button of the connected mobile phone.
※ Some mobile phones may not reject an INCOMING call using the action of d) above. In this case, press the **ON-HOOK** button on the connected mobile phone to reject.

b. Last call number redials

Select **BLUETOOTH** mode by pressing SEND button. To making a call to the last dialed number, press SEND button again. **OUTGOING CALL** appears on the radio display for 1 second.

※ Some mobile phones may require an additional press of SEND button to start the last number redial call.

c. Switching to private (headset) mode during a call

During an INCOMING or OUTGOING call started in hands-free mode, it is possible to switch to the private call mode using the mobile phone handset to speak and to hear the calling party in private.

a) Press SEND button during the conversation ; **PRIVATE** appears on the display.

b) To switch back to hands-free mode using the bluetooth radio, press SEND button again during the private conversation ; **HANDSFREE** is shown on the display and hands-free call operation continues.

※ The above switching function may cause disconnection of the bluetooth link between the bluetooth radio and some mobile phones.
If SEND button is pressed during the private conversation, the bluetooth connection will return automatically.

(3) Funtion of bluetooth audio player

① Playing music using bluetooth audio

The bluetooth radio supports the bluetooth profile Audio Advanced Distribution Profile (A2DP). If your mobile phone or music player supports this profile then it is possible to listen to music tracks located on your bluetooth device through the bluetooth radio and speakers.
Additionally, the bluetooth radio supports the Audio Video Remote Control Profile (AVRCP).
If your bluetooth mobile phone or music player supports this profile then it is possible to advance to the next track or replay previous tracks on using the buttons on the front of the bluetooth radio your machine.

a. Press MODE button until **BT AUDIO** is displayed.
b. When **BT AUDIO** appears on the display, select the music player feature on your bluetooth device. And then bluetooth device play automatically to begin playback.
c. To pauses the bluetooth audio playback, press SEL button for 2 seconds. Press the knob again for 2 seconds to resume playback.
d. Press buttons (⩓,⩔) advance to the next or previous music track.

※ (a) Check your bluetooth device owner's manual for details of how to play music tracks via an external bluetooth audio system such as the bluetooth radio.
(b) Some bluetooth mobile phones cannot play music at all or may play music tracks in low-quality audio through the bluetooth radio.
(c) Some mobile phones require additional pairing to allow bluetooth audio playback.
(d) Information about songs (ID3) (e.g. the elapsed playing time, song titles, song index, etc.) playing using bluetooth audio profile cannot be displayed on this bluetooth radio.

② Connecting a bluetooth music player and mobile phone simultaneously

It is possible to connect a bluetooth mobile phone and a separate bluetooth music player to the bluetooth radio at the same time. Phone calls can be sent and received using the hands-free feature while music is playing using the bluetooth audio feature.

(4) Bluetooth setting

① Setting the automatic call answer feature

If this function is selected, the bluetooth radio automatically answers all INCOMING calls.
This feature enhances safety as the driver does not need to take their hands from the steering wheel to accept an INCOMING call.
Note that this feature cannot be set at different settings for each of the paired mobile phones.

a. Press SEND button to select BLUETOOTH mode.
b. Turn selection knob until **SETTINGS** is displayed.
c. Press SEL button until **AUTO ANSWERING** is displayed.
d. Press SEL button and turn selection knob. The LCD then displays as follows :

ANSWER OFF → ANSWER 5 SEC → ANSWER 10 SEC → RETURN → ANSWER OFF

- ANSWER OFF = Automatic answer function is not active.
- ANSWER 5 SEC = Automatic answers all INCOMING calls after a 5 second delay.
- ANSWER 10 SEC = Automatic answers all INCOMING calls after a 10 second delay.
- RETURN = Return to previous menu.

e. After making your selection, press SEL button to store the selection.
f. **SETTINGS** is then displayed for adjustment if required.
g. If you do not wish to adjust any further bluetooth settings, press END button to return to the last selected mode.

② Setting calling voice volume

This function is to set the level of the mobile phone's calling voice volume to be heard through the bluetooth radio and speakers.

a. Follow steps a. to c. of above setting below ①.
b. When **VOICE VOLUME** appears on the display, press SEL button to display the current level of the calling voice. Turn selection knob right or left to adjust the calling voice volume as desired. This is the level the calling voice volume will be set to each time the bluetooth radio is used after the stating switch is turned off and then on again.
c. After making your selection, press SEL button to store the selection.
d. **SETTINGS** is then displayed for adjustment if required.
e. If you do not wish to adjust any further bluetooth settings, press END button to return to the last selected mode.

③ Setting the ring volume

This function is to set the level of the mobile phones ring tone volume to be heard through the bluetooth radio and speakers.

a. After making your selection, press SEL button to store the selection.
b. When **RING VOLUME** appears on the display, press the SEL button to display the current level of the ring tone. Turn selection knob right or left to adjust the ring tone volume as desired. This is the level the ringer volume will be set to each time the bluetooth radio is used after the starting switch is turned off and then on again.
c. After making your selection, press SEL button to store the selection.
d. The press END button to return to the last selected mode.

RADIO AND USB PLAYER (WITH BLUETOOTH) : MACHINE SERIAL NO.: #1812-

9403CD100

■ FRONT PANEL PRESENTATION

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

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

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

4 ····· Call & Pair button

5 ····· Call end button

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

7 ····· Station preset 2

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

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

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

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

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

13 ····· Auto tune up, Seek up button

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

15 ····· USB connector

16 ····· AUX IN Jack

17 ····· MIC hole

RADIO AND USB PLAYER (WITHOUT BLUETOOTH) : MACHINE SERIAL NO.: #1812-

9403CD101

■ FRONT PANEL PRESENTATION

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

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

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

4 ····· Radio seek up button

5 ····· Radio seek down button

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

7 ····· Station preset 2

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

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

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

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

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

13 ····· Track up button

14 ····· Track down button

15 ····· USB connector

16 ····· AUX IN Jack

■ GENERAL

(1) Power and volume button

① Power ON / OFF button

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

② Volume UP/DOWN control knob

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

③ Initial volume level set up

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

④ Clock ON/OFF control

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

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

⑤ Clock adjustment

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

(2) Menu Selection

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

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

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

② Bass control

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

③ Treble control

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

④ Balance control

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

⑤ Fader control

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

⑥ EQ control

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

EQ OFF → CLASSIC → POP → ROCK → JAZZ

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

⑦ Loud control

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

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

⑧ Beep control

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

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

(3) Mute control

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

(4) Mode selection

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

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

■ RADIO

(1) Mode button

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

(2) Manual tuning button

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

(3) Auto tuning button

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

(4) Station preset button

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

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

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

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

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

■ USB PLAYER

(1) USB playback

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

※ **If no mp3 or wma files in USB device, it will convert to the previous mode after display NO FILE.**

(2) Track Up / Down button

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

(3) MP3 directory / File searching

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

(4) Directory Up / Down button

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

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

(5) Track Scan Play (SCAN) button

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

(6) Track Repeat Play (RPT) button

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

(7) Track Random Play (RDM) button

- RANDOM playback : Simply press RDM (9) button to play the tracks in the device in a random sequence.
- RANDOM folder : Press and hold RDM button for longer than 2 seconds to random play the tracks in current folder.
- RANDOM off : Simply press it again to cancel RANDOM feature.

(8) ID3 v2 (DISP)

① While a MP3 file is playing, press DISP button (6) to display ID3 information. Repeat push DISP button (6) to show directory name / file name and album name / performer / title.

※ **If the MP3 disc does not have any ID3 information, it will show NO ID3.**

* USB Information and Notice
  a. Playback FILE SYSTEM and condition allowance.
     - FAT, FAT12, FAT16 and FAT32 in the file system.
     - V1.1, V2.2 and V2.3 in the TAG (ID3) version.
  b. Display up to 32 characters in the LCD display.
  c. No support any of MULTI-CAED Reader.
  d. No high speed playback but only playing with normal full speed.

※ **DRM files in the USB may cause malfunction to playback in the radio unit.**

※ **The temperature below -10 Celsius, the audio unit with USB hook up would be affected to play well.**

■ AUX OPERATION

It is possible to connect your portable media player to the audio system for playback of the audio tracks via the cab speakers.

To get the best results when connecting the portable media to the audio system, follow these steps :

- Use a 3.5 mm stereo plug cable to connect the media player headphone socket at each end as follows.
- Adjust the portable media player to approximately 3/4 volume and start playback.
- Press the MODE button (3) on the audio unit to change into AUX mode.
- The volume and tone can now be adjusted on the audio unit to the desired level.

※ **The audio quality of your media player and the audio tracks on it may not be of the same sound quality as the audio system is CD Player.**

※ **If the sound of the media player is too low compared with the radio or CD, increase the volume of the player.**

※ **If the sound of the media player is too loud and/or distorted, decrease the volume of the player.**

※ **When in AUX mode, only the Volume, Bass, Treble, EQ and Mode functions of the audio unit can be used.**

■ **BLUETOOTH** (if equipped)

1) Using a bluetooth wireless connection

(1) Your audio unit supports bluetooth wireless technology. You can set up a wireless link with bluetooth cellular phone.

(2) Keep PAIRING the cellular phone with audio unit in a few minutes as the phone are being switched on well enough.

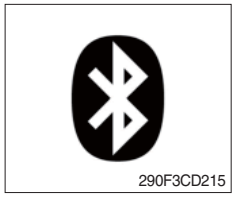
※ **Since this audio unit is on standby to connect with your cellular phone via bluetooth wireless technology, using this audio unit without running the engine can result battery drainage.**

※ **This audio unit phone call reception is on standby when ignition switch is set to ACC OFF or ON.**

※ **The line-of-sight distance between this audio unit and your cellular phone must be 10 meters or less for sending and receiving voice and data via bluetooth wireless technology. However the transmission distance may become shorter than the estimated distance depending on the environment in use.**

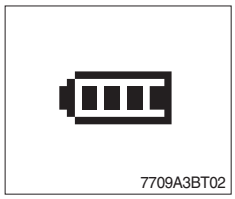
※ **Digital Noise & Echo suppression system provides the best sound clarity with little or no distortion (Echo & side tone will happen depending on cellular phone or service network).**

※ **To ensure the quality of calling, you should select a proper bluetooth VR level. This audio unit has already set with the best bluetooth VR level.**



① Bluetooth icon

It will blink while establishing the bluetooth pairing.
It will light after a bluetooth device connected.



② Battery icon

It indicates the battery status of the connected bluetooth device.

③ Single strength icon

It indicates the signal strength of the connected bluetooth device.

2) Pairing in hands free modes

(1) Press and hold CALL button (4) for 2 seconds until you hear beep sound, then appears PAIR STR on the display.

(2) For the next procedure, go to cellular phone pairing mode.

(3) If it is in pairing status with audio unit and cellular phone, PAIRING will show on the display.

(4) If you want to exit pairing mode, press CALL END button (5) briefly while pairing, then it will show PAIR CLR on the display.

(5) Bluetooth Icon and PAIR OK appear on the display when pairing is successful.

3) Cellular phone pairing mode

(1) Browse your cellular phone menu and find the connectivity or bluetooth connection section.

(2) Select search for a new handsfree device function and allow the phone to find the mobile.

(3) HYUNDAI should appear on your cellular phone screen.

(4) Press connect menu among the handsfree option on your cellular phone.

(5) The cellular phone should prompt for a pin code. Insert the pin code 1234.

(6) The cellular phone should confirm that it has established a new paired connection.

(7) Close the menu. The pairing is now completed. It appears PAIR FAIL on the display for 3 seconds.

※ Each cellular phone type has distinct phone menu so you may need to refer to your manufactures instruction for the correct procedure on how to connect a new bluetooth device.

※ Please retry to the pairing instruction if HYUNDAI does not appear on the cellular phone screen.

※ Please select authorized, if there is authorized menu in the menu of bluetooth connection in your cellular phone.

※ Once the bluetooth pairing is completed between your cellular pone and this audio unit, the both units will be automatically recognized on its paring and when you turn on the key in your car even though this audio unit is turned off.

※ This audio unit can store up to 6 phones pairings. If the memory is full, the first stored paired phone will be deleted.

※ The connecting priority will be given to the last connected cellular phone.

※ If you want to change the connecting priority, try to connect this audio unit from the cellular phone.

4) Bluetooth connection and disconnection

(1) When established bluetooth connection between this audio unit and the cellular phone, bluetooth icon on the display appears and then the display shows HF/AV CONN when handsfree & AV profile connected.


9403CD118

(2) To disconnect bluetooth link
Press and hold CALL END button (4) for 2 seconds, it shows DIS CON and disappears bluetooth Icon on the display.


9403CD117

(3) To disconnect bluetooth link
Press CALL button (3) briefly, it blinks bluetooth Icon on the display while bluetooth is being connected. If the connection is completed, it appears bluetooth Icon on the display.

※ When your cellular phone battery is at low charge, the bluetooth connection may occasionally be lost. To maintain good connectivity ensure that your phone battery is adequately charged.

※ In case of failure of bluetooth pairing :
- Delete item in paired list on your phone.
- Reset both phone by power off/on and the audio unit by ACC off/on.

※ Connecting priority of handsfree profile is higher than headset profile.

※ The headset mode does not support caller ID, reject call and call Transfer.

5) Using the audio unit as a handsfree device

(1) When the audio unit is ringing, it shows CALL and follows with the phone number ********** on the display.


9403CD117/8

(2) To accept call
Press CALL button (4), it appears ANSWER CALL and follows TALKING on the display.

(3) To end call
To end call, press CALL END button (5), it appears REJECT on the display.

※ If reject call is activated in your phone, then your cellular phone does not support reject call function.

6) Audio transfer between the audio unit and phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.

(1) Press CALL button (4) briefly during conversation, it appears CALL TRANS on the display. To switch back to the audio unit, press button (4) briefly during private conversation, then it appears CALL TRANS on the display again.

※ **This function will be a cause of disconnection of bluetooth link in some nokia phones, but you do not worry just press button (4) during private conversation, then switch back to the audio unit automatically.**

※ **The quality of calling between cellular phone and audio unit is better than calling between one audio unit and another one.**

7) Last call number dialing

(1) Press CALL button (4) briefly, it appears CALL TO, then simply press CALL button once again, it would make the last call with phone number display on LCD.
If Reject call is activated in your phone, then your cellular phone does not support Reject Call function.

※ **If you are using SAMSUNG phone, then you may need to press once more send button. First press button shows phone contact list in your phone, then second press make the last call.**

8) To make a call by cellular phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.

(1) The audio unit activated automatically when you make a call by cellular phone.
(2) When you make a call processing by cellular phone, it shows CALLING on the display.
(3) When you receive a call, the phone number ******** appears on the display.

9) Using the audio unit as bluetooth music

The audio unit supports A2DP (Audio Advanced Distribution Profile) and AVRCP (Audio Video Remote Control Profile), and both profiles are available to listen music at the audio unit via cellular phone which is supporting the two profiles above.

(1) To play music, search the menu on your cellular phone as below :
i.e : Menu → File manager → Music → Option → Play via bluetooth.
It appears BT MP3 on the display.

(2) During BT MP3 playing, you could select the previous or next track by pressing SEEK up or TRACK down button on audio unit or operate via your cellular phone.

(3) To stop music, press button (5) briefly and it will automatically switch into the previous mode.

(4) To resume music playing, press the play button on your cellular phone.

※ This function maybe different depends on cellular phone. Please follow the cellular phone menu. Some kinds of phone need to pair once more for bluetooth MP3 connection.

※ This function will be caused to disconnect A2DP, AVRCP depends on cellular phone.

※ Information about songs (e.g.: the elapsed playing time, song title, song index, etc.) cannot be displayed on this audio unit.

■ RESET AND PRECAUTIONS

1) Reset function

Interfere noise or abnormal compressed files in the MP3 disc or USB instrument may cause extraordinary operation (or unit frozen/locking up). It's strongly recommended to use appropriate USB storage not cause any malfunction to the audio unit. In the unlikely event that the player fails to operate correctly, try out to reset unit by any of following two methods.

(1) press and hold 

simultaneously for about 5 seconds. (without Bluetooth)

Press and hold 

simultaneously for about 5 seconds. (with Bluetooth)

(2) Take out the fuse for the audio system in the vehicle once and then plug again.

※ It will be necessary to re-enter the radio preset memories as these will have been erased when the microprocessor was reset.

After resetting the player, ensure all functions are operation correctly.

2) Precautions

When the inside of the car is very cold and the player is used soon after switching on the heater, moisture may form on the disc or the optical parts of the player and proper playback may not be possible.

If moisture forms on the optical parts of the player, do not use the player for about one hour. The condensation will disappear naturally allowing normal operation.

(1) Operation voltage : 9~32 volts DC, negative

(2) Output power : 40 watts maximum (20 watts x 2 channels)

(3) Tuning range

Area	Band	Frequency range	Step
USA	FM	87.5~107.9 MHZ	200K
	AM	530~1710 KHZ	10K
EUROPE	FM	87.5~108.0 MHZ	50K
	AM	522~1620 KHZ	9K
ASIA	FM	87.5~108.0 MHZ	100K
	AM	531~1602 KHZ	9K
LATIN	FM	87.5~107.9 MHZ	100K
	AM	530~1710 KHZ	10K

- AREA Selection :
  - To select an area, press and hold related buttons at FM1 band for about 3 seconds.
  - USA Area: Press and hold mode + 1DIS buttons for 3 seconds
  - EUROPE Area: Press and hold mode + 2 buttons for 3 seconds
  - ASIA Area: Press and hold mode + 3RPT buttons for 3 seconds
  - LATIN Area: Press and hold mode + 4RDM buttons for 3 seconds.

(4) USB version : USB 1.1

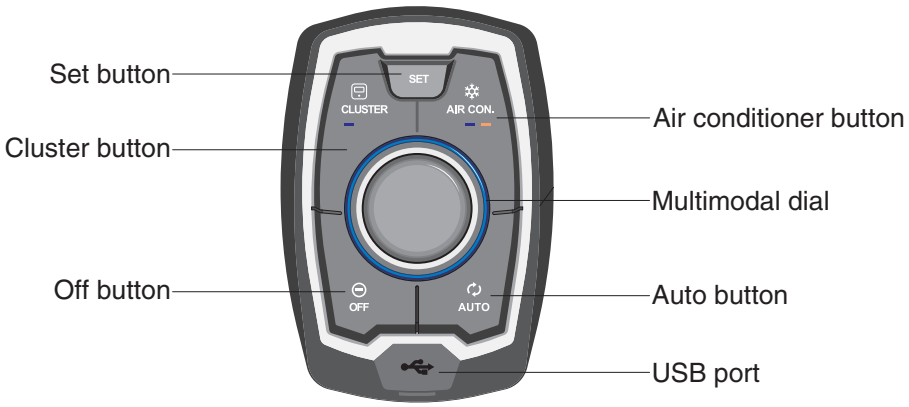
(5) Bluetooth version : V2.1

(6) Bluetooth supported profile :

- A2DP : Advanced Audio Distribution Profile
- AVRCP : Audio/Video Remote Control Profile
- HFP : Hands-Free Profile

3) HAPTIC CONTROLLER

The haptic controller consists of buttons, multimodal dial and USB port.



290F3CD173

(1) Cluster button

290F3CD174

① When you push this button, haptic controller execute cluster interlocked mode.

② In cluster interlocked mode, if you push the cluster button, the haptic controller return to previous mode.

③ Cluster interlocked mode ON : Blue lamp is turn ON
Cluster interlocked mode OFF : Blue lamp is turn OFF

(2) Air conditioner button

290F3CD175

① When you push this button, air conditioner system is operated.

② Determines whether to perform a cooling function of air conditioner.

- Blue lamp ON : Air conditioner operation
- Amber lamp ON : Fan only

(3) Set button

290F3CD176

① When you push this button, the haptic controller executes air conditioner mode and displays air conditioner control mode in cluster.

② Air conditioner control mode will be disappear when you push SET button again within 10 seconds or when you do not touch anything more than 10 seconds.

(4) OFF button

290F3CD177

① Only while air conditioner system is operating you can use this button.
② This button is only for air conditioner system off.

(5) Auto button

290F3CD178

① This button controls air conditioner ON/OFF.

※ **Refer to the page 3-32 for the auto switch of the air conditioner.**

(6) USB port

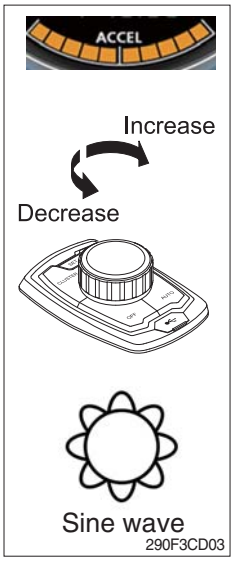

290F3CD179

① This port updates firmware using a dedicated cable.
② Haptic controller has built-in charging circuit supply max 500 mA current.

(7) Multimodal dial

- **Cluster interlocked mode OFF**

① **Acceleration mode**

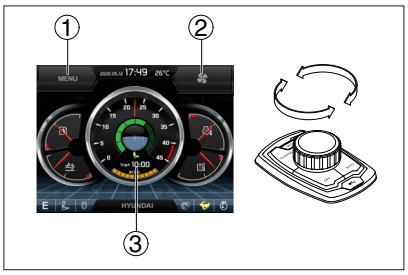


290F3CD03

- There are 10 dial setting.
- Setting 1 is low idle and setting 10 is high idle.
  · By rotating the dial to right : Engine speed increases
  · By rotating the dial to left : Engine speed decreases
- Dial operating pattern is sine wave torque.

- Cluster interlocked mode ON

① Cluster main menu

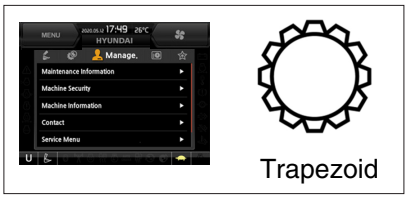


290F3CD240A

- You can select the quick menu by rotating the dial as below.

- CW rotation : move to right direction
- CCW rotation : move to left direction

② Cluster menu move



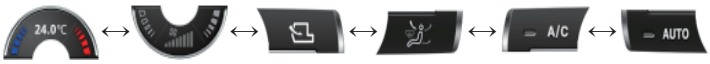
290F3CD180A

- You can move up and down of the cluster sub menu.
- Dial operating pattern is continuous rotation trapezoid torque.

③ Air conditioner menu

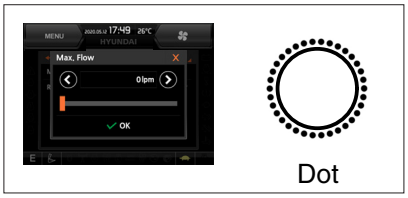
290F3CD181A

- You can move the menu of the air conditioner control mode.



- Dial operating pattern is mixed type trapezoid torque.

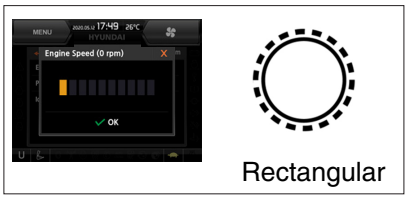
④ Slide choice menu



290F3CD182A

- You can increase or decrease the slide choice bar.
- Dial operating pattern is repeat dot interval torque.

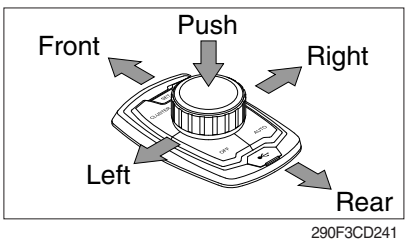
⑤ Level choice menu



290F3CD183A

- You can increase or decrease the level choice bar.
- Dial operating pattern is integrate rectangular torque.

⑥ Push button

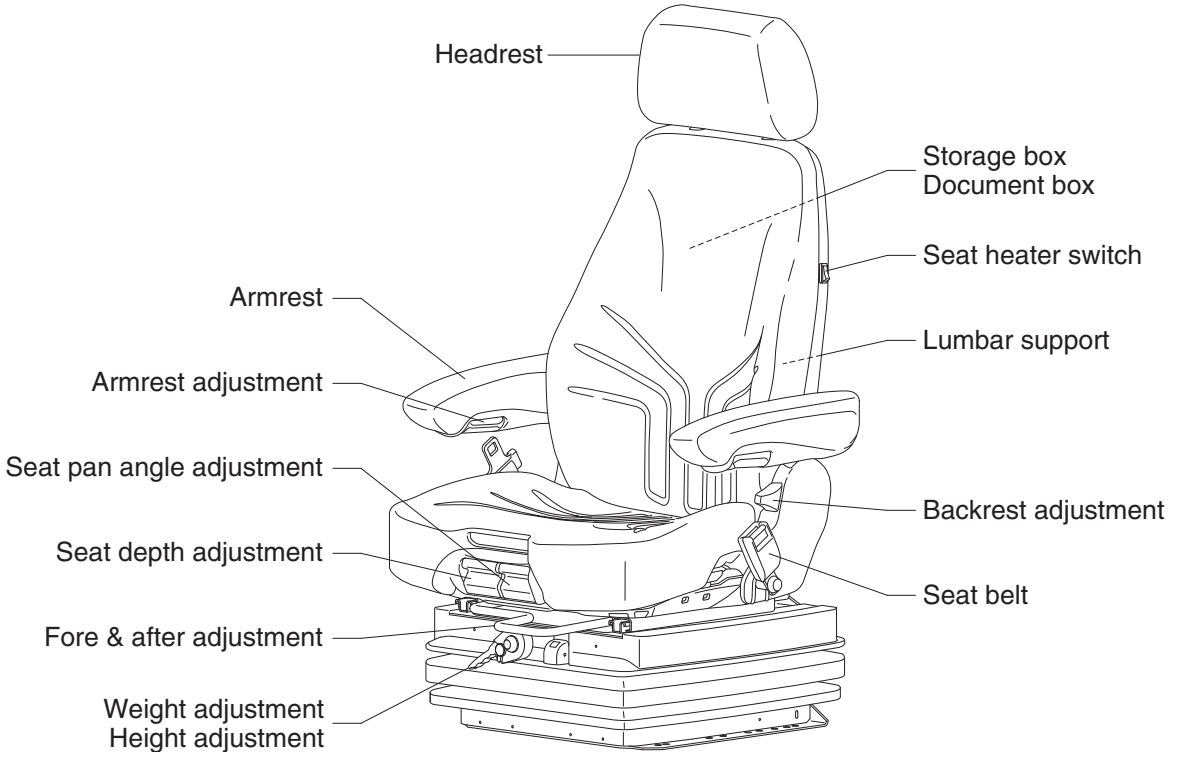


290F3CD241

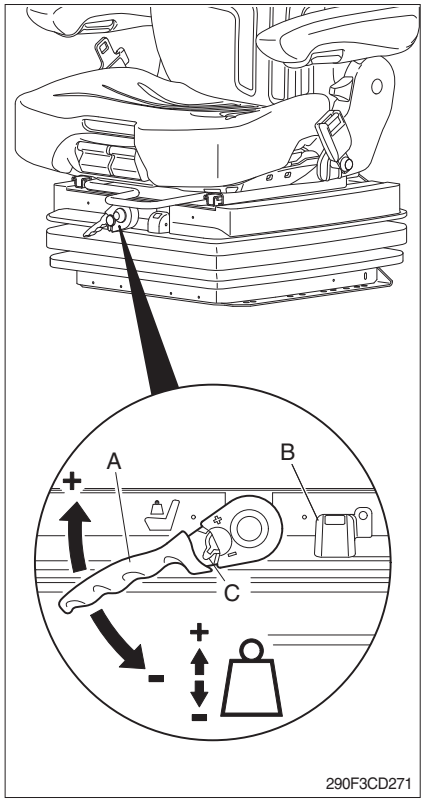
- **Push** : Select the current menu or the pop-up warning lamp move to the original position when warning lamp is happened.
- **Left** : ESC
- **Right** : CAM
- **Front** : Cluster main menu
- **Rear** : Return to acceleration mode

4) SEAT (SUSPENSION, STD)

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.



(1) Weight and height adjustment



With socket wrench (A) :

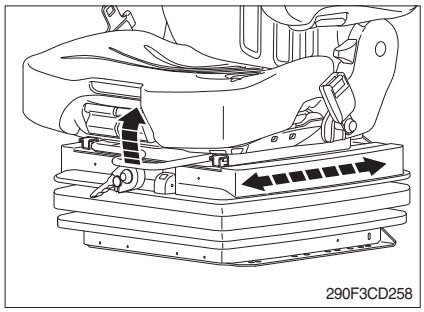
① The seat has to be adjusted for the operator's weight and height by tilting the handle (+) up or down (-) with the operator not sitting on the seat.

② The rotational direction is reversed by toggling the ratchet with the switch (C).

③ The operator's weight and the seat height are adjusted correctly when the green marking is completely visible in the indicator window (B) for weight and height.

④ The height can be adjusted individually as long as the green marking is visible.

(2) Fore/after adjustment



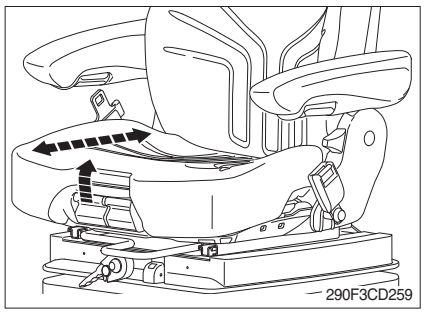
① The fore/after adjustment is released by lifting the locking lever.

⚠ Do not operate the locking lever while operating.

※ After the adjustment, the locking lever must latch into the desired position with an audible click. It should not be possible to move the operator's seat into another position when it is locked.

※ Do not lift the locking lever with your leg or calf.

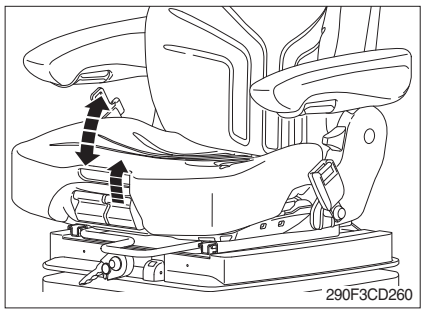
(3) Seat depth adjustment



① The depth of the seat pan can be individually adjusted.

② To adjust the depth of the seat cushion, pull the right handle upwards. By moving the seat pan backwards or forwards the desired seating position can be reached.

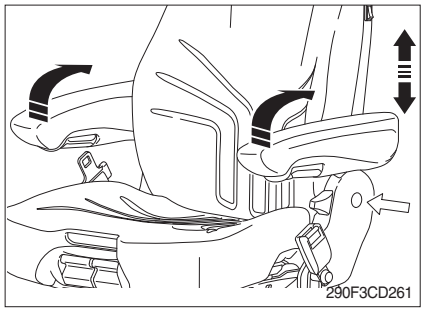
(4) Seat pan angle adjustment



① The angle of the seat pan can be individually adjusted.

② To adjust the angle of the seat pan, pull the left handle upwards. By exerting pressure on or off the front or rear part of the seat pan it can be moved to the desired angle position.

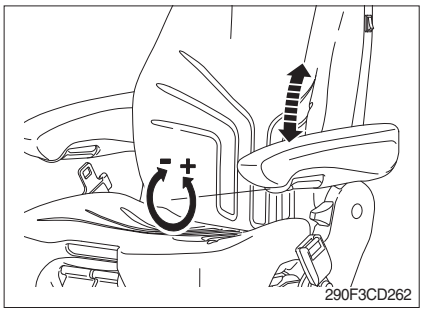
(5) Armrests



① The armrests can be folded up if required and the height can be individually adjusted.

② To adjust the armrest for height, separate the round cap (see arrow) from the cover and loosen the hexagon nut (size 13 mm) behind it adjust the armrests to the desired position (5 steps) and tighten the nut again (25 Nm).
Replace the cap onto the nut.

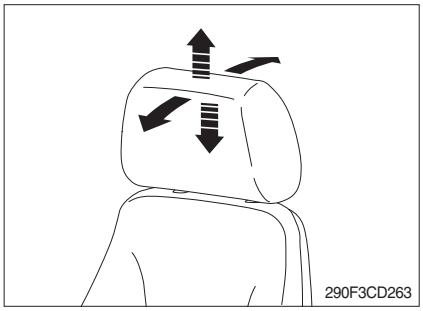
(6) Armrest adjustment



① The inclination of the armrest can be modified by turning the adjustment knob.

② When turning the knob to the outside (+), the front part of the armrest will be lifted; when turning the knob to the inside (-), it will be lowered.

(7) Headrest

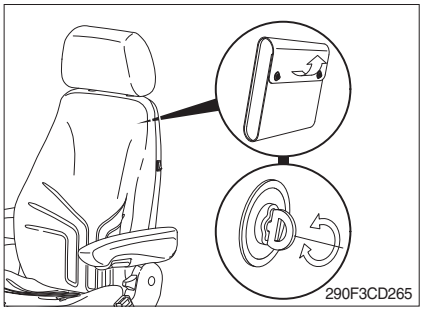


① The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.

② By pushing forwards or rearwards the angle of the headrest can be adjusted individually.

③ To remove the headrest, pull it over the end stop.

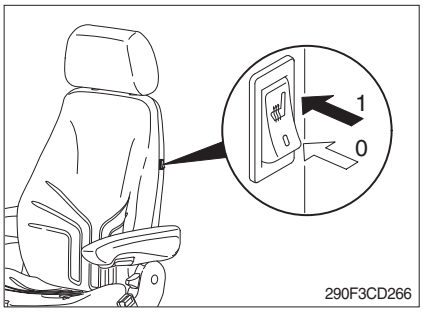
(8) Document box



① The document box is placed on the rear side of the backrest.

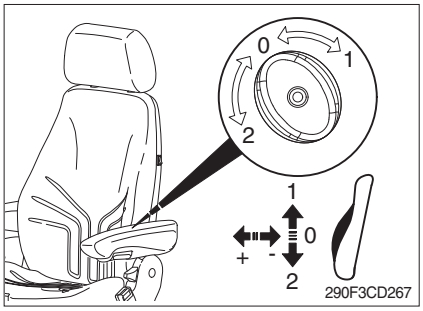
② To open the document box, first twist the turn lock closures 90° to the left or the right and then fold the cover of the document box upwards.

(9) Seat heater switch



① The seat heater can be turned on/off by pressing the switch.

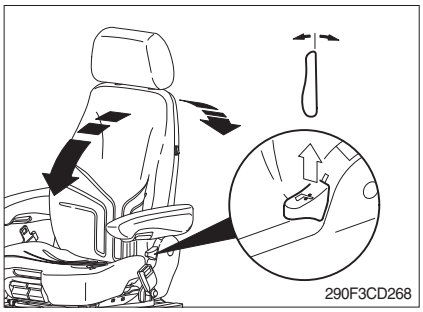
(10) Lumbar support



① By turning the adjustment knob to the left (2) or right (1), both the height and curvature of the backrest cushion can be individually adjusted.

② This increases both the seating comfort and the performance of the operator.

(11) Backrest adjustment



① Pull up the locking lever to release the backrest catch. When releasing the backrest, do not load the backrest by pressing against it.

② By exerting pressure on or off the front or rear part of the seat pan it can be moved to the desired position. Release the locking lever to lock the backrest.

※ It should not be possible to move the backrest into another position after it has been locked.

(12) Maintenance

Dirt can impair the function of the seat, so make sure you keep your seat clean.

Upholstery does not need to be removed from the seat frame for cleaning.

⚠ Take care with the backrest - it may jerk forward and cause injury.
When cleaning the backrest cushion, the backrest must be held in place when operating the backrest lever.

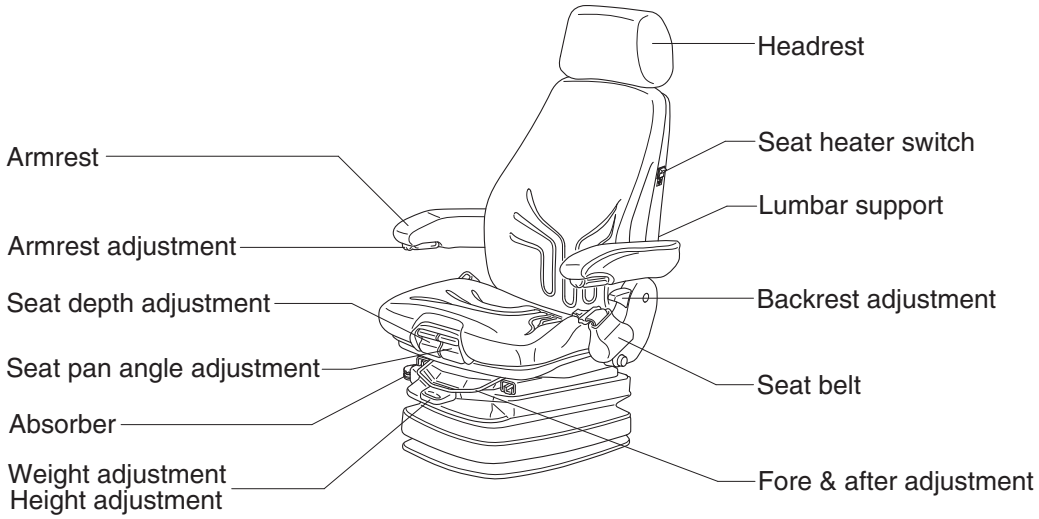
※ Do not clean the seat with a pressure washer.

During cleaning, the upholstery must not be soaked through.

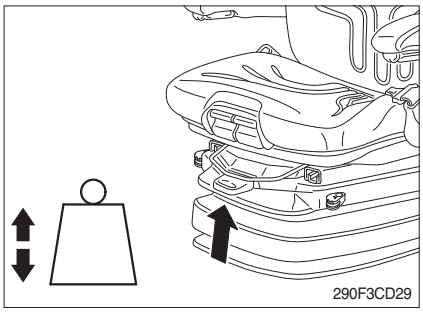
Use standard commercially available upholstery or plastics cleaning agent. Test first for compatibility on a small, concealed area.

5) SEAT (AIR SUSPENSION, OPTION)

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.



(1) Weight adjustment



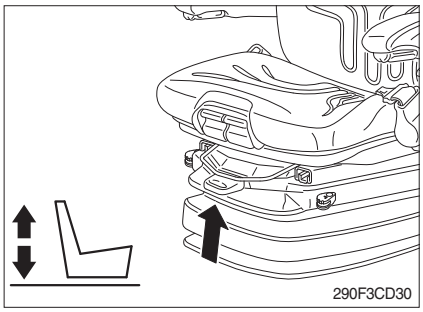
① The seat should be adjusted for the operator's weight by briefly pulling the actuator lever of the automatic weight and height adjuster (arrow) with the machine at a standstill and the operator's sitting on the seat.

The operator must sit absolutely still during adjustment.

※ Before adjusting the weight, adjust shock absorbers to the position "soft".

※ To prevent damage to the health, the setting for the operator's weight must be checked and adjusted before the machine is operated.

(2) Height adjustment



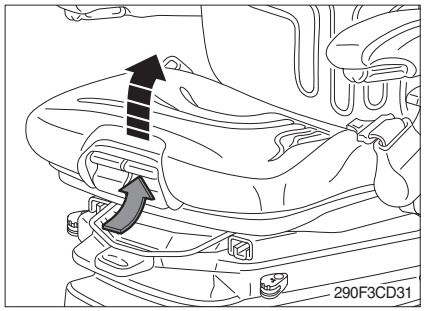
① The seat height can be set pneumatically and is continuously adjustable.

② The seat height can be altered by pulling or pressing the actuator lever fully out or in (arrow). If the adjustment reaches the top or bottom endstop, the height is adjusted automatically in order to guarantee a minimum spring travel.

※ Before adjusting the weight, adjust shock absorbers to the position "soft".

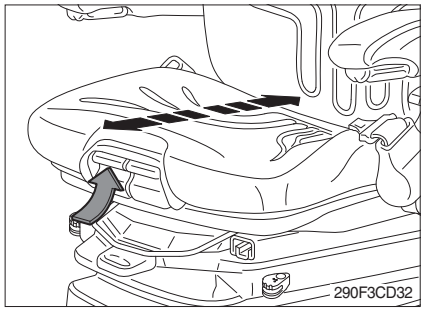
※ In order to avoid damage, do not operate compressor for more than 1 minute.

(3) Seat pan angle adjustment



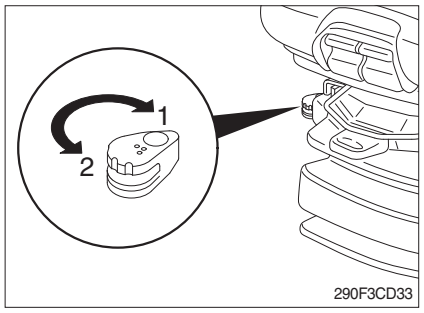
① The angle of the seat pan can be individually adjusted.
② To adjust the angle of the seat pan, lift the LH handle (see arrow). By exerting pressure on or off the seat pan it can be moved to the desired angle position.

(4) Seat depth adjustment



① The depth of the seat pan can be individually adjusted.
② To adjust the depth of the seat cushion, lift the RH handle (see arrow). By moving the seat cushion backwards or forwards the desired seating position can be reached.

(5) Absorber

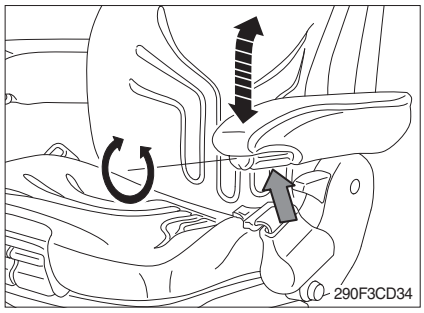


① The absorber setting of the seat can be varied to suit the on and off-road working conditions.
The cushioning effect can be individually adjusted for this purpose.

Turn the lever to the desired position and release.

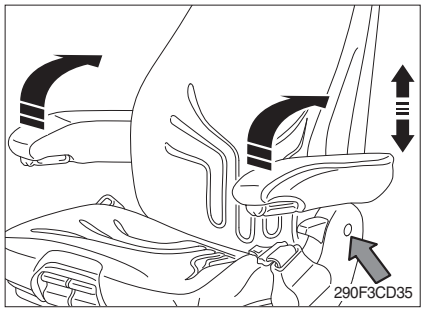
1 Soft
2 Hard

(6) Armrest adjustment



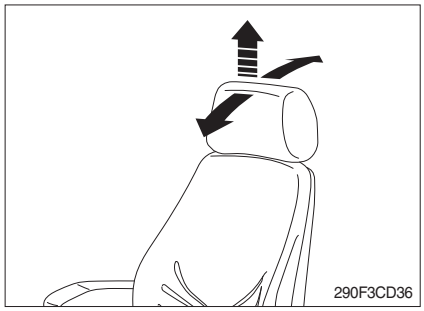
① The inclination of the armrests can be modified by turning the adjustment knob (arrow).

(7) Armrests



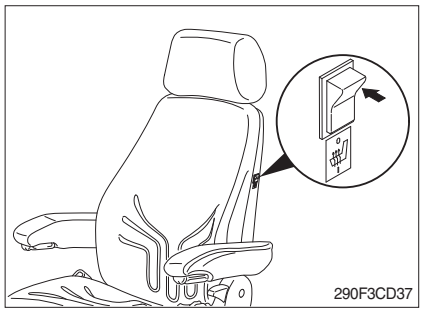
① The armrests can be folded up if required and the height individually adjusted.
② To adjust the armrests for height, separate the round cap (see arrow) from the cover, loosen the hexagon nut (size 13 ㎜), adjust the armrest to the desired position and tighten the nut again. Press the previously separated cap cover back onto the nut.

(8) Headrest



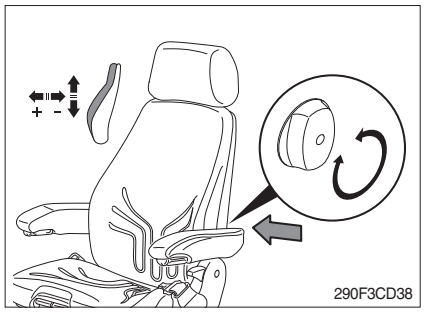
① The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.
② By pushing forward or rearward the angle of the headrest can be adjusted individually.
③ To remove the headrest, pull it over the end stop.

(9) Seat heater switch



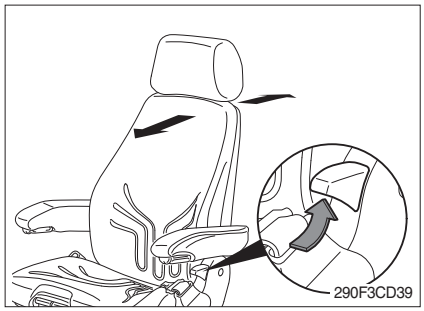
① The seat heater is turned on by pressing the switch.

(10) Lumbar support



① By turning the adjustment knob to the left or right, both the height and curvature of the backrest cushion can be individually adjusted.
② This increases both the seating comfort and the performance of the operator.

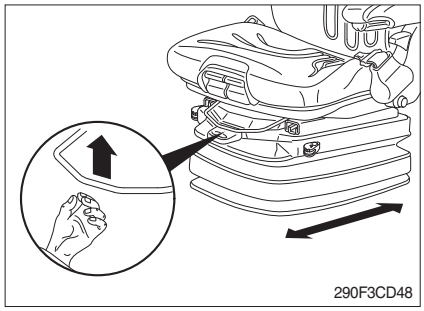
(11) Backrest adjustment



① The backrest is adjusted using the locking lever (arrow).

※ **The locking lever must latch into the desired position. It should not be possible to move the backrest into another position when it is locked.**

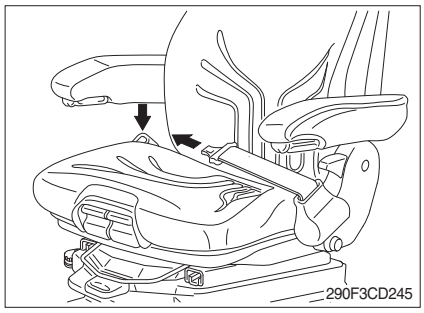
(12) Fore & after adjustment



① The fore/after adjustment is released by lifting the locking lever.

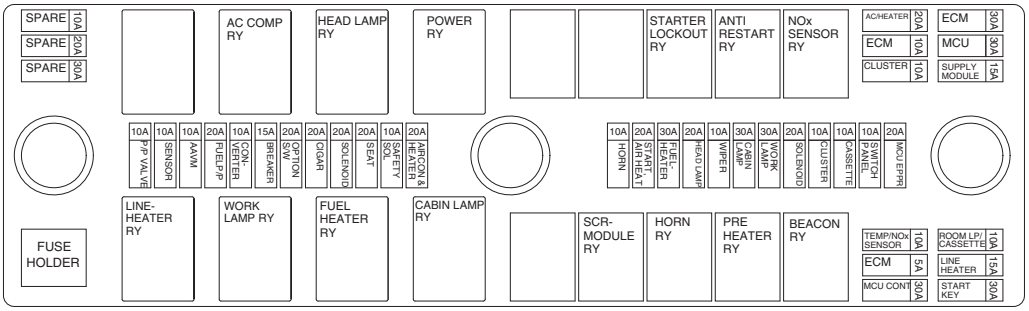
※ **The locking lever must latch into the desired position. It should not be possible to move the operator seat into another position when it is locked.**

(13) Seat belt



⚠ **Fail to wear a seat belt during machine operation may result in serious injury or death in the event of an accident or machine overturn.**

6) FUSE & RELAY BOX



290F3CD290

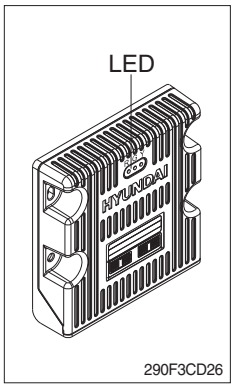
(1) The fuses protect the electrical parts and wiring from burning out.

(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) MCU



290F3CD26

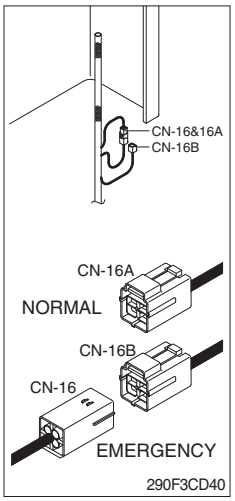
(1) To match the pump absorption torque with the engine torque, MCU varies EPPR valve output pressure, which control pump discharge amount whenever feedbacked engine speed drops under the reference rpm of each mode set.

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

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

G : green, R : red, Y : yellow

8) EMERGENCY ENGINE SPEED CONTROL CONNECTOR

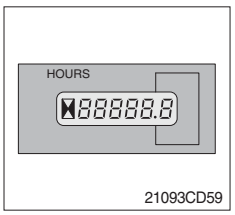


(1) When the CAN communication between the ECM and the MCU is abnormal due to malfunction, change the CN-16 connection from CN-16A to CN-16B and then control the engine speed by rotating the multimodal module of the haptic controller.

※ **Never connect connector CN-16 with CN-16B when MCU is in normal operation.**

※ **Make repair as soon as possible.**

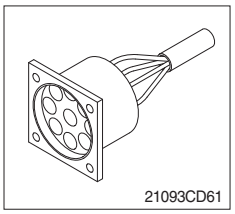
9) SERVICE METER



(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) MCU/ECM CONNECTOR



(1) MCU communicates the machine data with Laptop computer through the connector.

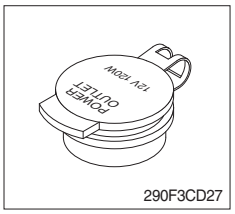
(2) ECM communicates the engine data with cummins INSITE adapter through the connector.

① ECM fault code check

② ECM program change

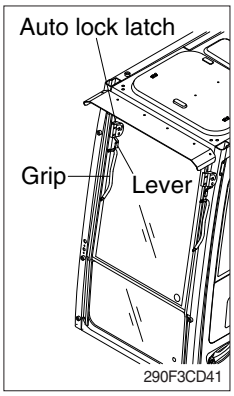
③ Engine data monitoring & test

11) SERVICE SOCKET (12V)



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

12) UPPER WINDSHIELD

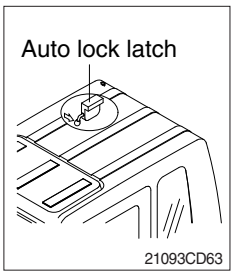


(1) Perform the following procedure in order to open the upper windshield.

① Pull both levers with hold both grips that are located at the top of the windshield frame and push the windshield upward.

② Hold both grips and back into the lock position until auto lock latch is engaged, then release the grips.

⚠ When working, without having locked the windshield by the auto lock (by pushing the windshield to the rear untill it's completely fixed), please be careful as it can cause personal injury if the windshield is not fixed or falls off.



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

① Pull the lever of the auto lock latch in order to release the auto lock latch.

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

1. SUGGESTION FOR NEW MACHINE

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

2) Operate according to below three steps and avoid excessive operation for the initial 100 hours.

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

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

3) Be careful during the initial 100 hours operation

(1) Check daily for the level and leakage of coolant, engine oil, hydraulic oil and fuel.

(2) Check regularly the lubrication and fill grease daily all lubrication points.

(3) Tighten bolts.

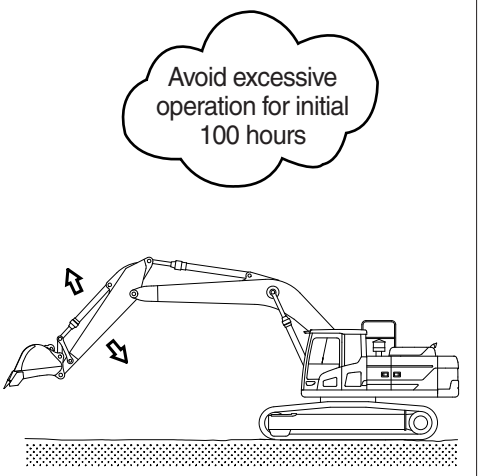
(4) Warm up the machine fully before operation.

(5) Check the gauges occasionally during the operation.

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

4) Replace followings after initial 250 hours of operation

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



290F4OP01

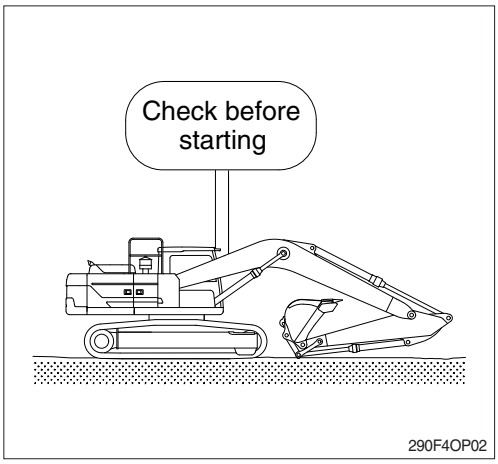
2. CHECK BEFORE STARTING THE ENGINE

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.



290F4OP02

3. STARTING AND STOP THE ENGINE

1) CHECK INDICATOR LIGHTS

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

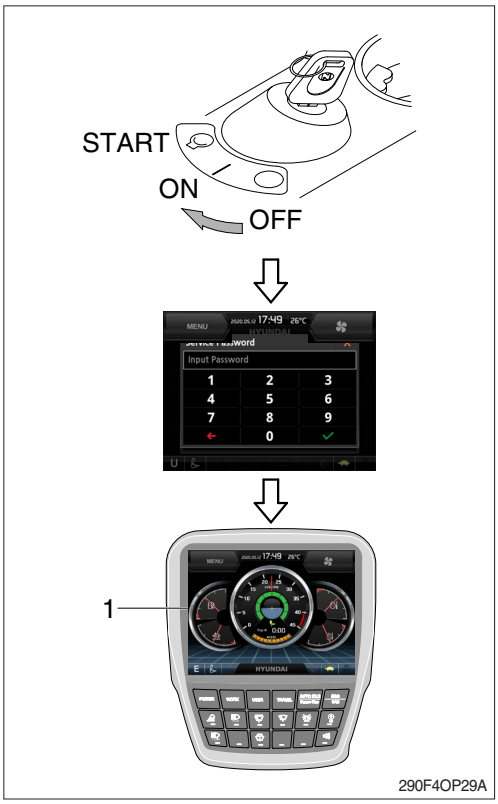
(2) Turn the starting switch to the ON position. Buzzer sounding for 4 seconds with HYUNDAI logo on cluster.

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

※ **If the password has failed 5 times, please wait 30 minutes before re-attempting to enter the password.**

※ **Refer to page 3-24 for ESL mode.**

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



2) STARTING ENGINE IN NORMAL TEMPERATURE

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

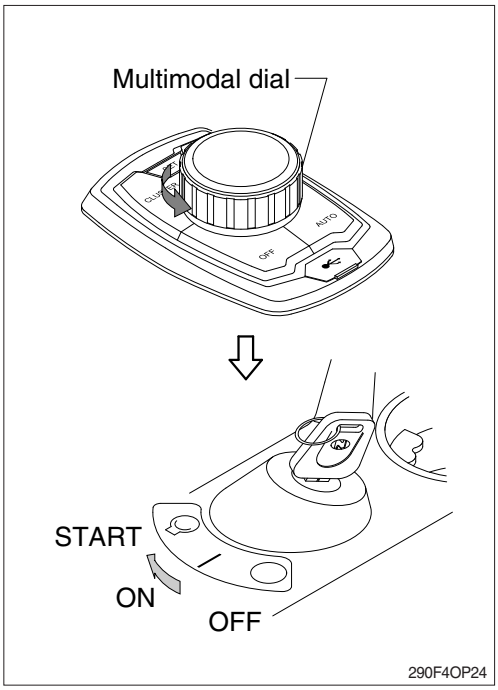
(1) Turn the multimodal dial to low idle position.

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

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

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

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



3) STARTING ENGINE IN COLD WEATHER

※ **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 2-30.**

※ **Fill the anti-freeze solution to the coolant as required.**

※ **If you turn ON the starting switch, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature.**

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

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

(3) Turn the starting switch to the ON position, and wait 1~2 minutes. More time may take according to ambient temperature.

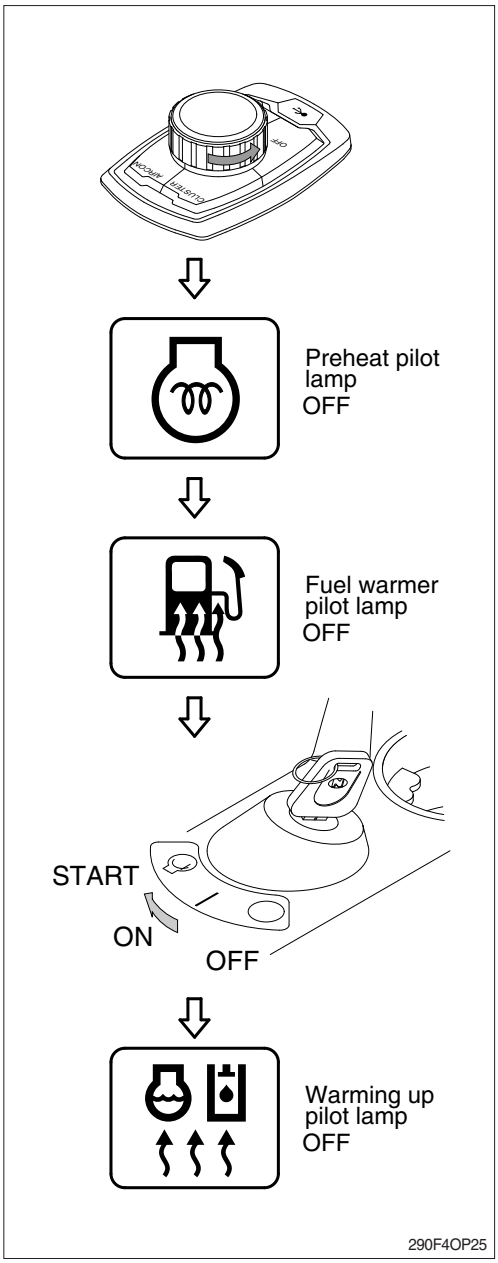
(4) Wait for five minutes to warm up the engine after the preheating pilot lamp off, and than turn the starting switch to the START position to start the engine.

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

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

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

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



4) INSPECTION AFTER ENGINE START

Inspect and confirm the following after engine starts.

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

(2) Are there leakages of oil or water?

(3) Are all the warning lamps turned OFF (1-13)?
The seat belt reminder warning lamp (16) pops up and the buzzer sounds until fasten the seat belt.

(4) Are the indicator of water temperature gauge (14) and hydraulic temperature gauge (15) in the operating range?

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

(6) Are the sound and vibration normal?

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

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

380F4OP02A

5) WARMING-UP OPERATION

※ **The most suitable temperature for the hydraulic oil is about 50˚C (122˚F).**
It can cause serious trouble in the hydraulic system by sudden operation when the hydraulic oil temperature is below 25˚C (77˚F).
Then temperature must be raised to at least 25˚C (77˚F) before starting work.

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

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

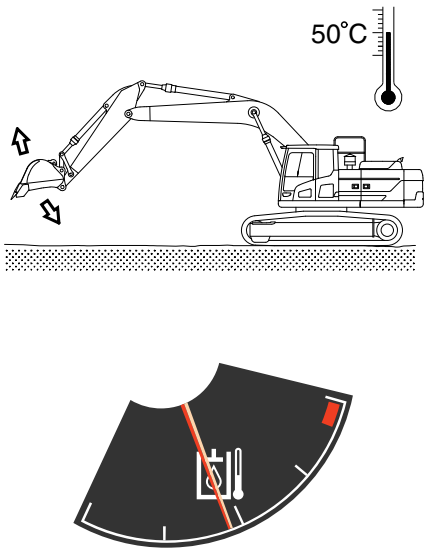
(3) Operate bucket lever for 5 minutes.

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

(4) Run the engine at 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.



290F4OP03

6) TO STOP THE ENGINE

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

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

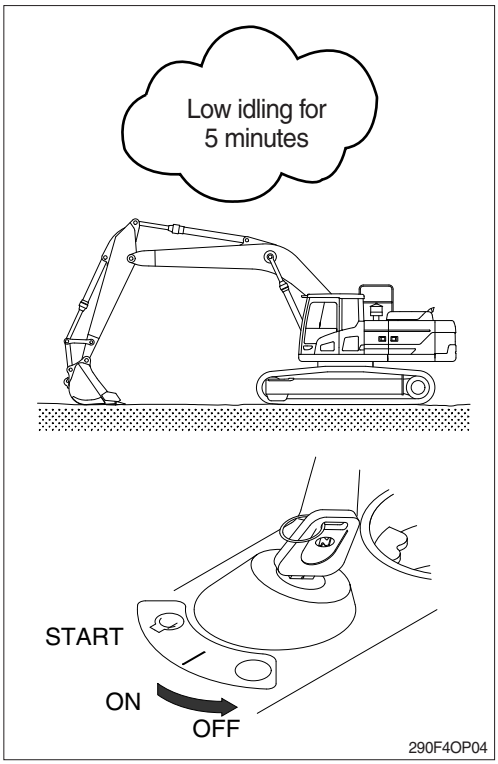
(1) Down the bucket on the ground then put all the levers in the neutral position.

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

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

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

(5) Lock the cab door.



4. MODE SELECTION SYSTEM

1) STRUCTURE OF MECHATRONICS SYSTEM

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

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

(1) Power mode

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

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

(2) Work mode

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

① **General work mode (bucket)**

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

② **Work tool mode (breaker, crusher)**

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

③ **Lifting mode**

Through RPM reduction, power boost activation and pump flow control, it improves fine operability and lift capability.

(3) User mode

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

② There are two methods for use of user mode.

a. In operation screen

User mode switch is used to memorize the current machine operating status and activate the memorized user mode.
Refer to page 3-16.

b. In menu

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

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

290F4OP31A

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

290F4OP32A

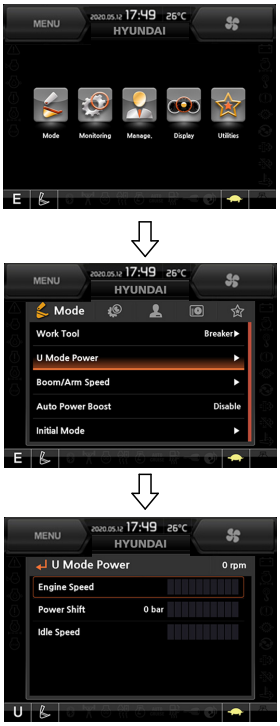
- High idle rpm, auto idle rpm and EPPR pressure can be adjusted and memorized in the U-mode.

※ **Refer to the page 3-20 for setting the user mode (available on U mode only).**

· LCD segment vs parameter setting

Step (▮)	Engine speed (rpm)	Idle speed (rpm)	Power shift (bar)
1	1300	700	0
2	1400	750	3
3	1500	800	6
4	1600	850	9
5	1700	900	12
6	1800	950	16
7	1850	1000	20
8	1900	1050	26
9	1950	1100 (auto decel)	32
10	2000	1150	38

※One touch decel & low idle : 1000 rpm



290F4OP33A

(4) Travel mode

: Low speed traveling.

: High speed traveling.

(5) Auto idle mode

Pilot lamp ON : Auto idle function is activated.

Pilot lamp OFF : Auto idle function is canceled.

(6) Monitoring system

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

(7) Self diagnostic system

① **MCU (Machine Control Unit)**

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

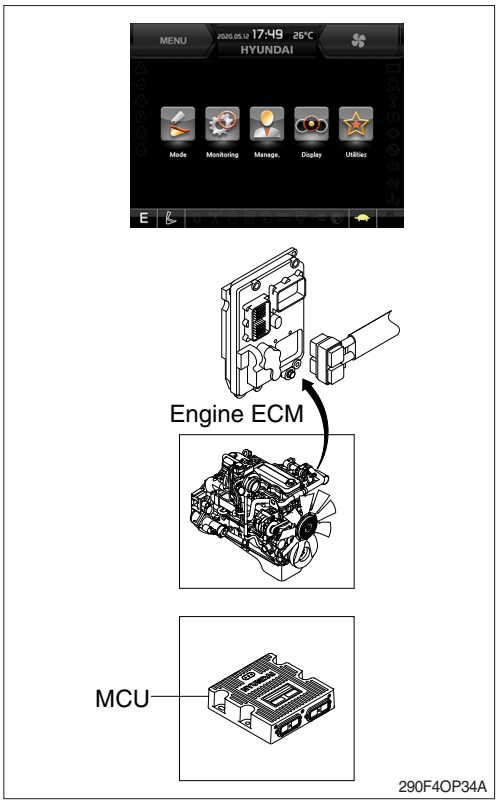
② **Engine ECM (Electronic Control Module)**

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

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

(8) Anti-restart system

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



2) HOW TO OPERATE MODE SELECTION SYSTEM

(1) When start key switch is turned ON

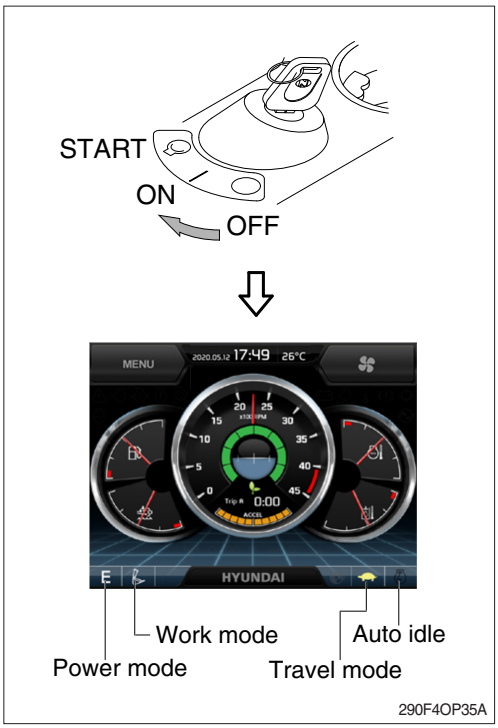
① When start key switch is turned on, the cluster turns on and buzzer sounds for 4 seconds. And then main information as gauges and engine speed are displayed on LCD.

② Initial default mode settings are displayed in the cluster.

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

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

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

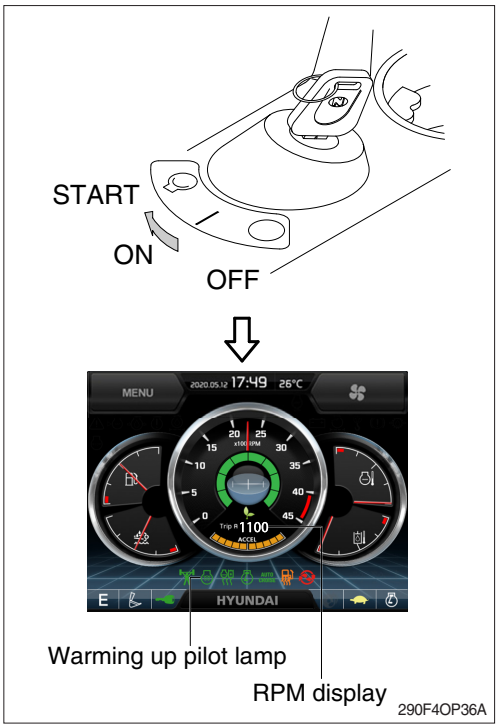


(2) After engine start

① When the engine is started, rpm display indicates low idle, 1000 rpm.

② If coolant temperature is below 30˚C, the warming up pilot lamp lights ON and after 4 seconds the engine speed increases to 1100 rpm automatically to warm up the machine.

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



290F4OP36A

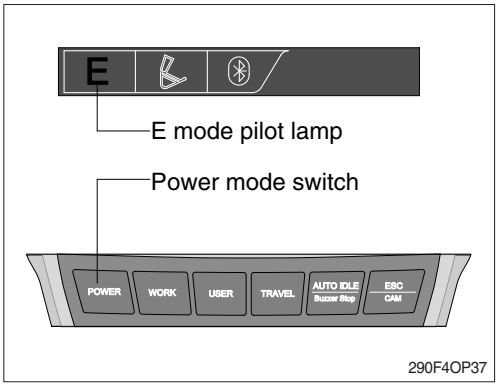
3) SELECTION OF POWER MODE

(1) E mode

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

Engine rpm	Effect
1600	Variable power control in proportion to lever stroke (improvement in fuel efficiency) ※ Same power as S mode in full lever operation.

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



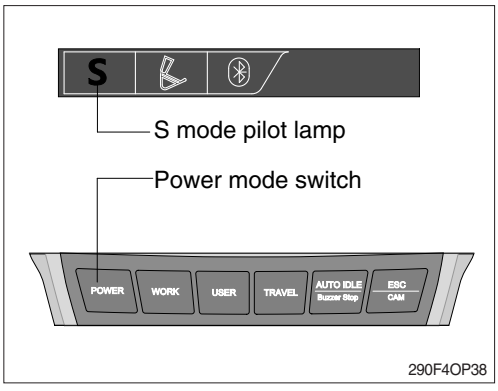
290F4OP37

(2) S mode

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

Engine rpm	Effect
1700	Standard power

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



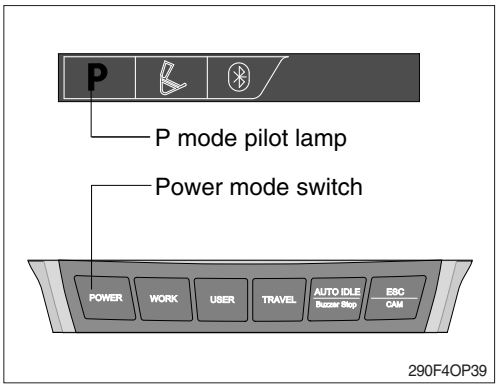
290F4OP38

(3) P mode

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

Engine rpm	Effect
1800	Approximately 120 % of power and speed available than S mode.

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



5. OPERATION OF THE WORKING DEVICE

※ Confirm the operation of control lever and working device.

1) Left control lever controls arm and swing.

2) Right control lever controls boom and bucket.

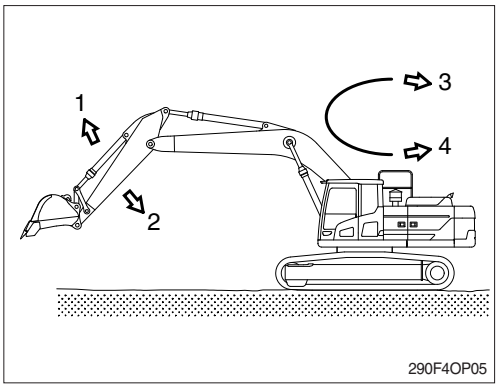
3) When you release the control lever, control lever returns to neutral position automatically.

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

290F4OP26

※ Left control lever

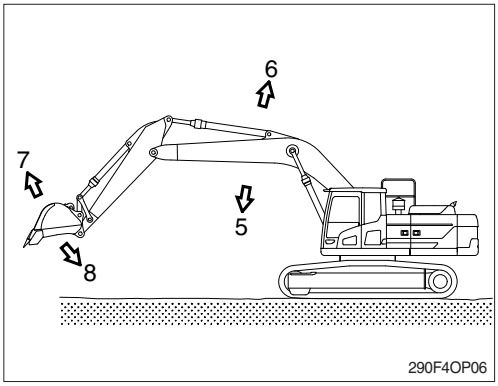
1 Arm roll-out
2 Arm roll-in
3 Swing right
4 Swing left



290F4OP05

※ Right control lever

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



290F4OP06

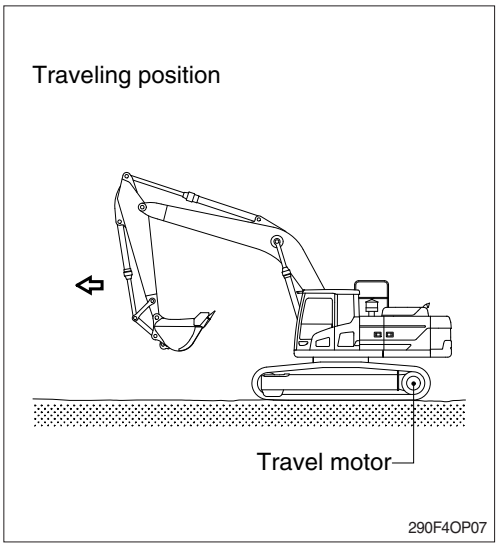
6. TRAVELING OF THE MACHINE

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.

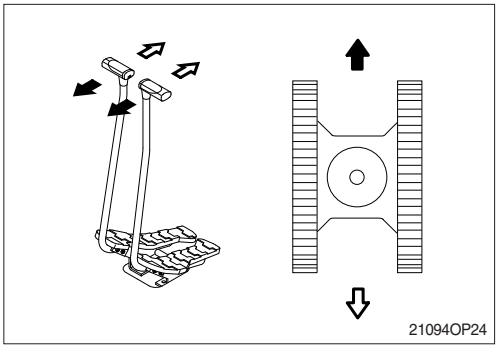
※ Do not travel continuously for a long time.

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

(3) Forward and backward traveling

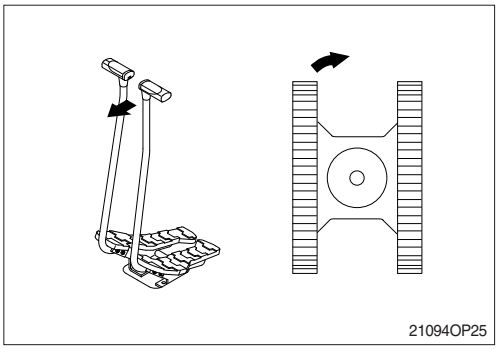
When the left and right travel lever or pedal are pushed at the same time, the machine will travel forward or backward.

※ 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.



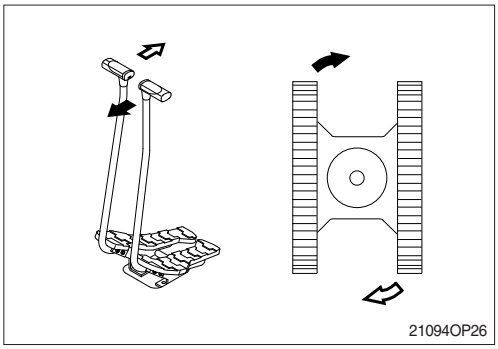
(4) Pivot turning

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

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

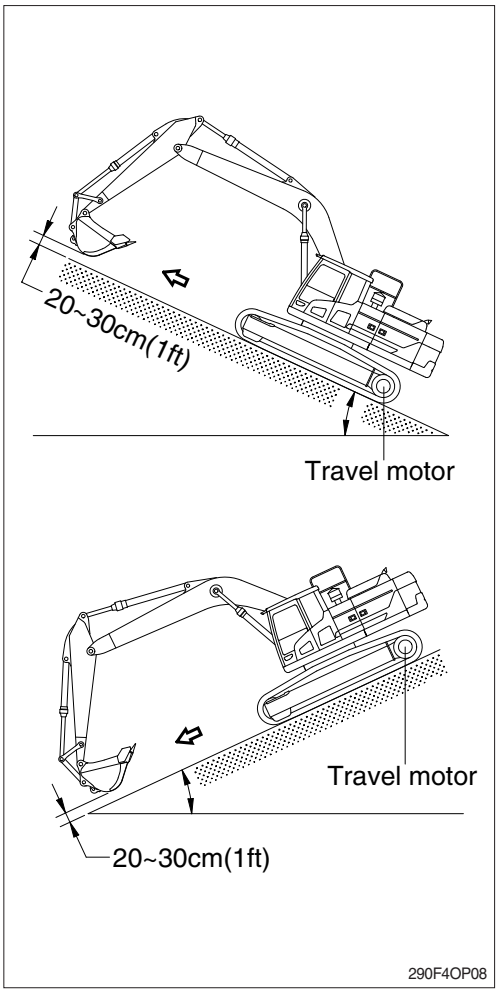
(4) When parking on a slope, use the bucket as a brake and place blocks behind the tracks to prevent sliding.

※ **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.**

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



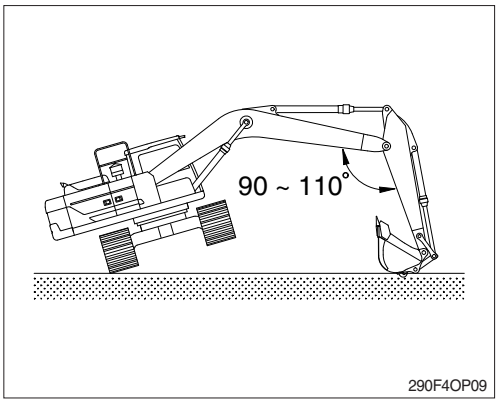
3) TRAVELING ON SOFT GROUND

※ **If possible, avoid 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

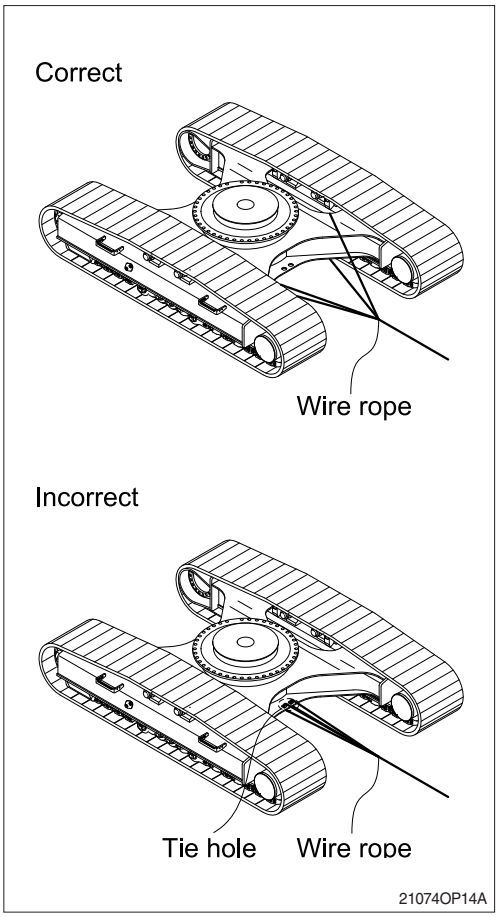
Tow the machine as follows when it can not move on it's own.

(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.

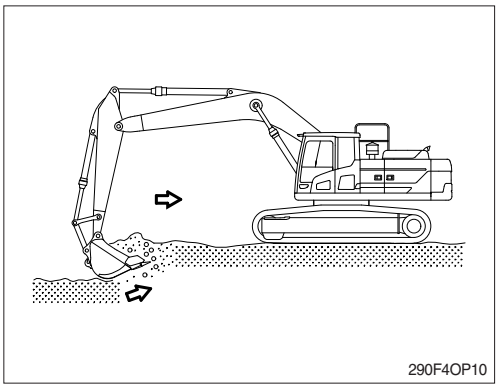
※ **Never tow the machine using only the tie hole, because this may break.**

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

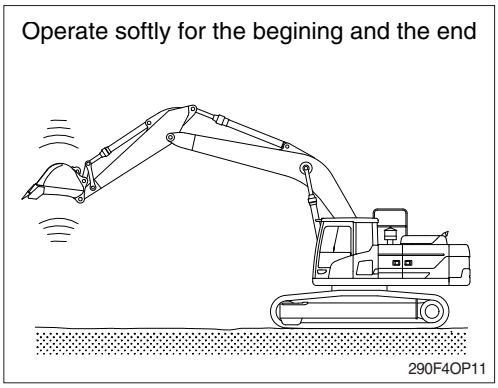


7. EFFICIENT WORKING METHOD

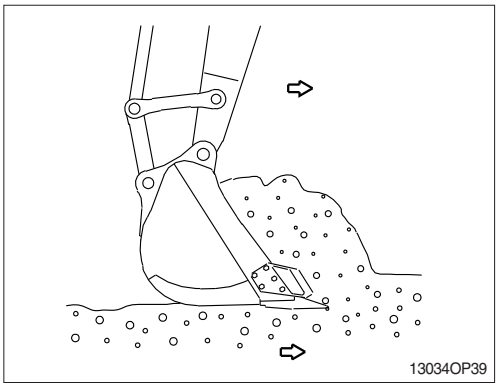
1) Do the digging work by arm.
   Use the pulling force of arm for digging and use together with the digging force of the bucket if necessary.



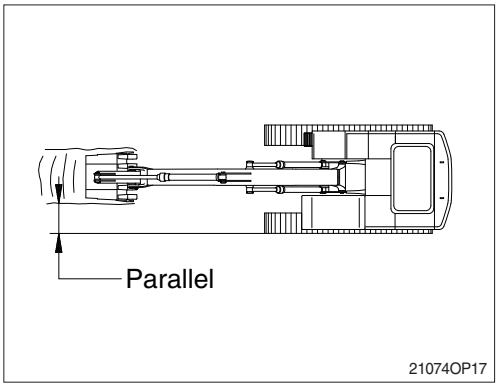
2) When lowering and raising the boom operate softly for the beginning and the end.
   In particularly, sudden stops while lowering the boom may cause damage to the machine.



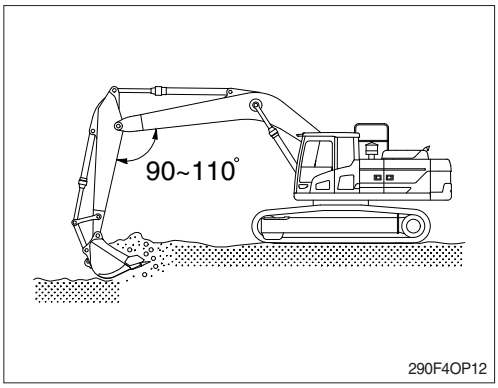
3) The digging resistance and wearing of tooth can be reduced by putting the end of bucket tooth to the digging direction.



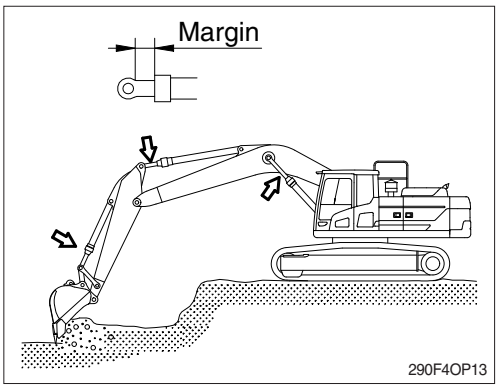
4) Set the tracks parallel to the line of the ditch to be excavated when digging ditch. Do not swing while digging.



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

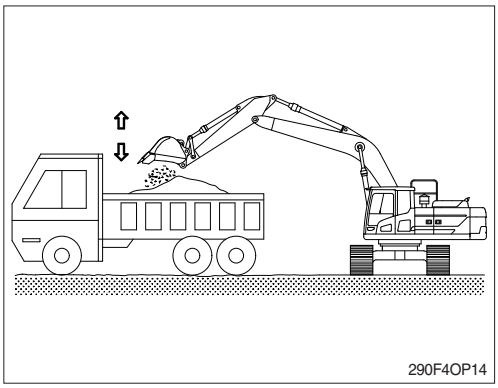


6) Operate leaving a small safety margin of cylinder stroke to prevent damage of cylinder when working with the machine.

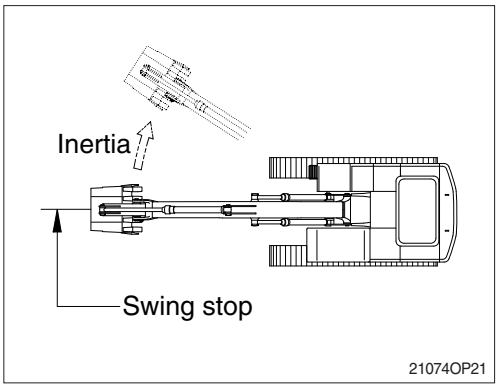


7) Keep the bucket to the dumping position and the arm horizontal when dumping the soil from the bucket.
   Operate bucket lever 2 or 3 times when hard to dump.

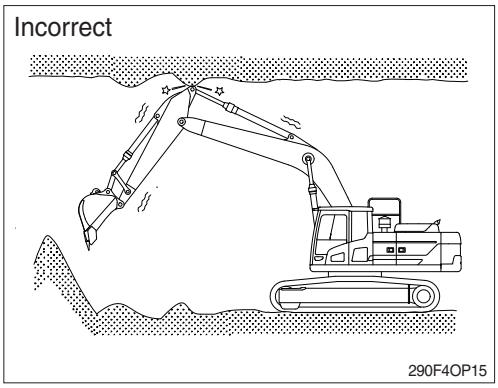
※ **Do not use the impact of bucket tooth when dumping.**



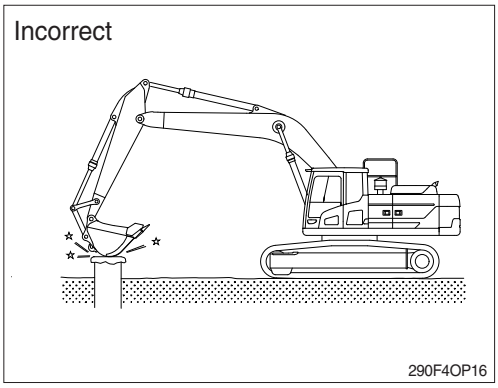
8) Operate stop of swing considering the swing slip distance is created by inertia after neutralizing the swing lever.



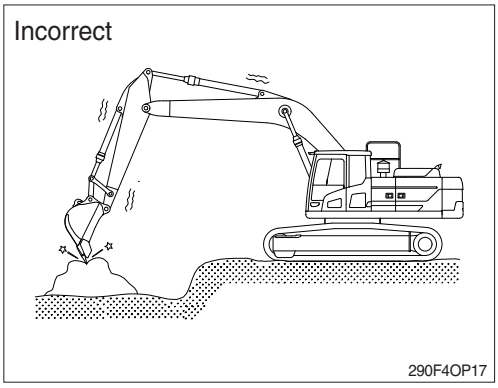
9) If the excavation is in an underground location or in a building, make sure that there is adequate overhead clearance and that there is adequate ventilation.



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



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



12) NEVER CARRY OUT EXCESSIVE OPERATIONS

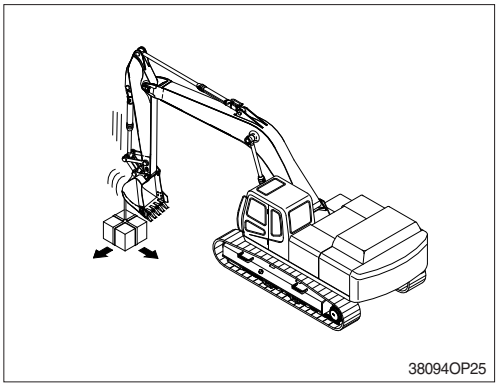
Operation exceeding machine performance may result in accident or failure.

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 HD Hyundai Construction Equipment distributor.



13) 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.

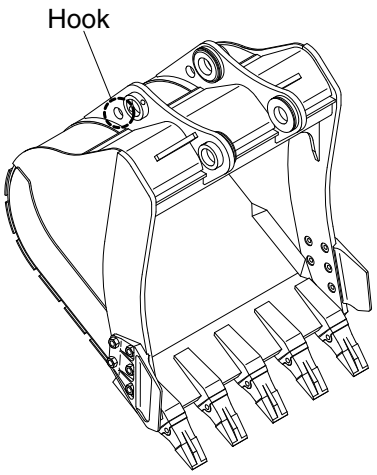
When performing lifting operation, never raise or lower a person.

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.

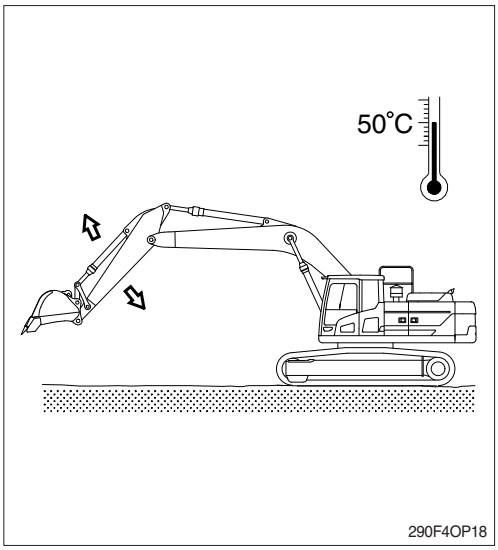
Never leave the operator's seat while lifting a load.
Note the use of the fine swing function on the slope. The spin may occur that is not intended by the operator.



290F4OP42

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 batteries will freeze more easily than fully charged.**

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

2) OPERATION IN SANDY OR DUSTY WORK SITES

(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 4 times of cleaning.**

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

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

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

(5) Keep all lubricated 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.

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

3) SEA SHORE OPERATION

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

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

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

4) OPERATION IN MUD, WATER OR RAIN WORK SITES

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

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

(3) Perform all daily lubrication and service.

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

5) OPERATION IN ROCKY WORK SITES

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

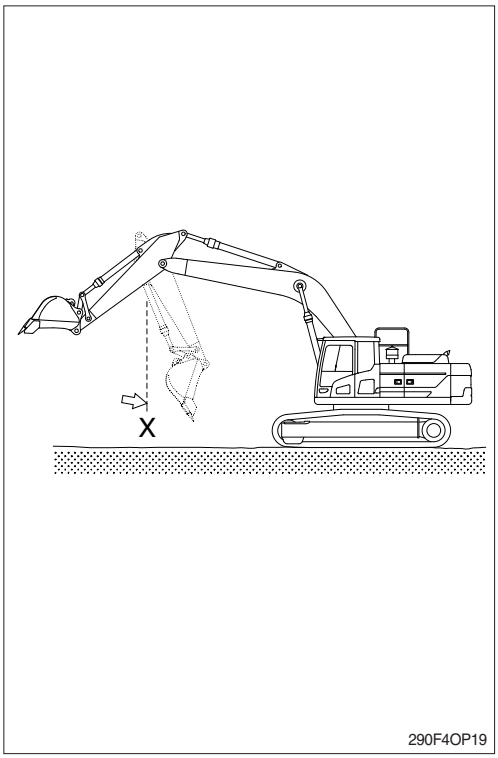
(2) Loosen the track tension a little when working in such areas.

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

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 1 minute) after the engine is stopped, the attachment will lower under its own weight when the attachment control lever is shifted to LOWER. This happens only when the starting switch is ON and the safety knob is the in the UNLOCK position. After the engine is stopped, set the safety knob to the LOCK position.

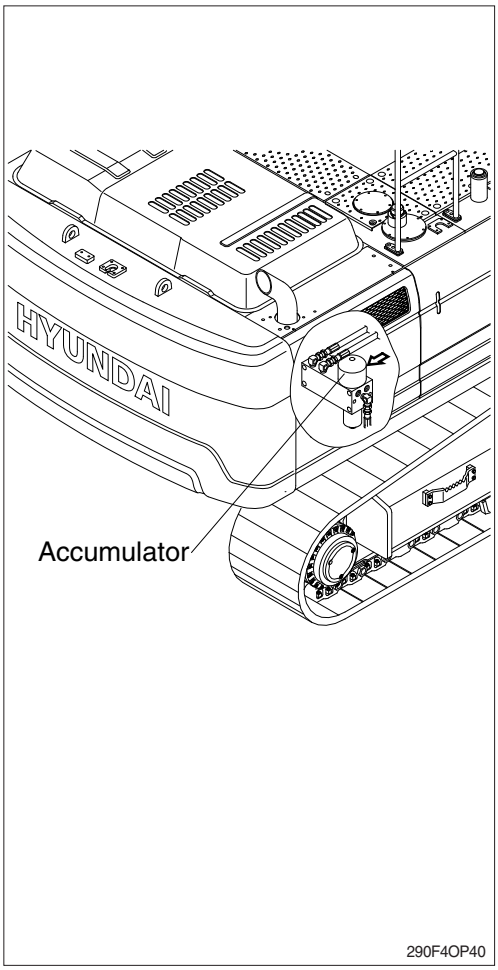
⚠ **Be sure no one is under or near the attachment before lowering the boom.**

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 HD Hyundai Construction Equipment 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) BEFORE STORAGE

(1) Cleaning the machine

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

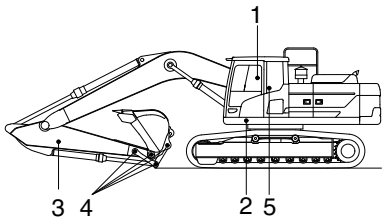
(2) Lubrication position of each part

Change all oil.

※ Be particularly careful when you reuse the machine.

As oil can be diluted during storage.

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



1 Lubricating manifold (5EA)
2 Boom cylinder pin (2EA)
3 Lubricating manifold (3EA)
4 Arm and bucket (7EA)
5 Boom rear bearing center (1EA)

290F4OP20

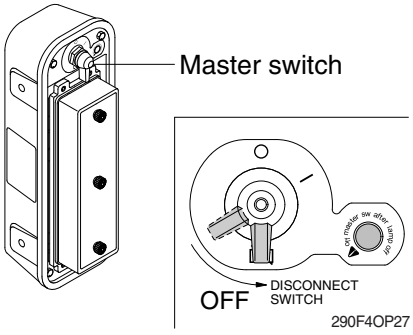
(3) Master switch

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

⚠ Off the master switch after lamp off.

⚠ It may cause severe failure of aftertreatment device.

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



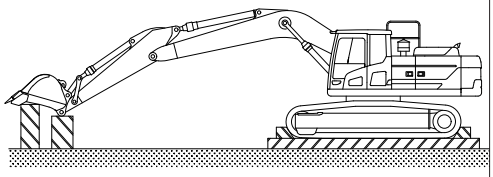
290F4OP27

(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.

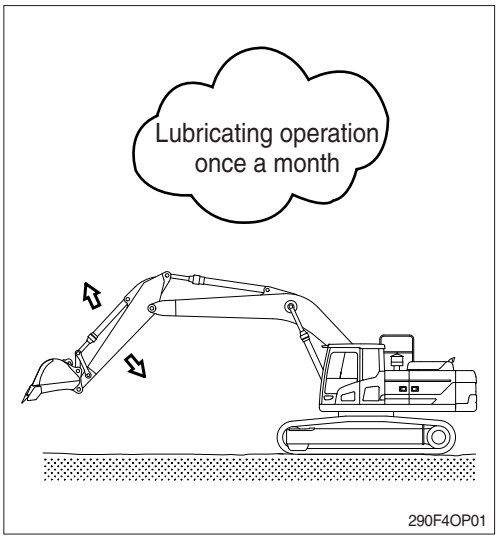
※ Lower the bucket to the ground and set a support under track.



290F4OP21

2) DURING STORAGE

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



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

※ Clean the anticorrosive on the piston rod of cylinder.

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

※ BATTERY

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

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

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

3) AFTER STORAGE

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

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

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

(3) When storage period is 6 months over

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

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

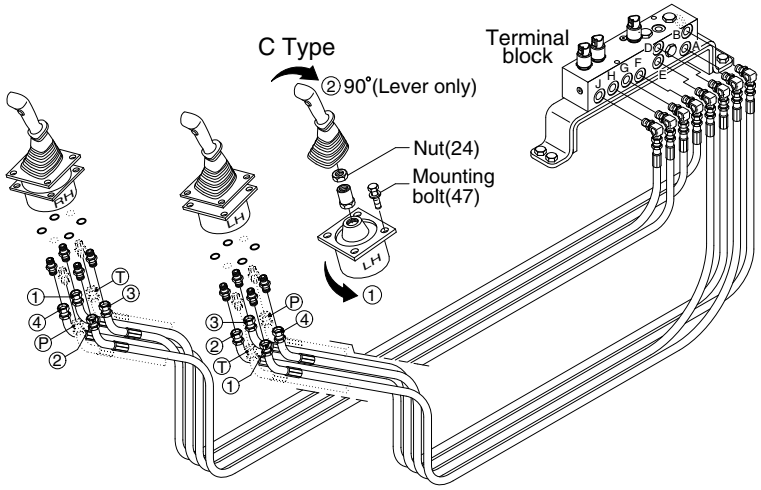
※ Remove the drain port plug and drain the water until the gear oil comes out and then tighten the drain plug.

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

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

12. RCV LEVER OPERATING PATTERN

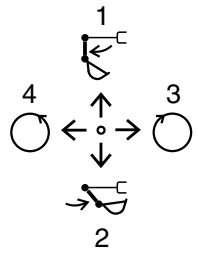
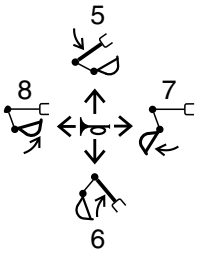
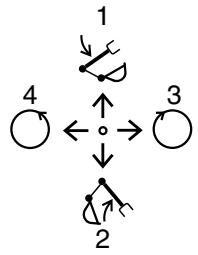
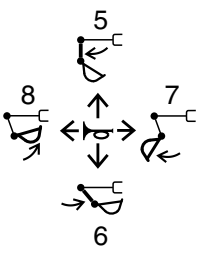
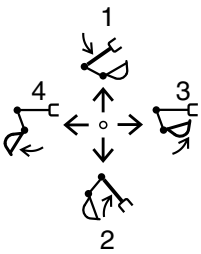
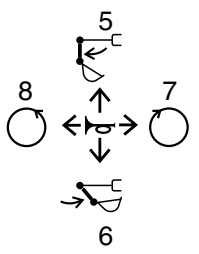
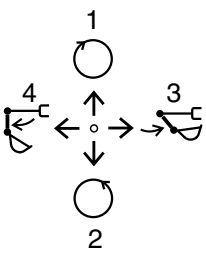
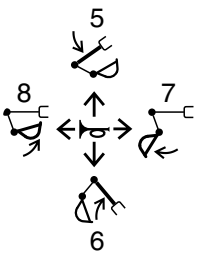
1) PATTERN CHANGE VALVE NOT INSTALL (standard)



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

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

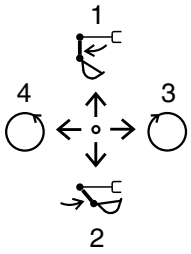
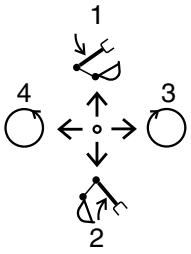
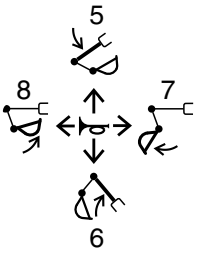
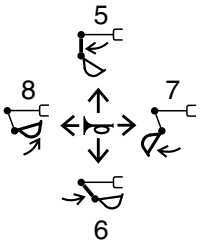
290F4OP41

Pattern	Operation		Control function		Hose connection (port)		
	Left RCV lever	Right RCV lever			RCV lever	Change of Terminal block	
						From	To
ISO Type HD Hyundai Construction Equipment			Left	1Arm out	②	D	-
				2Arm in	④	E	-
				3Swing right	③	B	-
				4Swing left	①	A	-
			Right	5Boom lower	④	J	-
				6Boom raise	②	H	-
				7Bucket out	①	G	-
				8Bucket in	③	F	-
A Type			Left	1Boom lower	②	D	J
				2Boom raise	④	E	H
				3Swing right	③	B	-
				4Swing left	①	A	-
			Right	5Arm out	④	J	D
				6Arm in	②	H	E
				7Bucket out	①	G	-
				8Bucket in	③	F	-
B Type			Left	1Boom lower	②	D	J
				2Boom raise	④	E	H
				3Bucket in	③	B	F
				4Bucket out	①	A	G
			Right	5Arm out	④	J	D
				6Arm in	②	H	E
				7Swing right	①	G	B
				8Swing left	③	F	A
C Type			Left	① Loosen the RCV lever mounting bolt (47) and rotates lever assy 90˚ counterclockwise; then install. ② To put lever in correct position, disassemble nut (24) and rotates only lever 90˚ clockwise.			
			Right	Same as ISO type			

2) PATTERN CHANGE VALVE INSTALL (option)

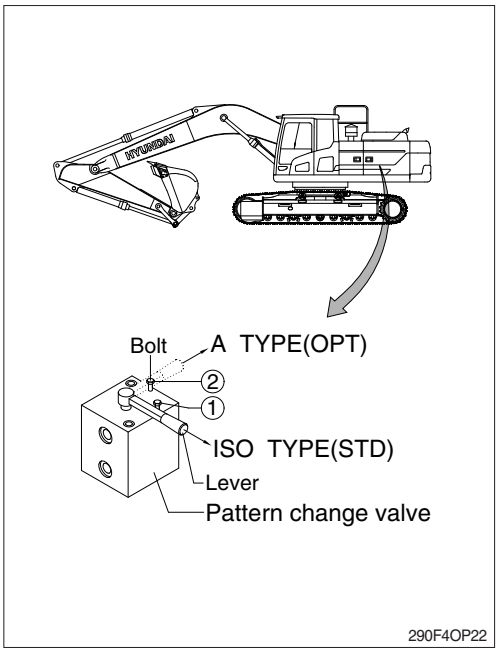
※ If the machine is equipped with the pattern change valve, the machine operation pattern can be easily changed.

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

Operation	ISO type	A type
Left RCV lever		
Right RCV lever		

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

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



(2) Change of operating pattern

① Loosen bolt.

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

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

· Position ① for "ISO" pattern.

· Position ② for "A" pattern.

13. SCR SYSTEM CLEANING

SCR system

※ The SCR system is used to decrease the mono-nitrogen oxides (NOx) emissions from the machine tailpipe.

※ It is unlawful to tamper with, modify, or remove any component of the SCR system.
It is also unlawful to use DEF/AdBlue® that does not meet the specifications provided or to operate the machine with no DEF/AdBlue®.

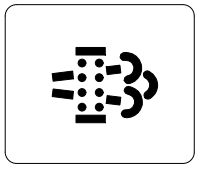
※ The type of SCR system cleaning composes of automatic SCR system cleaning and manual SCR system cleaning.

⚠ SCR system cleaning generates hot exhaust and causes hot exhaust system components.

⚠ Exhaust system components get very hot and can cause severe burns. Risk for fire.

⚠ Do not perform SCR system cleaning in a flammable environment.

(1) SCR system cleaning warning lamp



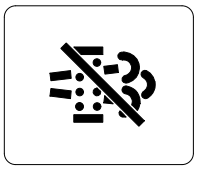
2609A3CD19

This warning lamp will light ON or blink when the SCR system cleaning is needed or activated.

※ Refer to page 3-9 for details.

※ The machine must be in a fireproof area during the entire SCR system cleaning process.

(2) SCR system cleaning inhibit warning lamp



2609A3CD20

This warning lamp will light ON when the SCR system cleaning switch is pushed inhibit position.

※ Refer to page 3-9 for details.

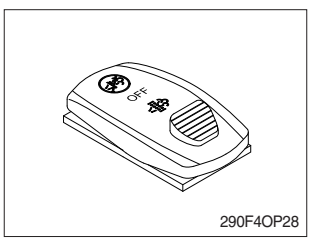
(3) HEST (high exhaust system temperature) warning lamp

2609A3CD21

This warning lamp will light ON when the exhaust temperatures are high due to SCR system cleaning.

※ Refer to page 3-10 for details.

(4) SCR system cleaning switch



290F4OP28

This switch is used to select the SCR system cleaning.

※ Refer to page 3-36 for details.

※ Manual SCR system cleaning : refer to page 3-10 for details.

1. PREPARATION FOR TRANSPORTATION

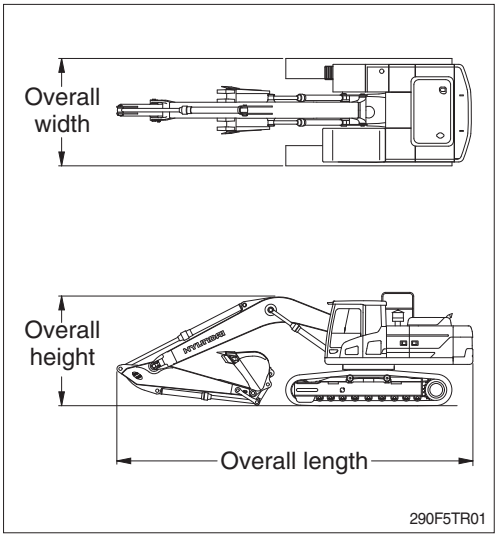
1) When transporting the machine, observe the various road rules, road transportation vehicle laws and vehicle limit ordinances, etc.

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.

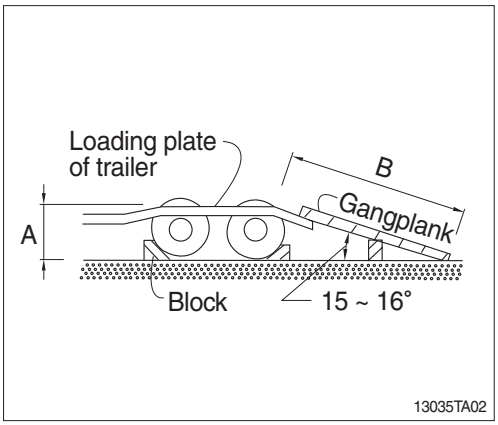
4) Get the permission from the related authority if necessary.

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



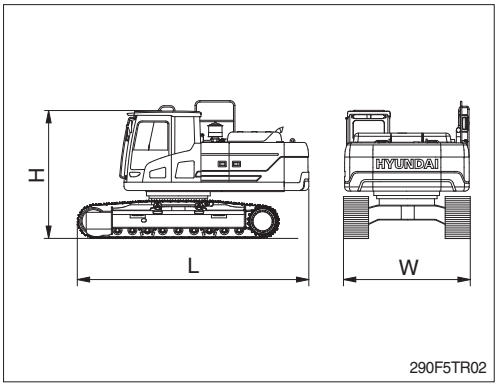
2. DIMENSION AND WEIGHT

1) HX300 L

(1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	5740 (18' 10")
H	Height	mm (ft-in)	3020 (9' 11")
W	Width	mm (ft-in)	3200 (10' 6")
Wt	Weight	kg (lb)	24530 (54080)

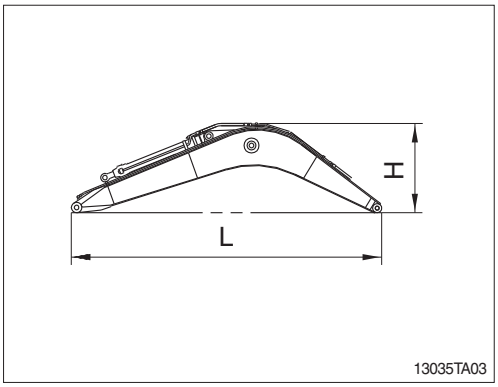
※ With 600 mm (24") triple grouser shoes and 5200 kg (11460 lb) counterweight.



(2) Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	6470 (21' 3")
H	Height	mm (ft-in)	1730 (5' 8")
W	Width	mm (ft-in)	790 (2' 7")
Wt	Weight	kg (lb)	2670 (5890)

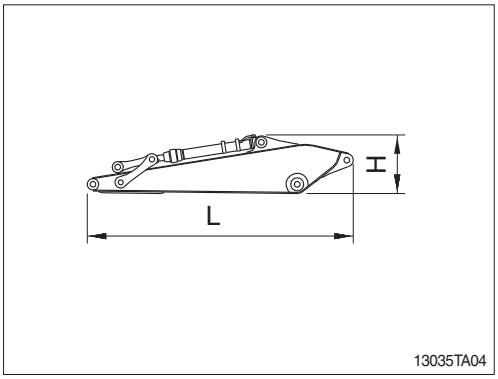
※ 6.25 m (20' 6") boom with arm cylinder (included piping and pins).



(3) Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	4190 (13' 9")
H	Height	mm (ft-in)	950 (3' 1")
W	Width	mm (ft-in)	360 (1' 2")
Wt	Weight	kg (lb)	1880 (4140)

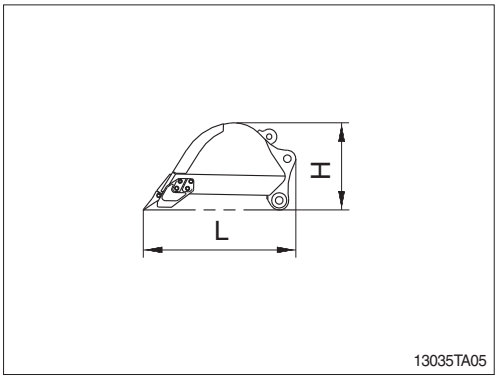
※ 3.05 m (10' 0") arm with bucket cylinder (included linkage and pins).



(4) Bucket assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1780 (5' 10")
H	Height	mm (ft-in)	1070 (3' 6")
W	Width	mm (ft-in)	1410 (4' 8")
Wt	Weight	kg (lb)	1100 (2430)

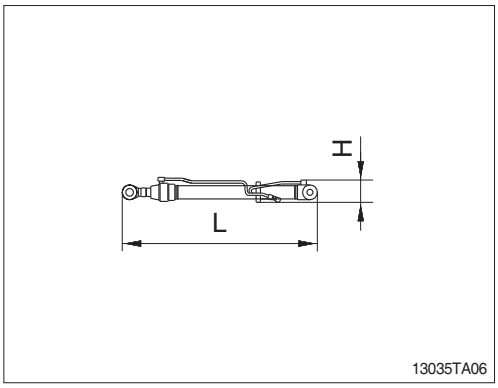
※ 1.27 m^3 (1.66 yd^3) SAE heaped bucket (included tooth and side cutters).



(5) Boom cylinder

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2240 (7' 4")
H	Height	mm (ft-in)	260 (0' 10")
W	Width	mm (ft-in)	390 (1' 3")
Wt	Weight	kg (lb)	540 (1190)

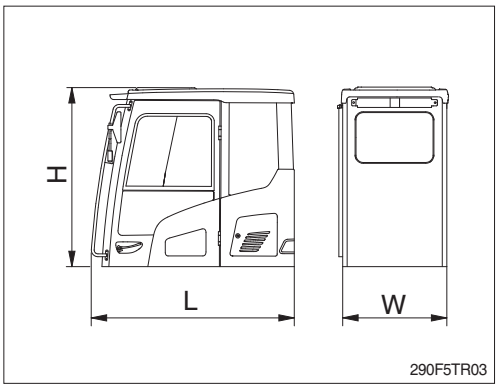
※ Included piping.



(6) Cab assembly

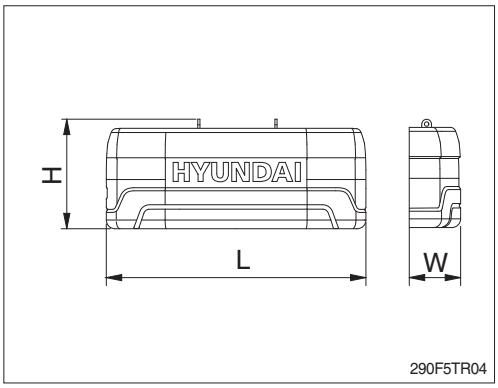
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1950 (6' 5") [2070 (6' 10")]
H	Height	mm (ft-in)	1780 (5' 10") [1822 (6')]"
W	Width	mm (ft-in)	1104 (3' 7") [1126 (3' 8")]
Wt	Weight	kg (lb)	495.3 (1092) [650.2 (1433)]

[ ] : with FOG GUARD



(7) Counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
H	Height	mm (ft-in)	1200 (3' 11")
W	Width	mm (ft-in)	590 (1' 11")
Wt	Weight	kg (lb)	5200 (11460)

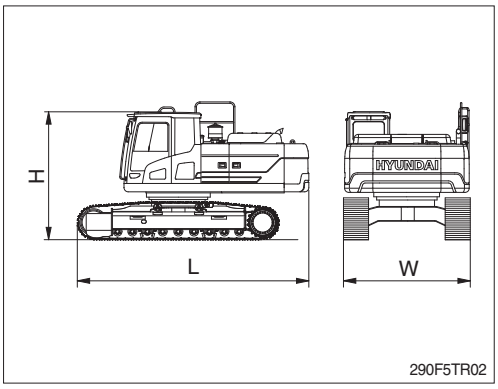


2) HX300 NL

(1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	5740 (18' 10")
H	Height	mm (ft-in)	3030 (9' 11")
W	Width	mm (ft-in)	2990 (9' 10")
Wt	Weight	kg (lb)	24140 (53220)

※ With 600 mm (24") triple grouser shoes and 5200 kg (11460 lb) counterweight.

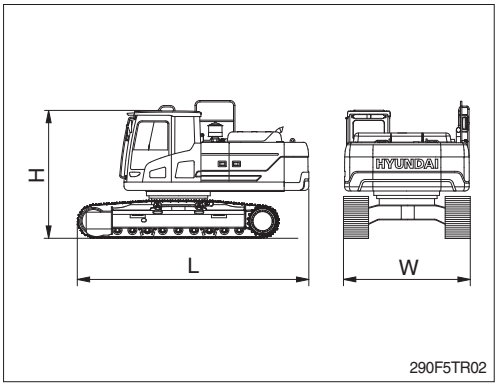


3) HX300 L LONG REACH

(1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	5740 (18' 10")
H	Height	mm (ft-in)	3030 (9' 11")
W	Width	mm (ft-in)	3400 (11' 2")
Wt	Weight	kg (lb)	27830 (61350)

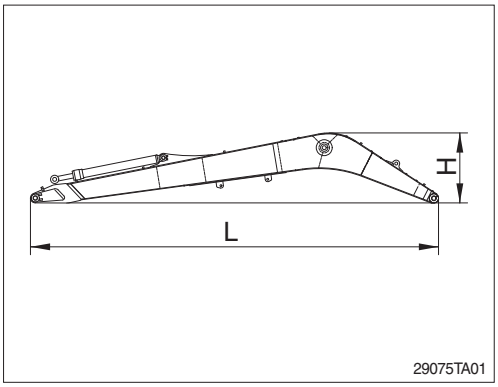
※ With 800 mm (32") triple grouser shoes and 7000 kg (15450 lb) counterweight.



(2) Boom assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	10410 (34' 2")
H	Height	mm (ft-in)	1675 (5' 6")
W	Width	mm (ft-in)	900 (3' 1")
Wt	Weight	kg (lb)	3420 (7540)

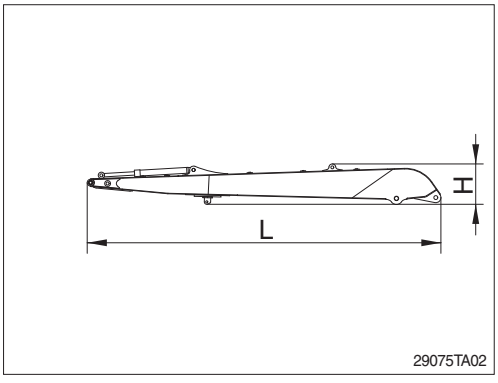
※ 10.2 m (33' 6") boom with arm cylinder (included piping and pins).



(3) Arm assembly

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	9010 (29' 7")
H	Height	mm (ft-in)	870 (2' 10")
W	Width	mm (ft-in)	480 (1' 7")
Wt	Weight	kg (lb)	1690 (3730)

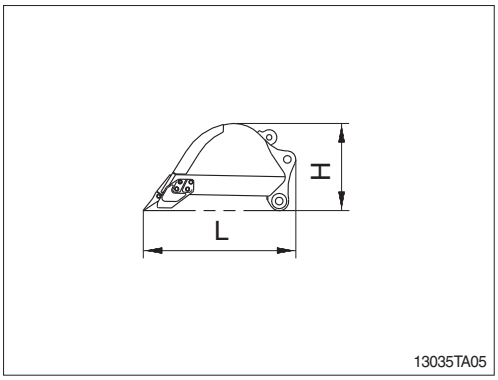
※ 7.85 m (25' 9") arm with bucket cylinder (included linkage and pins).



(4) Bucket assembly

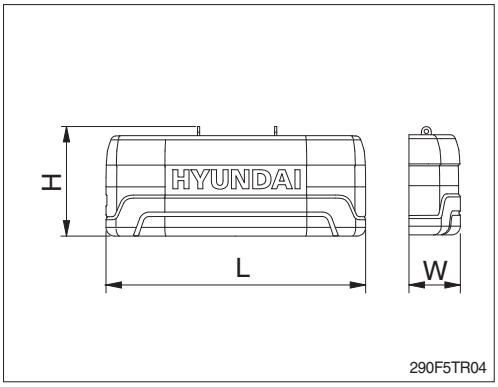
Mark	Description	Unit	Specification
L	Length	mm (ft-in)	1400 (4' 7")
H	Height	mm (ft-in)	820 (2' 8")
W	Width	mm (ft-in)	1035 (3' 5")
Wt	Weight	kg (lb)	460 (1010)

※ 0.52 m^3 (0.68 yd^3) SAE heaped bucket (included tooth and side cutters).



(5) Counterweight

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	2980 (9' 9")
H	Height	mm (ft-in)	1200 (3' 11")
W	Width	mm (ft-in)	590 (1' 11")
Wt	Weight	kg (lb)	7000 (15450)

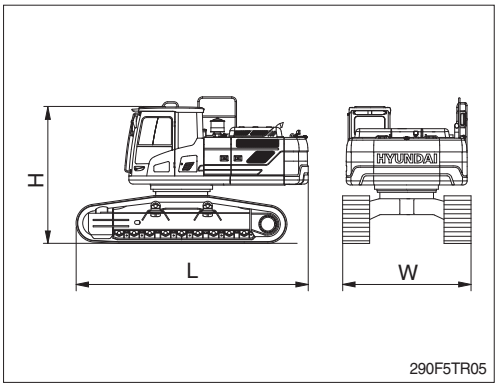


4) HX300 L HIGH WALKER

(1) Base machine

Mark	Description	Unit	Specification
L	Length	mm (ft-in)	5740 (18' 10")
H	Height	mm (ft-in)	3400 (11' 2")
W	Width	mm (ft-in)	3470 (11' 5")
Wt	Weight	kg (lb)	27370 (60340)

※ With 600 mm (24") triple grouser shoes and 5200 kg (11460 lb) counterweight.

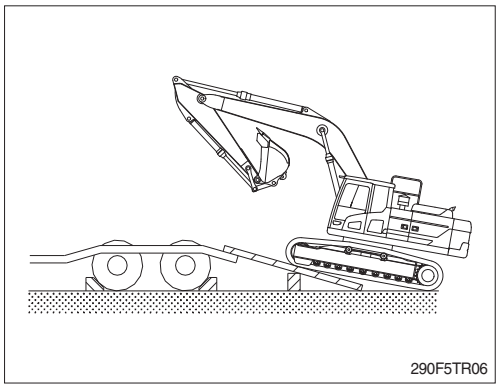


3. LOADING THE MACHINE

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

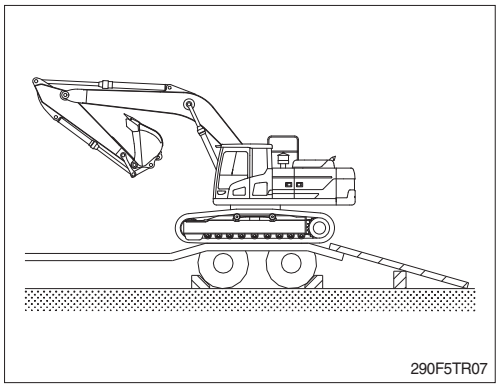
2) Use the gangplank with sufficient length, width, thickness and gradient.

3) Place the swing lock/fine switch to the LOCK position (if equipped) 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.

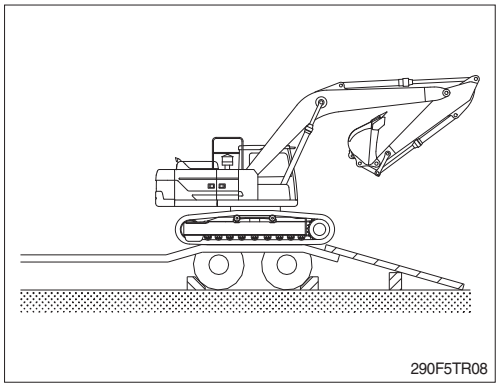

290F5TR06

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.


290F5TR07

(2) Place the swing lock/fine switch to the LOCK position (if equipped) after the swing the machine 180 degree.


290F5TR08

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

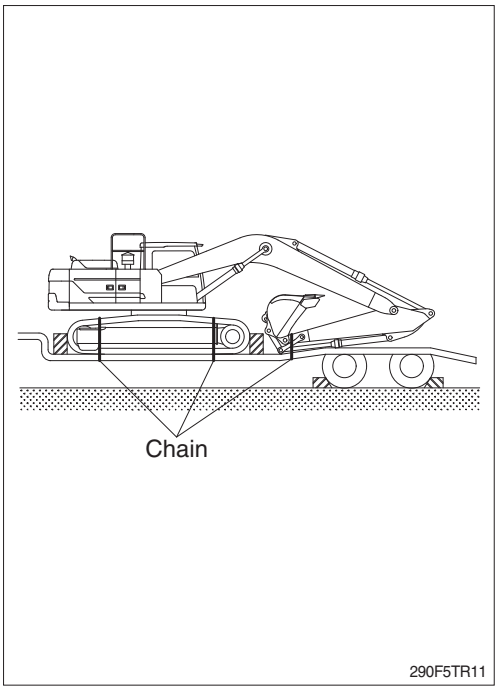
※ **Place rectangular timber under the bucket cylinder to prevent the damage of it during transportation.**

⚠ **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.**

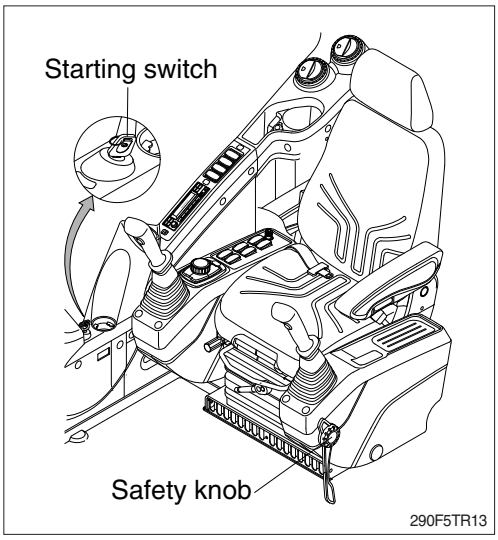


4. FIXING THE MACHINE

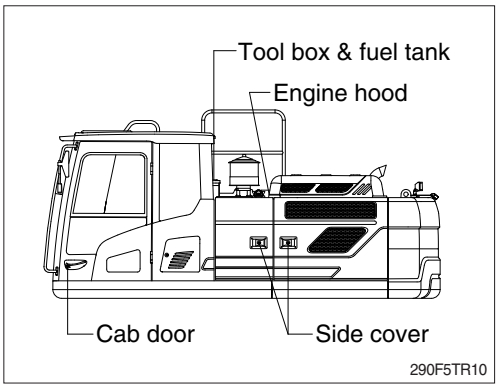
1) Lower down the working device on the loading plate of trailer.

2) Keep the safety knob on the LOCK position.

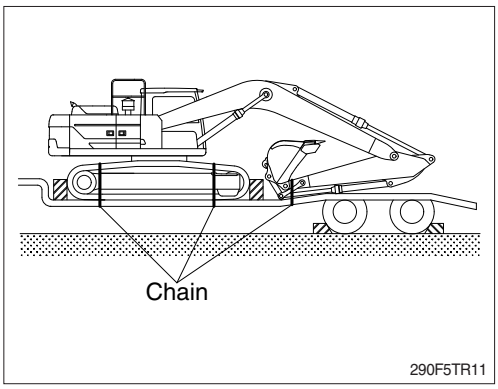
3) Turn OFF all the switches and remove the key.



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

⚠ **The wrong hoisting method or installation of lifting device can cause serious injury, death, or damage to the machine.**

1) Check the weight, length, width and height of the machine referring to chapter 7, Specification when you are going to hoist the machine.

2) Use approved lifting device and ensure distance between lifting device and machine to avoid con tact between the two.

※ **Remove any parts (footboard, etc) that may be damaged by contact with the lifting device before lifting.**

3) Place rubber plates at lifting points to avoid any damage to the machine.

4) Place crane in the proper place.

5) Install approvd lifting device as shown in the illustration.

6) Use stay between the wire rope and the machine to prevent damage to the rope or machine.
Set the lifting angle of the wire rope to 30°~ 40°.

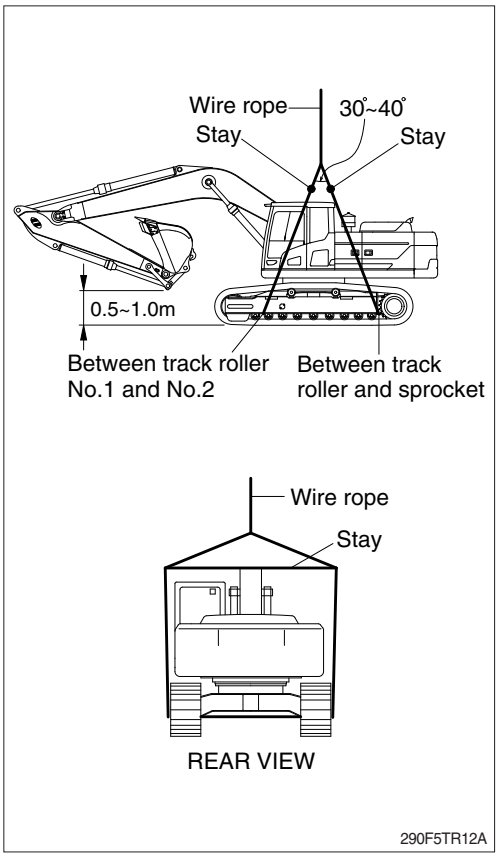
7) After the machine comes off the ground, check the hook condition and the lifting posture, and then lift slowly.

⚠ **Ensure that lifting device is free form any damage and is approved for the weight being lifted and supported.**

⚠ **Place the safety knob to LOCK position to prevent the machine from moving when hoisting the machine.**

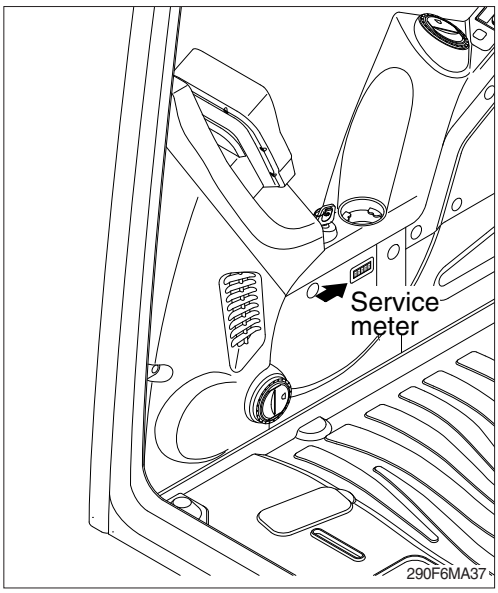
⚠ **Do not load abruptly.**

⚠ **Keep area clear of any and all personnel.**



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 hour meter at control panel.

(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) 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.

⚠ Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

△ Accumulated grease and oil on the machine is a fire hazard. Remove this debris with steam cleaning or high pressure water, at least every 1000 hours.

△ Inspect the engine compartment for any trash build up. Remove any trash build up from the engine compartment.

(5) Ask to your local dealer or HD Hyundai Construction Equipment for the maintenance advice if unknown.

3) PROPER MAINTENANCE

(1) Replace and repair of parts

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

Replace damaged or worn parts 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.

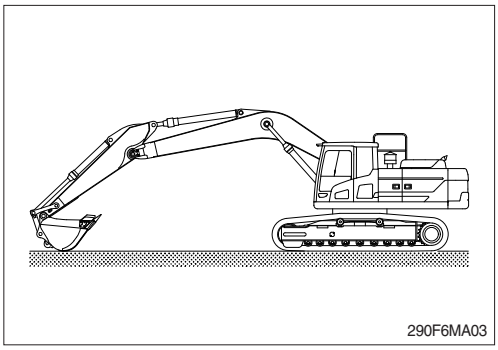
(9) For more detail information of maintenance, please contact local HD Hyundai Construction Equipment dealer.

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

4) RELIEVING THE PRESSURE IN THE HYDRAULIC SYSTEM

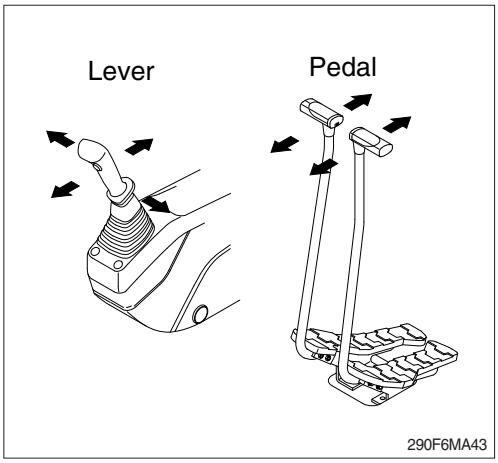
※ **Spouting of oil can cause the accident when loosening the cap or hose right after the operating of machine as the machine or oil is on the high pressure on the condition.**
Be sure to relieve the pressure in the system before repairing hydraulic system.

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

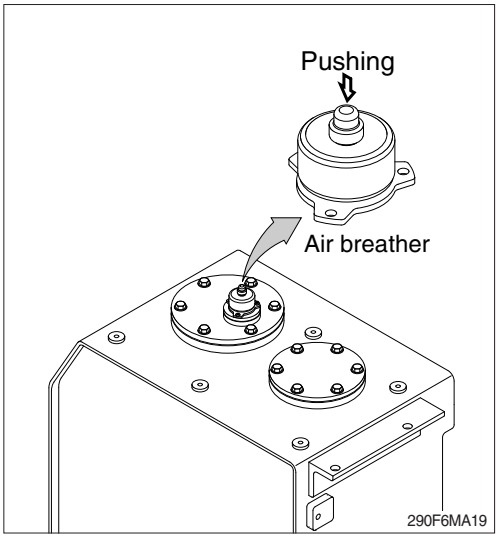


(2) Set the safety knob completely in the UNLOCK position, operate the control levers and pedals fully to the front, rear, left and right, to release the pressure in the hydraulic circuit.

※ **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) 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.

<table>
<tr><th colspan="3">Periodical replacement of safety parts</th><th>Interval</th></tr>
<tr><td colspan="2" rowspan="2">Engine</td><td>Fuel hose (tank-engine)</td><td rowspan="2">Every
2 years</td></tr>
<tr><td>Heater hose
(heater-engine)</td></tr>
<tr><td rowspan="6">Hydraulic system</td><td rowspan="3">Main circuit</td><td>Pump suction hose</td><td rowspan="3">Every
2 years</td></tr>
<tr><td>Pump delivery hose</td></tr>
<tr><td>Swing hose</td></tr>
<tr><td rowspan="3">Working device</td><td>Boom cylinder line hose</td><td rowspan="3">Every
2 years</td></tr>
<tr><td>Arm cylinder line hose</td></tr>
<tr><td>Bucket cylinder line hose</td></tr>
</table>

※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	8.8T		10.9T		12.9T	
	kgf · m	lbf · ft	kgf · m	lbf · ft	kgf · m	lbf · ft
M 6×1.0	0.8 ~ 1.2	5.8 ~ 8.6	1.2 ~ 1.8	8.7 ~ 13.0	1.5 ~ 2.1	10.9 ~ 15.1
M 8×1.25	2.0 ~ 3.0	14.5 ~ 21.6	2.8 ~ 4.2	20.3 ~ 30.4	3.4 ~ 5.0	24.6 ~ 36.1
M10×1.5	4.0 ~ 6.0	29.0 ~ 43.3	5.6 ~ 8.4	40.5 ~ 60.8	6.8 ~ 10.0	49.2 ~ 72.3
M12×1.75	6.8 ~ 10.2	50.0 ~ 73.7	9.6 ~ 14.4	69.5 ~ 104	12.3 ~ 16.5	89.0 ~ 119
M14×2.0	10.9 ~ 16.3	78.9 ~ 117	16.3 ~ 21.9	118 ~ 158	19.5 ~ 26.3	141 ~ 190
M16×2.0	17.9 ~ 24.1	130 ~ 174	25.1 ~ 33.9	182 ~ 245	30.2 ~ 40.8	141 ~ 295
M18×2.5	24.8 ~ 33.4	180 ~ 241	34.8 ~ 47.0	252 ~ 340	41.8 ~ 56.4	302 ~ 407
M20×2.5	34.9 ~ 47.1	253 ~ 340	49.1 ~ 66.3	355 ~ 479	58.9 ~ 79.5	426 ~ 575
M22×2.5	46.8 ~ 63.2	339 ~ 457	65.8 ~ 88.8	476 ~ 642	78.9 ~ 106	570 ~ 766
M24×3.0	60.2 ~ 81.4	436 ~ 588	84.6 ~ 114	612 ~ 824	102 ~ 137	738 ~ 991
M30×3.5	120 ~161	868 ~ 1164	168 ~ 227	1216 ~ 1641	202 ~ 272	1461 ~ 1967

(2) Fine thread

Bolt size	8.8T		10.9T		12.9T	
	kgf · m	lbf · ft	kgf · m	lbf · ft	kgf · m	lbf · ft
M 8×1.0	2.1 ~ 3.1	15.2 ~ 22.4	3.0 ~ 4.4	21.7 ~ 31.8	3.6 ~ 5.4	26.1 ~ 39.0
M10×1.25	4.2 ~ 6.2	30.4 ~ 44.9	5.9 ~ 8.7	42.7 ~ 62.9	7.0 ~ 10.4	50.1 ~ 75.2
M12×1.25	7.3 ~ 10.9	52.8 ~ 78.8	10.3 ~ 15.3	74.5 ~ 110	13.1 ~ 17.7	94.8 ~ 128
M14×1.5	12.4 ~ 16.6	89.7 ~ 120	17.4 ~ 23.4	126 ~ 169	20.8 ~ 28.0	151 ~ 202
M16×1.5	18.7 ~ 25.3	136 ~ 182	26.3 ~ 35.5	191 ~ 256	31.6 ~ 42.6	229 ~ 308
M18×1.5	27.1 ~ 36.5	196 ~ 264	38.0 ~ 51.4	275 ~ 371	45.7 ~ 61.7	331 ~ 446
M20×1.5	37.7 ~ 50.9	273 ~ 368	53.1 ~ 71.7	384 ~ 518	63.6 ~ 86.0	460 ~ 622
M22×1.5	51.2 ~ 69.2	370 ~ 500	72.0 ~ 97.2	521 ~ 703	86.4 ~ 116	625 ~ 839
M24×2.0	64.1 ~ 86.5	464 ~ 625	90.1 ~ 121	652 ~ 875	108 ~ 146	782 ~ 1056
M30×2.0	129 ~ 174	933 ~ 1258	181 ~ 245	1310 ~ 1772	217 ~ 294	1570 ~ 2126

2) PIPE AND HOSE (FLARE type)

Thread size (PF)	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

3) PIPE AND HOSE (ORFS type)

Thread size (UNF)	Width across flat (mm)	kgf · m	lbf · ft
9/16-18	19	4	28.9
11/16-16	22	5	36.2
13/16-16	27	9.5	68.7
1-3/16-12	36	18	130
1-7/16-12	41	21	152
1-11/16-12	50	35	253

4) FITTING

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

5) TIGHTENING TORQUE OF MAJOR COMPONENT

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt (engine-bracket)	M12 × 1.75	11.5 ± 1.0	83.2 ± 7.2
2		Engine mounting bolt (bracket-frame, FR)	M20 × 2.5	52.1 ± 5.0	377 ± 36.2
3		Engine mounting bolt (bracket-frame, RR)	M24 × 3.0	90 ± 9.0	651 ± 65
4		Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
5		Coupling mounting socket bolt	M20 × 2.5	46.5 ±2.5	336 ±18.1
6		Fuel tank mounting bolt	M20 × 2.5	46 ± 5.1	333 ± 36.9
7	Hydraulic system	Main pump housing mounting bolt	M10 × 1.5	4.8 ± 0.3	34.7 ± 2.2
8		Main pump mounting socket bolt	M20 × 2.5	52.1 ± 5.0	377 ± 36.2
9		Main control valve mounting nut	M12 × 1.75	12.3 ± 1.3	89.0 ± 9.4
10		Hydraulic oil tank mounting bolt	M20 × 2.5	46 ± 5.1	333 ± 36.9
11		Turning joint mounting bolt, nut	M12 × 1.75	12.3 ± 1.3	89.0 ± 9.4
12	Power train system	Swing motor mounting bolt	M20 × 2.5	58.4 ± 6.4	422 ± 46.3
13		Swing bearing upper part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
14		Swing bearing lower part mounting bolt	M24 × 3.0	100 ± 10	723 ± 72.3
15		Travel motor mounting bolt	M24 × 3.0	84 ± 8.0	608 ± 57.8
16		Sprocket mounting bolt	M20 × 2.5	57.9 ± 6.0	419 ± 43.4
17	Under carriage	Carrier roller mounting bolt, nut	M16 × 2.0	29.7 ± 3.0	215 ± 21.7
18		Track roller mounting bolt	M20 × 2.5	57.9 ± 6.0	419 ± 43.4
19		Track tension cylinder mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
20		Track shoe mounting bolt, nut	M22 × 1.5	123 ± 6.0	831 ± 36
21		Track guard mounting bolt	M20 × 2.5	57.9 ± 8.7	419 ± 62.9
22	Others	Counterweight mounting bolt	M36 × 3.0	337 ± 33	2440 ± 239
23		Cab mounting bolt	M12 × 1.75	12.8 ± 3.0	92.6 ± 21.7
24		Operator's seat mounting bolt	M 8 × 1.25	4.05 ± 0.8	29.3 ± 5.8

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

3. FUEL, COOLANT AND LUBRICANTS

1) NEW MACHINE

New machine used and filled with following lubricants.

Description	Specification
Engine oil (API CJ-4, ACEA-E9)	SAE 10W-30, ★SAE 5W-40
DEF/AdBlue®	ISO 22241 (32.5% high-purity urea and 67.5% deionized water)
WHydraulic oil	HD Hyundai Construction Equipment genuine long life (ISO VG 32, VG 46, VG 68) Conventional hydraulic oil (ISO VG 15★) HD Hyundai Construction Equipment Bio Hydraulic Oil (HBHO, ISO VG 46)
Swing and travel reduction gear	SAE 80W-90 (GL-4/GL-5)
Grease	Lithium base grease NLGI No. 2
Fuel	ASTM D975-No. 2, Ultra low sulfur diesel
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water. Mixture of 60% ethylene glycol base antifreeze and 40% water.★

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Material
DEF : Diesel Exhaust Fluid
DEF compatible with AdBlue®

Ultra low sulfur diesel
- sulfur content ≤ 15 ppm

★Cold region
Russia, CIS, Mongolia

2) RECOMMENDED OILS

HD Hyundai Construction Equipment genuine lubricating oils have been developed to offer the best performance and service life for your equipment. These oils have been tested according to the specifications of HD Hyundai Construction Equipment and, therefore, will meet the highest safety and quality requirements.
We recommend that you use only HD Hyundai Construction Equipment genuine lubricating oils and grease officially approved by HD Hyundai Construction Equipment.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C(°F)
			-50 (-58) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86) 40 (104)
Engine oil pan	Engine oil	24.4 (6.4)	★SAE 5W-40 SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
DEF/ AdBlue® tank	Mixture of urea and deionized water	42.5 (11.2)	ISO 22241, High-purity urea + deionized water (32.5:67.5)
Swing drive	Gear oil	11 (2.91)	★SAE 75W-90
Final drive		7.8×2 (2.1×2)	SAE 80W-90
Hydraulic tank	Hydraulic oil	Tank : 190 (50) System : 330 (87)	★ISO VG 15 ISO VG 32 ISO VG 46, HBHO VG 46★3 ISO VG 68
Fuel tank	Diesel fuel★1	500 (132)	★ASTM D975 NO.1 ASTM D975 NO.2
Fitting (grease nipple)	Grease	As required	★NLGI NO.1 NLGI NO.2
Radiator (reservoir tank)	Mixture of antifreeze and soft water★2	40 (10.6)	Ethylene glycol base permanent type (50 : 50) ★Ethylene glycol base permanent type (60 : 40)

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Material
DEF : Diesel Exhaust Fluid DEF compatible with AdBlue®

★ : Cold region (Russia, CIS, Mongolia)
★1 : Ultra low sulfur diesel
- sulfur content ≤ 15 ppm
★2 : Soft water
City water or distilled water
★3 : HD Hyundai Construction Equipment Bio Hydraulic Oil

※ Using any lubricating oils other than HD Hyundai Construction Equipment genuine products may lead to a deterioration of performance and cause damage to major components.
※ Do not mix HD Hyundai Construction Equipment genuine oil with any other lubricating oil as it may result in damage to the systems of major components.
※ Do not use any engine oil other than that specified above, as it may clog the diesel particulate filter(DPF).
※ For HD Hyundai Construction Equipment genuine lubricating oils and grease for use in regions with extremely low temperatures, please contact HD Hyundai Construction Equipment dealers.

4. MAINTENANCE CHECK LIST

1) DAILY SERVICE BEFORE STARTING

Check items	Service	Page
Visual check		
Engine oil level	Check, Add	6-18
Coolant level	Check, Add	6-20
Fan belt tension and damage	Check, Adjust	6-24, 25
Air cleaner (oil bath, option)	Check, Clean, Add	6-26-2~26-4
Fuel tank	Check, Refill	6-27
Prefilter	Check, Clean	6-27
DEF/AdBlue® tank	Check, Add	6-31
Hydraulic oil level	Check, Add	6-33
★ Attachment pin and bushing	Lubricate	6-42
· 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		
Control panel & pilot lamp	Check, Clean	6-43

★ Lubricate every 10 hours or daily for initial 100 hours.

2) EVERY 50 HOURS SERVICE

Check items	Service	Page
Fuel tank (water, sediment)	Drain	6-27
Swing reduction gear oil	Check, Add	6-36
Track tension	Check, Adjust	6-38
Attachment pin and bushing	Lubricate	6-42
· Bucket cylinder rod end		
· Bucket + Arm connecting		
· Bucket control link + Arm		
· Bucket control rod		

3) INITIAL 50 HOURS SERVICE

Check items	Service	Page
Bolts & Nuts · 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	Check, Tight	6-8

4) EVERY 200 HOURS SERVICE

Check items	Service	Page
★ Return filter	Replace	6-35
★ Pilot line filter	Replace	6-36
★ Drain filter cartridge	Replace	6-35

★ Replace 3 filters for continuous hydraulic breaker operation only.

5) INITIAL 250 HOURS SERVICE

Check items	Service	Page
Engine oil	Change	6-18, 19
Engine oil filter	Replace	6-18, 19
Prefilter (water, element)	Replace	6-27
Fuel filter element	Replace	6-28
Pilot line filter element	Replace	6-36
Hydraulic oil return filter	Replace	6-35
Drain filter cartridge	Replace	6-35
Swing reduction gear oil	Change	6-36
Travel reduction gear case	Change	6-37

6) EVERY 250 HOURS SERVICE

Check items	Service	Page
Battery (voltage)	Check, Clean	6-43
Swing bearing grease	Lubricate	6-36
Aircon & heater fresh air filter	Check, Clean	6-46
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		
Attachment pin and bushing	Lubricate	6-42
· Boom cylinder tube end		
· Boom foot		
· Boom cylinder rod end		
· Arm cylinder tube end		
· Arm cylinder rod end		
· Boom + Arm connecting		
· Bucket cylinder tube end		

7) INITIAL 500 HOURS SERVICE

Check items	Service	Page
Aircon & heater filter (inner)	Replace	6-46

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

8) EVERY 500 HOURS SERVICE

Check items	Service	Page
★Engine oil	Change	6-18, 19
★Engine oil filter	Replace	6-18, 19
Radiator, cooler fin and charge air cooler	Check, Clean	6-23
Fuel filter element	Replace	6-28
Prefilter	Change	6-27

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

9) EVERY 1000 HOURS SERVICE

Check items	Service	Page
Air cleaner element (primary)★1	Check, Clean	6-26
Hydraulic oil return filter	Replace	6-35
Air breather element	Replace	6-35
Drain filter cartridge	Replace	6-35
Pilot line filter	Replace	6-36
Swing reduction gear oil	Change	6-36
Grease in swing gear and pinion	Change	6-36
Travel motor reduction gear oil	Change	6-37

★1 When working in dusty environments, more frequent cleaning is highly recommended.

10) EVERY 2000 HOURS SERVICE

Check items	Service	Page
Coolant	Change	6-20, 21, 22, 23
Crankcase breather filter	Replace	6-29
Air cleaner (oil bath, option)	Disassemble, Clean, Replace	6-26-2~26-4
Hydraulic oil★2	Change	6-34
HBHO★3	Change	6-34
Hydraulic tank suction strainer	Check, Clean	6-34
RCV lever	Check, Lubricate	6-38
Hoses, fittings, clamps (fuel, coolant, hydraulic)	Check, Retighten, Replace	-

★2 Conventional hydraulic oil

★3 If do not want to change HBHO(HD Hyundai Construction Equipment Bio Hydarulic Oil, ISO VG 46) every 2000 hours, contact HD Hyundai Construction Equipment dealer and ask about SAMPLING.

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

11) EVERY 4000 HOURS SERVICE

Check items	Service	Page
Air cleaner element (primary, safety)★4	Replace	6-26
DEF/AdBlue® tank filter	Replace	6-31-1

★4 When working in dusty environments, more frequent replacing is highly recommended.

12) EVERY 4500 HOURS SERVICE

Check items	Service	Page
DEF/AdBlue® supply module filter	Replace	6-32

13) EVERY 5000 HOURS SERVICE

Check items	Service	Page
Hydraulic oil★5	Change	6-34

★5 HD Hyundai Construction Equipmentyundai genuine long life

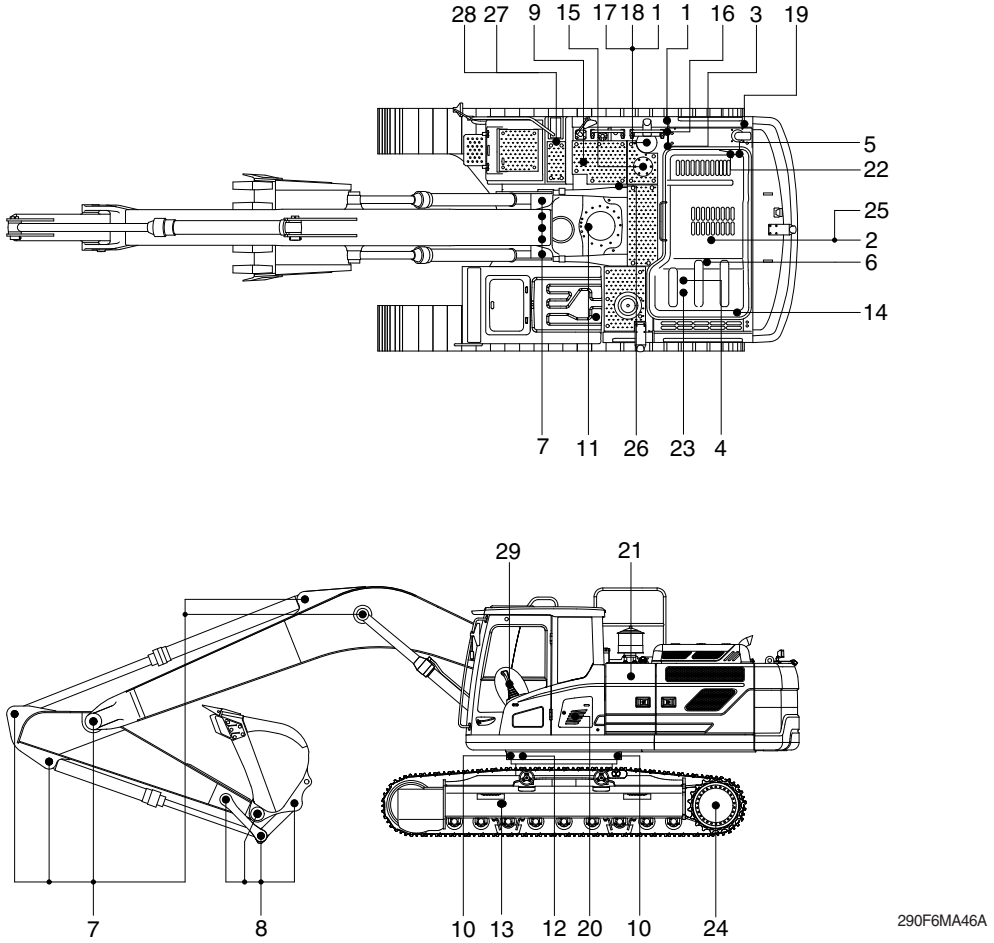
※Change oil every 1000 hours of continuous hydraulic breaker operation.

14) 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	6-27
· Prefilter	Clean or Replace	6-27
· Fuel filter element	Replace	6-28
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
· Charge air cooler	Check	6-23
Engine air system		
· Air cleaner element (primary)	Clean or Replace	6-26
· Air cleaner element (safety)	Replace	6-26
· Air cleaner element (oil bath, option)	Check, Clean, Replace	6-26-2~26-4
Hydraulic system		
· Hydraulic oil	Add or Change	6-33, 34
· Return filter	Replace	6-35
· Drain line filter	Replace	6-35
· Pilot line filter	Replace	6-36
· Element of breather	Replace	6-35
· Suction strainer	Clean	6-34
· RCV lever	Lubricate	6-38
Undercarriage		
· Track tension	Check, Adjust	6-38
Bucket		
· Tooth	Replace	6-40
· Side cutter	Replace	6-40
· Linkage	Adjust	6-41
· Bucket assy	Replace	6-39
Air conditioner and heater		
· Fresh air filter	Clean, Replace	6-46
· Recirculation filter	Clean	6-46
Other		
· DEF/AdBlue® tank	Check, Add	6-31
· DEF/AdBlue® supply module filter	Replace	6-32
· DEF/AdBlue® tank filter	Replace	6-31-1

5. MAINTENANCE CHART



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.

Service interval	No.	Description	Service action	Oil symbol	Capacity ℓ (U.S.gal)	Service points No.
10 Hours or daily	1	Hydraulic oil level	Check, Add	HO	190 (50.2)	1
	2	Engine oil level	Check, Add	EO	24.4 (6.4)	1
	4	Radiator coolant	Check, Add	C	40 (10.6)	1
	5	Prefilter (water, element)	Check, Clean	-	-	1
	6	Fan belt tension and damage	Check, Adjust	-	-	1
	9	Fuel tank	Check, Refill	DF	500 (132)	1
	21	Air cleaner (oil bath, option)	Check, Clean, Add	EO	5.0 (1.3)	1
	27	DEF/AdBlue® tank	Check, Add	DEF	42.5 (11.2)	1
50 Hours or weekly	8	Bucket linkage pins	Check, Add	PGL	-	6
	9	Fuel tank (water, sediment)	Check, Clean	-	-	1
	11	Swing reduction gear oil	Check, Add	GO	12.0 (3.2)	1
	13	Track tension	Check, Adjust	PGL	-	2
250 Hours	7	Attachment pins & bushing	Check, Add	PGL	-	11
	10	Swing bearing grease	Check, Add	PGL	-	2
	14	Battery (voltage)	Check	-	-	1
	20	Aircon and heater fresh air filter	Check, Clean	-	-	1

Service interval	No.	Description	Service action	Oil symbol	Capacity ℓ (U.S.gal)	Service points No.
Initial 250 Hours	2	Engine oil	Change	EO	24.4 (6.4)	1
	3	Engine oil filter	Replace	-	-	1
	5	Prefilter	Replace	-	-	1
	11	Swing reduction gear oil	Change	GO	12.0 (3.2)	1
	15	Hydraulic oil return filter	Replace	-	-	1
	16	Drain filter cartridge	Replace	-	-	1
	19	Pilot line filter element	Replace	-	-	1
	22	Fuel filter element	Replace	-	-	1
	22	Travel reduction gear case	Change	GO	8.0 (2.1)	2
500 Hours	2	Engine oil	Change	EO	24.4 (6.4)	1
	3	Engine oil filter	Replace	-	-	1
	5	Prefilter	Replace	-	-	1
	22	Fuel filter element	Replace	-	-	1
	23	Radiator, oil cooler, charge air cooler	Check, Clean	-	-	3
Initial 500 Hours	20	Aircon & heater recirculation filter	Replace	-	-	1
1000 Hours	11	Swing reduction gear oil	Change	GO	12.0 (3.2)	1
	12	Swing gear and pinion grease	Change	PGL	11.4 ㎏ (25.1 �lb)	1
	15	Hydraulic oil return filter	Replace	-	-	1
	16	Drain filter cartridge	Replace	-	-	1
	17	Air breather element	Replace	-	-	1
	19	Pilot line filter element	Replace	-	-	1
	21	Air cleaner element (primary)	Check, Clean	-	-	1
	22	Travel reduction gear case	Change	GO	8.0 (2.1)	2
2000 Hours	1	Hydraulic oil★1	Change	HO	190 (50.2)	1
	1	Hydraulic oil (HBHO★2)	Change	-	190 (50.2)	1
	4	Radiator coolant	Change	C	40 (10.6)	1
	18	Hydraulic oil suction strainer	Check, Clean	-	-	1
	21	Air cleaner (oil bath, option)	Disassemble, Clean, Replace	EO	5.0 (1.3)	1
	25	Crankcase breather filter	Replace	-	-	1
	29	RCV lever	Check, Lubricate	PGL	-	2
	-	Hoses, fittings, clamps (fuel, coolant, hydraulic)	Check, Retighten, Replace	-	-	-
4000 Hours	22	Air cleaner element (primary, safety)	Replace	-	-	2
	28	DEF/AdBlue® tank filter	Replace	-	-	1
4500 Hours	26	DEF/AdBlue® supply module filter	Replace	-	-	1
5000 Hours	1	Hydraulic oil★3	Change	HO	190 (50.2)	1
As required	20	Aircon & heater fresh filter	Replace	-	-	1
	20	Aircon & heater recirculation filter	Clean, Replace	-	-	1
	21	Air cleaner element (primary)	Clean, Replace	-	-	1
	21	Air cleaner element (safety)	Replace	-	-	1
	21	Air cleaner (oil bath, option)	Check, Clean, Replace	EO	5.0 (1.3)	1
	27	DEF/AdBlue® tank	Check, Add	DEF	42.5 (11.2)	1

★1 Conventional hydraulic oil ★2 HD Hyundai Construction Equipment Bio Hydraulic Oil

★3 HD Hyundai Construction Equipmentyundai genuine long life

※ Oil symbol

Please refer to the recommended lubricants for specification.

DF : Diesel fuel GO : Gear oil HO : Hydraulic oil DEF : DEF/AdBlue®

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.

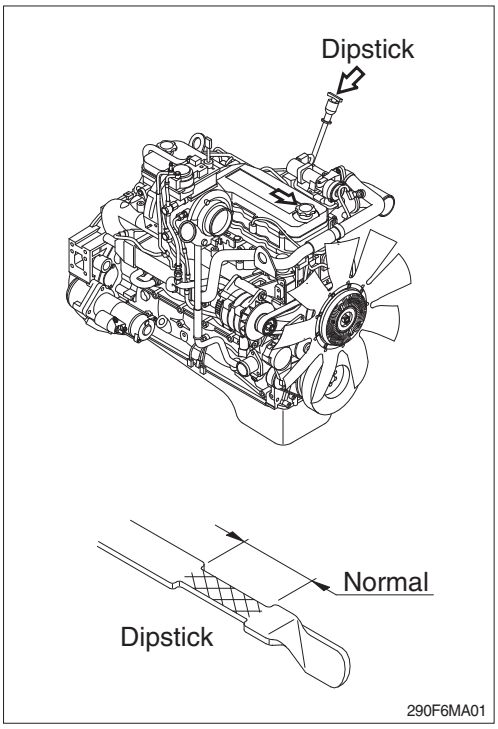
(2) Check the oil level by inserting the dipstick completely into the hole and pulling out again.

(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.**

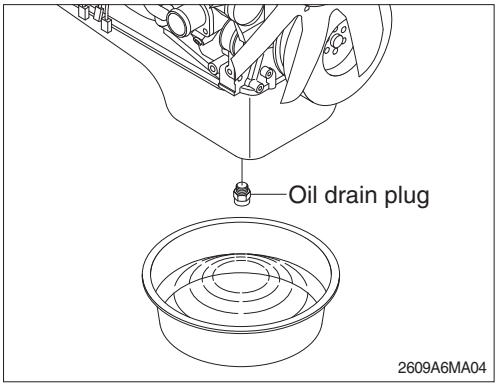


2) REPLACEMENT OF ENGINE OIL AND OIL FILTER

(1) Operate the engine until the coolant temperature reaches 60˚C (140˚F). Shut off the engine.

(2) Remove the oil drain plug. Drain the oil immediately to be sure all the oil and suspended contaminants are removed from the engine.

※ **A drain pan with a capacity of 30 liters (7.9 U.S. gallons) will be adequate.**

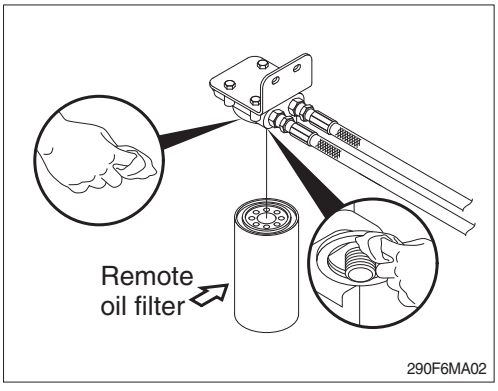


(3) Clean the area around the lubricating oil filter head.

(4) Use oil filter wrench to remove the oil filter.

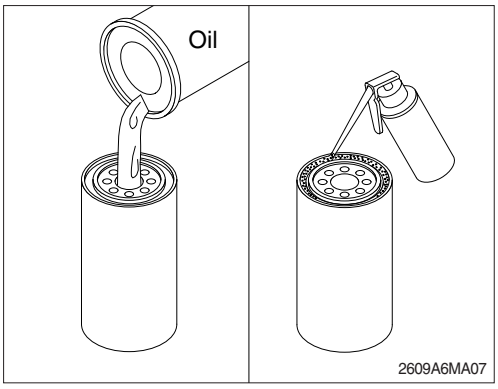
(5) Clean the gasket surface of oil filter head.

※ **The O-ring can stick on the filter head. Be sure it is removed before installing the new filter.**



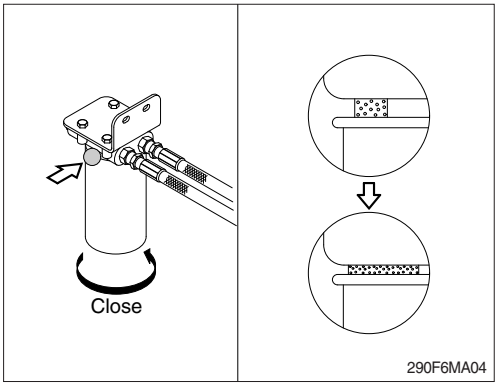
(6) Apply a light film of lubricating oil to the gasket sealing surface before installing the filters.

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



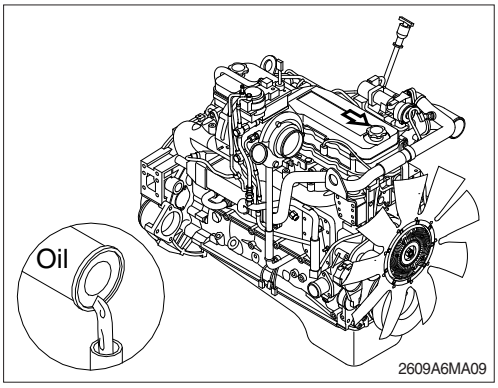
(7) Install the filter to the filter head.
Tighten the filter until the gasket contacts the filter head surface.
Tighten 3/4 to 1 turn after the gasket makes contact with the filter head.

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

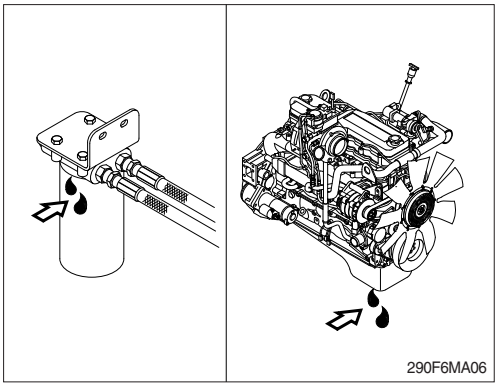


(8) Clean and check the lubricating oil drain plug threads and sealing surface.
Install the lubricating oil pan drain plug.

(9) Fill the engine with clean oil to the proper level.
· Quantity : 24.4 ℓ (6.4 U.S.gallons)



(10) Operate the engine at low idle and inspect for leaks at the filters and the drain plug.
Shut the engine off and check the oil level with the dipstick. Allow 15 minutes for oil to drain down before checking.



3) CHECK COOLANT

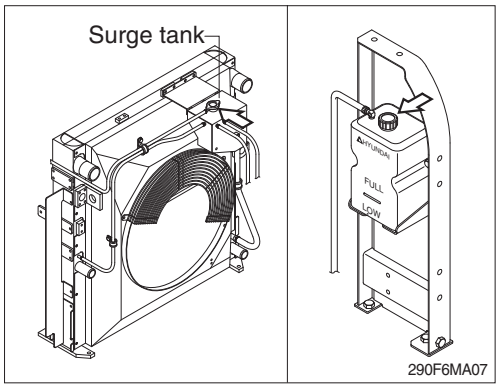
(1) Check if the level of coolant in reservoir tank is between FULL and LOW.

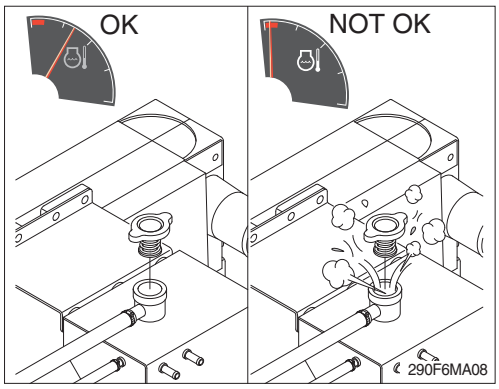
(2) Add the mixture of antifreeze and water after removing the cap of the reservoir tank if coolant is not sufficient.

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

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

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





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.

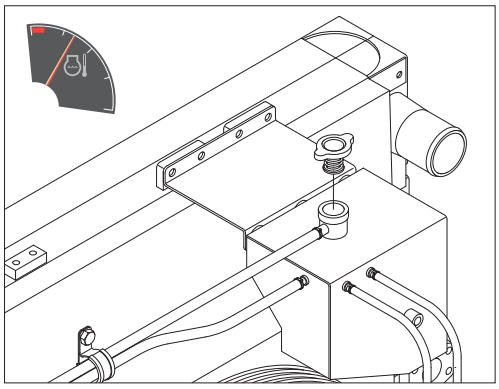
Avoid excessive contact-wash thoroughly after contact.

Keep out of reach of children.

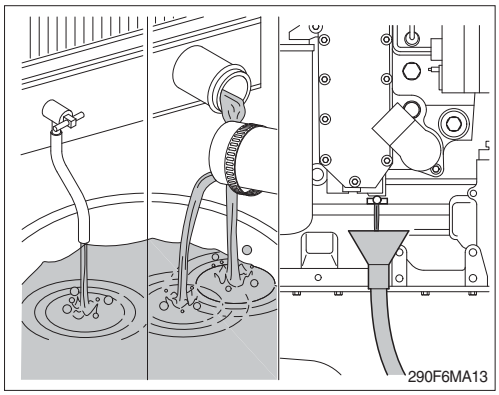
※ Protect the environment : Handling and disposal of used antifreeze can be subject to federal, state, and local law regulation.

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 (122 °F) before removing the coolant system pressure cap.**
Failure to do so can cause personal injury from heated coolant spray.
Drain the cooling system by opening the drain valve on the radiator and opening the drain valve on the bottom of the engine oil cooler housing.
A drain pan with a capacity of 57 liters (15 U.S. gallons) will be adequate.

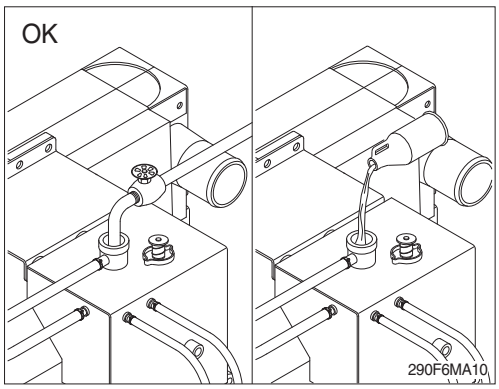


(2) Flushing of cooling system

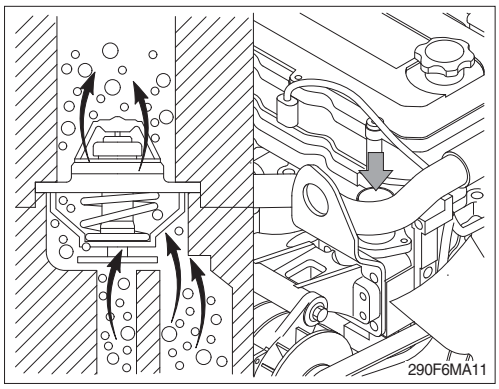
① Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).

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

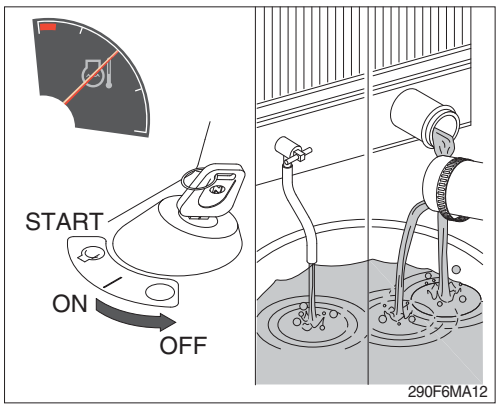
※ **Do not install the surge tank cap. The engine is to be operated without the cap for this process.**



※ **During filling, air must be vented from the engine coolant passages.**
The system must be filled slowly to prevent air locks or serious engine damage can result. Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.



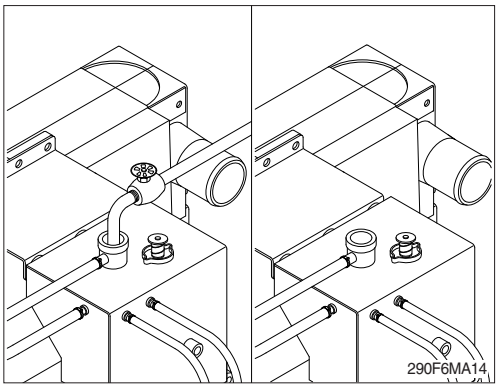
② Operate the engine for 5 minutes with the coolant temperature above 80°C (176°F) .
Shut the engine off, and drain the cooling system.



③ Fill the cooling system with clean water.

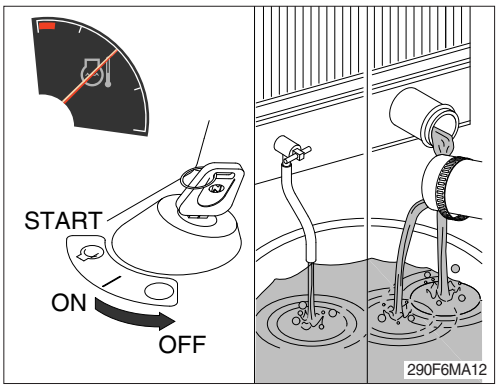
※ **Be sure to vent the engine and aftercooler for complete filling.**

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



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

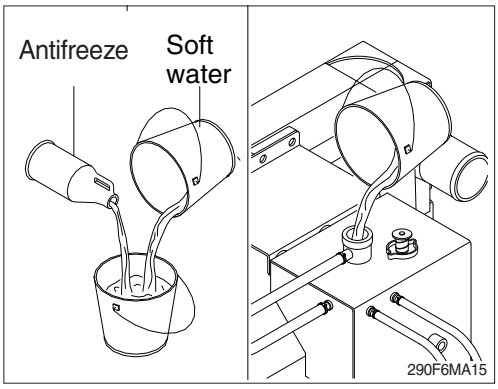
※ **If the water being drained is still dirty, the system must be flushed again until the water is clean.**



(3) Cooling system filling

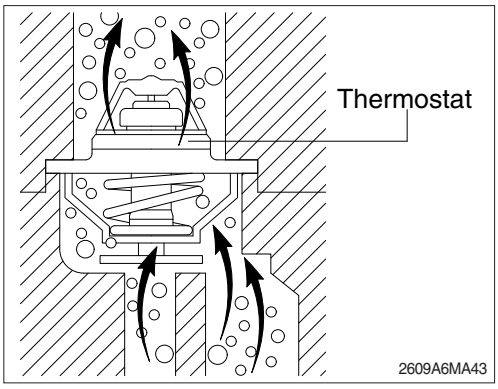
① Use a mixture of 50 percent soft water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to the page 6-10.
Coolant capacity (engine only) : 10 ℓ (2.6 U.S. gallons)

※ **Do not use hard water such as river water or well water.**

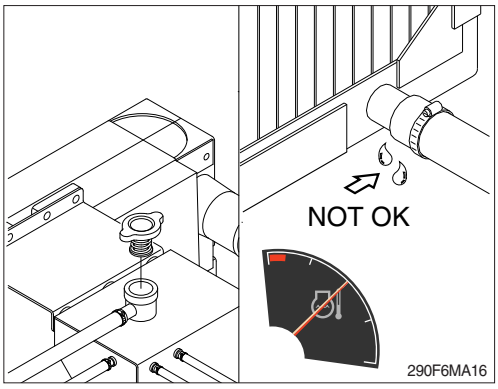


② The system has a maximum fill rate of 19 liters (5.0 U.S. gallons) per minute.
Do not exceed this fill rate.

※ **The system must be filled slowly to prevent air locks.**
During filling, air must be vented from the engine coolant passage.



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.

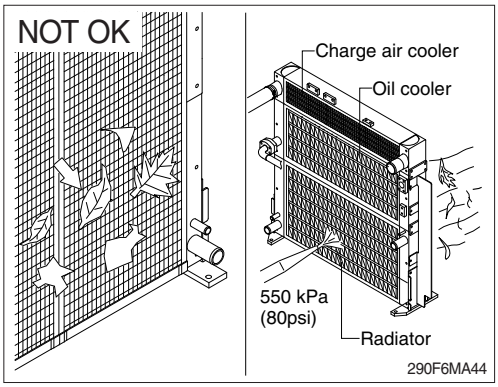
(1) Visually inspect the radiator for clogged radiator fins.

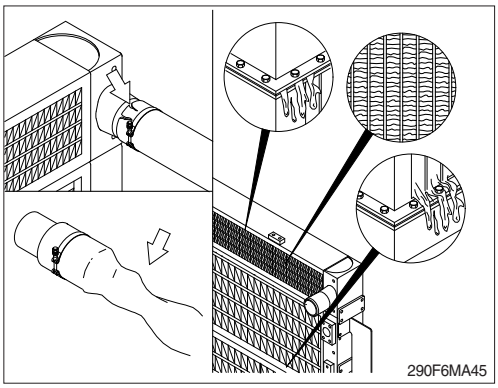
(2) Use 550 kPa (80 psi) air pressure to blow the dirt and debris from the fins.

(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.**

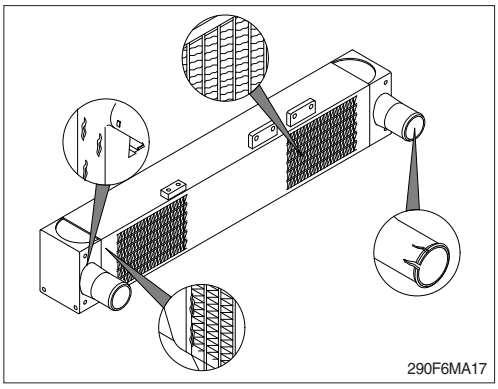
(4) Visually inspect the radiator for core leaks.





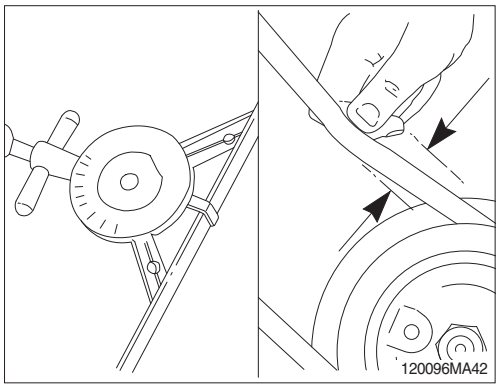
6) CHECK CHARGE AIR COOLER

Inspect the charge air cooler for dirt and debris blocking the fins. Check for cracks, holes, or other damage. If damage is found, please contact HD Hyundai Construction Equipment distributor.



7) FAN BELT

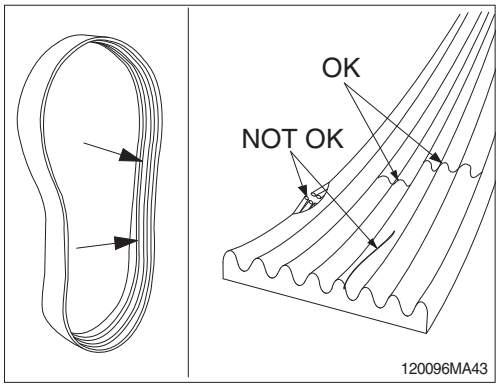
(1) An deflection method can be used to check belt tension by applying 11.3 kgf (25 lbf) force between the pulleys on V-belts. If the deflection is more than one belt thickness per foot of pulley center distance, the belt tension must be adjusted.



(2) Inspect the fan belt for damage.

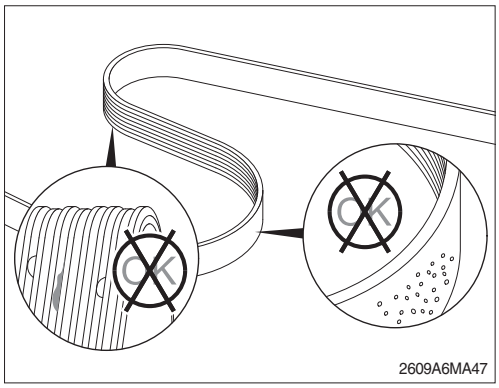
① Transverse (across the belt) cracks are acceptable.

② Longitudinal (direction of belt ribs) cracks that intersect with transverse cracks are not acceptable.



③ Inspect the belt
- Embedded debris
- Uneven/excessive rib wear
- Exposed belt cords
- Glazing (high heat)

※ If any of the above conditions are pressnt, the belt is unacceptable for reuse and must be replaced.



8) 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.

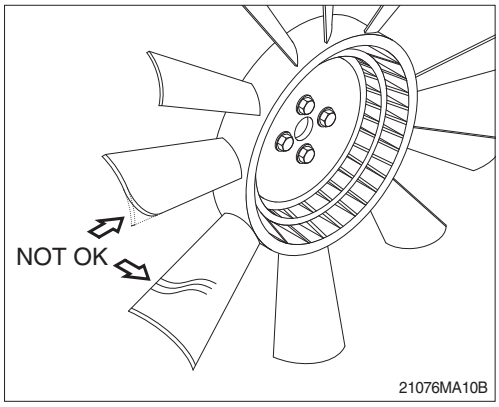
※ Rotate the crankshaft by using the engine bearing gear.

※ A visual inspection of the cooling fan is required daily.

Check for cracks, loose rivets, and bent or loose blades.

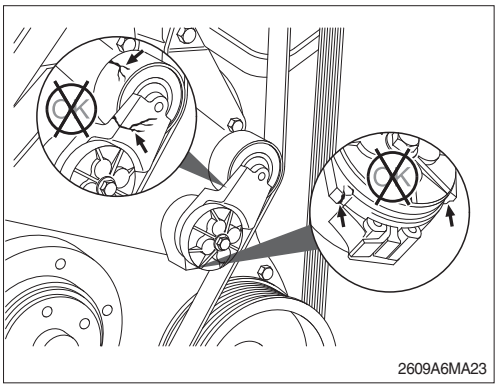
Check the fan to make sure it is securely mounted. Tighten the capscrews if necessary.

Replace any fan that is damaged.

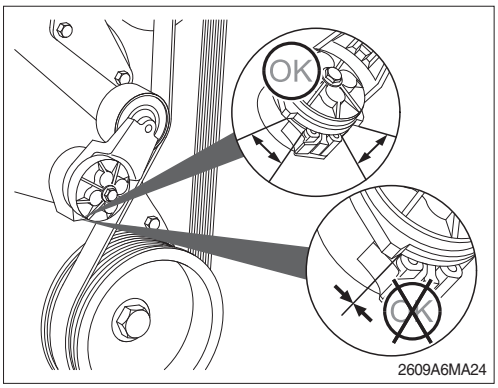


9) FAN BELT TENSIONER

(1) With the engine stopped, check the tensioner arm, pulley, and stops for cracks. If any cracks are found, the tensioner must be replaced.

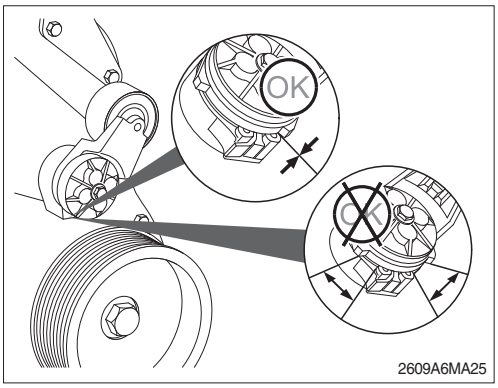


(2) With the belt installed, verify that neither tensioner arm stop is in contact with the spring case stop.
After replacing the belt, if the tensioner arm stops are still in contact with the spring case stop, replace the tensioner.

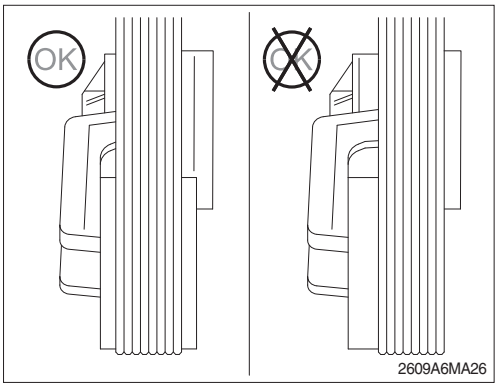


(3) With the belt removed, verify that the tensioner arm stop is in contact with the spring case stop.
If these two are not touching, the tensioner must be replaced.

※ **After replacing the belt, if the tensioner arm stop is still in contact with the spring case stop, the tensioner must be replace.**



(4) Check the location of the drive belt on the belt tensioner pulley. The belt should be centered on, or close to the middle of, the pulley. Misaligned belts, either too far forward or backward, can cause belt wear, belt roll-offs, or increase uneven tensioner bushing wear.



10) CLEANING OF AIR CLEANER (-#0176)

(1) Primary element

① Open the cover and remove the element.

② Wipe all contaminant and debris from inside the housing body.

③ Do not clean the filter element by striking or hitting the filter against any object to shake the debris from the filter element.

④ Clean the filter element with compressed air.

a. Remove dust from filter element by directing the compressed air into the opening of the air filter element.

b. Use 3 kgf/cm^2 (40 psi) maximum air pressure and hold the compressed air nozzle at least 2.5 cm (1") away from the pleats while cleaning. Make sure to keep the clean side of air filter free of debris.

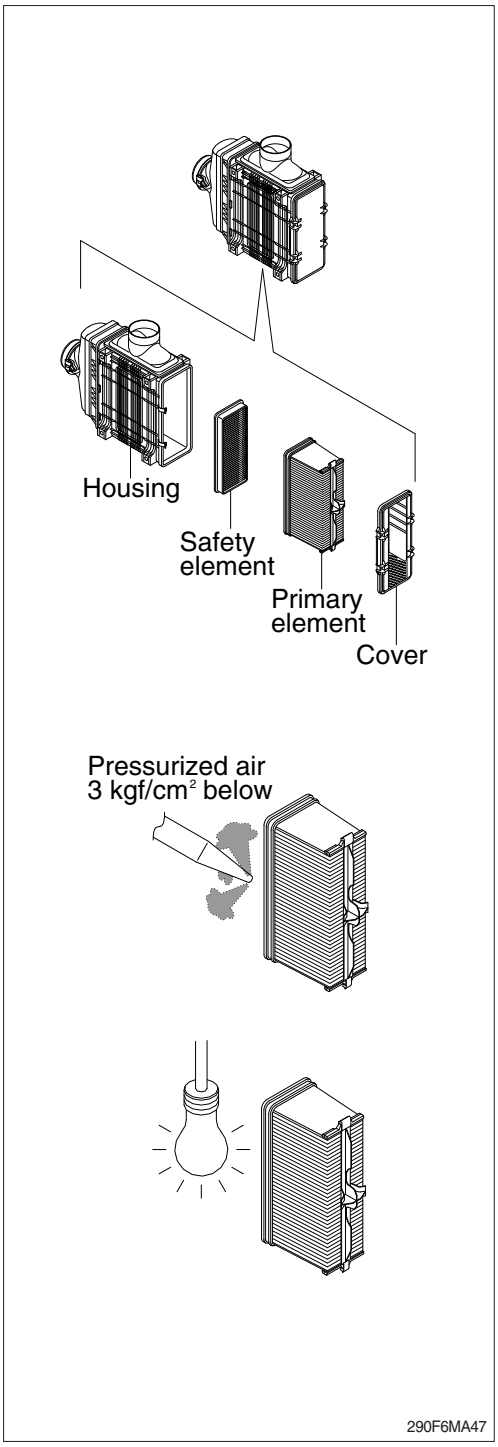
⑤ Visually inspect for damage to the filter elements and components. Use a light source to help identify any defects in the media. If any defects are observed discard the filter element and replace with a new primary filter element.

a. Before any type of cleaning, a visual inspection of the filter is needed. If there is any damage to the filter body, gaskets or endplates, do not clean or reuse; the filter should be discarded. Always clean filters in a clean environment, observe strict inspection procedures and repackage filters immediately after the cleaning process with appropriate materials.

b. Use observe proper safety precautions and dispose of waste materials in an environmentally compliant manner.

⑥ Re-install filter element into the air housing.

⑦ Replace the primary element at the fourth cleaning.



(2) Safety element

The safety filter element should never be cleaned since the safety filter is the last barrier to contaminant before it reaches engine.

The useful life of the safety filter is equivalent to that of the primary air filter only if the primary filter element is being regularly cleaned. If the primary filter element is not cleaned, the safety filter should be changed at every third primary air filter change or after one year of continuous service, whichever occurs first.

CLEANING OF AIR CLEANER (#0177-)

(1) Primary element

① Loosen the clamps and remove the element.

② Clean the inside of the body.

③ Clean the element with pressurized air.

· Remove the dust inside of the element by the pressurized air (below 3 kgf/cm², 40 psi) forward and backward equally.

④ Inspect for cracks or damage of element by putting a light bulb inside of the element.

⑤ Insert element and tighten the clamps.

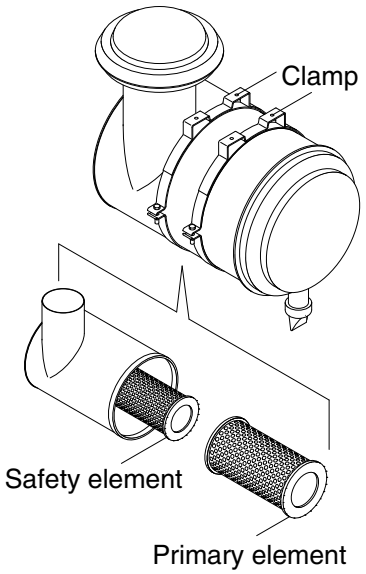
※ Replace the primary element after 4 times cleanings.

(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.

Machine serial No. : #0177-#1786



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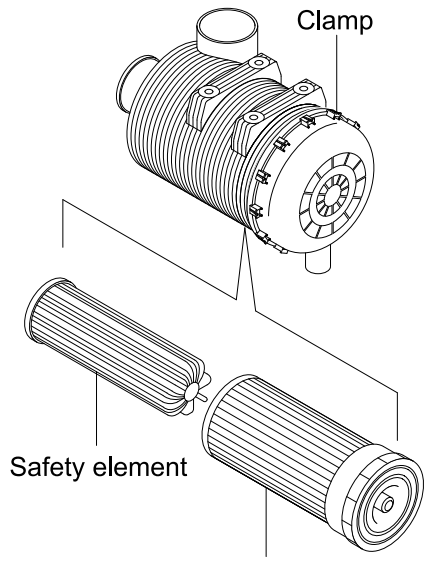
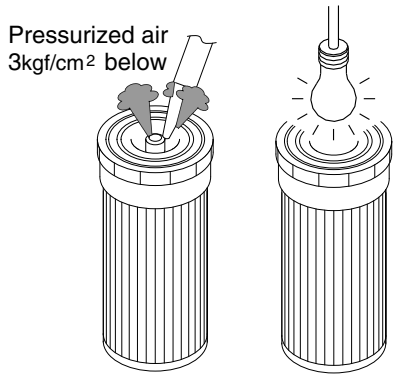
Machine serial No. : #1787-



300A6MA56



300A6MA57

10-1) AIR CLEANER (OIL BATH, OPTION)
(MACHINE SERIAL NO. : -#2242)

△ **Always cover the engine intake hole while the air cleaner is being serviced.**

(1) General service

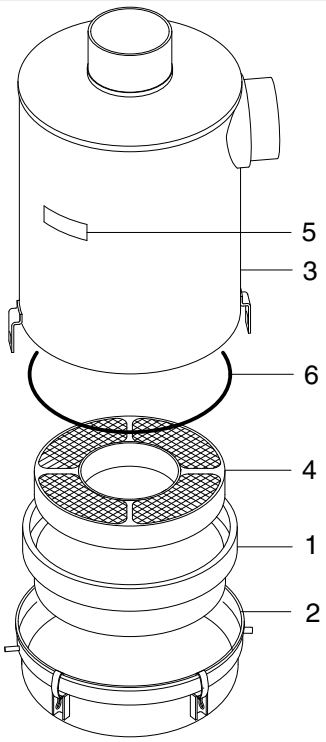
① The oil bath air cleaner should be inspected constantly for leaks and damage.

② The removable element assembly (4) should be removed the from the oil cups (1, 2) and inspected daily or at each oil cup service.
Watch all connections for mechanical tightness.

③ Be sure cleaner outlet pipe is not fractured.
If air cleaner has been dented or damaged,

④ check all connections immediately.
In case of leakage and if adjustment does not

⑤ correct the trouble, replace necessary parts or O-ring.



1 Inner cup assy
2 Outer cup assy
3 Body assy
4 Removable element
5 Marking
6 O-ring

480S6MA35

(2) Oil cup

① Service the inner oil cup (1) and outer oil cup (2) daily or when 1/2" of dirt has collected in bottom of either cup.

※ **Severe operating conditions may require several inspections daily.**

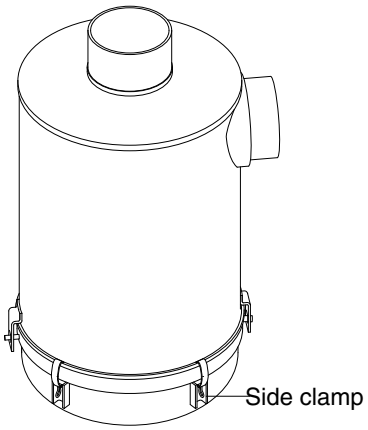
② Loosen the side clamps and removing bottom of unit and lift the removable element assembly (4) from the oil cup.

③ Pour out the oil and remove inner cup (1) from out cup (2) and remove sludge and wipe clean.

④ Reassembled inner cup (1) in outer cup (2) and refill both cups to indicated oil level.

⑤ The same oil specified for the engine crankcase is generally acceptable.

※ **Do not over fill or under fill the cup.**
Overfilling means loss of capacity and under filling means lack of efficiency.



480S6MA36

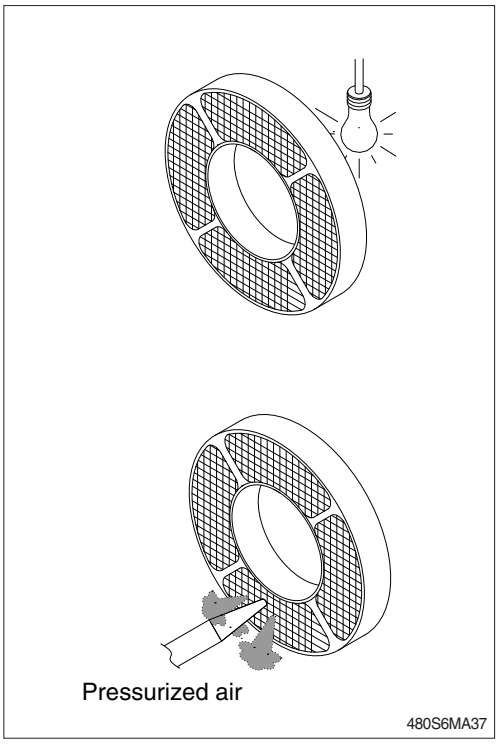
(3) Removable element

① First step in servicing removable element assembly is hold up to a strong light. An even, bright pattern of light through the wire element means if is clean.

② If removable element is even partially plugged with dirt, lint or chaff, wash thoroughly with solvent.
Then blowout with compressed air.

③ Inspect lower portion of body assembly and center tube each time oil cup is serviced. See back side for service details.

④ Reassemble removable element assembly to serviced oil cups and to air cleaner body.
Be sure the oil cup is tight to body assembly.

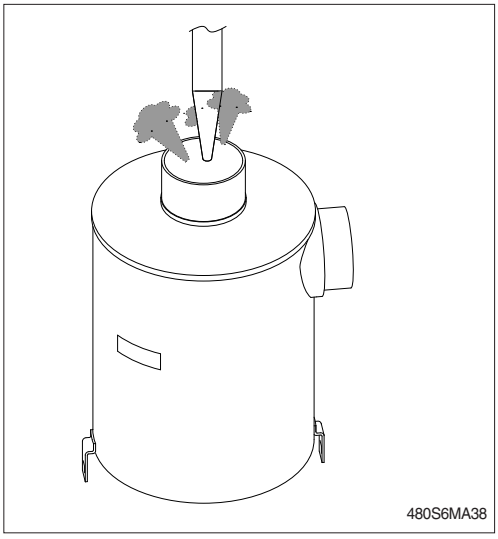


(4) Body assembly

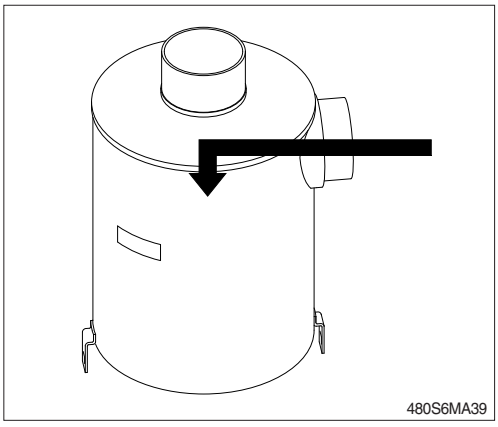
The lower portion of the body assembly should be inspected each time the air cleaner is serviced. If there is any sign of build-up or plugging, the body assembly should be removed and cleaned. At least once a year, remove the body assembly and perform the following service steps.

① Remove oil cup and removable element assembly.

② Check and clean center tube.



③ Pump solvent through the air outlet with sufficient force and volume to produce a hard, even stream out the bottom of the body assembly. Reverse flush until all foreign material is removed.



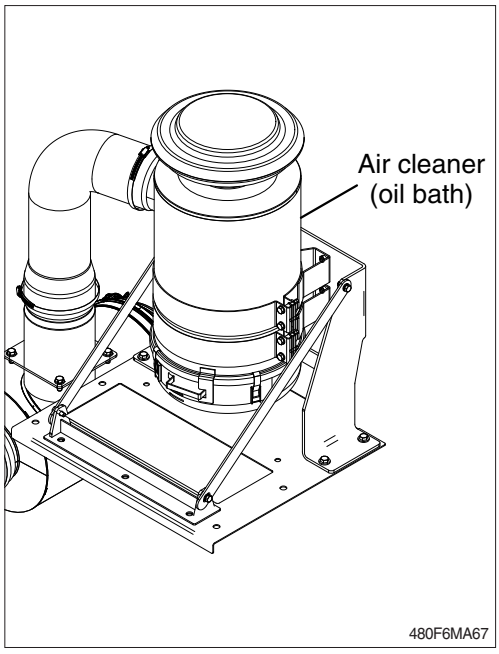
10-2) AIR CLEANER (OIL BATH, OPTION)
(MACHINE SERIAL NO. : #2243-)

※ In harsh working condition, the filter element must be inspected and cleaned daily or change the oil.

※ Failure to manage filters can cause degradation. If the filter is clogged, engine damage and power loss will occur.

※ In order to ensure the filtration efficiency of oil bath, it is recommended to replace a set of metal elements every year.

※ The maximum ash capacity of the filter element is approximately to 14 kg (31 lb).

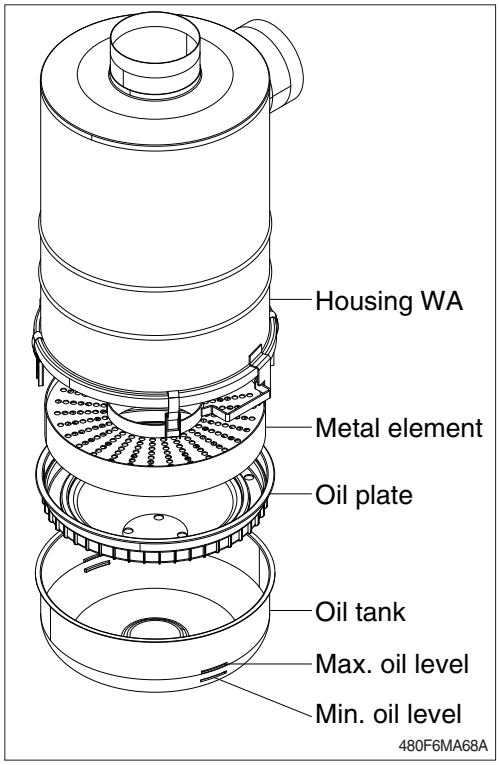


(1) Check air cleaner

Check the inside and outside of the air cleaner.

(2) Cleaning and replacement of filter element

① Disassemble as shown the illustration.
② Check the filter element with the light.
③ Clean or change the filter elment if necessary. Immerse the filter element in diesel for 20 to 30 minutes, take out the filter element and then wash is with diesel to remove the remaining dust on the filter element.
④ Use commpressed air to dry completely.
⑤ Check the housing WA.
⑥ Check the lower body of the air cleaner and center tube everytime when the oil tank is serviced. Replace any broken, cracked or missing part.
⑦ After serviced, assemble oil tank with oil plate and fill the oil (3 ~ 5 ℓ / 0.8 ~ 1.3 U.S. gal) in the guide line. Frequently check whether the oil tank buckle for looseness.



11) FUEL TANK

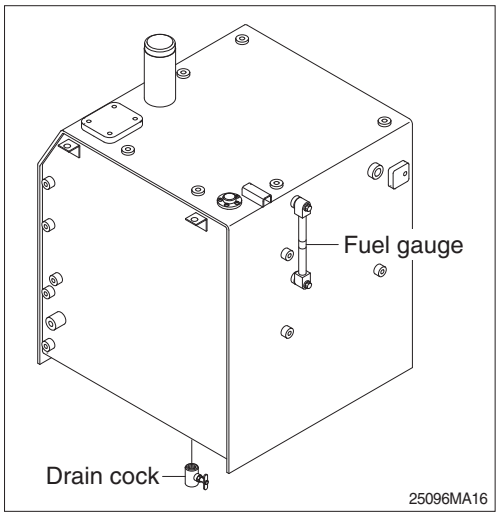
(1) Fill fuel fully when system the operation to minimize water condensation, and check it with fuel gauge before starting the machine.

(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.



12) PREFILTER

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

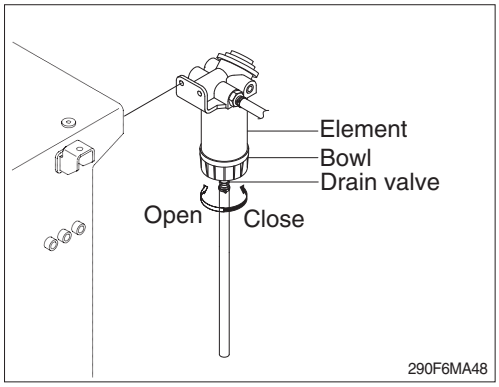
(1) Drain water

① Open bowl drain valve to evacuate water.

② Close drain valve.

※ Don't tighten up a drain valve so strong.

※ Please inspect and drain water frequently for remain water volume to be less than 1/3 volume of a collection bowl.



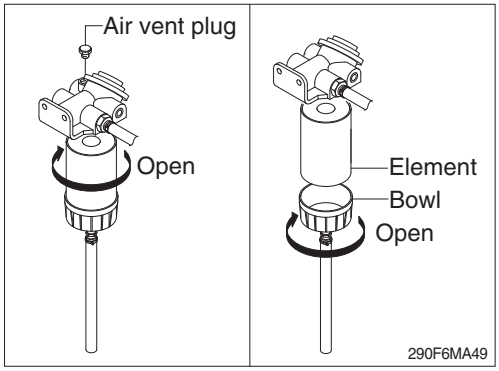
(2) Replace element

① Loosen the air vent plug and drain the unit of fuel. Follow "Drain water" instructions above.

② Remove element and bowl from filter head.

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

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

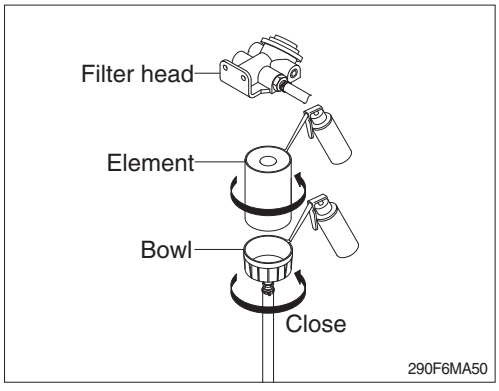


④ Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.

⑤ Attach bowl to new element firmly by hand.

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

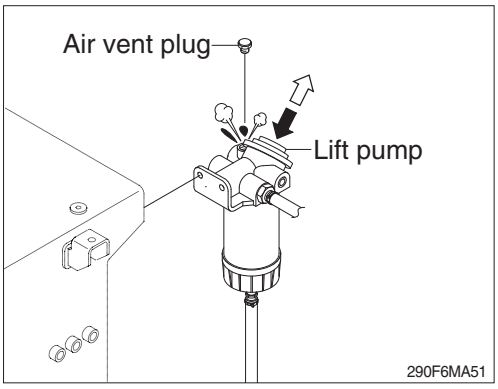
⑦ Attach the element and bowl to the head.



⑧ Do hand-priming the lift pump repeatedly until air bubbles comes out from air vent hole completely.

⑨ Tighten the air vent plug to its origin position.

⚠ **The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel. Do not loosen any fittings while the engine is running. Personal injury and property damage can result. Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to do decrease to a lower level.**



13) REPLACEMENT OF FUEL FILTER

(1) Use 1" wrench, loosen and remove the filter and clean the gasket surface.

※ **Make sure O-ring does not stick to filter head. Remove O-ring with screwdriver if necessary.**

(2) Lubricate the fuel filter O-ring with clean lubricating oil.

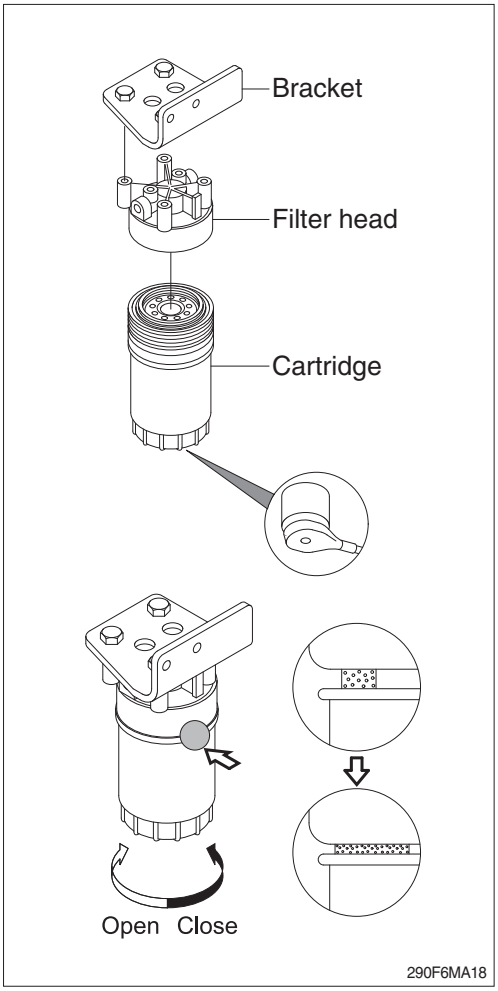
(3) Install the filter on the filter head. Tighten the filter until the gasket contacts the filter head surface. Tighten the fuel filter an additional 3/4 turn after contact.

※ **Mechanical overtightening can distort the threads or damage the filter element seal.**

(4) Relieve the air after mounting.

※ **Do not pre-fill an on-engine fuel filter with fuel. The system must be primed after the fuel filter is installed. Pre filling the fuel filter can result in debris entering the fuel system and damaging fuel system components.**

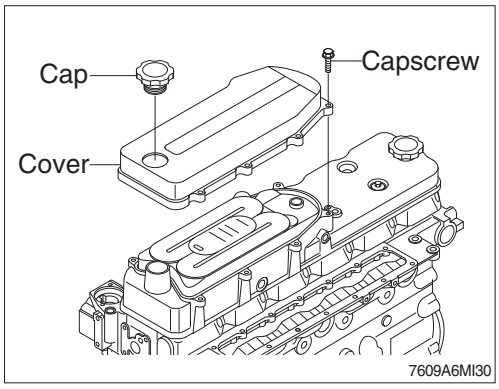
※ **Check for fuel leakage after the engine starts. If air is in the fuel system, the engine will not start. Start engine after bleeding the air according to the method of bleeding air.**



14) CRANKCASE BREATHER FILTER

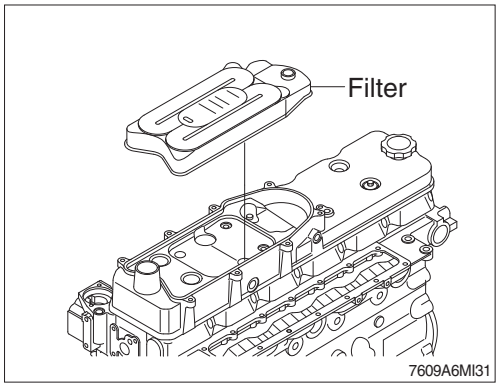
※ **Do not use pneumatic tools to remove the breather cover capscrews. Damage to the rocker cover can result.**

(1) Remove the oil fill cap.
(2) Remove the crankcase breather filter cover capscrews.
(3) Remove the filter cover.

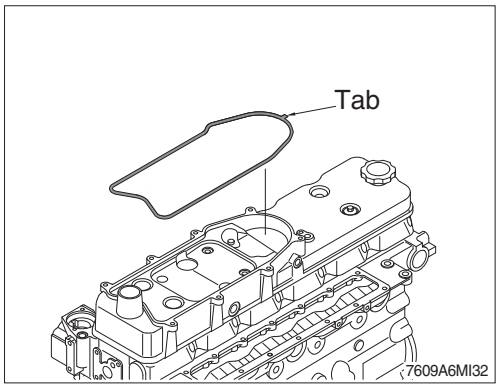


(4) Remove the crankcase breather filter from the rocker lever cover.

※ **Do not disturb the crankcase breather filter gasket located on the rocker lever cover.**
※ **Exposure to oil can cause the gasket to swell, which can make it difficult to install the gasket back into groove. If the gasket comes out of the groove, do not attemp to install the gasket. Replace it with a new gasket.**

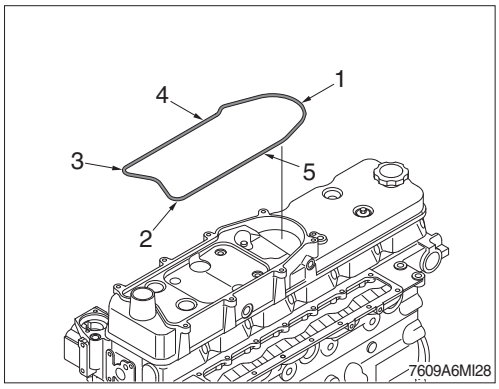


(5) If the gasket is damaged, remove the gasket by grasping the tab on the gasket and pulling up.
(6) Clean the crankcase breather filter mounting surface and O-ring sealing surfaces on the rocker lever cover.
(7) Clean the crankcase breather filter cover with warm soapy water.
Inspect the cover for cracks.
Replace the cover if damage is found.



(8) If the gasket was removed, install the gasket into the rocker lever cover groove starting with the tab end first. Then install the corners opposite the gasket tab end. Finish by pushing in the sides (see illustration).

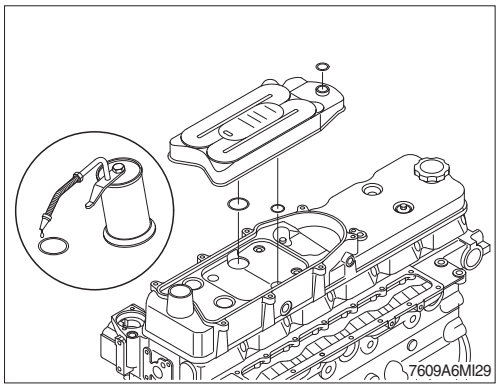
Gently push the gasket down into the groove. Do not used a finger to trace the gasket around into the groove during installation, as this will stretch the gasket, making it difficult to fully seat into the groove.



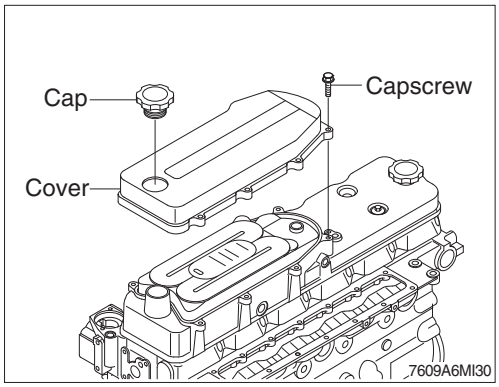
※ **Do not cut the gasket to make it fit into the groove, as this will result in an oil leak.**
The gasket must be fully seated around the entire perimeter of the rocker lever cover groove.

(9) Apply clean engine oil to the O-rings on the crankcase breather filter.

Install the filter onto the rocker lever cover.

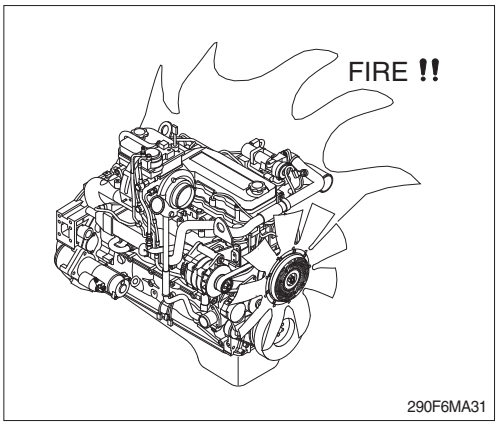


(10) Install the crankcase breather filter cover.
Install the filter cover capscrews.
Tighten the capscrews, starting with the inner-most capscrews and working outward in a circular manner.
· 0.71 kgf · m (5.16 lbf · ft)
Install the oil fill cap.



15) LEAKAGE OF FUEL

⚠ Be careful and clean the fuel hose, injection pump, fuel filter and other connections as the leakage from these part can cause fire.

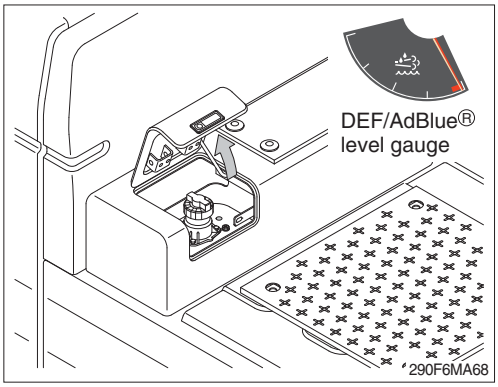


16) DEF/AdBlue® TANK

(1) The DEF/AdBlue® tank level must be checked daily with DEF/AdBlue® level gauge.

(2) If the DEF/AdBlue® level is found to below, DEF/AdBlue® must be added.

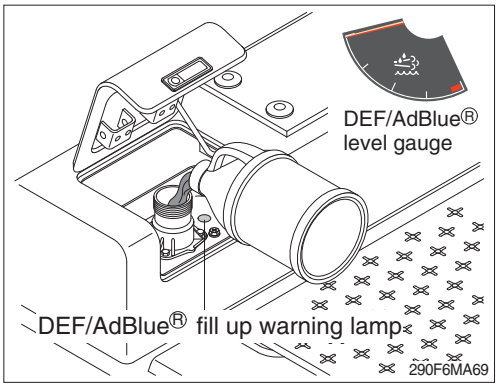
⚠ It is unlawful to tamper with or remove any component of the aftertreatment system. It is also unlawful to use a catalyst solution that does not meet the specifications provided or the operate the machine with no catalytic solution.



(3) DEF/AdBlue® fill up warning lamp turns on when tank is completely filled with DEF/AdBlue®. After turning light on, do not pour DEF/AdBlue® any more.

※ Fill the tank with DEF/AdBlue® after key on the start key.

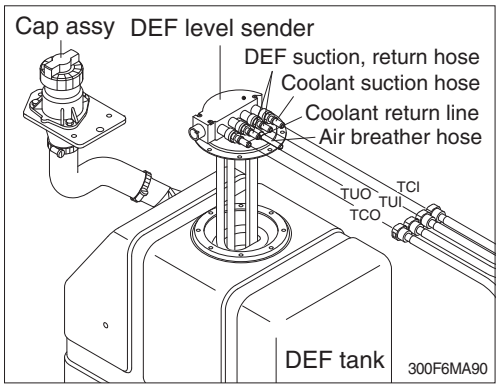
※ Be careful to entering dust, sand or other contamination substance when you refill the DEF/AdBlue® into the tank. Otherwise, fatal problem such as engine idle locking, derating or engine stopping can be happen.



16-1) DEF/AdBlue® TANK FILTER

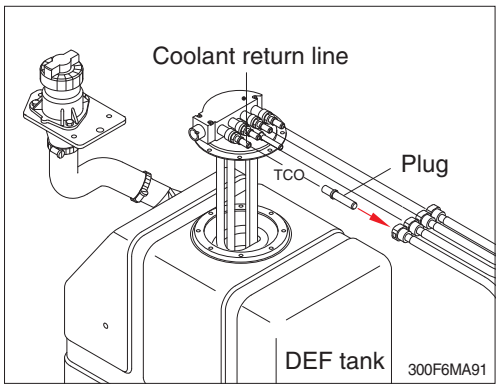
(1) Remove coolant, DEF/AdBlue® and air vent hoses.

※ **Move hoses back and forth 3~4 times to easily remove the hoses.**

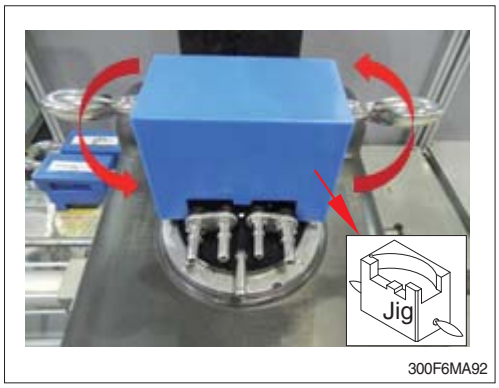


(2) Plugging the coolant return line with the plug (P/no : HDB030-0002).

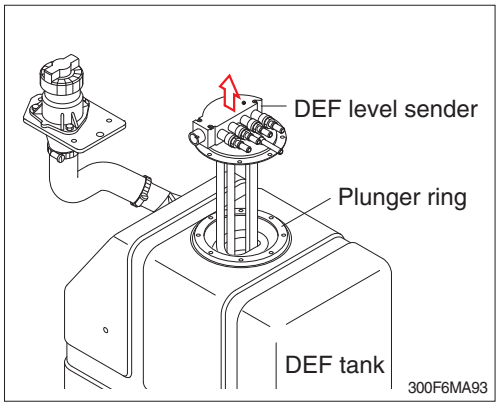
※ **When the coolant return line is removed, the coolant come out from the return line (TCO). Nearly comes out the coolant or DEF from other lines.**



(3) Rotate the DEF/AdBlue® level sender counter-clockwise about 20 degree with the Jig (P/no : HDB030-0001).



(4) Remove the DEF/AdBlue® level sender without removal of the plunger ring.



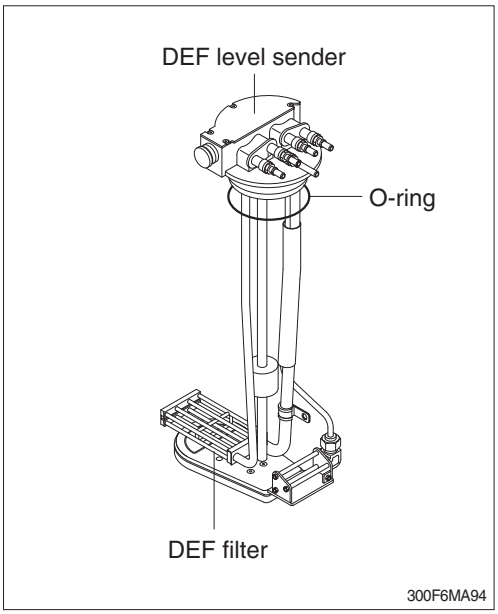
(5) Removed DEF/AdBlue® level sender.

※ **Make sure O-ring is on the right position.**

(6) Replace the DEF/AdBlue® filter and fit with a new filter.

※ **Replace the filter every 4000 hours.**

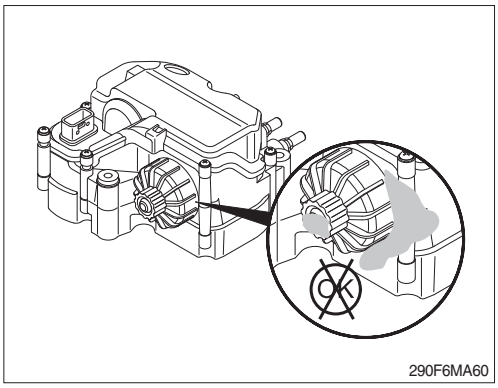
※ **Carry out installation in the reverse order to removal.**



17) DEF/AdBlue® SUPPLY MODULE FILTER

(1) Inspect the area around the seal and vent of DEF/AdBlue® supply module filter cap for signs of leakage.

※ **Turn OFF the master switch mounted electric box.**



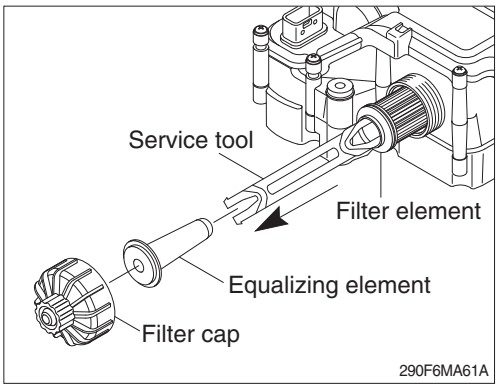
290F6MA60

(2) Unscrew the DEF/AdBlue® supply module filter cap.
A 30 ㎜ wrench can be used on the cap to aid in removal.

(3) Remove the filter equalizing element.

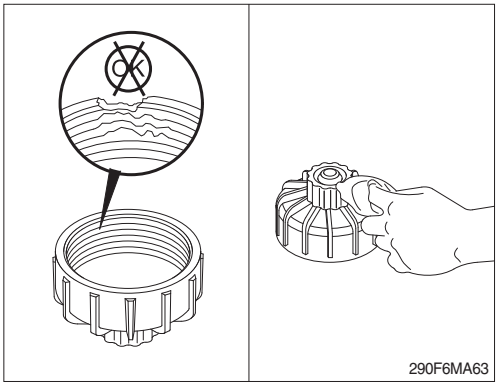
(4) Remove the old filter element.
A disposable service tool is included with the filter to aid in filter removal. Use the appropriate end of the tool, depending on the color of the plastic on the filter.
When inserting the tool a "click" sound can be heard which indicates proper engagement with the filter.

※ **If the filter element and equalizing element are removed from the aftertreatment DEF/AdBlue® tank, they must be discarded and replaced; regardless of condition.**



290F6MA61A

(5) Clean and inspect the filter cap
① Clean the aftertreatment DEF/AdBlue® tank cap and threads on the DEF/AdBlue® tank with warm water and a clean cloth.
② Check the condition of the threads on the filter cap, if the threads are damaged, replace the filter cap.

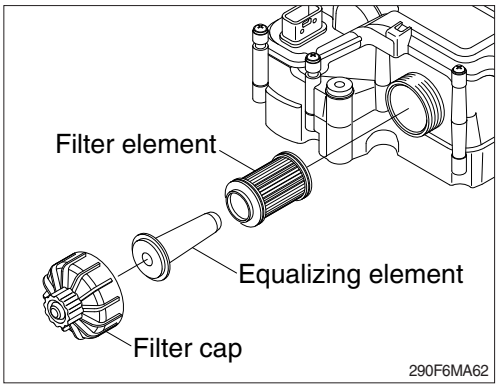


290F6MA63

(6) Slide the filter equalizing element in to the new filter element.

(7) Insert the assembly into the aftertreatment DEF/AdBlue® supply module.

(8) Install and tighten the filter cap.
· Tightening torque : 2.0 kgf · m (14.5 lbf · ft)



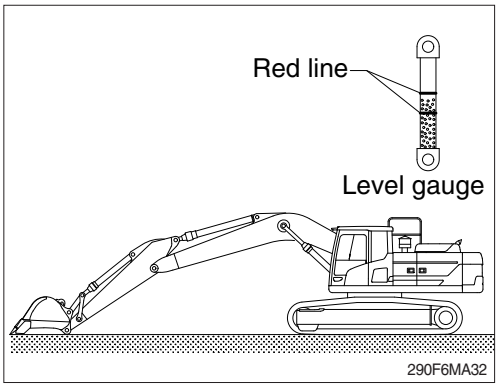
18) HYDRAULIC OIL CHECK

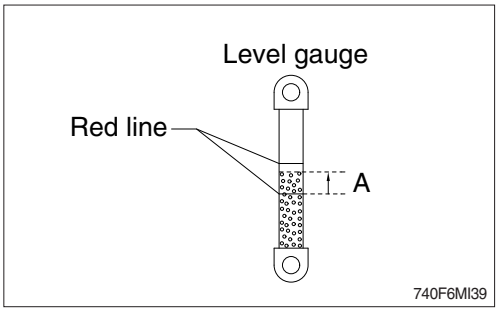
(1) Position the machine as shown in the illustration on the right. Then stop engine.

(2) Check the oil level at the level gauge of hydraulic oil tank.

(3) The oil level is normal if the oil is between the red lines. The oil level depends on the temperature of the hydraulic oil. Refer to the height (A) in the below table to check the level gauge.

Temperature		Height A	
℃	°F	mm	inch
0	32	15	0.6
10	50	25	1.0
20	68	30	1.2
30	86	35	1.4
40	104	40	1.6





※ Refer to page 3-22 for checking the temperature of the hydraulic oil.

※ Add the hydraulic oil, if necessary.

19) FILLING HYDRAULIC OIL

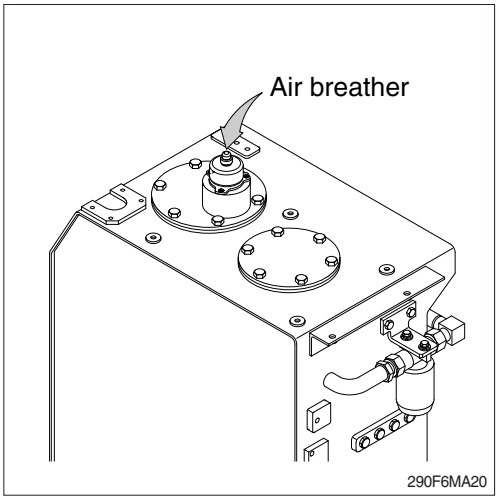
(1) Stop the engine to the position of level check.

(2) Relieve the pressure in the tank by pushing the top of the air breather.

(3) Remove the breather on the top of oil tank and fill the oil to the specified level.

(4) Start engine after filling and operate the work equipment several times.

(5) Check the oil level at the level check position after engine stops.



20) CHANGE HYDRAULIC OIL

(1) Lower the bucket on the ground pulling the arm and bucket cylinder to the maximum.

(2) Relieve the pressure in the tank by pushing the top of the air breather.

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

(4) Prepare a suitable container.

(5) To drain the oil open the drain valve at the bottom of the oil tank.

(6) Fill proper amount of recommended oil.

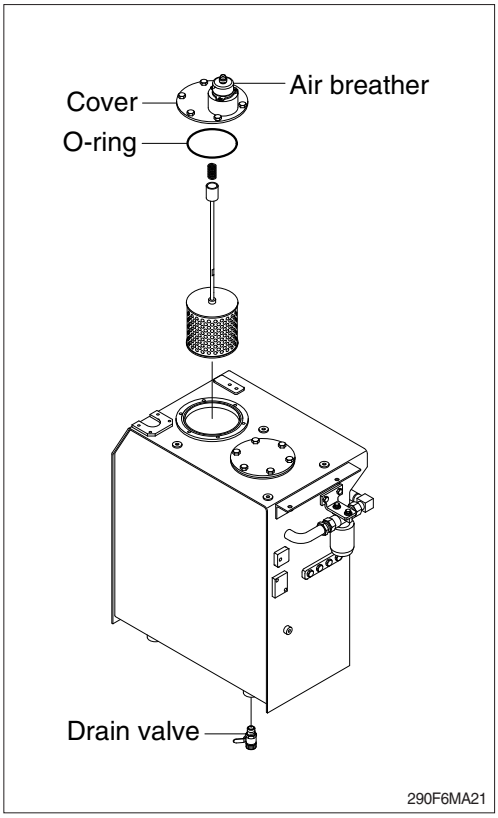
(7) Put the breather in the right position.

(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.

※ Incase of injecting HBHO (HD Hyundai Construction Equipment Bio Hydraulic Oil) to machines that have formerly used different hydraulic oil, the proportion of residual oil must not exceed 2 %

※ Do not mix any other Bio oil, use only HBHO as bio oil. If changing to Bio oil, contact HD Hyundai Construction Equipment dealer.



21) 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±1.4 kgf · m
(50±10 lbf · ft)

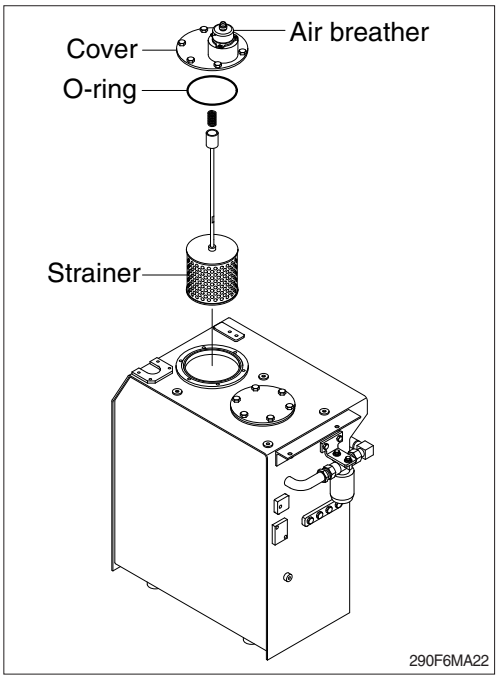
(2) Pull out the strainer in the tank.

(3) Wash the foreign material on the suction strainer with gasoline or cleaning oil.

(4) Replace the suction strainer if it is damaged.

(5) Assemble with reverse order of disassembly. Be sure to install a new O-ring and reinsert in the oil tank.

※ Loosen the bolt slowly at the cover can be spring out by the spring when removing it.



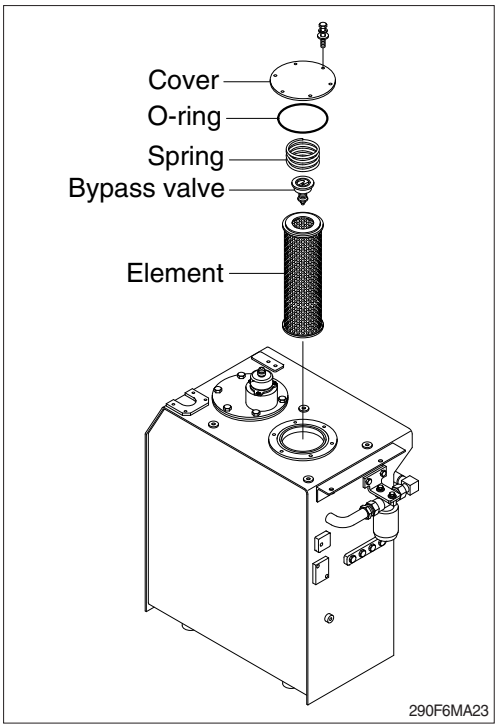
22) REPLACEMENT OF RETURN FILTER

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

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

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

(3) Replace the element with new one.



23) REPLACEMENT OF ELEMENT IN HYDRAULIC TANK BREATHER

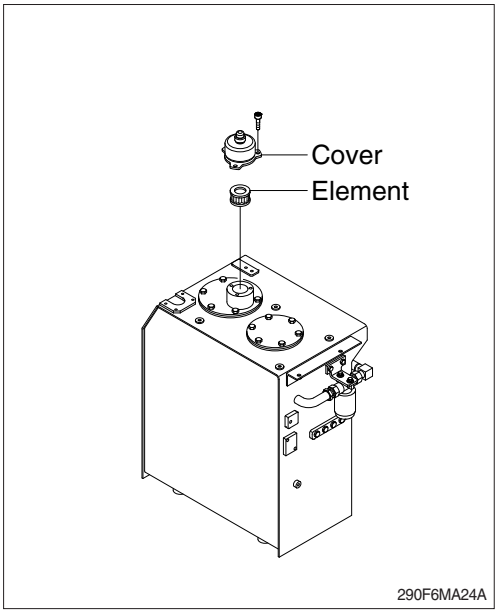
(1) Relieve the pressure in the tank by pushing the top of the air breather.

(2) Loosen the bolt 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 : 0.8~1.0 kgf · m (5.9~7.4 lbf · ft)

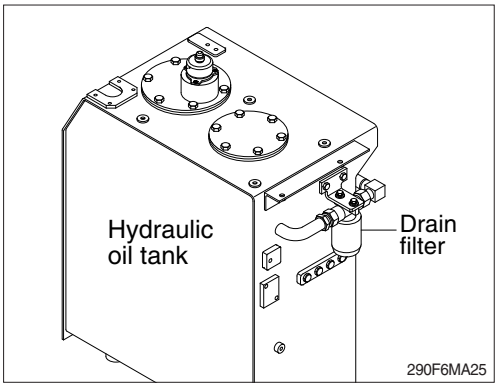


24) REPLACE OF DRAIN FILTER CARTRIDGE

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 250 hours of operation. Thereafter, change cartridge every 1000 hours.



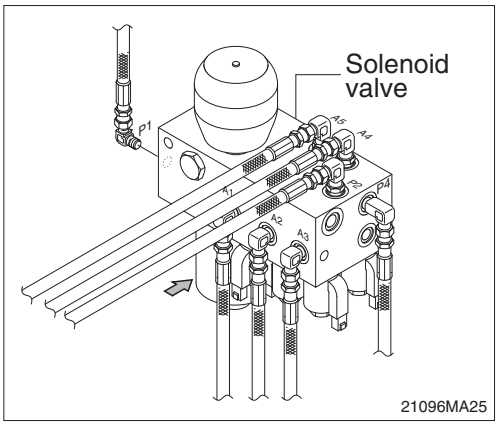
25) REPLACE OF PILOT LINE FILTER

(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 250 hours of operation. Thereafter, change cartridge every 1000 hours.

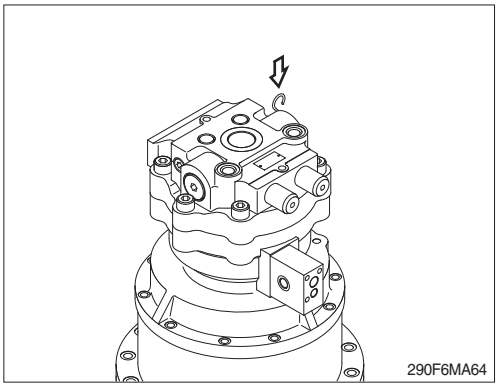


26) CHECK THE SWING REDUCTION GEAR OIL

(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.



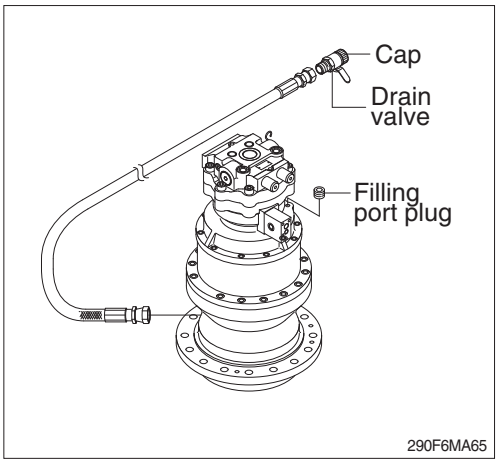
27) CHANGE SWING REDUCTION GEAR OIL

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

(2) Prepare a proper container.

(3) Open the cap and loosen the drain valve.

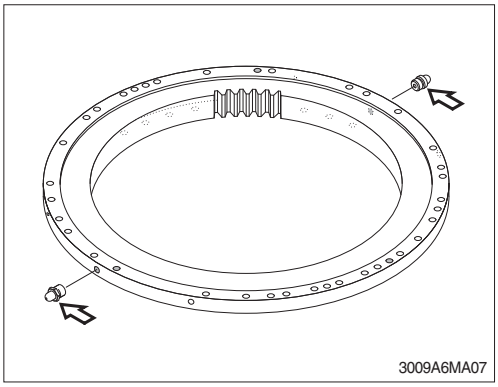
(4) Clean around the valve and close the drain valve and cap.
Fill proper amount of recommended oil.
· Amount of oil : 11 ℓ (2.91 U.S.gal)



28) LUBRICATE SWING BEARING

(1) Grease at 2 fitting.

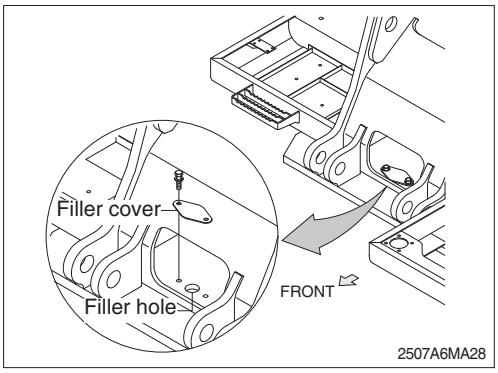
※ Lubricate every 250 hours.



29) SWING GEAR AND PINION

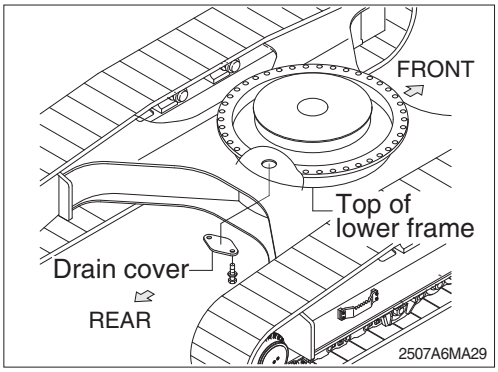
(1) Drain old grease

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

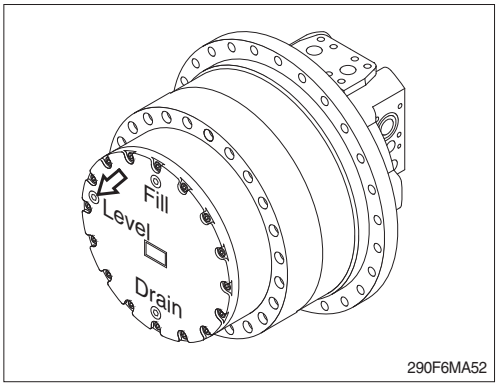
① Install drain cover.
② Fill with new grease.
③ Install filler cover.
· Capacity : 11.4 kg (25.1 lb)



30) 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.
· Amount of oil : 7.8 ℓ (2.1 U.S.gal)



31) CHANGE OF THE TRAVEL REDUCTION GEAR OIL

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

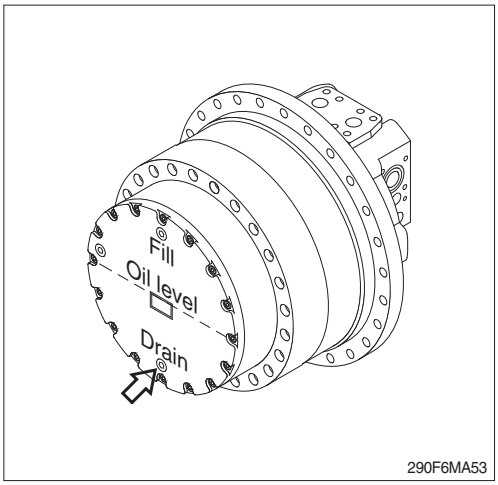
(2) Stop when the position of the drain plug is down.

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

(4) Drain the oil to adequate container.

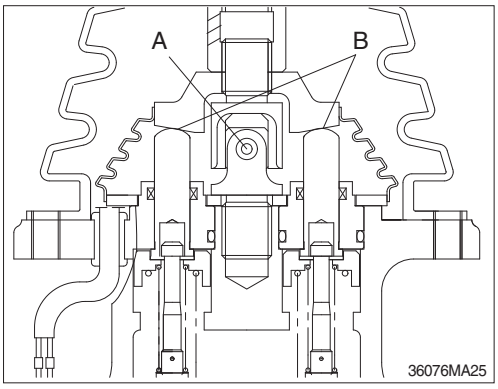
(5) Tighten the drain plug and fill specified amount of oil at filling port.

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



32) LUBRICATE RCV LEVER

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



33) ADJUSTMENT OF TRACK TENSION

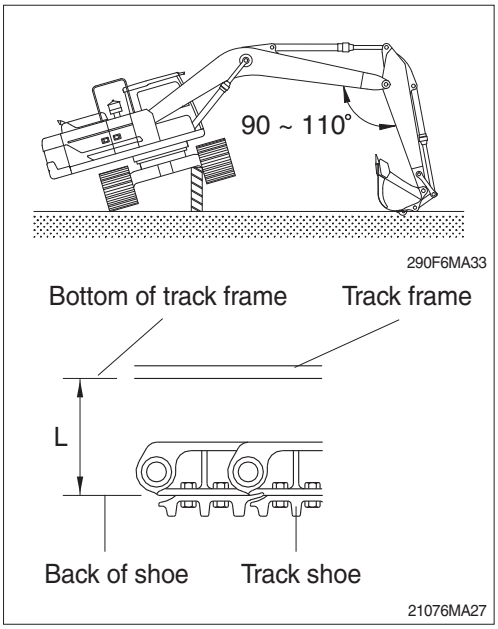
※ It is important to adjust the tension of track properly to extend the lifetime of track and traveling device.

※ The wear of pins and bushings on the under-carriage 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.



Length (L)	
360~390 mm	14.2~15.5"

(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.

⚠ Unscrew the grease nipple after release the tension by pushing the poppet only when necessarily required.
Grease leaking hole is not existing. So, while unscrew the grease nipple, grease is not leaking until the grease nipple is completely coming out. If the tension is not released in advance, the grease nipple can be suddenly popped out by pressurized grease.

※ 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.

34) 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.

(2) Lock the safety knob to the LOCK position and stop the engine.

(3) Remove the stopper bolts(1) and nuts(2), then remove pins(3, 4) and remove the bucket.

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

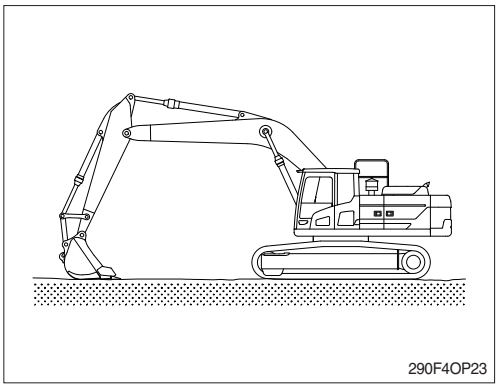
※ If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins.

※ After 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)

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

(5) Install the stopper bolt (1) and nuts (2) for each pin, then grease the pin.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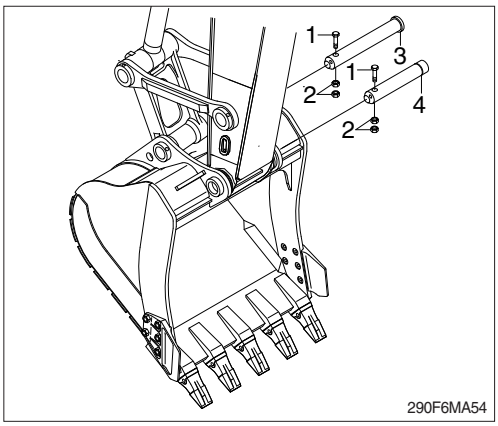

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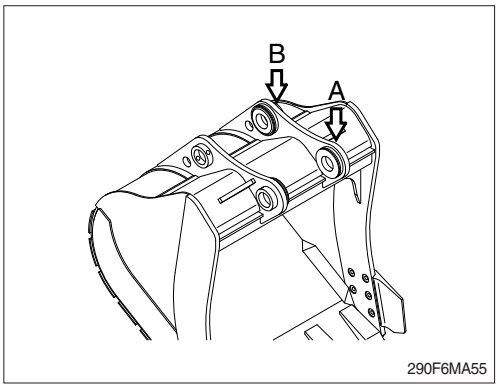

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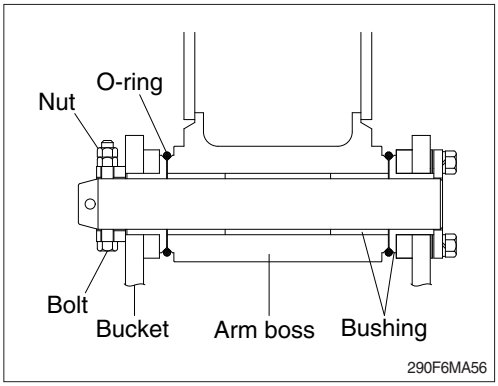

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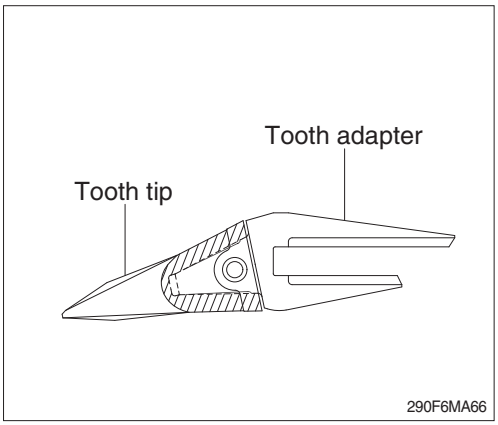
35) REPLACEMENT OF BUCKET TOOTH

(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.

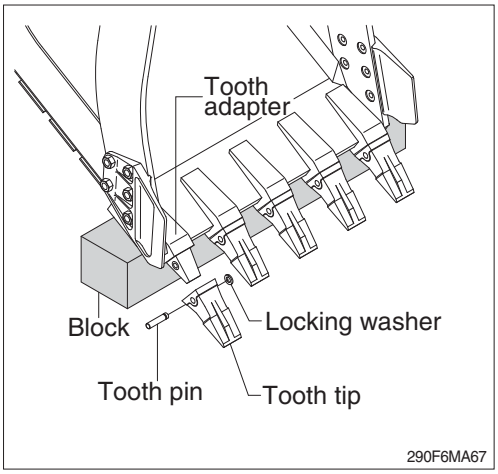
② Remove dust and mud from surface of tooth adapter by using knife.

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.



36) ADJUSTMENT OF BUCKET CLEARANCE

(1) Lower the bucket on the ground as the picture shown in the right.

(2) Swing to the right and keep the arm boss to be contact to the bucket left.

(3) Lock the safety knob to the LOCK position and stop the engine.

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

(5) Adjusting

① Loosen bolt (2), and remove washer (3), plate (1) and shim (4).

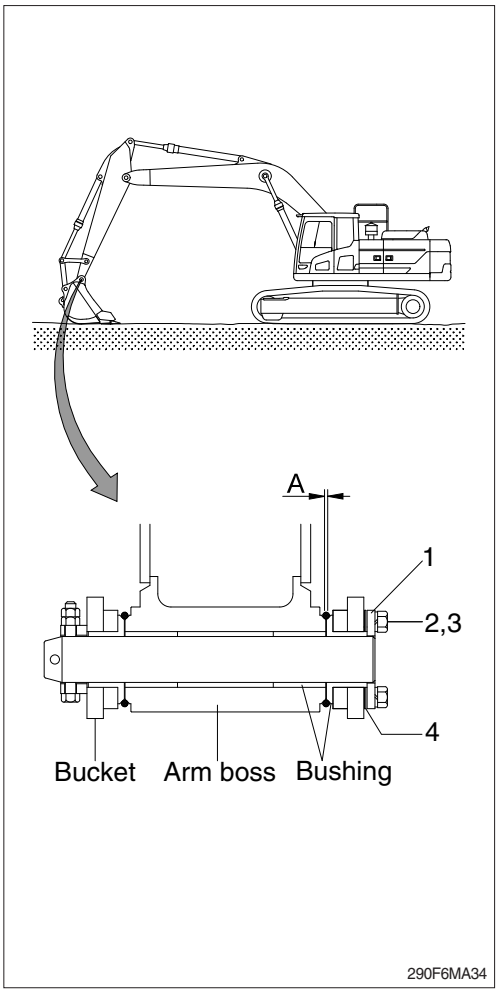
② Remove the shim equivalent value with measuring value.

③ Assemble the parts in the reverse order of removal.

· Tightening torque : 29.6±3.2 kgf · m
(214.0±23.1 lbf · ft)

· Normal clearance : 0.5 ~ 1.0 mm
(0.02 ~ 0.04 in)

※ If the bucket is not adjusted correctly, noise and vibration created during operation, and damaged O-ring, pin and bushing quickly.



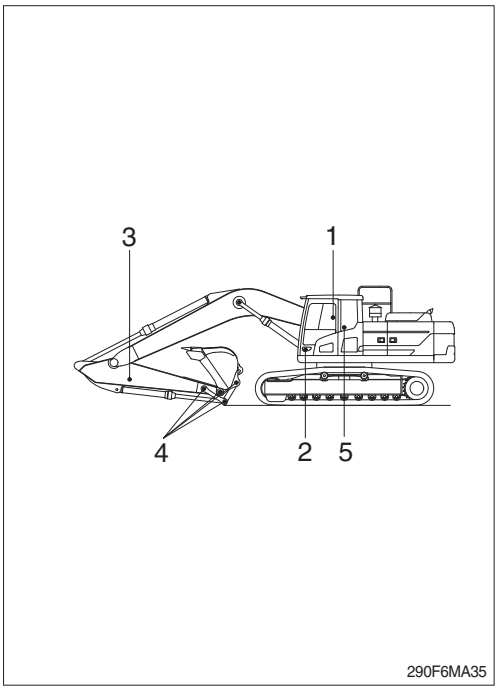
37) LUBRICATE PIN AND BUSHING

(1) Lubricate to each pin of working device

Lubricate the grease to the grease nipple according to the lubricating interval.

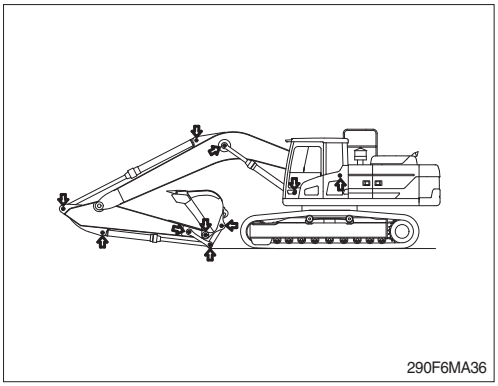
No.	Description	Qty
1	Lubrication manifold at boom	5
2	Boom cylinder pin	2
3	Lubricating manifold	3
4	Bucket cylinder pin (head, rod)	2
	Bucket link (control rod)	2
	Arm and bucket connection pin	1
	Arm and control rod connection pin	1
	Arm and control link connection pin	1
5	Boom rear bearing center	1

※ Shorten lubricating interval when working in the water or dusty place.



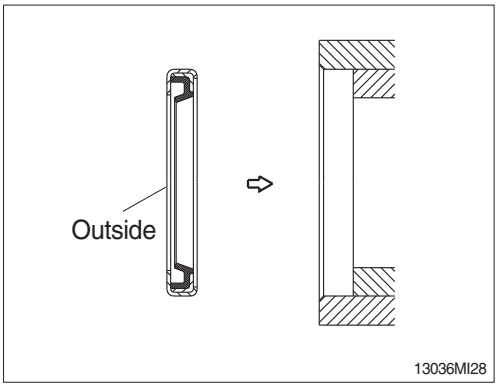
(2) Dust seals are mounted on the rotating part of working device to extend the lubricating interval.

※ Mount the lip to be faced outside when replace the dust seal.



※ If it is assembled in wrong direction, it will cause fast wear of pin and bushing, and create noise and vibration during operation.

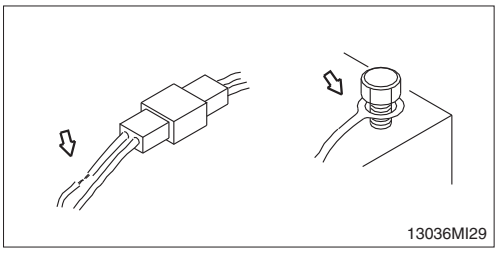
※ Assemble the seal same direction with picture and use with plastic hammer when replace.



7. ELECTRICAL SYSTEM

1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



2) BATTERY

(1) Clean

① Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

⚠ Battery gas can explode. Keep sparks and flames away from batteries.

⚠ Always wear protective glasses when working with batteries.

⚠ Do not stain clothes or skin with electrolyte as it is acid.
Be careful not to get the electrolyte in eyes. Wash with clean water and go to the doctor if it enters the eyes.

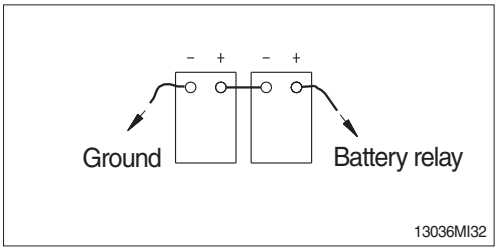
(2) Recycle

Never discard a battery.
Always return used batteries to one of the following locations.

- A battery supplier
- An authorized battery collection facility
- Recycling facility

(3) Method of removing the battery cable

Remove the cable from the ground connection first (⊖ terminal side) and reconnect it last when reassembling.



3) STARTING THE ENGINE WITH A BOOSTER CABLE

Keep following order when you are going to start engine using booster cable.

(1) Connection of booster cable

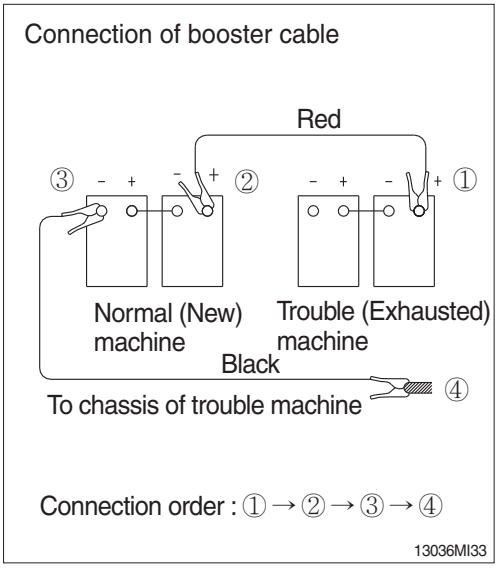
※ Use the same capacity of battery for starting.

① Make sure that the starting switches of the normal machine and trouble machine are both at the OFF position.

② Connect the red terminal of booster cable to the battery (+) terminal between exhausted and new battery.

③ Connect the black terminal of the booster cable between new battery (-) terminal and chassis of trouble machine.

※ Keep firmly all connection, the spark will be caused when connecting finally.

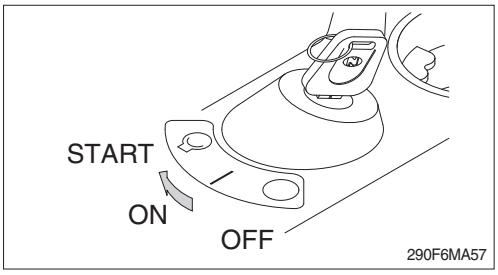


(2) Starting the engine

① Starting the engine of the normal machine and keep it to run at high idle.

② Start engine of the trouble machine with starting switch.

③ If you can not start it by one time, restart the engine after 2 minutes.



(3) Taking off the booster cable

① Take off the booster cable (black).

② Take off the booster cable (red) connected to the (+) terminal.

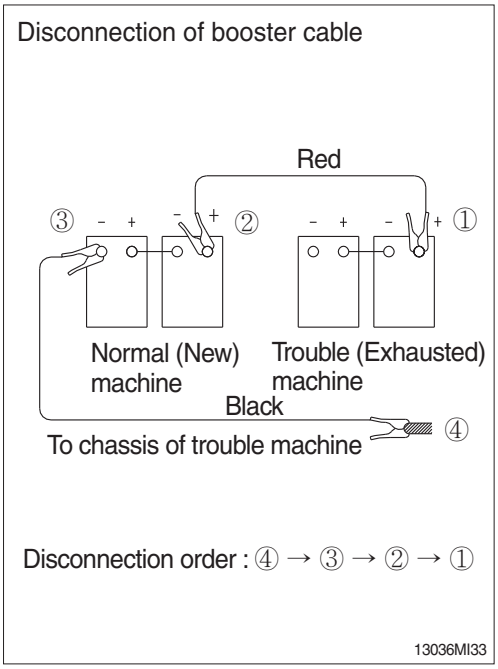
③ Run engine with high idle until charging the exhausted battery by alternator, fully.

⚠ 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.

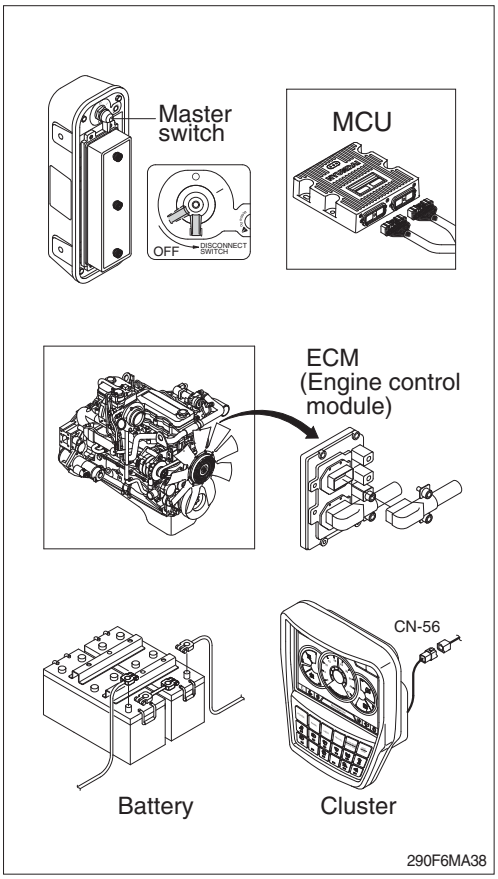
③ Before carrying out any electric welding on the machine, the battery cables should be disconnected and the connectors pulled out of the electronic control units (MCU, ECM, cluster etc).

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 system.

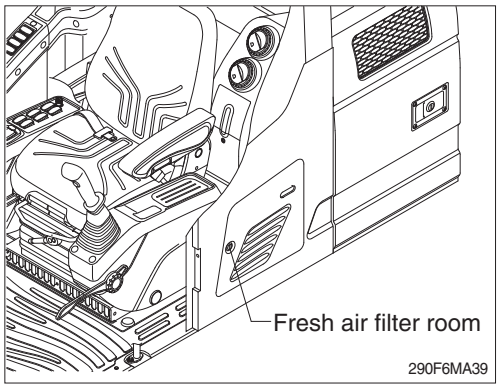


8. AIR CONDITIONER AND HEATER

1) CLEAN AND REPLACE OF FRESH AIR FILTER

※ **Always stop the engine before servicing.**

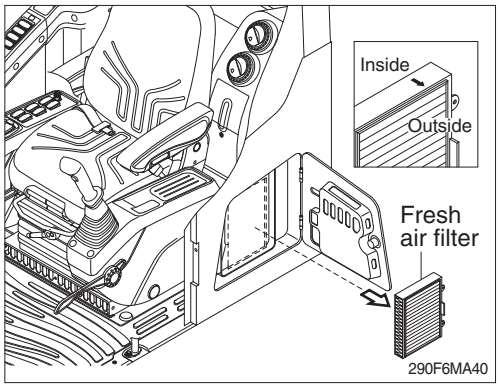
(1) Open the fresh air filter room.



(2) Remove the fresh air filter.

※ **When installing a filter, be careful not to change the filter direction.**

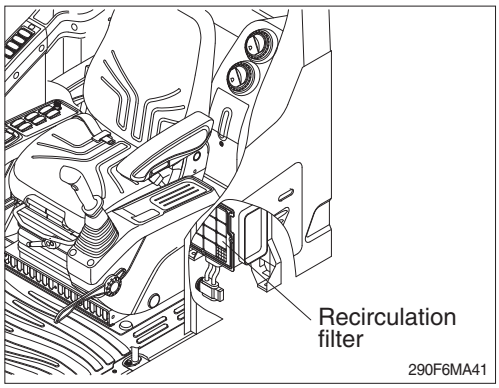
(3) If filter is damaged or badly contaminated, use a new filter.



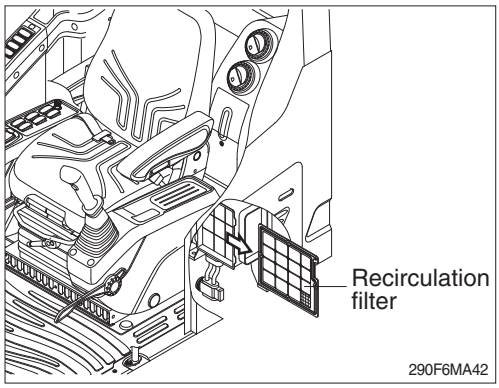
2) CLEAN AND REPLACE OF RECIRCULATION FILTER

※ **Always stop the engine before servicing.**

(1) Move seat and console box to arrow direction using the adjust knob.

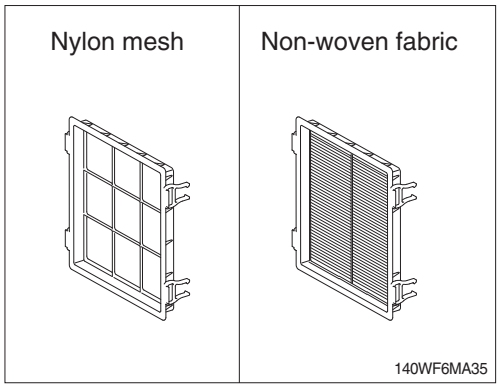


(2) Remove recirculation filter.



(3) Check the recirculation filter type.

(4) Non-woven fabric type
- If filter is damaged or badly contaminated, use a new filter.

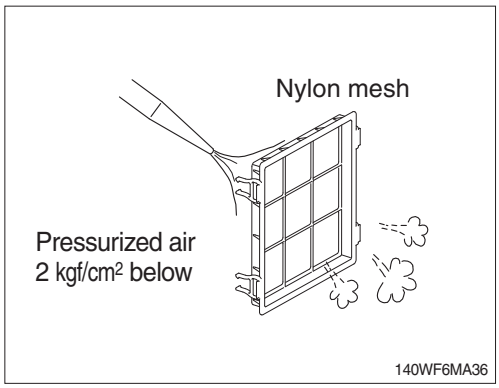


(5) Clean the recirculation filter using a pressurized air (below 2 kgf/cm², 28 psi) or washing with water.

△ **When using pressurized air, be sure to wear safety glasses.**

※ **Dry off after washing with water.**

(6) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.



3) PRECAUTIONS FOR USING AIR CONDITIONER

(1) When using the air conditioner for a long time, open the window once every one hour.

(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˚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.

6) REFRIGERANT

(1) Equipment contains fluorinated greenhouse gas.

Model	Type	Quantity	GWP
HX300 L	HFC-134a	0.70 kg (1.54 lb)	1001 CO_2 eq.

※ GWP

Global warming potential (GWP) is a measure of how much heat a gas traps in the atmosphere relative to that of carbon dioxide (CO2). GWP is calculated in terms of the 100-year warming potential of 1 kg of a greenhouse gas relative to 1 kg of CO2.

(2) Environmental precautions

The air conditioning system of the machine is filled with HFC-134a refrigerant at the factory.
HFC-134a refrigerant is a flourinated greenhouse gas and contributes to global warming.
Do not release refrigerant into the environment.

(3) Safety precautions

Work on the air conditioning system must only be performed by a qualified service technician.
Do not attempt to preform work on the air conditioning system.
Wear safety goggles, chemical resistant gloves and appropriate personal protective equipment to protect bare skin when there is a risk of contact with refrigerant.

(4) Action in case of exposure

① Eye contact / Limited skin contact
Rinse with warm water and apply a light bandage. Seek medical attention immediately.

② Extensive skin contact
Rinse with warm water and carefully heat the area with warm water or warm clothing.
Seek medical attention immediately.

③ Inhalation
Leave the area and find fresh air. Seek medical attention immediately.

1. 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. · In cold weather, check if fuel warmer system is working normal.	Refer to the pages 3-35 and 4-4.
Exhaust gas is white or blue.	· Adjust to specified oil quantity. · Replace with specified fuel.	
Exhaust gas occasionally turns black.	· Clean or replace the air cleaner element. · Check the nozzle. · Check engine compression 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

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

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

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

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

2. CIRCUIT CONFIGURATION

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

2) Set proper breaker pressure on load relief valve.

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

3) The pressure of the HX300 system is 350 kgf/cm^2 (4980 psi).

4) Adjusting oil quantity

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

· Setting oil quantity (220 lpm)

Flow set

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

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

Oil quantity setting

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

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

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

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

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

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

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

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

3. MAINTENANCE

1) MAINTENANCE OF HYDRAULIC OIL AND FILTER

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

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

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

2) RELEASE THE PRESSURE IN BREAKER CIRCUIT

When breaker operating is finished, stop engine and push pedal or switch for breaker to release pressure in breaker circuit.
If pressure still remains, the lifetime of the diaphragm in the accumulator will be shortened.

3) Be careful to prevent contamination by dust, sand and etc.
If such pollution become mixed into the oil, the pump moving parts will wear abnormally, shorten lifetime and become damaged.

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

Service interval unit : hours

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

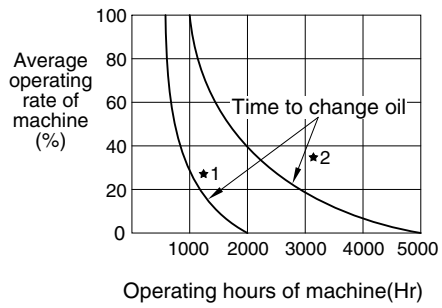
★1 : Conventional hydraulic oil

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

● **Replace following filter same time**

· Hydraulic return filter : 1 EA
· Pilot line filter : 1 EA
· Drain filter cartridge : 1 EA

Hyd oil change guide for hydraulic breaker



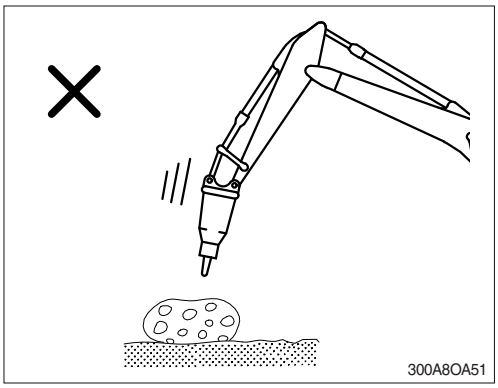
★1 : Conventional hydraulic oil

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

4. PRECAUTIONS WHILE OPERATING THE BREAKER

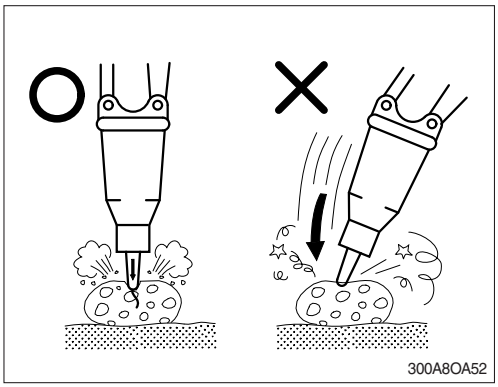
DO NOT BREAK ROCK WHILE LOWERING

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



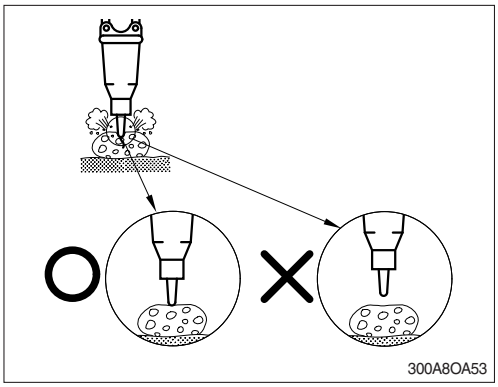
DIRECTION OF THRUST

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

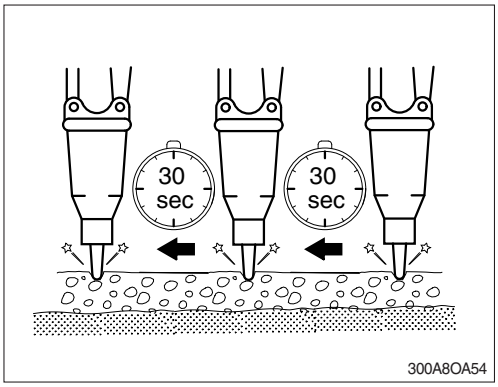


PROPER THRUST

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

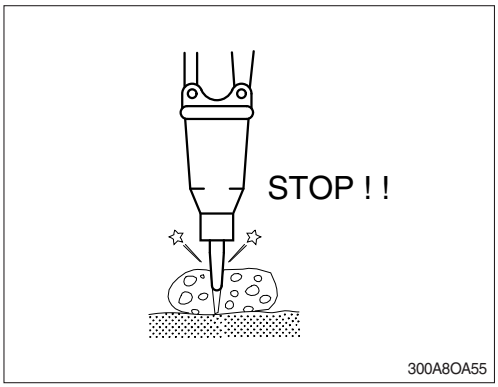


Move the impact point from the edge to the interior. Never try to break off a too large block, if the object has not broken within 30 seconds. The object should be broken up piece by piece in small blocks. Large distance steps will not improve working results.
Operating the breaker longer than 30 seconds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



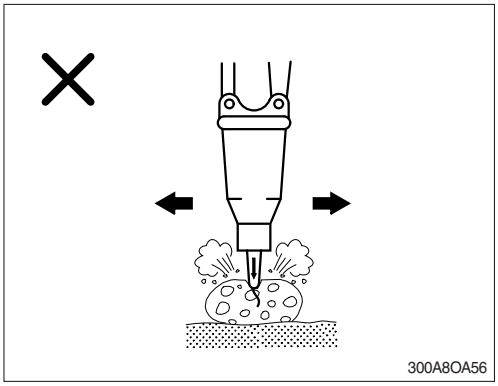
BLANKS THRUST

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



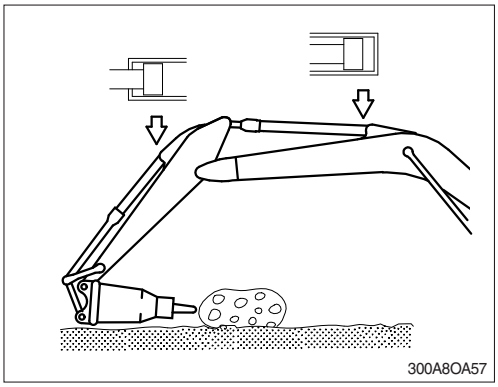
DO NOT MOVE MACHINE OR BREAKER WHILE STRIKING

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



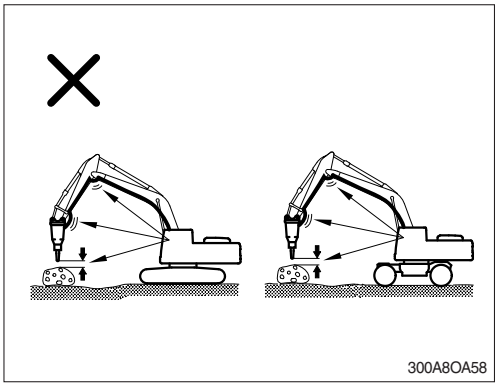
OPERATE BREAKER WITH A GAP IN EXCESS OF 100 mm (4 inches) FROM THE END OF THE STROKE TIP

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



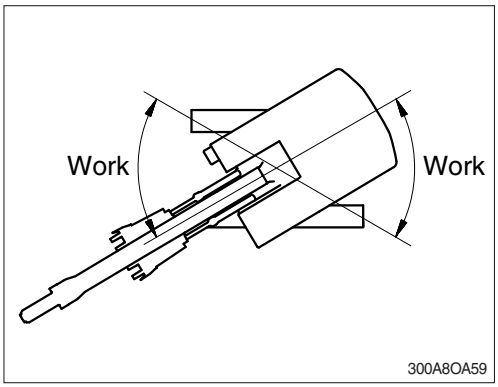
STOP THE OPERATION IMMEDIATELY IF HOSES VIBRATE EXCESSIVELY

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

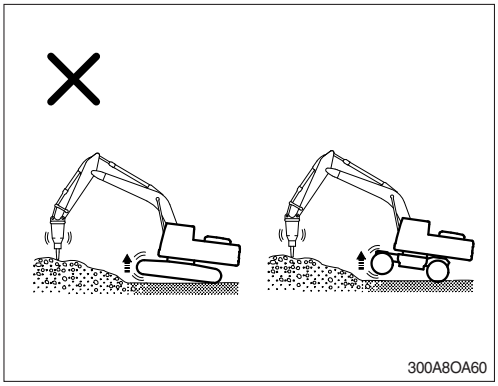


DO NOT WORK WHILE IN A SWING STATE

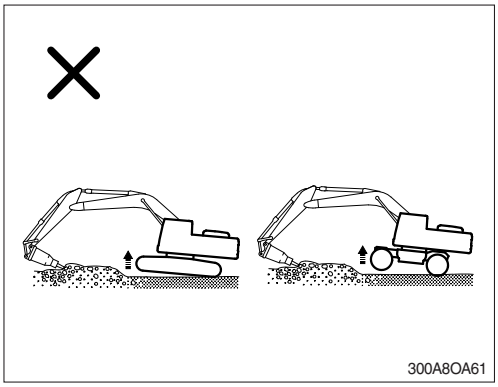
Do not work while swinging the upper structure. It cause oil leakage of the bend in the track shoe and rollers.



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

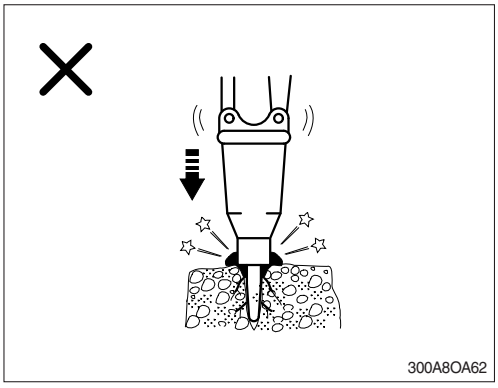


Do not extend the bucket cylinder fully and thrusting to raise the machine off the ground.



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

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



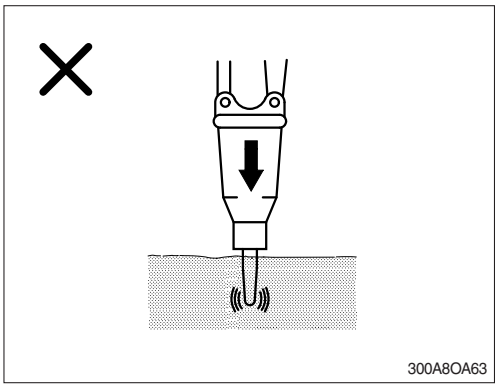
NEVER DRIVE THE CHISEL INTO THE GROUND

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

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

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

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

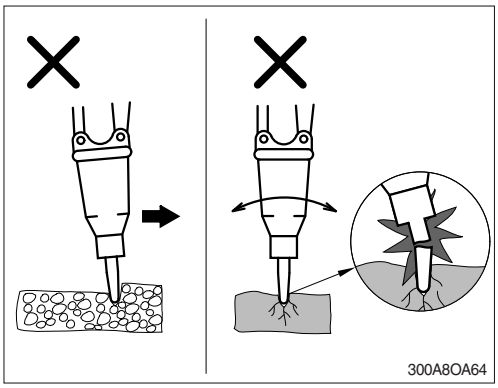


NEVER USE AS A LEVER

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

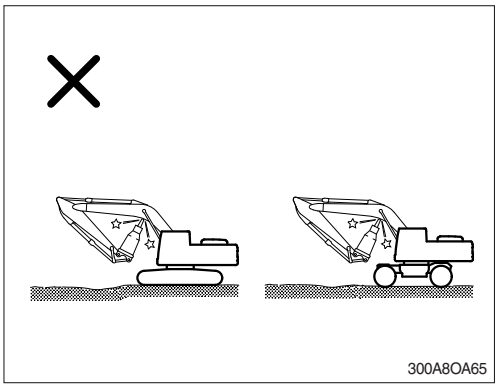
Under any circumstances, operating in this way is not permitted.

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



TAKE CARE OF CHISEL AND BOOM INTERFACE

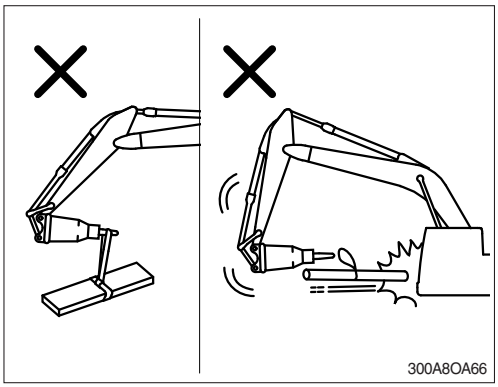
Be aware of clearance between breaker tip and the underside of boom as shown.



NEVER USE FOR LIFT OR TRANSPORT PURPOSES

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

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

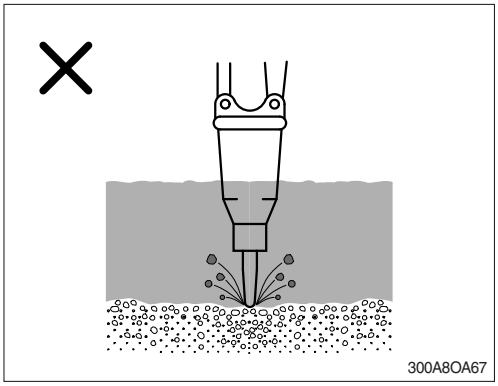


NEVER USE THE HYDRAULIC BREAKER UNDER WATER

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

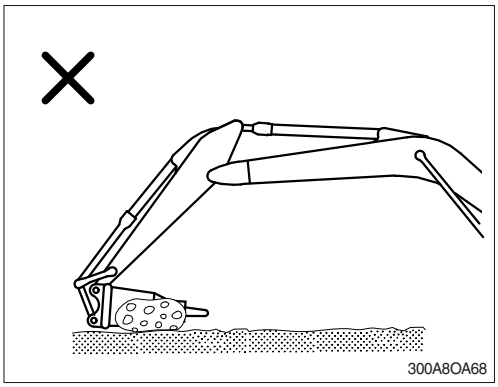
To operate the breaker under water, compressed air must be supplied into the breaker, into the impact chamber of the front-head, prior to use.

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



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

This may damage the operation device and swing system.

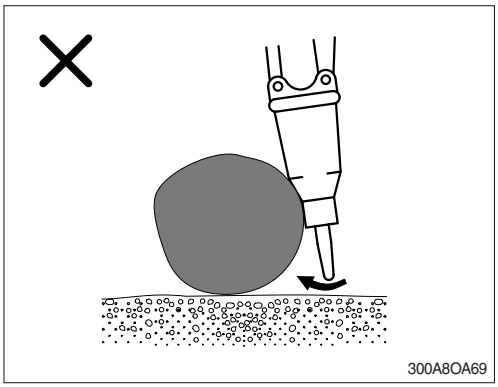


NEVER USE THE CHISEL OR HYDRAULIC BREAKER TO MOVE ROCKS OR OTHER OBJUCTS

The hydraulic breaker is not designed for this usage.

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

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

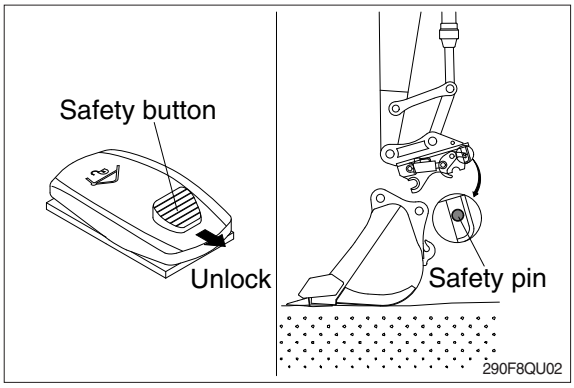


5. QUICK CLAMP

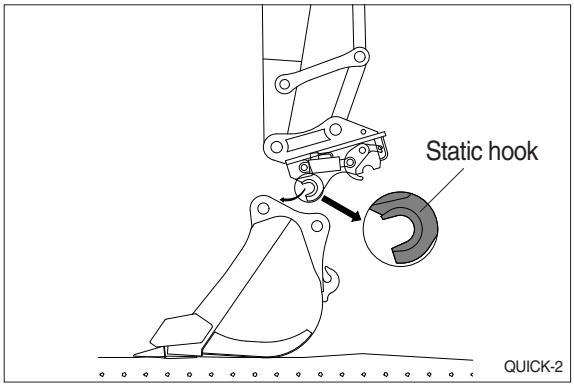
1) FIXING BUCKET WITH QUICK CLAMP

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

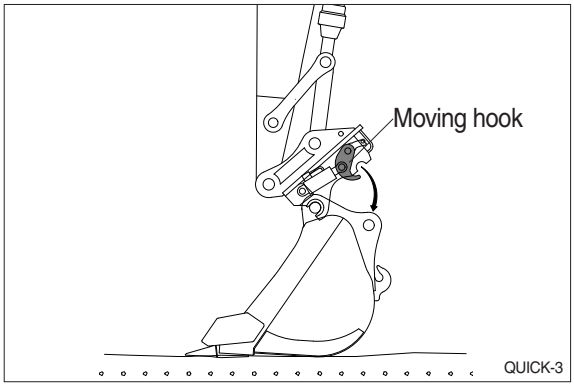
(2) Pulling safety button, press the quick clamp switch to unlock position. Then, the moving hook is placed on release position.



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

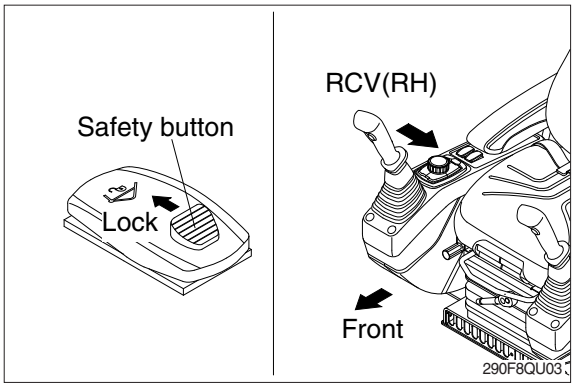


(4) Operate RCV lever to bucket-in position. Then, the moving hook is coupled with the bucket link pin.
Make sure that the moving hook is completely contacted with bucket link pin.

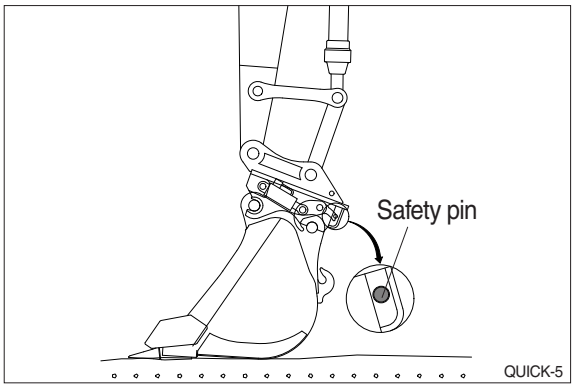


(5) Push safety button to lock position.
Operate RCV lever to bucket-in position.

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



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



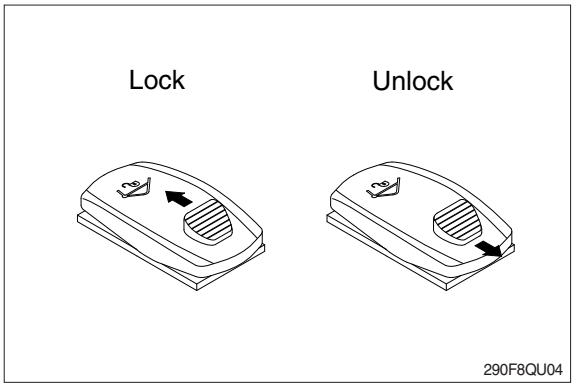
2) REMOVE BUCKET FROM QUICK CLAMP

Removing procedure is reverse of fixing.

3) PRECAUTION OF USING QUICK CLAMP

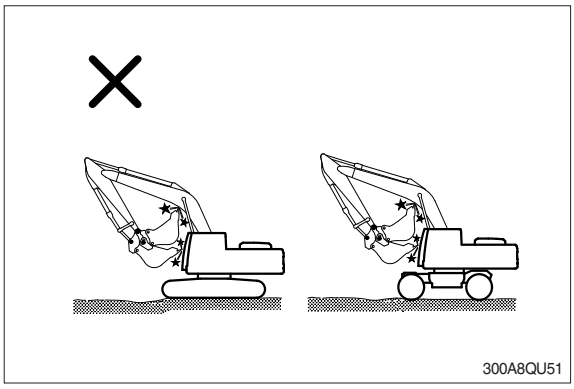
⚠ **When operating the machine with quick clamp, confirm that the quick clamp switch is lock position and safety pin of moving hook is inserted.**
Operating the machine with quick clamp switch unlocked and without safety pin of moving hook can cause the bucket to drop off and bring about the accident.

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



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

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



INDEX

Q

R

S

T

U

W