

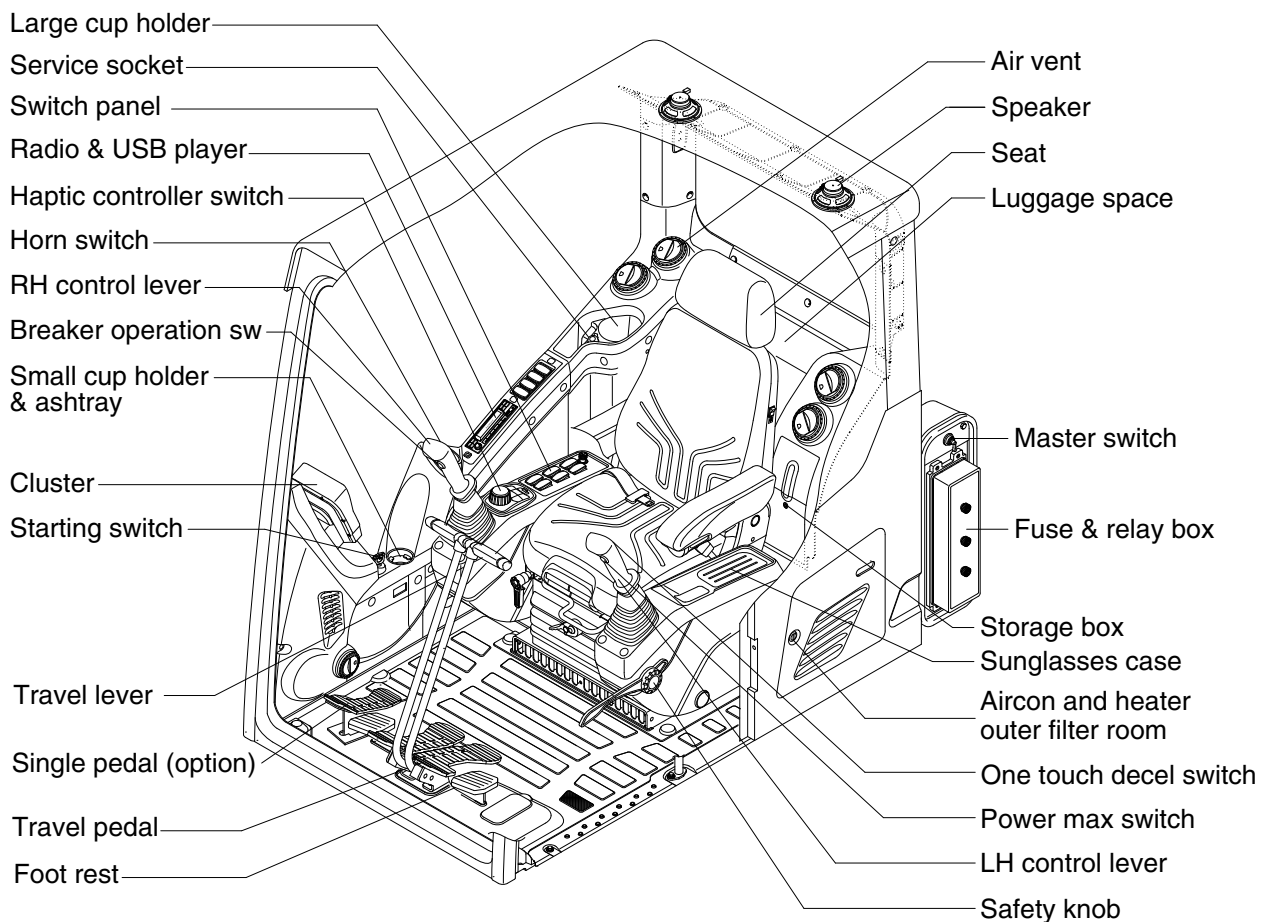
# CONTROL DEVICES

## 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 warning system for early detection of machine malfunction.



220A3CD01

## 2. CLUSTER

### 1) STRUCTURE

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

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

- ※ The cluster installed on this machine does not entirely guarantee the condition of the machine. Daily inspection should be performed according to chapter 6, Maintenance.
- ※ When the cluster provides a warning immediately check the problem, and perform the required action.



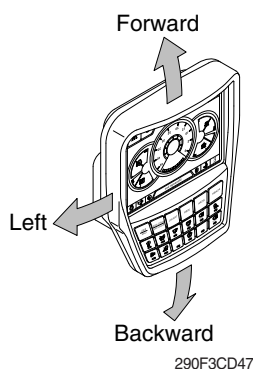
220A3CD20A

- ※ 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°



## 2) GAUGE

### (1) Operation screen

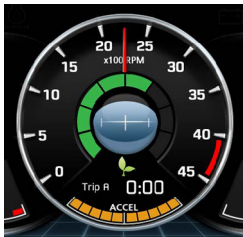
When you first turn starting switch ON, the operation screen will appear.



300A3CD21A

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

### (2) RPM / Speed gauge





300A3CD22

- ① This displays the engine speed.

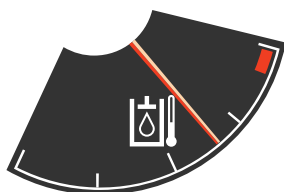
### (3) Engine coolant temperature gauge





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 in the normal condition range, check the electric device as this can be caused by poor connection of sensor.

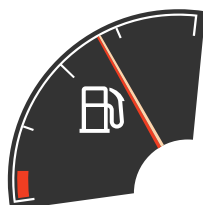
#### (4) Hydraulic oil temperature gauge





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 in the normal condition range, check the electric device as this can be caused by poor connection of electricity or sensor.

#### (5) Fuel level gauge





290F3CD55

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

#### (6) DEF/AdBlue® Level gauge



290F3CD57

- ① This gauge indicates the amount of liquid in the DEF/AdBlue® tank.
- ② Fill the DEF/AdBlue® when in the red range, or  lamp pops up and the buzzer sounds.
- ③ Do not overfull DEF/AdBlue®.
- ※ Refer to page 3-11.
- ※ If the gauge indicates the red range or  lamp blinks in red even though the machine is in the normal condition range, check the electric device as this can be caused by poor connection of electricity or sensor.

#### (7) Tripmeter display



290F3CD56

- ① This displays the engine the tripmeter.
- ※ Refer to page 3-35 for details.



### (8) Eco gauge



290F3CD58

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

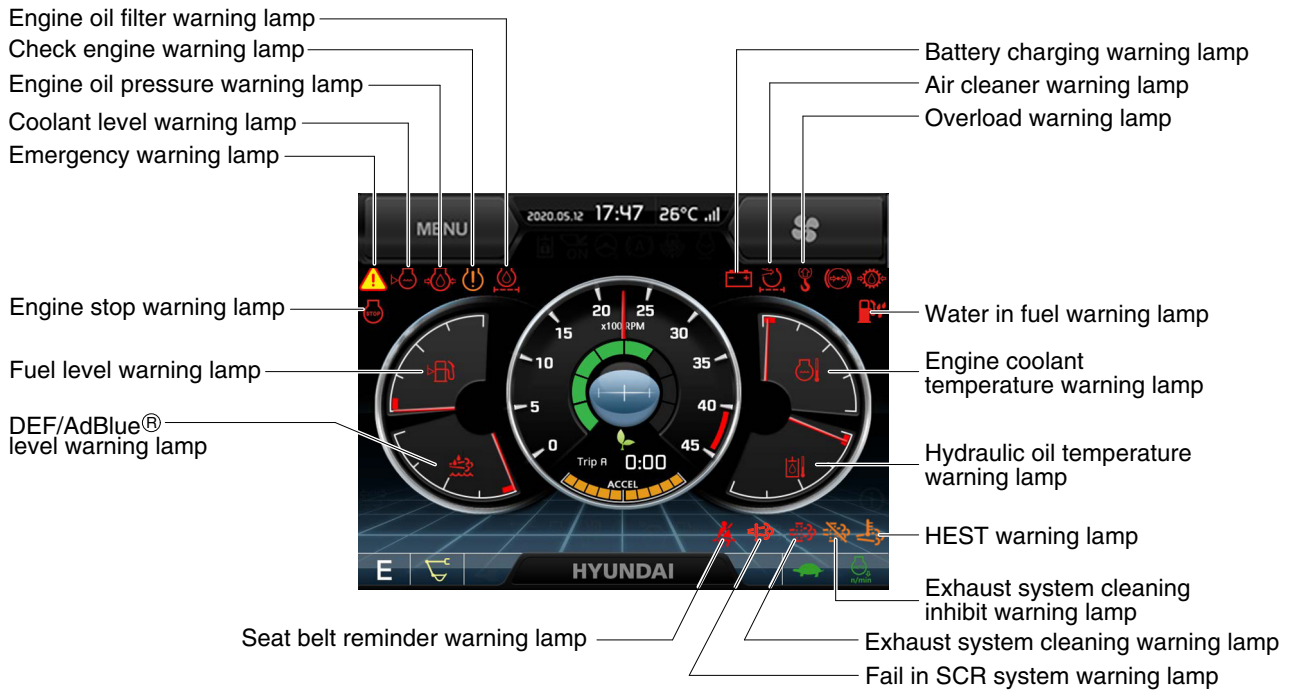
### (9) Accel dial gauge



290F3CD59









- ① This gauge indicates the level of accel dial.

### 3) WARNING LAMPS



300A3CD23B

#### ※ 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	<ul style="list-style-type: none"> <li>The pop-up warning lamp moves to the original position, blinks and the buzzer stops when; <ul style="list-style-type: none"> <li>the buzzer stop switch  is pushed</li> <li>the knob of the jog dial module is pushed</li> <li>the lamp of the LCD is touched</li> </ul> </li> </ul>
	Warning lamp pops up on the center of the LCD and the buzzer sounds	<ul style="list-style-type: none"> <li>The pop-up warning lamp moves to the original position, lights up or blinks and the buzzer stops when; <ul style="list-style-type: none"> <li>the buzzer stop switch  is pushed</li> <li>the knob of the jog dial module is pushed</li> <li>the lamp of the LCD is touched</li> </ul> </li> </ul> <p>※ Refer to page 3-11 for details.</p>
	Warning lamp pops up on the center of the LCD and the buzzer sounds	<ul style="list-style-type: none"> <li>The pop-up warning lamp moves to the original position, lights up and the buzzer stops after 2 seconds elapses.</li> </ul>
	Warning lamp pops up on the center of the LCD and the buzzer sounds	<ul style="list-style-type: none"> <li>The pop-up warning lamp moves to the original position, blinks and the buzzer stops after 2 seconds elapses.</li> </ul>
	Warning lamp pops up on the center of the LCD and the buzzer sounds	<ul style="list-style-type: none"> <li>Cluster displays this pop-up when it has communication error with MCU.</li> <li>If communication with MCU become normal state, it will disappear automatically.</li> </ul>
	Warning lamp pops up on the center of the LCD and the buzzer sounds	※ Refer to page 3-7 for details.
	Warning lamp lights up and the buzzer sounds	※ Refer to page 3-11 for details.

※ Refer to page 3-17 for the buzzer stop switch  and page 3-66 for the jog dial module.

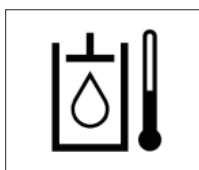
### (1) Engine coolant temperature warning lamp










290F3CD61

- ① Engine coolant temperature warning is indicated in 2 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  is pushed. The buzzer will stop and ,  lamps will blink.
- ③ Check the cooling system when the lamps keep blinking.

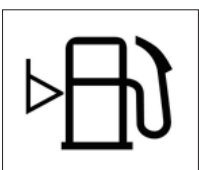
### (2) Hydraulic oil temperature warning lamp



290F3CD62

- ① Hydraulic oil temperature warning is indicated in 2 steps.
  - 100°C over : The  lamp pops up and the buzzer sounds.
  - 105°C over : The  lamp pops up and the buzzer sounds.
- ② The pop-up ,  lamps move to the original position and blinks when the buzzer stop switch  is pushed. The buzzer will stop and ,  lamps will blink.
- ③ Check the hydraulic oil level and hydraulic cooling system.

### (3) Fuel level warning lamp




290F3CD63

- ① This warning lamp pops up and the buzzer sounds when the fuel level is below 52 ℓ (13.7 U.S. gal).
- ② Fill the fuel immediately after the lamp blinks.

### (4) Emergency warning lamp



290F3CD64

- ① This warning lamp pops up and the buzzer sounds when each of the below warnings occurs.
  - Engine coolant overheating (over 107°C)
  - Hydraulic oil overheating (over 105°C)
  - MCU input voltage abnormal
  - Cluster communication data error
  - Engine ECM communication data error
- ※ The pop-up warning lamp moves to the original position and blinks when the buzzer stop switch  is pushed. The buzzer will stop.
- ② When this warning lamp blinks, machine must be checked and serviced immediately.

#### (5) Engine oil pressure warning lamp



290F3CD65

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

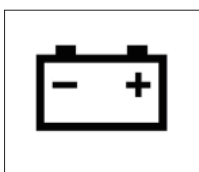
#### (6) Check engine warning lamp



290F3CD66

- ① This warning lamp pops up and the buzzer sounds when the communication between MCU and engine ECM is abnormal, or if the cluster received specific fault code from the engine ECM.
- ② Check the communication line between the two.  
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 air cleaner is clogged.
- ② Check, clean or replace filter.

#### (9) Overload warning lamp (opt)



290F3CD69

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

### (10) Engine stop warning lamp



290F3CD252

① This warning lamp pops up and the buzzer sounds after 30 minutes of run time elapses, when the DEF/AdBlue® tank has reached its minimum level. Stop engine immediately and check actual DEF/AdBlue® level.

② Fill the DEF/AdBlue® immediately.

※ Refer to page 3-11.

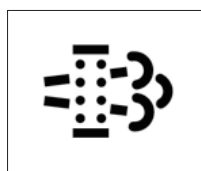
③ This lamp pops up and the buzzer sounds when the manual (stationary) exhaust system cleaning is not performed.

※ Refer to page 3-9.

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




※ "Engine shutdown" cluster message pops up when the exhaust gas temperature reaches above 800℃.

### (11) Exhaust system cleaning warning lamp

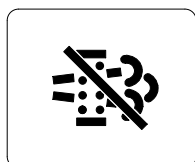


290F3CD70

① This warning lamp lights up or blinks when exhaust system cleaning is needed as seen in the table below.

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

### (12) Exhaust system cleaning inhibit warning lamp

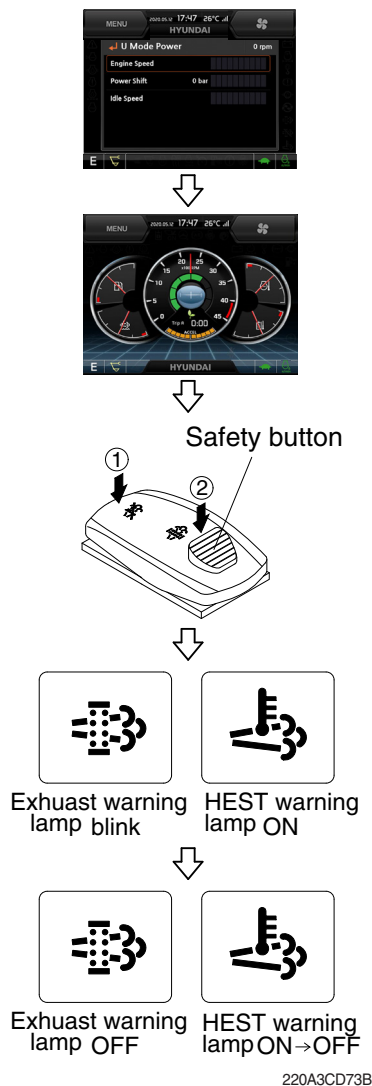


2609A3CD20

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

※ Refer to page 3-42 for the exhaust system cleaning switch.

## ※ Manual exhaust system cleaning



※ Manual exhaust system cleaning must be operated in a fireproof area.

※ To stop a manual exhaust system cleaning before it has completed, set to the exhaust 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 exhaust system cleaning.

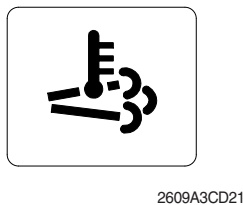
※ Refer to the page 3-42 for the exhaust system cleaning switch operation.

※ The engine speed may increase to 950~1050 rpm and exhaust system cleaning begins and it will take approximately 20~30 minutes.

③ The exhaust system cleaning warning lamp will blink and HEST warning lamp will light up during the exhaust system cleaning operation.

④ The exhaust system cleaning and/or HEST warning lamp light will go off when the exhaust 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 exhaust system cleaning.

② The lamp will also illuminate during a manual exhaust 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 is common for the lamp to illuminate on and off during normal equipment operation as the engine completes exhaust system cleaning cycles.

#### (14) DEF/AdBlue® level warning lamp



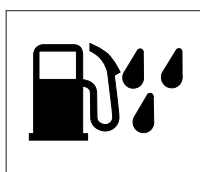
290F3CD257

① This warning lamp when ON or blinking, indicates that the DEF/AdBlue® level is low as per the 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
Fail in SCR system	DEF/AdBlue® level	Check engine	Stop engine	
On	On	Off	Off	<ul style="list-style-type: none"> <li>The DEF/AdBlue® level has fallen below the initial warning level (10%).</li> </ul>
On	On	On	Off	<ul style="list-style-type: none"> <li>The DEF/AdBlue® level has fallen below the initial derate level (2.5%).</li> <li>The engine power will be limited automatically.</li> </ul>
On	Blink	On	On	<ul style="list-style-type: none"> <li>This happens when 30 minutes has elapsed with empty conditions (0%) of the DEF/AdBlue® tank.</li> <li>The engine will enter the final derate level which may include low idle lock or engine shutdown with restart limitations.</li> <li>In order to remove the final derate, the DEF/AdBlue® tank must be filled to above 10% gauge reading.</li> </ul>

#### (15) Water in fuel warning lamp



300A3CD24A

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

※ When this lamp lights up, stop the machine and drain water from the separator.



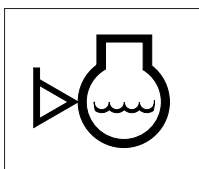
#### (16) Seat belt reminder warning lamp



300A3CD25

- ① When operator does not fasten the operator's seat belt, the seat belt reminder warning lamp pops up and the buzzer sounds.
- ② Fasten the seat belt.

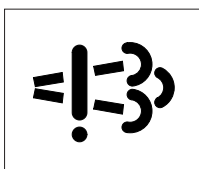
#### (17) Coolant level warning lamp



760F3CD58

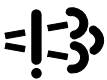
- ① This warning lamp indicates lack of coolant.
- ② Check and refill coolant.

#### (18) Fail in SCR system warning lamp



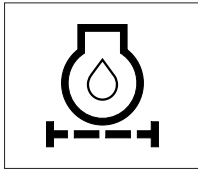
300A3CD15

- ① This warning lamp indicates there are faults related to SCR system.
  - ② The lamp lights up when each of the below warnings is happening.
    - a. Low DEF/AdBlue® level
    - b. Poor quality of DEF/AdBlue®
    - c. Tempering or malfunction in the aftertreatment system
  - ③ Once the lamp lights up, the engine will derate soon.
- ※ 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 75% of the highest torque.
Blink	After 3 h 45 min	· Torque is reduced to 50% of the highest torque.
Blink rapidly	After 4 hours	· Torque is reduced to 0% (low idling) of the highest 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.

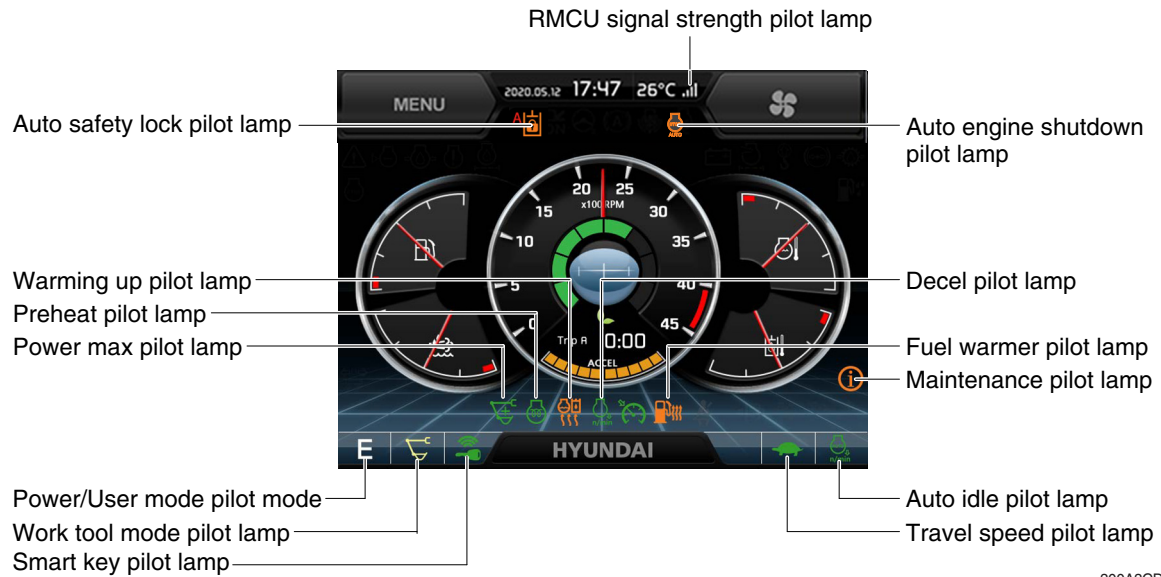
**(19) Engine oil filter warning lamp**



300A3CD306












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

#### 4) PILOT LAMPS



300A3CD26A

##### (1) Mode pilot lamps

No	Mode	Pilot lamp	Selected mode
1	Power mode		Heavy duty power work mode Standard power mode Economy power mode
2	User mode		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



300A3CD32

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

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

※ Refer to page 3-44 for power max function.

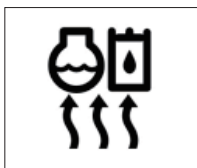
### (3) Preheat pilot lamp



290F3CD79

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

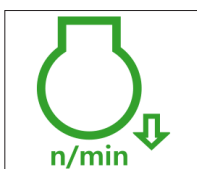
### (4) Warming up pilot lamp



290F3CD80

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

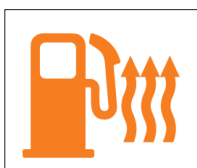
### (5) Decel pilot lamp



300A3CD33

- ① Operating one touch decel switch on the RCV lever makes the lamp light up.
  - ② Also, the lamp will light up and engine speed will be reduced automatically to save fuel when all levers and pedals are in the neutral position, and the auto idle function is selected.
- ※ **One touch decel is not available when the auto idle pilot lamp is turned ON.**
- ※ **Refer to page 3-44.**

### (6) Fuel warmer pilot lamp



300A3CD34

- ① This lamp lights up when the coolant temperature is below 10°C (50°F) or the hydraulic oil temperature is 20°C (68°F).
- ② The automatic fuel warming is cancelled when the engine coolant temperature is above 60°C (140°F), and the hydraulic oil temperature is above 45°C (113°F) since the start switch was ON position.

### (7) Maintenance pilot lamp



300A3CD35

- ① This lamp lights up when consumable parts are in need of replacement. It means that the change or replacement interval of parts is 30 hours from the required change interval.
  - ② Check the message in maintenance information of main menu. Also, this lamp lights up for 3 minutes when the start switch is switched to the ON position.
- ※ **Refer to page 3-28.**

### (8) RMCU signal strength pilot lamp (mobile only)



220A3CD200

① This lamp indicates RMCU signal strength as below.

-  : Searching
-  : Bad
-  : Normal
-  : Good
-  : Excellent

### (9) Smart key pilot lamp (opt)



300A3CD36A

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

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

※ Refer to the page 3-29.

### (10) Auto safety lock pilot lamp



300A3CD37A

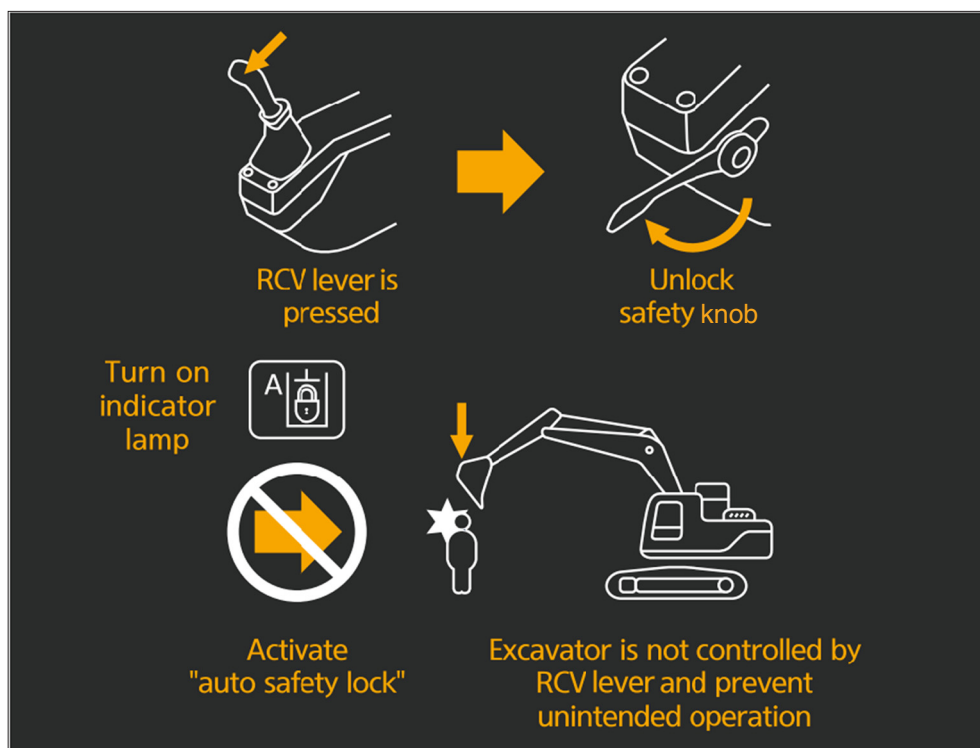
① Auto safety lock system prevents unintended operation of the machine in order to improve safety.

② Engine will only start if safety knob is locked.

③ If operator unlocks safety knob when RCV lever is pressed, machine is not controlled by RCV lever.

**⚠ If operator unlocks safety knob while any control/function is being operated, the machine will move violently. This could cause serious injury, death or damage to property.**

④ The function is released only by turning the safety knob to the UNLOCK position and the LOCK position again.



300A3CD38A

### (11) Auto engine shutdown pilot lamp





220A3CD202A

① This lamp is turned ON when the auto engine shutdown is activated.

※ Refer to the page 3-24.

### (12) Engine rpm state

Function	Safety Knob	Auto Idle Mode	One Touch Decel	RPM State
				
State 1	Unlock	OFF	OFF	High rpm
State 2	Unlock	OFF	ON	Low rpm
State 3	Unlock	ON	OFF	Auto Idle rpm
State 4	Lock	ON	OFF	Low rpm
State 5	Lock	OFF	ON	Low rpm
State 6	Unlock	ON	ON	Low rpm
State 7	Lock → Unlock	ON	ON	Low → High → Low rpm (few seconds later)
State 8	Lock	ON	OFF	Low rpm
State 9	Lock	ON	ON	Low rpm

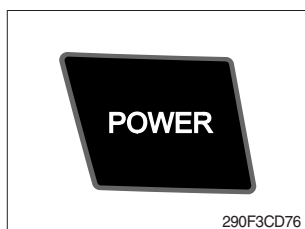
## 5) SWITCHES



300A3CD39A

※ When some of the switches are selected, the pilot lamps are displayed on the LCD. Refer to the page 3-13 for details.

### (1) Power mode switch

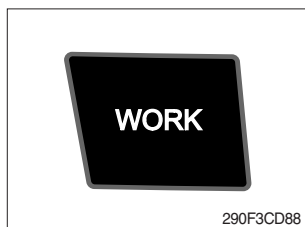


① This switch is to select the machine power mode and when pressed, the power mode pilot lamp will be displayed on the section of the monitor.

- P : Heavy duty power work.
- S : Standard power work.
- E : Economy power work.

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

### (2) Work mode switch

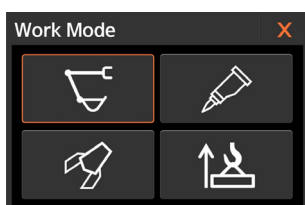


① This switch is to select the machine work mode, which shifts from general operation mode to optional attachment operation mode.

- : General operation mode
- : Breaker operation mode (if equipped)
- : Crusher operation mode (if equipped)
- : Lifting mode
- Not installed : Breaker or crusher is not installed.

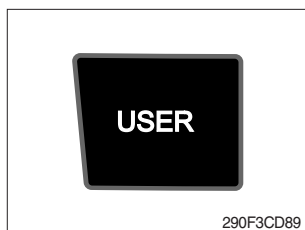
※ Refer to page 2-7 for details.

② If you press this switch for a time (1 second), quick pop-up will appear. When you select an attachment from the popup, the operation mode will immediately switch to selected attachment.







### (3) User mode switch



- ① This switch is used to select the user mode.
- ② Refer to page 3-21 for another set of the user mode.

### (4) Travel speed switch



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

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

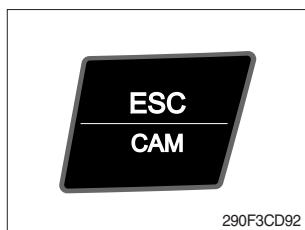
⚠ Serious injury or death can result from sudden changes in machine stability.

### (5) Auto idle/ buzzer stop switch



- ① This switch is used to activate or cancel the auto idle function.
  - Pilot lamp ON : Auto idle function is activated.
  - Pilot lamp OFF : Auto idle function is cancelled.
- ② The buzzer sounds when the machine has a problem.  
In this case, push this switch and buzzer stops, but the warning lamp blinks until the problem is cleared.

### (6) Escape/Camera switch



- ① This switch is used to return to the previous menu or parent menu.
- ② In the operation screen, pushing this switch will display the view of the camera on the machine (if equipped).  
Please refer to page 3-35 for the camera.
- ③ If the camera is not installed, this switch is used only ESC function.

### (7) Work light switch



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

#### (8) Head light switch



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

#### (9) Intermittent wiper switch



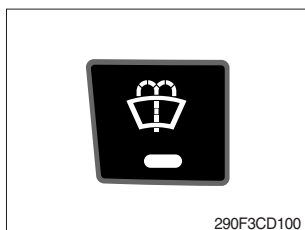
- ① When this switch is pressed, wipers operate intermittently.
- ② The pilot lamp lights up when this switch is pressed.

#### (10) Wiper switch



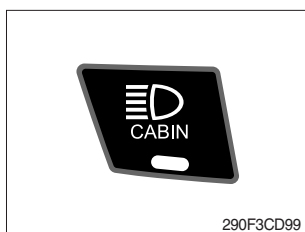
- ① This switch is used to operate the wiper.
- ② Note that the wiper will self-park when switched off.
- ③ The pilot lamp lights up when this switch is pressed.
- △ If the wiper does not operate with the switch in ON position, turn the switch OFF immediately. Check the cause. If the switch remains ON,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

#### (11) Washer switch



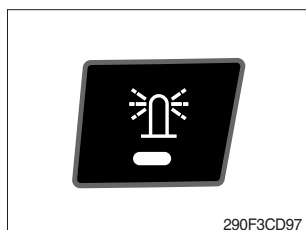
- ① Washer fluid is sprayed and the wiper is operated only when this switch is pressed.
- ② The pilot lamp lights up when this switch is pressed.

#### (12) Cab light switch



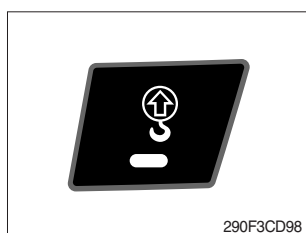
- ① This switch turns on the cab light.
- ② The pilot lamp lights up when this switch is pressed.

(13) Beacon switch (opt)



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

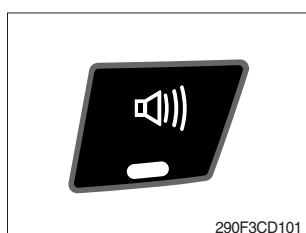
(14) Overload switch (opt)



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

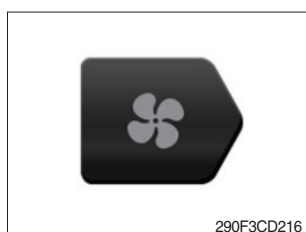
**⚠ Overloading the machine could impact the machines stability which could result in tipover hazard. A tipover hazard could result in serious injury or death. Always activate the overload warning device before you handle or lift objects.**

(15) Travel alarm switch



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

(16) Air conditioner quick touch switch



- ① This switch used to select air conditioner control mode.  
※ Refer to page 3-37.

(17) Main menu quick touch switch



- ① This switch is to activate the main menu in the cluster.  
※ Refer to page 3-20.

## 6) MAIN MENU

※ You can select or set the menu by the jog dial module 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



300A3CD40A

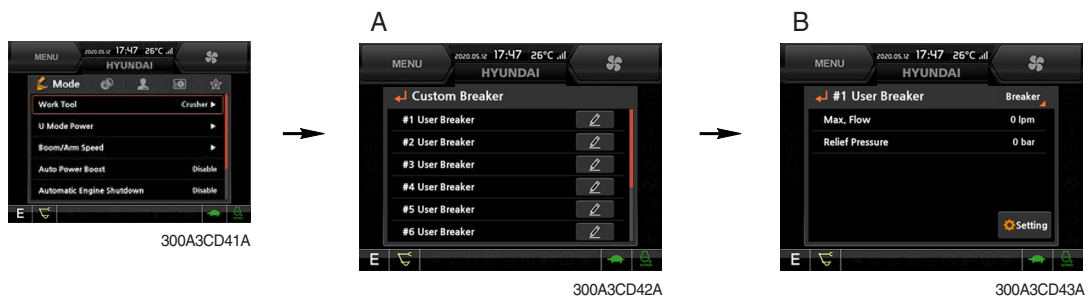
※ Please refer to the jog dial module, page 3-66 for selection and change of menu and input value.

### (1) Structure

No	Main menu	Sub menu	Description
1	 Mode 290F3CD103	Work tool U mode power Combination speed setting  Auto power boost IPC mode Auto engine shutdown Initial mode  Emergency mode	Breaker, Crusher, Not installed User mode only Load sensitivity, Trucking balance, Boom/Arm balance, Arm speed Enable, Disable Speed mode, Balance mode, Efficiency mode One time, Always, Disable Key on initial mode / initial work mode, Accel initial mode / step Switch function
2	 Monitoring 290F3CD104	Active fault Logged fault Delete logged fault Monitoring	MCU, Engine ECM, FATC, AAVM (option) MCU, Engine ECM, FATC, 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, jog dial module, 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, Optional piping pressure removal, Fine swing 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, ETC A type, B type
5	 Utilities 290F3CD107	Tripmeter Camera Auto idle time setting	3 kinds (A, B, C) Camera setting, Auto mode (travel) Time setting

## (2) Mode setup

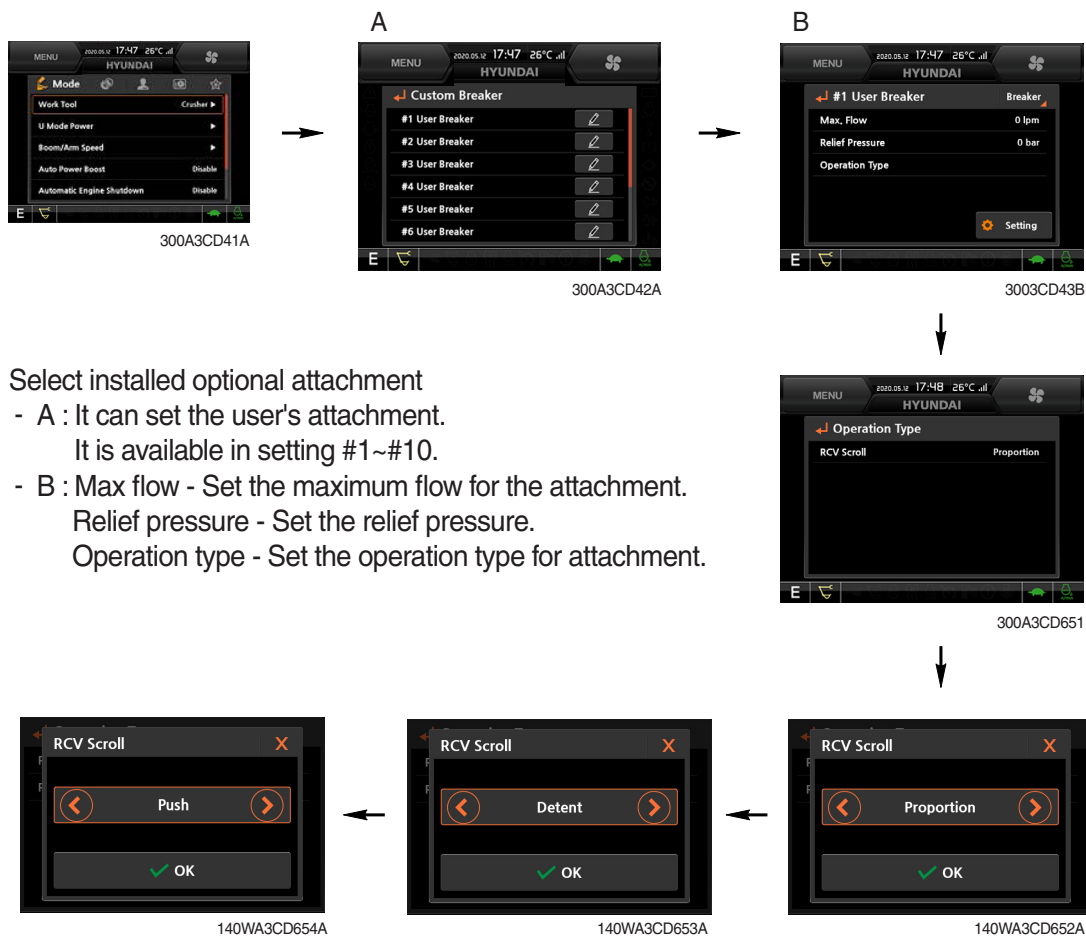
### ① Work tool (Machine Serial No. : -#0789)



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

## (2) Mode setup

### ① Work tool (Machine Serial No. : #0790-)

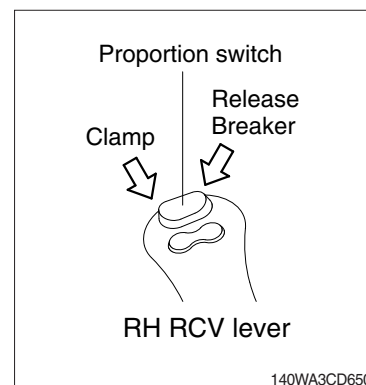


- Select installed optional attachment
  - A : It can set the user's attachment.  
It is available in setting #1~#10.
  - B : Max flow - Set the maximum flow for the attachment.  
Relief pressure - Set the relief pressure.  
Operation type - Set the operation type for attachment.

### ■ Operation type

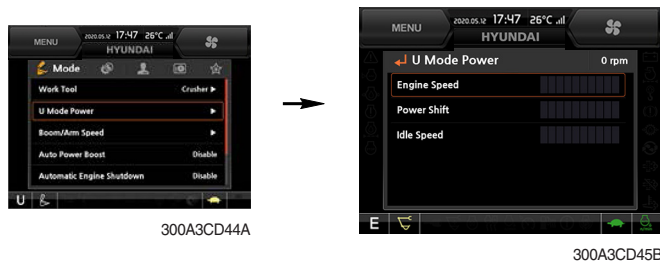
Operation type is used to set the operation of the proportion switch on the RCV lever if equipped proportional function.

- Push : Switch actuation will be deactivated when the proportion switch is released.
- Detent : Switch actuation will remain even if the proportion switch is released.  
To deactivate, move the switch in the same direction again or to the opposite direction.
- Proportion : Switch actuation is proportional to the movement of the proportion switch.



140WA3CD650

## ② U mode power

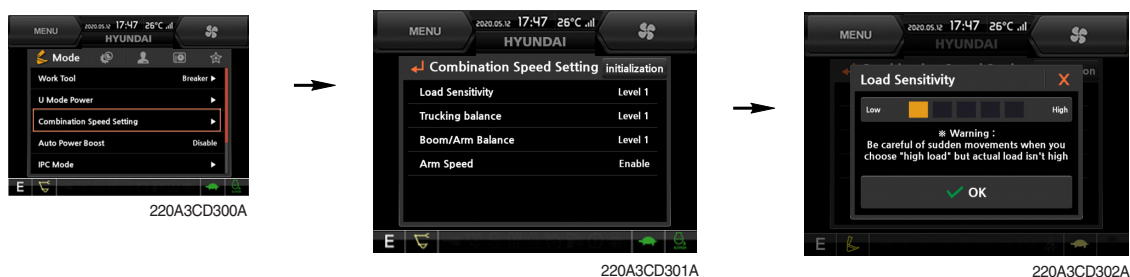


- Engine high idle rpm, auto idle rpm and pump torque (power shift) can be modulated and memorized separately in U-mode.
- U-mode can be activated by user mode switch.

Step (■)	Engine speed (rpm)	Idle speed (rpm)	Power shift
1	1300	750	10%
2	1400	800	20%
3	1500	850	30%
4	1600	900	40%
5	1700	950	50%
6	1800	1000 (auto decel)	60%
7	1850	1050	70%
8	1900	1100	80%
9	1950	1150	85%
10	2000	1200	90%

※ One touch decel & low idle : 850 rpm

## ③ Combination speed setting



- **Load sensitivity**
    - It changes fine control sensitivity. (boom up or arm out operation)
    - When the segment is close to high, the fine operation speed is increased. (Load sensitivity is high.)
    - It is recommended to set high segment when lifting heavy duty equipment or load.
- ⚠ The fine control speed is able to be unexpectedly fast by high setting and load condition. Do use the function through fine control test considering the condition.**



- **Trucking balance**

This is control the swing and boom up speed when the combined operation is activated.

- It adjusts the ratio of relative speed in the boom up and swing combination operation.
- The segment is close to swing, the swing speed has a priority.
- The segment of swing is recommended for use in work environments that require high swing speed and acceleration, some slow boom up, and more than 45 degrees.
- The segments are close to boom, the boom up speed has a priority.
- The segment of boom is mainly used in work environments that require high boom up work at a short swing angle of about 45 degrees.

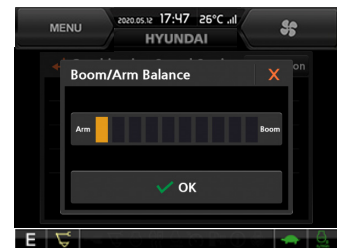


220A3CD303A

- **Boom / Arm balance**

This is control the boom up and arm in speed when the combined operation is activated. It is effective in work place mainly for leveling work.

- When the level is closer to arm, arm in operation speed has more priority than boom up operation.
- When the level is closer to boom, boom up operation speed has more priority than arm in operation.

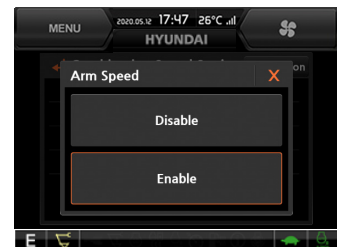


220A3CD304A

- **Arm speed**

This provides ON and OFF of the regeneration function of the arm in operation.

- Enable means that regeneration is ON, and an energy can be used efficiently through automatic regeneration according to the load.
- Disable means that regeneration is always OFF, and it can be effective for heavy digging work.



220A3CD305A

#### ④ Auto power boost



- 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.
- ※ The auto power boost function is activated in P mode. It does not work in S mode and E mode.

#### ⑤ IPC mode



- The operator can improve fuel consumption and working speed through IPC mode.
- IPC mode is working by using inertial energy in specific case.
- The IPC mode can be selected by this menu.
  - Speed mode / Balance mode / Efficiency mode
- The effect of IPC mode is different at power mode. The fuel efficiency is about 5% in P mode and about 3% in E mode based on Balance mode against Speed mode.
- The manufacturer recommends using the balance mode in IPC mode.
- ※ The effect is the result of the standard operation. Depending on the operator's working conditions and machine options, the results could be different.
- ※ Please update the cluster programs if this mode is not displayed in the mode setup menu. Refer to page 3-31.

## ⑥ Automatic engine shutdown



- 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



- **Key on initial mode**
  - Selected the power mode is activated when the engine is started.
- **Key on initial work mode**
  - Not installed
  - Last setting
  - Work mode
- **Accel initial mode**
  - Last setting value
  - User setting value
- **Accel initial step**
  - 0~9 step

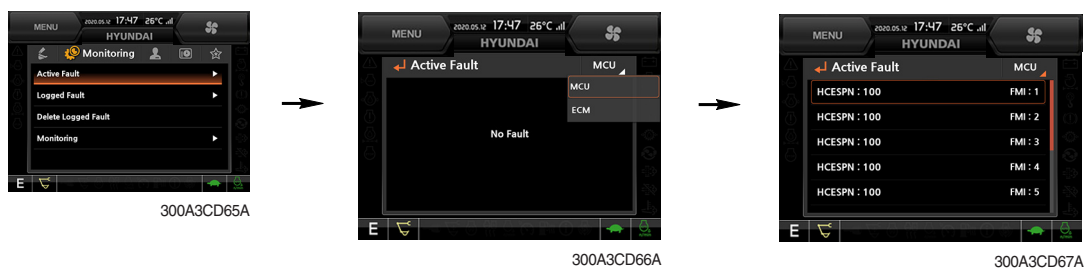
## ⑧ Emergency mode



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

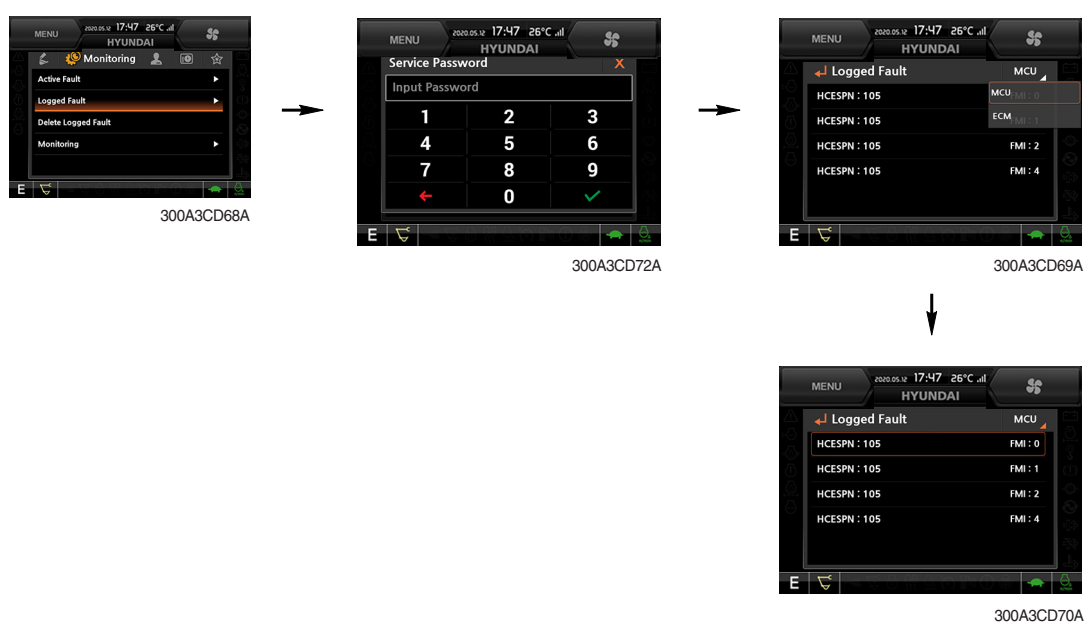
### (3) Monitoring

#### ① Active fault



- The active faults of the MCU, ECM, FATC, AAVM (option) can be checked by this menu.

#### ② Logged fault



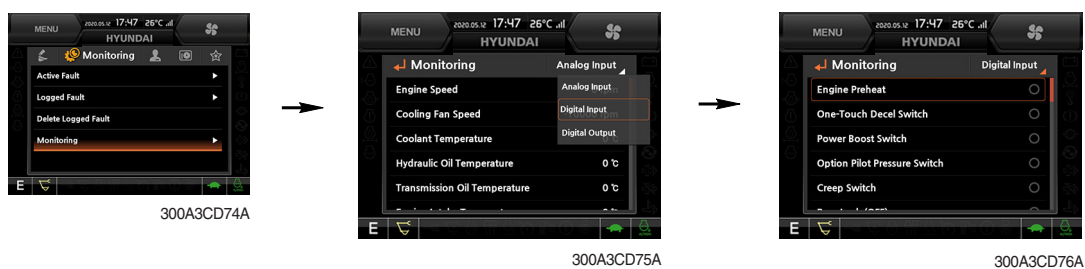
- The logged faults of the MCU, ECM, FATC, AAVM (option) can be checked by this menu.

#### ③ Delete logged fault



- The logged faults of the MCU, ECM, FATC, AAVM (option) can be deleted by this menu.

#### ④ Monitoring

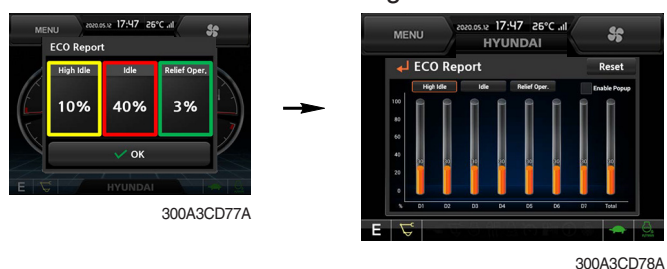


- The machine status such as the engine rpm, oil temperature, voltage and pressure etc. can be checked by this menu (Analog input).
- The switch status or output status can be confirmed by this menu (Digital input & Digital output).
- The activated switch or output pilot lamps ● will light up.

#### (4) Management

##### ① ECO report

This reports the machine's inefficient operation status in order to improve operator's improper working habit.



- Shows a breakdown of high idle, idle and relief operation when monitor is on.
- Gives a daily usage breakdown record for a 7 day period and an overall accumulated record from the first operation.



##### Relief operation



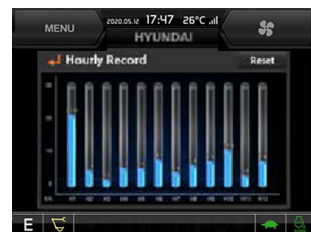
## ② Fuel rate information



A



B



C



D



### · General record (A)

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

### · Hourly record (B)

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

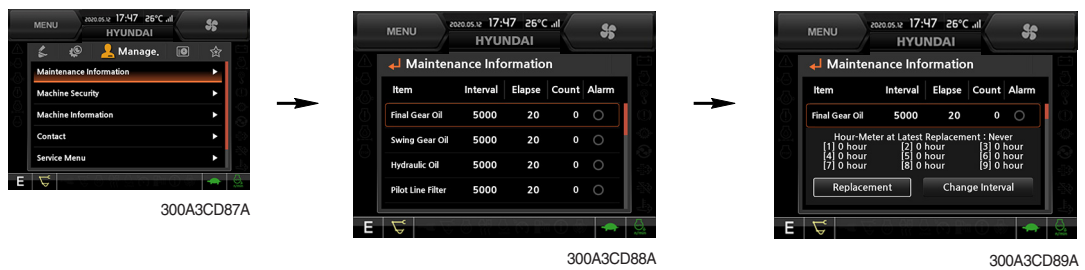
### · Daily record (C)

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

### · Mode record (D)

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

### ③ Maintenance information



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



#### ④ Machine security



##### · ESL mode setting

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

##### - Machine security

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

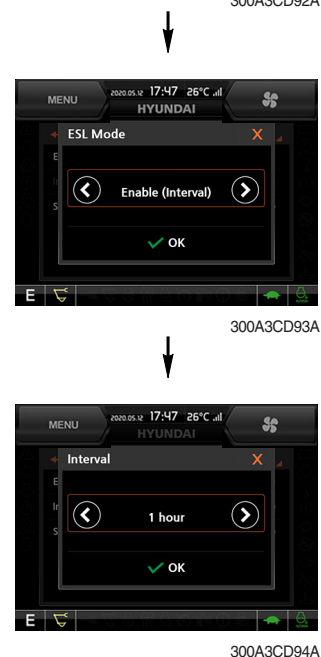
Enable (always) : The password is required whenever the operator starts engine.

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

※ Default password : 00000 + ✓

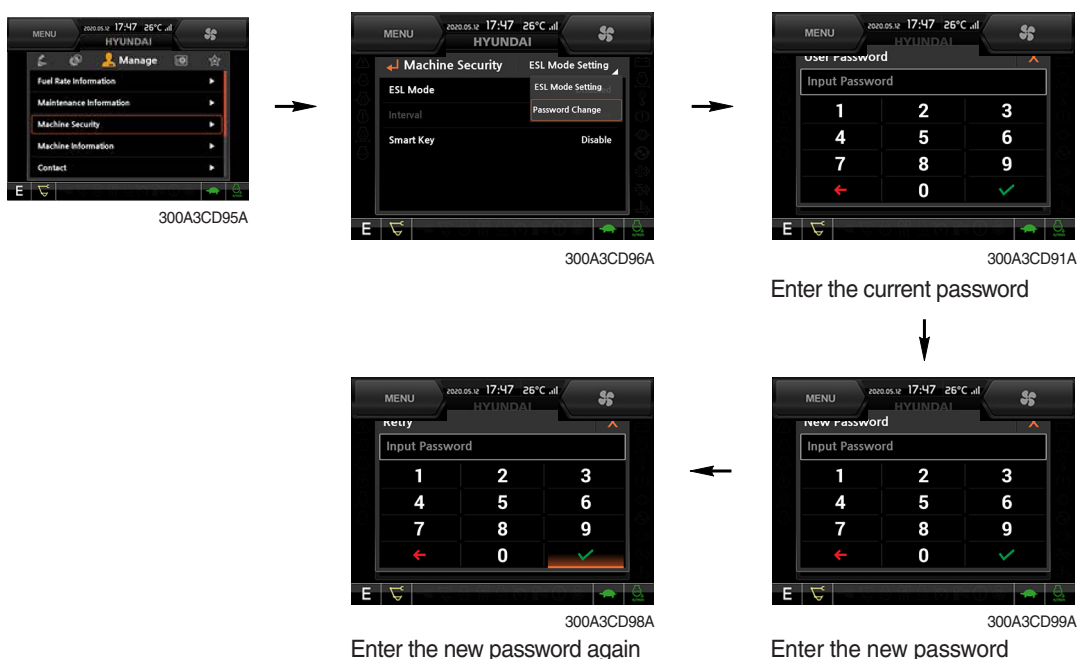
※ Password length : (5~10 digits) + ✓

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



##### · Password change

- The password is 5~10 digits.



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

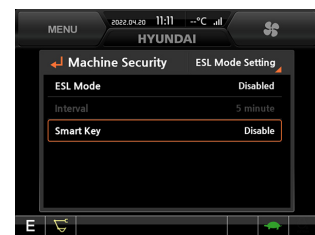
## - Smart key



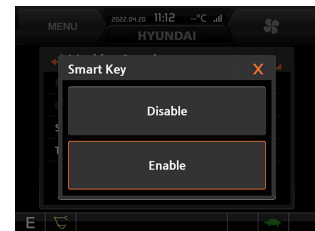
300A3CD90A



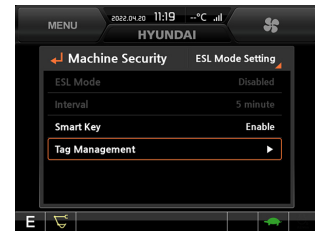
300A3CD91A



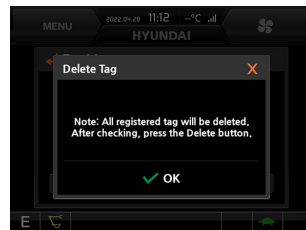
300A3CD001



300A3CD002

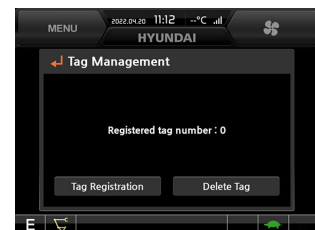


300A3CD003



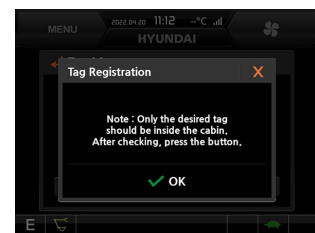
300A3CD006

Deleting



300A3CD004

Registering



300A3CD005

- 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.

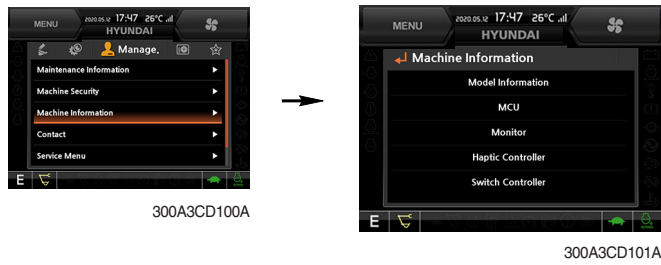
## - Tag management

- 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.

## ※ Engine Starting Condition

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

## ⑤ Machine Information



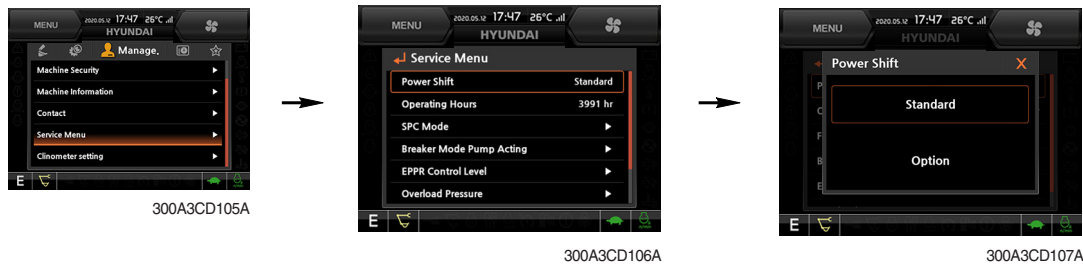
- This can confirm the identification of the model information (ECU), MCU, monitor, jog dial module, switch controller, RMCU, relay driver unit, FATC (air conditioner controller), AAVM (opt).

## ⑥ Contact (A/S phone number)



Enter the new A/S phone number

## ⑦ Service menu



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

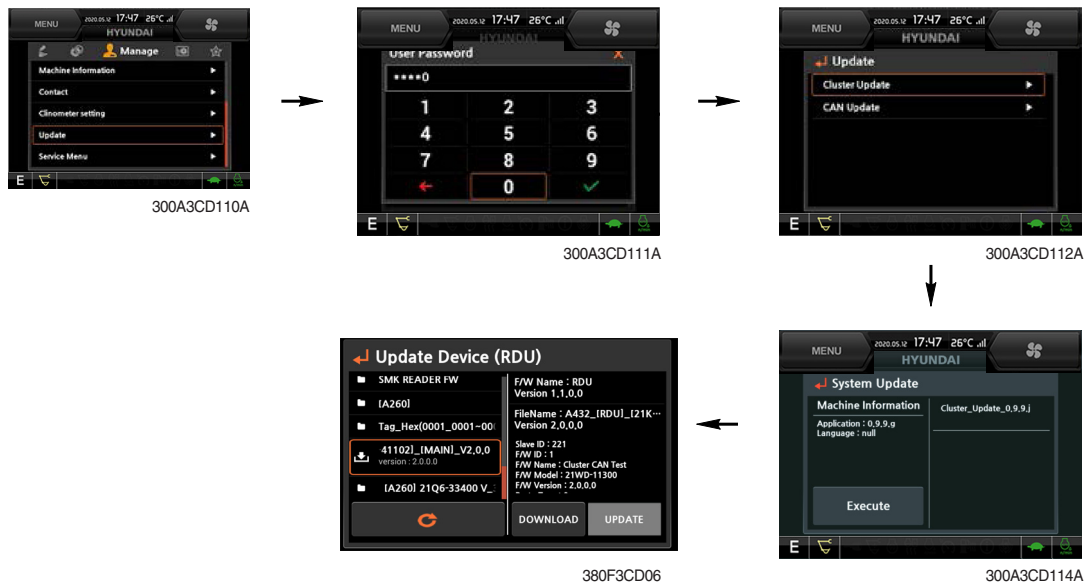
- Power shift (standard / option) : Power shift pressure can be set by option menu.
- Operating hours : Operating hours since the machine line out can be checked by this menu.
- Breaker mode pump acting (1 pump / 2 pump)
- EPPR current level (attach flow EPPR 1 & 2, boom priority EPPR, attach relief pressure EPPR 1 & 2)
- Overload pressure : 100 ~ 350 bar
- Optional piping pressure removal (Disable / Enable)  
It is removing the residual pressure remaining in the option line when the quick coupler is operated.
- Fine swing (Disable / Enable)

## ⑧ Clinometer



- When the machine is on the flatland, if you touch "initialization" on cluster, the values of X, Y will reset to "0".
- You can confirm tilt of machine in cluster's operating screen.

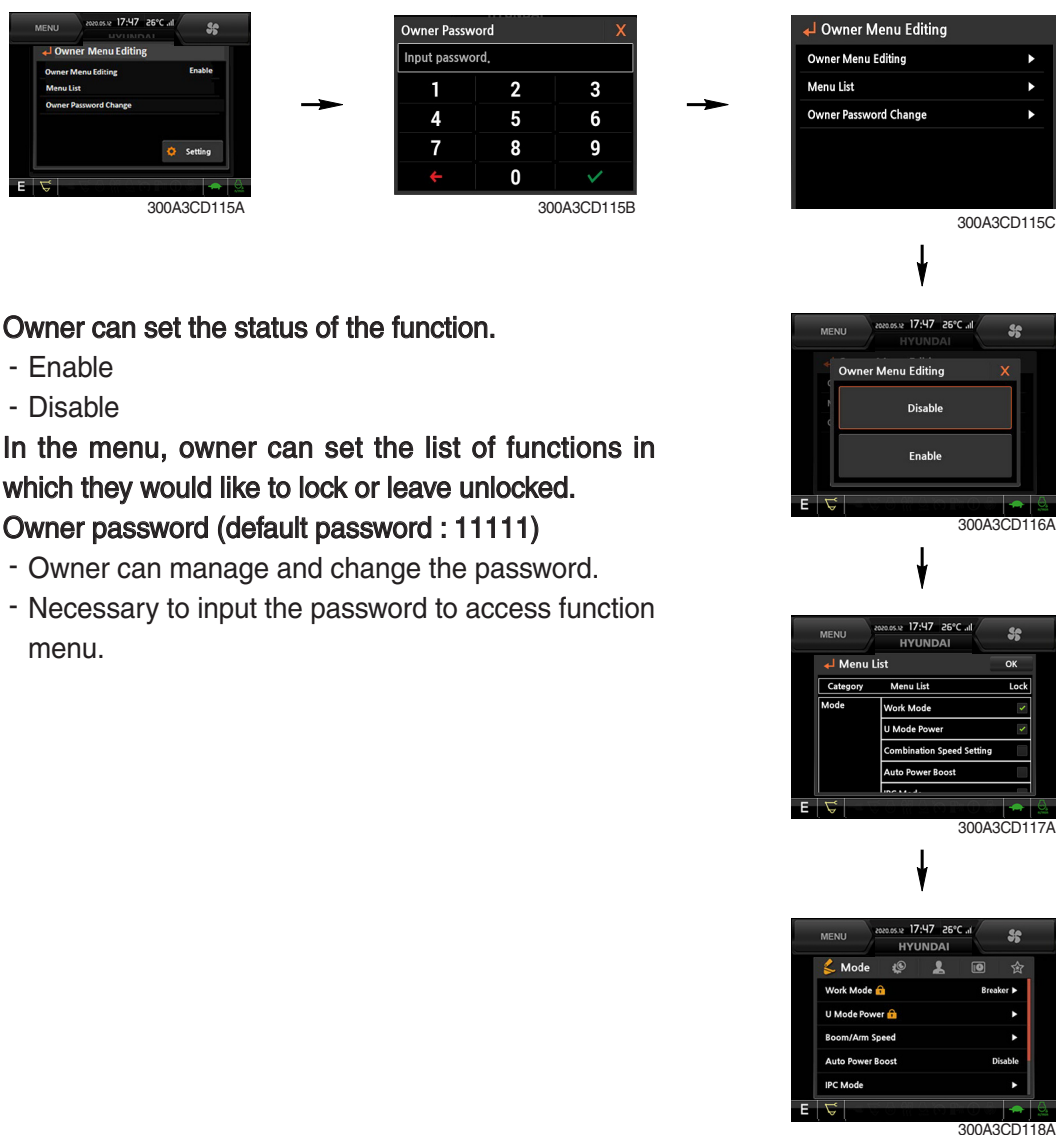
## ⑨ Update (cluster & ETC devices)



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

## ⑩ OME (owner menu editing)

The owner of machine can restrict operator access to set functions.



- Owner can set the status of the function.
  - Enable
  - Disable
- In the menu, owner can set the list of functions in which they would like to lock or leave unlocked.
- Owner password (default password : 11111)
  - Owner can manage and change the password.
  - Necessary to input the password to access function menu.

- **Password change**
- The password is 5~10 digits.



210WF3CD190A

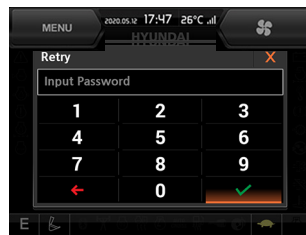


290F3CD140A



290F3CD135A

Enter the current password



290F3CD143A

Enter the new password again



290F3CD142A

Enter the new password

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

## (5) Display

### ① Display item



300A3CD119A



300A3CD120A



300A3CD121A

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

### ② Clock



300A3CD122A



300A3CD123A

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

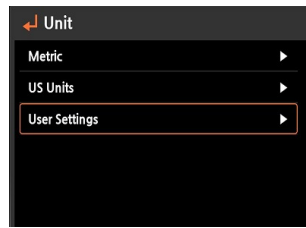
### ③ Brightness



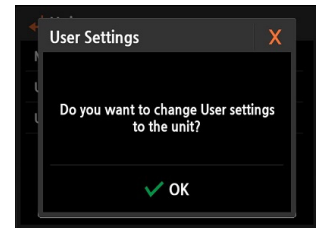
- If "Auto" is chosen, brightness for day and night can be set accordingly. Also by using the bar in lower side, users can define which an operation interval belongs to day and night. (in bar figure, white area represents night time while orange shows day time)

### ④ Unit





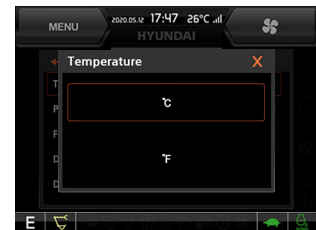
300A3CD130F



300A3CD130G



300A3CD131A



300A3CD132A

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

## ⑤ Language



300A3CD133A

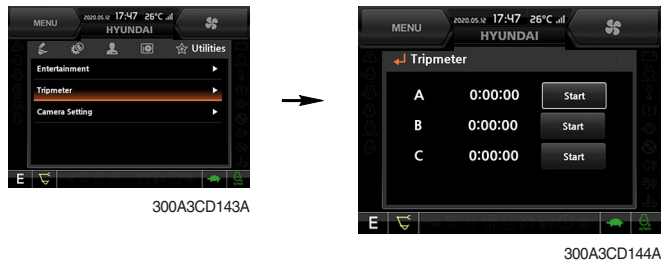


300A3CD134A

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

## (6) Utilities

### ① Tripmeter



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

### ② Camera setting

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



- Auto Mode (Travel) : Enable  
The cluster will automatically show camera view while machine is traveling.
- In the operation screen, rear camera screen shows up when ESC/CAM switch is pushed.



### ③ Auto idle time setting



- The auto idle time is can be set by this menu.
- Time : 3~30 seconds



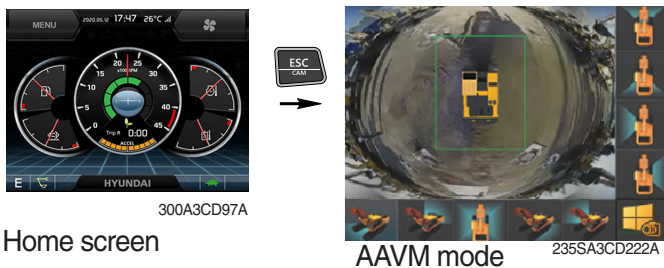
#### ④ AAVM (Advanced Around View Monitoring, option)

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



##### - Escape switch

- Activates AAVM mode from the beginning if AAVM is installed.
- While in the AAVM mode, select the ESC switch to return to the home screen.



##### - Buzzer stop switch

- AAVM mode detects surrounding pedestrians or objects and the warning buzzer sounds.
- User can turn OFF the warning sound by pressing the buzzer stop switch.



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



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

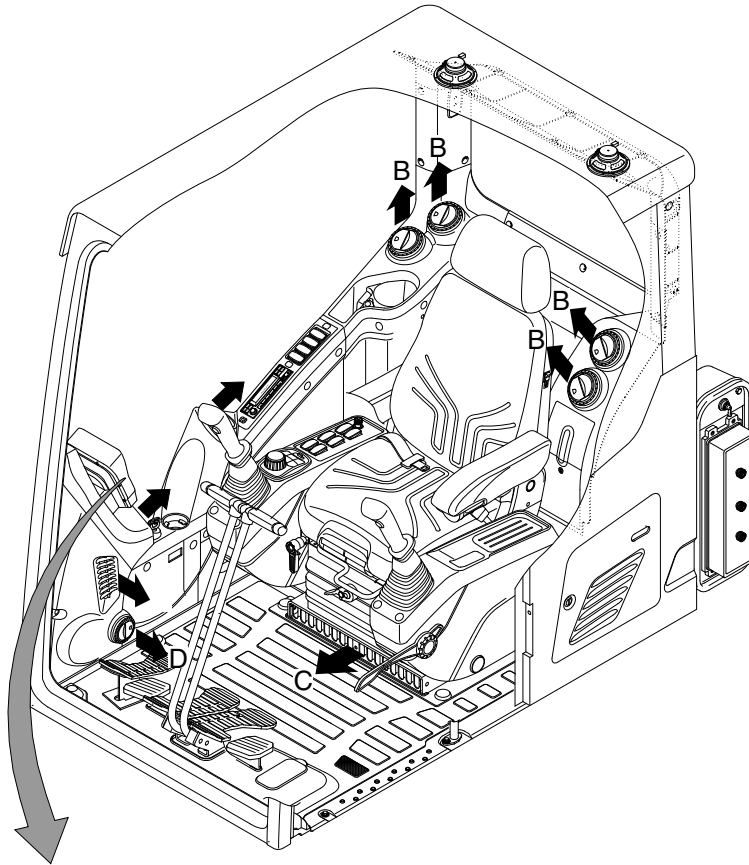
▲ Failure to comply may result in serious injury or death.

- ※ In AAVM mode, a touch screen of the LCD is available only. The multimodal dial of the jog dial module 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.

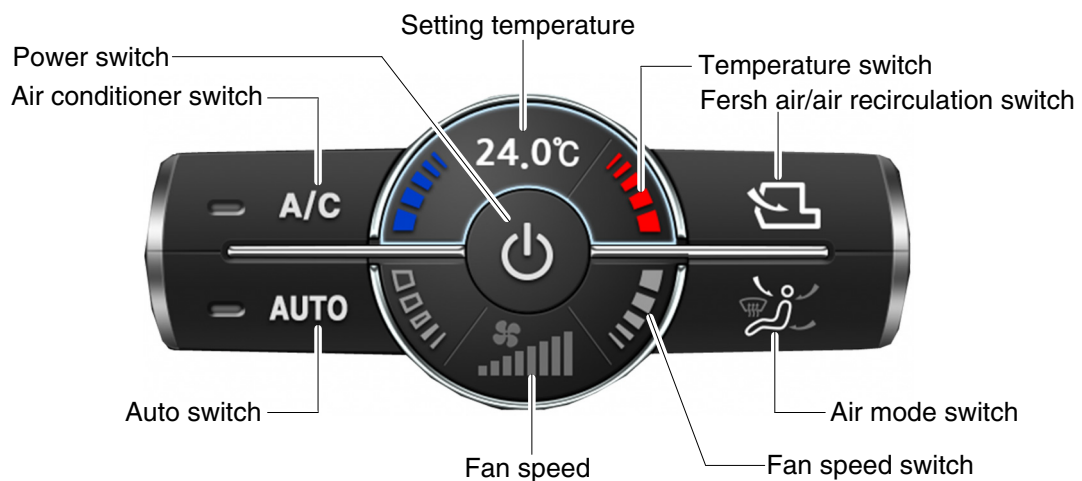
### · Location of air flow ducts



Cluster LCD



Cluster :  or  
Jog dial module : 



※ Jog dial module : Refer to page 3-66.

220A3CD21A

### (1) Power switch



- ① This switch turns the system ON and OFF.  
Just before powering OFF, set values are stored.
- ② Default setting values

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

### (2) 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



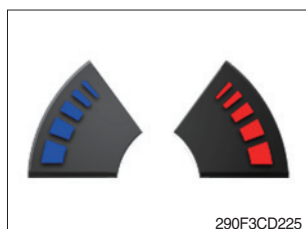
- ① Auto air conditioner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.

### (4) Setting temperature



- ① Displays the temperature setting.

### (5) Temperature switch

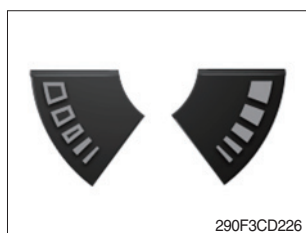


- ① Setting temperature indication  
· Lo (17°C), 17.5~31.5°C, Hi (32°C)
- ② Max cool and max warm beeps 5 times.
- ③ The max cool or the max warm position operates per the following table.

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

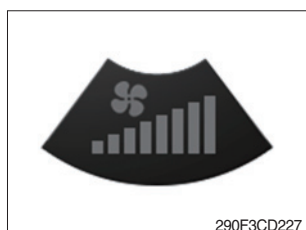
- ④ Temperature unit can be changed between celsius (°C) and fahrenheit (°F)
  - a. Default status (°C)
  - b. The temperature unit can be changed (°C ↔ °F) by pressing temperature switches (Up/Down) simultaneously for more than 5 seconds.

## (6) Fan speed switch



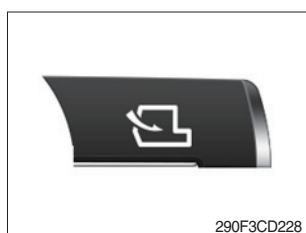
- ① Fan speed is controlled automatically by set temperature.
- ② This switch controls fan speed manually.
  - There are 8 up/down steps to control fan speed.
  - The maximum step or the minimum step beeps 5 times.

## (7) Fan speed



- ① Steps 1 through 8 to display the amount of air being circulated.

## (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 periods of time.**
    - ※ **Check condition of an outer filter and an inner filter periodically to maintain good efficiency of the system.**

## (9) Air mode switch



- ① Operating this switch, it beeps and displays symbol of each mode in the following 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					●

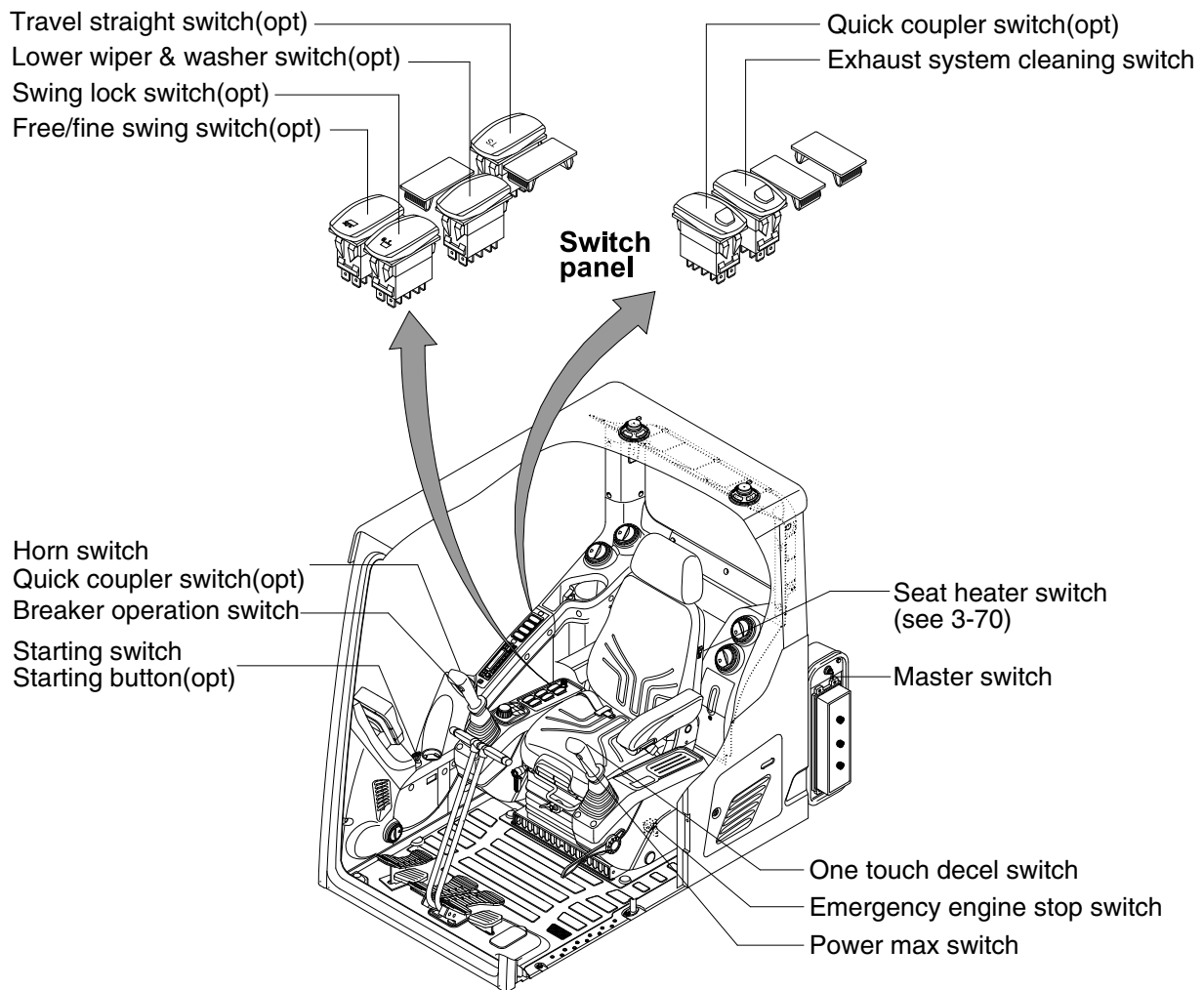
- ② When operating defroster, FRESH AIR/AIR RECIRCULATION switch turns to FRESH AIR mode and air conditioner switch turns ON.

### (10) Self diagnosis function

- ① Diagnostic methods : Diagnostic information window, select
- ② Diagnostic indication (Displays fault)

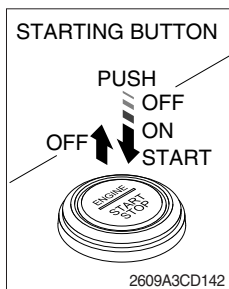
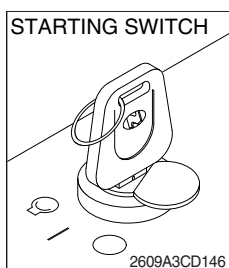
Fault code	Description	Fail safe function
F01	Ambient temperature sensor open	20°C alternate value control
F02	Ambient temperature sensor short	
F03	Cab inside temperature sensor open	25°C alternate value control
F04	Cab inside temperature sensor short	
F05	Evaporate temperature sensor open	0°C alternate 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



210A3CD02B

#### 1) STARTING SWITCH & STARTING BUTTON (OPT)



Starting button with smart key tag (opt)

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

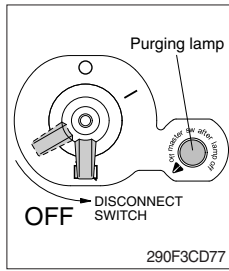
- ○ (OFF) : No of electrical circuits activate.
- | (ON) : All the systems of machine operate.
- ○ (START) : Use when starting the engine.

Release key immediately after starting.

- ※ If you turn ON the starting switch in cold weather, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature. Start the engine in 1~2 minutes after turning ON the starting switch. More time may be required according to ambient temperature.
- ※ Starting switch controller tries engine starting at least 3 seconds even if switch is released after driver's start trial (key switch : start position / starting button : long push) to prevent short-time cranking (which can not starting engine). If no-start conditions (unlock safety knob) are resolved (lock safety knob) during the 3 seconds of engine starting attempt, engine can be started.
- ※ Key must be in the ON position with engine running to maintain electrical and hydraulic function and prevent serious machine damage.

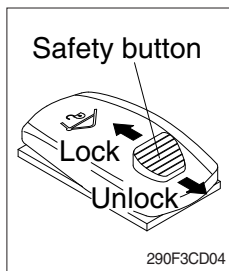


## 2) MASTER SWITCH



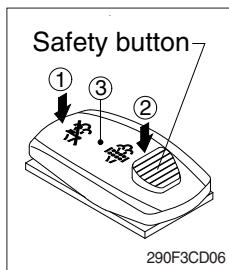
- (1) This switch is used to shut off the entire electrical system.
- (2) I : The battery remains connected to the electrical system.  
O : The battery is disconnected from the electrical system.
- ※ **Never turn the master switch to O (OFF) with the engine running. Engine and electrical system damage could result.**
- ※ **Turn OFF the master switch after purging lamp goes OFF.**

## 3) QUICK COUPLER SWITCH (option)



- (1) This switch is used to engage or disengage the moving hook on quick coupler.
- ※ **Refer to page 8-6 for details.**

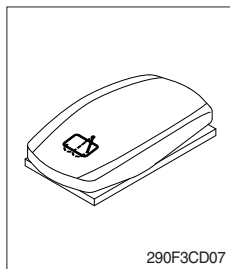
## 4) EXHAUST SYSTEM CLEANING SWITCH



- (1) This switch is used to select the exhaust system cleaning.
- (2) Inhibit position (①)**
  - ① The inhibit position disallows any automatic or manual exhaust system cleaning.
  - ② This may be used by operator to prevent exhaust system cleaning when the machine is operating in a hazardous environment and is concerned about high exhaust temperatures.
  - ③ It is strongly recommended that this position is only activated when high temperatures may cause a hazardous condition.
- (3) Auto position (③)**

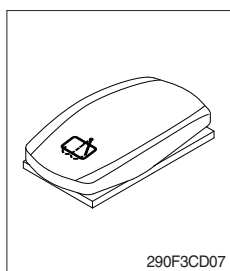
This position will initiate an automatic exhaust system cleaning.
- (4) Manual position (②)**
  - ① This position will only initiate a manual exhaust system cleaning when the machine is in non-mission condition, engine must run at low idle speed and exhaust system levels are high enough to allow cleaning.
  - ② HEST lamp will be illuminated during the entire exhaust system cleaning.
  - ※ **Refer to page 3-10 for details.**
  - ※ **This switch can be moved to the manual position (②) only when the safety button is pulled backward.**
  - ※ **Also, this switch returns to the auto position when released from the manual position (②).**

### 5) LOWER WIPER AND WASHER SWITCH (option)



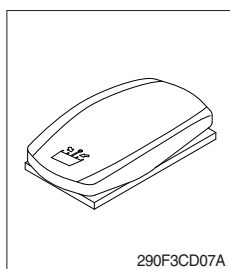
- (1) The washer fluid is sprayed and the wiper is operated only while pressing this switch.
- (2) The pilot lamp lights up when this switch is activated.

### 6) SWING LOCK SWITCH (option)



- (1) This switch is used to lock the swing parking brake.
- (2) Swing control is not available when this switch is activated.

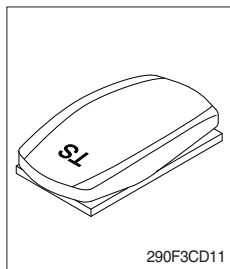
### 7) FINE SWING SWITCH (option)



- (1) When the switch is pressed to the ON position, the 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 the ON position, swing motion may become uncontrollable which could result in property damage, serious injury or death. Do not select ON position when the machine is operating on a slope.

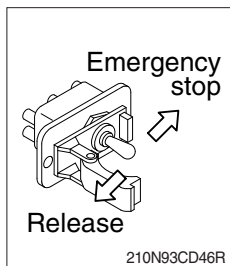


## 8) TRAVEL STRAIGHT SWITCH (option)



- (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.

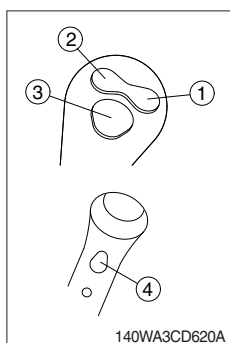
## 9) EMERGENCY ENGINE STOP SWITCH



- (1) This switch is used to stop the engine in the event of an emergency.  
 ※ **Be sure to return the emergency switch to the release or run position before trying to restart the engine.**

## 10) LH RCV LEVER SWITCH

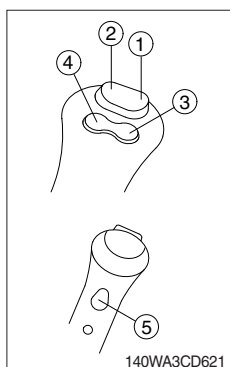
### (1) Button type



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

- ① None
  - ② None
  - ③ **One touch decel switch**
    - a. This switch is used to actuate the deceleration function quickly.
    - b. The engine speed is increased to previous setting value by pressing the switch again or operating state (working/travel).
  - ④ **Power max switch**
    - a. This switch activates power max function.  
 When this switch is pressed and held, hydraulic power of work equipment will be increased to approx 110 percent for a period of 8 seconds.
    - b. After 8 seconds, function is cancelled automatically even if the switch remains pressed.
- ※ **Do not use for craning purposes.**

### (2) Proportional type (option)

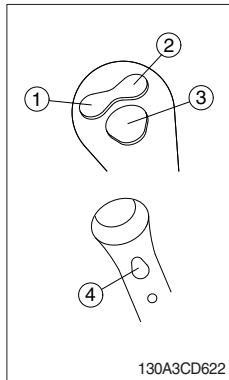


The switches on the LH RCV lever is function as below.

- ① **CW rotating switch**  
 When this switch is pressed, the clockwise rotating will operate.
- ② **CCW rotating switch**  
 When this switch is pressed, the counterclockwise rotating will operate.
- ③ **One touch decel switch** : Refer to (1)-③ above.
- ④ None.
- ⑤ **Power max switch** : Refer to (1)-④ above.

## 11) RH RCV LEVER SWITCH

### (1) Button type



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

① **Quick coupler switch**

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

**Refer to the page 8-6.**

② **None**

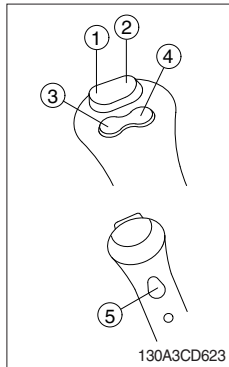
③ **Horn switch**

When this switch is pressed, the horn will sound.

④ **Breaker switch**

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

### (2) Proportional type (option)



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

① **2-way clamp switch**

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

② **2-way release switch**

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

③ **Quick coupler switch**

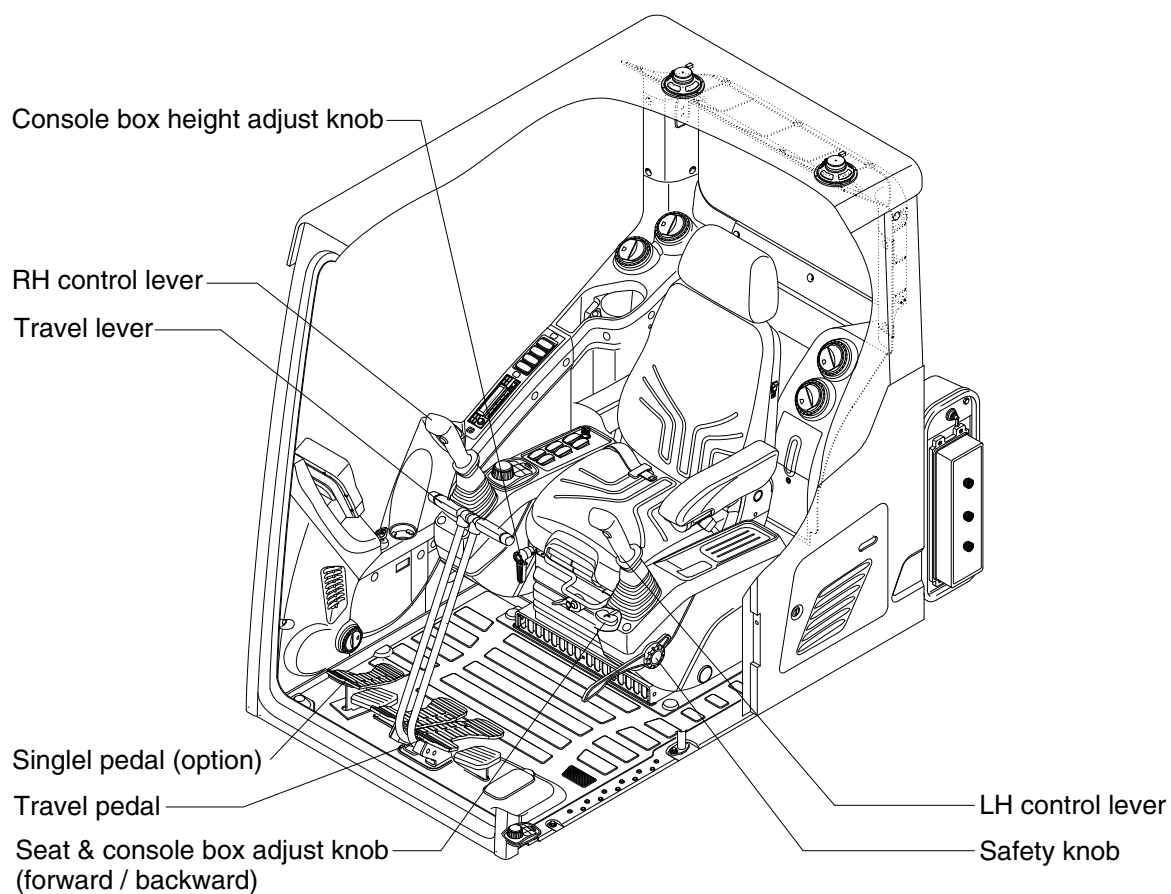
This switch is used to engage or disengage the moving hook on quick coupler.

**Refer to the page 8-6.**

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

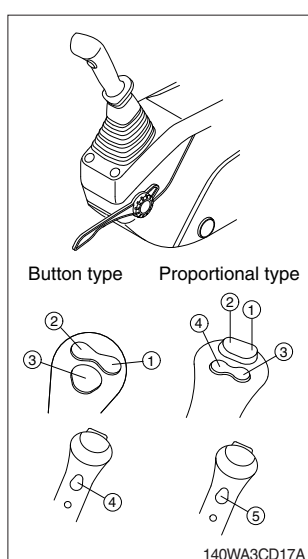
⑤ **Breaker switch : Refer to (1)-④ previous page.**

## 4. LEVERS AND PEDALS



220A3CD16

### 1) LH CONTROL LEVER



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

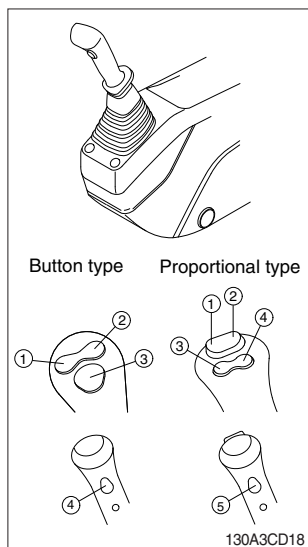
※ Refer to operation of working device in chapter 2 for details.

(2) The switch functions are as below.

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

※ Refer to page 3-44 for the details of the switch function.

## 2) RH CONTROL LEVER



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

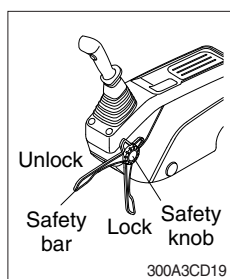
※ Refer to operation of working device in chapter 2 for details.

(2) The switch functions are as below.

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

※ Refer to page 3-45 for the details of the switch function.

## 3) SAFETY KNOB



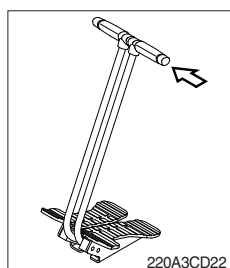
(1) All control levers and pedals are disabled from operation by locating the safety knob to the LOCK position as shown.

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

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

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

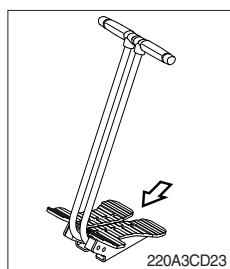
## 4) TRAVEL LEVER



(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 2 for details.

## 5) TRAVEL PEDAL

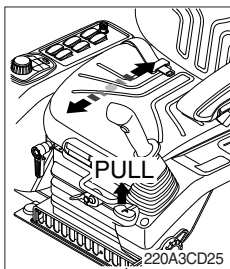


(1) This pedal is used to move the machine forward or backward.

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

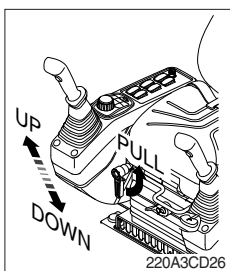
(3) Refer to traveling of machine in chapter 2 for details.

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



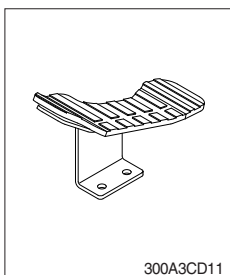
- (1) This knob is used to move the seat and console box to fit the contours of the operator's body.
- (2) Pull the knob to adjust forward or backward over 150 mm (5.9").

#### 7) CONSOLE BOX (CONTROL LEVER) HEIGHT ADJUST KNOB



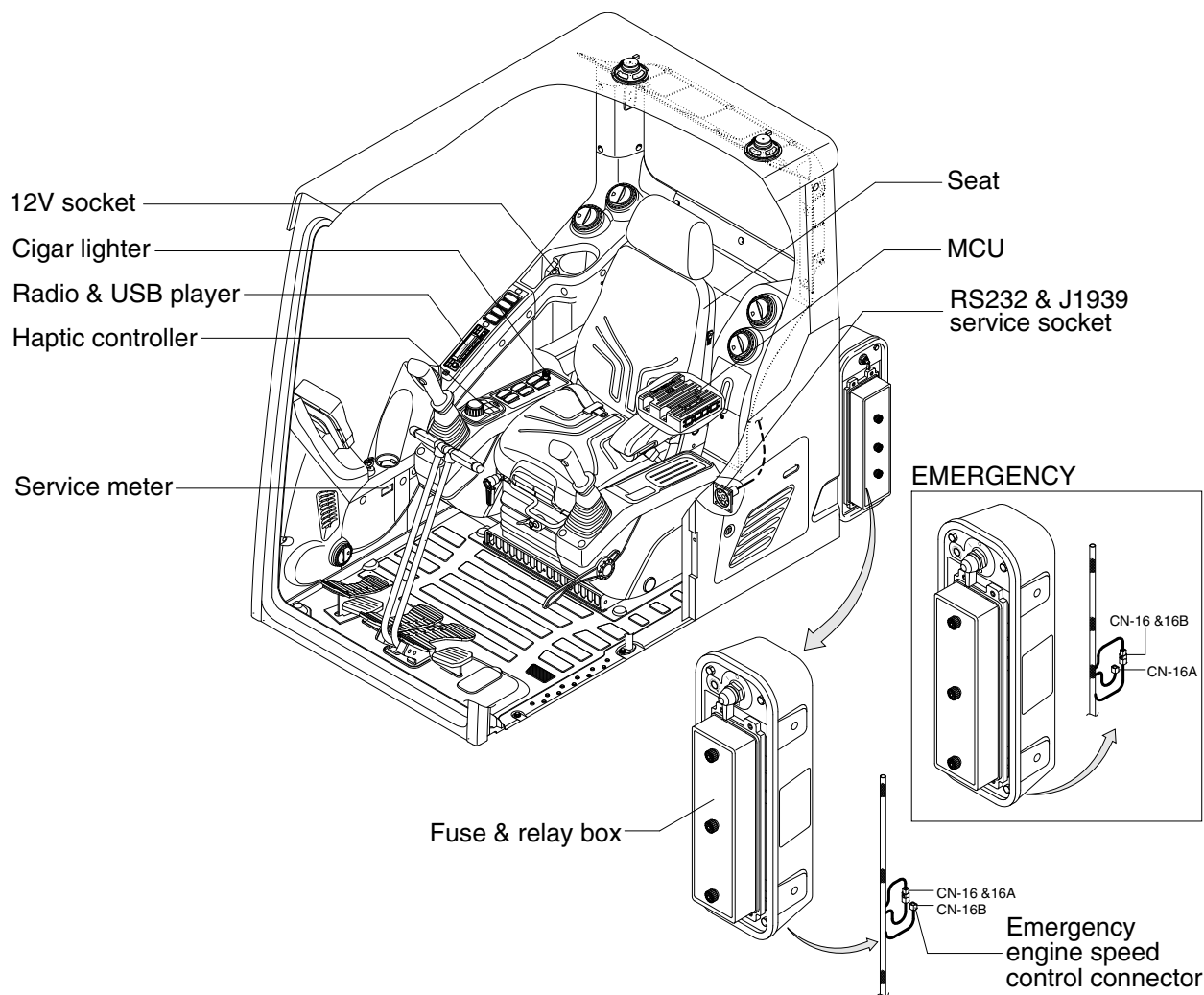
- (1) This knob is used to move the LH and RH control levers to fit the contours of the operator's body.
- (2) The control levers can be moved upward and downward at 45° over 80 mm (2.4").

#### 8) SINGLE PEDAL (option)



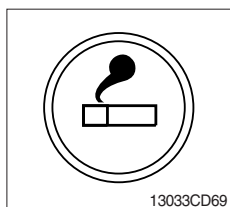
- (1) This pedal is used to operate the 2nd boom.
- (2) If the pedal is pushed front, the 2nd boom will be going down. And the pedal is pushed rear, the 2nd boom will be going up. Refer to operation of working device in chapter 2 for details.

## 5. OTHERS



220A3CD24

### 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. : -#0979)

### ■ WITH BLUETOOTH



9403CD100

### ■ FRONT PANEL PRESENTATION

















- |   |  |
|---|--|
| <p>1  ..... Power ON/OFF,<br/>Volume UP/DOWN button</p> <p>2  ..... Manual UP/DOWN Tuning,<br/>File search, SEL button</p> <p>3  ..... Mode button,<br/>Audio mute button</p> <p>4  ..... Call &amp; Pair button</p> <p>5  ..... Call end button</p> <p>6  ..... Station preset 1<br/>DIS ..... Display button</p> <p>7  ..... Station preset 2</p> <p>8  ..... Station preset 3<br/>RPT ..... Repeat play button</p> <p>9  ..... Station preset 4<br/>RDM ..... Random play button</p> | <p>10  ..... Station preset 5<br/>DIR- ..... Directory down button</p> <p>11  ..... Station preset 6<br/>DIR+ ..... Directory up button</p> <p>12  ..... Scan play button (SCAN)<br/>Best station memory (BSM) button</p> <p>13  ..... Auto tune up, Seek up button</p> <p>14  ..... Auto tune down, Track down button</p> <p>15  ..... USB connector</p> <p>16  ..... AUX IN Jack</p> <p>17  ..... MIC hole</p> |
|---|--|

## ■ WITHOUT BLUETOOTH



9403CD101

## ■ FRONT PANEL PRESENTATION

- |  |   |
|--|---|
| <p>1  ..... Power ON/OFF,<br/>Volume UP/DOWN button</p> <p>2  ..... Manual UP/DOWN Tuning,<br/>File search, SEL button</p> <p>3  ..... Mode button,<br/>Audio mute button</p> <p>4  ..... Radio seek up button</p> <p>5  ..... Radio seek down button</p> <p>6  ..... Station preset 1<br/>DIS ..... Display button</p> <p>7  ..... Station preset 2</p> <p>8  ..... Station preset 3<br/>RPT ..... Repeat play button</p> <p>9  ..... Station preset 4<br/>RDM ..... Random play button</p> | <p>10  ..... Station preset 5<br/>DIR- ..... Directory down button</p> <p>11  ..... Station preset 6<br/>DIR+ ..... Directory up button</p> <p>12  ..... Scan play button (SCAN)<br/>Best station memory (BSM) button</p> <p>13  ..... Track up button</p> <p>14  ..... Track down button</p> <p>15  ..... USB connector</p> <p>16  ..... AUX IN Jack</p> |
|--|---|



## ■ GENERAL

### (1) Power and volume button



#### ① Power ON / OFF button

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

#### ② Volume UP/DOWN control knob

Turn VOL knob (1) right to increase the volume level.

Turn VOL knob (1) left to decrease the volume.

After 5 seconds the display will return to the previous display mode.

#### ③ Initial volume level set up

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

Then turn button (1) right or left to set the volume level as the I-VOL level.

#### ④ Clock ON/OFF control

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

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

#### ⑤ Clock adjustment

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

## (2) Menu Selection



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

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

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

### ② Bass control

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

### ③ Treble control

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

### ④ Balance control

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

### ⑤ Fader control

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

### ⑥ EQ control

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

EQ OFF → CLASSIC → POP → ROCK → JAZZ

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

#### ⑦ Loud control

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

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

#### ⑧ Beep control

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

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

#### (3) Mute control

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

#### (4) Mode selection

- ① Repeat press MODE button (3) to switch between FM1, FM2, AM, USB, AUX, BT MUSIC.
- ※ If there is no USB, AUX, Bluetooth Phone connected, it would not display USB, AUX, BT when you press button (3).

## ■ RADIO

### (1) Mode button



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

### (2) Manual tuning button



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

### (3) Auto tuning button



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



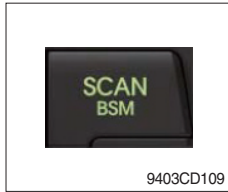
### (4) Station preset button



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

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

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



① Press BSM button (12) momentarily to scan the 6 preset stations stored in the selected band. When you hear your desired station, press it again to listen to it.

Press BSM button (12) for longer than 2 seconds to activate the Best Station Memory feature which will automatically scan and enter each station into memory.

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

## ■USB PLAYER

### (1) USB playback



- ① The unit was equipped with a front USB jack and also a rear USB Jack.

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

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

### (2) Track Up / Down button



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



### (3) MP3 directory / File searching



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

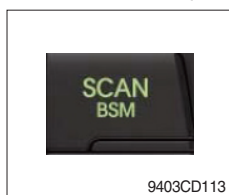
### (4) Directory Up / Down button



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

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

#### (5) Track Scan Play (SCAN) button



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

#### (6) Track Repeat Play (RPT) button



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

#### (7) Track Random Play (RDM) button



- RANDOM playback : Simply press RDM (9) button to play the tracks in the device in a random sequence.
- RANDOM folder : Press and hold RDM button for longer than 2 seconds to randomly play the tracks in the current folder.
- RANDOM off : Simply press it again to cancel RANDOM feature.

#### (8) ID3 v2 (DISP)



- ① While a MP3 file is playing, press DISP button (6) to display ID3 information. Repeat push DISP button (6) to show directory name / file name and album name / performer / title.

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

#### \* USB Information and Notice

- 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.
- Display up to 32 characters in the LCD display.
- No support any of MULTI-CARD Reader.
- No high speed playback but only playing with normal full speed.

※ DRM files in the USB may cause malfunction to playback in the radio unit.

※ In temperatures below -10°C (14°F), the audio unit with USB hook up may be affected and not play well.

## ■AUX OPERATION

It is possible to connect your portable media player to the audio system for playback of the audio tracks via the cab speakers.

To get the best results when connecting the portable media to the audio system, follow these steps :

- Use a 3.5 mm stereo plug cable to connect the media player headphone socket at each end as follows.
- Adjust the portable media player to approximately 3/4 volume and start playback.
- Press the MODE button (3) on the audio unit to change into AUX mode.
- The volume and tone can now be adjusted on the audio unit to the desired level.

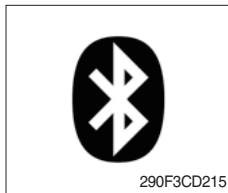
- ※ The audio quality of your media player and the audio tracks on it may not be of the same sound quality as the audio system is CD Player.
- ※ If the sound of the media player is too low compared with the radio or CD, increase the volume of the player.
- ※ If the sound of the media player is too loud and/or distorted, decrease the volume of the player.
- ※ When in AUX mode, only the Volume, Bass, Treble, EQ and Mode functions of the audio unit can be used.



## ■BLUETOOTH (if equipped)

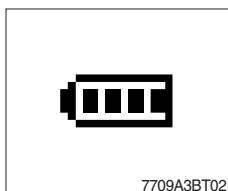
### (1) Using a bluetooth wireless connection

- ① Your audio unit supports bluetooth wireless technology. You can set up a wireless link with bluetooth cellular phone.
  - ② Continue to pair the cellular phone with the audio unit. Within a few moments the two should be able to connect.
- ※ Since this audio unit is on standby to connect with your cellular phone via bluetooth wireless technology, using this audio unit without running the engine can result in battery drainage.
  - ※ This audio units phone call reception is on standby when ignition switch is set to ACC OFF or ON.
  - ※ The line-of-sight distance between this audio unit and your cellular phone must be 10 meters or less for sending and receiving voice and data via bluetooth wireless technology. However the transmission distance may become shorter than the estimated distance depending on the environment where it is being used.
  - ※ Digital Noise & Echo suppression system provides the best sound clarity with little or no distortion (Echo & side tone will happen depending on cellular phone or service network).
  - ※ To ensure the quality of calling, you should select a proper bluetooth VR level. This audio unit is already equipped with the best bluetooth VR level.



#### a. Bluetooth icon

It will blink while establishing the bluetooth pairing.  
It will light up after a bluetooth device connected.



#### b. Battery icon

It indicates the battery status of the connected bluetooth device.



#### c. Single strength icon

It indicates the signal strength of the connected bluetooth device.

## (2) Pairing in hands free modes



- ① Press and hold CALL button (4) for 2 seconds until you hear beep sound, then PAIR STR will appear on the display.
- ② For the next procedure, go to cellular phone pairing mode.
- ③ If it is in pairing status with audio unit and cellular phone, PAIRING will show on the display.
- ④ If you want to exit pairing mode, press CALL END button (5) briefly while pairing, then it will show PAIR CLR on the display.
- ⑤ Bluetooth Icon and PAIR OK appear on the display when pairing is successful.

## (3) Cellular phone pairing mode

- ① Browse your cellular phone menu and find the connectivity or bluetooth connection section.
  - ② Select search for a new handsfree device function and allow the phone to find the mobile.
  - ③ HYUNDAI should appear on your cellular phone screen.
  - ④ Press connect menu among the handsfree option on your cellular phone.
  - ⑤ The cellular phone should prompt for a pin code. Insert the pin code 1234.
  - ⑥ The cellular phone should confirm that it has established a new paired connection.
  - ⑦ Close the menu. The pairing is now completed. It appears PAIR FAIL on the display for 3 seconds.
- ※ Each cellular phone type has distinct phone menu so you may need to refer to your manufactures instruction for the correct procedure on how to connect a new bluetooth device.
  - ※ Please retry the pairing instruction if HYUNDAI does not appear on the cellular phone screen.
  - ※ Please select authorized, if there is authorized menu in the menu of bluetooth connection in your cellular phone.
  - ※ Once the bluetooth pairing is completed between your cellular phone and this audio unit, both units will be automatically recognized on its paring like when you turn on the key in your car even though the audio unit is turned off.
  - ※ This audio unit can store up to 6 phones pairings. If the memory is full, the first stored paired phone will be deleted.
  - ※ The connecting priority will be given to the last connected cellular phone.
  - ※ If you want to change the connecting priority, try to connect this audio unit from the cellular phone you want.

#### (4) Bluetooth connection and disconnection

- ① When established bluetooth connection is made between this audio unit and the cellular phone, bluetooth icon on the display appears and then the display shows HF/AV CONN when handsfree & AV profile is connected.



- ② To disconnect bluetooth link  
Press and hold CALL END button (5) for 2 seconds, it shows DIS CON and bluetooth Icon disappears on the display.



- ③ To connect bluetooth link  
Press CALL button (4) briefly, it blinks bluetooth Icon on the display while bluetooth is being connected. If the connection is completed, bluetooth Icon displays on the display.

※ When your cellular phone battery is at low charge, the bluetooth connection may occasionally be lost. To maintain good connectivity ensure that your phone battery is adequately charged.

※ In case of failure of bluetooth pairing :

- Delete item in paired list on your phone.
- Reset both phone by power off/on and the audio unit by ACC off/on.

※ Connecting priority of handsfree profile is higher than headset profile.

※ The headset mode does not support caller ID, reject call and call Transfer.

#### (5) Using the audio unit as a handsfree device

- ① When the audio unit is ringing, it shows CALL and follows with the phone number \*\*\*\*\* on the display.



- ② To accept call  
Press CALL button (4), ANSWER CALL followed by TALKING will show in the display.

- ③ To end call  
To end call, press CALL END button (5), REJECT appears on the display.

※ If reject call is activated in your phone, then your cellular phone does not support reject call function.

#### (6) Audio transfer between the audio unit and phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.



- ① Press CALL button (4) briefly during conversation, it appears CALL TRANS on the display. To switch back to the audio unit, press button (4) briefly during private conversation, then it appears CALL TRANS on the display again.

※ This function will be a cause of disconnection of bluetooth link in some nokia phones, but do not worry, just press button (4) during private conversation, then switch back to the audio unit automatically.

※ The quality of calling between cellular phone and audio unit is better than calling between one audio unit and another one.

#### (7) Last call number dialing



- ① Press CALL button (4) briefly, it appears CALL TO on the display, then simply press CALL button once again, it would make the last call with phone number displayed on LCD.

If Reject call is activated in your phone, then your cellular phone does not support Reject Call function.

※ If you are using SAMSUNG phone, then you may need to press send button once more. With the first press of button it should show contact list in your phone, then if you press again you should be ready to make the last call.

#### (8) To make a call by cellular phone

The audio transfer function is for switching the call from the audio unit to the cellular phone for private conversation.

- ① The audio unit will be activated automatically when you make a call with cellular phone.
- ② When you make a call processing by cellular phone, it shows CALLING on the display.
- ③ When you receive a call, the phone number \*\*\*\*\* appears on the display.

#### **(9) Using the audio unit as bluetooth music**

The audio unit supports A2DP (Audio Advanced Distribution Profile) and AVRCP (Audio Video Remote Control Profile), and both profiles are available to listen music at the audio unit via cellular phone which is supporting the two profiles above.

- ① To play music, search the menu on your cellular phone as below :  
i.e : Menu→ File manager→ Music→ Option→ Play via bluetooth.  
It appears BT MP3 on the display.
  - ② During BT MP3 playing, you could select the previous or next track by pressing SEEK up or TRACK down button on audio unit or operate via your cellular phone.
  - ③ To stop music, press button (5) briefly and it will automatically switch into the previous mode.
  - ④ To resume music playing, press the play button on your cellular phone.
- ※ This function may be different depending on cellular phone. Please follow the cellular phone menu. Some types of phones need to pair once more for bluetooth MP3 connection.
  - ※ This function will be caused to disconnect A2DP, AVRCP depends on cellular phone.
  - ※ Information about songs (e.g.: the elapsed playing time, song title, song index, etc.) cannot be displayed on this audio unit.

## ■ RESET AND PRECAUTIONS

### (1) Reset function

Interfering noise or abnormal compressed files in the MP3 disc or USB instrument may cause intermittent operation (or unit frozen/locking up). It is strongly recommended to use appropriate USB storage to not cause any malfunction to the audio unit. In the unlikely event that the player fails to operate correctly, try to reset unit by any of following two methods.

① press and hold   simultaneously for about 5 seconds. (without Bluetooth)

② Press and hold   simultaneously for about 5 seconds. (with Bluetooth)

※ Take out the fuse for the audio system in the vehicle once and then plug it back in.

※ It will be necessary to re-enter the radio preset memories as these will have been erased when the microprocessor was reset.

After resetting the player, ensure all functions are operating correctly.

### (2) Precautions

When the inside of the cab is very cold and the player is used shortly after switching on the heater, moisture may form on the disc or the optical parts of the player and proper playback may not be possible.

If moisture forms on the optical parts of the player, do not use the player for about one hour. The condensation will disappear naturally allowing normal operation.

- ① Operation voltage : 9~32 volts DC, negative
- ② Output power : 40 watts maximum (20 watts x 2 channels)
- ③ Tuning range

Area	Band	Frequency range	Step
USA	FM	87.5~107.9 MHZ	200K
	AM	530~1710 KHZ	10K
EUROPE	FM	87.5~108.0 MHZ	50K
	AM	522~1620 KHZ	9K
ASIA	FM	87.5~108.0 MHZ	100K
	AM	531~1602 KHZ	9K
LATIN	FM	87.5~107.9 MHZ	100K
	AM	530~1710 KHZ	10K

#### ● AREA Selection :

- To select an area, press and hold related buttons at FM1 band for about 3 seconds.
- USA Area: Press and hold mode + 1DIS buttons for 3 seconds
- EUROPE Area: Press and hold mode + 2 buttons for 3 seconds
- ASIA Area: Press and hold mode + 3RPT buttons for 3 seconds
- LATIN Area: Press and hold mode + 4RDM buttons for 3 seconds.

- ④ USB version : USB 1.1
- ⑤ Bluetooth version : V2.1
- ⑥ Bluetooth supported profile :
  - A2DP : Advanced Audio Distribution Profile
  - AVRCP : Audio/Video Remote Control Profile
  - HFP : Hands-Free Profile

## 2) RADIO AND USB PLAYER (MACHINE SERIAL NO. : #0980-)

### ■ WITH BLUETOOTH



19A3RD02

- 1 USB port with cover : Open the cover and connect the USB storage device.
- 2 ENTER/AST button with tune dial.
- 3 Display window for play / reception / menu state and information.
- 4 POWER button with VOLUME dial : turns power on, mute function on/off or selects a menu item (press), control the volume level or menu item.
- 5 AUX port with cover : Open the cover and plugging the external audio device.
- 6 Call / call end button :
  - when a call comes in : accepts a call (press); rejects a call (press and hold)
  - during a call connection : ends a call (press) ; switches between hands-free and private call modes (press and hold)
  - in standby mode: opens call list (press) ; makes a call a recently connected number (press and hold)
- 7 BAND button : enters Radio mode or changes the radio band (press).
- 8 Preset button :
  - Radio: Recall each stored station (press) ; store each station (press and hold).
  - USB : changes playback mode (press 1 II, 2 RPT or 3 RDM buttons); shows available information about the current track (press 4 INFO button) ; move to folder down/up (press 5 D-/6 D+ buttons).
  - Bluetooth audio : pause/resume playback (press 1 II) ; shows information of the connected Bluetooth device (press 4 INFO button).
- 9 MODE button : selects USB, Bluetooth audio or AUX play mode (press).
- 10 MENU button : enters Menu setting mode or returns to the previous menu (press).

## ■ WITHOUT BLUETOOTH

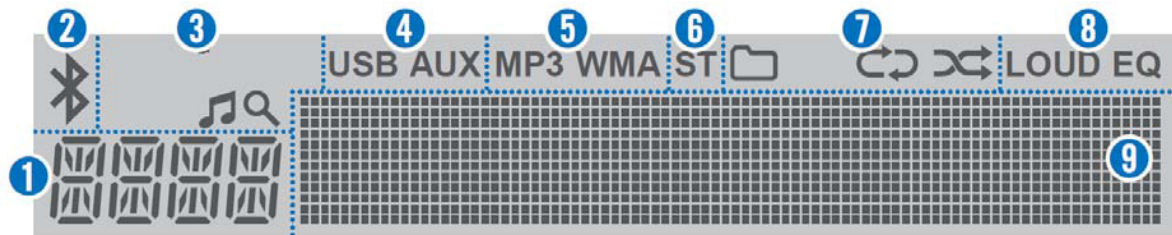


19A3RD01




- 1 USB port with cover : Open the cover and connect the USB storage device.
- 2 ENTER/AST button with tune dial.
- 3 Display window for play/reception/menu state and information.
- 4 POWER button with VOLUME dial : turns power on, mute function on/off or selects a menu item (press), control the volume level or menu item.
- 5 AUX port with cover : Open the cover and plugging the external audio device.
- 6 FM button : enters FM Radio mode.
- 7 AM button : enters AM Radio mode.
- 8 Preset button :
  - Radio : Recall each stored station (press) ; store each station (press and hold).
  - USB : changes playback mode (press 1 II, 2 RPT or 3 RDM buttons) ; shows available information about the current track (press 4 INFO button) ; move to folder down/up (press 5 D-/6 D+ buttons).
- 9 MODE button : selects USB or AUX play mode (press).
- 10 MENU button : enters Menu setting mode or returns to the previous menu (press).



## ■ DISPLAY WINDOW (LCD)

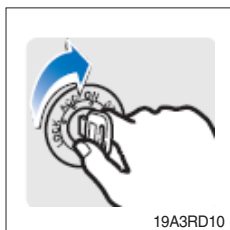


19A3RD03

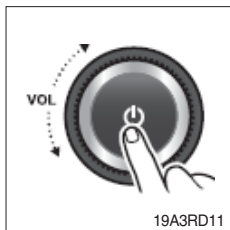
- |  |  |
|--|--|
| <p>1 Function display area for showing the function mode.</p> <p>2 Bluetooth indicator for the Bluetooth connection.</p> <p>3 Search indicator for USB play list.</p> <p>4 USB/AUX indicators for the USB or External device connection.</p> <p>5 MP3/WMA indicators for USB's Audio Stream detections.</p> <p>6 ST (Stereo) indicators for FM stereo reception.</p> | <p>7 Playback mode indicators for USB playback mode.</p> <p>  : Folder mode.<br/>  : Repeat playback.<br/>  : Random playback.         </p> <p>8 LOUD/EQ indicators for sound effect.</p> <p>LOUD : Loudness mode.</p> <p>EQ : EQ mode.</p> <p>9 Multi-function display area for showing the play, reception or menu information.</p> |
|--|--|

## ■ GENERAL

### (1) Power and volume button



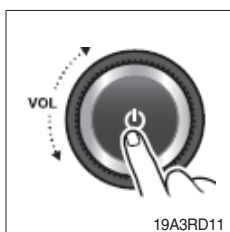
- ① Turn the starting switch to ON position.



- ② Press the POWER button to turn the power on.

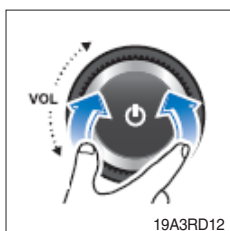
- If the source is ready, playback also starts.
- To turn on the power directly.

By connecting an USB into the USB port or pressing the BAND, MODE (while the USB is connected), you can also turn on the power and the unit then plays.



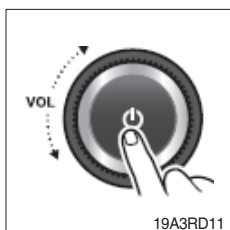
- ③ When power is on, press and hold the POWER button to turn power off.

### (2) Adjusting volume directly



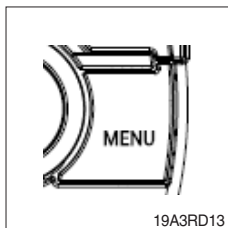
- ① Turn the VOLUME dial to control volume.
  - Available volume range : 00 (mute)~41.

### (3) Muting the sound quickly

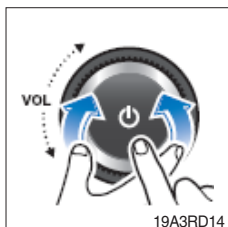


- ① Press the MUTE button to turn mute on.
  - "MUTE" will flash on the display and mute the sound.
  - Press the MUTE button again or turn VOLUME dial to restore sound.

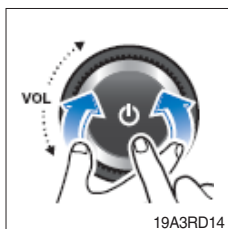
#### (4) Setting the sound



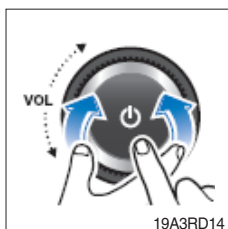
- ① Press MENU button to enter the Settings menu mode.
  - After entering MENU mode, press MENU button to return to the previous item.



- ② Turn VOLUME dial to select the "SOUND" or "EQUALIZER" as below, then press this dial.
  - SOUND : sets the sound mode.
  - EQUALIZER : selects the equalizer style.

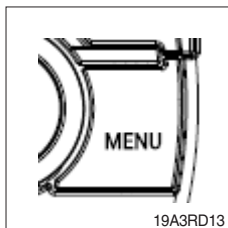


- ③ Turn VOLUME dial to select the desired Sound setting mode, then press this dial.
  - BASS : sets the bass sound level (-5~+5).
  - MIDDLE : sets the middle sound level (-5~+5).
  - TREBLE : sets the treble sound level (-5~+5).
  - BALANCE : sets the sound balance between the right and left speakers (LEFT 15~RIGHT 15).
  - EQUALIZER : selects the one of the 7 EQ styles (EQ OFF, POP, ROCK, COUNTRY, VOICE, JAZZ, CLASSIC).
  - PREVIOUS : Return to previous menu screen.

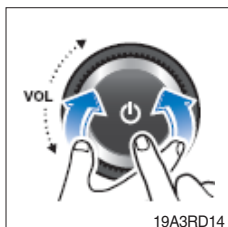


- ④ Turn VOLUME dial to adjust the value of the level, balance or style, then press this dial.

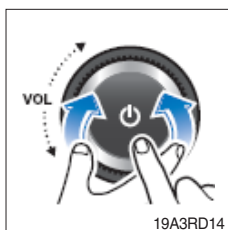
## (5) Setting the system functions



- ① Press MENU button to enter the Settings menu mode. Turn VOLUME dial to select "SYSTEM" as below, then press this dial.



- ② Turn the VOLUME dial to select the "BT ON/OFF", "SCROLL", "LOUD" or "BEEP" then press this dial.
- BT (Bluetooth) ON/OFF : activate (On) or deactivate (Off) the Bluetooth function. – (only ARA-9010HB).
  - SCROLL : activate (On) or deactivate (Off) the text scroll feature for LCD display screen.
  - LOUD : activate (On) or deactivate (Off) the loudness sound effect.
  - BEEP : activate (On) or deactivate (Off) the beep sound feature.
  - PREVIOUS : Return to previous menu screen.

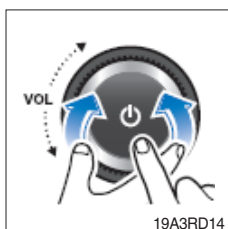


- ③ Turn VOLUME dial to select ON or OFF, then press this dial.

## (6) Setting the region



- ① Press MENU button to enter the Settings menu mode. Turn VOLUME dial to select "AREA" as below, then press this dial.
- AREA : sets the region for radio.



- ② Turn the VOLUME dial to select the desired area as below, then press this dial.
- If the region setting is not selected correctly to your country or region, the radio reception can not be received. Retry the setting the region of radio reception correctly.
  - The region setting is required only for the first time.

- **ASIA/M.East**

FM : 87.5~108.0 MHz (100 kHz step)

AM : 531~1,602 kHz (9 kHz step)

- **AMERICA**

FM : 87.5~107.9 MHz (200 kHz step)

AM : 530~1,710 kHz (10 kHz step)

- **LATIN**

FM : 87.5~108.0 MHz (100 kHz step)

AM : 530~1,710 kHz (10 kHz step)

- **EUROPE**

FM : 87.5~108.0 MHz (50 kHz step)

AM : 531~1,620 kHz (9 kHz step)

- **JAPAN**

FM : 76~90 MHz (100 kHz step)

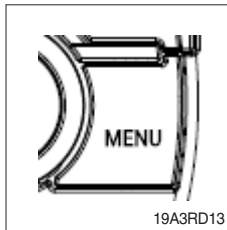
AM : 522~1,629 kHz (9 kHz step)

- **Russia (OIRT)**

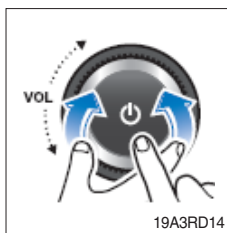
FM : 65.0~74.0 MHz (30 kHz step)

AM : 522~1,602 kHz (9 kHz step)

## (7) Checking/updating the system Software

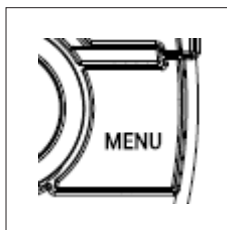


- ① Press MENU button to enter the Settings menu mode. Turn VOLUME dial to select "SOFTWARE" as below, then press this dial.
  - SOFTWARE : check/update the system software.

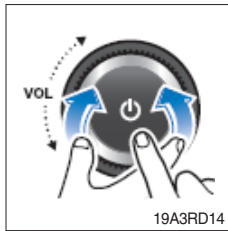


- ② To check the system software, turn the VOLUME dial to select the "VERSION CHECK", then press this dial.
- ③ To update the system software, turn the VOLUME dial to select the "UPDATE", then press this dial.
  - Download the latest system software to a USB device for update to this unit, then open the cover and plug the USB device to the USB port.
  - Perform update with the start switch "ON" when the battery is sufficiently charged by driving the vehicle. When the battery is discharged while updating, the system may get damaged with the update stopped.

## (8) Setting the Bluetooth mode (only ARA-9010HB)



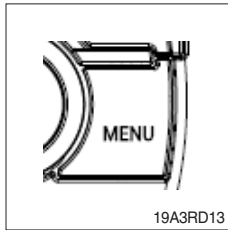
- ① Press MENU button to enter the Settings menu mode. Turn VOLUME dial to select "BLUETOOTH" as below, then press this dial.
  - Bluetooth: Bluetooth setting mode.



- ② Turn VOLUME dial to select the desired Bluetooth setting mode, then press this dial.
  - PAIR : register a Bluetooth device.
  - SELECT : selects/connects a device from registered Bluetooth devices.
  - DELETE : removes a device from registered Bluetooth device.
  - MIC VOL : adjusts the Bluetooth microphone.
  - H/F VOL : adjusts the Bluetooth hands-free volume.
  - Phone Book : activates/deactivates the phone book download feature from connected device.
  - BT INFO : shows the Bluetooth information of this system.
  - PREVIOUS : returns to previous menu screen.
- ③ To change the connected Bluetooth device, turn the VOLUME dial to select the "SELECT", then press this dial. Turn the VOLUME dial to select the desired device list, then press this dial.
- ④ To delete the Bluetooth device, turn the VOLUME dial to select the "DELETE", then press this dial. Turn the VOLUME dial to select the desired device list, then press this dial.
  - If the currently connected device is delete, this unit attempts to connect with the following priority Bluetooth device automatically.
- ⑤ To adjust the Bluetooth microphone initial volume, turn the VOLUME dial to select the "MIC VOL", then press this dial. Turn the VOLUME dial to set desired Bluetooth microphone initial volume level, then press this dial.
  - The default setting is 3, the volume range is 1~5.
- ⑥ To adjust the Bluetooth hands-free initial volume, turn the VOLUME dial to select the "H/F VOL", then press this dial. Turn the VOLUME dial to set desired Bluetooth hands-free initial volume level, then press this dial.
  - The default setting is 15, the volume range is 6~32.
- ⑦ To download the phone book, turn the VOLUME dial to select the "phone book", then press this dial. Turn the VOLUME dial to select the "ENABLE", then press this dial.
  - The phone book can download up to 1,000 phone numbers.

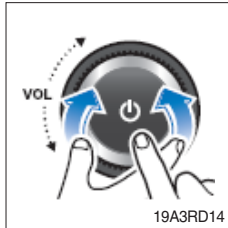
## ■ BLUETOOTH

### (1) Pairing/Connecting your device




- ① Firstly, set up the Bluetooth device to be connected from the Bluetooth settings menu to enable other devices to search for the Bluetooth device.

Press MENU button to enter the Menu settings mode.





- ② Turn VOLUME dial to select the "BLUETOOTH" as below, then press this dial.

- ③ Turn the VOLUME dial to select the "PAIR", then press this dial.

- When you first register, appear the "BT Pairing" on the display window, then search the Bluetooth devices for connection.
- If a Bluetooth device is not connected, press and hold the  button to enter the pairing mode directly.

- ④ Search and select device "Device Name" in your Bluetooth device, then confirm.

- The Bluetooth registration standby proceeds for 1 minute. If the registration is failed during 1minute, restart over from the beginning.
- After a while, the Bluetooth device is automatically registered. When pairing is successful, the "Connected" and "Device name" will be displayed 3 seconds.
- When your Bluetooth device is connected,  appear on the display.
- If the Bluetooth device is disconnected,  disappear.

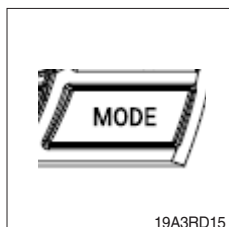
- ⑤ Repeat items 1~4 to register to add another Bluetooth device.


- Up to 5 devices can be paired to this unit.
- The last device connected to this unit is set to automatically connect to the highest priority.

## (2) Playing the Bluetooth music

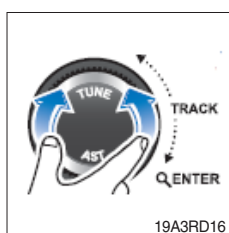
To play Bluetooth music

- ※ A2DP (Advanced Audio Distribution Profile) : This function only operates with Bluetooth devices that support A2DP version 1.2 or above.
- ※ Should be set to Stereo Headset in Bluetooth device type menu of your device

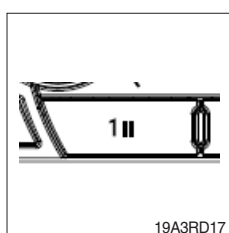


- ① Press the MODE button repeatedly to select the BT Audio mode. Appears  on display window and start playback.
  - If a Bluetooth device is not connected, you can not select.
  - If music is not yet playing from your mobile device after switching to Bluetooth Music (streaming audio) mode or after pressing Play on the mobile device itself, try to start music playback by pressing the Play button again.
  - The output music playback from Bluetooth devices with this unit.
  - There will be music playback automatically play upon entering since once played. It stops automatically when you exit from the music.
  - You can also phone or Bluetooth device other than the home screen mode, Bluetooth music play mode when entering and exiting, the device does not play automatically.

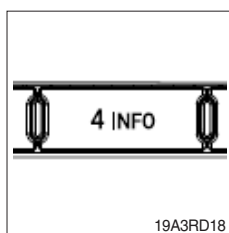
## (3) Controlling the playback



- ① While playing, turn the TUNE/TRACK dial to moves to the previous or next track.
  - Clockwise : move to the next file.
  - Counter-clockwise : move to beginning of the current file or previous file.



- ② While playing, press the [1 II] button to pause the track with "PAUSE" indicator.
  - Press this button again to play the current track.



- ③ Press the [4 INFO] button to check the information of current connected device.
  - About the music files are not displayed.
  - During Bluetooth music playback, do not operate the music changes too quickly. Allow enough time for the machine-to-machine communication.



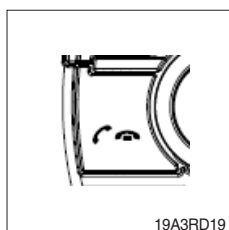
#### (4) Answering a call

- ※ When a call comes in, the audio source is muted, and display the call information with ring tone.
- ※ If the phonebook is not downloaded, only incoming phone number is displayed without the caller information.

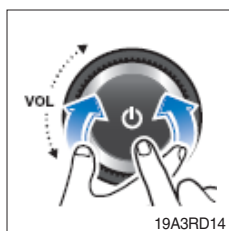


- ① To answer a call, press the button or to reject a call press and hold the button.
  - When a call comes in, the audio source is muted.
  - When a call is ended, this unit returns to the previous state media playback.

#### (5) Making a call from recent number

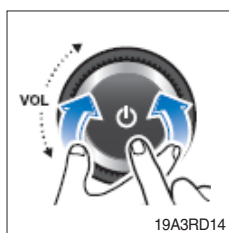


- ① To call the recent connected number, press the button to display recent call number.
  - The recent calls list is displayed. Turn the VOLUME dial to select a recent call number, then press this dial to make a call.
  - The recent calls list displays up to 10.



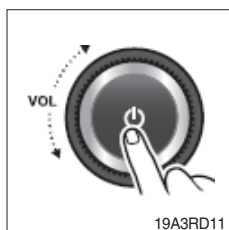
- ② To call the last connected number directly, press and hold the button.

#### (6) During a call ...



- ① To adjust the a call volume, turn the VOLUME dial.
  - The call volume works with Bluetooth devices, and operates separately from the volume of this unit.

- ② To deactivate the microphone, press the POWER button.

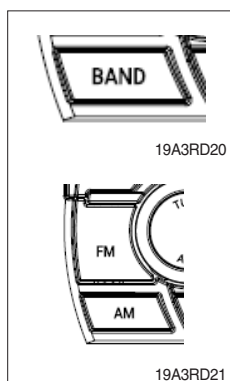


- ③ To switch from hands-free mode to the phone handset mode, press and hold the button.  
To returns the phone conversation to hands-free mode, press and hold the button.

- ④ To end a call, press the button.
  - • End a call, then return to the playing state.

## ■ RADIO

### (1) Tuning in a radio station

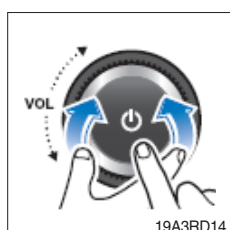


① Press the BAND or FM/AM button repeatedly to enter the radio band in order of FM1, FM2, FMA, AM1, AM2 or AMA.

- You can select the FM1, FM2, FMA or AM1, AM2, AMA radio band.

While the Auto Store stations(AST) are stored, you can select the AMA or FMA band by additional.

- The previously chosen broadcasting station will be received.

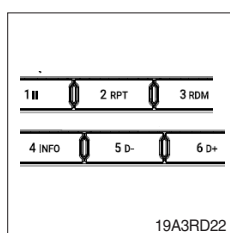


② Turn the TUNE/TRACK dial to select the station.

- Briefly turn this dial, plays previous/next frequency.
- Turn and hold this dial, automatically search for station with superior reception.
- Press this dial, starting from the current station, stations with superior reception are scanned for 5 seconds and the previous station is restored. During the seeking or scanning, if press or turn the dial left/right again, the selected station will begin playing.
- During the FM reception, the Stereo [ST] indicator is on.

### (2) Saving radio stations manually

※ You can save up to 6 preset channels each for FM1, FM2, AM1,AM and AM2 band. If change the stations while driving, use preset button to prevent accidents.



① Press the BAND or FM/AM button repeatedly to select the band.

② After selecting the frequency, press and hold the PRESET [1II]~[6 D+] button.

③ The frequency is saved to the selected preset button.

- A total of 24 frequencies with 6 preset frequencies each for FM1/FM2/AM1/AM2 modes can be saved.

### (3) Saving radio stations automatically

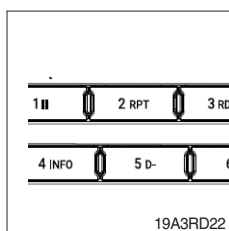
※ You can save up to 6 preset channels automatically each for FMA and AMA band.



- ① Press the BAND or FM/AM button repeatedly to enter the radio band.
  - The previously chosen broadcasting station will be received.
- ② Press and hold the AST button to automatically save receivable frequencies to Preset button.
  - Up to 6 stations can be stored in each of the FMA and AMA band.

### (4) Listening to a preset station

- ① Press the BAND or FM/AM button repeatedly to enter the radio band in order of FM1, FM2, FMA, AM1, AM2 or AMA.
  - You can select the FM1, FM2, FMA or AM1, AM2, AMA radio band.
  - While the Auto Store stations(AST) are stored, you can select the AMA or FMA band by additional.
  - The previously chosen broadcasting station will be received.



- ② Press the PRESET [1II]~[6 D+] button.
  - From the 6 presets, select the frequency you want to listen to.

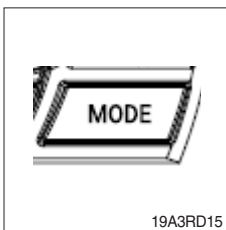
## ■ USB PLAYER

### (1) Playing an USB device



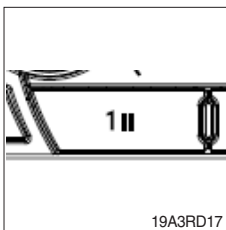
① Open the cover, plug the USB device(included MP3/WMA media file) to the USB port.

- Once a USB is connected, USB will automatically start playing from the first file within the USB.
- If a previously played USB is reconnected, then the file after the most recently played file is played.
- If a different USB is connected or the file information within the USB was changed, then the USB will start playing from the first song within the USB.



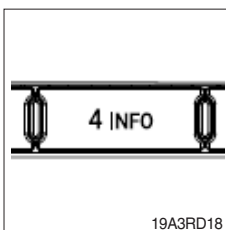
② When an USB device to be played is already connected, press the MODE button to play USB device.

- The previously selected file is played.



③ While playing, press the [1||] button to pause the file.

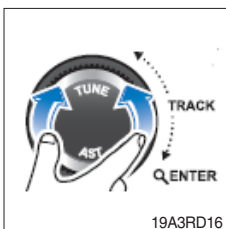
### (2) Changing the song information



① Press the [4 INFO] button repeatedly to display information about the file being played.

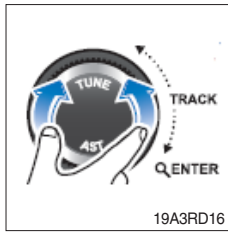
- The information displayed includes the file name, playing time, ID3 Tag or folder name information saved with the song.
- If there is no information on the playing file, the unit will display "NO INFO", and then file name.

### (3) Controlling the playback



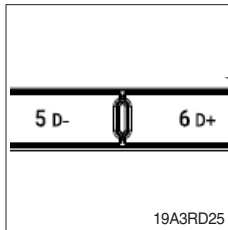
① While playing, turn the ►► | TRACK | ◀◀ dial left/right to moves to the previous or next track.

- Clockwise : move to the next file.
- Counter-clockwise : move to the previous file.



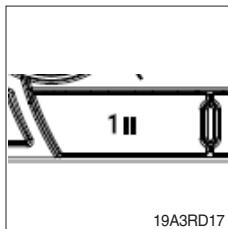
② While the ►►| TRACK |◀◀ dial is being turned and held, the file will rewind or fast forward at high speed. Once released, the file will begin playing at normal speed.

- Clockwise : fast forward.
- Counter-clockwise : fast rewind
- The search function works but search speed is not constant. While fast forwarding or rewinding, the playback sound is not output.



③ Press the [5 D-] or [6 D+] button to moves to the previous or next folder.

- [5 D-] press : move to previous folder.
- [6 D+] press : move to next folder.
- While folder moving, the folder name will be displayed briefly.



④ While playing, press the [1 II] button to pause the track.

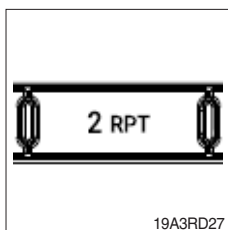
- Press the button again to play the current track.





④ To find the song you want to play directly, press the Q (Search) button.

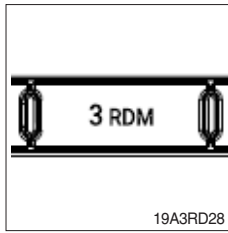
- Turn the ►►| TRACK |◀◀ dial to select the desired file name, then press this dial.




#### (4) Change the playback mode



① Press the [2 RPT] button to select the Repeat playback mode.

-  On : The current file plays repeatedly.
-  On : The current folder plays repeatedly.
- Off : Cancels repeat playback.



- ② Press the [3 RDM] button to select the Random playback mode.
-   On : All files of current folder play in random order.
  -  On : All files of USB device play in random order.
  - Off : Cancels random playback.

#### (5) Handling precautions for USB device

- The device will only recognize USB devices formatted in FAT 16/32. When formatting the external USB device, the device may not properly recognize a Byte/Sector selection other than 512 Bytes or 2,048 Bytes.
- The amount of time required to recognize the external USB device may differ depending on the type, size, or file formats stored on the USB. Such differences in the required time are not indications of malfunction. Please wait the period of time required to recognize the device.
- This unit can recognize maximum 9,999 files and 256 folders into the USB device.
- The device may not recognize the USB device if separately purchased USB hubs and extension cables are being used.
- The device may not support normal operation when using formats such as HDD Type, CF, or SD Memory.
- The device will not support files locked by DRM (Digital Rights Management).

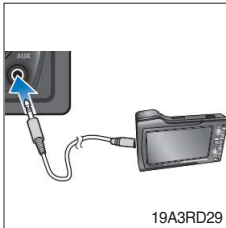
## ■ AUX PLAYER

### (1) Listening to auxiliary audio equipment

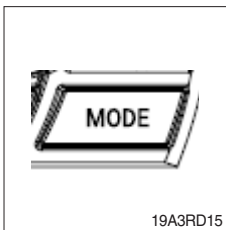
※ By connecting an optional portable audio device to the AUX input jack (stereo 3.5 pi) on the unit and then simply selecting the source, you can listen on your car speakers.



- ① Turn the VOLUME dial left to decrease the volume level.
  - The AUX volume can also be controlled separately through the connected device.



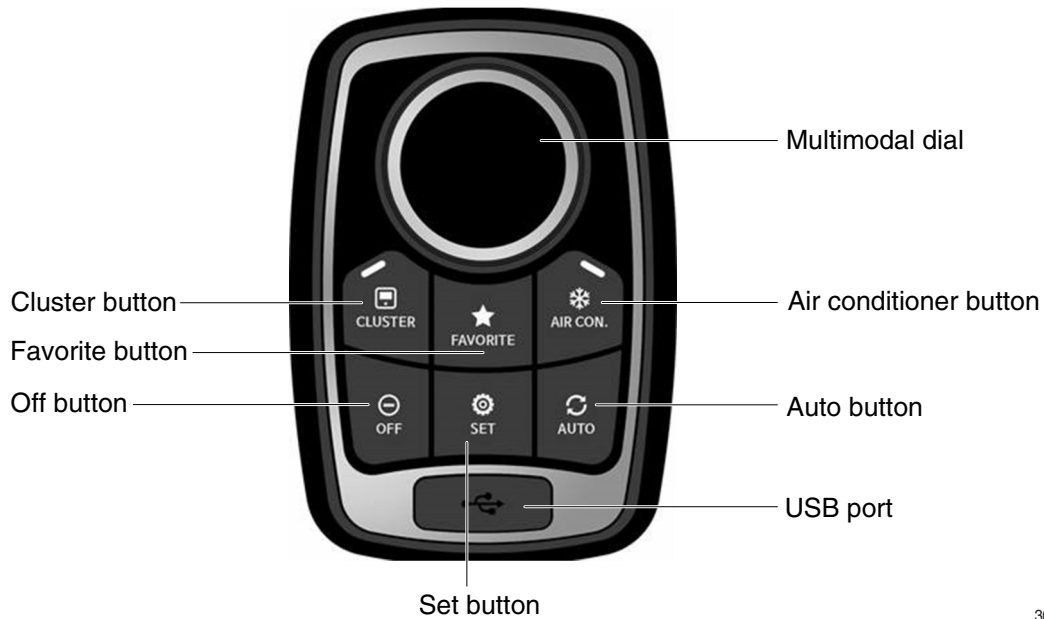
- ② Turn the external audio equipment off. Open the cover, connect the audio output of the external audio equipment to AUX input terminal on the unit.
- ③ Turn the external audio equipment on. Start playback of the external audio equipment at a moderate volume.



- ④ Press the MODE button repeatedly to select the AUX function.
- ⑤ Set your usual listening volume by turn the VOLUME dial left/right on the unit.
  - Once the connector is disconnected, the previous mode will be restored.
  - AUX mode can be used only when an external audio player has been connected.

### 3) JOG DIAL MODULE

The jog dial module consists of buttons, multimodal dial and USB port.

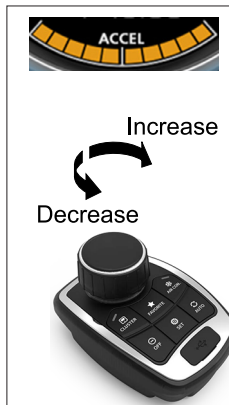


300A3CD150

#### (1) Multimodal dial

- Cluster interlocked mode OFF

##### ① Acceleration mode



300A3CD151

- There are 10 dial settings.
- 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
- ※ When the cluster button is clicked on the haptic panel, the engine rpm does not change even when the haptic dial is rotated.

#### (2) USB port



300A3CD152

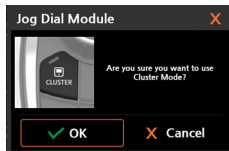
- ① This port updates firmware using a dedicated cable.
- ② Jog dial module has a built-in charging circuit supply max 500 mA current.



### (3) Cluster button



300A3CD153



160WA3CD02

- ① When you select this button, the pop-up appears to determine whether to use the cluster interlocked mode to prevent malfunctions.
  - If you press "OK" on the pop-up, the cluster interlocked mode will be turned on.
  - If you press "Cancel" on the pop-up, the Cluster interlocked mode will be turned off.
- ② In cluster interlocked mode, if you push the cluster button, jog dial module returns to previous mode.
- ③ Cluster interlocked mode ON : Blue lamp comes ON  
Cluster interlocked mode OFF : Blue lamp turns OFF

### (4) Air conditioner button



300A3CD154

- ① When you push this button, air conditioner system is operated.
- ② Determines whether or not to perform a cooling function of air conditioner.
  - Blue lamp ON : Air conditioner operation
  - Amber lamp ON : Fan only

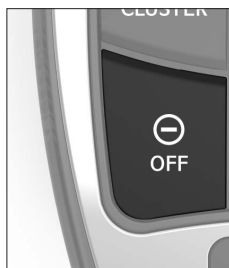
### (5) Set button



300A3CD155

- ① When you push this button, jog dial module executes air conditioner mode and displays air conditioner control mode in cluster.
- ② Air conditioner control mode will disappear when you push SET button again within 10 seconds or when you do not touch anything for more than 10 seconds.

### (6) OFF button



300A3CD156

- ① You can only use this button when the air conditioner system is operating.
- ② This button is only for air conditioner system off.

## (7) Auto button



300A3CD157

- ① This button controls the auto function of air conditioner and heater system ON/OFF.

※ Refer to the page 3-37 for the auto switch of the air conditioner.

## (8) Favorite button



300A3CD158

- ① When you push this button for 2 seconds, cluster screen is saved.

- ② Push this button, cluster screen that you saved is opened.

※ **Saveable screen** : Mode, Monitoring, Manage, Display, Utilities.

## (9) Cluster interlocked mode ON

### ① Cluster main menu



300A3CD160A

- 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



300A3CD161A

- You can move up and down the cluster sub menu.

### ③ Air conditioner menu



300A3CD162A

- You can move the menu of the air conditioner control mode.



#### ④ Slide choice menu



300A3CD163A

- You can increase or decrease the slide choice bar.

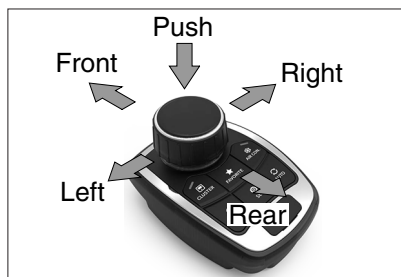
#### ⑤ Level choice menu



300A3CD164A

- You can increase or decrease the level choice bar.

#### ⑥ Push button



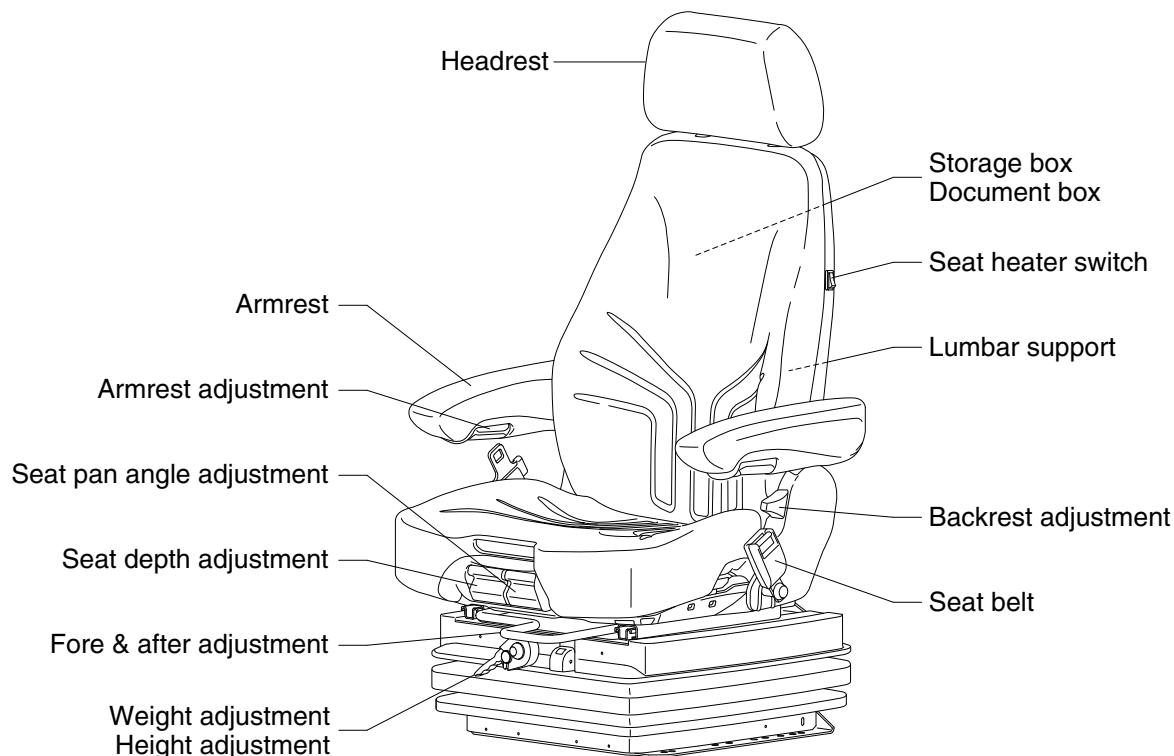
300A3CD165

- **Push** : Select the current menu or the pop-up warning lamp moves to the original position when warning lamp occurs.
- **Left** : ESC
- **Right** : CAM
- **Front** : Cluster main menu
- **Rear** : Return to acceleration mode

#### 4) SEAT (SUSPENSION, STD)

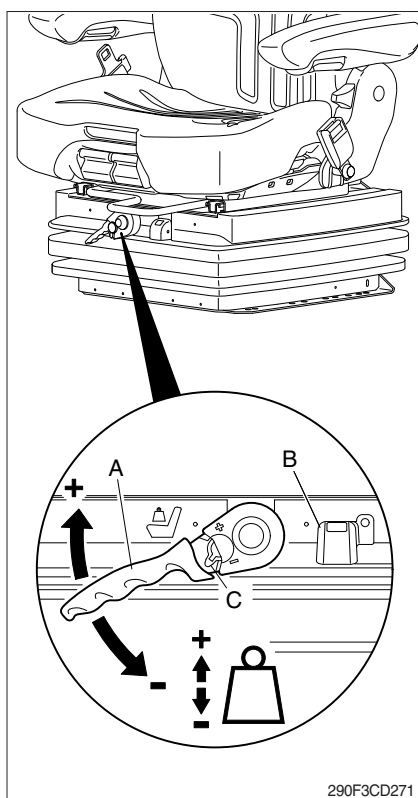
The seat is adjustable to fit the contours of the operator's body. It will reduce operator fatigue due to long work hours and enhance work efficiency.

※ The seat belt reminder warning lamp pops up and the buzzer sounds until seat belt is fastened.



290F3CD270

##### (1) Weight and height adjustment

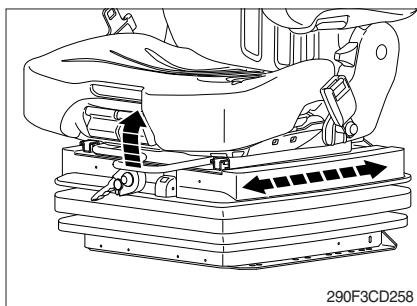


290F3CD271

##### 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 flipping the ratchet with the lever (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



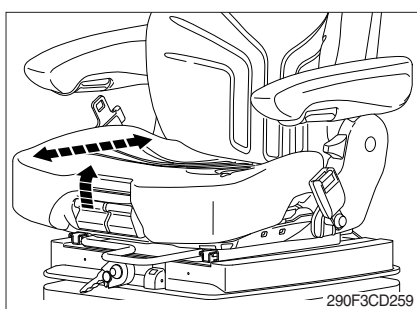
- ① The fore/after adjustment is released by lifting the locking lever.

**▲ Do not operate the locking lever while operating the machine.**

※ 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.

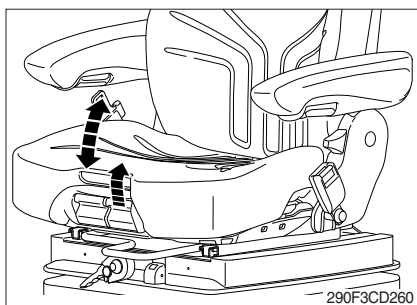
## (3) Seat depth adjustment



- 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.

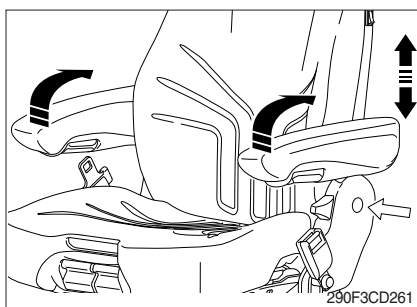
## (4) Seat pan angle adjustment



- 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 position.

## (5) Armrests

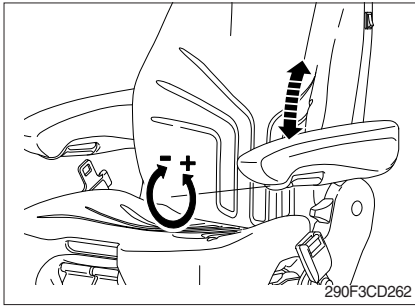


- ① The armrests can be folded up if desired and the height can be individually adjusted.

② To adjust the height of armrest, separate the round cap (see arrow) from the cover and loosen the hexagon nut (13 mm). Adjust the armrests to the desired position (5 steps) and retighten the nut. Reinstall the cap.

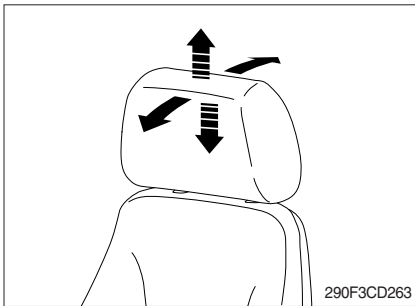
· Tightening torque : 2.6 kgf·m (18.8 kgf·m)

### (6) Armrest adjustment



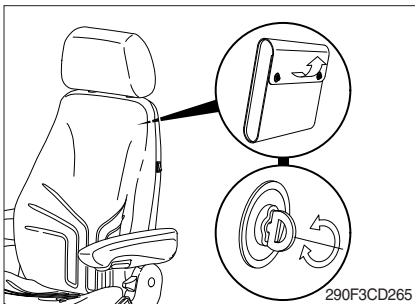
- ① The inclination of the armrest can be modified by turning the adjustment knob.
- ② When turning the knob to the outside (+), the front part of the armrest will be lifted; when turning the knob to the inside (-), it will be lowered.

### (7) Headrest



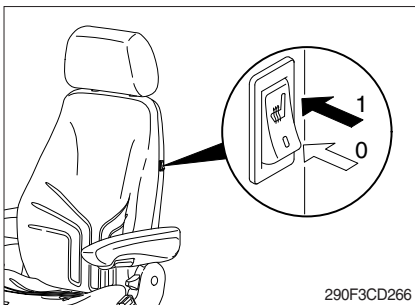
- ① The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.
- ② By pushing forwards or rearwards the angle of the headrest can be adjusted individually.
- ③ To remove the headrest, pull it over the end stop.

### (8) Document box



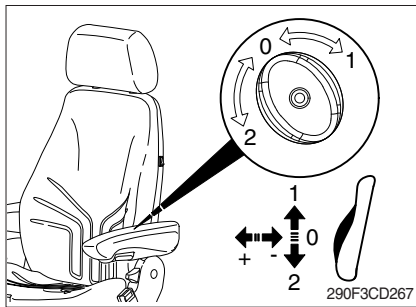
- ① The document box is placed on the rear side of the backrest.
- ② To open the document box, first twist the turn lock closures 90° to the left or the right and then fold the cover of the document box upwards.

### (9) Seat heater switch



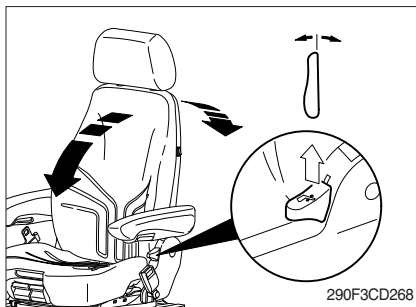
- ① The seat heater can be turned on/off by pressing the switch.

## (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 should improve 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.

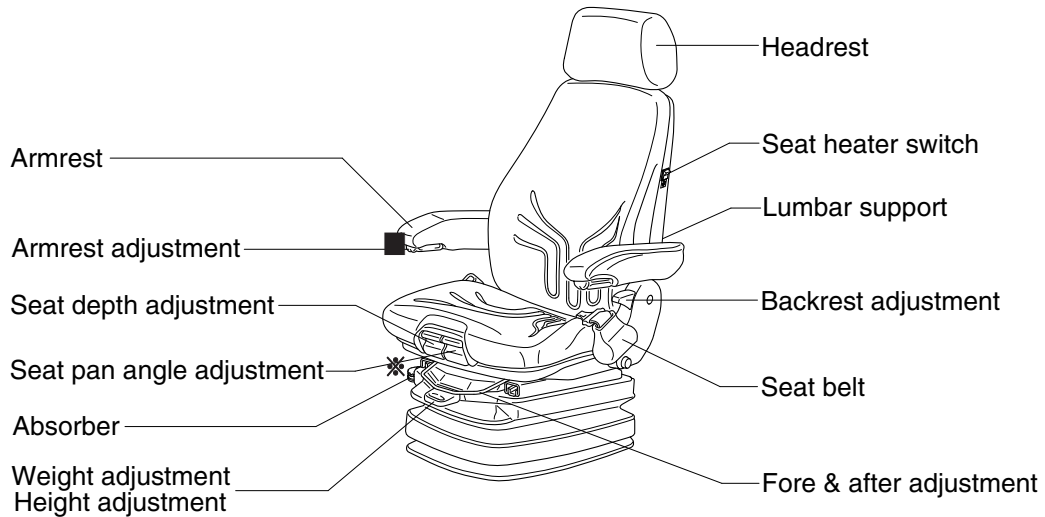
During cleaning, the upholstery should never be soaked.

Use standard commercially available upholstery or plastics cleaning agent. Test first for compatibility on a small, concealed area.

## 5) SEAT (AIR SUSPENSION, OPTION)

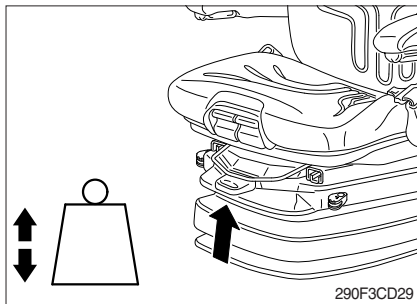
The seat is adjustable to fit the contours of the operator's body. It will reduce operator fatigue in the event of long work hours and it should enhance work efficiency.

※ The seat belt reminder warning lamp pops up and the buzzer sounds until the seat belt is fastened.



290F3CD28

### (1) Weight adjustment

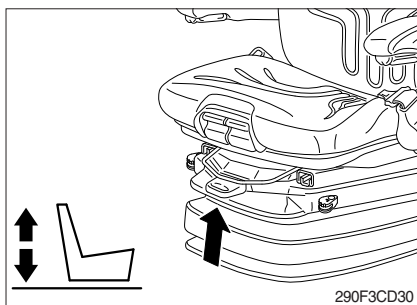


- ① The seat should be adjusted for the operator's weight by briefly pulling the actuator lever of the automatic weight and height adjuster (arrow) with the machine at a standstill and with the operator sitting on the seat.

The operator must sit absolutely still during adjustment.

- ※ Before adjusting the weight, adjust shock absorbers to the position "soft".
- ※ To prevent personal health, the setting for the operator's weight must be checked and adjusted before the machine is operated.

### (2) Height adjustment

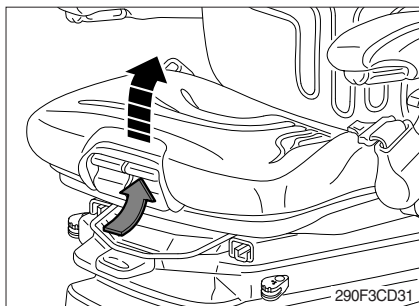


- ① The seat height can be set pneumatically and is continuously adjustable.
- ② The seat height can be altered by pulling or pressing the actuator lever fully out or in (arrow). If the adjustment reaches the top or bottom endstop, the height is adjusted automatically in order to provide minimum spring 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.

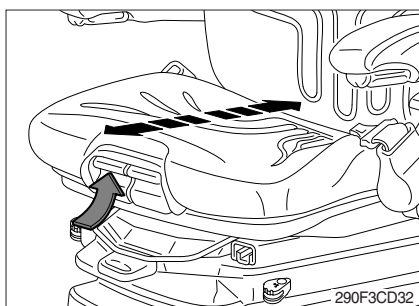


### (3) Seat pan angle adjustment



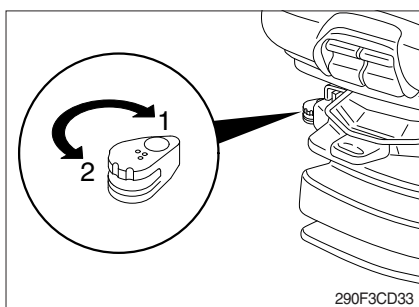
- ① The angle of the seat pan can be individually adjusted.
- ② To adjust the angle of the seat pan, lift the LH handle (see arrow). By exerting pressure on or off the seat pan it can be moved to the desired angled position.

### (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). Move the seat cushion backwards or forwards until the desired position is reached.

### (5) Absorber

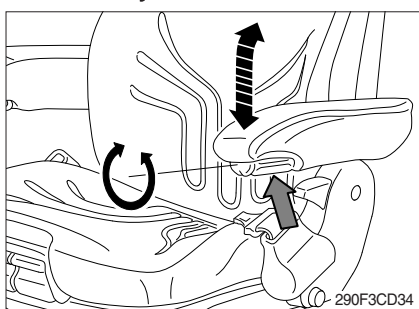


- ① The absorber setting of the seat can be varied to suit on and off-road working conditions. The cushioning effect can be individually adjusted for this purpose.

Turn the lever to the desired position and release.

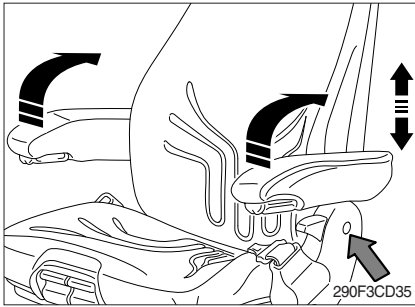
- 1 Soft
- 2 Hard

### (6) Armrest adjustment



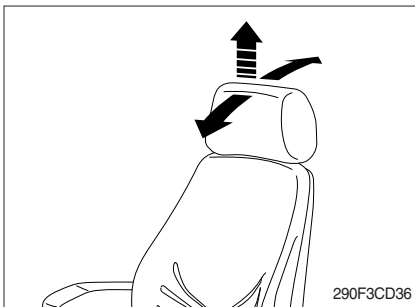
- ① The inclination of the armrests can be modified by turning the adjustment knob (arrow).

### (7) Armrests



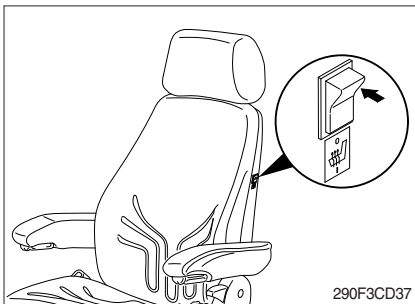
- ① The armrests can be folded up if desired and the height can be individually adjusted.
- ② To adjust the height of armrest, separate the round cap (see arrow) from the cover and loosen the hexagon nut (13 mm). Adjust the armrests to the desired position (5 steps) and retighten the nut. Reinstall the cap.
  - Tightening torque : 2.6 kgf·m (18.8 kgf·m)

### (8) Headrest



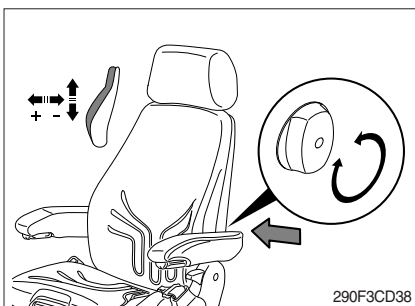
- ① The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stops.
- ② By pushing forward or rearward the angle of the headrest can be adjusted individually.
- ③ To remove the headrest, pull it over the end stops.

### (9) Seat heater switch



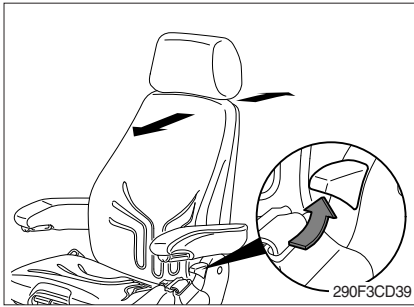
- ① The seat heater is turned on by pressing the switch.

### (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 should help improve performance of operator.

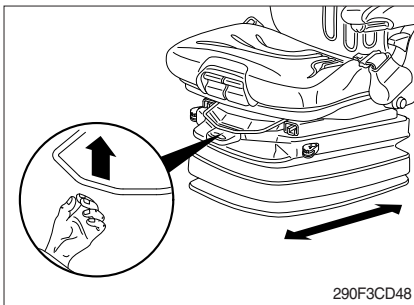
### (11) Backrest adjustment



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 when it is locked.

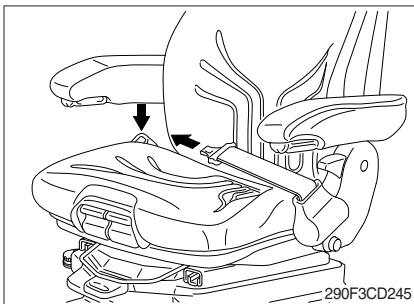
### (12) Fore & after adjustment



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 when it is locked.

### (13) Seat belt

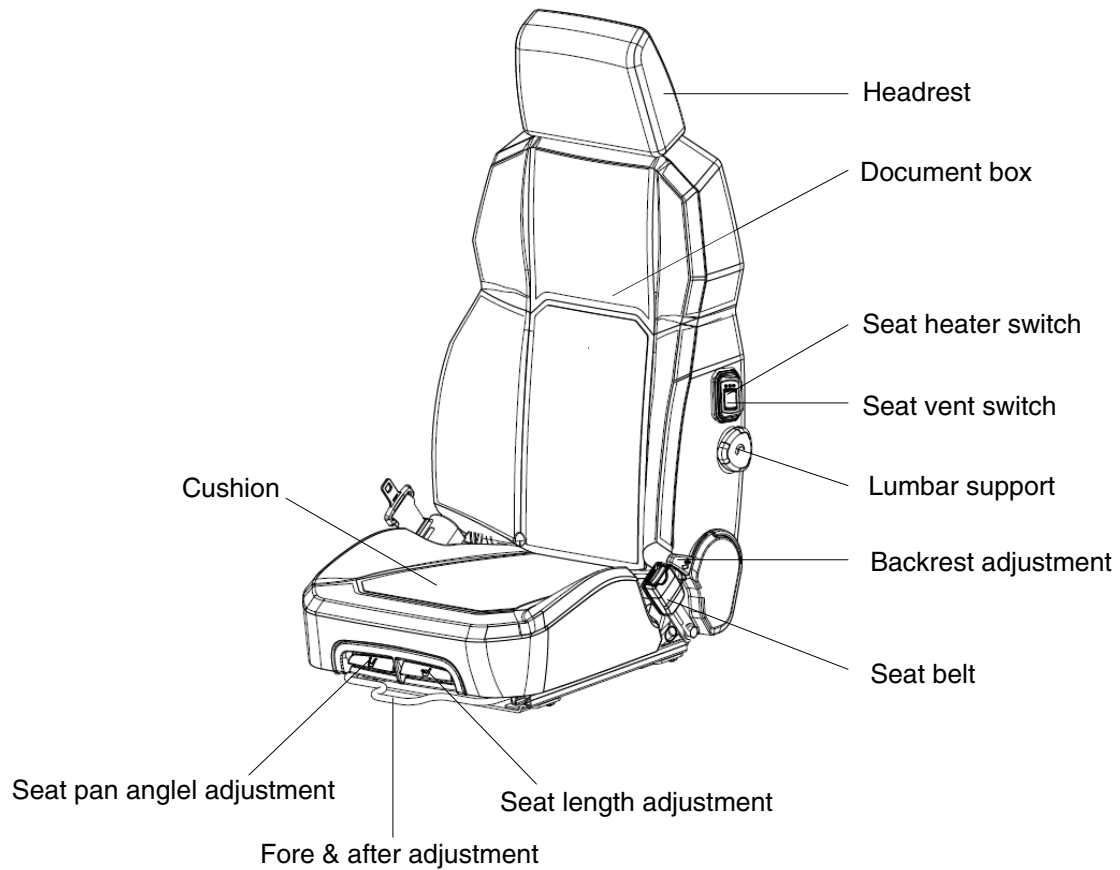


⚠ Failure to wear a seat belt during machine operation may result in serious injury or death in the event of an accident or machine overturn.

## ■ SEAT (HEAT & VENT, OPTION)

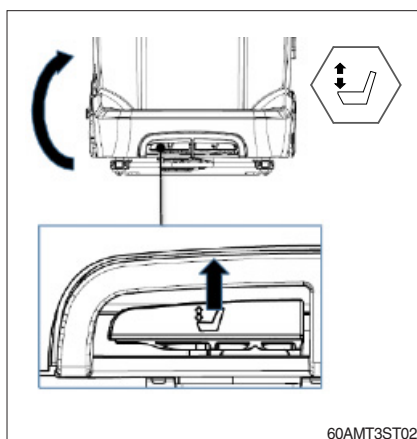
The seat is adjustable to fit the contours of the operator's body. It will reduce operator fatigue in the event of long work hours and it should enhance work efficiency.

※ The seat belt reminder warning lamp pops up and the buzzer sounds until the seat belt is fastened.



210AL3ST01K

### (1) Cushion tilt

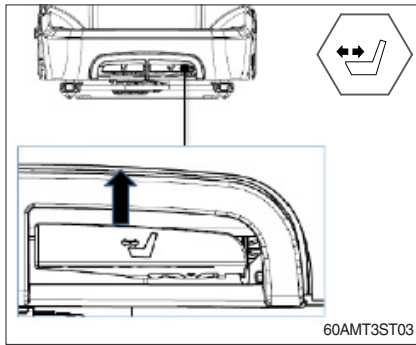


60AMT3ST02

① The angle of the seat cushion can be individually adjusted. This optimises comfort, supporting your legs where they need it most.

- Pull and lift the handle upwards to raise cushion and set to one of three increments.
- Pull and lift handle and push down to lower seat cushion.

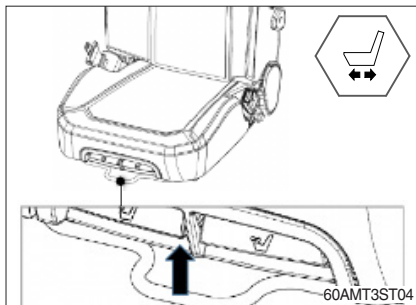
## (2) Cushion extension



① The seat cushion can be extended as desired, until required seating position is reached. This optimises comfort for users of different heights.

- Pull and lift the handle upwards and pull seat cushion out to extend.
- Pull and lift handle upwards and push seat cushion back to reduce cushion depth.

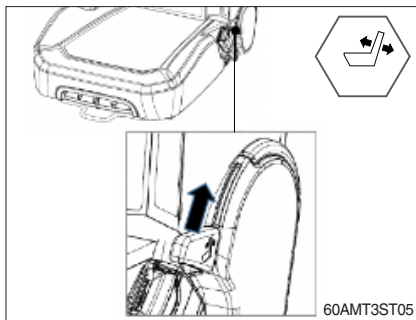
## (3) Fore/after adjustment



① The seat upper can be forward / backward as desired, until required seating position is reached. This optimises comfort for users of different positions.

- Pull and lift the handle upwards and move seat forward / backward as desired.

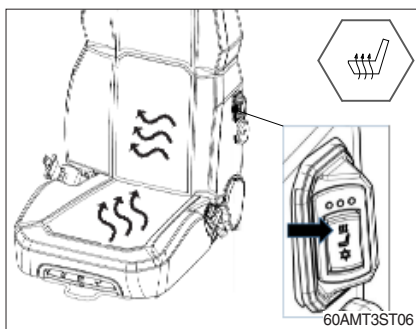
## (4) Backrest recliner



① To recline the seat, pull backrest recline lever upwards, whilst applying pressure on the backrest until desired angle is reached.

② Before releasing lever to lock position, take care that the seat offers sufficient clearance to the controls for operation.

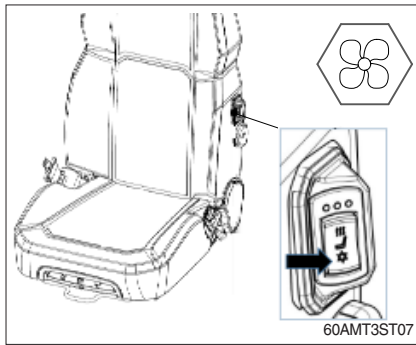
## (5) Heater



① Operating the heater is important for maintaining driver comfort and alertness. 3 heat settings are available.

- To turn on, press button once. This is the full power setting.
- To reduce heat, button can be pushed again for mid-lever heat and again for lowest heat setting. Press again to turn off.

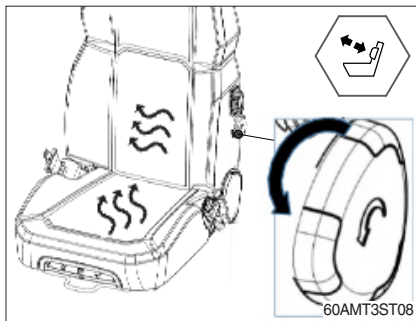
## (6) Ventilation



① Air ventilation improves driver comfort and alertness, maintaining productivity. 3 cool settings are available.

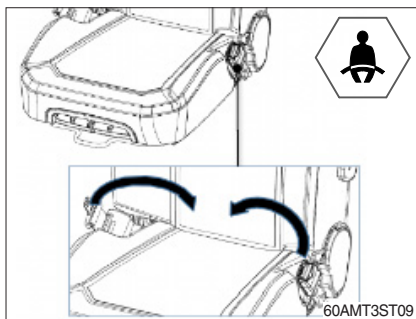
- To turn on, press button once. This is the full power setting.
- To reduce cooling, button can be pushed again for mid-level cool, and again for lowest cool setting. Press again to turn off.

## (7) Mechanical lumbar



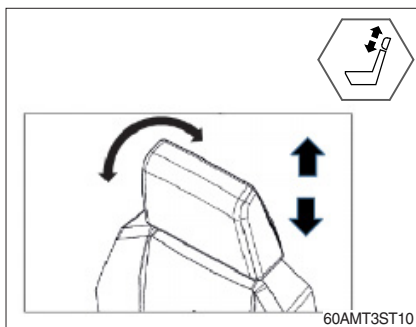
- ① The lumbar can be adjusted mechanically.
- ② Turn handle counterclockwise to achieve desired lumbar setting. Continuing to rotate the handle will return the lumbar to its initial position.

## (8) Seat belt



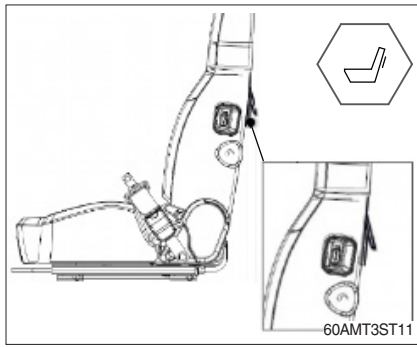
- ① A 2 point retractable seat belt is an available option to offer added driver security.
- ② Pull the belt to extend and push into buckle clip. An audible 'click' will sound once belt is securely fastened.

## (9) Headrest



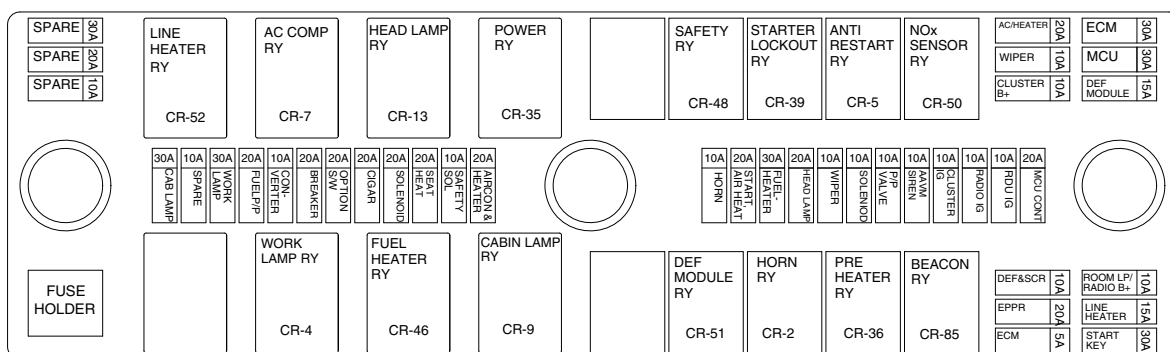
- ① The headrest provides extra upper back and head support when operating the vehicle. Pull firmly upwards to extend and push firmly downwards to lower.
- ② The headrest can be manually inclined forwards and reclined backwards to offer optimum head support.

**(10) Document pouch**



- ① Situated on the back of the seat, the document pouch offers an area to store paperwork.

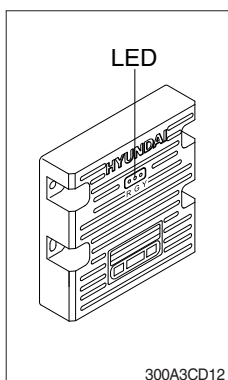
## 6) FUSE AND RELAY BOX



210A3CD290

- (1) The fuses protect the electrical parts and wiring from burning out.
  - (2) The fuse box cover indicates the capacity of each fuse and which circuit it protects.
- ※ **When replacing a fuse or relay, always use one of the same capacity.**
- ▲ **Before replacing a fuse or relay, be sure to turn OFF the starting switch.**

## 7) MCU



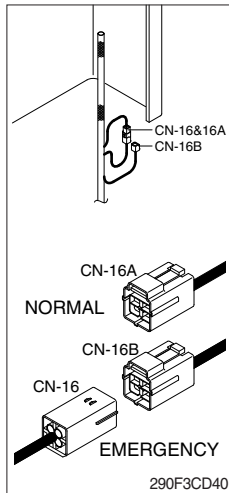
- (1) To match the pump absorption torque with the engine torque, MCU varies EPPR valve output pressure, which controls pump discharge volume whenever engine speed drops and provides feedback, under the reference rpm of each mode set.
- (2) Three LED lamps on the MCU display as below.

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

G : green, R : red, Y : yellow



## 8) EMERGENCY ENGINE SPEED CONTROL CONNECTOR

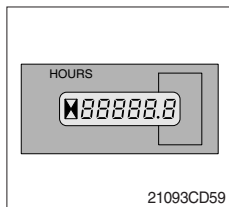


(1) When the CAN communication between the ECM and the MCU is abnormal due to malfunction, change the CN-16 connection from CN-16A to CN-16B and then control the engine speed by rotating the multimodal module of the jog dial module.

※ **Never connect connector CN-16 with CN-16B when MCU is in normal operation.**

※ **Make repair as soon as possible.**

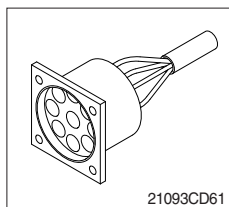
## 9) SERVICE METER



(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.

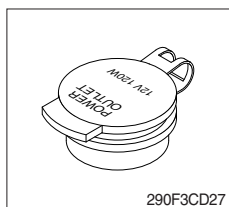
(2) ECM communicates the engine data with cummins INSITE adapter through the connector.

① ECM fault code check

② ECM program change

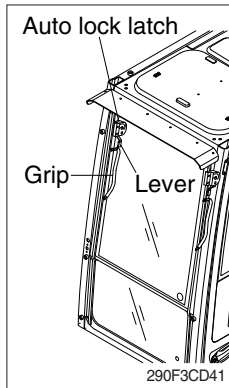
③ Engine data monitoring & test

## 11) 12V SOCKET



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

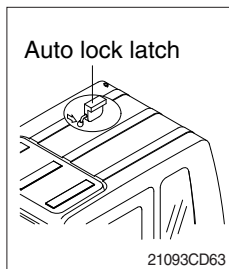
## 12) UPPER WINDSHIELD



(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 pull back into the lock position until auto lock latch is engaged, then release the grips.

**⚠ When working, without having locked the windshield by the auto lock (by pushing the windshield to the rear until it's completely fixed), please be careful as it can cause personal injury if the windshield is not fixed or falls off.**



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

- ① Pull the lever of the auto lock latch in order to release the auto lock latch.
- ② Steps in the reverse order to close the upper windshield.

## 6. 2DMG+ SYSTEM

### 1) OUTLINE

This system displays the distance information between the bucket tip and the target surface of the machine on the cluster to use the levelling work or the slopping work etc.

※ 2DMG+ : 2 Dimension Machine Guidance Plus

#### (1) System layout

The system consists of the angle sensor, laser catcher, integrated controller and cluster.



300A3MG01B\_E

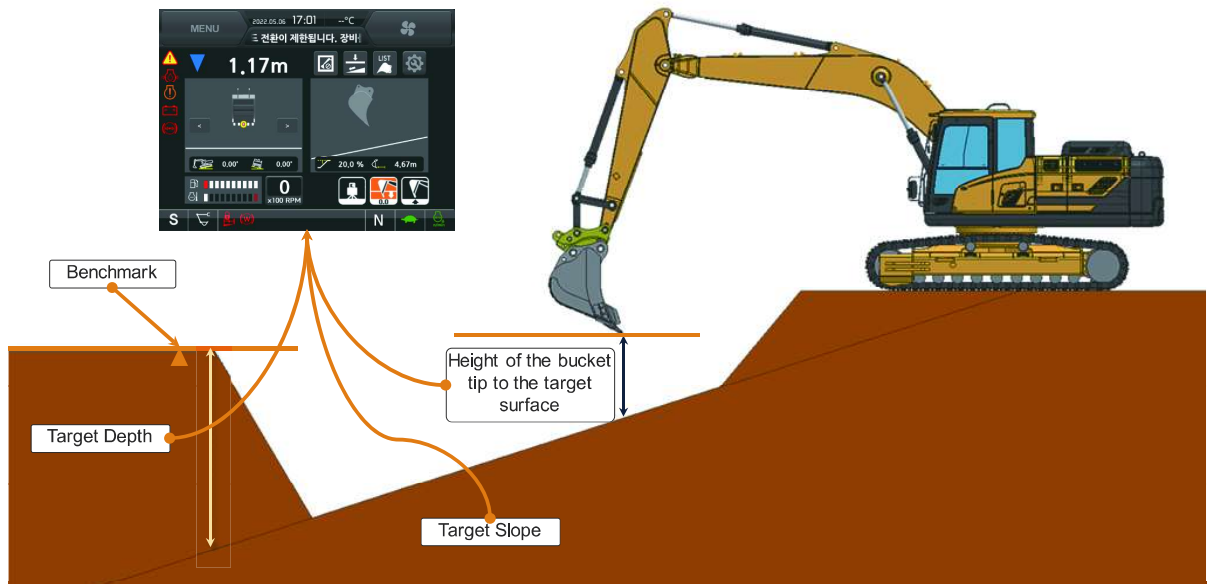
## (2) Major function

HD Hyundai Construction Equipment 2DMG+ is an automated surveying function providing positional information of the bucket tips in the form of visual indicators and audible alarms.



300A3MG03\_E

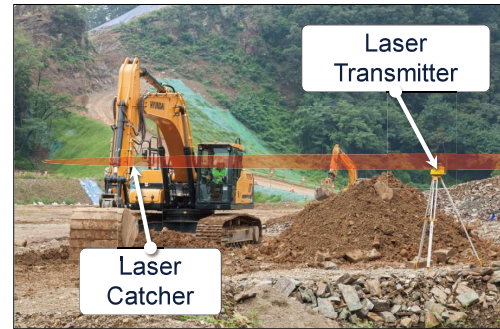
- 2DMG+ is an automated surveying function providing positional information of the bucket tips in the form of visual indicators and audible alarms.



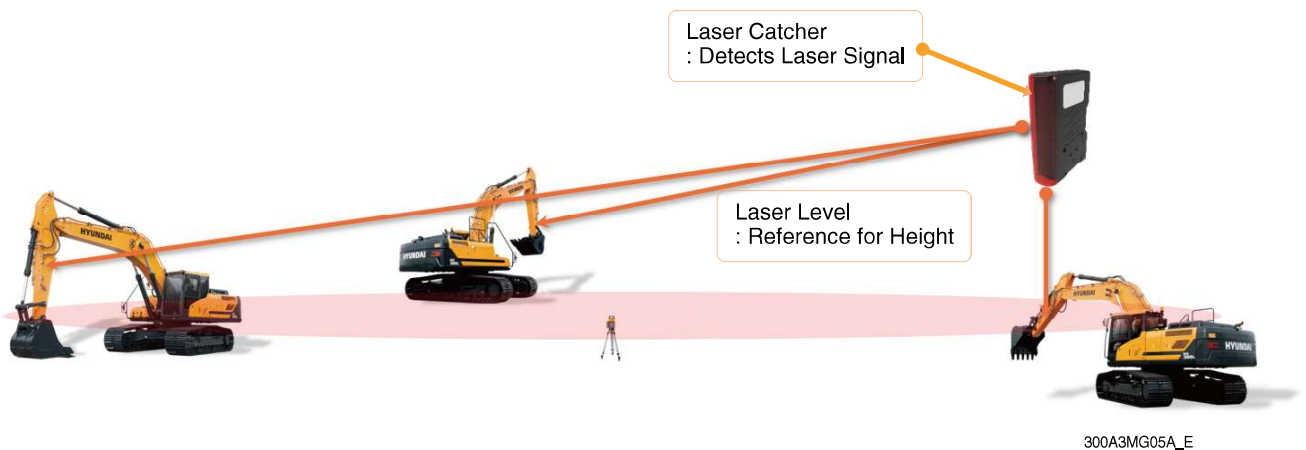
300A3MG02B\_E

### (3) Laser catcher

- ① This is additional function to set the bucket tip height easily when using the HD Hyundai Construction Equipment 2DMG+.
- ② This is useful to a wide area levelling work, long distance slopping work and cooperation work with other machines.



300A3MG04\_E



### (4) Default main screen



300A3MG06A\_E

## (5) Laser catch screen

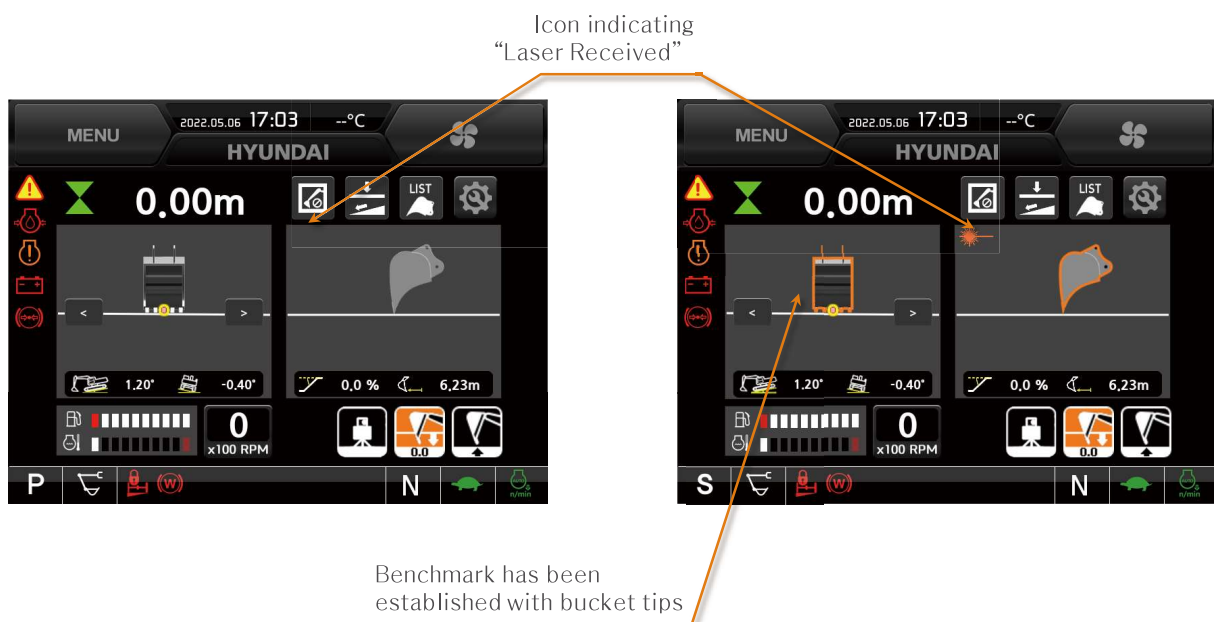


300A3MG07\_E

## (6) Screen after laser caught

Benchmark not established

Benchmark established



300A3MG08\_E

## 2) BENCHMARK SETTING

### (1) Reference position utilization

Set the benchmark as below procedures.

- ① Set the reference position that knowing the height by the measuring.  
In the site, use the measured reference position that marked by stake.
- ② Move the machine to a location that the attachment reach to the reference position.
- ③ Put the bucket tip on the reference position and press the benchmark button of the cluster or RCV lever. (Please refer to the benchmark setting or unsetting)
- ④ Make sure not to move the reference position height when placing the bucket on the reference position.
- ⑤ The benchmark setting is completed when the benchmark button is changed right figure.



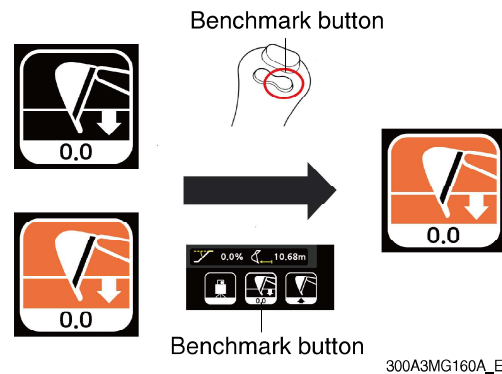
300A3MG09\_E



300A3MG10A

### ※ Benchmark setting

Press the benchmark button of cluster or the right button on the LH RCV lever shortly.  
Pop the lower left figure up and set is completed (lower right figure).



300A3MG160A\_E



300A3MG161\_E



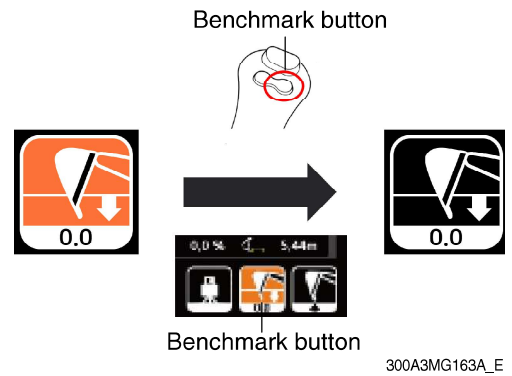
300A3MG10A



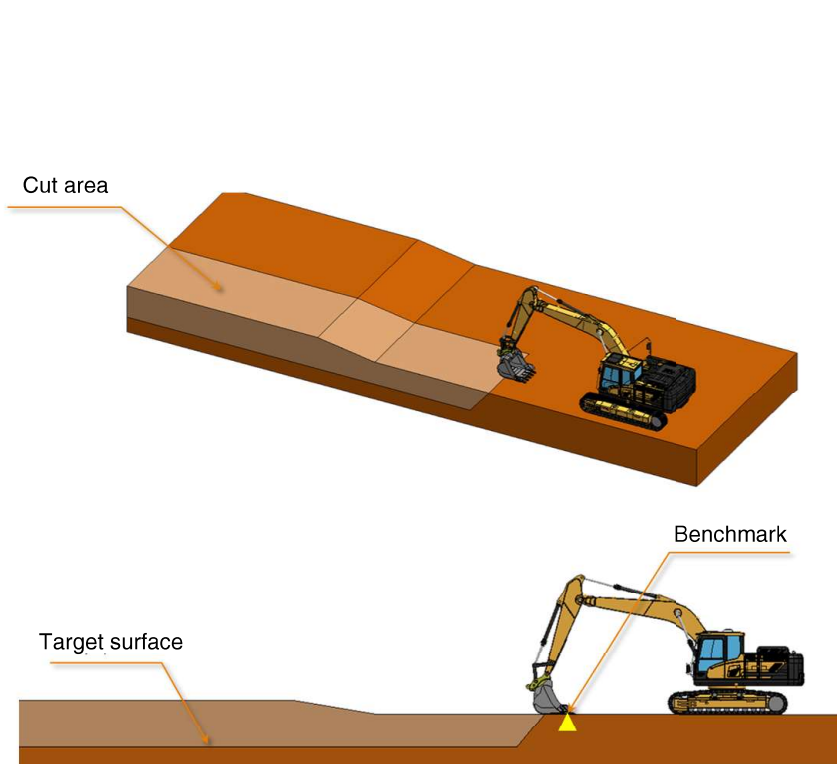
### ※ Benchmark releasing

Press the benchmark button of cluster or the right button on the LH RCV lever long (about 1.5 sec).

Pop the lower left figure up and setting is cancelled (lower right figure)



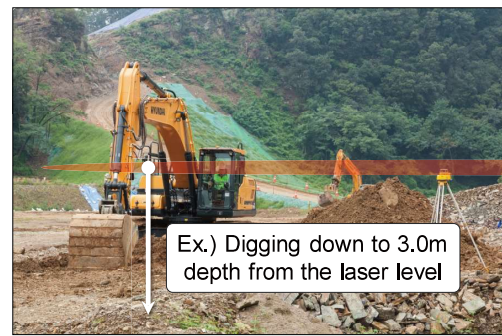
### ⑥ Benchmark setting details





## (2) Laser transmitter utilization 1

- ① This is to set the benchmark by using laser without bucket reference position when the bucket reference position setting method is not useful because the digging depth or slope is set by the laser.



300A3MG12\_E

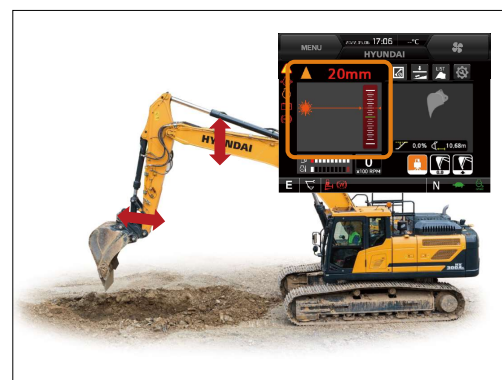
- ② First, go into the laser scanning mode by operating the cluster to catch the laser.



300A3MG12\_E

- ③ Operate the boom and arm appropriately while checking the laser signal indicator to catch the laser signal.

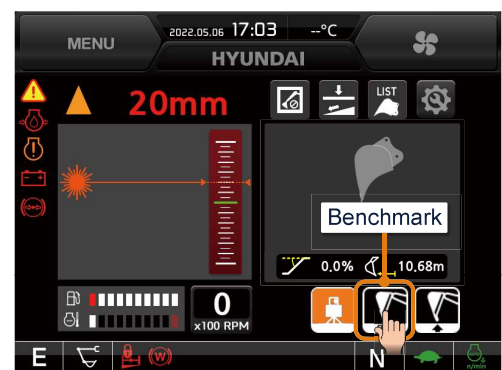
※ Move the boom up and down until the signal is detected when the 'no signal' is displayed.





300A3MG14\_E

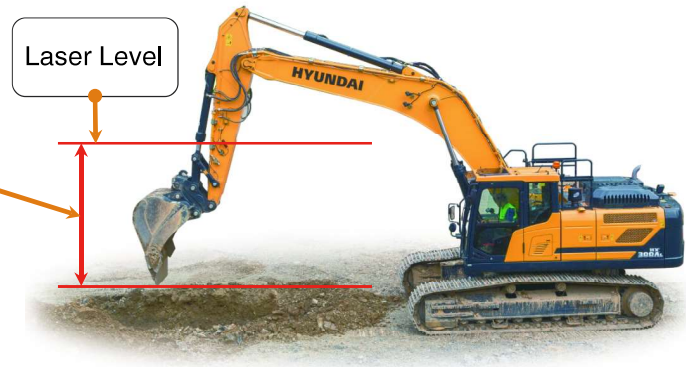
- ④ Press the benchmark button when the laser signal go into the scanning zone (▲ 60 mm ~ ▼ 60 mm) of the laser catcher.

※ At this moment, take some time to stabilize the laser signal



300A3MG15\_E

- ⑤ The laser benchmark setting is completed when the benchmark button (  ) is activated and the laser icon (  ) is displayed at the left top side of the bucket side view.
- ※ The numerical value of the height indicator means the height different between the laser lever and the bucket tip height.
  - ※ In case of the laser line, be aware that the benchmark changing selection (bucket outline emphasis of the bucket front view and side view) is not activated.



300A3MG16A\_E

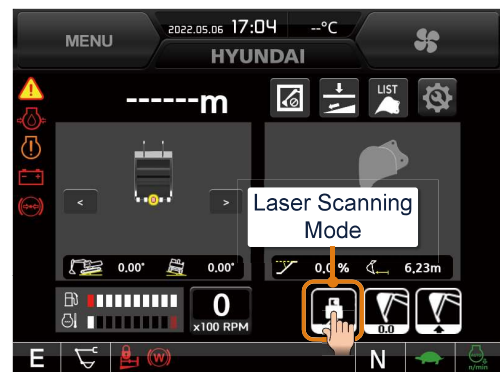
### (3) Laser transmitter utilization 2

- ① This is to keep the benchmark uniformly while the machine is moving by using the laser transmitter with the bucket reference position when the digging work with the HD Hyundai Construction Equipment 2DMG+.



300A3MG17\_E

- ② First, go into the laser scanning mode by operating the cluster to catch the laser.



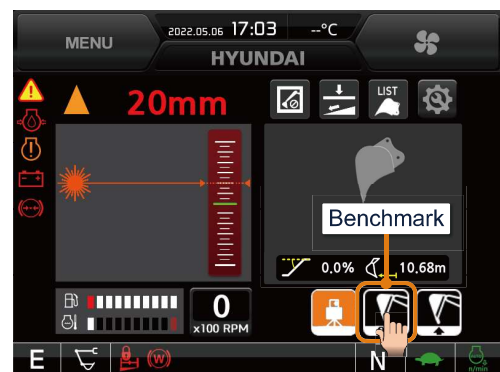
300A3MG18\_E

- ③ Operate the boom and arm appropriately while checking the laser signal indicator to catch the laser signal.
- ※ Move the boom up and down until the signal is detected when the 'no signal' is displayed.



300A3MG19\_E

- ④ Press the benchmark button when the laser signal go into the scanning zone (▲ 60 mm ~ ▼ 60 mm) of the laser catcher.
- ※ At this moment, take some time to stabilize the laser signal



300A3MG15\_E

- ⑤ Confirm the laser icon is displayed at the left top side of bucket side view.  
Then place the bucket tip on the reference position of the ground and press the bucket figure of the bucket front view.



300A3MG21\_E

- ⑥ Confirm that the bucket figure outline of the bucket front view and side view is emphasized on the main screen. At this time, the height indicator is changed from the laser base to the benchmark base and then the benchmark setting is completed.



300A3MG22\_E

### 3) BENCHMARK MOVEMENT SETTING

#### (1) Touch point utilization

- ① The benchmark resetting work is needed because the offset is occurred in case of moving the machine from one place to other place.



300A3MG23\_E

- ② The benchmark resetting work is needed because the offset is occurred in case of moving the machine from one place to other place.




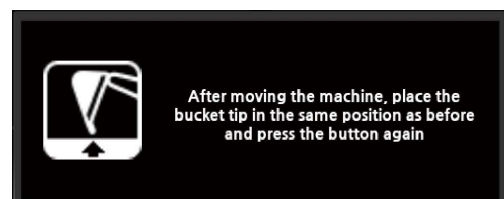
300A3MG25\_E

- ③ Press the touch point button (  ).  
※ The touch point must be set in advance.



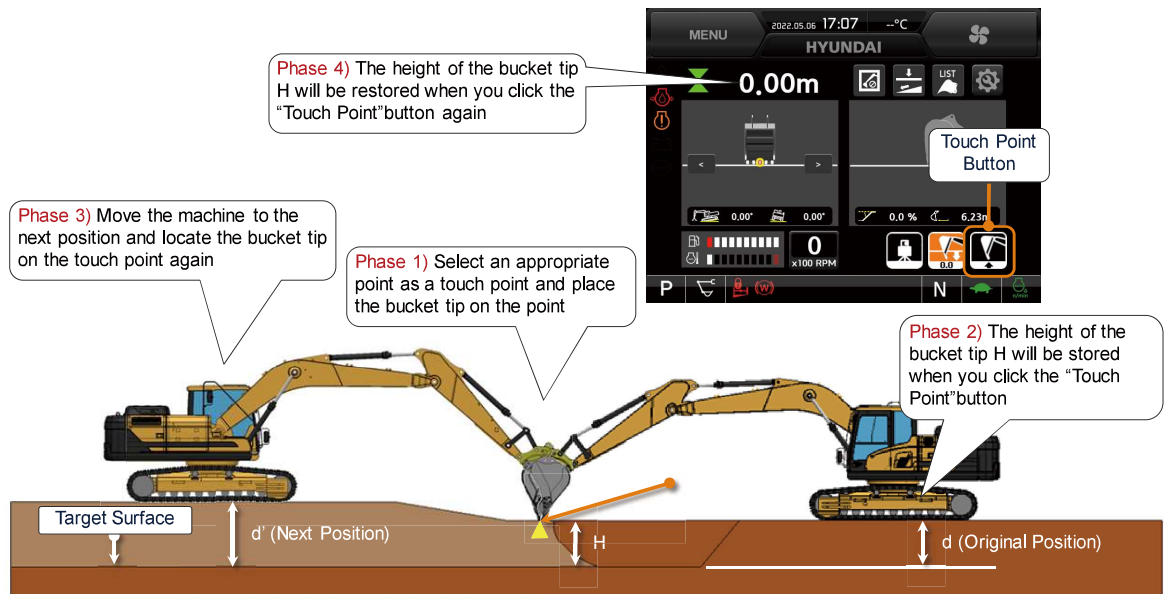
300A3MG24\_E

- ④ Display the message to move the touch point on the screen as right figure and the button icon (  ) is activated.  
⑤ After moving the machine, replace the bucket tip in the same position as before and press the touch point button again.



300A3MG26\_E

## ⑤ Summary of the benchmark movement setting (touch point utilization)



300A3MG27\_E



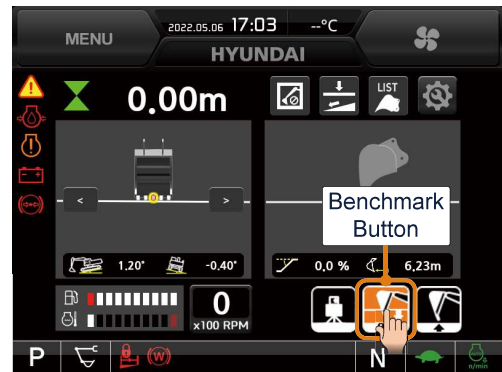
## (2) Reference height utilization

- ① Mark the 0 m level position on the working ground at present.



300A3MG28\_E

- ② After moving the machine, place the bucket tip on the 0 m level position as marked previous step and resetting the benchmark.

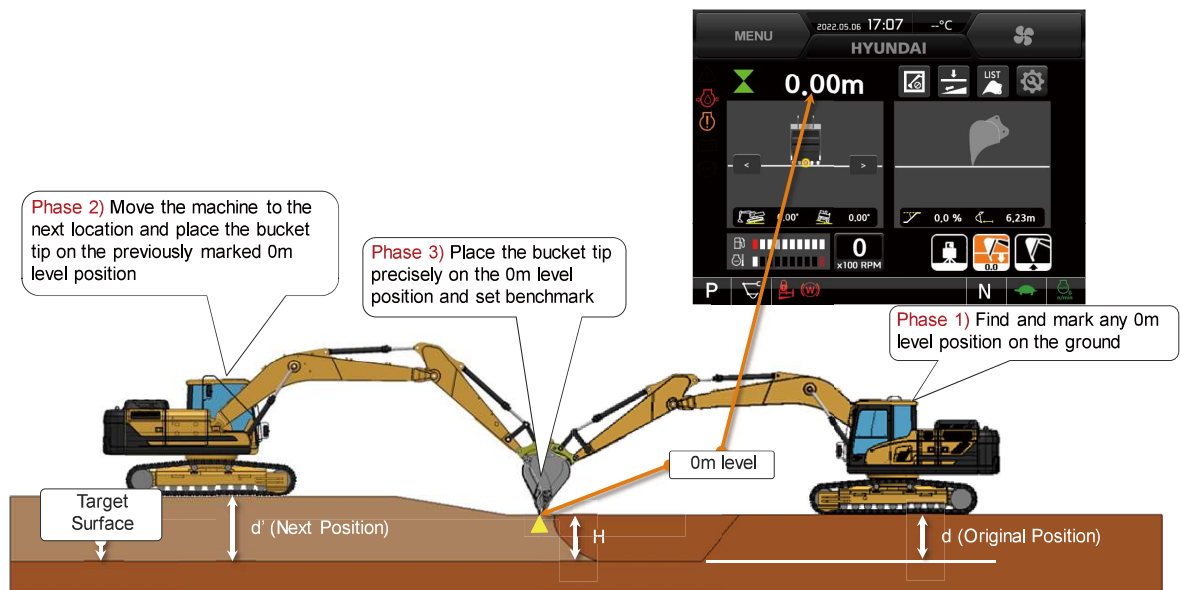


300A3MG29\_E



300A3MG31\_E

### ③ Summary of the benchmark movement setting (reference height utilization)



300A3MG32\_E

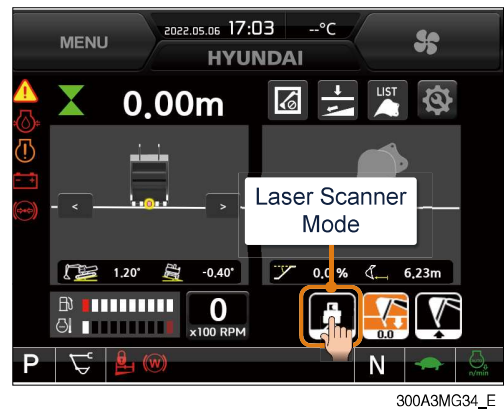


### (3) Laser transmitter utilization

- ① Before moving the machine, check the location of the laser transmitter and swing the upper structure of the machine appropriately to catch signal with the laser transmitter.
- ※ **Before using the laser transmitter, be sure to check the is on and not inclined.**



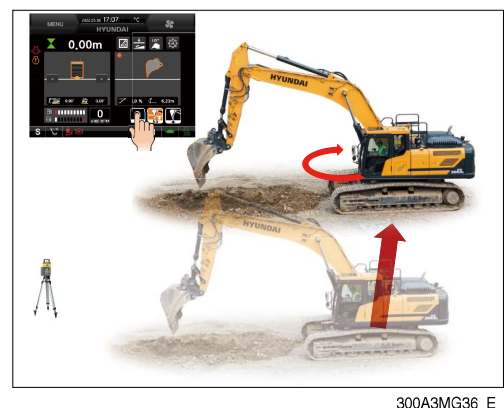
- ② Before moving the area, catch the laser signal. Press the laser scanning button and go into the laser scanning mode.



- ③ After adjusting boom and arm appropriately while checking the laser signal indicator to catch the laser signal and complete the scanning laser signal by pressing the benchmark button.
- ※ **Move the boom up and down until the signal is detected when the 'no signal' is displayed.**

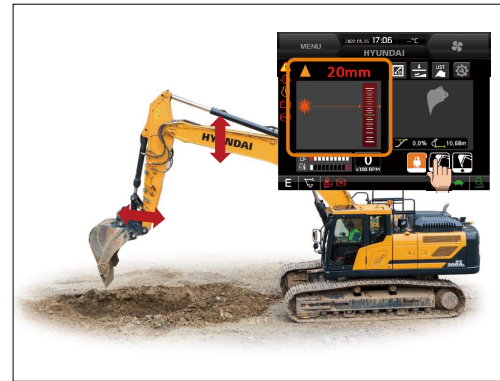


- ④ After moving the machine to the next working area, the laser catcher face toward the laser transmitter by swinging the machine upper structure to catch the laser signal. After the machine pose is set appropriately, go into the laser scanning mode by pressing the laser scanning button.



- ⑤ After adjusting boom and arm appropriately while checking the laser signal indicator to catch the laser signal and complete the scanning laser signal by pressing the benchmark button.

※ Move the boom up and down until the signal is detected when the 'no signal' is displayed.



300A3MG37\_E

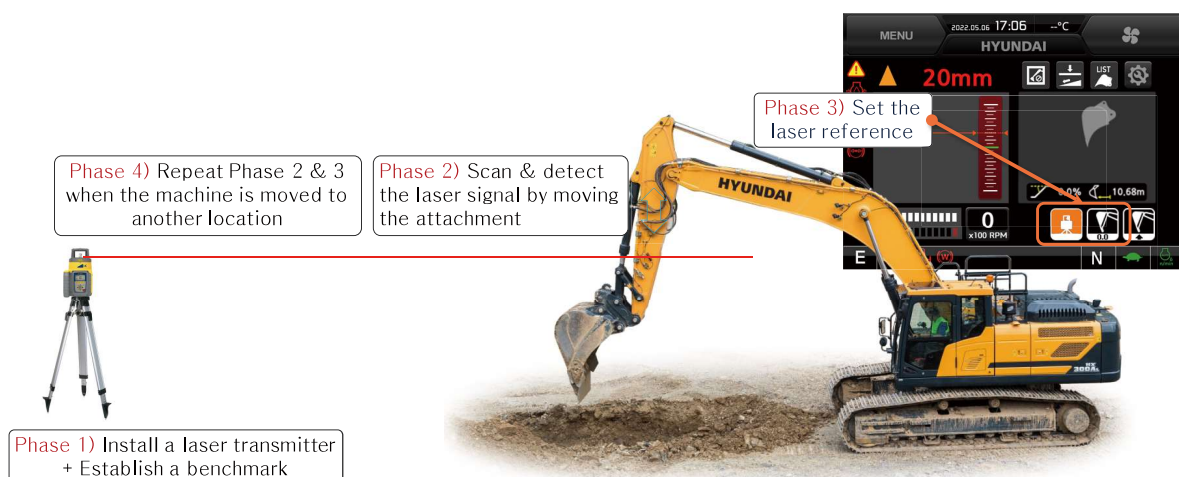
- ⑥ After moving the touch point, go to the next procedure.



300A3MG38\_E

⑦ **Benchmark movement setting summary (laser transmitter utilization)**

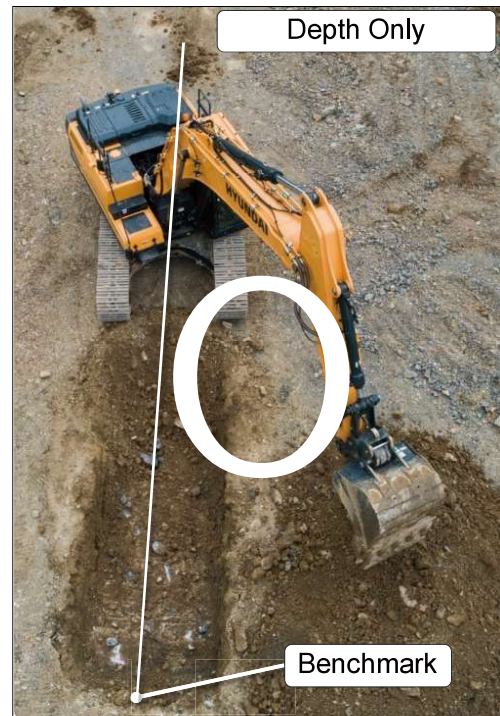
- Check the operation of the laser transmitter that is set to the working site.
- After working the machine at present position, detect the laser signal by going into the laser scanning mode and moving the attachment.
- The laser signal is detected, complete the laser rscanning by pressing the benchmark button of the cluster.
- After moving the machine to the next work location, repeat b and c steps.



300A3MG39\_E

#### (4) Precautions when the benchmark movement setting

- ① If the benchmark movement setting is completed, you can keep the original benchmark height even if the machine is moved.
- ② In case the benchmark movement is proceeded while the slope working, the benchmark movement is valid only when there is no swing operation.
- ③ The benchmark movement setting can enable in spite of the swing operation of the machine when the the depth setting only.



300L3MG16\_E



- ④ In case, the working is proceeded by using the slope laser, the transmitter is installed to face toward the front side of the machine after the digging target slope setting. The attachment face toward the front side unless swinging when the laser signal is caught.

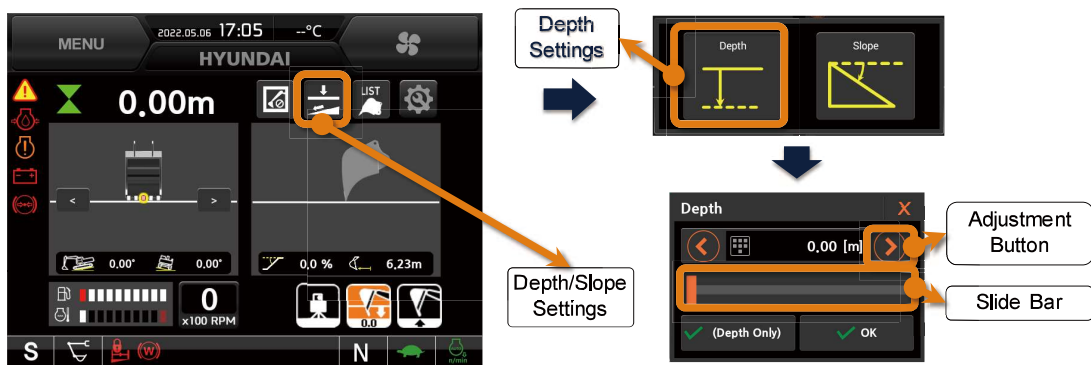


300L3MG17\_E

#### 4) TARGET DEPTH AND SLOPE SETTING


##### (1) Target surface depth setting (slide bar input)

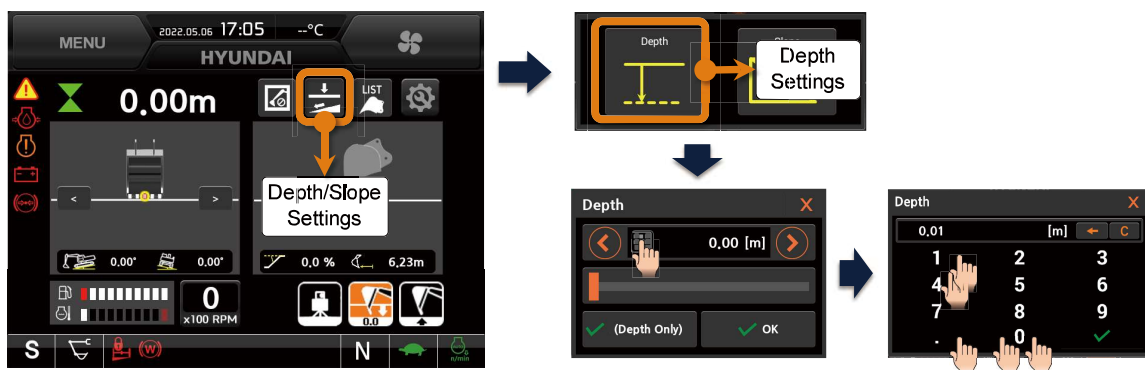
- ① Press the 'depth/slope' setting button (  ) to set-up the target surface depth to digging work.
- ② Press the 'depth' setting button (  ) when the 'depth' and 'slope' button are pop-up.
- ③ Enter the decided depth value when the window is pop-up to set-up of the target digging depth setting.
- ④ Set-up the depth roughly by using slide bar and enter the exact value by pressing the detail setting button.
- ⑤ The length value can be input maximum 20 m by 0.01 m unit.



300A3MG40\_E




##### (2) Target surface depth setting (keypad input)

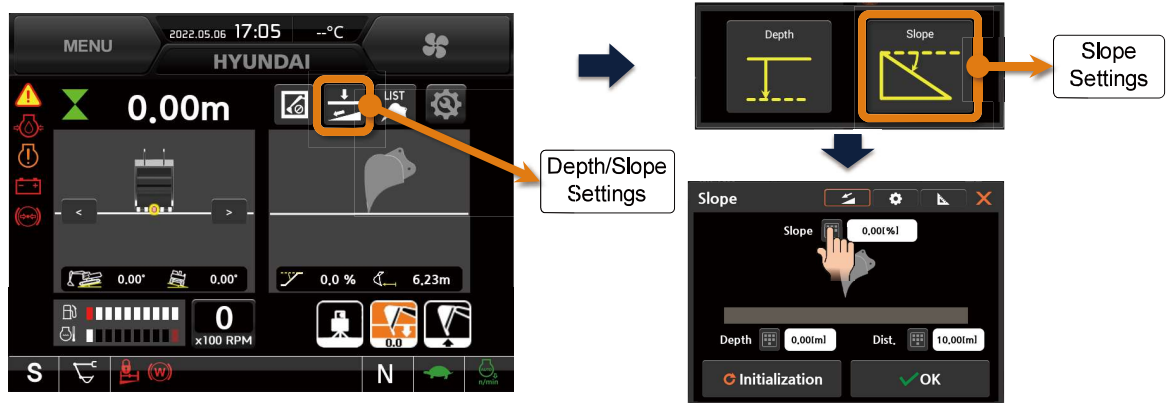
- ① Refer to the above clause, go into the depth setting menu.
- ② Press the button of the depth display window and go into keypad input window.
- ③ Enter the decided depth value by the keypad and press  button.
- ④ Complete the depth setting as below.
  - Levelling work : Press the OK (depth only) button
  - Slopping work : Press the OK button



300A3MG41\_E

### (3) Target surface slope setting (% unit input)





- ① Press the 'depth/slope' button (  ) to set-up the target surface depth and slope setting.
- ② Press the 'slope' button (  ) when the 'depth' and 'slope' button are pop-up.
- ③ Press the 'slope' button (  ) and enter the decided slope value (%) when the window is pop-up to set-up of the target slope setting.
- ④ Complete the slope setting by pressing the OK button.
- ⑤ The slope value can be input from minimum -100 % to maximum 100 % by 0.01% unit.

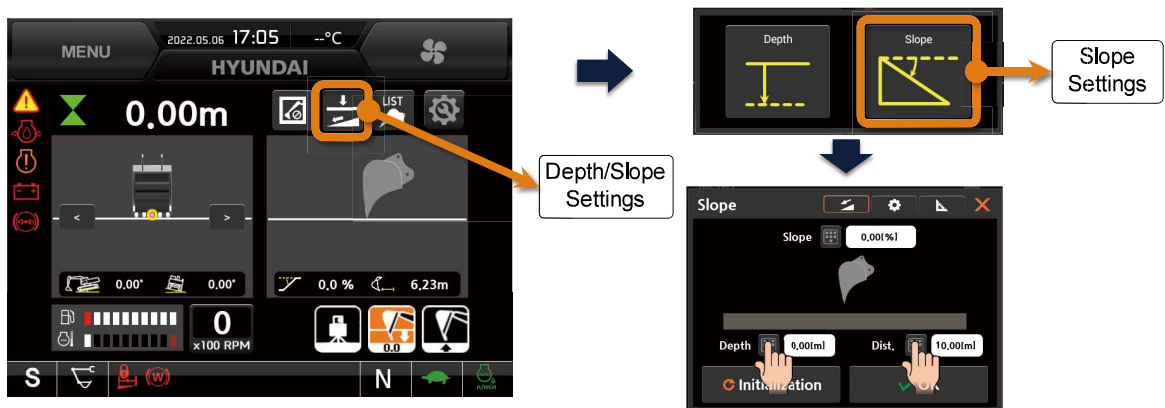


300A3MG42\_E






#### (4) Target surface slope setting (length and height value input)

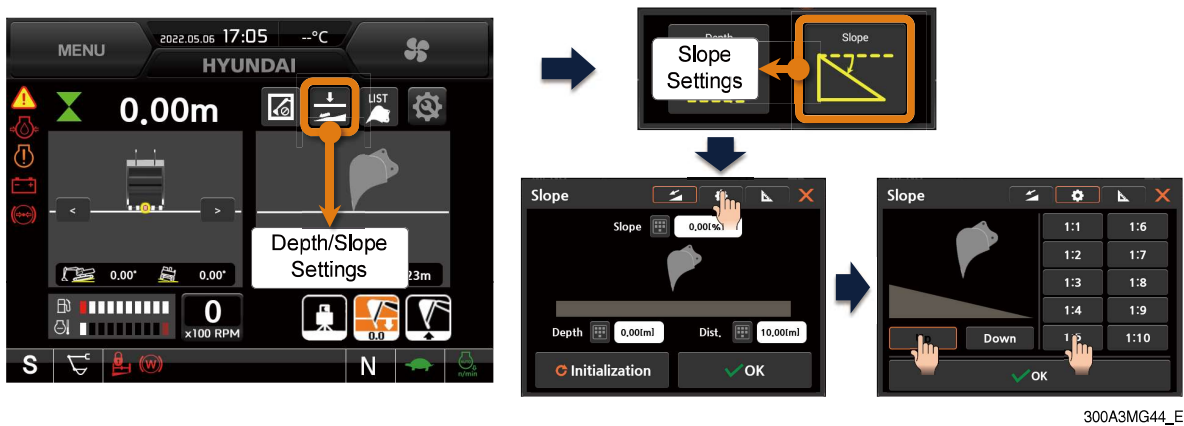
- ① Press the 'depth/slope' button (  ) to set-up the target surface depth and slope setting.
- ② Press the 'slope' button (  ) when the 'depth' and 'slope' button are pop-up.
- ③ Press the depth button (  ) and length button (  ) and enter the decided values when the window is pop-up to set-up of the target slope setting.
- ④ Enter the height value as the slope from the operator to bucket side.
  - Descend slope : + value
  - Ascend slope : - value
- ⑤ Complete the slope setting by pressing the OK button.




300A3MG43\_E

## (5) Target surface slope setting (selection for slope preset values)

- ① Press the 'depth/slope' button (  ).
  - ② Press the 'slope' setting button (  ) of the pop-up window.
  - ③ Press the slope default value menu button (  ) on the top side of the slope setting window.
  - ④ Enter the decided slope value and direction and press the OK button.
- ※ 1:X means the slope of 1 meter height at x meter distance.



## (6) Target surface slope setting (slope measurement)

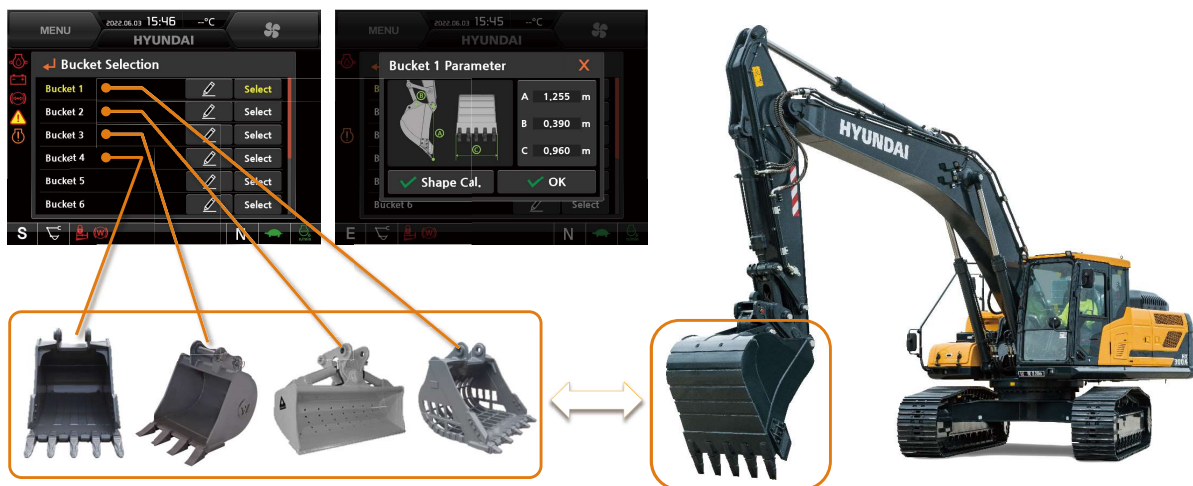
- ① Refer to the above clause, go into the slope setting window.
  - ② Press the slope measurement menu button (  ) on the top side of the slope setting window.
  - ③ Press the 'Measurement' button on the left window after place the bucket tip on the start point of the slope.
  - ④ Press the 'Measurement' button on the right window after place the bucket tip on the another point of the slope.
  - ⑤ Confirm the result of the slope measurement.
- ※ To acquire the accuracy of the slope measurement, place a long distance between the start point and another point of the slope as possible.



## 5) BUCKET SETTING FUNCTION

### (1) Bucket selection

- ① You can use a bucket to change other bucket when you have many kinds of buckets.
- ② The dimensions and name of each bucket need to be entered beforehand.
- ③ If the dimensions of the bucket is incorrect, the measurement accuracy is unable to guarantee.  
Be careful when you input the data.



300A3MG46\_E



(2) Bucket selection menu details

① Bucket selection menu details



300A3MG47\_E

② Press the 'bucket selection' menu button.



300A3MG48\_E

③ The 'bucket selection' menu will be displayed.



300A3MG49\_E

### (3) Bucket change installation

You have to designate the bucket information to match with the bucket dimension information in case of changing to a different bucket.

- ① Replace the current bucket to a different bucket ( No.1 bucket → No.2 bucket)

※ The dimensions of each bucket need to be stored beforehand.



300A3MG50

- ② Go into the 'bucket selection' menu.



300A3MG51\_E

- ③ Press the 'selection' button of the No.2 bucket.



300A3MG52\_E

- ④ Confirm the No.2 bucket display is changed to orange color.



300A3MG53\_E

#### (4) Bucket dimension input

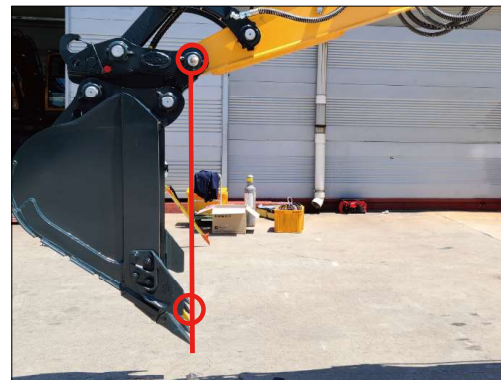
To ensure the measurement accuracy, please follow the correct dimension input procedure.

- ① Replace your bucket to measure dimensions.



300A3MG54

- ② Adjust the position of the bucket pin and bucket tip to vertical with ground by using a plumb-bob etc.



300A3MG55

- ③ Refer to the next page, measure the required dimension to input data.



300A3MG56

- ④ Go into the 'bucket selection' menu.



300A3MG51\_E

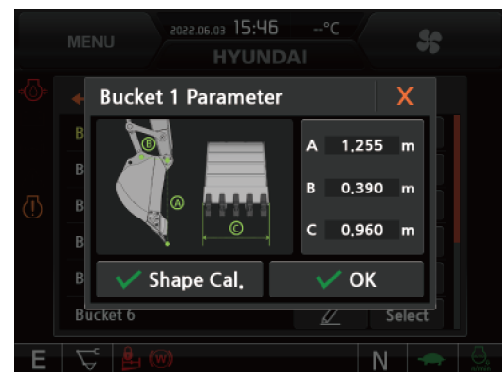
⑤ Press the name of the object bucket to input.



300A3MG57\_E

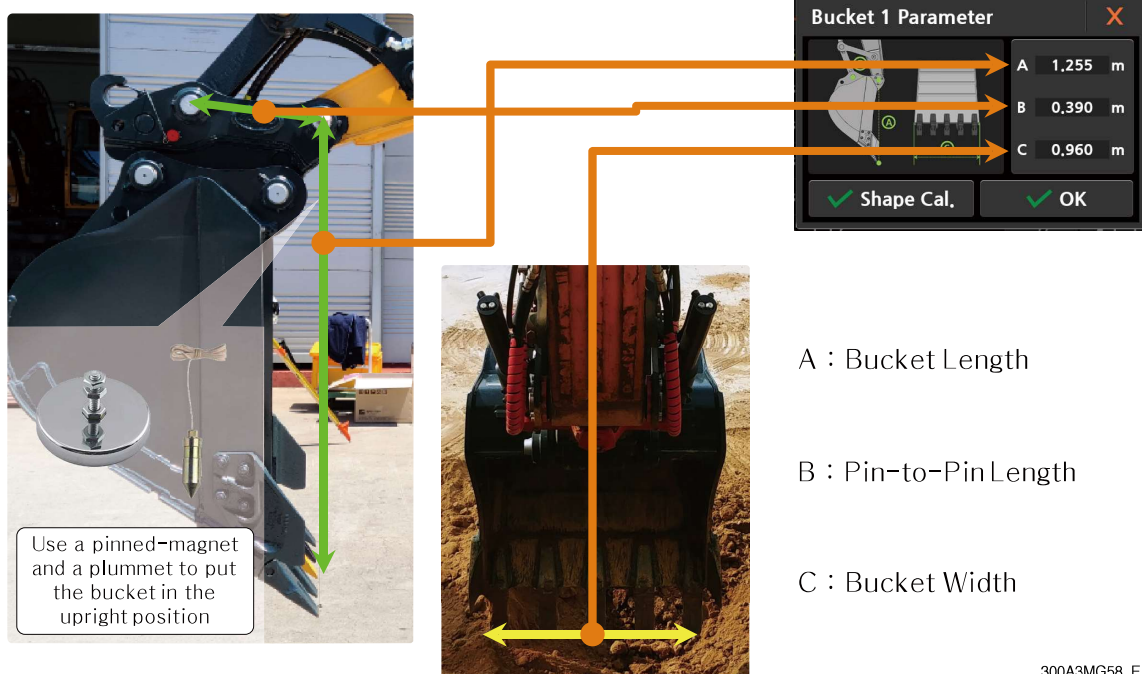
⑥ Input the value by pressing the figure of A, B, C.

※ Keep the bucket pin and bucket tip in a vertical position and then input the value.



300A3MG58\_E

⑦ Bucket dimension measurement position details



300A3MG58\_E

### (5) Bucket name change

You can rename the buckets to identify them easily.

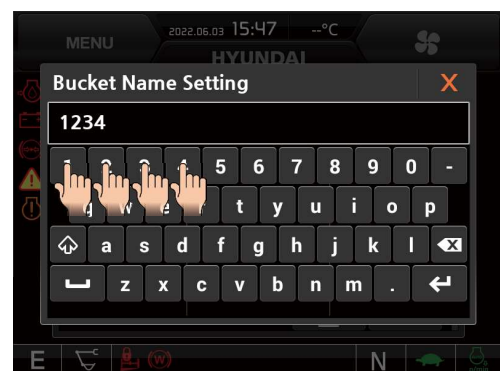
- ① Go into the 'bucket selection' menu.



- ② Press the name change button.



- ③ Input the bucket name.  
Example : 1234



- ④ Confirm the changed name.



## (6) Bucket shape calibration

Bucket shape calibration is an additional procedure to ensure the performance of working area violation alarm function(E-Bound).

- ① Go into the 'bucket selection' menu.



300A3MG51\_E

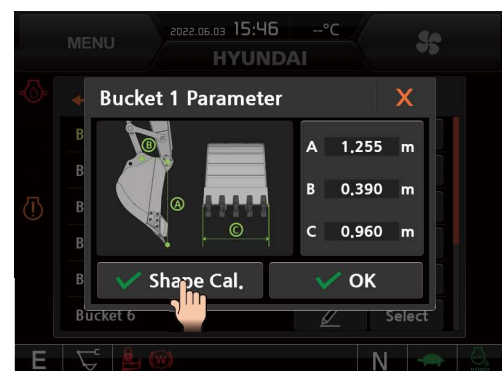
- ② Press the object bucket to input shape calibration.

※ The shape calibration is proceeded the bucket only that is completed the figure input.



300A3MG57\_E

- ③ Press the 'shape cal.' button when the bucket figure input window is displayed.



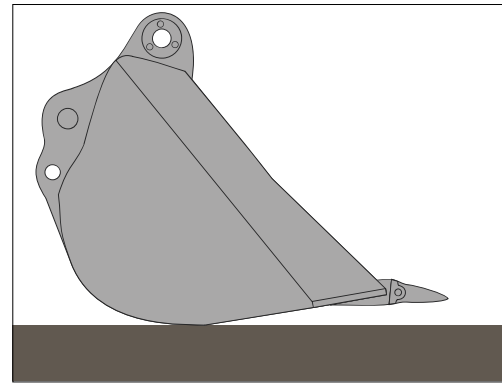
300A3MG63\_E

- ④ Check menu and figure of the 'shape cal. phase 1' and instruction of the right side.



300A3MG64\_E

- ⑤ Refer to the instruction and adjust the posture of the bucket relating with the flat ground.



300A3MG65

- ⑥ Press and activate the 'set' button of the 'shape cal. phase 1' menu and press the 'next' button.



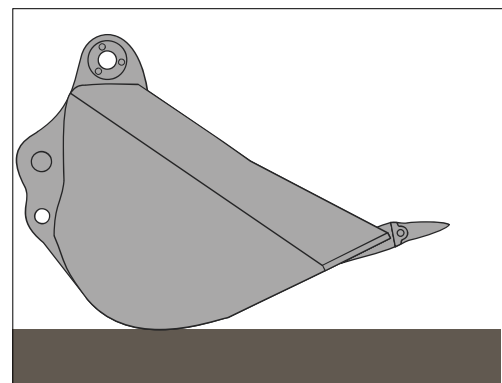
300A3MG66\_E

- ⑦ Check menu and figure of the 'shape cal. phase 2' and instruction of the right side.



300A3MG67\_E

- ⑧ Refer to the instruction and adjust the posture of the bucket relating with the flat ground.



300A3MG68



- ⑨ Press and activate the 'set' button of the 'shape cal. phase 2' menu and press the 'next' button.



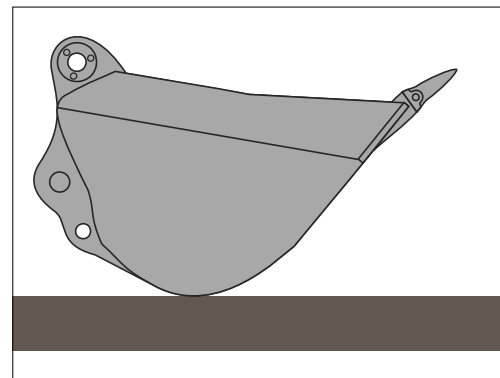
300A3MG69\_E

- ⑩ Check menu and figure of the 'shape cal. phase 3' and instruction of the right side.



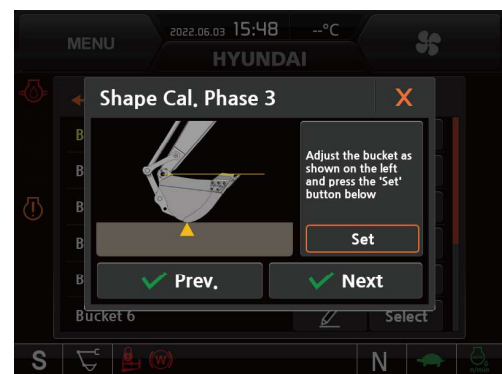
300A3MG70\_E

- ⑪ Refer to the instruction and adjust the posture of the bucket relating with the flat ground.



300A3MG71

- ⑫ Press and activate the 'set' button of the 'shape cal. phase 3' menu and press the 'next' button.



300A3MG72\_E

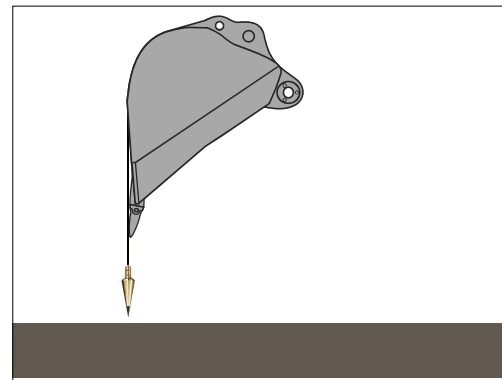


- ⑬ Check menu and figure of the 'shape cal. phase 4' and instruction of the right side.



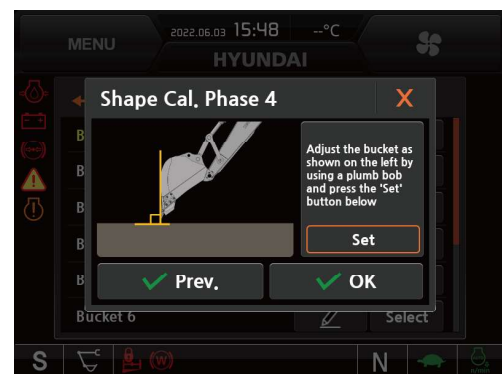
300A3MG73\_E

- ⑭ Adjust the bottom surface of the bucket to vertical with ground by using a plumb-bob etc.



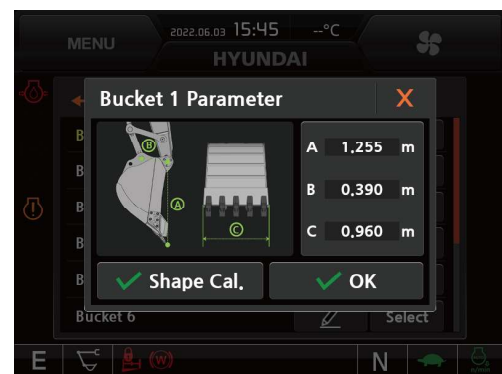
300A3MG74

- ⑮ Press and activate the 'set' button of the 'shape cal. phase 4' menu and press the 'next' button.



300A3MG75\_E

- ⑯ Check the display of the shape calculation icon.
- ※ The shape calibration procedure is valid only when the shape of the bucket bottom side is composed of a single radius surface.
  - ※ Please keep in mind to position the bottom side of the bucket at the same spot on the ground from phase 1 to phase 3.



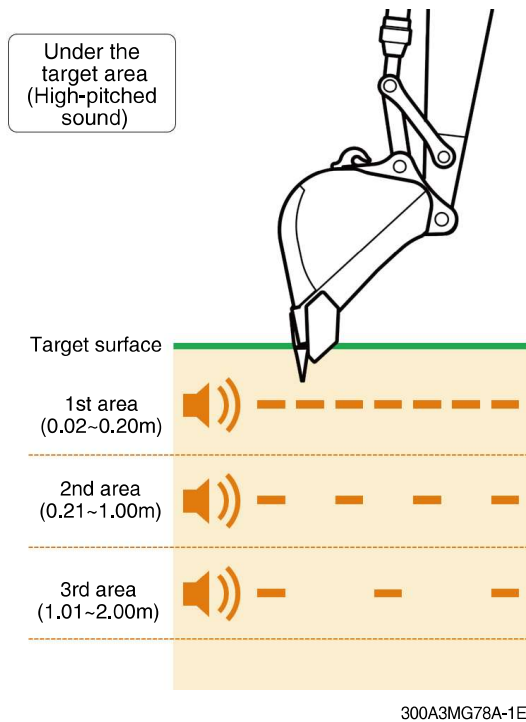
300A3MG76\_E

## 6) ALARM SOUND SETTING

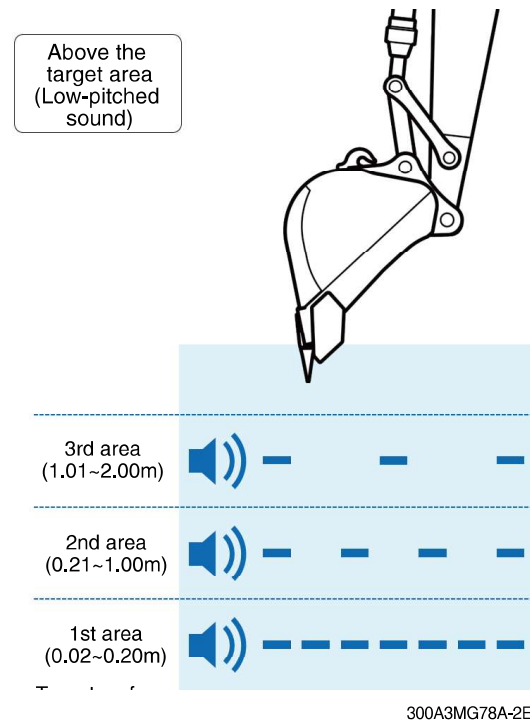
- (1) The monitor generates various alarm sounds according to the distance level between the target surface and the bucket tips.
- (2) The alarm sound can be set to enable or disable.
- (3) The depth margin of the 1st warning zone can be set from 0 m~2 m range.



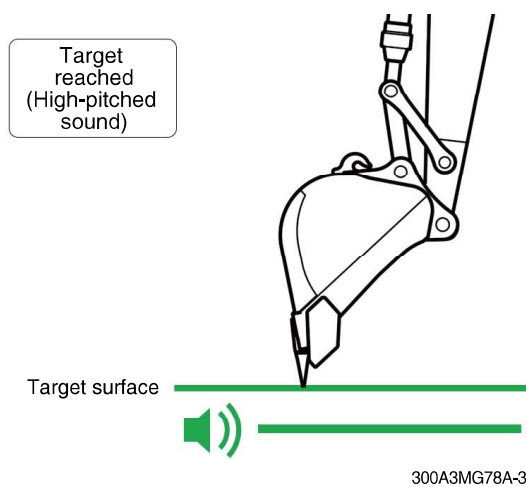
300A3MG77\_E



300A3MG78A-1E

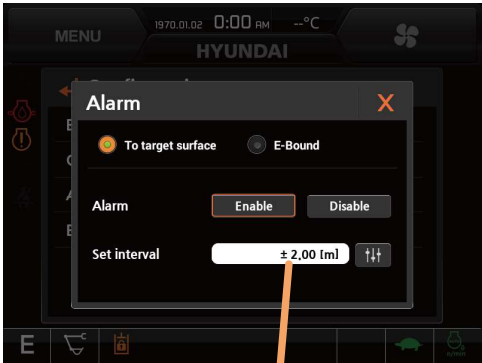


300A3MG78A-2E



300A3MG78A-3

(4) Alarm sound setting details

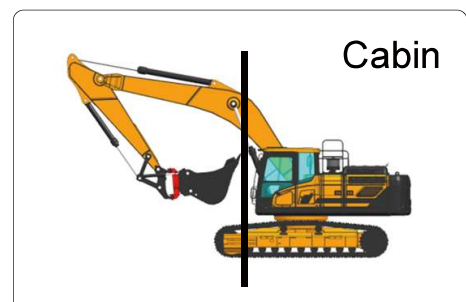
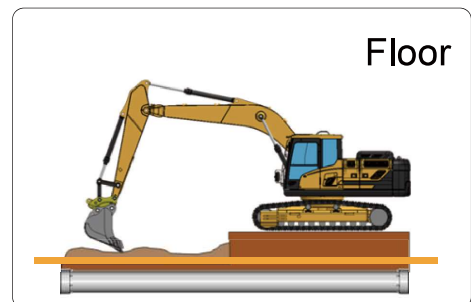
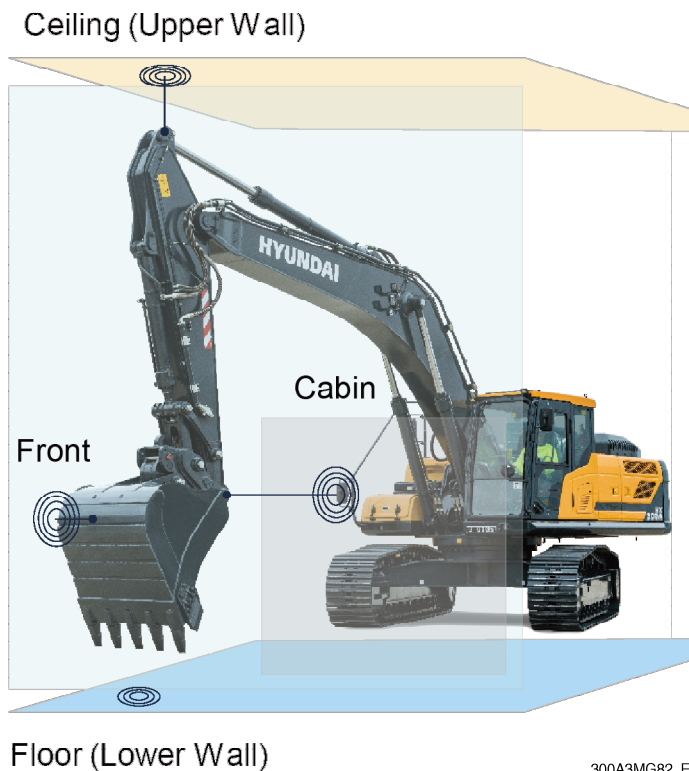


300A3MG81A\_E

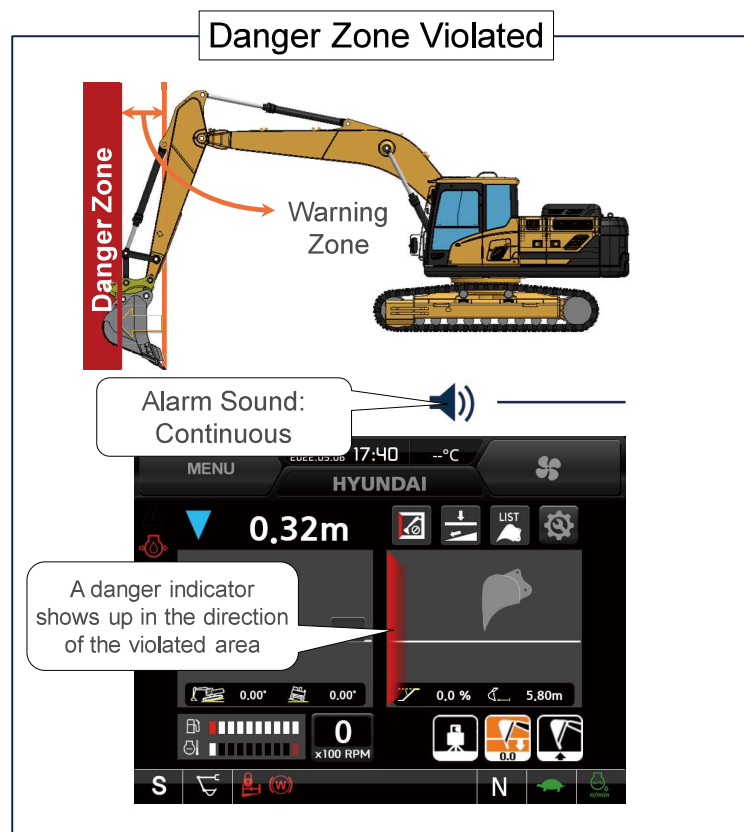
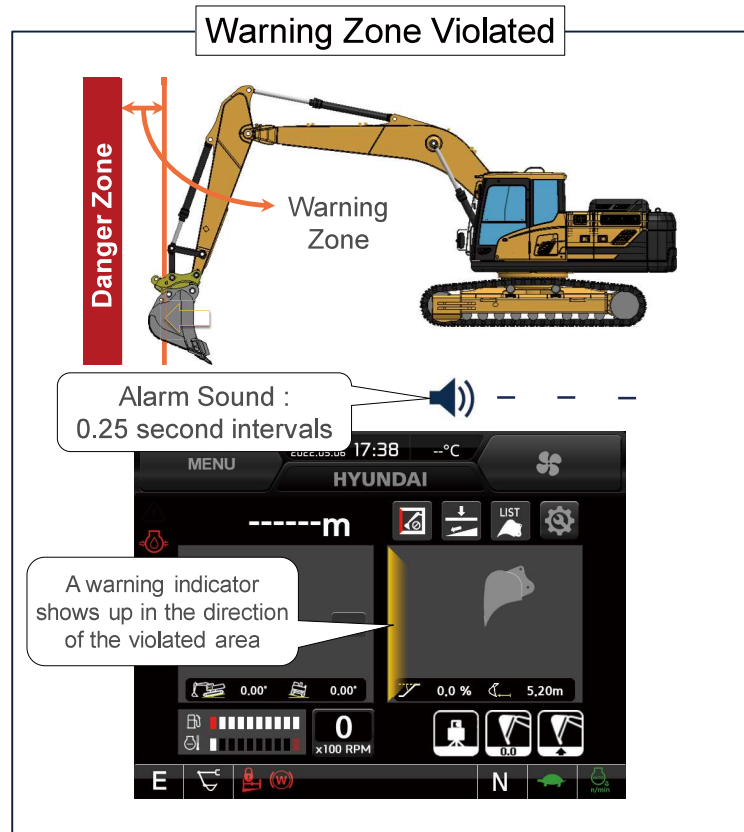
## 7) ALARM SETTING OF WORKING ZONE VIOLATION (E-Bound Alarm)

### (1) Outline

- ① Audible and visual warning functions for imaginary work zone around the attachment of an excavator.
  - Zone : Ceiling side, Floor side, Front side, Cabin side
- ② This is useful to keep the working environment safely and prevent the machine damage.



- ③ Alarm will ring when the attachment approaches the danger zone or violates the danger zone.



## (2) Warning function activation when the working zone is violated

- ① Danger indicator show up when the each danger zone is violated : Cluster screen warning+alarm sound

– Ceiling side



300A3MG89\_E

– Floor side



300A3MG90\_E

– Front side



300A3MG91\_E

– Cabin side



300A3MG92\_E



② Warning alarm is enabled when the attachment approaches each danger zone : Cluster screen warning+alarm sound

– Ceiling side



300A3MG93\_E

– Floor side



300A3MG94\_E

– Front side



300A3MG95\_E

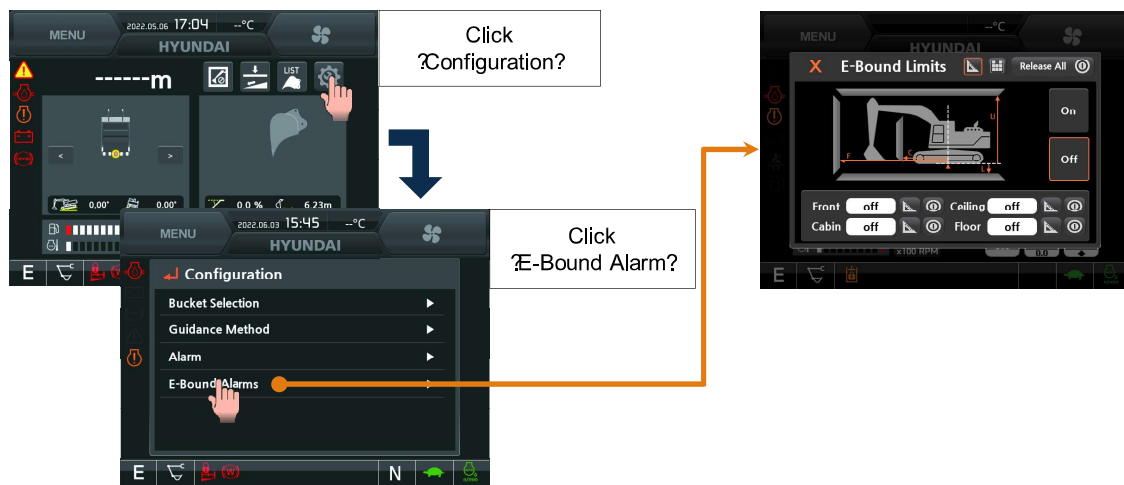
– Cabin side



300A3MG96\_E

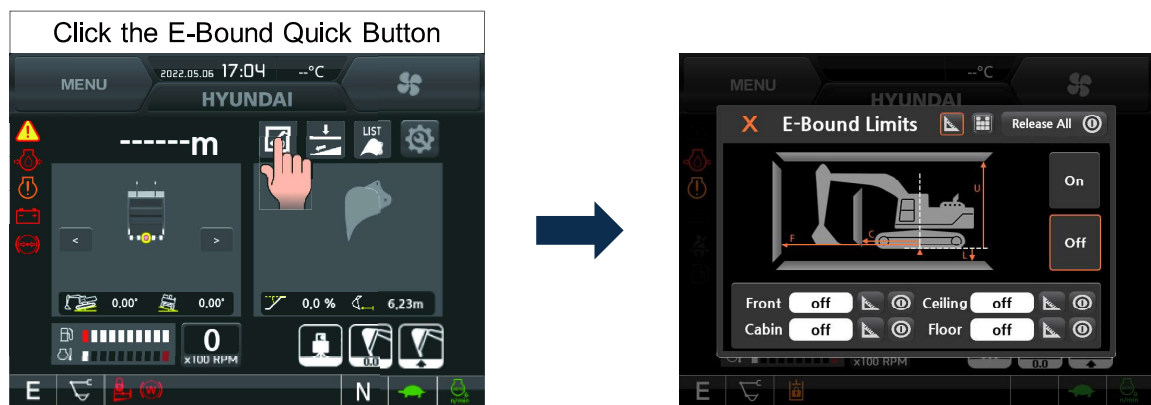
### (3) Configuration of menus for working zone violation warnings

#### ① Moving route 1 of the working zone violation warning menu



300A3MG97A\_E

#### ② Moving route 2 of the working zone violation warning menu

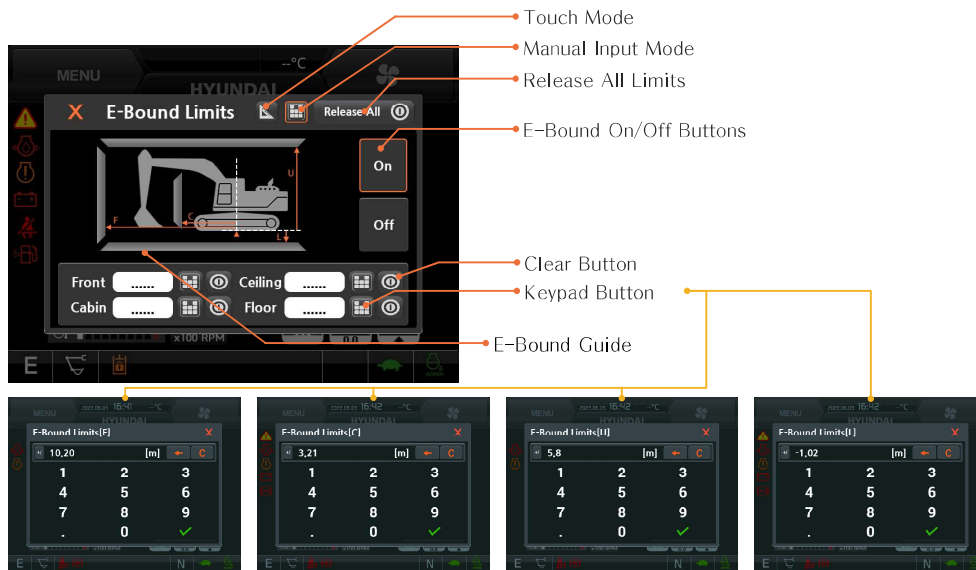


300A3MG98A\_E



#### (4) Working zone setting

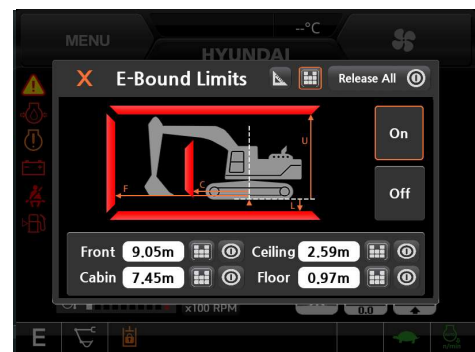
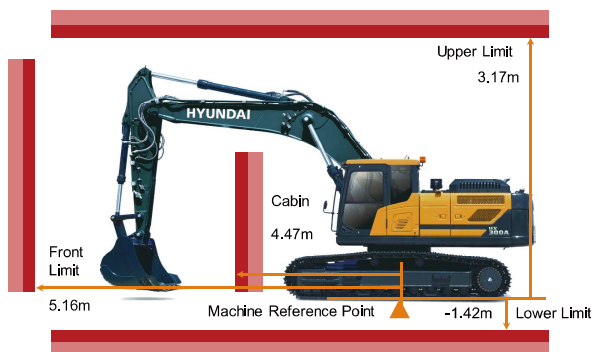
##### ① Consists of the working zone setting screen



300A3MG99A\_E

##### ② Working zone setting-direct input

- Measure the distance from the machine reference point to the working zone as below figure.
- Go into the 'E-bound limits' menu and confirm the 'On' button is activated on the right side of the menu.
- Press the 'manual input mode' button ( ) on the top side of the menu.
- Input the figure by using the keypad after pressing the keypad button ( ) of the working zone item to set.
- Confirm the figure of the working zone and display of the working zone indicator on the 'E-bound guide' window.

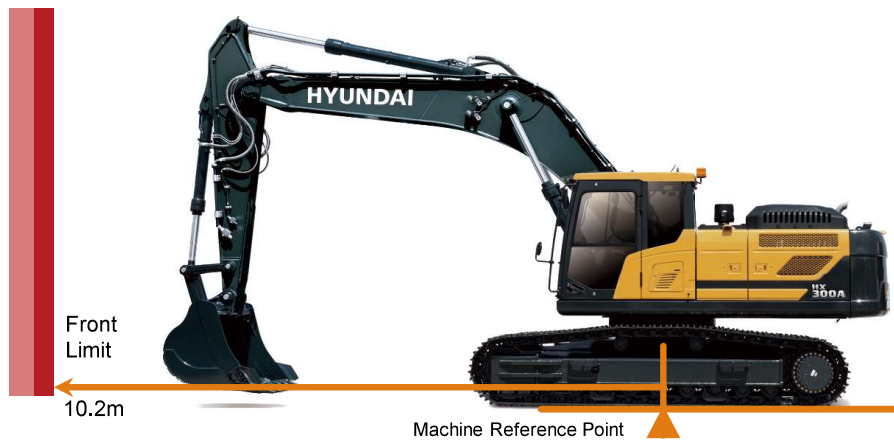


300A3MG100A\_E


### ③ Working zone setting-direct input example

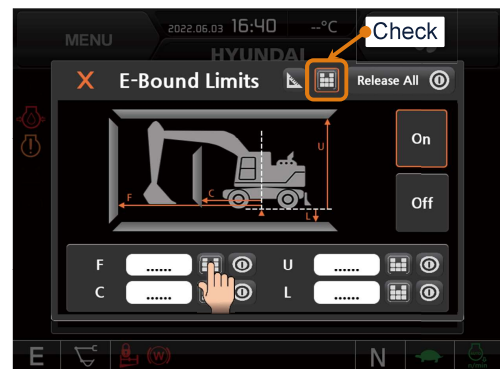
#### a. Front side working zone input

- Measure the distance from the machine reference point to the front side working zone.



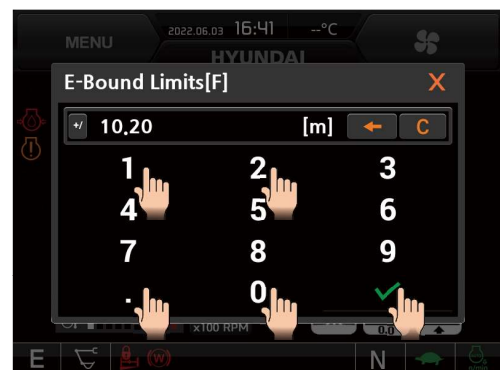
300A3MG101\_E

- Press the keypad button (  ) of the item F in the 'E-bound limits' setting menu.



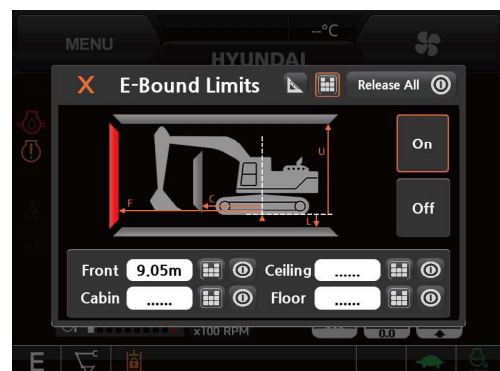
300A3MG102A\_E

- Input the measured figure.



300A3MG103\_E

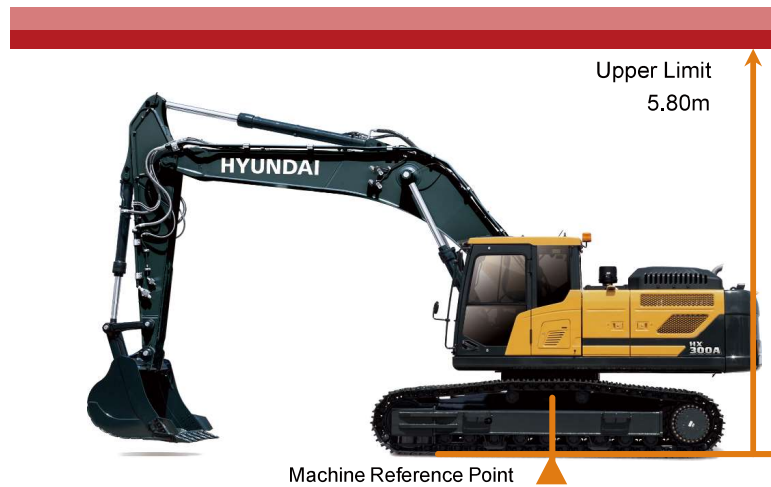
- Confirm the indicator for front side is activated and the value for the distance to the front side on the E-Bound Limits window.




300A3MG104A\_E

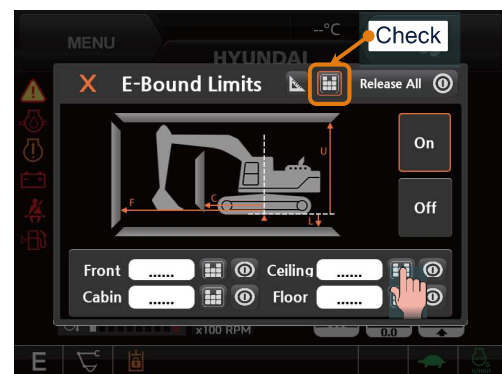
b. Ceiling side working zone input

- Measure the distance from the machine reference point to the ceiling side working zone.



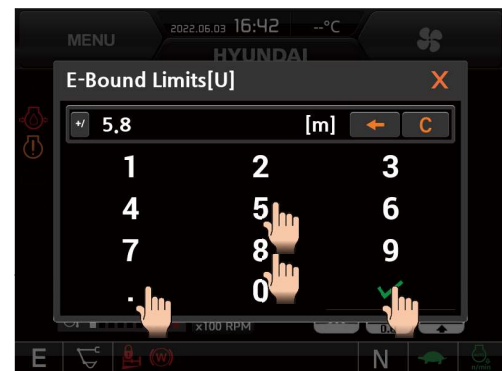
300A3MG105\_E

- Press the keypad button (  ) of the item U in the 'E-bound limits' setting menu.



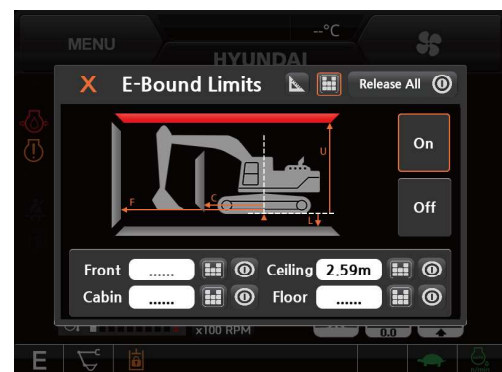
300A3MG106A\_E

- Input the measured figure.



300A3MG107\_E

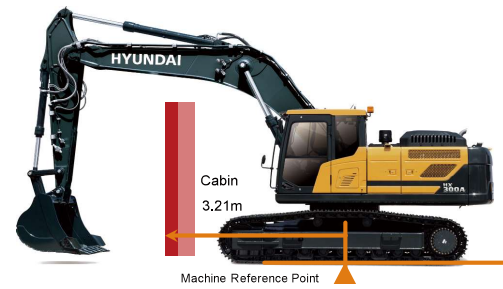
- Confirm the indicator for ceiling side is activated and the value for the distance to the ceiling side on the E-Bound Limits window.




300A3MG108A\_E

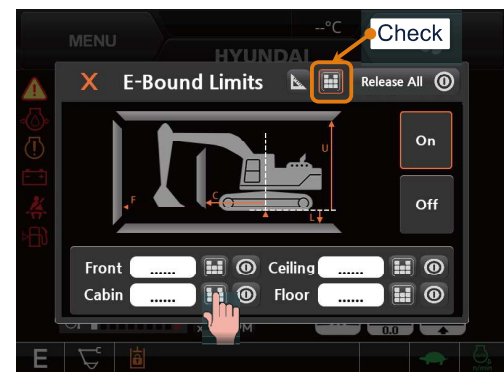
c. **Cabin side working zone input**

- Measure the distance from the machine reference point to the cabin side working zone.



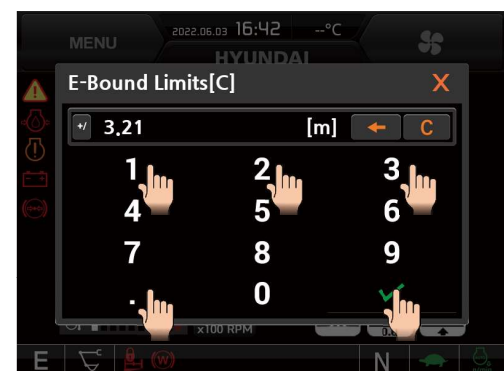
300A3MG109\_E

- Press the keypad button (  ) of the item C in the 'E-bound limits' setting menu.



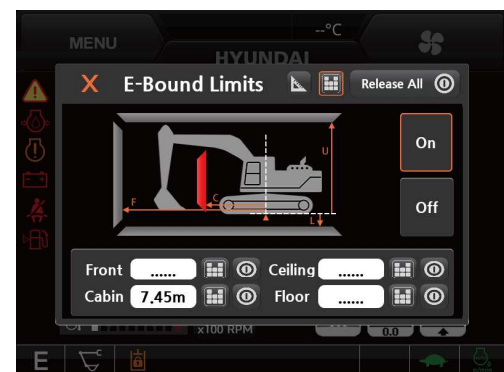
300A3MG110A\_E

- Input the measured figure.



300A3MG111\_E

- Confirm the indicator for cabin side is activated and the value for the distance to the cabin side on the E-Bound Limits window.




300A3MG112A\_E

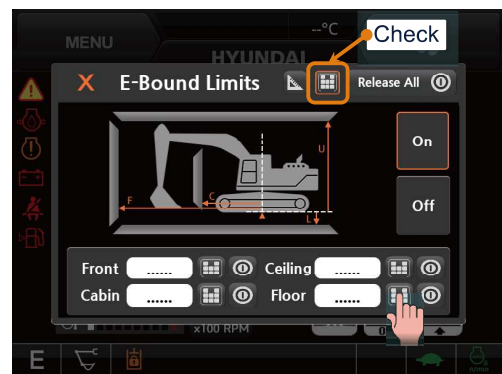
d. **Floor side working zone input**

- Measure the distance from the machine reference point to the floor side working zone.



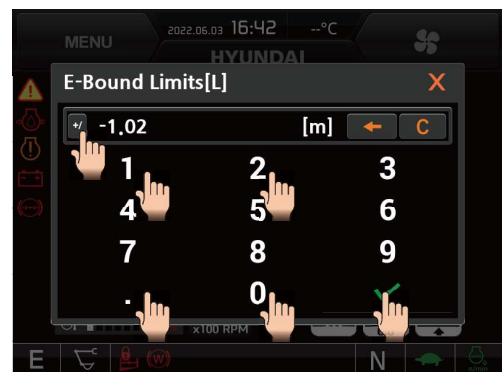
300A3MG113\_E

- Press the keypad button (  ) of the item L in the 'E-bound limits' setting menu.



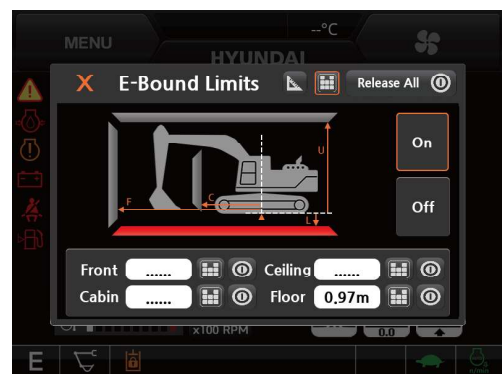
300A3MG114A\_E

- Input the measured figure.





300A3MG115\_E

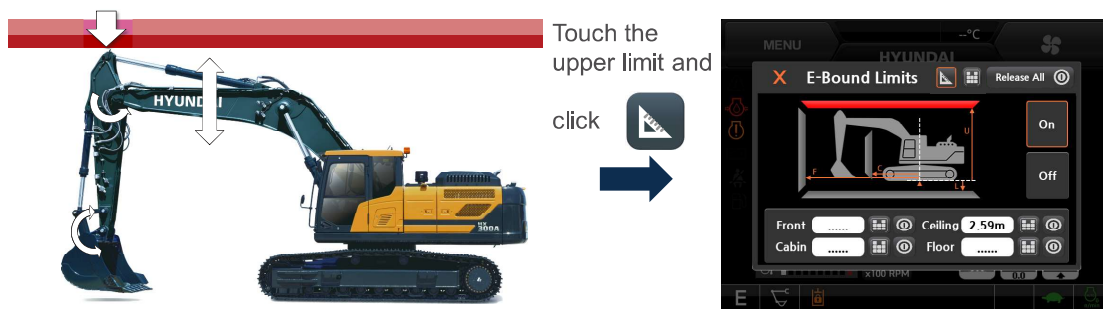
- Confirm the indicator for floor side is activated and the value for the distance to the floor side on the E-Bound Limits window.



300A3MG116A\_E

#### ④ Working zone setting-touch input

- Adjust the some point of the attachment touches or locates near the working zone by operating the attachment.
- Go into the 'E-bound limits' menu and confirm the 'On' button is activated on the right side of the menu.
- Press the 'touch input mode' button (  ) on the top side of the menu.
- Press the keypad button (  ) of the working zone item to set.
- Confirm the figure of the working zone and display of the working zone indicator on the 'E-bound guide' window.



300A3MG117A\_E


## ⑤ Working zone setting-touch input example

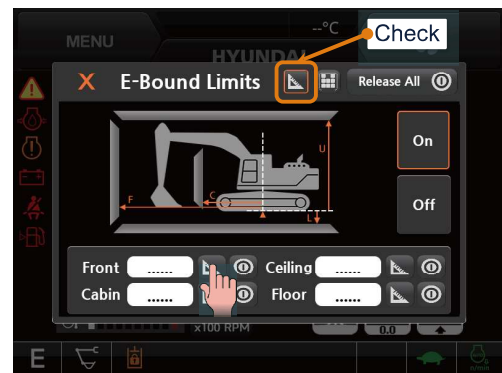
### a. Front side working zone input

- Adjust the attachment location near the front side working zone to set



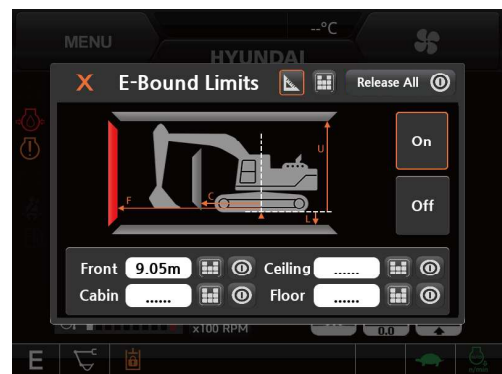
300A3MG118\_E

- Press the keypad button (  ) of the item F in the 'E-bound limits' setting menu.



300A3MG119A\_E

- Confirm the indicator for front side is activated and the value for the distance to the front side on the E-Bound Limits window.




300A3MG120A\_E

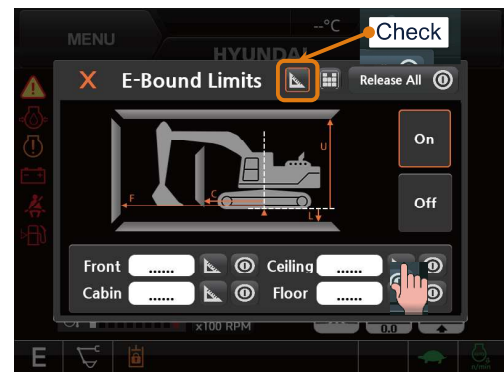
b. **Ceiling side working zone input**

- Adjust the attachment location near the ceiling side working zone to set



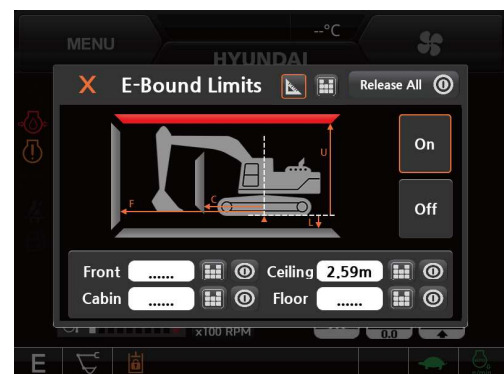
300A3MG121\_E

- Press the keypad button (  ) of the item U in the 'E-bound limits' setting menu.



300A3MG122A\_E

- Confirm the indicator for ceiling side is activated and the value for the distance to the ceiling side on the E-Bound Limits window.



300A3MG123A\_E




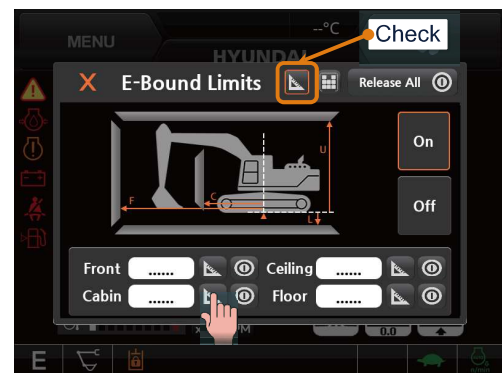
c. **Cabin side working zone input**

- Adjust the attachment location near the cabin side working zone to set



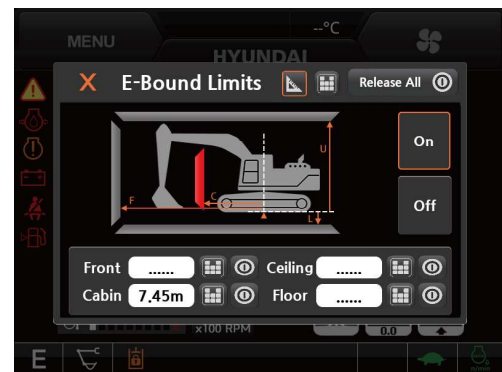
300A3MG124\_E

- Press the keypad button (  ) of the item C in the 'E-bound limits' setting menu.



300A3MG125A\_E

- Confirm the indicator for cabin side is activated and the value for the distance to the cabin side on the E-Bound Limits window.




300A3MG126A\_E

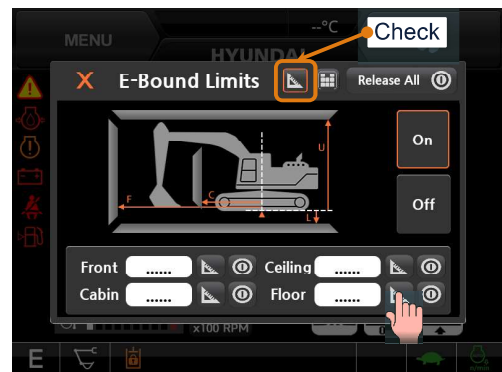
d. **Floor side working zone input**

- Adjust the attachment location near the floor side working zone to set



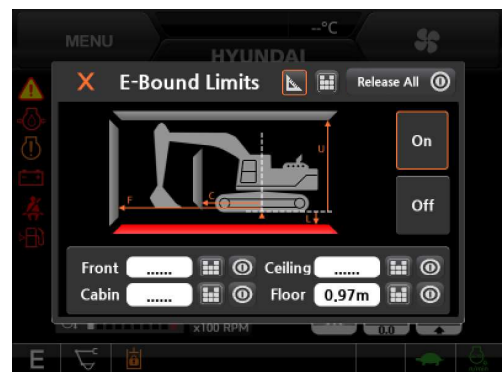
300A3MG127

- Press the keypad button (  ) of the item L in the 'E-bound limits' setting menu.



300A3MG128A\_E

- Confirm the indicator for floor side is activated and the value for the distance to the floor side on the E-Bound Limits window.



300A3MG129A\_E

(5) Working zone violation alarm setting

① Working zone violation alarm function ON/Off

a. E-bound alarm on



300A3MG130\_E

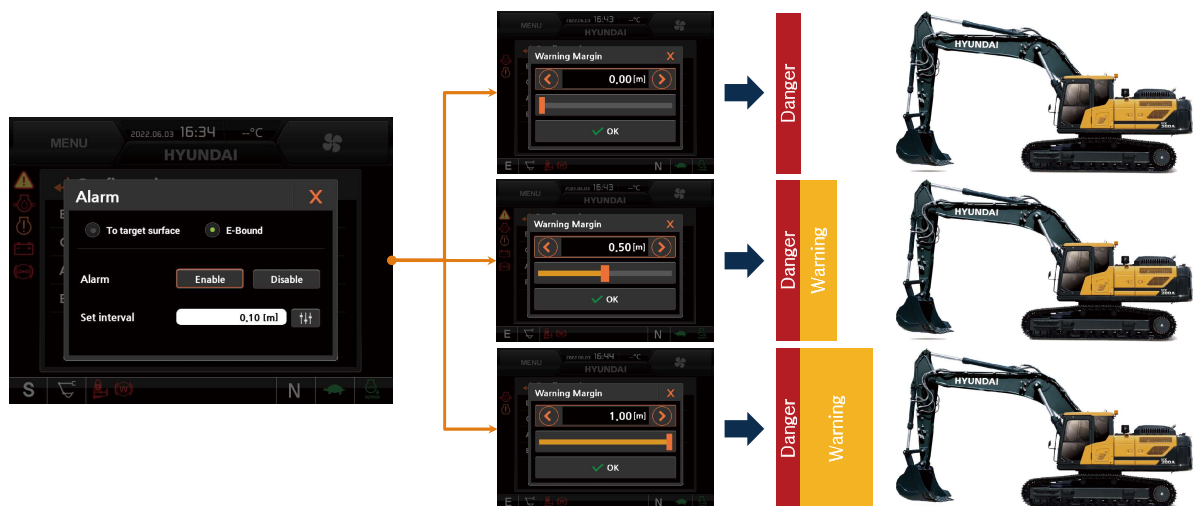
b. E-bound alarm off



300A3MG131\_E

## ② Warning zone distance setting

- This set-up the warning zone to activate the warning previously before the working zone is violated.
- Adjust the warning zone distance by using the keypad.
- The warning zone distance can be set from 0 m (none warning zone) to 2 m.  
We recommend to set 30 cm more.



300A3MG132\_E

## ③ Precaution when the working zone violation warning function is used

- The working zone of the ceiling side, floor side and cabin side can be keep when the machine moves working area forward or backward without swing.
- The working zone can be keep as table below according to moving method of the machine location.

Working type	Moving method	Front side	Cabin side	Ceiling side	Floor side
Depth working	Touch point utilization	○	○	○	○
	Zero point re-setting	—	○	○	○
	laser scanning	—	○	○	○
Slope working	Touch point utilization	○	○	○	○
	Zero point re-setting	—	○	○	○
	laser scanning	—	○	—	—