

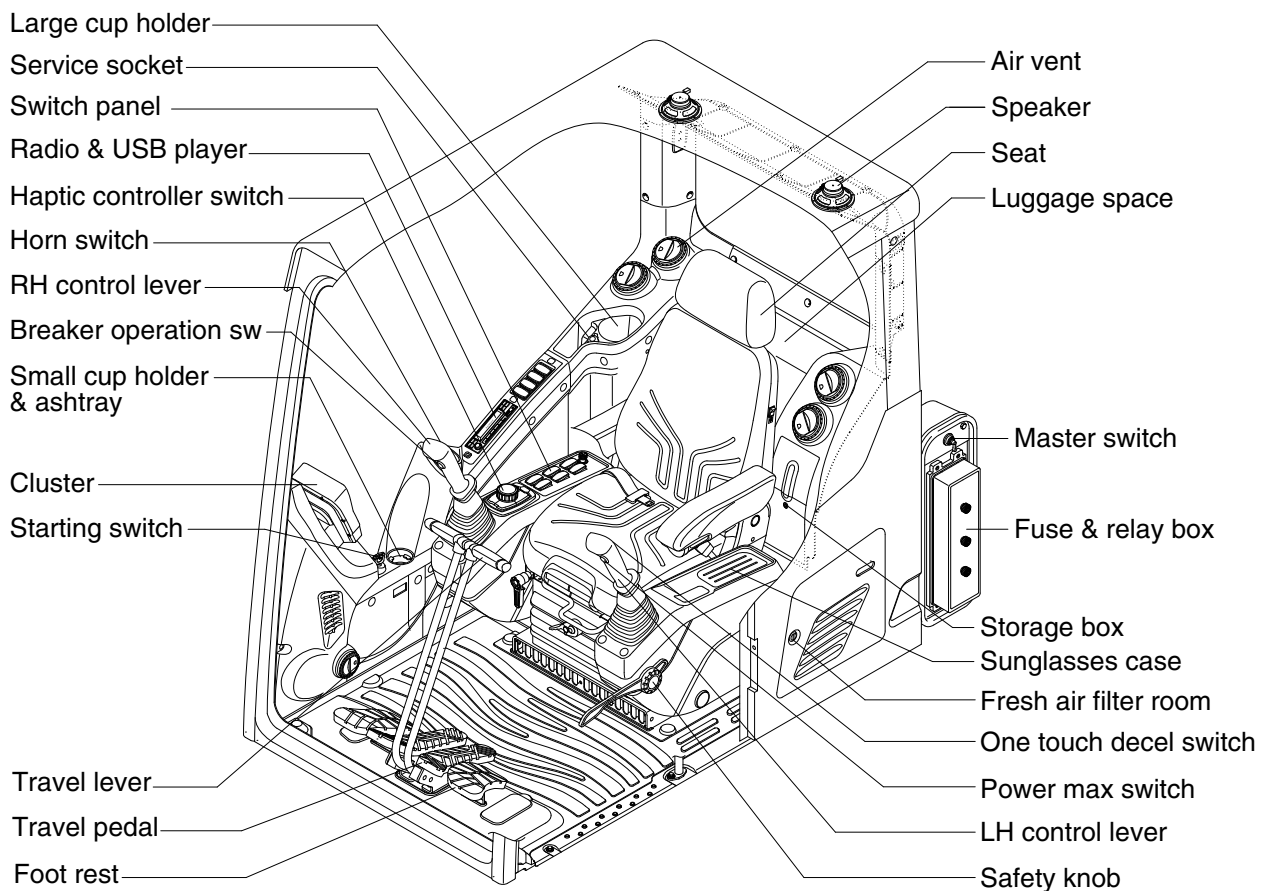
# CONTROL DEVICES

## 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 safety warning system for early detection of machine malfunction.



290F3CD01

## 2. CLUSTER

### 1) STRUCTURE

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

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

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



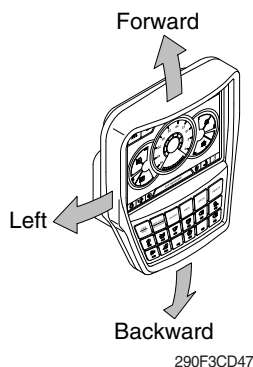
480F3CD50A

- ※ 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.



290F3CD51A

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

※ Operation screen type can be set by the screen type menu of the display.

Refer to page 3-26 for details.

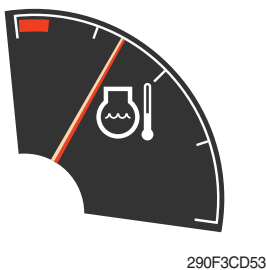
### (2) RPM / Speed gauge



290F3CD49

- ① This display the engine speed.


### (3) Engine coolant temperature gauge




290F3CD53

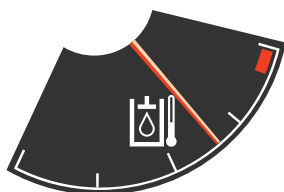
- ① This gauge indicates the temperature of coolant.

- White range : 40-107°C (104-225°F)
- Red range : Above 107°C (225°F)



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

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

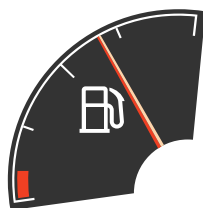
#### (4) Hydraulic oil temperature gauge





290F3CD54

- ① This gauge indicates the temperature of hydraulic oil.
  - White range : 40-105°C(104-221°F)
  - Red range : Above 105°C(221°F)
- ② If the indicator is in the red range or  lamp pops up and the buzzer sounds reduce the load on the system. If the gauge stays in the red range, stop the machine and check the cause of the problem.
- ※ If the gauge indicates the red range or  lamp blinks in red even though the machine is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.

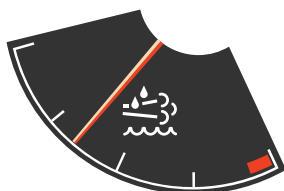
#### (5) Fuel level gauge





290F3CD55

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

#### (6) DEF/AdBlue® Level gauge



290F3CD57

- ① This gauge indicates the amount of liquid in the DEF/AdBlue® tank.
- ② Fill the DEF/AdBlue® when the red range, or  lamp pops up and the buzzer sounds.
- ③ Do not pour DEF/AdBlue® any more when the DEF/AdBlue® fill up warning lamp lights ON.
- ※ Refer to page 3-10.
- ※ If the gauge indicates the red range or  lamp blinks in red even though the machine is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.

#### (7) Tripmeter display



290F3CD56

- ① This displays the engine the tripmeter.
- ※ Refer to page 3-28 for details.



### (8) Eco gauge



290F3CD58

- ① This gauge indicates the fuel consumption rate and machine load status. So that operators can be careful with fuel economy.
- ② The fuel consumption rate or machine load is higher, the number of segment is increased.
- ③ The color of Eco gauge indicates operation status.
  - White : Idle operation
  - Green : Economy operation
  - Yellow : Non-economy operation at a medium level.
  - Red : Non-economy operation at a high level.

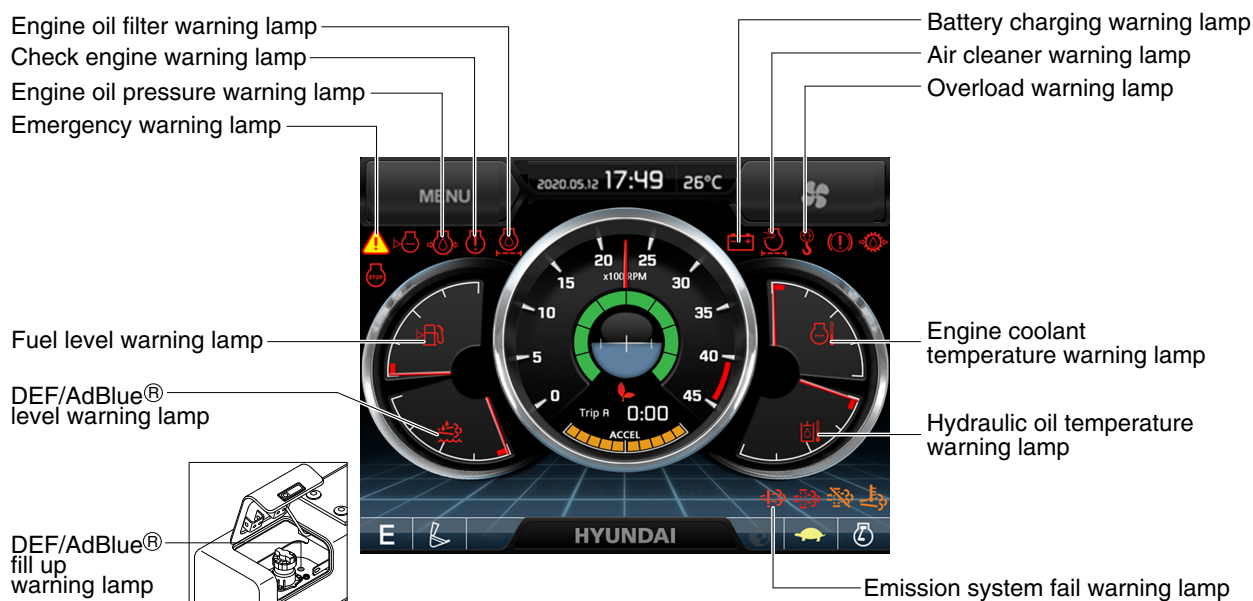
### (9) Accel dial gauge



290F3CD59

- ① This gauge indicates the level of accel dial.

### 3) WARNING LAMPS



480F3CD60A

#### ※ 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 and blinks, and the buzzer stops when ;</li> <li>- the buzzer stop switch <b>AUTO IDLE Buzzer Stop</b> is pushed</li> <li>- the knob of the haptic controller is pushed</li> <li>- the lamp of the LCD is touched</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 and light ON or blinks, and the buzzer stops when ;</li> <li>- the buzzer stop switch <b>AUTO IDLE Buzzer Stop</b> is pushed</li> <li>- the knob of the haptic controller is pushed</li> <li>- the lamp of the LCD is touched</li> </ul> <p>※ Refer to page 3-10 for details.</p>
	Warning lamp pops up on the center of the LCD and the buzzer sounds	<p>※ Refer to page 3-7 for details.</p>

※ Refer to page 3-15 for the buzzer stop switch **AUTO IDLE Buzzer Stop** and page 3-55 for the haptic controller.

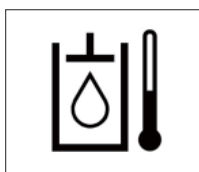
### (1) Engine coolant temperature warning lamp










290F3CD61

- ① Engine coolant temperature warning is indicated two steps.
  - 103°C over : The  lamp pops up and the buzzer sounds.
  - 107°C over : The  lamp pops up and the buzzer sounds.
- ② The pop-up ,  lamps move to the original position and blinks when the buzzer stop switch  is pushed. And the buzzer stops and ,  lamps keep blink.
- ③ Check the cooling system when the lamps keep blink.

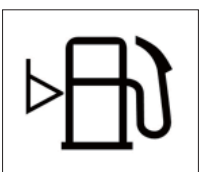
### (2) Hydraulic oil temperature warning lamp



290F3CD62

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

### (3) Fuel level warning lamp




290F3CD63

- ① This warning lamp pops up and the buzzer sounds when the level of fuel is below 92 ℓ (24.3 U.S. gal).
- ② Fill the fuel immediately when the lamp blinks.

### (4) Emergency warning lamp



290F3CD64

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

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



290F3CD65

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

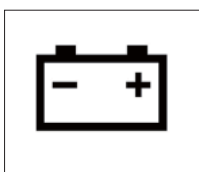
#### (6) Check engine warning lamp



290F3CD66

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

#### (7) Battery charging warning lamp



290F3CD67

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

#### (8) Air cleaner warning lamp



290F3CD68

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

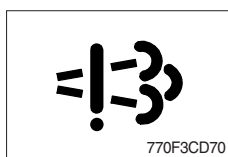
#### (9) Overload warning lamp (opt)



290F3CD69

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

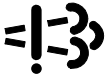
#### (10) Emission system fail warning lamp



① This warning lamp lights ON if there are faults on the SCR system.

※ In the case of some faults, the torque is reduced.

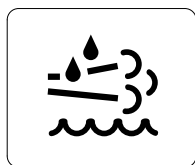
※ Please contact your HD Hyundai Construction Equipment service center or local dealer.

Warning lamp		Torque reduction
	Time	
On	Fault detected	-
Blink	After 30 minutes	· Torque is reduced by 1% per minute to 70% of the highest torque.
Blink rapidly	After 4 hours	· Torque is reduced by to 0% (low idling) within 2~10 minutes.

※ 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.


※ If a new fault occurs within 40 hours of operation since the first fault, the warning lamp will come ON. After 30 minutes of operation, the warning lamp will blink rapidly and torque will be reduced to 0% (low idling) within 30 minutes.

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

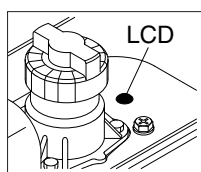


290F3CD257

- ① This warning lamp indicates when ON or blinking, that the DEF/AdBlue® level is low as table below.
- ※ It is recommended that the DEF/AdBlue® tank be filled completely full of the DEF/AdBlue® in order to correct any fault conditions.
- ※ The engine resumes normal torque after DEF/AdBlue® has been filled to a level of at least 20%.

Warning lamp		Description
	DEF/AdBlue® level	
On	20%	<ul style="list-style-type: none"> <li>· The DEF/AdBlue® level has fallen below the initial warning level (20%).</li> </ul>
Blink	10%	<ul style="list-style-type: none"> <li>· The DEF/AdBlue® level has fallen below the critical warning level (10%).</li> <li>· Torque is reduced by 1% per minute to 70% of the highest torque.</li> </ul>
Blink rapidly	0%	<ul style="list-style-type: none"> <li>· This is happened when 30 minutes elapsed with empty conditions (0%) of the DEF/AdBlue® tank.</li> <li>· Torque is reduced by to 0% (low idling) within 2~10 minutes.</li> </ul>

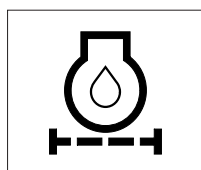
### (12) DEF/AdBlue® fill up warning lamp



290F3CD272

- ① This lamp lights ON when the DEF/AdBlue® tank is completely filled with DEF/AdBlue®.
- ※ Fill the tank with the DEF/AdBlue® after start switch ON and then turn OFF the start switch.
- ※ Do not pour DEF/AdBlue® any more when this lamp lights ON. Otherwise DEF/AdBlue® tank may freeze and burst in winter season.

### (13) Engine oil filter warning lamp

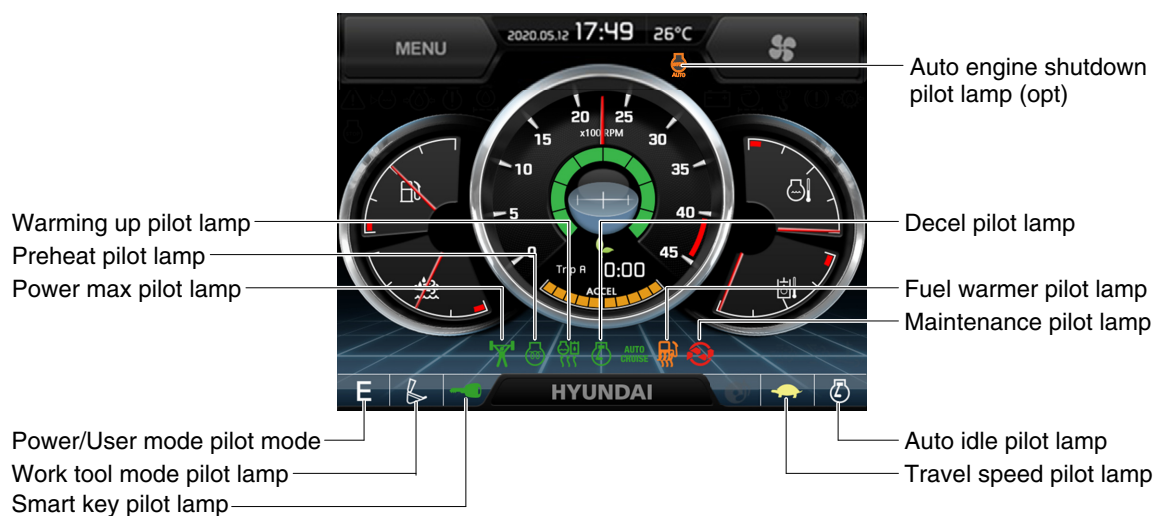


300A3CD306

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



## 4) PILOT LAMPS



290F3CD74A

### (1) Mode pilot lamps

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

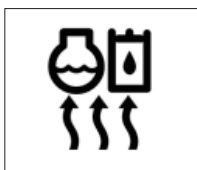
### (2) Power max pilot lamp



290F3CD78

- ① The lamp will be ON when pushing power max switch on the LH RCV lever.
  - ② The power max function is operated maximum 8 seconds.
- ※ Refer to the page 3-37 for power max function.

### (3) Warming up pilot lamp



290F3CD80

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

### (4) Decel pilot lamp



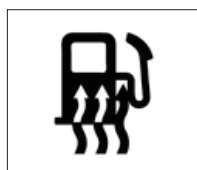
290F3CD81

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

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

※ **Refer to the page 3-36.**

### (5) Fuel warmer pilot lamp



290F3CD82

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

### (6) Maintenance pilot lamp

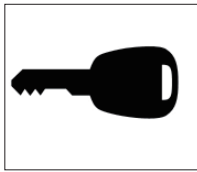


290F3CD83

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

※ **Refer to the page 3-22.**

**(7) Smart key pilot lamp (opt)**



290F3CD214

- ① This lamp is ON when the engine is started by the start button.
- ② This lamp is red when the authentication fails, green when succeeds.

※ **Refer to the page 3-23.**

**(8) Auto engine shutdown pilot lamp (opt)**



220A3CD202A

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

※ **Refer to the page 3-20-1.**

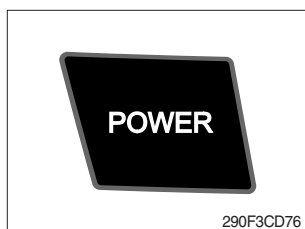
## 5) SWITCHES



290F3CD86A

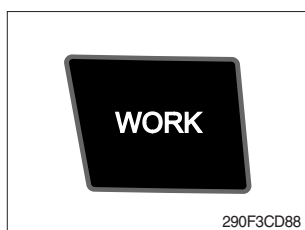
※ When some of the switches are selected, the pilot lamps are displayed on the LCD. Refer to the page 3-11 for details.




### (1) Power mode switch



- ① This switch is to select the machine power mode and selected power mode pilot lamp is displayed on the pilot lamp position.
  - P : Heavy duty power work.
  - S : Standard power work.
  - E : Economy power work.
- ② The pilot lamp changes E → S → P → E in order.

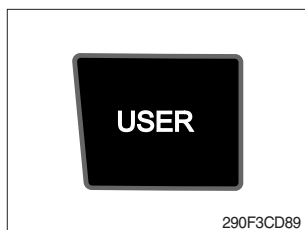
### (2) Work mode switch



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

※ Refer to the page 4-7 for details.



### (3) User mode switch



- ① This switch is used to memorize the current machine operating status in the MCU and activate the memorized user mode.
  - Memory : Automatically saved after key OFF.
  - Action : Push this switch.
  - Cancel : Push this switch once more.
- ② Refer to the page 3-19 for another set of user mode.

### (4) Travel speed switch



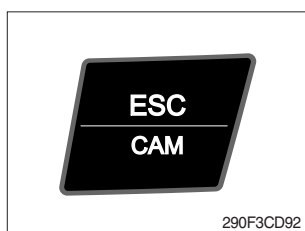
- ① This switch is used to select the travel speed alternatively.
  -  : Low speed
  -  : High speed
- ※ Do not change the setting of the travel speed switch. Machine stability may be adversely affected.
- ⚠ Personal injury can result from sudden changes in machine stability.

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



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

### (6) Escape/Camera switch



- ① This switch is used to return to the previous menu or parent menu.
- ② In the operation screen, pushing this switch will display the view of the camera on the machine (if equipped). Please refer to page 3-28 for the camera.
- ③ If the camera is not installed, this switch is used only ESC function.

### (7) Work light switch



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

#### (8) Head light switch



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

#### (9) Intermittent wiper switch



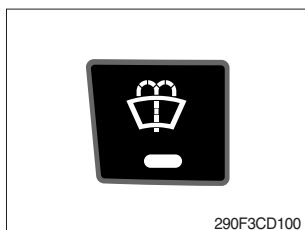
- ① This switch is used to wipe operates intermittently.
- ② The pilot lamp is turned ON when operating the switch.

#### (10) Wiper switch



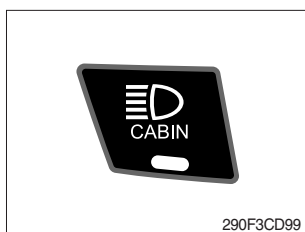
- ① This switch is used to operate the window wiper.
- ② Note that the wiper will self-park when switched off.
- ③ The pilot lamp is turned ON when operating the switch.
- ※ **If the wiper does not operate with the switch in ON position, turn the switch OFF immediately. Check the cause. If the switch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

#### (11) Washer switch



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

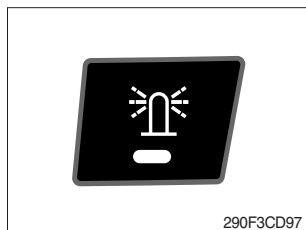
#### (12) Cab light switch



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

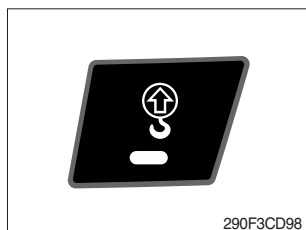


### (13) Beacon switch (opt)



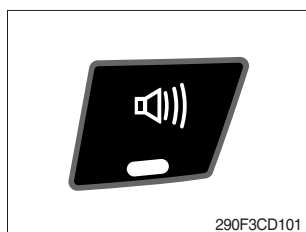
- ① This switch turns ON the rotary light on the cab.
- ② The pilot lamp is turned ON when operating the switch.

### (14) Overload switch (opt)



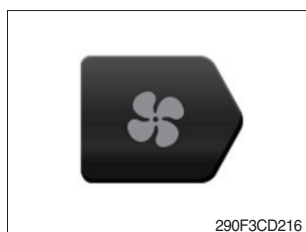
- ① When this switch turned ON, buzzer makes sound and overload warning lamp comes ON in case that the machine is overload.
  - ② When it turned OFF, buzzer stops and warning lamp goes out.
- ▲ Overloading the machine could impact the machines stability which could result in tipover hazard. A tipover hazard could result in serious injury or death. Always activate the overload warning device before you handle or lift objects.**

### (15) Travel alarm switch



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

### (16) Air conditioner quick touch switch



- ① This switch used to select air conditioner control mode.  
※ Refer to the page 3-30.

### (17) Main menu quick touch switch



- ① This switch is to activate the main menu in the cluster.  
※ Refer to the page 3-18.

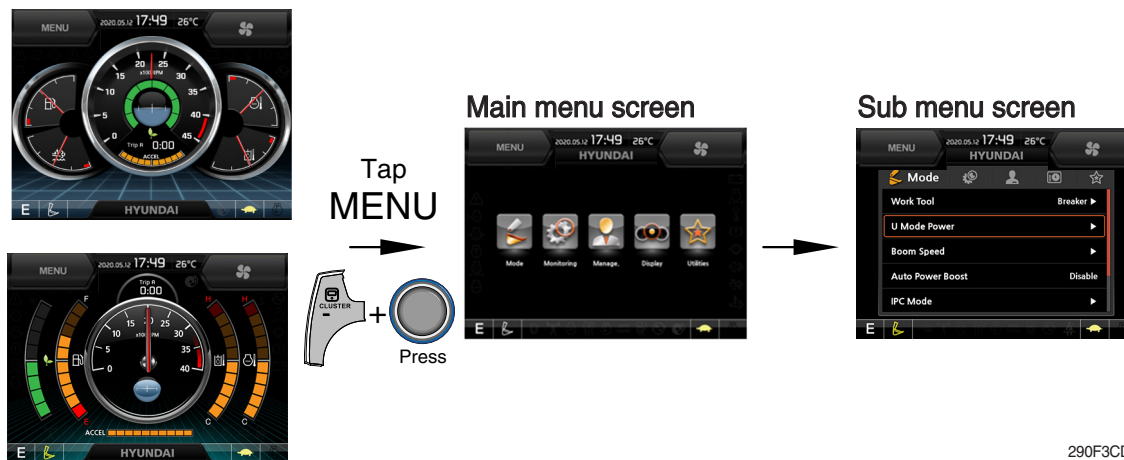
## 6) MAIN MENU

※ You can select or set the menu by the haptic controller or touch screen.

On the operation screen, tap MENU to access the main menu screen.

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


### · Operation screen



290F3CD102A

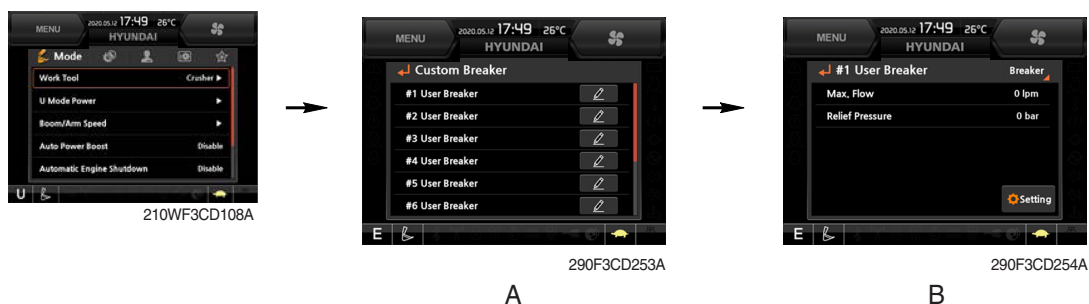
※ Please refer to the haptic controller, page 3-55 for selection and change of menu and input value.

### (1) Structure

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

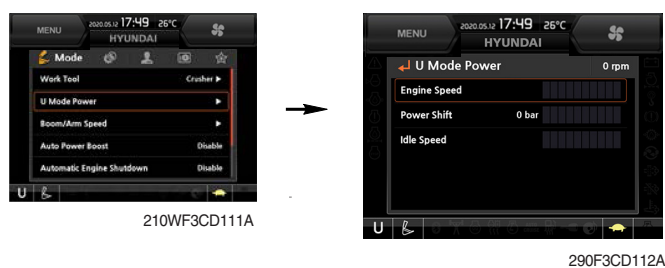
## (2) Mode setup

### ① Work tool



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

### ② U mode power

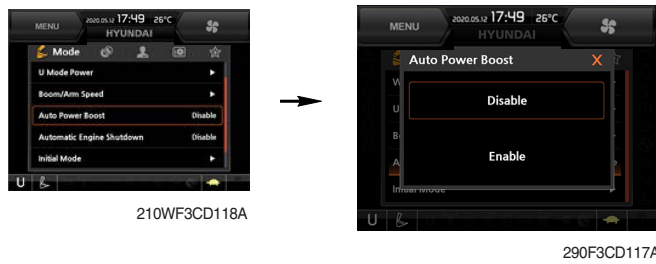


- Engine high idle rpm, auto idle rpm and pump torque (power shift) can be modulated and memorized separately in U-mode.
- U-mode can be activated by user mode switch.

Step (■)	Engine speed (rpm)	Idle speed (rpm)	Power shift (bar)
1	1200	800	0
2	1300	850	3
3	1350	900	6
4	1450	950	9
5	1550	1000 (auto decel)	12
6	1650	1050	16
7	1700	1100	20
8	1750	1150	26
9	1800	1200	32
10	1850	1250	38

※ One touch decel & low idle : 800 rpm

### ③ 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.

### ④ IPC mode



- The IPC mode can be selected by this menu.
  - Speed mode
  - Balance mode (default)
  - Efficiency mode
- This mode is applied only general operation mode of the work tool mode.
- ※ Please update the cluster programs if this mode is not displayed in the mode setup menu. Refer to the page 3-24-1.

### ⑤ Automatic engine shutdown (option)



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

### ⑥ Initial mode



- **Key on initial mode**
  - Selected the power mode is activated when the engine is started.
- **Accel initial mode**
  - Last setting value
  - User setting value
- **Accel initial step**
  - 0~9 step

### ⑦ Emergency mode



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

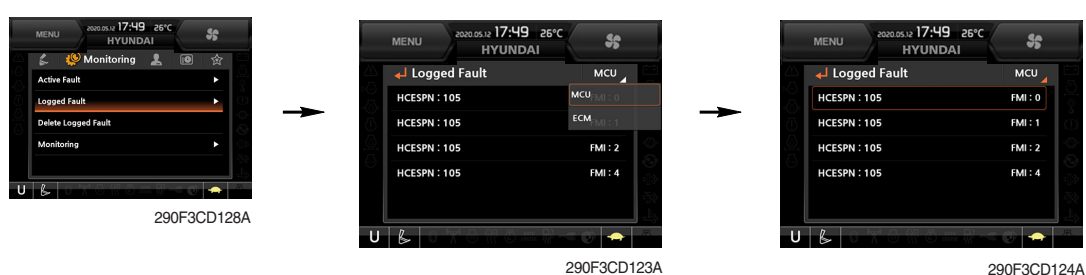
### (3) Monitoring

#### ① Active fault



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

#### ② Logged fault



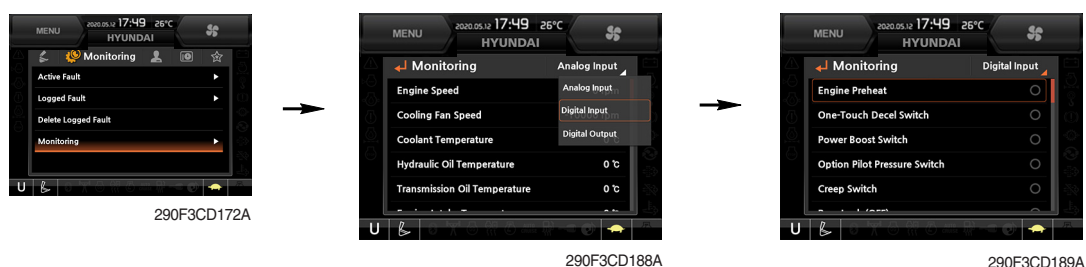
- The logged faults of the MCU, engine ECM, air conditioner or AAVM (option) can be checked by this menu.

#### ③ Delete logged fault



- The logged faults of the MCU, engine ECM, air conditioner or 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 ● are light ON.



#### (4) Management

##### ① Fuel rate information



210WF3CD14A



210WF3CD15A

A



B



C



D



210WF3CD16

##### · General record (A)

- Average fuel rate (left) (from "Reset" to now)  
Fuel consumption 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 for 12 hours earlier data.
- All hourly records deletion by "Reset".

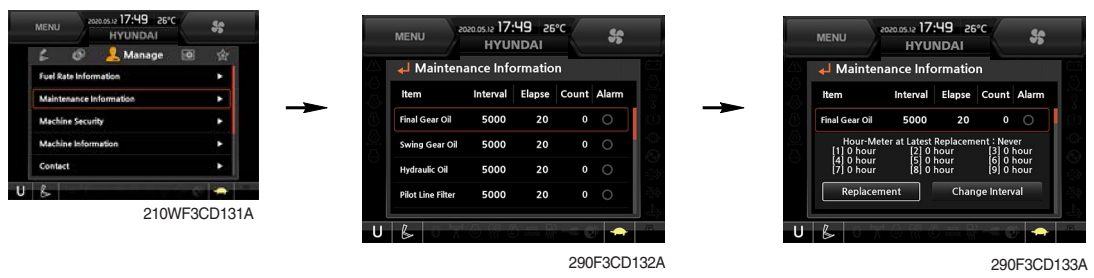
##### · Daily record (C)

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

##### · Mode record (D)

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

## ② Maintenance information



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

### ③ Machine security



#### · 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.

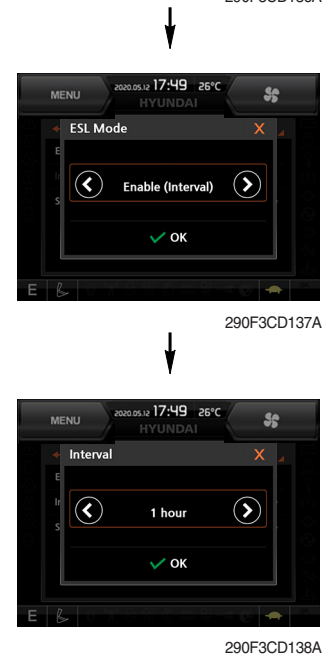
Enable (always) : The password is required whenever the operator starts engine.

- 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 +

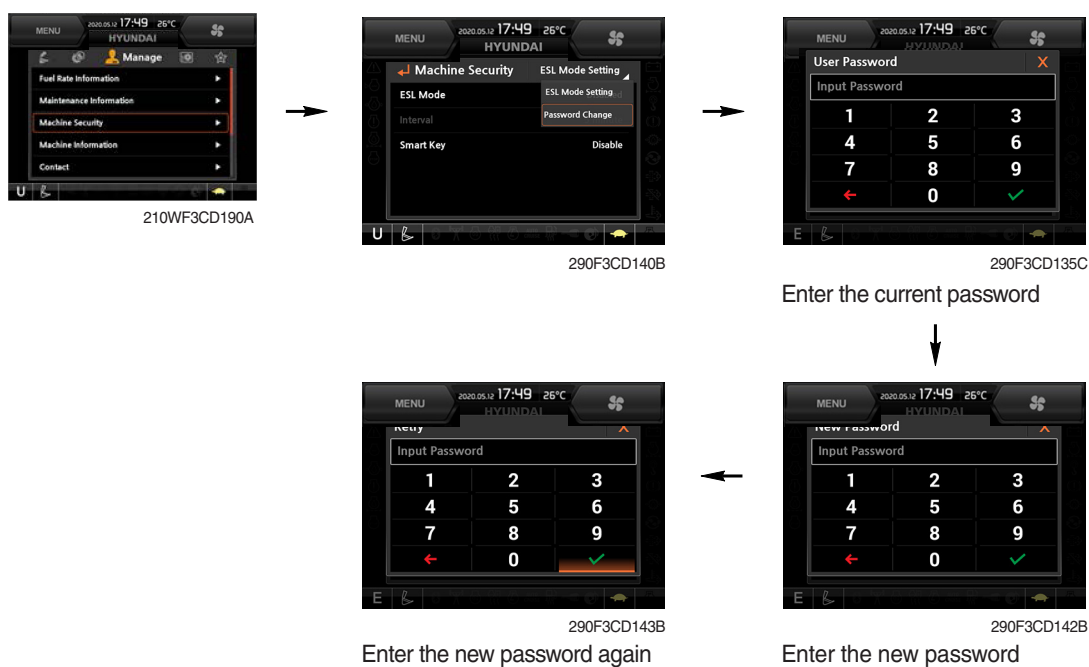
※ Password length : (5~10 digits) +

- 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.

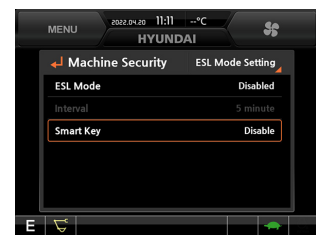
## - Smart key



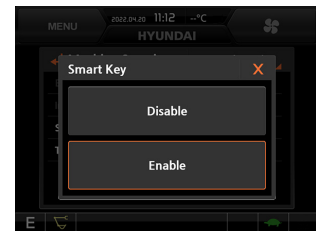
210WF3CD190A



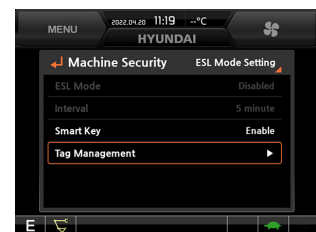
290F3CD135C



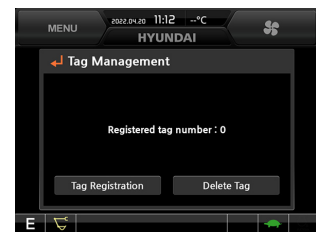
290F3CD001



290F3CD002

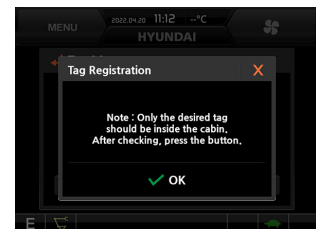


290F3CD003



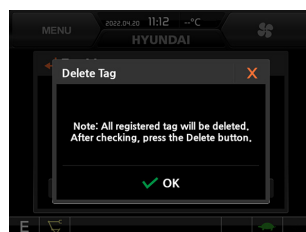
290F3CD004

Registering



290F3CD005

Deleting



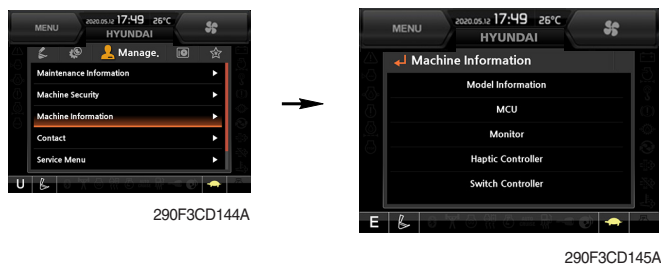
290F3CD006

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

## - Tag management

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

#### ④ Machine Information



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

#### ⑤ Contact (A/S phone number)



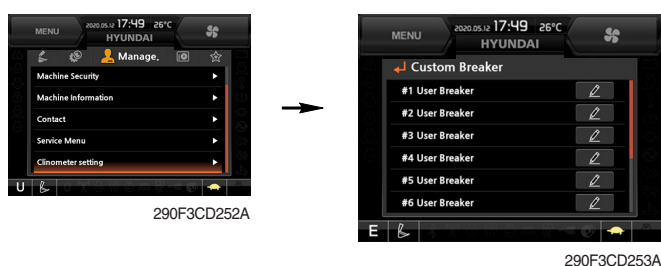
Enter the new A/S phone number

#### ⑥ Service menu



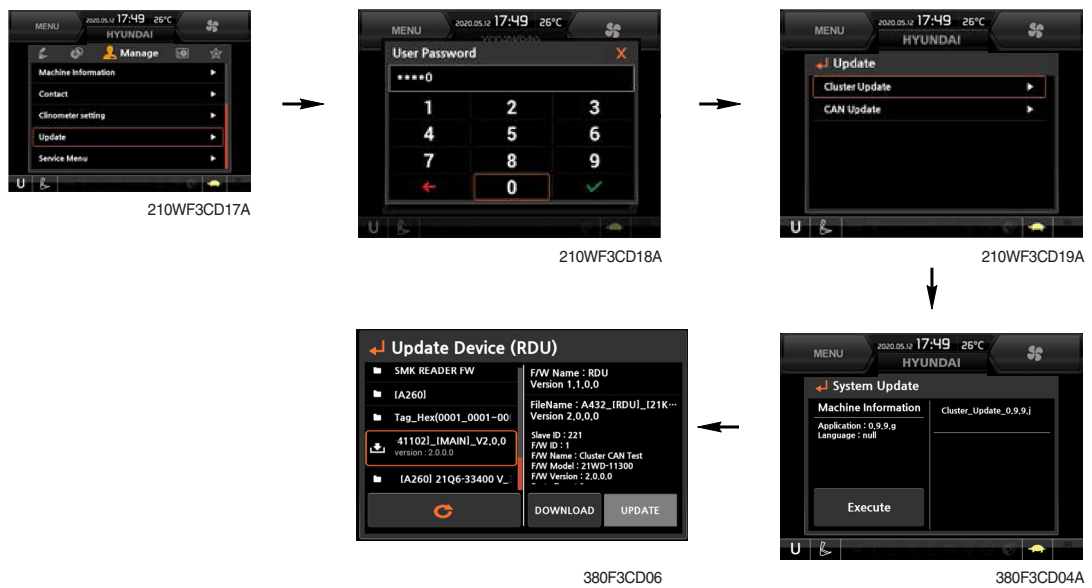
- Power shift (standard/option) : Power shift pressure can be set by option menu.
- Operating hours : Operating hours since the machine line out can be checked by this menu.
- Breaker mode pump acting (1 pump/2 pump)
- EPPR current level (attach flow EPPR 1 & 2, boom priority EPPR, attach relief pressure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

#### ⑦ Clinometer



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

## ⑧ Update (cluster & ETC devices)



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



## (5) Display

### ① Display item



290F3CD154A



290F3CD155A



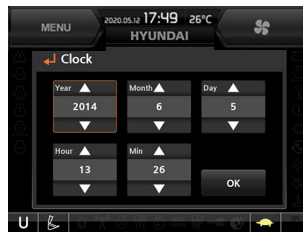
290F3CD156A

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

### ② Clock



290F3CD157A



290F3CD158A

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

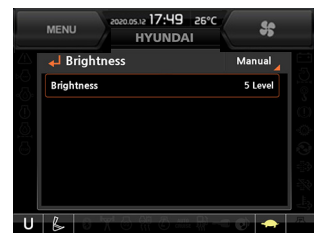
### ③ Brightness



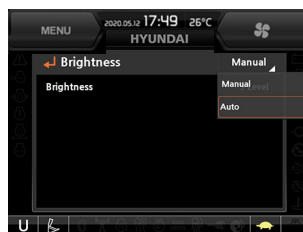
290F3CD159A



290F3CD160A



290F3CD139A



290F3CD141A



290F3CD191A



290F3CD192

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

#### ④ Unit



- 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



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

## ⑥ Screen type



290F3CD165A



A Type (Default) 290F3CD166A



290F3CD156B



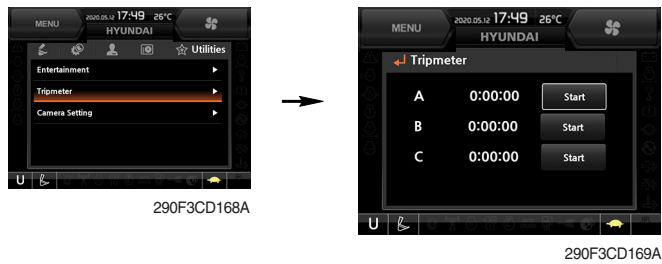
B Type (Option) 290F3CD194A



290F3CD167B

## (6) Utilities

### ① Tripmeter



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

### ② Camera setting

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



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



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

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

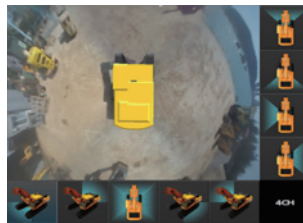


##### - Escape button

- It will enter into the AAVM mode from the beginning screen if the AAVM is installed.
- While in the AAVM mode, select the ESC button to return to the beginning screen.



The beginning screen



AAVM mode

##### - Buzzer stop button

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



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



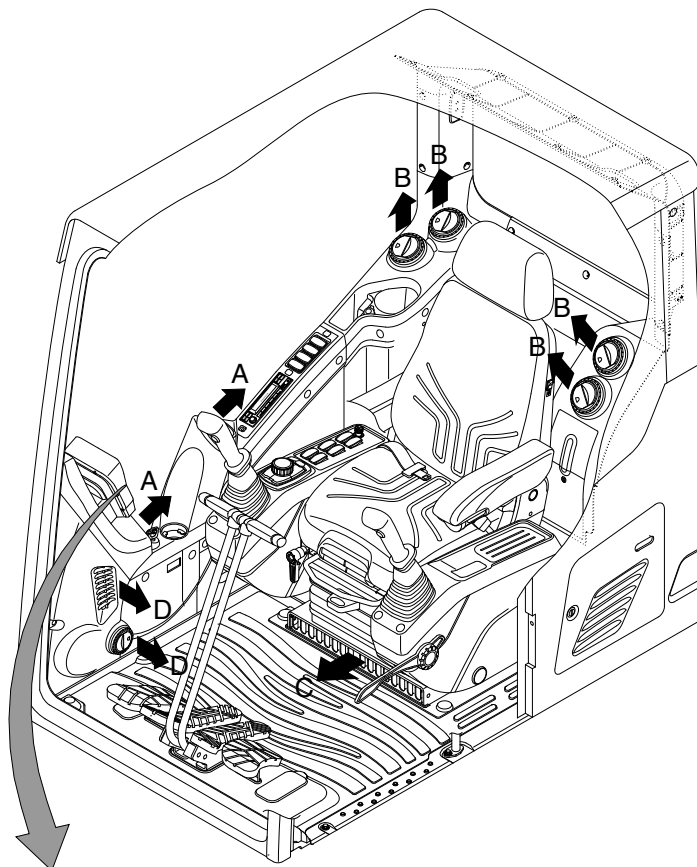
- When the worker or pedestrian go inside of red line (radius 3 m), an internal danger area of equipping on the cluster screen, the warning buzzer sounds and it displays the red rectangular box for the recognition of the worker and pedestrian. At this time, the operator should stop work immediately,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

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

## 7) AIR CONDITIONER AND HEATER

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

### · Location of air flow ducts

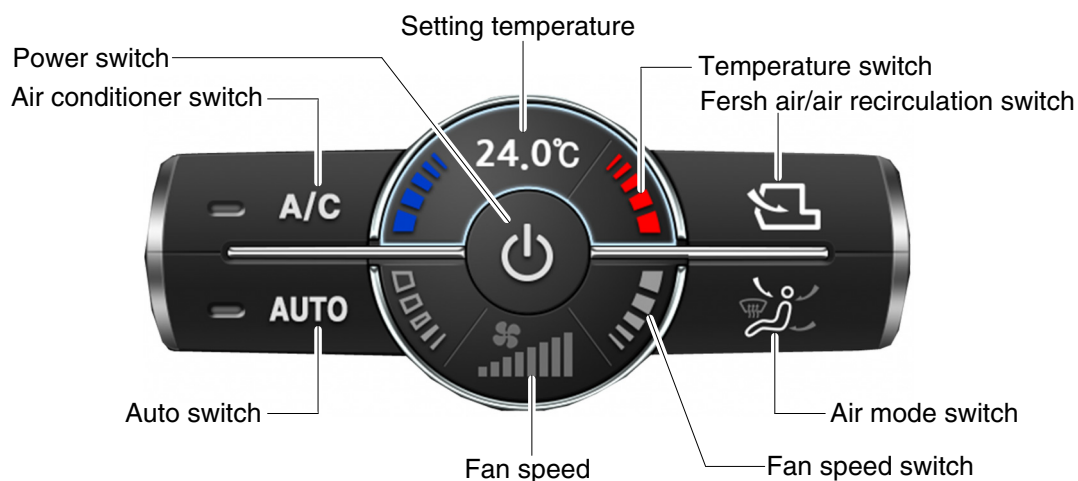


Cluster LCD



Cluster :  or

Haptic controller : 



※ Haptic controller : Refer to page 3-55.

290F3CD201A

### (1) Power switch



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

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

### (2) Air conditioner switch



- ① This switch turns the compressor ON/OFF.
- ※ **Air conditioner operates to remove vapor and drains water through a drain hose. Water can be sprayed into the cab in case that the drain cock at the ending point of drain hose has a problem.**  
**In this case, exchange the drain cock.**

### (3) Auto switch



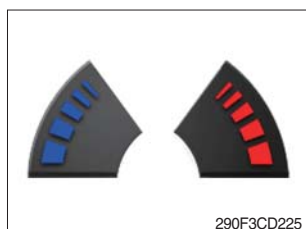
- ① Auto air conditioner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.

### (4) Setting temperature



- ① Display the temperature setting out.

### (5) Temperature switch



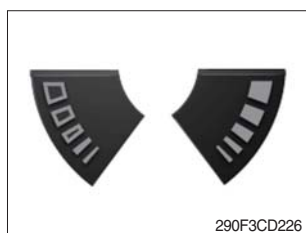
- ① Setting temperature indication  
· Lo (17°C), 17.5~31.5°C, Hi (32°C)
- ② Max cool and max warm beeps 5 times.
- ③ The max cool or the max warm position operates as following table.

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

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

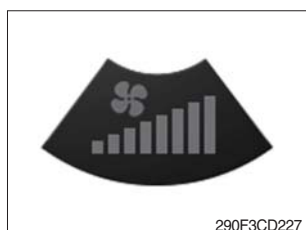


## (6) Fan speed switch



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

## (7) Fan speed



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

## (8) Fresh air/air recirculation switch



- ① It is possible to change the air-inlet method.
  - a. **Fresh air** (🌬️)  
Inhaling air from the outside.
  - b. **Air recirculation** (🔄)  
It recycles the heated or cooled air to increase the energy efficiency.
    - ※ **Change air occasionally when using recirculation for a long time.**
    - ※ **Check out the fresh air filter and the recirculation filter periodically to keep a good efficiency.**

## (9) Air mode switch



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

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

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



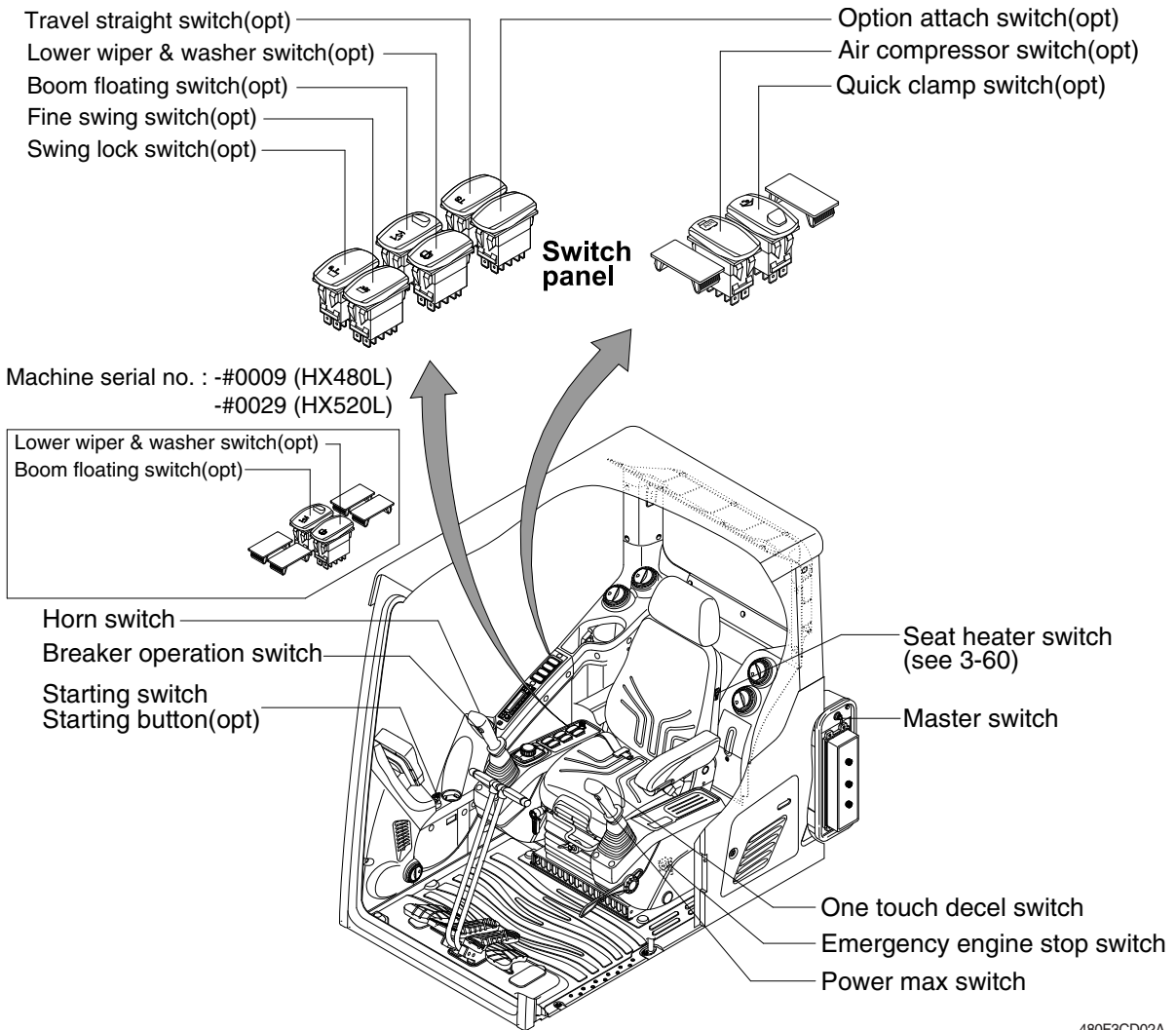
## 8) SELF DIAGNOSIS FUNCTION

(1) Diagnostic methods : Diagnostic information window, select

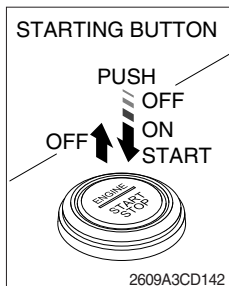
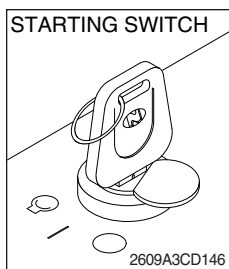
(2) Diagnostic indication (Displays fault)

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

### 3. SWITCHES



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



Starting button with smart key tag (opt)

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

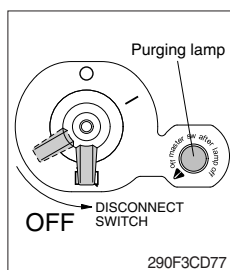
- ○ (OFF) : None of electrical circuits activate.
- | (ON) : All the systems of machine operate.
- ⦿ (START) : Use when starting the engine.

Release key immediately after starting.

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

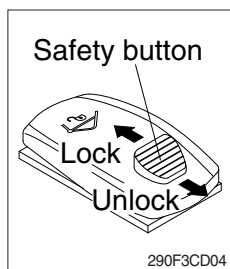
※ Key must be in the ON position with engine running to maintain electrical and hydraulic function and prevent serious machine damage.

## 2) MASTER SWITCH



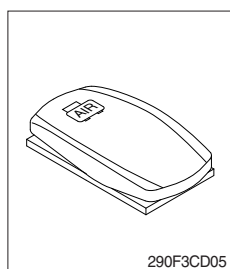
- (1) This switch is used to shut off the entire electrical system.
- (2) I : The battery remains connected to the electrical system.  
O : The battery is disconnected to the electrical system.
- ※ **Never turn the master switch to O (OFF) with the engine running. Engine and electrical system damage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

## 3) QUICK CLAMP SWITCH (option)



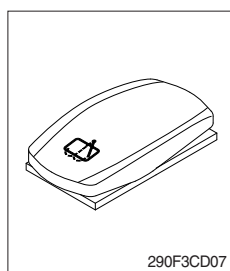
- (1) This switch is used to engage or disengage the moving hook on quick clamp.
- ※ **Refer to the page 8-6 for details.**

## 4) AIR COMPRESSOR SWITCH (option)



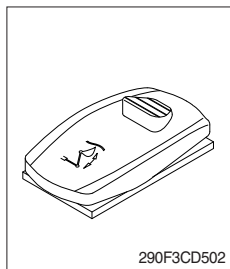
- (1) This switch is used to activate the air compressor.
- (2) The indicator lamp is turned on when operating the switch.

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



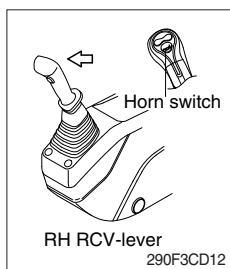
- (1) The washer liquid is sprayed and the wiper is operated only while pressing this switch.
- (2) The pilot lamp is turned ON when operating the switch.

## 6) BOOM FLOATING SWITCH (option)



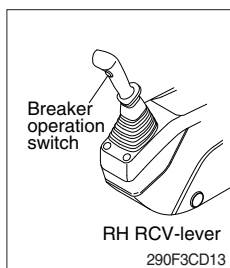
- (1) This mode is used to smooth boom operation.
- (2) Rod and head of boom cylinder are connected to the tank at the same time. So boom can be moved by the ground shape though only arm operation.

## 7) HORN SWITCH



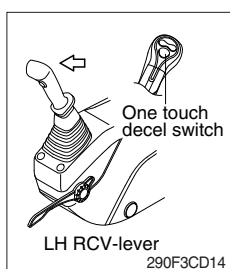
- (1) This switch is at the top of right side control lever.  
On pressing, the horn sounds.

## 8) BREAKER OPERATION SWITCH



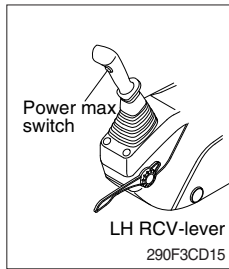
- (1) On pressing this switch, the breaker operates only when the breaker operation mode is selected.

## 9) ONE TOUCH DECEL SWITCH



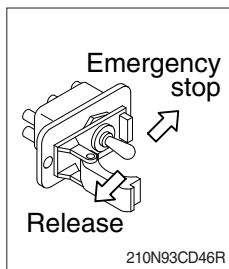
- (1) This switch is used to actuate the deceleration function quickly.
- (2) The engine speed is increased to previous setting value by pressing the switch again.
- (3) One touch decel function is available only when the auto idle pilot lamp is turned OFF.

## 10) POWER MAX SWITCH



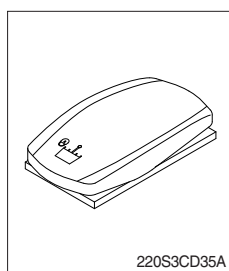
- (1) This switch activate power max function.  
When this switch is kept pressed, hydraulic power of work equipment will be increased to approx 110 percent during 8 seconds.
  - (2) After 8 seconds, function is cancelled automatically even the switch keeps pressed.
- ※ **Do not use for craning purposes.**

## 11) EMERGENCY ENGINE STOP SWITCH



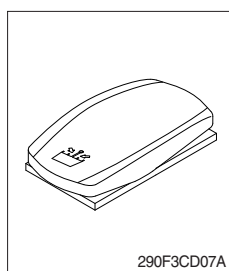
- (1) This switch is used to emergency stop the engine.
- ※ **Be sure to keep the emergency switch on the release position when restart the engine.**

## 12) SWING LOCK SWITCH (option, HX480L #0010- / HX520L #0030-)



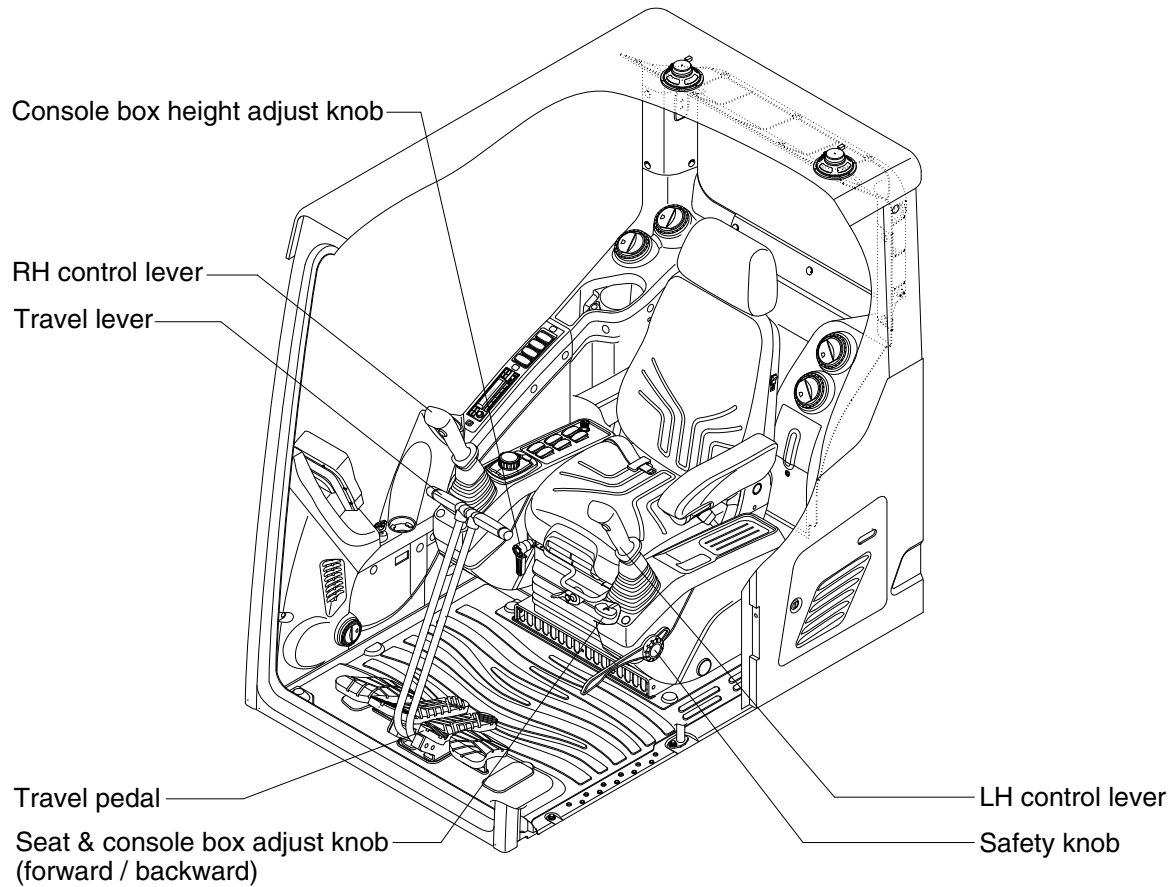
- (1) When the switch is pressed ON position, the swing parking brake is locked and swing control is not available by shut off the swing pilot pressure to the swing spool.

## 13) FINE SWING SWITCH (option, HX480L #0010- / HX520L #0030-)



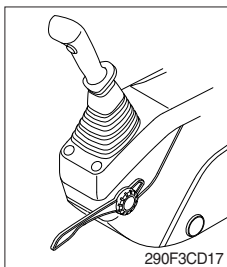
- (1) When the switch is pressed ON position, the swing parking brake is released.
  - (2) Swing control improves during deceleration of a swing because the swing is allowed the drift instead of stopping abruptly.
- ▲ **If the machine is operating on a slope with the switch in this position, swing motion may become uncontrollable which could result in property damage, personal injury or death. Do not use this position when the machine is operating on a slope.**

## 4. LEVERS AND PEDALS



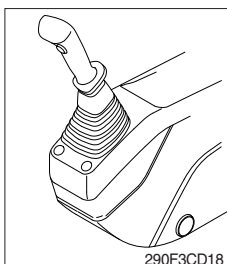
290F3CD16

### 1) LH CONTROL LEVER



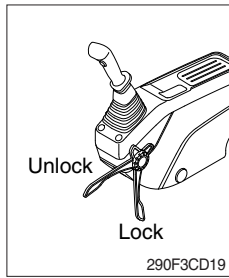
- (1) This joystick is used to control the swing and the arm.
- (2) Refer to operation of working device in chapter 4 for details.

### 2) RH CONTROL LEVER



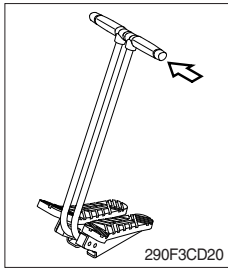
- (1) This joystick is used to control the boom and the bucket.
- (2) Refer to operation of working device in chapter 4 for details.

### 3) SAFETY LEVER



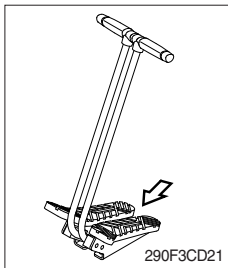
- (1) All control levers and pedals are disabled from operation by locating the lever to lock position as shown.
  - ※ **Be sure to lower the lever to LOCK position when leaving from operator's seat.**
- (2) By pull lever to UNLOCK position, the machine is operational.
  - ※ **Do not use the safety lever for handle when getting on or off the machine.**

### 4) TRAVEL LEVER



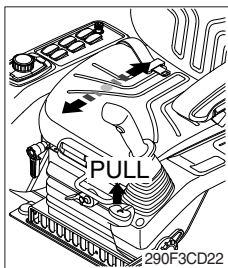
- (1) This lever is mounted on travel pedal and used for traveling by hand. The operation principle is same as the travel pedal.
- (2) Refer to traveling of the machine in chapter 4 for details.

### 5) TRAVEL PEDAL



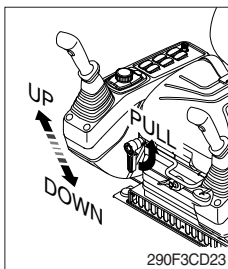
- (1) This pedal is used to move the machine forward or backward.
- (2) If left side pedal is pressed, left track will move.  
If right side pedal is pressed, right track will move.
- (3) Refer to traveling of machine in chapter 4 for details.

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



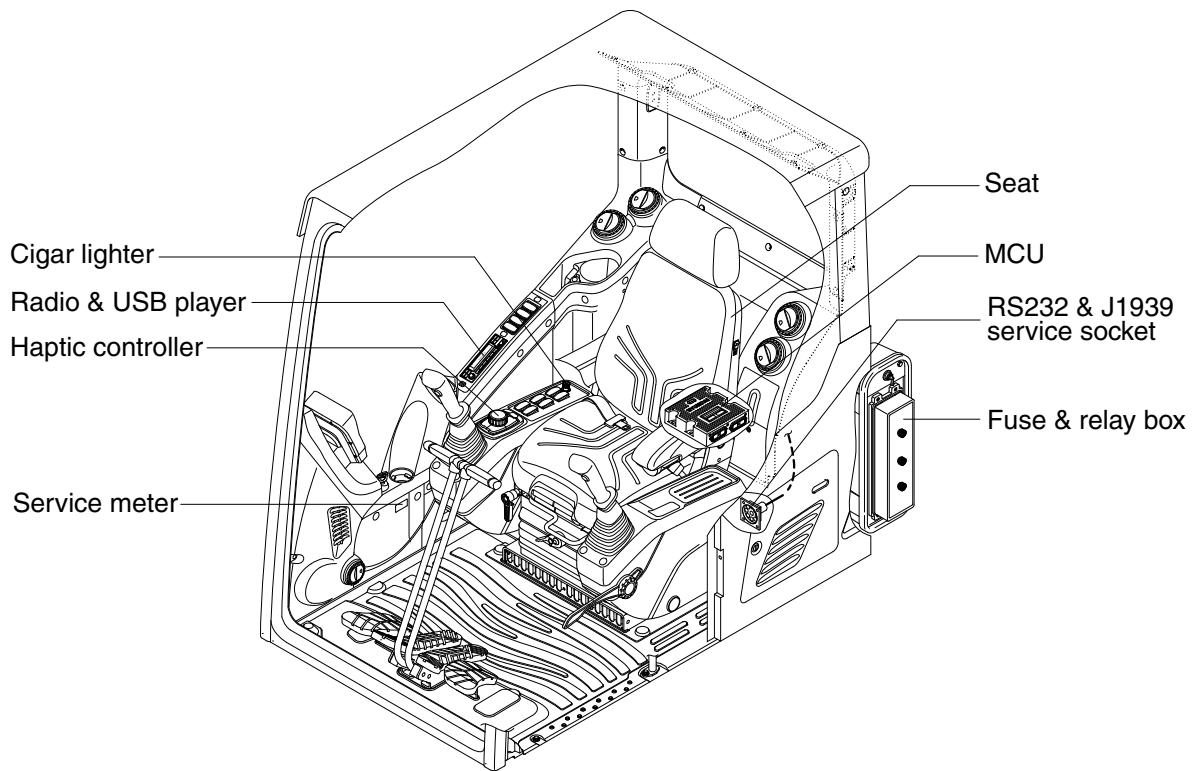
- (1) This knob is used to move the seat and console box to fit the contours of the operator's body.
- (2) Pull the knob to adjust forward or backward over 150 mm (5.9").

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



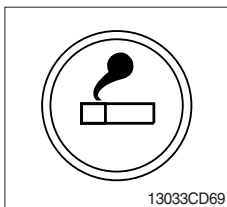
- (1) This knob is used to move the LH and RH control levers to fit the contours of the operator's body.
- (2) The control levers can be moved upward and downward over 80 mm (2.4").

## 5. OTHERS



480F3CD24

### 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**

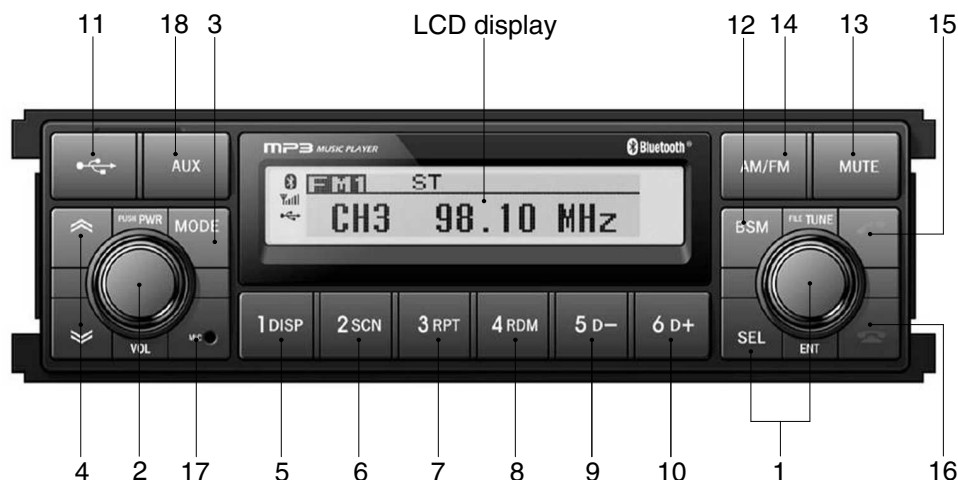
**Use cigar lighter socket when you need emergency power.  
Do not use the lighter exceeding 24 V, 100 W.**



2) RADIO AND USB PLAYER : HX480 MACHINE SERIAL NO.: -#0057

RADIO AND USB PLAYER : HX520 MACHINE SERIAL NO.: -#0086

## ■ BASIC FUNCTIONS



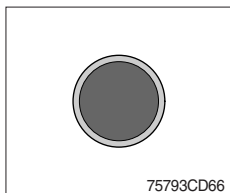
75793CD62-2

## ■ FRONT PANEL PRESENTATION

- |   |  |  |    |  |   |
|---|--|--|----|--|---|
| 1 |  | ..... Audio selection button                                   | 10 |  | ..... Preset memory button 6<br>D+ ..... Directory up |
|   |  | ..... Audio selection knob                                     | 11 |  | ..... Aux function                                    |
| 2 |  | ..... Power and volume button                                  | 12 |  | ..... Preset scan (PS)<br>Best station memory (BSM)   |
| 3 |  | ..... Mode button<br>(select RADIO / USB / AUX)                | 13 |  | ..... Audio mute button                               |
| 4 |  | ..... UP / DOWN tuning button                                  | 14 |  | ..... AM / FM button (radio)                          |
| 5 |  | ..... Preset memory button 1<br>DISP ..... ID3 v2 display      | 15 |  | ..... Send  |
| 6 |  | ..... Preset memory button 2<br>SCN ..... File scan            | 16 |  | ..... End   |
| 7 |  | ..... Preset memory button 3<br>RPT ..... Repeat play selector | 17 |  | ..... MIC (microphone)                                |
| 8 |  | ..... Preset memory button 4<br>RDM ..... Random play selector | 18 |  | ..... Aux connector                                   |
| 9 |  | ..... Preset memory button 5<br>D- ..... Directory down        |    |  |   |

## ■ GENERAL

### (1) Power and volume button



#### ① Power ON/OFF button

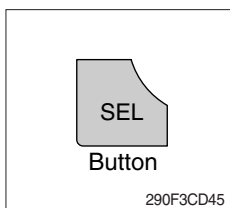
Press power button to turn the unit ON or OFF shortly.

When the power is ON, the previous mode (last memory) will appear.

#### ② Volume up / down control

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

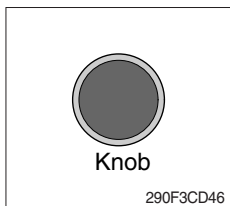
### (2) Sound function selection button/knob (audio selection)



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

BASS → TREBLE → BAL → LOUD → EQ → BASS

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



#### ② Bass control

To adjust the bass level, first select the bass mode by pressing the SEL button until BASS indication appears on the LCD display. Within 5 seconds of choosing the bass mode, turn selection knob right / left to adjust the bass level as desired.

The bass level will be shown on the LCD display from a minimum of BASS -10 to a maximum of BASS +10.

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

#### ③ Treble control

To adjust the treble level, first select the treble mode by pressing the SEL button until TREBLE indication appears on the LCD display. Within 5 seconds of choosing the treble mode, turn selection knob right / left to adjust the treble level as desired.

The treble level will be shown on the LCD display from a minimum of TREBLE -10 to a maximum of TREBLE +10.

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

#### ④ Balance control

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

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

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

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

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

#### ⑤ Loud control

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

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

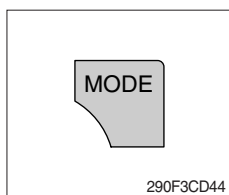
To select the loudness feature, press SEL button until LOUD ON or LOUD OFF is displayed, then turn selection knob left or right to activate or deactivate loudness.

#### ⑥ Equalizer (EQ)

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

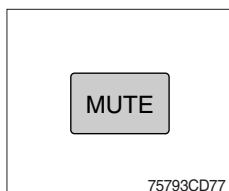
To select the desired curve, first select the EQ mode by pressing SEL button until the "EQ OFF" indication appears on the display panel. Within 5 seconds of choosing the EQ mode, turn selection knob to select an equalizer curve as desired.

### (3) Mode button



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

### (4) Audio mute button

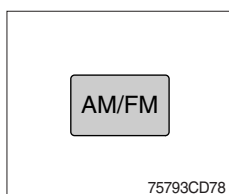


- ① Press mute button momentarily to mute volume and MUTE mark will blink on the LCD display.

Press the button again to return to the mode in use before the mute mode was activated.

## ■ RADIO

### (1) AM / FM / LW band selector

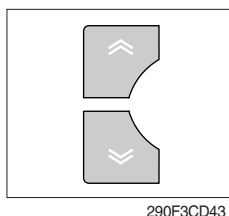




- ① Each time this button is pressed, the radio button is changed. Each time this button is pressed, LCD displays each band as follows :

FM1 → FM2 → FM3 → AM → LW → FM1

※ LW band is only available for Europe.

### (2) Up / down tuning

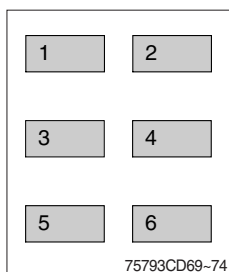


- ① To automatically select a radio station, momentarily press the up tune seek button  or down tune seek button  for less than 3 seconds to search for the closest radio station.

To manually select a radio station, press the up tuning & down tuning button for longer than 3 seconds.

The radio frequency will move up or down step by step each time you press button.

### (3) Station pre-set button

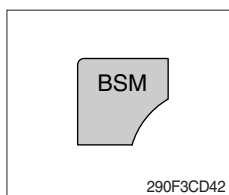


- ① Pressing these buttons shortly will recall your favorite pre-set radio stations.

To store your favorite stations into any of the 6 pre-set memories in each band (AM/FM/LW), use the following procedure :

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

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



##### ① Pre-set scan (PS)

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

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

##### ② Best station memory (BSM)

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

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

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

#### ■ USB PLAYER



75793CD81-1

##### (1) USB function

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

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

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

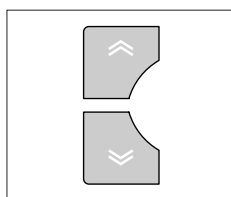
##### (2) AUX function

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

② Change AUX mode by pressing MODE button.

If audio file of Audio device is playing, you can listen to music through speaker.

### (3) File selection & cue / review button



290F3CD43

#### ① File selection function

This button is used to select file up / down.

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

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

#### ② Cue / review functions

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

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

### (4) MP3 directory / file searching

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

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

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

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

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

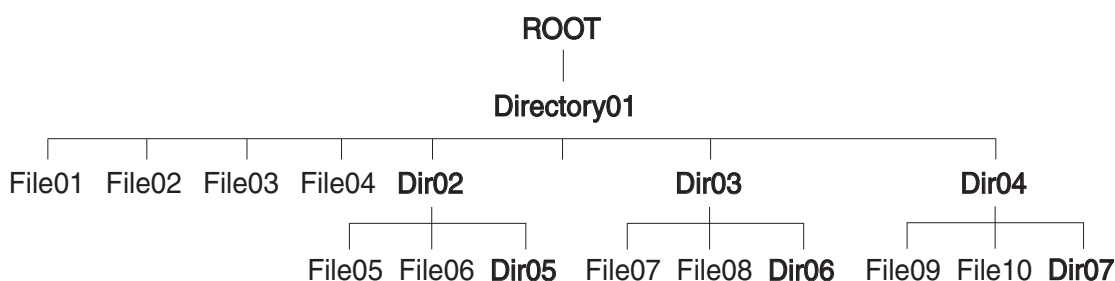
· Method 2 : ROOT → Dir01 → Dir02 → Dir05 → Dir03 → Dir06 → Dir04 → Dir07 → ROOT

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

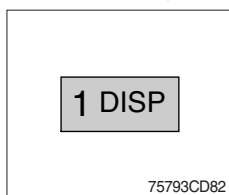
For instance, the file search changes in Dir01 as follows.

File01 → File02 → File03 → File04 → File01

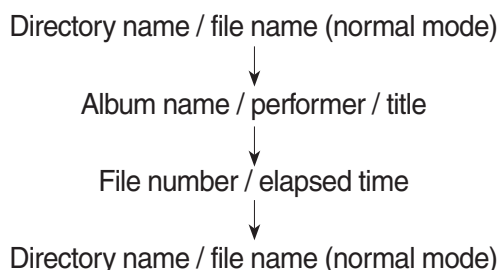
※ MP3 directory / file configuration



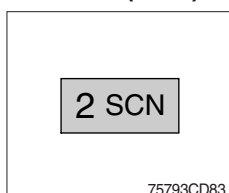
### (5) ID3 v2 display



- ① Disp button is used to change the display information.  
While playing an MP3 file, you can change the file information shown on the LCD display.  
Each time you press DISP (display), the display changes to show the following.
- ※ If the MP3 disc does not have any ID3 information, the display will show NO ID3 on LCD display.

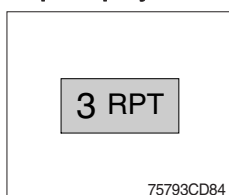


### (6) File scan (SCN)



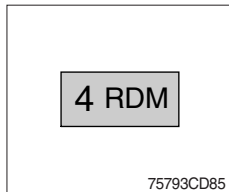
- ① During USB play, press SCN button to play the first 10 seconds of each file on the whole file on the USB (SCN mark will appear on the LCD display).  
When a desired file is reached, press the SCN button again to cancel the function.  
The unit will then play the selected file.
- ※ In case of playing MP3 file, when the SCN (scan) button is pressed and held for longer than 2 seconds, the SCN mark will blink on the LCD display and all files in the selected directory will be introduced until the file scan mode is cancelled by pressing the SCN button again or by activating the random or repeat functions.

### (7) Repeat play selector (RPT)



- ① During USB play, press RPT button to play the selected file repeatedly (RPT will appear on the LCD display).  
Play of the file will continue to repeat until this button is pressed again and the RPT disappears from the LCD display.
- ※ In case of playing MP3 file, when the RPT button is pressed and held longer than 2 seconds, the RPT mark will blink on the LCD display and play all files in the selected directory and will be repeated until the directory repeat mode is cancelled by pressing the repeat button again or by activating the scan or random functions (RPT mark will disappear from LCD display).

#### (8) Random play selector (RDM)

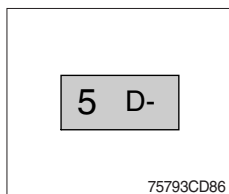


- ① During USB play, press RDM button to play the files on the USB in a random shuffled order (RDM will appear on the LCD display). The file select function will also select file in the random order instead of the normal process.

The random play mode can be cancelled by this button again.

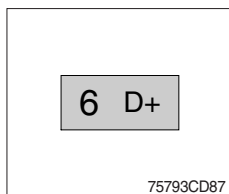
- ※ In case of MP3 file, when the random button is pressed and held longer than 2 seconds, the RDM mark will blink on the LCD display and play all files in directory randomly until the directory random mode is cancelled by pressing the random button again or by activating the scan or repeat functions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

#### (9) Directory down



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

#### (10) Directory up



- ① Press D+ button briefly while playing MP3 . The next directory is located each time you press this button.
- ※ If the MP3 file does not have a directory, the unit play MP3 at 10-file intervals.
- ※ If any MP3 file does not exist in USB, this button can not operate.



## ■BLUETOOTH

### (1) Introduce

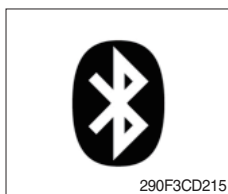
The bluetooth radio supports bluetooth wireless technology. Bluetooth technology provides a wireless link between a bluetooth mobile phone or bluetooth music player and the HD Hyundai Construction Equipment bluetooth radio.

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

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

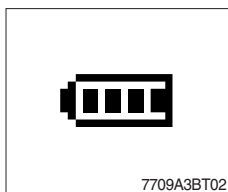
Check your mobile phone owner's manual for details.

- ※ When the starting switch is in the ON position, the bluetooth radio is on standby to connect with your mobile phone even if the radio is switched off. The machine battery may therefore become drained if the ignition switch remains in the ON position for an extended period of time.
- ※ Bluetooth technology uses low power radio transmission to connect to your bluetooth mobile phone or bluetooth music player. As radio signal strength reduces over distance, the quality of sound performance during phone calls and music playback may become poor if the distance between the radio and device widens. It is recommended that the mobile phone or music player is kept inside the cab for best results.
- ※ As a bluetooth wireless connection can extend to 10 meters, your bluetooth device may automatically connect to the bluetooth radio even if the device is not in the machine.
- ※ The bluetooth radio uses the latest digital noise & echo suppression system to provide the best sound clarity with little or no distortion, but in some conditions there may be some echo and noise experienced. It is recommended to keep the car windows closed during hands-free calls for best results.



#### ① Bluetooth indicator

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



#### ② Battery strength indicator

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



#### ③ Single level indicator

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

## (2) Bluetooth function

### ① Pairing a bluetooth mobile phone or music player

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

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

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

#### a. Connection method

- a) Press SEND button for 2 seconds in any mode, **PAIRING** appears on the bluetooth radio display.
  - b) Browse your mobile phone or music player menu to find the **SETTINGS** or **CONNECTIVITY** section to find the bluetooth connection section.
  - c) Find the command that may be called search for bluetooth device or discovery mode so that your bluetooth device can locate all the bluetooth devices within range that may be connected.
  - d) After the search is complete, **HFI AUDIO** should appear on your mobile phone or music player screen.
  - e) Select **CONNECT** or **SELECT** on your mobile phone or music player.
  - f) The mobile phone or music player should now prompt you to enter a PIN code. Enter 0000 into your bluetooth device and select OK.
  - g) The mobile phone or music player should confirm that it has established a new paired connection with the bluetooth radio.
  - h) The connecting process is now complete.
  - i) If the connecting process is successful, the bluetooth logo appears on the radio display and paired phone name (e.g. Samsung or LG) and **CONNECTED** appear on the display for 2 seconds.
  - j) Your bluetooth device is now ready for use with the bluetooth radio.
  - k) If the pairing failed, **FAIL** appears on the bluetooth radio display.
- ※ (a) The bluetooth radio allows a maximum of 6 bluetooth devices to be paired.
    - (b) Bluetooth technology only allows one phone to be connected to your bluetooth radio at one time.
    - (c) If a bluetooth music player is to be connected together with a mobile phone, refer to the page 3-55, PLAYING MUSIC USING BLUETOOTH AUDIO.
    - (d) Bluetooth connection with a mobile phone is normally established using the Hands-Free Profile (HFP). However, in some cases, the connection may use Head Set Profile (HSP) and some functions may not be available.
    - (e) As each mobile phone or music player brand and model has a different menu structure and control names, you may need to refer to the user manual of your bluetooth device for the correct procedure to connect to another bluetooth device.
    - (f) Once the bluetooth pairing is complete, automatic connection between mobile phone and the bluetooth radio is possible whenever the starting switch is switched ON.

The mobile phone must be set to automatically connect to the bluetooth radio to allow this automatic connection.

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

## ② Disconnecting a bluetooth device

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

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

## ③ Select a bluetooth device


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

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

Table 2-1

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

SAMSUNG → LG → APPLE → MOTOROLA → BACK → SAMSUNG

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

#### ④ Deleting a previously paired bluetooth device

If you no longer need to use a paired bluetooth device with the bluetooth radio, it can be deleted.

It is from the registration assignment for another mobile phone.

Refer to the example of paired devices shown table 2-1.

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

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

Table 2-2

#### ⑤ Basic telephone operation

##### a. Using the bluetooth radio for hands-free calls

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

#### b. Last call number redials

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

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

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

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

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

- ※ The above switching function may cause disconnection of the bluetooth link between the bluetooth radio and some mobile phones.

If SEND button is pressed during the private conversation, the bluetooth connection will return automatically.

### (3) Function of bluetooth audio player

#### ① Playing music using bluetooth audio

The bluetooth radio supports the bluetooth profile Audio Advanced Distribution Profile (A2DP). If your mobile phone or music player supports this profile then it is possible to listen to music tracks located on your bluetooth device through the bluetooth radio and speakers.

Additionally, the bluetooth radio supports the Audio Video Remote Control Profile (AVRCP).

If your bluetooth mobile phone or music player supports this profile then it is possible to advance to the next track or replay previous tracks on using the buttons on the front of the bluetooth radio your machine.

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

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

#### ② Connecting a bluetooth music player and mobile phone simultaneously

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

#### (4) Bluetooth setting

##### ① Setting the automatic call answer feature

If this function is selected, the bluetooth radio automatically answers all INCOMING calls.

This feature enhances safety as the driver does not need to take their hands from the steering wheel to accept an INCOMING call.

Note that this feature cannot be set at different settings for each of the paired mobile phones.

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

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

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

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

##### ② Setting calling voice volume

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

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

##### ③ Setting the ring volume

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

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

RADIO AND USB PLAYER (WITH BLUETOOTH) : HX480 MACHINE SERIAL NO.: #0058-  
RADIO AND USB PLAYER (WITH BLUETOOTH) : HX520 MACHINE SERIAL NO.: #0087-



9403CD100

## ■ FRONT PANEL PRESENTATION

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



















RADIO AND USB PLAYER (WITHOUT BLUETOOTH) : HX480 MACHINE SERIAL NO.: #0058-  
RADIO AND USB PLAYER (WITHOUT BLUETOOTH) : HX520 MACHINE SERIAL NO.: #0087-



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 next turned on.

To adjust the I-VOL level, press and hold VOL button (1) for longer than 2 seconds. The current volume level displays on the display panel.

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

#### ④ Clock ON/OFF control

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

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

#### ⑤ Clock adjustment

With CLOCK ON selected, press VOL knob again after CLOCK ON display, the hour will blink, turn VOL knob right or left to adjust hour.

Simply press VOL again, the minute will blink, turn VOL knob to adjust minute. Then press VOL again to confirm the clock once finished.

## (2) Menu Selection



- ① This button can adjust the sound effect and other things.

Each time you press this button (2), LCD displays as follows :

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

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

### ② Bass control

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

### ③ Treble control

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

### ④ Balance control

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

### ⑤ Fader control

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

### ⑥ EQ control

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

EQ OFF → CLASSIC → POP → ROCK → JAZZ

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

#### ⑦ Loud control

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

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

#### ⑧ Beep control

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

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

#### (3) Mute control

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

#### (4) Mode selection

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

## ■ RADIO

### (1) Mode button



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

### (2) Manual tuning button



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

### (3) Auto tuning button



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

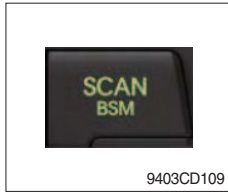


### (4) Station preset button



- ① In radio mode, pressing buttons (6) to (11) will recall the radio stations that are memorized. To store desired stations into any of the 6 preset memories, in either the AM or FM bands, use the following procedure :
  - a. Select the desired station.
  - b. Press and hold one of the preset buttons for more than 2 seconds to store the current station into preset memory. Six stations can be memorized on each of FM1, FM2, and AM.

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



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

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

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

## ■ USB PLAYER

### (1) USB playback



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

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

※ If no mp3 or wma files in USB device, it will convert to the previous mode after display NO FILE.

### (2) Track Up / Down button



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



### (3) MP3 directory / File searching



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

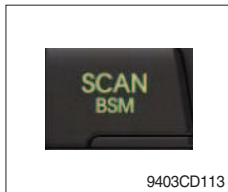
### (4) Directory Up / Down button



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

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

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



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

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



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

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



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

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



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

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

\* USB Information and Notice

- 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-CAED 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.**

※ **The temperature below -10 Celsius, the audio unit with USB hook up would be affected to play well.**

## ■ AUX OPERATION

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

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

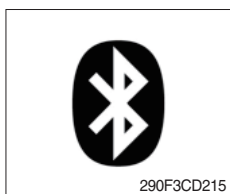
- Use a 3.5 mm stereo plug cable to connect the media player headphone socket at each end as follows.
  - Adjust the portable media player to approximately 3/4 volume and start playback.
  - Press the MODE button (3) on the audio unit to change into AUX mode.
  - The volume and tone can now be adjusted on the audio unit to the desired level.
- ※ The audio quality of your media player and the audio tracks on it may not be of the same sound quality as the audio system is CD Player.
  - ※ If the sound of the media player is too low compared with the radio or CD, increase the volume of the player.
  - ※ If the sound of the media player is too loud and/or distorted, decrease the volume of the player.
  - ※ When in AUX mode, only the Volume, Bass, Treble, EQ and Mode functions of the audio unit can be used.



## ■ BLUETOOTH (if equipped)

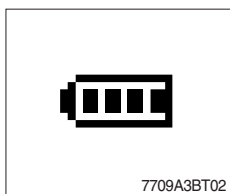
### 1) Using a bluetooth wireless connection

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



#### ① Bluetooth icon

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



#### ② Battery icon

It indicates the battery status of the connected bluetooth device.



#### ③ Single strength icon

It indicates the signal strength of the connected bluetooth device.

## 2) Pairing in hands free modes



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

## 3) Cellular phone pairing mode

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

#### 4) Bluetooth connection and disconnection

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



- (2) To disconnect bluetooth link  
Press and hold CALL END button (4) for 2 seconds, it shows DIS CON and disappears bluetooth icon on the display.



- (3) To disconnect bluetooth link  
Press CALL button (3) briefly, it blinks bluetooth icon on the display while bluetooth is being connected. If the connection is completed, it appears bluetooth icon on the display.

- ※ When your cellular phone battery is at low charge, the bluetooth connection may occasionally be lost. To maintain good connectivity ensure that your phone battery is adequately charged.
- ※ In case of failure of bluetooth pairing :
  - Delete item in paired list on your phone.
  - Reset both phone by power off/on and the audio unit by ACC off/on.
- ※ Connecting priority of handsfree profile is higher than headset profile.
- ※ The headset mode does not support caller ID, reject call and call Transfer.

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

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



- (2) To accept call  
Press CALL button (4), it appears ANSWER CALL and follows TALKING on the display.
- (3) To end call  
To end call, press CALL END button (5), it appears REJECT on the display.
- ※ If reject call is activated in your phone, then your cellular phone does not support reject call function.

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

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



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

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

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

## 7) Last call number dialing



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

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

※ If you are using SAMSUNG phone, then you may need to press once more send button. First press button shows phone contact list in your phone, then second press make the last call.

## 8) To make a call by cellular phone

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

(1) The audio unit activated automatically when you make a call by cellular phone.

(2) When you make a call processing by cellular phone, it shows CALLING on the display.

(3) When you receive a call, the phone number \*\*\*\*\* appears on the display.

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

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

(1) To play music, search the menu on your cellular phone as below :

i.e : Menu → File manager → Music → Option → Play via bluetooth.

It appears BT MP3 on the display.

(2) During BT MP3 playing, you could select the previous or next track by pressing SEEK up or TRACK down button on audio unit or operate via your cellular phone.

(3) To stop music, press button (5) briefly and it will automatically switch into the previous mode.

(4) To resume music playing, press the play button on your cellular phone.

※ This function maybe different depends on cellular phone. Please follow the cellular phone menu. Some kinds of phone need to pair once more for bluetooth MP3 connection.

※ This function will be caused to disconnect A2DP, AVRCP depends on cellular phone.

※ Information about songs (e.g.: the elapsed playing time, song title, song index, etc.) cannot be displayed on this audio unit.

## ■ RESET AND PRECAUTIONS

### 1) Reset function

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

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

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

- (2) Take out the fuse for the audio system in the vehicle once and then plug again.

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

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

### 2) Precautions

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

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

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

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

#### ● AREA Selection :

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

- (4) USB version : USB 1.1

- (5) Bluetooth version : V2.1

- (6) Bluetooth supported profile :

- A2DP : Advanced Audio Distribution Profile
- AVRCP : Audio/Video Remote Control Profile
- HFP : Hands-Free Profile

### 3) HAPTIC CONTROLLER

The haptic controller consists of buttons, multimodal dial and USB port.



290F3CD173

#### (1) Cluster button



290F3CD174

- ① When you push this button, haptic controller execute cluster interlocked mode.
- ② In cluster interlocked mode, if you push the cluster button, the haptic controller return to previous mode.
- ③ Cluster interlocked mode ON : Blue lamp is turn ON  
Cluster interlocked mode OFF : Blue lamp is turn OFF

#### (2) Air conditioner button



290F3CD175

- ① When you push this button, air conditioner system is operated.
- ② Determines whether to perform a cooling function of air conditioner.
  - Blue lamp ON : Air conditioner operation
  - Amber lamp ON : Fan only

#### (3) Set button



290F3CD176

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

#### (4) OFF button



290F3CD177

- ① Only while air conditioner system is operating you can use this button.
- ② This button is only for air conditioner system off.

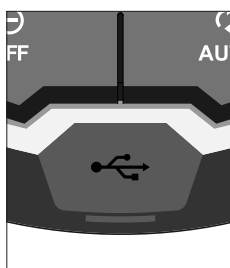
#### (5) Auto button



290F3CD178

- ① This button controls air conditioner ON/OFF.
- ※ Refer to the page 3-31 for the auto switch of the air conditioner.

#### (6) USB port



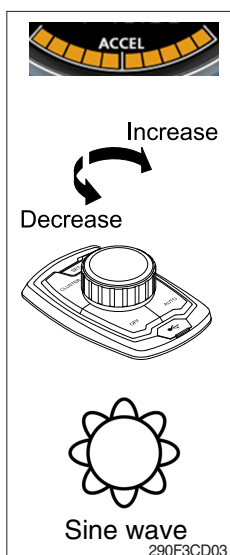
290F3CD179

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

#### (7) Multimodal dial

- Cluster interlocked mode OFF

##### ① Acceleration mode



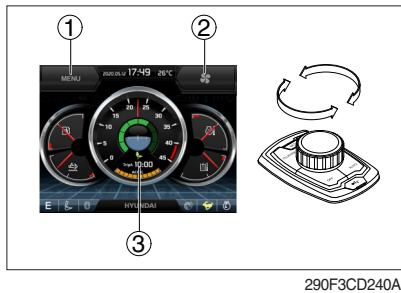
290F3CD03

- There are 10 dial setting.
- Setting 1 is low idle and setting 10 is high idle.
  - By rotating the dial to right : Engine speed increases
  - By rotating the dial to left : Engine speed decreases
- Dial operating pattern is sine wave torque.



## - Cluster interlocked mode ON

### ① Cluster main menu

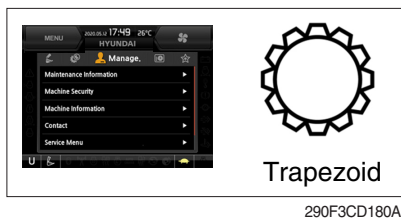


- You can select the quick menu by rotating the dial as below.



- CW rotation : move to right direction
- CCW rotation : move to left direction

### ② Cluster menu move

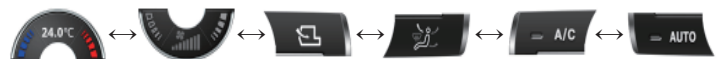


- You can move up and down of the cluster sub menu.
- Dial operating pattern is continuous rotation trapezoid torque.

### ③ Air conditioner menu



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



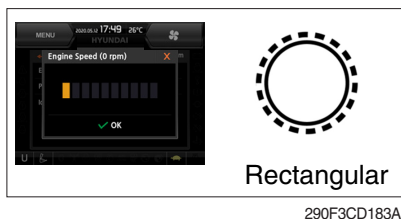
- Dial operating pattern is mixed type trapezoid torque.

### ④ Slide choice menu



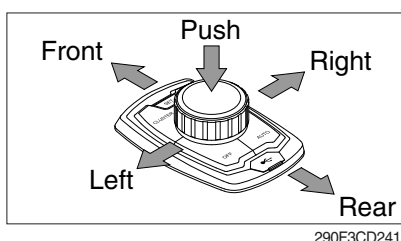
- You can increase or decrease the slide choice bar.
- Dial operating pattern is repeat dot interval torque.

### ⑤ Level choice menu



- You can increase or decrease the level choice bar.
- Dial operating pattern is integrate rectangular torque.

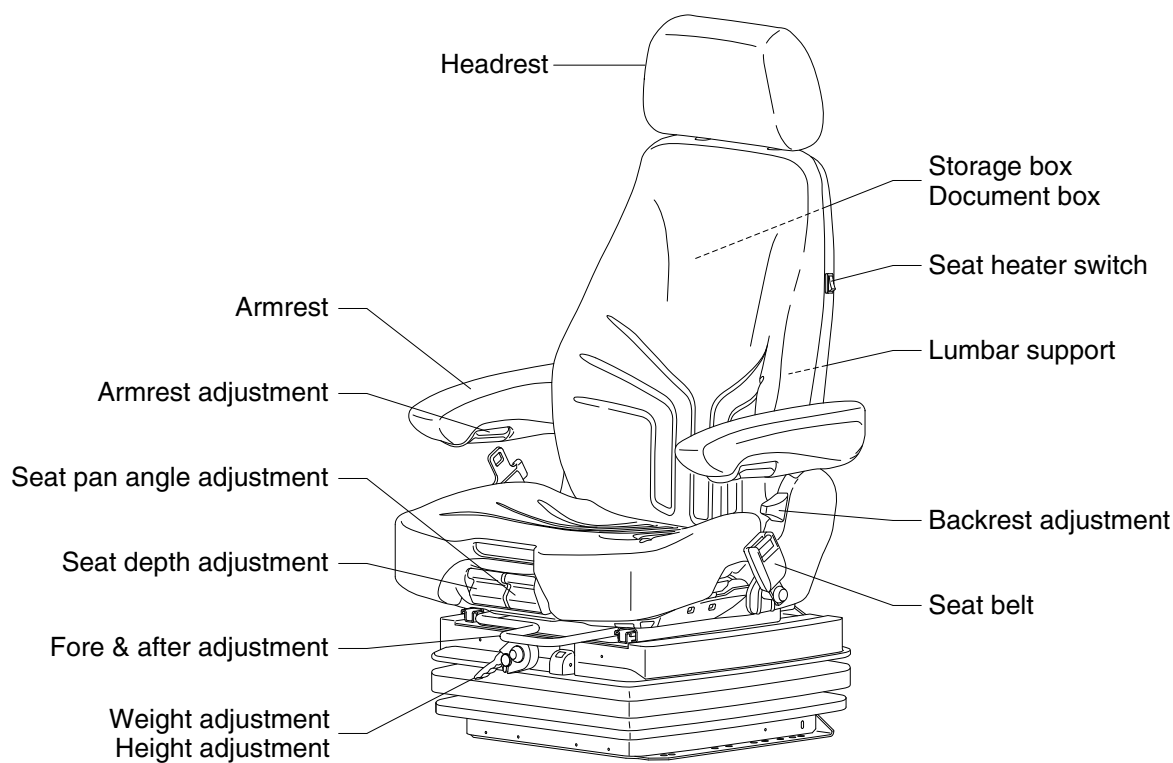
### ⑥ Push button



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

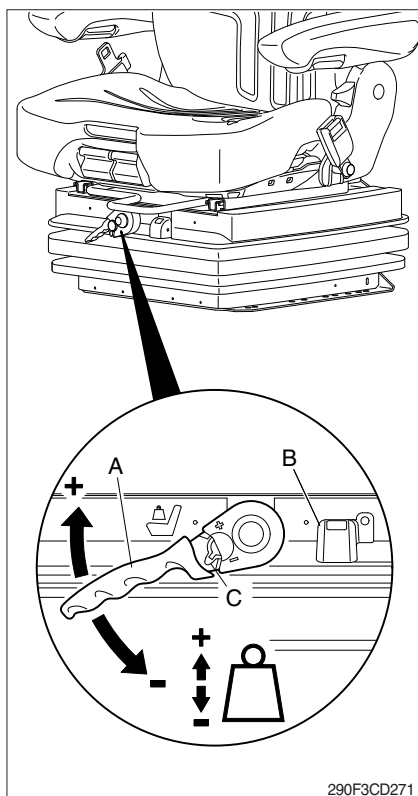
#### 4) SEAT (SUSPENSION, STD)

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



290F3CD270

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

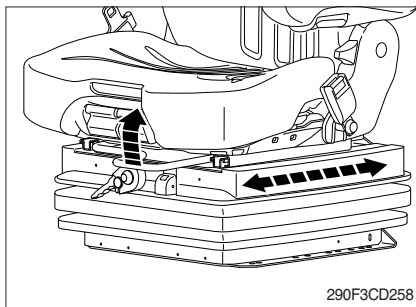


290F3CD271

##### 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 toggling the ratchet with the switch (C).
- ③ The operator's weight and the seat height are adjusted correctly when the green marking is completely visible in the indicator window (B) for weight and height.
- ④ The height can be adjusted individually as long as the green marking is visible.

## (2) Fore/after adjustment

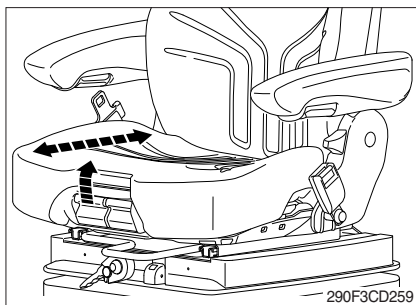


- ① The fore/after adjustment is released by lifting the locking lever.

**⚠ Do not operate the locking lever while operating.**

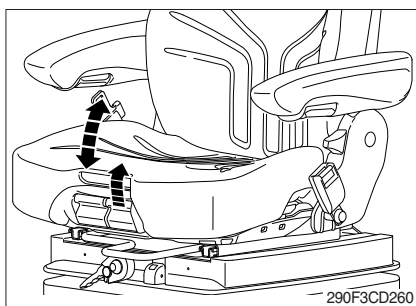
- ※ After the adjustment, the locking lever must latch into the desired position with an audible click. It should not be possible to move the operator's seat into another position when it is locked.
- ※ Do not lift the locking lever with your leg or calf.

## (3) Seat depth adjustment



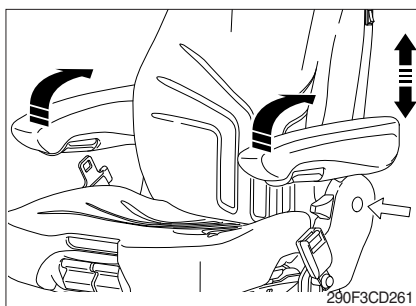
- ① The depth of the seat pan can be individually adjusted.
- ② To adjust the depth of the seat cushion, pull the right handle upwards. By moving the seat pan backwards or forwards the desired seating position can be reached.

## (4) Seat pan angle adjustment



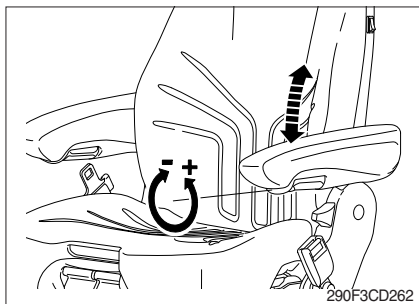
- ① The angle of the seat pan can be individually adjusted.
- ② To adjust the angle of the seat pan, pull the left handle upwards. By exerting pressure on or off the front or rear part of the seat pan it can be moved to the desired angle position.

## (5) Armrests



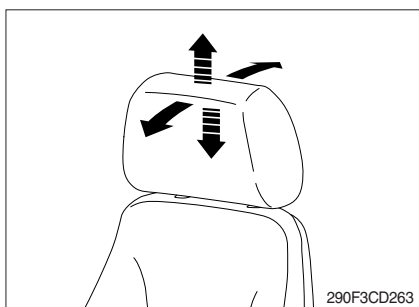
- ① The armrests can be folded up if required and the height can be individually adjusted.
- ② To adjust the armrest for height, separate the round cap (see arrow) from the cover and loosen the hexagon nut (size 13 mm) behind it adjust the armrests to the desired position (5 steps) and tighten the nut again (25 Nm). Replace the cap onto the nut.

### (6) Armrest adjustment



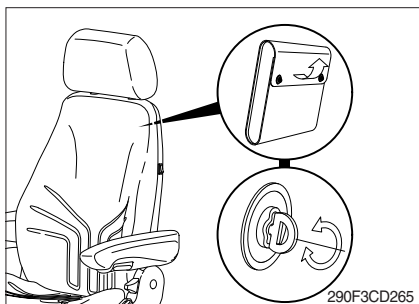
- ① The inclination of the armrest can be modified by turning the adjustment knob.
- ② When turning the knob to the outside (+), the front part of the armrest will be lifted; when turning the knob to the inside (-), it will be lowered.

### (7) Headrest



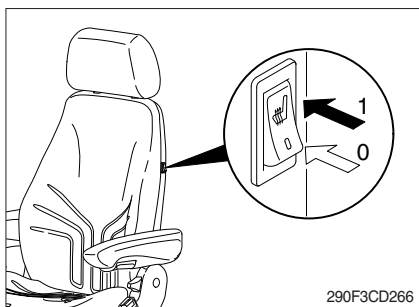
- ① The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.
- ② By pushing forwards or rearwards the angle of the headrest can be adjusted individually.
- ③ To remove the headrest, pull it over the end stop.

### (8) Document box



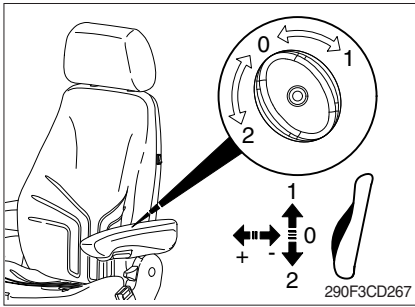
- ① The document box is placed on the rear side of the backrest.
- ② To open the document box, first twist the turn lock closures 90° to the left or the right and then fold the cover of the document box upwards.

### (9) Seat heater switch



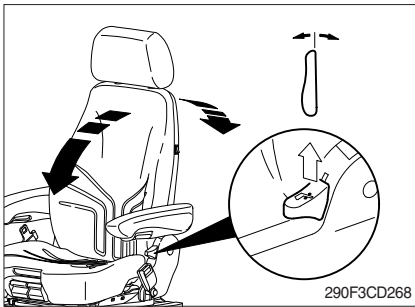
- ① The seat heater can be turned on/off by pressing the switch.

### (10) Lumbar support



- ① By turning the adjustment knob to the left (2) or right (1), both the height and curvature of the backrest cushion can be individually adjusted.
- ② This increases both the seating comfort and the performance of the operator.

### (11) Backrest adjustment



- ① Pull up the locking lever to release the backrest catch. When releasing the backrest, do not load the backrest by pressing against it.
  - ② By exerting pressure on or off the front or rear part of the seat pan it can be moved to the desired position. Release the locking lever to lock the backrest.
- ※ **It should not be possible to move the backrest into another position after it has been locked.**

### (12) Maintenance



Dirt can impair the function of the seat, so make sure you keep your seat clean.

Upholstery does not need to be removed from the seat frame for cleaning.

**▲ Take care with the backrest - it may jerk forward and cause injury.**

**When cleaning the backrest cushion, the backrest must be held in place when operating the backrest lever.**

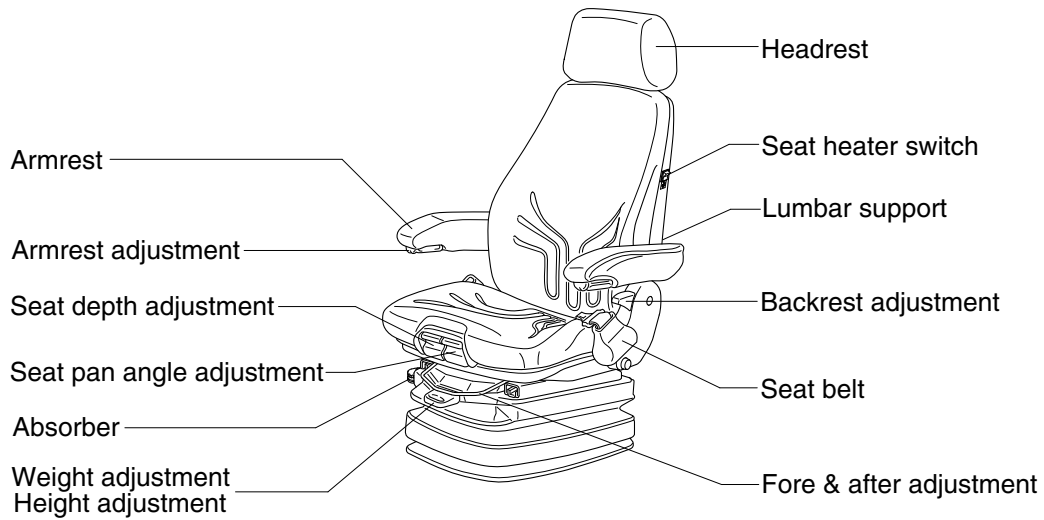
※ **Do not clean the seat with a pressure washer.**

During cleaning, the upholstery must not be soaked through.

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

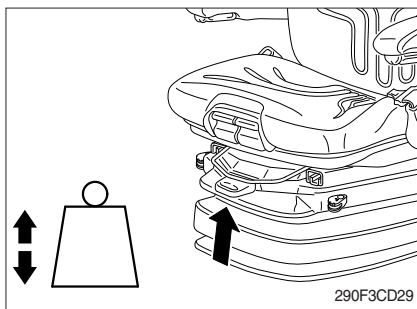
## 5) SEAT (AIR SUSPENSION, OPTION)

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



290F3CD28

### (1) Weight adjustment

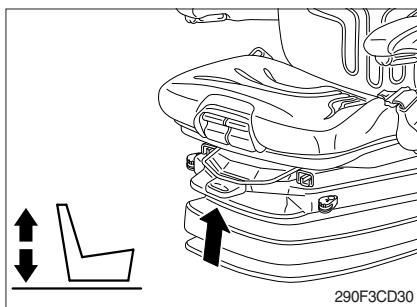


- ① The seat should be adjusted for the operator's weight by briefly pulling the actuator lever of the automatic weight and height adjuster (arrow) with the machine at a standstill and the operator's sitting on the seat.

The operator must sit absolutely still during adjustment.

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

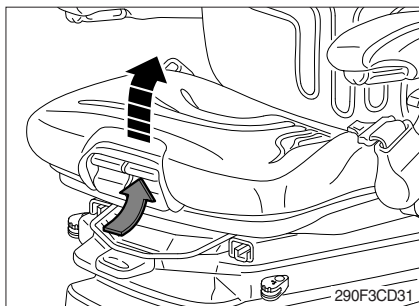
### (2) Height adjustment



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

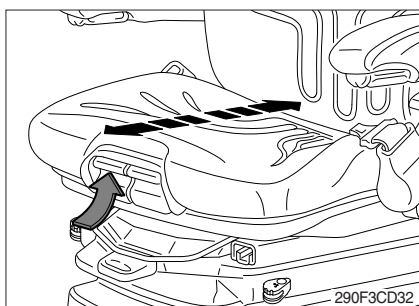
- ※ **Before adjusting the weight, adjust shock absorbers to the position "soft".**
- ※ **In order to avoid damage, do not operate compressor for more than 1 minute.**

### (3) Seat pan angle adjustment



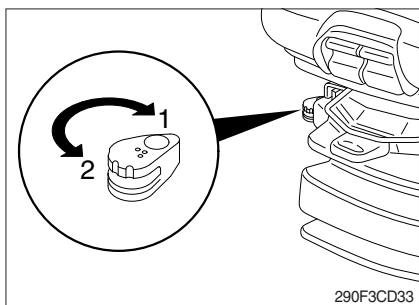
- ① The angle of the seat pan can be individually adjusted.
- ② To adjust the angle of the seat pan, lift the LH handle (see arrow). By exerting pressure on or off the seat pan it can be moved to the desired angle position.

### (4) Seat depth adjustment



- ① The depth of the seat pan can be individually adjusted.
- ② To adjust the depth of the seat cushion, lift the RH handle (see arrow). By moving the seat cushion backwards or forwards the desired seating position can be reached.

### (5) Absorber

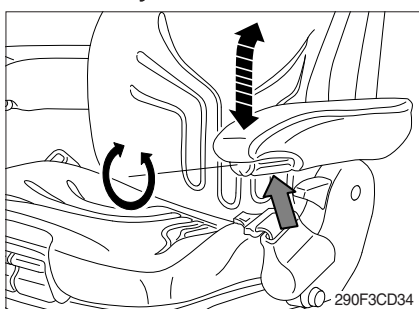


- ① The absorber setting of the seat can be varied to suit the on and off-road working conditions. The cushioning effect can be individually adjusted for this purpose.

Turn the lever to the desired position and release.

- 1 Soft
- 2 Hard

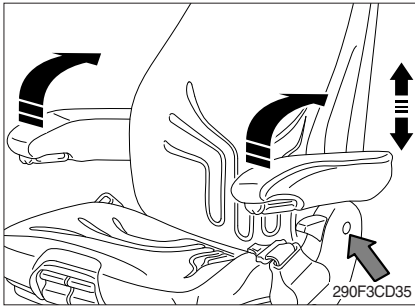
### (6) Armrest adjustment



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

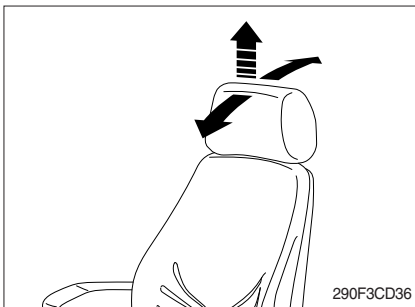


### (7) Armrests



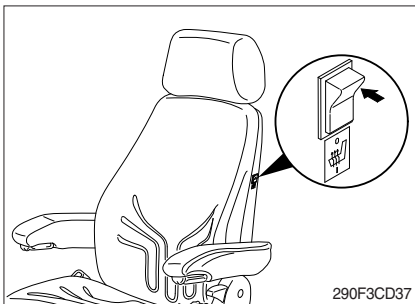
- ① The armrests can be folded up if required and the height individually adjusted.
- ② To adjust the armrests for height, separate the round cap (see arrow) from the cover, loosen the hexagon nut (size 13 mm), adjust the armrest to the desired position and tighten the nut again. Press the previously separated cap cover back onto the nut.

### (8) Headrest



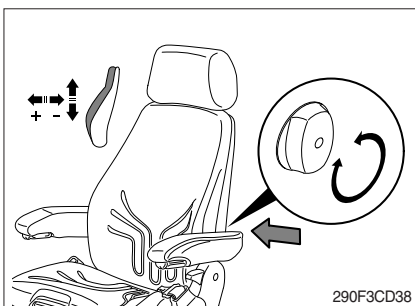
- ① The headrest can be individually adjusted for height by pulling it upward over the various increments up the end stop.
- ② By pushing forward or rearward the angle of the headrest can be adjusted individually.
- ③ To remove the headrest, pull it over the end stop.

### (9) Seat heater switch



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

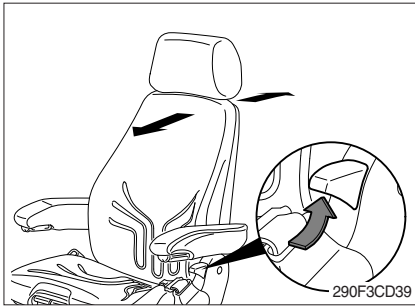
### (10) Lumbar support



- ① By turning the adjustment knob to the left or right, both the height and curvature of the backrest cushion can be individually adjusted.
- ② This increases both the seating comfort and the performance of the operator.



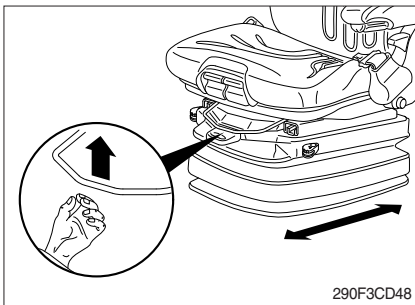
### (11) Backrest adjustment



① The backrest is adjusted using the locking lever (arrow).

※ The locking lever must latch into the desired position. It should not be possible to move the backrest into another position when it is locked.

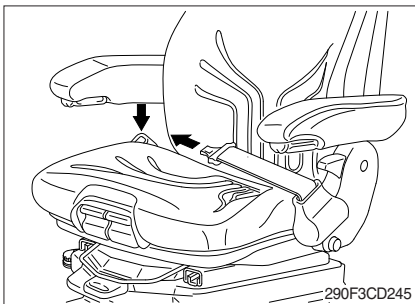
### (12) Fore & after adjustment



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

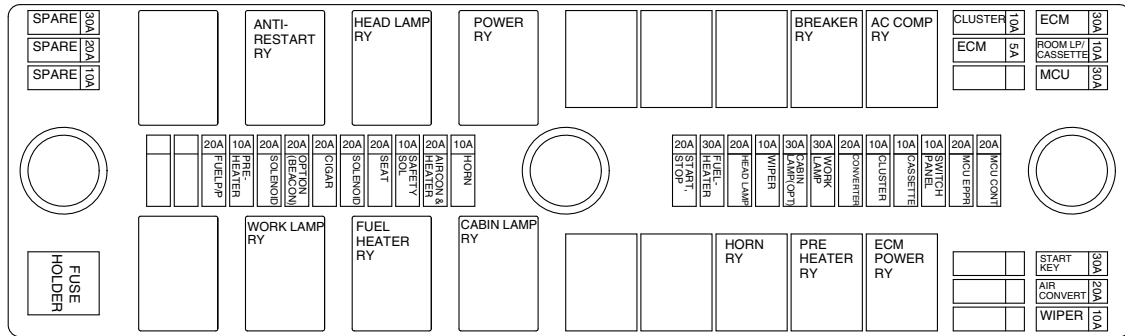
※ The locking lever must latch into the desired position. It should not be possible to move the operator seat into another position when it is locked.

### (13) Seat belt



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

## 6) FUSE & RELAY BOX



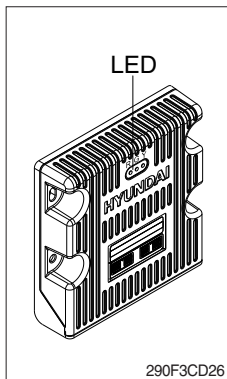
290F3CD25

- (1) The fuses protect the electrical parts and wiring from burning out.
- (2) The fuse box cover indicates the capacity of each fuse and circuit it protects.

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

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

## 7) MCU

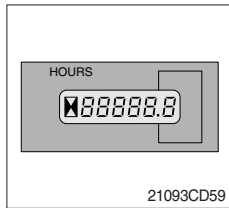


- (1) To match the pump absorption torque with the engine torque, MCU varies EPPR valve output pressure, which control pump discharge amount whenever feedbacked engine speed drops under the reference rpm of each mode set.
- (2) Three LED lamps on the MCU display as below.

LED lamp	Trouble	Service
G is turned ON	Normal	-
G and R are turned ON	Trouble on MCU	<ul style="list-style-type: none"> <li>Change the MCU</li> </ul>
G and Y are turned ON	Trouble on serial communication line	<ul style="list-style-type: none"> <li>Check if serial communication lines between controller and cluster are disconnected</li> </ul>
Three LED are turned OFF	Trouble on MCU power	<ul style="list-style-type: none"> <li>Check if the input power wire (24 V, GND) of controller is disconnected</li> <li>Check the fuse</li> </ul>

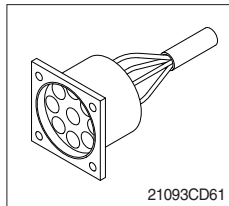
G : green,      R : red,      Y : yellow

## 8) SERVICE METER



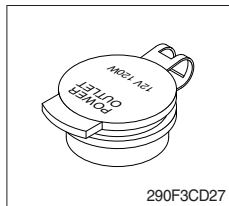
- (1) This meter shows the total operation hours of the machine.
- (2) Always ensure the operating condition of the meter during the machine operation. Inspect and service the machine based on hours as indicated in chapter 6, maintenance.

## 9) MCU/ECM CONNECTOR



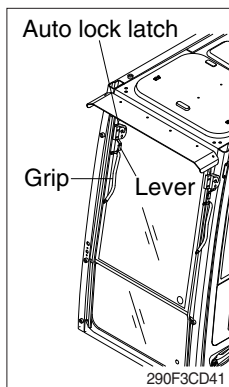
- (1) MCU communicates the machine data with Laptop computer through the connector.
- (2) ECM communicates the engine data with cummins INSITE adapter through the connector.
  - ① ECM fault code check
  - ② ECM program change
  - ③ Engine data monitoring & test

## 10) SERVICE SOCKET (12V)



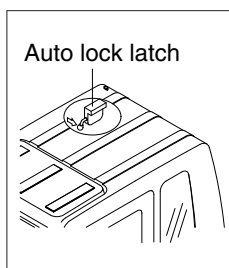
- (1) Utilize the power of 12 V as your need and do not exceed power of 12 V, 30 W.

## 11) UPPER WINDSHIELD



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

**⚠ When working, without having locked the windshield by the auto lock (by pushing the windshield to the rear 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 Reverse above step ① and ② in order to close the upper windshield.