

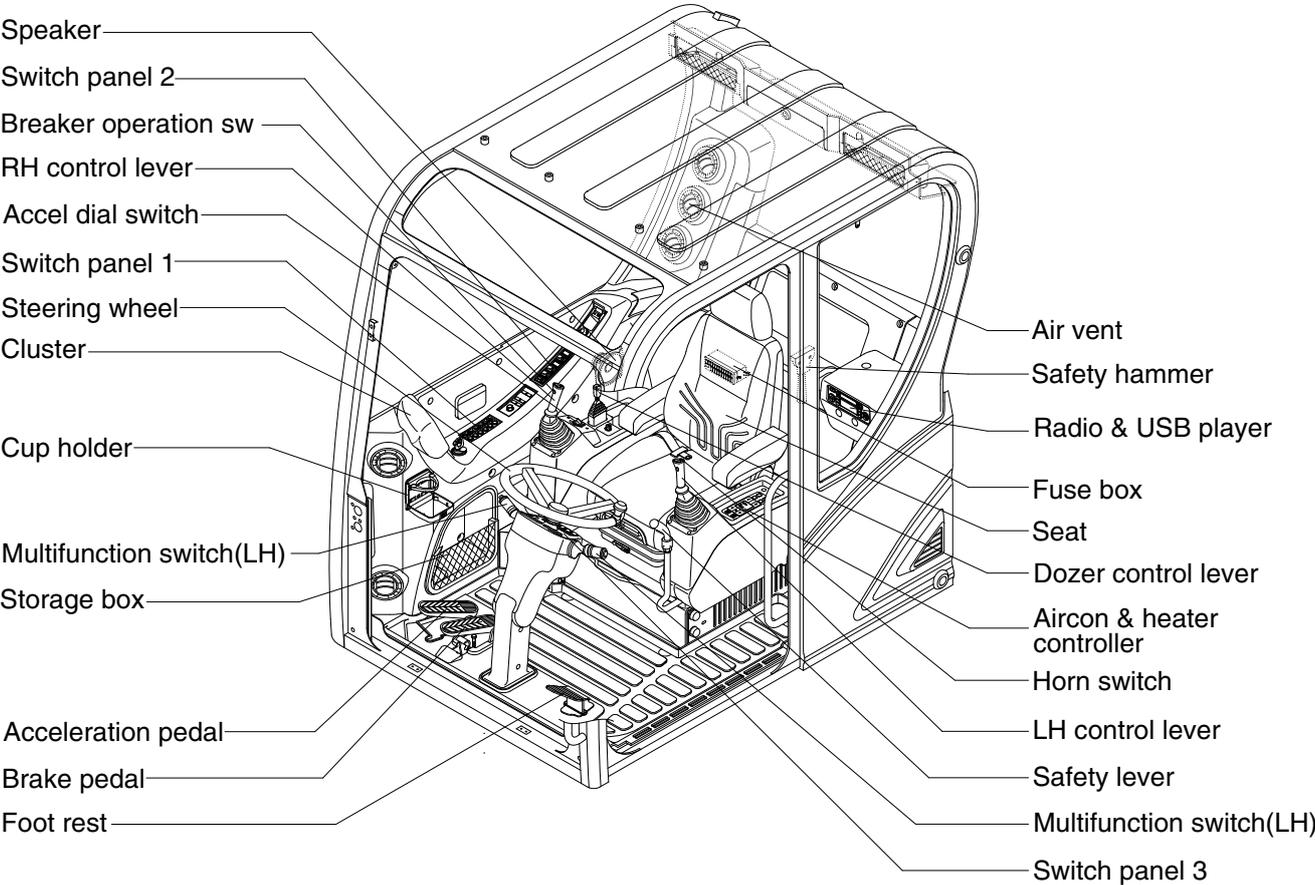
CONTROL DEVICES

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.



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.



- ※ The warning lamp pops up, lights ON (on the left-top side) and the buzzer sounds when the machine has a problem.

The warning lamp lights ON until the problem is cleared. Refer to page 3-5 for details.

2) GAUGE

(1) Operation screen

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

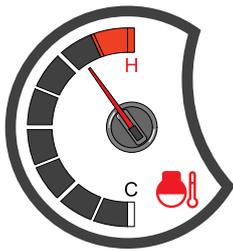


- | | | |
|-----------------------------|--------------------|--------------|
| 1 Engine coolant temp gauge | 3 Fuel level gauge | 5 Accel dial |
| 2 Hydraulic oil temp gauge | 4 Engine rpm | |

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

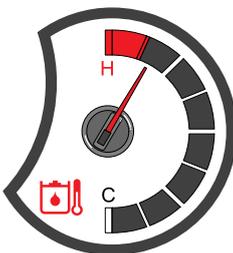
Refer to page 3-19 for details.

(2) Engine coolant temperature gauge



- ① This gauge indicates the temperature of coolant.
 - Black range : 40-115°C (104-239°F)
 - Red range : Above 115°C (239°F)
 - ② If the indicator is in the red range or  lamp lights ON in red, turn OFF the engine and check the engine cooling system.
- ※ If the gauge indicates the red range or  lamp lights ON 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.

(3) Hydraulic oil temperature gauge



- ① This gauge indicates the temperature of hydraulic oil.
 - Black 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 lights ON in red, reduce the load on the system. If the gauge stays in the red range, stop the machine and check the cause of the problem.
- ※ If the gauge indicates the red range or  lamp lights ON 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) Fuel level gauge



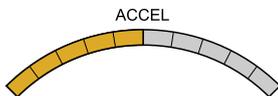
- ① This gauge indicates the amount of fuel in the fuel tank.
- ② Fill the fuel when the red range, or  lamp lights ON in red.
- ※ If the gauge indicates the red range or  lamp lights ON in red even though the machine is on the normal condition, check the electric device as that can be caused by the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

(5) Engine rpm display



- ① This displays the engine speed.

(6) Accel dial display



- ① This displays acceleration dial level from 0 to 10 step.

3) COMMUNICATION ERROR AND LOW VOLTAGE WARNING POP-UP

(1) Communication error pop-up



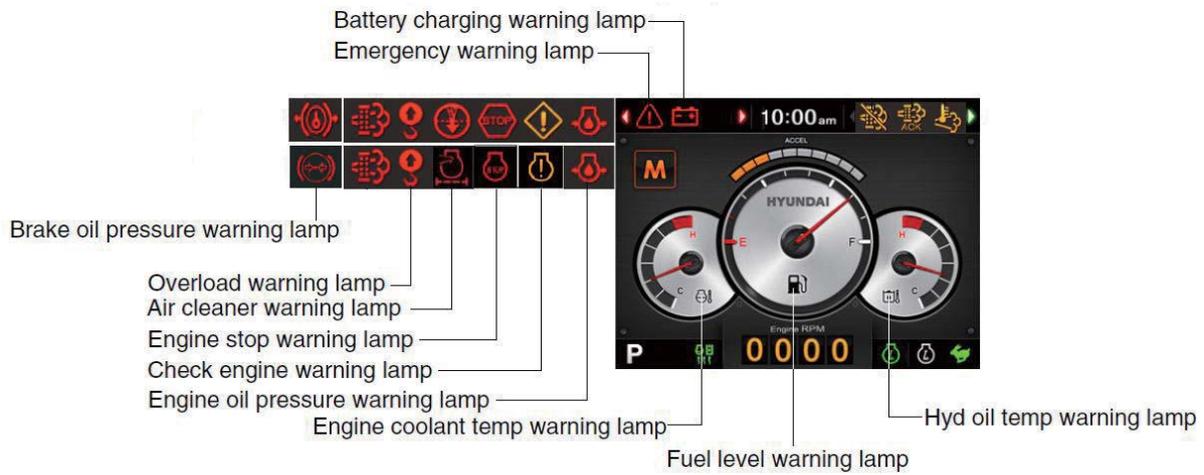
- ① Cluster displays this communication error pop-up when it has communication error with MCU.
- ② Communication error pop-up displays at operation screen only. Just buzzer alarm at the other screen.
- ③ If communication with MCU become normal state, it will disappear automatically.

(2) Low voltage warning pop-up



- ① Cluster displays this low voltage warning pop-up when the battery voltage is low.
- ② Low voltage warning pop-up displays at operation screen only. Just buzzer alarm at the other screen.
- ③ This pop-up will disappear with using touch screen or buzzer stop switch. While the battery voltage is low, buzzer sounds every minute.
- ④ When the battery voltage is higher than 11.5 V, the pop-up off.

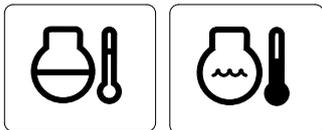
4) WARNING LAMPS



※ Each warning lamp on the left-top of the LCD pops up on the center of LCD and the buzzer sounds when the each warning is happened. The pop-up warning lamp moves to the original position and lights ON when the buzzer stop switch is pushed or the pop-up is touched. And the buzzer stops. Refer to page 3-11 for the switch.

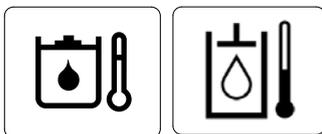
※ When the warning lamps light ON more than 4, you can check all lamps with next page button(◀ , ▶) near the warning lamps.

(1) Engine coolant temperature warning lamp



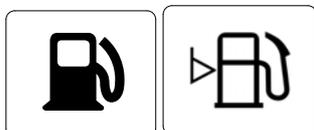
- ① The  lamp pops up on the center of LCD and the buzzer sounds when the engine coolant temperature is over 115°C.
- ② The pop-up  lamp moves to the original position and lights ON when the buzzer stop switch is pushed or pop-up is touched. Also, the buzzer stops and  lamp keeps ON.
- ③ Check the cooling system when the lamp keeps ON.

(2) Hydraulic oil temperature warning lamp



- ① The  lamp pops up on the center of LCD and the buzzer sounds when the hydraulic oil temperature is over 105°C.
- ② The pop-up  lamp moves to the original position and lights ON when the buzzer stop switch is pushed or pop-up is touched. Also, the buzzer stops and  lamp keeps ON.
- ③ Check the hydraulic oil level and hydraulic oil cooling system.

(3) Fuel level warning lamp



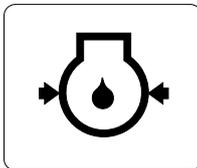
- ① This warning lamp lights ON and the buzzer sounds when the level of fuel is below 10%.
- ② Fill the fuel immediately when the lamp is ON.

(4) Emergency warning lamp



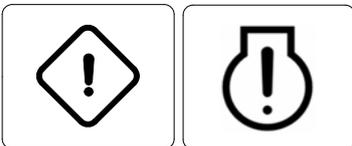
- ① This lamp pops up and the buzzer sounds when each of the below warnings are happened.
 - Engine coolant overheating (over 115°C)
 - Hydraulic oil overheating (over 105°C)
 - MCU input voltage abnormal
 - Accel dial circuit abnormal or open
- ※ **The pop-up warning lamp moves to the original position and lights ON when the buzzer stop switch is pushed or pop-up is touched. Also the buzzer stops. This is same as following warning lamps.**
- ② When this warning lamp lights ON, machine must be checked and serviced immediately.

(5) Engine oil pressure warning lamp



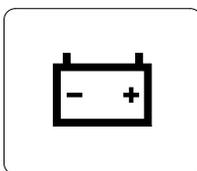
- ① This lamp lights ON when the engine oil pressure is low.
- ② If the lamp lights ON, shut OFF the engine immediately. Check oil level.

(6) Check engine warning lamp



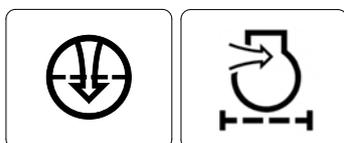
- ① This lamp lights ON when the communication between MCU and engine ECM on the engine is abnormal, or if the cluster received any fault code from engine ECM.
- ② Check the communication line between them.
If the communication line is OK, then check the fault codes on the cluster.

(7) Battery charging warning lamp



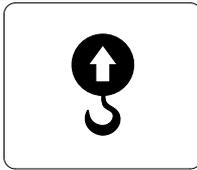
- ① This lamp lights ON when the battery charging voltage is low.
- ② Check the battery charging circuit when this lamp is ON.

(8) Air cleaner warning lamp



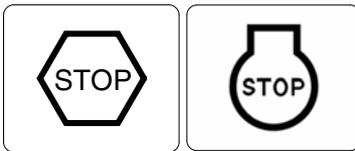
- ① This lamp lights ON when the filter of air cleaner is clogged.
- ② Check the filter and clean or replace it.

(9) Overload warning lamp (opt)



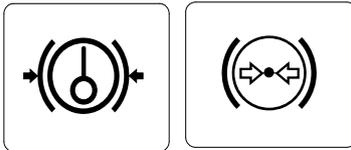
- ① When the machine is overload, the overload warning lamp lights ON during the overload switch is ON. (if equipped)
- ② Reduce the machine load.
Initiate a manual regeneration

(10) Stop engine warning lamp



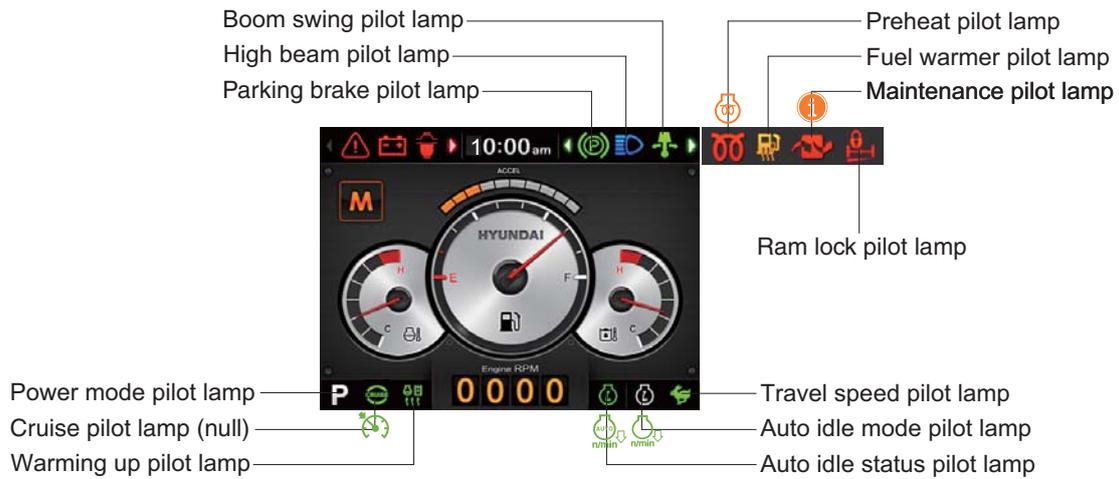
- ① If the lamp lights ON, stop the engine immediately and check the engine.
 - ② Check the fault codes on the monitor.
- ※ **Please contact your Hyundai service center or local dealer.**

(11) Brake oil pressure warning lamp



- ① The lamp lights ON when the oil pressure of service brake drops below the normal range.
 - ② When the lamp is ON, stop the engine and check for its cause.
- ※ **Do not operate until any problems are corrected.**

5) PILOT LAMPS



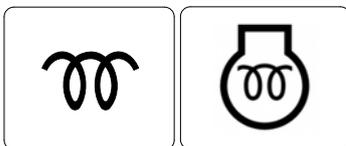
55W9A3CD02

※ When the pilot lamps light ON more than 3, you can check all lamps with next page button (◀, ▶).

(1) Mode pilot lamps

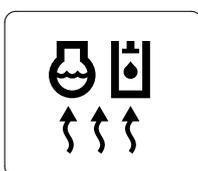
No	Mode	Pilot lamp	Selected mode
1	Power mode		Heavy duty power work mode
			Standard power mode
2	Travel mode		Low speed traveling
			High speed traveling
3	Auto idle mode		Auto idle status
			Auto idle mode

(2) Preheat pilot lamp



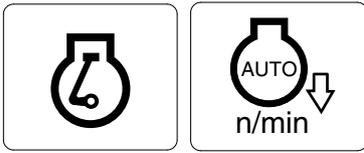
- ① Turning the start key switch ON position starts preheating in cold weather.
- ② Start the engine after this lamp is OFF.

(3) Warming up pilot lamp



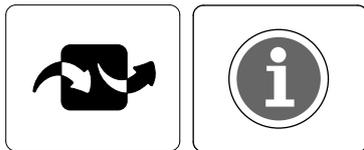
- ① This lamp is turned ON when the coolant temperature is below 30°C (86°F).
- ② The automatic warming up is cancelled when the engine coolant temperature is above 30°C, or when 10 minutes have passed since starting the engine.

(4) Auto idle status/ mode pilot lamp



- ① The auto idle pilot lamp will be ON when the idle mode is selected.
- ② The auto idle status pilot lamp will be ON when all levers and pedals are at neutral position, and the auto idle mode is selected.

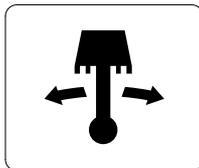
(5) Maintenance pilot lamp



- 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.

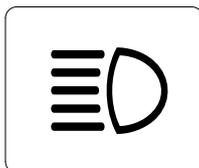
※ Refer to the page 3-17.

(6) Boom swing pilot lamp



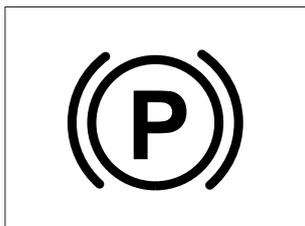
- ① This lamp is ON when the boom swing pedal is operated.

(7) High beam pilot lamp



- ① This lamp works when the illuminating direction is upward.
- ② This lamp comes ON when the dimmer switch is operated, e.g, when passing another vehicle.

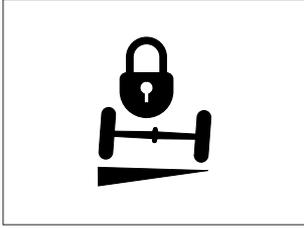
(8) Parking brake pilot lamp



- ① When the parking brake is actuated, the lamp lights ON.

※ Check the lamp is OFF before driving.

(9) Ram lock pilot lamp



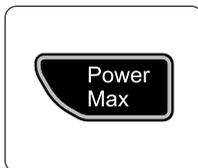
- ① This pilot lamp lights ON when ram lock switch is rear position.
- ② Also, the pilot lamp lights ON when the parking switch is ON or service brake is applied.

6) SWITCHES



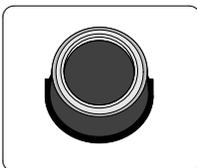
※ When the switches are selected, the pilot lamps are displayed on the LCD. Refer to the page 3-10 for details.

(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.
- ② The pilot lamp changes S → P → S in order.

(2) Select switch

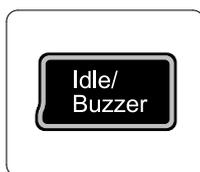


- ① This switch is used to select or change the menu and input value.
- ② Knob push
 - Long (over 2 sec) : Return to the operation screen
 - Medium (0.5~2 sec) : Return to the previous screen
 - Short (below 0.5 sec) : Select menu
- ③ Knob rotation

This knob changes menu and input value.

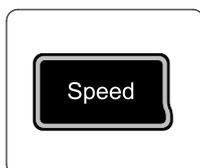
 - Right turning : Down direction / Increase input value
 - Left turning : Up direction / Decreased input value

(3) Auto idle/ buzzer stop switch



- ① This switch is used to activate or cancel the auto idle function.
- 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.

(4) Travel speed control switch



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

(5) 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 3-21 for the camera.
- ③ If the camera is not installed, this switch is used only ESC function.

7) MAIN MENU

· Operation screen



Tap
 or
 Press

 Press


Main menu screen



Sub menu screen



※ Please refer to select switch, page 3-12 for selection and change of menu and input value.

(1) Structure

No	Main menu	Sub menu	Description
1	 Monitoring	Active fault - Machine Active fault - Engine Logged fault - Machine Logged fault - Engine Monitoring (Analog) Monitoring (Digital) - Input Monitoring (Digital) - Output	MCU ECU MCU ECU Machine information Switch status Output status
2	 Management	ESL mode setting Change password Maintenance information Machine Information A/S phone number Service menu	ESL mode setting Password change Replacement, Change interval oils and filters Cluster, MCU, Engine, Machine A/S phone number, A/S phone number change Delete logged faults, Software download, Operating hour, power shift
3	 Display	Clock Screen type Brightness setting Unit setting Language Calibration	Clock A type, B type, C type Manual, Auto Temperature, Pressure 12 language Calibrating the touch screen
4	 Utilities	Camera setting Mode Video	Number of active, Display order, Camera No. Operation mode select Play music and video file

(2) Monitoring

① Active fault - Machine



- The active faults of the MCU can be checked by this menu.

② Active fault - Engine



- The active faults of engine ECU can be checked by this menu.

③ Logged fault - Machine/ Engine



- The logged faults of the MCU or engine ECU can be checked by this menu.
- Only for the service person.

④ Monitoring (Analog)



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

⑤ Monitoring (Digital) - Input



- The switch status can be confirmed by this menu.
- The activated switches are blue light ON.

⑥ Monitoring (Digital) - Output



- The output status can be confirmed by this menu.
- The output pilot lamps are blue light ON.

(3) Management

① ESL mode setting



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.
- If the ESL mode was selected Enable, the password will be required when the start switch is turned ON.
- **Disable** : Not used ESL function
- **Enable (always)** : The password is required whenever the operator starts engine.
- **Enable (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 maximum 2 days.

※ **Default password** : 00000

※ **Password length** : 5~10 digit

② Change password

- The password is 5~10 digits.



Enter the current password

Enter the new password



The new password is stored in the MCU.

Enter the new password again

③ Maintenance information



- Elapse : Maintenance elapsed time.
- Interval : The change or replace interval can be changed in the unit of 50 hours.
- History-Hour : Maintenance replacement history.
- Replacement : The elapsed time will be reset to zero (0).
- **Change or relpace interval**

No	Item	Interval
1	Engine oil	500
2	Final gear oil	1000
3	Swing gear oil	1000
4	Hydraulic oil	5000
5	Pilot line filter	1000
6	Hydraulic oil return filter	1000
7	Engine oil filter	500
8	Fuel filter	500
9	Pre-filter	500
10	Hydraulic tank breather	1000
11	Air cleaner	500
12	Radiator coolant	2000
13	Swing gear pinion grease	1000

④ Machine Information



- This can confirm the identification of the cluster, MCU, engine and machine.

⑤ A/S phone number



- The A/S phone number can be checked and changed.

⑥ Service menu



Enter the password

- Delete logged fault : Logged faults of MCU or engine ECU can be deleted.
- S/W download : Update and display software about operating system, application, image and font.
- Operating hours : Operating hours since the machine line out can be checked.
- Power shift : Set power shift mode (standard/option)

(4) Display

① Clock



- The first line's three spots "****-**-**" represent Year/Month/Day each.
- The second line shows the current time. (AM, PM/0:00~12:59)

② Screen type



- The screen type (A,B,C) of the LCD can be selected by this menu.

③ Brightness setting calibration



Manual (1st~10th step)



Auto (day/night)



Auto (time)

- If "Auto" is chosen, brightness for day and night can be differently set up. Also, users can define which day time interval. (Set day starting time and ending time)

④ Unit setting



- Temperature : °C ↔ °F
- Pressure : bar ↔ MPa ↔ kgf/cm² ↔ psi

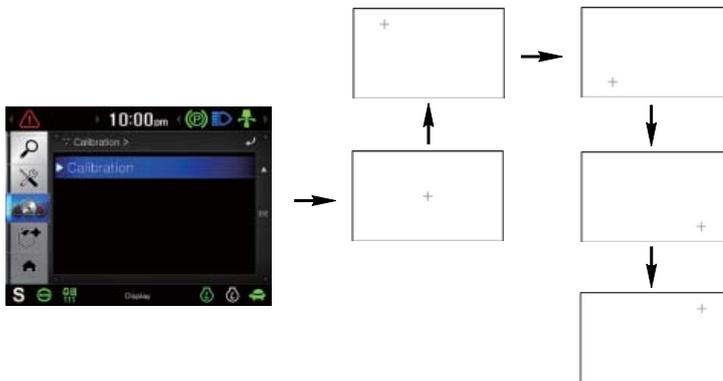
⑤ Language



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

⑥ Calibration

- When touch awareness goes wrong, this function use.
Fall in the next step if touches the middle point of cross with fingernail.
If touches total five points as follows, the setting is completed.



(5) Utilities

① Camera setting

- Three cameras can be installed on the machine and the display order can be set by this menu.
- If the camera was not equipped, this menu is not useful.



- In the operation screen, if the ESC/CAM switch is pushed, rear view camera display or stop.
- Turning the select switch in clockwise direction, the next ordered will be shown and in counter-clockwise direction, the previously ordered will be shown. Also, you can change camera channel using touch the screen.
- Push the select switch or touch the screen, the displayed screen will be enlargement.



② Mode



- When this cluster's buttons are not work, you can control using touch screen instead of these buttons.
- You can only control in this mode screen.

③ Video

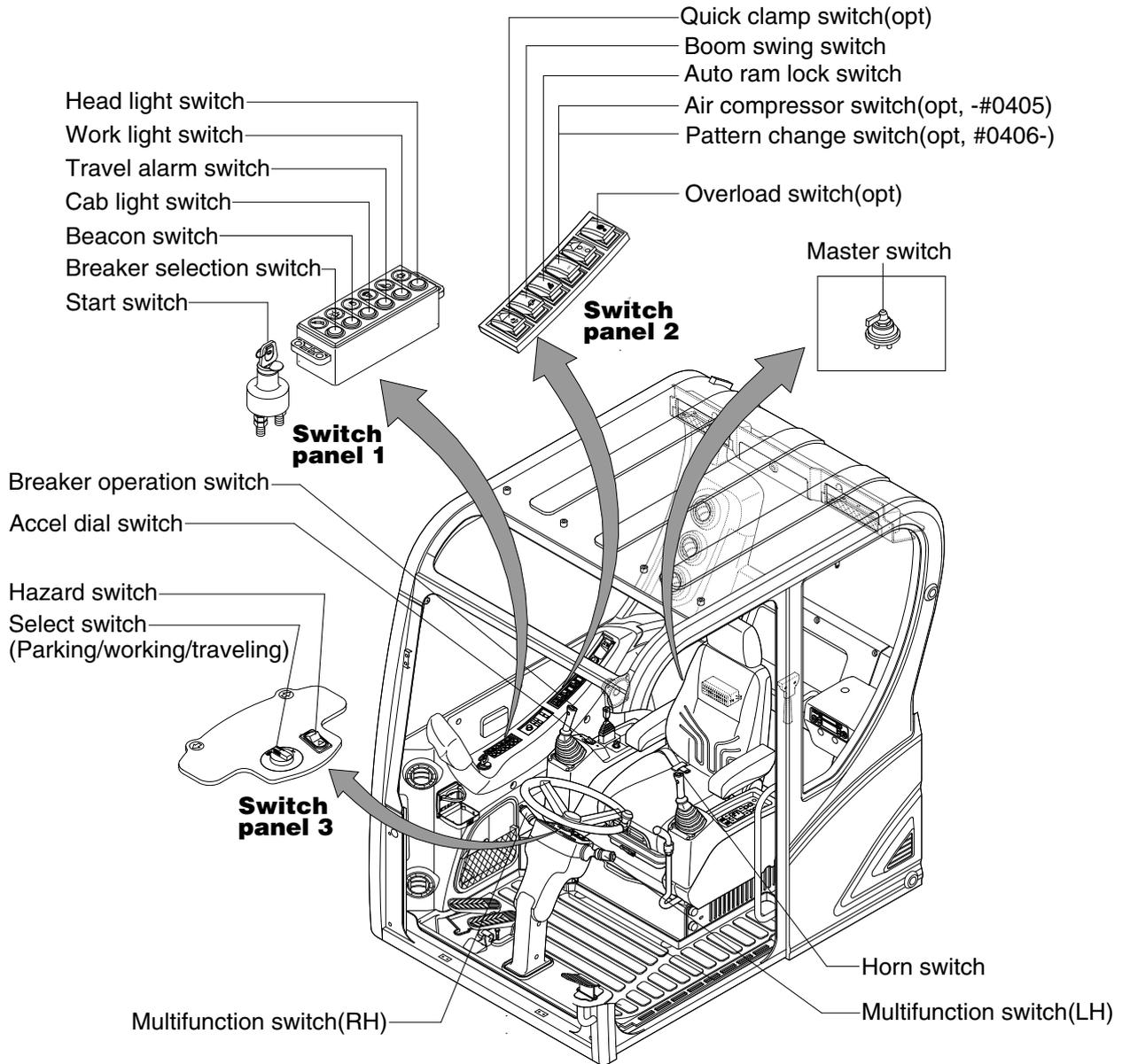
- Play MP4 or codec file of external hard disk through USB port.
- The USB port is located under the cluster.



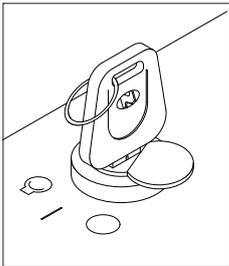
- Over 1100 engine rpm, the screen turns into the operation screen with MP4 or codec file playing for the safety.

No.	Function	Control	No.	Function	Control
1	Previous track	Power mode switch or touch	7	Sound volume	Speed switch or touch
2	Next track	Speed switch or touch	8	Stop	ESC/CAM button or touch
3	Play	Touch	9	File name	-
4	Pause	Touch	10	Current time/ Total time	-
5	Contents display	Touch	11	Current playing time	-
6	Mute	Touch	-	-	-

3. SWITCHES



1) STARTING SWITCH



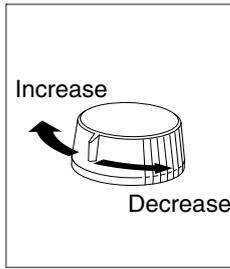
(1) There are three positions, OFF, ON and START.

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

Release key immediately after starting.

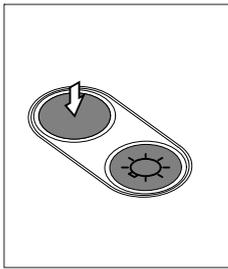
※ **Key must be in the ON position with engine running to maintain electrical and hydraulic function and prevent serious machine damage.**

2) ACCEL DIAL



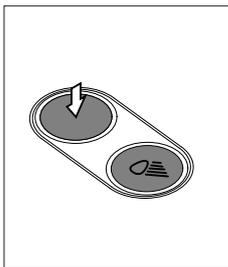
- (1) There are 10 dial setting.
- (2) Setting 1 is low idle and setting 10 is high idle.
 - By rotating the accel dial to right : Engine speed increased.
 - By rotating the accel dial to left : Engine speed decreased.

3) HEAD LIGHT SWITCH



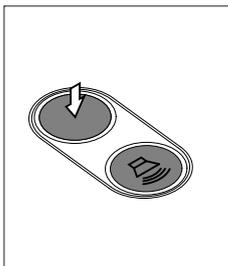
- (1) This switch is used to operate the head light.
 - Press the switch once, the head light comes ON and the pilot lamp ON.
 - Press the switch once more, the head light and pilot lamp turn off.

4) WORK LIGHT



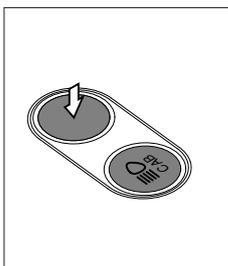
- (1) This switch is used to operate the work light.
 - Press the switch once, the work light comes ON and the pilot lamp ON.
 - Press the switch once more, the work light and pilot lamp turn off.

5) TRAVEL ALARM SWITCH



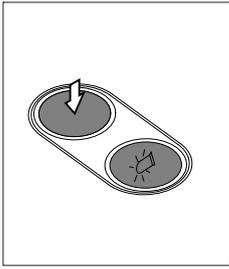
- (1) This switch is used to alarm surroundings when the machine travels to forward and backward.
- (2) On pressing this switch, the alarm operates only when the machine is traveling.

6) CAB LIGHT SWITCH



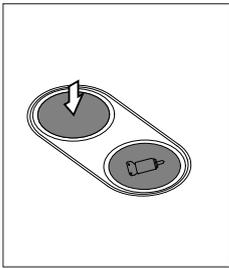
- (1) This switch turns on the cab light on the cab.

7) BEACON SWITCH (option)



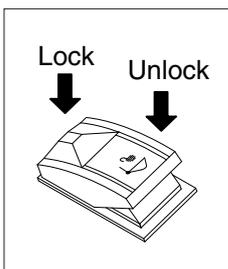
- (1) This switch turns ON the rotary light on the cab.
- (2) The below indicator lamp is turned ON when operating this switch.

8) BREAKER SELECTION SWITCH (option)



- (1) This switch is used to operate breaker.
- ※ The breaker operates only when this switch is pressed.

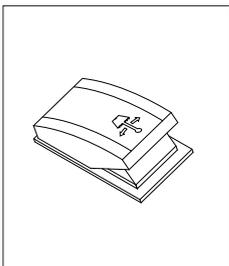
9) QUICK CLAMP SWITCH (option)



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

※ Refer to the page 8-6 for details.

10) BOOM SWING SWITCH

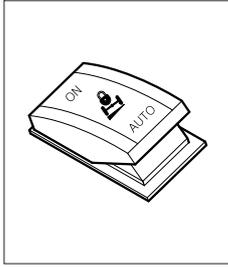


- (1) This switch is used to swing the boom to the right or left direction.

- (2) The indicator lamp turned ON when selected this switch.

※ Refer to the page 4-7 for the operation.

11) AUTO RAM LOCK SWITCH



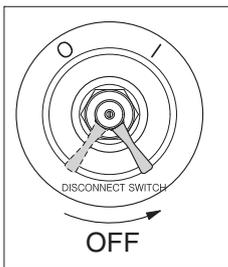
(1) This switch activate front axle oscillation cylinder to locking position for increase of stability.

- ON : Set front axle to locking position for excavation work or travels even ground. Also, the ram lock pilot lamp comes ON at the travel pilot lamp.
- AUTO : Set front axle to locking or unlocking as table.

※ Refer to page 3-31 for select switch.

Select switch (parking/working/traveling)	Ram lock	Conditions
Parking (P)	Locking	· Always
Traveling (T)	Unlocking	· Always
Working (W)	Locking	· FNR lever in neutral position · Service brake pedal is depressed.
	Unlocking	· FNR lever in forward/reverse position and service brake pedal is not depressed. · 2 way pedal is equipped and service brake pedal is not depressed.

12) MASTER SWITCH

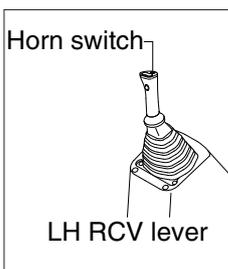


(1) This switch is used to shut off the entire electrical system.

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

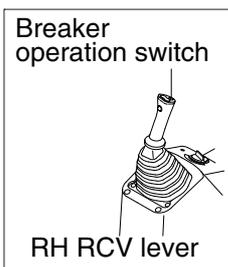
※ **Never turn the master switch to O (OFF) with the engine running. It could result in engine and electrical system damage.**

13) HORN SWITCH



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

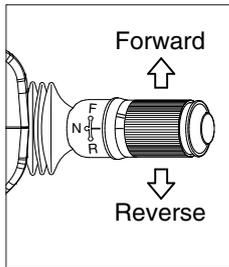
14) BREAKER OPERATION SWITCH



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

15) RH MULTI FUNCTION SWITCH

(1) FNR lever



① This lever changes travel direction of machine.

- **F** : Machine moves forward
- **N** : Neutral position
- **R** : Machine moves backward

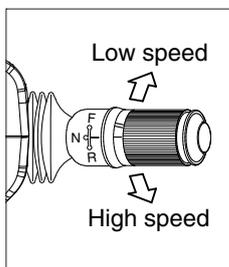
▲ Travel direction will be reversed if lower structure is positioned with dozer in front.

② The warning buzzer sounds when the lever is in the reverse position.

▲ If this lever is not in the neutral position, engine does not started.

▲ Be sure to stop the machine when changing the direction forward or backward while traveling.

(2) Travel speed switch

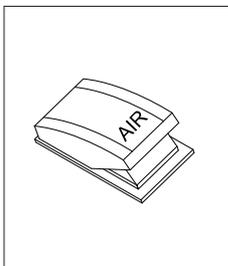


① This switch is for selecting travelling speed between high and low.

- Low speed (←) : 11.3 km/hr (7.0 mph), turtle mark
- High speed (⇌) : 30 km/hr (19.0 mph), rabbit mark

▲ In case of changing the travel speed, be sure to stop the machine completely.

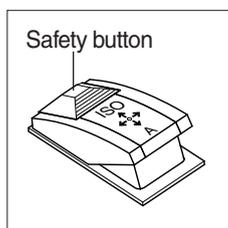
16) AIR COMPRESSOR SWITCH (option, -#0405)



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

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

17) PATTERN CHANGE SWITCH (option, #0406-)



① The pattern change can be operated easily using this switch.

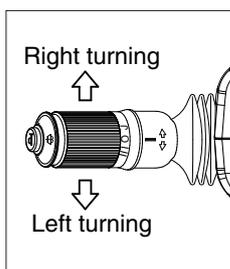
- Position ISO : ISO type pattern
- Position A : A type pattern

※ Before starting the machine, check switch position.

※ Refer to the page 4-26 for the details.

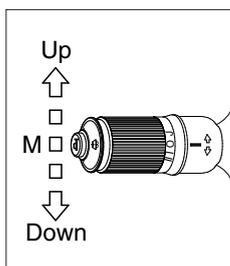
18) LH MULTI FUNCTION SWITCH

(1) Direction indication lamp switch



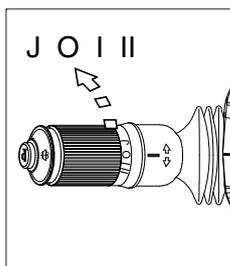
- ① This switch is used to warn or signal the turning direction of the machine to other machines or equipment.
- ② Push the lever to forward for turning right (↗), pull the lever to backward for turning left (↖).
- ③ The turning pilot lamp comes ON at the travel pilot lamp on the steering column.

(2) Dimmer switch



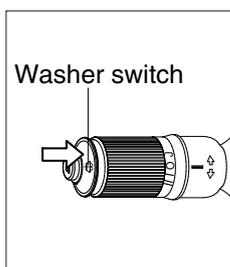
- ① This switch is used to turn the head lights direction.
- ② Switch positions.
 - Up (↗) : To flash for passing
 - Middle (M) : Head lights low beam ON
 - Down (↖) : Head lights high beam ON
- ③ If you release the switch when it's in up position, the switch will return to middle.

(3) WIPER SWITCH



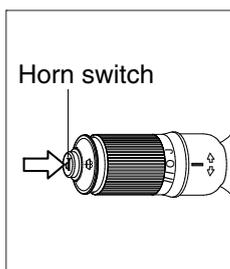
- ① When the switch is in J position, the wiper moves intermittently.
- ② When placed in I or II position, the wiper moves continuously.

(4) WASHER SWITCH



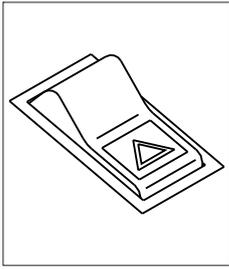
- ① If you push the grip of the lever, washer liquid will be sprayed and the wiper will be activated 2-3 times.
- ※ Check the quantity of washer liquid in the tank. If the level of the washer liquid is LOW, add the washer liquid (in cold, winter days) or water. The capacity of tank is 1.5 liter.

(5) HORN SWITCH



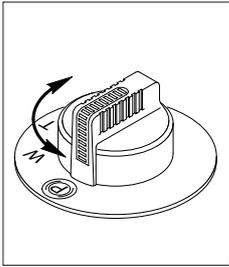
- ① This switch is at the end of left side multifunction switch. On pressing, the horn sounds.

19) HAZARD SWITCH



- (1) Use for parking, or roading machine.
 - (2) LH and RH turn signal lamps come ON at the same time by this switch.
- ※ If the switch is left ON for a long time, the battery may be discharged.

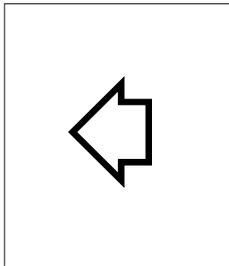
20) SELECT SWITCH (parking / working / traveling)



- (1) This switch is used to select the operation mode as below.
 - Parking ((P)) : The parking brake is applied.
 - Working (W) : The machine needs to be working.
 - Traveling (T) : The machine needs to be traveling.

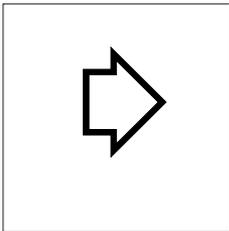
21) TURNING PILOT LAMP

(1) Left turning pilot lamp



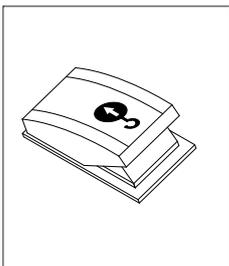
- (1) This lamp flashes with sound when the LH multifunction switch is move to backward position.

(2) Right turning pilot lamp



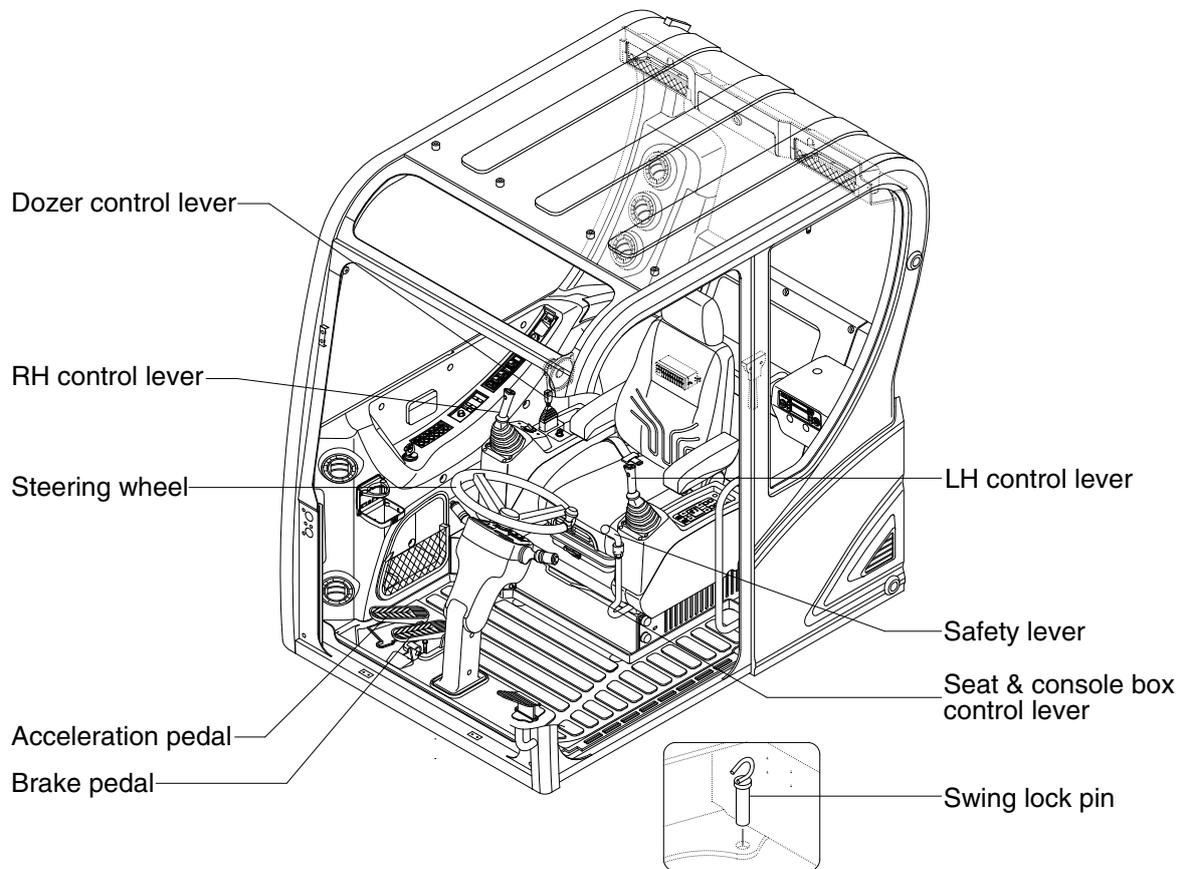
- ① This lamp flashes with sound when the LH multifunction switch is
- ② move to forward position.

22) OVERLOAD SWITCH (option)

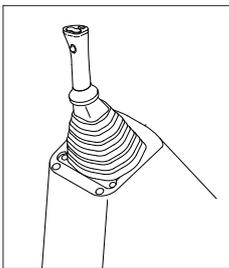


- (1) When this switch pressed ON position, buzzer makes sound and overload warning lamp comes ON in case that the machine is overload.
- (2) When it pressed OFF position, buzzer stops and warning lamp goes out.

4. LEVERS AND PEDALS

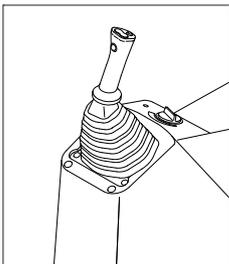


1) LH CONTROL LEVER



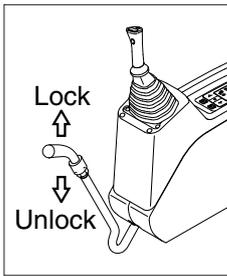
- (1) This joystick is used to control the swing and the arm.
- (2) Refer to **operation of working device** in chapter 4 for details.

2) RH CONTROL LEVER



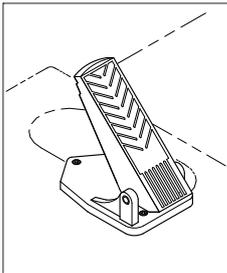
- (1) This joystick is used to control the boom and the bucket.
- (2) Refer to **operation of working device** in chapter 4 for details.

3) SAFETY LEVER



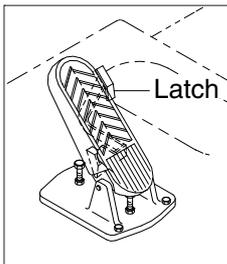
- (1) All control levers and pedals are disabled from operation by locating the lever to lock position as shown.
 - ※ **Be sure to raise the lever to LOCK position and tilt LH console box when leaving from operator's seat.**
- (2) By pushing lever to UNLOCK position, machine is operational.
 - ※ **Do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

4) ACCELATION PEDAL



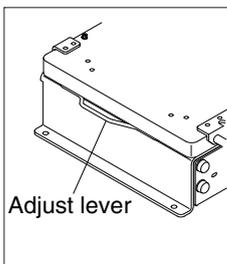
- (1) When this pedal is stepped, the machine starts traveling.
 - ▲ **Before starting the machine with stepping on the pedal, check if the underframe is certainly in the traveling direction.**

5) BRAKE PEDAL



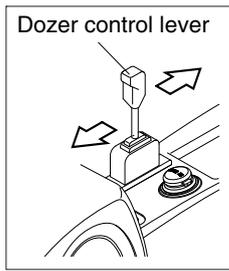
- (1) Pedal and latch provide two kinds of service brake function.
- (2) To operate service brake, push pedal with latch by foot.
 - ▲ **Push pedal and latch at once to avoid unexpected locking of pedal in traveling condition.**
 - ▲ **During travel, do not push pedal only in full stroke. It is dangerous due to the locking of service brake.**
- (3) If you want to choose working brake, just push pedal in full stroke without latch then the latch locks pedal and service brake is working continuously until you push the latch to release the pedal.
- (4) Push latch to release working brake.

6) SEAT AND CONSOLE BOX ADJUST LEVER



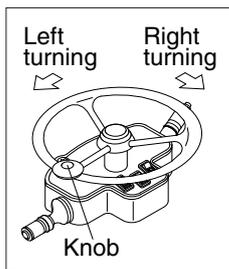
- (1) This lever is used to move the seat and console box to fit the contours of the operator's body.
- (2) Pull the lever to adjust forward or backward over 90 mm (3.5").

7) DOZER CONTROL LEVER



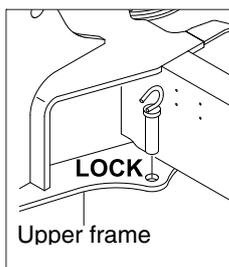
- (1) This lever is used to operate the dozer blade.
- (2) If the lever is pushed forward, the dozer blade will be going down.
If the lever is pulled back, the dozer blade will be going up.

8) STEERING WHEEL



- (1) If the steering wheel is turned to left, the machine will move to the left and turn it to the right, the machine will move to the right.
- (2) As the handle is equipped with a knob, it is convenient to operate with one hand or quickly.

9) SWING LOCK PIN

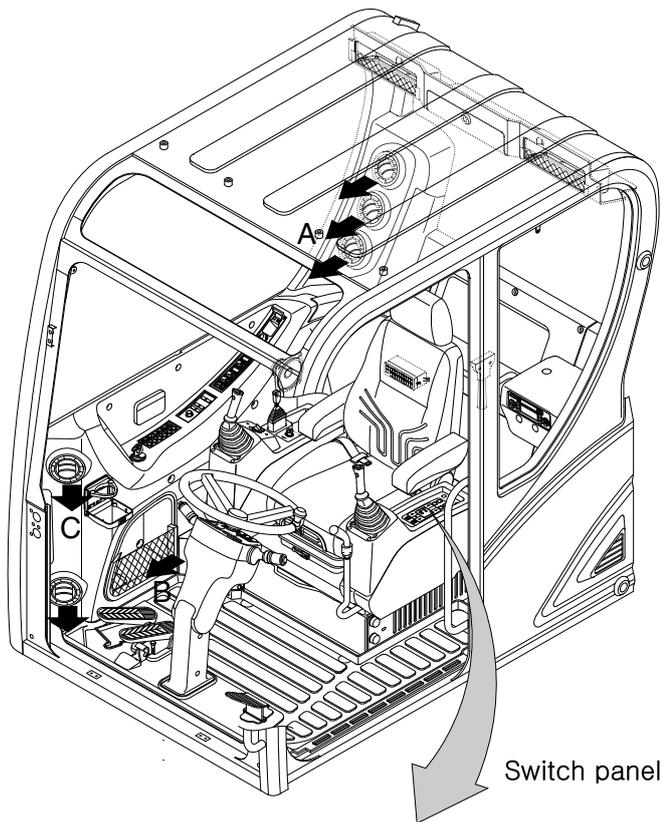


- (1) This is the system to lock the swing by connecting the upper swing part and the lower frame mechanically.
 - (2) The swing is locked when the lever is down and released when the lever is up.
- ※ **Before operating the machine, be sure to release the swing lock device.**

5. FULL AUTO AIR CONDITIONER AND HEATER

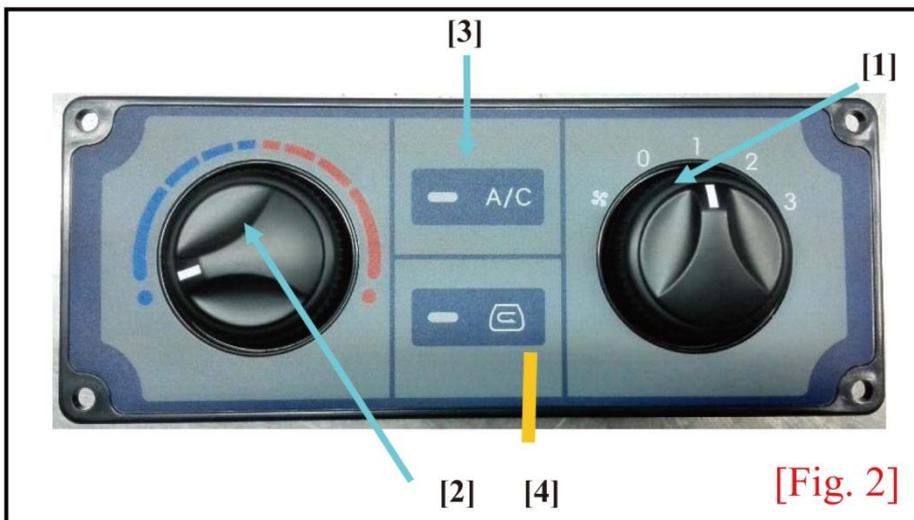
Full auto air conditioner and heater system automatically keeps the optimum condition in accordance with operator's temperature configuration sensing ambient and cabin inside temperature.

· Location of air flow ducts



5. Start of air-conditioner

The air conditioner is started by operating the controller inside the vehicle. The main structure and function of the controller are as follows:



5. Start of air conditioner

No.	Name	Main Function
1	Air volume adjustment switch	Adjust the air volume of the unit in the cooling or heating mode (3 levels: LOW/MIDDLE/HIGH).
2	Internal temperature adjustment switch	This is used by the operator to set the internal temperature in the cooling mode. ► Turn this switch left to the maximum. The internal temperature will be set to 30 °C (until the power switch of the compressor clutch is turned on or off). ► Turn this switch right to the maximum. The internal temperature will be set to 15 °C.
3	Cooling start LED	This LED indicates the clutch action in the cooling mode.
4	Internal/external air circulation switch	Enable the internal/external air circulation (this function is not available at present).

5-1 Operation order of air conditioner

No.	Operation Switch	Start Order and Method
1	Engine	Start the engine of the vehicle.
2	Cooling operation	► Close the heating water valve [13] shown in Fig. 1 to prevent the engine cooling water from flowing into the HVAC unit. ► Turn the internal temperature setting switch in Fig. 2 right to the maximum in the cooling mode. (2) Internal temperature setting: right to the maximum = 15 °C middle position = 22-24 °C left to the maximum = 30 °C ※ Note: If there is a “click” sound within the OFF range when this switch is turned left to set the temperature, it indicates that the compressor power switch is engaged but the compressor clutch is OFF. Thus, the clutch must not be turned OFF when this switch is turned left.
3	Air volume adjustment switch	► Turn the air volume adjustment switch [1] in Fig. 2 to the Level 1 (LOW) position. The compressor will be powered on and start working. At the same time, the motor of the HVAC unit will work and cold air will be supplied into the vehicle. ► During the initial start of the air conditioner, turn the air volume adjustment switch right to the Level 3 (HIGH) position to quickly reduce the internal temperature.

No.	Operation Switch	Start Order and Method
4	Internal temperature setting switch (in cooling mode)	<p>▶ As shown in Fig. 2, when the internal temperature setting switch [2] is set in the middle “(A)” position, the air conditioner will continue working. If the internal temperature reaches 22-24 °C, the power supply of the compressor clutch will be automatically turned on/off, to maintain the internal temperature.</p> <p>※ Note: The above functions are available only in the cooling mode. In the heating mode, the switch must be turned left to the maximum and kept in the OFF state.</p>

5-1 Operation order of air conditioner

No.	Operation Switch	Operation Order and Method
1	Heating	<p>▶ For heating, open the heating water valve in Fig. 1, making the engine cooling water flow into the HVAC unit.</p>
2	Internal temperature setting switch	<p>▶ Turn the temperature setting switch left to the maximum until there is a “click” sound in the OFF range, and keep this state.</p> <p>※ Note: If the temperature setting switch turned right, the compressor clutch will be driven to work, which will obviously affect heating and cause compressor failure.</p>
3	Air volume adjustment switch	<p>▶ Turn the air volume adjustment switch in Fig. 2 to the Level 1 (LOW) position or any desired position, the motor of the HVAC unit will be driven to work, and hot air will be supplied into the vehicle.</p>

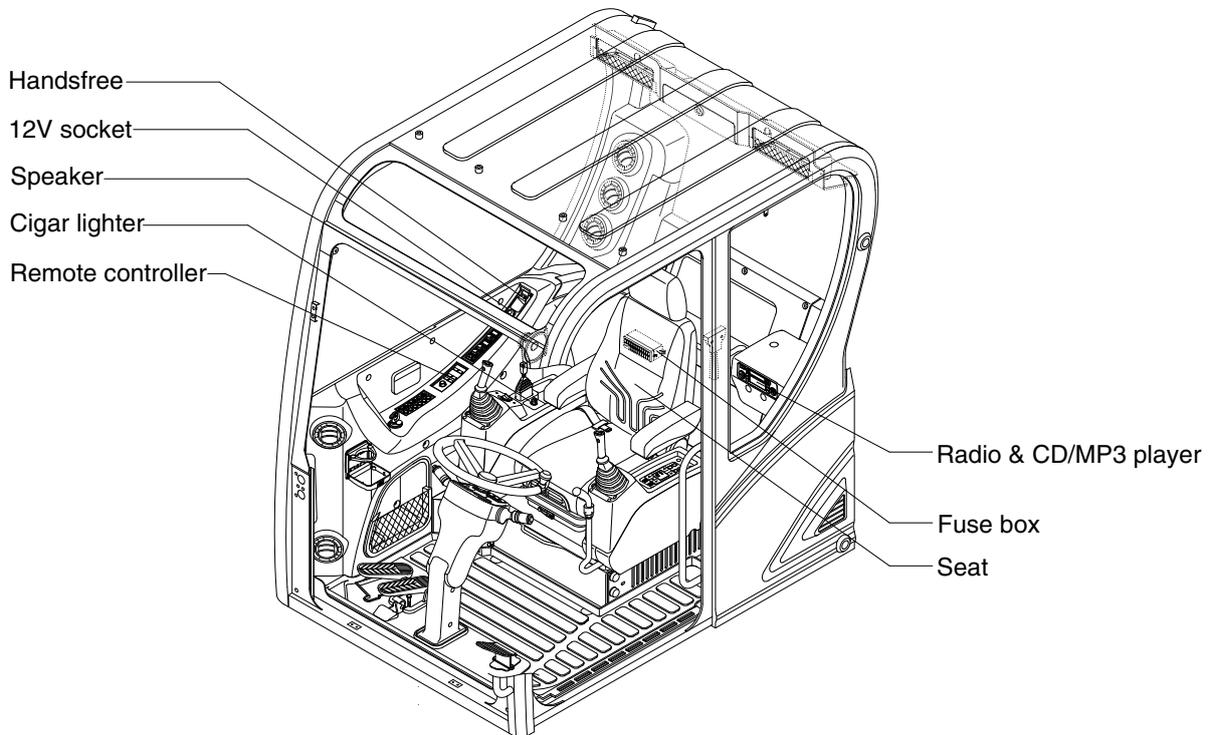
5-2 Installation and precaution of air conditioner

Item	Installation Method and Precaution
<p>Compression installation</p>	<ul style="list-style-type: none"> ▶ Compressor installation: The compressor is installed with the vehicle engine and auxiliary bracket, and must be secured with more than three bolts. (The strength of fixing bolts must be 9.8T or above.) ▶ Parallelism of V-belt: The deviation of parallelism between the engine pulley and compressor clutch pulley must be within ± 1.0 mm. ▶ Tension of V-belt: The tension of the V-belt refers to the tension measured at about 10 mm away from the belt center when the force of about 10 Kg is applied, as shown in the figure. The belt tension must be checked and adjusted once a week. 
<p>Condenser installation</p>	<ul style="list-style-type: none"> ▶ The condenser is secured on the frame with at least 4 bolts of 8T or above (torque: 2Kg/m). ▶ If the condenser is in front of and also far from the radiator and air does not pass through the condenser, an additional air cutoff device should be installed.
<p>Dryer installation</p>	<ul style="list-style-type: none"> ▶ The dryer is secured vertically with at least two bolts.
<p>HVAC unit installation</p>	<ul style="list-style-type: none"> ▶ The HVAC unit is secured on the frame with at least 4 bolts of 8T or above (torque: 2Kg/m). ▶ The air duct cannot be connected without sealing measures, in order to prevent air leakage.
<p>Hose and wire</p>	<ul style="list-style-type: none"> ▶ Avoid interference by protrusions in the surrounding environment during hose and wire connection. The parts that may be subject to friction due to vehicle vibration should be secured with clips onto the frame.

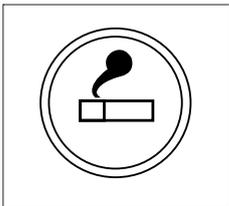
5-3 Refrigerant filling and commissioning

Item	Use Method and Precaution											
Seal check	<ul style="list-style-type: none"> ▶ After hose and wire connection, check seals for air leakage. (Mark hose connections with a marker.) ▶ Check seals with nitrogen. Apply the pressure of 20 Kg/㎤ (use the same high or low pressure) via the pressure gauge. Observe the change in the reading of the pressure gauge in about 15 minutes, and check air leakage. ※ Note: Use nitrogen only in seal check. ▶ Completely drain residual nitrogen after seal check. 											
Vacuum operation	<ul style="list-style-type: none"> ▶ Connect the vacuum pump and pressure gauge, and carry out vacuum operation (about 10-15 minutes) with the vacuum pump when vacuum conditions are met. ▶ Close the instrument valve after vacuum operation. Observe the change in the reading of the instrument in about 10 minutes. ※ Note: The pressure gauge used in air leakage check and vacuum operation should be inspected and calibrated on a regular basis. 											
Refrigerant filling	<ul style="list-style-type: none"> ▶ If no air leakage is found, connect the refrigerant to the pressure gauge with an inspected and calibrated scale, to drain residual air in the gauge tube via the refrigerant. ▶ Align the pointer of the scale with 0, and fill a specified amount of gaseous refrigerant through the high-pressure gauge tube. 											
Commissioning	<ul style="list-style-type: none"> ▶ After filling the refrigerant, start the engine with the attached pressure gauge, check the pressure indicated by the pressure gauge via the air conditioner controller, and inspect the system. ▶ In principle, the system pressure should be checked at the ambient temperature above 25 °C. <table border="1" data-bbox="603 1447 1385 1738" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th data-bbox="603 1447 799 1529">Ambient Temperature</th> <th data-bbox="799 1447 995 1529">Low Pressure (Kg/cm²)</th> <th data-bbox="995 1447 1192 1529">High Pressure (Kg/cm²)</th> <th data-bbox="1192 1447 1385 1529">Condition</th> </tr> </thead> <tbody> <tr> <td data-bbox="603 1529 799 1574">25-30 °C</td> <td data-bbox="799 1529 995 1574">1.0-2.5</td> <td data-bbox="995 1529 1192 1574">11-15</td> <td data-bbox="1192 1529 1385 1738" rowspan="2"> <ul style="list-style-type: none"> ▶ Speed: 1,800 rpm ▶ Internal temperature: 25-28 °C </td> </tr> <tr> <td data-bbox="603 1574 799 1738">30-35 °C</td> <td data-bbox="799 1574 995 1738">1.8-3.5</td> <td data-bbox="995 1574 1192 1738">13-18</td> </tr> </tbody> </table> <p data-bbox="603 1738 1385 1816">※ Note: The above results vary with the ambient temperature changing, so they cannot be used as a basis of judgment.</p>	Ambient Temperature	Low Pressure (Kg/cm ²)	High Pressure (Kg/cm ²)	Condition	25-30 °C	1.0-2.5	11-15	<ul style="list-style-type: none"> ▶ Speed: 1,800 rpm ▶ Internal temperature: 25-28 °C 	30-35 °C	1.8-3.5	13-18
Ambient Temperature	Low Pressure (Kg/cm ²)	High Pressure (Kg/cm ²)	Condition									
25-30 °C	1.0-2.5	11-15	<ul style="list-style-type: none"> ▶ Speed: 1,800 rpm ▶ Internal temperature: 25-28 °C 									
30-35 °C	1.8-3.5	13-18										

6. OTHERS

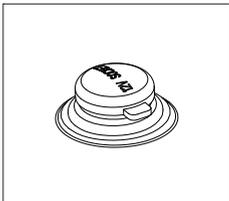


1) CIGAR LIGHTER



- (1) This can be used when the engine starting switch is ON.
 - (2) The lighter can be used when it springs out in a short while after being pressed down.
- ※ **Service socket**
Use cigar lighter socket when you need emergency power.
Do not use the lighter exceeding 12V, 120W.

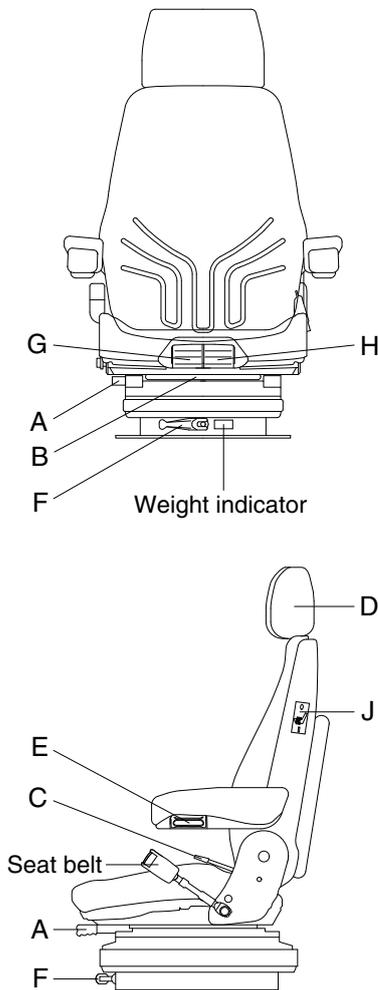
2) 12V SOCKET (option)



- (1) Utilize the power of 12V as your need and do not exceed power of 12V, 120W.

3) SEAT

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



(1) Forward/Backward adjustment (A)

- ① Pull lever A to adjust seat forward or backward.
- ② The seat can be moved forward and backward over 130 mm (5.1") in 13 steps.

▲ Do not lift the locking lever with you leg or calf.

(2) Upward/Downward adjustment (B)

- ① Pull lever B to adjust seat upward or downward over 60 mm (2.4").
- ② Forward or backward side adjustment only can be made, tilting to one side, by moving lever B respectively.

(3) Reclining adjustment (C)

Pull lever C to adjust seat back rest.

(4) Armrest adjustment (E)

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

(5) Headrest adjustment (D)

This is adjustable vertically and forward or rearward to fit operator's requirements.

(6) Weight adjustment (F)

Adjust the lever with the seat empty to the operator's weight.

(7) Seat depth adjustment (G)

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

(8) Seat pan angle adjustment (H)

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

(9) Seat heater (J)

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

0 = Seat heater OFF

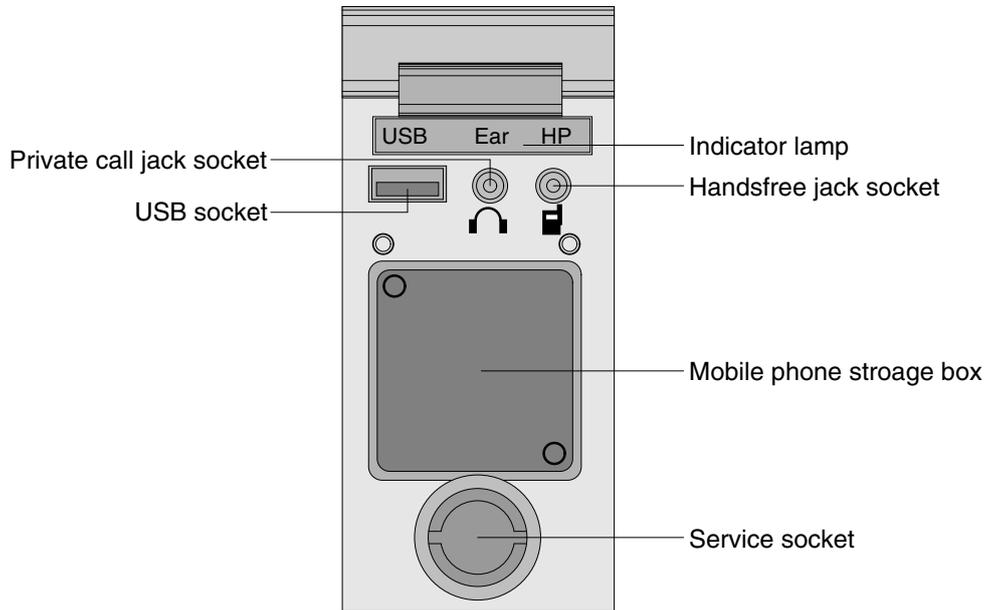
I = Seat heater ON

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

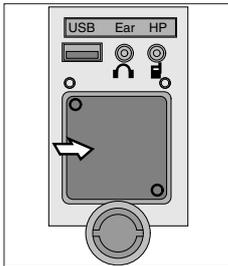
▲ Replace the seat belt at least once every three years, regardless of appearance.

4) HANDSFREE

Allow you to dial a call or to have a conversation without holding your handset. Use the remote controller when making and answering a calls or ring off.

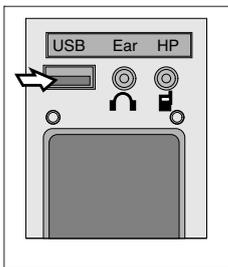


(1) Mobile phone storage box



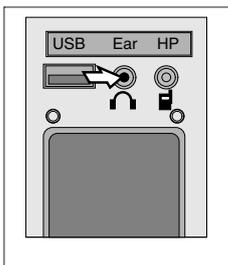
- ① Mobile phone can be stored when call by handsfree.

(2) USB socket



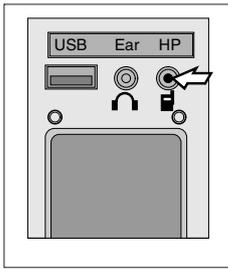
- ① This socket is used to charging the mobile phone.

(3) Private call jack socket



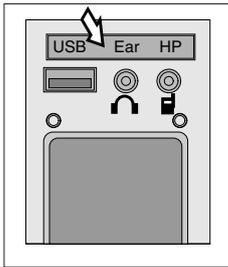
- ① This can be used protect you privacy calling by using ear phone.
- ② The mobile phone must be connected handsfree jack socket.

(4) Handsfree jack socket



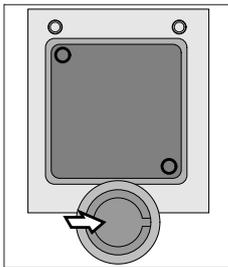
- ① Connect the jack cable when call by handsfree.
- ② Use the special adapter when jack cable is not interchangeable.
- ③ Check the jack type of mobile phone before use.

(5) Indicator lamp



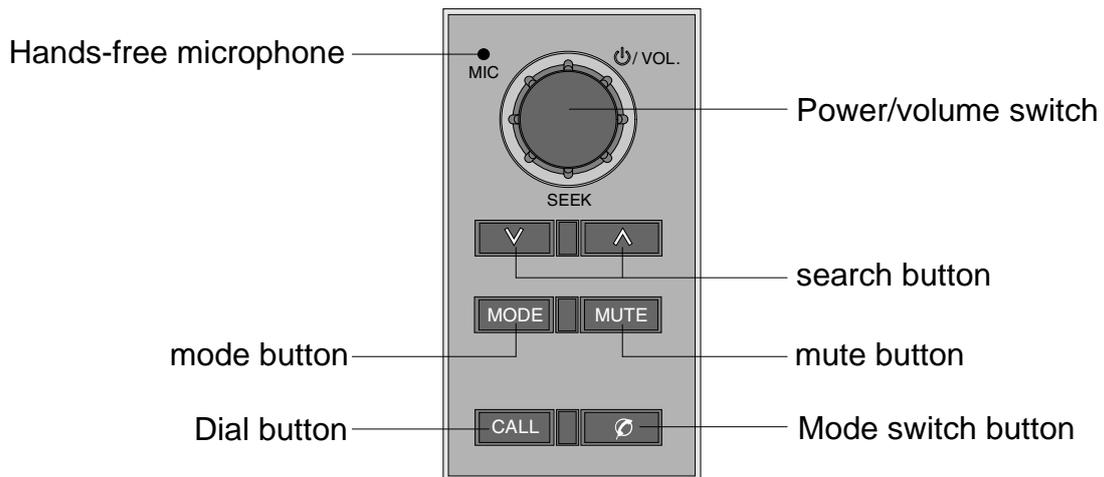
- ① This lamp is turned ON when the handsfree mode selected.

(6) Service socket



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

5) REMOTE CONTROL



(1) Power/volume switch



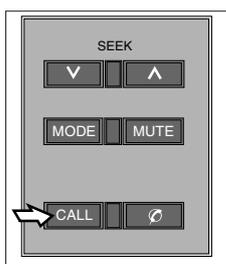
- ① This switch is used to turn on or off audio or hands-free
 - ② Switch to the right, increase the hands-free volume, up to 7 level
 - ③ The switch turns to the left and the volume drops
- ※ When audio mode is selected, the switch adjusts the audio volume

(2) Mode switch button



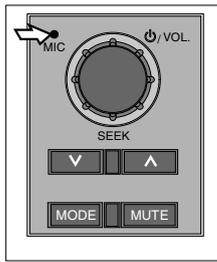
- ① This button is used to select hands-free or audio mode
 - light on: Hands-free mode
 - light off: Audio mode

(3) Dial button



- ① This button is used to answer, redial the last phone number and hang up the phone
- ② If you want to make a call, press this button to guide you to hear the beep

(4) Hands-free microphone



- ① When making a hands-free call, the microphone transmits the user's voice to the caller

(5) search button



- ① Press this key and the radio automatically searches for and stays on the next broadcast channel
- ② press  Search for high frequency
press  Search for low frequency

(6) mute button



- ① Press this button to mute or unmute while listening to the broadcast

(7) mode button



- ① Press this key to cycle between modes. If a USB drive is connected, you can enter the next mode directly
- ② RADIO mode, BT PLAY mode, USB mode and AUX IN mode.

6) FUSE BOX

WORK LAMP	30A	START KEY, ROOM LAMP	30A
HORN, CIGAR LIGHTER	30A	CLUSTER, MCU	20A
FUEL FILLER P/P, BEACON LAMP	20A	AIRCON/ HEATER	20A
WIPER MOTOR	10A	CONTROLLER	30A
SOLENOID	20A	TURN LAMP	10A
ALT, START	20A	CASSETTE, SW PANEL	10A
TRAVEL, SAFETY SOL	20A	CLUSTER MCU	10A
PRE-HEAT, FUEL FEEDING	20A	AIRCON & HEATER	20A
ILLUMINATION	10A	AIRCON FAN	40A
ILLUMINATION	10A	HEAD LAMP	20A
FUSE HOLDER		SPARE	10A
		SPARE	40A

55W9A3CD29

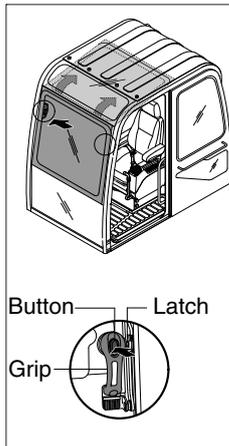
(1) The fuses protect the electrical parts and wiring from burning out.

(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) UPPER WINDSHIELD



(1) Perform the following procedure in order to open the upper windshield.

① Release both latches in order to release the upper windshield.

② Hold both grips that are located at both side the windshield frame push the windshield upward.

③ Hold both grips that are provided on the windshield frame and back into the storage position until auto lock latch is engaged.

▲ **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.

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

8) RADIO AND USB PLAYER



Technical Specifications

FM Section

Frequency range 87.5MHz-108MHz

Search up long 100KHz

Lock sensitivity 23±8dB

Signal to noise ratio ≥48dB

MP3 part

Frequency response 20Hz-20KHz

Signal to noise ratio 60dB

AM FM section

Frequency range 522KHz-1620KHz

Lock sensitivity 36±10dB

Signal to noise ratio ≥43dB

The device supports the function of charging mobile phone with USB data cable.

Note: It is not advisable to charge for a long time, and the battery may be damaged because there is no battery saturation detection function during charging.

Function for radio



Td-650 is a knob-type car audio system, including FM, AM tuning radio, Bluetooth, MP3 (USB/SD) clock sound adjustment, external audio input, loudness and other functions.

- . System configuration: digital tuned radio, USB/SD-MP3 player, electronic clock display.
- . Radio function: support FM (87.5~108MHz), AM (522~1620KHz), can store 24 stations.
- . AUX function: Supports the play of MP3 files in U disk or SD card, and supports the input of audio from mobile phone and MP3.
- . Sound function: support POP/ROCK/Classic/Flat sound.
- . Bluetooth function: Support bluetooth phone connection and bluetooth music playback function.

Radio button



- (1) PWR: switch machine
- (2) BND: band rotation
- (3) LOU/📞: loudness control, hang up the phone
- (4) 1/□ /||, 2/INT, 3/RPT, 4/RDM, 5/D-DN, 6/D-LP: radio/storage keys, MP3 player keys
- (5) AS/PS: Automatic presets of radio/songs
- (6) MOD: Mode selection
- (7) ⤴⤵ :Manual/automatic search radio button; Select previous/Next song button, fast forward/fast back button
- (8) MOD: short press to switch from USB/SD to FM, then short press to switch FM1/FM2/FM3
long press to automatically search and save
- (9) CLK: clock display/Settings

Radio operation



1. Basic setting

1.1 Mode switch: Press "PWR" to make the product in working state. Press the "MOD" button to loop through each mode in turn. If the USB flash drive is connected, the product directly enters the next mode. This product consists of RADIO mode, BT PLAY mode, USB mode and AUX IN mode

1.2 Radio Settings: Press the "PWR" button, and then press the "BND" button to select the desired band from FM1, FM2, FM3, AM1 and AM2.

Short press the "▲" button or "▼" button to start automatic radio search. Long press the "▲" button or "▼" button for more than 2S to manually search the radio station.

Long press the "AS/PS" button for more than 2S to automatically preset the radio. Long press any of the "1" to "6" buttons for more than 2S, and the current radio will be preset to the corresponding button

2. MP3(USB/SD/MMC) play

2.1 In the radio working mode, after inserting the USB flash drive /SD, it will automatically switch to the USB flash drive /SD playback mode

Press the button to play the previous/next song in USB /SD

Long press the button to rewind/forward the current song

When the USB flash drive /SD is played, the corresponding USB flash drive /SD icon blinks

2.2 In MP3 playing mode: play/pause control keys, browse, repeat, random, -10/+10 song selection operation

1/□ /||: Play/pause control 2/INT: Preview play/scan play 3/RPT: Repeat/All

4/RDM: Random/All 5/D-DN: tune number minus 10 tune selection control key

6/D-LP: tune number plus 10 tune selection control key

Turn the knob counterclockwise to reduce the current volume and turn the button clockwise to increase the current volume

Radio operation



3. Clock setting

3.1 Operation in radio /MP3 playing mode

3.2 Short press MUTE/CLK to switch the MUTE switch

3.3 Long press the key to display the clock, and then long press the key again to adjust the hour value by turning the knob against/clockwise after beating for hours, and long press the key again to adjust the value of minutes by turning the knob against/clockwise after beating for minutes. 5 consecutive beats will automatically quit the clockwise setting

Note: The clock will continue to cycle when the BAT power is off after the setting

4. Sound settings

4.1 Operation in radio /MP3 mode: Short press the knob, successively appear BS O/TE O/BL O/EQOF

4.2 appear BS O display (Bass), reverse/clockwise turn the button to select the low value

4.3 appear TE O display (Treble), Turn the reverse/clockwise button to select the high tone value of the BL O display (Balance)

4.4 Turn the reverse/clockwise button to select the balance value of left and right speakers after the appearance

4.5 Turn the reverse/clockwise button only after the appearance of the EQOF display. Will produce the JAZZ/POP/ROCK/CLASSIC/FLAT/EQOF sound, will not be able to manually during the electronic sound bass and treble values

5. The bluetooth Settings

5.1 Open the bluetooth of the mobile phone and search for the new "device" function. When the system gets signal contact with the mobile phone, it will prompt whether the mobile phone is connected to the device. Select "Yes" to start the connection. After the connection is successful "BT" is displayed on the LCD screen of the system, indicating that the connection is successful. If you are not in BT PLAY mode after bluetooth pairing, press the "MOD" button to switch to BT PLAY mode