

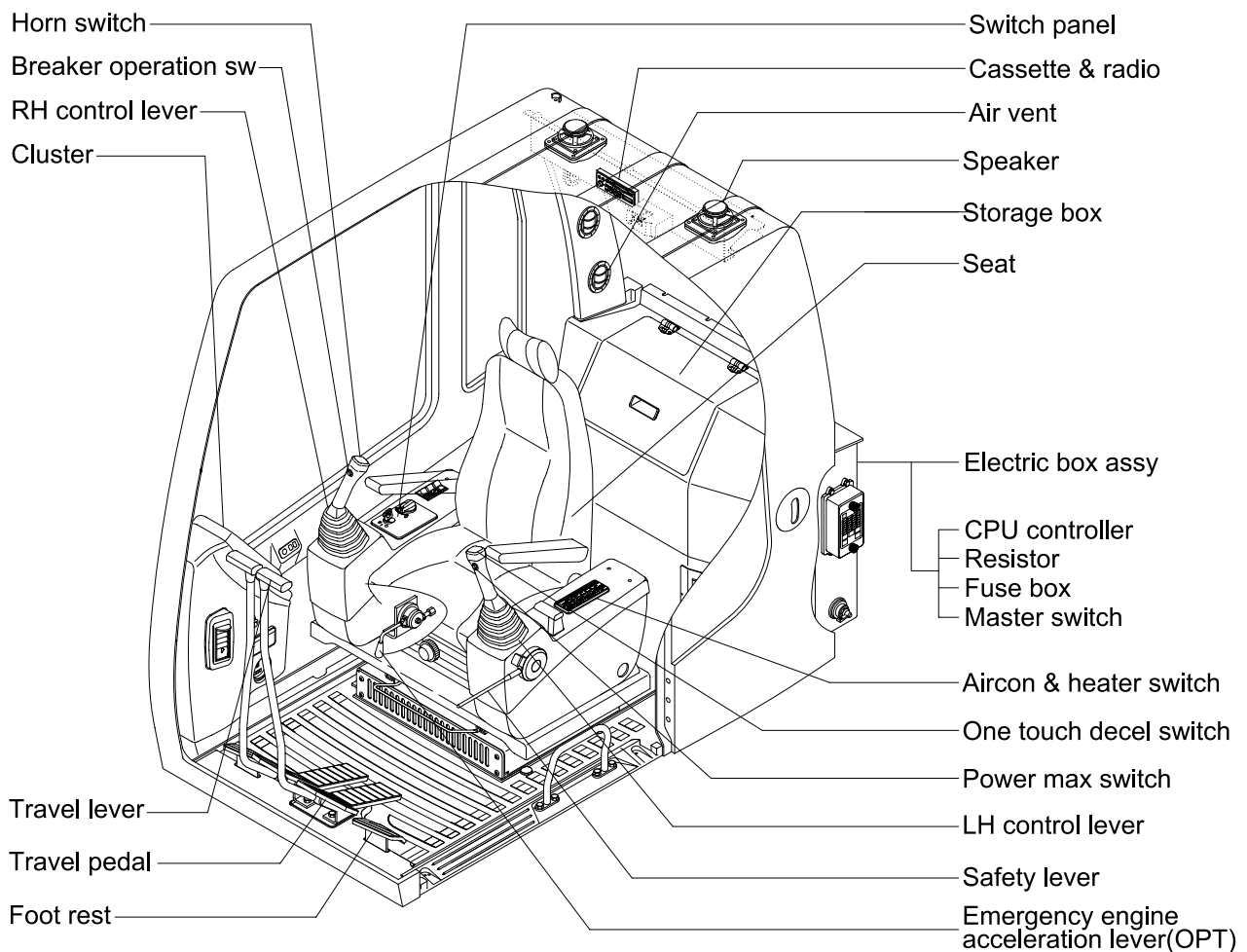
CONTROL DEVICES

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.



11073CD01

2. CLUSTER

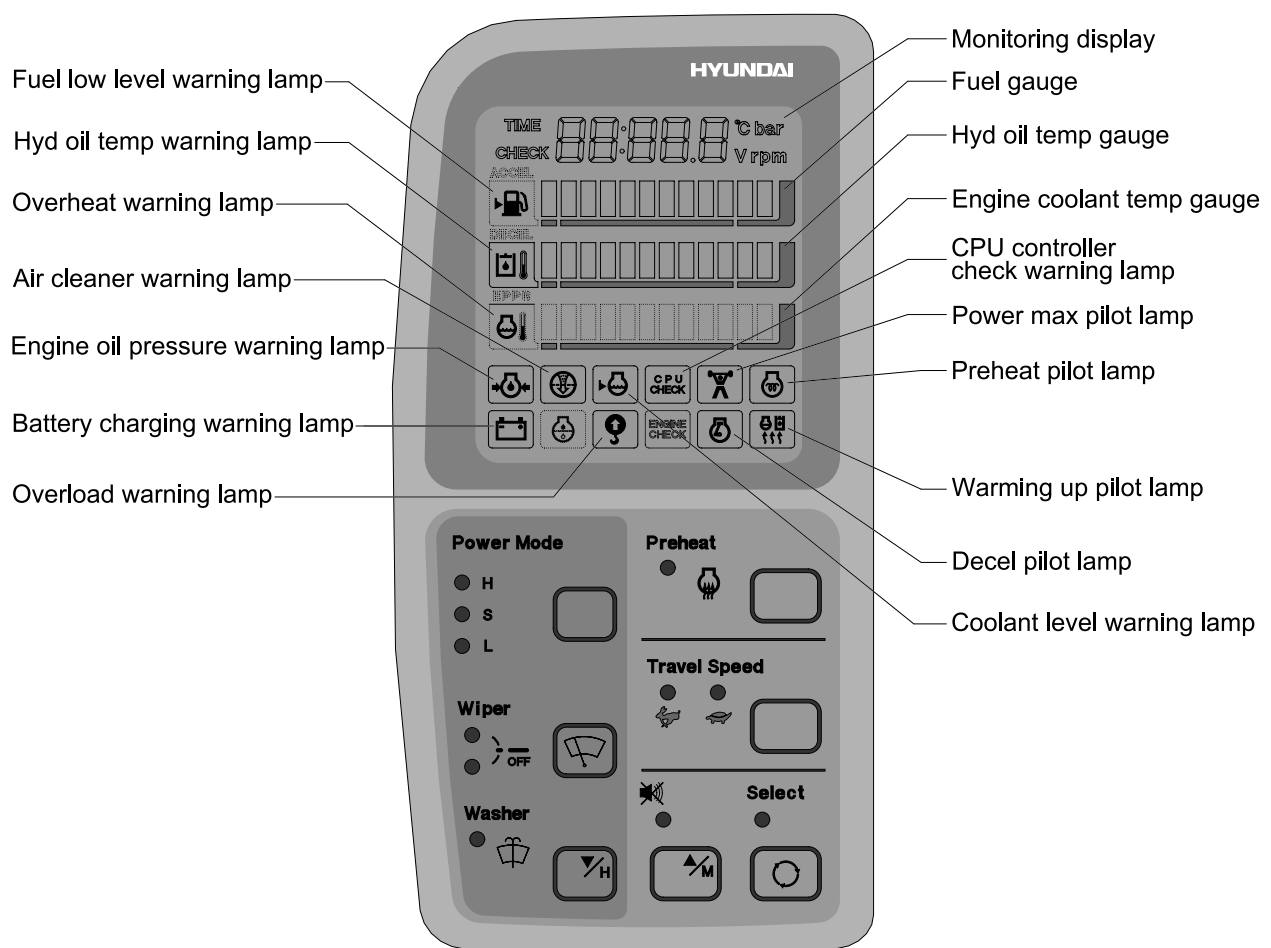
1) MONITOR PANEL

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

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

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

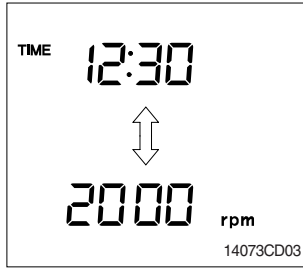
※ When the monitor provides a warning immediately check the problem, and perform the required action.



11073CD02

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

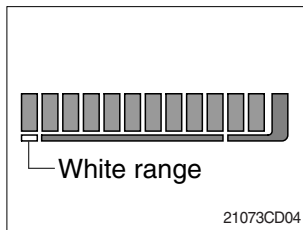
(1) Monitoring display



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


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

(2) Fuel gauge

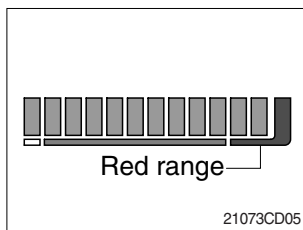


- ① This gauge indicates the amount of fuel in the fuel tank.

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

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

(3) Hydraulic oil temperature gauge



- ① This indicates the temperature of coolant.

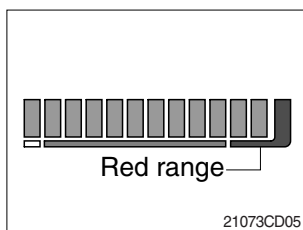
- White range : Below 30°C(86°F)
- Green range : 30-105 °C(86-221°F)
- Red range : Above 105°C(221°F)

- ② The green range illuminates when operating.

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

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

(4) Engine coolant temperature gauge



- ① This indicates the temperature of coolant.

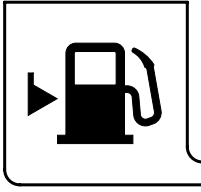
- White range : Below 30°C(86°F)
- Green range : 30-105 °C(86-221°F)
- Red range : Above 105°C(221°F)

- ② The green range illuminates when operating.

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

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

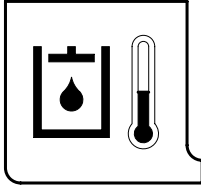
(5) Fuel low level warning lamp



21073CD04A

- ① This lamp blinks and the buzzer sounds when the level of fuel is below 28 l (7.4U.S. gal).
- ② Fill the fuel immediately when the lamp blinks.

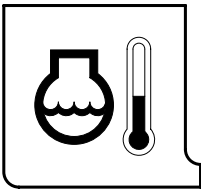
(6) Hydraulic oil temperature warning lamp



21073CD05A

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

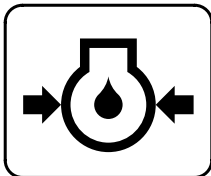
(7) Overheat warning lamp



21073CD06A

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

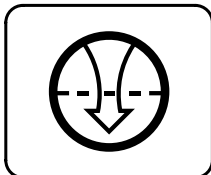
(8) Engine oil pressure warning lamp



21073CD07

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

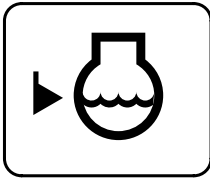
(9) Air cleaner warning lamp



21073CD08

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

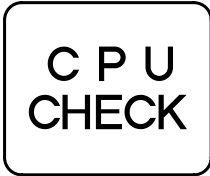
(10) Coolant level warning lamp



21073CD09

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

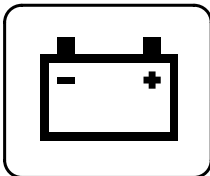
(11) CPU controller check warning lamp



21073CD10

- ① Communication problem between CPU controller and cluster makes the lamp blinks and the buzzer sounds.
- ② Check if any fuse for CPU burnt off.
- ③ If not check the communication line between them.

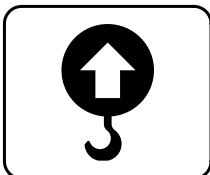
(12) Battery charging warning lamp



21073CD13

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

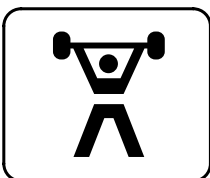
(13) Overload warning lamp



21073CD15

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

(14) Power max pilot lamp



21073CD11

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

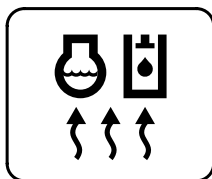
(15) Decel pilot lamp



21073CD17

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

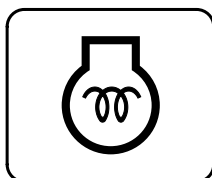
(16) Warming up pilot lamp



21073CD18

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

(17) Preheat pilot lamp



21073CD12

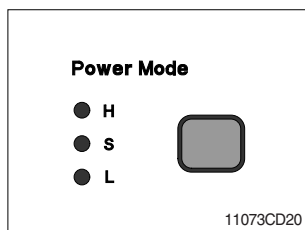
- ① Turning the start key switch ON position starts preheating in cold weather.
- ② Start the engine as this lamp is OFF.

2) SWITCH PANEL



11073CD19

(1) Power mode switch

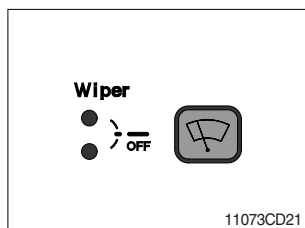


① This switch is to select the machine power mode, which shifts from high power work to standard power work and light power work in a row by pressing the switch.

- **H** : This is used for high power work
- **S** : This is used for standard power work
- **L** : This is used for light power work

※ Refer to the page 4-7 for details.

(2) Wiper mode switch



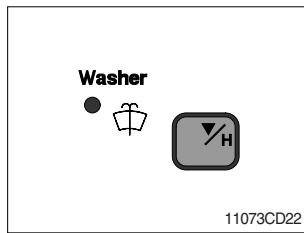
① This switch is used to operate wiper.

- Press the switch once to operate wiper.
- Press the switch once more to intermittently operate wiper low speed.
- Press the switch once more to turn off wiper.

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

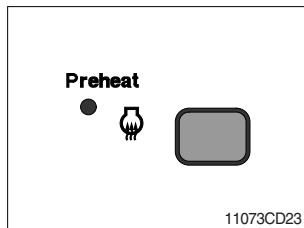
※ **If wiper does not operate with the switch in the ON position, turn the switch off immediately. Check the cause. If the switch remains ON, it can result in motor failure.**

(3) Washer switch



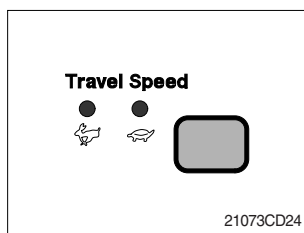
- ① The washer liquid is sprayed and the wiper is operated only while pressing this switch.
- ② The indicator lamp is turned ON when operating this switch.

(4) Preheat switch



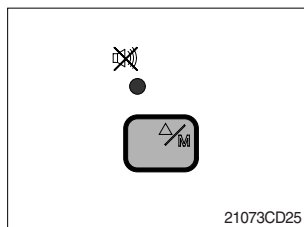
- ① This switch is used for starting the engine in cold weather. If pressed, grid heater is activated to get easier engine starting.
※ **Never hold the push button switch in for more than 30 seconds, as this can damage the grid heater.**
- ② The indicator lamp is turned ON when operating this switch.

(5) Travel speed control switch



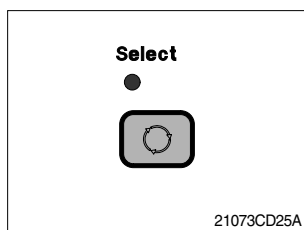
- ① This switch is to control the travel speed which is changed to high speed(Rabbit mark) by pressing the switch and low speed(Turtle mark) by pressing it again.



(6) Buzzer stop switch



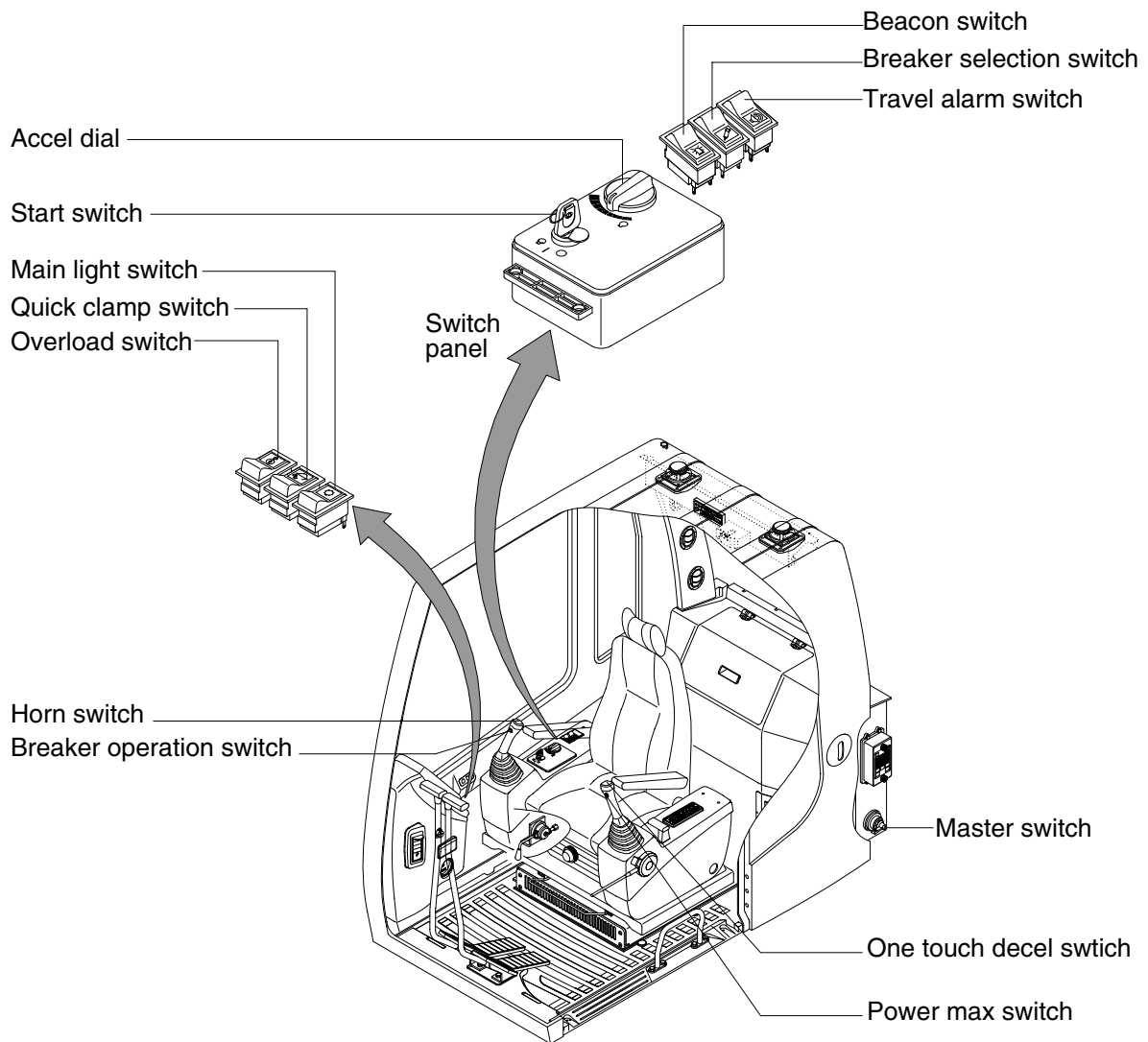
- ① When the starting switch is turned ON first, normally the alarm buzzer sounds for 2 seconds during lamp check operation.
- ② The red lamp lights ON and the buzzer sounds when the machine has a problem.
In this case, press this switch and buzzer stops, but the red lamp lights until the problem is cleared.

(7) Select switch



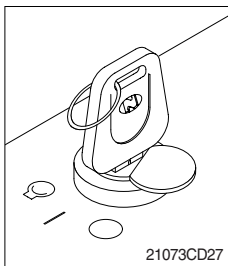
- ① This switch is used to select the monitor display function.
※ **Refer to the page 4-11 for details.**
- ② If the switch is pressed for 3 seconds in time display mode, it moves to time adjusting function, and you can adjust the time as below.
 - Hour by auto decel()switch
 - Minute by buzzer stop() switch.
- ③ After time set, the switch is pressed, it returns to clock display.

3. SWITCHES



11073CD26

1) STARTING SWITCH

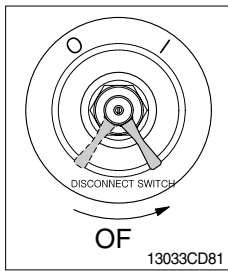


(1) There are three positions, OFF, ON and START.

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

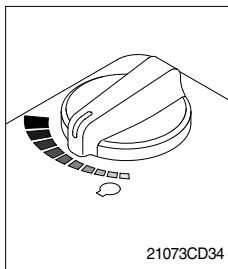
※ Key must be in the ON position with engine running to maintain electrical and hydraulic function and prevent serious machine damage.

2) MASTER SWITCH



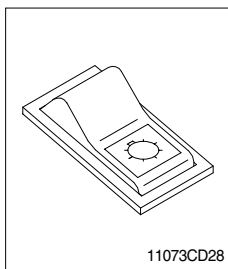
- (1) This switch is used to shut off the entire electrical system.
 - (2) **I** : The battery remains connected to the electrical system.
O : The battery is disconnected to the electrical system.
- ※ **Never turn the master switch to O(OFF) with the engine running. It could result in engine and electrical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

3) ACCEL DIAL SWITCH



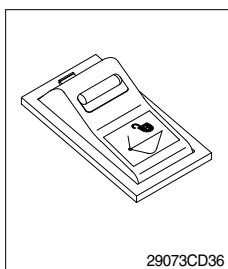
- (1) There are 10 dial setting.
- (2) Setting 1 is low idle and setting 10 is high idle.
 - By rotating the accel dial to right : Engine speed increases
 - By rotating the accel dial to left : Engine speed decreases

4) MAIN LIGHT SWITCH



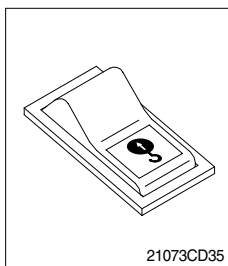
- (1) This switch is used to operate the head light and work light by two steps.
 - First step : Head light and cluster illumination lamp comes ON.
Also, the below indicator lamp comes ON.
 - Second step : Work light comes ON.

5) QUICK CLAMP SWITCH(Optional)



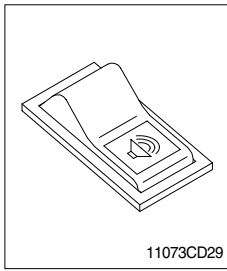
- (1) This switch is used to engage or disengage the moving hook on quick clamp.
- ※ **Refer to the page 8-6 for details.**

6) OVERLOAD SWITCH(Optional)



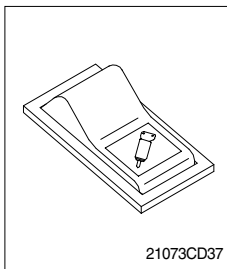
- (1) When this switch turned ON, buzzer makes sound and overload warning lamp comes ON in case that the machine is overloaded.
- (2) When turned OFF, buzzer stops and warning lamp goes out.

7) TRAVEL ALARM SWITCH



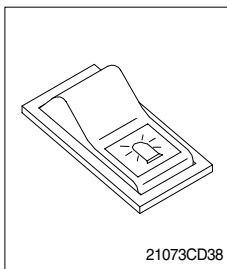
- (1) This switch is to activate travel alarm function when the machine travels forward and backward.
- (2) On pressing this switch, the alarm buzzer sounds only when the machine is traveling.

8) BREAKER SELECTION SWITCH(Optional)



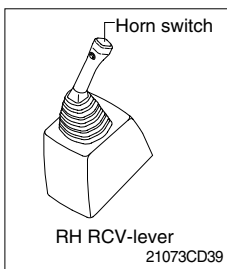
- (1) This switch is used to select breaker.
※ The breaker operates only when this switch is selected.

9) BEACON SWITCH(Optional)



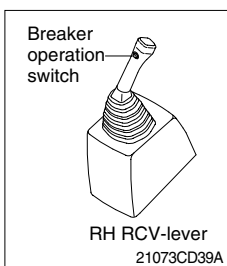
- (1) This switch turns ON the rotary light on the cab.
- (2) The below indicator lamp is turned ON when operating this switch.

10) HORN SWITCH



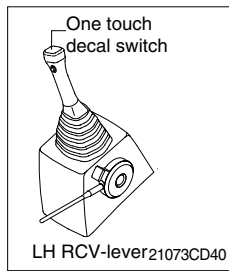
- (1) This switch is at the top of right side control lever.
On pressing, the horn sounds.

11) BREAKER OPERATION SWITCH



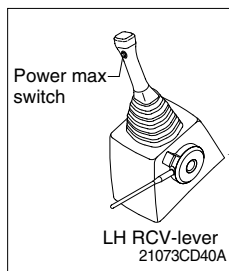
- (1) On pressing this switch, the breaker operates only when the breaker selection switch on the switch panel is selected.

12) ONE TOUCH DECEL SWITCH



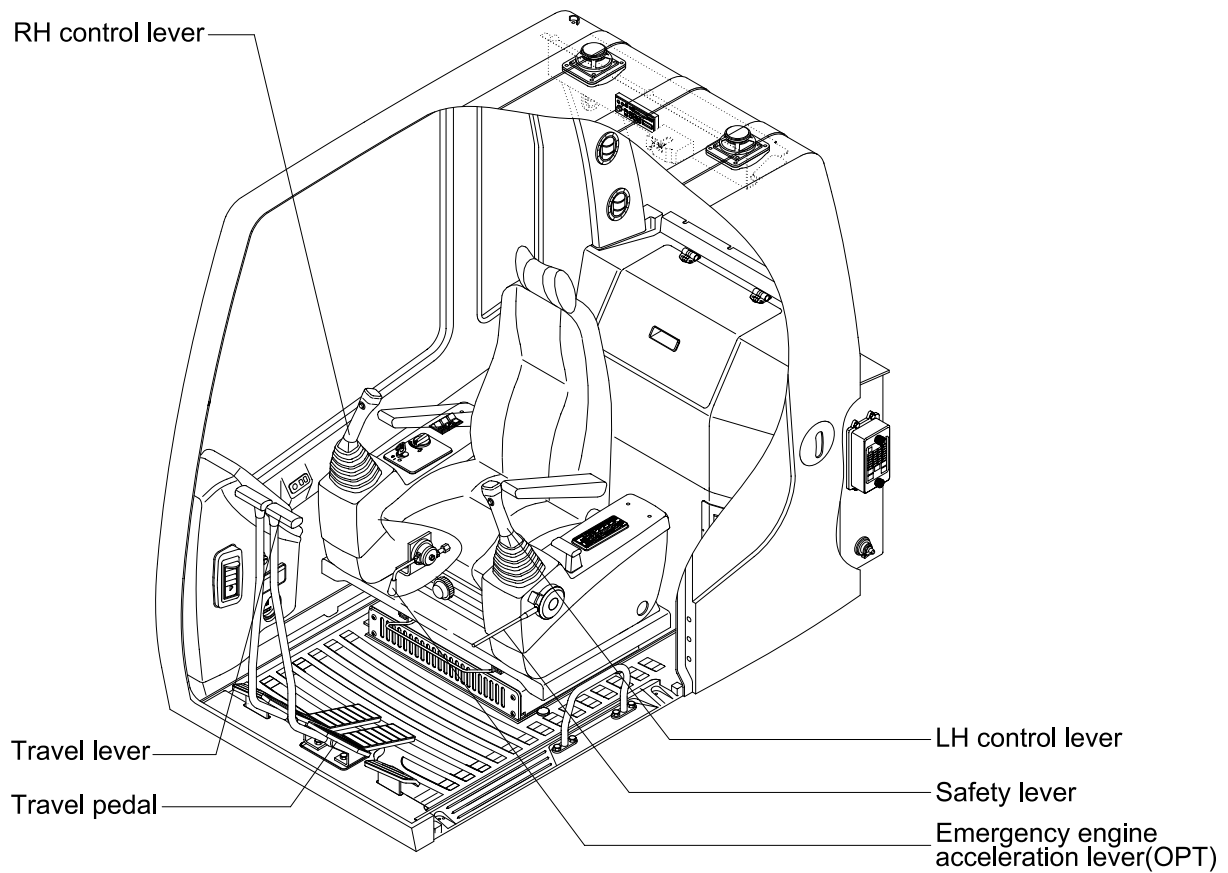
- (1) This switch is used to actuate the deceleration function quickly.
- (2) The engine speed is increased to previous setting value by pressing the switch again.

13) POWER MAX SWITCH



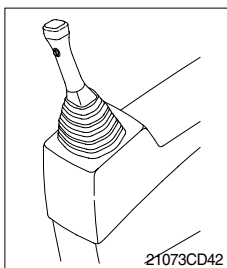
- (1) This switch activate power max function.
When this switch is kept pressed, hydraulic power of work equipment will be increased upto 110 percent during 8 seconds.
 - (2) After 8 seconds, function is cancelled automatically even switch is keep pressed.
- ※ **Do not use for craning purposes.**

4. LEVERS AND PEDALS



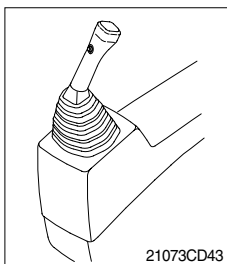
11073CD41

1) LH CONTROL LEVER



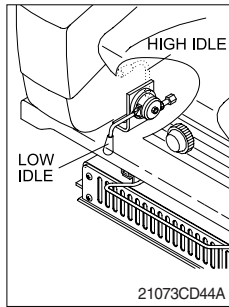
- (1) This joystick is used to control the swing and the arm.
- (2) Refer to **operation of working device** in chapter 4 for details.

2) RH CONTROL LEVER



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

3) ENGINE ACCELERATION LEVER FOR EMERGENCY(Optional)



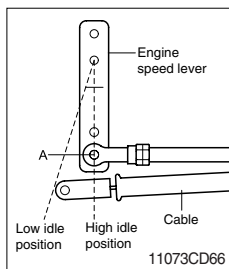
- (1) This lever is used to increase or reduce the rotation speed of engine when the abnormality is occurred in the CPU controller.

Connect the connector CN-19 and CN-19B of frame harness.

※ **Refer to page 3-25.**

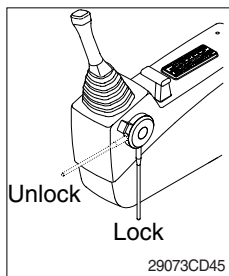
- (2) Move the lever up to increase engine RPM.
Move the lever down to decrease engine RPM.
When stopping the engine, turn the key to OFF and move the acceleration lever completely down.

※ METHOD OF CONNECTING EMERGENCY ENGINE ACCELERATION LEVER(Optional)



- (1) Open engine hood and disconnect rod from throttle lever.
- (2) Connect emergency engine acceleration cable to throttle lever at A point.

4) SAFETY LEVER



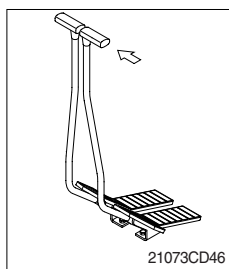
- (1) All control levers and pedals are disabled from operation by locating the lever to lock position as shown.

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

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

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

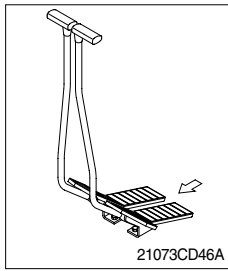
5) TRAVEL LEVER



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

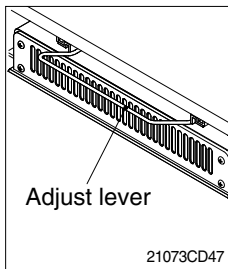
- (2) Refer to **traveling of the machine** in chapter 4 for details.

6) 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.

7) SEAT AND CONSOLE BOX ADJUST LEVER

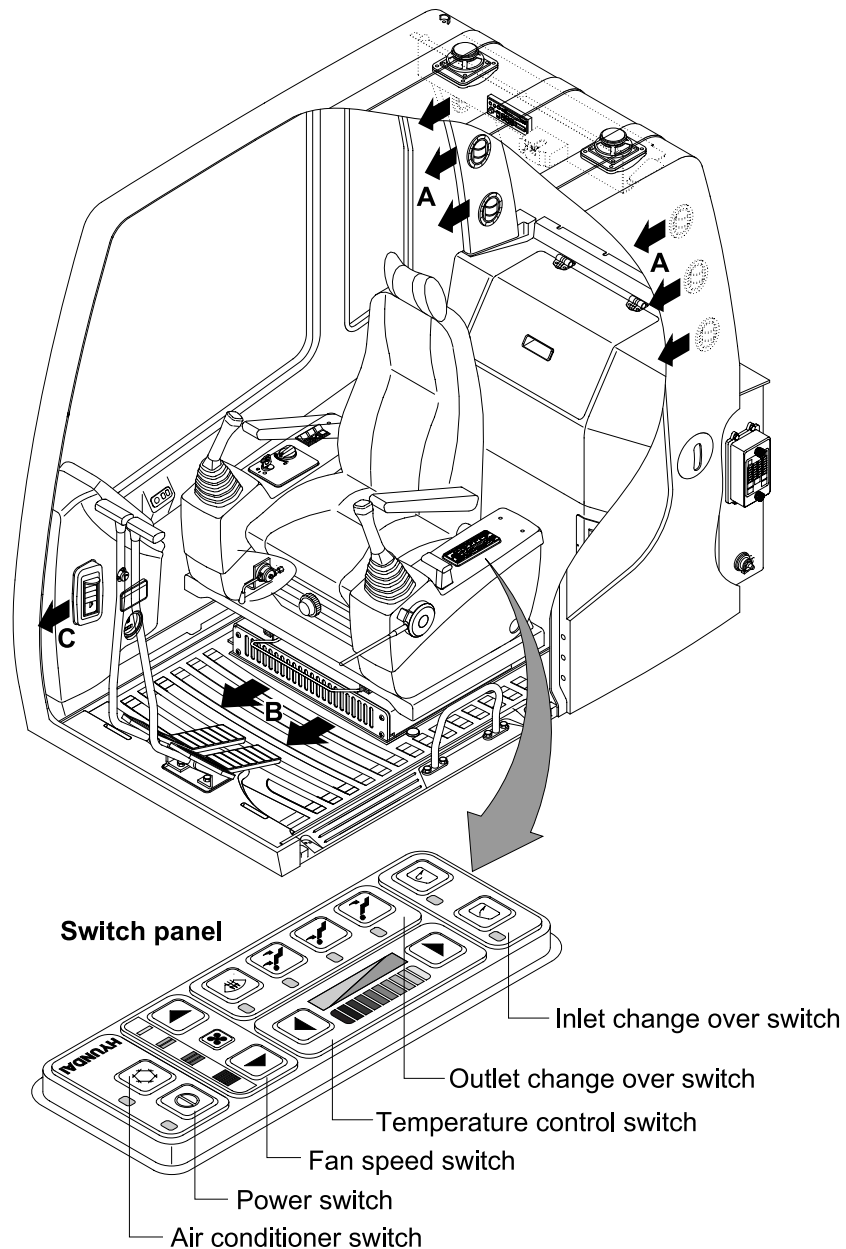


- (1) This lever is used to move the seat and console box to fit the contours of the operator's body.
- (2) Pull the lever to adjust forward or backward over 220mm(8.7").

5. AIR CONDITIONER AND HEATER

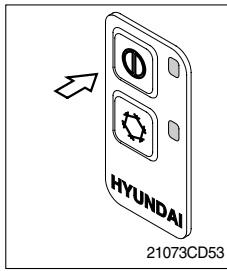
Air conditioner and heater are equipped for pleasant operation against outside temperature and defrost on window glass.

- Location of air flow ducts



11073CD48

1) POWER SWITCH

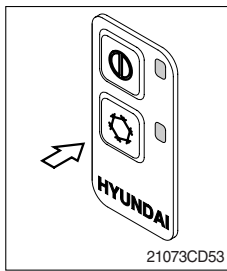


(1) This switch makes the system and the LED simultaneously ON or OFF.

(2) Default setting values

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

2) AIR CONDITIONER SWITCH(Compressor switch)

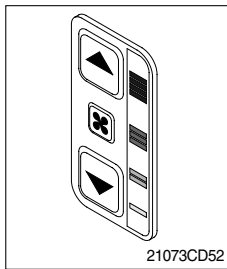


(1) Operating this switch turns the compressor and the LED simultaneously ON or OFF.

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

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

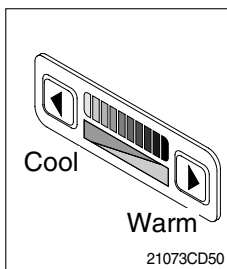
3) FAN SPEED SWITCH



(1) It is possible to control the fan to four steps.

(2) The first step or the fourth step gives 5 times beeps.

4) TEMPERATURE CONTROL SWITCH



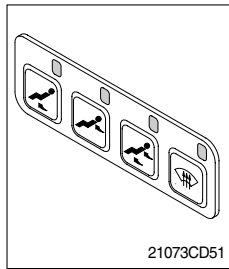
(1) There are 9 steps to control temperature from max cool to max warm controlled up and down by 1 step.

(2) Max cool and max warm arouse 5 times beeps.

(3) For the max warm or the max cool it's better to be configured as following table.

Temperature	Air conditioner	Fan speed	Outlet	Inlet
Max cool	ON	4	Face	Recirculation
Max warm	OFF	3	Foot	Fresh

5) OUTLET CHANGE OVER SWITCH



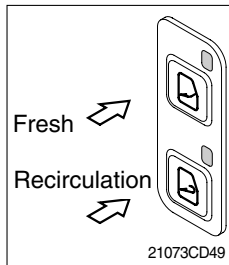
(1) There are four steps of air flow.

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

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

(3) In case of heating range(5~Max warm), air conditioner won't turns ON.

6) INLET CHANGE OVER SWITCH



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

① Fresh

Inhaling air from the outside to pressurize cab inside.

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

② Recirculation

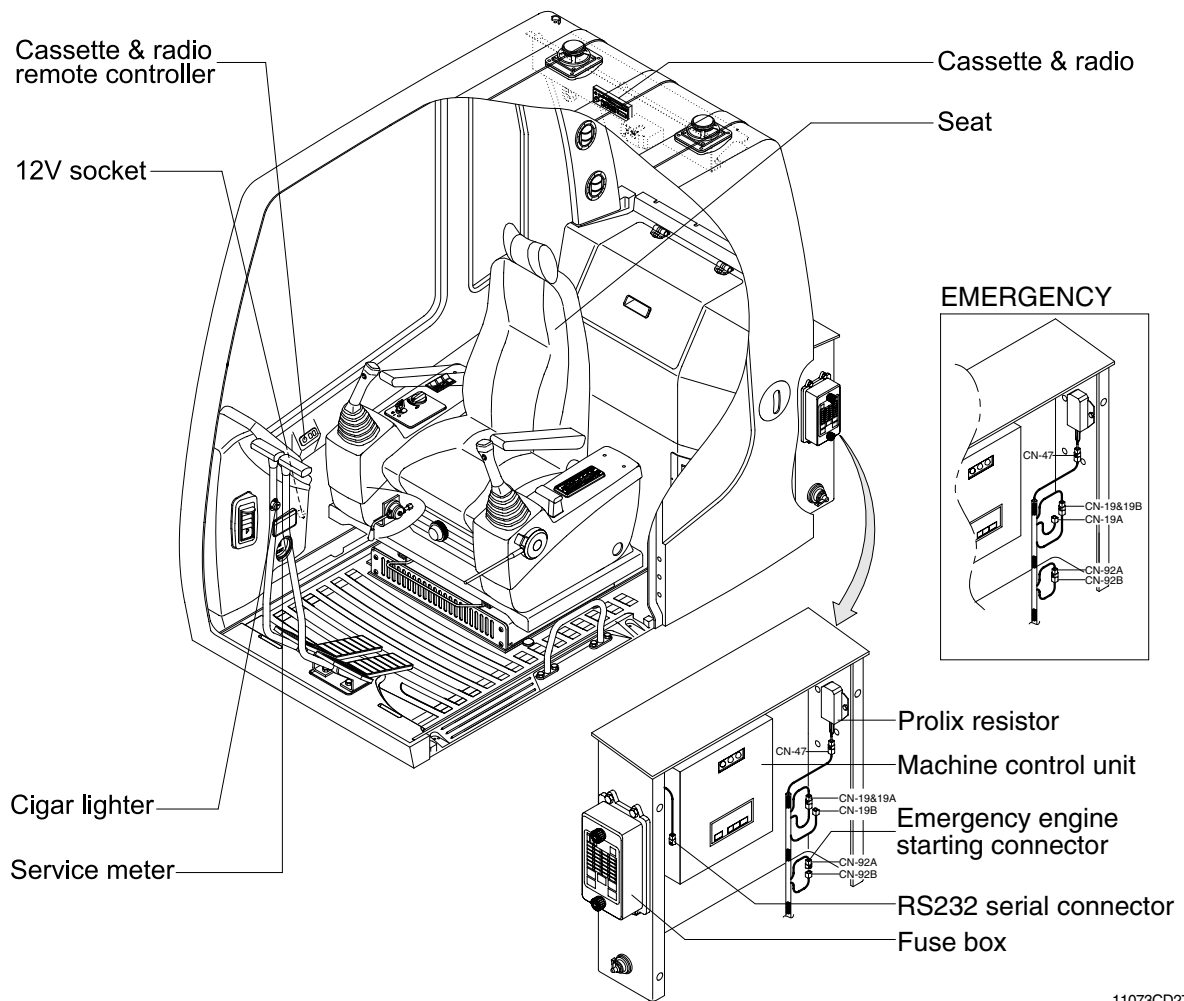
It recycles the heated or cooled air to increase the energy efficiency.

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

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

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

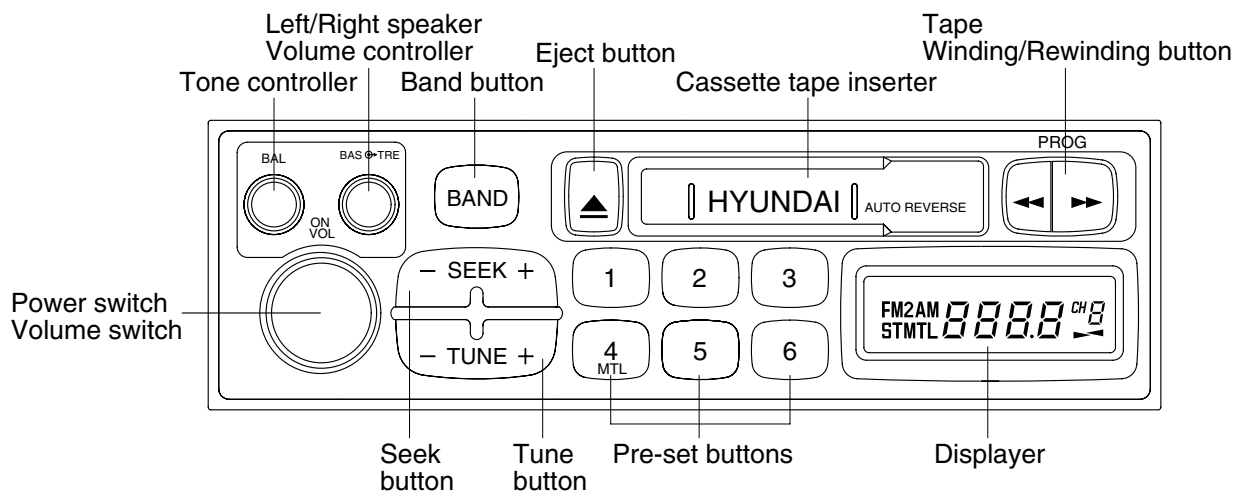
6. OTHERS



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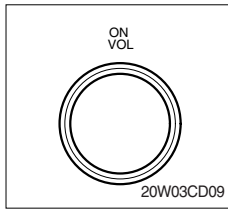
1) CASSETTE AND RADIO

High performance audio system is equipped for pleasant operation.



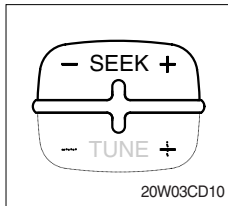
20W03CD08

(1) Power and volume switch



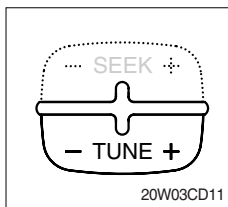
- ① This switch is turned to right, power will be turned ON and the sound is increased.
 - ② If it is turned to left, volume will be decreased and power will be turned OFF.
- ※ **The volume controller of the cassette radio does not operate when turning ON the remote controller power.**

(2) Seek button



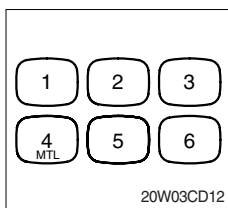
- ① If this seek button is pressed, the radio automatically stops at the next frequency of broadcasting for your listening.

(3) Tune button



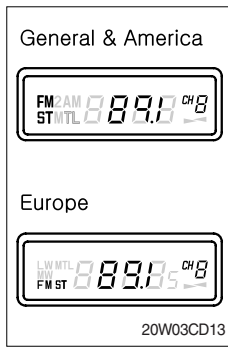
- ① Whenever you press " + " button, higher channels are selected.
- ② Whenever you press " - " button, lower channels are selected.
- ③ **General**
AM band : Frequency changes in 9kHz between 531 to 1602kHz.
FM band : Frequency changes in 0.1MHz between 87.5 to 108.0MHz.
- ④ **America**
AM band : Frequency changes in 10kHz between 530 to 1710kHz.
FM band : Frequency changes in 0.2MHz between 87.9 to 107.9MHz.
- ⑤ **Europe**
LW band : Frequency changes in 9kHz between 153 to 279kHz.
MW band : Frequency changes in 9kHz between 522 to 1620kHz.
FM band : Frequency changes in 0.05MHz between 87.5 to 108.0MHz.

(4) Pre - set button



- ① You can immediately listen to the station by pressing pre-set button for which broadcasting station is pre-set.
- ② How to set broadcasting in memory.
 - You can pre-set 6 stations each AM/FM band.
 - When you want the station to be set in memory, press selected pre-set button for more than 2 seconds.

(5) Displayer



① General and America

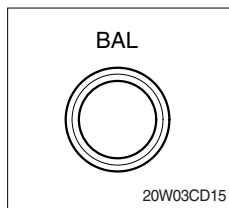
- When radio is turned ON, stereo, AM, FM, FM2, MTL and reception frequency are displayed.

② Europe

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

③ When cassette tape is played, indicator arrow(◀ , ▶) are displayed.

(6) Left/Right speaker volume button

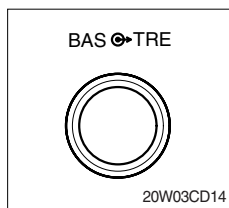


① If balance button is pressed, it will spring out.

Volume of right and left speakers will be adjusted by turning the button to right or left.

② It will be fixed by pressing again after adjustment.

(7) Tone button



① BASS tone

If tone button is pressed, it will spring out.

If it is turned to right, BASS tone is increased, and if it is turned to left, BASS tone is decreased.

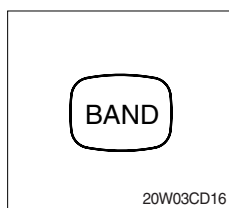
② TREBLE tone

You can adjust the TREBLE tone by pull out the button.

If it is turned to right, TREBLE tone is increased, and if it is turned to left, TREBLE tone is decreased.

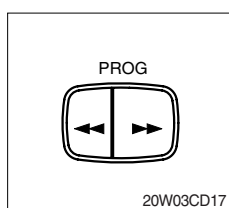
③ It will be fixed by pressing again after adjustment.

(8) Band button



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

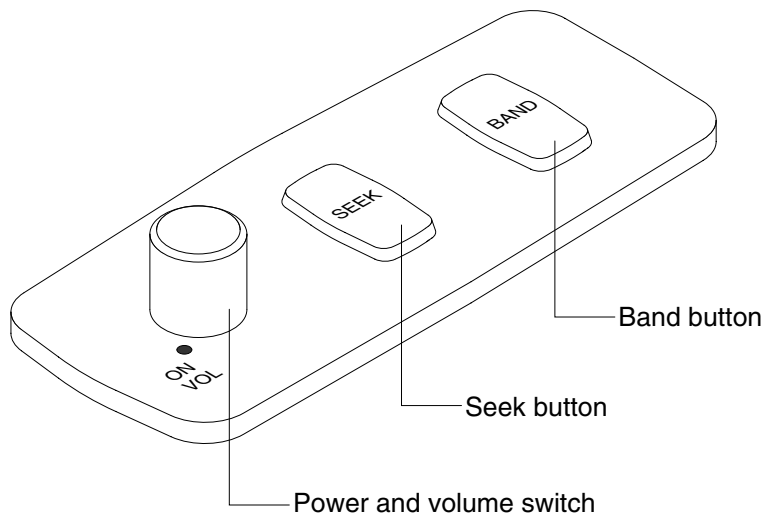
(9) Tape winding/Rewinding button



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

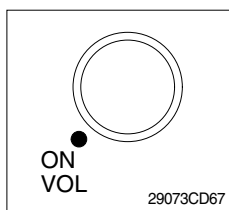
② If you press one of these buttons the tape will be winding fast or rewinding, and if you press another button on a certain point, the tape will be played.

2) REMOTE CONTROLLER(Cassette and radio)



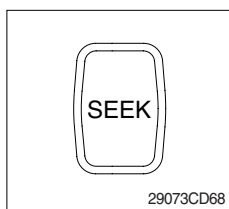
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(1) Power and volume switch



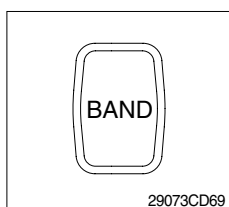
- ① This switch is turned to right, power will be turned ON and the sound is increased.
- ② If it is turned to left, volume will be decreased and power will be turned OFF.
- ※ **This switch does not operate when turning ON the cassette radio power.**

(2) Seek button



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

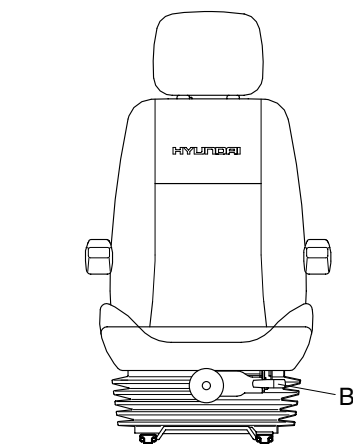
(3) Band button



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

3) SEAT

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



(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 170mm(6.7") in 9 steps.

(2) Upward/Downward adjustment(B)

- ① Pull lever B to adjust seat upward or downward.
- ② Forward or backward side adjustment only can be made, tilting to one side, by moving lever B respectively.

(3) Reclining adjustment(C)

Pull lever C to adjust seat back rest.

(4) Arm rest adjustment(E)

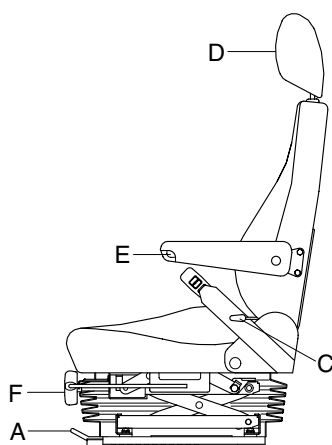
This can be adjusted by pushing the button E to right and left.

(5) Head rest adjustment (D)

This is adjustable vertically to fit operator's requirements.

(6) Cushion adjustment (F)

Adjust the handle to the operator's weight.

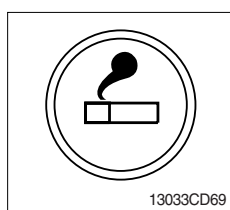


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▲ Always check the condition of the seat belt and mounting hardware before operating the machine.

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

4) CIGAR LIGHTER



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

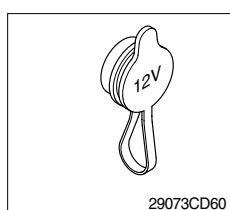
(2) The lighter can be used when it springs out in a short while after being pressed down.

※ Service socket

Use cigar lighter socket when you need emergency power.

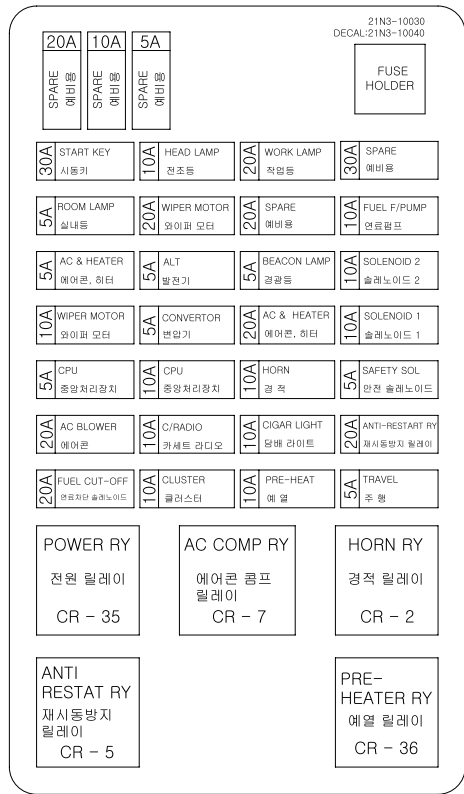
Do not use the lighter exceeding 24V, 100W.

5) 12V SOCKET(Optional)



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

6) FUSE BOX



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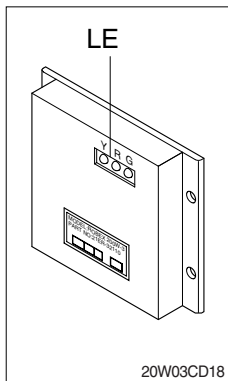
(1) The fuses protect the electrical parts and wiring from burning out.

(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) MACHINE CONTROL UNIT(MCU)



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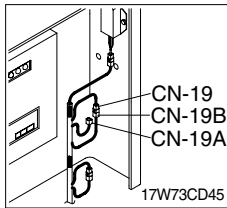
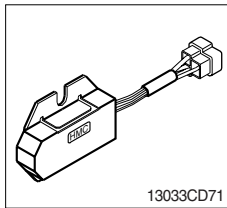
- (1) To match the engine torque with the pump absorption torque, machine control unit varies EPPR valve output pressure, which control pump discharge amount whenever feedbacked engine speed drops under the reference rpm of each mode set.

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

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

G : green, R : red, Y : yellow

8) PROLIX RESISTOR



(1) This resistor is used to continuous working by connect with connector CN-19 of frame harness in case of malfunction of the CPU controller.

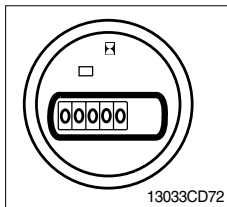
(2) Keep this resistor disconnected when the CPU controller is normal operation.

※ **Never connect this resistor to frame harness(CN-19) when CPU controller is in normal operation.**

· Normal : CN-19 connect with connector CN-19A

· Emergency : CN-19 connect with connector CN-19B

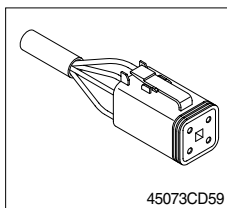
9) SERVICE METER



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

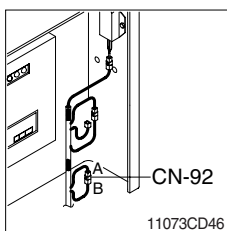
(2) Always ensure the operating condition of the meter during the machine operation. Inspect and service the machine based on hours as indicated in chapter 6, **maintenance**.

10) RS232 SERIAL CONNECTOR



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

11) EMERGENCY ENGINE STARTING CONNECTOR

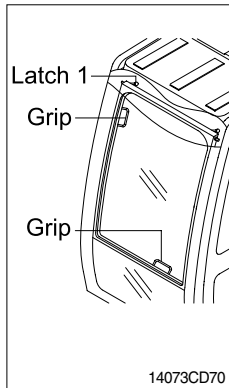


(1) If the CPU controller is removed, the engine does not start.

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

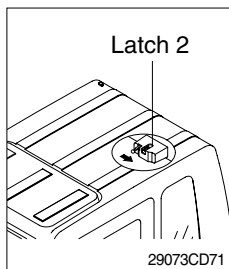
※ **Do not connect these connectors when the CPU is not removed.**

12) UPPER WINDSHIELD



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

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



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

- ① Move the lever of the auto lock latch(2) in the direction of the arrow in order to release the auto lock latch.
- ② Reverse step ① through step ③ in order to close the upper windshield.