

## GROUP 2 MONITORING SYSTEM

### 1. OUTLINE

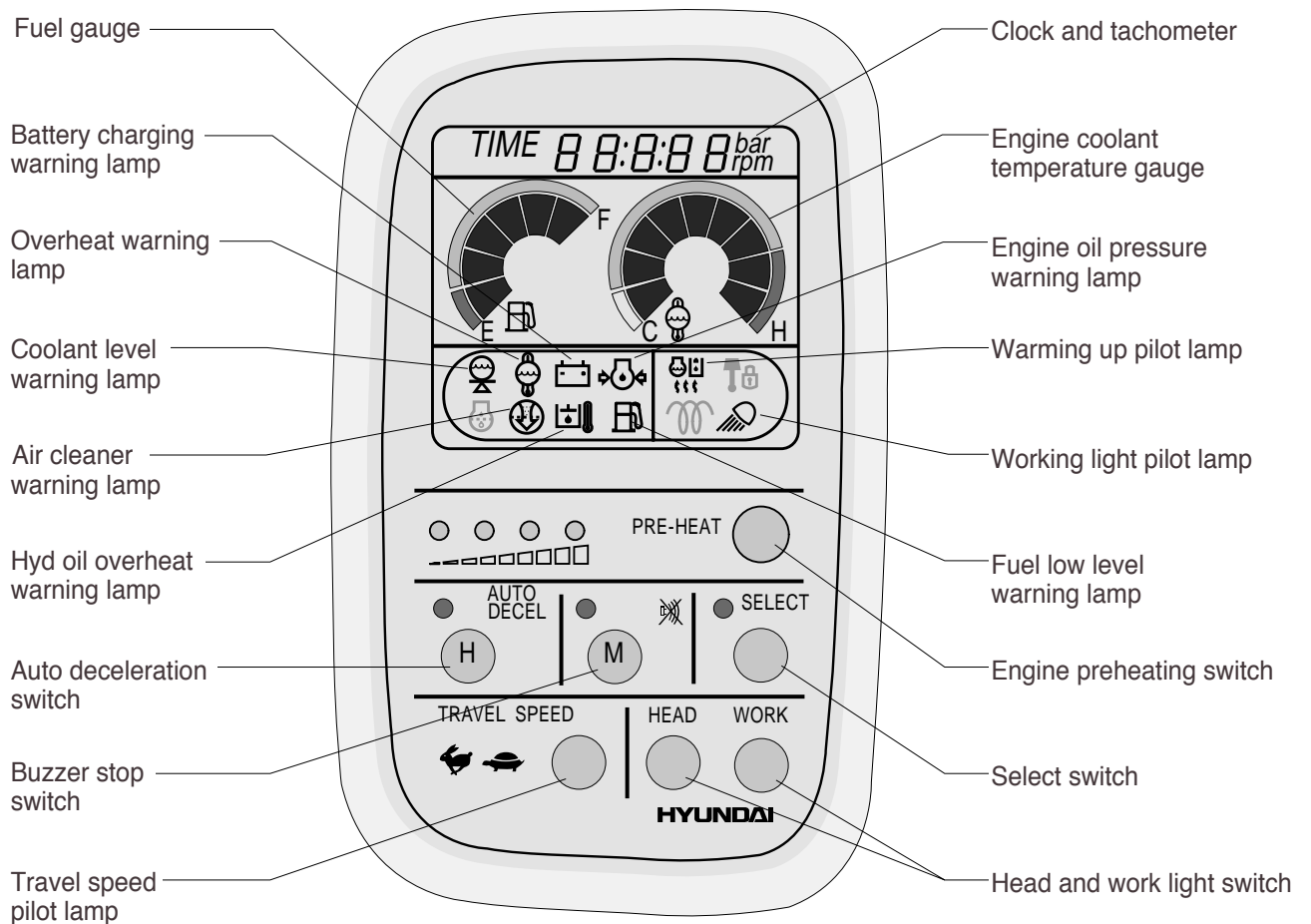
Monitoring system consists of the monitor part and switch part.

The monitor part gives warnings when any abnormality occurs in the machine and informs the condition of the machine.

Various select switches are built into the monitor panel, which act as the control portion of the machine control system.

### 2. CLUSTER

#### 1) MONITOR PANEL



## 2) CLUSTER CHECK PROCEDURE

### (1) Start key : ON

Check monitor initial 3 seconds

- a. All lamps light up.
- b. Buzzer sound.

Check monitor after 3 seconds : Indicate machine condition

- a. Tachometer : 0 rpm
- b. Fuel gauge : All light up below appropriate level
- c. Engine coolant temperature gauge : All light up below appropriate level
- d. Warning lamp

During start key **ON** the engine oil pressure lamp and battery charging lamp go on, but it is not abnormal.

When engine coolant temperature below 30°C, the warming up lamp lights up and then operating the preheat switch.

### (2) Start of engine

Check machine condition

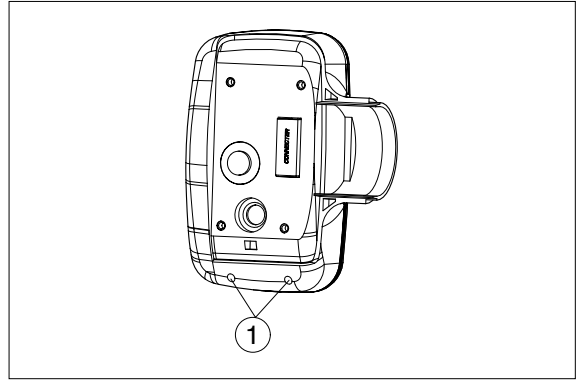
- a. Tachometer indicate at present rpm
- b. Gauge and warning lamp : Indicate at present condition.  
When normal condition : All warning lamp OFF
- c. Travel speed pilot lamp : Low(Turtle)

When abnormal condition

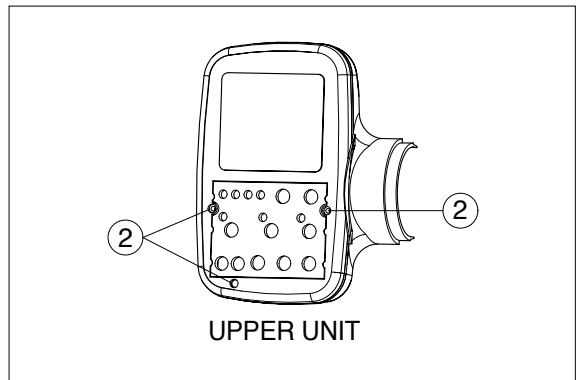
- a. The lamp lights up and the buzzer sounds.
- b. If **BUZZER STOP** switch is pressed, buzzer sound is canceled but the lamp light up until normal condition.

### 3. EXCHANGE METHOD OF THE ROM

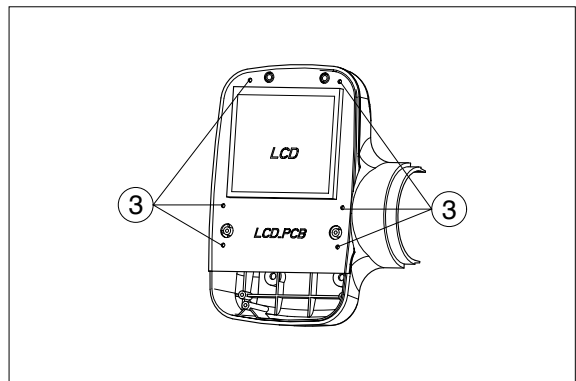
- 1) Disassemble the cluster.  
(Screw driver(+)) or L wrench 6mm)
- 2) Loosen the screw.(1 × 2 units)  
(Screw driver(+)) under d=5mm, over =100mm)



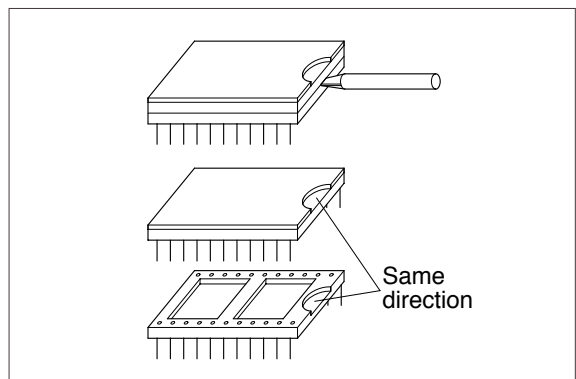
- 3) Remove the decal attached in front side of cluster.(First remove decal a little in the corner with sharp tool and remove all of decal by hand.)
- 4) Loosen the screw.(2 × 3units)  
(Screw driver(+))



- 5) Then you can have two piece of cluster easily.(Upper, lower unit)
- 6) Loosen the screw.(3 × 6units)(You can see the screws in the rear side of upper unit)  
(Screw driver(+))



- 7) Then you can turn the LCD plate to the left side and remove the old ROM from the LCD plate.  
(Small screw dirver(-)) or sharp tool)
- 8) Install the new ROM.(Be careful of direction and assemble the cluster in the reverse order to removal).



## 4. CLUSTER FUNCTION

### 1) TACHOMETER



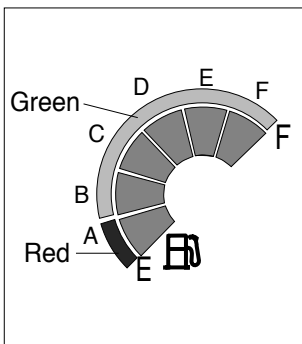
- (1) Tachometer displays the number of engine revolutions.  
Refer select switch for the selection and adjustment.

### 2) CLOCK



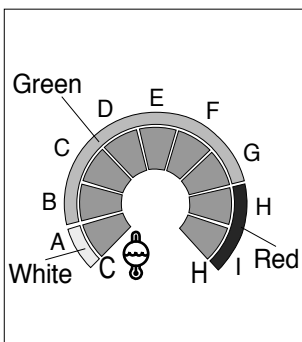
- (1) Clock displays the current time by electric digital timer.  
(2) Refer select switch for the selection and adjustment.

### 3) FUEL GAUGE



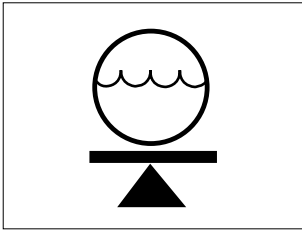
- (1) This gauge indicates the amount of fuel in the fuel tank.
- Warning lamp display : Approximately 22
  - Segment A : Approximately 39
  - Segment B : Approximately 60
  - Segment C : Approximately 80
  - Segment D : Approximately 99
  - Segment E : Approximately 119
  - Segment F : Approximately 140
  - Quantity of fuel tank : Approximately 140

### 4) ENGINE COOLANT TEMPERATURE GAUGE



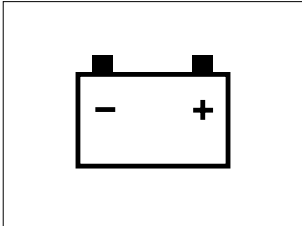
- (1) This gauge indicates the temperature of coolant.
- Segment A : Approximately 40~60°C(White)
  - Segment B : Approximately 60~70°C(Green)
  - Segment C : Approximately 70~85°C(Green)
  - Segment D : Approximately 85~98°C(Green)
  - Segment E : Approximately 98~101°C(Green)
  - Segment F : Approximately 101~103°C(Green)
  - Segment G : Approximately 103~105°C(Green)
  - Segment H : Approximately 105~110°C(Red)
  - Segment I : Approximately 110°C over(Red)

#### 5) COOLANT LEVEL WARNING LAMP



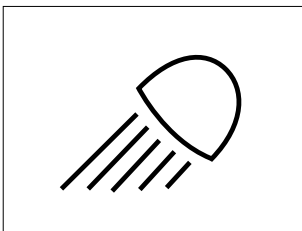
- (1) This lamp is turned ON when the coolant is below LOW in the reservoir tank of radiator.
- (2) Check if the coolant level is between FULL and LOW in the reservoir tank located at the side of RH cowl after opening the engine cover, and check if there is mixture of oil and coolant.

#### 6) BATTERY CHARGING LAMP



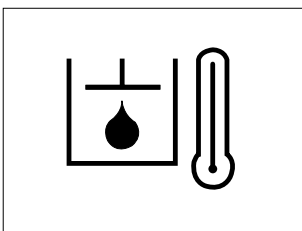
- (1) Check if the charging lamp is OFF during engine operation. If the lamp is turned ON, it is not charged.
- (2) This lamp is ON before starting the engine, but it is turned OFF after starting the engine. Check the battery charging circuit when this lamp comes ON while the engine runs.

#### 7) WORK LAMP INDICATOR LAMP



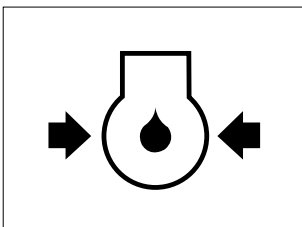
- (1) When the work lamp switch is turned ON, the work lamp mounted on boom and the work lamp indicator lamp light ON.

#### 8) HYDRAULIC OIL OVERHEAT WARNING LAMP



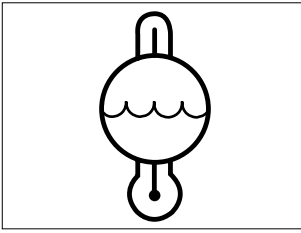
- (1) This warning lamp operates and the buzzer sounds when the temperature of hydraulic oil is over 100°C(216°F).
- (2) Check the coolant when the lamp is turned ON.

#### 9) ENGINE OIL PRESSURE WARNING LAMP



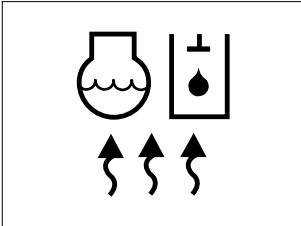
- (1) This lamp is turned ON before starting the engine but turned OFF after starting the engine as the pressure caused from the engine oil pump lubricates each part.

### 10) OVERHEAT WARNING LAMP



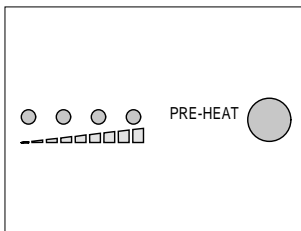
- (1) This lamp is turned ON when the temperature of coolant is over the normal temperature(110°C) and lose the cooling function.
- (2) Check the coolant when the lamp is ON.

### 11) WARMING UP LAMP



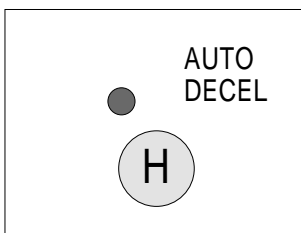
- (1) This lamp is turned ON when the coolant temperature is below 30°C.
- (2) The automatic warming up is canceled when the engine coolant temperature is above 30°C, or when 10 minutes have passed since starting.

### 12) ENGINE PREHEATING SWITCH



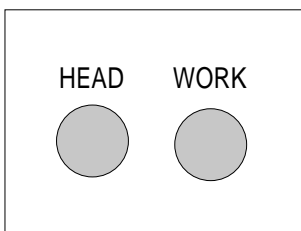
- (1) In case of severe cold weather, this switch is used to preheat engine before starting.
- (2) When this switch is pressed 4 LED lamps are turned ON for 15 seconds in sequence and all LED lamp OFF after a few second blink light when the time is completed.
- (3) Even if LED lamp is ON, this function is stopped when starting.

### 13) AUTO DECELERATION SWITCH



- (1) This switch is used to select the auto-deceleration function.
- (2) If the auto deceleration function is activated the engine speed is lowered when temporary stop or stand-by for dump is required.
- (3) At each pressing of the switch, a short term beep sounds.

### 14) WORK AND HEAD LIGHT SWITCH



#### (1) Head light switch

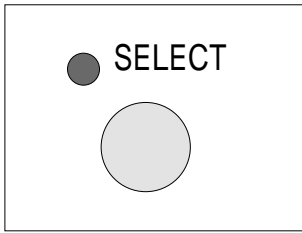
This switch is used to operate the head light and clearance lamp by following two step.

- First step : When this switch is pressed, clearance lamp and cluster illumination lamp comes ON.
- Second step : When this switch is pressed, head light comes ON.

#### (2) Work light switch

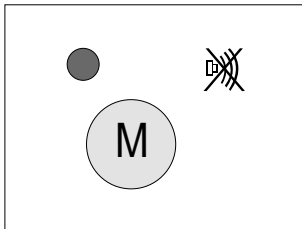
When this switch is pressed, head light comes ON.

### 15) SELECTION SWITCH(Tachometer and clock)



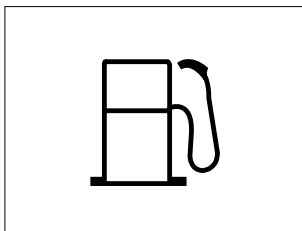
- (1) This switch is used to select the tachometer or clock.
- (2) The switch is pressed, each function is selected by turns.
- (3) The switch is pressed over 3 seconds, it is selected time adjusting function.
  - Hour : Auto decel switch
  - Minute : Buzzer stop switch
- (4) After time set, if the switch is pressed, it is returned to clock.

### 16) BUZZER STOP SWITCH



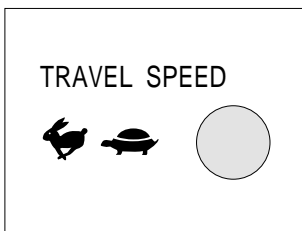
- (1) The buzzer sounds is stopped by touching this buzzer stop switch.
- (2) Buzzer sound comes out when cluster lights up a warning indicator lamp.
- (3) At each pressing of the switch, a short term beep sounds.



### 17) FUEL LOW LEVEL LAMP



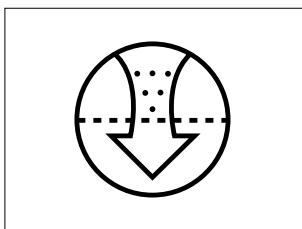
- (1) This lamp lights on when fuel level is below 22 .
- (2) In that case, fill up fuel again.

### 18) TRAVEL SPEED PILOT LAMP



- (1) This lamp indicates the travel speed.
- (2) When the machine travels selected high speed by LH multifunction switch, the rabbit mark(  ) is turned ON machine travels selected low speed, the turtle mark(  ) is turned ON.

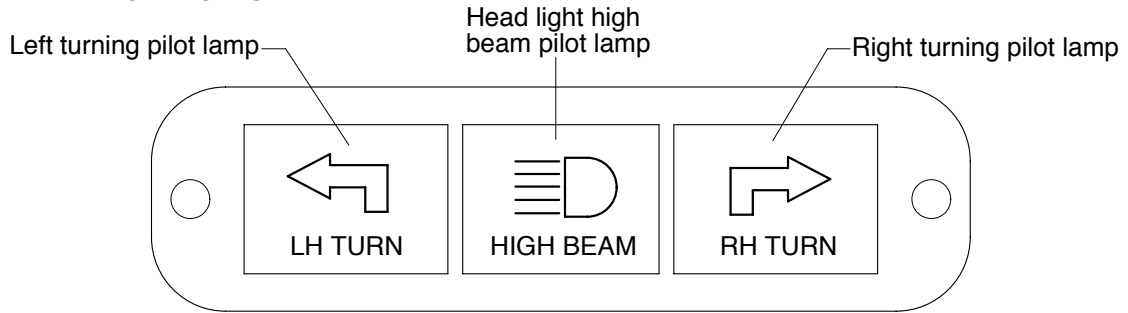
### 19) AIR CLEANER WARNING LAMP



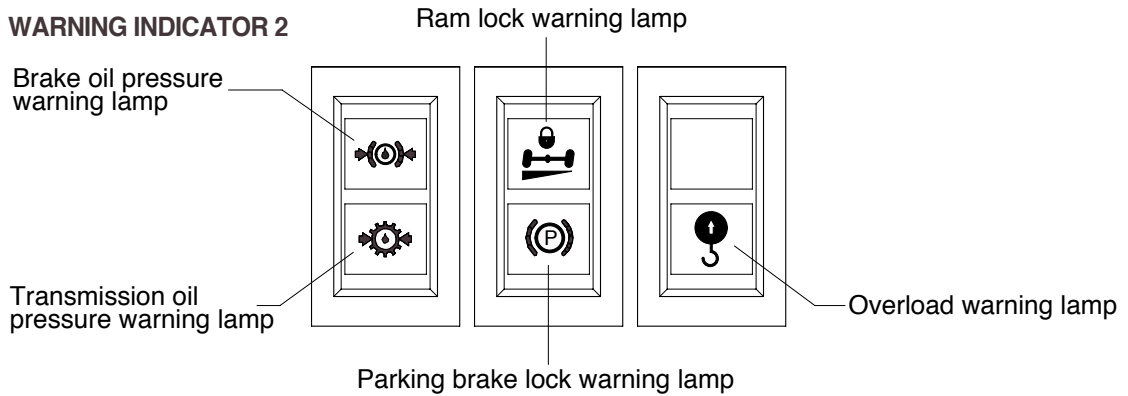
- (1) This lamp is operated by the vacuum caused inside when the filter of air cleaner is clogged which supply air to the engine.
- (2) Check the filter and clean or replace it when the lamp operates.

## 5. WARNING INDICATOR FUNCTION

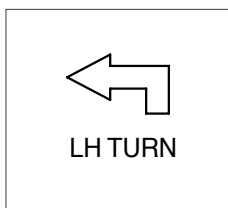
### · WARNING INDICATOR 1



### · WARNING INDICATOR 2

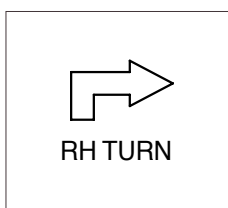


#### 1) LEFT TURNING PILOT LAMP



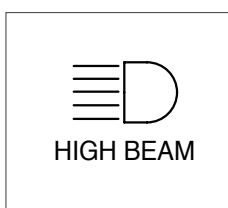
- (1) This lamp flashes with sound when the RH multifunction switch is move to forward position.

#### 2) RIGHT TURNING PILOT LAMP



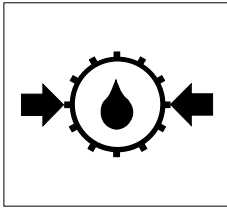
- (1) This lamp flashes with sound when the RH multifunction switch is move to backward position.

#### 3) HEAD LIGHT HIGH BEAM PILOT LAMP



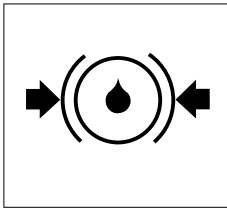
- (1) This lamp is ON when the head light switch is high beam position or passing function.
- (2) When passing other machines ahead, this lamp must be used for a few seconds to give other machines warning for a few seconds.

#### 4) TRANSMISSION OIL PRESSURE WARNING LAMP



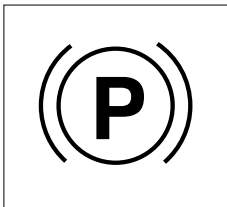
- (1) The lamp lights ON when the oil pressure of the transmission drops.
- (2) When the lamp is ON, stop the engine and check the transmission system.

#### 5) BRAKE OIL PRESSURE WARNING LAMP



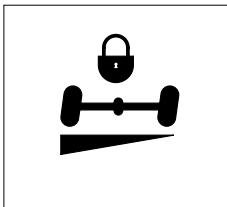
- (1) The lamp lights ON when the oil pressure of service brake drops below the normal range.
- (2) When the lamp is ON, stop the engine and check for its cause.  
**Do not operate until any problems are corrected.**

#### 6) PARKING BRAKE LOCK WARNING LAMP



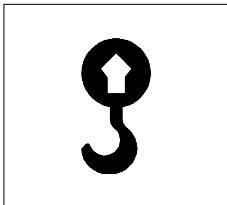
- (1) When the parking brake is actuated, the lamp lights ON.  
**Check the lamp is OFF before driving.**

#### 7) RAM LOCK WARNING LAMP



- (1) This warning lamp light ON when ram lock switch is rear piston.
- (2) Also, the warning lamp light ON when the parking switch is ON or service brake is applied.

#### 8) OVERLOAD WARNING LAMP



- (1) When the machine is overload, the overload warning lamp comes ON during the overload switch ON.