

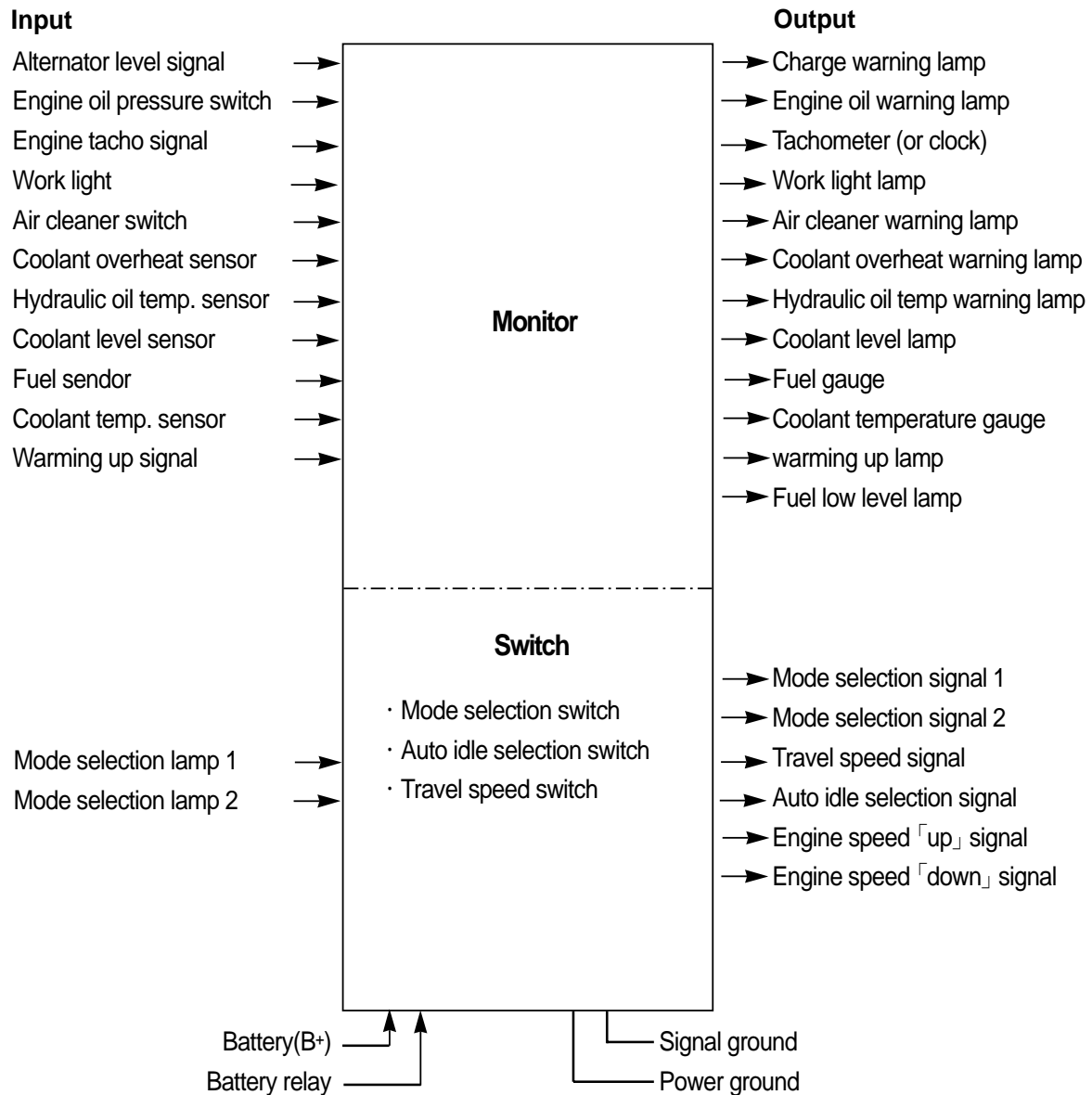
GROUP 3 MONITORING SYSTEM

1. OUTLINE

Monitoring system consists of the monitor part and switch part.

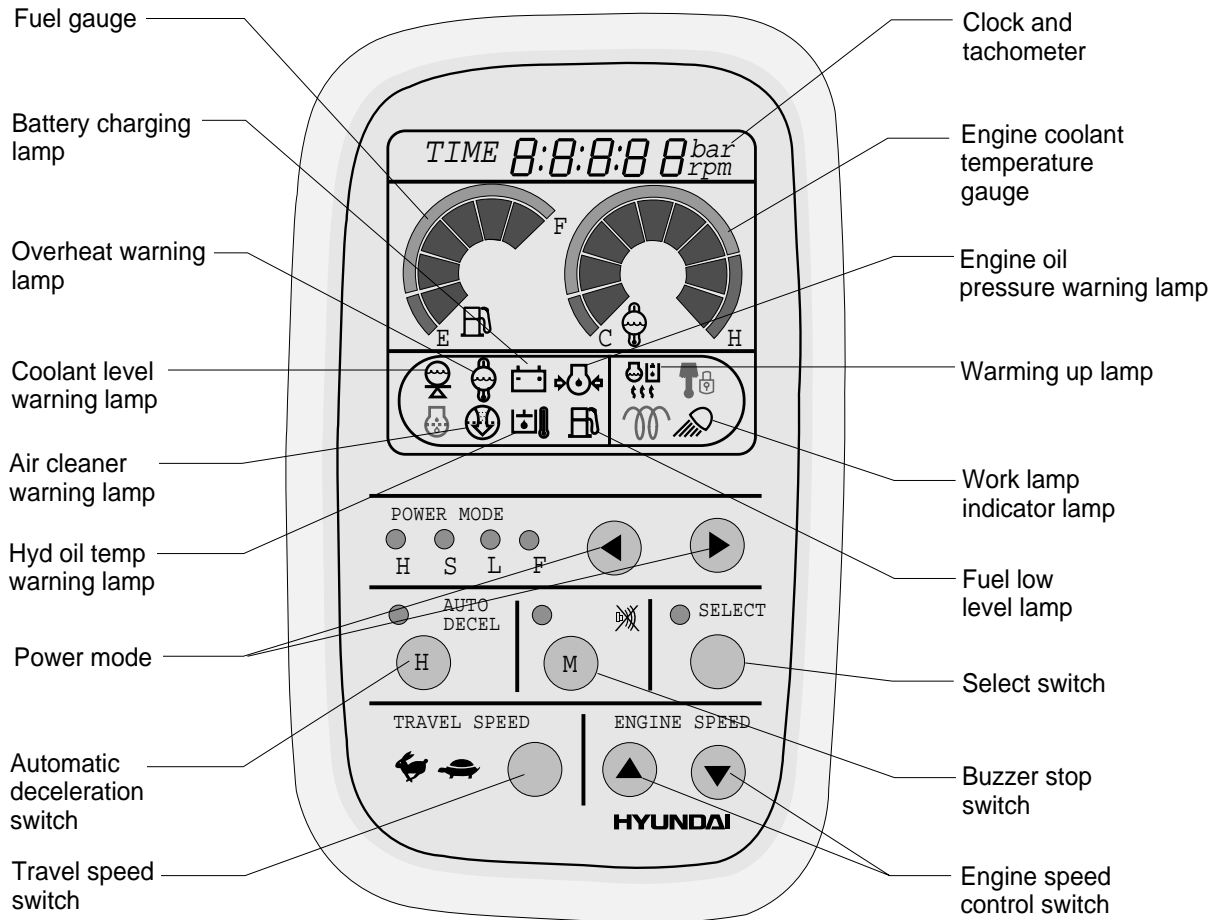
The monitor part gives warnings when any abnormality occurs in the machine and informs the condition of the machine.

Various select switches built into the monitor panel, and it acts as the control portion of the machine control system.



2. CLUSTER

1) Monitor panel



2) CLUSTER CHECK PROCEDURE

(1) Start key : ON

- ① Check monitor initial 3 seconds
 - a. All lamps light up.
 - b. Buzzer sound.

- ② Check monitor after 3 seconds : indicate machine condition
 - a. Tachometer : 0rpm
 - b. Fuel gauge : All light up below appropriate level
 - c. Engine coolant temperature gauge : All light up below appropriate level
 - d. Warning lamp
 - ※ In case, 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 light up.

- ③ Switch portion
 - a. Mode selection : S mode
 - b. Auto decel LED : ON
 - c. Travel speed switch : Low(turtle)

(2) Start of engine

- ① 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. Mode selection : S mode
 - d. Auto decel : ON(about 800rpm)
 - e. Travel speed : Low(turtle)

- ② When warming up operation
 - a. Warming up lamp : ON
 - b. 3 seconds after engine started, engine speed increases to 1650rpm speed (Auto decel LED : ON)
 - ※ Others same as above ①

- ③ When abnormal condition
 - a. The lamp lights up and the buzzer sounds.

3. CLUSTER CONNECTOR

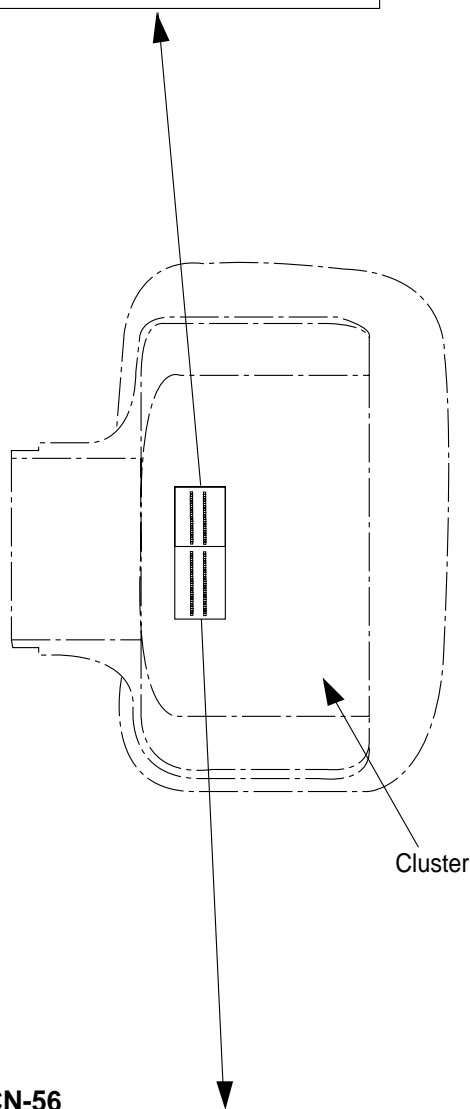
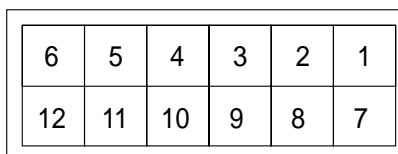
1) CN-57 CONNECTOR

| No. | Signal | Input/output |
|-----|-------------------------------|--------------|
| 1 | Engine speed 「down」 | output |
| 2 | Engine speed 「up」 | output |
| 3 | Engine coolant gauge | input |
| 4 | Fuel gauge | input |
| 5 | Power source(24V) | - |
| 6 | Power source(B ⁺) | - |
| 7 | Travel speed selection | output |
| 8 | Mode selection 2 | output |
| 9 | Mode selection 1 | output |
| 10 | Engine rpm | input |
| 11 | Power ground | - |
| 12 | Signal ground | - |

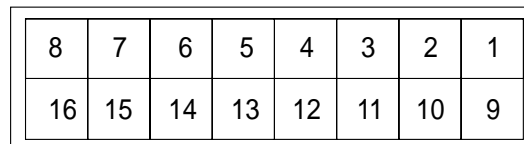
2) CN-56 CONNECTOR

| No. | Signal | Input/output |
|-----|-----------------------------|--------------|
| 1 | Mode LED 1 | input |
| 2 | Mode LED 2 | input |
| 3 | Null | - |
| 4 | Null | - |
| 5 | Null | - |
| 6 | Coolant level sensor | input |
| 7 | Battery charging warning | input |
| 8 | Auto decel selection | output |
| 9 | Head light | input |
| 10 | Work light | input |
| 11 | Null | - |
| 12 | Hyd. oil overheat warning | input |
| 13 | Engine oil pressure warning | input |
| 14 | Air cleaner clog warning | input |
| 15 | Coolant overheat warning | input |
| 16 | Warming up | output |

CN-57

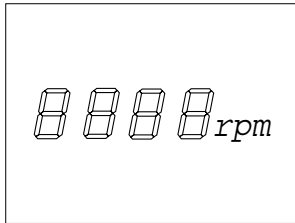


CN-56



4. CLUSTER FUNCTION

1) TACHOMETER



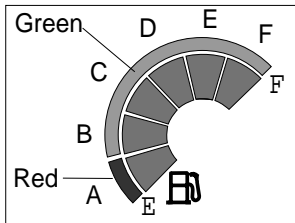
- ① Tachometer displays the number of engine revolutions.
- ② Refer select switch for the selection and adjustment.

2) CLOCK



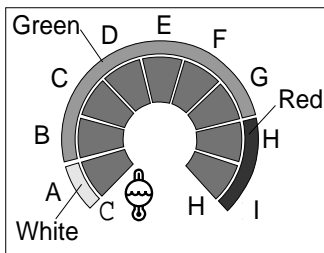
- ① Clock displays the current time by electric digital timer(LCD).
- ② Refer select switch for the selection and adjustment.

3) FUEL GAUGE



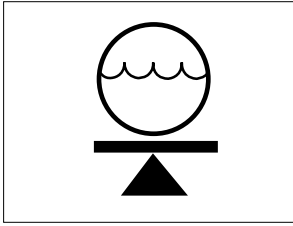
- ① This gauge indicates the amount of fuel in the fuel tank.
 - Segment A : Approximately 30 l (Warning lamp display)
 - Segment B : Approximately 65 l
 - Segment C : Approximately 100 l
 - Segment D : Approximately 138 l
 - Segment E : Approximately 176 l
 - Segment F : Approximately 214 l
 - Quantity of fuel tank : Approximately 250 l

4) ENGINE COOLANT TEMPERATURE GAUGE



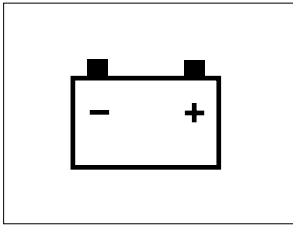
- ① This gauge indicates the temperature of coolant.
 - Segment A : Approximately 40~60°C(White)
 - Segment B : Approximately 60~67°C(Green)
 - Segment C : Approximately 67~74°C(Green)
 - Segment D : Approximately 74~81°C(Green)
 - Segment E : Approximately 81~88°C(Green)
 - Segment F : Approximately 88~95°C(Green)
 - Segment G : Approximately 95~102°C(Green)
 - Segment H : Approximately 102~110°C(Red)
 - Segment I : Approximately 110°C~ (Red)

5) COOLANT LEVEL WARNING LAMP



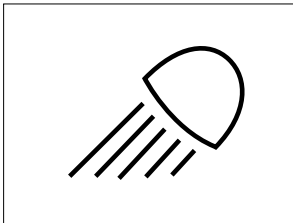
- ① This lamp is turned ON when the coolant is below LOW in the reservoir tank of radiator.
- ② Check if the coolant level is between FULL and LOW in the reservoir tank locating the side of radiator after opening the engine cover, and check if there is mixture of oil and coolant.

6) BATTERY CHARGING LAMP



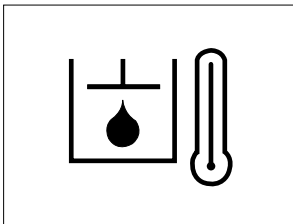
- ① Check if the charging lamp is OFF during engine operation. If the lamp is turned ON, it is not charged.
- ② This lamp is ON before starting the engine, it is turned OFF after starting the engine. Check the battery charging circuit when this lamp comes ON.

7) WORKING LIGHT LAMP



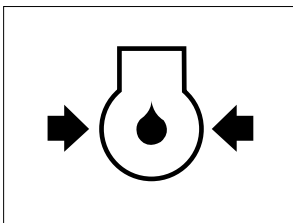
- ① When the working light switch is turned ON, the working light mounted on boom and the working light indicator lamp light ON.

8) HYDRAULIC OIL OVERHEAT WARNING LAMP



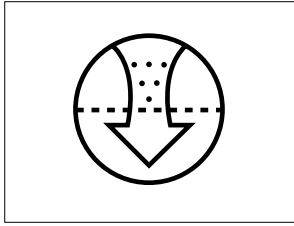
- ① This warning lamp operates and the buzzer sounds when the temperature of hydraulic oil is over 105°C.
- ② Check the coolant when the lamp is turned ON.

9) ENGINE OIL PRESSURE WARNING LAMP



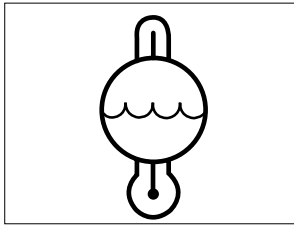
- ① This lamp is turned ON before starting the engine but turned OFF after starting the engine as the pressure caused from the engine oil pump lubricates each part.

10) AIR CLEANER WARNING LAMP



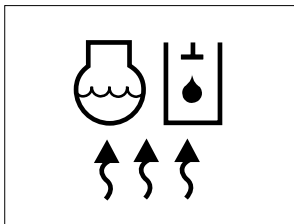
- ① This lamp operates by the vacuum caused inside when the filter of air cleaner is clogged which supply air to the engine.
- ② Check the filter and wash or replace it when the lamp operates.

11) OVERHEAT WARNING LAMP



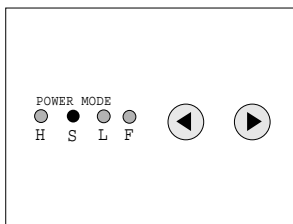
- ① This lamp is turned ON when the temperature of coolant is over the normal temperature(110°C)and lose the cooling function.
- ② Check the coolant when the lamp is ON.

12) WARMING UP LAMP



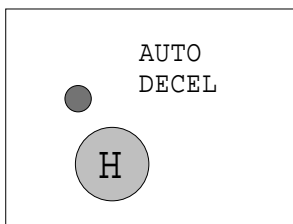
- ① This lamp is turned ON when the coolant temperature is below 30°C.
- ② The automatic warming up is cancelled when the engine coolant temperature is above 30°C, or when 10 minutes have passed since starting.

13) MODE SELECTION SWITCH



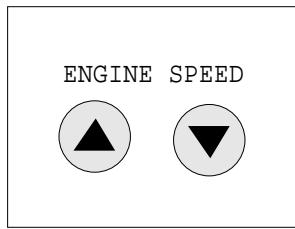
- ① The lamp of selected mode is turned ON by pressing the right switch(◀ , ▶), when selecting the mode to use.
 - H : This is used for heavy-duty work.
 - S : This is used for ordinary work.
 - L : This is used for light-duty work.
 - F : This is used for light-duty work, especially for finishing work.



14) AUTO DECELERATION SWITCH



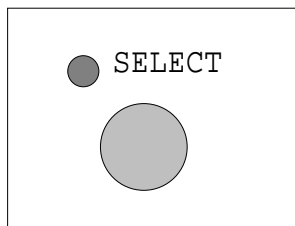
- ① This switch is used to actuate the auto-deceleration function.
- ② The engine speed is lowered by touching the switch when temporary stop or stand-by for dump is required.

15) ENGINE SPEED CONTROL SWITCH



- ① This switch is to control the engine speed which is increased by pressing  switch and decreased the engine speed by pressing  switch.

16) 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 for 3 seconds, it is selected time adjusting function.
 - Hour : Auto decel switch
 - Minute : Buzzer stop switch
- ④ After time set, the switch is pressed, it is returned clock.

17) BUZZER

- ① The buzzer sounds when the warning lamp lights ON.