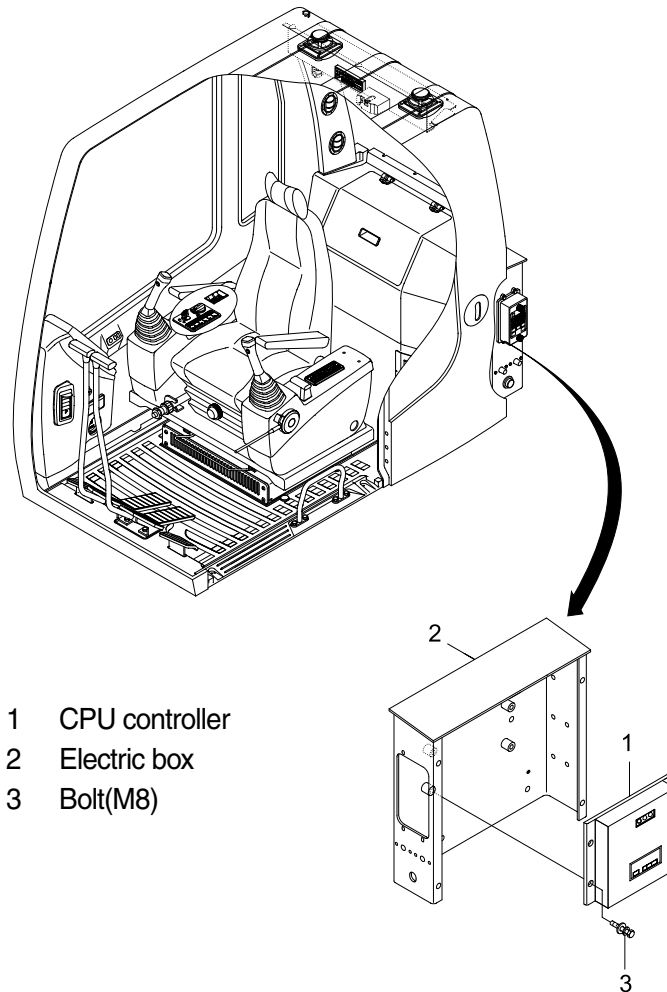


## GROUP 10 ENGINE CONTROL SYSTEM

### 1. CPU CONTROLLER AND ECM (Electronic control module)



- 1 CPU controller
- 2 Electric box
- 3 Bolt(M8)

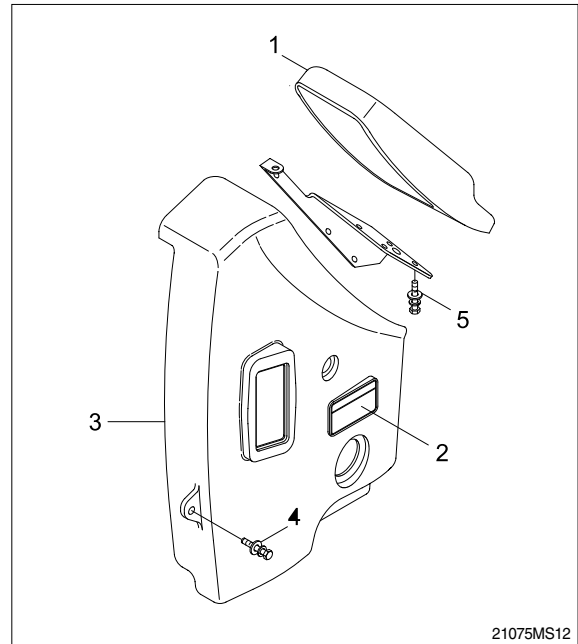
### 2. CPU CONTROLLER ASSEMBLY

- 1) Remove four pieces of bolt(3) of electric box(2).
- 2) Disconnect 2 connectors from CPU controller.
- 3) Remove 6 pieces of screw and open the cover of CPU controller.
- 4) Inspection : Check PCB(Printed Circuit Board)
  - (1) If any damage is found, replace CPU controller assembly.
  - (2) If not, but CAPO system does not work please report it to HHI dealer or A/S department.

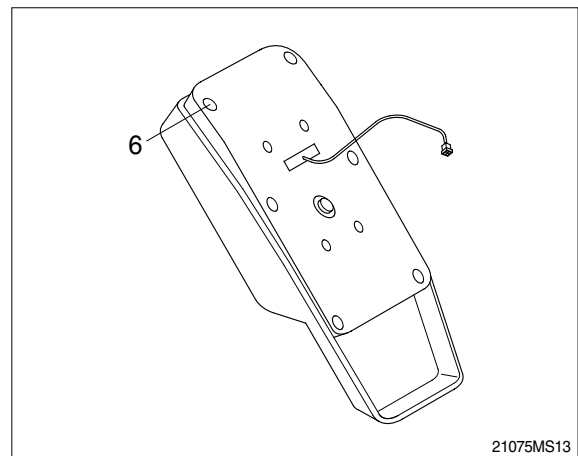
21075MS11

### 3. EXCHANGE METHOD OF THE ROM IN THE CLUSTER

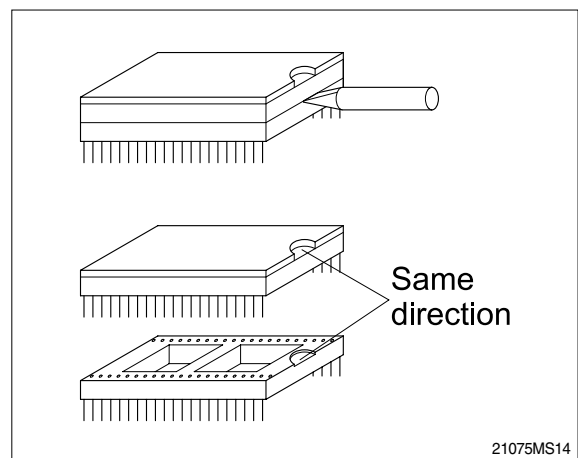
- 1) Disassemble the ash tray(2).
- 2) Disassemble the wiper motor cover(3).
- 3) Disassemble the cluster(1).



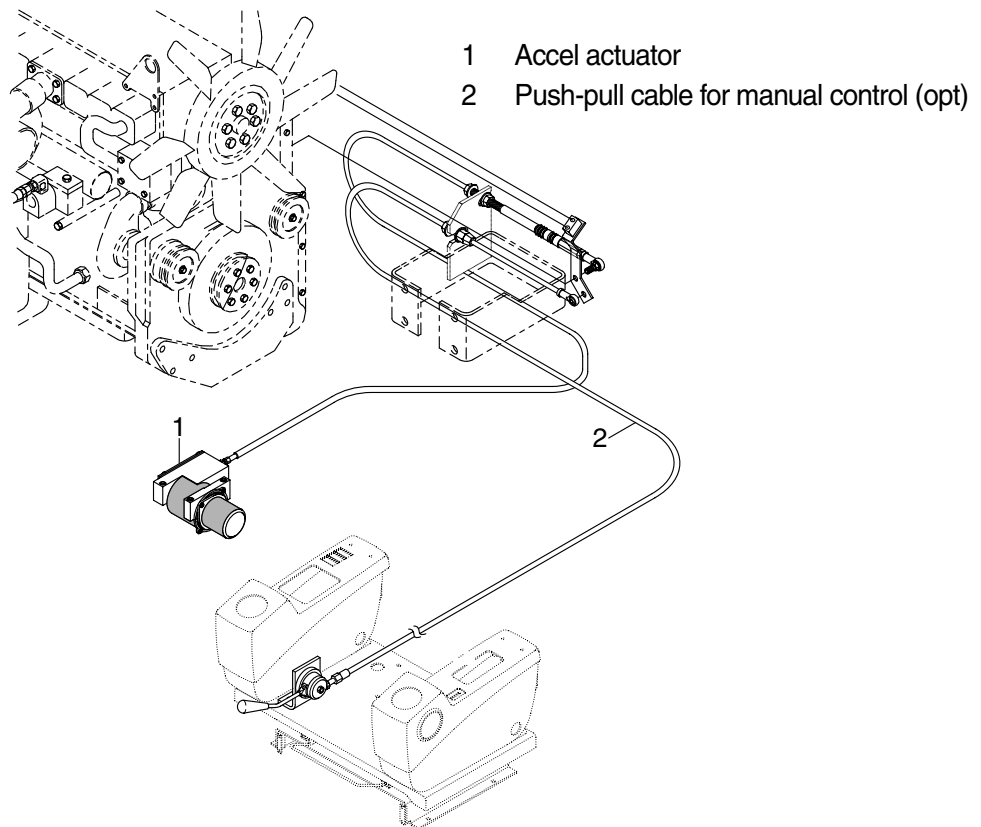
- 4) Loosen the screws(6EA) located back of the cluster.
- 5) Then you can open the upper case of the cluster easily.



- 6) Install the new ROM.(Be careful of direction and assmelbe the cluster in the reverse order to removal).

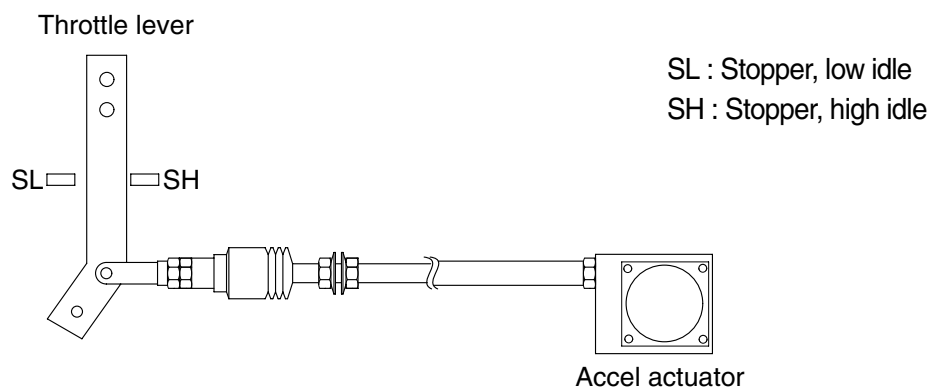


## 4. ENGINE ACCEL ACTUATOR



29075MS30

### 1) ENGINE THROTTLE LEVER

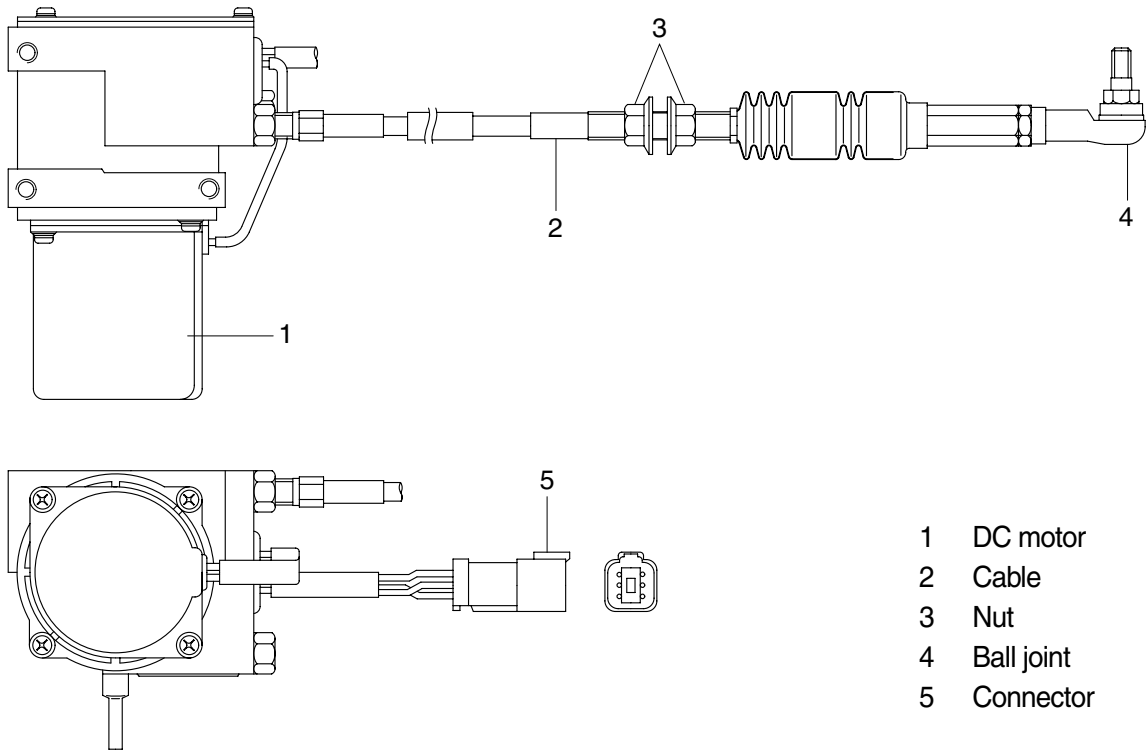


(R160-7 TIER II) 5-18(2)

### 2) EMERGENCY CABLE (Push-pull cable)

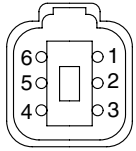
It controls engine speed by connecting onto the lever of the injection pump when the malfunction of the CPU controller or the accel actuator happen.

### 3) ACCEL ACTUATOR



- 1 DC motor
- 2 Cable
- 3 Nut
- 4 Ball joint
- 5 Connector

(R290-7 TIER II) 5-19(1)

Connector		
Type	6P, female	
Line color & description	1	White(Potentiometer 5V)
	2	Blue(Potentiometer SIG)
	3	Black(Potentiometer GND)
	4	-
	5	Green(Motor+)
	6	Yellow(Motor -)
Inspection	Check resistance Spec : 1~2 Ω (Between No.5-6) 0.8~1.2k Ω (Between No.1-3)	

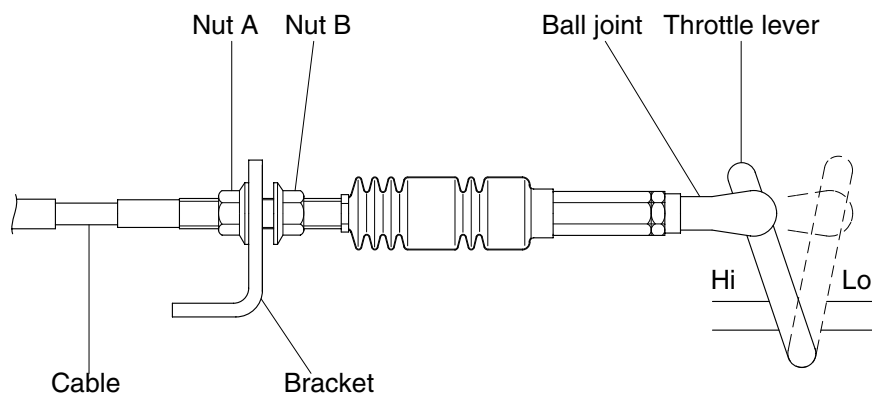
#### 4) ACCEL ACTUATOR CABLE SETTING PROCEDURE

##### (1) Key OFF

- ① Connect the ball joint of cable to engine throttle lever.
- ② Pull the cable to high stopper and put nut **A** edge to yoke of the bracket.
  - ※ Make throttle lever not contact to the edge of high stopper.
- ③ Turn nut **A** to clockwise until touching to the edge of high stopper.
- ④ Make 1 turn more to clockwise in condition of the nut **A** contact to the edge of high stopper.

##### (2) Key START

- ① Confirm if the engine speed on cluster is same as each mode specification.
- ② If the engine speed displayed on cluster is higher than each mode specification, then turn the nut **A** to counter clockwise and make the engine speed same to each mode specification.
- ③ If the engine speed displayed on cluster is lower than each mode specification, then turn the nut **A** to clockwise and make the engine speed same to each mode specification.
- ④ Turn nut **B** to clockwise and fix the cable to bracket.

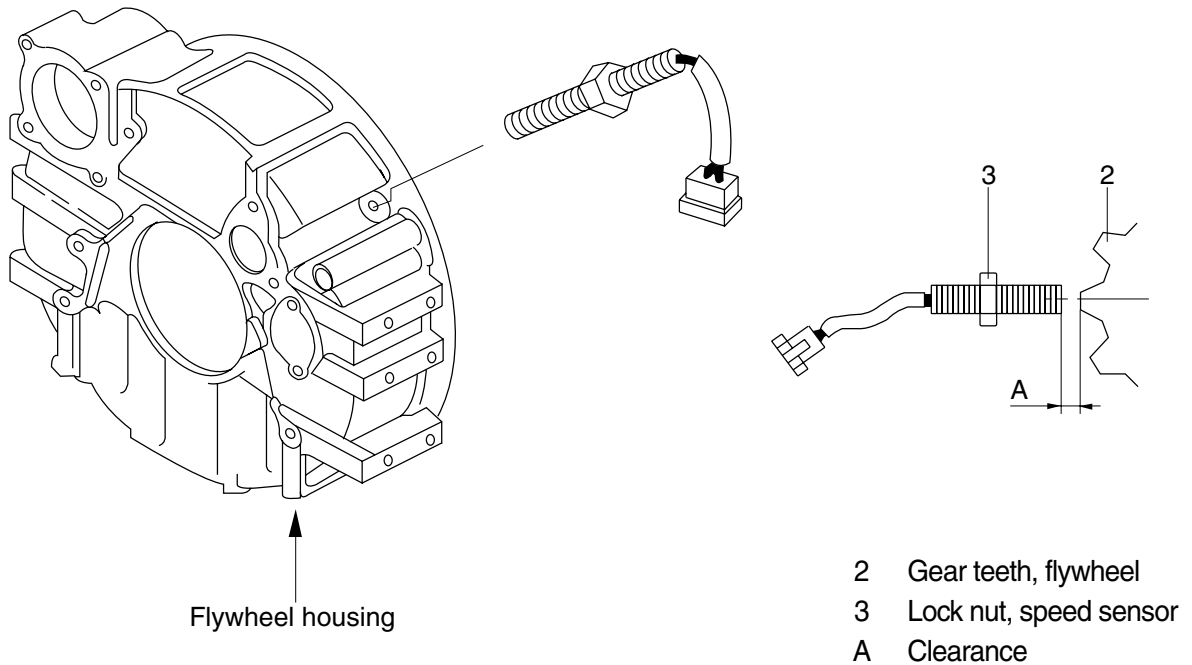


29075MS31

Mode	RPM
H	1950±50
S	1850±50
Auto decel	1200±100
Key start	1100±100

## 5. ENGINE SPEED SENSOR

### 1) DETECT ACTUAL ENGINE RPM AND SEND SIGNAL TO TACHOMETER



(R290-7 TIER II) 5-20

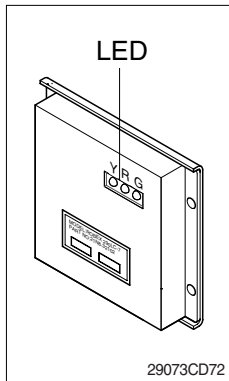
### 2) INSTALLATION

- (1) Clean contacting point of sensor.
- (2) Loosen lock nut.
- (3) Screw speed sensor into flywheel housing.
- (4) Turn it back 135° when it contacts with gear teeth.
- (5) Tight lock nut and connect wiring.

### 3) INSPECTION

- (1) Check resistance
  - SPEC :  $300 \pm 30 \Omega$
- (2) Check voltage while engine run.
  - SPEC : 2~28Vac, dependent on the engine speed(rpm)

## 6. CPU CONTROLLER



(1) To match the engine torque with the pump absorption torque, CPU controller 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	-
R is turned ON	Trouble on CPU	· Change the controller
G and Y are turned ON	Trouble on serial communication line	· Check if serial communication lines between controller and cluster are disconnected
Three LED are turned OFF	Trouble on CPU controller power	· Check if the input power wire (24V, GND) of controller is disconnected · Check the fuse

G : green,      R : red,      Y : yellow