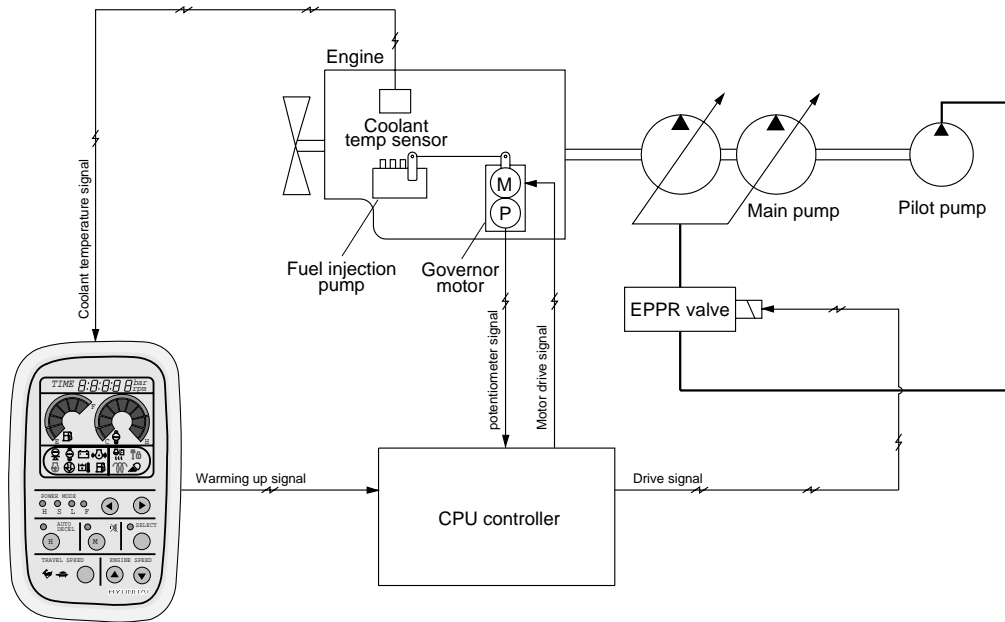## GROUP 11 AUTOMATIC WARMING UP FUNCTION

1. Cluster reads engine coolant temperature through the temperature sensor, and if the coolant temperature is less than 30℃, it turns the warming-up lamp ON and sends warming-up control signal to the CPU controller.

2. When the CPU controller receives the warming-up control signal from the cluster, it increases the engine speed from key start rpm to 1250rpm. At this time the mode is not change.

3. In case of the coolant temperature increases up to 30℃, the engine speed is decreased to key start speed. And if an operator changes mode set among the warming-up function, the CPU controller cancels the automatic warming up function.

4. Logic table(1)

Description	Condition	Function
Actuated	- Coolant temperature : Less than 30℃(after engine run)	- Mode : Default(**S** mode) - Warming up time : Maximum 10 minutes - Warming-up lamp : ON
Canceled	- Coolant temperature : Above 30℃ - Warming up time : Above 10 minutes - Changed mode set by operator ★ If any of the above conditions is applicable, the automatic warming-up function is canceled	- Default mode - Default mode - Changed mode
Warming-up lamp	Coolant temperature : Above 30℃	Warming-up lamp : OFF

5. LOGIC TABLE(2)

Description	Coolant temp. ≤30℃	Coolant temp. >30℃	Remark
Signal	Low(0V)	High(5V)	Cluster
Warming-up lamp	ON	OFF	
Mode	Default(**S** mode)	Default(**S** mode)	CPU controller