

ON-BOARD DIAGNOSTIC FUNCTION

B3E070261190T03

Malfunction detection function

- Detects errors in the input and output signals. (The ignition switch is at the ON position or the engine is running.)
- If a malfunction is detected, a DTC is output to the DLC-2 through the malfunction display function. At the same time, malfunction detection results are sent to the fail-safe and memory functions.

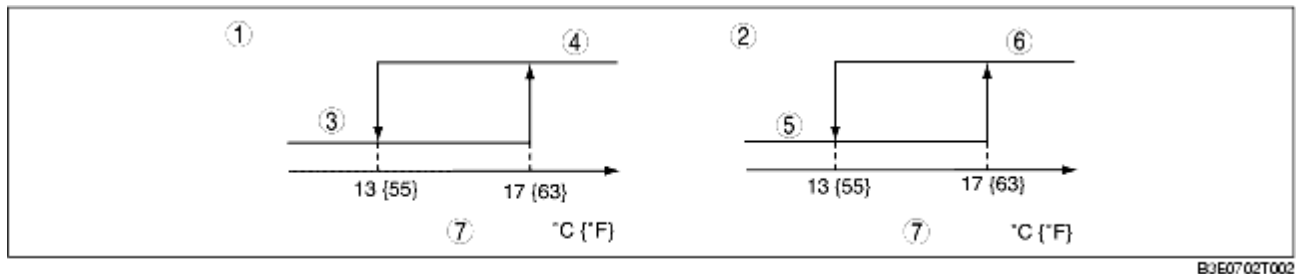
Fail-safe function

- If a malfunction is detected by the malfunction detection function and a malfunction is determined, the following controls are performed to prevent an operating malfunction of the full-auto air conditioner and malfunction of output parts.

Fail-safe Function Table

Part where malfunction is determined	Malfunction determined when IG SW at ON	Malfunction already exists when IG SW turned to ON
Cabin temperature sensor	Cabin temperature sensor input value is fixed at the value right before the malfunction.	Cabin temperature sensor input value is fixed at 25 °C {77 °F} .
Ambient temperature sensor	Ambient temperature sensor input value is fixed at the value right before the malfunction.	Ambient temperature sensor input value is fixed at 15 °C {59 °F} .
Evaporator temperature sensor	Evaporator temperature sensor input value is fixed at 0 °C {32 °F} .	←
Solar radiation sensor	Solar radiation sensor value is fixed at the value right before the malfunction.	Solar radiation sensor value is fixed at 0 W/m² .
Engine coolant temperature sensor	Engine coolant temperature sensor input value is fixed at 85 °C {185 °F} .	←
Air mix actuator (potentiometer)	Air mix actuator drive signal is stopped right when the malfunction is determined. However, it is fixed at MAX COLD when the manually set temperature is at 15.0 and fixed at MAX HOT when the manually set temperature is at 29.0 .	Control based on ambient temperature. (See Graph 1.) However, it is fixed at MAX COLD when the manually set temperature is at 15.0 and fixed at MAX HOT when the manually set temperature is at 29.0 .
Airflow mode actuator (potentiometer)	Airflow mode actuator drive signal is stopped right when the malfunction is determined. • However, for manual operation using the MODE switch, only vent mode is operable. • The defroster switch is operable.	Control based on ambient temperature. (See Graph 2.) • However, for manual operation using the MODE switch, only vent mode is operable. • The defroster switch is operable.
Air mix actuator (motor lock)	Air mix actuator drive signal is stopped right when the malfunction is determined. After this, a drive signal is output to the air mix actuator and malfunction determination is performed approx. every 5 min.	After the IG SW is at ON, the air mix actuator drive signal is again output normally. After this, a drive signal is output to the air mix actuator and malfunction determination is performed approx. every 5 min.

Airflow mode actuator (motor lock)	Airflow mode actuator drive signal is stopped right when the malfunction is determined. After this, a drive signal is output to the airflow mode actuator and malfunction determination is performed approx. every 5 min.	After the IG SW is at ON, the airflow mode actuator drive signal is again output normally. After this, a drive signal is output to the airflow mode actuator and malfunction determination is performed approx. every 5 min.
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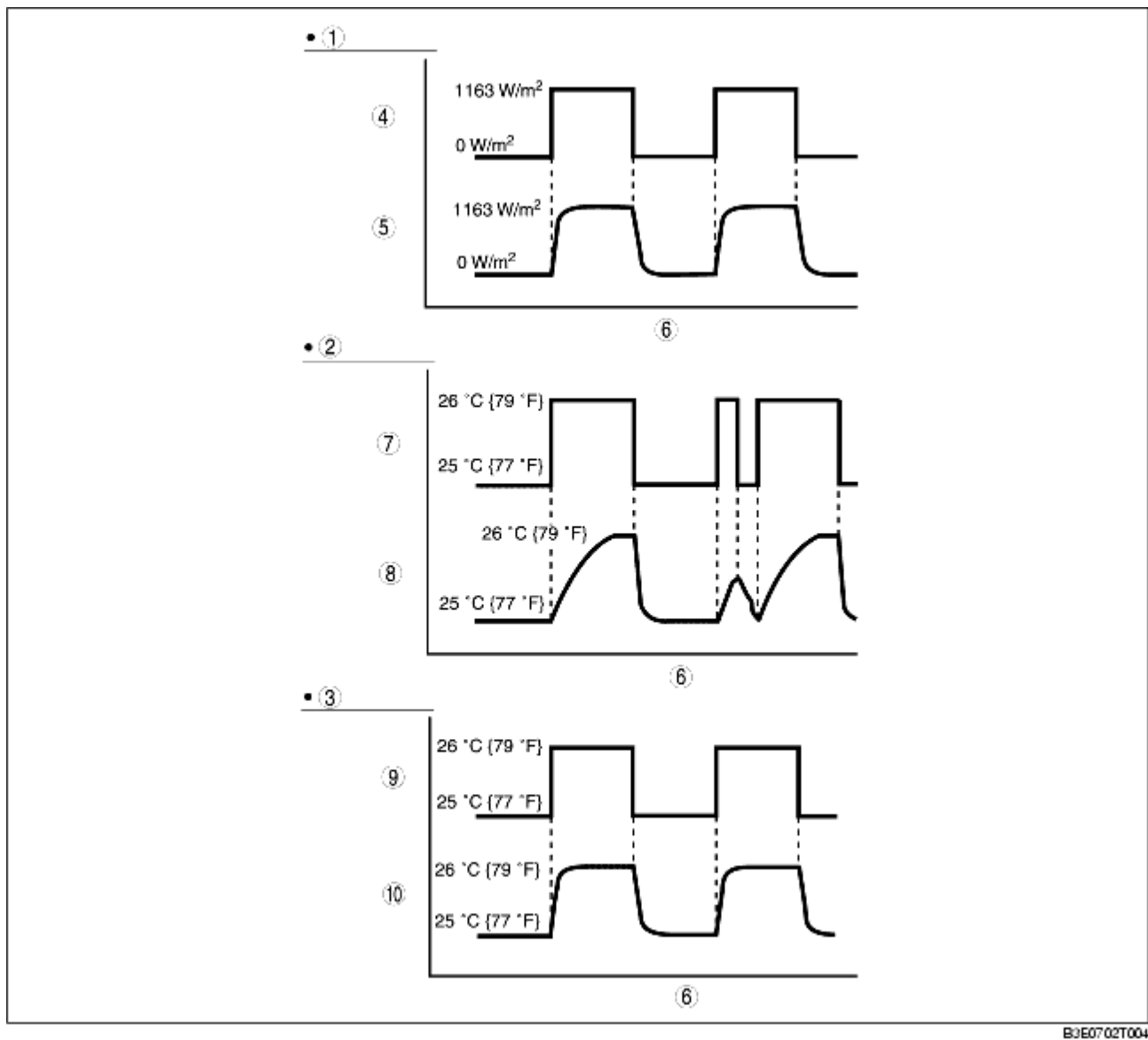
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1	Graph 1
2	Graph 2
3	MAX HOT
4	MAX COLD
5	DEFROSTER
6	VENT
7	Ambient temperature

Sensor Signal Delay Function

• Due to factors such as direct and intermittent sunlight (travelling through a city or highway tunnel), or radiant heat from the ground under a parked vehicle as well as the opening and closing of doors, the amount of solar radiation, and the ambient and cabin temperatures may change intermittently, partially, or suddenly. If control was performed based exactly on these variations, the air conditioning function would be negatively effected and smooth control could not occur. In order to prevent this, the climate control unit delays the input signals for solar radiation, and the ambient and cabin temperature as shown in the following figure. Stable control occurs due to the reading out of an average of all the variations.

• When the engine is re-started after being temporarily stopped, the ambient temperature sensor may detect a temperature higher then the actual ambient temperature. To prevent this, when the engine coolant temperature exceeds the specified value, the detected ambient temperature is corrected based on the data for the ambient temperature before the engine was stopped that is stored in climate control unit and control is performed accordingly.



1	Solar radiation delay
2	Ambient temperature delay
3	Cabin temperature delay
4	(Example) Actual solar radiation variation
5	Delayed solar radiation determination by climate control unit
6	Time
7	(Example) Actual ambient temperature variation
8	Delayed ambient temperature determination by climate control unit
9	(Example) Actual cabin temperature variation
10	Delayed cabin temperature determination by climate control unit

Memory Function

- Stores the signal determined to be malfunctioning by the malfunction detection function, and the memory is not cleared even if the ignition switch is turned off (LOCK position) or the malfunction has been repaired.
- Clear stored malfunction data by connecting the WDS or equivalent to the DLC-2.

Display Function

- This function is for outputting present or past malfunctions via the DLC-2 as DTCs.
- DTCs output via the DLC-2 can be read out using the WDS or equivalent.

Malfunction Display Mode

- Present and past malfunctions in the control system circuits (open/short circuits) are detected, and the DTCs indicated in the table are displayed on the WDS or equivalent. Since once a past malfunction is stored, it will remain stored even after the malfunction has been repaired, clear past malfunctions after completing repairs.
- Clear stored past malfunctions by connecting the WDS or equivalent to the DLC-2.

DTC Table

DTC	Malfunction location	Detected condition	Memory function
B1251	Cabin temperature sensor	Cabin temperature sensor circuit open	X
B1253		Cabin temperature sensor circuit short (body ground)	X
B1260	Solar radiation sensor	Solar radiation sensor circuit short (power supply)	X
B1261		Solar radiation sensor circuit short (body ground)	-
B1274	Airflow mode actuator (potentiometer)	Airflow mode actuator (potentiometer) circuit short (power supply)	X
B1275		Airflow mode actuator (potentiometer) circuit short (body ground)	X
B1282	Air mix actuator (potentiometer)	Air mix actuator (potentiometer) circuit short (power supply)	X
B1283		Air mix actuator (potentiometer) circuit short (body ground)	X
B1947	Evaporator temperature sensor	Evaporator temperature sensor circuit short (body ground)	X
B2014		Evaporator temperature sensor circuit open	X
B2832	Airflow mode actuator (motor lock)	Airflow mode actuator (motor lock) circuit short	X
B2834	Air mix actuator (motor lock)	Air mix actuator (motor lock) circuit short	X
U0140	CAN communication system	Reception error in signal from PJB	X
U0155		Reception error in signal from ICM (HEC)	X
U0184		Reception error in signal from audio unit	X
U0516		BUS OFF error	X