ON-BOARD DIAGNOSTIC [REAR VEHICLE MONITORING (RVM) SYSTEM]

id092200021851

Outline

- The on-board diagnostic function consists of the following functions: a malfunction detection function, which detects overall malfunctions in the rear vehicle monitoring control module-related parts; a memory function, which stores detected DTCs; a display function, which indicates malfunction locations and status via DTC output; and a PID/data monitoring function, which reads out specific input/output signals and verifies the input/output condition.
- Using the Mazda Modular Diagnostic System (M-MDS), DTCs can be read out and deleted, and the PID/data monitoring function can be activated.

Malfunction Detection Function

- Detects malfunctions in input/output signals.
- If a malfunction occurs, the rear vehicle monitoring control module records the malfunction as a DTC. A recorded DTC can be read by the Mazda Modular Diagnostic System (M-MDS).

×: Applicable
—: Not applicable

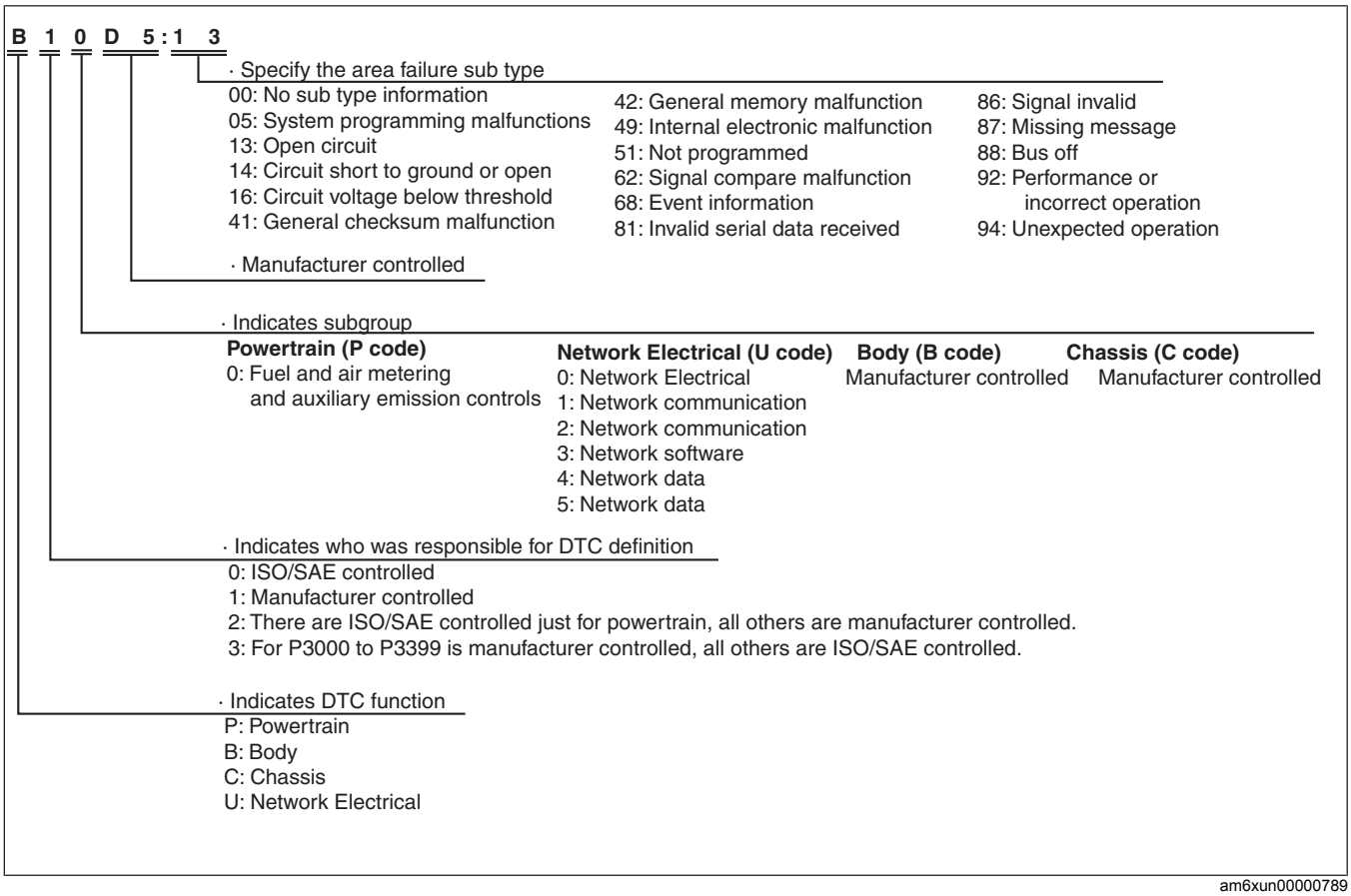
DTC No.	Rear vehicle monitoring (RVM) system warning light (amber)	Description	Fail-safe function	Drive cycle	Self test type*1	Memory function
B11CB:11	On	RVM warning indicator light (RH) circuit malfunction	×	—	C, D	×
B11CB:15	On	RVM warning indicator light (RH) circuit malfunction	×	—	C, D	×
B11D3:11	On	RVM warning indicator light (LH) circuit malfunction	×	—	C, D	×
B11D3:15	On	RVM warning indicator light (LH) circuit malfunction	×	—	C, D	×
B11F2:23	On	RVM switch circuit malfunction	×	—	C	×
U0001:88	On	Unit communication error (MS-CAN)	×	—	C	×
U0028:87	On	Rear vehicle monitoring control module (LH) and (RH) communication error	×	—	C	×
U0100:00	On	Communication error with PCM	×	—	C	×
U0121:00	On	Communication error with DSC HU/CM	×	—	C	×
U0155:00	On	Communication error with instrument cluster	×	—	C	×
U0214:00	On	Communication error with start stop unit	×	—	C	×
U0401:68	On	Error signal received from PCM	×	—	C	×
U0415:68	On	Error signal received from DSC HU/CM	×	—	C	×
U0423:68	On	Error signal received from instrument cluster	×	—	C	×
U0515:68	On	Error signal received from start stop unit	×	—	C	×
U1A4B:16	On	Rear vehicle monitoring control module (LH) low power supply input	×	—	C	×
U1A4B:17	On	Rear vehicle monitoring control module (LH) high power supply input	×	—	C	×
U1A4B:43	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×
U1A4B:44	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×
U1A4B:45	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×
U1A4B:46	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×
U1A4B:47	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×
U1A4B:48	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×

DTC No.	Rear vehicle monitoring (RVM) system warning light (amber)	Description	Fail-safe function	Drive cycle	Self test type*1	Memory function
U1A4B:49	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×
U1A4B:54	On	Radar aiming is not performed or radar sensor axis is deviated (rear vehicle monitoring control module (LH))	×	—	C	×
U1A4B:96	On	Rear vehicle monitoring control module (LH) malfunction	×	—	C	×
U1A4B:97	On	Radar sensor sensitivity temporarily decreases depending on various external and environmental factors (rear vehicle monitoring control module (LH))	×	—	C	×
U2100:00	On	Rear vehicle monitoring control module (RH) configuration error	×	—	C, D	×
U3000:43	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:44	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:45	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:46	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:47	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:48	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:49	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:4B	On	Temperature temporarily increases depending on various external and environmental factors (rear vehicle monitoring control module (LH) or (RH))	×	—	C	×
U3000:54	On	Radar aiming is not performed or radar sensor axis is deviated (rear vehicle monitoring control module (RH))	×	—	C, D	×
U3000:96	On	Rear vehicle monitoring control module (RH) malfunction	×	—	C	×
U3000:97	On	Radar sensor sensitivity temporarily decreases depending on various external and environmental factors (rear vehicle monitoring control module (RH))	×	—	C	×
U3003:16	On	Rear vehicle monitoring control module (RH) low power supply input	×	—	C, D	×
U3003:17	On	Rear vehicle monitoring control module (RH) high power supply voltage input	×	—	C, D	×

*1 : C: CMDTC self test, D: ODDTC self test

DTC 7-digit code definition

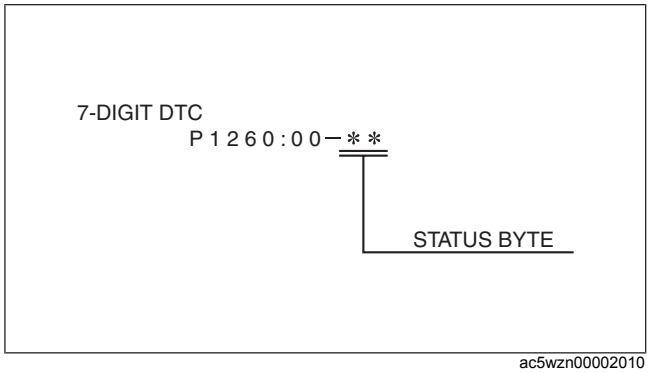
- When related systems or components have failed, the CM stores the DTC of the malfunctioning part in the CM memory, and allows for the retrieval of the store data using scanning tool when necessary. The DTCs are indicated using seven digits. Each digit indicates the following.



am6xun00000789

Status byte for DTC

- The status byte is the two digits (two digits after hyphen (-)) after the 7-digit DTC.
- The status byte is a code which indicates the pending code, current/past malfunction status, or warning illumination status.
- The status byte can be read by performing a CMDTC self-test using the Mazda Modular Diagnostic System (M-MDS).
- For details on the status byte, refer to the explanation on the M-MDS when reading the DTC.



ac5wzn00002010

Detection condition for the applicable DTC

DTC No.	System malfunction location	Detection condition
B11CB:11	RVM warning indicator light (RH) circuit malfunction	Rear vehicle monitoring control module (LH) detects short to ground in RVM warning indicator light (RH).
B11CB:15	RVM warning indicator light (RH) circuit malfunction	Rear vehicle monitoring control module (LH) detects an open or short circuit to ground in RVM warning indicator light (RH) power supply circuit.
B11D3:11	RVM warning indicator light (LH) circuit malfunction	Rear vehicle monitoring control module (LH) detects short to ground in RVM warning indicator light (LH).
B11D3:15	RVM warning indicator light (LH) circuit malfunction	Rear vehicle monitoring control module (LH) detects an open or short circuit to ground in RVM warning indicator light (LH) power supply circuit.
B11F2:23	RVM switch circuit malfunction	The rear vehicle monitoring control module (RH) receives RVM switch ON signal from the instrument cluster for 2 min or more.
U0001:88	Unit communication error (MS-CAN)	The rear vehicle monitoring control module (RH) detects a CAN bus communication line (MS-CAN) malfunction.
U0028:87	Rear vehicle monitoring control module (LH) and (RH) communication error	No communication between rear vehicle monitoring control modules (LH) and (RH) for 1 s or more.

DTC No.	System malfunction location	Detection condition
U0100:00	Communication error with PCM	The rear vehicle monitoring control module (RH) cannot receive CAN signal from the PCM for 2 s or more.
U0121:00	Communication error with DSC HU/CM	Rear vehicle monitoring control module (RH) cannot receive CAN signal from the DSC HU/CM for 2 s or more.
U0155:00	Communication error with instrument cluster	The rear vehicle monitoring control module (RH) cannot receive CAN signal from the instrument cluster for 2 s or more.
U0214:00	Communication error with start stop unit	The rear vehicle monitoring control module (RH) cannot receive CAN signal from the start stop unit for 2 s or more.
U0401:68	Error signal received from PCM	The rear vehicle monitoring control module (RH) receives malfunction signal from the PCM for 2 s or more.
U0415:68	Error signal received from DSC HU/CM	The rear vehicle monitoring control module (RH) receives malfunction signal from the DSC HU/CM for 2 s or more.
U0423:68	Error signal received from instrument cluster	The rear vehicle monitoring control module (RH) receives malfunction signal from the instrument cluster for 2 s or more.
U0515:68	Error signal received from start stop unit	The rear vehicle monitoring control module (RH) receives malfunction signal from the start stop unit for 2 s or more.
U1A4B:16	Rear vehicle monitoring control module (LH) low power supply voltage input	Rear vehicle monitoring control module (LH) low power supply voltage input
U1A4B:17	Rear vehicle monitoring control module (LH) high power supply voltage input	Power supply circuit voltage of 16 V or more is detected in rear vehicle monitoring control module (LH) for 1 s or more.
U1A4B:43	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) external RAM malfunction detected.
U1A4B:44	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) internal RAM malfunction detected.
U1A4B:45	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) ROM malfunction detected.
U1A4B:46	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) EEPROM malfunction detected.
U1A4B:47	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) monitoring system malfunction detected.
U1A4B:48	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) communication circuit malfunction detected.
U1A4B:49	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) voltage control circuit malfunction detected.
U1A4B:54	Radar aiming is not performed or radar sensor axis is deviated (rear vehicle monitoring control module (LH))	Malfunction in radar aiming of rear vehicle monitoring control module (LH) detected for 1 s or more.
U1A4B:96	Rear vehicle monitoring control module (LH) malfunction	Rear vehicle monitoring control module (LH) internal circuit malfunction detected.
U1A4B:97	Radar sensor sensitivity temporarily decreases depending on various external and environmental factors (rear vehicle monitoring control module (LH))	Radar sensor sensitivity in rear vehicle monitoring control module (LH) temporarily decreases
U2100:00	Rear vehicle monitoring control module (RH) configuration error	Rear vehicle monitoring control module (RH) configuration error detected.
U3000:43	Rear vehicle monitoring control module (RH) malfunction	Rear vehicle monitoring control module (RH) malfunction
U3000:44	Rear vehicle monitoring control module (RH) malfunction	Rear vehicle monitoring control module (RH) internal RAM malfunction detected.
U3000:45	Rear vehicle monitoring control module (RH) malfunction	Rear vehicle monitoring control module (RH) ROM malfunction detected.
U3000:46	Rear vehicle monitoring control module (RH) malfunction	Rear vehicle monitoring control module (RH) EEPROM malfunction detected.
U3000:47	Rear vehicle monitoring control module (RH) malfunction	Rear vehicle monitoring control module (RH) monitoring system malfunction detected.
U3000:48	Rear vehicle monitoring control module (RH) malfunction	Rear vehicle monitoring control module (RH) communication circuit malfunction detected.
U3000:49	Rear vehicle monitoring control module (RH) malfunction	Rear vehicle monitoring control module (RH) voltage control circuit malfunction detected.

DTC No.	System malfunction location	Detection condition
U3000:4B	Temperature temporarily increases depending on various external and environmental factors (rear vehicle monitoring control module (LH) or (RH))	Rear vehicle monitoring control module internal temperature of 85 °C {185 °F} or more detected for 10 s or more.
U3000:54	Radar aiming is not performed or radar sensor axis is deviated (rear vehicle monitoring control module (RH))	Malfunction in radar aiming of rear vehicle monitoring control module (RH) detected for 1 s or more.
U3000:96	Rear vehicle monitoring control module (RH) malfunction	Inhibits the rear vehicle monitoring system.
U3000:97	Radar sensor sensitivity temporarily decreases depending on various external and environmental factors (rear vehicle monitoring control module (RH))	Radar sensor sensitivity in rear vehicle monitoring control module (RH) temporarily decreases
U3003:16	Rear vehicle monitoring control module (RH) low power supply voltage input	Power supply circuit voltage of 9 V or less is detected in rear vehicle monitoring control module (RH) for 1 s or more.
U3003:17	Rear vehicle monitoring control module (RH) high power supply voltage input	Power supply circuit voltage of 16 V or more is detected in rear vehicle monitoring control module (RH) for 1 s or more.

Data Monitor Function

- The PID/data monitor function performs reading in real time of optionally selected input/output signal monitor items that are set in the rear vehicle monitoring control module.

PID/data monitor table

PID name	Unit/Status	Data contents	Inspection item(s)
AIM_ANGL_L	° (deg)	Displays rear vehicle monitoring control module (LH) radar aiming angle.	Rear vehicle monitoring control module (LH)
AIM_ANGL_R	° (deg)	Displays rear vehicle monitoring control module (RH) radar aiming angle.	Rear vehicle monitoring control module (RH)
Buzzer	Off/On	• Off: Rear vehicle monitoring warning alarm does not sound. • On: Rear vehicle warning alarm sounds.	Instrument cluster
INTNL_TMP_L	°C,°F	Displays rear vehicle monitoring control module (LH) internal temperature.	Rear vehicle monitoring control module (LH)
INTNL_TMP_R	°C,°F	Displays rear vehicle monitoring control module (RH) internal temperature.	Rear vehicle monitoring control module (RH)
MAIN_SW	Off/On	• Off: RVM switch not pressed • On: RVM switch pressed	RVM switch
OP_BRT_L	—	Displays the RVM warning indicator light (LH) output brightness.	RVM warning indicator light (LH)
OP_BRT_R	—	Displays the RVM warning indicator light (RH) output brightness.	RVM warning indicator light (RH)
RVM_SYS_ST	Off/ Passive_On /Active_On/ Failure	• Off: Rear vehicle monitoring system does not operate. • Passive_On: Rear vehicle monitoring system is on standby. • Active_On: Rear vehicle monitoring system operates. • Failure: Rear vehicle monitoring system malfunction	Rear vehicle monitoring control module
TURN_SW_L	Off/On	• Off: Turn switch is in position other than LH. • On: Turn switch is in LH position.	Turn Switch
TURN_SW_R	Off/On	• Off: Turn switch is in position other than RH. • On: Turn switch is in RH position.	Turn Switch
VPWR_L	V	Displays rear vehicle monitoring control module (LH) power supply voltage.	Rear vehicle monitoring control module (LH)
VPWR_R	V	Displays rear vehicle monitoring control module (RH) power supply voltage.	Rear vehicle monitoring control module (RH)
VSPD	KPH, MPH	Vehicle speed is displayed.	—
YAW_RATE	°/s	• —: Vehicle is stopped or while moving straight ahead. • Exceeds 0°/s: Vehicle tilted left. • Less than 0°/s: Vehicle tilted right.	SAS control module

Active Command Modes Function

- The active command modes are shown below.

Command name	Unit/ Operation	Data contents	Output part name
Buzzer	Off/On	• Off: Rear vehicle monitoring warning alarm does not sound. • On: Rear vehicle monitoring warning alarm sounds.	Rear vehicle monitoring warning alarm (instrument cluster)
WRN_IND_L	Off/On	• Off: Turns off the RVM warning indicator light (LH). • On: Illuminates the RVM warning indicator light (LH).	RVM warning indicator light (LH)
WRN_IND_R	Off/On	• Off: Turns off the RVM warning indicator light (RH). • On: Illuminates the RVM warning indicator light (RH).	RVM warning indicator light (RH)