ON-BOARD DIAGNOSTIC SYSTEM [FRONT BODY CONTROL MODULE (FBCM)]

id094000002700

Outline

- The on-board diagnostic function consists of the following functions: A malfunction detection function, which detects overall malfunctions in the front body control module (FBCM)-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 front body control module (FBCM) records the malfunction as a DTC. A recorded DTC can be read by the Mazda Modular Diagnostic System (M-MDS).

DTC table

×: Applicable
—: Not applicable

DTC No.	Warning/ indicator light	Description	Fail-safe function	Drive cycle	Self test type*1	Memory function
B1008:02	—	Windshield wiper control signal mismatch	—	—	C, D	×
B1008:62	—	Windshield wiper (LO) switch signal mismatch	—	—	C, D	×
B1048:7B	—	Brake fluid level sensor circuit malfunction	—	—	C, D	×
B1087:88	—	LIN communication error	—	—	C, D	×
B1088:88	—	LIN communication error	—	—	C, D	×
B1095:72	—	Autostop switch circuit malfunction	—	—	C, D	×
B1095:73	—	Autostop switch circuit malfunction	—	—	C, D	×
B109A:12	—	Headlight (HI) relay circuit malfunction	—	—	C, D	×
B109A:14	—	Headlight (HI) relay circuit malfunction	—	—	C, D	×
B10A6:64	—	Light switch error signal received	—	—	C, D	×
B10A8:12*2	—	Headlight (LO) relay circuit malfunction	—	—	C, D	×
B10AD:86*3	—	Error signal received from auto-light sensor/rain sensor	—	—	C, D	×
B10AF:12	—	Blower relay circuit malfunction	—	—	C, D	×
B1142:13	—	Front body control module (FBCM) power supply voltage (+IG1 power supply) input circuit malfunction	—	—	C, D	×
B1143:13	—	IG2 power supply control circuit malfunction	—	—	C, D	×
B11DB:86	—	Error signal received from current sensor	—	—	C, D	×
B1314:11	—	Illumination output circuit malfunction	—	—	C, D	×
B134D:02	—	Headlight control signal malfunction	—	—	C, D	×
B13AF:62	—	Headlight LO signal mismatch	—	—	C, D	×
B13CF:19	—	IG2 power supply output circuit malfunction	—	—	C, D	×
B13D0:11	—	TNS circuit malfunction	—	—	C, D	×
B13D2:12*4	—	Front fog light relay circuit malfunction	—	—	C, D	×
B13FE:12*5	—	Headlight (LO) relay (LH) circuit malfunction	—	—	C, D	×
B13FE:14*5	—	Headlight (LO) relay (RH) circuit malfunction	—	—	C, D	×
B141E:12*5	—	Headlight (LO) relay (RH) circuit malfunction	—	—	C, D	×
B1C79:97	—	Washer motor switch circuit malfunction	—	—	C, D	×
B1C82:97*6	—	Headlight cleaner motor switch circuit malfunction	—	—	C, D	×
B1C84:12	—	Rear window defroster circuit malfunction	—	—	C, D	×
B1C84:14	—	Rear window defroster circuit malfunction	—	—	C, D	×
B1D06:11	—	Turn light (LH) circuit malfunction	—	—	C, D	×

DTC No.	Warning/ indicator light	Description	Fail-safe function	Drive cycle	Self test type*1	Memory function
B1D06:13	—	Turn light (LH) circuit malfunction	—	—	C, D	×
B1D07:11	—	Turn light (RH) circuit malfunction	—	—	C, D	×
B1D07:13	—	Turn light (RH) circuit malfunction	—	—	C, D	×
C1126:11	—	Parking light (LH/RH) circuit malfunction	—	—	C, D	×
C1126:13	—	Parking light (LH/RH) circuit malfunction	—	—	C, D	×
U0001:88	—	Module communication error (HS-CAN)	×	—	C, D	×
U0100:00	—	Communication error with PCM	×	—	C, D	×
U0101:00*7	—	Communication error with TCM	×	—	C, D	×
U0121:00	—	Communication error with DSC HU/CM	×	—	C, D	×
U0151:00*11	—	SAS control module communication error	×	—	C, D	×
U0155:00	—	Communication error with instrument cluster	×	—	C, D	×
U0164:68*8	—	Communication error between climate control unit	—	—	C, D	×
U0214:00	—	Communication error with start stop unit	×	—	C, D	×
U0231:68*3	—	Communication error with auto-light sensor/rain sensor	—	—	C, D	×
U023A:00*9	—	Communication error with forward sensing camera (FSC)	×	—	C, D	×
U0298:68	—	Communication error with DC-DC converter	—	—	C, D	×
U0338:09	—	Error signal received from start stop unit	—	—	C, D	×
U0401:68	—	Error signal received from PCM	—	—	C, D	×
U0415:68*10	—	Error signal received from DSC HU/CM	—	—	C, D	×
U0515:00*11	—	SAS control module communication error	×	—	C, D	×
U053B:68*9	—	Error signal received from forward sensing camera (FSC)	—	—	C, D	×
U0599:68	—	Error signal received from DC-DC converter	—	—	C, D	×
U1007:68	—	Communication error with current sensor	—	—	C, D	×
U2005:68	—	Error signal received from PCM	—	—	C, D	×
U2100:00	—	Front body control module (FBCM) configuration error	—	—	C, D	×
U2101:00	—	Front body control module (FBCM) configuration error	—	—	C, D	×
U3000:49	—	Front body control module (FBCM) internal malfunction	—	—	C, D	×
U3000:56	—	Front body control module (FBCM) configuration error	—	—	C, D	×
U3003:16	—	Front body control module (FBCM) power supply voltage (+B power supply) low input	—	—	C, D	×
U3003:17	—	Front body control module (FBCM) power supply voltage (+B power supply) high input	—	—	C, D	×
U3006:62	—	Front body control module (FBCM) power supply voltage mismatch	—	—	C, D	×

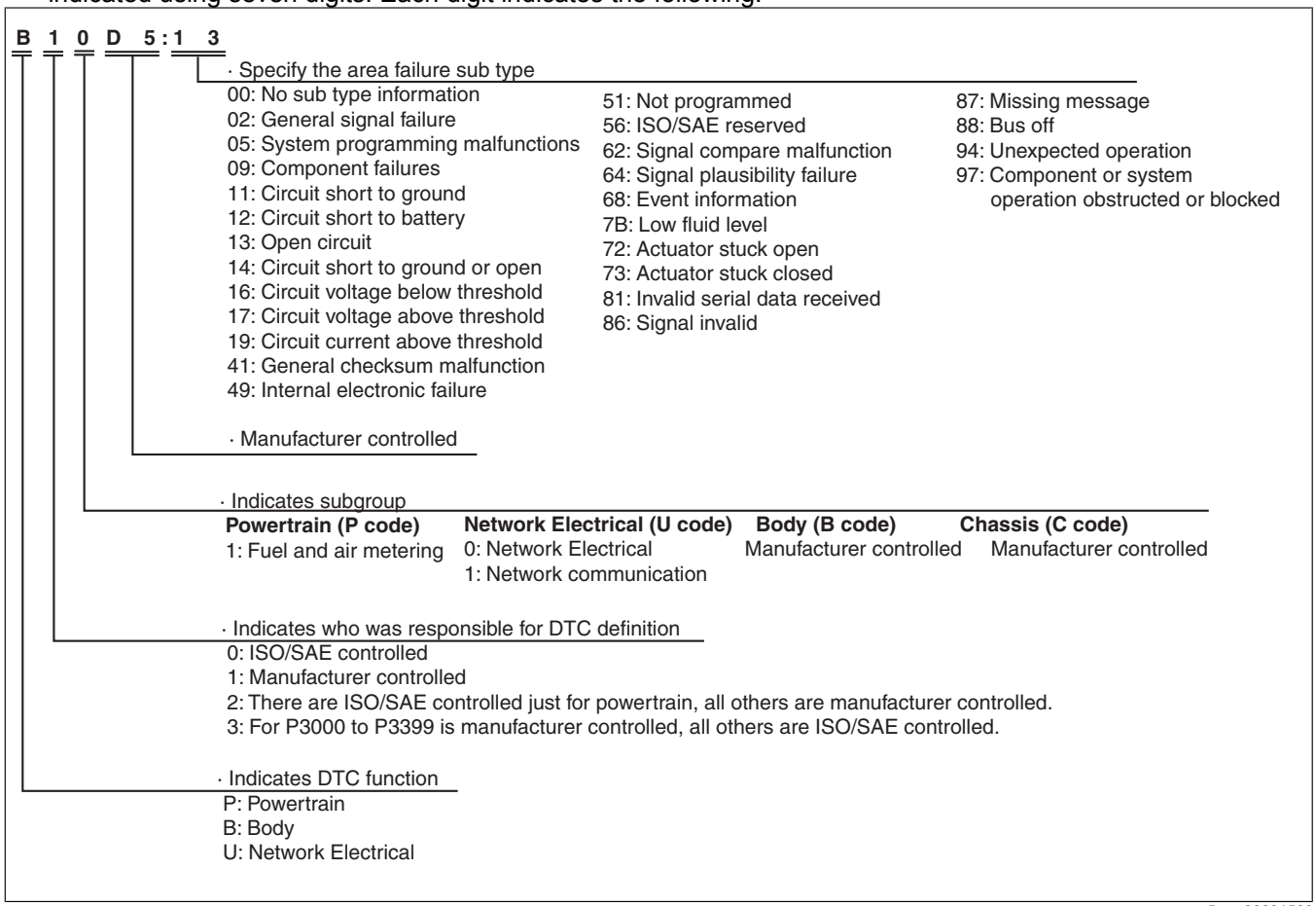
*1 : C: CMDTC self test, D:ODDTC self test
*2 : With headlights (halogen type)
*3 : With auto-light sensor
*4 : With front fog lights
*5 : With headlights (discharge type)
*6 : With headlight cleaner
*7 : ATX
*8 : With manual A/C
*9 : With forward sensing camera (FSC)

*10 : With emergency stop signal system (ESS)

*11 : Some vehicles are not displayed depending on vehicle's period of manufacture

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.



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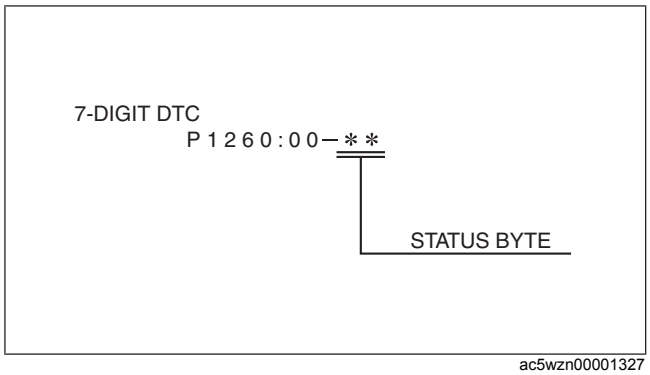
Status byte for DTC

- The status byte is the 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 Mazda Modular Diagnostic System (M-MDS) when reading the DTC.



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Detection condition for the applicable DTC

DTC	System malfunction location	Detection condition
B1008:02	Windshield wiper control signal mismatch	The front body control module (FBCM) receives error signals from the start stop unit with the ignition switched ON (engine off or on).
B1008:62	Windshield wiper (LO) switch signal mismatch	The front body control module (FBCM) and start stop unit signals are compared and it is detected that the signals do not match for 5 s or more with the ignition switched ON (engine off or on).

DTC	System malfunction location	Detection condition
B1048:7B	Brake fluid level sensor circuit malfunction	The front body control module (FBCM) detected that the brake fluid level is less than MIN with the ignition switched ON (engine off or on).
B1087:88	LIN communication error	LIN bus communication line malfunction detected for 1 s or more
B1088:88	LIN communication error	LIN bus communication line malfunction detected for 1 s or more
B1095:72	Autostop switch circuit malfunction	The front body control module (FBCM) detects that the autostop switch is stuck closed with the ignition switched ON (engine off or on).
B1095:73	Autostop switch circuit malfunction	The front body control module (FBCM) detects that the autostop switch is stuck open with the ignition switched ON (engine off or on).
B109A:12	Headlight (HI) relay circuit malfunction	The front body control module (FBCM) detects a short to power supply in the headlight HI relay circuit with the ignition switched ON (engine off or on).
B109A:14	Headlight (HI) relay circuit malfunction	The front body control module (FBCM) detects an open or short to ground in the headlight HI relay circuit with the ignition switched ON (engine off or on).
B10A6:64	Light switch error signal received	The front body control module (FBCM) receives error signals from the start stop unit for 5 s or more with the ignition switched ON (engine off or on).
B10A8:12*1	Headlight (LO) relay circuit malfunction	The front body control module (FBCM) detects a short to power supply in the headlight LO relay circuit with the ignition switched ON (engine off or on).
B10AD:86*2	Error signal received from auto-light sensor/ rain sensor	The front body control module (FBCM) receives error signals from the auto-light sensor/rain sensor 10 times continuously with the ignition switched ON (engine off or on).
B10AF:12	Blower relay circuit malfunction	The front body control module (FBCM) detects a short to power supply in the blower relay circuit with the ignition switched ON (engine off or on).
B1142:13	Front body control module (FBCM) power supply voltage (+IG1 power supply) input circuit malfunction	The front body control module (FBCM) detects an open circuit in the IG1 relay circuit for 2 s or more with the ignition switched ON (engine off or on).
B1143:13	IG2 power supply control circuit malfunction	The front body control module (FBCM) detects an open circuit in the start stop unit circuit for 2 s or more with the ignition switched ON (engine off or on).
B11DB:86	Error signal received from current sensor	The front body control module (FBCM) receives error signals from the current sensor for 5 s or more with the ignition switched ON (engine off or on).
B1314:11	Illumination output circuit malfunction	The front body control module (FBCM) detects a short to ground in the illumination output circuit with the ignition switched ON (engine off or on).
B134D:02	Headlight control signal malfunction	The condition in which the front body control module (FBCM) and start stop unit signals are compared and no match is detected between the signals for 5 s or more with the ignition switched ON (engine off or on).
B13AF:62	Headlight LO signal mismatch	The condition in which the CAN and module signals are compared and no match is detected between the signals for 5 s or more with the ignition switched ON (engine off or on).
B13CF:19	IG2 power supply output circuit malfunction	The front body control module (FBCM) detects over-current in IG2 power supply output circuit with the ignition switched ON (engine off or on).
B13D0:11	TNS relay circuit malfunction	The front body control module (FBCM) detects a short to ground in the TNS relay circuit with the ignition switched ON (engine off or on).
B13D2:12*3	Front fog light relay circuit malfunction	The front body control module (FBCM) detects a short to power supply in the front fog light relay circuit with the ignition switched ON (engine off or on).
B13FE:12*4	Headlight (LO) relay (RH) circuit malfunction	The front body control module (FBCM) detects a short to power supply in the headlight LO relay (RH) circuit with the ignition switched ON (engine off or on).

DTC	System malfunction location	Detection condition
B13FE:14*4	Headlight (LO) relay (RH) circuit malfunction	The front body control module (FBCM) detects an open or short circuit to ground in the headlight LO relay (RH) circuit with the ignition switched ON (engine off or on).
B141E:12*4	Headlight (LO) relay (LH) circuit malfunction	The front body control module (FBCM) detects a short to power supply in the headlight LO relay (LH) circuit with the ignition switched ON (engine off or on).
B1C79:97	Washer motor switch circuit malfunction	The front body control module (FBCM) detects a malfunction in the washer motor circuit for 2 min or more with the ignition switched ON (engine off or on).
B1C82:97*5	Headlight cleaner motor switch circuit malfunction	The front body control module (FBCM) detects a malfunction in headlight cleaner motor circuit for 2 min or more with the ignition switched ON (engine off or on).
B1C84:12	Rear window defroster circuit malfunction	The front body control module (FBCM) detects a short to power supply in the rear window defroster relay circuit with the ignition switched ON (engine off or on).
B1C84:14	Rear window defroster circuit malfunction	The front body control module (FBCM) detects an open or short to ground in the rear window defroster relay circuit with the ignition switched ON (engine off or on).
B1D06:11	Turn light (LH) circuit malfunction	The front body control module (FBCM) detects a short to ground in the turn light (LH) circuit with the ignition switched ON (engine off or on).
B1D06:13	Turn light (LH) circuit malfunction	The front body control module (FBCM) detects an open or short to power supply in the turn light (LH) circuit with the ignition switched ON (engine off or on).
B1D07:11	Turn light (RH) circuit malfunction	The front body control module (FBCM) detects a short to ground in the turn light (RH) circuit with the ignition switched ON (engine off or on).
B1D07:13	Turn light (RH) circuit malfunction	The front body control module (FBCM) detects an open or short to power supply in the turn light (RH) circuit with the ignition switched ON (engine off or on).
C1126:11	Parking light (LH/RH) circuit malfunction	The front body control module (FBCM) detects a short to ground in the parking light (LH/RH) circuit with the ignition switched ON (engine off or on).
C1126:13	Parking light (LH/RH) circuit malfunction	The front body control module (FBCM) detects an open or short to power supply in the parking light (LH/RH) circuit with the ignition switched ON (engine off or on).
U0001:88	Module communication error (HS-CAN)	The front body control module (FBCM) detects CAN bus communication line (HS-CAN) malfunction 10 times continuously.
U0100:00	Communication error with PCM	The front body control module (FBCM) could not receive CAN signal from the PCM for 5 s or more.
U0101:00*6	Communication error with TCM	The front body control module (FBCM) could not receive CAN signal from the TCM for 5 s or more.
U0121:00	Communication error with DSC HU/CM	The front body control module (FBCM) could not receive CAN signal from the DSC HU/CM for 5 s or more.
U0151:00*10	SAS control module communication error	The front body control module (FBCM) could not receive CAN signal from the SAS control module for 5 s or more.
U0155:00	Communication error with instrument cluster	The front body control module (FBCM) could not receive CAN signal from the instrument cluster for 5 s or more.
U0164:68*7	Communication error between climate control unit	The front body control module (FBCM) receives error signals from the climate control unit for 5 s or more with the ignition switched ON (engine off or on).
U0214:00	Communication error with start stop unit	The front body control module (FBCM) could not receive CAN signal from the start stop unit for 5 s or more.
U0231:68*2	Communication error with auto-light sensor/ rain sensor	The front body control module (FBCM) receives error signals from the auto-light sensor/rain sensor for 5 s or more with the ignition switched ON (engine off or on).
U023A:00*8	Communication error with forward sensing camera (FSC)	The front body control module (FBCM) could not receive CAN signal from the forward sensing camera (FSC) for 5 s or more.
U0298:68	Communication error with DC-DC converter	The front body control module (FBCM) detects a communication error with the DC-DC converter.

DTC	System malfunction location	Detection condition
U0338:09	Error signal received from start stop unit	The front body control module (FBCM) receives CAN error signals from the start stop unit 3 times with the ignition switched ON (engine off or on).
U0401:68	Error signal received from PCM	The front body control module (FBCM) receives error signals from the PCM for 5 s or more with the ignition switched ON (engine off or on).
U0415:68*9	Error signal received from DSC HU/CM	The front body control module (FBCM) receives error signals from the DSC HU/CM for 5 s or more with the ignition switched ON (engine off or on).
U053B:68*8	Error signal received from forward sensing camera (FSC)	The front body control module (FBCM) receives error signals from the forward sensing camera (FSC) for 5 s or more with the ignition switched ON (engine off or on).
U0515:00*10	SAS control module communication error	The front body control module (FBCM) could not receive CAN signal from the SAS control module for 5 s or more.
U0599:68	Error signal received from DC-DC converter	The front body control module (FBCM) receives error signals from the DC-DC converter for 5 s or more with the ignition switched ON (engine off or on).
U1007:68	Communication error with current sensor	The front body control module (FBCM) detects communication error with the current sensor for 5 s.
U2005:68	Error signal received from PCM	The front body control module (FBCM) receives vehicle speed signal error from the PCM for 5 s or more with the ignition switched ON (engine off or on).
U2100:00	Front body control module (FBCM) configuration error	Front body control module (FBCM) configuration error detected.
U2101:00	Front body control module (FBCM) configuration error	Front body control module (FBCM) configuration error detected.
U3000:49	Front body control module (FBCM) internal malfunction	Malfunction inside front body control module (FBCM) detected.
U3000:56	Front body control module (FBCM) configuration error	Front body control module (FBCM) configuration error detected.
U3003:16	Front body control module (FBCM) power supply voltage (+B power supply) low input	Front body control module (FBCM) power supply circuit voltage of 9 V or less is detected for 10 s or more with the ignition switched ON (engine off or on).
U3003:17	Front body control module (FBCM) power supply voltage (+B power supply) high input	Front body control module (FBCM) power supply circuit voltage of 14.2 V or more is detected for 10 s or more with the ignition switched ON (engine off or on).
U3006:62	Front body control module (FBCM) power supply voltage mismatch	Any voltage detected at front body control module (FBCM) terminals 2A, 1A, 1B, 3K, and 3L is 3V or less for 5 s or more with the ignition switched ON (engine off or on).

*1 : With headlights (halogen type)
*2 : With auto-light sensor
*3 : With front fog lights
*4 : With headlights (discharge type)
*5 : With headlight cleaner
*6 : ATX
*7 : With manual A/C
*8 : With forward sensing camera (FSC)
*9 : With emergency stop signal system (ESS)
*10 : Some vehicles are not displayed depending on vehicle's period of manufacture

Snapshot data
- The data for all DTCs currently detected is stored.

Snapshot data

—: Not applicable

Snapshot data item	Unit		Data contents	Data read/use method	Corresponding data monitor items
AAT	°C	°F	Ambient temperature	—	—

Snapshot data item	Unit	Data contents	Data read/use method	Corresponding data monitor items
APP_STATUS	Accelerator Pedal Off/Under20%/ Over20%/FAIL	Accelerator pedal position status	—	—
CFG_STATUS	Config Complete/ Not Configured/ Config Error	Instrument cluster configuration status	—	—
ECT_STATUS	Under 0 degrees C/ 0 - Under 80 degrees C/Over 80 degrees C/FAIL	Engine coolant temperature status	—	—
IC_VPWR	V	Instrument cluster power supply voltage	• The front body control module (FBCM) constantly receives the power supply voltage value of the instrument cluster sent via CAN signal from the instrument cluster. • If a DTC is detected, the front body control module (FBCM) records the power supply voltage of the instrument cluster when the DTC was detected, and it is displayed in the M-MDS.	VPWR*1
IG-ON_TIMER	hh:mm:ss*2	Elapsed time since ignition was switched ON (engine off or on) **Note** • The instrument cluster records the elapsed time since the ignition was switched ON (engine off or on).	• The front body control module (FBCM) constantly receives the elapsed time since the ignition was switched ON (engine off or on) sent via CAN signal from the instrument cluster. • If a DTC is detected, the front body control module (FBCM) records the elapsed time since the ignition was switched ON (engine off or on) when the DTC was detected, and it is displayed in the M-MDS.	—
PWR_MODE_KEY	Key Out/Key Recently Out (Position 0)/ Accessory (Position 1)/Post Ignition (Position 2)/Ignition On (Position 2)/ Running (Position 2)/Running - Starting	• Key Out: Ignition switched off • Key Recently Out (Position 0): Elapsed time **within 3 s** since ignition was switched off • Accessory (Position 1): Ignition is switched to ACC • Post Ignition (Position 2): Elapsed time **within 3 s** since ignition was switched ON (engine off or on) • Ignition On (Position 2): Ignition switched ON (engine off) • Running (Position 2): Ignition switched ON (engine on) • Running - Starting: Cranking condition	• The front body control module (FBCM) constantly receives the ignition switch status sent via CAN signal from the instrument cluster. • If a DTC is detected, the front body control module (FBCM) records the ignition switch status when the DTC was detected, and it is displayed in the M-MDS.	—

Snapshot data item	Unit		Data contents	Data read/use method	Corresponding data monitor items
RPM_STATUS	Engine Stop/ Under1500rpm/ Over1500rpm/FAIL		Engine speed status	• The front body control module (FBCM) constantly receives the engine speed sent via CAN signal from the instrument cluster. • If a DTC is detected, the front body control module (FBCM) records the engine speed when the DTC was detected, and it is displayed in the M-MDS.	TACHOMTR*1
SHIFT_STATUS	P/N/D/R/FAIL		Selector lever position status	• The front body control module (FBCM) constantly receives the selector lever position sent via CAN signal from the instrument cluster. • If a DTC is detected, the front body control module (FBCM) records the selector lever position when the DTC was detected, and it is displayed in the M-MDS.	—
TOTAL_DIST	km	Miles	Accumulated total traveled distance from completion of vehicle until front body control module (FBCM) detects DTC (Odometer value in instrument cluster)	The total traveled distance from which the front body control module (FBCM) detects DTCs to the present can be calculated by performing the following procedure. 1. Verify the odometer value in the instrument cluster. 2. Verify the snapshot data item TOTAL_DIST. 3. Subtract 2 from 1.	—
TOTAL_TIME	hh:mm:ss*2		Accumulated total elapsed time since vehicle completion until front body control module (FBCM) detects a DTC **Note** • When the ROOM fuse is removed, and the ignition is switched off, the time is not included in the elapsed time.	The elapsed time from which the front body control module (FBCM) detects DTCs to the present can be calculated by performing the following procedure. 1. Verify the instrument cluster PID item TOTAL_TIME. 2. Verify the snapshot data item TOTAL_TIME. 3. Subtract 2 from 1.	TOTAL_TIME*1
VPWR	V		Front body control module (FBCM) power supply voltage	—	VPWR_B

Snapshot data item	Unit	Data contents	Data read/use method	Corresponding data monitor items
VSPD_STATUS	Stop/0-10km/h/ Over10km/h/FAIL	Vehicle speed status	• The front body control module (FBCM) constantly receives the vehicle speed sent via CAN signal from the instrument cluster. • If a DTC is detected, the front body control module (FBCM) records the vehicle speed when the DTC was detected, and it is displayed in the M-MDS.	SPEEDOMTR* 1

*1 : Instrument cluster PID (See ON-BOARD DIAGNOSTIC [INSTRUMENT CLUSTER].)
*2 : The seconds may be indicated after the decimal point.

Data monitor function

- With the PID/data monitor function, input/output signal monitor items set in the front body control module (FBCM) can be selected and read out in real-time.

PID/data monitor table

PID	Unit/ Operation	Data contents	Data read/use method	Inspection item (s)
ABK_CS_BG	Off/On	• Off: Theft-deterrent system answer-back signal is not received. • On: Theft-deterrent system answer-back signal is received.	—	• Front body control module (FBCM) • Rear body control module (RBCM) • Start stop unit
ABK_CS_KEY*1	Off/On	• Off: Advanced keyless entry system answer-back signal is not received. • On: Advanced keyless entry system answer-back signal is received.	—	• Front body control module (FBCM) • Rear body control module (RBCM) • Start stop unit
ABK_HN_KEY*1	Off/On	• Off: Keyless entry system horn answer-back signal is not received. • On: Keyless entry system horn answer-back signal is received.	—	• Front body control module (FBCM) • Rear body control module (RBCM) • Start stop unit
BAT_TMP	°C, °F	Battery temperature is displayed.	—	Battery
BG_ALARM_CS*2	Off/On	• Off: Theft-deterrent system alarm signal is not received. • On: Theft-deterrent system alarm signal is received.	—	• Front body control module (FBCM) • Rear body control module (RBCM)
BLWR_MT_RY	Off/On	• Off: Blower relay is off. • On: Blower relay is on.	—	Blower relay
BRAKE_SW	Off/On	• Off: Brake switch (No. 2) is off. (Brake pedal is depressed.) • On: Brake switch (No. 2) is on. (Brake pedal is not depressed.)	—	• Brake switch • PCM • TCM

PID	Unit/ Operation	Data contents	Data read/use method	Inspection item (s)
BRK_F_L_SW	Normal/ Low/ Reserved/ Unknown	• Normal: Brake fluid level is between MAX and MIN. • Low: Brake fluid level is lower than MIN. • Reserved: - • Unknown: Brake fluid level is not determined.	—	Brake fluid level sensor
DCDC_CVT_ST	Wake_Up/ Bypass/ Boost_1/ Boost_2/ Boost_3/ Error/ Default	DC-DC converter status	—	DC-DC converter
DCDC_VLT_I	V	DC-DC converter input voltage is displayed.	—	DC-DC converter
DCDC_VLT_O	V	DC-DC converter output voltage is displayed.	—	DC-DC converter
DEFOG_R_CS	Off/On	• Off: Rear window defroster control signal is not received. • On: Rear window defroster control signal is received.	—	• Front body control module (FBCM) • Climate control unit
ENG_C_TMP	°C, °F	Engine coolant temperature is displayed.	—	• ECT sensor • PCM
ESS_ST	Off/On	• Off: ESS is not operated. • On: ESS is operated.	—	• Front body control module (FBCM) • DSC HU/CM
F_FOG_LMP*3	Off/On	• Off: Front fog light is turned off. • On: Front fog light is turned on.	—	Front fog light
F_FOG_SW*3	Off/On	• Off: Front fog light switch is not in F.FOG position • On: Front fog light switch is in F.FOG position	—	• Front fog light switch • Start stop unit
H/L	OFF/ DRL*12/ TNS/H/ L_LOW/H/ L_HI	• OFF: Headlight is turned off. • DRL: Running light is turned on. • TNS: TNS is turned on. • H/L_LOW: Headlight (LO) is turned on. • H/L_HI: Headlight (HI) is turned on.	—	• Headlight relay (HI/LO) • Parking light • Taillight • License plate light • Running light
H/L_CLN_RY*4	Off/On	• Off: Headlight cleaner relay is off. • On: Headlight cleaner relay is on.	—	• Front body control module (FBCM) • Headlight cleaner relay
H/L_CS_RLS	Off/ TNS_On/ TNS+H/L_On	• Off: TNS and headlight on request signal is not received from auto-light sensor. • TNS_On: TNS on signal is received from auto-light sensor. • TNS+H/L_On: TNS and headlight LO on signal is received from auto-light sensor.	—	Auto-light sensor
H/L_HI	Off/On	• Off: Headlight HI is turned off. • On: Headlight HI is turned on.	—	Headlight HI
H/L_SW_HI	Off/On	• Off: Light switch is in LO position. • On: Light switch is in HI position.	—	• Light switch • Start stop unit

PID	Unit/ Operation	Data contents	Data read/use method	Inspection item (s)
H/ L_SW_LOW1	Off/On	Displays dimmer switch position of light switch sent from start stop unit via CAN signal • Off: Other than dimmer switch LO position of light switch is received • On: Dimmer switch LO position of light switch is received	Verify if the monitor value switches when the dimmer switch of the light switch is switched between LO and HI positions. If the dimmer switch operation and monitor values do not match, inspect the start stop unit or CAN communication. **Note** • If PID items H/ L_SW_LOW1 and H/ L_SW_LOW2 do not match, the front body control module (FBCM) detects a DTC. Also, the headlight (low) may be constantly illuminated.	• Light switch • Start stop unit
H/ L_SW_LOW2	Off/On	Displays dimmer switch position of light switch connected to front body control module (FBCM) terminal 2W • Off: Other than dimmer switch LO position of light switch is received • On: Dimmer switch LO position of light switch is received	Verify if the monitor value switches when the dimmer switch of the light switch is switched between LO and HI positions. If the dimmer switch operation and monitor values do not match, inspect the light switch or related wiring harness. **Note** • If PID items H/ L_SW_LOW1 and H/ L_SW_LOW2 do not match, the front body control module (FBCM) detects a DTC. Also, the headlight (low) may be constantly illuminated.	• Light switch • Start stop unit
H/ L_SW_OFF	Off/On	• Off: Light switch is not in OFF position • On: Light switch is in OFF position	—	• Light switch • Start stop unit
H/ L_SW_PASS	Off/On	• Off: Light switch is not in passing position • On: Light switch is in passing position	—	• Light switch • Start stop unit
H/ L_SW_TNS	Off/On	• Off: Light switch is not in TNS position • On: Light switch in TNS position	—	• Light switch • Start stop unit
H/L_TNS	Off/On	• Off: TNS is turned off. • On: TNS is turned on.	—	• Parking light • Taillight • License plate lights
HAZARD_LMP	Off/On	• Off: Hazard light is turned off. • On: Hazard light is turned on.	—	• Front turn light • Side turn lights • Rear turn light
HAZARD_SW	Off/On/ Unknown	• Off: Hazard warning switch is not pressed. • On: Hazard warning switch is pressed. • Unknown: Hazard warning switch on/off is not determined.	—	• Hazard warning switch • Start stop unit
HBC_CS*6	Off/On/ Invalid	• Off: High beam control (HBC) system signal is not received. • On: High beam control (HBC) system signal is received. • Invalid: High beam control (HBC) system signal has error.	—	Forward sensing camera (FSC)

PID	Unit/ Operation	Data contents	Data read/use method	Inspection item (s)
HBC_ST*6	Off/On	• Off: High beam control (HBC) system is not operated. • On: High beam control (HBC) system is operated.	—	Forward sensing camera (FSC)
IG_ST	Off/On	• Off: IG1 is off. • On: IG1 is on.	—	• IG1 relay • PCM • Start stop unit
L_OFF_AUTO*13	Off/On	• Off: TNS or headlight off control by auto-light off system is not operated. • On: TNS or headlight off control by auto-light off system is operated.	—	• Front body control module (FBCM) • Auto light sensor
L_OFF_BS	Off/On	**Note** • Displays in the M-MDS but it does not operate.	—	Front body control module (FBCM)
OIL_P_SW	Off (Normal)/ On(Low)	**Note** • Displays in the M-MDS but it does not operate.	—	Oil pressure switch
OUT_CAR_TMP	°C, °F	Ambient temperature is displayed.	—	• Ambient temperature sensor • PCM
P_BRAKE_SW	Off/On	• Off: Parking brake switch is off. (Parking brake lever is not pulled.) • On: Parking brake switch is on. (Parking brake lever is pulled.)	—	• Parking brake switch • Instrument cluster
PNC_CS	Off/On	• Off: Panic control signal is not received. • On: Panic control signal is received.	—	• Front body control module (FBCM) • Rear body control module (RBCM)
PTC_HEAT_CS*7	Off/On	• Off: PTC heater control signal is not received. • On: PTC heater control signal is received.	—	PTC heater
R_FOG_LMP*8	Off/On	• Off: Rear fog light is turned off. • On: Rear fog light is turned on.	—	• Rear fog light • Instrument cluster • Front body control module (FBCM) • Rear body control module (RBCM)
R_FOG_SW*8	Off/On	• Off: Rear fog light switch is not in R.FOG position • On: Rear fog light switch is in R.FOG position	—	• Rear fog light switch • Start stop unit
RLS_FLT*5	O.K./ FAULT	• OK: Rain sensor is normal. • FAULT: Rain sensor has a malfunction.	—	Rain sensor
S_HT_CUT *9	No_Request/Cut	• No_Request: Except below • Cut: Seat warmer is turned off or lowered.	—	Front body control module (FBCM)
SHIFT_L_POS*10	Between/P/ R/N/D/S (2)//L(1)	• Between: Selector lever is between two positions • P: Selector lever is in P position • R: Selector lever is in R position • N: Selector lever is in N position • D: Selector lever is in D position • S (2): Selector lever is in D position 2nd gear • L (1): Selector lever is in D position 1st gear	—	TCM
TURN_L_L	Off/On	• Off: Turn light (LH) is turned off. • On: Turn light (LH) is turned on.	—	• Front turn light • Side turn lights • Rear turn light

PID	Unit/ Operation	Data contents	Data read/use method	Inspection item (s)
TURN_L_R	Off/On	• Off: Turn light (RH) is turned off. • On: Turn light (RH) is turned on.	—	• Front turn light • Side turn lights • Rear turn light
TURN_SW	Off/ Turn_R_On / Turn_L_On /Unknown	• Off: Turn switch is in OFF position • Turn_R_On: Turn switch is in RH position • Turn_L_On: Turn switch is in LH position • Unknown: Turn switch position is not determined	—	• Turn Switch • Start stop unit
VPWR_B	V	Front body control module (FBCM) power supply voltage is displayed.	—	Front body control module (FBCM)
VSPD	KPH, MPH	Vehicle speed is displayed.	—	PCM
WAS_FLUID_L*11	Normal/ Low/ Reserved/ Unknown	• Normal: Washer fluid level is normal. • Low: Washer fluid level is low. • Reserved: — • Unknown: Washer fluid level is not determined.	—	Washer fluid-level sensor
WAS_MT_RY_F	Off/On	• Off: Front washer motor relay is off. • On: Front washer motor relay is on.	—	Front body control module (FBCM)
WAS_MT_RY_R	Off/On	• Off: Rear washer motor relay is off. • On: Rear washer motor relay is on.	—	Front body control module (FBCM)
WASHER_F	Off/On	• Off: Front washer switch is off • On: Front washer switch is on	—	• Windshield washer switch • Start stop unit
WASHER_R	Off/On	• Off: Rear wiper and washer switch is not in rear washer position • On: Rear wiper and washer switch is in rear washer position	—	• Rear wiper and washer switch • Start stop unit
WIP_CS_RLS*5	Off/ Single_Wipe/ F_Wiper_LOW/ F_Wiper_HI/Failure	• Off: Wiper operation signal is not received from rain sensor. • Single_Wipe: Signal to operate wiper once is received from rain sensor. • F_Wiper_LOW: Signal to operate wiper at low speed is received from rain sensor. • F_Wiper_HI: Signal to operate wiper at high speed is received from rain sensor. • Failure: Communication with rain sensor is failed.	—	Rain sensor
WIP_F	OFF/LOW/ HI/INT / AUTO	• OFF: Windshield wiper switch is in OFF position • LOW: Windshield wiper switch is in LO position • HI: Windshield wiper switch is in HI position • INT / AUTO: Windshield wiper switch is in INT or AUTO position	—	• Windshield wiper switch • Start stop unit
WIP_F_INT_L	%	Windshield wiper INT level signal value received.	—	• Windshield wiper switch • Start stop unit
WIP_F_LOW	Off/On	• Off: Windshield wiper switch is not in LO position. • On: Windshield wiper switch is in LO position.	—	• Windshield wiper switch • Start stop unit
WIP_F_MST	Stop/Move	• Stop: Autostop switch is on. • Move: Autostop switch is off.	—	Windshield wiper motor
WIP_F_RY_HI	Off/On	• Off: Windshield wiper high relay is off. • On: Windshield wiper high relay is on.	—	Front body control module (FBCM)
WIP_F_RY_LO	Off/On	• Off: Windshield wiper low relay is off. • On: Windshield wiper low relay is on.	—	Front body control module (FBCM)
WIP_R	OFF/LOW/ INT	• OFF: Rear wiper switch is in OFF position • LOW: Rear wiper switch is in ON position • INT: Rear wiper switch is in INT position	—	• Rear wiper switch • Start stop unit

PID	Unit/ Operation	Data contents	Data read/use method	Inspection item (s)
WIP_R_RY	Off/On	• Off: Rear wiper motor is not operated. • On: Rear wiper motor is operated.	—	• Rear wiper motor • Instrument cluster • Rear body control module (RBCM)

*1 : With advanced keyless entry system
*2 : With theft-deterrent system
*3 : With front fog lights
*4 : With headlight cleaner
*5 : With auto-light sensor
*6 : With high beam control (HBC) system
*7 : With PTC heater
*8 : With rear fog light
*9 : With seat warmer
*10 : ATX
*11 : With washer fluid-level sensor
*12 : With running light
*13 : With auto light system

Active Command Modes Function

- The active command modes are shown below.

Simulation item	Unit/ Operation	Data contents	Output part name
DEFOG_R_ST	Off/On	• Off: Stops rear window defroster. • On: Operates rear window defroster.	Filament
ESS_ST	Off/On	• Off: Stops ESS. • On: Operates ESS.	Front body control module (FBCM)
F_FOG_LMP*1	Off/On	• Off: Turns off front fog light. • On: Illuminates front fog light.	Front fog light
H/L	OFF/DRL/ TNS/H/ L_LOW/H/ L_HI	• Off: Turns off headlights. • DRL: Illuminates running light.*3 • TNS: Illuminates TNS. • H/L_LOW: Illuminates headlights LO. • H/L_HI: Illuminates headlights HI.	• Headlight LO/HI • Parking light • Taillight • License plate light • Running light
H/L_CLN_RY*2	Off/On	• Off: Turns headlight cleaner relay off. • On: Turns headlight cleaner relay on.	Front body control module (FBCM)
HAZARD_LMP	Off/On	• Off: Turns off hazard warning light. • On: Flashes hazard warning light.	• Front turn light • Side turn lights • Rear turn light
PTC_HEAT_ST*4	0%/10%/ 20%/30%/ 40%/50%/ 60%/70%/ 80%	• 0%: Stops PTC heater output. • 10%: Controls PTC heater output level to 10%. • 20%: Controls PTC heater output level to 20%. • 30%: Controls PTC heater output level to 30%. • 40%: Controls PTC heater output level to 40%. • 50%: Controls PTC heater output level to 50%. • 60%: Controls PTC heater output level to 60%. • 70%: Controls PTC heater output level to 70%. • 80%: Controls PTC heater output level to 80%.	PTC heater
WAS_MT_RY_F	Off/On	• Off: Turns front washer motor relay off. • On: Turns front washer motor relay on.	Front body control module (FBCM)
WAS_MT_RY_R	Off/On	• Off: Turns rear washer motor relay off. • On: Turns rear washer motor relay on.	Front body control module (FBCM)

*1 : With front fog lights
*2 : With headlight cleaner
*3 : With running light
*4 : With PTC heater