

## ON-BOARD DIAGNOSTIC

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### Features

- The CAN system-related modules have an on-board diagnostic function. The on-board diagnostic function consists of the following functions: A malfunction detection function, which detects malfunctions in the CAN system-related parts; a memory function, which stores detected DTCs; a display function, which indicates malfunctioning areas and status via DTC display.

### On-board diagnostic function

#### Malfunction detection function

- Detects errors in the input and output signals.
- If a malfunction is detected, a DTC is output to the DLC-2 through the malfunction indication function. At the same time, malfunction detection results are sent to the memory function.

#### Memory function

- The memory function stores malfunctions in input/output signal systems. With this function, malfunction data is not cleared after the ignition is switched off (LOCK), even if the malfunctioning signal system has returned to normal.
- The stored malfunction information can be cleared by connecting the Mazda Modular Diagnostic System (M-MDS) to the DLC-2 following the Workshop Manual procedure for clearing codes.

#### Display Function

- This function is for outputting present or past malfunctions via the DLC-2 as DTCs.
- To read DTCs output to the DLC-2, use the Mazda Modular Diagnostic System (M-MDS).

#### DTC table (HS-CAN)

DTC output module (Mazda Modular Diagnostic System (M-MDS) display)	DTC	Malfunction location
PCM*1 (PCM)	U0073:00	Unit communication error
	U0101:00	Communication error with TCM
	U0121:00	Communication error with DSC HU/CM
	U0131:00	Communication error with EPS control module
	U0140:00	Communication error with front body control module (FBCM)
	U0151:00	Communication error with SAS control module
	U0155:00	Communication error with instrument cluster
	U0214:00	Communication error with start stop unit
PCM*2 (PCM)	U0073:00	Unit communication error
	U0101:00	Communication error with TCM
	U0120:00	Communication error with start stop unit
	U0121:00	Communication error with DSC HU/CM
	U0131:00	Communication error with EPS control module
	U0140:00	Communication error with front body control module (FBCM)
	U0151:00	Communication error with SAS control module
	U0155:00	Communication error with instrument cluster
DSC HU/CM (ABS)	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0101:00	Communication error with TCM
	U0114:00	Communication error with 4WD control module
	U0131:00	* Communication error with EPS control module* <sup>8</sup> * Communication error with start stop unit* <sup>9</sup>
	U0154:00	Communication error with SAS control module
	U0155:00	Communication error with instrument cluster
	U0235:00	Communication error with laser sensor
TCM*3 (TCM)	U0073:00	Unit communication error
	U0100:00	Communication error with PCM
	U0121:00	Communication error with DSC HU/CM
	U0141:00	Communication error with front body control module (FBCM)
	U0155:00	Communication error with instrument cluster

DTC output module (Mazda Modular Diagnostic System (M-MDS) display)	DTC	Malfunction location
AFS control module *4 (AFS)	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0131:00	Communication error with EPS control module
	U0140:00	Communication error with front body control module (FBCM)
	U0155:00	Communication error with instrument cluster
Front body control module (FBCM) (F_BCM)	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0101:00	Communication error with TCM
	U0121:00	Communication error with DSC HU/CM
	U0155:00	Communication error with instrument cluster
	U0214:00	Communication error with start stop unit
4WD control module *5 (4×4)	U0515:00	Communication error with SAS control module
	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0101:00	Communication error with TCM
Laser sensor *6 (SCBS)	U0121:00	Communication error with DSC HU/CM
	U0131:00	Communication error with EPS control module
	U0155:00	Communication error with instrument cluster
	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
Forward sensing camera *7 (FSC)	U0101:00	Communication error with TCM
	U0121:00	Communication error with DSC HU/CM
	U0131:00	Communication error with EPS control module
	U0140:00	Communication error with front body control module (FBCM)
	U0155:00	Communication error with instrument cluster
	U0214:00	Communication error with start stop unit
Start stop unit (SSU)	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0101:00	Communication error with TCM
	U0121:00	Communication error with DSC HU/CM
	U0121:87	Communication error with DSC HU/CM
	U0131:00	Communication error with EPS control module
	U0140:00	Communication error with front body control module (FBCM)
	U0146:00	Communication error with instrument cluster
	U0151:00	Communication error with SAS control module
EPS control module (EPS)	U0155:00	Communication error with instrument cluster
	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0121:00	Communication error with DSC HU/CM
SAS control module (RCM)	U0155:00	Communication error with instrument cluster
	U0001:88	Unit communication error
Instrument cluster (IC)	U0155:00	Communication error with instrument cluster
	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0101:00	Communication error with TCM
	U0114:00	Communication error with 4WD control module
	U0121:00	Communication error with DSC HU/CM
	U0131:00	Communication error with EPS control module
	U0140:00	Communication error with front body control module (FBCM)
	U0151:00	Communication error with SAS control module
	U0182:00	Communication error with AFS control module
	U0214:00	Communication error with start stop unit
	U0235:00	Communication error with laser sensor
	U023A:00	Communication error with forward sensing camera

\*1 : SKYACTIV-G 2.0, SKYACTIV-G 2.5

\*2 : SKYACTIV-D 2.2

\*3 : ATX vehicles

- \*4 : With AFS system  
 \*5 : 4WD vehicles  
 \*6 : With smart city brake support  
 \*7 : With hi-beam control (HBC) system  
 \*8 : Without smart city brake support or steering angle sensor  
 \*9 : With smart city brake support or steering angle sensor

#### DTC table (MS-CAN)

DTC output module (M-MDS display)	DTC	Malfunction location
Rear body control module (RBCM) (R_BCM)	U0010:88	Unit communication error
	U0155:00	Communication error with instrument cluster
BSM control module (LH)*1 (BSML)	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0131:00	Communication error with EPS control module
	U0155:00	Communication error with instrument cluster
	U0214:00	Communication error with start stop unit
	U0233:00	Communication error with BSM control module (RH)
BSM control module (RH)*1 (BSMR)	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0131:00	Communication error with EPS control module
	U0155:00	Communication error with instrument cluster
	U0214:00	Communication error with start stop unit
	U0232:00	Communication error with BSM control module (LH)
Rear vehicle monitoring control module (RH)*2 (RVM)	U0001:88	Unit communication error
	U0100:00	Communication error with PCM
	U0121:00	Communication error with DSC HU/CM
	U0155:00	Communication error with instrument cluster
Climate control unit*3 (EATC)	U0010:88	Unit communication error
	U0155:00	Communication error with instrument cluster
Audio unit*4 (ACU)	U0010:88 (16:Er12)	Unit communication error
	U0142:00	Communication error with rear body control module (RBCM)
	U0155:00	Communication error with instrument cluster
Instrument cluster (IC)	U0010:88	Unit communication error
	U0142:00	Communication error with rear body control module (RBCM)
	U0232:00	Communication error with rear vehicle monitoring control module (RH)
	U0233:00	Communication error with BSM control module (RH)

- \*1 : With BSM system  
 \*2 : With rear vehicle monitoring system  
 \*3 : With full-auto air conditioner  
 \*4 : With audio unit

#### Malfunction diagnosis procedure

- After the vehicle is brought in, verify the repair order form and the malfunctioning symptom, and if a CAN malfunction is considered to be the cause, perform CAN malfunction diagnosis to determine if the malfunction is in the CAN system or not.
- For CAN malfunction diagnosis, the voltage at the CAN connection terminal on the DLC-2 is measured, and based on the measured value, the CAN circuit can be examined or the malfunction symptom can be determined.
- If the malfunction symptom is not an open circuit, inspect the voltage or continuity at the CAN circuit and determine the malfunctioning part.
- If the malfunction symptom is an open circuit, determine the area of the open circuit by using the displayed communication error DTC and the module in which communication has failed.

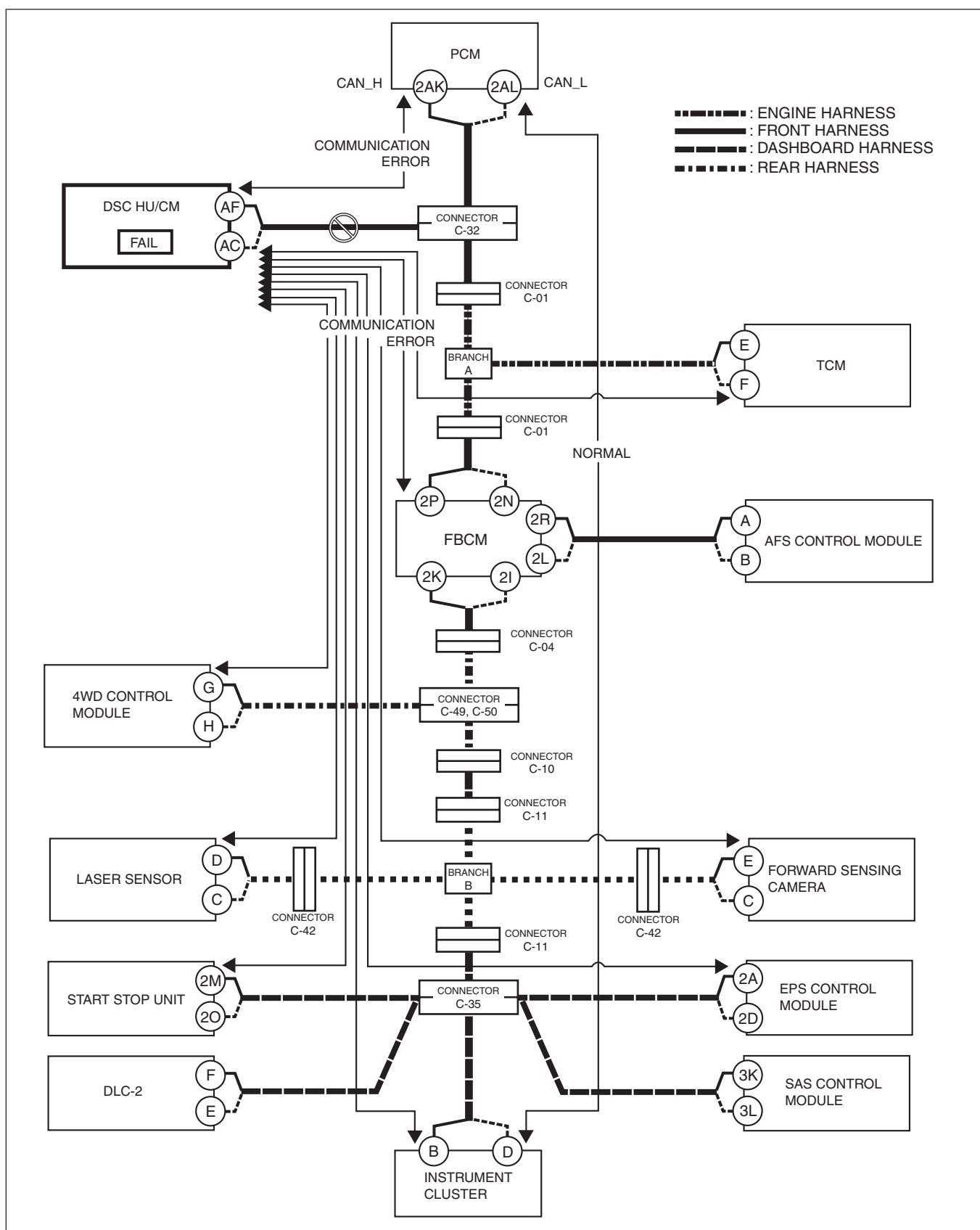
#### Example: determining open circuit location

1. Verify the CAN system-related module DTCs and the failed module using the Mazda Modular Diagnostic System (M-MDS).

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DTC output module	Mazda Modular Diagnostic System (M- MDS) display	Displayed DTC	System malfunction location
PCM	PCM	U0121:00	Communication error with DSC HU/CM
TCM	TCM	U0121:00	Communication error with DSC HU/CM
Front body control module (FBCM)	F_BCM	U0121:00	Communication error with DSC HU/CM
4WD control module	4×4	U0121:00	Communication error with DSC HU/CM
Laser sensor	SCBS	U0121:00	Communication error with DSC HU/CM
Forward sensing camera	FSC	U0121:00	Communication error with DSC HU/CM
Start stop unit	SSU	U0121:00	Communication error with DSC HU/CM
EPS control module	EPS	U0121:00	Communication error with DSC HU/CM
Instrument cluster	IC	U0121:00	Communication error with DSC HU/CM

Module	Fail
DSC HU/CM	×



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- Despite normal communication between the PCM and instrument cluster, a communication error DTC is displayed for the signal between the DSC HU/CM and PCM / TCM / front body control module (FBCM) / 4WD control module / laser sensor / forward sensing camera / start stop unit / EPS control module / instrument cluster. In addition, the wiring harness between the DSC HU/CM and connector C-32 is considered to be malfunctioning because "Fail" is displayed for the DSC HU/CM.