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2013 Mazda MX-5 Miata Service and Repair Manual

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Step	Inspection	Results	Action
3	INSPECT CHARGING SYSTEM • Are the generator and drive belt tension normal? (See GENERATOR INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See GENERATOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See GENERATOR INSPECTION [SKYACTIV-D 2.2].) (See GENERATOR INSPECTION [SKYACTIV-G 2.5T].) (See DRIVE BELT INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See DRIVE BELT INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See DRIVE BELT INSPECTION [SKYACTIV-D 2.2].) (See DRIVE BELT INSPECTION [SKYACTIV-G 2.5T].)	Yes	Go to the next step.
		No	Replace the generator and/or drive belt if necessary. Go to Step 7. (See GENERATOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See GENERATOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See GENERATOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) (See GENERATOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].) (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) (See DRIVE BELT REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)
4	INSPECT FUSE CONDITION • Is the fuse (EPAS 60 A) normal?	Yes	Go to the next step.
		No	Replace the fuse, then go to Step 7.
5	INSPECT EPS CONTROL MODULE POWER SUPPLY CIRCUIT FOR OPEN OR SHORT CIRCUIT • Start the engine. • Measure the voltage between following EPS control module terminal (wiring harness-side) and ground. — EPS control module: 1B−ground • Is the voltage 8 V or more?	Yes	Go to the next step.
		No	Repair or replace the wiring harness (including fuse) between the EPS control module and ground, then go to Step 7.
6	INSPECT EPS CONTROL MODULE GROUND CIRCUIT FOR POOR GROUND OR OPEN CIRCUIT • Switch the ignition off. • Inspect for continuity between EPS control module terminal 1A and body ground. • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between terminal 1A and body ground, then go to the next step.

PID name (definition) M-MDS display	Unit/Operation	Operation Status (Reference)	Inspection item(s)	EPS control module terminal
OH_IG_CNT_C	–	• The number of times the ignition is switched ON during the period from when overheat protection control (complete) is finished to the time the next overheat protection control (complete) is started — Displays a maximum number of 255 times in which the ignition is switched ON until the first overheat protection control (complete) is started. — During overheat protection control (complete), the number of times the ignition is switched ON is not counted, and 0 is displayed.	–	–
OH_IG_CNT_M	–	• The number of times the ignition is switched ON during the period from when overheat protection control (middle) is finished to the time the next overheat protection control (middle) is started — Displays a maximum number of 255 times in which the ignition is switched ON until the first overheat protection control (middle) is started. — During overheat protection control (middle), the number of times the ignition is switched ON is not counted, and 0 is displayed.	–	–

(2)Select “Modules”.

(3)Select “EPS”.

5.Verify the DTC according to the directions on the screen.

6.Press the clear button on the DTC screen to clear the DTC.

7.Perform DTC inspection. (See DTC INSPECTION [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)

8.Verify that no DTCs are displayed.

DTC M-MDS	Power steering malfunction indicator light illumination status	Diagnosis system component	Fail-safe	Drive cycle	Self test type*1	Memory function	Page
U053B:61	Illuminates	Forward sensing camera (FSC)	×	–	C, D	×	(See DTC U053B:61 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
U053B:82	Illuminates	Signal error to forward sensing camera (FSC)	×	–	C, D	×	(See DTC U053B:00/U053B:82/U053B:83 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
U053B:83	Illuminates	Signal error to forward sensing camera (FSC)	×	–	C, D	×	
U2011:19	Illuminated	EPS motor	×	–	C, D	×	(See DTC C200D:1C/C200D:64/U2011:19/U2011:1C/U2011:62/U2011:72/U2011:92 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
U2011:1C	Illuminated	EPS motor	×	–	C, D	×	
U2011:62	Illuminated	EPS motor	×	–	C, D	×	
U2011:72	Illuminated	EPS motor	×	–	C, D	×	
U2011:92	Illuminated	EPS motor	×	–	C, D	×	
U2300:54	–	EPS configuration	×	–	C, D	×	(See DTC U2300:54/U2300:55/U2300:56 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
U2300:55	Illuminated	EPS configuration	×	–	C, D	×	
U2300:56	–	EPS configuration	×	–	C, D	×	
U3000:16	Illuminated	EPS control module	×	–	C, D	×	(See DTC U3000:16/U3000:1C/U3000:28/U3000:41/U3000:46/U3000:47/U3000:49/U3000:61/U3000:73/U3000:96 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
U3000:1C	Illuminated	EPS control module	×	–	C, D	×	
U3000:28	Illuminated	EPS control module	×	–	C, D	×	
U3000:41	Illuminated	EPS control module	×	–	C, D	×	
U3000:46	–	EPS control module	×	–	C, D	×	
U3000:47	Illuminated	EPS control module	×	–	C, D	×	
U3000:49	Illuminated	EPS control module	×	–	C, D	×	
U3000:4B	–	EPS control module	×	–	C, D	×	(See DTC U3000:4B [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
U3000:61	Illuminated	EPS control module	×	–	C, D	×	(See DTC U3000:16/U3000:1C/U3000:28/U3000:41/U3000:46/U3000:47/U3000:49/U3000:61/U3000:73/U3000:96 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
U3000:73	Illuminated	EPS control module	×	–	C, D	×	
U3000:96	Illuminated	EPS control module	×	–	C, D	×	
U3003:16	Illuminated	Battery power supply	×	–	C, D	×	(See DTC U3003:16 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)

PID/DATA MONITOR INSPECTION [ELECTRIC POWER STEERING (EPS) CONTROL MODULE]

SM2898496

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1.Connect the M-MDS to the DLC-2.

2.After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

(1)Select “DataLogger”.

(2)Select “Modules”.

(3)Select “EPS”.

3.Select the applicable monitor item from the PID table.

4.Verify the PID data according to the directions on the screen.

Note

• The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.

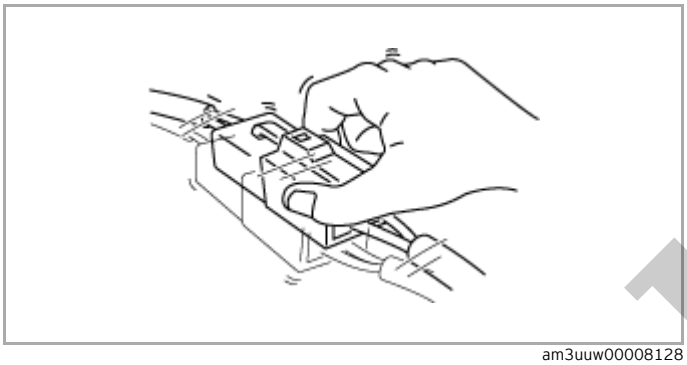
Step	Inspection	Results	Action
4	VERIFY THAT THE SAME DTC IS NOT PRESENT • Using the M-MDS, clear the DTC from the EPS control module. (See CLEARING DTC [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].) • Using the M-MDS, perform the EPS control module DTC inspection. (See DTC INSPECTION [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the EPS control module, then go to the next step. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
		No	Go to the next step.
5	VERIFY THAT NO OTHER DTCs ARE PRESENT • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
		No	DTC troubleshooting completed.

*1:(See CONTROLLER AREA NETWORK (CAN) MALFUNCTION DIAGNOSIS FLOW [TYPE-A (SKYACTIV-G 2.5)].) (See CONTROLLER AREA NETWORK (CAN) MALFUNCTION DIAGNOSIS FLOW [TYPE-A (SKYACTIV-G 2.5T, SKYACTIV-D 2.2)].) (See CONTROLLER AREA NETWORK (CAN) MALFUNCTION DIAGNOSIS FLOW [TYPE-B].)

Action for Non-repeatable Malfunction

• If the malfunction does not recur, verify the malfunction cause by performing the following actions:

— Based on the repair order form, attempt to drive the vehicle or perform tests to replicate the malfunction, record the data at that time, and detect the malfunction cause.
— Shake the wiring harness or connector of the electrical component which is suspected to be the cause of the malfunction, and inspect for occurrence of any malfunction or DTCs.



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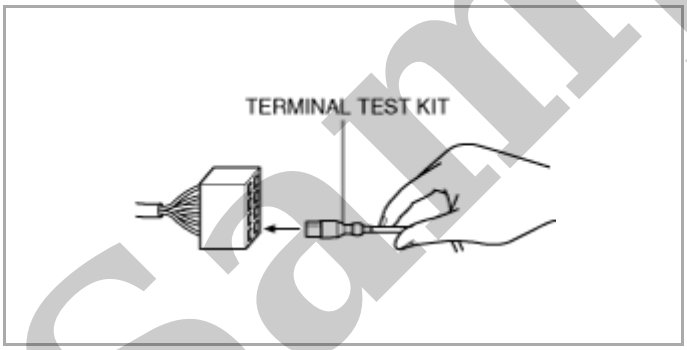
— Inspect the female terminals on the connector of the electric component which is suspected to be the cause of the malfunction for poor connection. (See ELECTRICAL SYSTEM.)

Note

• Tool used (Reference): terminal test kit (49US-15-KIT)



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DTC C200D:1C/C200D:64/U2011:19/U2011:1C/U2011:62/U2011:72/U2011:92 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE]

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DTC	C200D:1C, C200D:64	Resolver sensor
	U2011:19, U2011:1C, U2011:62, U2011:72, U2011:92	EPS motor
DETECTION CONDITION		• C200D:1C — Malfunction detected in resolver sensor internal circuit • C200D:64 — Signal error detected in resolver sensor signal • U2011:19, U2011:1C, U2011:62, U2011:72 — Malfunction detected in EPS motor internal circuit • U2011:92 — Malfunction detected in EPS motor internal circuit in the backup control
FAIL-SAFE FUNCTION		• Refer to "Fail-safe Function Table". (See DTC TABLE [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
POSSIBLE CAUSE		• Malfunction in internal steering column, EPS motor
SYSTEM WIRING DIAGRAM		Not applicable

Diagnostic Procedure

Step	Inspection	Results	Action
1	VERIFY DTC • Using the M-MDS, clear the DTC from the EPS control module. (See CLEARING DTC [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].) • Using the M-MDS, perform the EPS control module DTC inspection. (See DTC INSPECTION [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].) • Is the same Pending DTC present?	Yes	Replace the EPS control module (EPS motor). (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
		No	Go to the next step.
2	VERIFY THAT NO OTHER DTCs ARE PRESENT • Are any other DTCs output?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
		No	DTC troubleshooting completed.

DTC C200B:02/C200B:16/C200B:62/C200B:64/C200B:85 [ELECTRIC POWER STEERING (EPS) CONTROL MODULE]

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DTC C200B:02, C200B:16, C200B:62, C200B:64	Torque sensor
DETECTION CONDITION	• C200B:02 — Signal error detected in torque sensor signal • C200B:16 — Open or short circuit is detected in torque sensor circuit • C200B:62 — Difference occurs between the torque sensor signal 1 and the torque sensor signal 2 from torque sensor • C200B:64 — Signal error detected in torque sensor signal • C200B:85 — Torque sensor signal is out of the specified range
FAIL-SAFE FUNCTION	• Refer to "Fail-safe Function Table". (See DTC TABLE [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].)
POSSIBLE CAUSE	• Torque sensor malfunction • EPS control module malfunction
SYSTEM WIRING DIAGRAM	Not applicable

Diagnostic Procedure

Step	Inspection	Results	Action
1	INSPECT TORQUE SENSOR USING M-MDS • Connect the M-MDS to the DLC-2. • Switch the ignition ON (engine off). • Access "STR_TRQ_S_M" and "STR_TRQ_S_S" PIDs. (See PID/DATA MONITOR INSPECTION [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].) • Verify that the data monitor value changes when the steering wheel is turned. — Left: 0−positive — Right: 0− negative • Do the torque sensor signal values change in the same way?	Yes	Go to the next step.
		No	Replace the steering column (torque sensor), then go to the next step. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
2	VERIFY THAT SAME DTC IS NOT PRESENT • Using the M-MDS, clear the DTC from the EPS control module. (See CLEARING DTC [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].) • Using the M-MDS, perform the EPS control module DTC inspection. (See DTC INSPECTION [ELECTRIC POWER STEERING (EPS) CONTROL MODULE].) • Is the same Pending DTC present?	Yes	Repeat the inspection from Step 1. If the malfunction recurs, replace the EPS control module, then go to the next step. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
		No	Go to the next step.