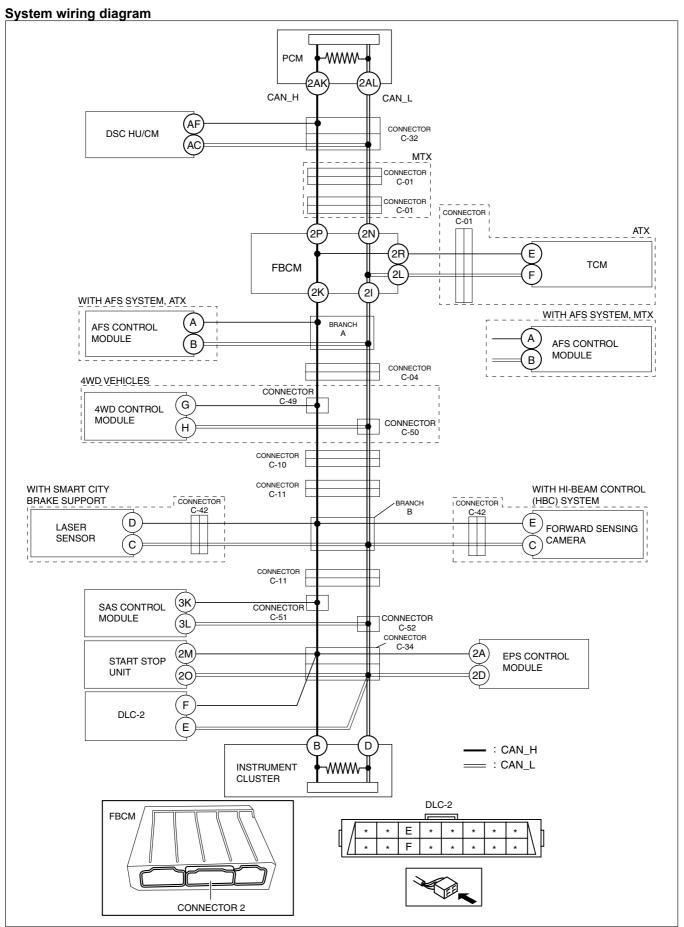
## DETERMINING SHORT BETWEEN CIRCUITS LOCATION (HS-CAN) [SKYACTIV-D 2.2 (R.H.D.)]

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## Caution

 Perform the following malfunction diagnosis only when it is diagnosed with a short between circuits by CONTROLLER AREA NETWORK (CAN) MALFUNCTION DIAGNOSIS FLOW [SKYACTIV-D 2.2 (R.H.D.)].



## **Determination procedure**

## Caution

- When disconnecting the connector, verify that there is no looseness, damage, deformation, corrosion, or poor connection of the connector terminals.
  When inspecting the DLC-2, touch it with a paper clip or similar thin pin without directly inserting a tester into the terminals.

Step	Inspection		Action
1	INSPECT BETWEEN FRONT BODY CONTROL	Yes	Go to Step 6.
	MODULE (FBCM) AND INSTRUMENT CLUSTER FOR SHORT BETWEEN CIRCUITS  Disconnect the negative battery cable. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION [SKYACTIV-D 2.2].)  Disconnect connector 2 which has front body control module (FBCM) terminals 2K and 2I  Connect the negative battery cable. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION [SKYACTIV-D 2.2].)  Switch the ignition ON (engine off).  Measure the voltage at DLC-2 terminals F and E.  Is the voltage at DLC-2 terminals F and E the	No	Go to the next step.
2	INSPECT FRONT BODY CONTROL MODULE (FBCM) FOR SHORT BETWEEN CIRCUITS  • Switch the ignition off (LOCK).  • Disconnect the negative battery cable. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION [SKYACTIV-D 2.2].)  • Inspect for continuity between front body control module (FBCM) terminals 2K and 2I.  • Is there continuity?	Yes	Replace the front body control module (FBCM) because there is a short between circuits in the front body control module (FBCM). (See FRONT BODY CONTROL MODULE (FBCM) REMOVAL/INSTALLATION.) Go to the next step.
3	INSPECT BETWEEN TCM OR AFS CONTROL MODULE AND FRONT BODY CONTROL MODULE (FBCM) FOR SHORT BETWEEN CIRCUITS  • Inspect for continuity between TCM terminals E and F. (ATX)  • Inspect for continuity between AFS control module terminals A and B. (MTX)  • Is there continuity?	Yes	Go to the next step. (ATX) Go to Step 5. (MTX) Go to Step 30. (ATX) Go to Step 28. (MTX)
4	INSPECT BETWEEN TCM AND CONNECTOR	Yes	Go to the next step.
	<ul> <li>C-01 FOR SHORT BETWEEN CIRCUITS</li> <li>Disconnect connector C-01.</li> <li>Inspect for continuity between TCM terminals E and F.</li> <li>Is there continuity?</li> </ul>	No	Repair or replace the wiring harness between the front body control module (FBCM) and connector C-01 because the wiring harness is shorted between circuits.

Step	Inspection		Action
5	INSPECT TCM OR AFS CONTROL MODULE	Yes	Repair or replace the wiring harness between the TCM
	FOR SHORT BETWEEN CIRCUITS		and connector C-01 because the wiring harness is
	Disconnect the TCM connector. (ATX)		shorted between circuits. (ATX)
	Disconnect the AFS control module connector.		Repair or replace the wiring harness between the AFS
	(MTX)		control module and front body control module (FBCM)
	Inspect for continuity between TCM terminals E		because the wiring harness is shorted between circuits.
	and F (wiring harness side) (ATX).		(MTX)
	Inspect for continuity between AFS control	No	Replace the TCM because there is a short between
	module terminals A and B (wiring harness side).		circuits in the TCM. (ATX)
	(MTX)		(See CONTROL VALVE BODY REMOVAL/
	Is there continuity?		INSTALLATION [FW6A-EL, FW6AX-EL].)
			(See CONTROL VALVE BODY REMOVAL/
			INSTALLATION [GW6A-EL, GW6AX-EL].)
			• Replace the AFS control module because there is a short
			between circuits in the AFS control module.
			(See ADAPTIVE FRONT LIGHTING SYSTEM (AFS)
			CONTROL MODULE REMOVAL/INSTALLATION.)
6	INSPECT BETWEEN CONNECTOR C-04 AND	Yes	Go to Step 8.
	INSTRUMENT CLUSTER FOR SHORT	No	• Go to the next step. (ATX)
	BETWEEN CIRCUITS		• Repair or replace the wiring harness between the front
	Switch the ignition off (LOCK).     Disconnect the pagetive battery cable.		body control module (FBCM) and connector C-04
	Disconnect the negative battery cable.     (See NEGATIVE BATTERY CABLE)		because the wiring harness is shorted between circuits.
	DISCONNECTION/CONNECTION		(MTX)
	[SKYACTIV-D 2.2].)		
	• Disconnect connector C-04.		
	Connect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Switch the ignition ON (engine off).		
	Measure the voltage at DLC-2 terminals F and		
	E.		
	Is the voltage at DLC-2 terminals F and E the		
	same?	.,	
7	INSPECT AFS CONTROL MODULE FOR	Yes	Repair or replace the wiring harness between the AFS
	SHORT BETWEEN CIRCUITS		control module and front body control module (FBCM) /
	Disconnect the AFS control module connector.     Inappet for continuity between AFS control		connector C-04 because the wiring harness is shorted between circuits.
	Inspect for continuity between AFS control module terminals A and B (wiring harness side).	No	Replace the AFS control module because there is a short
	• Is there continuity?	No	between circuits in the AFS control module.
	is alors something.		(See ADAPTIVE FRONT LIGHTING SYSTEM (AFS)
			CONTROL MODULE REMOVAL/INSTALLATION.)
8	INSPECT BETWEEN CONNECTORS C-49	Yes	Go to Step 9.
	AND C-50 AND INSTRUMENT CLUSTER FOR	No	Go to the next step.
	SHORT BETWEEN CIRCUITS	-	'
	Switch the ignition off (LOCK).		
	Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Disconnect connectors C-49 and C-50.		
	Connect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	• Switch the ignition ON (engine off).		
	Measure the voltage at DLC-2 terminals F and		
	E.		
	• Is the voltage at DLC-2 terminals F and E the		
	same?		

Step	Inspection		Action
9	INSPECT BETWEEN 4WD CONTROL	Yes	Go to the next step.
	MODULE AND CONNECTORS C-49 AND C-50	No	Repair or replace the wiring harness between connector
	FOR SHORT BETWEEN CIRCUITS	110	C-04 and connectors C-49 and C-50 because the wiring
	Switch the ignition off (LOCK).		harness is shorted between circuits.
	Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Inspect for continuity between 4WD control		
	module terminals G and H.		
	Is there continuity?		
10	INSPECT 4WD CONTROL MODULE FOR	Yes	Repair or replace the wiring harness between the 4WD
	SHORT BETWEEN CIRCUITS		control module and connectors C-49 and C-50 because the
	Disconnect the 4WD control module connector.		wiring harness is shorted between circuits.
	Inspect for continuity between 4WD control	No	Replace the 4WD control module because there is a short
	module terminals G and H (wiring harness side).		between circuits in the 4WD control module.
	• Is there continuity?		(See 4WD CONTROL MODULE REMOVAL/
	·		INSTALLATION.)
11	INSPECT BETWEEN CONNECTOR C-10 AND	Yes	Go to the next step.
	INSTRUMENT CLUSTER FOR SHORT	No	Repair or replace the wiring harness between connectors
	BETWEEN CIRCUITS		C-49 and C-50 and connector C-10 because the wiring
	Switch the ignition off (LOCK).		harness is shorted between circuits.
	Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Disconnect connector C-10.		
	Connect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Switch the ignition ON (engine off).		
	• Measure the voltage at DLC-2 terminals F and		
	E		
	• Is the voltage at DLC-2 terminals F and E the		
40	same?		0 1 01 10
12	INSPECT BETWEEN CONNECTOR C-11 AND	Yes	Go to Step 18.
	INSTRUMENT CLUSTER FOR SHORT	No	Go to the next step.
	BETWEEN CIRCUITS		
	Switch the ignition off (LOCK).     Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	• Disconnect connector C-11.		
	Connect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	• Switch the ignition ON (engine off).		
	Measure the voltage at DLC-2 terminals F and		
	E.		
	Is the voltage at DLC-2 terminals F and E the		
	same?		
	<u> </u>		

Step	Inspection		Action
13	INSPECT BETWEEN CONNECTOR C-11 AND	Yes	Go to the next step.
	FORWARD SENSING CAMERA/LASER	No	Repair or replace the wiring harness between connector
	SENSOR FOR SHORT BETWEEN CIRCUITS		C-11 and connector C-10 because the wiring harness is
	Switch the ignition off (LOCK).		shorted between circuits.
	Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Inspect for continuity between forward sensing		
	camera terminals E and C. (With high beam		
	control (HBC) system)		
	Inspect for continuity between laser sensor		
	terminals D and C. (With smart city brake		
	support)		
	Is there continuity?		
14	INSPECT BETWEEN LASER SENSOR AND	Yes	Go to the next step.
	CONNECTOR C-42 FOR SHORT BETWEEN	No	Go to Step 16.
	CIRCUITS		
	Disconnect connector C-42.		
	Inspect for continuity between laser sensor		
	terminals D and C.		
4.5	• Is there continuity?	Vos	Denois or replace the wiring berness between the least
15	INSPECT LASER SENSOR FOR SHORT BETWEEN CIRCUITS	Yes	Repair or replace the wiring harness between the laser
	Disconnect the laser sensor connector.		sensor and connector C-42 because the wiring harness is shorted between circuits.
	Inspect for continuity between laser sensor	No	Replace the laser sensor because there is a short between
	terminals D and C (wiring harness side).	INO	circuits in the laser sensor.
	• Is there continuity?		(See LASER SENSOR REMOVAL/INSTALLATION.)
16	INSPECT BETWEEN FORWARD SENSING	Yes	Go to the next step.
	CAMERA AND CONNECTOR C-42 FOR	No	Repair or replace the wiring harness between connector
	SHORT BETWEEN CIRCUITS		C-11 and connector C-42 because the wiring harness is
	Inspect for continuity between forward sensing		shorted between circuits.
	camera terminals E and C.		
	Is there continuity?		
17	INSPECT FORWARD SENSING CAMERA FOR	Yes	Repair or replace the wiring harness between the forward
	SHORT BETWEEN CIRCUITS		sensing camera and connector C-42 because the wiring
	Disconnect the forward sensing camera		harness is shorted between circuits.
	connector.	No	Replace the forward sensing camera because there is a
	Inspect for continuity between forward sensing		short between circuits in the forward sensing camera.
	camera terminals E and C (wiring harness side).		(See FORWARD SENSING CAMERA (FSC) REMOVAL/
40	• Is there continuity?	V	INSTALLATION.)
18	INSPECT BETWEEN CONNECTOR C-51, C-52 AND INSTRUMENT CLUSTER FOR SHORT	Yes	Go to Step 21.
	BETWEEN CIRCUITS	No	Go to the next step.
	Switch the ignition off (LOCK).		
	Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	• Disconnect connector C-51, C-52.		
	Connect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Switch the ignition ON (engine off).		
	Measure the voltage at DLC-2 terminals F and		
	E.		
	• Is the voltage at DLC-2 terminals F and E the		
	same?		

Step	Inspection		Action
19	INSPECT BETWEEN SAS CONTROL	Yes	Go to the next step.
	MODULE AND CONNECTOR C-51, C-52 FOR SHORT BETWEEN CIRCUITS  • Switch the ignition off (LOCK).  • Disconnect the negative battery cable. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION [SKYACTIV-D 2.2].)  • Inspect for continuity between SAS control module terminals 3K and 3L.  • Is there continuity?	No	Repair or replace the wiring harness between connector C-11 and connector C-51, C-52 because the wiring harness is shorted between circuits.
20	INSPECT SAS CONTROL MODULE FOR SHORT BETWEEN CIRCUITS  • Disconnect the SAS control module connector.  • Is there continuity between SAS control module terminals 3K and 3L (wiring harness side)?  • Is there continuity?	Yes	Repair or replace the wiring harness between the SAS control module and connector C-51, C-52 because the wiring harness is shorted between circuits.  Replace the SAS control module because there is a short between circuits in the SAS control module.  (See SAS CONTROL MODULE REMOVAL/INSTALLATION.)
21	INSPECT BETWEEN DLC-2 AND CONNECTOR C-34 FOR SHORT BETWEEN CIRCUITS  • Switch the ignition off (LOCK).  • Disconnect the negative battery cable. (See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION [SKYACTIV-D 2.2].)  • Disconnect connector C-34.  • Inspect for continuity between DLC-2 terminals F and E.  • Is there continuity?	No No	Repair or replace the wiring harness between DLC-2 and connector C-34 because the wiring harness is shorted between circuits.  Go to the next step.
22	INSPECT BETWEEN START STOP UNIT AND CONNECTOR C-34 FOR SHORT BETWEEN CIRCUITS  Inspect for continuity between start stop unit terminals 2M and 2O.  Is there continuity?	Yes No	Go to the next step. Go to Step 24.
23	INSPECT START STOP UNIT FOR SHORT BETWEEN CIRCUITS  • Disconnect the start stop unit connector.  • Is there continuity between start stop unit terminals 2M and 2O (wiring harness side)?  • Is there continuity?	Yes	Repair or replace the wiring harness between the start stop unit and connector C-34 because the wiring harness is shorted between circuits.  Replace the start stop unit because there is a short between circuits in the start stop unit.  (See START STOP UNIT REMOVAL/INSTALLATION.)
24	INSPECT BETWEEN EPS CONTROL MODULE AND CONNECTOR C-34 FOR SHORT BETWEEN CIRCUITS  Inspect for continuity between EPS control module terminals 2A and 2D.  Is there continuity?	Yes No	Go to the next step. Go to Step 26.
25	INSPECT EPS CONTROL MODULE FOR SHORT BETWEEN CIRCUITS  • Disconnect the EPS control module connector.  • Is there continuity between EPS control module terminals 2A and 2D (wiring harness side)?  • Is there continuity?	Yes	Repair or replace the wiring harness between the EPS control module and connector C-34 because the wiring harness is shorted between circuits.  Replace the EPS control module because there is a short between circuits in the EPS control module.  (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
26	INSPECT BETWEEN INSTRUMENT CLUSTER AND CONNECTOR C-34 FOR SHORT BETWEEN CIRCUITS  Inspect for continuity between instrument cluster terminals B and D.  Is there continuity?	Yes No	Go to the next step.  Repair or replace the wiring harness between connector C-51, C-52 and connector C-34 because the wiring harness is shorted between circuits.

Step	Inspection		Action
27	INSPECT INSTRUMENT CLUSTER FOR	Yes	Repair or replace the wiring harness between the
	SHORT BETWEEN CIRCUITS		instrument cluster and connector C-34 because the wiring
	Disconnect the instrument cluster connector.     Is there continuity between instrument cluster.	No	harness is shorted between circuits.  Replace the instrument cluster because there is a short
	terminals B and D (wiring harness side)?	INU	between circuits in the instrument cluster.
	• Is there continuity?		(See INSTRUMENT CLUSTER REMOVAL/
	·		INSTALLATION.)
28	INSPECT BETWEEN CONNECTOR C-01 AND	Yes	Repair or replace the wiring harness between connector
	FRONT BODY CONTROL MODULE (FBCM)		C-01 and the front body control module (FBCM) because
	FOR SHORT BETWEEN CIRCUITS	Nia	the wiring harness is shorted between circuits.
	Switch the ignition off (LOCK).     Disconnect the negative battery cable.	No	Go to the next step.
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Connect connector 2 which has front body		
	control module (FBCM) terminals 2K and 2I.		
	• Disconnect connector C-01.		
	Connect the negative battery cable.      Connect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	• Switch the ignition ON (engine off).		
	Measure the voltage at DLC-2 terminals F and		
	E.		
	• Is the voltage at DLC-2 terminals F and E the		
20	same? INSPECT BETWEEN CONNECTOR C-01 AND	Voo	Denois as sanlage the wising horness between connector
29	CONNECTOR C-32 FOR SHORT BETWEEN	Yes	Repair or replace the wiring harness between connector C-01 and connector C-32 because the wiring harness is
	CIRCUITS		shorted between circuits.
	Switch the ignition off (LOCK).	No	Go to Step 31.
	Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Connect connector C-01.      Connect connector C-01.      Connect connector C-01.		
	Disconnect connector C-32.     Connect the pagetive better cable.		
	Connect the negative battery cable.     (See NEGATIVE BATTERY CABLE)		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	• Switch the ignition ON (engine off).		
	Measure the voltage at DLC-2 terminals F and E.		
	• Is the voltage at DLC-2 terminals F and E the same?		

Step	Inspection		Action
30	INSPECT BETWEEN CONNECTORS C-32	Yes	Repair or replace the wiring harness between connector
	AND FRONT BODY CONTROL MODULE		C-32 and the front body control module (FBCM) because
	(FBCM) FOR SHORT BETWEEN CIRCUITS		the wiring harness is shorted between circuits.
	Switch the ignition off (LOCK).	No	Go to the next step.
	Disconnect the negative battery cable.		·
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Connect connector 2 which has front body		
	control module (FBCM) terminals 2K and 2I.		
	Disconnect connector C-32.		
	Connect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Switch the ignition ON (engine off).		
	Measure the voltage at DLC-2 terminals F and		
	E.		
	• Is the voltage at DLC-2 terminals F and E the		
24	same? INSPECT BETWEEN DSC HU/CM AND	V	Co to the most step
31	CONNECTOR C-32 FOR SHORT BETWEEN	Yes No	Go to the next step. Go to Step 33.
	CIRCUITS	INO	G0 to Step 33.
	Switch the ignition off (LOCK).		
	Disconnect the negative battery cable.		
	(See NEGATIVE BATTERY CABLE		
	DISCONNECTION/CONNECTION		
	[SKYACTIV-D 2.2].)		
	Inspect for continuity between DSC HU/CM		
	terminals AF and AC.		
	Is there continuity?		
32	INSPECT DSC HU/CM FOR SHORT BETWEEN	Yes	Repair or replace the wiring harness between the DSC HU/
	CIRCUITS		CM and connector C-32 because the wiring harness is
	Disconnect the DSC HU/CM connector.		shorted between circuits.
	Inspect for continuity between DSC HU/CM	No	Replace the DSC HU/CM because there is a short between
	terminals AF and AC (wiring harness side).		circuits in the DSC HU/CM.
	Is there continuity?		(See DSC HU/CM REMOVAL/INSTALLATION.)
33	INSPECT PCM FOR SHORT BETWEEN	Yes	Repair or replace the wiring harness between the PCM and
	CIRCUITS		connector C-32 because the wiring harness is shorted
	Disconnect the PCM connector.		between circuits.
	Inspect for continuity between PCM terminals	No	Replace the PCM because there is a short between circuits
	2AK and 2AL (wiring harness side).		in the PCM.
	Is there continuity?		(See PCM REMOVAL/INSTALLATION [SKYACTIV-D
			2.2].)