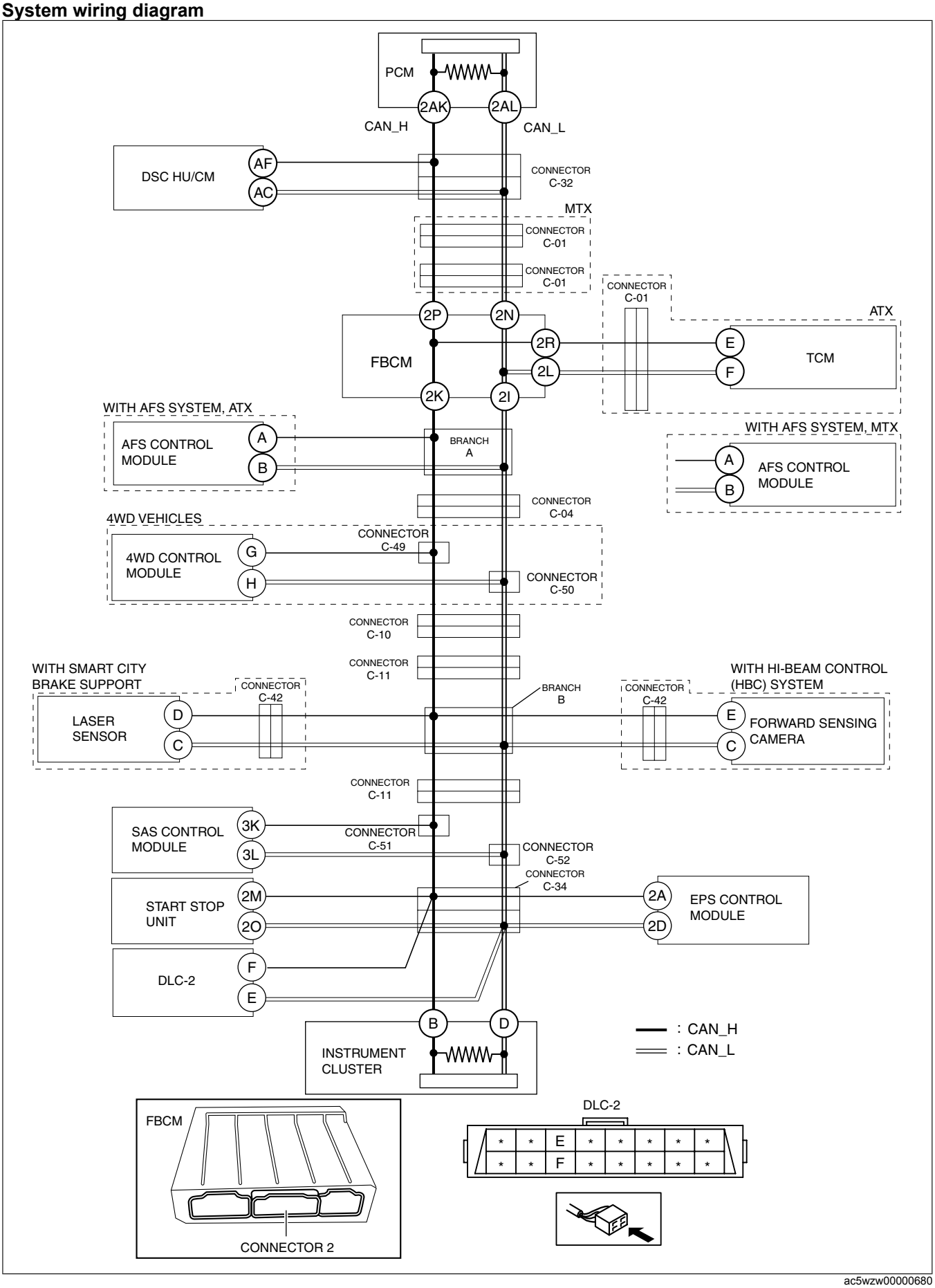
DETERMINING SHORT TO GROUND LOCATION (HS-CAN) [SKYACTIV-D 2.2 (R.H.D.)]

id100206000600

Caution

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

System wiring diagram



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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 FOR SHORT TO GROUND BETWEEN FRONT BODY CONTROL MODULE (FBCM) AND INSTRUMENT CLUSTER** • 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 2P and 2N. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Go to Step 6.
		No	Go to the next step.
2	**INSPECT CAN LINE INSIDE FRONT BODY CONTROL MODULE (FBCM) FOR SHORT TO GROUND** • Inspect for continuity at the following terminals: — Between front body control module (FBCM) terminal 2P and body ground — Between front body control module (FBCM) terminal 2N and body ground • Is there continuity?	Yes	Replace the front body control module (FBCM) because there is a short to ground in the front body control module (FBCM). (See FRONT BODY CONTROL MODULE (FBCM) REMOVAL/INSTALLATION.)
		No	Go to the next step.
3	**INSPECT FOR SHORT TO GROUND BETWEEN TCM OR AFS CONTROL MODULE AND FRONT BODY CONTROL MODULE (FBCM)** • Inspect for continuity at the following terminals: — Between TCM control module terminal E and body ground (ATX) — Between TCM control module terminal F and body ground (ATX) — Between AFS control module terminal A and body ground (MTX) — Between AFS control module terminal B and body ground (MTX) • Is there continuity?	Yes	• Go to the next step. (ATX) • Go to Step 5. (MTX)
		No	• Go to Step 30. (ATX) • Go to Step 28. (MTX)
4	**INSPECT FOR SHORT TO GROUND BETWEEN TCM AND CONNECTOR C-01** • Disconnect connector C-01. • Inspect for continuity at the following terminals: — Between TCM control module terminal E and body ground — Between TCM control module terminal F and body ground • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the front body control module (FBCM) and connector C-01 because the wiring harness is shorted to ground.

Step	Inspection		Action
5	**INSPECT CAN LINE IN TCM OR AFS CONTROL MODULE FOR SHORT TO GROUND** • Disconnect the TCM connector. (ATX) • Disconnect the AFS control module connector. (MTX) • Inspect for continuity at the following terminals: — Between TCM terminal E (wiring harness side) and body ground (ATX) — Between TCM terminal F (wiring harness side) and body ground (ATX) — Between AFS control module terminal A (wiring harness side) and body ground (MTX) — Between AFS control module terminal B (wiring harness side) and body ground (MTX) • Is there continuity?	Yes	• Repair or replace the wiring harness between the TCM and connector C-01because the wiring harness is shorted to ground. (ATX) • Repair or replace the wiring harness between the AFS control module and front body control module (FBCM) because the wiring harness is shorted to ground. (MTX)
		No	• Replace the TCM because there is a short to ground in the TCM. (ATX) (See CONTROL VALVE BODY REMOVAL/ 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 to ground in the AFS control module. (MTX) (See ADAPTIVE FRONT LIGHTING SYSTEM (AFS) CONTROL MODULE REMOVAL/INSTALLATION.)
6	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTOR C-04 AND INSTRUMENT CLUSTER** • Disconnect connector C-04. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Go to Step 8.
		No	• Go to the next step. (ATX) • Repair or replace the wiring harness between the front body control module (FBCM) and connector C-04 because the wiring harness is shorted to ground. (MTX)
7	**INSPECT CAN LINE IN AFS CONTROL MODULE FOR SHORT TO GROUND** • Disconnect the AFS control module connector. • Inspect for continuity at the following terminals: — Between AFS control module terminal A (wiring harness side) and body ground — Between AFS control module terminal B (wiring harness side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between the AFS control module and front body control module (FBCM) / connector C-04 because the wiring harness is shorted to ground.
		No	Replace the AFS control module because there is a short to ground in the AFS control module. (See ADAPTIVE FRONT LIGHTING SYSTEM (AFS) CONTROL MODULE REMOVAL/INSTALLATION.)
8	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTORS C-49 AND C-50 AND INSTRUMENT CLUSTER** • Disconnect connectors C-49 and C-50. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Go to Step 11.
		No	Go to the next step.
9	**INSPECT FOR SHORT TO GROUND BETWEEN 4WD CONTROL MODULE AND CONNECTORS C-49 AND C-50** • Inspect for continuity at the following terminals: — Between 4WD control module terminal G and body ground — Between 4WD control module terminal H and body ground • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between connector C-04 and connectors C-49 and C-50 because the wiring harness is shorted to ground.

Step	Inspection		Action
10	**INSPECT CAN LINE IN 4WD CONTROL MODULE FOR SHORT TO GROUND** • Disconnect the 4WD control module connector. • Inspect for continuity at the following terminals: — Between 4WD control module terminal G (wiring harness side) and body ground — Between 4WD control module terminal H (wiring harness side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between the 4WD control module and connectors C-49 and C-50 because the wiring harness is shorted to ground.
		No	Replace the 4WD control module because there is a short to ground in the 4WD control module. (See 4WD CONTROL MODULE REMOVAL/ INSTALLATION.)
11	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTOR C-10 AND INSTRUMENT CLUSTER** • Disconnect connector C-10. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between connectors C-49 and C-50 and connector C-10 because the wiring harness is shorted to ground.
12	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTOR C-11 AND INSTRUMENT CLUSTER** • Disconnect connector C-11. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Go to Step 18.
		No	Go to the next step.
13	**INSPECT FOR SHORT TO GROUND BETWEEN LASER SENSOR AND CONNECTOR C-42** • Disconnect connector C-42. • Inspect for continuity at the following terminals: — Between laser sensor terminal D and body ground — Between laser sensor terminal C and body ground • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 15.
14	**INSPECT CAN LINE INSIDE LASER SENSOR FOR SHORT TO GROUND** • Disconnect the laser sensor connector. • Inspect for continuity at the following terminals: — Between laser sensor terminal D (wiring harness side) and body ground — Between laser sensor terminal C (wiring harness side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between the laser sensor and connector C-42 because the wiring harness is shorted to ground.
		No	Replace the laser sensor because there is a short to ground in the laser sensor. (See LASER SENSOR REMOVAL/INSTALLATION.)
15	**INSPECT FOR SHORT TO GROUND BETWEEN FORWARD SENSING CAMERA AND CONNECTOR C-42** • Inspect for continuity at the following terminals: — Between forward sensing camera terminal E and body ground — Between forward sensing camera terminal C and body ground • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 17.

Step	Inspection		Action
16	**INSPECT CAN LINE IN FORWARD SENSING CAMERA FOR SHORT TO GROUND** • Disconnect the forward sensing camera connector. • Inspect for continuity at the following terminals: — Between forward sensing camera terminal E (wiring harness side) and body ground — Between forward sensing camera terminal C (wiring harness side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between the forward sensing camera and connector C-42 because the wiring harness is shorted to ground.
		No	Replace the forward sensing camera because there is a short to ground in the forward sensing camera. (See FORWARD SENSING CAMERA (FSC) REMOVAL/ INSTALLATION.)
17	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTORS C-11 AND C-42** • Connect connector C-42. • Inspect for continuity at the following terminals: — Between forward sensing camera terminal E and body ground (with high beam control (HBC) system) — Between forward sensing camera terminal C and body ground (with high beam control (HBC) system) — Between laser sensor terminal D and body ground (with smart city brake support) — Between laser sensor terminal C and body ground (with smart city brake support) • Is there continuity?	Yes	Repair or replace the wiring harness between connector C-11 and connector C-42 because the wiring harness is shorted to ground.
		No	Repair or replace the wiring harness between connector C-10 and connector C-11 because the wiring harness is shorted to ground.
18	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTOR C-51, C-52 AND INSTRUMENT CLUSTER** • Disconnect connector C-51, C-52. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Go to Step 21.
		No	Go to the next step.
19	**INSPECT FOR SHORT TO GROUND BETWEEN SAS CONTROL MODULE AND CONNECTOR C-51, C-52** • Inspect for continuity at the following terminals: — Between SAS control module terminal 3K and body ground — Between SAS control module terminal 3L and body ground • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between connector C-11 and connector C-51, C-52 because the wiring harness is shorted to ground.
20	**INSPECT CAN LINE IN SAS CONTROL MODULE FOR SHORT TO GROUND** • Disconnect the SAS control module connector. • Inspect for continuity at the following terminals: — Between SAS control module terminal 3K (wiring harness side) and body ground — Between SAS control module terminal 3L (wiring harness side) and body ground • 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 to ground.
		No	Replace the SAS control module because there is a short to ground in the SAS control module. (See SAS CONTROL MODULE REMOVAL/ INSTALLATION.)
21	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTORS C-34 AND DLC-2** • Disconnect connector C-34. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between connector C-34 and DLC-2 because the wiring harness is shorted to ground.
		No	Go to the next step.

Step	Inspection		Action
22	**INSPECT FOR SHORT TO GROUND BETWEEN START STOP UNIT AND CONNECTOR C-34** • Inspect for continuity at the following terminals: — Between start stop unit terminal 2M and body ground — Between start stop unit terminal 2O and body ground • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 24.
23	**INSPECT CAN LINE IN START STOP UNIT FOR SHORT TO GROUND** • Disconnect the start stop unit connector. • Inspect for continuity at the following terminals: — Between start stop unit terminal 2M (wiring harness side) and body ground — Between start stop unit terminal 2O (wiring harness side) and body ground • 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 to ground.
		No	Replace the start stop unit because there is a short to ground in the start stop unit. (See START STOP UNIT REMOVAL/INSTALLATION.)
24	**INSPECT FOR SHORT TO GROUND BETWEEN EPS CONTROL MODULE AND CONNECTOR C-34** • Inspect for continuity at the following terminals: — Between EPS control module terminal 2A and body ground — Between EPS control module terminal 2D and body ground • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 26.
25	**INSPECT CAN LINE IN EPS CONTROL MODULE FOR SHORT TO GROUND** • Disconnect the EPS control module connector. • Inspect for continuity at the following terminals: — Between EPS control module terminal 2A (wiring harness side) and body ground — Between EPS control module terminal 2D (wiring harness side) and body ground • 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 to ground.
		No	Replace the EPS control module because there is a short to ground in the EPS control module. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
26	**INSPECT FOR SHORT TO GROUND BETWEEN INSTRUMENT CLUSTER AND CONNECTOR C-34** • Inspect for continuity at the following terminals: — Between instrument cluster terminal B and body ground — Between instrument cluster terminal D and body ground • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness between connector C-51, C-52 and connector C-34 because the wiring harness is shorted to ground.
27	**INSPECT CAN LINE IN INSTRUMENT CLUSTER FOR SHORT TO GROUND** • Disconnect the instrument cluster connector. • Inspect for continuity at the following terminals: — Between instrument cluster terminal B (wiring harness side) and body ground — Between instrument cluster terminal D (wiring harness side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between the instrument cluster and connector C-34 because the wiring harness is shorted to ground.
		No	Replace the instrument cluster because there is a short to ground in the instrument cluster. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)

Step	Inspection		Action
28	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTOR C-01 AND FRONT BODY CONTROL MODULE (FBCM)** • Disconnect connector C-01. • Connect connector 2 which has front body control module (FBCM) terminals 2P and 2N. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between connector C-01 and the front body control module (FBCM) because the wiring harness is shorted to ground.
		No	Go to the next step.
29	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTOR C-32 AND CONNECTOR C-01** • Disconnect connector C-32. • Connect connector C-01. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between connector C-32 and connector C-01 because the wiring harness is shorted to ground.
		No	Go to Step 31.
30	**INSPECT FOR SHORT TO GROUND BETWEEN CONNECTORS C-32 AND FRONT BODY CONTROL MODULE (FBCM)** • Disconnect connector C-32. • Connect connector 2 which has front body control module (FBCM) terminals 2P and 2N. • Inspect for continuity at the following terminals: — Between DLC-2 terminal F and body ground — Between DLC-2 terminal E and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between connector C-32 and the front body control module (FBCM) because the wiring harness is shorted to ground.
		No	Go to the next step.
31	**INSPECT FOR SHORT TO GROUND BETWEEN DSC HU/CM AND CONNECTOR C-32** • Inspect for continuity at the following terminals: — Between DSC HU/CM terminal AF and body ground — Between DSC HU/CM terminal AC and body ground • Is there continuity?	Yes	Go to the next step.
		No	Go to Step 33.
32	**INSPECT CAN LINE IN DSC HU/CM FOR SHORT TO GROUND** • Disconnect the DSC HU/CM connector. • Inspect for continuity at the following terminals: — Between DSC HU/CM terminal AF (wiring harness side) and body ground — Between DSC HU/CM terminal AC (wiring harness side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between the DSC HU/CM and connector C-32 because the wiring harness is shorted to ground.
		No	Replace the DSC HU/CM because there is a short to ground in the DSC HU/CM. (See DSC HU/CM REMOVAL/INSTALLATION.)
33	**INSPECT CAN LINE IN PCM FOR SHORT TO GROUND** • Disconnect the PCM connector. • Inspect for continuity at the following terminals: — Between PCM terminal 2AK (wiring harness side) and body ground — Between PCM terminal 2AL (wiring harness side) and body ground • Is there continuity?	Yes	Repair or replace the wiring harness between the PCM and connector C-32 because the wiring harness is shorted to ground .
		No	Replace the PCM because there is a short to ground in the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)