BODY SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.
This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.
Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)	AC
HVAC SYSTEM (DIAGNOSTICS)	AC
AIRBAG SYSTEM	AB
AIRBAG SYSTEM (DIAGNOSTICS)	AB
SEAT BELT SYSTEM	SB
LIGHTING SYSTEM	LI
WIPER AND WASHER SYSTEMS	WW
ENTERTAINMENT	ET
COMMUNICATION SYSTEM	COM
GLASS/WINDOWS/MIRRORS	GW
BODY STRUCTURE	BS
INSTRUMENTATION/DRIVER INFO	IDI
SEATS	SE
SECURITY AND LOCKS	SL
SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)	SR
EXTERIOR/INTERIOR TRIM	EI
EXTERIOR BODY PANELS	EB

BODY SECTION

CRUISE CONTROL SYSTEM	CC
CRUISE CONTROL SYSTEM (DIAGNOSTICS)	CC
IMMOBILIZER (DIAGNOSTICS)	IM

CRUISE CONTROL SYSTEM (DIAGNOSTICS)

CC

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1. Basic Diagnostic Procedure

A: PROCEDURE

	Step	Value	Yes	No
1	**START DIAGNOSIS.** 1) Perform pre-inspection. <Ref. to CC-6, INSPECTION, General Description.> 2) Check cruise control main switch operation. Is cruise control main switch turned ON?	Cruise main switch is turned ON.	Go to step **2.**	Go to symptom 1. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>
2	**PREPARE SUBARU SELECT MONITOR.** Is the Subaru select monitor available?	Subaru select monitor is available.	Go to step **3.**	Go to step **4.**
3	**PERFORM CRUISE CANCEL CONDITIONS DIAGNOSIS.** Perform cruise cancel conditions diagnosis. <Ref. to CC-10, Subaru Select Monitor.> Is trouble code indicated?	Trouble code is not indicated.	Go to step **4.**	Go to "List of Diagnostic Trouble Code (DTC)". <Ref. to CC-26, List of Diagnostic Trouble Code (DTC).>
4	**CHECK CRUISE CONTROL SET OPERATION.** Check cruise control set operation. Can cruise control be set while driving at 40 km/h (25 MPH)?	Cruise control can be set.	Go to step **5.**	Go to symptom 2. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>
5	**CHECK VEHICLE SPEED IS HELD WITHIN SET SPEED.** Make sure vehicle speed is held within set speed. Is vehicle speed held within set speed ±3 km/h (±2 MPH) ?	Vehicle speed is held within set speed.	Go to step **6.**	Go to symptom 3. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>
6	**CHECK RESUME/ACCEL OPERATION.** Check RESUME/ACCEL operation. Does vehicle speed increase or return to set speed after RESUME/ACCEL switch has been pressed?	Vehicle speed increases or returns to set speed.	Go to step **7.**	Go to symptom 4. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>
7	**CHECK SET/COAST OPERATION.** Check SET/COAST operation. Does vehicle speed decrease after SET/COAST switch has been pressed?	Vehicle speed decreases.	Go to step **8.**	Go to symptom 5. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>
8	**CHECK CANCEL OPERATION.** Check CANCEL operation. Is cruise control released after CANCEL switch has been pressed?	Cruise control is released.	Go to step **9.**	Go to symptom 6. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>
9	**CHECK CRUISE CONTROL RELEASE OPERATION.** Check cruise control release operation. Is cruise control released after brake pedal has been depressed?	Cruise control is released.	Go to step **10.**	Go to symptom 7. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>

Step		Value	Yes	No
10	**CHECK CRUISE CONTROL RELEASE OPERATION.** Check cruise control release operation. Is cruise control released after clutch pedal has been depressed? (MT)	Cruise control is released.	Finish the diagnostics.	Go to symptom 8. <Ref. to CC-12, SYMPTOM CHART, Diagnostics Chart with Symptom.>

2. General Description

A: CAUTION

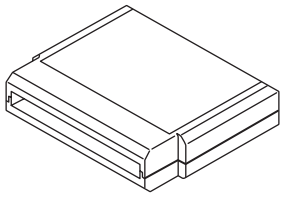
1. SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

Airbag system wiring harness is routed near the cruise control module and cruise control command switch.

CAUTION:
• All airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
• Be careful not to damage airbag system wiring harness when servicing the cruise control module and cruise control command switch.

B: PREPARATION TOOL

1. SPECIAL TOOLS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST24082AA210	24082AA210 (Newly adopted tool)	CARTRIDGE	Troubleshooting for electrical systems.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical systems. • English: 22771AA030 (Without printer) • German: 22771AA070 (Without printer) • French: 22771AA080 (Without printer) • Spanish: 22771AA090 (Without printer)

2. GENERAL TOOLS

TOOL NAME	REMARKS
Circuit Tester	Used for measuring resistance, voltage and ampere.

C: INSPECTION

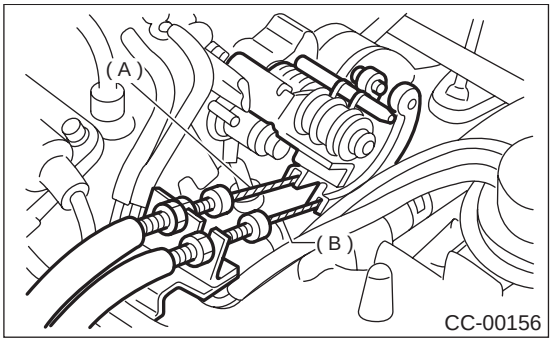
1. BATTERY

Measure battery voltage and specific gravity of electrolyte.

Standard voltage:
12 V, or more

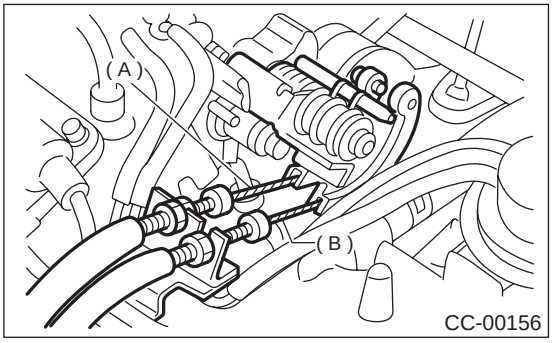
Specific gravity:
Above 1.260

2. CRUISE CONTROL CABLE



Check the cruise control cable (B) installation.
If NG, install the cable securely.

3. ACCELERATOR CABLE

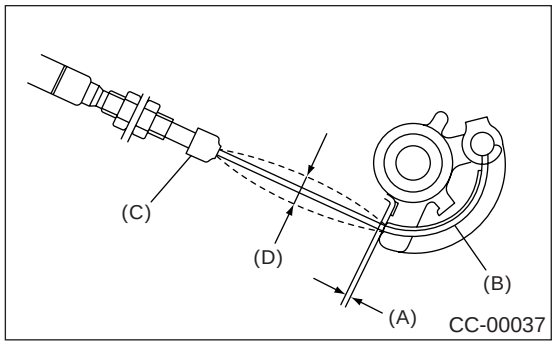


Check movement of the accelerator cable (A) when the cruise control throttle is moved by hand.
If NG, check throttle cam.

4. THROTTLE CAM

Check that the throttle cam moves smoothly.
If NG, repair throttle cam.

5. CABLE FREE PLAY



Check that the clearance (A) between throttle cam (B) and lever or cable deflection (D) is within specifications.

Throttle cam-to-lever clearance:
0 — 1 mm (0 — 0.04 in)

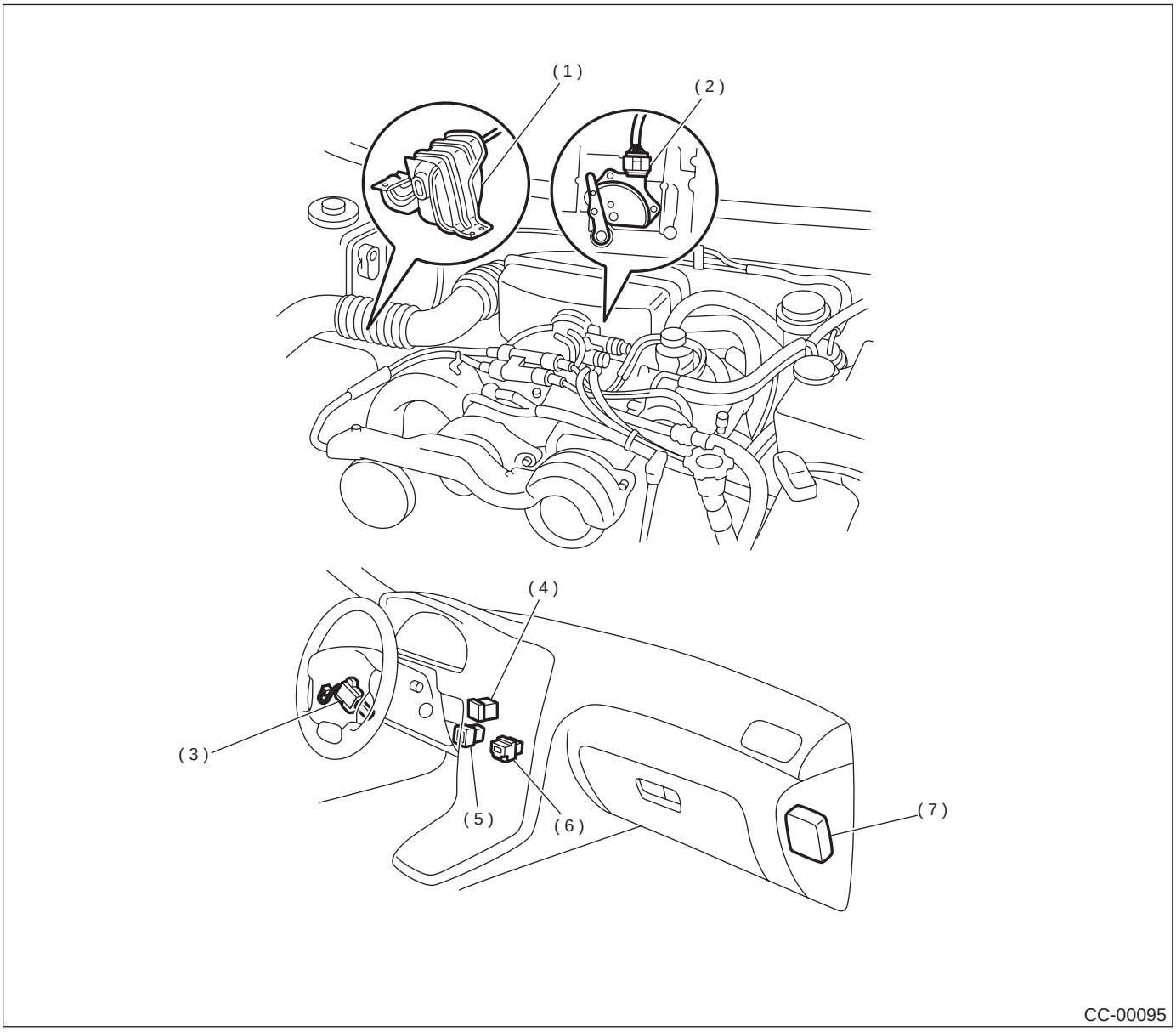
Inner cable deflection:
1 — 8 mm (0.04 — 0.31 in)

If NG, adjust the clearance or the deflection with the adjust nut.

NOTE:
Check that the cap (C) is positioned in the groove.

3. Electrical Components Location

A: LOCATION

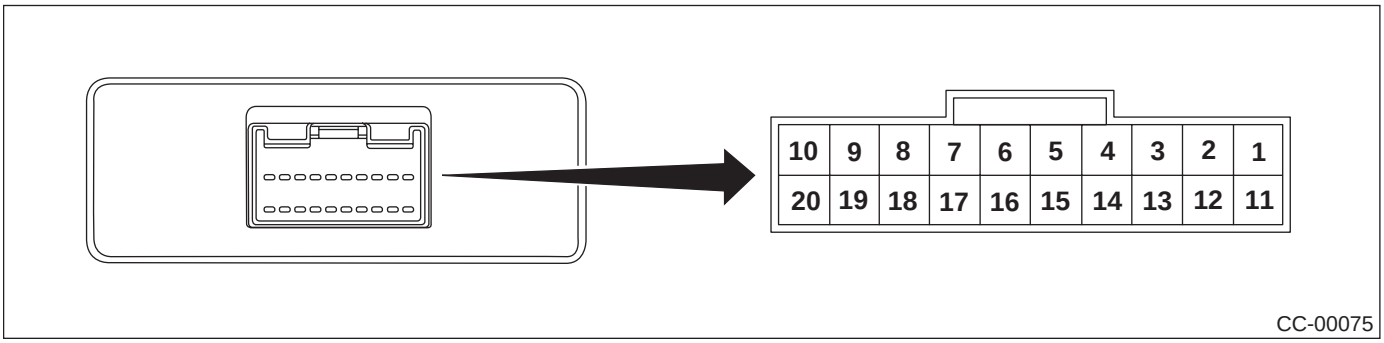


(1) Actuator
(2) Inhibitor switch (AT)
(3) Cruise control command switch
(4) Cruise control main switch
(5) Clutch switch (MT)
(6) Stop and brake switch
(7) Cruise control module

NOTE:
Electrical component locations are for LHD vehicles.
Cruise control actuator and cruise control module locations for RHD vehicles are symmetrically opposite.
Cruise control main switch location is different depending on destination.

4. Cruise Control Module I/O Signal

A: ELECTRICAL SPECIFICATION



Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Main light	1	• Battery voltage is present when main switch is turned OFF. • “0” volt is present when main switch is turned ON.
Inhibitor switch (AT)	4	• Battery voltage is present when selector lever is other than “P” or “N” position. • “0” volt is present when selector lever is set to “P” or “N” position.
Motor B	5	• ON-and-OFF (“0”-and-battery voltage) operation is alternately repeated while cruise control is operating. • “0” volt is present when main switch is turned OFF.
Ground	6	—
Motor A	7	• ON-and-OFF (“0”-and-battery voltage) operation is alternately repeated while cruise control is operating. • “0” volt is present when main switch is turned OFF.
RESUME/ACCEL switch	9	• Battery voltage is present when command switch is turned to RESUME/ACCEL position. • “0” volt is present when command switch is released.
SET/COAST switch	10	• Battery voltage is present when command switch is turned to SET/COAST position. • “0” volt is present when command switch is released.
Main power supply	11	• Battery voltage is present when main switch is turned ON. • “0” volt is present when main switch is turned OFF.
Ignition switch	12	• Battery voltage is present when ignition switch is turned ON. • “0” volt is present when ignition switch is turned OFF.
Motor C	13	• ON-and-OFF (“0”-and-battery voltage) operation is alternately repeated while cruise control is operating. • “0” volt is present when main switch is turned OFF.
Motor clutch	14	• ON-and-OFF (“0”-and-battery voltage) operation is alternately repeated while cruise control is operating. • “0” volt is present when vehicle is stopped.
Cruise control main switch	15	• Battery voltage is present during pressing the main switch. • “0” volt is present when main switch is released.
Brake switch	16	Leave clutch pedal released (MT), while cruise control main switch is turned ON. Then check that; • Battery voltage is present when brake pedal is released. • “0” volt is present when brake pedal is depressed. Additionally only in MT vehicle, keep the cruise control main switch to ON and leave brake pedal released. Then check that; • Battery voltage is present when clutch pedal is released. • “0” volt is present when clutch pedal is depressed.
Data link connector	17	—
Data link connector	18	—

Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Vehicle speed sensor (MT) TCM (AT)	19	Lift-up the vehicle until all four wheels are raised off ground, and then rotate any wheel manually. Approx. “5” and “0” volt pulse signals are alternately input to cruise control module.
Stop light switch	20	Turn ignition switch to OFF. Then check that; • Battery voltage is present when brake pedal is depressed. • “0” volt is present when brake pedal is released.
NOTE: Voltage at terminals 5, 7, 13 and 14 cannot be checked unless vehicle is driving by cruise control operation.		

B: SCHEMATIC

<Ref. to WI-142, SCHEMATIC, Cruise Control System.>

5. Subaru Select Monitor

A: OPERATION

1. GENERAL

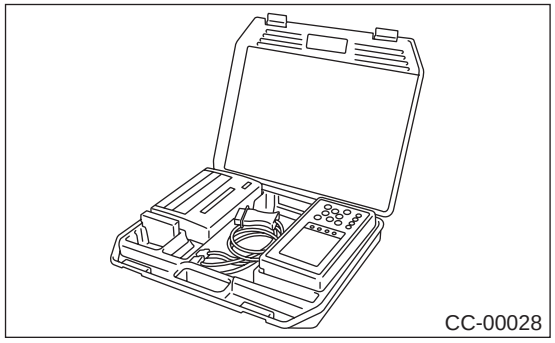
The on-board diagnosis function of the cruise control system uses an external Subaru Select Monitor.
The on-board diagnosis function operates in two categories, which are used depending on the type of problems;
1) Cruise cancel conditions diagnosis
(1) This category of diagnosis requires actual vehicle driving in order to determine the cause, (as when cruise speed is cancelled during driving although cruise cancel condition is not entered).
(2) Cruise control module memory stores the cancel condition (Code No.) which occurred during driving. When there are plural cancel conditions (Code No.), they are shown on the Subaru Select Monitor.

CAUTION:
• The cruise control memory stores not only the cruise "cancel" which occurred (although "cancel" operation is not entered by the driver), but also the "cancel" condition input by the driver.
• The content of memory is cleared when ignition switch or cruise main switch is turned OFF.

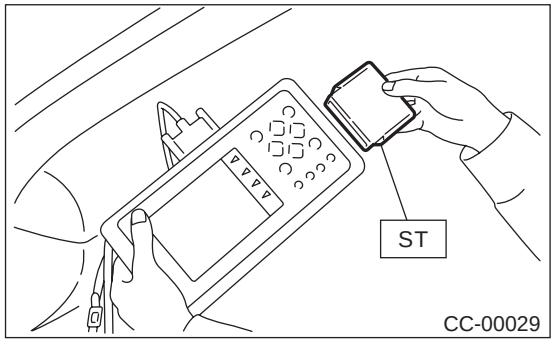
2) Real-time diagnosis
The real-time diagnosis function is used to determine whether or not the input signal system is in good order, according to signal emitted from switches, sensors, etc.
(1) Vehicle cannot be driven at cruise speed because problem occurs in the cruise control system or its associated circuits.
(2) Monitor the signal conditions from switches and sensors.

2. CRUISE CANCEL CONDITIONS DIAGNOSIS

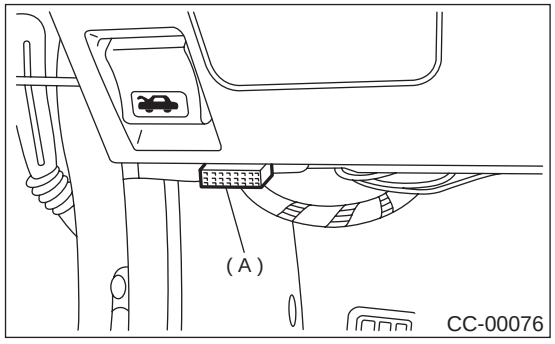
1) Prepare Subaru Select Monitor kit.



2) Connect diagnosis cable to Subaru Select Monitor.
3) Insert cartridge into Subaru Select Monitor. <Ref. to CC-5, SPECIAL TOOLS, PREPARATION TOOL, General Description.>

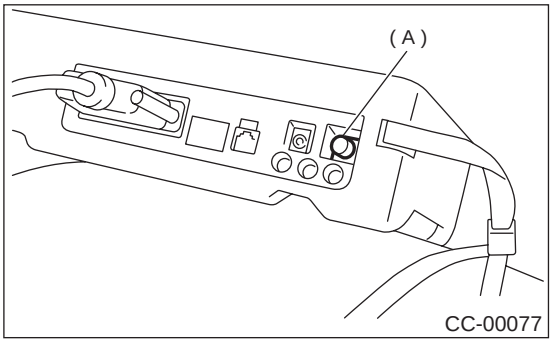


4) Connect Subaru Select Monitor to data link connector.
(1) Data link connector (A) is located in the lower portion of the instrument panel (on the driver's side).



(2) Connect diagnosis cable to data link connector.
5) Start engine and turn cruise control main switch to ON.

6) Turn Subaru Select Monitor switch (A) to ON.



7) On the «Main Menu» display screen, select the {All System Diagnosis} and press the [YES] key.

NOTE:
The diagnostic trouble code (DTC) is also shown in the {Each System Check} mode. This mode is called up on the «Cruise Control Diagnosis» display screen by selecting the item {Cancel Code(s) Display}.

8) Drive vehicle at least 30 km/h (19 MPH) with cruise speed set.
9) If cruise speed is canceled itself (without doing any cancel operations), a diagnostic trouble code (DTC) will appear on select monitor display.

CAUTION:
• A diagnostic trouble code (DTC) will also appear when cruise cancel is effected by driver. Do not confuse.
• Have a co-worker ride in vehicle to assist in diagnosis during driving.

NOTE:
Diagnostic trouble code (DTC) will be cleared by turning ignition switch or cruise control main switch to OFF.

3. REAL-TIME DIAGNOSIS

1) Connect select monitor.
2) Turn ignition switch and cruise control main switch to ON.
3) Turn Subaru Select Monitor switch to ON.
4) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
5) On the «System Selection Menu» display screen, select the {Cruise Control} and press the [YES] key.
6) Press the [YES] key after displayed the information of engine type.
7) On the «Cruise Control Diagnosis» display screen, select the {Current Data Display & Save} and press the [YES] key.
8) Make sure that normal indication is displayed when controls are operated as indicated below:
• Depress/release the brake pedal. (Stop light switch and brake switch turn ON or OFF.)
• Turn ON/OFF the “SET/COAST” switch.
• Turn ON/OFF the “RESUME/ACCEL” switch.
• Depress/release the clutch pedal. (MT)
• Set the selector lever to P or N. (AT)

NOTE:
• For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
• For detailed concerning diagnostic trouble codes (DTCs), refer to the List of Diagnostic Trouble Code (DTC).
<Ref. to CC-26, List of Diagnostic Trouble Code (DTC).>

6. Diagnostics Chart with Symptom

A: SYMPTOM CHART

Symptom		Repair area	Reference
1	Cruise control main switch is not turned ON.	(1) Check power supply.	<Ref. to CC-14, CHECK POWER SUPPLY, Diagnostics Chart with Symptom.>
		(2) Check cruise control main switch.	<Ref. to CC-16, CHECK CRUISE CONTROL MAIN SWITCH, Diagnostics Chart with Symptom.>
2	Cruise control cannot be set.	(1) Check SET/COAST switch.	<Ref. to CC-18, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostics Chart with Symptom.>
		(2) Check stop light switch and brake switch.	<Ref. to CC-20, CHECK STOP LIGHT SWITCH AND BRAKE SWITCH, Diagnostics Chart with Symptom.>
		(3) Check clutch switch (MT).	<Ref. to CC-22, CHECK CLUTCH SWITCH (MT), Diagnostics Chart with Symptom.>
		(4) Check inhibitor switch (AT).	<Ref. to CC-24, CHECK INHIBITOR SWITCH (AT), Diagnostics Chart with Symptom.>
		(5) Check vehicle speed sensor.	<Ref. to CC-28, DTC 22 VEHICLE SPEED SENSOR, Diagnostics Chart with Trouble Code.>
		(6) Check motor drive system.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
		(7) Check motor clutch drive system.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>
3	Vehicle speed is not held within set speed ±3 km/h (±2 MPH).	(1) Check vehicle speed sensor.	<Ref. to CC-28, DTC 22 VEHICLE SPEED SENSOR, Diagnostics Chart with Trouble Code.>
		(2) Check motor drive system.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
		(3) Check motor clutch drive system.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>
4	Vehicle speed does not increase or does not return to set speed after RESUME/ ACCEL switch has been pressed.	(1) Check RESUME/ACCEL switch.	<Ref. to CC-18, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostics Chart with Symptom.>
		(2) Check motor drive system.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
		(3) Check motor clutch drive system.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>
5	Vehicle speed does not decrease after SET/COAST switch has been pressed.	(1) Check SET/COAST switch.	<Ref. to CC-18, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostics Chart with Symptom.>
		(2) Check motor drive system.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
		(3) Check motor clutch drive system.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>
6	Cruise control is not released after CANCEL switch has been pressed.	(1) Check CANCEL switch.	<Ref. to CC-18, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostics Chart with Symptom.>
		(2) Check motor drive system.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
		(3) Check motor clutch drive system.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>
7	Cruise control is not released after brake pedal has been depressed.	(1) Check stop light switch and brake switch.	<Ref. to CC-20, CHECK STOP LIGHT SWITCH AND BRAKE SWITCH, Diagnostics Chart with Symptom.>
		(2) Check motor drive system.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
		(3) Check motor clutch drive system.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>

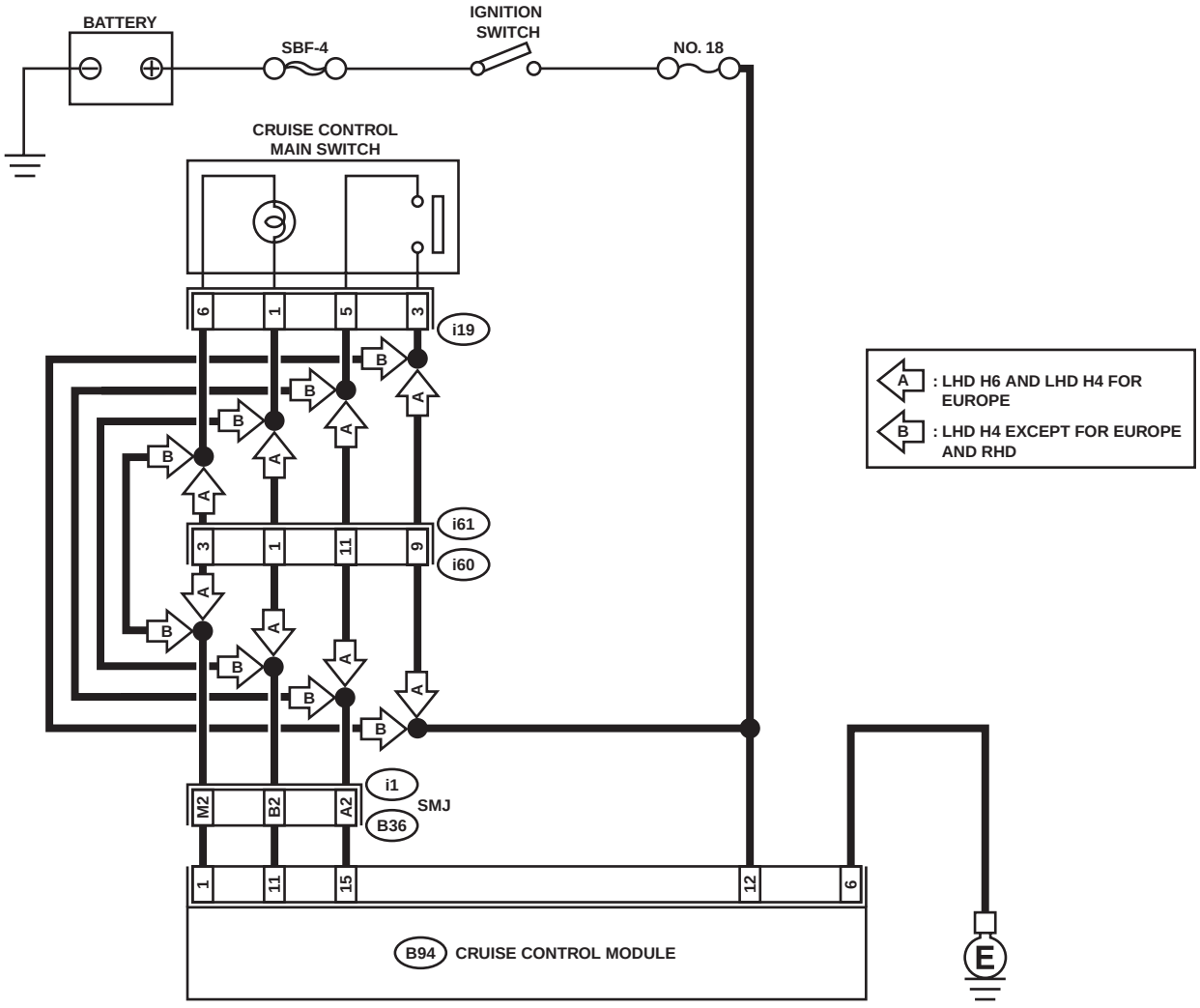
Symptom		Repair area	Reference
8	Cruise control is not released after clutch pedal has been depressed (MT).	(1) Check clutch switch.	<Ref. to CC-22, CHECK CLUTCH SWITCH (MT), Diagnostics Chart with Symptom.>
		(2) Check motor drive system.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
		(3) Check motor clutch drive system.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>

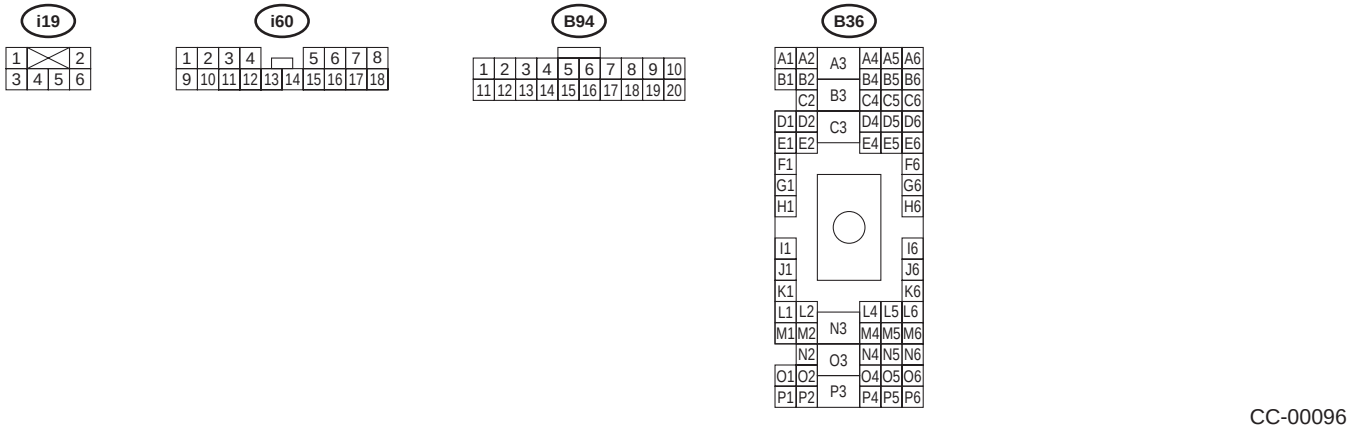
B: CHECK POWER SUPPLY

TROUBLE SYMPTOM:

Cruise control cannot be set, and indicator does not come on. (When main switch is pressed.)

WIRING DIAGRAM:





CC-00096

	Step	Value	Yes	No
1	**CHECK POWER SUPPLY.** 1) Turn ignition switch OFF. 2) Disconnect cruise control module harness connector. 3) Turn ignition switch ON. 4) Measure voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B94) No. 12 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **2.**	• Check fuse No. 18 (in fuse & relay box). • Check harness for open or short between cruise control module and fuse & relay box.
2	**CHECK GROUND CIRCUIT.** 1) Turn ignition switch OFF. 2) Measure resistance between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B94) No. 6 — Chassis ground:*** Is the measured value less than the specified value?	10 Ω	Power supply and ground circuit are OK.	Repair harness.

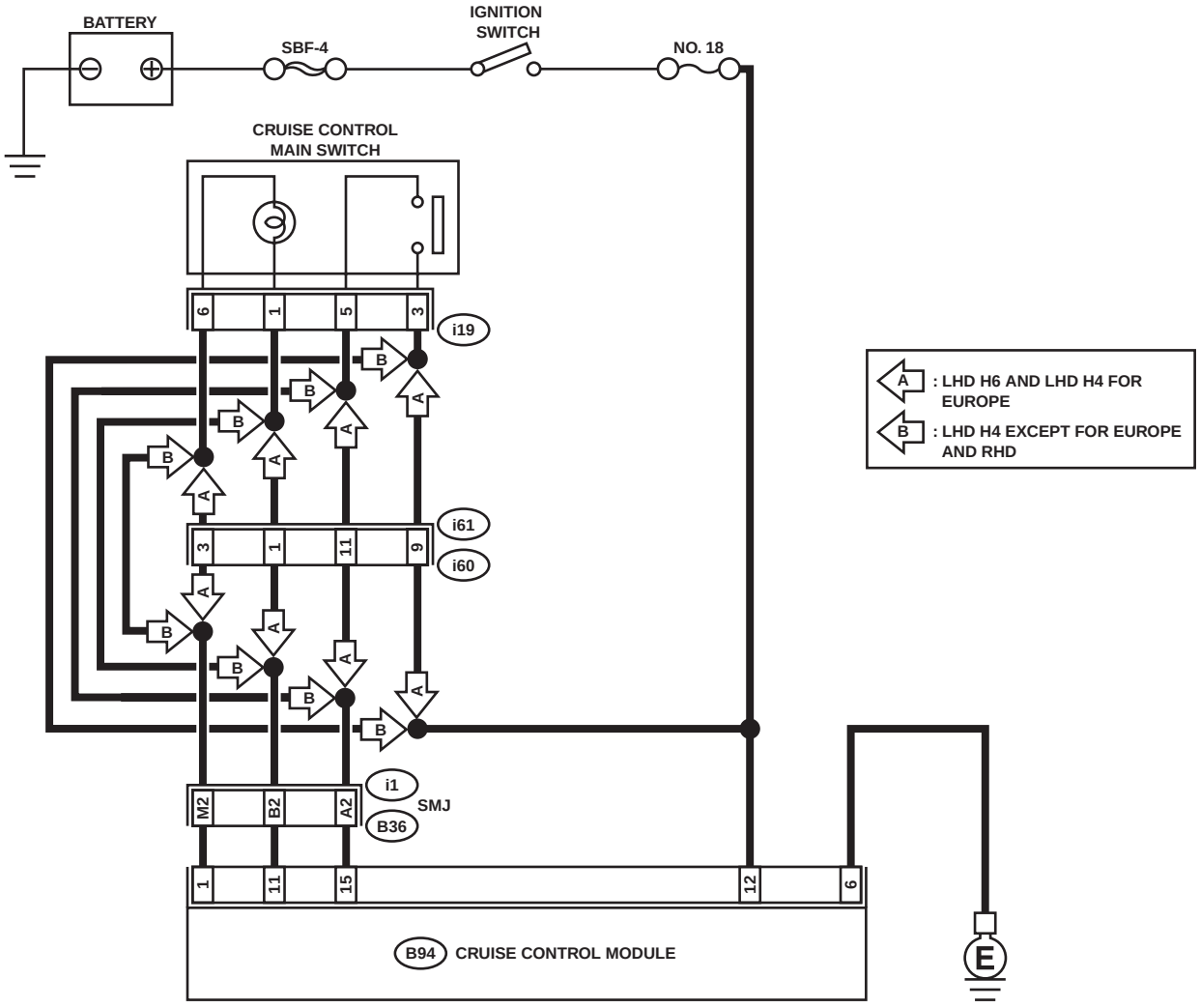
C: CHECK CRUISE CONTROL MAIN SWITCH

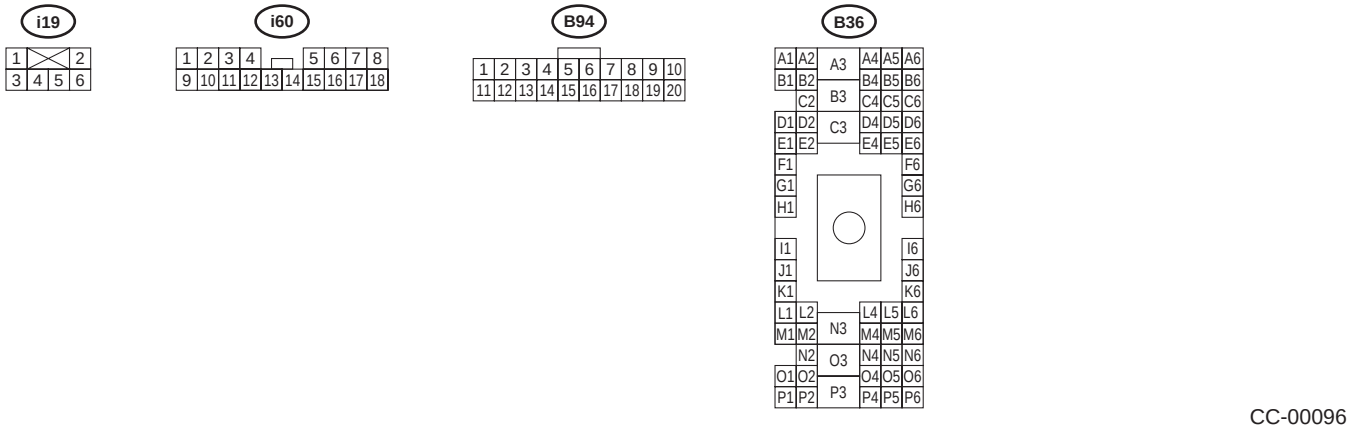
TROUBLE SYMPTOM:

Cruise control main switch is not turned ON and cruise control cannot be set.

NOTE:
When the main relay (built-in cruise control module) operates, the main switch circuit is in normal condition.
The main relay operation can be checked by hearing the operation sounds.
This operation sounds will be heard when ignition switch and cruise control main switch is turned to ON.

WIRING DIAGRAM:





CC-00096

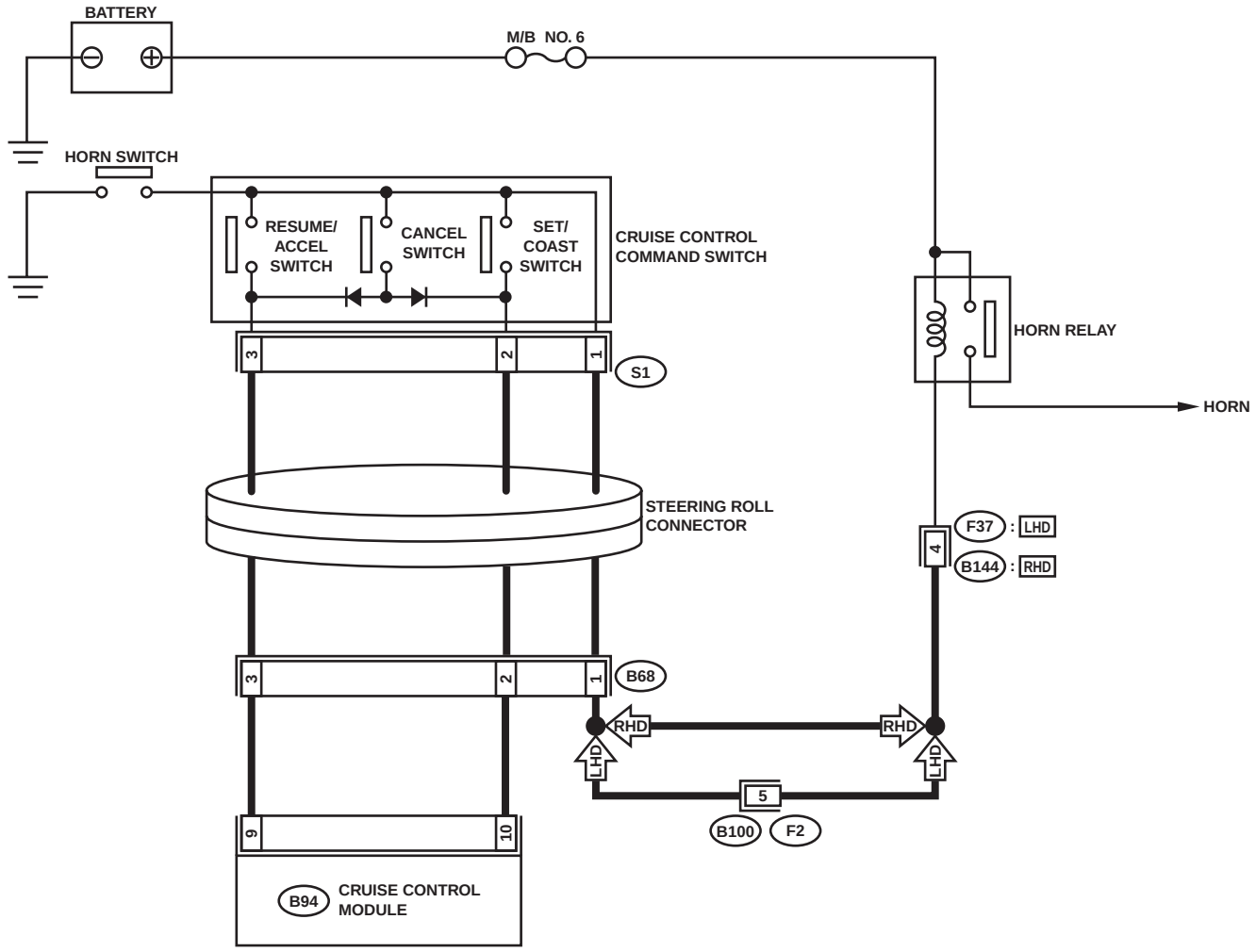
	Step	Value	Yes	No
1	**CHECK CRUISE CONTROL MAIN SWITCH CIRCUIT.** 1) Turn ignition switch OFF. 2) Disconnect cruise control main switch harness connector. 3) Turn ignition switch ON. 4) Measure voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(i19) No. 3 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **2.**	• Check fuse No. 18 (in fuse & relay box). • Check harness for open or short between cruise control main switch and fuse & relay box.
2	**CHECK CRUISE CONTROL MAIN SWITCH CIRCUIT.** 1) Turn ignition switch OFF. 2) Disconnect cruise control module harness connector. 3) Measure resistance between cruise control module harness connector terminal and cruise control main switch harness connector terminal. ***Connector & terminal*** ***(B94) No. 15 — (i19) No. 5:*** ***(B94) No. 1 — (i19) No. 6:*** ***(B94) No. 11 — (i19) No. 1:*** Is the measured value less than the specified value?	10 Ω	Go to step **3.**	Repair harness.
3	**CHECK CRUISE CONTROL MAIN SWITCH.** Remove and check cruise control main switch. <Ref. to CC-7, Cruise Control Main Switch.> Is cruise control main switch OK?	Cruise control main switch is OK.	Replace cruise control module.	Replace cruise control main switch.

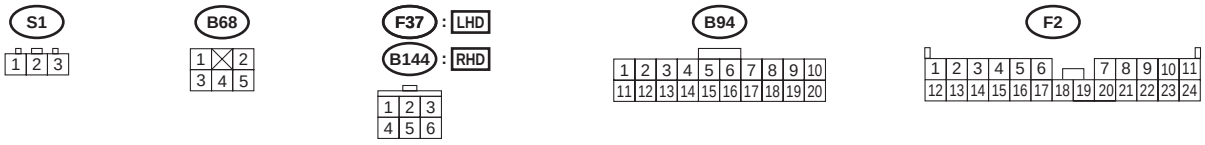
D: CHECK CRUISE CONTROL COMMAND SWITCH

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:





CC-00097

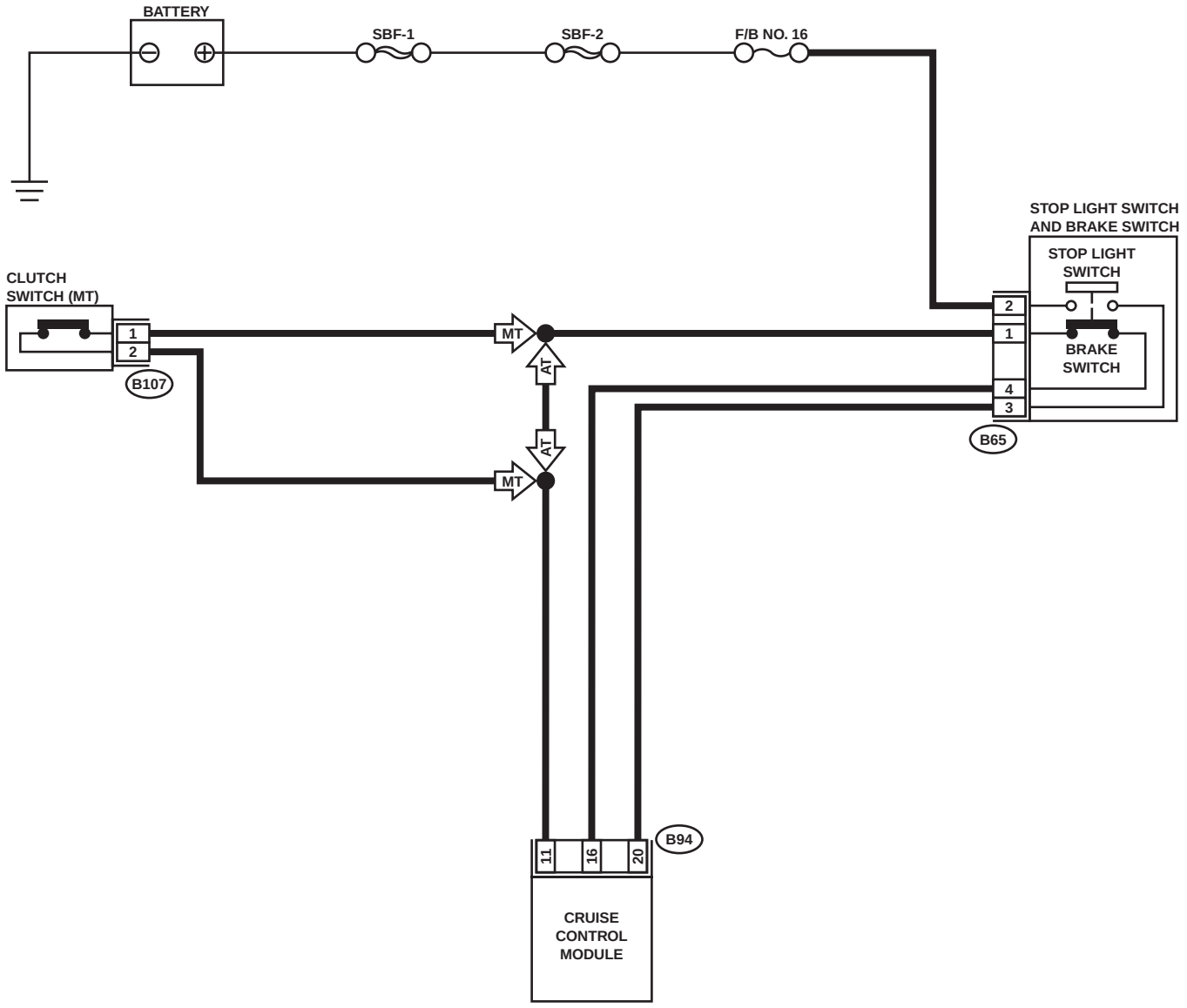
	Step	Value	Yes	No
1	**CHECK SET/COAST SWITCH CIRCUIT.** 1) Turn ignition switch OFF. 2) Disconnect cruise control module harness connector. 3) Measure voltage between harness connector terminal and chassis ground when SET/COAST switch is pressed and not pressed. ***Connector & terminal*** ***(B94) No. 10 (+) — Chassis ground (–):*** Is the measured value less than the specified value, when SET/COAST switch is not pressed? Does the measured value exceed the specified value, when SET/COAST switch is pressed?	When SET/COAST switch is not pressed: 0 V, and when SET/COAST switch is pressed: 10 V	Go to step **2.**	Go to step **4.**
2	**CHECK RESUME/ACCEL SWITCH CIRCUIT.** Measure voltage between harness connector terminal and chassis ground when RESUME/ACCEL switch is pressed and not pressed. ***Connector & terminal*** ***(B94) No. 9 (+) — Chassis ground (–):*** Is the measured value less than the specified value, when RESUME/ACCEL switch is not pressed? Does the measured value exceed the specified value, when RESUME/ACCEL switch is pressed?	When RESUME/ACCEL switch is not pressed: 0 V, and when RESUME/ACCEL switch is pressed: 10 V	Go to step **3.**	Go to step **4.**
3	**CHECK CANCEL SWITCH CIRCUIT.** Measure voltage between harness connector terminal and chassis ground when CANCEL switch is pressed and not pressed. ***Connector & terminal*** ***(B94) No. 9 (+) — Chassis ground (–):*** ***(B94) No. 10 (+) — Chassis ground (–):*** Is the measured value less than the specified value, when CANCEL switch is not pressed? Does the measured value exceed the specified value, when CANCEL switch is pressed?	When CANCEL switch is not pressed: 0 V, and when CANCEL switch is pressed: 10 V	Cruise control command switch circuit is OK.	Go to step **4.**
4	**CHECK POWER SUPPLY FOR COMMAND SWITCH.** Check horn operation. Does horn sound?	Horn sounds.	Go to step **5.**	• Check fuse No. 6 (in main fuse box). • Check horn relay. <Ref. to COM-3, HORN RELAY, INSPECTION, Horn System.> • Check harness for open or short between cruise control command switch and fuse & relay box.
5	**CHECK CRUISE CONTROL COMMAND SWITCH.** Remove and check cruise control command switch. <Ref. to CC-8, Cruise Control Command Switch.> Is cruise control command switch OK?	Cruise control command switch is OK.	Check harness between cruise control command switch and cruise control module.	Replace cruise control command switch.

E: CHECK STOP LIGHT SWITCH AND BRAKE SWITCH

TROUBLE SYMPTOM:

Cruise control cannot be set.

WIRING DIAGRAM:



CC-00080

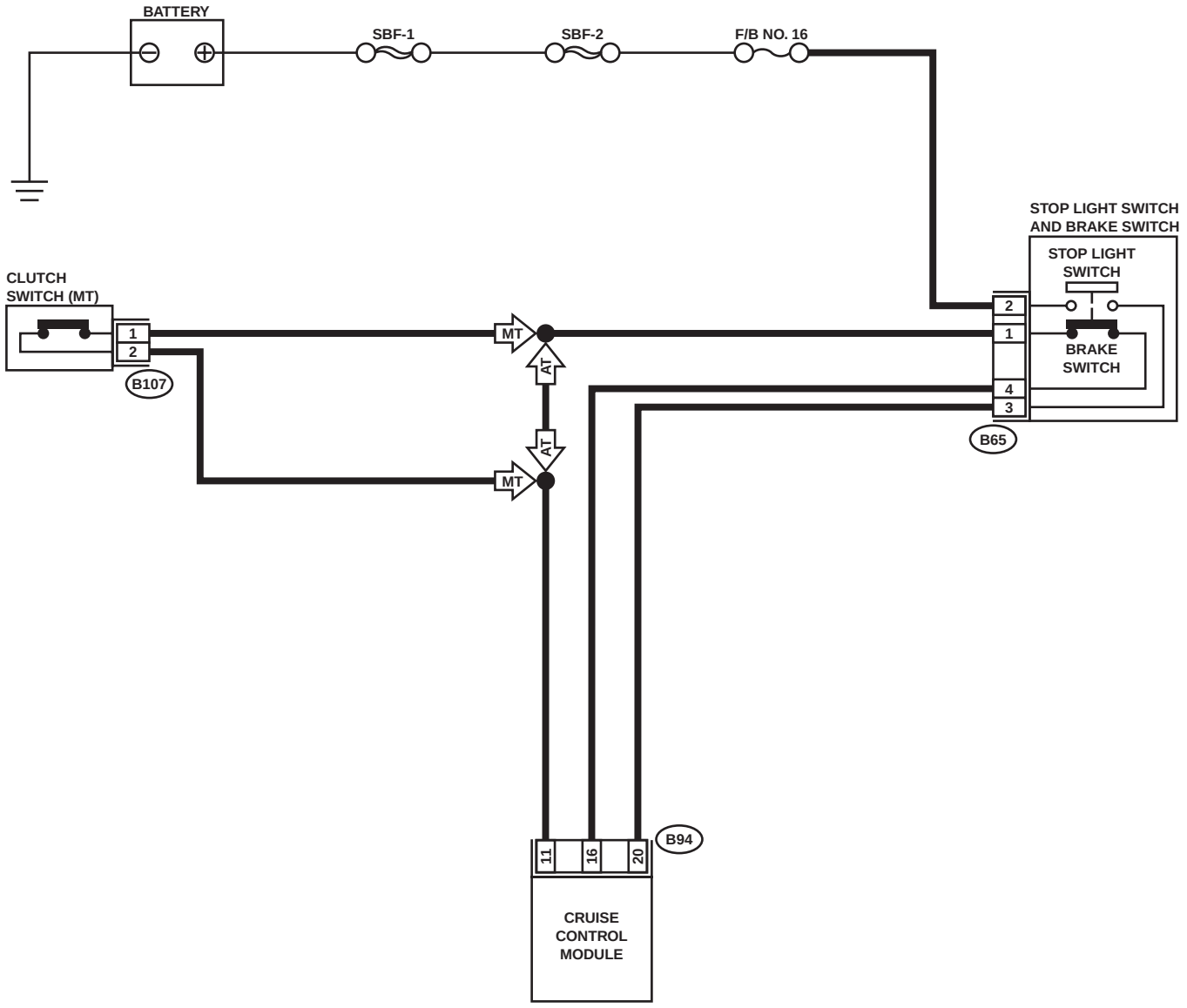
	Step	Value	Yes	No
1	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH CIRCUIT.** 1) Turn ignition switch OFF. 2) Disconnect stop light switch and brake switch harness connector. 3) Turn ignition switch ON. 4) Turn cruise control main switch ON. 5) Measure voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B65) No. 2 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **2.**	• Check fuse No. 16 (in fuse & relay box). • Check harness for open or short between stop light/brake switch and fuse & relay box.
2	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH CIRCUIT.** Measure voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B65) No. 1 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **3.**	• Check harness for open or short between stop light/brake switch and cruise control module (AT). • Check clutch switch and the circuit (MT).
3	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH CIRCUIT.** 1) Turn cruise control main switch and ignition switch OFF. 2) Disconnect cruise control module harness connector. 3) Measure resistance between cruise control module harness connector terminal and stop light switch and brake switch harness connector terminal. ***Connector & terminal*** ***(B94) No. 20 — (B65) No. 3:*** ***(B94) No. 16 — (B65) No. 4:*** Is the measured value less than the specified value?	10 Ω	Go to step **4.**	Repair harness.
4	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH.** Remove and check stop light switch and brake switch. <Ref. to CC-9, Stop and Brake Switch.> Are stop light switch and brake switch OK?	Stop light switch and brake switch are OK.	Stop light switch and brake switch circuit are OK.	Replace stop light switch and brake switch.

F: CHECK CLUTCH SWITCH (MT)

TROUBLE SYMPTOM:

Cruise control cannot be set.

WIRING DIAGRAM:



CC-00080

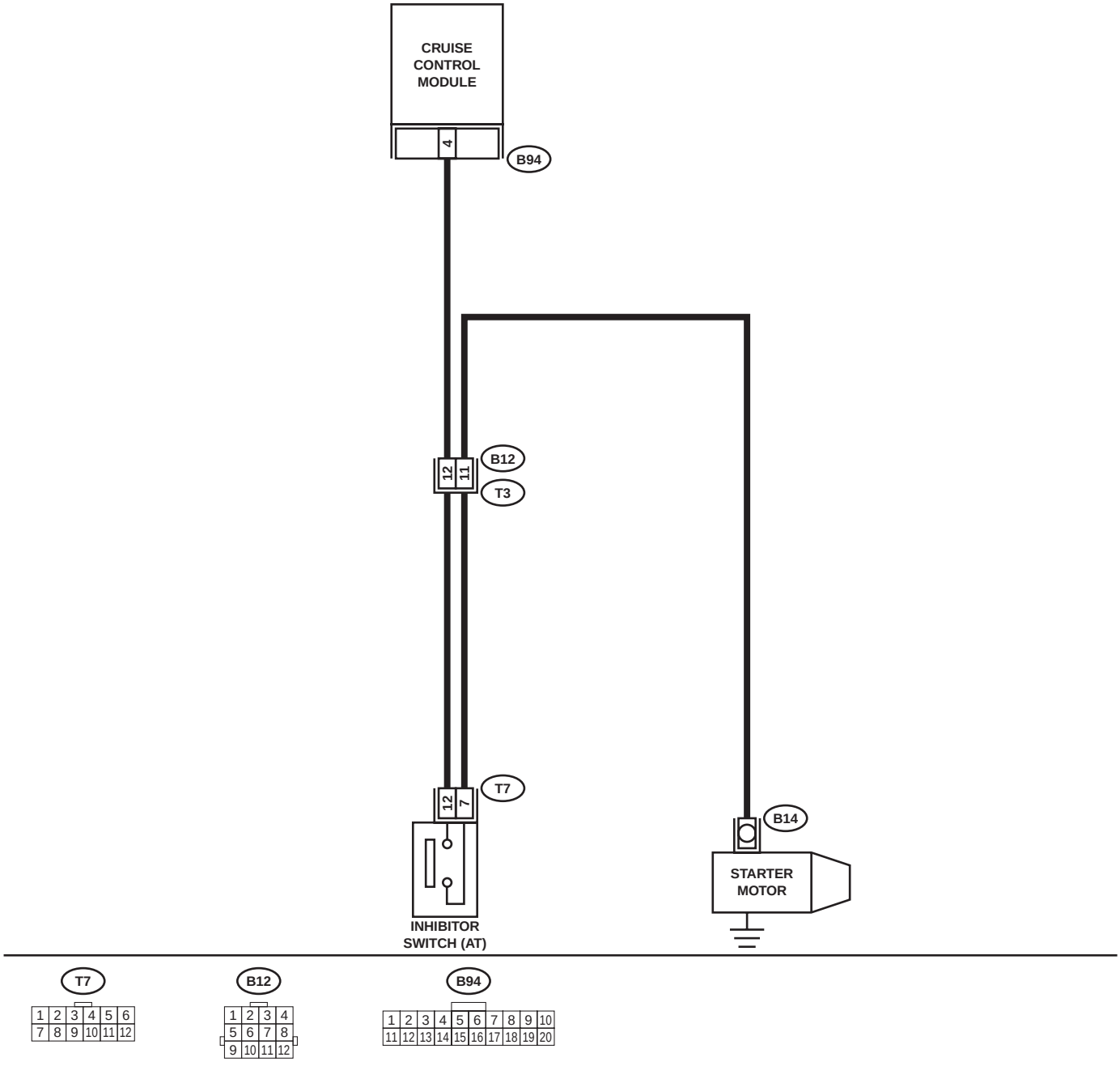
	Step	Value	Yes	No
1	**CHECK CLUTCH SWITCH CIRCUIT.** 1) Turn ignition switch OFF. 2) Disconnect clutch switch harness connector. 3) Turn ignition switch ON. 4) Turn cruise control main switch ON. 5) Measure voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B107) No. 2 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **2.**	Check harness for open or short between clutch switch and cruise control module.
2	**CHECK CLUTCH SWITCH CIRCUIT.** 1) Turn cruise control main switch and ignition switch OFF. 2) Disconnect stop light switch and brake switch harness connector. 3) Measure resistance between clutch switch harness connector terminal and stop light switch and brake switch harness connector terminal. ***Connector & terminal*** ***(B107) No. 1 — (B65) No. 1:*** Is the measured value less than the specified value?	10 Ω	Go to step **3.**	Repair harness.
3	**CHECK CLUTCH SWITCH.** Remove and check clutch switch. <Ref. to CC-10, Clutch Switch.> Is clutch switch OK?	Clutch switch is OK.	Clutch switch circuit is OK.	Replace clutch switch.

G: CHECK INHIBITOR SWITCH (AT)

TROUBLE SYMPTOM:

Cruise control cannot be set.

WIRING DIAGRAM:



CC-00098

	Step	Value	Yes	No
1	**CHECK INHIBITOR SWITCH CIRCUIT.** 1) Turn ignition switch OFF. 2) Disconnect inhibitor switch harness connector. 3) Turn ignition switch ON. 4) Turn cruise control main switch ON. 5) Measure voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(T7) No. 12 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **2.**	Check harness for open or short between inhibitor switch and cruise control module.
2	**CHECK INHIBITOR SWITCH CIRCUIT.** 1) Turn cruise control main switch and ignition switch OFF. 2) Disconnect starter motor harness connector. 3) Measure resistance between inhibitor switch harness connector terminal and chassis ground. ***Connector & terminal*** ***(T7) No. 7 — (B14) No. 1:*** Is the measured value less than the specified value?	10 Ω	Go to step **3.**	Repair harness.
3	**CHECK INHIBITOR SWITCH.** Remove and check inhibitor switch. <Ref. to CC-11, Inhibitor Switch.> Is inhibitor switch OK?	Inhibitor switch is OK.	Inhibitor switch circuit is OK.	Replace inhibitor switch.

7. List of Diagnostic Trouble Code (DTC)

A: LIST

DTC	Item	Contents of diagnosis	Reference
21	Inner relay is seized.	Cruise control module inner relay is seized when main switch is OFF.	<Ref. to CC-27, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostics Chart with Trouble Code.>
22	Vehicle speed sensor	Vehicle speed signal changes more than 10 km/h (6 MPH) within 350 ms.	<Ref. to CC-28, DTC 22 VEHICLE SPEED SENSOR, Diagnostics Chart with Trouble Code.>
24	Cruise control module is abnormal.	Two vehicle speed values stored in cruise control module memory are not the same.	<Ref. to CC-27, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostics Chart with Trouble Code.>
25	Cruise control module is abnormal.	Two output values stored in cruise control module memory are not the same.	<Ref. to CC-27, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostics Chart with Trouble Code.>
28	Wiring harness opened.	Open wiring harness circuit is detected via control module relay when main switch is ON.	<Ref. to CC-31, DTC 28 WIRING HARNESS OPENED., Diagnostics Chart with Trouble Code.>
35	Motor drive system is abnormal.	• Motor output circuit is open or shorted. • Motor drive circuit is open or shorted.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
36	Trouble of motor turning speed	Motor turning speed is low.	<Ref. to CC-32, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostics Chart with Trouble Code.>
37	Motor clutch drive system is abnormal.	• Motor clutch output circuit is open or shorted. • Motor clutch drive circuit is open or shorted.	<Ref. to CC-34, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostics Chart with Trouble Code.>
38	Motor drive shaft does not engage properly.	Motor drive gear engagement is not properly adjusted.	<Ref. to CC-36, DTC 38 MOTOR DRIVE SHAFT DOES NOT ENGAGE PROPERLY., Diagnostics Chart with Trouble Code.>
39	Motor is overloaded.	Current flows through motor more frequently than under normal conditions.	<Ref. to CC-36, DTC 39 MOTOR IS OVERLOADED., Diagnostics Chart with Trouble Code.>
2A	Cruise control module is abnormal.	Cruise control module self-diagnosis function senses abnormality.	<Ref. to CC-27, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostics Chart with Trouble Code.>

8. Diagnostics Chart with Trouble Code

A: DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM

DIAGNOSIS:

- Poor welding of built-in relay of cruise control module.
- Failure of built-in CPU RAM of cruise control module.

TROUBLE SYMPTOM:

- Cruise control is canceled and memorized cruise speed is also canceled.
- Once cruise control is canceled, cruise control cannot be set until the ignition switch and cruise control main switch turns OFF, and then turns ON again.

NOTE:
Check input/output signal and vehicle speed signal with select monitor. When signals are in good condition, failure is in cruise control module. (Check power supply and ground conditions of cruise control module.)

B: DTC 22 VEHICLE SPEED SENSOR

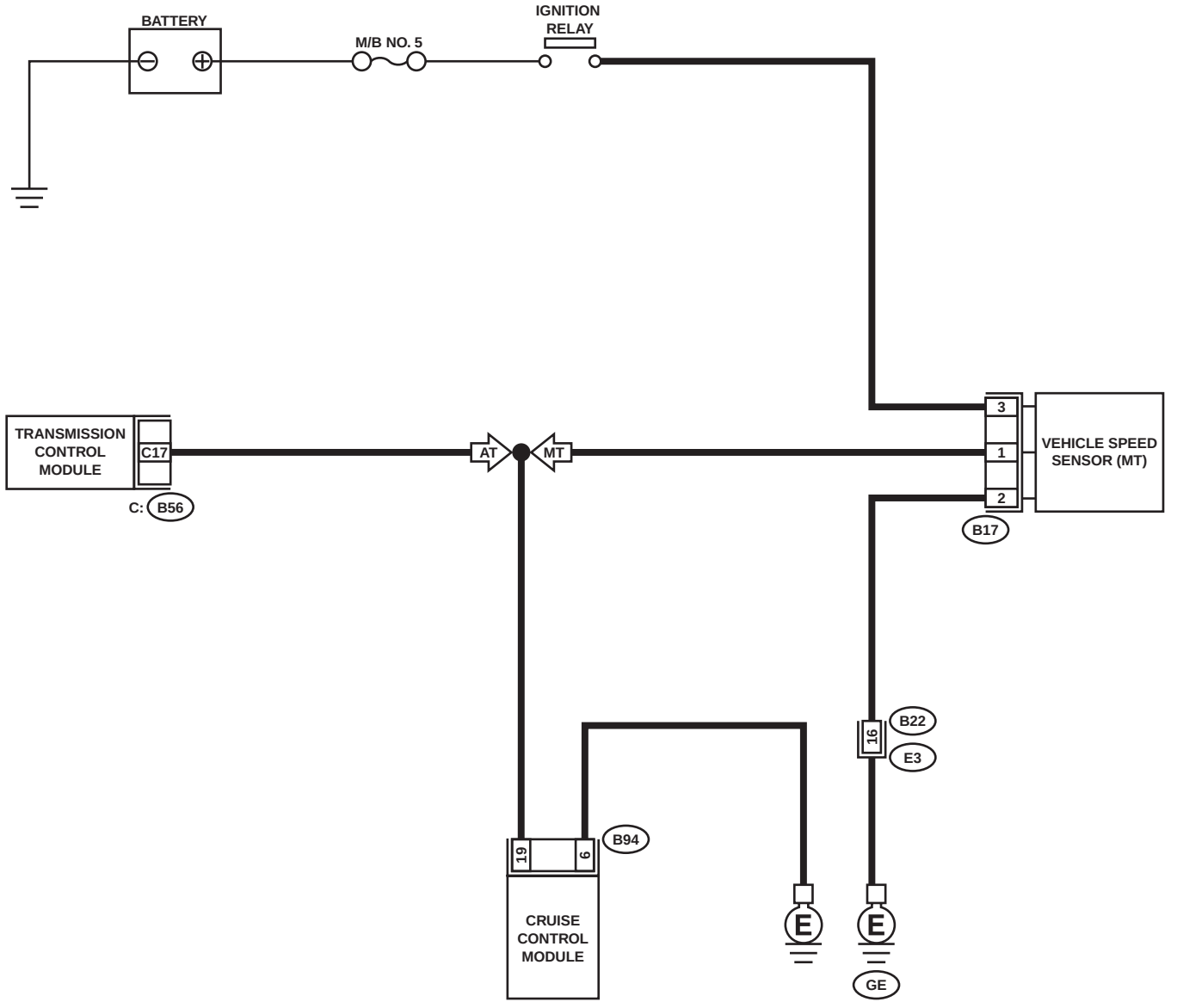
DIAGNOSIS:

Disconnection or short circuit of vehicle speed sensor system.

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:



CC-00099

	Step	Value	Yes	No
1	**CHECK TRANSMISSION TYPE.** Is the transmission type MT?	Transmission type is MT.	Go to step **2.**	Go to step **6.**
2	**CHECK HARNESS BETWEEN BATTERY AND VEHICLE SPEED SENSOR.** 1) Turn ignition switch to OFF. 2) Disconnect harness connector from vehicle speed sensor. 3) Turn ignition switch to ON. 4) Measure voltage between vehicle speed sensor harness connector terminal and chassis ground. ***Connector & terminal*** ***(B17) No. 3 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **3.**	Check harness for open or short between ignition relay and vehicle speed sensor.
3	**CHECK HARNESS BETWEEN CRUISE CONTROL MODULE AND VEHICLE SPEED SENSOR.** 1) Turn ignition switch to OFF. 2) Disconnect harness connector from cruise control module. 3) Measure resistance between vehicle speed sensor harness connector terminal and cruise control module harness connector terminal. ***Connector & terminal*** ***(B17) No. 1 — (B94) No. 19:*** Is the measured value less than the specified value?	10 Ω	Go to step **4.**	Repair harness.
4	**CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND ENGINE GROUND.** Measure resistance between vehicle speed sensor harness connector terminal and engine ground. ***Connector & terminal*** ***(B17) No. 2 (+) — Engine ground (–):*** Is the measured value less than the specified value?	10 Ω	Go to step **5.**	Repair harness.
5	**CHECK VEHICLE SPEED SENSOR.** 1) Connect harness connector to vehicle speed sensor. 2) Lift-up the vehicle and support with safety stands. 3) Drive the vehicle at speed greater than 20 km/h (12 MPH). **Warning:** **Be careful not to be caught up by the running wheels.** 4) Measure voltage between cruise control module harness connector terminal and chassis ground. ***Connector & terminal*** ***(B94) No. 19 (+) — Chassis ground (–):*** Is the measured value same as the specified value?	0 ←→ 5 V	Replace cruise control module. <Ref. to CC-6, Cruise Control Module.>	Replace vehicle speed sensor.

	Step	Value	Yes	No
6	**CHECK HARNESS BETWEEN CRUISE CONTROL MODULE AND TRANSMISSION CONTROL MODULE.** 1) Turn ignition switch to OFF. 2) Disconnect harness connector from transmission control module and cruise control module. 3) Measure resistance between cruise control module harness connector terminal and transmission control module harness connector terminal. ***Connector & terminal*** ***(B94) No. 19 — (B56) No. 17:*** Is the measured value less than the specified value?	10 Ω?	Go to step **7.**	Repair harness.
7	**CHECK TRANSMISSION CONTROL MODULE.** 1) Connect harness connector to transmission control module. 2) Lift-up the vehicle and support with safety stands. 3) Drive the vehicle faster than 10 km/h (6 MPH). **Warning:** **Be careful not to be caught by the running wheels.** 4) Measure voltage between transmission control module harness connector terminal and chassis ground. ***Connector & terminal*** ***(B56) No. 17 (+) — Chassis ground (–):*** Is the measured value same as the specified value?	0 ←→ 5 V	Replace cruise control module. <Ref. to CC-6, Cruise Control Module.>	Replace transmission control module. <Ref. to AT-76, Transmission Control Module (TCM).>

C: DTC 28 WIRING HARNESS OPENED.

Step		Value	Yes	No
1	**CHECK BATTERY.** Measure battery specific gravity of electrolyte. Does the measured value exceed the specified value?	1.250	Go to step **2.**	Charge or replace battery. Go to step **2.**
2	**CHECK FUSES, CONNECTORS AND HARNESSES.** Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding. Is there anything unusual about the appearance of main fuse, fuse, harness, connector and grounding?	Fuse, harness, connector and grounding are OK.	End of inspection.	Repair or replace faulty parts.

D: DTC 35 AND 36 ACTUATOR MOTOR

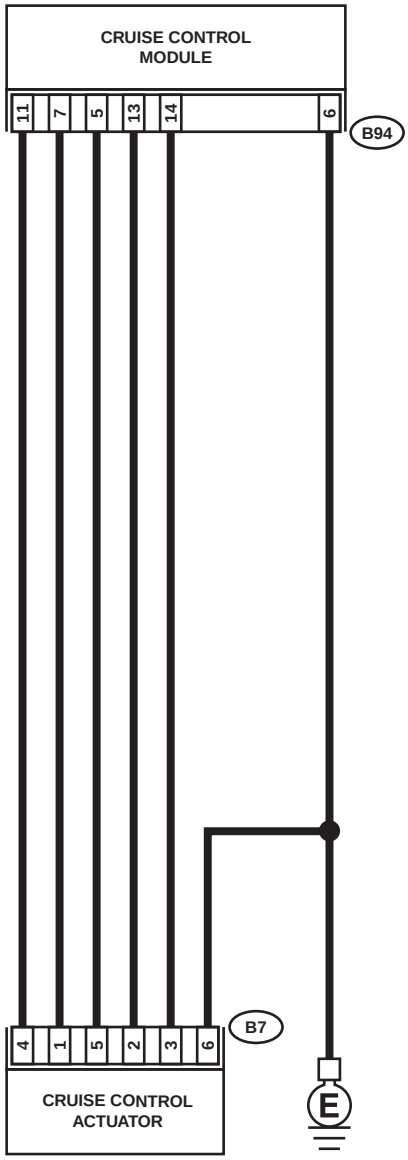
DIAGNOSIS:

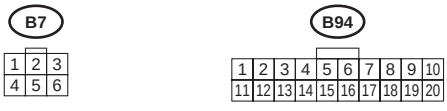
Open or poor contact of cruise control actuator motor.

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:





CC-00083

	Step	Value	Yes	No
1	**CHECK POWER SUPPLY.** 1) Turn ignition switch OFF. 2) Disconnect harness connector from cruise control actuator. 3) Turn ignition switch ON. 4) Turn cruise control main switch ON. 5) Measure voltage between cruise control actuator harness connector terminal and chassis ground. ***Terminals*** ***(B7) No. 4 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **2.**	Check harness for open or short between cruise control module and cruise control actuator.
2	**CHECK GROUND CIRCUIT OF ACTUATOR.** 1) Turn ignition switch and cruise control main switch OFF. 2) Measure resistance between cruise control actuator harness connector terminal and chassis ground. ***Terminals*** ***(B7) No. 6 — Chassis ground:*** Is the measured value less than the specified value?	10 Ω	Go to step **3.**	Repair harness.
3	**MEASURE RESISTANCE OF ACTUATOR.** Measure resistance of cruise control actuator motor. ***Terminals*** ***No. 4 — No. 1:*** ***No. 4 — No. 2:*** ***No. 4 — No. 5:*** Is the measured value same as the specified value?	Approximately 5 Ω	Go to step **4.**	Replace cruise control actuator. <Ref. to CC-4, Actuator.>
4	**CHECK HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.** 1) Disconnect harness connector from cruise control module. 2) Measure resistance between cruise control module harness connector terminal and cruise control actuator harness connector terminal. ***Connector & terminal*** ***(B7) No. 1 — (B94) No. 7:*** Is the measured value less than the specified value?	10 Ω	Go to step **5.**	Repair harness.
5	**CHECK HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.** Measure resistance between cruise control module harness connector terminal and cruise control actuator harness connector terminal. ***Connector & terminal*** ***(B7) No. 5 — (B94) No. 5:*** Is the measured value less than the specified value?	10 Ω	Replace cruise control module. <Ref. to CC-6, Cruise Control Module.>	Repair harness.

E: DTC 37 ACTUATOR MOTOR CLUTCH

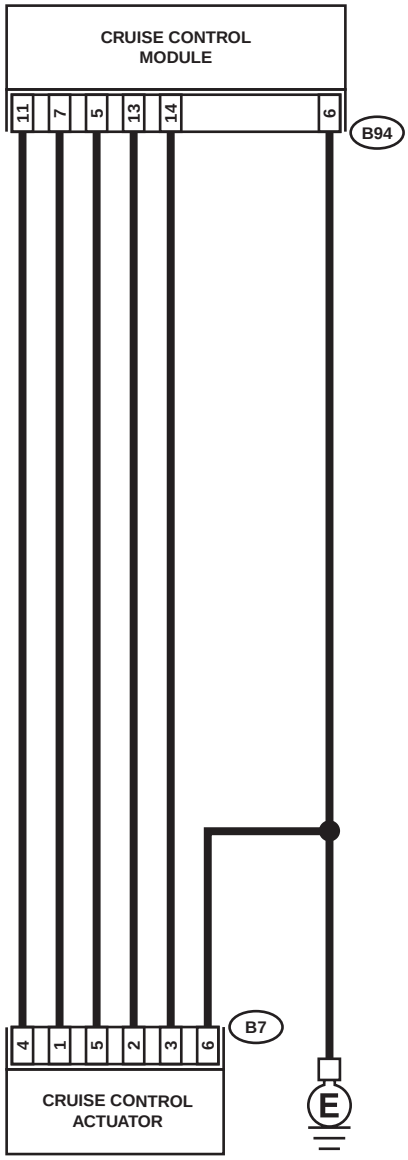
DIAGNOSIS:

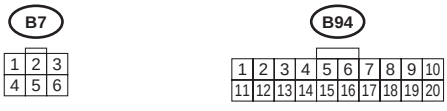
Open or poor contact of cruise control actuator motor clutch.

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:





CC-00083

	Step	Value	Yes	No
1	**CHECK POWER SUPPLY.** 1) Turn ignition switch OFF. 2) Disconnect harness connector from cruise control actuator. 3) Turn ignition switch ON. 4) Turn cruise control main switch ON. 5) Measure voltage between cruise control actuator harness connector terminal and chassis ground. ***Terminals*** ***(B7) No. 4 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10 V	Go to step **2.**	Check harness for open or short between cruise control module and cruise control actuator.
2	**CHECK GROUND CIRCUIT OF ACTUATOR.** 1) Turn ignition switch and cruise control main switch OFF. 2) Measure resistance between cruise control actuator harness connector terminal and chassis ground. ***Terminals*** ***(B7) No. 6 — Chassis ground:*** Is the measured value less than the specified value?	10 Ω	Go to step **3.**	Repair harness.
3	**MEASURE RESISTANCE OF ACTUATOR CLUTCH.** Measure resistance of cruise control actuator clutch. ***Terminals*** ***No. 3 — No. 6:*** Is the measured value same as the specified value?	Approximately 39 Ω	Go to step **4.**	Replace cruise control actuator. <Ref. to CC-4, Actuator.>
4	**CHECK HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.** 1) Disconnect harness connector from cruise control module. 2) Measure resistance between cruise control module harness connector terminal and cruise control actuator harness connector terminal. ***Connector & terminal*** ***(B7) No. 2 — (B94) No. 13:*** Is the measured value less than the specified value?	10 Ω	Go to step **5.**	Repair harness.
5	**CHECK HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.** Measure resistance between cruise control module harness connector terminal and cruise control actuator harness connector terminal. ***Connector & terminal*** ***(B7) No. 3 — (B94) No. 14:*** Is the measured value less than the specified value?	10 Ω	Replace cruise control module. <Ref. to CC-6, Cruise Control Module.>	Repair harness.

F: DTC 38 MOTOR DRIVE SHAFT DOES NOT ENGAGE PROPERLY.

	Step	Value	Yes	No
1	**CHECK ACTUATOR MOTOR.** 1) Turn ignition switch to OFF. 2) Disconnect harness connector from cruise control actuator. 3) Remove cruise control actuator from mounting bracket. 4) Pull cable by hand to check for looseness or status of inner gear engagement. Are foreign particles caught in inner gear or does inner gear engage and disengage improperly?	Cable and inner gear are OK.	Replace cruise control actuator. <Ref. to CC-4, Actuator.>	Check the cruise control cable adjustment.<Ref. to CC-6, CABLE FREE PLAY, INSPECTION, General Description.>

G: DTC 39 MOTOR IS OVERLOADED.

	Step	Value	Yes	No
1	**CHECK THE OPERATING CURRENT TO ACTUATOR MOTOR.** 1) Connect Subaru Select Monitor to data link connector. 2) Try to drive the vehicle while operating the cruise control system. 3) Measure the operation current to the cruise control actuator motor. Is the measured value less than the specified value?	10 A	Replace cruise control module. <Ref. to CC-6, Cruise Control Module.>	Check the power supply circuit. <Ref. to CC-14, CHECK POWER SUPPLY, Diagnostics Chart with Symptom.>