CRUISE CONTROL SYSTEM (DIAGNOSTICS) (non-STi)

1. Basic Diagnostic Procedure

A: PROCEDURE

	Step	Check	Yes	No
1	**START DIAGNOSIS.** 1)Perform the pre-inspection. <Ref. to CC-4, INSPECTION, General Description.> 2)Check the cruise control main switch operation.	Is the cruise control main switch turned ON?	Go to step **2.**	Go to symptom 1. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>
2	**PREPARE SUBARU SELECT MONITOR.**	Is the select monitor available?	Go to step **3.**	Go to step **4.**
3	**PERFORM CRUISE CANCEL CONDITIONS DIAGNOSIS.** Perform the cruise cancel conditions diagnosis. <Ref. to CC-8, Subaru Select Monitor.>	Are any DTC indicated?	Go to "List of DTC". <Ref. to CC-28, List of DTC.>	Go to step **4.**
4	**CHECK CRUISE CONTROL SET OPERATION.** Check the cruise control set operation.	Can the cruise control be set while driving at 40 km/h (25 MPH)?	Go to step **5.**	Go to symptom 2. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>
5	**CHECK VEHICLE SPEED IS HELD WITHIN SET SPEED.** Make sure the vehicle speed is held within set speed.	Is the vehicle speed held within set speed ±3 km/h (±2 MPH)?	Go to step **6.**	Go to symptom 3. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>
6	**CHECK RESUME/ACCEL OPERATION.** Check the RESUME/ACCEL operation.	Does the vehicle speed increase or return to set speed after RESUME/ACCEL switch has been pressed?	Go to step **7.**	Go to symptom 4. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>
7	**CHECK SET/COAST OPERATION.** Check the SET/COAST operation.	Does the vehicle speed decrease after SET/COAST switch has been pressed?	Go to step **8.**	Go to symptom 5. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>
8	**CHECK CANCEL OPERATION.** Check the CANCEL operation.	Is the cruise control released after CANCEL switch has been pressed?	Go to step **9.**	Go to symptom 6. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>
9	**CHECK CRUISE CONTROL RELEASE OPERATION.** Check the cruise control release operation.	Is the cruise control released after brake pedal has been depressed?	Go to step **10.**	Go to symptom 7. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>
10	**CHECK CRUISE CONTROL RELEASE OPERATION.** Check the cruise control release operation.	Is the cruise control released after clutch pedal has been depressed? (MT model)	Finish the diagnostics.	Go to symptom 8. <Ref. to CC-10, SYMPTOM CHART, Diagnostic Procedure with Symptom.>

2. General Description

A: CAUTION

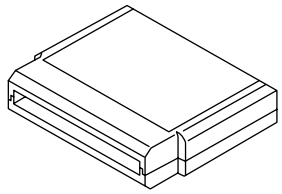
1. SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

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 the 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
 ST24082AA230	24082AA230	CARTRIDGE	Troubleshooting for electrical systems.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical systems.

2. GENERAL TOOLS

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

C: INSPECTION

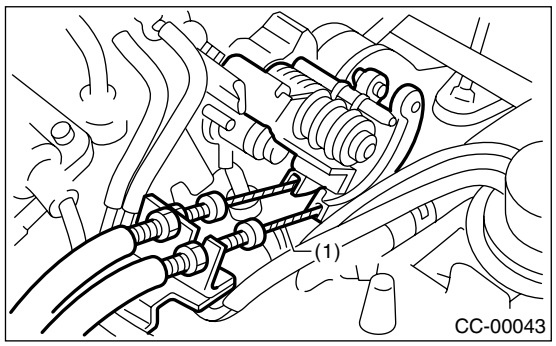
1. BATTERY

Measure the battery voltage and specific gravity of electrolyte.

Standard voltage:
12 V, or more

Specific gravity:
Above 1.260

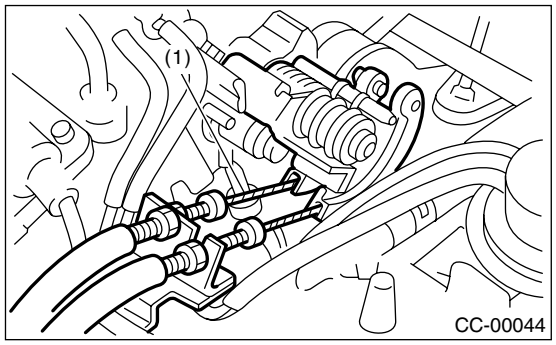
2. CRUISE CONTROL CABLE



(1) Cruise control cable

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

3. ACCELERATOR CABLE



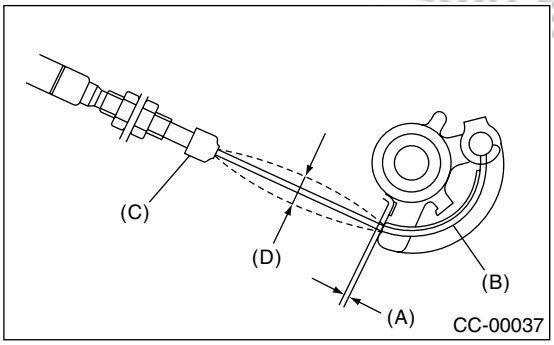
(1) Accelerator cable

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

4. THROTTLE CAM

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

5. CABLE FREE PLAY



Check that the throttle cam-to-lever clearance (A) or cable (B) deflection amount (D) is within specifications.

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

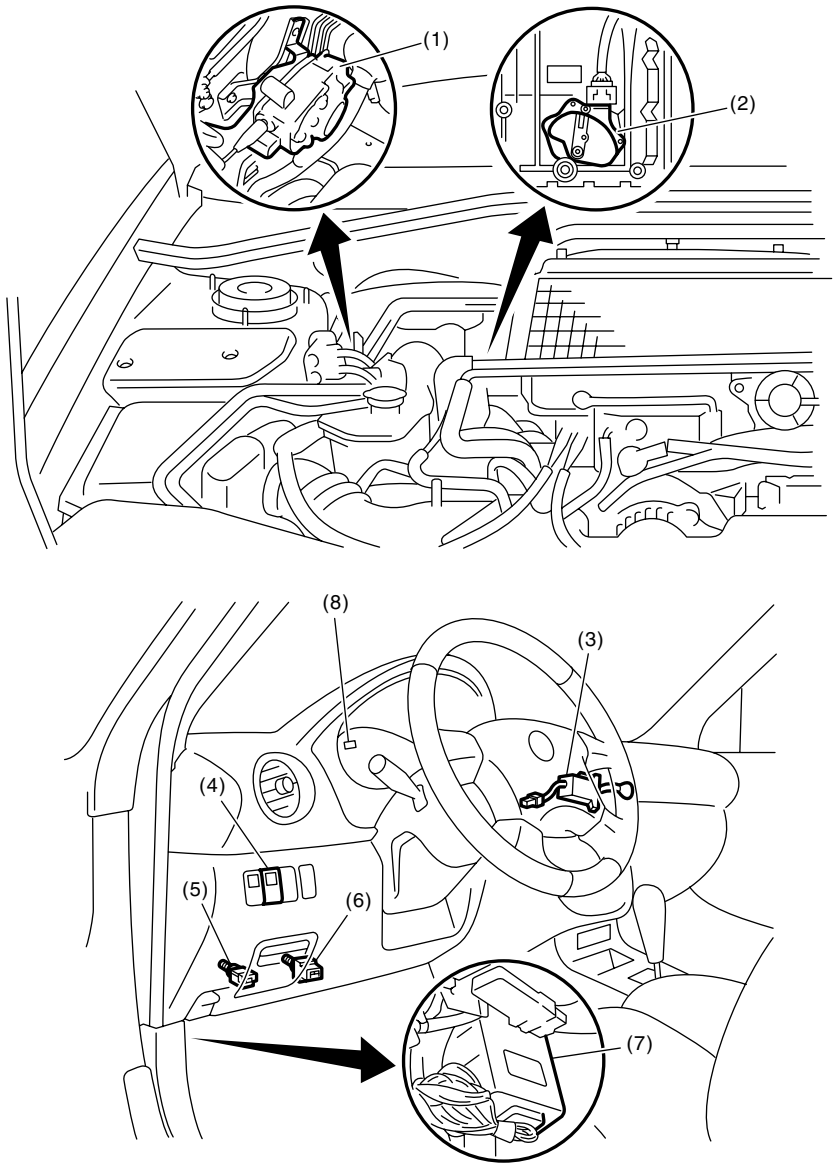
Inner cable deflection:
1 — 8 mm (0.04 — 0.31 in)

If NG, adjust the clearance with the adjust nut.

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

3. Electrical Components Location

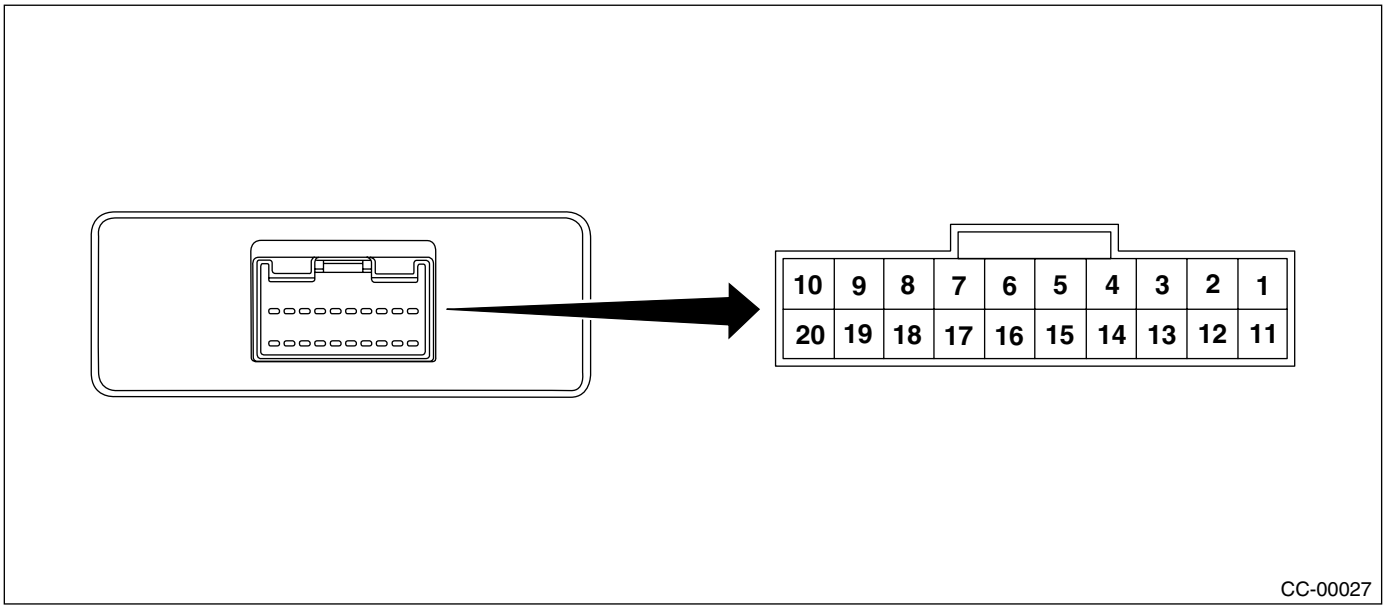
A: LOCATION



(1) Actuator
(2) Inhibitor switch (AT model)
(3) Cruise control command switch
(4) Cruise control main switch
(5) Clutch switch (MT model)
(6) Stop and brake switch
(7) Cruise control module
(8) Cruise indicator light and cruise set indicator light

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)
Cruise indicator light	1	• Battery voltage is present when main switch is turned OFF. • “0” volt is present when main switch is turned ON.
Cruise set indicator light	3	• “0” volt is present when cruise control is set and operated. • Battery voltage is present when cruise control is not set and not operated.
Inhibitor switch (AT model)	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 ignition switch is turned ON. • “0” volt is present when ignition 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 cruise control main switch. • “0” volt is present when main switch is turned OFF.

Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Brake switch	16	Leave clutch pedal released (MT model), 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 model, 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	—
Vehicle speed sensor (MT model) TCM (AT model)	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-73, SCHEMATIC, Cruise Control System.>

5. Subaru Select Monitor

A: OPERATION

1. GENERAL

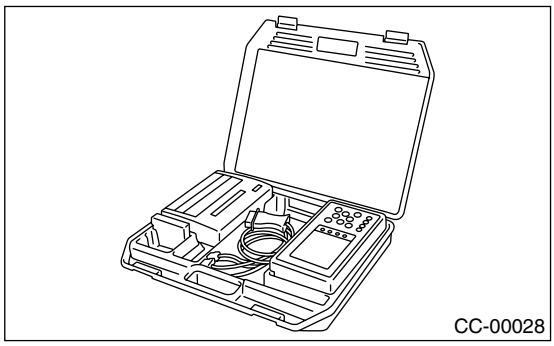
The on-board diagnosis function of the cruise control system uses the Subaru Select Monitor.
The on-board diagnosis function operates in two categories, which are used depending on the type of problems;
1) Cruise cancel conditions diagnosis:
(1) This category of diagnosis requires actual vehicle driving 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.

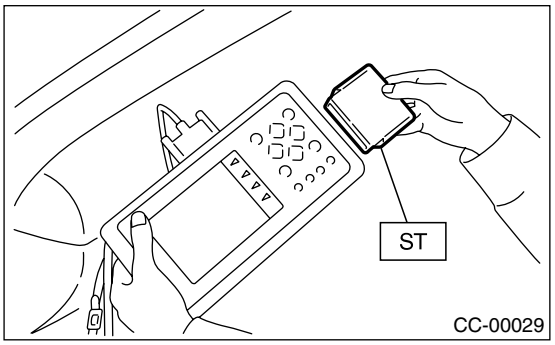
2) Real-time diagnosis:
The real-time diagnosis function is used to determine whether or not the input signal system is in good order, according to signal emitted from switches, sensors, etc.
(1) Vehicle cannot be driven at cruise speed because problem occurs in the cruise control system or its associated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

2. CRUISE CANCEL CONDITIONS DIAGNOSIS

1) Prepare the Subaru Select Monitor kit.

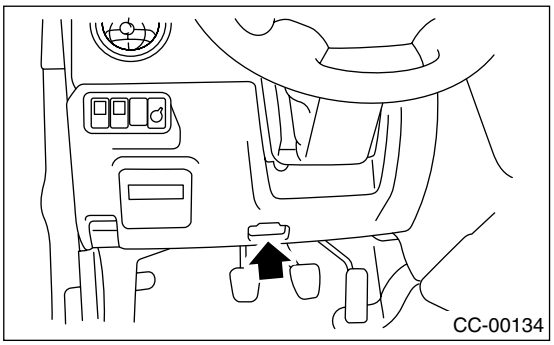

CC-00028

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

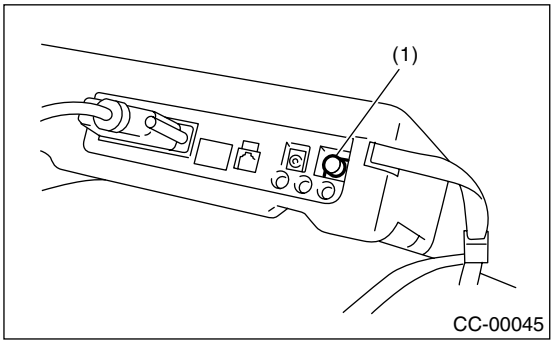


CC-00029

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


CC-00134

(2) Connect the diagnosis cable to data link connector.
5) Start the engine and turn the cruise control main switch to ON.
6) Turn the Subaru Select Monitor switch to ON.



CC-00045

(1) Power switch

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

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

8) Drive the vehicle at least 40 km/h (25 MPH) with cruise speed set.
9) If the cruise speed is canceled itself (without doing any cancel operations), a DTC will appear on select monitor display.

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

NOTE:
DTC will be cleared by turning the ignition switch or cruise control main switch to OFF.

3. REAL-TIME DIAGNOSIS

1) Connect the select monitor.
2) Turn the ignition switch and cruise control main switch to ON.
3) Turn the Subaru Select Monitor switch to ON.
4) On the Main Menu display screen, select the {Each System Check} and press [YES] key.
5) On the System Selection Menu display screen, select the {Cruise Control} and press [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 [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.)
• Turn ON the “SET/COAST” switch.
• Turn ON the “RESUME/ACCEL” switch.
• Depress/release the clutch pedal. (MT model)
• Set the selector lever to P or N. (AT model)

NOTE:
• For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
• For details concerning DTCs, refer to the List of DTC. <Ref. to CC-28, List of DTC.>

6. Diagnostic Procedure with Symptom

A: SYMPTOM CHART

Symptom		Repair area	Reference
1	Cruise control main switch is not turned to ON.	(1) Check the power supply.	<Ref. to CC-12, CHECK POWER SUPPLY, Diagnostic Procedure with Symptom.>
		(2) Check the cruise control main switch.	<Ref. to CC-14, CHECK CRUISE CONTROL MAIN SWITCH, Diagnostic Procedure with Symptom.>
2	Cruise indicator light does not illuminate.	(1) Check the cruise indicator light.	<Ref. to CC-16, CHECK CRUISE INDICATOR LIGHT, Diagnostic Procedure with Symptom.>
		(2) Check the cruise set indicator light.	<Ref. to CC-18, CHECK CRUISE SET INDICATOR LIGHT, Diagnostic Procedure with Symptom.>
3	Cruise control cannot be set.	(1) Check the SET/COAST switch.	<Ref. to CC-20, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostic Procedure with Symptom.>
		(2) Check the stop light switch and brake switch.	<Ref. to CC-22, CHECK STOP LIGHT SWITCH AND BRAKE SWITCH, Diagnostic Procedure with Symptom.>
		(3) Check the clutch switch (MT model).	<Ref. to CC-24, CHECK CLUTCH SWITCH (MT MODEL), Diagnostic Procedure with Symptom.>
		(4) Check the inhibitor switch (AT model).	<Ref. to CC-26, CHECK INHIBITOR SWITCH (AT MODEL), Diagnostic Procedure with Symptom.>
		(5) Check the vehicle speed sensor.	<Ref. to CC-30, DTC 22 VEHICLE SPEED SENSOR, Diagnostic Procedure with DTC.>
		(6) Check the motor drive system.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
		(7) Check the motor clutch drive system.	<Ref. to CC-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>
4	Vehicle speed is not held within set speed ±3 km/h (±2 MPH).	(1) Check the vehicle speed sensor.	<Ref. to CC-30, DTC 22 VEHICLE SPEED SENSOR, Diagnostic Procedure with DTC.>
		(2) Check the motor drive system.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
		(3) Check the motor clutch drive system.	<Ref. to CC-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>
5	Vehicle speed does not increase or does not return to set speed after RESUME/ ACCEL switch has been pressed.	(1) Check the RESUME/ ACCEL switch.	<Ref. to CC-20, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostic Procedure with Symptom.>
		(2) Check the motor drive system.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
		(3) Check the motor clutch drive system.	<Ref. to CC-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>
6	Vehicle speed does not decrease after SET/COAST switch has been pressed.	(1) Check the SET/COAST switch.	<Ref. to CC-20, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostic Procedure with Symptom.>
		(2) Check the motor drive system.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
		(3) Check the motor clutch drive system.	<Ref. to CC-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>
7	Cruise control is not released after CANCEL switch has been pressed.	(1) Check the CANCEL switch.	<Ref. to CC-20, CHECK CRUISE CONTROL COMMAND SWITCH, Diagnostic Procedure with Symptom.>
		(2) Check the motor drive system.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
		(3) Check the motor clutch drive system.	<Ref. to CC-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>
8	Cruise control is not released after brake pedal has been depressed.	(1) Check the stop light switch and brake switch.	<Ref. to CC-22, CHECK STOP LIGHT SWITCH AND BRAKE SWITCH, Diagnostic Procedure with Symptom.>
		(2) Check the motor drive system.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
		(3) Check the motor clutch drive system.	<Ref. to CC-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>

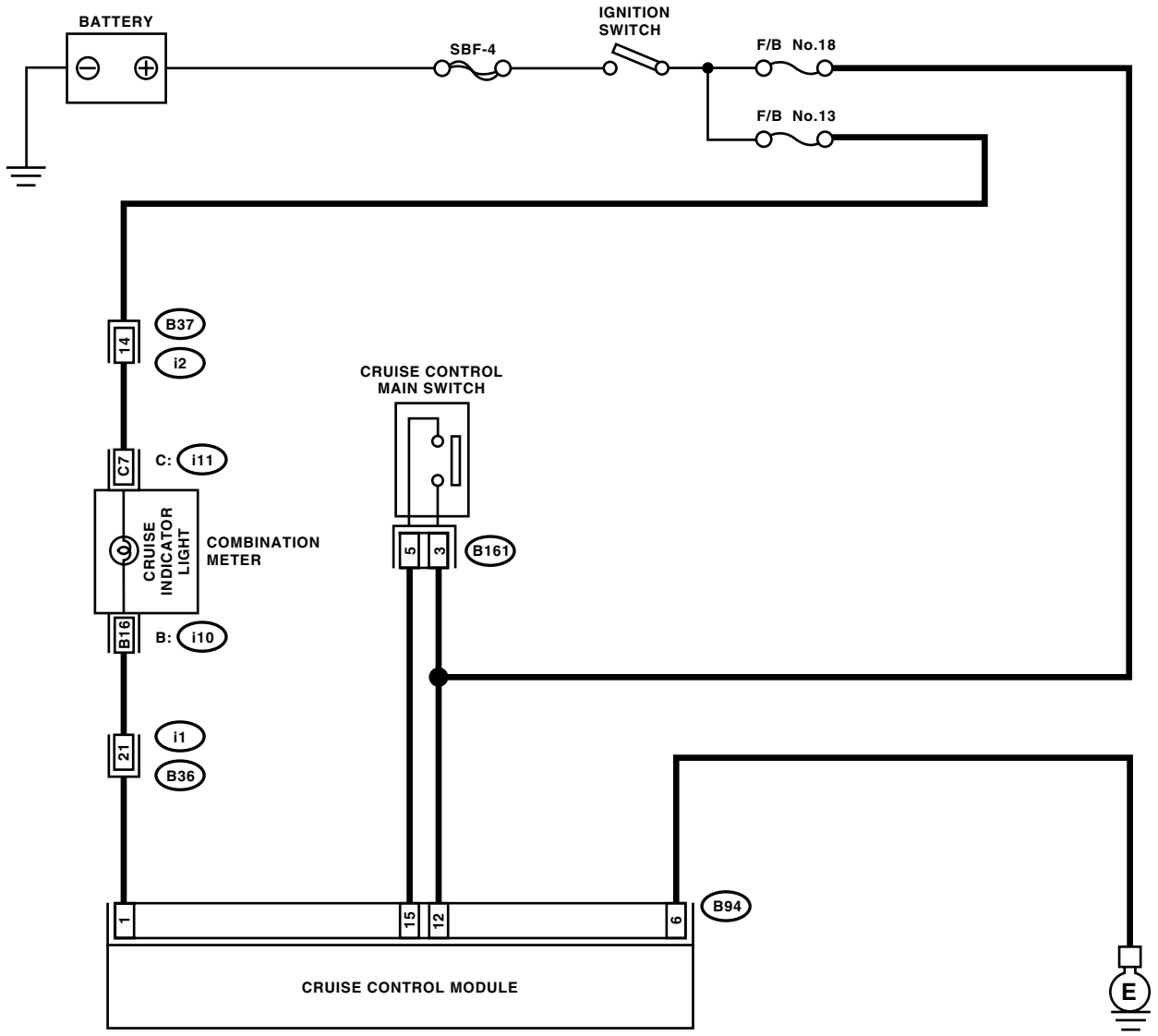
Symptom		Repair area	Reference
9	Cruise control is not released after clutch pedal has been depressed (MT model).	(1) Check the clutch switch.	<Ref. to CC-24, CHECK CLUTCH SWITCH (MT MODEL), Diagnostic Procedure with Symptom.>
		(2) Check the motor drive system.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
		(3) Check the motor clutch drive system.	<Ref. to CC-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>

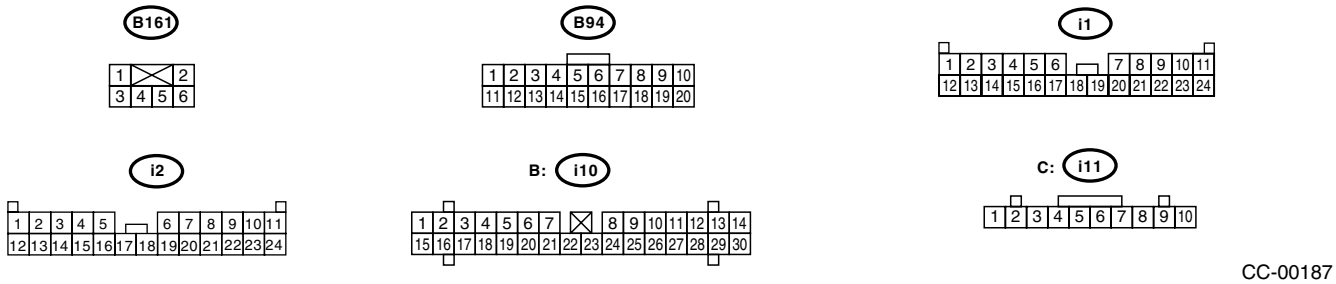
B: CHECK POWER SUPPLY

TROUBLE SYMPTOM:

Cruise control is not turned to ON.

WIRING DIAGRAM:





CC-00187

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

C: CHECK CRUISE CONTROL MAIN SWITCH

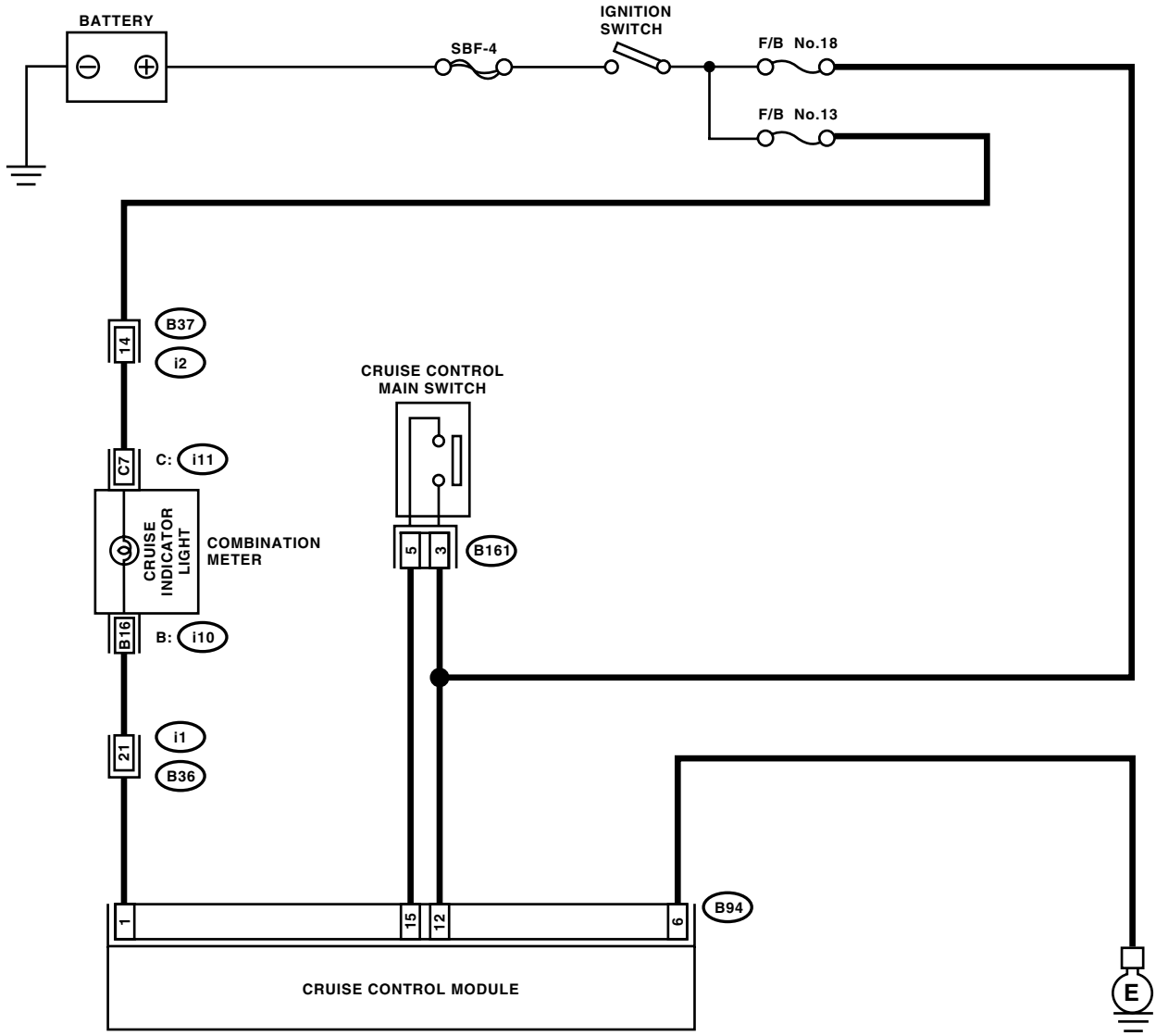
TROUBLE SYMPTOM:

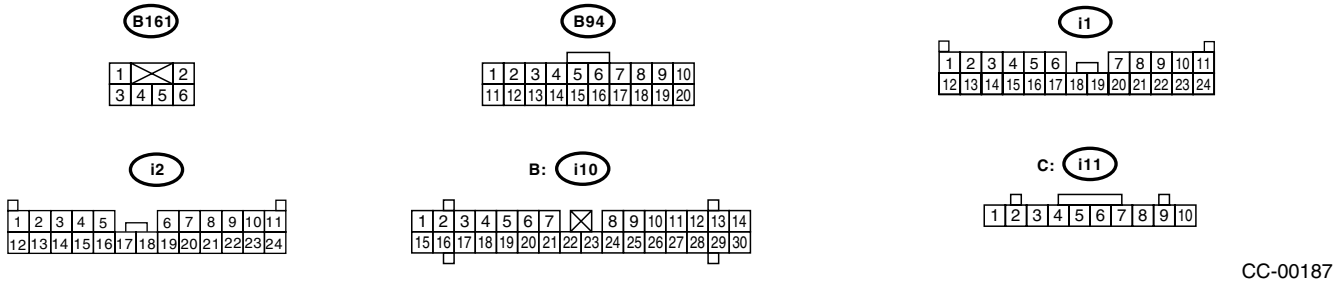
Cruise control main switch is not turned to ON and cruise control cannot be set.

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 sound.
This operation sound will be heard when the ignition switch and cruise control main switch is turned to ON.

WIRING DIAGRAM:





CC-00187

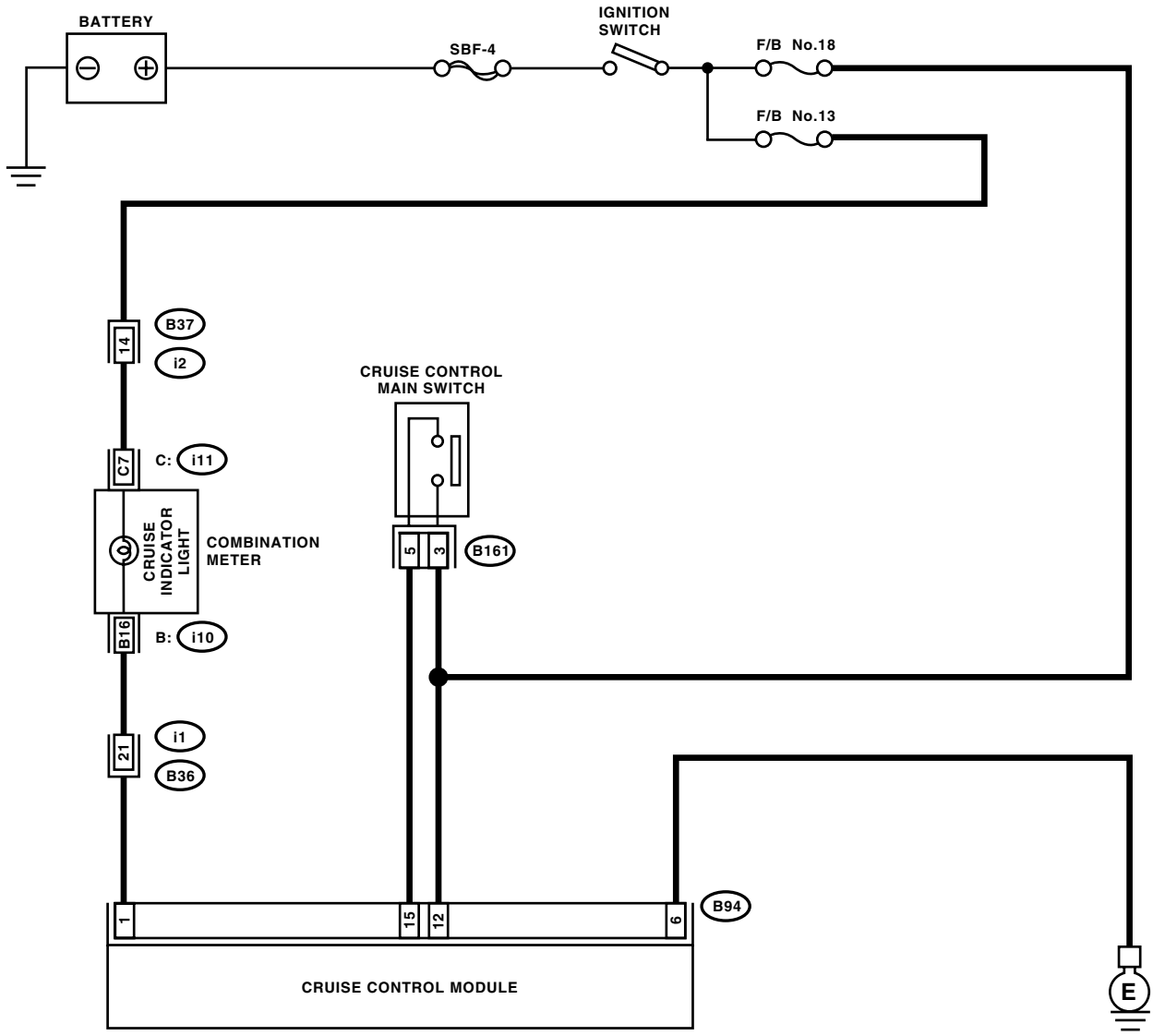
	Step	Check	Yes	No
1	**CHECK CRUISE CONTROL MAIN SWITCH CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the cruise control main switch harness connector. 3)Turn the ignition switch to ON. 4)Measure the voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B161) No. 3 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **2.**	• Check the fuse No. 18 (in fuse & relay box). • Check the harness for open or short between cruise control main switch and fuse & relay box.
2	**CHECK CRUISE CONTROL MAIN SWITCH CIRCUIT.** 1)Turn the ignition switch OFF. 2)Disconnect the cruise control module harness connector. 3)Measure the resistance between cruise control module harness connector terminal and cruise control main switch harness connector terminal. ***Connector & terminal*** ***(B94) No. 15 — (B161) No. 5:***	Is the resistance less than 10 Ω?	Go to step **3.**	Repair the harness.
3	**CHECK CRUISE CONTROL MAIN SWITCH.** Remove and check the cruise control main switch. <Ref. to CC-6, Cruise Control Main Switch.>	Is the cruise control main switch OK?	Replace the cruise control module.	Replace the cruise control main switch.

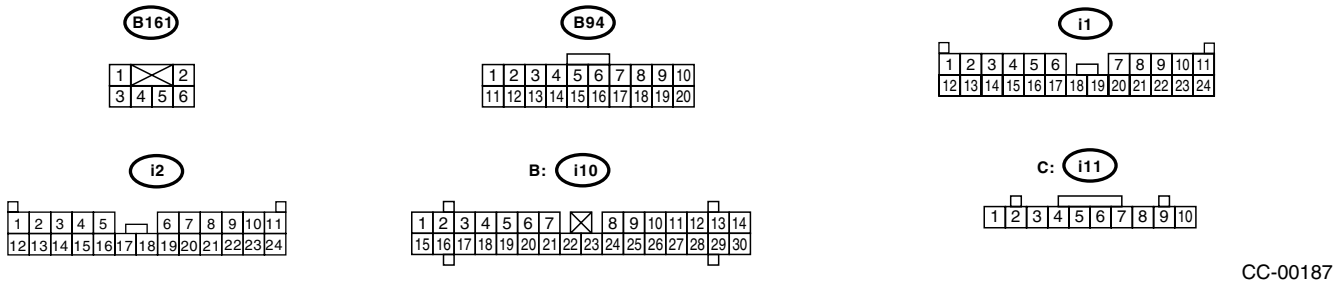
D: CHECK CRUISE INDICATOR LIGHT

TROUBLE SYMPTOM:

Cruise control can be set, but cruise indicator light does not illuminate.

WIRING DIAGRAM:





CC-00187

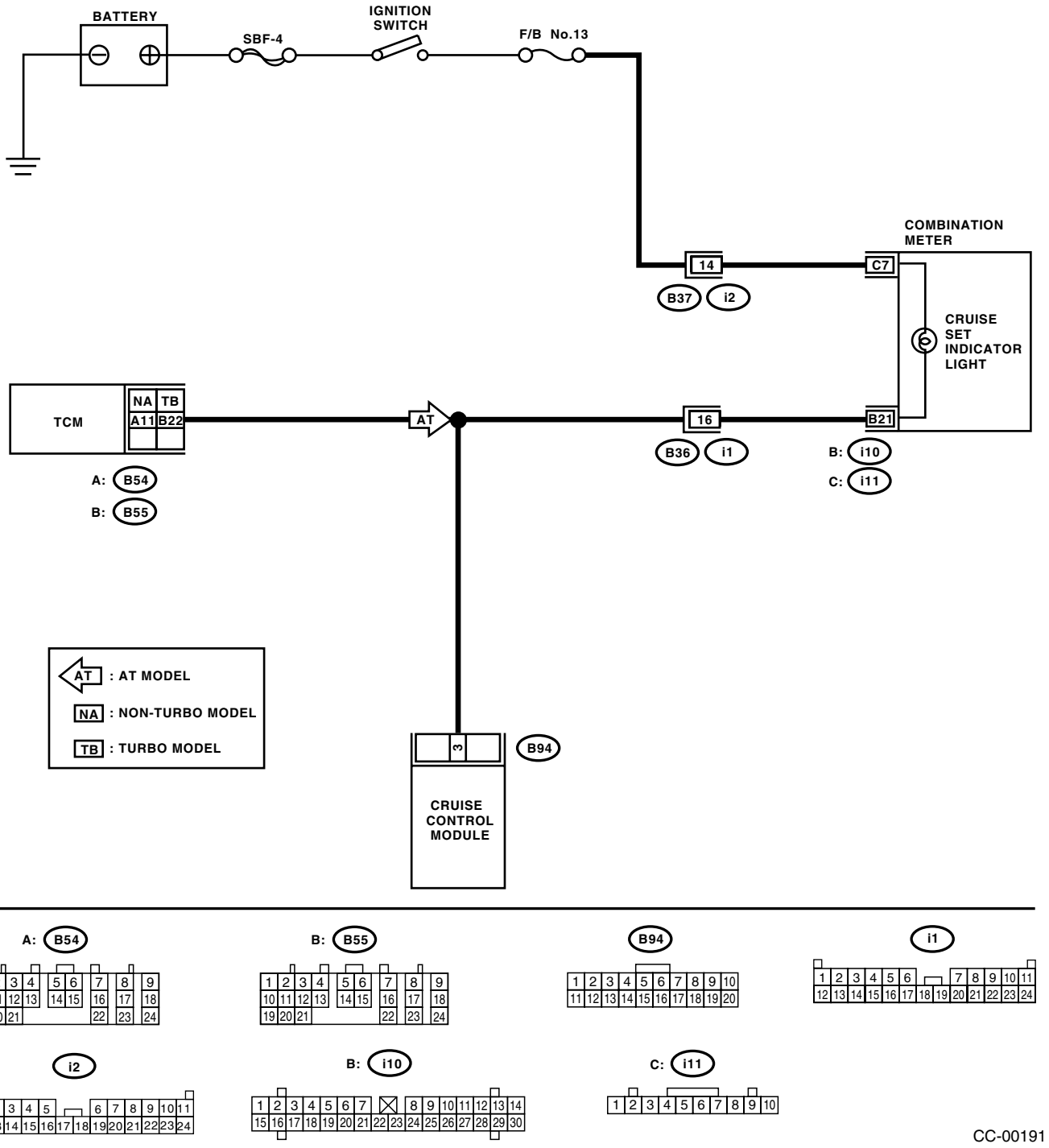
	Step	Check	Yes	No
1	**CHECK CRUISE INDICATOR LIGHT CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the combination meter harness connector. 3)Turn the ignition switch to ON. 4)Measure the voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(i11) No. 7 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **2.**	• Check the fuse No. 13 (in fuse & relay box). • Check the harness for open or short between combination meter and fuse & relay box.
2	**CHECK CRUISE INDICATOR LIGHT CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the cruise control module harness connector. 3)Measure the resistance between cruise control module harness connector terminal and combination meter harness connector terminal. ***Connector & terminal*** ***(B94) No. 1 — (i10) No. 16:***	Is the resistance less than 10 Ω?	Go to step **3.**	Repair the harness.
3	**CHECK CRUISE INDICATOR LIGHT CIRCUIT.** Ground the cruise control module harness connector terminal with a suitable wire. ***Connector & terminal*** ***(B94) No. 1 — Chassis ground:***	Does the cruise indicator light illuminate?	Replace the cruise control module.	Check the cruise indicator light bulb in combination meter, and replace it if malfunction occurred. No malfunction found, replace the printed circuit of combination meter.

E: CHECK CRUISE SET INDICATOR LIGHT

TROUBLE SYMPTOM:

Cruise control can be set, but cruise set indicator light does not illuminate.

WIRING DIAGRAM:



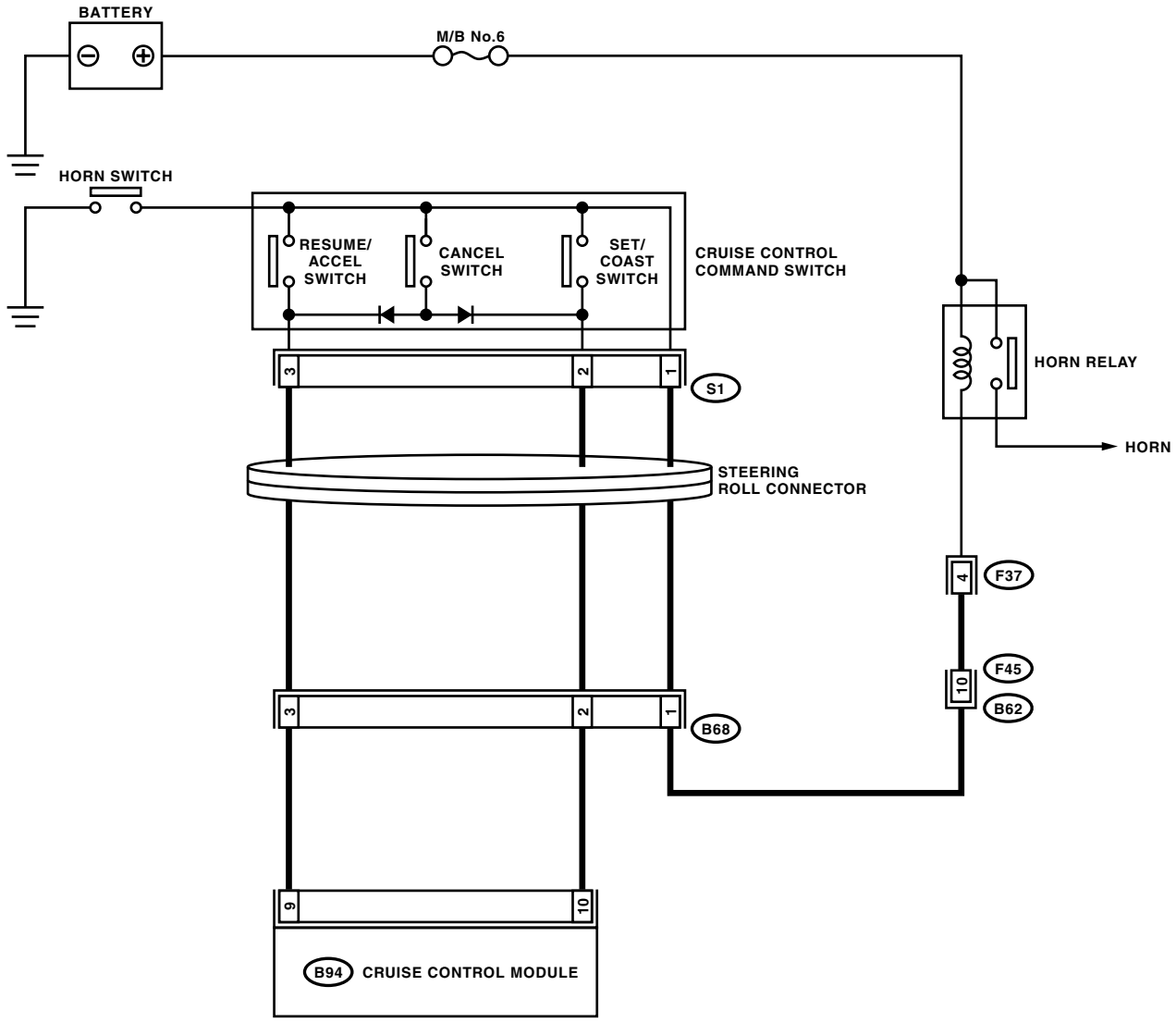
Step		Check	Yes	No
1	**CHECK CRUISE SET INDICATOR LIGHT CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the combination meter harness connector. 3)Measure the voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(i11) No. 7 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **2.**	• Check the fuse No. 13 (in fuse & relay box). • Check the harness for open or short between combination meter and fuse & relay box.
2	**CHECK CRUISE SET INDICATOR LIGHT CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the cruise control module harness connector. 3)Measure the resistance between cruise control module harness connector terminal and combination meter harness connector terminal. ***Connector & terminal*** ***(i10) No. 21 — (B94) No. 3:***	Is the resistance less than 10 Ω?	Go to step **3.**	Repair the harness.
3	**CHECK CRUISE SET INDICATOR LIGHT CIRCUIT.** Ground the cruise control module harness connector terminal with a suitable wire. ***Connector & terminal*** ***(B94) No. 3 — Chassis ground:***	Does the cruise set indicator light illuminate?	Replace the cruise control module.	Check the cruise set indicator light bulb in combination meter, and replace it if malfunction occurred. No malfunction found, replace the printed circuit of combination meter.

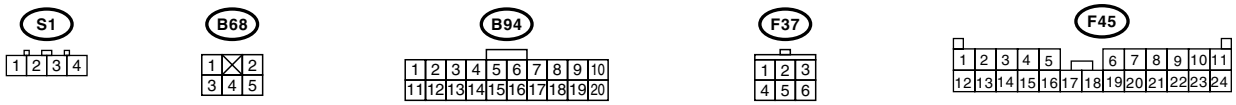
F: CHECK CRUISE CONTROL COMMAND SWITCH

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:





CC-00188

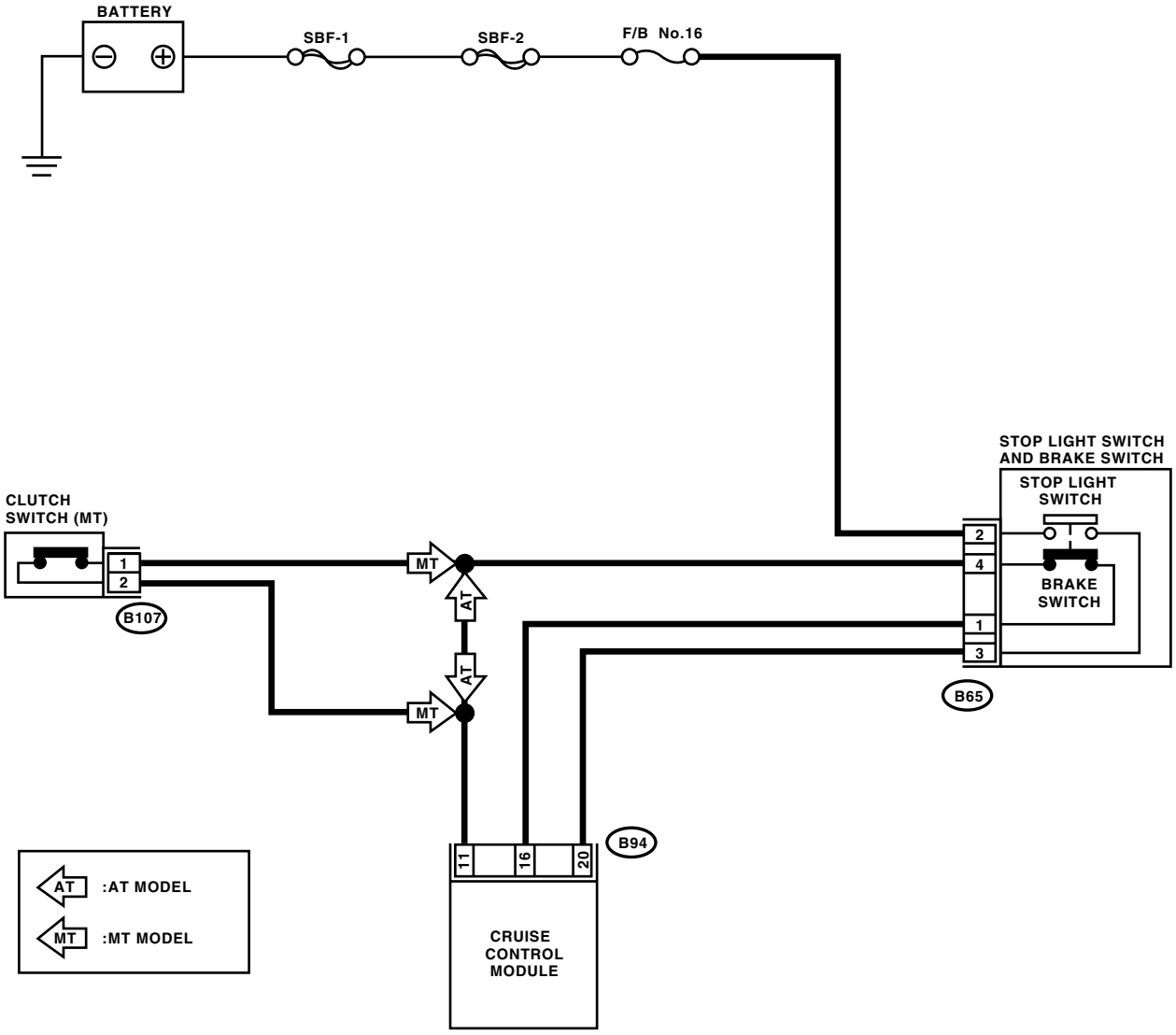
	Step	Check	Yes	No
1	**CHECK SET/COAST SWITCH CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the cruise control module harness connector. 3)Measure the voltage between harness connector terminal and chassis ground when SET/COAST switch is pressed and not pressed. ***Connector & terminal*** ***(B94) No. 10 (+) — Chassis ground (–):***	Is the voltage 0 V when SET/COAST switch is not pressed? Is the voltage more than 10 V when SET/COAST switch is pressed?	Go to step **2.**	Go to step **4.**
2	**CHECK RESUME/ACCEL SWITCH CIRCUIT.** Measure the 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 voltage 0 V when RESUME/ACCEL switch is not pressed? Is the voltage more than 10 V when RESUME/ACCEL switch is pressed?	Go to step **3.**	Go to step **4.**
3	**CHECK CANCEL SWITCH CIRCUIT.** Measure the 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 voltage 0 V when CANCEL switch is not pressed? Is the voltage more than 10 V when CANCEL switch is pressed?	Cruise control command switch circuit is OK.	Go to step **4.**
4	**CHECK POWER SUPPLY FOR COMMAND SWITCH.** Check the horn operation.	Does the horn sound?	Go to step **5.**	• Check the fuse No. 6 (in main fuse box). • Check the horn relay. <Ref. to COM-3, HORN RELAY, INSPECTION, Horn System.> • Check the harness for open or short between cruise control command switch and fuse & relay box.
5	**CHECK CRUISE CONTROL COMMAND SWITCH.** Remove and check the cruise control command switch. <Ref. to CC-7, Cruise Control Command Switch.>	Is the cruise control command switch OK?	Check the harness between cruise control command switch and cruise control module.	Replace the cruise control command switch.

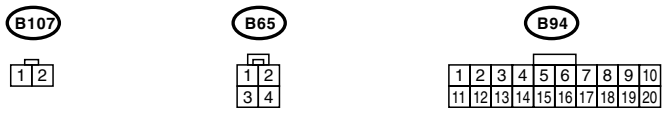
G: CHECK STOP LIGHT SWITCH AND BRAKE SWITCH

TROUBLE SYMPTOM:

Cruise control cannot be set.

WIRING DIAGRAM:





CC-00033

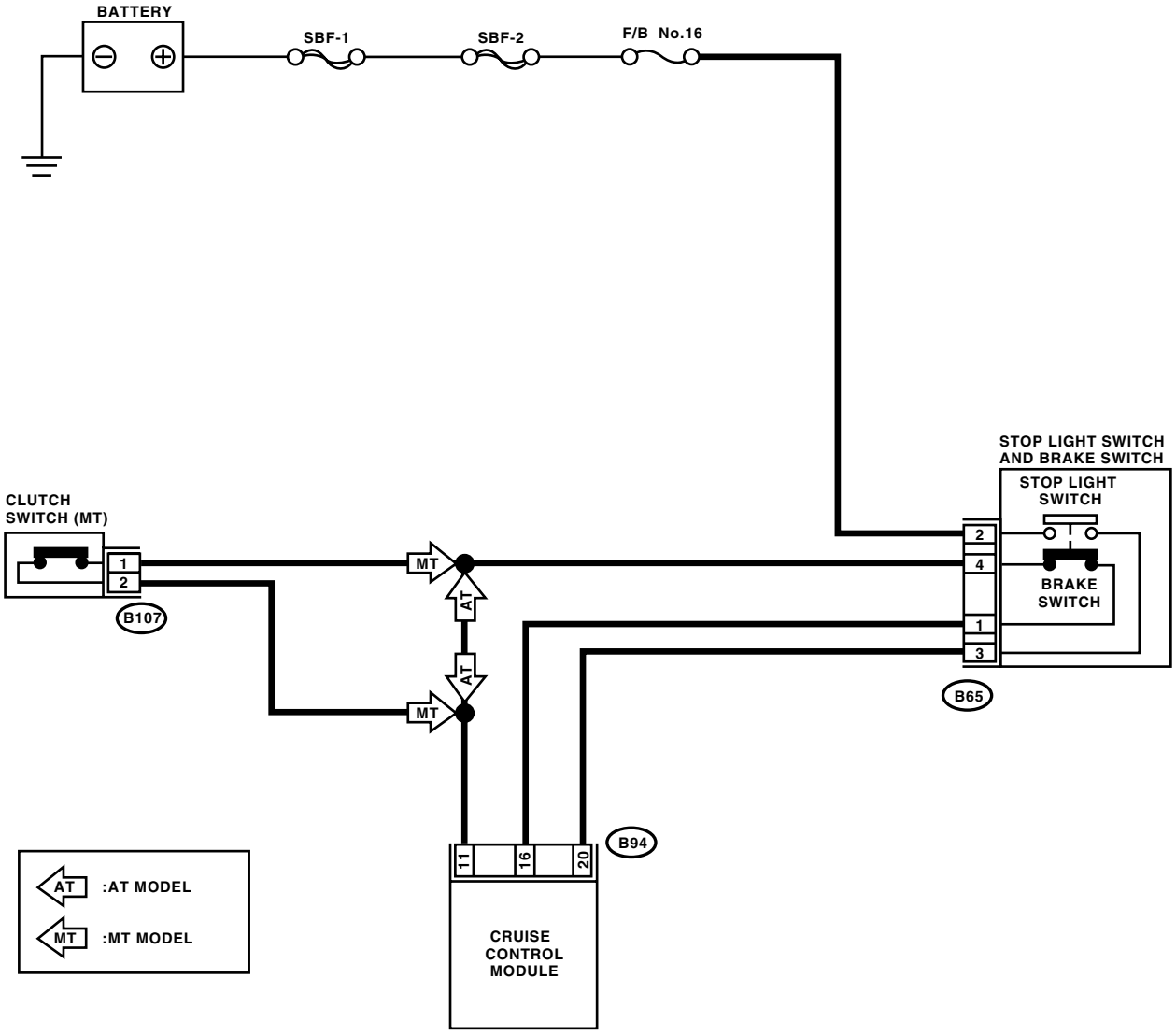
	Step	Check	Yes	No
1	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the stop light switch and brake switch harness connector. 3)Turn the ignition switch to ON. 4)Turn the cruise control main switch to ON. 5)Measure the voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B65) No. 2 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **2.**	• Check the fuse No. 16 (in fuse & relay box). • Check the harness for open or short between stop light/brake switch and fuse & relay box.
2	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH CIRCUIT.** Measure the voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B65) No. 4 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **3.**	• Check the harness for open or short between stop light/brake switch and cruise control module (AT model). • Check the clutch switch and circuit (MT model).
3	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH CIRCUIT.** 1)Turn the cruise control main switch and ignition switch to OFF. 2)Disconnect the cruise control module harness connector. 3)Measure the 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. 1:***	Is the resistance less than 10 Ω?	Go to step **4.**	Repair the harness.
4	**CHECK STOP LIGHT SWITCH AND BRAKE SWITCH.** Remove and check the stop light switch and brake switch. <Ref. to CC-8, Stop and Brake Switch.>	Are the stop light switch and brake switch OK?	Stop light switch and brake switch circuit are OK.	Replace the stop light switch and brake switch.

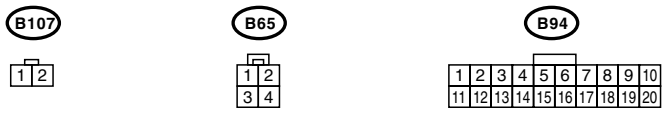
H: CHECK CLUTCH SWITCH (MT MODEL)

TROUBLE SYMPTOM:

Cruise control cannot be set.

WIRING DIAGRAM:





CC-00033

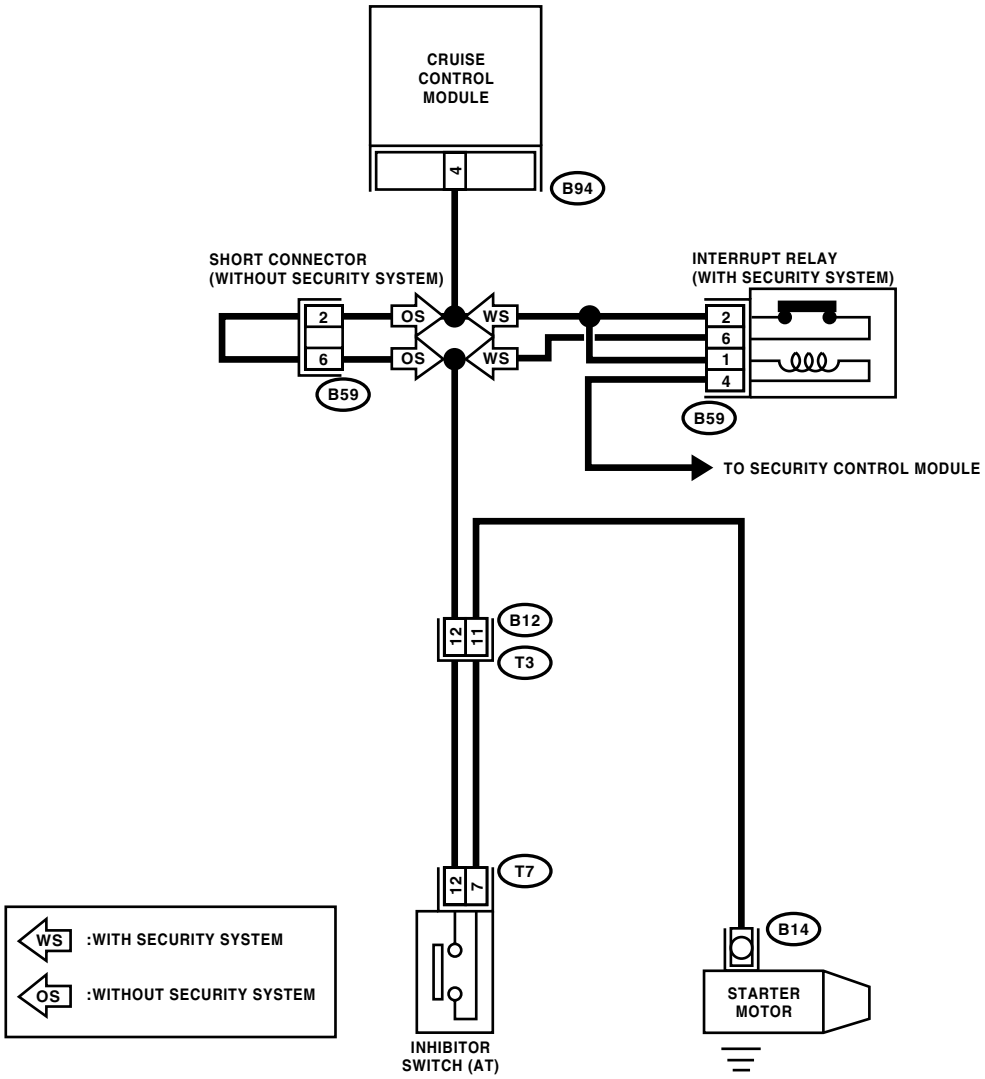
	Step	Check	Yes	No
1	**CHECK CLUTCH SWITCH CIRCUIT.** 1)Turn the ignition switch to OFF. 2)Disconnect the clutch switch harness connector. 3)Turn the ignition switch to ON. 4)Turn the cruise control main switch to ON. 5)Measure the voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B107) No. 2 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **2.**	Check the harness for open or short between clutch switch and cruise control module.
2	**CHECK CLUTCH SWITCH CIRCUIT.** 1)Turn the cruise control main switch and ignition switch to OFF. 2)Disconnect the stop light switch and brake switch harness connector. 3)Measure the resistance between clutch switch harness connector terminal and stop light switch and brake switch harness connector terminal. ***Connector & terminal*** ***(B107) No. 1 — (B65) No. 4:***	Is the resistance less than 10 Ω?	Go to step **3.**	Repair the harness.
3	**CHECK CLUTCH SWITCH.** Remove and check the clutch switch. <Ref. to CC-9, Clutch Switch.>	Is the clutch switch OK?	Clutch switch circuit is OK.	Replace the clutch switch.

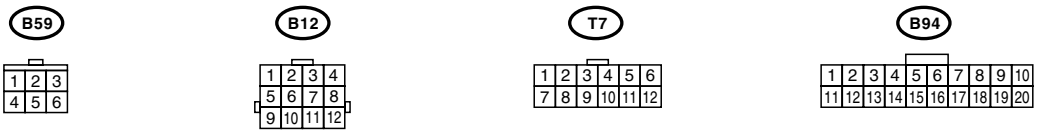
I: CHECK INHIBITOR SWITCH (AT MODEL)

TROUBLE SYMPTOM:

Cruise control cannot be set.

WIRING DIAGRAM:





CC-00189

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

7. List of 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-29, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostic Procedure with DTC.>
22	Vehicle speed sensor	Vehicle speed signal changes more than 10 km/h (6 MPH) within 350 ms.	<Ref. to CC-30, DTC 22 VEHICLE SPEED SENSOR, Diagnostic Procedure with DTC.>
24	Cruise control module is abnormal.	Two vehicle speed values stored in cruise control module memory are not the same.	<Ref. to CC-29, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostic Procedure with DTC.>
25	Cruise control module is abnormal.	Two output values stored in cruise control module memory are not the same.	<Ref. to CC-29, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostic Procedure with DTC.>
28	Wiring harness opened.	Open wiring harness circuit is detected via control module relay when main switch is ON.	<Ref. to CC-32, DTC 28 WIRING HARNESS OPENED, Diagnostic Procedure with DTC.>
35	Motor drive system is abnormal.	• Motor output circuit is open or shorted. • Motor drive circuit is open or shorted.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
36	Trouble of motor turning speed	Motor turning speed is low.	<Ref. to CC-33, DTC 35 AND 36 ACTUATOR MOTOR, Diagnostic Procedure with DTC.>
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-35, DTC 37 ACTUATOR MOTOR CLUTCH, Diagnostic Procedure with DTC.>
38	Motor drive shaft does not engage properly.	Motor drive gear engagement is not properly adjusted.	<Ref. to CC-37, DTC 38 MOTOR DRIVE SHAFT DOES NOT ENGAGE PROPERLY, Diagnostic Procedure with DTC.>
39	Motor is overloaded.	Current flows through motor more frequently than under normal conditions.	<Ref. to CC-37, DTC 39 MOTOR IS OVERLOADED, Diagnostic Procedure with DTC.>
2A	Cruise control module is abnormal.	Cruise control module self-diagnosis function senses abnormality.	<Ref. to CC-29, DTC 21, 24, 25 AND 2A CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM, Diagnostic Procedure with DTC.>

8. Diagnostic Procedure with DTC

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.

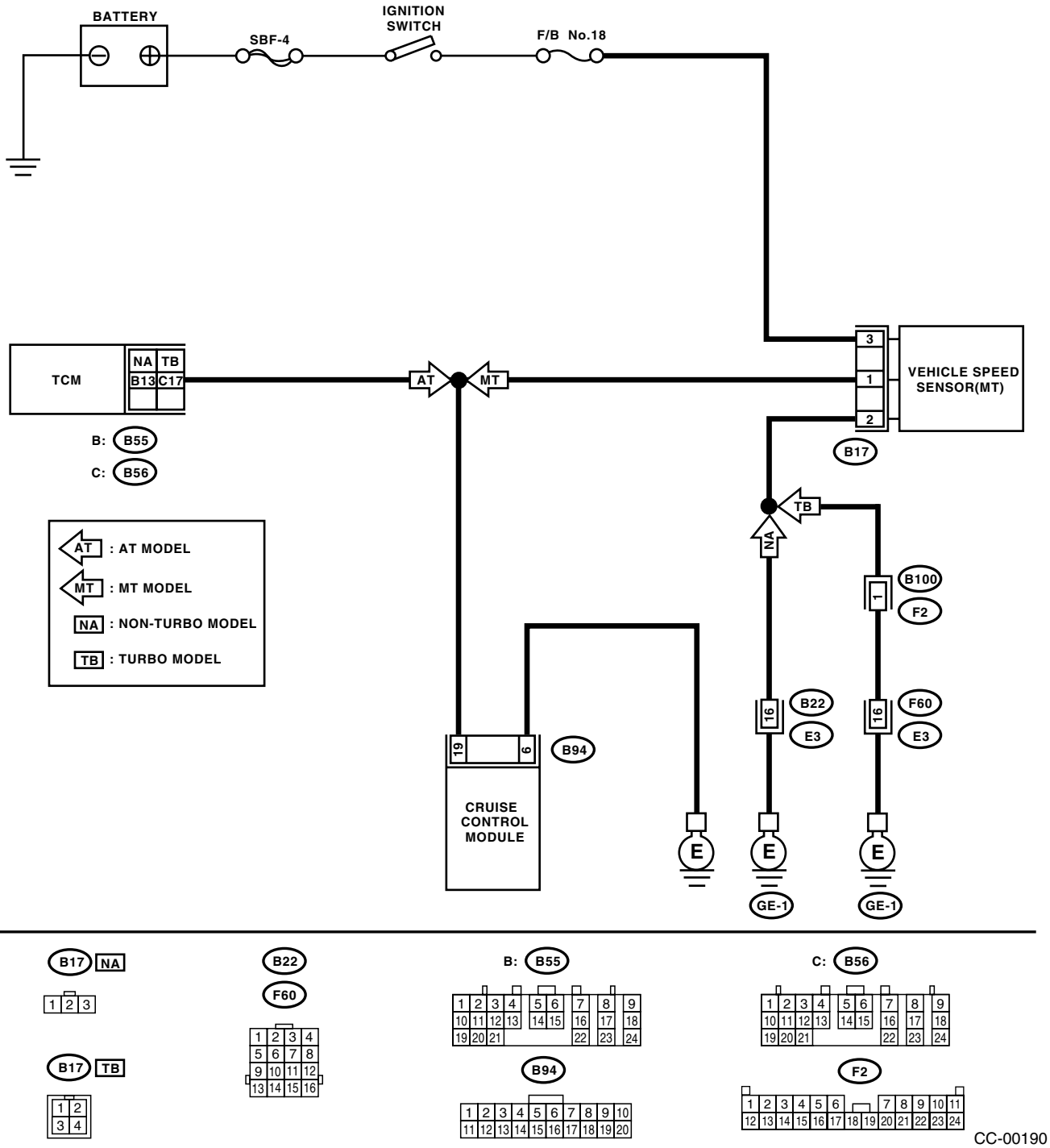
TROUBLE SYMPTOM:

- 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 the 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-00190

	Step	Check	Yes	No
1	**CHECK TRANSMISSION TYPE.**	Is the transmission type MT?	Go to step **2.**	Go to step **6.**
2	**CHECK HARNESS BETWEEN BATTERY AND VEHICLE SPEED SENSOR.** 1)Turn the ignition switch to OFF. 2)Disconnect the harness connector from vehicle speed sensor. 3)Turn the ignition switch to ON. 4)Measure the voltage between vehicle speed sensor harness connector terminal and chassis ground. ***Connector & terminal*** ***(B17) No. 3 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **3.**	Check the harness for open or short between fuse and vehicle speed sensor.
3	**CHECK HARNESS BETWEEN CRUISE CONTROL MODULE AND VEHICLE SPEED SENSOR.** 1)Turn the ignition switch to OFF. 2)Disconnect the harness connector from cruise control module. 3)Measure the 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 resistance less than 10 Ω?	Go to step **4.**	Repair the harness.
4	**CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND ENGINE GROUND.** 1)Turn the ignition switch to OFF. 2)Measure the resistance between vehicle speed sensor harness connector terminal and engine ground. ***Connector & terminal*** ***(B17) No. 2 — Engine ground:***	Is the resistance less than 10 Ω?	Go to step **5.**	Repair the harness.
5	**CHECK VEHICLE SPEED SENSOR.** 1)Connect the 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 the voltage between cruise control module harness connector terminal and chassis ground. ***Connector & terminal*** ***(B94) No. 19 (+) — Chassis ground (–):***	Is the voltage less than 1 V ←→ more than 5 V?	Replace the cruise control module. <Ref. to CC-5, Cruise Control Module.>	Replace the vehicle speed sensor.

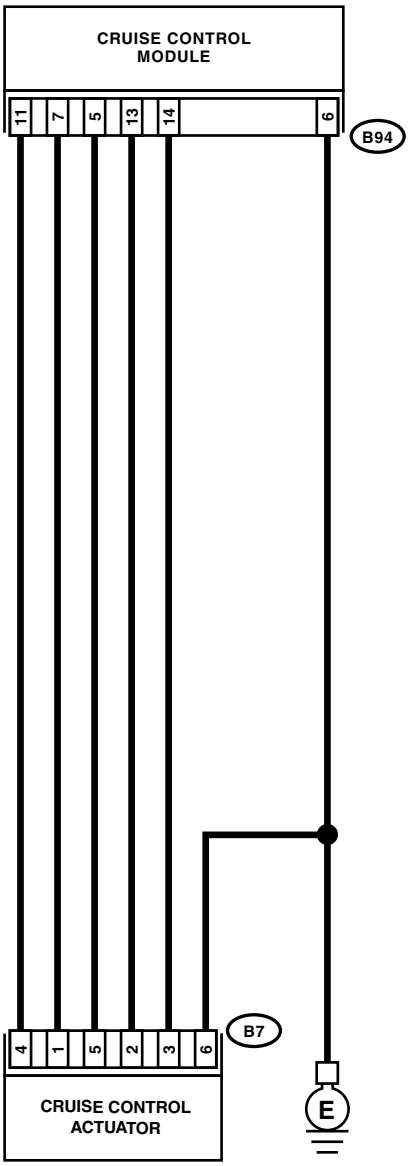
	Step	Check	Yes	No
6	**CHECK HARNESS BETWEEN CRUISE CONTROL MODULE AND TRANSMISSION CONTROL MODULE.** 1)Turn the ignition switch to OFF. 2)Disconnect the harness connector from transmission control module and cruise control module. 3)Measure the resistance between cruise control module harness connector terminal and transmission control module harness connector terminal. ***Connector & terminal*** ***NON-TURBO MODEL*** ***(B94) No. 19 — (B55) No. 13:*** ***TURBO MODEL*** ***(B94) No. 19 — (B56) No. 17:***	Is the resistance less than 10 Ω?	Go to step **7.**	Repair the harness.
7	**CHECK TRANSMISSION CONTROL MODULE.** 1)Connect the 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 the voltage between transmission control module harness connector terminal and chassis ground. ***Connector & terminal*** ***NON-TURBO MODEL*** ***(B55) No. 13 (+) — Chassis ground (–):*** ***TURBO MODEL*** ***(B56) No. 17 (+) — Chassis ground (–):***	Is the voltage less than 1 V ⟷ more than 5 V?	Replace the cruise control module. <Ref. to CC-5, Cruise Control Module.>	Replace the transmission control module. <Ref. to 4AT-67, Transmission Control Module (TCM).>

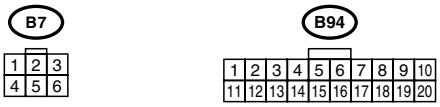
C: DTC 28 WIRING HARNESS OPENED

	Step	Check	Yes	No
1	**CHECK BATTERY.** Measure the battery specific gravity of electrolyte.	Is the battery specific gravity more than 1.260?	Go to step **2.**	Charge or replace the 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?	Repair or replace the faulty parts.	End of inspection.

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:



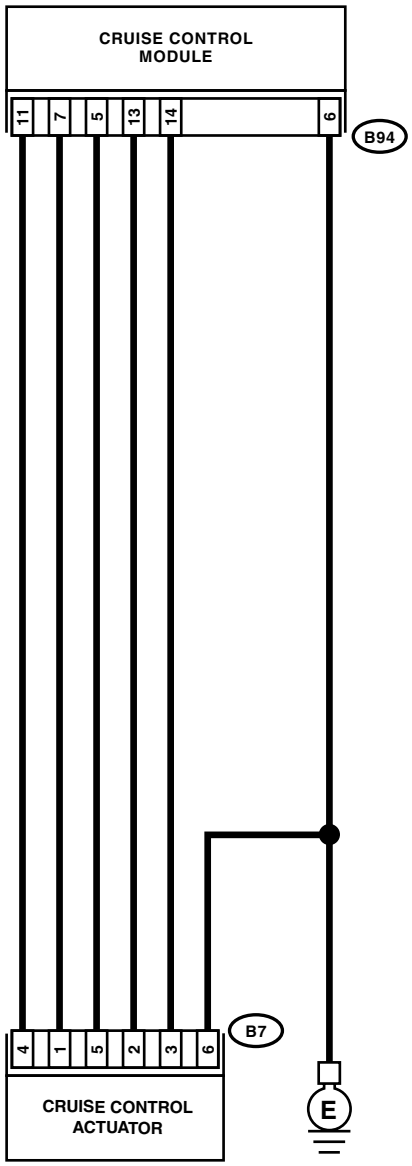


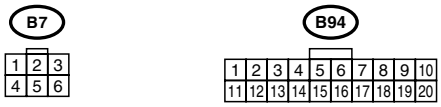
CC-00177

	Step	Check	Yes	No
1	**CHECK POWER SUPPLY.** 1)Turn the ignition switch to OFF. 2)Disconnect the harness connector from cruise control actuator. 3)Turn the ignition switch to ON. 4)Turn the cruise control main switch to ON. 5)Measure the voltage between cruise control actuator harness connector terminal and chassis ground. ***Connector & Terminal*** ***(B7) No. 4 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **2.**	Check the harness for open or short between cruise control module and cruise control actuator.
2	**CHECK GROUND CIRCUIT OF ACTUATOR.** 1)Turn the ignition switch and cruise control main switch to OFF. 2)Measure the resistance between cruise control actuator harness connector terminal and chassis ground. ***Connector & Terminal*** ***(B7) No. 6 — Chassis ground:***	Is the resistance less than 10 Ω?	Go to step **3.**	Repair the harness.
3	**MEASURE RESISTANCE OF ACTUATOR.** Measure the resistance of cruise control actuator motor. ***Terminals*** ***No. 4 — No. 1:*** ***No. 4 — No. 2:*** ***No. 4 — No. 5:***	Is the resistance approx. 5 Ω?	Go to step **4.**	Replace the cruise control actuator. <Ref. to CC-4, Actuator.>
4	**CHECK HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.** 1)Disconnect the harness connector from cruise control module. 2)Measure the 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 resistance less than 10 Ω?	Go to step **5.**	Repair the harness.
5	**CHECK HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.** Measure the 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 resistance less than 10 Ω?	Replace the cruise control module. <Ref. to CC-5, Cruise Control Module.>	Repair the 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-00177

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

F: DTC 38 MOTOR DRIVE SHAFT DOES NOT ENGAGE PROPERLY

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

G: DTC 39 MOTOR IS OVERLOADED

	Step	Check	Yes	No
1	**CHECK THE OPERATING CURRENT TO ACTUATOR MOTOR.** 1)Connect the 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. ***Connector & terminal*** ***(B7) No. 4 (+) — Chassis ground (–):***	Is the current more than 10 A?	Replace the cruise control module. <Ref. to CC-5, Cruise Control Module.>	Check the power supply circuit. <Ref. to CC-12, CHECK POWER SUPPLY, Diagnostic Procedure with Symptom.>