BODY ELECTRICAL SYSTEM (CRUISE CONTROL) 6-2

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1. Precaution

A: 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.

2. Pre-inspection

A: FUNCTION TESTS

Conduct road tests by selecting a smooth, flat road or use free rollers for road test simulation.

1. CRUISE CONTROL MAIN SWITCH

- 1) Turn ignition switch to ON.
- 2) Check that cruise control main switch indicator light comes on when main switch is pressed (ON).
- 3) Check that main switch indicator light goes out when main switch is pressed again (OFF).
- 4) Turn ignition switch to OFF with main switch ON (indicated by illumination). Turn ignition switch ON again to ensure that main switch indicator light remains OFF.

2. CRUISE CONTROL COMMAND SWITCH

- 1) Check that cruise control command switch is properly set in "SET/COAST", "RESUME/ACCEL", or "CANCEL" mode.
- 2) Also check that command switch returns to the original position when released.

3. CONSTANT SPEED TEST

- 1) Turn cruise control main switch to ON.
- 2) Drive the vehicle at a speed greater than 40 km/h (25 MPH).
- 3) Press command switch to set in "SET/COAST" mode.
- 4) Ensure that vehicle is maintained at the speed set when command switch was pressed.

4. ACCELERATION TEST

- 1) Set vehicle speed at a speed greater that 40 km/h (25 MPH).
- 2) Ensure that vehicle continues to accelerate while holding command switch in "RESUME/ACCEL" mode, and that vehicle maintains that optional speed when command switch is released.

5. DECELERATION TEST

- 1) Set vehicle speed at an optional speed greater than 40 km/h (25 MPH).
- 2) Ensure that vehicle continues to decelerate while holding command switch in "SET/COAST" mode, and that it maintains that optional speed when command switch is released.

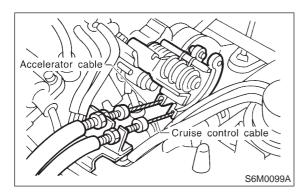
NOTE:

When vehicle speed reaches the lower speed limit of 30 km/h (19 MPH) during deceleration, cruise control will be released.

B: CRUISE CONTROL CABLE

CHECK CRUISE CONTROL CABLE. 2B1:

Check cruise control cable installation.



(CHECK)

Is the cruise control cable securely installed to the left of the accelerator cable?

(YES)

: Go to step **2B2**.

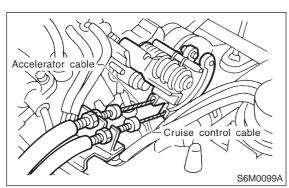
NO

: Install cruise control cable securely. Go

to step 2B2.

2B2: CHECK ACCELERATOR CABLE.

Check function of accelerator cable.



CHECK

: Does the accelerator cable throttle cam move when the cruise control throttle is moved by hand?

YES

: Repair accelerator cable throttle cam. Go to step 2B3.

: Go to step **2B3**. NO

CHECK THROTTLE CAM. 2B3:

Check function of throttle cam.

CHECK

: Does the throttle cam move smoothly?

YES

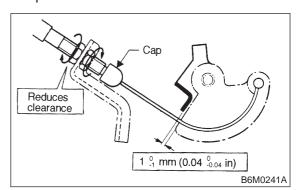
: Go to step **2B4**.

NO

: Repair throttle cam. Go to step **2B4**.

2B4: CHECK CABLE FREE PLAY.

Ensure that throttle cam-to-lever clearance is within specifications.



(CHECK)

: Is throttle cam-to-lever clearance between 0 and 1 mm (0 and 0.04 in)?

(YES)

: Go to step **2C1**.

(NO)

: Adjust cable end by adjusting nuts. Go to step 2C1.

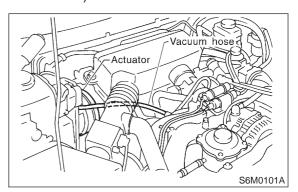
NOTE:

Ensure that cap is positioned in groove.

C: VACUUM HOSE

CHECK VACUUM HOSE VISUALLY. 2C1:

Check vacuum hose (which connects actuator and intake manifold).



CHECK

: Is there disconnection or cracks in vacuum hose?

YES

: Replace vacuum hose. Go to step **2D1**.

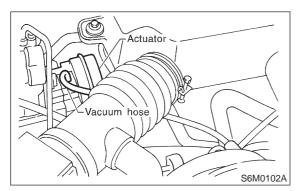
NO

: Go to step 2D1.

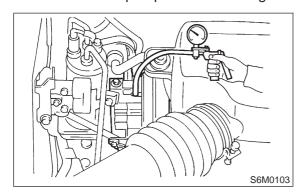
D: ACTUATOR

2D1: CHECK FUNCTION OF ACTUATOR.

1) Disconnect vacuum hose from actuator.



2) Connect vacuum pump as shown in figure.



3) Make sure that cruise control cable moves smoothly and quickly when a vacuum pressure of 40.0 kPa (300 mmHg, 11.81 inHg) is applied to actuator.

CHECK : Does cruise control cable have a stroke of 35 mm (1.38 in)?

YES : Go to step 2D2.

NO : Replace actuator. <Ref. to 6-2 [W11B1].> Go to step **2D2**.

NOTE:

• When vacuum pressure is released from condition 3) above, make sure the cable returns to its original position smoothly and quickly.

• After inspection, disconnect vacuum pump and connect vacuum hose.

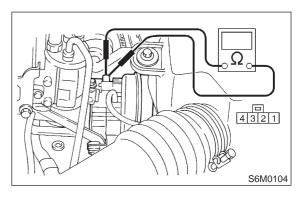
2D2: MEASURE RESISTANCE OF VALVE.

1) Disconnect connector from actuator.

2) Measure resistance between terminals of actuator.

Terminals

No. 2 — No. 3:



(CHECK): Is resistance less than 100 Ω ?

YES : Go to step 2D3.

Replace actuator. <Ref. to 6-2

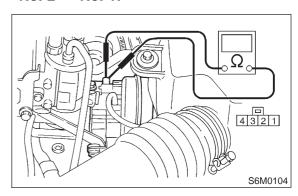
[W11B1].>

2D3: MEASURE RESISTANCE OF VALVE.

Measure resistance between terminals of actuator.

Terminals

No. 2 — No. 1:



(CHECK): Is resistance less than 69 Ω ?

YES: Go to step 2D4.

Replace actuator. <Ref. to 6-2

[W11B1].>

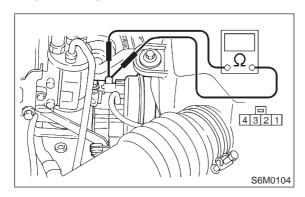
2. Pre-inspection

2D4: MEASURE RESISTANCE OF VALVE.

Measure resistance between terminals of actuator.

Terminals

No. 2 — No. 4:



: Is resistance less than 69 Ω ?

: Go to step **2D5**. YES)

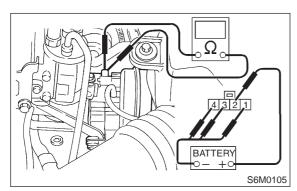
Replace actuator. <Ref. 6-2 NO

[W11B1].>

2D5: CHECK FOR LEAKAGE AND STICK-ING OF VALVES.

1) Disconnect connector from actuator.

2) Make sure that cruise control cable moves smoothly when connecting + (positive) battery cable to terminal No. 2 and - (negative) battery cable to terminals No. 1, 3 and 4 of actuator connector.



: Does cruise control cable have a CHECK stroke of 35 mm (1.38 in) within 3 sec-

onds? : Go to step **2D6**.

YES)

: Replace actuator. <Ref. 6-2 NO

[W11B1].> Go to step 2D6.

2D6: CHECK FOR LEAKAGE AND STICK-ING OF VALVES.

When the battery cable is disconnected from former condition <Ref. to 6-2 [T2D5].> Step 2), make sure the cable returns to its original position smoothly.

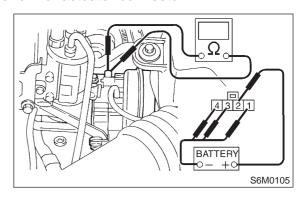
CHECK : Does cruise control cable get back to its original position within 1.5 seconds?

: Go to step **2D7**. YES

: Replace actuator. <Ref. to 6-2 NO [W11B1].> Go to step **2D7**.

2D7: CHECK CABLE MOVEMENT.

Connect + (positive) battery cable to terminal No. 2 and - (negative) battery cable to terminals No. 1, 3 and 4 of actuator connector.



: Does cruise control perform pull CHECK operation?

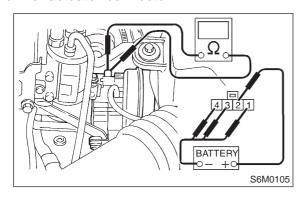
: Go to step **2D8**. (YES)

: Replace actuator. <Ref. 6-2 NO

[W11B1].> Go to step 2D8.

2D8: CHECK CABLE MOVEMENT.

Connect + (positive) battery cable to terminal No. 2 and – (negative) battery cable to terminals No. 1 and 4 of actuator connector.



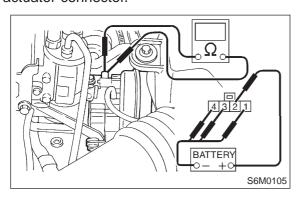
CHECK : Does cruise control perform hold operation?

YES: Go to step 2D9.

Replace actuator. <Ref. to 6-2 [W11B1].> Go to step **2D9**.

2D9: CHECK CABLE MOVEMENT.

Connect + (positive) battery cable to terminal No. 2 and – (negative) battery cable to terminal No. 4 of actuator connector.



CHECK : Does cruise control perform release operation?

YES : Go to step 2E1.

Replace actuator. <Ref. to 6-2 [W11B1].> Go to step **2E1**.

E: POWER SUPPLY

2E1: CHECK BATTERY.

Measure battery specific gravity of electrolyte.

CHECK : Is battery specific gravity more than 1.250?

(YES) : Go to step 2E2.

: Charge or replace battery. <Ref. to 6-2 [W2A0].> Go to step **2E2**.

2E2: CHECK FUSES, CONNECTORS AND HARNESSES.

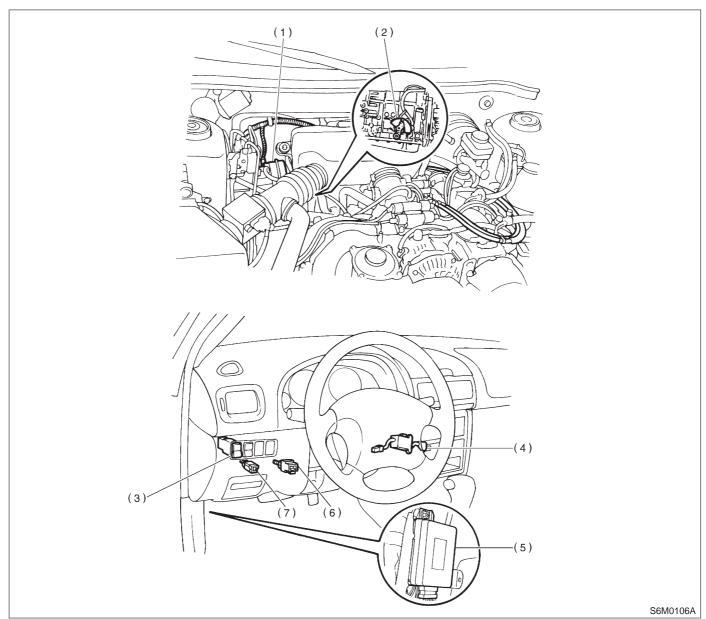
Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

CHECK : Is there anything unusual about the appearance of main fuse, fuse, harness, connector and grounding?

(YES): Repair or replace faulty parts. End of pre-inspection.

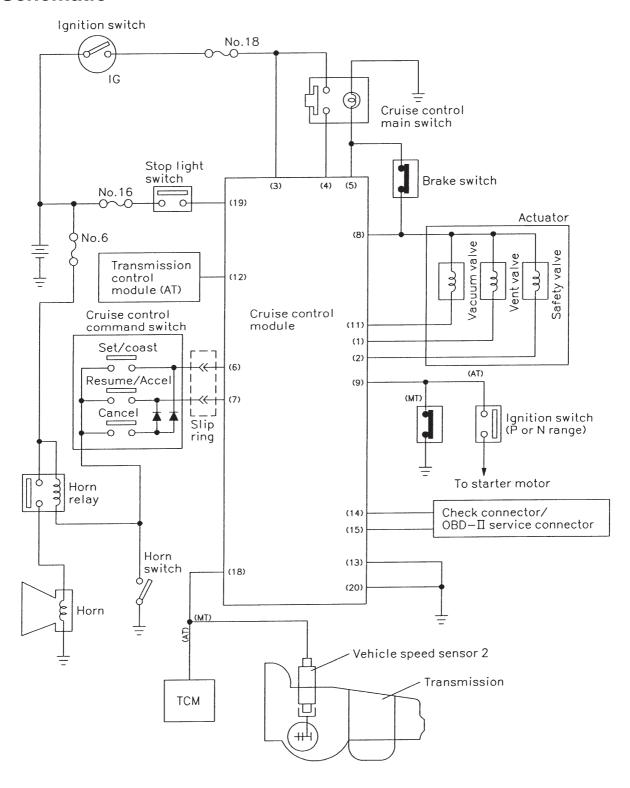
: End of pre-inspection.

3. Electrical Components Location



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

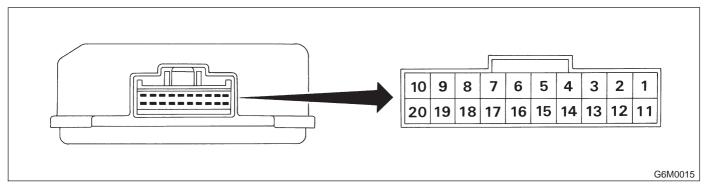
4. Schematic



S6M0325

MEMO:

5. Control Module I/O Signal



Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)	
Vent valve	1	 Power supply is ON when vehicle is stopped. ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating. 	
Safety valve	2	 Power supply is ON when vehicle is stopped. ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating. 	
Ignition switch	3	 Battery voltage is present when ignition switch is turned ON. "0" volt is present when ignition switch is turned OFF. 	
Cruise control main switch	4	 Battery voltage is present when main power is turned ON. "0" volt is present when main power is turned OFF. 	
Power supply to vacuum valve, vent valve, safety valve and indicator light	5	 Battery voltage is present when main power is turned ON. "0" volt is present when main power is turned OFF. 	
SET/COAST switch	6	 Battery voltage is present when command switch is turned to SET/COAST position. "0" volt is present when command switch is released. 	
RESUME/ACCEL switch	7	 Battery voltage is present when command switch is turned to RESUME/ ACCEL position. "0" volt is present when command switch is released. 	
Brake switch	8	Set selector lever to any position other than "P" or "N" position (AT) / 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, or • Battery voltage is present when clutch pedal is released (MT). • "0" volt is present when clutch pedal is depressed (MT). • Battery voltage is present when selector lever is in any position other than "P" or "N" position (AT). • "0" volt is present when selector lever is set to "P" or "N" position (AT).	
Clutch switch (MT)/ Inhibitor switch (AT)	9	 Battery voltage is present when clutch pedal is released (MT). "0" volt is present when clutch pedal is depressed (MT). Battery voltage is present when selector lever is in any position other than "P" or "N" position (AT). "0" volt is present when selector lever is set to "P" or "N" position (AT). 	
Vacuum valve	11	 Power supply is ON when vehicle is stopped. ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating. 	
Set signal to transmission control module (AT)	12	• TCM emits a ground-level signal while driving vehicle at least 40 km/h (25 MPH) with SET switch ON.	
Ground	13	_	
Check connector/ OBD-II service connector	14	_	
Check connector/ OBD-II service connector	15	_	

BODY ELECTRICAL SYSTEM (CRUISE CONTROL) [T500] 6-2 5. Control Module I/O Signal

Content	Terminal No. Measuring conditions and I/O signals (ignition switch ON and eng			
Vehicle speed sensor 2 (MT) Automatic transmission control module (AT)	18	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	19	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.		
Ground	20	_		
NOTE: Voltage at terminals 1, 2, 11 and 12 cannot be checked unless vehicle is driving by cruise control operation.				

6-2 [T6A1] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

6. Diagnostics Chart for On-board Diagnosis System

6. Diagnostics Chart for Onboard Diagnosis System

A: BASIC DIAGNOSTIC PROCEDURE

6A1: CHECK CRUISE CONTROL MAIN SWITCH.

1) Trouble occurs.

2) Perform pre-inspection. <Ref. to 6-2 [T200].>

3) Check cruise control main switch.

CHECK : Does cruise control main switch turn

ON?

(YES) : Go to step 6A2.

No : Go to "Diagnostics Chart for Power

Line". <Ref. to 6-2 [T700].>

6A2: CHECK CRUISE SPEED IS SET.

CHECK : Does cruise speed properly set while driving at minimum of 40 km/h (25

MPH)?

(YES) : Go to step 6A3.

No : Go to "Diagnostics Chart with Trouble

Code". <Ref. to 6-2 [T800].>

6A3: CHECK CRUISE CONTROL IS

RELEASED.

CHECK : Does cruise control properly release

during operation?

(YES) : Go to step 6A4.

: Go to "Diagnostics Chart with Trouble

Code". <Ref. to 6-2 [T800].>

6A4: CHECK CRUISE SPEED IS HELD

WITHIN SET SPEED.

CHECK : Does cruise speed hold within set

speed ± 3 km/h (2 MPH)?

YES : Go to step 6A5.

(No): Go to pre-inspection of actuator. < Ref.

to 6-2 [T2D0].>

6A5: CHECK RESUME/ACCEL SWITCH.

CHECK : Does RESUME/ACCEL switch function properly?

(YES) : Go to step 6A6.

: Go to "Diagnostics Chart with Trouble

Code". <Ref. to 6-2 [T800].>

6A6: CHECK SET/COAST SWITCH.

CHECK : Does SET/COAST switch function

properly?

(YES) : Go to step 6A7.

(NO)

(YES)

: Go to "Diagnostics Chart with Trouble

Code". <Ref. to 6-2 [T800].>

6A7: CHECK CANCEL SWITCH.

CHECK : Does CANCEL switch function prop-

erly?

(YES) : Go to step 6A8.

: Go to "Diagnostics Chart with Trouble

Code". <Ref. to 6-2 [T800].>

6A8: CHECK CRUISE SPEED IS RELEASED.

CHECK : Does cruise speed release when

brake pedal is depressed?

: Go to step 6A9.

: Go to "Diagnostics Chart with Trouble

Code". <Ref. to 6-2 [T800].>

6A9: CHECK CRUISE SPEED IS

RELEASED.

CHECK : Does cruise speed release when

clutch pedal is depressed?

(YES) : Cruise control system is in correct order.

: Go to "Diagnostics Chart with Trouble

Code". <Ref. to 6-2 [T800].>

B: ON-BOARD DIAGNOSIS WITH SELECT MONITOR

1. GENERAL

The on-board diagnosis function of the cruise control system uses an external select monitor.

The on-board diagnosis function operates in two categories, which are used depending on the type of problems;

NOTE:

Select monitor cartridge:

No. 24082AA090

- 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 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.
- 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 problems 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) Connect select monitor.
- 2) Start the engine and turn cruise control main switch to ON.
- 3) Set select monitor in "All System Diagnosis" mode.

NOTE:

The diagnostic code 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".

- 4) Drive vehicle at least 40 km/h (25 MPH) with cruise speed set.
- 5) If cruise speed is canceled itself (without doing any cancel operations), a diagnostic code will appear on select monitor display.

CAUTION:

- A diagnostic code 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 code 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) Select the "Current Data Display & Save" mode on the select monitor "Cruise Control Diagnosis" screen.
- 4) Ensure 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)
- Set the selector lever to P or N. (AT)

7. Diagnostics Chart for Power Line

A: BASIC DIAGNOSTICS PROCEDURE

7A1: DRIVE AT CRUISE SPEED.

СНЕСК) : Can cruise speed be set?

(VES) : Go to "CHECK INDICATOR AND CIR-CUIT IN CRUISE CONTROL MAIN

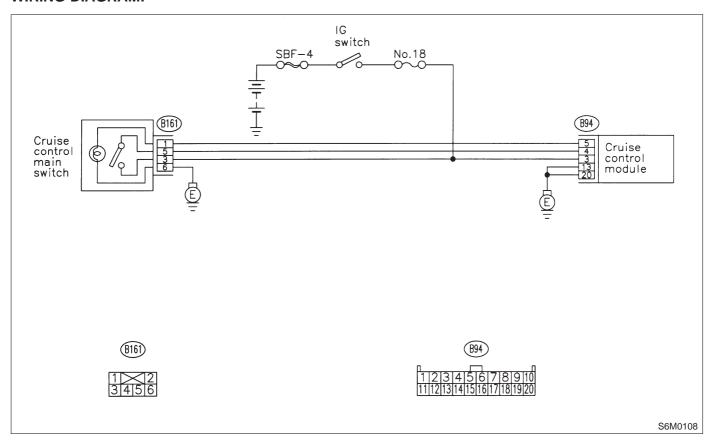
SWITCH". <Ref. to 6-2 [T7B0].>

: Go to "CHECK CRUISE CONTROL MAIN SWITCH". <Ref. to 6-2 [T7C0].>

B: CHECK INDICATOR AND CIRCUIT IN CRUISE CONTROL MAIN SWITCH DIAGNOSIS:

Bulb failure or open harness of the indicator circuit in the cruise control main switch.
 TROUBLE SYMPTOM:

• Cruise control can be set, normally indicator does not come on. (When main switch is pressed.) **WIRING DIAGRAM:**



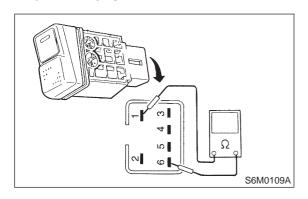
7B1: CHECK CRUISE CONTROL MAIN SWITCH.

- 1) Remove cruise control main switch.
- 2) Measure resistance between cruise control main switch terminals.

Terminals

NO)

No. 1 — No. 6:



 \widehat{CHECK} : Is resistance between 10 and 80 Ω ?

YES: Go to step 7B2.

: Replace switch illumination bulb. <Ref.

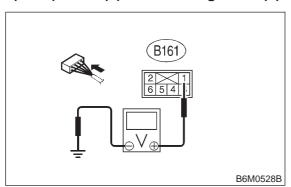
to 6-2 [W11B2].>

7B2: CHECK CIRCUIT BETWEEN CRUISE CONTROL MODULE AND CRUISE CONTROL MAIN SWITCH INDICATOR LIGHT.

- 1) Turn the ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Measure voltage between cruise control main switch connector and the chassis ground.

Connector & terminal

(B161) No. 1 (+) — Chassis ground (-):



CHECK): Is voltage more than 10 V?

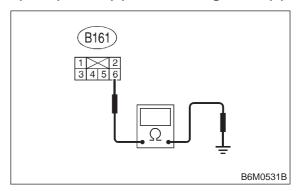
YES : Go to step 7B3.

No : Repair or replace wiring harness.

7B3: CHECK CIRCUIT BETWEEN CRUISE CONTROL MODULE AND CRUISE CONTROL MAIN SWITCH INDICATOR LIGHT.

- 1) Turn the ignition switch and cruise control main switch to OFF.
- 2) Remove the connector from the cruise control main switch.
- 3) Measure resistance of ground circuit between the cruise control main switch connector and chassis ground.

Connector & terminal (B161) No. 6 (+) — Chassis ground (-):



 $\widehat{\text{CHECK}}$: Is resistance less than 10 Ω ?

: Replace cruise control module. <Ref. to

6-2 [W11B4].>

(NO) : Repair or replace wiring harness.

6-2 [T7C0] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

7. Diagnostics Chart for Power Line

C: CHECK CRUISE CONTROL MAIN SWITCH

DIAGNOSIS:

• Faulty cruise control main switch, or open harness.

TROUBLE SYMPTOM:

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

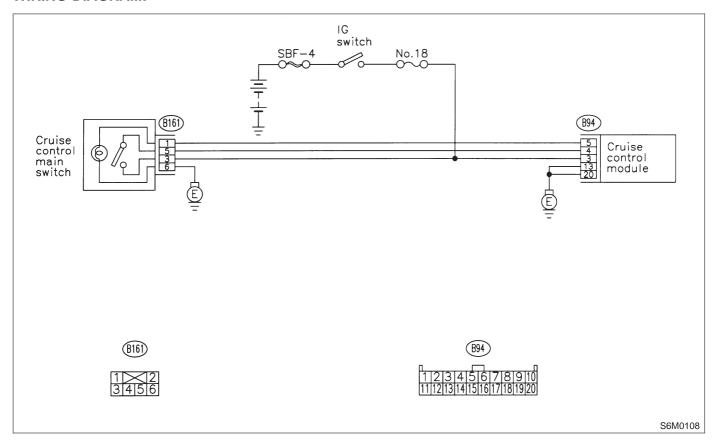
NOTE:

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.

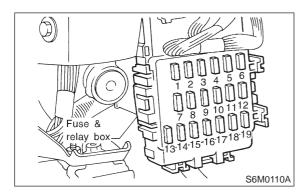
This operation sounds will be heard when ignition switch and cruise control main switch is turned to ON.

WIRING DIAGRAM:



7C1: CHECK FUSE.

Check fuse No. 18.



: Is fuse No. 18 blown? CHECK

: Replace fuse No. 18. Go to step 7C2. YES

: Go to step **7C2**. NO

7C2: CHECK POWER SUPPLY.

1) Turn ignition switch to ON.

2) Measure voltage between fuse & relay box connector and chassis ground.

Connector & terminal (B152) No. 5 (+) — Chassis ground (-):

CHECK): Is voltage more than 10 V?

: Go to step **7C3**. YES)

: Replace fuse No. 18. When fuse No. 18 (NO) is blown again, repair shorted parts of

circuit.

7C3: **CHECK CRUISE CONTROL MAIN** SWITCH.

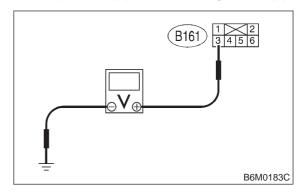
1) Turn ignition switch to OFF.

2) Remove cruise control main switch and disconnect connector.

3) Turn ignition switch to ON.

4) Measure voltage between cruise control main switch connector and chassis ground.

Connector & terminal (B161) No. 3 (+) — Chassis ground (-):



: Is voltage more than 10 V? (CHECK)

: Go to step 7C4. (YES)

: Replace cruise control main switch. NO

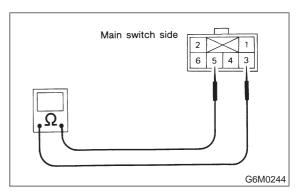
<Ref. to 6-2 [W11B2].>

CHECK CRUISE CONTROL MAIN 7C4: SWITCH.

Measure resistance between cruise control main switch terminals.

Terminals

No. 3 — No. 5:



: Is resistance less than 10 Ω ? (When (CHECK) switch is ON.)

: Go to step **7C5**. (YES)

: Replace cruise control main switch. NO <Ref. to 6-2 [W11B2].>

6-2 [T7C5] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

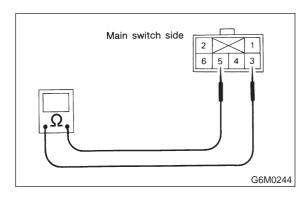
7. Diagnostics Chart for Power Line

7C5: CHECK CRUISE CONTROL MAIN SWITCH.

Measure resistance between cruise control main switch terminals.

Terminals

No. 3 — No. 5:



CHECK : Is resistance less than 1 MΩ? (When switch is OFF.)

YES : Go to step **7C6**.

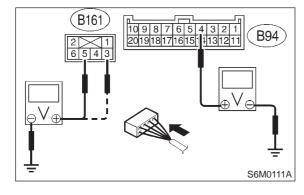
: Replace cruise control main switch.

<Ref. to 6-2 [W11B2].>

7C6: CHECK HARNESS BETWEEN
CRUISE CONTROL MAIN SWITCH
CONNECTOR AND CHASSIS
GROUND.

- 1) Connect connector.
- 2) Turn ignition switch to ON.
- 3) Turn cruise control main switch to ON.
- 4) Measure voltage between terminal of cruise control main switch and chassis ground.

Connector & terminal (B161) No. 3 (+) — Chassis ground (-):



CHECK : Is voltage more than 10 V?

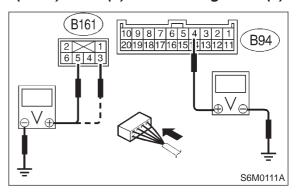
Services: Go to step 7C7.

No : Repair or replace wiring harness.

7C7: CHECK HARNESS BETWEEN
CRUISE CONTROL MAIN SWITCH
CONNECTOR AND CHASSIS
GROUND.

Measure voltage between terminal of cruise control main switch chassis ground.

Connector & terminal (B161) No. 5 (+) — Chassis ground (-):



(CHECK): Is voltage more than 10 V?

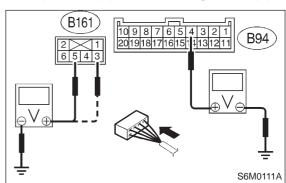
: Go to step **7C8**.

: Repair or replace wiring harness.

7C8: CHECK HARNESS BETWEEN
CRUISE CONTROL MODULE CONNECTOR AND CHASSIS GROUND.

Measure voltage between terminal of cruise control module and chassis ground.

Connector & terminal (B94) No. 4 (+) — Chassis ground (-):



: Is voltage more than 10 V?

: Replace cruise control module. <Ref. to 6-2 [W11B4].>

No : Repair or replace wiring harness.

NOTE:

Depress cruise control main switch with fingers while measuring voltage between (B161) No. 5 and chassis ground.

8. Diagnostics Chart with Diagnostic Code

A: DIAGNOSTIC CODE LIST

Diagnostic code	Item	Contents of diagnosis	Index No.
11	BRAKE SW/STOP SW	Input signals from brake switch "OFF", stop light switch "ON"	<ref. 6-2="" [t8b0].="" to=""></ref.>
12	CLUTCH SW/INHIBITOR SW	(Brake pedal is depressed.) Input signals from clutch switch "OFF" (MT), or inhibitor switch "P or N" (AT) [Clutch pedal is depressed (MT), or selector lever is set to P or N position (AT).]	<ref. 6-2="" [t8c0].="" to=""></ref.>
13	LOW SPEED LIMIT	Low-speed control limiter	<ref. 6-2="" [t8d0].="" to=""></ref.>
14	CANCEL SW	Input signal from cancel switch (faulty SET/COAST switch or RESUME/ACCEL switch)	<ref. 6-2="" [t8e0].="" to=""></ref.>
21	VACUUM VALVE	Faulty vacuum valve or valve drive system	<ref. 6-2="" [t8f0].="" to=""></ref.>
22	VENT 2 VALVE	Faulty vent 2 valve or valve drive system	<ref. 6-2="" [t8f0].="" to=""></ref.>
23	VENT 1 VALVE	Faulty vent 1 valve or valve drive system	<ref. 6-2="" [t8f0].="" to=""></ref.>
24	SPEED SENSOR	Faulty vehicle speed sensor 2 (MT) or transmission control module (AT)	<ref. 6-2="" [t8d0].="" to=""></ref.>
25	CONTROL MODULE	Faulty CPU RAM included in cruise control module	<ref. 6-2="" [t8g0].="" to=""></ref.>

B: DIAGNOSTIC CODE 11 (BRAKE SWITCH, STOP LIGHT SWITCH)

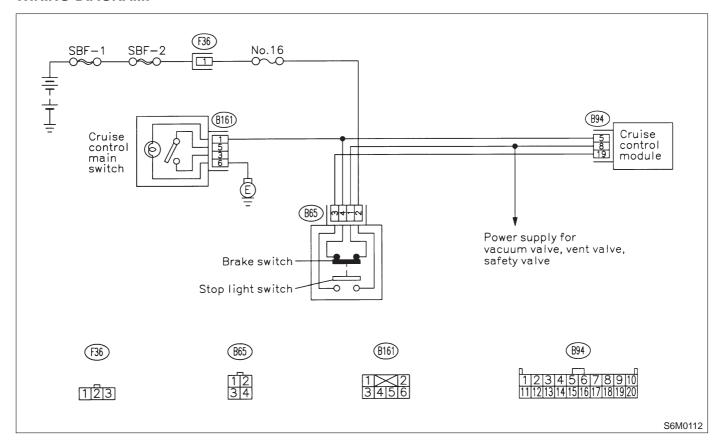
DIAGNOSIS:

• Failure or disconnection of the stop light switch and brake switch.

TROUBLE SYMPTOM:

• Cruise control cannot be set.

WIRING DIAGRAM:

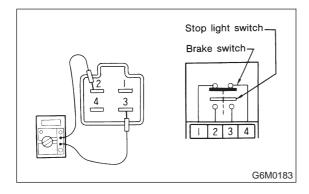


8B1: CHECK BRAKE SWITCH.

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Apply parking brake securely.
- 4) Set select monitor in "Current Data Display & Save" mode.
- 5) Depress the brake pedal and check signals for proper operation.
 - (1) The Stop Lamp Switch shown on the display turns from "OFF" to "ON".
 - (2) The Brake Switch shown on the display turns from "OFF" to "ON".
- 6) Release the brake pedal.
- 7) Remove connector of stop and brake switch.
- 8) Check circuit between brake switch terminal.

Terminals

No. 1 — No. 4: (Brake switch)



CHECK : Is resistance less than 1 Ω? (When brake pedal is released.)

YES : Go to step 8B2.

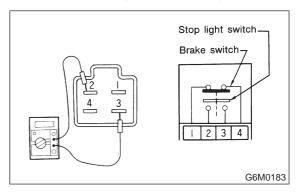
Replace brake and stop light switch. <Ref. to 4-5 [C100].>

8B2: CHECK BRAKE SWITCH.

Check circuit between brake switch terminal.

Terminals

No. 1 — No. 4: (Brake switch)



CHECK : Is resistance more than 1 MΩ? (When brake pedal is depressed.)

YES : Go to step 8B3.

No : Replace brake and stop light switch.

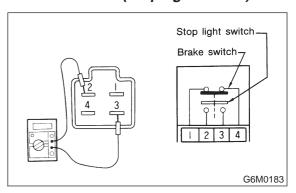
<Ref. to 4-5 [C100].>

8B3: CHECK STOP LIGHT SWITCH.

Check circuit between stop light switch terminal.

Terminals

No. 2 — No. 3: (Stop light switch)



CHECK : Is resistance more than 1 MΩ? (When brake pedal is released.)

YES : Go to step 8B4.

Replace brake and stop light switch.

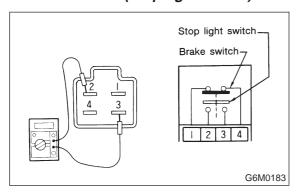
<Ref. to 4-5 [C100].>

8B4: CHECK STOP LIGHT SWITCH.

Check circuit between stop light switch terminal.

Terminals

No. 2 — No. 3: (Stop light switch)



CHECK : Is resistance less than 1 Ω? (When brake pedal is depressed.)

Replace cruise control module. <Ref. to 6-2 [W11B4].>

Replace brake and stop light switch. <Ref. to 4-5 [C1A0].>

BODY ELECTRICAL SYSTEM (CRUISE CONTROL) [T8B4] 6-2 8. Diagnostics Chart with Diagnostic Code

MEMO:

C: DIAGNOSTIC CODE 12 (CLUTCH SWITCH, INHIBITOR SWITCH)

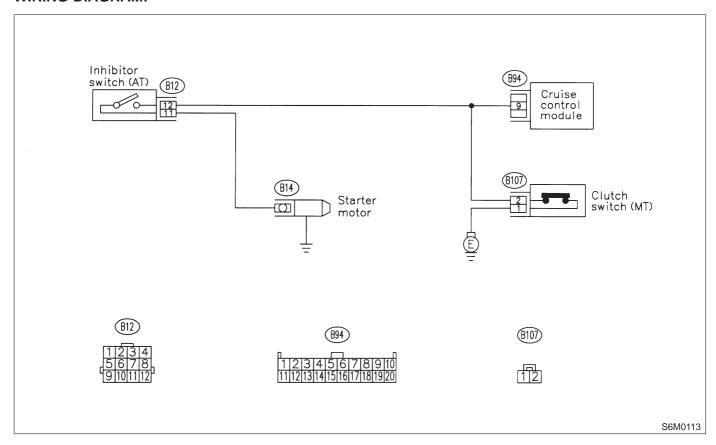
DIAGNOSIS:

- Failure or disconnection of the clutch switch. (MT)
- Failure or disconnection of the inhibitor switch. (AT)

TROUBLE SYMPTOM:

Cruise control cannot be set.

WIRING DIAGRAM:



8C1: CHECK CLUTCH SWITCH. (MT)

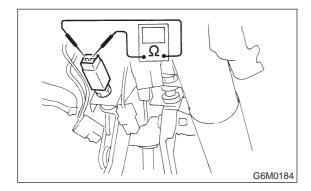
- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Apply parking brake securely.
- 4) Set select monitor in "Current Data Display & Save" mode.
- 5) Depress the clutch pedal and check signal for proper operation. (MT)

The Clutch/Inhibitor Switch shown on the display turns from "ON" to "OFF".

- 6) Disconnect connector of clutch switch.
- 7) Check continuity of the clutch switch.

Terminals

No. 1 — No. 2:



CHECK : Is resistance less than 10 Ω? (When clutch pedal is released.)

YES : Go to step 8C2.

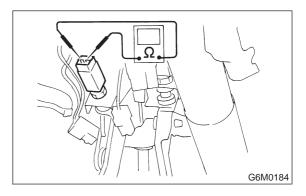
: Replace clutch switch. <Ref. to 4-5 [C1A0].>

8C2: CHECK CLUTCH SWITCH. (MT)

Check continuity of the clutch switch.

Terminals

No. 1 — No. 2:



CHECK : Is resistance more than 1 MΩ? (When clutch pedal is depressed.)

Replace cruise control module. <Ref. to 6-2 [W11B4].>

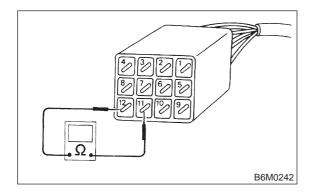
: Replace clutch switch. <Ref. to 4-5 [C1A0].>

8C3: CHECK INHIBITOR SWITCH. (AT)

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Apply parking brake securely.
- 4) Set select monitor in "Current Data Display & Save" mode.
- 5) Set the selector lever from P or N position to D position and check signal for proper operation. (AT) The Clutch/Inhibitor Switch shown on the display turns from "ON" to "OFF".
- 6) Set the selector lever to P or N position.
- 7) Disconnect connector of inhibitor switch.
- 8) Check continuity of the inhibitor switch.

Terminals

No. 11 — No. 12:



CHECK : Is resistance less than 10 Ω ? (When selector lever is in P or N.)

YES : Go to step 8C4.

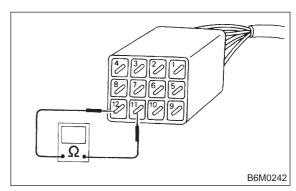
: Replace inhibitor switch. <Ref. to 3-2 [W2C0].> Repair inhibitor switch wiring harness.

8C4: CHECK INHIBITOR SWITCH. (AT)

Check continuity of the inhibitor switch.

Terminals

No. 11 — No. 12:



CHECK : Is resistance more than 1 MΩ? (When selector lever is not in P or N.)

Replace cruise control module. <Ref. to 6-2 [W11B4].>

Replace inhibitor switch. <Ref. to 3-2 [W2C0].> Repair inhibitor switch wiring harness.

BODY ELECTRICAL SYSTEM (CRUISE CONTROL) [T8C4] 6-2 8. Diagnostics Chart with Diagnostic Code

MEMO:

D: DIAGNOSTIC CODE 13 AND 24 (SPEED SENSOR SYSTEM)

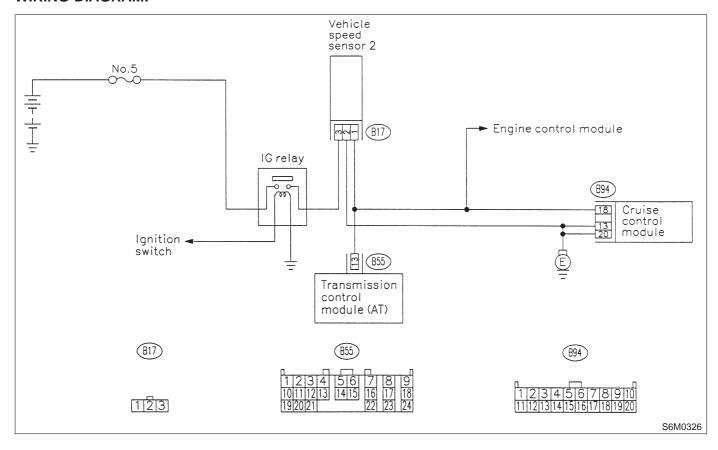
DIAGNOSIS:

• Disconnection or short circuit of vehicle speed sensor 2 (MT model) or transmission control module (AT model).

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:



8D1: CHECK TRANSMISSION TYPE.

CHECK): Is the transmission type MT?

: Go to step 8D2.

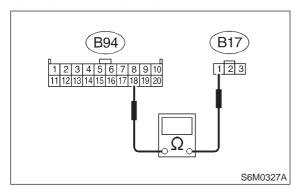
NO : Go to step 8D7.

8D2: CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL MOD-ULE AND VEHICLE SPEED SENSOR 2.

1) Disconnect connector from vehicle speed sensor 2 and cruise control module.

2) Measure resistance of harness connector between vehicle speed sensor 2 and cruise control module.

Connector & terminal (B17) No. 1 — (B94) No. 18:



(CHECK): Is the resistance less than 10 Ω ?

YES : Go to step 8D3.

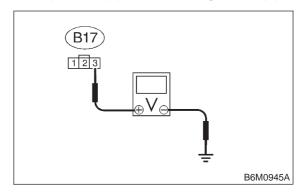
: Repair wiring harness.

8D3: CHECK HARNESS CONNECTOR BETWEEN BATTERY AND VEHICLE SPEED SENSOR 2.

1) Turn ignition switch to ON.

2) Measure voltage between vehicle speed sensor 2 connector (B17) and chassis ground.

Connector & terminal (B17) No. 3 (+) — Chassis ground (-):



CHECK : Is the voltage more than 10 V?

YES: Go to step 8D4.

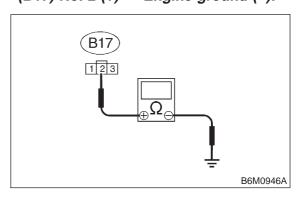
Repair harness connector between battery and vehicle speed sensor 2.

8D4: CHECK HARNESS CONNECTOR BETWEEN VEHICLE SPEED SENSOR 2 AND ENGINE GROUND.

1) Turn ignition switch to OFF.

2) Measure resistance between vehicle speed sensor 2 connector (B17) and engine ground.

Connector & terminal (B17) No. 2 (+) — Engine ground (-):



(CHECK): Is the resistance less than 10 Ω ?

YES: Go to step 8D5.

: Repair harness connector between vehicle speed sensor 2 and engine ground.

NO

8D5: CHECK VEHICLE SPEED SENSOR 2.

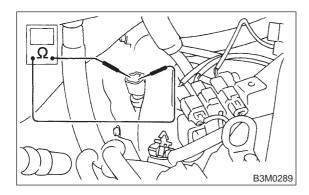
NOTE:

- If resistance between terminals of vehicle speed sensor 2 is out of specification, the sensor may have a failure.
- If resistance is OK and voltage between terminals of vehicle speed sensor 2 is out of specification, mechanical trouble may be present between vehicle speed sensor 2 and speedometer shaft in transmission.

Measure resistance between terminals of vehicle speed sensor 2.

Terminals

No. 2 — No. 3:



CHECK : Is the resistance between 350 and

450 Ω?

YES : Go to step 8D6.

: Replace vehicle speed sensor 2.

8D6: CHECK VEHICLE SPEED SENSOR 2.

- 1) Connect connector to vehicle speed sensor 2.
- 2) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.

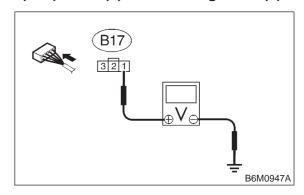
WARNING:

Be careful not to be caught up by the running wheels.

- 3) Drive the vehicle at speed greater than 20 km/h (12 MPH).
- 4) Measure voltage between vehicle speed sensor 2 connector (B17) and chassis ground.

Connector & terminal

(B17) No. 1 (+) — Chassis ground (-):



CHECK): Is the voltage more than 4 V?

: Replace cruise control module. <Ref. to

6-2 [W11B4].>

: Replace vehicle speed sensor 2.

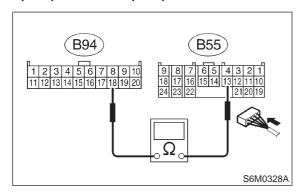
8D7: CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL MOD-**ULE AND AUTOMATIC TRANSMIS-**SION CONTROL MODULE.

- 1) Disconnect connector from automatic transmission control module and cruise control module.
- 2) Measure resistance between cruise control module connector and automatic transmission control module connector.

CAUTION:

To measure the voltage and/or resistance, use a tapered pin with a diameter of less than 0.64 mm (0.025 in). Do not insert the pin more than 5 mm (0.20 in).

Connector & terminal (B94) No. 18 — (B55) No. 13:



: Is the resistance less than 10 Ω ? CHECK

: Go to step 8D8. YES)

NO : Repair harness connector between cruise control module and automatic

transmission control module.

8D8: CHECK AUTOMATIC TRANSMISSION CONTROL MODULE.

- 1) Connect connector to automatic transmission control module.
- 2) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.

WARNING:

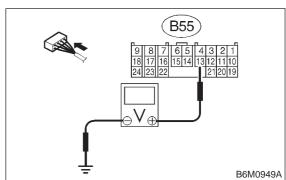
Be careful not to be caught by the running wheels.

- 3) Drive the vehicle faster than 20 km/h (12MPH).
- 4) Measure voltage between automatic transmission control module connector (B55) and chassis ground.

CAUTION:

To measure the voltage and/or resistance, use a tapered pin with a diameter of less than 0.64 mm (0.025 in). Do not insert the pin more than 5 mm (0.20 in).

Connector & terminal (B55) No. 13 (+) — Chassis ground (-):



: Is the voltage more than 4 V? CHECK)

> : Replace cruise control module. <Ref. to 6-2 [W11B4].>

NO

YES)

: Replace automatic transmission control module. <Ref. to 3-2 [W22A0].>

E: DIAGNOSTIC CODE 14 (SET/COAST SWITCH, RESUME/ACCEL SWITCH, CANCEL SWITCH)

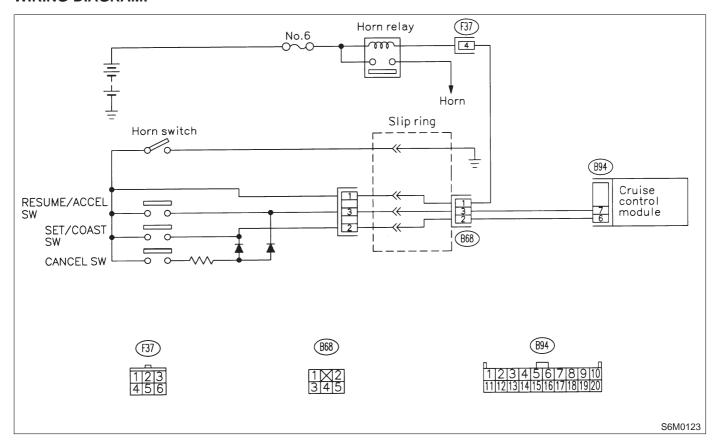
DIAGNOSIS:

Short circuit inside the SET SW and RESUME SW.

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:



8E1: CHECK POWER SUPPLY.

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Set select monitor in "Current Data Display & Save" mode.
- 4) Check signals for proper operation.
 - (1) When pushing the SET/COAST switch: The SET/COAST switch shown on the display turns from "OFF" to "ON".
 - RESUME/ACCEL (2) When pushing the switch:

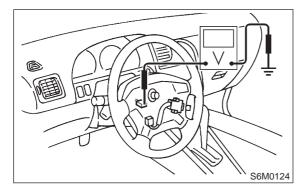
The RESUME/ACCEL switch shown on the display turns from "OFF" to "ON".

- 5) Turn ignition switch to OFF.
- 6) Disconnect connector from cruise control command switch.
- 7) Turn ignition switch to ON.
- 8) Measure voltage between cruise control command switch connector and chassis ground.

Terminals

NO

No. 1 (+) — Chassis ground (-):



: Is voltage more than 10 V? CHECK

: Go to step **8E2**. YES)

> : Repair or replace wiring harness between fuse & relay box and cruise control command switch. <Ref. to 6-2

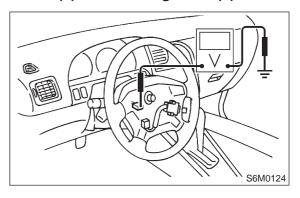
[W11B3].>

8E2: CHECK CRUISE CONTROL COM-MAND SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Connect connector of cruise control command switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between cruise control command switch connector and chassis ground.

Terminals

No. 2(+) — Chassis ground (-):



: Is voltage more than 10 V? (When (CHECK) SET/COAST switch is ON.)

: Go to step **8E3**. YES

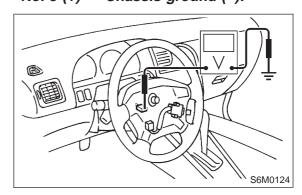
: Replace cruise control command NO switch. <Ref. to 6-2 [W11B3].>

8E3: CHECK CRUISE CONTROL COM-MAND SWITCH.

Measure voltage between cruise control command switch connector and chassis ground.

Terminals

No. 3(+) — Chassis ground (-):



: Is voltage more than 10 V? (When (CHECK) RESUME/ACCEL switch is ON.)

: Go to step **8E4**. YES

> : Replace cruise control command switch. <Ref. to 6-2 [W11B3].>

33

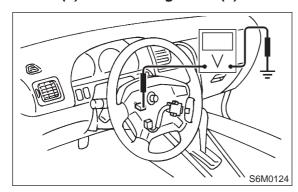
NO

8E4: CHECK CRUISE CONTROL COM-MAND SWITCH.

Measure voltage between cruise control command switch connector and chassis ground.

Terminals

No. 2 (+) — Chassis ground (-):



CHECK : Is voltage more than 10 V? (When CANCEL switch is ON.)

YES : Go to step 8E5.

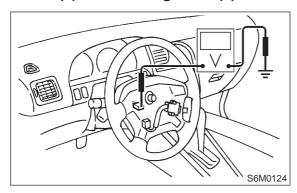
: Replace cruise control command switch. <Ref. to 6-2 [W11B3].>

8E5: CHECK CRUISE CONTROL COM-MAND SWITCH.

Measure voltage between cruise control command switch connector and chassis ground.

Terminals

No. 3(+) — Chassis ground (-):



CHECK : Is voltage more than 10 V? (When CANCEL switch is ON.)

YES : Go to step 8E6.

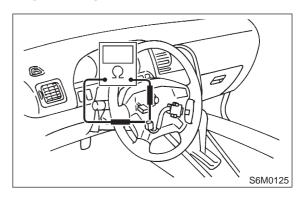
: Replace cruise control command switch. <Ref. to 6-2 [W11B3].>

8E6: CHECK CRUISE CONTROL COM-MAND SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from cruise control command switch.
- 3) Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 2:



CHECK : Is resistance less than 10 Ω ? (When SET/COAST switch is ON.)

Go to step 8E7.

NO

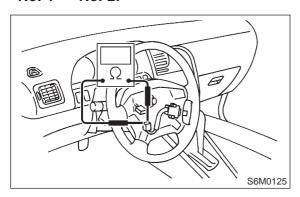
: Replace cruise control command

8E7: CHECK CRUISE CONTROL COM-MAND SWITCH.

Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 2:



CHECK : Is resistance more than 1 MΩ? (When SET/COAST switch is OFF.)

YES : Go to step 8E8.

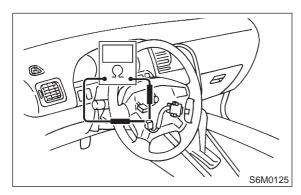
Replace cruise control command switch. <Ref. to 6-2 [W11B3].>

8E8: CHECK CRUISE CONTROL COM-MAND SWITCH.

Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 3:



: Is resistance less than 10 Ω? (When RESUME/ACCEL switch is ON.)

YES : Go to step 8E9.

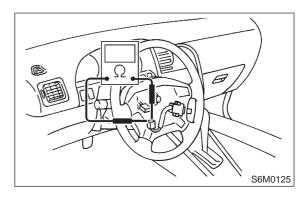
Replace cruise control command switch. <Ref. to 6-2 [W11B3].>

8E9: CHECK CRUISE CONTROL COM-MAND SWITCH.

Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 3:



CHECK : Is resistance more than 1 MΩ? (When RESUME/ACCEL switch is OFF.)

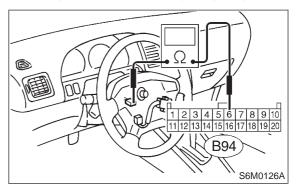
YES : Go to step 8E10.

: Replace cruise control command switch. <Ref. to 6-2 [W11B3].>

8E10: CHECK HARNESS CONNECTOR
BETWEEN CRUISE CONTROL COMMAND SWITCH AND CRUISE CONTROL MODULE.

- 1) Disconnect connector from cruise control module.
- 2) Measure resistance of harness connector between cruise control command switch and cruise control module.

Connector & terminal
No. 2 (command switch) — (B94) No. 6:



(CHECK): Is resistance less than 10 Ω ?

YES: Go to step 8E11.

: Repair or replace wiring harness.

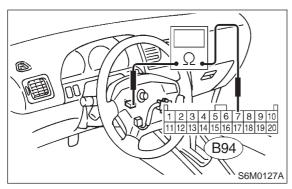
NO

8E11: CHECK HARNESS CONNECTOR
BETWEEN CRUISE CONTROL COMMAND SWITCH AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control command switch and cruise control module.

Connector & terminal

No. 3 (command switch) — (B94) No. 7:



(CHECK): Is resistance less than 10 Ω ?

: Replace cruise control module. <Ref. to

6-2 [W11B4].>

YES

: Repair or replace wiring harness.

BODY ELECTRICAL SYSTEM (CRUISE CONTROL) [T8E11] 6-2 8. Diagnostics Chart with Diagnostic Code

MEMO:

F: DIAGNOSTIC CODE 21, 22 AND 23 (VACUUM VALVE, VENT 2 VALVE, VENT 1 VALVE)

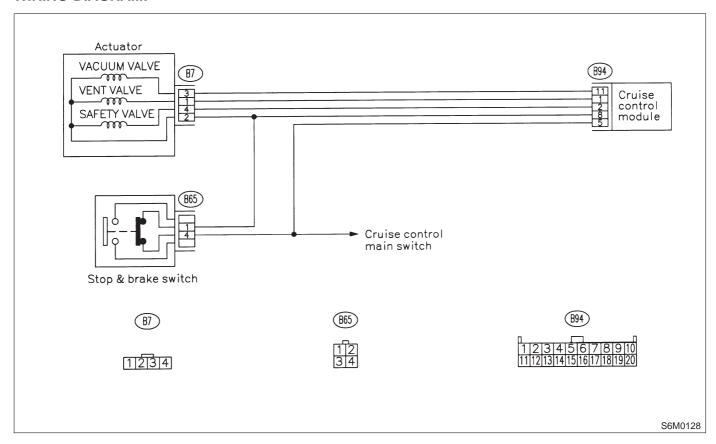
DIAGNOSIS:

• Open or poor contact of vacuum valve, vent 2 valve and vent 1 valve.

TROUBLE SYMPTOM:

Cruise control cannot be set. (Cancels immediately.)

WIRING DIAGRAM:

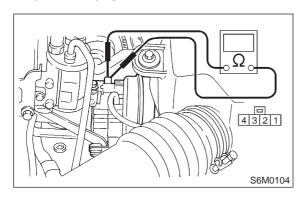


8F1: MEASURE RESISTANCE OF VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE.

- 1) Disconnect connector from actuator.
- 2) Measure resistance of vacuum valve, vent 2 valve and vent 1 valve.

Terminals

No. 2 — No. 3:



(CHECK): Is resistance less than 22 Ω ?

(YES): Go to step 8F2.

No : Replace actuator. <Ref. to 6-2

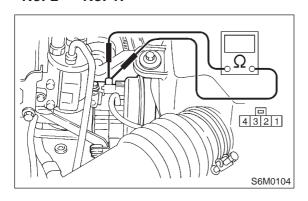
[W11B1].>

8F2: MEASURE RESISTANCE OF VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE.

Measure resistance of vacuum valve, vent 2 valve and vent 1 valve.

Terminals

No. 2 — No. 1:



(CHECK): Is resistance less than 55 Ω ?

YES : Go to step 8F3.

No : Replace actuator. <Ref. to 6-2

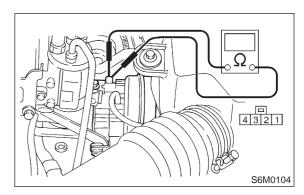
[W11B1].>

8F3: MEASURE RESISTANCE OF VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE.

Measure resistance of vacuum valve, vent 2 valve and vent 1 valve.

Terminals

No. 2 — No. 4:



(CHECK): Is resistance less than 55 Ω ?

YES: Go to step 8F4.

(NO): Replace actuator. <Ref. to 6-2

[W11B1].>

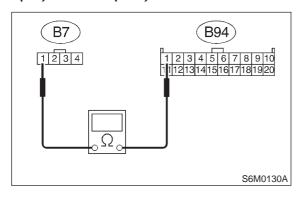
6-2 [T8F4] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

8. Diagnostics Chart with Diagnostic Code

8F4: PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR
(VACUUM VALVE, VENT 2 VALVE
AND VENT 1 VALVE) AND CRUISE
CONTROL MODULE.

- 1) Disconnect connector from cruise control module.
- 2) Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Connector & terminal (B7) No. 1 — (B94) No. 1:



 $\widehat{\text{CHECK}}$: Is resistance less than 10 Ω ?

YES : Go to step 8F5.

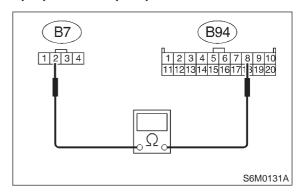
NO)

: Repair or replace wiring harness between actuator <Ref. to 6-2 [W11B1].> and cruise control module <Ref. to 6-2 [W11B4].>.

8F5: PERFORM A CIRCUIT TEST IN HAR-NESS BETWEEN ACTUATOR (VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE) AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Connector & terminal (B7) No. 2 — (B94) No. 8:



(CHECK): Is resistance less than 10 Ω ?

Go to step **8F6**.

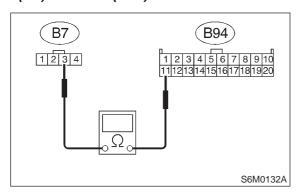
NO

: Repair or replace wiring harness between actuator <Ref. to 6-2 [W11B1].> and cruise control module <Ref. to 6-2 [W11B4].>.

8F6: PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR
(VACUUM VALVE, VENT 2 VALVE
AND VENT 1 VALVE) AND CRUISE
CONTROL MODULE.

Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Connector & terminal (B7) No. 3 — (B94) No. 11:



CHECK): Is resistance less than 10 Ω ?

YES) : Go to step 8F7.

NO

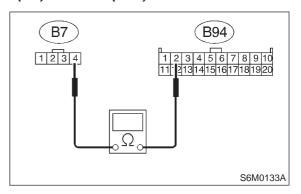
: Repair or replace wiring harness between actuator <Ref. to 6-2 [W11B1].> and cruise control module

<Ref. to 6-2 [W11B4].>.

8F7: PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR
(VACUUM VALVE, VENT 2 VALVE
AND VENT 1 VALVE) AND CRUISE
CONTROL MODULE.

Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Connector & terminal (B7) No. 4 — (B94) No. 2:



(CHECK): Is resistance less than 10 Ω ?

YES: Replace cruise control module.

NO

: Repair or replace wiring harness between actuator <Ref. to 6-2 [W11B1].> and cruise control module

<Ref. to 6-2 [W11B4].>.

G: DIAGNOSTIC CODE 25 (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.)

9. Diagnostics Chart with Select Monitor

A: FUNCTION MODE

NOTE:

Applicable select monitor cartridge:

No. 24082AA090

Select the "Cruise Control" system using the select monitor and set the "Current Data Display & Save" mode. The following parameters will then appear on the display.

Vehicle Speed

The current vehicle speed is shown on the display.

Stop Lamp Switch

When the brake pedal is depressed, the stop lamp switch shown on the display turns from "OFF" to "ON".

Brake Switch

When the brake pedal is depressed, the brake switch shown on the display turns from "OFF" to "ON".

"SET/COAST" Switch

When the cruise control command switch is placed in the "SET/COAST" position, the SET/COAST switch shown on the display turns from "OFF" to "ON".

• "RESUME/ACCEL" Switch

When the cruise control command switch is placed in the "RESUME/ACCEL" position, the RESUME/ACCEL switch shown on the display turns from "OFF" to "ON".

Clutch/Inhibitor Switch

When the clutch pedal is depressed, the clutch/inhibitor switch shown on the display turns from "ON" to "OFF". (MT models)

When the selector lever is moved from the "N" or "P" position to any other position, the clutch/inhibitor switch shown on the display turns from "ON" to "OFF".