● **SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"**

Airbag system wiring harness is routed near the cruise control sub switch.

CAUTION:
● All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
● Be careful not to damage Airbag system wiring harness when servicing the cruise control sub switch.

1. On-board Diagnosis System

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 —- the cruise cancel conditions diagnosis and real-time diagnosis, which are used depending on the type of problems.

Applicable cartridge No.: 498349300

● Cruise cancel conditions diagnosis

This category of diagnosis requires actual vehicle driving in order to determine the cause, (as when cruise speed is cancelled during driving although no cruise cancel condition is not entered).

⇩

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 in order, for 2 seconds per Code No., on the select monitor.

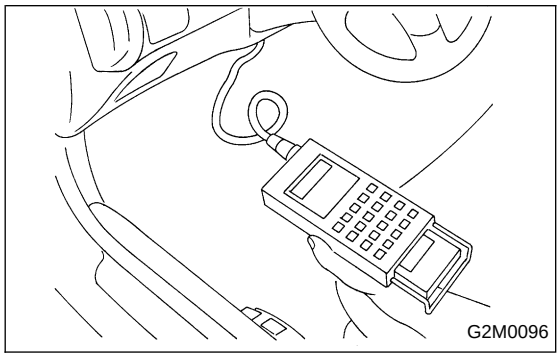
CAUTION:
● The cruise control memory stores not only the cruise "cancel" which occurred (although "cancel" operation is not entered by the driver), but also the "cancel" condition input by the driver.
● The content of memory is cleared when ignition switch or cruise main switch is turned OFF.

● Real-time diagnosis
The real-time diagnosis function is used to determine whether or not the input of output signal system is in good order, according to signal emitted from switches, sensors, etc.

Vehicle cannot be driven at cruise speed because problems occurs in the cruise control system or its associated circuits.

⇩

Dummy signals are manually entered from sub switch, etc.


G2M0096

2. ON-BOARD DIAGNOSIS PROCEDURES USING SELECT MONITOR

1) Connect select monitor to date link connector.
2) Turn ignition switch ON, then turn cruise main switch ON.
3) Turn select monitor's power ON. All LED's will come on. Select monitor display will read, after several seconds.

NOTE:
If cruise main switch is OFF, error 1 will appear. Turn cruise main switch ON and repeat steps 2.

4) Press "F", "B", "0", and "ENT" in that order, and enter the desired designated code ("FB0", for example), or press scroll key to select the code.

3. DIAGNOSIS OF CRUISE CANCEL CONDITIONS

1) Connect select monitor.
2) Turn ignition and cruise main switch ON, and set select monitor in “FB0” mode.
3) Start engine and drive vehicle at least 40 km/h (25 MPH) with cruise speed set.
4) If cruise speed is canceled itself (without doing any cancel operations), a trouble code will appear on select monitor display.

CAUTION:
● A trouble 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.

Function code indication		Item to measure		Contents of diagnosis
Code No.	Abbreviation	Trouble code	Abbreviation	
FB0	CANCEL	10	OK	Normal
		11	BRAKE/STOP	Input signals from brake switch “OFF”, stop light switch “ON” (Brake pedal is depressed.)
		12	CLU or N	Input signals from clutch switch “OFF”, inhibitor switch “N” (Clutch pedal is depressed, or select lever is set to “N”.)
		13	SPEED LIM	Low-speed control limiter
		14	SET+RESUME	Input signal from cancel switch “ON”
		21	VAC VALVE	Faulty vacuum valve or valve drive system
		22	VENT2 VALVE	Faulty vent 2 valve or valve drive system
		23	VENT1 VALVE	Faulty vent 1 valve or valve drive system
		24	SP SENSOR	Faulty vehicle speed sensor
		25	CONTROL UNIT	Faulty control module

5) Trouble code will be cleared by turning ignition or cruise main switch OFF.

4. REAL-TIME DIAGNOSIS

1) Connect select monitor.
2) Turn ignition switch and cruise main switch ON.
3) Set select monitor in FA0 mode.
4) Ensure that normal indication is displayed when controls are operated as indicated below:

- When SET/COAST switch is pressed.
- WHEN RESUME/ACCEL switch is pressed.
- When brake pedal is depressed. (Stop and brake switch turns ON.)
- When clutch pedal is depressed (MT model).
- When select lever is set to “N” (AT model).

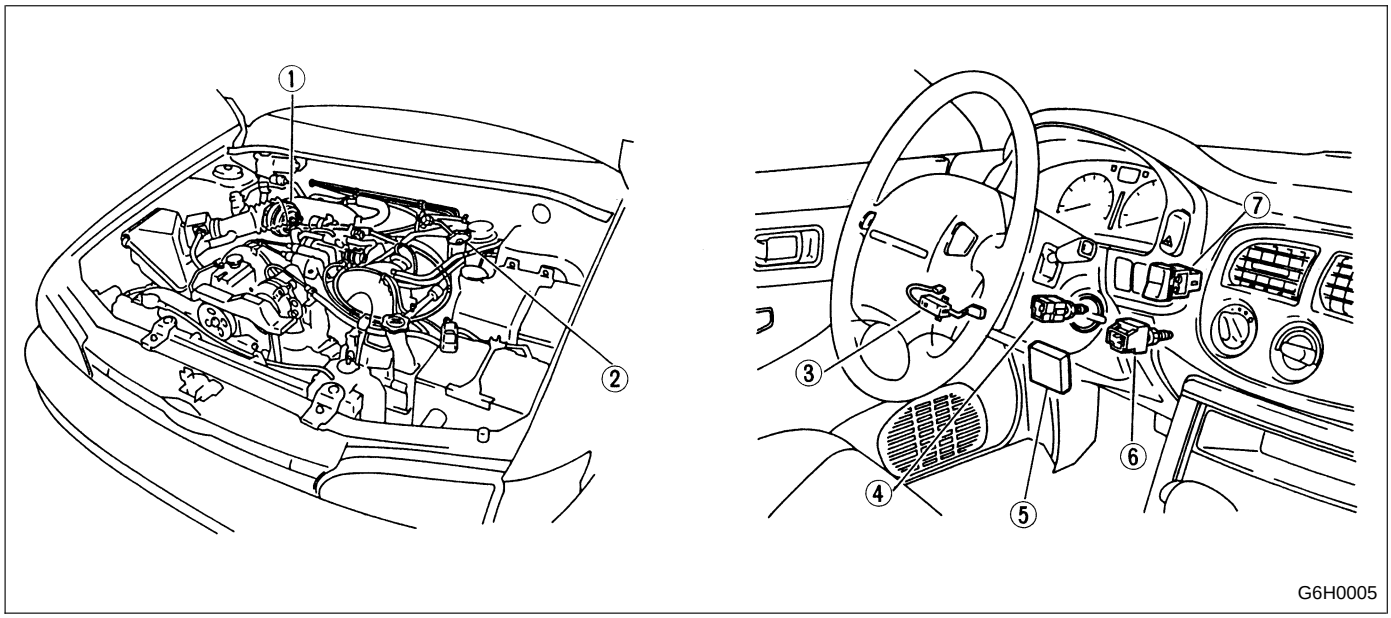
Function code indication		Item to measure	Content of items to be monitored
Code No.	Abbreviation		
FA0	ST	Stop light switch	LED No.1 comes on when switch is turned ON. (Brake pedal is depressed.)
	BR	Brake switch	LED No. 2 comes on when brake pedal is depressed.
	SE	SET/COAST switch	LED No. 3 comes on when switch is turned ON.
	RE	RESUME/ACCEL switch	LED No. 4 comes on when switch is turned ON.
	IH	Clutch switch/inhibitor switch	• LED No. 5 comes on when clutch pedal is depressed (MT model). • LED No. 5 comes on when select lever is set to “N” (AT model).

NOTE:
LED’s come on shortly after switches are pressed.

5. DATA SHOWN ON SELECT MONITOR DISPLAY DISPLAY

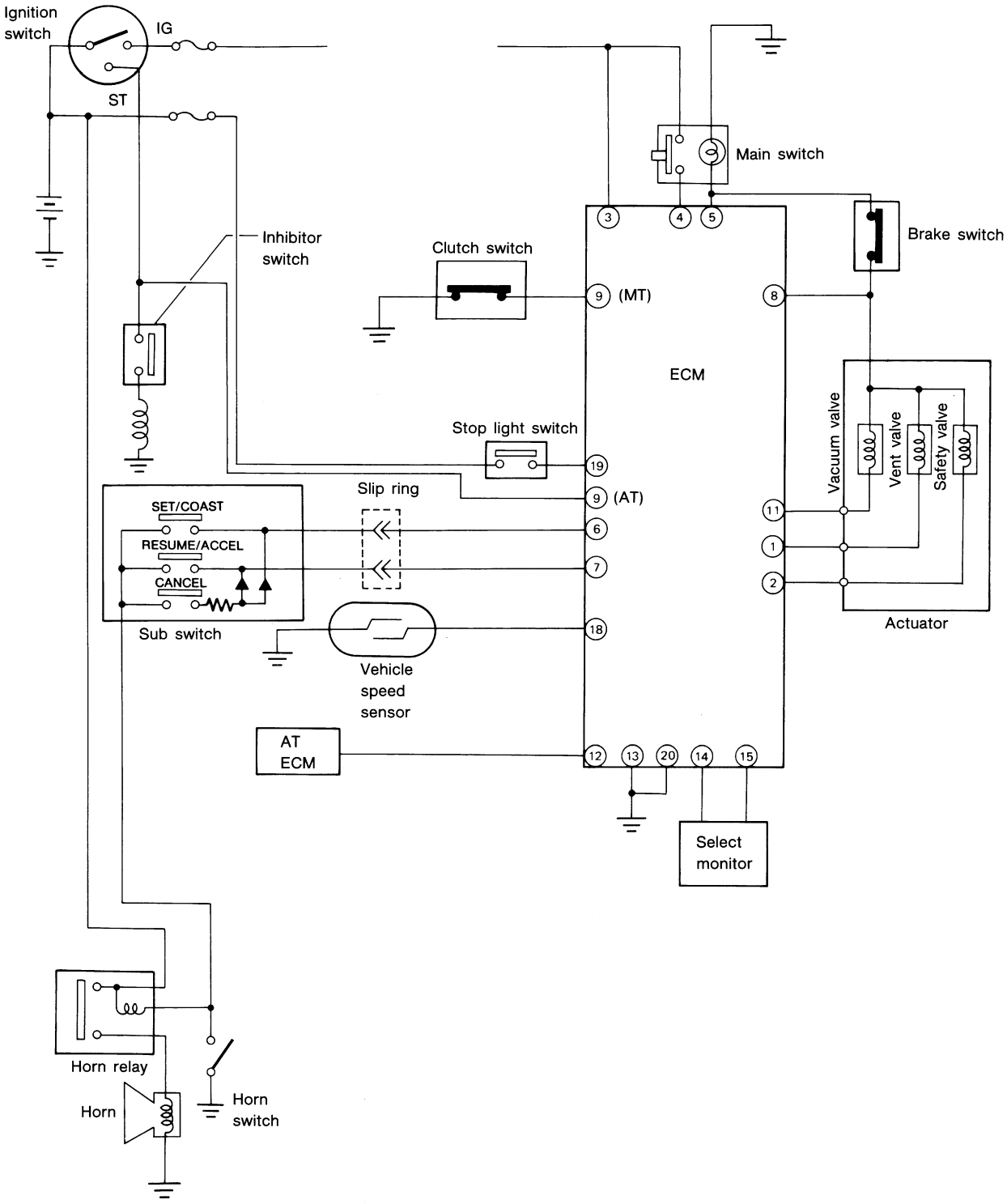
Indication of function code		Item to measure	Contents of items to be monitored
Code No.	Abbreviation		
F 00	CRUISE CONTROL	Cruise control module identification	Reads ROM ID number of cruise control module to display a possible communication state.
F 01	VSP (MPH)	Vehicle speed (MPH)	Displays vehicle speed data (in miles/h) determined by cruise control module in relation to signal emitted from vehicle speed sensor 2 in combination meter.
F 02	VSP (km/h)	Vehicle speed (km/h)	Displays vehicle speed in km/h.

2. Electrical Unit Location



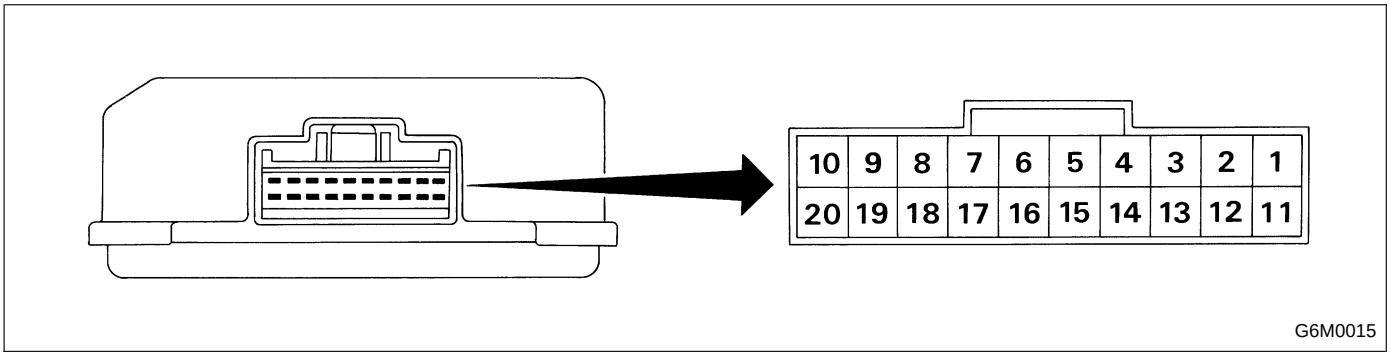
① Actuator
② Inhibitor switch
③ Sub switch
④ Clutch switch
⑤ Control module
⑥ Stop and brake switch
⑦ Main switch

3. Schematic



G6M0177

4. Control Module I/O Signal

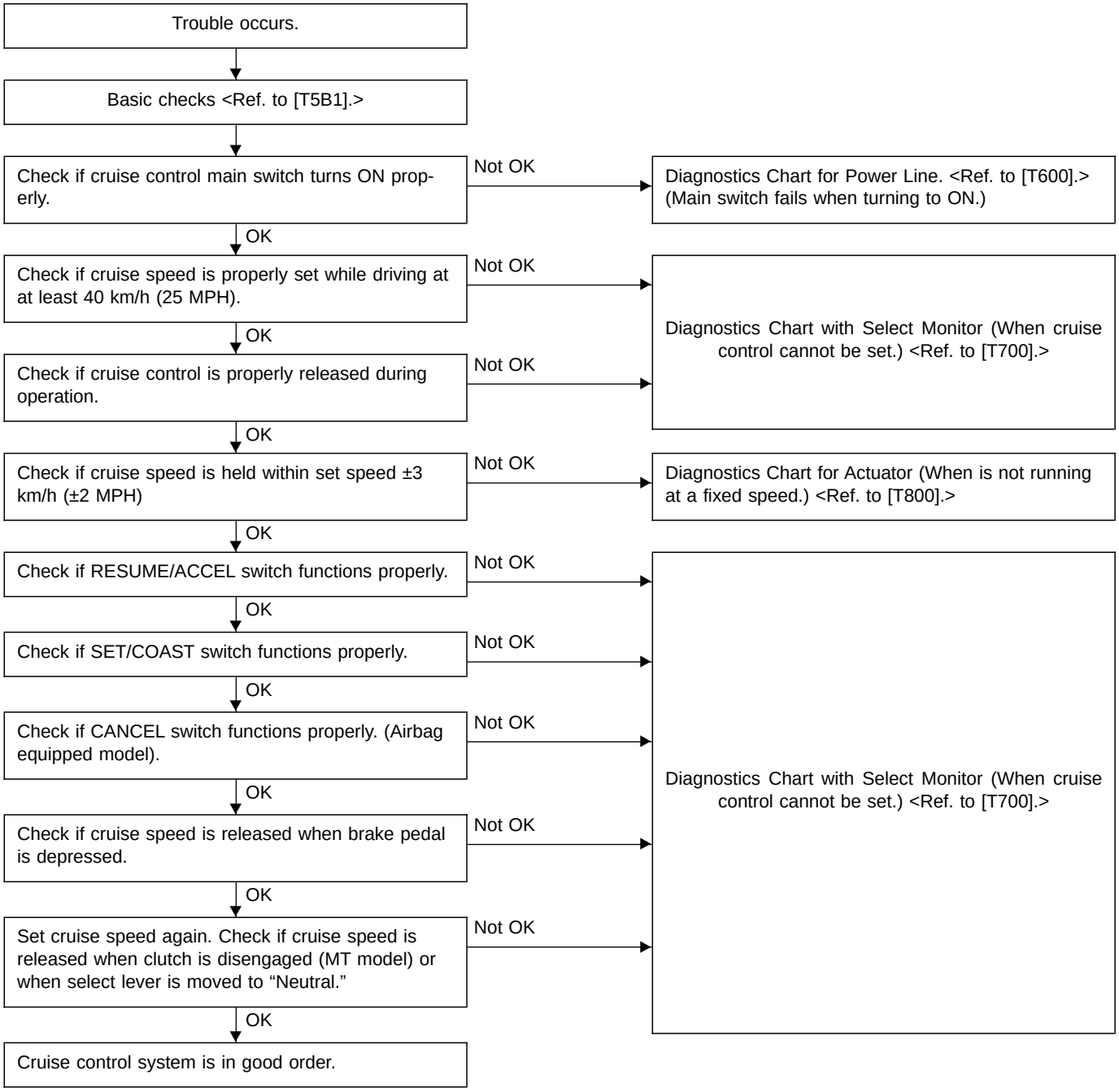


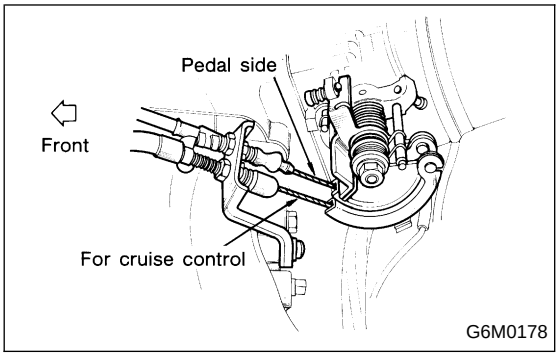
Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Vent valve	1	● Power supply is ON when vehicle is stopped. ● ON-and-OFF (0 and 12 volts) operation is alternately repeated while cruise control is operating.
Safety valve	2	● Power supply is ON when vehicle is stopped. ● ON-and-OFF (0 and 12 volts) operation is alternately repeated while cruise control is operating.
Ignition switch	3	● Battery voltage is present when switch is turned on.
Main switch	4	● When main switch is pressed, battery voltage is present. ● When main switch is OFF, “0” volt is present.
Power Supply to vacuum valve, vent valve, safety valve and set indicator	5	● When main switch is pressed, battery voltage is present.
SET/COAST switch	6	● When switch is turned ON, battery voltage is present. ● When switch is turned OFF, “0” volt is present.
RESUME/ACCEL switch	7	● When switch is turned ON, battery voltage is present. ● When switch is turned OFF, “0” volt is present.
Brake switch	8	Set select lever to any position other than “P” or “N” (AT model)/leave clutch released (MT model), with main switch ON. Then check that: ● 0 volt is present when brake pedal is depressed. ● Battery voltage is present when brake pedal is released, or ● 0 volt is present when clutch pedal is depressed (MT model). ● Battery voltage is present when clutch pedal is released (MT model). ● 0 volt is present when select lever is set to “P” or “N” (AT model). ● Battery voltage is present when select lever is in any position other than “P” or “N” (AT model).
Inhibitor switch Clutch switch	9	When switch is turned ON, “0” volt is present.
Vacuum valve	11	● Power supply is ON when vehicle is stopped. ● ON-and-OFF (0 and 12 volts) operation is alternately repeated while cruise control is operating.
AT control (Set signal)	12	ECM emits a ground-level signal while driving vehicle at least 40 km/h (25 MPH) with SET switch ON.
GND	13	—
Select monitor (Output)	14	—
Select monitor (Input)	15	—
Vehicle speed sensor	18	● When all four wheels are raised off ground and any wheel is rotated manually, approximately 5 and 0 volt pulse signals are alternately sent to cruise control module.
Stop light switch	19	With ignition switch ON or OFF: ● Depress brake pedal to check that battery voltage is present. ● “0” volt is present with brake pedal released.
GND	20	—

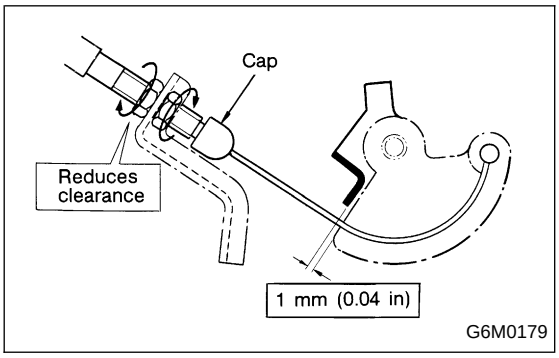
Voltage at terminals (1, 2, 11 and 12) cannot be checked unless vehicle is driving at cruising speed.

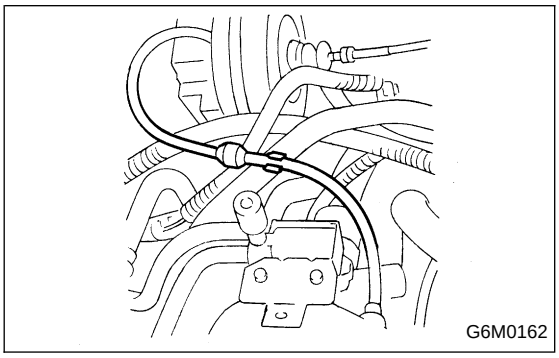
5. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE









B: BASIC CHECKS

1. CHECK CABLE

1) Cable installation
   (1) Ensure that cruise control cable is attached to the left of accelerator cable (on accelerator pedal side).
   (2) Ensure that accelerator cable throttle cam does not move when cruise control throttle cam is moved by hand.
   (3) Ensure that throttle cam moves smoothly.

2) Cable free play
   (1) Ensure that throttle cam-to-lever clearance is within specifications.

Standard value: 1 mm (0.04 in)

NOTE:
If clearance is not within specifications, adjust cable at its outer end.

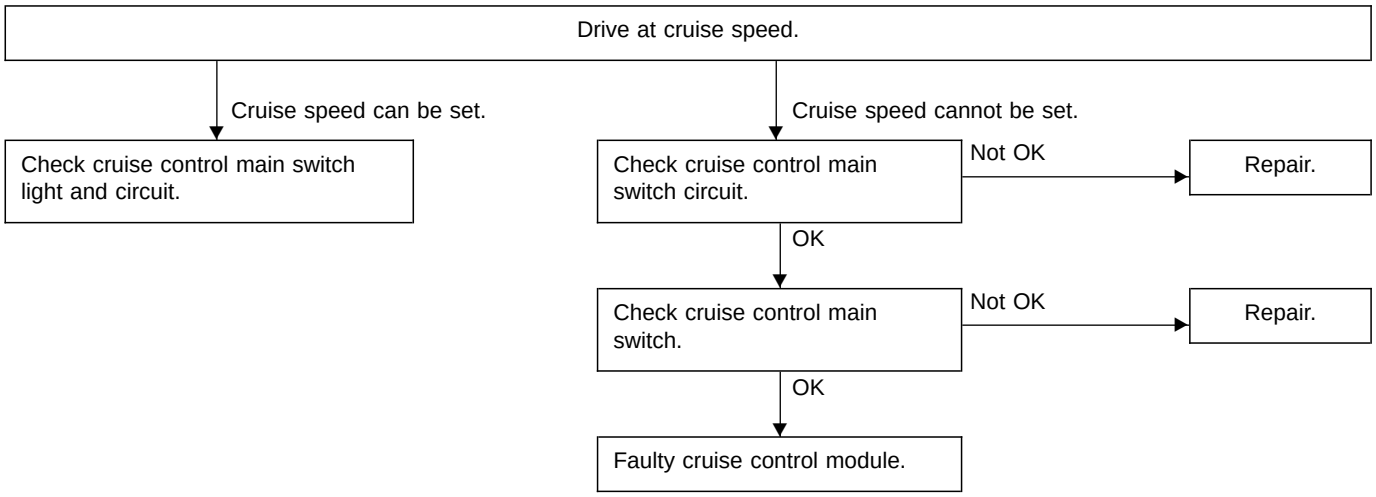
   (2) Ensure that cap is positioned in groove.
   (3) Ensure that cable deflects within specifications.

Standard value:
1 — 8 mm (0.04 — 0.31 in)

2. CHECK VACUUM HOSE

1) Check vacuum hose (which connects actuator and intake manifold) for disconnection or cracks.

6. Diagnostics Chart for Power Line



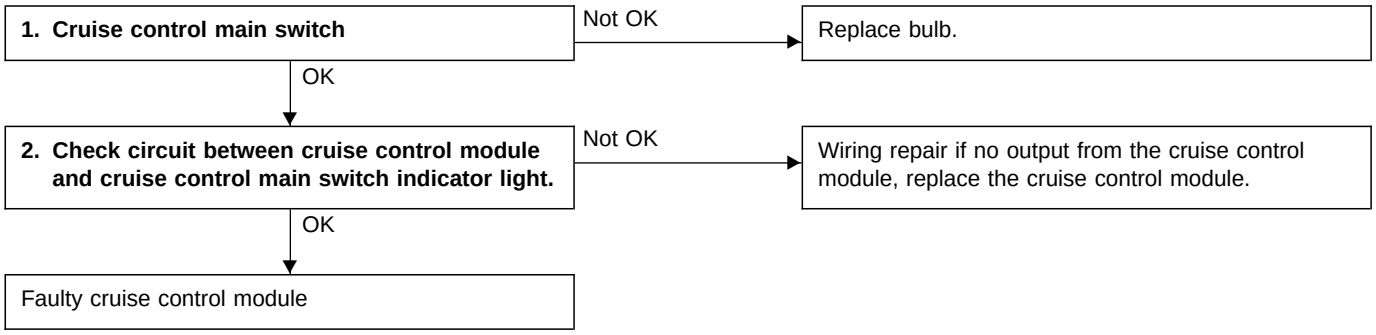
A: CHECK INDICATOR AND CIRCUIT IN CRUISE CONTROL MAIN SWITCH

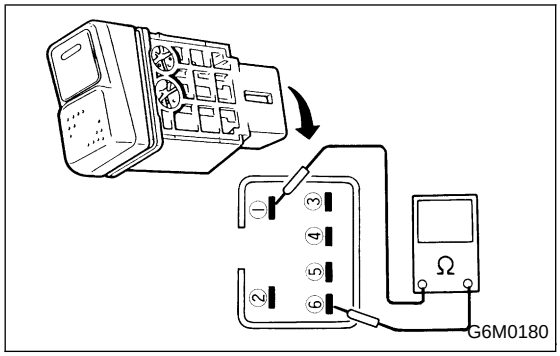
DIAGNOSIS:

- 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.)

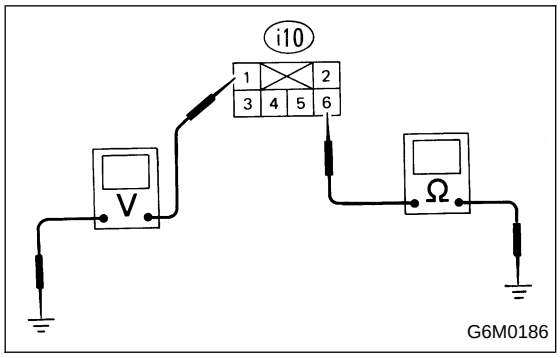




1. CRUISE CONTROL MAIN SWITCH

1) Remove cruise main switch.
Turn lower part of the housing upward to remove. If this cannot be done, insert a small screwdriver on the right hand side of the housing to remove the lock.
2) Measure resistance value between cruise control main switch terminals.

Terminal/Specified resistance:
No. 1 — No. 6/Approx. 120 Ω



2. CHECK CIRCUIT BETWEEN CRUISE CONTROL MODULE AND CRUISE CONTROL MAIN SWITCH INDICATOR LIGHT

1) Measure voltage between cruise control main switch and body. (Perform this measurement by turning ON the ignition switch and the cruise control main switch.)

Connector & terminal/Specified voltage:
(i10) No. 1 — Body/10 — 13 V

2) Remove the connector from the cruise control main switch.
3) Measure the resistance value between the cruise control main switch connector and the body.

Connector & terminal/Specified resistance:
(i10) No. 6 — Body/10 Ω, max.

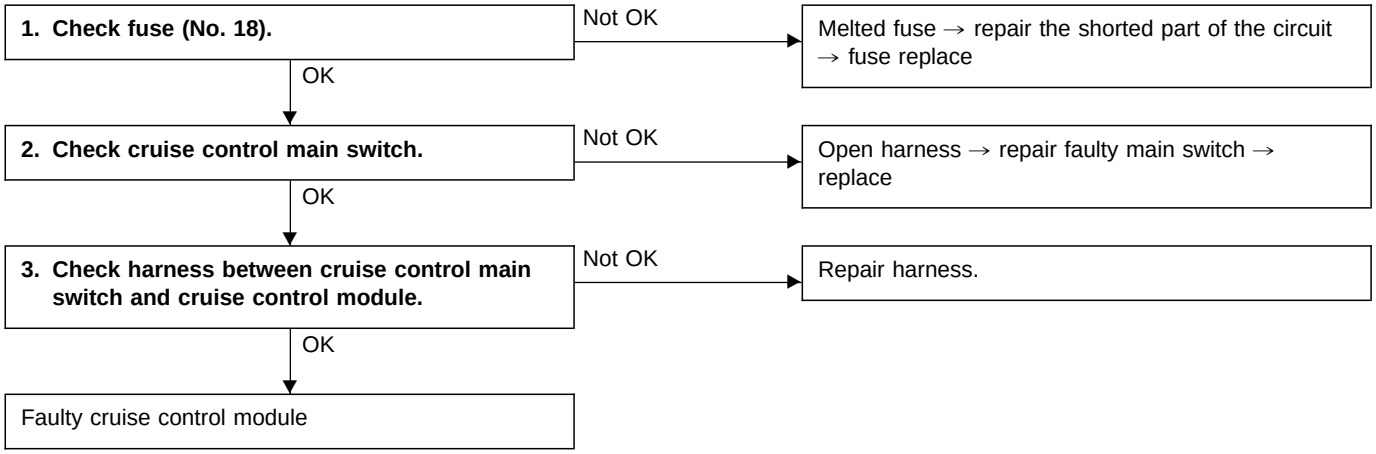
B: CHECK CRUISE CONTROL MAIN SWITCH

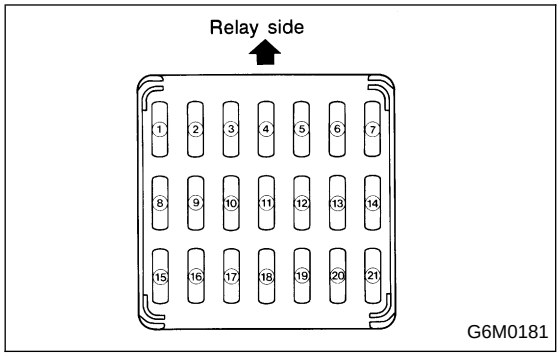
DIAGNOSIS:

- Faulty cruise control main switch, or open harness.

TROUBLE SYMPTOM:

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

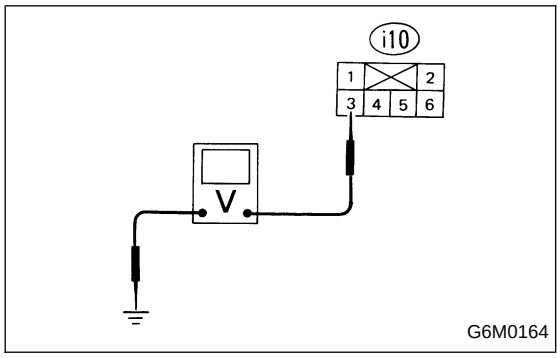




1. CHECK FUSE (NO. 18)

1) Check fuse.
Test circuit with a tester.
2) Checking voltage of the ignition power source
Turn ignition switch ON and measure the voltage between the fuse box connector and the body.

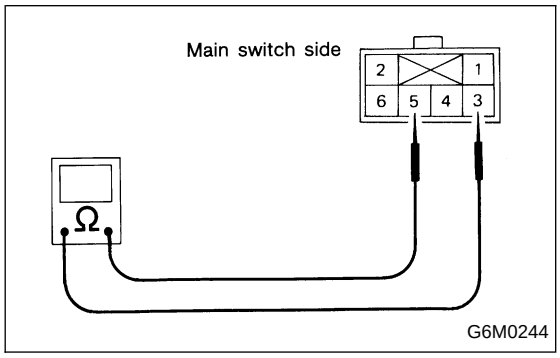
Connector & terminal/Specified voltage:
(B34) No. 4 — Body/10 — 13 V



2. CHECK CRUISE CONTROL MAIN SWITCH

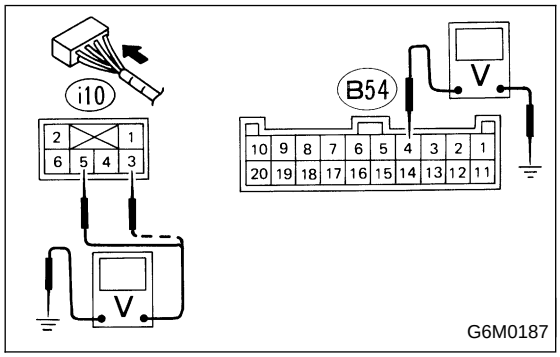
1) Remove cruise control main switch and disconnect connector.
Turn ignition switch ON and measure the voltage between cruise control main switch connector and body.

Connector & terminal/Specified voltage:
(i10) No. 3 — Body/10 — 13 V



2) Check ON/OFF function of main switch
Measure resistance between main switch and terminal.

Terminal/Specified resistance:
No. 3 — No. 5/10 Ω, max. (Switch ON)
1 MΩ, min. (Switch OFF)

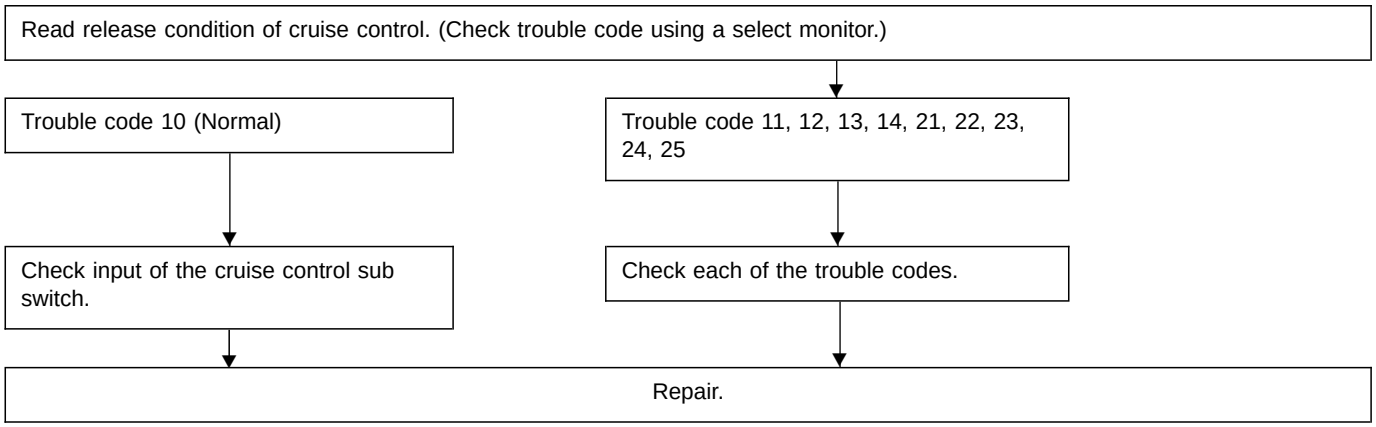


3. CHECK HARNESS BETWEEN CRUISE CONTROL MAIN SWITCH AND CRUISE CONTROL MODULE

1) Connect connector.
2) Turn ignition switch ON.
3) Turn cruise main switch ON.
4) Measure voltage between each of terminals and body.

Connector & terminal/Specified voltage:
(i10) No. 3 — Body/10 — 13 V
(i10) No. 5 — Body/10 — 13 V
(B54) No. 4 — Body/10 — 13 V

7. Diagnostics Chart with Select Monitor — When cruise control cannot be set —



Trouble code	Item	Contents of diagnosis	Page
10	OK	Normal	—
11	Brake/switch, Stop light switch	Input signals from brake switch “OFF”, stop light switch “ON” (Brake pedal is depressed.)	20
12	Clutch switch, N position	Input signals from clutch switch “OFF”, inhibitor switch “N” (Clutch pedal is depressed, or select lever is set to “N”.)	22
13	Speed limiter	Low-speed control limiter	24
14	Set switch and resume switch	Input signal from cancel switch “ON”	26
21	Vacuum valve	Faulty vacuum valve or valve drive system	27
22	Vent 2 valve	Faulty vent 2 valve or valve drive system	27
23	Vent 1 valve	Faulty vent 1 valve or valve drive system	27
24	Speed sensor	Faulty vehicle speed sensor	24
25	Control module	Faulty control module	28

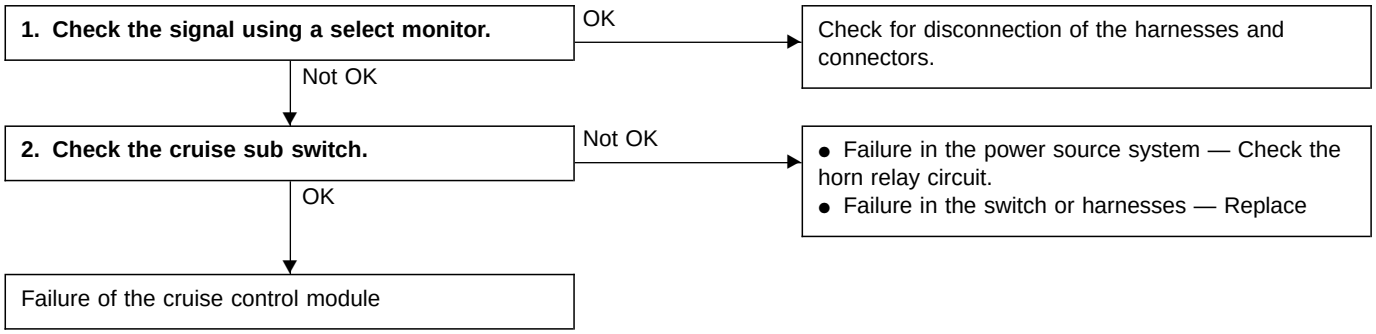
A: CHECKING INPUT OF CRUISE CONTROL SUB SWITCH

DIAGNOSIS:

- SET/COAST SW or disconnection of the wiring or short circuit.
- RESUME/ACCEL SW or disconnection of the wiring or short circuit.

TROUBLE SYMPTOM:

- Cruise control cannot be set, or it is cancelled immediately.
- RESUME/ACCEL cannot be operated.



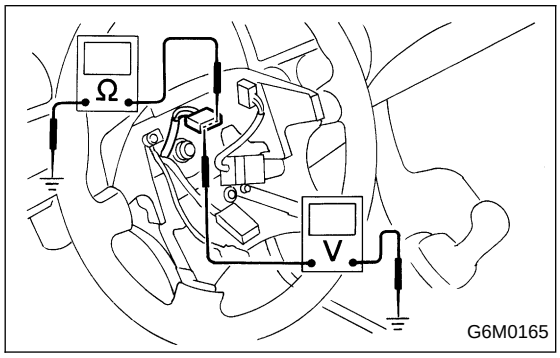
LED No.	Signal name	Display
1	—	—
2	—	—
3	SET/COAST switch	SE
4	RESUME/ACCEL switch	RE
5	—	—
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

ST	BR	SE	RE	IH
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10

1. CHECK THE SIGNAL USING A SELECT MONITOR

- Measuring condition: Turn ON the ignition switch and cruise main switch.
- Operation of the function keys: FA0 ENT
  When pushing the SET SW: LED No. 3 goes out — lights
  When pushing the RESUME SW: LED No. 4 goes out — lights



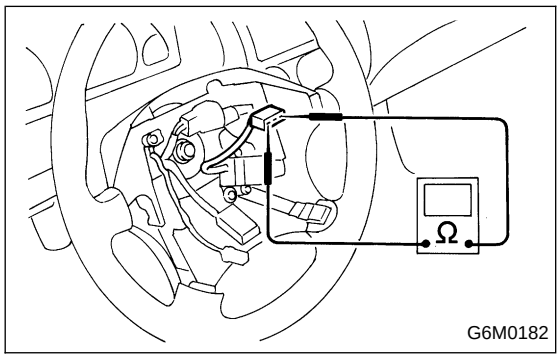
2. CHECK THE CRUISE SUB SWITCH

1) Separate connector from sub switch. (Use together with horn power supply.)
2) Check voltage between sub switch connector and body.

Terminals/Specified voltage:
No. 1 — Body/10 — 13 V

3) Check for harness short circuit between sub switch and cruise control module.

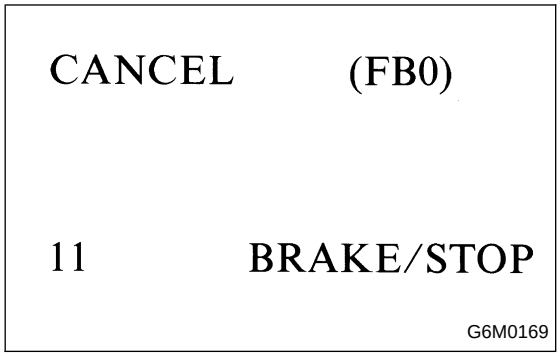
Terminals/Specified resistance:
No. 2 — Body/1 MΩ, min.
No. 3 — Body/1 MΩ, min.



4) Check inner switch of the cruise control sub switch and check continuity at switch side connector.

Terminals:
No. 1 — 2 (SET/COAST SWITCH)
No. 1 — 3 (RESUME/ACCEL SWITCH)

Specified resistance:
10 Ω, max. (Switch ON)
1 MΩ, min. (Switch OFF)



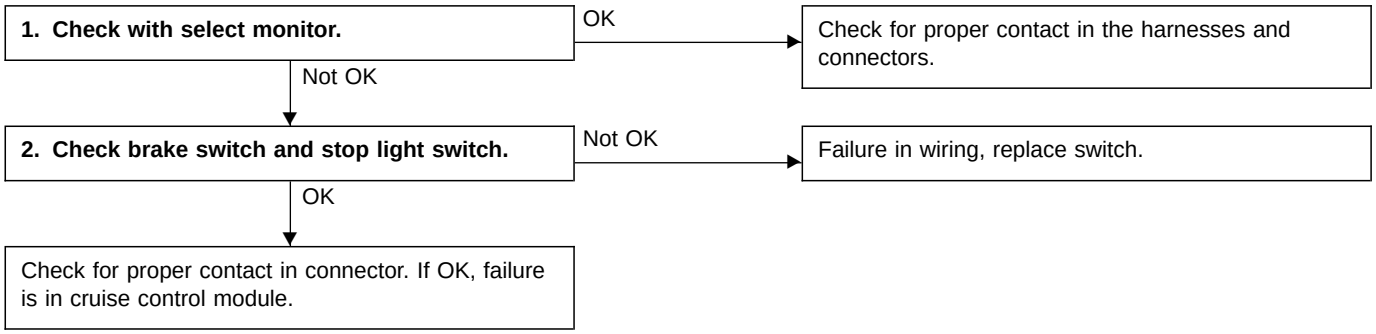
B: TROUBLE CODE 11 — BRAKE SW, STOP LIGHT SW —

DIAGNOSIS:

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

TROUBLE SYMPTOM:

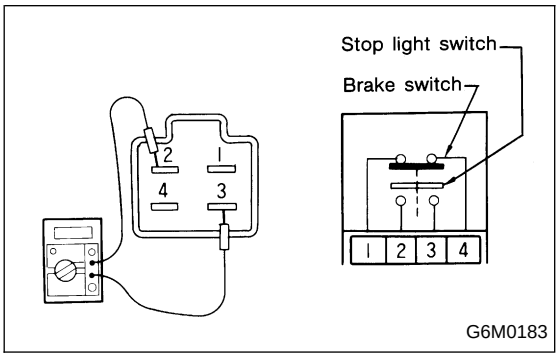
- Cruise control cannot be set.



LED No.	Signal name	Display
1	Stop light switch	ST
2	Brake switch	BR
3	—	—
4	—	—
5	—	—
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

ST	BR	SE	RE	IH
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10



1. CHECK WITH SELECT MONITOR

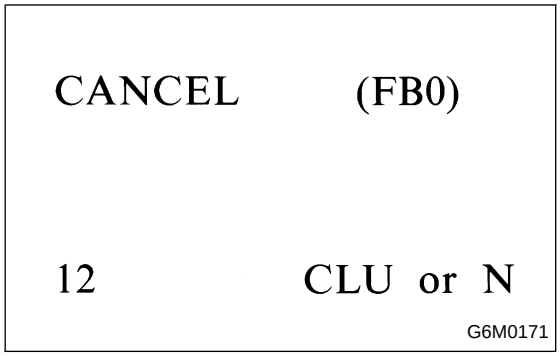
- Measurement condition: Turn ignition switch ON. Turn cruise main switch ON.
- Operation of the function keys: FA0 ENT

1) When depressing brake pedal (Set in the D range for AT, without depressing clutch pedal for MT)
Stop light switch: LED No. 1 goes out — lights.
Brake switch : LED No. 2 goes out — lights.

2. CHECK BRAKE SWITCH AND STOP LIGHT SWITCH

1) Remove connector of stop and brake switch.
2) Check circuit between each terminal.

Pedal operation	Brake switch between No. 1 — 4	Stop light switch between No. 2 — 3
Depressing the brake pedal.	Circuit failure	Circuit normal
Without depressing the brake pedal.	Circuit normal	Circuit failure



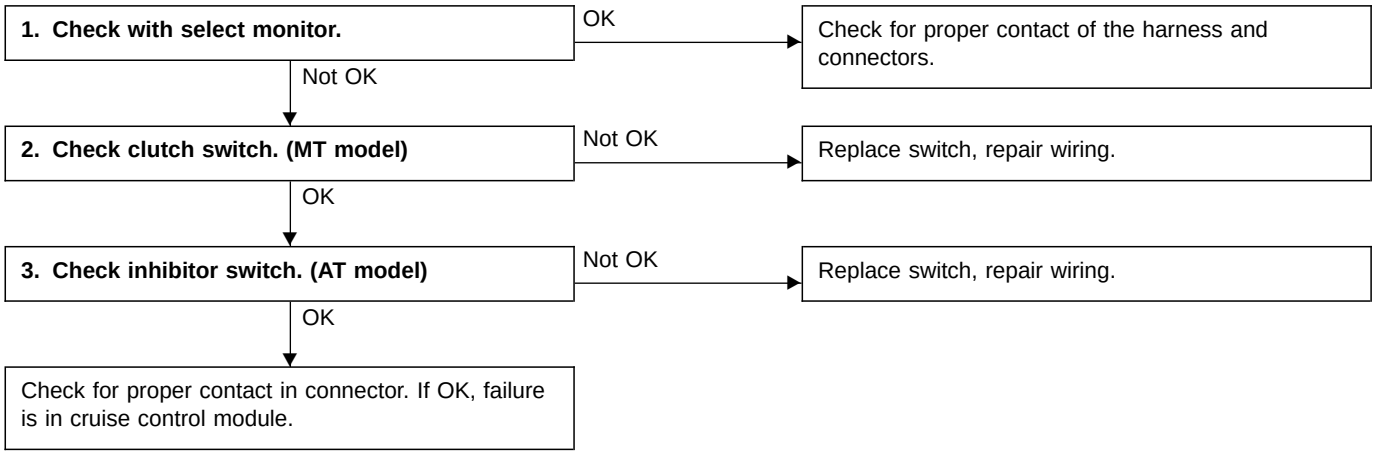
C: TROUBLE CODE 12 — CLUTCH SWITCH, N POSITION —

DIAGNOSIS:

- Failure or disconnection of inhibitor switch
- Failure or disconnection of clutch switch

TROUBLE SYMPTOM:

- Cruise control cannot be set.



LED No.	Signal name	Display
1	—	—
2	—	—
3	—	—
4	—	—
5	Clutch switch/inhibitor switch	IH
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

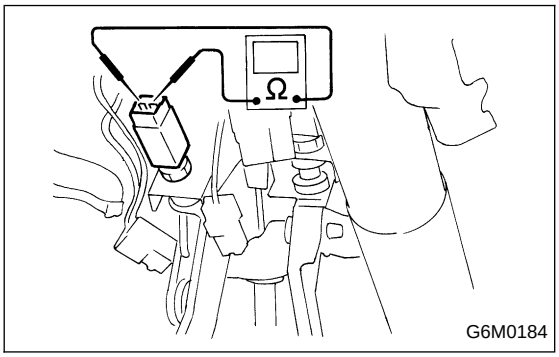
ST	BR	SE	RE	IH
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10

1. CHECK WITH SELECT MONITOR

- Measurement condition: Turn ignition switch ON.
  Turn cruise main switch ON.
- Operation of function keys: FA0 ENT

1) When depressing clutch pedal;
LED No. 5 goes out — lights.
2) When setting shift lever in N position;
LED No. 5 goes out — lights.



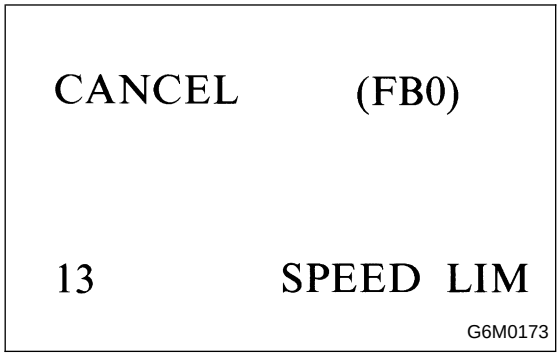
2. CHECK CLUTCH SWITCH (MT MODEL)

1) Check items for the clutch switch. (Circuit test between terminals)

Terminals/Specified resistance:
No. 1 — No. 2/10 Ω, max. (Without pedal depressing).
/1 MΩ, min. (Pedal depressing).

3. CHECK INHIBITOR SWITCH (AT MODEL)

1) When engine starts in the N position (the starter rotates), N position contact point of the inhibitor is normal.
2) Check the wiring harness.



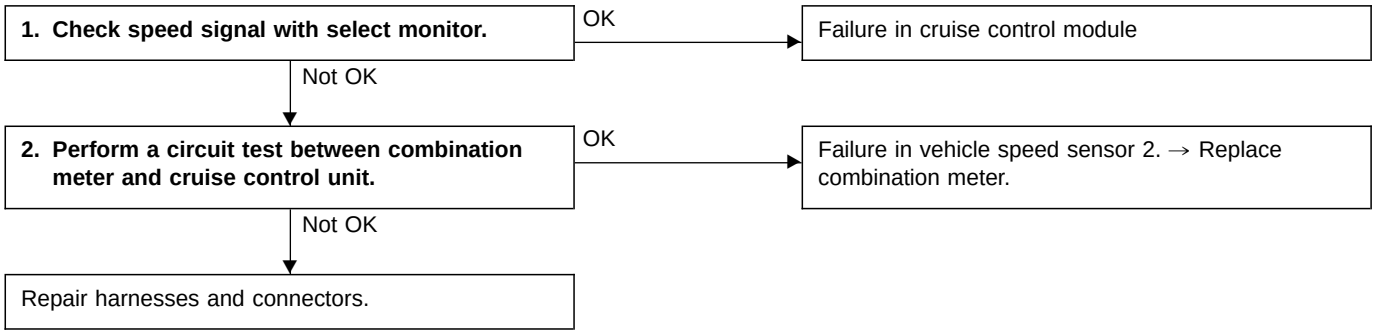
D: TROUBLE CODE 13 AND 24 — SPEED LIMITER, SPEED SENSOR —

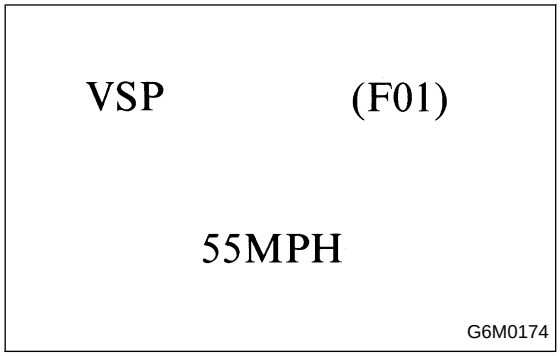
DIAGNOSIS:

- Disconnection or short circuit of speed sensor.

TROUBLE SYMPTOM:

- Cruise control cannot be set. (Cancelled immediately.)



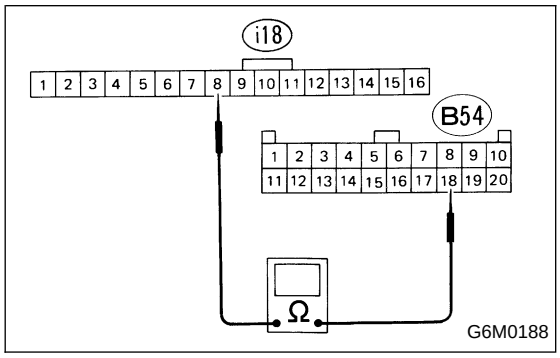


1. CHECK SPEED SIGNAL WITH SELECT MONITOR

- Driving condition: Running at speed greater than 40 km/h (25 MPH)
- Operation of the function keys: F02 ENT

NOTE:

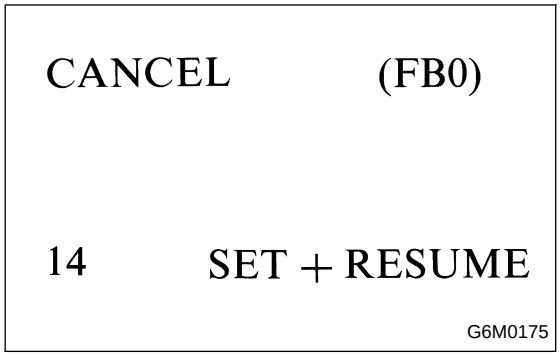
- When there is a failure in the meter cable or the vehicle speed sensor 2, the indicated value of the meter will be incorrect.
- When there is a disconnection or short circuit in the harness between the meter and the cruise control module, the indicated value will be 0 — 1 km/h.



2. PERFORM A CIRCUIT TEST BETWEEN COMBINATION METER AND CRUISE CONTROL UNIT

1) Separate connectors from combination meter and cruise control module.
2) Perform a circuit test in the harnesses.

Connector & terminal/Specified resistance:
(i18) No. 8 — (B54) No. 18/10 Ω, max.



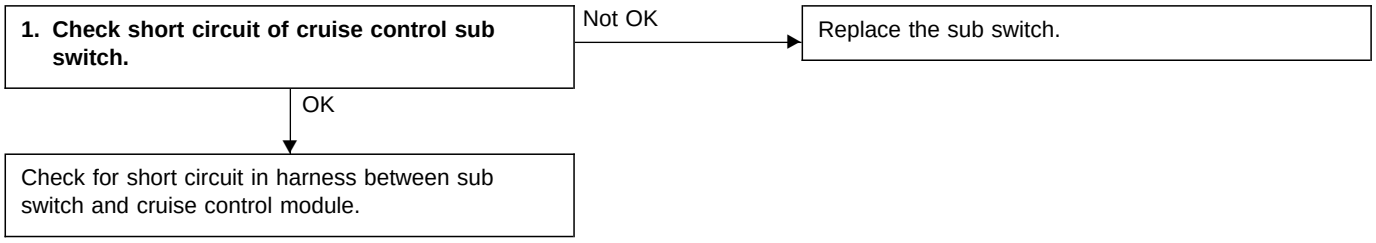
E: TROUBLE CODE 14 — SET SWITCH AND RESUME SWITCH (CANCEL SW-ON) —

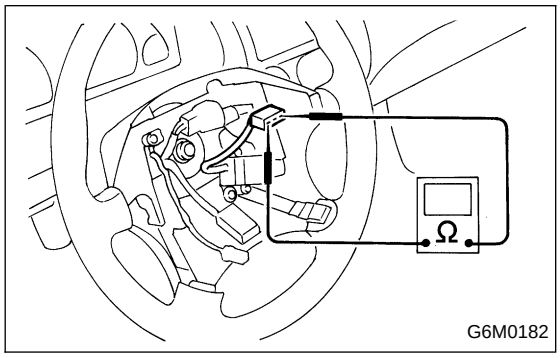
DIAGNOSIS:

- Short circuit inside the SET SW and RESUME SW.

TROUBLE SYMPTOM:

- Cruise control cannot be set. (Cancelled immediately.)



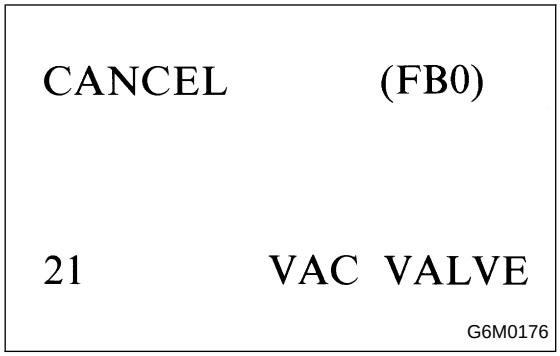


1. CHECK SHORT CIRCUIT OF CRUISE CONTROL SUB SWITCH

1) Separate connector of cruise control sub switch.
2) Measure resistance between each terminal of cruise control sub switch.

Terminal/Specified resistance:

SET switch ON No. 1 — No. 2/10 Ω, max.
RESUME switch ON No. 1 — No. 3/10 Ω, max.
CANCEL switch ON No. 1 — No. 2/10 Ω, max.
No. 1 — No. 3/10 Ω, max.



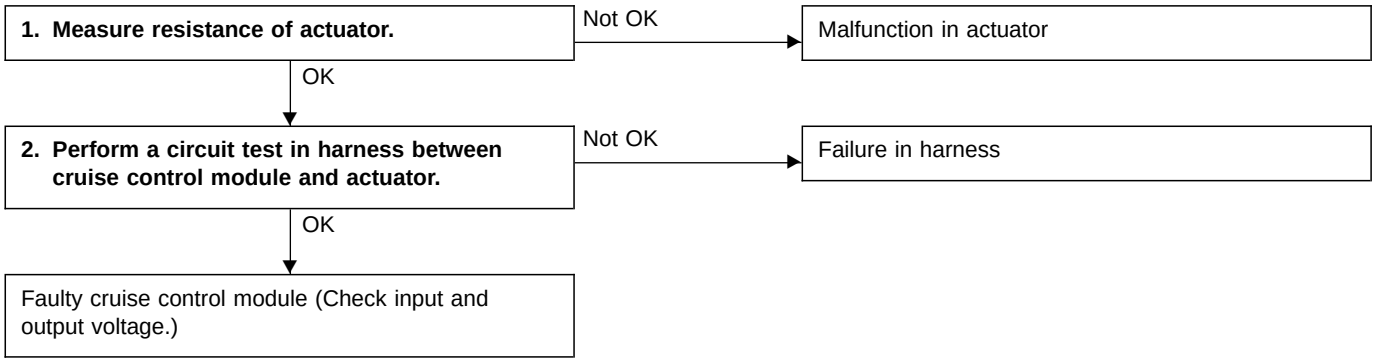
F: TROUBLE CODE 21, 22 AND 23 — VACUUM VALVE, VENT 1 VALVE, VENT 2 VALVE —

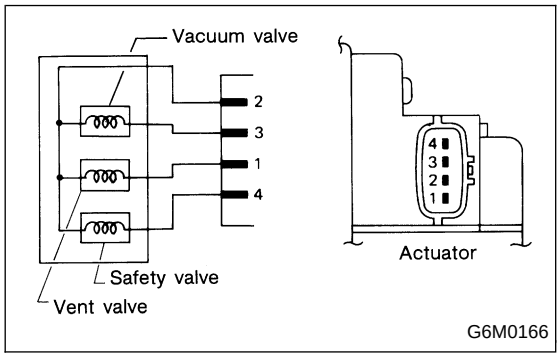
DIAGNOSIS:

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

TROUBLE SYMPTOM:

- Cruise control cannot be set, or cancelled immediately.



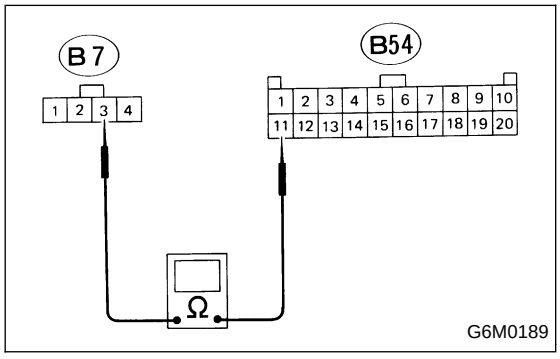


1. MEASURE RESISTANCE OF ACTUATOR

1) Separate the connector.
2) Measure the resistance value of the actuator.

Terminals/Specified resistance:

No. 2 — No. 1/55 Ω
No. 2 — No. 3/22 Ω
No. 2 — No. 4/55 Ω

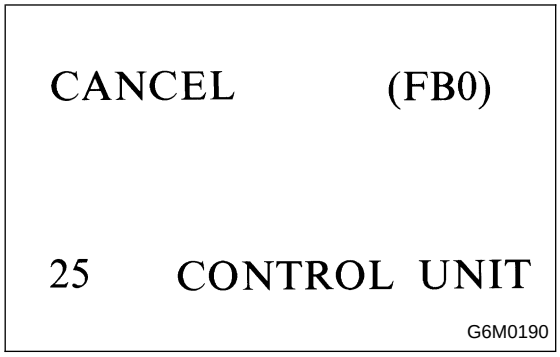


2. PERFORM A CIRCUIT TEST IN HARNESS BETWEEN CRUISE CONTROL MODULE AND ACTUATOR

1) Separate both sides of connectors.
2) Perform a circuit test between each of the harnesses.

Connector & terminal/Specified resistance:

(B7) No. 1 — (B54) No. 1/10 Ω, max.
(B7) No. 2 — (B54) No. 8/10 Ω, max.
(B7) No. 3 — (B54) No. 11/10 Ω, max.
(B7) No. 4 — (B54) No. 2/10 Ω, max.



Replace cruise control module.

G: TROUBLE CODE 25 — CONTROL MODULE —

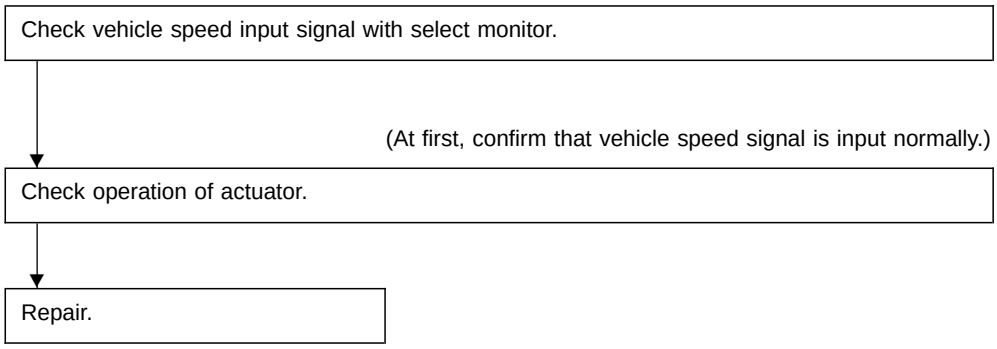
DIAGNOSIS:

- Faulty cruise control module.

TROUBLE SYMPTOM:

- Cruise control cannot be set.

8. Diagnostics Chart for Actuator



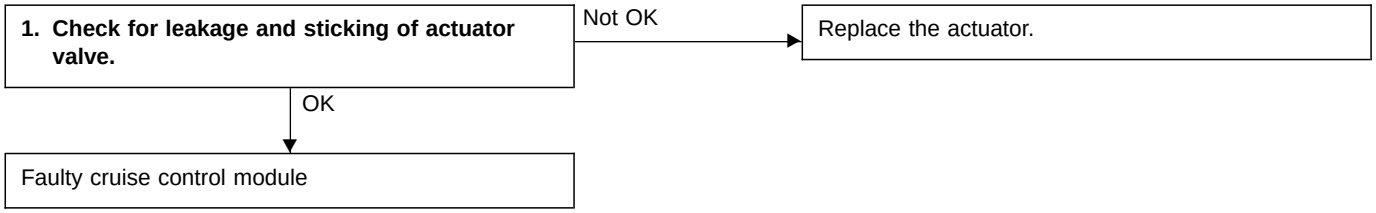
A: CHECK OPERATION OF ACTUATOR

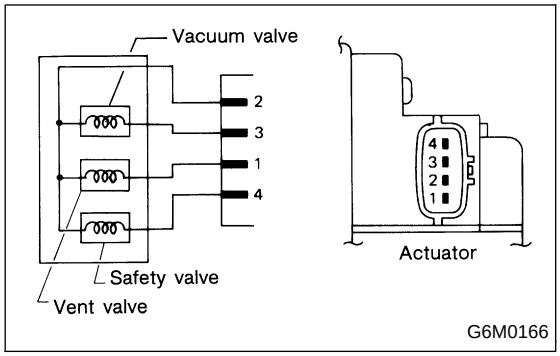
DIAGNOSIS:

- Sticking of air leaves of actuator, or sticking of valve and actuator diaphragm.

TROUBLE SYMPTOM:

- Cannot run at set speed ±3 km/h (±2 MPH).

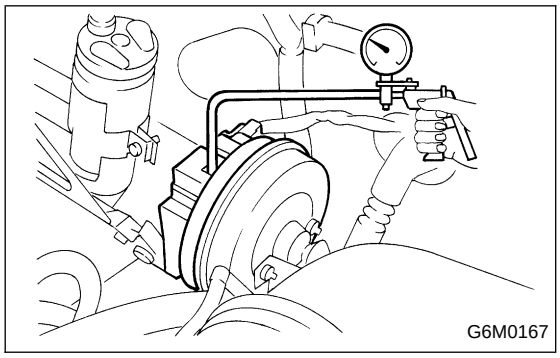




1. CHECK FOR LEAKAGE AND STICKING OF ACTUATOR VALVE

1) Measure resistance of actuator.

Terminals/Specified resistance:
No. 2 — No. 1/55 Ω (Vent valve)
No. 2 — No. 3/22 Ω (Vacuum valve)
No. 2 — No. 4/55 Ω (Safety valve)



2) Check operation of actuator.
(1) Connect ⊕ battery cable to terminal 2 and ⊖ battery cable to terminal 1, 3 and 4.
(2) Make sure cable moves smoothly when a vacuum pressure of 40.0 kPa (300 mmHg, 11.81 inHg) is applied to actuator using vacuum pump.

Stroke: 35 mm (1.38 in)
Movement time: Within 3 seconds

(3) When the battery is removed from condition (2) above, make sure the cable returns to its original position smoothly.

Movement time: Within 1.5 seconds

(4) Connect battery to each terminal and check cable movement when vacuum pressure is applied by vacuum pump.

Vacuum pressure	Terminal No.				Battery		Operation mode
	1	2	3	4	⊕	⊖	
OFF	—	—	—	—	—	—	—
ON (Vacuum pressure applied.)		○			○		Pull
			○			○	
	○					○	
				○		○	
		○			○		Hold
	○					○	
				○		○	
		○			○		Release
				○		○	