

8. Diagnostics Chart with Trouble Code

A: DIAGNOSTIC TROUBLE CODE LIST

Diagnostic trouble code	Item	Contents of diagnosis	Index No.
21	Inner relay is seized.	Cruise control module inner relay is seized when main switch is OFF.	<Ref. to 6-2a [T8B0].>
22	Vehicle speed sensor	Vehicle speed signal changes more than 10 km/h (6 MPH) within 350 ms.	<Ref. to 6-2a [T8C0].>
24	Cruise control module is abnormal.	Two vehicle speed values stored in cruise control module memory are not the same.	<Ref. to 6-2a [T8B0].>
25	Cruise control module is abnormal.	Two output values stored in cruise control module memory are not the same.	<Ref. to 6-2a [T8B0].>
28	Wiring harness opened.	Open wiring harness circuit is detected via control module relay when main switch is ON.	<Ref. to 6-2a [T8D0].>
35	Motor drive system is abnormal.	<ul style="list-style-type: none"> ● Motor output circuit is open or shorted. ● Motor drive circuit is open or shorted. 	<Ref. to 6-2a [T8E0].>
37	Motor clutch drive system is abnormal.	<ul style="list-style-type: none"> ● Motor clutch output circuit is open or shorted. ● Motor clutch drive circuit is open or shorted. 	<Ref. to 6-2a [T8F0].>
38	Motor drive shaft does not engage properly.	Motor drive gear engagement is not properly adjusted.	<Ref. to 6-2a [T8G0].>
39	Motor is overloaded.	Current flows through motor more frequently than under normal conditions.	<Ref. to 6-2a [T8H0].>
2A	Cruise control module is abnormal.	Cruise control module self-diagnosis function senses abnormality.	<Ref. to 6-2a [T8B0].>

B: DIAGNOSTIC TROUBLE CODE 21, 24, 25 AND 2A (CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM)

DIAGNOSIS:

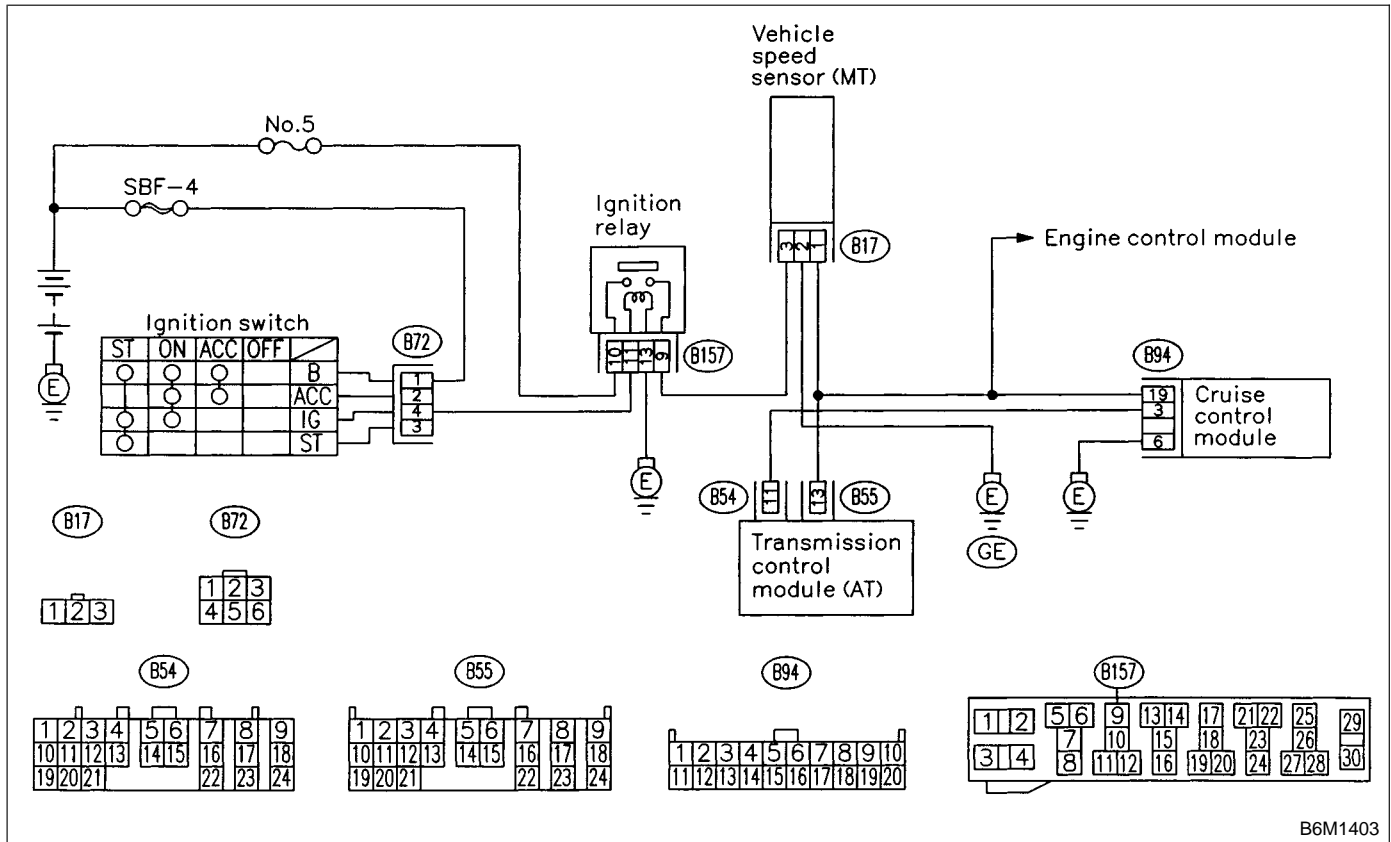
- Poor welding of built-in relay of cruise control module.
- Failure of built-in CPU RAM of cruise control module.

C: DIAGNOSTIC TROUBLE CODE 22 (VEHICLE SPEED SENSOR)

DIAGNOSIS:

Disconnection or short circuit of vehicle speed sensor system.

WIRING DIAGRAM:



B6M1403

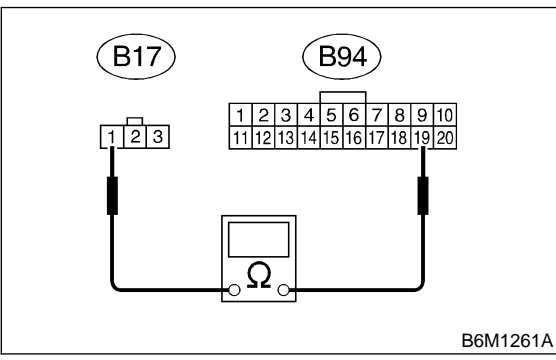
8C1 : CHECK TRANSMISSION TYPE.

- CHECK** : *Is the transmission type MT?*
- YES** : Go to step **8C2**.
- NO** : Go to step **8C6**.

8C2 : CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL MODULE AND VEHICLE SPEED SENSOR.

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

Connector & terminal
(B17) No. 1 — (B94) No. 19:

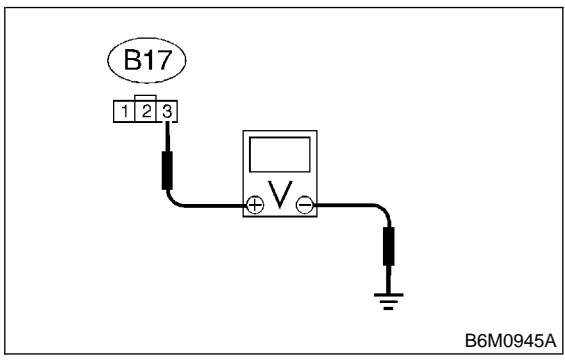


- CHECK** : *Is the resistance less than 10 Ω?*
- YES** : Go to step **8C3**.
- NO** : Repair wiring harness.

8C3 : CHECK HARNESS CONNECTOR BETWEEN BATTERY AND VEHICLE SPEED SENSOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between vehicle speed sensor connector (B17) and chassis ground.

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

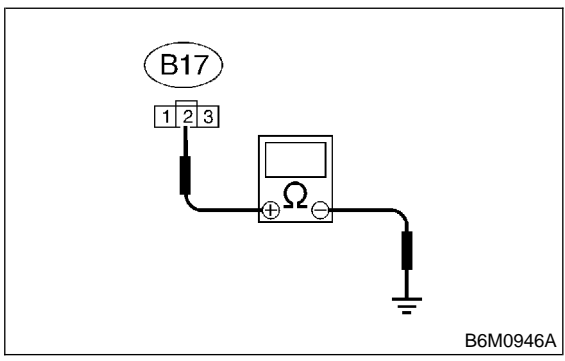


- CHECK** : *Is the voltage more than 10 V?*
- YES** : Go to step **8C4**.
- NO** : Repair harness connector between battery and vehicle speed sensor.

8C4 : CHECK HARNESS CONNECTOR BETWEEN VEHICLE SPEED SENSOR AND ENGINE GROUND.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between vehicle speed sensor connector (B17) and engine ground.

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



- CHECK** : *Is the resistance less than 10 Ω?*
- YES** : Go to step **8C5**.
- NO** : Repair harness connector between vehicle speed sensor and engine ground.

8C5 : CHECK VEHICLE SPEED SENSOR.

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

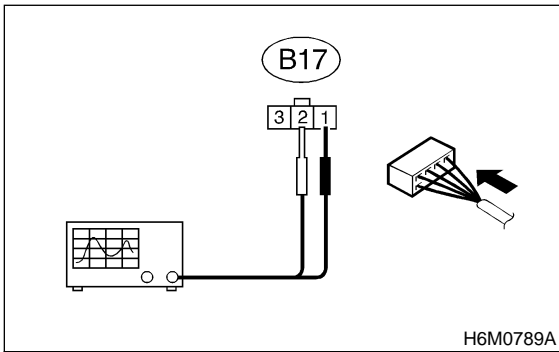
WARNING:

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

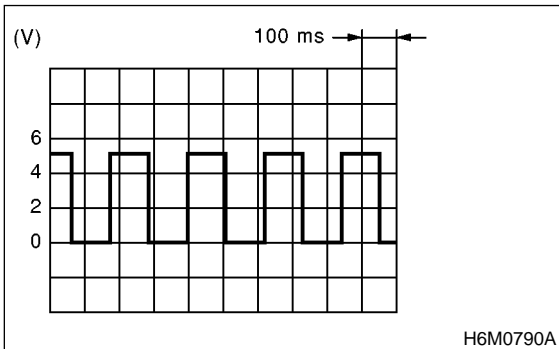
- 3) Set oscilloscope to vehicle speed sensor connector terminals.

Positive probe; (B17) No. 1

Earth lead; (B17) No. 2



- 4) Drive the vehicle at speed greater than 20 km/h (12 MPH).
- 5) Measure signal voltage indicated on oscilloscope.



CHECK : *Is the voltage more than 5 V?*

YES : Replace cruise control module. <Ref. to 6-2 [W12A4].>

NO : Replace vehicle speed sensor.

8C6 : CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL MODULE AND AUTOMATIC TRANSMISSION CONTROL MODULE.

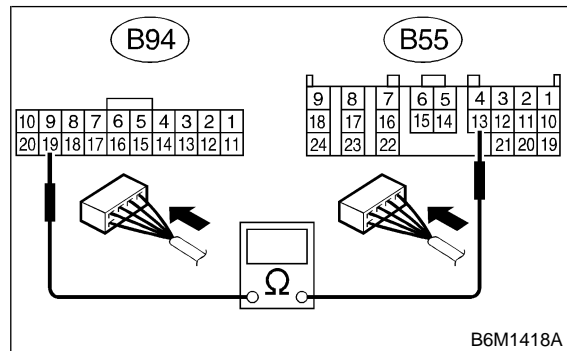
- 1) Disconnect connector from automatic transmission control module and cruise control module.
- 2) Measure resistance between cruise control module connector and automatic transmission control module connector.

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. 19 — (B55) No. 13:



CHECK : *Is the resistance less than 10 Ω?*

YES : Go to step 8C7.

NO : Repair harness connector between cruise control module and automatic transmission control module.

8C7 : 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.

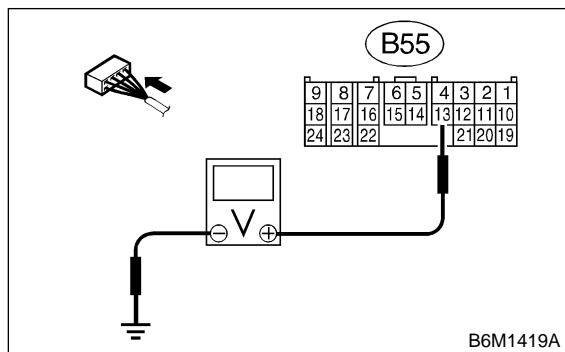
- 3) Drive the vehicle faster than 10 km/h (6 MPH).
- 4) Measure voltage between automatic transmission control module connector (B55) and chassis ground.

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 (-):



- CHECK** : **Is the voltage less than 1 V ←→ more than 4 V?**
- YES** : Replace cruise control module. <Ref. to 6-2 [W12A4].>
- NO** : Replace automatic transmission control module. <Ref. to 3-2 [W2300].>

D: DIAGNOSTIC TROUBLE CODE 28 (WIRING HARNESS OPENED.)

8D1 : CHECK BATTERY.

Measure battery specific gravity of electrolyte.

- CHECK** : **Is battery specific gravity more than 1.250?**
- YES** : Go to step **8D2**.
- NO** : Charge or replace battery. <Ref. to 6-2 [W200].> Go to step **8D2**.

8D2 : CHECK FUSES, CONNECTORS AND HARNESSES.

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

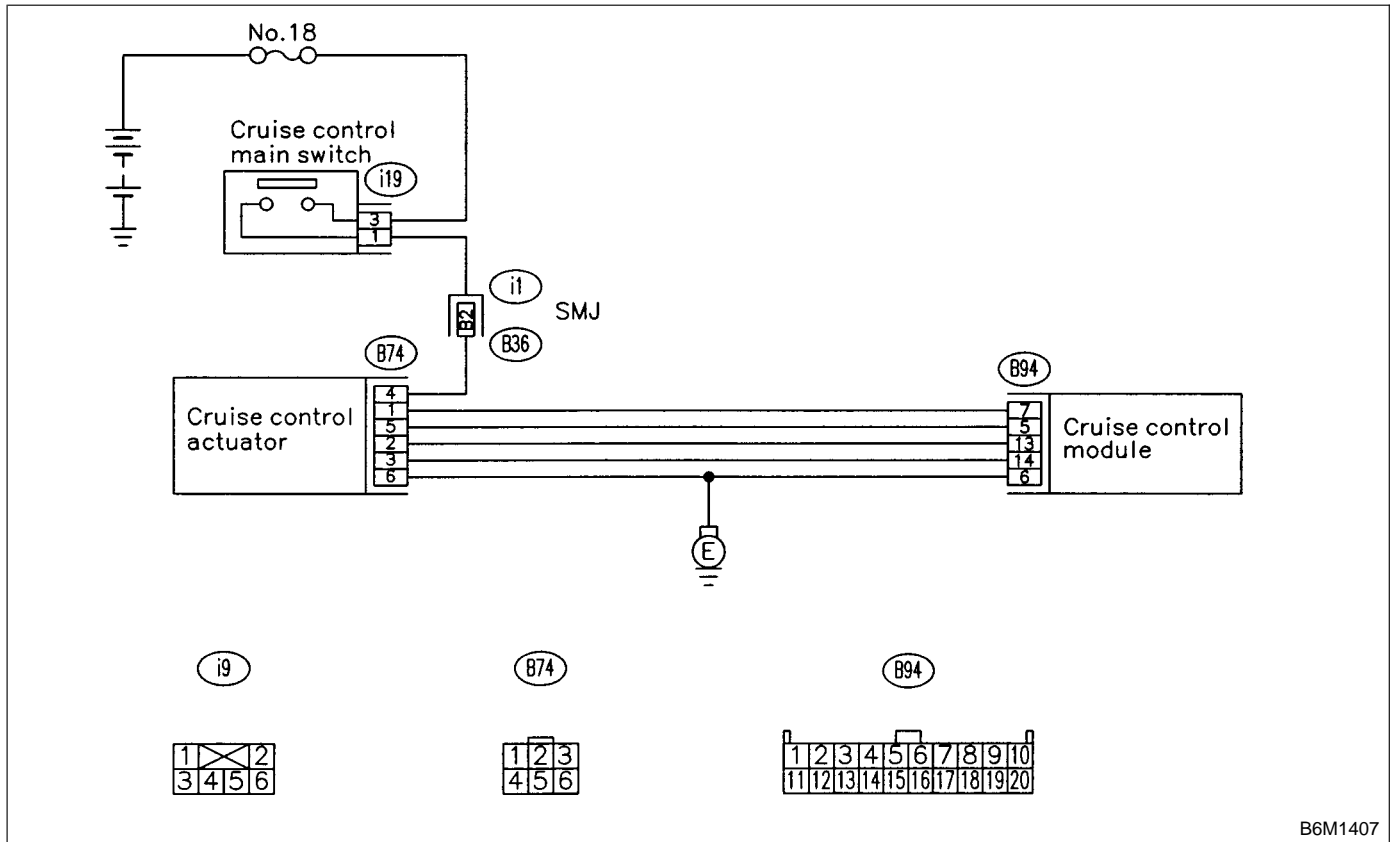
- CHECK** : **Is there anything unusual about the appearance of main fuse, fuse, harness, connector and grounding?**
- YES** : Repair or replace faulty parts.
- NO** : End of inspection.

E: DIAGNOSTIC TROUBLE CODE 35 (ACTUATOR MOTOR)

DIAGNOSIS:

Open or poor contact of cruise control actuator motor.

WIRING DIAGRAM:



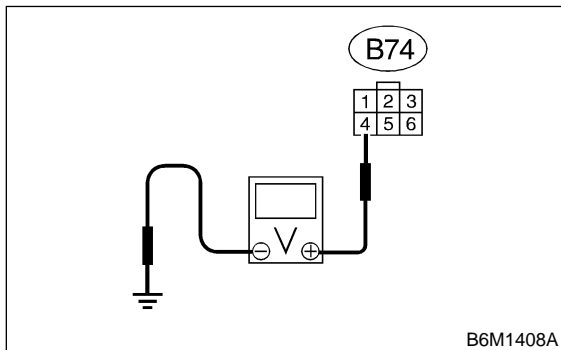
B6M1407

8E1 : CHECK POWER SUPPLY.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from cruise control actuator.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between cruise control actuator connector and chassis ground.

Terminals

(B74) No. 4 (+) — Chassis ground (-):



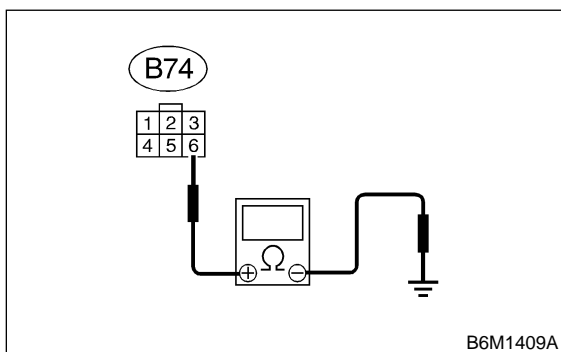
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 8E2.
- NO** : Repair or replace wiring harness between fuse and relay box and cruise control actuator.

8E2 : CHECK GROUND LINE OF ACTUATOR.

Measure resistance between cruise control actuator connector and chassis ground.

Terminals

(B74) No. 6 (+) — Chassis ground (-):



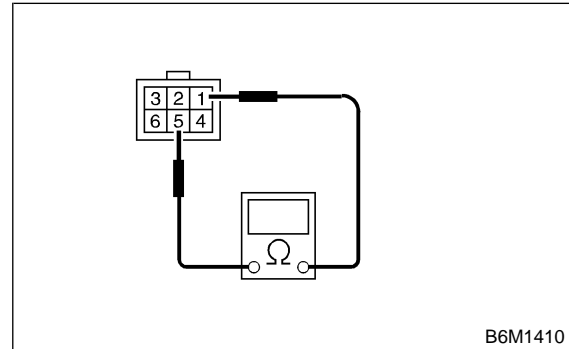
- CHECK** : Is resistance less than 10 Ω?
- YES** : Go to step 8E3.
- NO** : Repair or replace wiring harness between cruise control actuator and chassis ground.

8E3 : MEASURE RESISTANCE OF ACTUATOR.

Measure resistance of cruise control actuator motor.

Terminals

No. 1 — No. 5:



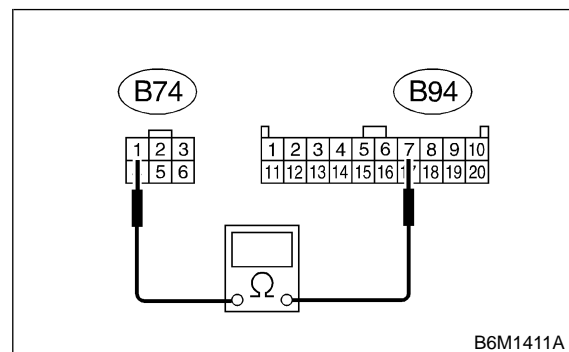
- CHECK** : Is resistance approximately 46 Ω?
- YES** : Go to step 8E4.
- NO** : Replace cruise control actuator. <Ref. to 6-2 [W12A1].>

8E4 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.

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

Connector & terminal

(B74) No. 1 — (B94) No. 7:



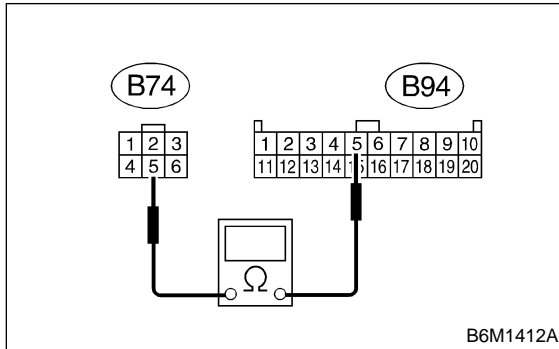
- CHECK** : Is resistance less than 10 Ω?
- YES** : Go to step 8E5.
- NO** : Repair or replace wiring harness between cruise control actuator and cruise control module.

8E5 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control module and cruise control actuator.

Connector & terminal

(B74) No. 5 — (B94) No. 5:



- CHECK** : **Is resistance less than 10 Ω?**
- YES** : Replace cruise control module. <Ref. to 6-2 [W12A4].>
- NO** : Repair or replace wiring harness between cruise control actuator and cruise control module.

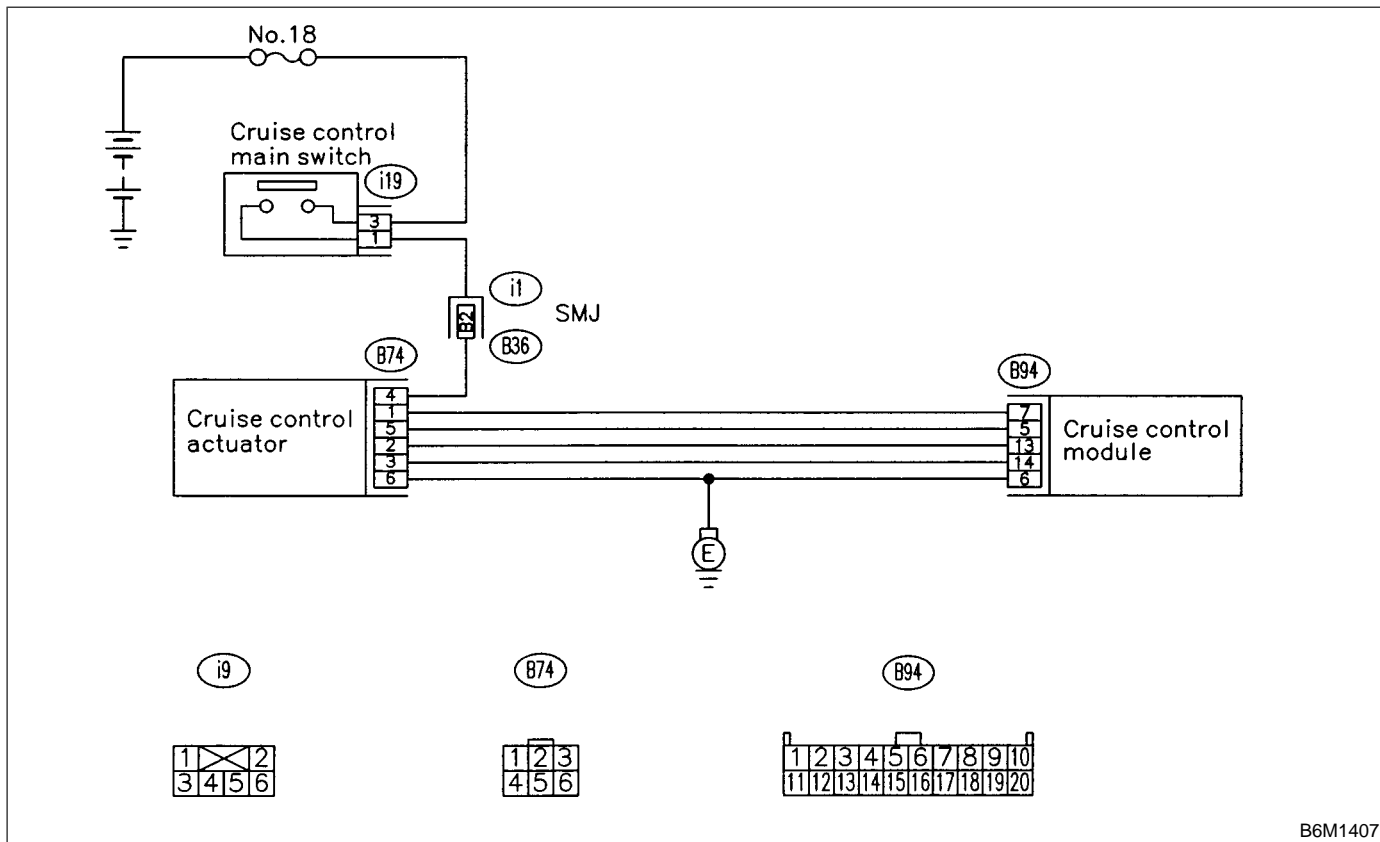
MEMO:

F: DIAGNOSTIC TROUBLE CODE 37 (ACTUATOR MOTOR CLUTCH)

DIAGNOSIS:

Open or poor contact of cruise control actuator motor clutch.

WIRING DIAGRAM:



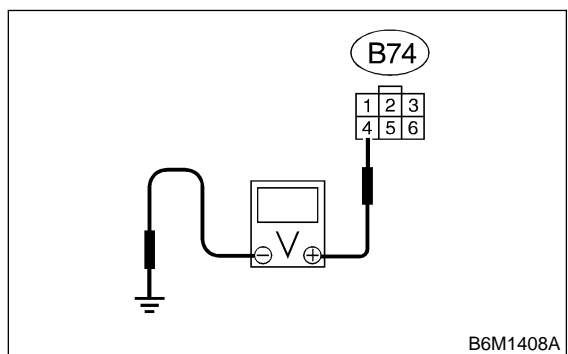
B6M1407

8F1 : CHECK POWER SUPPLY.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from cruise control actuator.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between cruise control actuator and chassis ground.

Terminals

(B74) No. 4 (+) — Chassis ground (-):



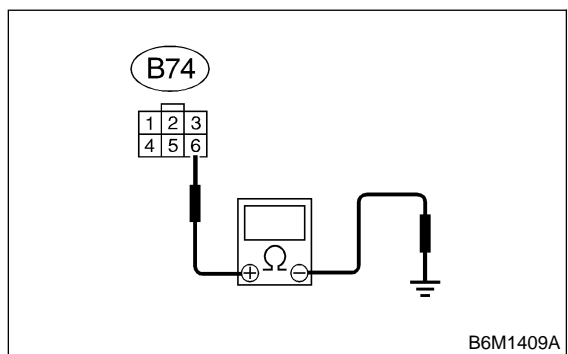
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 8F2.
- NO** : Repair or replace wiring harness between fuse and relay box and cruise control actuator.

8F2 : CHECK GROUND LINE OF ACTUATOR.

Measure resistance between cruise control actuator and chassis ground.

Terminals

(B74) No. 6 — Chassis ground:



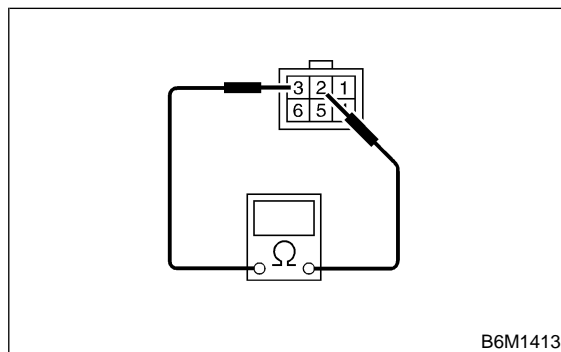
- CHECK** : Is resistance less than 10 Ω?
- YES** : Go to step 8F3.
- NO** : Repair or replace wiring harness between cruise control actuator and chassis ground.

8F3 : MEASURE RESISTANCE OF ACTUATOR CLUTCH.

Measure resistance of cruise control actuator clutch.

Terminals

No. 2 — No. 3:



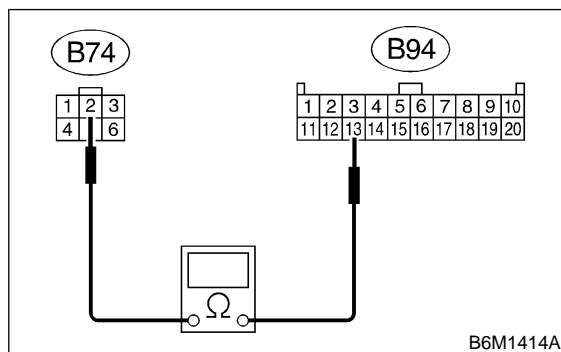
- CHECK** : Is resistance approximately 46 Ω?
- YES** : Go to step 8F4.
- NO** : Replace cruise control actuator. <Ref. to 6-2 [W12A1].>

8F4 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.

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

Connector & terminal

(B74) No. 2 — (B94) No. 13:



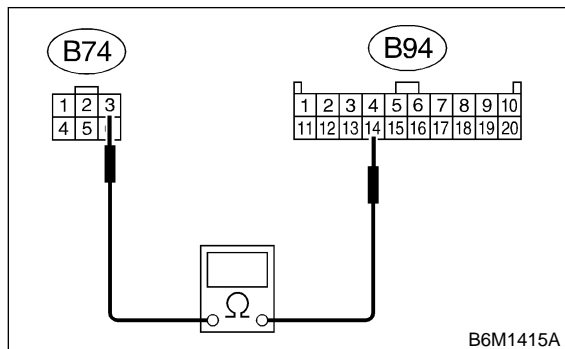
- CHECK** : Is resistance less than 10 Ω?
- YES** : Go to step 8F5.
- NO** : Repair or replace wiring harness between cruise control actuator and cruise control module.

8F5 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control module and cruise control actuator.

Connector & terminal

(B74) No. 3 — (B94) No. 14:

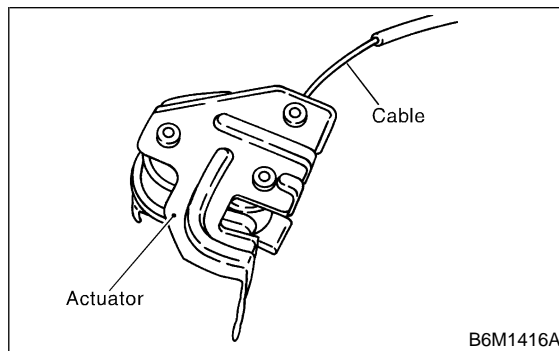


- CHECK** : **Is resistance less than 10 Ω?**
- YES** : Replace cruise control module. <Ref. to 6-2 [W12A4].>
- NO** : Repair or replace wiring harness between cruise control actuator and cruise control module.

G: DIAGNOSTIC TROUBLE CODE 38 (MOTOR DRIVE SHAFT DOES NOT ENGAGE PROPERLY.)

8G1 : CHECK ACTUATOR MOTOR.

- 1) Disconnect connector from cruise control actuator.
- 2) Remove cruise control actuator from mounting bracket.
- 3) Pull cable by hand to check for looseness or status of inner gear engagement.



- CHECK** : **Are foreign particles caught in inner gear or does inner gear engage and disengage improperly?**
- YES** : Replace cruise control actuator. <Ref. to 6-2 [W12A1].>
- NO** : Check the cruise control cable adjustment. <Ref. to 6-2a [T2B1].>