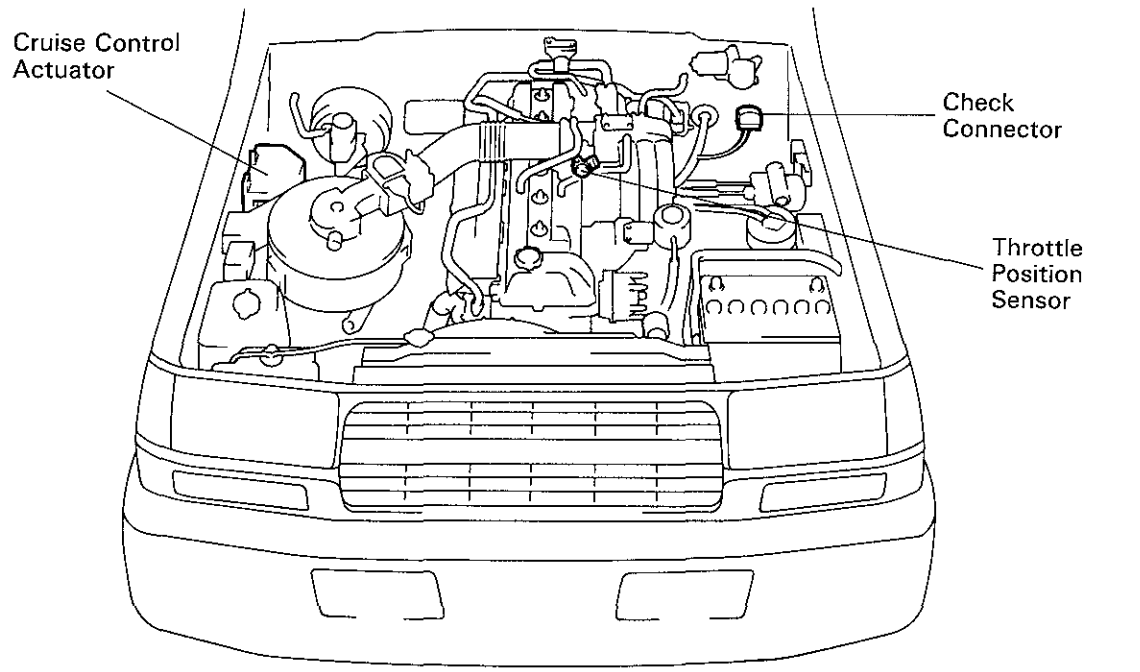
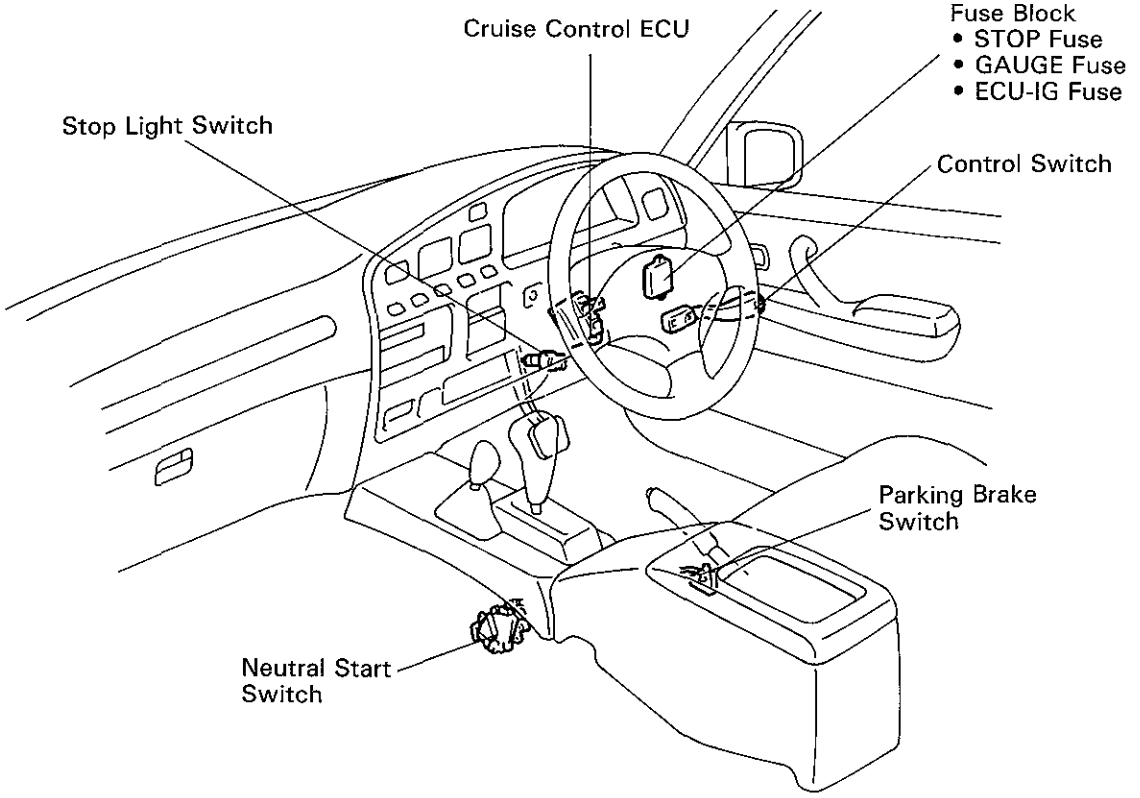
# CRUISE CONTROL SYSTEM

## PARTS LOCATION

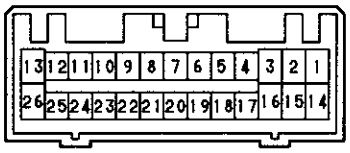



N06712
N04081

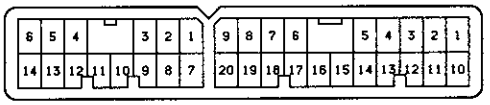
# CONNECTOR DIAGRAMS

Cruise Control ECU

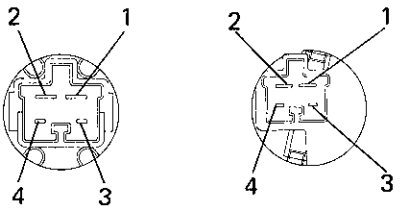



Control Switch (in Combination Switch)

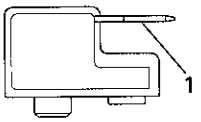
Connector "A" Connector "B"




Stop Light Switch



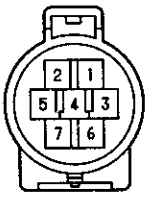

Parking Brake Switch



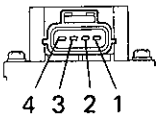

Speed Sensor



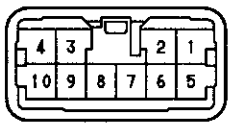

Actuator



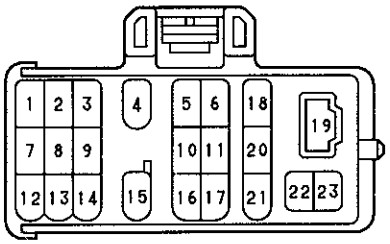

Throttle Position Sensor
(1FZ-FE)




Ignition Switch

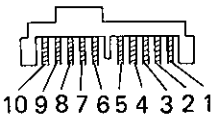



Check Connector
(TDCL)

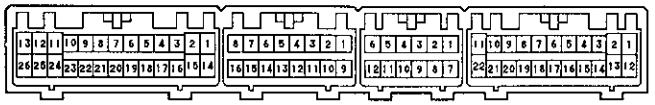



Combination Meter
(Cruise Control Indicator)
(Brake Warning)

Connector "A"




EFI ECU



# SYSTEM DESCRIPTION

- When the ignition switch is turned ON, current flows from the battery to terminal 14 of the cruise control (CC) ECU.
- Terminal 13 of the CC ECU is always grounded.

**Basic Operation**

HINT: For all explanations below, the ignition switch is in the ON position.

**1. MAIN SWITCH OPERATION**

When the main switch is pushed ON, current flows from terminal 4 of the CC ECU → terminal B-15 of the control switch → terminal B-20 of the switch → ground.

As a result, the CC ECU is on standby and terminal 5 of the CC ECU is grounded. Therefore the CC indicator lights up.

**2. CONTROL SWITCH OPERATION**

The control switch controls the SET, COAST, RESUME, ACCEL and CANCEL functions. When the control switch is turned to each position, current flows from terminals 18 of the CC ECU → terminals B-5 of the control switch → terminal B-20 of the switch → ground.

In the way, the CC ECU detects each position the control switch is turned to, and starts operation.
HINT: The SET function is detected by the CC ECU when the control switch released from SET/COAST.

**3. SPEED CONTROL OPERATION**

When the vehicle speed is set by the control switch, the ECU sends signal from terminal 10 → terminal 2 of the stop light switch → terminal 4 of the switch → terminal 5 of the actuator → (magnetic clutch) → terminal 4 of the actuator → ground.

At the same time, the CC ECU sends the signal from terminal 24 → terminal 1 of the actuator → (position sensor) → terminal 3 of the actuator → terminal 26 of the CC ECU. When the occurs, the position sensor sends the position of the actuator arm as a signal (voltage) from terminal 2 of the actuator to terminal 25 of the CC ECU.

When the actual vehicle speed drops below the set speed, the CC ECU sends a signal (voltage) from terminal 12 → terminal 6 of actuator → (motor) → terminal 7 of actuator → terminal 11 of CC ECU. This causes the motor to rotate the actuator arm in the throttle opening direction, increasing the vehicle speed. Then, when the arm reaches the prescribed angle, the CC ECU detects this at terminal 25 and stops the signal from 12.

When the actual vehicle speed rises above the set speed, the CC ECU sends a signal from terminal 11, turning the motor in the opposite direction so that the vehicle speed is reduced.

**4. MANUAL CANCEL OPERATION**

The CC system has the following methods of cancellation:

- **Speed Control Switch (CANCEL)**
  When the control switch is turned to CANCEL position.
- **Parking Brake Switch**
  When the parking brake lever is pulled, the parking brake switch is turned ON and sends a cancellation signal (ground voltage) to terminal 3 of the CC ECU.
- **Neutral Start Switch (A/T)**
  When the shift lever is set to "N" or "P" range, the neutral start switch is turned ON and sends a cancellation signal (ground voltage) to terminal 2 of the CC ECU.
- **Stop Light Switch**
  When the brake pedal is depressed, SW B of the stop light switch is turned OFF, the magnetic clutch (in actuator) is released, and SW A of the stop light switch is turned ON and sends a cancellation signal (battery voltage) to terminal 16 of the CC ECU.

When the CC ECU detects any of the above signals, it stops output of signals to the actuator, and cancels cruise control.

# DIAGNOSIS SYSTEM

**Output of Diagnostic Code**

**READ DIAGNOSTIC CODE**

**(Type A)**

(a) Turn the ignition switch on.

(b) Turn the control switch to SET or RESUME position and keep it there.

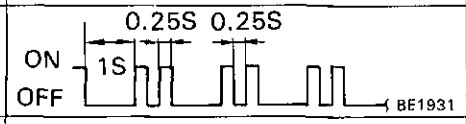
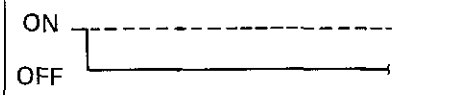
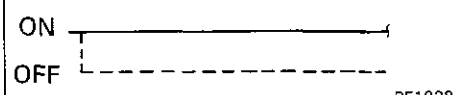
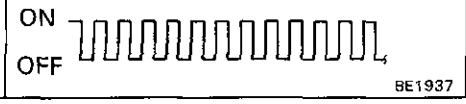
(c) After pushing the main switch ON, keep the SET or RESUME switch ON for 3 seconds.

(d) Check that the "CRUISE" indicator light lights up in the combination meter.

(e) Turn the SET/COAST switch off.

(f) Meet the conditions listed in the table below.

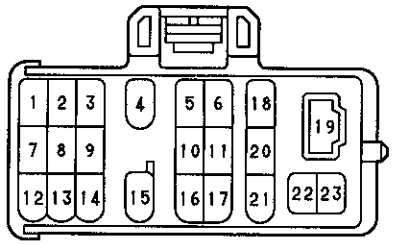
(g) Read the diagnosis code on the cruise control indicator light.

| No. | Conditions | Indication code | Diagnosis |
|---|---|---|---|
| 1 | Turn the control switch to SET/COAST position. |   | SET/COAST circuit is normal. |
| 2 | Turn the control switch to RES/ACC position. |   | RES/ACC circuit is normal. |
| 3 | Each cancel switch is turned ON.<br>• Control switch (to CANCEL)<br>• Stop light switch<br>• *Parking brake switch*<br>• Neutral start switch (to N or P range) |   | Each cancel switch is normal. |
| 4 | Drive at approx. 40 km/h (25 mph) or below. |   | Speed sensor circuit is normal. |
| | Drive at approx. 40 km/h (25 mph) or over. |   | Speed sensor circuit is normal. |

HINT:

- Indication codes appear in order from No. 1.
- If there is no indication code, perform troubleshooting and inspection. (See page BE-34)
- Indication is stopped when the MAIN switch is repushed.

**Diagnosis Check Connector**




lei-23-1

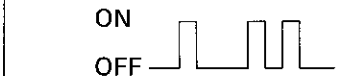
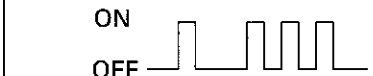
**(Type B)**

(a) If while driving with the cruise control on, the system is canceled by a malfunction in either the actuator, speed sensor or speed control switch circuit, the cruise control indicator light "CRUISE" will blink 5 times.

(b) While stopped, connect terminals $E_1$ (3) and Tc (11) of the check connector.

HINT: If the ignition switch is turned off, the diagnostic code will be erased from the computer memory.

(c) Read the diagnostic code on the indicator light "CRUISE".

| Code No. | CRUISE MAIN Indicator Light Blinking Pattern | Diagnosis |
|---|---|---|
| – |  BE3931 | Normal |
| 11 |  BE3931 | • Duty ratio of 100 % output to motor acceleration side.<br>• Overcurrent in motor circuit. |
| 12 |  BE3931 | • Overcurrent in magnet clutch circuit.<br>• Open in magnet clutch circuit. |
| 13 |  BE3931 | • Open in actuator motor circuit.<br>• Position sensor detects abnormal voltage.<br>• Position sensor signal value does not change when the motor operates. |
| 21 |  BE3932 | • Vehicle speed signal not sent for 140 msec. or longer |
| *23 |  BE3932 | • Actual vehicle speed has dropped by 16 km/h (10 mph) or more below the set speed. |
| 32 |  BE3933 | • Short in control switch circuit. |
| 34 |  BE3933 | • Voltage abnormality in control switch. |

HINT: When two or more codes are indicated, the lowest numbered code will be displayed first.

(*) When the vehicle speed is reduced on uphill roads, the speed can be set again and driving continued. (This is not a malfunction.)

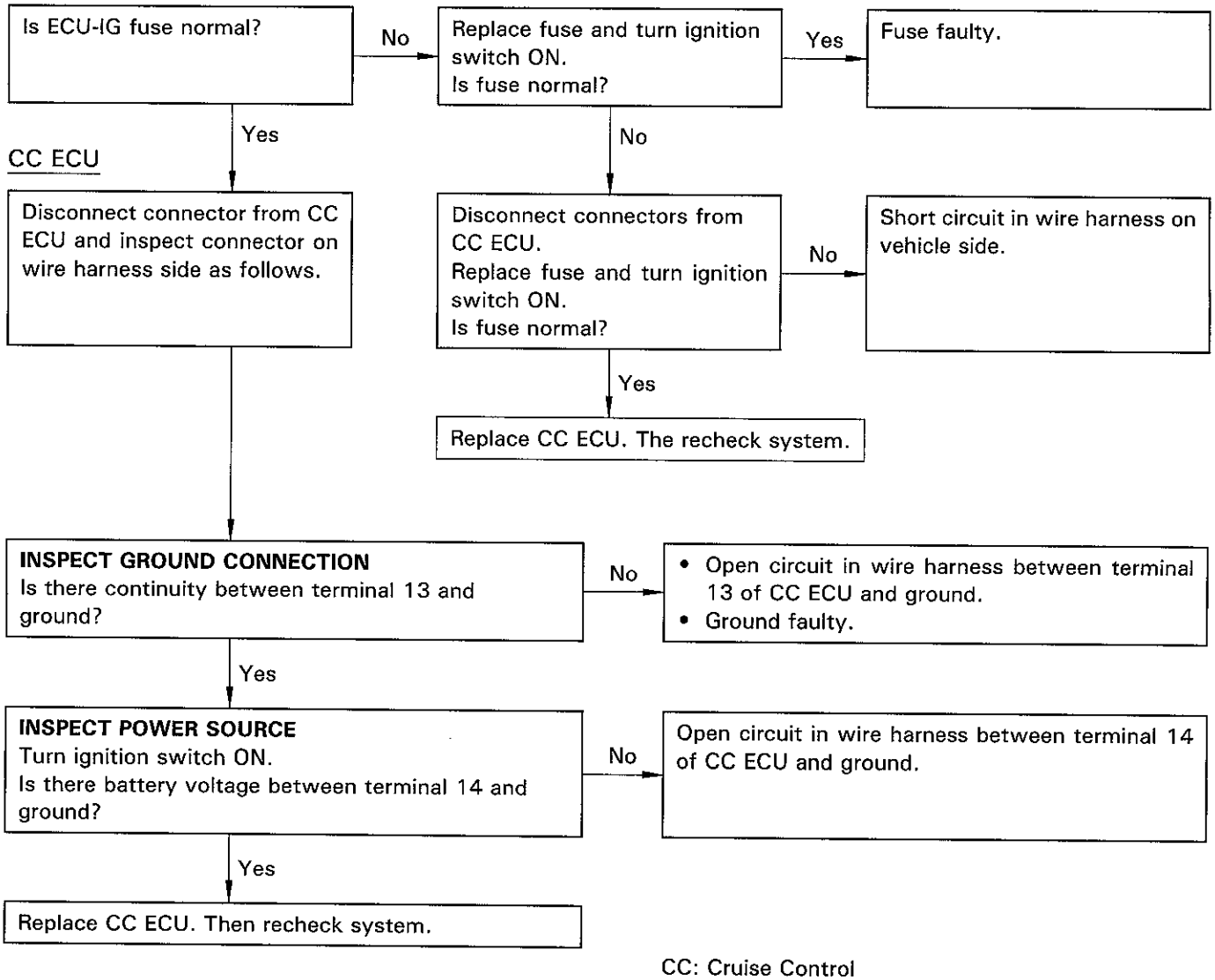
# TROUBLESHOOTING

You will find the source of the trouble more easily by properly using the table shown below. In this table, the numbers indicate the order of priority of the causes of trouble. Check each part in the order shown.

| Chart No. | | | | | D | C | C | F | H | G | E | I | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inspection Item / Diagnosis Code / Problem | Type B | Type A | | CC ECU | Actuator | Main Switch (in Control Switch) | Control Switch | Stop Light Switch | Neutral Start Switch | Parking Brake Switch | Speed Sensor | Throttle Position Sensor | Speed Control Cable and Control Link | Wire Harness |
| • "CRUISE" indicator light blinks 5 times.<br>• Cruise control system does not set.<br>• Cruise control system does not operate. | 11 | | | 2 | 1 | | | | | | | | | 3 |
| | 12 | | | 3 | 1 | | | 2 | | | | | | 4 |
| | 13 | | | 2 | 1 | | | | | | | | | 3 |
| | 21 | | | 2 | | | | | | | 1 | | | 3 |
| | 23 | | | 4 | 3 | | | | | | 2 | | 1 | |
| | 32 | | | 2 | | | 1 | | | | | | | 3 |
| | 34 | | | 2 | | | 1 | | | | | | | |
| | 41 | | | 1 | | | | | | | | | | |
| | Normal | 4 | OK | 8 | 7 | 1 | 2 | 3 | 4 | 5 | | | 6 | 9 |
| | | | NG | 2 | | | | | | | 1 | | | |
| Set speed deviates on high or low side. | | | | 4 | 3 | | | | | | 1 | | 2 | |
| Large speed increase or speed drop when the speed control switch turned to SET. | | | | 4 | 3 | | | | | | | 2 | 1 | |
| Vehicle speed fluctuates when speed control switch turned to SET. | | | | 4 | 3 | | | | | | 1 | | 2 | |
| Set speed does not cancel when brake pedal depressed. | 3 | | OK | 1 | | | | | | | | | | |
| | | | NG | 2 | | | | 1 | | | | | | |
| Set Speed does not cancel when parking brake lever pulled. | 3 | | OK | 1 | | | | | | | | | | |
| | | | NG | 2 | | | | | | 1 | | | | |
| Set speed does not cancel when shifted to "N" range. | 3 | | OK | 1 | | | | | | | | | | |
| | | | NG | 2 | | | | | 1 | | | | | |
| Vehicle speed does not decrease when speed control switch turned to COAST. | 1 | | OK | 4 | 1 | | | | | | 3 | | 2 | |
| | | | NG | 2 | | | 1 | | | | | | | |
| Vehicle speed does not accelerate when speed control switch turned to ACCEL. | 2 | | OK | 4 | 1 | | | | | | 3 | | 2 | |
| | | | NG | 2 | | | 1 | | | | | | | |
| Vehicle speed does not return to memorized speed when control switch turned on RESUME. | 2 | | OK | 4 | 1 | | | | | | 3 | | 2 | |
| | | | NG | 2 | | | 1 | | | | | | | |
| Set speed does not cancel when speed control switch turned to CANCEL. | 3 | | OK | 1 | | | | | | | | | | |
| | | | NG | 2 | | | 1 | | | | | | | |
| Speed can be set below about 40 km/h (25 mph). | 4 | | OK | 1 | | | | | | | | | | |
| | | | NG | 2 | | | | | | | 1 | | | |
| Cruise control will not disengage even at about 40 km/h (25 mph). | 4 | | OK | 1 | | | | | | | | | | |
| | | | NG | 3 | | | | | | | 1 | | 2 | |
| Acceleration response is sluggish when speed control switch turned to "ACCEL" or "RESUME". | | | | 4 | 3 | | 1 | | | | 2 | | 1 | |

## A POWER SOURCE CIRCUIT

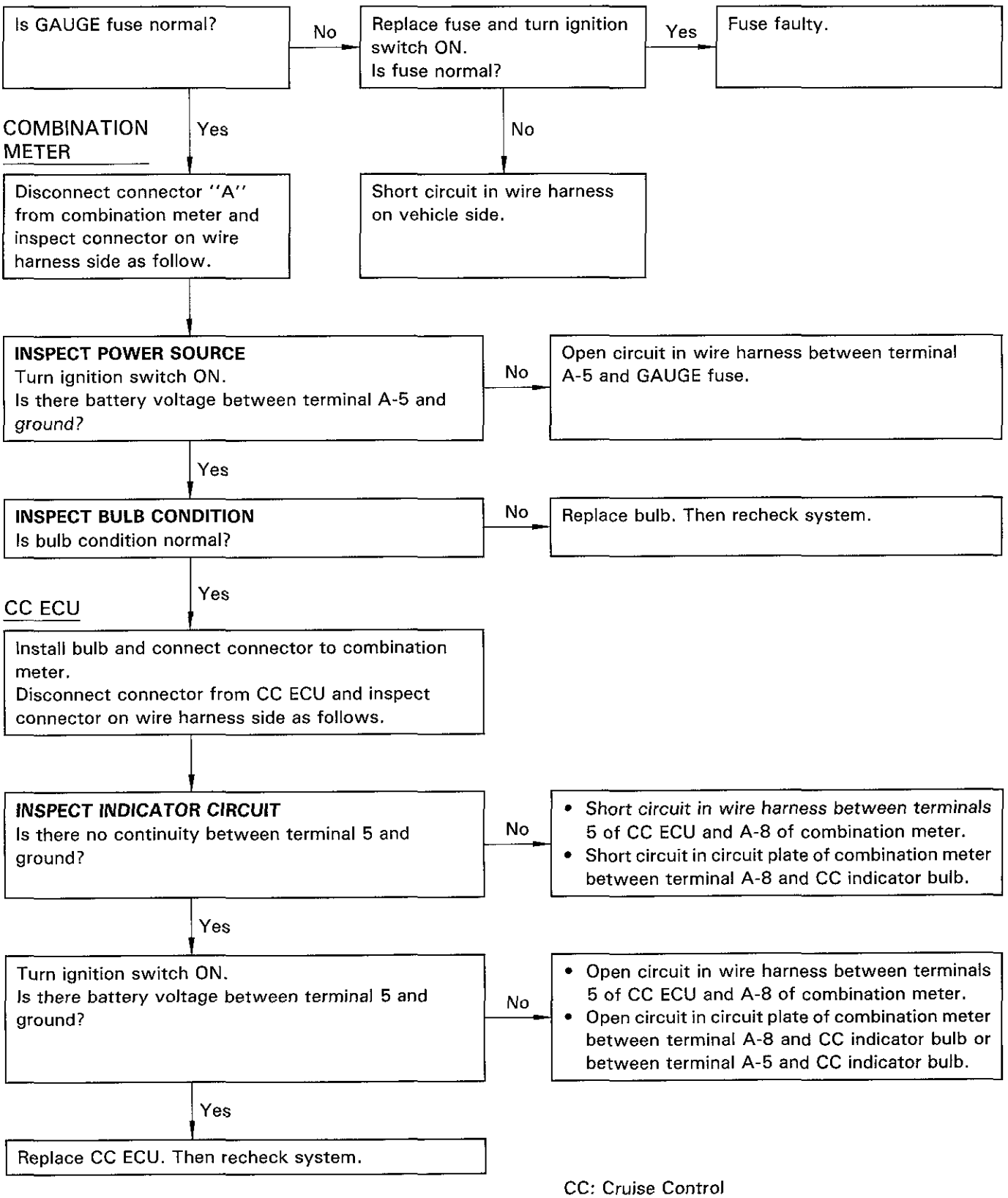
HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.




CC: Cruise Control

## B CRUISE CONTROL INDICATOR CIRCUIT

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.




CC: Cruise Control

## C CONTROL SWITCH CIRCUIT

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.

CONTROL SWITCH

Disconnect connector from control switch and inspect connector on wire harness side as follows.

**INSPECT GROUND CONNECTION**
Is there continuity between terminal B-20 and ground?

No → • Open circuit in wire harness between terminal B-20 of control switch and ground.
• Ground faulty.

Yes

INSPECT CONTROL SWITCH (See page BE-47)
Is control switch operation normal?

No → Replace control switch. Then recheck system.

Yes

CC ECU

Connect connector to control switch.
Disconnect connectors from CC ECU and inspect connectors on wire harness side as follows.

**INSPECT MAIN SWITCH CIRCUIT**
Is there continuity between terminal 4 and ground with main switch OFF?

Yes → Short circuit in wire harness between terminals 4 of CC ECU and B-15 of control switch.

No

Is there continuity between terminal 4 and ground with main switch ON?

No → Open circuit in wire harness between terminals 4 of CC ECU and B-15 of control switch.

Yes

**INSPECT CONTROL SWITCH CIRCUIT**
Is there continuity between terminal 18 and ground with control switch OFF?

Yes → Short circuit in wire harness between terminals 18 of CC ECU and B-5 of control switch.

No

Is there resistance as shown in table below between terminal 18 and ground when control switch is turned to each position?

| Position | Resistance (Ω) |
|---|---|
| RES/ACC | Approx. 68 |
| SET/COAST | Approx. 198 |
| CANCEL | Approx. 418 |

No → Open circuit in wire harness between terminals 18 of CC ECU and B-5 of control switch.

Yes

Replace CC ECU. Then recheck system.

CC: Cruise Control

## D ACTUATOR CIRCUIT

HINT: While carrying out the following inspection, make certain that connectors and terminals are properly connected.

ACTUATOR

Disconnect connector from actuator and inspect connector on wire harness side as follows.

↓

**INSPECT GROUND CONNECTION**
Is there continuity between terminal 4 and ground?

No → • Open circuit in wire harness between terminal 4 of actuator and ground.
• Ground faulty.

↓ Yes

**INSPECT ACTUATOR (See page BE-48)**
Is actuator operation normal?

No → Replace actuator. Then recheck system.

↓ Yes

STOP LIGHT SWITCH

**INSPECT STOP LIGHT SWITCH INSTALLATION**
Is stop light switch installed properly?

No → Reinstall stop light switch properly. Then recheck system.

↓ Yes

Connect connector to actuator.
Disconnect connector from stop light switch and inspect connector on wire harness side as follows.

↓

**INSPECT SAFETY MAGNETIC CLUTCH CIRCUIT**
Is there approx. 38.5 Ω between terminal 4 and ground?

No → Open or short circuit in wire harness between terminals 4 of stop light and 5 of actuator.

↓ Yes

**INSPECT STOP LIGHT SWITCH (See page BE-47)**
Is stop light switch operation normal?

No → Replace stop light switch. Then recheck system.

↓ Yes

CONTINUED ON NEXT PAGE

CC: Cruise Control

CONTINUED FROM PREVIOUS PAGE

CC ECU

Connect connector to stop light switch.
Disconnect connectors from CC ECU and inspect connectors on wire harness side as follows.

**INSPECT MAGNETIC CLUTCH CIRCUIT**
Is there approx. 38.5 Ω between terminal 10 and ground?

No → Open or short circuit in wire harness between terminals 10 of CC ECU and 5 of actuator.

Yes

**INSPECT MOTOR CIRCUIT**
Is there no continuity between terminal 12 and ground?

No → Short circuit in wire harness between terminals 12 of CC ECU and 6 of actuator.

Yes

Is there no continuity between terminal 11 and ground?

No → Short circuit in wire harness between terminals 11 of CC ECU and 7 of actuator.

Yes

Is there continuity between terminals 12 and 11 with actuator arm in a position except max. open or max. close?

No → Open circuit in wire harness between terminals 12 of CC ECU and 6 of actuator or between terminals 11 of CC ECU and 7 of actuator.

Yes

**INSPECT POSITION SENSOR CIRCUIT**
Is there no continuity between terminal 24 and ground?

No → Short circuit in wire harness between terminals 24 of CC ECU and 1 of actuator.

Yes

Is there approx. 2 kΩ between terminals 24 and 26?

No →
- Open circuit in wire harness between terminals 26 of CC ECU and 3 of actuator.
- Open circuit in wire harness between terminals 24 of CC ECU and 1 of actuator.

Yes

Does resistance change even between terminals 26 and 25?

No → Open or short circuit in wire harness between terminals 25 of CC ECU and 2 of actuator.

Yes

Replace CC ECU. Then recheck system.

CC: Cruise Control

## E SPEED SENSOR CIRCUIT

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.

SPEED SENSOR

Disconnect connector from speed sensor and inspect connector on wire harness side as follows.

↓

**INSPECT GROUND CONNECTION**
Is there continuity between terminal 13 and ground?

No → • Open circuit in wire harness between terminal 13 of speed sensor and ground.
• Ground faulty.

↓ Yes

**INSPECT SPEED SENSOR (See page BE-47)**
Is speed sensor operation normal?

No → Replace speed sensor. Then recheck system.

↓ Yes

CC ECU

Connect connector to speed sensor.
Disconnect connector from CC ECU and inspect connector on wire harness side as follows.

↓

**INSPECT SPEED SENSOR CIRCUIT**
Is there continuity repeatedly between terminal 20 and ground?

No → • Open or short circuit in wire harness between terminals 20 of CC ECU and 2 of speed sensor.

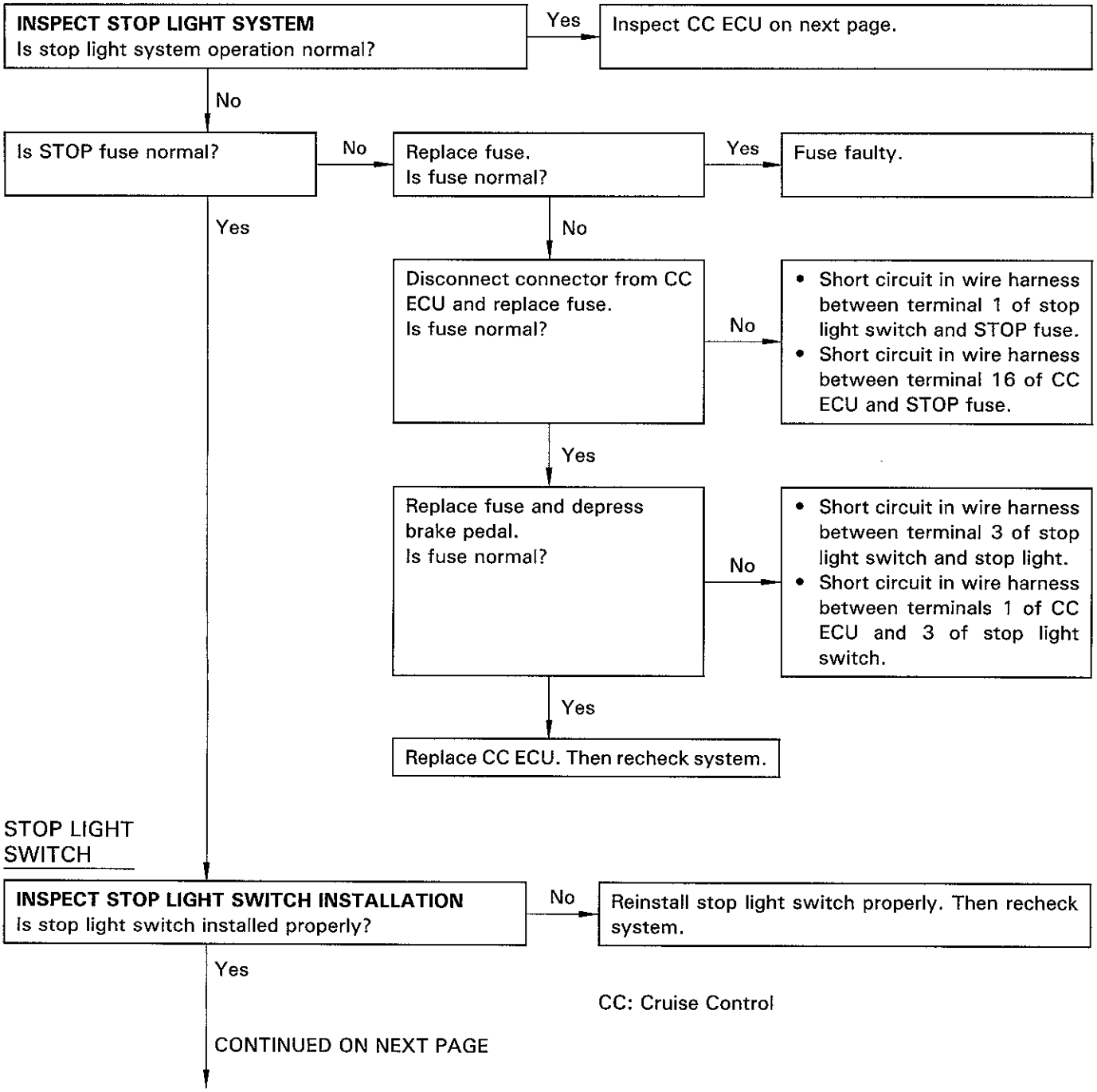
↓ Yes

Replace CC ECU. Then recheck system.

CC: Cruise Control

## F STOP LIGHT SWITCH CIRCUIT

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.



CONTINUED FROM PREVIOUS PAGE

STOP LIGHT SWITCH

Disconnect connector from stop light switch and inspect connector on wire harness side as follows.

**INSPECT POWER SOURCE**
Is there battery voltage between terminal 1 and ground?
- No → Open circuit in wire harness between terminal 1 of stop light switch and STOP fuse.
- Yes ↓

**INSPECT STOP LIGHT CIRCUIT**
Connect terminals 1 and 3.
Do stop lights light up?
- No → • Open circuit in wire harness between terminal 3 of stop light switch and ground.
  • Ground faulty.
- Yes ↓

**INSPECT STOP LIGHT SWITCH (See page BE-47)**
Is stop light switch operation normal?
- No → Replace stop light switch. Then recheck system.
- Yes ↓

CC ECU

Connect connector to stop light switch.
Disconnect connector from CC ECU and inspect connector on wire harness side as follows.
→ If stop light system operation is normal, start inspection from this step.

**INSPECT STOP LIGHT SWITCH CIRCUIT**
Is there battery voltage between terminal 1 and ground?
- No → Open circuit in wire harness between terminal 1 of CC ECU and STOP fuse.
- Yes ↓

Is there battery voltage between terminal 16 and ground when brake pedal depressed?
- No → Open circuit in wire harness between terminals 16 of CC ECU and 3 of stop light switch.
- Yes ↓

Replace CC ECU. Then recheck system.

CC: Cruise Control

## G PARKING BRAKE SWITCH CIRCUIT

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.

**INSPECT PARKING BRAKE SWITCH**
**(See page BE-47)**
Is parking brake switch operation normal?

No → Replace parking brake switch. Then recheck system.

Yes

CC ECU

Connect connector to parking brake switch.
Disconnect connector from CC ECU and inspect connector on wire harness side as follows.

**INSPECT PARKING BRAKE SWITCH CIRCUIT**
Is there continuity between terminal 3 and ground when parking brake lever is pulled?

No → Short circuit in wire harness between terminal 3 of CC ECU and parking brake switch.

Yes

Is there no continuity between terminal 3 and ground when parking brake lever is released?

No → Open circuit in wire harness between terminal 3 of CC ECU and parking brake switch.

Yes

Replace CC ECU. Then recheck system.

CC: Cruise Control

## H NEUTRAL START SWITCH CIRCUIT

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.

**INSPECT STARTING SYSTEM**
Is starting system normal?
- No → Repair starting system. Then recheck system.
- Yes ↓

CC ECU

Disconnect connector from CC ECU and inspect connector on wire harness side as follows.

**INSPECT NEUTRAL START SWITCH CIRCUIT**
Is there continuity between terminal 2 and ground when shift lever is shifted to P or N range?
- No → Open circuit in wire harness between terminals 2 of CC ECU and neutral start switch.
- Yes ↓

Is there no continuity between terminal 2 and ground when shift lever is shifted to L, 2, 3, or R range?
- No → Short circuit in wire harness between terminals 2 of CC ECU and neutral start switch.
- Yes ↓

Replace CC ECU. Then recheck system.

CC: Cruise Control

## I ECT SOLENOID No.2 CIRCUIT (with A/T)

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.

**INSPECT ECT SYSTEM**
Is ECT system normal?
- No → Repair ECT system. Then recheck system.
- Yes ↓

CC ECU

Disconnect connector from CC ECU and inspect connector on wire harness side as follows.

**INSPECT NO.2 SOLENOID CIRCUIT**
Is there approx. 13 Ω between terminal 22 and ground?
- No → Open or short circuit in wire harness between terminal 22 of CC ECU and No.2 solenoid.
- Yes ↓

Replace CC ECU. Then recheck system.

CC: Cruise Control

## J IDL SIGNAL CIRCUIT (w/ 1FZ-FE Engine)

HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.

THROTTLE POSITION SENSOR

**INSPECT THROTTLE POSITION SENSOR ADJUSTMENT (Refer to FI Section of ENGINE Repair Manual.)** Is throttle position sensor adjustment normal?

No → Adjust position sensor position. Then recheck system.

Yes ↓

**INSPECT THROTTLE POSITION SENSOR (Refer to FI Section of ENGINE Repair Manual.)** Is throttle position sensor operation normal?

No → Replace throttle position sensor. Then recheck system.

Yes ↓

CC ECU

Connect connector to throttle position sensor. Disconnect connector from CC ECU and inspect connector on wire harness side as follows.

↓

**INSPECT IDL SIGNAL CIRCUIT** Is there continuity between terminal 23 and ground when acceleration pedal is released?

No → Open circuit in wire harness between terminals 23 of CC ECU and 2 of throttle position sensor.

Yes ↓

Is there no continuity between terminal 23 and ground when acceleration pedal is depressed?

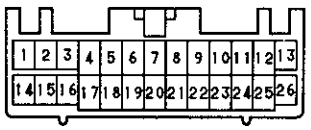
No → Short circuit in wire harness between terminals 23 of CC ECU and 2 of throttle position sensor.

Yes ↓

Replace CC ECU. Then recheck system.

CC: Cruise Control

Wire Harness Side




Vd-26-1-B

# Cruise Control ECU Circuit

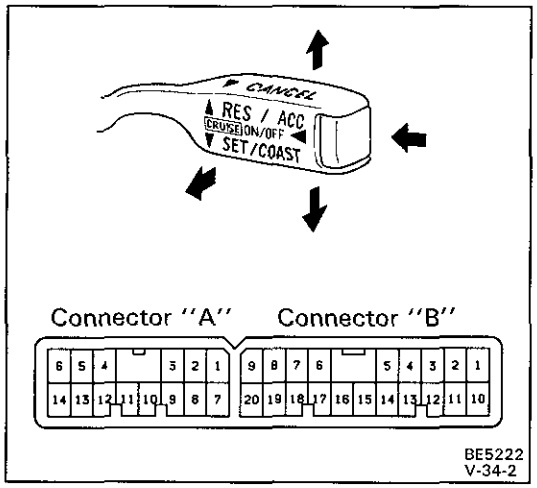
## INSPECT ECU CIRCUIT

Disconnect connector and inspect connector on wire harness side as shown in the chart.

| Check for | Measured item | Tester connection | Condition | | Specified value |
|---|---|---|---|---|---|
| Continuity | Neutral start switch | 2 – ground | Shift lever position | N or P | Continuity |
| | | | | L, 2, D or R | No continuity |
| | Parking brake switch | 3 – ground | Parking brake lever position | released | No continuity |
| | | | | pulled | Continuity |
| | Control switch | 4 – ground | Main switch position | OFF | No continuity |
| | | | | ON | Continuity |
| | Ground connection | 13 – ground | Constant | | Continuity |
| | Actuator (motor) | *11 – 12 | Actuator arm position | max. OPEN | (12 → 11) Continuity |
| | | | | max. CLOSE | (11 → 12) Continuity |
| | | | | any position except above position | (12 → 11) Continuity |
| | TDCL circuit | 8 – ground | Constant | | No continuity |
| | | | Terminals Tc and E1 connected | | Continuity |
| | Throttle position sensor (IDL: 1FZ-FE Engine) | 23 – ground | Acceleration pedal position | released | Continuity |
| | | | | depressed | No continuity |
| | Speed sensor | 20 – ground | With ignition switch ON, speedometer shaft or speed sensor shaft turned. | | Continuity ↕ No continuity |
| Resistance | Actuator (position sensor) | 24 – 26 | Constant | | Approx. 2 kΩ |
| | | 24 – 25 | Actuator arm turned | | Resistance change even |
| | Actuator (magnetic clutch) | 10 – ground | Brake pedal position | released | Approx. 38.5 Ω |
| | | | | depressed | No continuity |
| | Control switch | 18 – ground | Control switch position | OFF | No continuity |
| | | | | RES/ACC | Approx. 68 Ω |
| | | | | SET/COAST | Approx. 198 Ω |
| | | | | CANCEL | Approx. 418 Ω |
| | ECT No.2 solenoid valve (A/T) | 22 – ground | Constant | | Approx. 13 Ω |
| Voltage | Power source | 14 – ground | Ignition switch position | LOCK or ACC | No voltage |
| | | | | ON | Battery voltage |
| | STOP fuse | 1 – ground | Constant | | Battery voltage |
| | Stop light | 16 – ground | Brake pedal position | released | No voltage |
| | | | | depressed | Battery voltage |

*: This circuit includes the diode. If the circuit shown no continuity, change the positive and negative proves and recheck system.

If circuit is as specified, try another ECU.




## CONTROL SWITCH INSPECTION

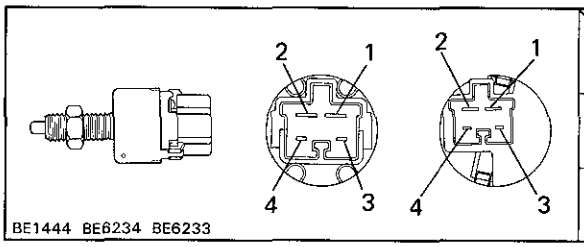
### INSPECT SWITCH

| Switch position | | Terminal B20 | B11 | B5 | B17 | B15 |
|---|---|---|---|---|---|---|
| Main | ON | ○ | | | | ○ |
| | OFF | | | | | |
| Control | RES/ACC | ○ | | ○ | | |
| | SET/COAST | ○ | | ○ | | |
| | CANCEL | ○ | | ○ | | |

If the continuity is not as specified, replace the control switch.

## STOP LIGHT SWITCH INSPECTION

### INSPECT SWITCH




| Switch position | Terminal 1 | 2 | w/ CCS 3 | 4 |
|---|---|---|---|---|
| Switch pin free (Brake pedal depressed) | ○ | ○ | | |
| Switch pin pushed in (Brake pedal released) | | | ○ | ○ |

If continuity is not as specified, replace the stop light switch.

## NEUTRAL START SWITCH INSPECTION

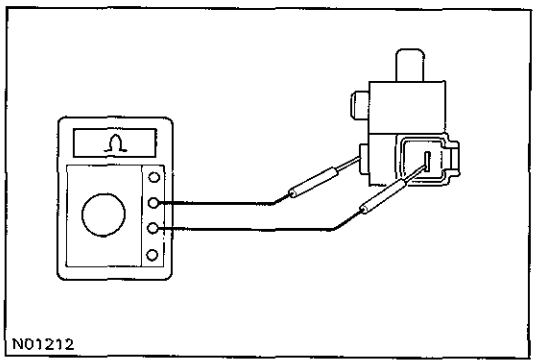
**See page AT section**

## THROTTLE POSITION SWITCH INSPECTION

**(Refer to FI section of Engine Repair Manual)**

## PARKING BRAKE SWITCH INSPECTION

### INSPECT SWITCH



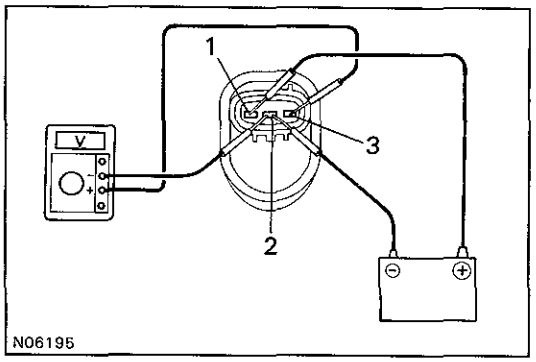

(a) Check that there is continuity between terminal and the switch set nut with switch pin released. (parking brake lever pulled up)

(b) Check that there is no continuity between terminal and the switch set nut with switch pin pushed in. (parking brake lever released)

If operation is not as specified, replace the switch.

## SPEED SENSOR INSPECTION

### INSPECT SENSOR




(a) Connect the positive (+) lead from battery to terminal 1 and negative (−) lead to terminal 2.

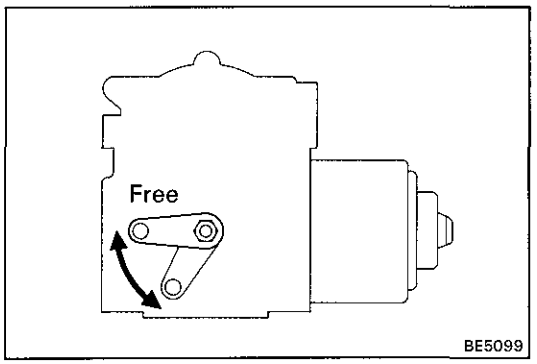
(b) Connect the positive (+) lead from tester to terminal 3 and negative (−) lead to terminal 2.

(c) Revolve shaft.

(d) Check that there is voltage changer from approx. 0 V to 11 V or more between terminal 3 and 2.

HINT: The voltage change should be 20 times per each revolution of the speed sensor shaft.

If operation is not as specified, replace the sensor.

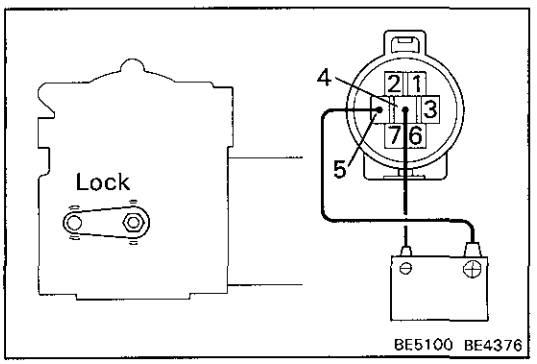



# CRUISE CONTROL ACTUATOR INSPECTION

## INSPECT ACTUATOR

**(Magnet Clutch)**

(a) Check that the arm moves smoothly by hand.

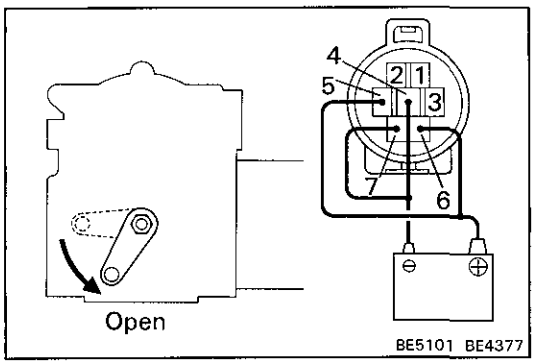



(b) Connect the positive (+) lead from the battery to terminal 5 and the negative (−) lead to terminal 4. (magnet clutch turned ON)

(c) Check that the arm does not move by hand.

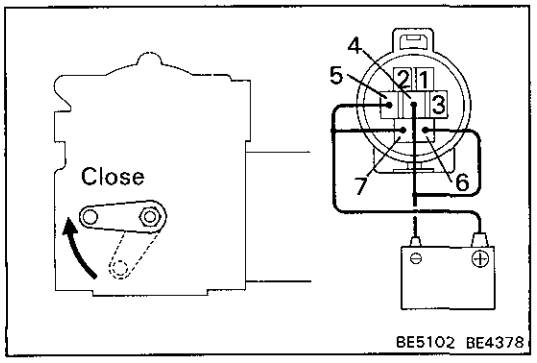
If operation is not as specified, replace the motor.

**(Motor)**



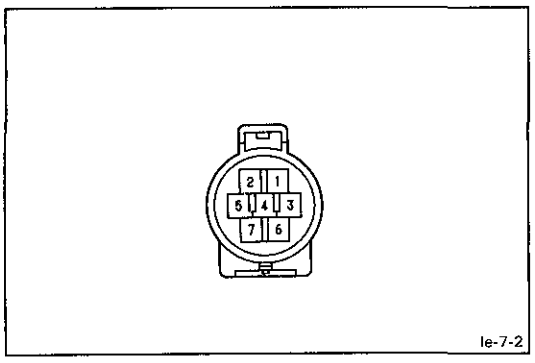

(a) With the magnetic clutch ON, connect the positive (+) lead from the battery to terminal 6 and the negative (−) lead to terminal 7, check that the arm moves to the open side.

(b) When the arm reached to the open position, check that the motor operation stops.




(c) With the magnetic clutch ON, connect the positive (+) lead from the battery to terminal 7 and the negative (−) lead to terminal 6, check that the arm moves to the close side.

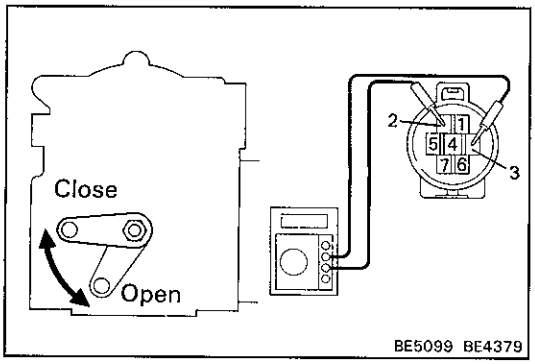
(d) When the arm reaches to the closed position, check that the motor operation stops.




**(Position Sensor)**

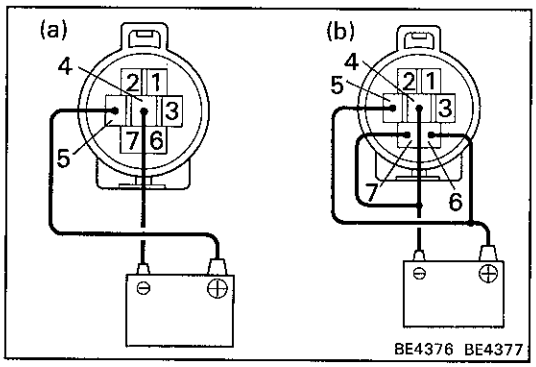
(a) Measure the resistance between terminals 1 and 3.

**Resistance: Approx. 2 kΩ**




(b) When the arm is moving from the closed to open position, check that resistance between terminals 2 and 3 increases from approx. 0.5 to 1.7 kΩ.

If operation is not as specified, replace the motor.



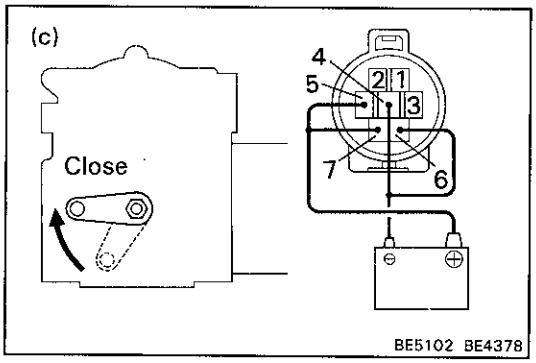

## CONTROL LINK ASSEMBLY ADJUSTMENT

### ADJUST CONTROL LINK ASSEMBLY

(a) Connect the positive (+) lead from the battery to terminal 5 and the negative (−) lead to terminal 4 of the actuator.
(magnet clutch turned ON)

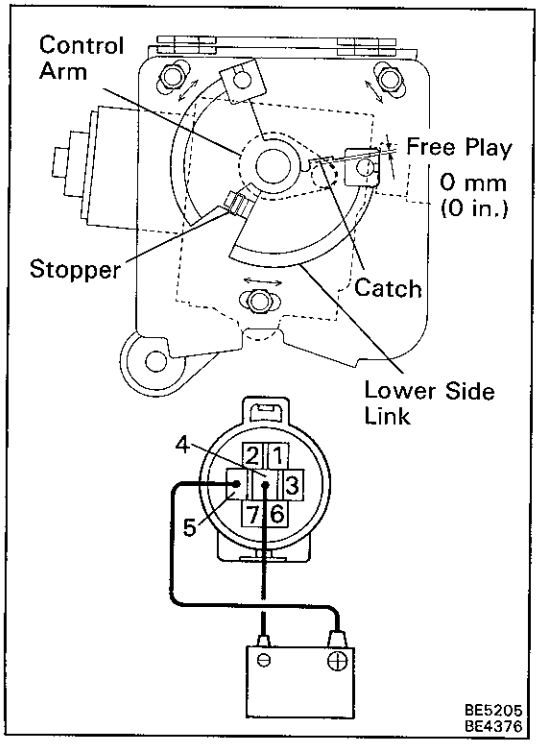
**NOTICE: Keep the magnet clutch ON until adjustment of control link assembly is completed.**

(b) With the magnetic clutch ON, connect the positive (+) lead from the battery to terminal 6 and the negative (−) lead to terminal 7.
(Arm moves to the open side.)




(c) With the magnetic clutch ON, connect the positive (+) lead from the battery to terminal 7 and the negative (−) lead to terminal 6.
(Arm moves to the close side.)

(d) Install the control link assembly to the actuator.




(e) Rotate the control link assembly so that the catch of the control link assembly's lower side link comes in contact with the actuator control arm (Free play 0).

**Free play: 0 mm (0 in.)**

**NOTICE: Rotate the lower side link to the right until it touches the stopper.**

(f) In condition (d), install and torque the three nuts.

(g) Disconnect lead wire from the actuator.