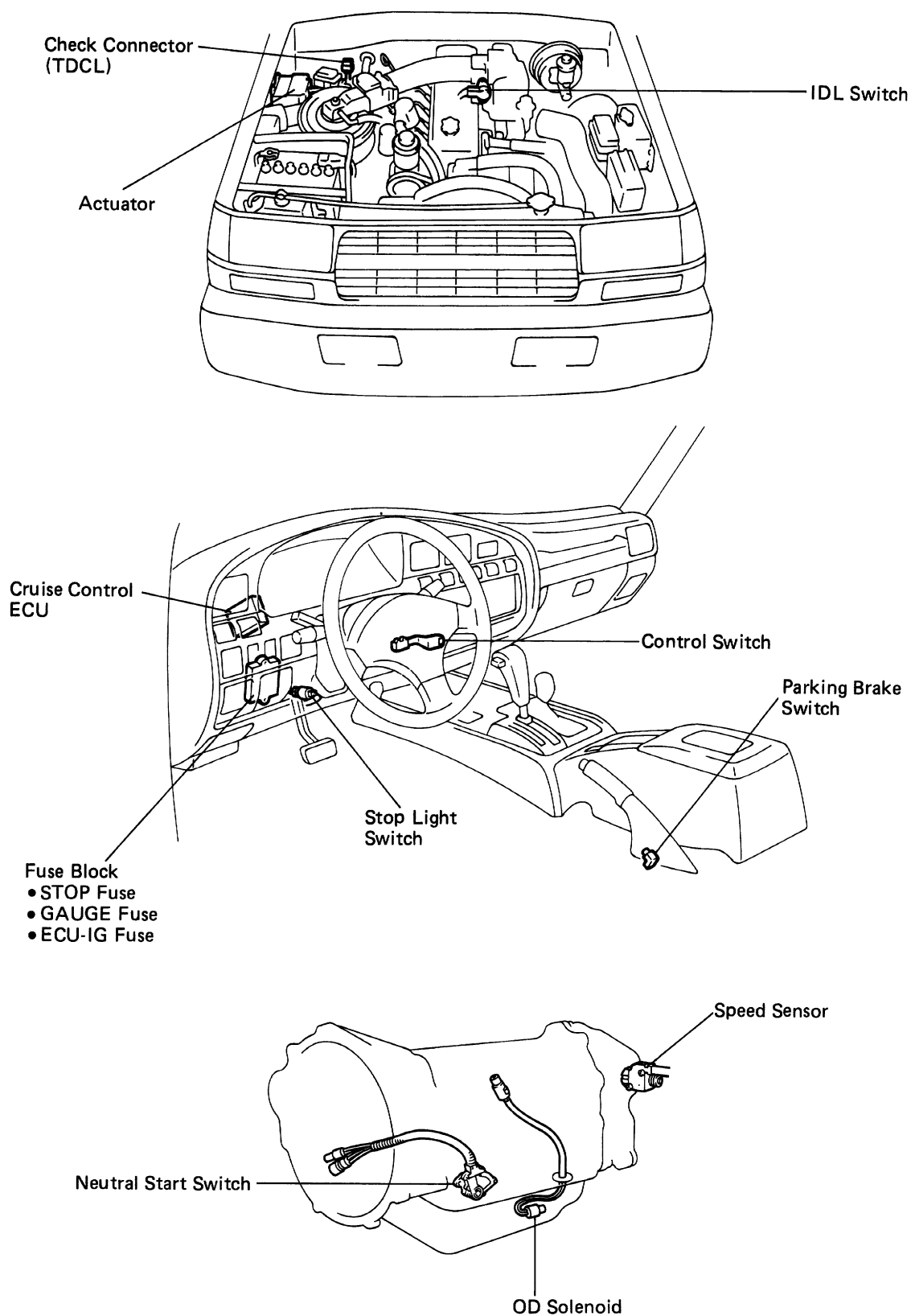
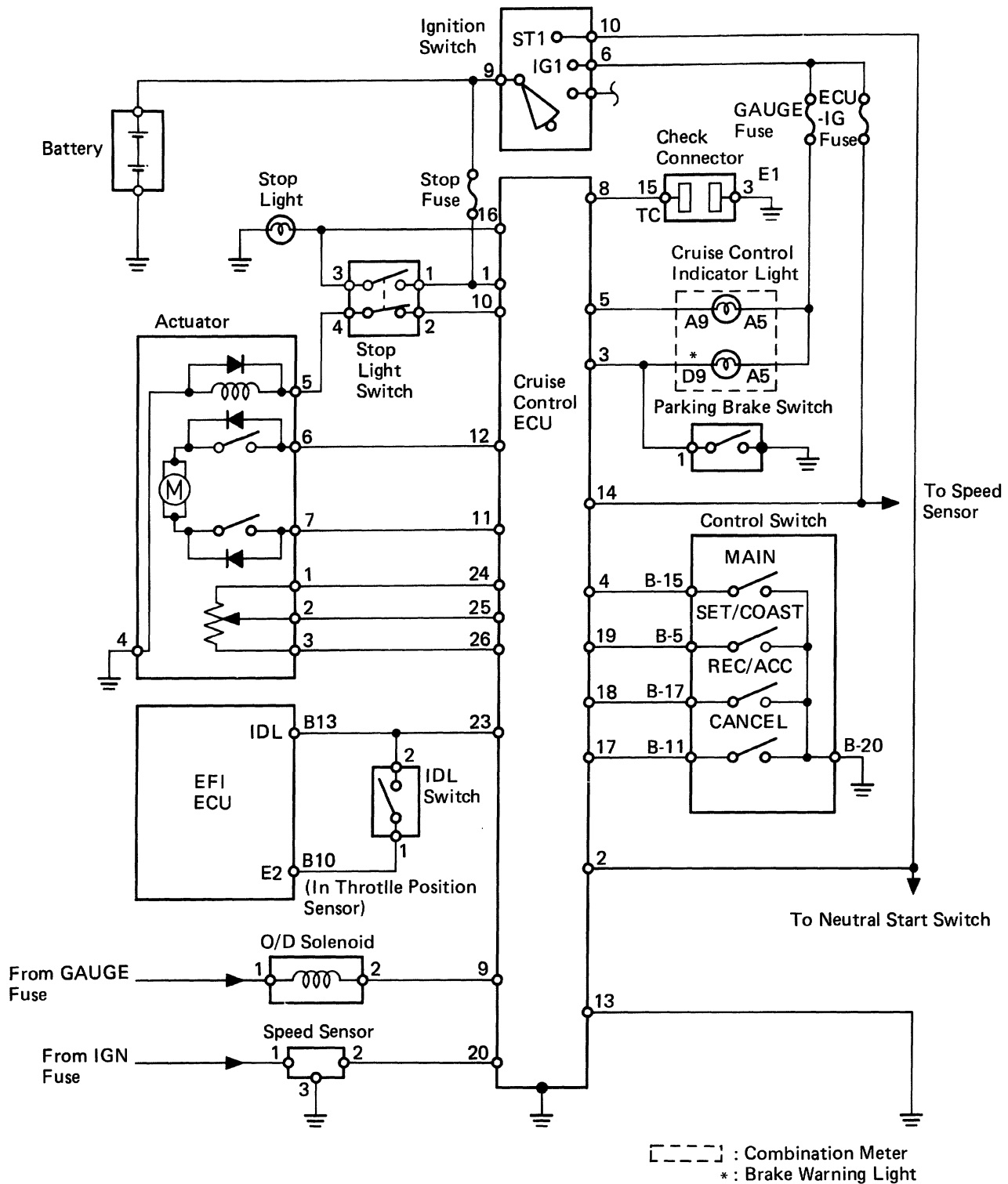


CRUISE CONTROL SYSTEM

Parts Location

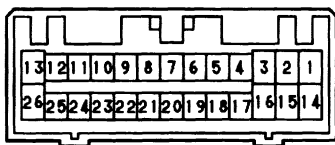


Wiring Diagram



Connector Diagrams

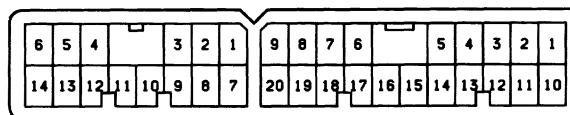
Cruise Control ECU



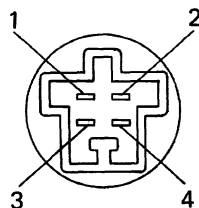
Control Switch

Connector "A"

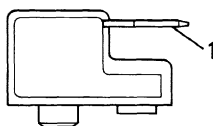
Connector "B"



Stop Light Switch



Parking Brake Switch



Speed Sensor



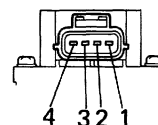
Actuator



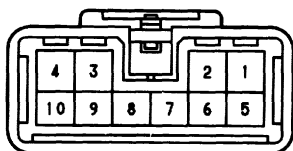
O/D Solenoid



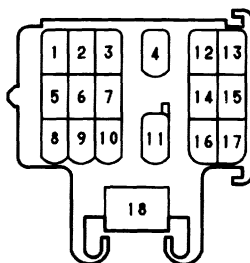
Throttle Position Sensor



Ignition Switch

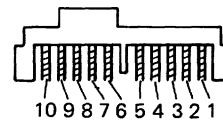


Check Connector (TDCL)



Combination Meter (Cruise Control Indicator)

Connector "A"

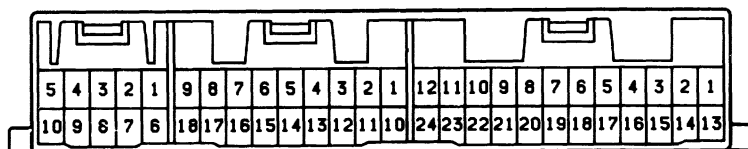


(Brake Warning)

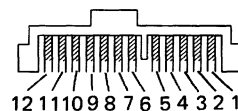
EFI ECU

Connector "C" Connector "B"

Connector "A"



Connector "D"



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 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 19, 18 or 17 of the CC ECU → terminals B-5, B-11 or B-17 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 → (safety 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 terminal 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 cancellation signal (ground voltage) to terminal 3 of the CC ECU.

- **Neutral Start Switch**

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 safety 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.

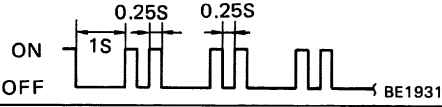
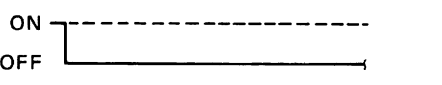
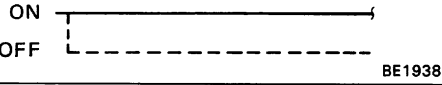
Diagnosis System

Output of Diagnostic Code

READ DIAGNOSTIC CODE

(Type A)

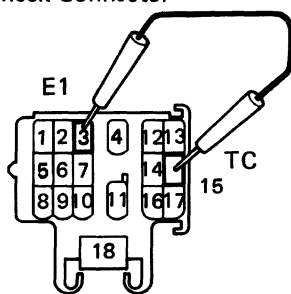
- (a) Turn the ignition switch on.
- (b) Turn the control switch to SET/COAST position, and keep it there.
- (c) Push the main switch ON.
- (d) Check that the indicator light "CRUISE" lights-up in the combination meter.
- (e) Turn the SET/COAST switch off.
- (f) Meet the conditions listed in the table 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.	 ON OFF	SET/COAST circuit is normal.
2	Turn the control switch to RES/ACC position.	 ON OFF	RES/ACC circuit is normal.
3	Each cancel switch is turned ON. - Control switch (to CANCEL) - Stop light switch - Parking brake switch - Neutral start switch (to N or P range)	 ON OFF	Each cancel switch is normal.
4	Drive at approx. 40 km/h (25 mph) or below.	 ON OFF	Speed sensor circuit is normal.
	Drive at approx. 40 km/h (25 mph) or over.	 ON OFF	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-77](#))
- Indication is stopped when the MAIN switch is repushed.

Diagnosis Check Connector



BE2026

(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 3 and 15 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".

Indication code		Diagnosis
	 BE1939	Normal.
11	 BE1940	Excessive current flowed to motor or safety magnetic clutch drive circuit.
12	 BE2711	Open circuit in safety magnetic clutch circuit.
13	 BE4344	- Position sensor circuit abnormal. - Open circuit in motor.
21	 BE1941	Vehicle speed signal not sent for 140 msec. or longer.
23	 BE1943	*Vehicle speed has decreased by 16 km/h (10 mph) or more from the set speed during cruising.
31	 BE1944	RESUME/ACCEL switch is ON always when MAIN switch is pushed ON.
33	 BE2712	SET/COAST switch signal and RES/ACC switch signal turned on simultaneously.

CONTINUED ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

Indication code		Diagnosis
41	 BE4345	ECU malfunction.
* If the set speed can be maintained when the speed control switch is again set at SET/COAST, there is no malfunction.		

HINT:

- Indication codes appear in order from No. 11
- If there is no indication code, perform troubleshooting and inspection. (See page [BE-77](#))

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.

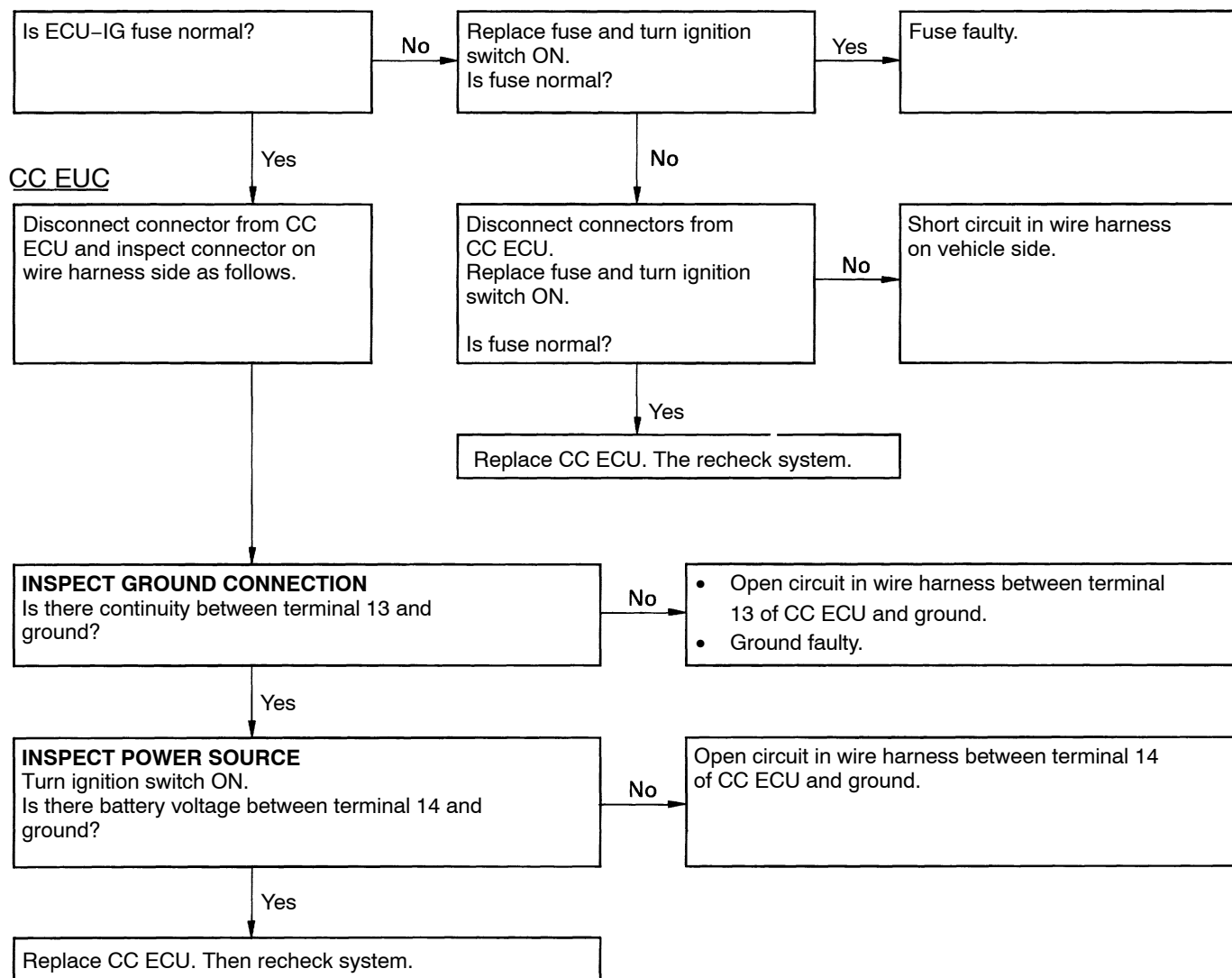
Chart No.					C	D	D	F	H,I	G	E	I	J		
Inspection Item															
Diagnosis Code				CC ECU	Actuator	Main Switch (In Control Switch)	Control Switch	Stop Light Switch	Neutral Start Switch	Parking Brake Switch	Speed Sensor, or Speedometer Cable	O/D Solenoid	Throttle Position Sensor (IDL)	Speed Control Cable, Control Link	Other Parts
Problem	Type B	Type A													
• "CRUISE" indicator light blinks 5 times. • Cruise control system does not set. • Cruise control system does not operate.	11			2	1										
	12			3	1			2							
	13			2	1										
	21			2							1				
	23				3						2			1	
	31			2			1								
	33			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 control switch turned to SET.				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	3	1			2							
			NG	2				1							
Set speed does not cancel when parking brake lever pulled.		3	OK	2	1										
			NG	2						1					
Set speed does not cancel when shifted to "N" range.		3	OK	2	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		1						3	4	5	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	2	1										
			NG	2			1								
Speed can be set below about 40 km/h (25 mph).		4	OK	2	1										
			NG	2							1				
Cruise control will not disengage even at about 40 km/h (25 mph).		4	OK	2	1										
			NG	2							1				
Acceleration response is sluggish when speed control switch turned to "ACCEL" or "RESUME".				6	3		1					4	5	2	

* : Inspect wire harness.

* : Inspect wire harness.

A POWER SOURCE CIRCUIT

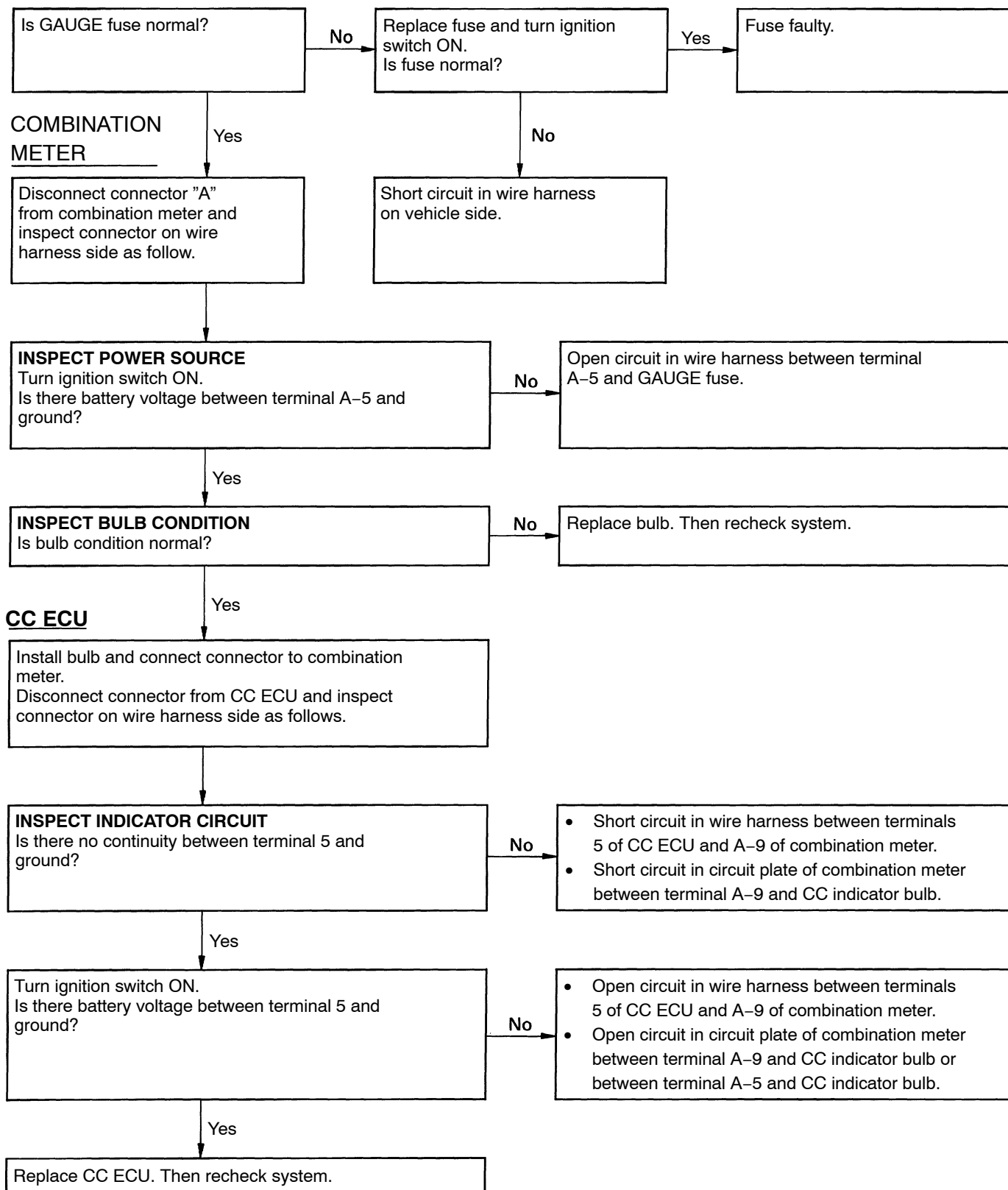
HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.



CC: Cruise Control

B CRUISE CONTROL INDICATOR CIRCUIT

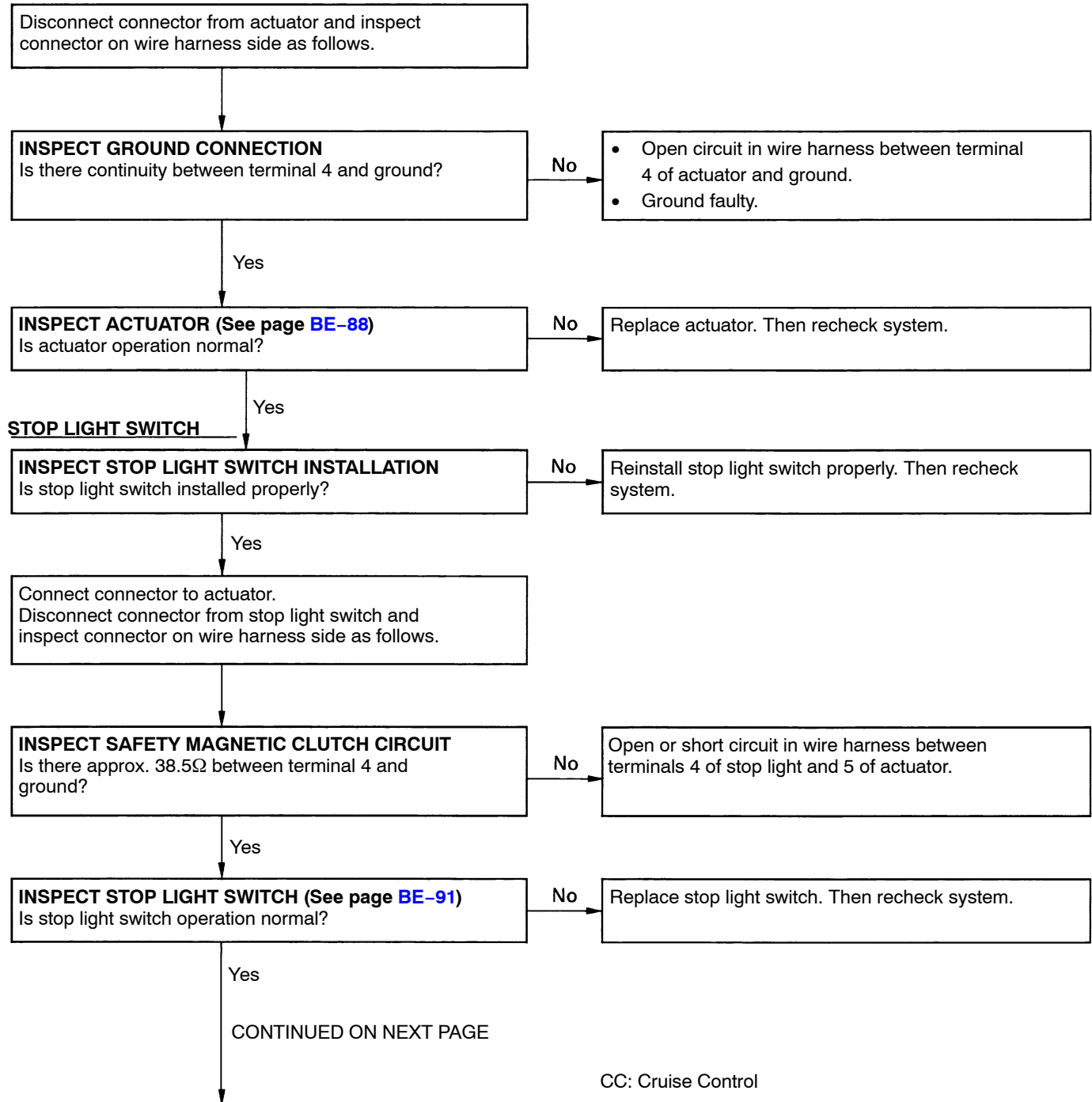
HINT: while carrying out the following inspection, make certain that the connectors and terminals are properly connected.

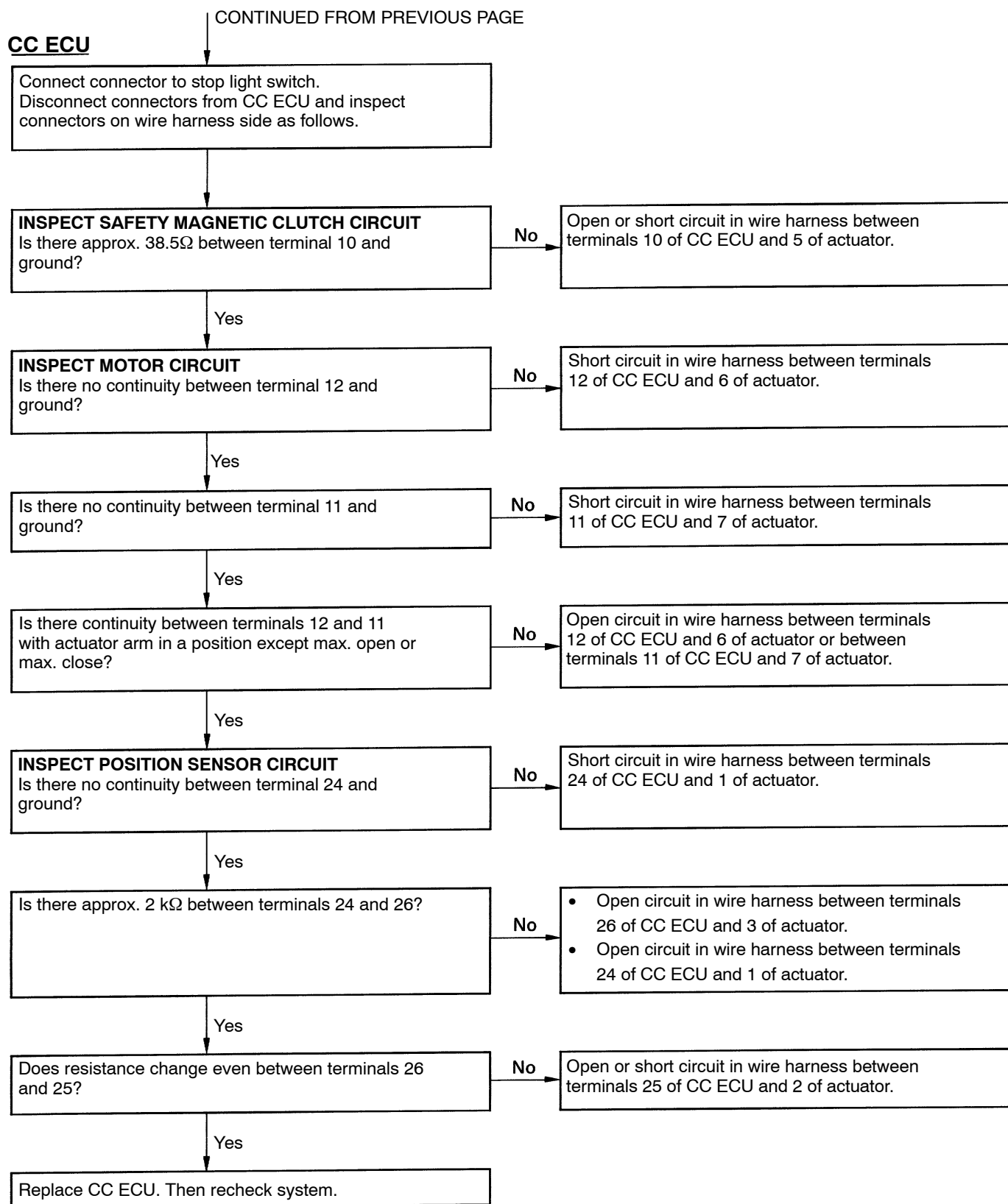


C ACTUATOR CIRCUIT

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

ACTUATOR





CC: Cruise Control

D 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-87)

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 no continuity between terminal 4 and ground with main switch OFF?

No

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

Yes

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 no continuity between terminal 19 or 18 or 17 and ground with control switch OFF?

No

Short circuit in wire harness between terminals 19, 18, 17 of CC ECU and B-5, B-17, B-11 of control switch.

Yes

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

Position	Terminal XX
RES/ACC	18
SET/COAST	19
CANCEL	17

No

Open circuit in wire harness between terminals XX of CC ECU and YY of control switch.

Terminal XX

Terminal YY

19

B-5

18

B-17

17

B-1 1

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 3 and ground?

No

- Open circuit in wire harness between terminal 3 of speed sensor and ground.
- Ground faulty.

Yes

INSPECT SPEED SENSOR (See page BE-87)

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.

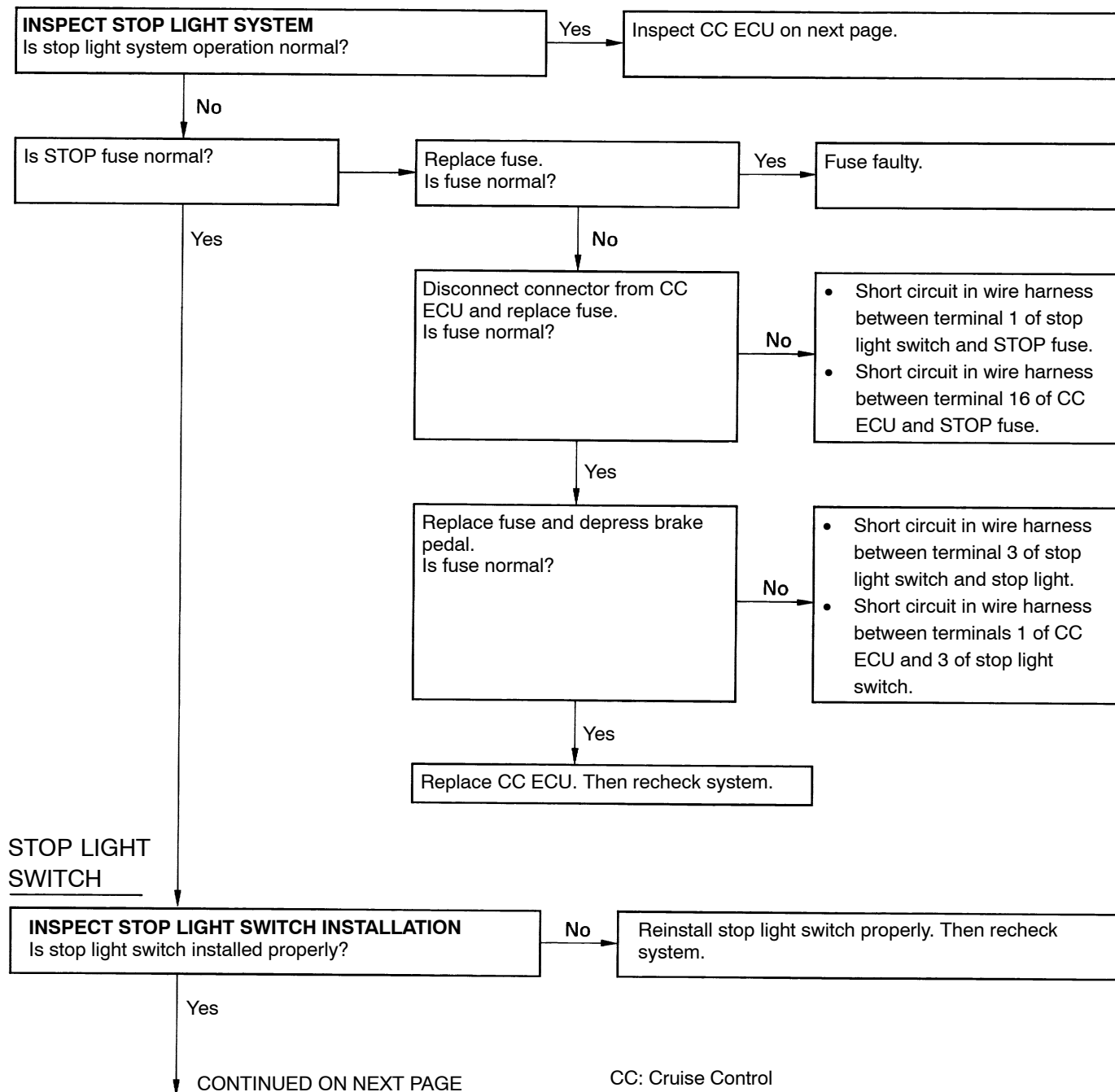
Yes

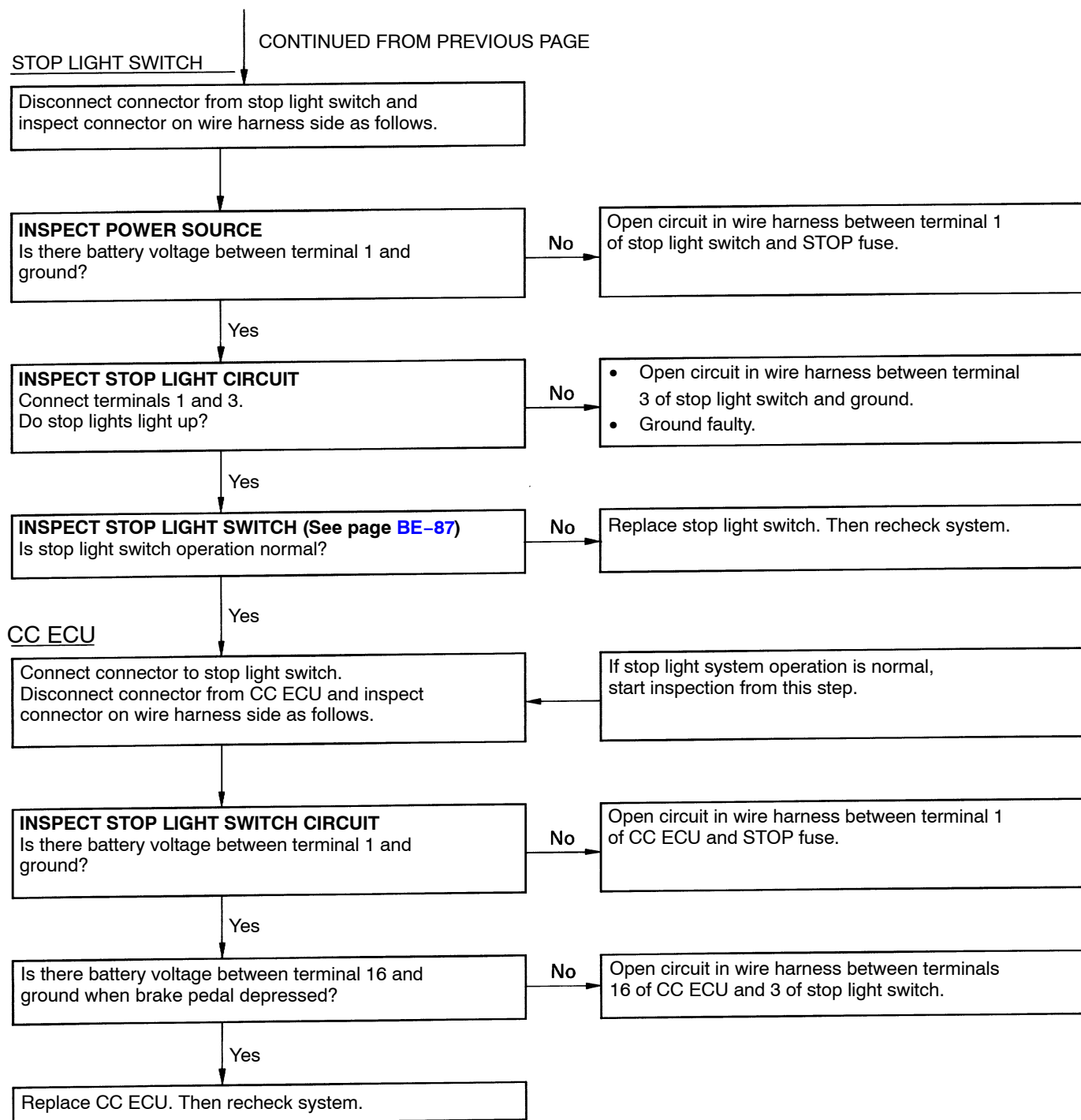
Replace CC ECU. Then recheck system.

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.

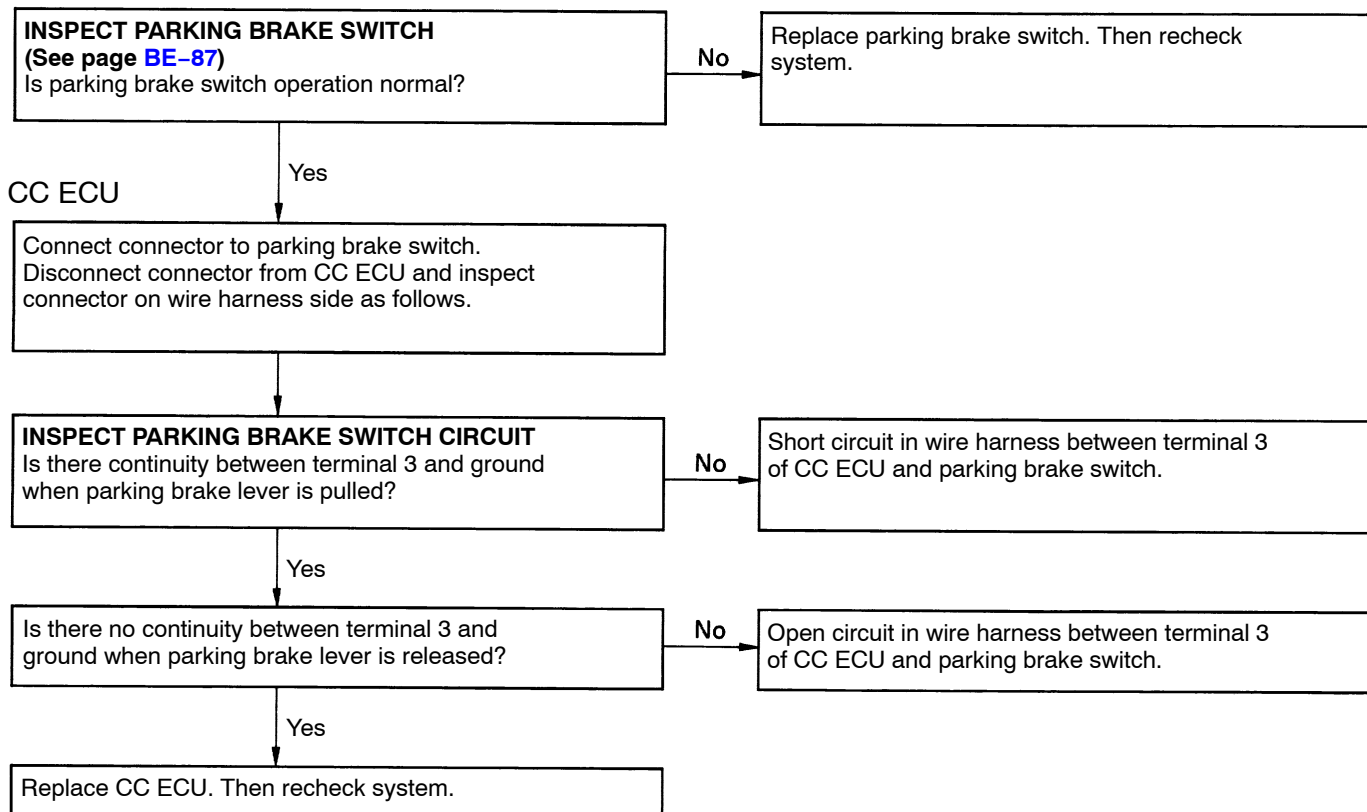




CC: Cruise Control

G PARKING BRAKE SWITCH CIRCUIT

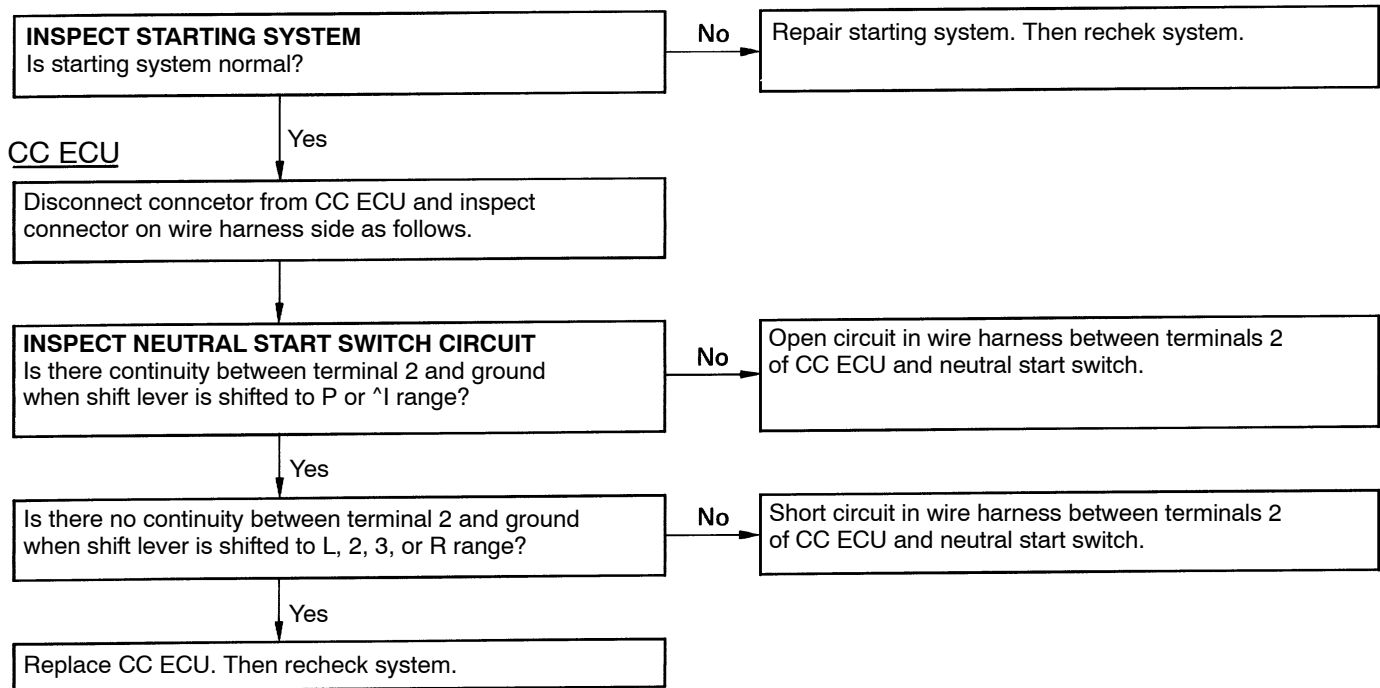
HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.



CC: Cruise Control

H NEUTRAL START SWITCH CIRCUIT

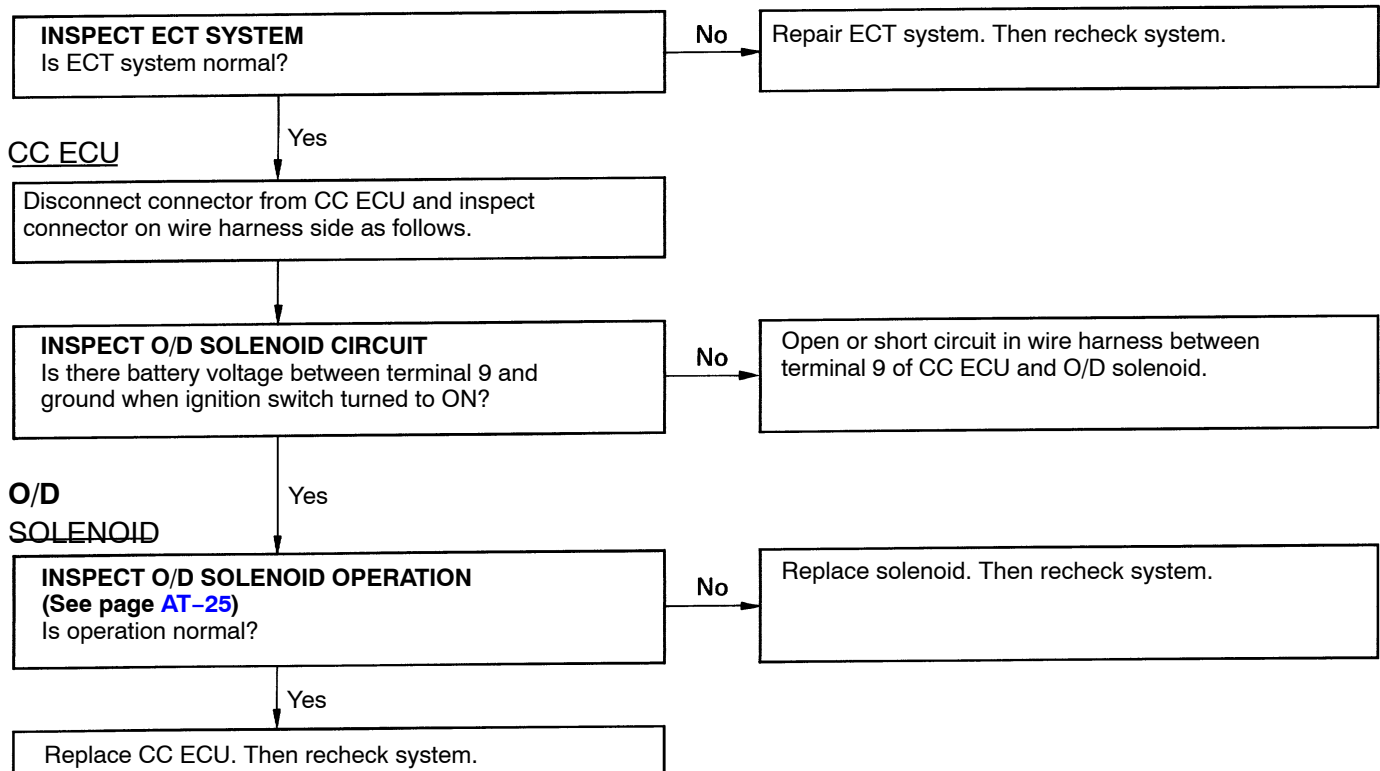
HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.



CC: Cruise Control

I O/D SOLENOID CIRCUIT

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

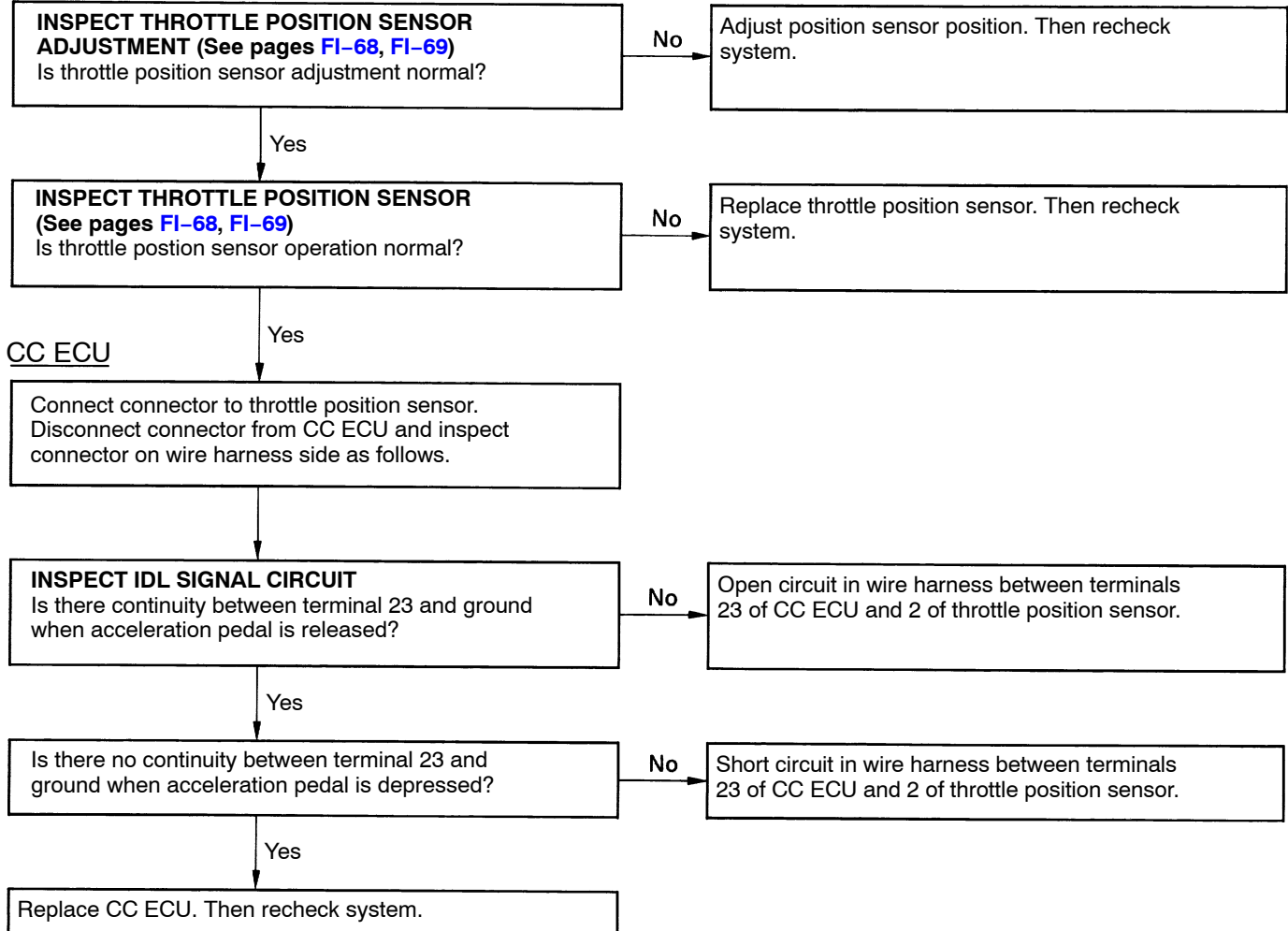


CC: Cruise Control

J IDL SIGNAL CIRCUIT

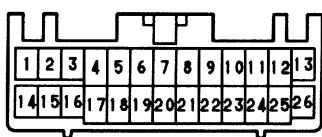
HINT: While carrying out the following inspection, make certain that the connectors and terminals are properly connected.

THROTTLE POSITION SENSOR



CC: Cruise Control

Wire Harness Side



Vd-26-1-B

Cruise Control ECU Circuit

INSPECT ECU CIRCUIT

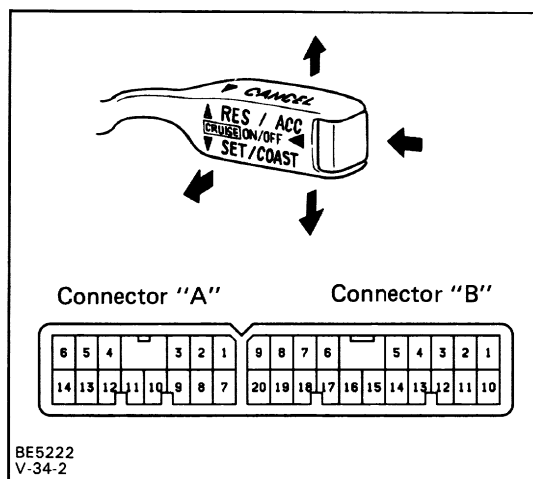
Disconnect connector and inspect connector on wire harness side as shown in the chart.

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
	Control switch	18 – ground	Control switch position	RES/ACC	Continuity
		19 – ground	Control switch position	SET/COAST	Continuity
		17 – ground	Control switch position	CANCEL	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
Resistance	TDCL circuit	8 – ground	Constant		No continuity
			Terminals Te and E 1 connected		Continuity
	Throttle position sensor (IDL)	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
	Actuator (position sensor)	24 – 26	Constant		Approx. 2 kΩ
		24 – 2 5	Actuator arm turned		Resistance change even
Voltage	Actuator (Safety magnetic clutch)	10 – ground	Brake pedal position	released	Approx. 38.5Ω
				depressed	No continuity
	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
	O/D solenoid	9 – ground	Ignition switch position	LOCK or ACC	No voltage
				ON	Battery voltage

*: This circuit include the diode.

If circuit is as specified, try another ECU.

If circuit is not as specified, refer to [BE-71](#) wiring diagram and inspect the circuits connected to other parts.



Parts Inspection

1. INSPECT SWITCHES

(Control Switch/Continuity)

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

If continuity is not as specified, replace the control switch.
Stop Light Switch/Continuity)

Terminal Switch position		1	2	3	4
Switch pin free (Brake pedal depressed)					
Switch pin pushed in (Brake pedal released)					

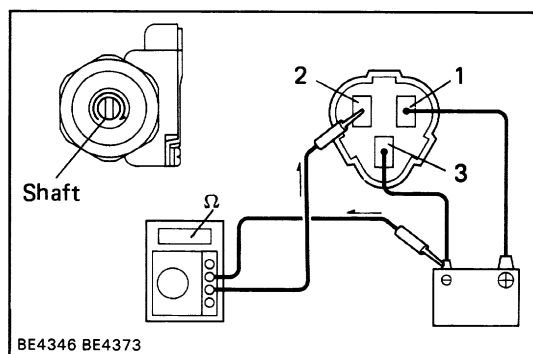
If continuity is not as specified, replace the stop light switch .

(Neutral Start Switch)

See page [AT-25](#).

(Parking Brake Switch)

See page [BE-42](#).

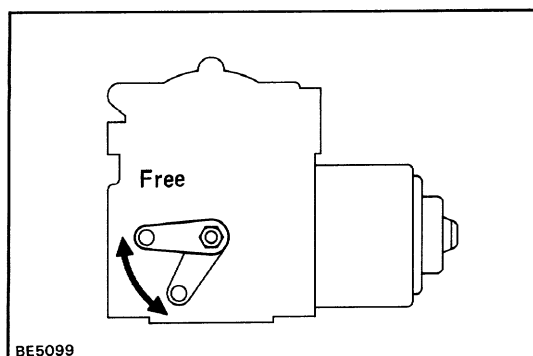


2. INSPECT SPEED SENSOR

- Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 3.
- Check that there is continuity between terminal 2 and the battery negative (-) terminal four times per each revolution of the shaft.

HINT: Connect the test leads so that the current from the ohmmeter can flow from terminal 2 to battery negative (-) terminal.

If operation is not as specified, replace the speed sensor.

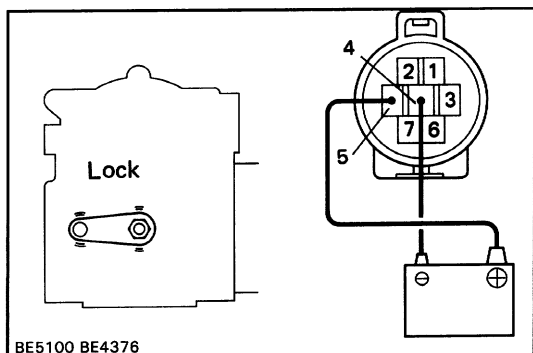


3. INSPECT ACTUATOR

(Motor Type)

Safety Magnet Clutch

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

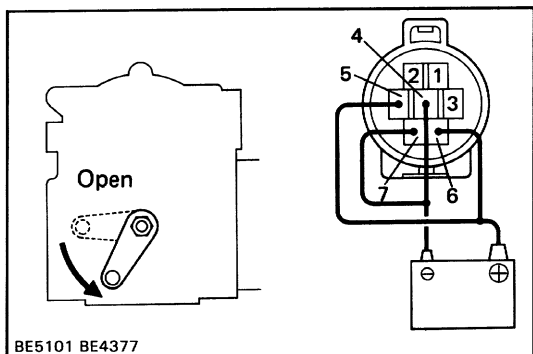


(b) Connect the positive (+) lead from the battery to terminal 5 and the negative (-) lead to terminal 4.

(Safety magnet clutch turned ON)

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

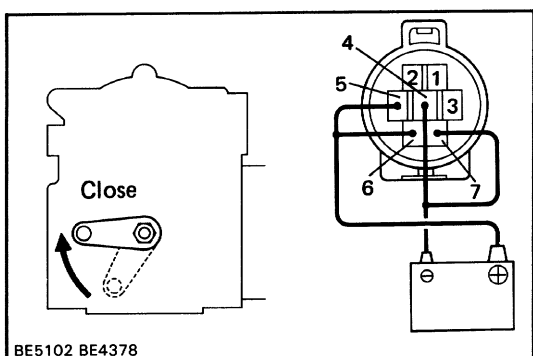
If operation is not as specified, replace the motor.



Motor

(a) With the safety 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.

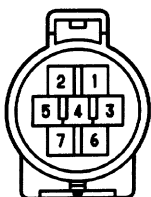
(b) When the arm reached to the open position, check that the motor operation stops.



(c) With the safety 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.

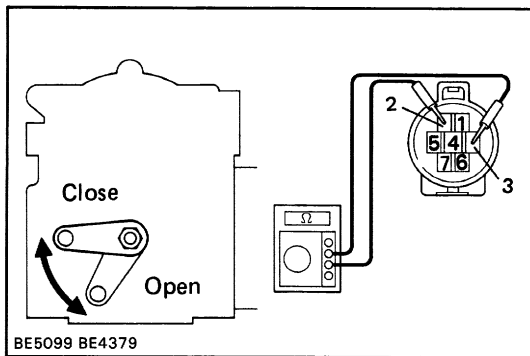
Actuator Side



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 k Ω . If operation is not as specified, replace the motor.

4. INSPECT THROTTLE POSITION SWITCH

(See pages FI-68, FI-69)

Adjustment of Control Link Assembly 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.

(Safety magnet clutch turned ON)

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

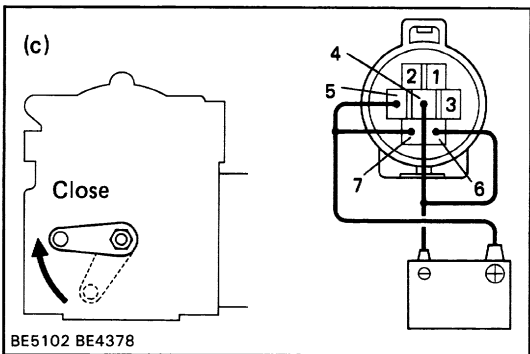
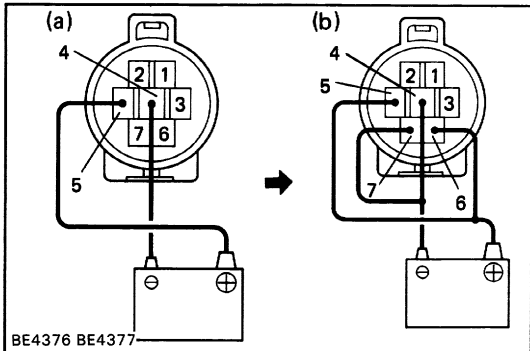
- (b) With the safety magnetic clutch ON, connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead to terminal 7.

(Arm moves to the open side.)

- (c) With the safety 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.

