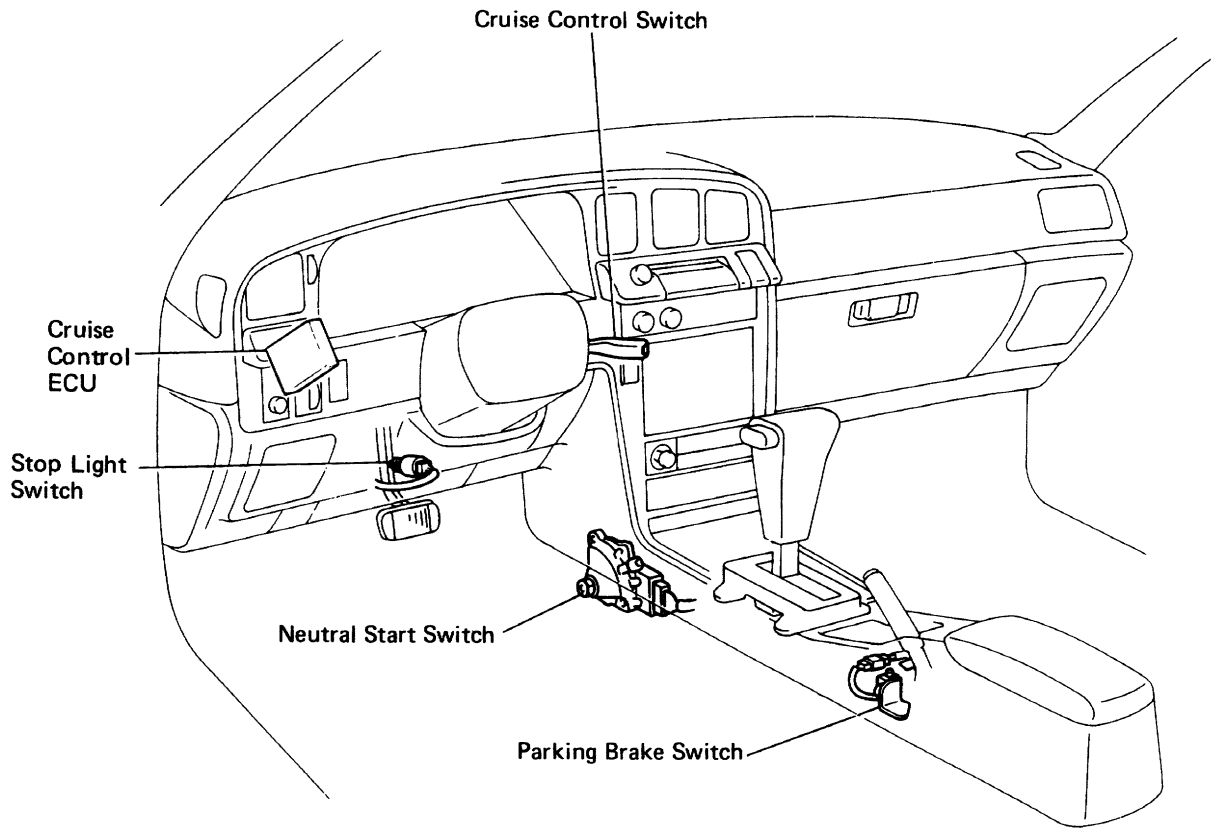
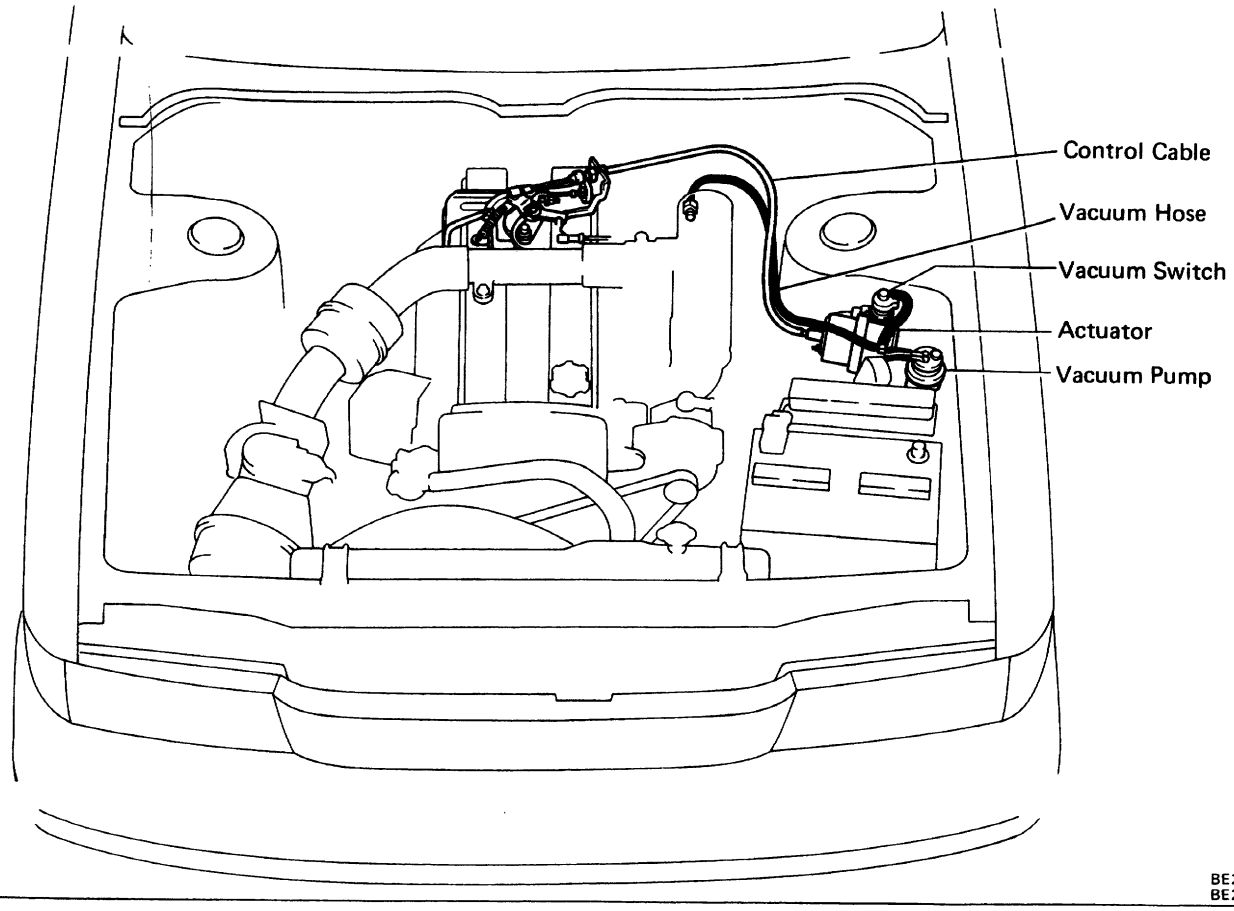
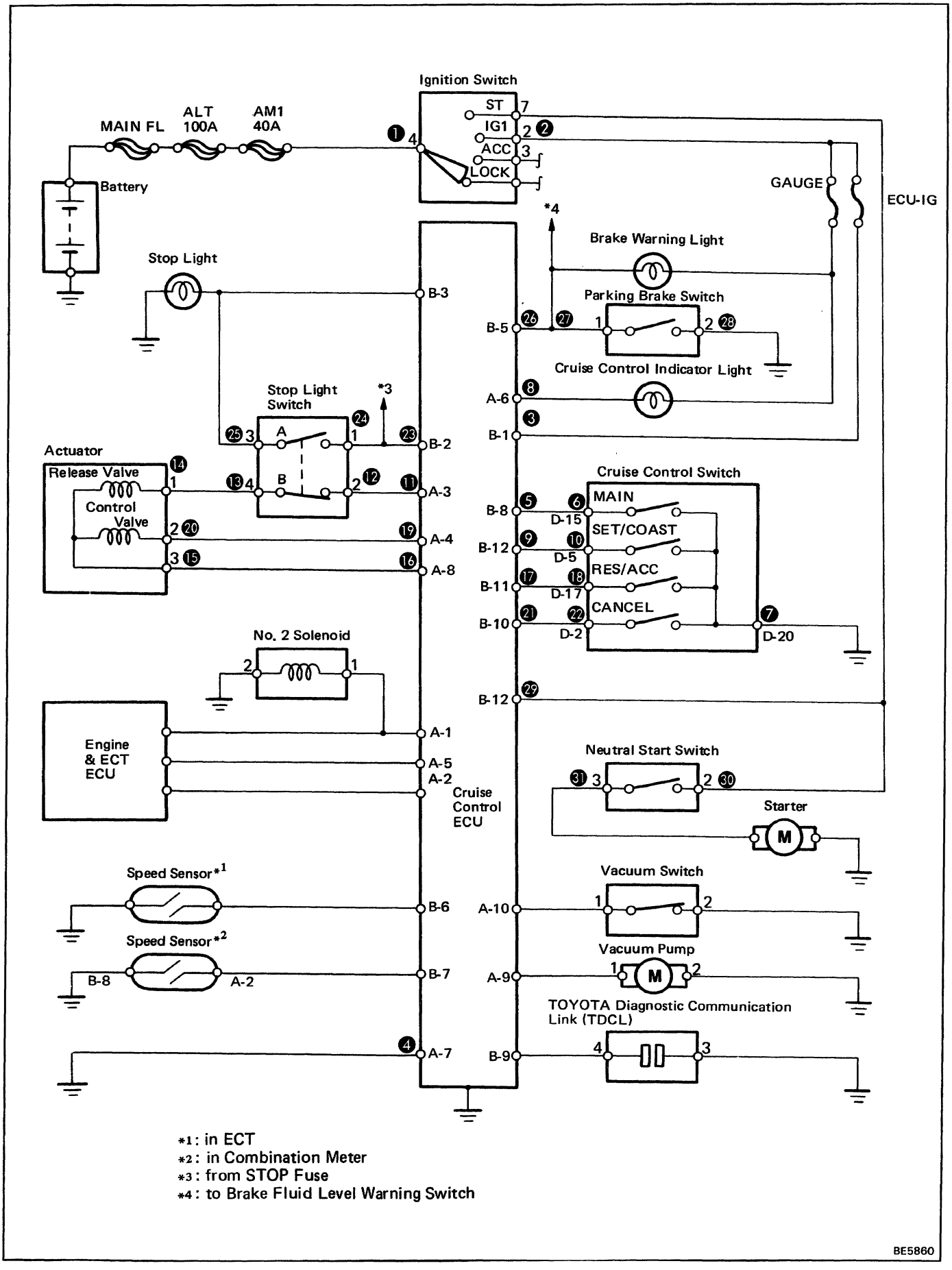
CRUISE CONTROL SYSTEM
Parts Location





BE2706
BE2707

Wiring Diagram

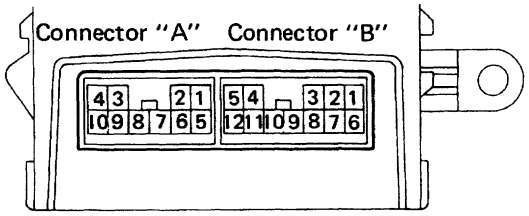


*1: in ECT
*2: in Combination Meter
*3: from STOP Fuse
*4: to Brake Fluid Level Warning Switch

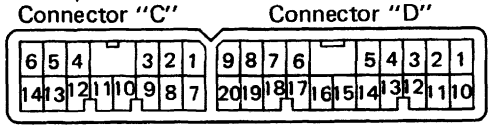
BE5860

Connector Diagrams

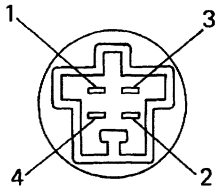
Cruise Control ECU



Cruise Control Switch
(Combination Switch Connector)



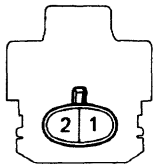
Stop Light Switch



Parking Brake Switch

Neutral Start Switch

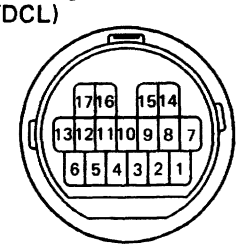
Vacuum Switch



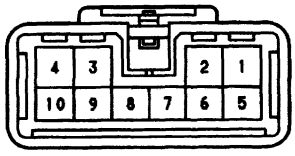
Actuator

Vacuum Pump

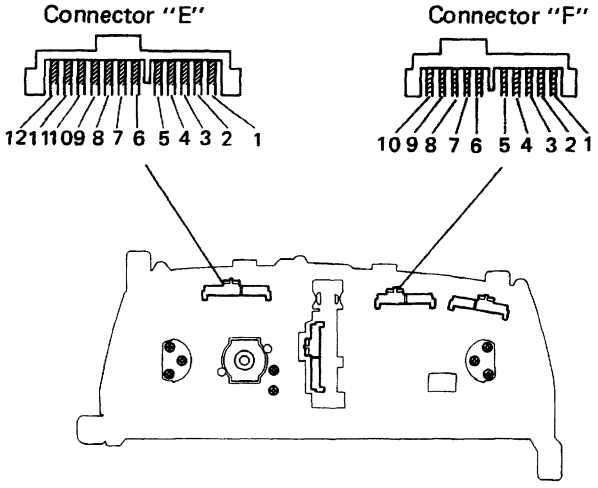
TOYOTA Diagnostic Communication Link (TDCL)



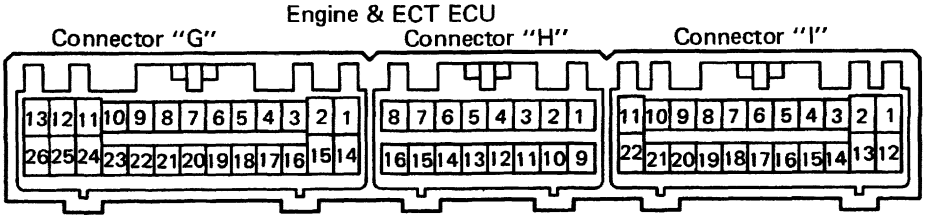
Ignition Switch



Speed Sensor (in Combination Meter)



Engine & ECT ECU



BE2709 V-34-2
BE5756 H-2-2 IC-3-2 BE2027
IS-3-2-A IS-2-2-0 FI3688
e-10-2-B BE1266 BE2676
BE2565
VAD-64-2

System Description

CONTROL SWITCH operation

Switch	Position
Ignition switch	ON

Current Circuit

Battery → ❶ → ❷ → ❸ → ❹ → Ground

- The cruise control switch controls MAIN switch, SET/COAST, RESUME/ACCEL and CANCEL function.

1. MAIN SWITCH operation

Switch	Position
Ignition switch	ON
CC MAIN switch	ON

Current Circuit

Battery → ❶ → ❷ → ❸ → ❺ → ❻ → ❼ → Ground
❸ → ❽ → ❹ → Ground
(Indicator Light ON)

2. SET/COAST SWITCH operation

Switch	Position
Ignition switch	ON
CC MAIN switch	ON
SET/COAST switch	ON

Current Circuit

Battery → ❶ → ❷ → ❸ → ❺ → ❻ → ❼ → Ground
❸ → ❽ → ❹ → Ground
(Indicator Light ON)

Condition: Continuity ❾ → ❿ → ❼ → Ground (SET/COAST switch ON)

<Actuator Operation> (Current Circuit)

⓫ → ⓬ → ⓭ → ⓮ → ⓯ → ⓰ → ❹ → Ground

If the SET/COAST switch is released at the moment, the vehicle speed is registered in memory.

3. RESUME/ACCEL SWITCH operation

Switch	Position
Ignition switch	ON
CC MAIN switch	ON
RESUME/ACCEL switch	ON

Current Circuit

Battery → ❶ → ❷ → ❸ → ❺ → ❻ → ❼ → Ground
❸ → ❽ → ❹ → Ground
(Indicator Light ON)

Condition: Continuity ⓱ → ⓲ → ❼ → Ground (RESUME/ACCEL switch ON)

<Actuator Operation> (Current Circuit)

⓫ → ⓬ → ⓯ → ⓰ → ❹ → Ground

If the RESUME/ACCEL switch is released at the moment, the vehicle speed is registered in memory.

4. CANCEL operation

- The Cruise Control is provided with several types of the cancel switch, such as the cruise control switch (CANCEL), the stop light switch, the parking brake switch and the neutral start switch.

(a) Cruise Control Switch (CANCEL)

Switch	Position
CANCEL switch	ON

Condition: Continuity ㉑ → ㉒ → ⑦ → Ground

Then, cancellation signal is send to CC ECU.

(b) Stop Light Switch

Switch	Position
Stop light switch (Brake pedal depressed)	ON

Condition: Continuity ㉓ → ㉔ → ㉕ → Ground
⑪ → ⑫
⑬ → ⑭

Condition: No continuity ⑫ → ⑬

Then, cancellation signal is send to CC ECU.

(c) Parking Brake Switch

Switch	Position
Parking brake switch (Parking brake lever pulled)	ON

Condition: Continuity ㉖ → ㉗ → ㉘ → Ground

Then, cancellation signal is send to CC ECU.

(d) Neutral Start Switch

Switch	Position
Neutral start switch	ON

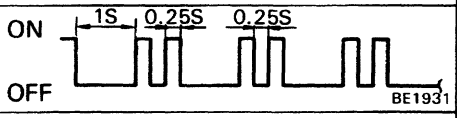
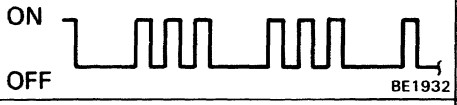
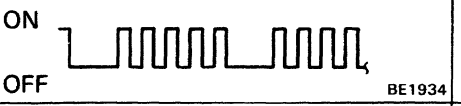
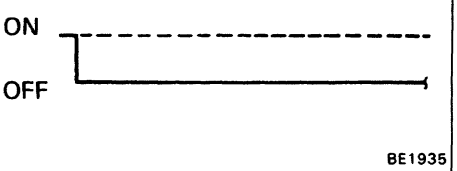
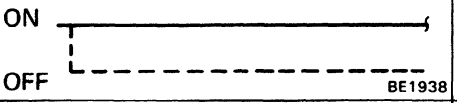
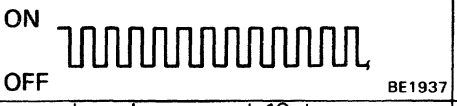
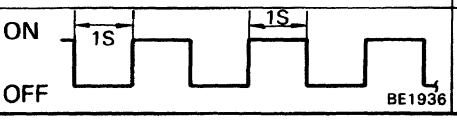
Condition: Continuity ㉙ → ㉚ → ㉛ → Ground

Then, cancellation signal is send to CC ECU.

Therefore, the operation of the CCS is canceled and the actuator is shut off due to the operation of these switches.

Diagnosis System
Output of Diagnostic Code
READ DIAGNOSTIC CODE
(Type A)

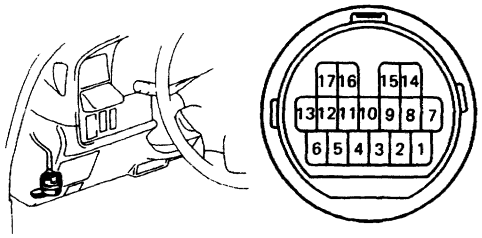
(a) Turn the ignition switch on
(b) Turn the control switch to SET/COAST position, and keep it.
(e) Push the main switch ON.
(d) Check that the indicator light "CRUISE" in the combination meter.
(e) Turn the SET/COAST switch off.
(f) Meet the conditions listed below.
(g) Read the diagnostic code on the 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	Vacuum switch is turned ON.		Vacuum switch circuit is normal.
4	Each cancel switch is turned ON. • Control switch (to CANCEL) • Stop light switch • Parking brake switch • Neutral start switch (to N or P range)		Each cancel switch is normal.
5	Drive approx. 40 km/h (25 mph) or below.		Speed sensor circuit is normal.
6	Drive approx. 40 krn/h (25 mph) or over. (w/o ECT)		Speed sensor (in meter) circuit is normal.
7	Drive 40 km/h (25 mph) or over. (wl ECT)		Speed sensor (in ECT) circuit is normal.

HINT:

- After inspecting No.3, turn the vacuum switch OFF and perform No.4–7.
- Disconnect the vacuum switch connector.
- Idle the engine.
- If there is no indication code, perform diagnosis and inspection. (See page BE–89)
- Indication is stopped when the MAIN switch is repushed.

TOYOTA Diagnostic Communication Link (TDCL)



BE2710 FI3688

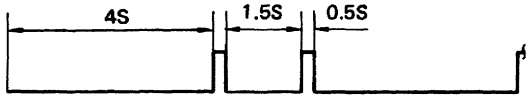
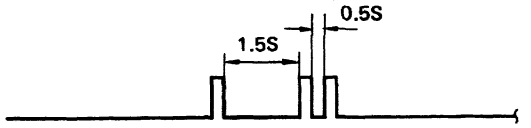
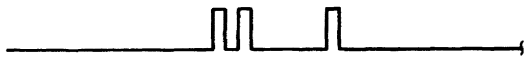
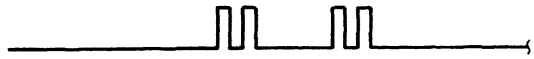
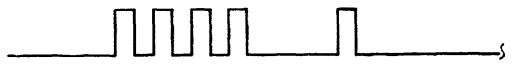
(Type B)

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

(b) While stopped, connect terminals 3 and 4 of the TOYOTA Diagnostic Communication Link (TDCL).

HINT: Should the power be cut, the diagnostic code will be erased from the ECU memory.

(c) Read the diagnostic code on the cruise control indicator light.

Indication code		Diagnosis
	 BE1939	Normal.
11	 BE1940	Actuator circuit or Actuator (Control Valve Circuit) is abnormal.
12	 BE2711	Actuator circuit or Actuator (Release Valve Circuit) is abnormal.
21	 BE1941	Speed sensor (in Meter) circuit is abnormal.
22	 BE1942	Speed sensor (in ECT) circuit is abnormal.
23	 BE1943	*Vehicle speed has decreased by 16 km/h (10 mph) or more from the set speed.
31	 BE1944	RES/ACC switch circuit is abnormal. (Switch signal always turned on.)
33	 BE2712	SET/COAST switch signal and RES/ACC switch signal turned on simultaneously.
41	 BE4343	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 diagnosis and inspection. (See page BE–89)

Troubleshooting

You will find the troubles easier using the table well shown below. In this table, each number shows the priority of causes in troubles. Check each part in order.

Chart No.					E	A	B,C,D	H	J	I	K	K	F,G		
Inspection Item / **Diagnosis Code** / **Problem**	Type B	Type A		ECU	Actuator	Main Switch	Control Switch	Stop Light Switch	Neutral Start Switch	Parking Brake Switch	Vacuum Switch	Vacuum Pump	Speed Sensor or Speedometer Cable	Speedometer Cable Function	Others
• "CRUISE" indicator light blinks 5 time. • Cruise control system does not set. • Cruise control system does not operate.	11			2	1										
	12			3	1			2							
	21			2									1		
	22			2									1		*2
	23			6	2						5	4	3	1	*3
	31			2			1								
	33			2			1								
	Normal	5	OK	8	7	1	2	3	4	5				6	*4
			NG	2									1		
Setting speed deviated on high or low side.		3	OK	6	5						4	3	2	1	
			NG								1				
Vehicle speed fluctuates when speed control switch turned to SET.				4	3								1	2	
Setting speed does not cancel when brake pedal depressed.		4	OK	3	1			2							
			NG	2				1							
Setting speed does not cancel when parking brake lever pulled.		4	OK	2	1										
			NG	2						1					
Setting speed does not cancel when shifted to "N" range.		4	OK	2	1										
			NG	2					1						
Vehicle speed does not decrease when speed control switch turned to COAST.		1	OK	3	1									2	
			NG	2			1								
Vehicle speed does not accelerate when speed control switch turned to ACC.		2	OK	3	1									2	
			NG	2			1								
Vehicle speed does not return to memorized speed when control switch turned on RESUME.		2	OK	3	1									2	
			NG	2			1								
Setting speed does not cancel when speed control switch turned to CANCEL.		4	OK	2	1										
			NG	2			1								
Speed can be set below about 40 km/h (25 mph).		5	OK	2	1										
			NG	2									1		
Cruise control wilt not disengage even at about 40 km/h (25 mph).		5	OK	2	1										
			NG	3									1	2	
Acceleration response is sluggish when speed control switch turned to "ACCEL" or "RESUME".		3	OK	4	3							2		1	*3
			NG								1	2			

*1 : In the Speedometer or ECT Sensor * 2 : w/ ABS; Rear Speed Sensor or ABS ECU *3 : Vacuum Hose
*4 : Vacuum Hose & Brake Fluid

Inspection Chart

A INSPECTION OF POWER SOURCE CIRCUIT

Turn ignition switch on.

Is ECU–IG fuse normal?

No → Replace fuse. Is operation normal?

No → • Short circuit in wire harness between ECU–IG fuse and terminal D 3 of control switch or terminal 131 of ECU.
• Inspect main switch. (See page BE–111)

Yes → Yes → Fuse faulty.

MAIN SWITCH

Disconnect combination switch connector.

INSPECT POWER SOURCE
Is there battery voltage between terminal D20 and ground?

No → Open circuit in wire harness between ECU–IG fuse and terminal D3 of control switch.

Yes

INSPECT SWITCH OPERATION
Is main switch operation normal? (See page BE–111)

No → Replace control switch. Then recheck system.

Yes

Is there battery voltage between terminal B8 of ECU and ground with main switch pushed on?

No → Open circuit in wire harness between terminal D 15 of control switch and terminal B 8 of ECU.

Yes

Is there continuity between terminal D 15 of control switch and ground?

Yes → Short circuit in wire harness between terminal D 15 of control switch and terminal B8 of ECU.

No

Connect combination switch connector.

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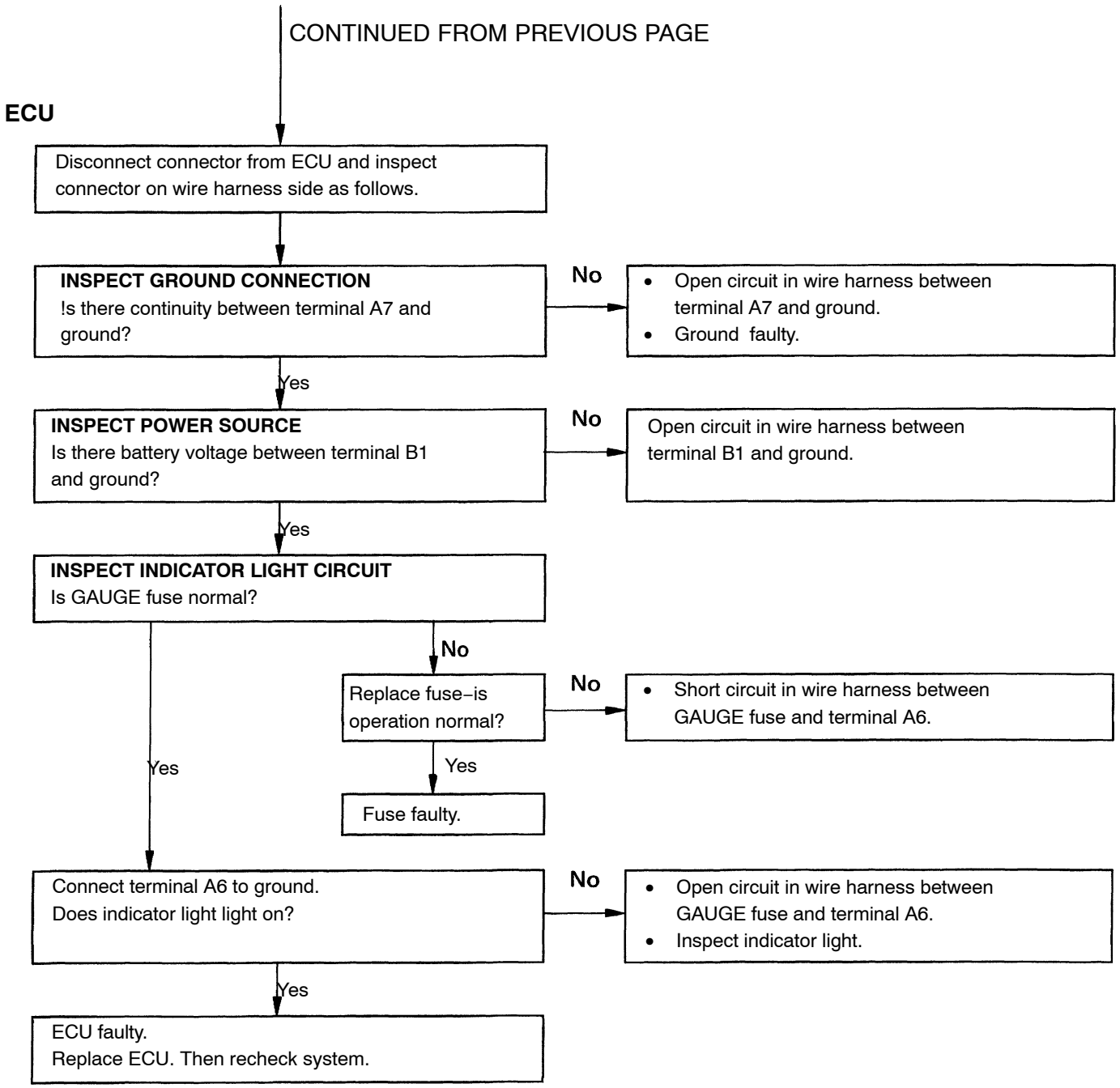
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ECU
Disconnect connector from ECU and inspect connector on wire harness side as follows.
INSPECT GROUND CONNECTION
!s there continuity between terminal A7 and ground?
No
• Open circuit in wire harness between terminal A7 and ground.
• Ground faulty.
Yes
INSPECT POWER SOURCE
Is there battery voltage between terminal B1 and ground?
No
Open circuit in wire harness between terminal B1 and ground.
Yes
INSPECT INDICATOR LIGHT CIRCUIT
Is GAUGE fuse normal?
No
Replace fuse–is operation normal?
No
• Short circuit in wire harness between GAUGE fuse and terminal A6.
Yes
Yes
Fuse faulty.
Yes
Connect terminal A6 to ground.
Does indicator light light on?
No
• Open circuit in wire harness between GAUGE fuse and terminal A6.
• Inspect indicator light.
Yes
ECU faulty.
Replace ECU. Then recheck system.

B INSPECTION OF SET/COAST SWITCH CIRCUIT

Turn ignition switch off.

CONTROL SWITCH

INSPECT GROUND CONNECTION
Disconnect combination switch connector
Is there continuity between terminal D20 of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal D20 and ground.
- Ground faulty.

Yes ↓

INSPECT CONTROL SWITCH OPERATION
Is control switch operation normal?
(See page BE–110)

No → Replace control switch. Then recheck system.

Yes ↓

Connect combination switch connector.

ECU

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

INSPECT SET/COAST CIRCUIT
Is there continuity between terminal B 12 and ground with control switch turned to SET/COAST position?

No → Open circuit in wire harness between terminal B 12 of ECU and terminal D 5 of control switch.

Yes ↓

Is there continuity between terminal B 12 and ground when control switch released?

Yes → Short circuit in wire harness between terminal6 12 of ECU and terminal D 5 of control switch.

No ↓

ECU faulty.
Replace ECU. Then recheck system.

C INSPECTION OF RES/ACC SWITCH CIRCUIT

Turn ignition switch off.

CONTROL SWITCH

INSPECT GROUND CONNECTION
Disconnect combination switch connector.
Is there continuity between terminal D20 of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal D20 and ground.
- Ground faulty.

Yes ↓

INSPECT CONTROL SWITCH OPERATION
Is control switch operation normal?
(See page BE–111)

No → Replace control switch. Then recheck system.

Yes ↓

Connect combination switch connector.

ECU

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

INSPECT RESUME/ACCEL CIRCUIT
Is there continuity between terminal B 11 and ground with control switch turned to RESUME/ ACCEL position?

No → Open circuit in wire harness between terminal B 11 of ECU and terminal D 17 of control switch.

Yes ↓

Is there continuity between terminal B 11 and ground when control switch released?

Yes → Short circuit in wire harness between terminal B 11 of ECU and terminal D 17 of control switch.

No ↓

ECU faulty.
Replace ECU. Then recheck system.

D INSPECTION OF CANCEL SWITCH CIRCUIT

Turn ignition switch off.

CONTROL SWITCH

INSPECT GROUND CONNECTION
Disconnect combination switch connector
Is there continuity between terminal D20 of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal D20 and ground.
- Ground faulty.

Yes ↓

INSPECT CONTROL SWITCH OPERATION
Is control switch operation normal?
(See page BE–111)

No → Replace control switch. Then recheck system.

Yes ↓

Connect combination switch connector.

ECU

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

INSPECT CANCEL CIRCUIT
Is there continuity between terminal B 10 and ground with control switch turned to CANCEL position?

No → Open circuit in wire harness between terminal B 10 of ECU and terminal D 11 of control switch.

Yes ↓

Is there continuity between terminal B 10 and ground when control switch released?

Yes → Short circuit in wire harness between terminal B 10 of ECU and terminal D 11 of control switch.

No ↓

ECU faulty.
Replace ECU. Then recheck system.

E INSPECTION OF ACTUATOR CIRCUIT

Turn ignition switch off.

VACUUM HOSE

Are there cracks or other damage on the vacuum hose?

Yes → Replace vacuum hose. Then recheck system.

No

ACTUATOR

INSPECT CABLE FREEPLAY
Is control cable freeplay less than 10 mm (0.39 in.)?

No → Adjust control cable freeplay.

Yes

INSPECT ACTUATOR OPERATION
Disconnect connector from actuator.
Is actuator operation normal?
(See page BE–112)

No → Replace actuator. Then recheck system.

Yes

Is there continuity between terminal 3 of wire harness side connector and ground?

No → Open circuit in wire harness between terminal 3 of actuator and terminal A8 of ECU.

Yes

STOP LIGHT SWITCH

INSPECT STOP LIGHT SWITCH CIRCUIT
Disconnect connector from stop light switch.
Is there continuity between terminal 4 of wire harness side connector and ground?

Yes → Short circuit in wire harness between terminal 1 of actuator and terminal 4 of stop light switch.

No

Connect the connector to actuator.
Is there continuity between terminal 4 of wire harness side connector and ground?

No → Open circuit in wire harness between terminal 1 of actuator and terminal 4 of stop light switch.

Yes (There is resistance approx. 68 Ω)

INSPECT STOP LIGHT SWITCH OPERATION
Is stop light switch operation normal?
(See page BE–110)

→ Replace stop light switch. Then recheck system.

Yes

Connect connector to stop light switch.

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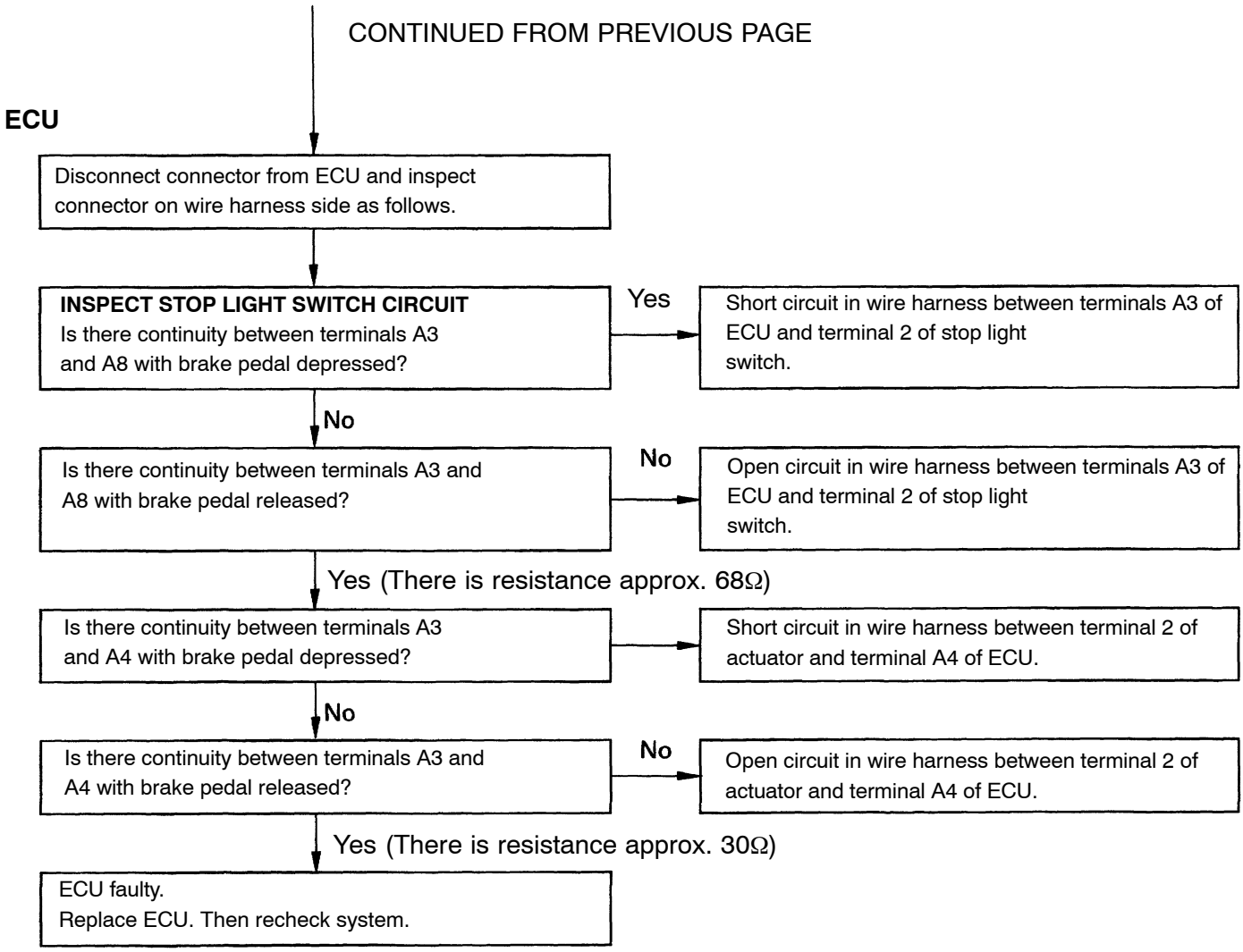
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ECU
Disconnect connector from ECU and inspect connector on wire harness side as follows.
INSPECT STOP LIGHT SWITCH CIRCUIT
Is there continuity between terminals A3 and A8 with brake pedal depressed?
Yes
Short circuit in wire harness between terminals A3 of ECU and terminal 2 of stop light switch.
No
Is there continuity between terminals A3 and A8 with brake pedal released?
No
Open circuit in wire harness between terminals A3 of ECU and terminal 2 of stop light switch.
Yes (There is resistance approx. 68Ω)
Is there continuity between terminals A3 and A4 with brake pedal depressed?
Short circuit in wire harness between terminal 2 of actuator and terminal A4 of ECU.
No
Is there continuity between terminals A3 and A4 with brake pedal released?
No
Open circuit in wire harness between terminal 2 of actuator and terminal A4 of ECU.
Yes (There is resistance approx. 30Ω)
ECU faulty.
Replace ECU. Then recheck system.

F INSPECTION OF SPEED SENSOR CIRCUIT (COMBINATION METER SIDE)

SPEEDOMETER CABLE

INSPECT SPEEDOMETER CABLE
Does the meter fluctuate when driving at a steady speed?

Yes → Meter cable faulty.

No

Turn ignition switch off.

SPEED SENSOR

INSPECT GROUND CONNECTION
Disconnect connectors from combination meter. Is there continuity between terminal B8 of wire harness side connector and ground?

No → Open circuit in wire harness between terminal B8 and ground.

Yes

INSPECT SPEED SENSOR OPERATION
Is speed sensor operation normal?
(See page BE–39 and BE–111)

No → Speed sensor faulty.

Yes

Turn ignition switch on.

Is there voltage 5 V or more between terminal B7 of ECU and ground.

No → ECU or power source faulty.
Recheck power source circuit.

Yes

Is there voltage 5 V or more between terminal A2 of wire harness side connector and ground?

No → Short circuit in wire harness between terminal A2 and terminal B 7 of ECU.

Yes

Turn ignition switch off.

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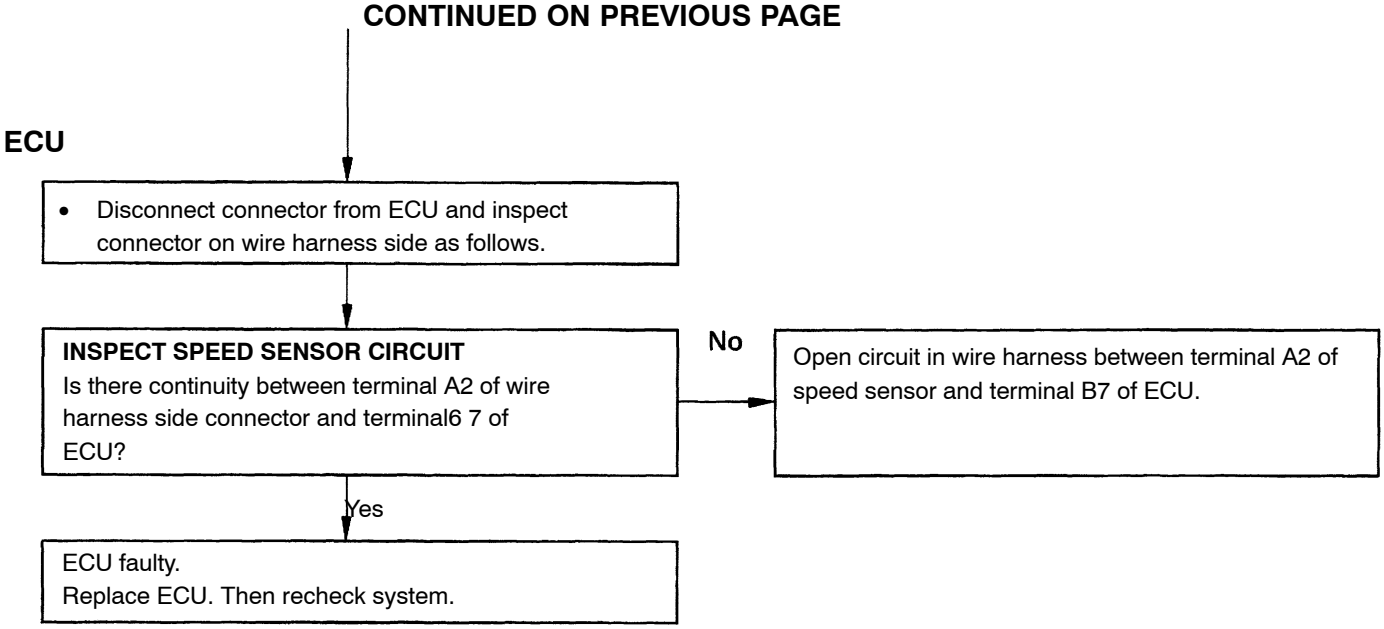

G INSPECTION OF SPEED SENSOR CIRCUIT (ECT SIDE)

Jack up rear wheel on one side.

SPEED SENSOR

INSPECT GROUND CONNECTION
Is there continuity between terminal of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal and ground.
- Ground faulty.

Yes ↓

INSPECT SPEED SENSOR OPERATION
Is speed sensor operation normal?
(See page BE–111)

No → Speed sensor faulty.

Yes ↓

Turn ignition switch on.

Is there voltage approx. 5 V or more between terminal B6 of ECU and ground?

No → ECU or power source faulty.
Recheck power source circuit.

Yes ↓

Is there voltage 5 V or more between terminal of speed sensor and ground?

No → Short circuit in wire harness between terminal of speed sensor and terminal B6 of ECU.

Yes ↓

Connect connector to speed sensor.

ECU

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

INSPECT SPEED SENSOR CIRCUIT
Does the voltage between terminal B6 and ground change repeatedly from 0 V to approx. 5 V or more when the wheel spins?

No →
- Open circuit in wire harness between terminal of ECU and speed sensor.
- Speed sensor connector connection faulty.

Yes ↓

ECU faulty.
Replace ECU. Then recheck system.

H INSPECTION OF STOP LIGHT SWITCH CIRCUIT

Turn ignition switch off.

Is STOP fuse normal?

No → Replace fuse. Is operation normal?

No → Short circuit in wire harness between terminal B2 of ECU or terminal 1 of stop light switch and fuse.

Yes

Yes → Fuse faulty.

STOP LIGHT SWITCH

INSPECT GROUND CONNECTION
Disconnect connector from stop light switch.
Is there continuity between terminal 3 of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal 3 and ground.
- Body ground faulty.

Yes

INSPECT STOP LIGHT SWITCH OPERATION
Is stop light switch operation normal?
(See page BE–111)

No → Replace stop light switch.

Yes

Connect connector to stop light switch.

ECU

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

INSPECT STOP FUSE CIRCUIT
Is there battery voltage between terminal B2 and ground with brake pedal released?

No → Open circuit in wire harness between terminal B2 of ECU and STOP fuse.

Yes

INSPECT STOP LIGHT SWITCH CIRCUIT
Is there battery voltage between terminal63 and ground with brake pedal depressed?

No → Open circuit in wire harness between terminal B3 of ECU and terminal 3 of stop light switch.

Yes

Replace ECU.

INSPECTION OF PARKING BRAKE SWITCH CIRCUIT

Turn ignition switch off.

BRAKE FLUID LEVEL WARNING SWITCH

INSPECT GROUND CONNECTION
Disconnect connector from brake fluid level warning switch. Is there continuity between terminal 2 of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal 2 of brake fluid level warning switch.
- Ground faulty.

Yes ↓

INSPECT BRAKE WARNING SWITCH
Is brake fluid level warning switch operation normal? (See page BE–43)

No → Replace brake warning switch.

Yes ↓

Connect the connector to brake warning switch.

PARKING BRAKE SWITCH

INSPECT GROUND CONNECTION
Disconnect connector from parking brake switch. Is there continuity between terminal 2 of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal 2 of parking brake switch.
- Ground faulty.

Yes ↓

INSPECT PARKING BRAKE SWITCH OPERATION
Disconnect connector from parking brake switch. Is parking brake switch operation normal? (See page BE–43)

No → Replace parking brake switch.

Yes ↓

Connect connector to parking brake switch.

ECU

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

Ignition switch turned on.

Is there no voltage between terminal65 and ground with parking brake lever pulled up?

No → Open circuit in wire harness between terminal B 5 of ECU and terminal of parking brake switch.

Yes ↓

Is there battery voltage between terminal B5 and body ground with parking brake released?

No → Short circuit in wire harness between terminal B 5 of ECU and terminal 1 of parking brake switch, terminal 1 of brake fluid level warning switch or parking brake Indicator light.

Yes ↓

ECU faulty.
Replace ECU. Then recheck system.

J INSPECTION OF NEUTRAL START SWITCH CIRCUIT

Turn ignition switch off.

NEUTRAL START SWITCH

INSPECT GROUND CONNECTION
Disconnect connector from neutral start switch. Is there continuity between terminal 3 of wire harness side connector and ground?

No → Open circuit in wire harness between terminal 3 of neutral start switch and ground.

Yes

INSPECT NEUTRAL START SWITCH OPERATION
Is neutral start switch operation .normal?
(See page AT–40)

No → Replace neutral switch.

Yes

Connect connector to neutral start switch.

ECU

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

INSPECT NEUTRAL START SWITCH CIRCUIT
Is there continuity between terminal B4 and ground when shifted to ”N” and ”P” range?

No → Open circuit in wire harness between terminal64 of ECU and terminal 2 of neutral start switch.

Yes

ECU faulty.
Replace ECU. Then recheck system.

K INSPECTION OF VACUUM CIRCUIT

Turn ignition switch off.

VACUUM HOSE

Are there cracks or other damage on the vacuum hose?

Yes → Replace vacuum hose.

No

VACUUM SWITCH

INSPECT VACUUM SWITCH CIRCUIT
Disconnect connector from vacuum switch.
Is there continuity terminal 2 of vacuum switch and ground?

No →
- Open circuit in wire harness between terminal 2 of vacuum switch and ground.
- Ground faulty.

Yes

INSPECT VACUUM SWITCH OPERATION
Is vacuum switch normal? (See page BE–111)

No → Replace vacuum switch.

Yes

VACUUM PUMP

INSPECT GROUND CONNECTION
Disconnect connector from vacuum pump.
Is there continuity between terminal 2 of wire harness side connector and ground?

No →
- Open circuit in wire harness between terminal 2 and ground.
- Ground faulty.

Yes

INSPECT VACUUM PUMP OPERATION
Is vacuum pump operation normal?
(See page BE–112)

No → Replace vacuum pump.

Yes

Connect connector to vacuum switch and pump.

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ECU

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

INSPECT VACUUM SWITCH CIRCUIT
Is there continuity between terminal A 10 and ground?

No → Open circuit in wire harness between terminal A 10 of ECU and terminal 1 of vacuum switch.

Yes

Start engine (idling).

Is there continuity between terminal A 10 and ground?

Yes → Short circuit in wire harness between terminal A 10 of ECU and terminal 1 of vacuum switch.

No

Stop engine.

INSPECT VACUUM PUMP CIRCUIT
Is there continuity between terminal 1 and ground?

No → Open circuit in wire harness between terminal A9 of ECU and terminal 1 of vacuum switch.

Yes

Is there continuity between terminal 1 and ground when disconnect connector from vacuum pump?

Yes → Short circuit in wire harness between terminal A9 of ECU and terminal 1 of vacuum pump.

No

ECU faulty.
Replace ECU. Then recheck system.

L INSPECTION OF ECT SOLENOID CIRCUIT

Start engine (idling).

TCCS ECU

Is there battery voltage between terminal G21 of Engine & ECT ECU and ground?

No → Short or open circuit in wire harness between terminal G21 of Engine & ECT ECU and terminal A5 of ECU.

Yes

Is there voltage approx. 5 V between terminal A2 of ECU and ground?

No → Short or open circuit in wire harness between terminal A2 of ECU and terminal 121 of Engine & ECT ECU.

Yes

Stop engine.

ECU

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

INSPECT ECT SOLENOID CIRCUIT
Is there continuity between terminal A1 of wire harness side connector and terminal G18 of Engine & ECT ECU?

No → Open circuit in wire harness between terminal A1 of ECU and terminal G 18 of Engine & ECT ECU.

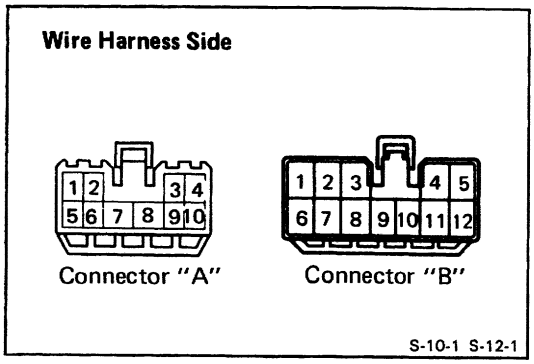
Yes

Is resistance value about 11 – 15Ω between terminal G 18 wire harness side connector and ground?

No → Open or short circuit in wire harness between terminal A 1 of ECU and terminal G 18 of Engine & ECT ECU or ECT solenoid (No. 2).

Yes

ECU faulty.
Replace ECU. Then recheck system.



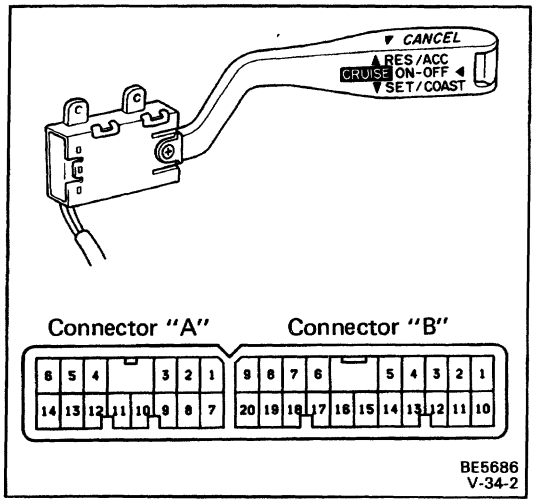
Parts Inspection

1. INSPECT ECU CIRCUIT

Disconnect the connector from the ECU and inspect the connector on wire harness side as shown below.

Connection or Measure item	Check for	Tester Connection	Condition		Specified valve
Body ground	Continuity	A–7 – Ground	Constant		Continuity
Vacuum pump		A–9 – Ground	Constant		Continuity * 1
Vacuum switch		A–10 – Ground	Vacuum	No vacuum	Continuity
				More than 170 f 30 mmHg (6.69 ± 1.18 in.Hg 22.66 ± 4.0 kPa)	No continuity
Stop light switch		B–2 – B–3	Brake pedal position	Depressed	Continuity* 1
				Released	No continuity
Stop light		B–3 – Ground	Constant		Continuity* 1
Neutral start switch		B–4 – Ground	Shift position	"N" or "P" range	Continuity
				Ex. "N" or "P" range	No continuity
Parking brake switch		B–5 – Ground	Parking brake lever position	Pulled	Continuity
				Released	No continuity
Speed sensor * 3		B–6 – Ground	Vehicle moving slowly		1 pulse per each revo–lution of propeller shaft
Speed sensor *4 (in combination meter)		B–7 – Ground	Vehicle moving slowly		1 pulse each 40 cm approx. (15.75 in.)
MAIN switch*2		B–1 – B–8	Main switch position	Pushed	Continuity
				Released	No continuity
TOYOTA Diagnostic Communication Link		B–9 – Ground	Short terminals between "Tc" and "El"		Continuity
			Released		No continuity
CANCEL switch*2		6–10 – Ground	Cruise control switch position	Turned to "CANCEL"	Continuity
				Released	No continuity
RES/ACC switch*2		B–11 –Ground		Turned to "RES/ACC"	Continuity
				Released	No continuity
SET/COAST switch*2		B–12 – Ground		Turned to "SET/COAST"'	Continuity
				Released	No continuity
No. 2 solenoid valve * 3	Resistance	A–1 – Ground	Constant		less than 15 0
Stop light switch and actuator (release valve)		A–3 – A–8	Brake pedal position	Depressed	No continuity
				Released	Approx. 68Ω
Actuator (control valve)		A–4 – Ground	Constant		Approx. 30 12
GAUGE fuse and indicator light	Voltage	A–6 – Ground	Ignition switch position	ON	Battery voltage
				LOCK, ACC or ST	No voltage
ECU–IG fuse (Power source)		B–1 – Ground		ON	Battery voltage
				LOCK, ACC or ST	No voltage

*1 : There is resistance in the circuit. *2 : There is on cruise control switch. *3 : There is in ATM. *4 : There is in combination meter

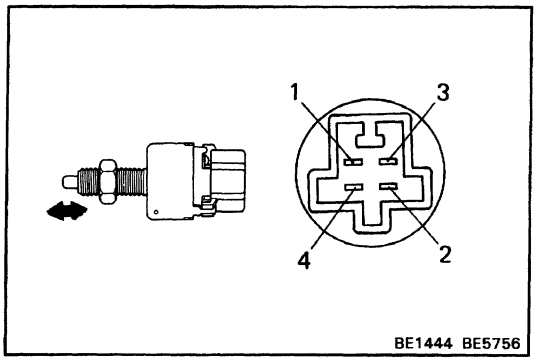


2. INSPECT SWITCHES

(Control Switch/Continuity)

Terminal / Switch position	B3 (L)	65 (V)	B2 (y)	B15 (R)	B17 (O)	B20 (B)
OFF						
RES/ACC					○	○
MAIN				○		○
SET/COAST		○				○
CANCEL			○			○

If continuity is not as specified, replace the switch.

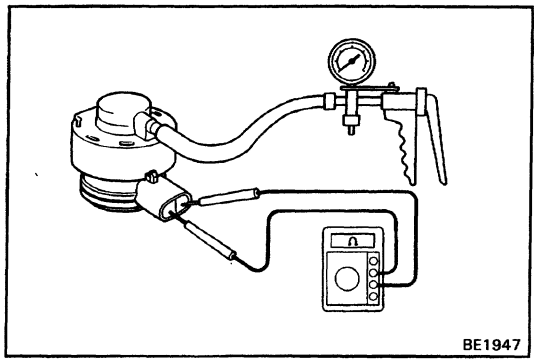


(Stop Light Switch/ Continuity)

Inspect the switch continuity between terminals.

Terminals / 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 switch.



(Vacuum Switch/ Operation)

(a) Check that there is continuity between terminals with no vacuum.

(b) Check that there is no continuity between terminals with a vacuum of 170 ± 30 mmHg (6.69 ± 1.18 in.Hg, 22.66 ± 4.00 kPa) or above.

If operation is not as specified, replace the switch.

(Parking Brake Switch/ Operation)

See step 2 on page BE–43.

(Neutral Start Switch/ Operation)

See page AT–40.

3. INSPECT SPEED SENSOR

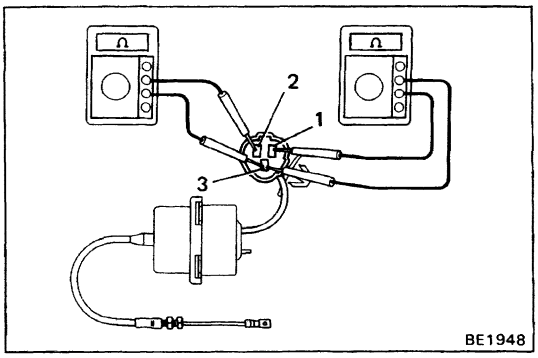
(Combination Meter Side/ Operation)

See step 2 on page BE–39.

(ECT Side)

w/o ABS: See step 6 on page AT–31.

w/ ABS: See Inspection of Rear Speed sensor on page BR–76.



4. INSPECT ACTUATOR

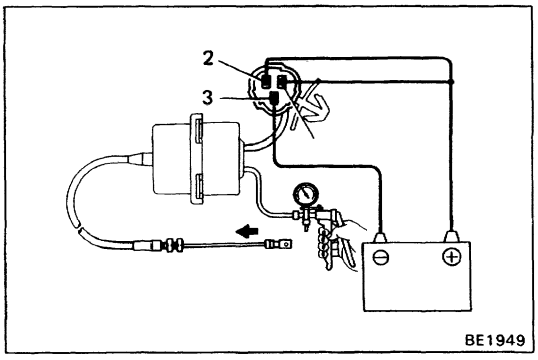
(Resistance)

Measure the resistance value between terminals as follows.

Resistance: 1 – 3 Approx. 68Ω

2 – 3 Approx. 30Ω

If the resistance value is not as specified, replace the actuator.



(Operation)

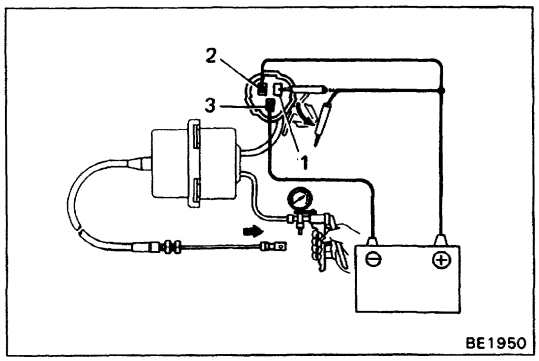
(a) Connect the positive (+) lead from the battery to terminals 1 and 2, and the negative (–) lead to terminal 3.

(b) Slowly apply vacuum from 0 to 300 mmHg (0 to 11. 81 in.Hg, 0 to 40.0 kPa), check that the control cable can be pulled smoothly.

Cable stroke: Approx. 36 mm (1.42 in.)

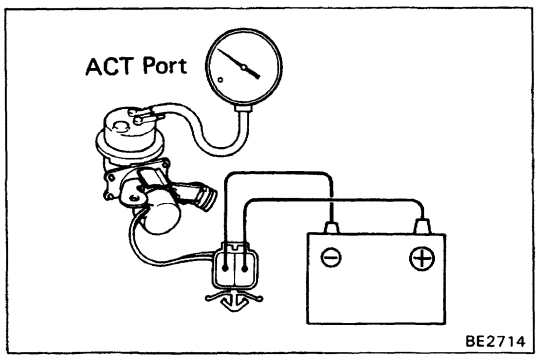
(c) With the vacuum stabilized, check that the control cable does not return.

HINT: As you apply and hold the vacuum with the vacuum pump, the drawn in diaphragm will in some cases return. This does not indicate a malfunction. Actuator leakage is allowable.



(d) Disconnect terminal i or 2 and check that the control cable returns to its original position and the vacuum returns to 0 mmHg (0 in.Hg, 0 kPa).

If operation is not as specified, replace the actuator.



5. INSPECT VACUUM PUMP

(a) Connect a vacuum gauge to the ACT side of the pump.

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

(c) Check that there is a vacuum of 200 mmHg (7.87 in. Hg, 26.7 kPa) or above.

If operation is not as specified, replace the pump.