

CRUISE CONTROL SYSTEM

1993 Toyota Celica

1993 ACCESSORIES/SAFETY EQUIPMENT
Toyota Cruise Control Systems

Celica

DESCRIPTION

Cruise control system consists of Cruise Control Electronic Control Unit (CC ECU), actuator and associated cables, speed sensor(s), parking brake switch, cruise control switch, stoplight switch, park/neutral switch (A/T), clutch switch (M/T) and related wiring. See Fig. 1. System allows vehicle to cruise at a desired speed greater than 25 MPH.

Speed control will cancel when brake pedal or clutch pedal is depressed, CANCEL switch is activated or automatic transmission shift lever is moved to "N" position. If vehicle speed falls below 25 MPH or drops 10 MPH less than preset speed, will be canceled. If a malfunction is detected in either actuator, speed sensor or speed control switch circuits cruise control function, speed control will also be canceled.

OPERATION

Pressing cruise control CRUISE ON-OFF to ON position, activates system. CRUISE indicator light in instrument cluster comes on to indicate activation of system. To set desired speed, press control SET/COAST switch and release switch. Vehicle speed will now be maintained. To increase speed, depress accelerator pedal enough to exceed set speed. When accelerator pedal is released, speed will return to speed previously set.

To cancel set speed, press cruise control CANCEL switch, depress brake pedal, depress clutch pedal or place shift lever in "N" position. If vehicle speed falls to less than 25 MPH, set speed will automatically cancel. If vehicle speed falls below set speed by 10 MPH, set speed will also automatically cancel.

Pressing cruise control RES/ACC switch, allows vehicle to return to set speed before cancellation. Pressing cruise control RES/ACC position and keeping it there gradually increases vehicle speed. Pressing cruise control SET/COAST position and keeping it there gradually decreases vehicle speed.

ACTUATOR (MOTOR)

Actuator consists of a motor, safety magnetic clutch, control arm and position sensor. When actuator receives a signal from CC ECU, it engages safety magnetic clutch and activates motor. Motor causes control arm to move, opening or closing engine throttle valve.

When motor rotates forward, control arm also rotates via safety magnetic clutch, gears and drive shaft. Control arm pulls a cable connected to engine throttle valve and opens the valve accordingly. When motor rotates in a reverse direction, control arm also rotates in a reverse direction and engine throttle valve closes.

Safety magnetic clutch disengages motor from control arm and shuts throttle valve when vehicle speed approaches 10 MPH or more above set speed during cruise control operation, when motor malfunctions or when a circuit problem occurs. Position sensor detects rotary angle of control arm and constantly sends a signal to CC ECU.

ACTUATOR (VACUUM)

Actuator consists of a vacuum diaphragm, control cable and vacuum control valve. When cruise control is activated, vacuum actuator receives an input signal from CC ECU, to increase vehicle speed. Signal from CC ECU causes vacuum control valve to close atmospheric intake port introducing a vacuum to diaphragm. Control cable is pulled and throttle valve is opened, increasing vehicle speed to preselected speed. To close throttle valve, signal from CC ECU is decreased, causing vacuum control valve to reduce vacuum and increase atmospheric pressure. Control cable is released and throttle valve is closed.

CRUISE CONTROL SWITCH

CRUISE ON-OFF Switch

Cruise control CRUISE ON-OFF switch is power switch for cruise control system. When ignition is turned off, cruise control CRUISE ON-OFF switch is also turned off. Switch remains off even when ignition is turned on again.

SET/COAST Position

With cruise control CRUISE ON-OFF switch turned on and vehicle speed greater than 25 MPH, press cruise control switch in SET/COAST position and then release. CC ECU will store vehicle speed and control that speed constantly.

While in cruise control mode, if cruise control switch is pressed and held in SET/COAST position, actuator motor will be energized. Engine throttle valve will close, and vehicle will decelerate until switch is released. From then on, CC ECU will store new vehicle speed and control that speed constantly.

RES/ACC Position

If cruise control system is canceled by any of various cancellation methods, the previously set speed can be resumed by moving cruise control switch to RES/ACC position and then releasing. Set speed, however, cannot be resumed if vehicle speed drops to less than 25 MPH, as CC ECU memory will be cleared.

While in cruise control mode, if cruise control switch is pressed and held in RES/ACC position, actuator motor will be energized. Engine throttle valve will open, and vehicle will accelerate until switch is released. From then on, CC ECU stores new vehicle speed and controls that speed constantly.

CANCEL Position

When cruise control switch is turned to CANCEL position, a cancellation signal is sent from cruise control switch to CC ECU.

CRUISE CONTROL ELECTRONIC CONTROL UNIT (CC ECU)

CC ECU constantly monitors and compares set speed with actual vehicle speed from input sensors. When vehicle speed is different from set speed, CC ECU activates actuator motor to change engine throttle valve, changing vehicle speed.

CC ECU includes a self-diagnostic function. If cruise control system is canceled by any condition other than driver operation, CC ECU assumes a malfunction has occurred and may set a corresponding fault code.

SPEED SENSOR

Speed sensors are located in combination meter and/or on

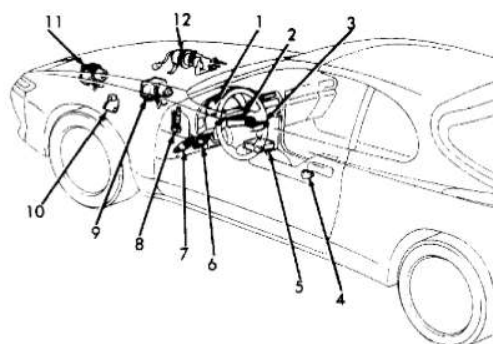
extension housing of Electronically Controlled Transmission (ECT) or M/T. Speed sensor rotor shaft is driven by a gear on speedometer output shaft. For each shaft rotation, speed sensor sends a 20-pulse signal to instrument cluster. This signal is converted inside instrument cluster to a 4-pulse signal which is sent to CC ECU. CC ECU calculates vehicle speed from this pulse frequency.

SELF-DIAGNOSTIC SYSTEM

When vehicle is in cruise control mode, system will cancel due to a malfunction in either actuator, speed sensor or speed control switch circuit. When cruise control functions are canceled, CRUISE light will blink 5 times, indicating 2-digit trouble code(s) are stored in CC ECU memory. See CC ECU TROUBLE CODE DEFINITION table under SELF-DIAGNOSTICS. Two digit trouble codes(s) will be stored in CC ECU memory until ignition is turned off. See SELF-DIAGNOSTICS.

If a fault or symptom is present, but no trouble codes were set, a circuit function test can be performed. Circuit function test will display a one digit function code if circuit tested is okay. See CRUISE CONTROL CIRCUIT FUNCTION TEST under TROUBLE SHOOTING.

NOTE: Intermittent failures may cause CRUISE indicator light to flicker or come on. Light will go out after fault goes away. Fault may or may not be present at time of testing; however, a corresponding trouble code may be stored in CC ECU memory. See SELF-DIAGNOSTICS.



1. Combination Meter
 - Cruise Control Indicator
 - No. 1 Vehicle Speed Sensor (A/T)
2. Ignition Switch
3. Control Switch
4. Parking Brake Switch
5. Cruise Control ECU
6. Stoplight Switch
7. Clutch Switch (M/T)
8. No. 1 Vehicle Speed Sensor (M/T)
9. Motor Type Actuator (3S-GTE)
10. Park/Neutral Position Switch (A/T)
11. Vacuum Type Actuator (Except 3S-GTE)
12. Motor Type Actuator (Except 3S-GTE)

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Fig. 1: Locating Cruise Control Components
Courtesy of Toyota Motor Sales, U.S.A., Inc.

SELF-DIAGNOSTICS

*** PLEASE READ THIS FIRST ***

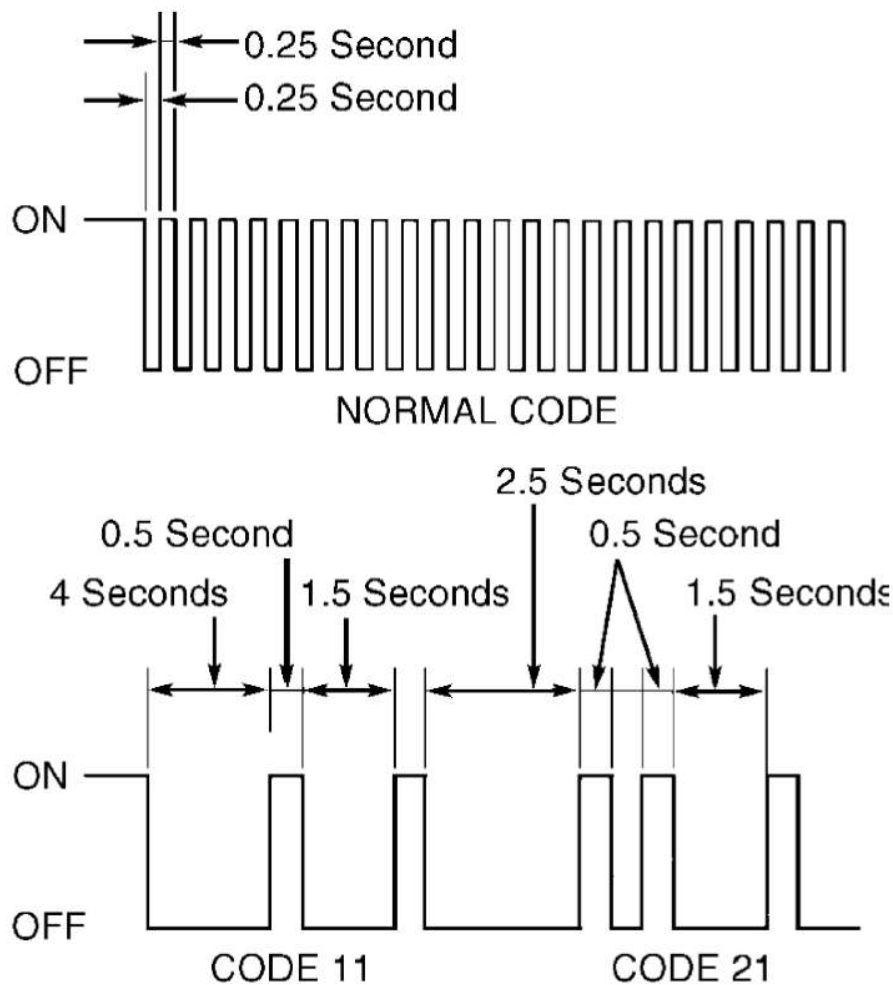
CAUTION: Celica is equipped with a Supplemental Restraint System (SRS). SRS wiring harness is routed close to instrument cluster, steering wheel and related components. All SRS wiring harnesses and connectors are Yellow. DO NOT use electrical test equipment on these circuits. Before working

on cruise control components, disable air bag system. Refer to AIR BAG RESTRAINT SYSTEM article in ACCESSORIES/SAFETY EQUIPMENT section.

WARNING: Wait at least 90 seconds after disabling SRS. Back-up power circuit, capacitor, maintains system voltage for about 90 seconds after battery is disconnected. Servicing cruise control system before 90 seconds may cause accidental air bag deployment and possible personal injury.

READING TROUBLE CODES

Trouble codes are displayed as flashes of CRUISE indicator light. All trouble codes are 2-digit numbers. CC ECU outputs trouble codes from lowest to highest. These codes indicate current faults in system and should be serviced in order of appearance. Pay careful attention to length of pauses in order to read codes correctly. See Fig. 2.



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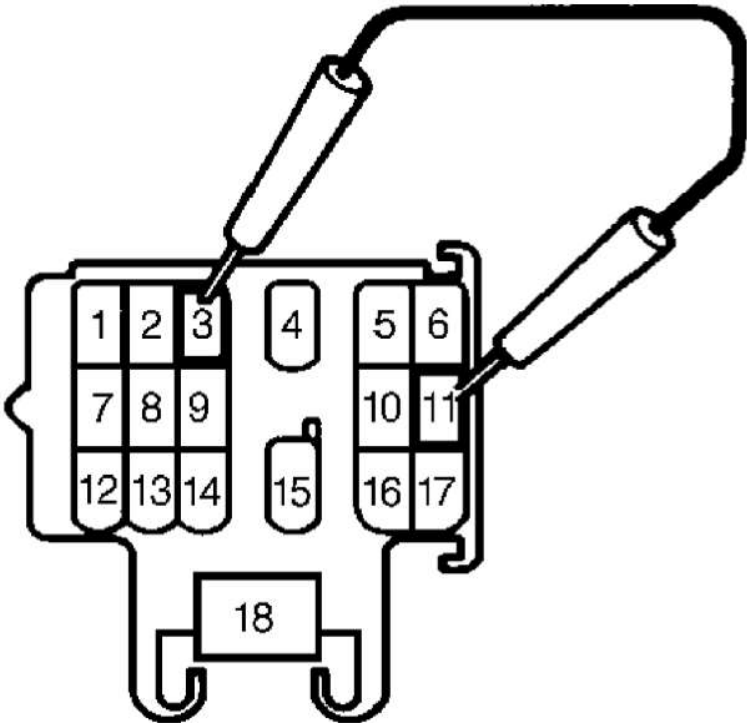
Fig. 2: Reading Service Codes
Courtesy of Toyota Motor Sales, U.S.A., Inc.

RETRIEVING TROUBLE CODES

- 1) Codes from CC ECU self-diagnostic system are retrieved through self-test diagnostic Data Link Connector (DLC). Test drive vehicle to allow fault codes to set in CC ECU memory. If CRUISE indicator light begins to flash 5 times while driving or cruise control will not set or operate, check for trouble codes. Go to next step.
- 2) Stop vehicle and leave ignition switch in ON position. If ignition switch is turned to OFF position, any stored trouble codes will be erased from CC ECU memory. Connect jumper wire between DLC self-diagnostic terminals. See CC ECU CODE RETRIEVAL table. See Fig. 3.
- 3) If any code is present, perform test(s) in order given. See CC ECU FAULT CODE DEFINITION table. If no codes are present and CRUISE indicator light begins flashing on and off every .25 seconds, perform NORMAL code tests in order given. See CC ECU FAULT CODE DEFINITION table. If no codes are present and CRUISE indicator light does not flash on and off every .25 seconds, and cruise control system malfunction still exists, perform CRUISE CONTROL CIRCUIT FUNCTION TEST under TROUBLE SHOOTING.

CC ECU CODE RETRIEVAL TABLE

Application	DLC Self-Test Terminals
Celica	3 & 11



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Fig. 3: DLC Terminal ID
Courtesy of Toyota Motor Sales, U.S.A., Inc.

CC ECU FAULT CODE DEFINITION

CC ECU FAULT CODE DEFINITION TABLE

Code No.	Diagnosis Problem	(1) Perform Test No.
Normal	Indicator Light Flashes 5 Times, CC System Can Not Be Set Or Does Not Operate	3, 5, 6, 8, 9, 7, 4, (2), (3)
11	Excessive Voltage To Motor Acceleration Side	4, (2), (3)
11	Over Current/Short In Motor Circuit	4, (2), (3)
12	Open In Magnet Clutch Circuit	4, 6, (2), (3)
12	Overcurrent/Short In Magnet Clutch Circuit	4, 6, (2), (3)
13 (4)	Position Sensor Detects Abnormal Voltage	4, (2)
13 (4)	Open In Actuator Motor Circuit	4, (2)
13 (4)	Position Sensor Signal Value Does Not Change When Motor Operates	4, (2)
21	Speed Sensor Signal Not Sent To CC ECU For 140 Milliseconds Or Longer	5, (2)
23 (5)	Vehicle Speed Decreased 10 MPH Or More Below Speed Set During Cruise Control Operation	(6), 5, 4, 13
31 (4)	RES/ACC Mode Is On At All Times When MAIN Switch Is On	3, (2)
32	Short In Control Switch Circuit	3, (2)
34	Control Does Not Turn Off Before Switching	3, (2)
41	Faulty CC ECU	(2)
(1) - Perform test numbers in order given. (2) - Replace CC ECU, and retest system. (3) - Check wire harness and connectors. (4) - Except with vacuum type actuator. (5) - If speed set can be maintained when speed control switch is again set to SET/COAST position, there is no malfunction. (6) - Check speed control cable and control link function.		

CLEARING CODES

CAUTION: Do not disconnect vehicle battery to clear codes.

To clear codes from CC ECU memory, turn ignition off. This procedure erases fault codes from CC ECU memory. If problem has not been corrected or fault is still present, code will be reset in CC ECU memory.

TROUBLE SHOOTING

NOTE: Before TROUBLE SHOOTING BY SYMPTOM, perform SELF-DIAGNOSTICS. TROUBLE SHOOTING BY SYMPTOM should only be performed if no self-diagnostic trouble codes are present.

CRUISE CONTROL CIRCUIT FUNCTION TEST

Retrieving 1-Digit Normal Function Code

Turn ignition on. Push cruise control switch to SET/COAST or RES/ACC position and hold. Set CRUISE ON-OFF (MAIN) switch to ON position. Ensure CRUISE indicator light comes on in combination meter and flashes after 3 seconds. Release cruise control switch from SET/COAST or RES/ACC position. Activate each switch circuit in order given. If other than a normal function code is displayed, go to TROUBLE SHOOTING BY SYMPTOM. If normal code is displayed and cruise control is still malfunctioning, go to TROUBLE SHOOTING BY SYMPTOM. Normal function code will be displayed by CRUISE indicator light, as each circuit is activated as follows:

* SET/COAST

Set cruise control switch to SET/COAST position and hold.

Indicator light will flash normal Code 2, if circuit function is normal. SET/COAST circuit normal function code will repeat normal Code 2.

* RES/ACC

Set cruise control switch to RES/ACC position and hold.

Indicator light will flash normal Code 3, if circuit function is normal. RES/ACC circuit normal function code will repeat normal Code 3.

* CANCEL Switches

Raise vehicle and support drive wheels off ground. Perform

CANCEL switch test with engine running. Press CANCEL switch to ON and OFF positions. Depress and release brake pedal. Apply and release parking brake. On A/T models, move shift lever from "D" to "N" position. On M/T models, depress and release clutch pedal. If circuit is normal, indicator light will come on when switch is in OFF position and go off when switch is in ON position.

* Vehicle Speed Sensor

Raise vehicle and support drive wheels off ground. Start

engine and slowly depress accelerator pedal until specified speed is reached. Turn CRUISE ON-OFF (MAIN) switch to ON position. If circuit is normal, indicator light will flash on and off every .25 second at vehicle speeds greater than 25 MPH. At vehicle speeds of 25 MPH or less, if circuit is normal, indicator light will come on and stay on. On models with Electrically Controlled Transmission (ECT), drive vehicle at 25 MPH or less. If circuit is normal, indicator light will come on and stay on. If indicator light functions as described, this would be considered a normal code.

NOTE: When 2 or more function codes are sent to CC ECU, only the lowest numbered function code will be displayed.

CLEARING FUNCTION CODES

CAUTION: DO NOT disconnect vehicle battery to clear codes.

Normal function code display will be canceled when CRUISE ON-OFF switch is set to OFF position.

TROUBLE SHOOTING BY SYMPTOM

NOTE: Perform tests No. 1 and No. 2 to ensure power source and indicator light circuits are okay. Perform following tests in order listed.

Vehicle Speed Does Not Decrease When Speed Control Switch Set To SET/COAST

When normal function code is displayed, check speed control cable function and perform TEST 4 and 5. When other than normal function code is displayed, perform TEST 3.

Cruise Control System Can Not Be Set, Does Not Operate Or Indicator Light Flashes 5 Times

When normal function code is displayed, check wire harness, speed control cable function and perform TEST 3, 6, 8, 9, 7, and 4. When other than normal function code is displayed, perform TEST 5.

Vehicle Speed Fluctuates When Speed Control Switch Turned To SET/COAST Position

Check speed control cable function and perform TEST 5 and 4.

Large Speed Drop When Cruise Control Switch Turned To SET/COAST

Check speed control cable function and perform TEST 12 and 4.

Vehicle Speed Does Not Increase When Control Set To RES/ACC - Perform TEST 4, 5, 11, and 10. When other than normal function code is displayed, perform TEST 3.

Set Speed Changes On High Or Low Side

When normal function code is displayed, check speed control cable function and perform TEST 5 and 4. On models with motor type actuator perform TEST 12 only. When other than normal function code is displayed, perform TEST 5.

Acceleration Response Is Sluggish When Control Is Set To RES/ACC

On models with vacuum type actuator, perform TEST 3, 4, 11, and 10. On models with motor type actuator, perform TEST 3, 4, 11, 10, and 12.

Vehicle Does Not Return To Memorized Speed When Control Set To RES/ACC

When normal function code is displayed, check speed control cable function and perform TEST 4 and 5. When other than normal function code is displayed, perform TEST 3.

Set Speed Does Not Cancel When Brake Pedal Depressed

When normal function code is displayed, perform TEST 4 and 6. When other than normal function code is displayed, perform TEST 6.

Set Speed Does Not Cancel When Parking Brake Applied

When normal function code is displayed, perform TEST 4. When other than normal function code is displayed, perform TEST 7.

Speed Does Not Cancel When Shifted to "N" (A/T) Or Clutch Pedal Depressed (M/T)

When normal function code is displayed, perform TEST 4. When

other than normal function code is displayed, perform TEST 8 (A/T) or 9 (M/T).

Set Speed Does Not Cancel When Control Set To CANCEL

When normal function code is displayed, perform TEST 4. When other than normal function code is displayed, perform TEST 3.

Set Speed Can Be Set Below Approximately 25 MPH

When normal function code is displayed, perform TEST 4. When other than normal function code is displayed, perform TEST 5.

Set Speed Will Not Disengage At Approximately 25 MPH Or Less

When normal function code is displayed, perform TEST 4. When other than normal function code is displayed, perform TEST 5 and check speed control cable function.

TESTING & DIAGNOSIS

TEST 1: POWER SOURCE CIRCUIT

1) Check CC ECU-IG fuse and replace if faulty. If fuse is okay, go to next step. If fuse failure is continuous, turn ignition off and disconnect Cruise Control Electronic Control Unit (CC ECU) wire harness connector. Install NEW fuse. Turn ignition on and check fuse. If fuse fails, check for short in wire harness between CC ECU-IG fuse and CC ECU. If fuse is okay, replace CC ECU and retest.

2) Turn ignition off and disconnect CC ECU wire harness connector. Ensure continuity exists between CC ECU ground terminal and body ground. See CC ECU CONNECTOR GROUND & POWER TERMINAL IDENTIFICATION table. If continuity is not present, repair open in circuit. If continuity is present, go to next step.

3) Turn ignition on. Measure voltage between power terminal and ground. See CC ECU CONNECTOR GROUND & POWER TERMINAL IDENTIFICATION table. If battery voltage is not present, repair open in circuit. If battery voltage is present, replace CC ECU and retest system.

CC ECU CONNECTOR GROUND & POWER TERMINAL IDENTIFICATION TABLE

Application	Ground Term. (Wire Color)	Power Term. (Wire Color)
Motor Actuator	A9 (BRN)	A1 (BLK/RED)
Vacuum Actuator	15 (BRN)	12 (BLK/RED)

TEST 2: CRUISE CONTROL INDICATOR LIGHT CIRCUIT

1) Turn ignition off. Ensure GAUGE fuse is okay. If fuse is okay, go to next step. If fuse is not okay replace fuse and turn ignition on. If fuse fails, check for short on harness side and repair as necessary.

2) Remove combination meter and disconnect connector(s). Turn ignition on and ensure battery voltage exists between ground and connector terminal on GAUGE fuse side of combination meter. If battery voltage is present, go to next step. If battery voltage is not present, go to step 5).

3) Remove CRUISE indicator light and ensure continuity. Replace if necessary. If bulb is okay install bulb, connect combination meter connector and go to next step.

4) Turn ignition off. Disconnect CC ECU wire harness connector(s). Ensure continuity exists between ground and CC ECU

indicator light terminal. If continuity is not present, go to next step. If continuity is present, repair short in indicator light circuit between CC ECU connector and combination meter or between combination meter circuit plate and indicator light. See appropriate vehicle under step 5) for terminal identification.

5) Turn ignition on. Ensure battery voltage exists between ground and CC ECU indicator light terminal. If battery voltage is present, replace CC ECU and retest system. If battery voltage is not present, repair open in indicator light circuit between CC ECU connector and combination meter or open in combination meter circuit plate between indicator light terminal and indicator bulb or between GAUGE fuse terminal and indicator bulb.

6) Test between GAUGE fuse and combination meter 12-pin connector "B" terminal No. B7 (Red/Blue wire). Test between combination meter Brown 10-pin connector "C" terminal No. C2 and CC ECU connector terminal No. B6 with motor actuator or No. 4 with vacuum actuator, (Light Green wire). Test between combination meter 12-pin connector "B" terminal No. B7 (Red/Blue wire) and indicator light to combination meter Brown 10-pin connector "C" terminal No. C2 (Light Green wire).

TEST 3: CONTROL SWITCH CIRCUIT

NOTE: Ensure main switch and control switch operations are normal. See COMPONENT TESTING.

1) Disconnect control switch connector(s), (6-pin with Supplemental Restraint System (SRS) or 14-pin connector "A" and Black 20-pin connector "B" without SRS). Ensure continuity exists between ground and control switch connector terminal No. 3 or B17 (Brown wire). If continuity is present, go to next step. If continuity is not present, repair faulty ground or open in circuit between ground and control switch terminal No. 3 or B17.

3) Disconnect CC ECU connector. Ensure continuity exists between main switch connector terminal and ground terminal or resistance between control switch connector terminal and ground terminal at specified switch positions. See CRUISE CONTROL SWITCH TERMINALS and CRUISE CONTROL SWITCH TESTING tables. Replace cruise control switch if results are not as specified. If results are as specified, go to step 8).

CRUISE CONTROL SWITCH TERMINALS TABLE

Main Switch Terminal (Wire Color)	Control Switch Terminal (Wire Color)	Ground Terminal (Wire Color)
4 (WHT) (1)	5 (YEL/BLK)	3 (BRN)
B15 (YEL/BLK) (2)	B5 (WHT)	B17 (BRN)

(1) - With Supplemental Restraint System.

(2) - Without Supplemental Restraint System.

CRUISE CONTROL SWITCH TESTING TABLE

Switch Position	Result
Main OFF	No Continuity
Main ON	Continuity
Control OFF	No Continuity
Control RES/ACC	Approximately 68 Ohms

Control SET/COAST	Approximately 198 Ohms
Control CANCEL	Approximately 418 Ohms

SLIP RING TESTING TABLE

5-Pin Slip Ring Terminal No.	6-Pin Slip Ring Terminal No.
2	6
3	4
4	5

4) Turn ignition off and connect control switch connector. Disconnect CC ECU connector(s). Turn CRUISE ON-OFF (MAIN) switch to OFF position and ensure no continuity exists between ground and CC ECU harness side connector terminal. See CC ECU-TO-CRUISE ON-OFF (MAIN) SWITCH HARNESS TESTING table. If continuity is not present, go to next step. If continuity is present, repair short in circuit between CC ECU terminal and control switch terminal.

5) If continuity is not present, turn CRUISE ON-OFF (MAIN) switch to ON position and ensure continuity exists between ground and CC ECU connector terminal. If continuity is not present, repair open in circuit between CC ECU terminal and control switch terminal. See CC ECU-TO-CRUISE ON-OFF (MAIN) SWITCH HARNESS TESTING table. If continuity is present, go to next step.

CC ECU-TO-CRUISE ON-OFF (MAIN) SWITCH HARNESS TESTING TABLE

CC ECU Terminal	Control Switch Terminal
A8 (YEL/BLK) Motor Actuator	5 (W/ SRS), 15 (W/O SRS)
6 (YEL/BLK) Vacuum Actuator	5 (W/ SRS), 15 (W/O SRS)

6) Turn control switch to OFF position and ensure no continuity exists between ground and CC ECU harness side connector terminal. See CC ECU-TO-CRUISE ON-OFF (MAIN) SWITCH HARNESS TESTING table. If continuity is present, repair short in circuit between CC ECU terminal and control switch terminal.

7) Turn control switch to 3 operating positions. Measure resistance between ground and CC ECU terminal at each switch position. See CC ECU-TO-CONTROL SWITCH HARNESS TESTING table. If resistance is not as specified, repair open in harness between CC ECU terminal and control switch terminal. If resistance is as specified, replace cruise control switch.

CC ECU-TO-CONTROL SWITCH HARNESS TESTING TABLE

CC ECU Terminal	Control Switch Terminal
B8 (WHT) Motor Actuator	4 (W/ SRS), B5 (W/O SRS)
19 (WHT) Vacuum Actuator	4 (W/ SRS), B5 (W/O SRS)

TEST 4A: ACTUATOR CKT VAC TYPE ACTUATOR (W/ VAC ACTUATOR)

1) Inspect actuator vacuum hoses and ensure no cracks or other damage is present. Replace vacuum hose as necessary.

2) Disconnect 3-pin connector from vacuum actuator. Ensure

continuity exists between ground and actuator harness side connector terminal No. 3 (White/Black wire). If continuity is present, verify actuator operation. See ACTUATOR OPERATION - WITH VACUUM TYPE ACTUATOR under COMPONENT TESTING. If actuator is okay, go to step 5). Replace actuator if it is faulty and retest system. If continuity is not present, go to next step.

3) Disconnect CC ECU connector and ensure continuity exists between ground and CC ECU harness side connector terminal No. 15 (Brown wire). If continuity is present, go to next step. If continuity is not present, repair faulty ground or open in harness between CC ECU terminal No. 15 and ground.

4) Ensure continuity exists between CC ECU side connector terminals No. 15 (Brown wire) and No. 16 (White/Black wire). If continuity is not present, replace CC ECU and retest. If continuity is present, repair open in harness between CC ECU terminal No. 16 and actuator connector terminal No. 3.

5) Ensure correct installation and operation of stoplight switch. See step 2) under TEST 4B: ACTUATOR CIRCUIT MOTOR TYPE ACTUATOR.

6) Connect actuator connector and disconnect stoplight switch 4-pin connector. Measure resistance between stoplight switch connector terminal No. 4 (Red/Yellow wire) and ground. If approximately 68 ohms are present, go to next step. If approximately 68 ohms are not present, repair open or short in harness between stoplight connector terminal No. 4 and actuator connector terminal No. 1 (Red/Yellow wire).

7) Connect stoplight switch 4-pin connector. Turn ignition off and disconnect CC ECU connector. On harness side measure resistance between CC ECU terminals No. 5 (Red/Green wire) and No. 16 (White/Black wire). If approximately 30 ohms are present, go to next step. If approximately 30 ohms are not present, repair open or short in harness between CC ECU connector terminal No. 5 and actuator connector No. 2 (Red/Green wire).

8) Ensure brake pedal is released. On harness side measure resistance between CC ECU connector terminals No. 3 (Green/Black wire) and No. 16 (White/Black wire). If approximately 68 ohms are present, replace CC ECU and retest system. If approximately 68 ohms are not present, repair open or short in harness between CC ECU connector terminal No. 5 (Red/Green wire) and stoplight connector terminal No. 3 (Green/Black wire).

TEST 4B: ACTUATOR CIRCUIT MOTOR TYPE ACTUATOR

1) Disconnect actuator connector. Ensure continuity exists on harness side between actuator connector No. 4 (White/Black wire) and ground. See Fig. 4. If continuity is present, verify actuator operation. See ACTUATOR OPERATION - MOTOR TYPE under COMPONENT TESTING. Replace actuator if faulty and retest system. If actuator is okay, go to next step. If continuity is not present, repair faulty ground or open in harness between actuator terminal No. 4 and ground.

2) Ensure stoplights come on when brake pedal is depressed. If stoplights come on, go to step 5). If stoplights do not come on, ensure .02-.09" (.5-2.3 mm) clearance between stoplight switch and brake pedal stop. Loosen switch lock nut to adjust clearance. If stoplights do not come on after adjusting switch when brake pedal is depressed, disconnect 4-pin stoplight switch connector and go to next step.

3) Depress brake pedal (stoplight switch pin free). Ensure continuity exists between stoplight switch connector terminals No. 1 (Green/White wire) and No. 2 (Green/Red wire). If continuity is not as specified, replace stoplight switch and retest system. If stoplight switch is okay, go to next step.

4) Release brake pedal (stoplight switch pin pushed in).

Ensure continuity exists between stoplight switch connector terminals No. 3 (Green/Black wire) and No. 4 (Red/Yellow wire). If continuity is not as specified, replace stoplight switch and retest system. If stoplight switch is okay, go to next step.

5) Connect actuator connector and disconnect stoplight switch connector. Measure resistance between ground and stoplight switch terminal No. 4 (Red/Yellow wire). If resistance is approximately 38.5 ohms, go to next step. If resistance is not approximately 38.5 ohms, repair open or short in wire harness between stoplight connector terminal No. 4 and actuator connector terminal No. 5 (Red/Yellow wire).

NOTE: Magnet clutch and motor circuits include a diode. If circuit shows no continuity or incorrect resistance, reverse positive and negative test leads and retest circuit.



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Fig. 4: Motor Type Actuator Connector Terminal ID
Courtesy of Toyota Motor Sales, U.S.A., Inc.

6) Connect stoplight switch connector and disconnect CC ECU connector(s). Measure resistance between ground and CC ECU connector terminal. See CC ECU-TO-MOTOR TYPE ACTUATOR HARNESS TESTING table. If resistance is approximately 38.5 ohms, go to next step. If resistance is not approximately 38.5 ohms, repair open or short in harness between CC ECU connector terminal and actuator connector terminal.

7) Ensure no continuity exists between ground and CC ECU connector terminals. If continuity is not present, go to next step. If continuity is present, repair short in harness between CC ECU terminal and actuator terminal.

8) Move actuator arm to a position other than fully open or fully closed. Ensure continuity exists between CC ECU connector terminals. If continuity is present, go to next step. If continuity is not present, repair open in harness between CC ECU connector terminal(s) and actuator terminal(s). See CC ECU-TO-MOTOR TYPE ACTUATOR HARNESS TESTING table.

9) Ensure no continuity exists between ground and CC ECU connector terminal No. A12. If continuity is not present, go to next step. If continuity is present, repair short in harness between CC ECU terminal No. 24 or No. A12 and actuator connector terminal No. 1. See CC ECU-TO-MOTOR TYPE ACTUATOR HARNESS TESTING table.

10) Measure resistance between CC ECU connector terminals No. 24 and No. A10 and No. A12. If approximately 2000 ohms resistance are present, go to next step. If approximately 2000 ohms are not present, repair open in harness between CC ECU connector terminal No. A10 and actuator connector terminal No. 3 or between CC ECU connector terminal No. A12 and actuator connector terminal No. 1. See CC ECU-TO-MOTOR TYPE ACTUATOR HARNESS TESTING table.

11) Move position sensor arm from closed to open position and back again. Ensure resistance change, as arm is moved, between CC ECU connector terminals No. A10 and No. A11. If resistance changes evenly, replace CC ECU and retest system. If resistance does not change evenly, repair open or short in harness between CC ECU terminal No. A11 and actuator terminal No. 2. See CC ECU-TO-MOTOR TYPE ACTUATOR HARNESS TESTING table.

CC ECU-TO-MOTOR TYPE ACTUATOR HARNESS TESTING TABLE

CC ECU Terminal		Actuator Terminal Or To Ground
Magnet Clutch Circuit		
B3 (GRN/BLK)		5 (RED/YEL)
Motor Circuit		
B4 (PNK/BLK)		6 (PNK/BLK)
B10 (RED/GRN)		7 (RED/GRN)
Position Sensor Circuit		
A10 (GRY/BLK)		3 (GRY/BLK)
A11 (GRY/RED)		2 (GRY/RED)
A12 (GRY)		1 (GRY)

TEST 5B: NO. 1 VEHICLE SPEED SENSOR CIRCUIT (A/T)

1) If speedometer fluctuates while driving at a steady speed, replace speedometer cable and retest system. If speedometer does not fluctuate, go to next step.

2) Remove combination meter to gain access to back. Disconnect 12-pin connector "B". Ensure continuity exists between ground and connector "B" terminal No. B5, Brown wire. If continuity is present, verify No. 1 vehicle speed sensor operation. See NO. 1 VEHICLE SPEED SENSOR (A/T) under COMPONENT TESTING. If speed sensor is okay, go to step 3), for models with motor actuator, go to step 4) for models with vacuum actuator see step 5). If continuity is not present, repair faulty ground and/or open in harness between connector "B" terminal No. B5 and ground.

3) On models with motor actuator, connect combination meter connector "B" and disconnect CC ECU 12-pin connector "A". Ensure repeated continuity exists between CC ECU connector terminal No. A7 (Blue/White wire) and ground. If continuity repeats, replace CC ECU and retest system. If continuity does not repeat, repair open or short in harness between CC ECU connector terminal No. A7 and combination meter terminal No. B6, or an open or short in circuit plate between terminal No. B6 and speed sensor, or an open in circuit plate between combination meter terminal No. B5 and speed sensor.

4) On models with vacuum actuator, connect combination meter connector "B" and disconnect CC ECU connector. Ensure repeated continuity exists between CC ECU connector terminal No. 8 (5S-FE, Blue/White wire; except 5S-FE, Blue wire) and ground. If continuity repeats, replace CC ECU and retest system. If continuity does not repeat, repair open or short in harness between CC ECU connector terminal No. 8 and combination meter terminal No. B6, or an open or short in circuit plate between terminal No. B6 and speed sensor, or an open in circuit plate between combination meter terminal No. B5 and speed sensor.

TEST 5C: NO. 1 VEHICLE SPEED SENSOR CIRCUIT (WITH M/T)

1) Locate speed sensor on manual transaxle and disconnect 3-pin connector. Ensure continuity exists between connector terminal No. 3 (Brown wire) and ground. If continuity is not present, repair faulty ground or open in harness between connector terminal No. 3 and ground. If continuity is present, verify No. 1 vehicle speed sensor operation. See NO. 1 VEHICLE SPEED SENSOR (M/T) under COMPONENT TESTING. If speed sensor is okay, go to step 2) for models with motor actuator or step 3) for models with vacuum actuator.

2) Connect combination meter connector "B" and disconnect CC ECU 12-pin connector "A". Ensure repeated continuity exists between CC ECU connector terminal No. A7 (Blue/White wire) and ground as speed sensor is rotated. If continuity repeats, replace CC ECU and retest system. If continuity does not repeat, repair open or short in harness

between CC ECU connector terminal No. A7 and speed sensor terminal No. 2 (Blue wire).

3) Connect combination meter connector "B" and disconnect CC ECU connector. Ensure repeated continuity exists between CC ECU connector terminal No. 8 (Blue wire) and ground as speed sensor is rotated. If continuity repeats, replace CC ECU and retest system. If continuity does not repeat, repair open or short in harness between CC ECU connector terminal No. 8 and speed sensor terminal No. 2 (Blue wire).

TEST 6: STOPLIGHT SWITCH

1) Verify normal operation of stoplight system. If stoplight system operates correctly, go to step 9). If stoplight system does not operate correctly, ensure STOP fuse is okay. If STOP fuse is okay, go to step 4). Replace fuse if needed. If fuse fails again, go to step 2). If fuse does not fail again, go to step 3).

2) If STOP fuse fails after replacement, disconnect CC ECU connector and replace fuse. If fuse fails again repair short in harness between stoplight switch terminal and STOP fuse or between CC ECU terminal and STOP fuse. See STOPLIGHT SWITCH TO STOP FUSE CIRCUIT table.

STOPLIGHT SWITCH TO STOP FUSE CIRCUIT TABLE

Stoplight Switch Terminal	CC ECU Terminal
Motor Actuator 2 (GRN/RED)	A2 (GRN/RED)
Vacuum Actuator 2 (GRN/RED)	18 (GRN/RED)

3) If STOP fuse does not fail after replacement, depress brake pedal and inspect STOP fuse. If fuse does not fail, replace CC ECU and retest system. If fuse fails again, repair short in harness between stoplight terminal and stoplights or between CC ECU terminal and stoplights. See STOPLIGHT SWITCH TO STOPLIGHTS CIRCUIT table.

STOPLIGHT SWITCH TO STOPLIGHTS CIRCUIT TABLE

Stoplight Switch Terminal	CC ECU Terminal
Motor Actuator 1 (GRN/WHT)	A3 (GRN/WHT)
Vacuum Actuator 1 (GRN/WHT)	17 (GRN/WHT)

4) Ensure stoplights come on when brake pedal is depressed. If stoplights do not come on, ensure .02-.09" (.5-2.3 mm) clearance between stoplight switch and brake pedal stop. Loosen switch lock nut to adjust clearance. If stoplights do not come on after adjusting switch when brake pedal is depressed, disconnect 4-pin stoplight switch connector and go to next step.

5) Depress brake pedal (stoplight switch pin free). Ensure continuity exists between stoplight switch connector terminals No. 1 (Green/White wire) and No. 2 (Green/Red wire).

6) Release brake pedal (stoplight switch pin pushed in). Ensure continuity exists between stoplight switch connector terminals No. 3 (Green/Black wire and No. 4 (Red/Yellow wire). If continuity is

not as specified, replace stoplight switch and retest system. If stoplight switch is okay, go to next step.

7) Disconnect stoplight switch connector. Ensure battery voltage between stoplight connector terminal No. 2 (Green/Red wire) and STOP fuse. If battery voltage is present, go to next step. If battery voltage is not present, repair open in harness between stoplight connector terminal No. 2 and STOP fuse.

8) Using a jumper wire, connect stoplight connector terminals No. 1 (Green/White wire) and No. 2 (Green/Red wire). If brake lights come on, go to next step. If brake lights do not come on, repair open in harness between stoplight connector terminal No. 1 and ground.

9) If stoplight system is operating normally, start testing with this step. Connect stoplight connector and disconnect CC ECU connector (12-pin connector "A", models with motor actuator). Ensure battery voltage between ground and CC ECU connector terminal No. A2 (with motor actuator, Green/Red wire) or No. 18 (with vacuum actuator, Green/Red wire). If battery voltage is present, go to next step. If battery voltage is not present, repair open in harness between terminal No. 1 or No. A2 or No. 18 and STOP fuse.

10) Ensure battery voltage, when brake pedal is depressed, between ground and CC ECU terminal No. A3 (with motor actuator) or No. 17 (with vacuum actuator), Green/White wire. If battery voltage is present, replace CC ECU and retest system. If battery voltage is not present, repair open in harness between CC ECU connector terminal No. 16 or No. A3 or No. 17 and stoplight switch terminal No. 1, Green/White wire.

TEST 7: PARKING BRAKE SWITCH

1) Disconnect parking brake switch. Ensure continuity exists between switch terminal and ground with switch in ON position (switch pin released). Ensure no continuity exists between switch terminal and ground with switch in OFF position (switch pin pushed in). If continuity is not as specified replace switch. If continuity is as specified, go to next step.

2) Connect parking brake switch connector and disconnect CC ECU connector (12-pin connector "A", models with motor actuator). Release parking brake and ensure no continuity exists between ground and CC ECU terminal No. A5 (with motor actuator, Red/Green wire) or No. 14 (with vacuum actuator, Red/Green wire). If continuity is present, repair short in harness between parking brake switch and CC ECU terminal No. 3 or No. A5 or No. 14. If continuity is not present, go to next step.

3) Ensure continuity exists, with parking brake set, between ground and CC ECU terminal No. A5 (with motor actuator) or No. 14 (with vacuum actuator). If continuity is not present, repair open in harness between parking brake switch and terminal No. 3 or No. A5 or No. 14. If continuity is present replace CC ECU and retest system.

TEST 8: PARK/NEUTRAL POSITION SWITCH

NOTE: Park/Neutral position switch includes a diode. If circuit shows no continuity, reverse positive and negative test leads and retest circuit.

1) Ensure starting system is operating normally. Disconnect CC ECU connector (12-pin connector "A", models with motor actuator). Set shift lever to "P" or "N" position. Ensure continuity exists between ground and CC ECU connector terminal No. A4 (with motor actuator, Black wire) or No. 13 (with vacuum actuator, Black wire). If continuity is not present, repair open in harness between CC ECU terminal No. 2 or No. A4 or No. 13 and park/neutral position switch connector terminal No. 2 (Black/White wire).

2) Set shift lever to "L", 2, 3, and "R" positions. Ensure no continuity exists between ground and CC ECU connector terminal No. A4 (with motor actuator) or No. 13 (with vacuum actuator). If continuity is not present, replace CC ECU and retest system. If continuity is present, repair short in harness between terminal No. 2 or No. A4 or No. 13 and park/neutral position switch connector terminal No. 2 (Black/White wire).

TEST 9: CLUTCH SWITCH (M/T)

1) Ensure engine does not start when clutch pedal is released. If engine starts, ensure .176-.216" (4.5-5.5 mm) clearance between clutch switch and clutch pedal stop. Adjust clutch switch as necessary.

2) Disconnect 2-pin clutch switch connector. Ensure continuity exists between terminals when clutch pedal is depressed (switch pin free). Ensure no continuity when clutch pedal is released (switch pin pushed in). If continuity is not as specified, replace clutch switch.

3) Disconnect clutch switch connector. Ensure continuity exists between ground and clutch switch terminal No. 1. If continuity is present, go to next step. If continuity is not present, repair faulty ground and/or open in harness between terminal No. 1 or No. 2 and ground.

4) Connect clutch switch connector and disconnect CC ECU connector (12-pin connector "A", with motor actuator). Release clutch pedal and ensure no continuity exists between ground and CC ECU connector terminal A4 (with motor actuator) or No. 13 (with vacuum actuator), Black wire. If continuity is not present, go to next step. If continuity is present, repair short in harness between CC ECU connector terminal No. 2 or No. A4 or No. 13 and clutch switch terminal No. 2 or No. 1.

5) Depress clutch pedal and ensure continuity exists between ground and CC ECU connector terminal No. A4 (with motor actuator), or No. 13, (models with vacuum actuator), Black wire. If continuity is present, replace CC ECU and retest system. If continuity is not present, repair open in harness between CC ECU connector terminal No. 2 or No. A4 or No. 13 and clutch switch terminal No. 2 or No. 1.

NOTE: Ensure Electrical Controlled Transmission (ECT) system is operating normally. Repair system as necessary.

TEST 10A: NO. 2 SOLENOID ELECTRICAL CONTROLLED TRANSMISSION

1) Disconnect CC ECU connector (10-pin connector "B", models with motor actuator). Measure resistance between ground and CC ECU connector terminal No. B1 (with motor actuator, Brown/Yellow wire) or No. 9 (5S-FE A/T with vacuum actuator, Brown/Yellow wire). If approximately 13 ohms are present, replace CC ECU and retest system.

2) If approximately 13 ohms are not present, repair open or short in harness between No. 2 solenoid and CC ECU connector terminal No. B1 (with motor actuator, Brown/Yellow wire) or No. 9 (5S-FE A/T with vacuum actuator, Brown/Yellow wire).

NOTE: Ensure Electrical Controlled Transmission (ECT) system is operating normally. Repair system as necessary.

TEST 11: O/D OFF CIRCUIT (A/T)

NOTE: Ensure overdrive off system is operating normally. Repair system as necessary.

1) Disconnect CC ECU connector (10-pin connector "B" with

motor actuator). Set overdrive main switch to ON position. Ensure continuity exists between ground and CC ECU connector terminal No. B2 (with motor actuator) or No. 7 (with vacuum actuator), (Pink wire). If continuity is present, go to next step. If continuity is not present, repair open in harness between CC ECU connector terminal No. B2 (with motor actuator) or No. 7 (with vacuum actuator), (Pink wire) and overdrive main switch.

2) Set overdrive main switch to OFF position. Ensure no continuity exists between ground and CC ECU connector terminal No. B2 (with motor actuator) or No. 7 (with vacuum actuator), (Pink wire). If continuity is present, replace CC ECU and retest system. If continuity is not present, repair short in harness between CC ECU connector terminal No. B2 (with motor actuator) or No. 7 (with vacuum actuator), (Pink wire) and overdrive main switch.

TEST 12: THROTTLE POSITION SENSOR IDL SIGNAL

NOTE: Ensure throttle position sensor adjustment and operation are normal. See G - TESTS W/CODES article in the ENGINE PERFORMANCE section. Adjust or replace throttle position sensor as necessary.

1) On models with motor actuator, connect Throttle Position Sensor (TPS) connector and disconnect CC ECU connector (10-pin connector "B", models with motor actuator). Release accelerator pedal and ensure continuity exists between ground and CC ECU connector terminal No. B9 (with motor actuator, Pink wire).

2) If continuity is present, go to next step. If continuity is not present, repair open in harness between CC ECU connector terminal No. 23 or No. B9 and terminal No. 2/IDL of 4-pin throttle position sensor connector (Pink wire).

3) Depress accelerator pedal and ensure no continuity exists between ground and CC ECU connector terminal No. B9 (with motor actuator, Pink wire). If continuity is not present, replace CC ECU and retest system. If continuity is present, repair short in harness between CC ECU connector terminal No. 23 or No. B9 and terminal No. 2 of 4-pin throttle position sensor connector.

COMPONENT TESTING

Actuator Operation - With Vacuum Type Actuator

1) Disconnect 3-pin actuator connector. Resistance between actuator harness connector terminals No. 1 (Red/Yellow wire) and No. 3 (White/Black wire) should be approximately 68 ohms. Resistance between actuator terminals No. 2 (Red/Green wire) and No. 3 (White/Black wire) should be 30 ohms. If resistance is as specified, go to next step. If resistance is not as specified, replace actuator.

2) Connect positive battery lead to actuator terminals No. 1 and No. 2. Connect negative battery lead to actuator terminal No. 3. Slowly apply vacuum from 0-11.81 in. Hg. Control cable should pull smoothly as vacuum increases approximately 1.57" (40 mm). With vacuum stabilized control cable should not return. Disconnect positive battery from terminals No. 1 and 2. Control cable should return to original position as vacuum returns to zero. If vacuum actuator operation is not as specified, replace actuator and retest system.

NOTE: As vacuum is applied and held, drawn-in diaphragm may return. This does not indicate a malfunction as actuator leakage is allowable.

Actuator Operation - With Motor Type Actuator

1) Disconnect motor actuator linkage and 7-pin actuator

connector. Ensure magnet clutch moves smoothly by moving arm by hand. Connect positive battery lead to actuator terminal No. 5 (Red/Yellow wire) and negative battery lead to actuator terminal No. 4 (White/Black wire). This activates magnet clutch and arm should not move by hand. If operation is not as specified, replace actuator motor. If operation is as specified, go to next step. See Fig. 4.

2) Do not disconnect battery leads from actuator terminals No. 5 and No. 4. With magnet clutch activated, connect positive battery lead to actuator terminal No. 6 (Pink/Black wire). Connect negative battery lead to actuator terminal No. 7 (Red/Green wire). Motor operation should start and arm should move smoothly to open position (acceleration side). When arm reaches open position, motor operation should stop.

3) With magnet clutch activated, reverse positive and negative leads on actuator terminals No. 6 and No. 7. Motor operation should start and arm should move smoothly to closed position (deceleration side). When arm reaches closed position, motor operation should stop. If motor operation is not as specified, replace actuator motor and retest system. If operation is as specified, disconnect battery leads from 7-pin actuator connector.

CRUISE CONTROL SWITCH TESTING TABLE

Switch Position	Result
Control OFF	No Continuity
Control RES/ACC	Approximately 68 Ohms
Control SET/COAST	Approximately 198 Ohms
Control CANCEL	Approximately 418 Ohms

Position Sensor Operation

Measure resistance between actuator terminals No. 1 (Gray wire) and No. 3 (Gray/Black wire). Resistance should be approximately 2000 ohms. Check resistance between actuator connector terminals No. 2 (Gray/Red wire) and No. 3 while moving arm from closed to open position. Resistance should increase from approximately 500 ohms to 1800 ohms. If operation is not as specified, replace actuator motor.

No. 1 Vehicle Speed Sensor (A/T)

Remove combination meter and locate speedometer/speed sensor at back of meter under 12-pin connector in middle of meter. Locate terminals No. "A" and No. "B" on right side of speedometer/speed sensor shaft. Ensure continuity exists between terminals No. "A" and No. "B" 4 times for each revolution of speedometer shaft. Replace speed sensor if operation is not as specified and retest system.

No. 1 Vehicle Speed Sensor (M/T)

Locate speed sensor on manual transaxle and remove. Disconnect 3-pin connector. Connect positive battery lead to connector terminal No. 1 (Black/Red wire) and negative lead to terminal No. 3 (Brown wire). Connect voltmeter positive lead to terminal No. 2 (Blue wire) and negative tester lead to battery negative terminal. Ensure approximately a 0-5 volt, change 4 times per each revolution of speed sensor shaft. Replace speed sensor if operation is not as specified.

CRUISE CONTROL ECU CIRCUIT TESTING CHARTS

NOTE: CC ECU circuit testing charts are provided to pinpoint a malfunctioning circuit. Checking pin voltages at CC ECU connector will help determine if CC ECU is receiving and sending proper voltage signals. Using test charts may also help in determining if there is a short or open in harness

or connectors. Test circuit continuity, resistance and voltages by backprobing CC ECU harness connector.

NOTE: Unless stated otherwise in testing procedures, perform all voltage tests using a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance. Voltage readings may vary slightly due to battery condition or charging rate.



Fig. 5: CC ECU Harness & Conn. Testing (W/ Vacuum Actuator - 1 Of 2)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

CC ECU HARNESS & CONNECTOR TESTING ² (Celica W/ Vacuum Actuator)

Test Lead (Red)	Pin No.	Component Description	¹ Specified Value		Pin No.	Common Lead (Black)
			ON	OFF		
WHT/BLU	1	DLC 1 Circuit (Connector Terminals No. 3 & 11 Connected)	< 1Ω	N/A	N/A	GROUND
WHT/BLU	1	DLC 1 Circuit (Connector Terminals Disconnected)	N/A	≥ 1 MΩ	N/A	GROUND
YEL/BLK	6	Main Control Switch (ON - Switch In ON Position)	< 1Ω	≥ 1 MΩ	N/A	GROUND
PNK ³	7	Engine Coolant Temperature & O/D Switch (Engine Cold)	< 1Ω	N/A	N/A	GROUND
PNK ³	7	Engine Coolant Temperature & O/D Switch (Engine Hot) (ON - O/D Switch In ON Position)	< 1Ω	≥ 1 MΩ	N/A	GROUND
BLK	13	Park/Neutral Switch A/T (ON - "N" Or "P" Position)	< 1Ω	≥ 1 MΩ	N/A	GROUND
BLK	13	Clutch Switch M/T (ON - Depressed)	< 1Ω	≥ 1 MΩ	N/A	GROUND
RED/GRN	14	Parking Brake Switch (ON - Parking Brake Applied)	< 1Ω	≥ 1 MΩ	N/A	GROUND
BRN	15	Cruise Control ECU Ground	< 1Ω	N/A	N/A	GROUND
GRN/BLK	3	Actuator Release Valve (ON - Brake Pedal Released)	68Ω	≥ 1 MΩ	16	WHT/BLK
RED/GRN	5	Actuator Control Valve	30Ω	N/A	16	WHT/BLK
BRN/YEL	9	Electrical Controlled Transaxle No. 2 Solenoid Valve	13Ω	N/A	N/A	GROUND
WHT	19	Control Switch (ON - Control Switch OFF Position)	≥ 1 MΩ	N/A	N/A	GROUND
WHT	19	Control Switch (ON - Control Switch RES/ACC Position)	68Ω	N/A	N/A	GROUND
WHT	19	Control Switch (ON - Control Switch SET/COAST Position)	198Ω	N/A	N/A	GROUND
WHT	19	Control Switch (ON - Control Switch CANCEL Position)	418Ω	N/A	N/A	GROUND

¹ - Symbol definitions: < means less than; > means greater than; ≤ means equal to or less than; ≥ means equal to or greater than; B+ means battery voltage; Ω means Ohms; MΩ means Mega (Million) Ohms.
² - Disconnect Cruise Control ECU connector and test on harness side as shown. If results are not as specified, replace CC ECU and retest.
³ - ECU Terminal No. 7 is Pink wire on 5S-FE A/T with Electronic Controlled Transmission, and Yellow/Black wire on 4A-FE A/T without ECT.

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Fig. 6: CC ECU Harness & Conn. Testing (W/ Vacuum Actuator - 2 Of 2)
Courtesy of Toyota Motor Sales, U.S.A., Inc.



Fig. 7: CC ECU Harness Voltage Testing (W/ Vacuum Actuator - 1 Of 2)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

CC ECU VOLTAGE TESTING ² (Celica W/ Vacuum Actuator)

Test Lead (Red)	Pin No.	Component Description	¹ Specified Value		Pin No.	Common Lead (Black)
			ON	OFF		
LT GRN	4	Cruise Control Indicator Light (ON - Ignition Switch In ON Position)	B+	Zero	N/A	GROUND
	8	No. 1 Vehicle Speed Sensor Ignition In ON Position, Speedometer Shaft Or No. 1 Speed Sensor Shaft Turned	*	N/A	N/A	GROUND
BLK/RED	12	Cruise Control ECU Power Source ECU-IG Fuse (ON - Ignition Switch In ON Position)	B+	Zero	N/A	GROUND
GRN/WHT	17	Stoplight (ON - Brake Pedal Depressed)	B+	Zero	N/A	GROUND
GRN/RED	18	Stoplight Power Source STOP Fuse	B+	Zero	N/A	GROUND

¹ - Symbol definitions: < means less than; > means greater than; ≤ means equal to or less than;
 ≥ means equal to or greater than; B+ means battery voltage;
 Ω means Ohms; MΩ means Mega (Million) Ohms.

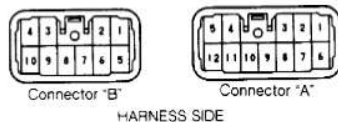
² - Disconnect Cruise Control ECU connector and test on harness side as shown. If results are not as specified, replace CC ECU and retest.

³ - ECU terminal No. 8 is Blue wire. Except 5S-FE A/T, it is Blue/White wire.

⁴ - Voltage will change repeatedly.

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Fig. 8: CC ECU Harness Voltage Testing (W/ Vacuum Actuator - 2 Of 2)
 Courtesy of Toyota Motor Sales, U.S.A., Inc.



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Fig. 9: CC ECU Harness Voltage Testing (W/ Motor Actuator - 1 Of 2)
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

CC ECU VOLTAGE TESTING ² (Celica W/ Motor Actuator)

Test Lead (Red)	Pin No.	Component Description	¹ Specified Value		Pin No.	Common Lead (Black)
			ON	OFF		
BLK/RED	A1	Cruise Control ECU Power Source ECU-IG Fuse (ON - Ignition Switch In ON Position)	B+	Zero	N/A	GROUND
GRN/RED	A2	Stoplight Power Source STOP Fuse	B+	N/A	N/A	GROUND
GRN/WHT	A3	Stoplight (ON - Brake Pedal Depressed)	B+	Zero	N/A	GROUND
	A7	No. 1 Vehicle Speed Sensor Ignition In ON Position, Speedometer Shaft Or No. 1 Speed Sensor Shaft Turned	*	N/A	N/A	GROUND

¹ - Symbol definitions: < means less than; > means greater than; ≤ means equal to or less than;
 ≥ means equal to or greater than; B+ means battery voltage;
 Ω means Ohms; MΩ means Mega (Million) Ohms.

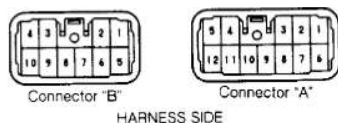
² - Disconnect Cruise Control ECU connector and test on harness side as shown. If results are not as specified, replace CC ECU and retest.

³ - A/T is Blue/White wire. M/T is Blue wire.

⁴ - Voltage will change repeatedly.

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Fig. 10: CC ECU Harness Voltage Testing (W/ Motor Actuator - 2 Of 2)
 Courtesy of Toyota Motor Sales, U.S.A., Inc.



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Fig. 11: CC ECU Harness & Conn. Testing (W/ Motor Actuator - 1 Of 2)
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

CC ECU HARNESS & CONNECTOR TESTING ² (Celica W/ Motor Actuator)

Test Lead (Red)	Pin No.	Component Description	¹ Specified Value		Pin No.	Common Lead (Black)
			ON	OFF		
BLK	A4	Park/Neutral Switch A/T (ON - "N" Or "P" Position)	< 1Ω	≥ 1 MΩ	N/A	GROUND
BLK	A4	Clutch Switch M/T (ON - Depressed)	< 1Ω	≥ 1 MΩ	N/A	GROUND
RED/GRN	A5	Parking Brake Switch (ON - Parking Brake Applied)	< 1Ω	≥ 1 MΩ	N/A	GROUND
YEL/BLK	A8	Control Switch (ON - Switch In ON Position)	< 1Ω	≥ 1 MΩ	N/A	GROUND
BRN	A9	Cruise Control ECU Ground	< 1Ω	N/A	N/A	GROUND
GRY/BLK	A10	Actuator Position Sensor	2000Ω	N/A	A12	GRY
GRY/BLK	A10	Actuator Position Sensor (Actuator Arm Turned)	*	N/A	A11	GRY/RED
BRN/YEL	B1	Electrical Controlled Transaxle No. 2 Solenoid Valve	13Ω	N/A	N/A	GROUND
PNK	B2	Engine Coolant Temperature & O/D Switch (Engine Cold)	< 1Ω	N/A	N/A	GROUND
PNK	B2	Engine Coolant Temperature & O/D Switch (Engine Hot) (ON - O/D Switch In ON Position)	< 1Ω	≥ 1 MΩ	N/A	GROUND
GRN/BLK	B3	Actuator Magnet Clutch (ON - Brake Pedal Released)	38.5Ω	≥ 1 MΩ	N/A	RED/GRN
PNK/BLK	B4	Actuator Motor (ON - Actuator Arm MAX. OPEN Position)	< 1Ω	N/A	B10	PNK/BLK
RED/GRN	B10	Actuator Motor (ON - Actuator Arm MAX. CLOSE Position)	< 1Ω	N/A	B4	RED/GRN
PNK/BLK	B4	Actuator Motor (ON - Actuator Arm In Any Position Except OPEN Or CLOSE) ³	< 1Ω	N/A	B10	GROUND
WHT/BLU	B7	DLC 1 Circuit (Connector Terminals No. 3 & 11 Connected)	< 1Ω	N/A	N/A	GROUND
WHT/BLU	B7	DLC 1 Circuit (Connector Terminals Disconnected)	N/A	≥ 1 MΩ	N/A	GROUND
WHT	B8	Control Switch (ON - Control Switch OFF Position)	≥ 1 MΩ	N/A	N/A	GROUND
WHT	B8	Control Switch (ON - Control Switch RES/ACC Position)	68Ω	N/A	N/A	GROUND
WHT	B8	Control Switch (ON - Control Switch SET/COAST Position)	198Ω	N/A	N/A	GROUND
WHT	B8	Control Switch (ON - Control Switch CANCEL Position)	418Ω	N/A	N/A	GROUND
PNK	B9	Throttle Position Sensor IDL (ON - Gas Pedal Released)	< 1Ω	≥ 1 MΩ	N/A	GROUND

¹ - Symbol definitions: < means less than; > means greater than; ≤ means equal to or less than; ≥ means equal to or greater than; B+ means battery voltage; Ω means Ohms; MΩ means Mega (Million) Ohms.

² - Disconnect Cruise Control ECU connector and test on harness side as shown. If results are not as specified, replace CC ECU and retest.

³ - Continuity should be present in either direction.

⁴ - As actuator arm is turned resistance will change evenly.

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Fig. 12: CC ECU Harness & Conn. Testing (W/ Motor Actuator - 2 Of 2)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

WIRING DIAGRAMS

Proceed to chassis WIRING DIAGRAMS article in WIRING DIAGRAMS section.