DESCRIPTION

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS - EXCEPT PICKUP article. DO NOT apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

Cruise control system uses a vacuum actuator to control throttle position, thus maintaining desired vehicle speed. Based on various inputs, cruise control module controls operation of actuator solenoid.

OPERATION

When cruise control main switch is in ON position, system is ready to be engaged. Cruise control switch sets or adjusts desired speed. Cruise control switch contains SET/COAST and RESUME/ACCEL switches. System will not operate at speeds less than 25 MPH.

To engage system, accelerate to desired speed (greater than 25 MPH) and momentarily press SET/COAST switch. To disengage system, apply brakes or turn cruise control main switch off.

To accelerate from a set cruising speed, press and hold RESUME/ACCEL switch until vehicle is at desired speed, and then release RESUME/ACCEL switch. To decrease speed, press and hold SET/COAST switch until vehicle is at desired speed, and then release SET/COAST switch.

To resume previous set speed, momentarily press RESUME/ACCEL switch (previous set speed cannot be resumed if system was disengaged using cruise control main switch).

NOTE: System uses 2 switches to determine if brakes are being applied: cruise brake switch (dedicated to cruise control system) and brakelight switch (part of brakelight system).

NOTE: On vehicles with automatic overdrive transmission, if speed drops 9 MPH less than set speed, cruise control module cancels or prevents OD transmission function. When vehicle speed returns to within 2 MPH of set speed for at least 20 seconds, OD transmission function is restored.

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
Actuator	Right Rear Corner Of Engine Compartment
Brakelight Switch	On Brake Pedal Bracket
Cruise Brake Switch	On Brake Pedal Bracket
Cruise Control Main Switch	Integral With Cruise Control Switch Stalk
Cruise Control Module	Behind Right Kick Panel
Cruise Control Switch	On Right Side Of Steering Column
Transmission Range Switch	On Top Of Transmission
Vehicle Speed Sensor	On Transmission

ADJUSTMENTS

BRAKELIGHT SWITCH & CRUISE BRAKE SWITCH

Disconnect appropriate switch harness connector. Loosen switch adjusting nuts. Back switch out until it does not contact brake pedal. Turn switch in until clearance between switch housing and pedal stopper is .004-.039" (.10-1.00 mm). Tighten adjusting nuts. Connect switch harness connector.

TRANSMISSION RANGE (TR) SWITCH

Disconnect negative battery cable. Disconnect TR switch harness connector. Place transmission in Neutral. Loosen TR switch retaining bolts. Connect an ohmmeter between terminals "A" and "H" at TR switch. See **Fig. 1** . Adjust switch until there is continuity between terminals "A" and "H" at TR switch. Tighten TR switch retaining bolts to 70-95 INCH lbs. (8-11 N.m). Connect TR switch harness connector. Connect negative battery cable. Ensure vehicle will only start with transmission in Park or Neutral.

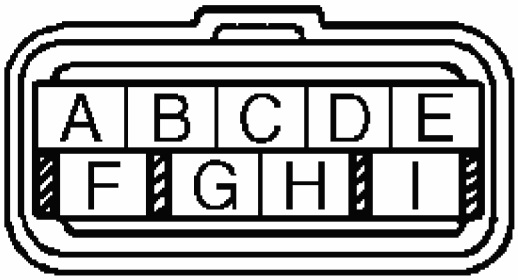

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Fig. 1: Identifying Transmission Range (TR) Switch Terminals
Courtesy of MAZDA MOTORS CORP.

SELF-DIAGNOSTIC SYSTEM

One of two on-board diagnostic modes may be utilized. The CONDITION DETECTION MODE indicates trouble in cruise control system. The OPERATION MODE checks correct input signals to the cruise control module. Modes are performed using either the New Generation Star (NGS) tester or cruise indicator light.

Perform OPERATION MODE first. If system passes all operation modes, perform CONDITION DETECTION MODE. If condition detection mode does not output any DTCs, check components in the following order: main switch, cruise control module, cruise brake switch, brakelight switch, cruise control switch, actuator, and vehicle speed sensor. See **COMPONENT TESTS** . If no components are defective, repair wiring as necessary. See **WIRING DIAGRAMS** .

OPERATION MODE

NOTE: To cancel operation mode, turn ignition switch to LOCK position or turn cruise control main switch off.

Using New Generation Star (NGS) Tester

1. Connect New Generation Star (NGS) Tester (49-T088-0A0) and Adapter (49-T088-004) according to manufacturer's instructions. Turn ignition switch to ON position. Ensure cruise control main switch is off. Press RESUME/ACCEL switch, then press cruise control main switch to activate system inspection. Cruise indicator light should illuminate.

2. Set tester adapter switch to AUX 2. Using NGS tester, select VEHICLE & ENGINE SELECTION and press TRIGGER. Select DIAGNOSTIC DATA LINK and press TRIGGER. Select CCM - CRUISE CONTROL MODULE and press TRIGGER. Select DIAGNOSTIC TEST MODE and press TRIGGER. Select CRUISE CONTROL INPUT SW SELF TEST and press TRIGGER. Press START button.
3. Press SET/COAST switch. If SET/COAST SW-PRESS is displayed on NGS tester, go to next step. If SET/COAST SW-PRESS is not displayed on NGS tester, check cruise control switch circuit. See **DTC 21: CRUISE CONTROL SWITCH CIRCUIT (SET/COAST)** under DIAGNOSTIC TESTS.
4. Press RESUME/ACCEL switch. If RESUME/ACCEL SW-PRESS is displayed on NGS tester, go to next step. If RESUME/ACCEL SW-PRESS is not displayed on NGS tester, check cruise control switch circuit. See **DTC 22: CRUISE CONTROL SWITCH CIRCUIT (RESUME/ACCEL)** under DIAGNOSTIC TESTS.
5. Depress brake pedal. If BRAKE PEDAL-DEPRESS is displayed on NGS tester, go to next step. If BRAKE PEDAL-DEPRESS is not displayed on NGS tester, check brake switch circuit. See **DTC 31: BRAKE SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
6. Place gear selector in Neutral. If N RANGE NEUTRAL POSITION-SHIFT is displayed on NGS tester, go to step 7 . If N RANGE NEUTRAL POSITION-SHIFT is not displayed on NGS tester, check transmission range switch circuit. See **DTC 35: TRANSMISSION RANGE (TR) SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
7. Drive vehicle at a speed greater than 25 MPH. If VEHICLE SPEED-ABOVE 40 KM/H (25 MPH) is displayed on NGS tester, operation mode has passed. Perform condition detection mode. See **CONDITION DETECTION MODE** . If VEHICLE SPEED-ABOVE 40 KM/H (25 MPH) is not displayed on NGS tester, check vehicle speed sensor circuit. See **DTC 37: VEHICLE SPEED SENSOR CIRCUIT** under DIAGNOSTIC TESTS.

Using Cruise Indicator Light

NOTE: If RESUME/ACCEL switch is malfunctioning, cruise indicator light will not provide a correct indication when cruise system is inspected. Use NGS tester procedure.

NOTE: On 2-digit output patterns, a short pause separates each digit of output pattern (example of output pattern 21: 2 long flashes, short pause, 1 short flash). If no output pattern is present, light will not flash.

1. Turn ignition switch to ON position. Ensure cruise control main switch is off. Press and hold RESUME/ACCEL switch then press cruise control main switch to activate system inspection. Cruise indicator light should illuminate.

2. Press SET/COAST switch. If output pattern 21 is retrieved, go to next step. If output pattern 21 is not retrieved, check cruise control switch circuit. See **DTC 21: CRUISE CONTROL SWITCH CIRCUIT (SET/COAST)** under DIAGNOSTIC TESTS.
3. Press RESUME/ACCEL switch. If output pattern 22 is retrieved, go to next step. If output pattern 22 is not retrieved, check cruise control switch circuit. See **DTC 22: CRUISE CONTROL SWITCH CIRCUIT (RESUME/ACCEL)** under DIAGNOSTIC TESTS.
4. Depress brake pedal. If output pattern 31 is retrieved, go to next step. If output pattern 31 is not retrieved, check brake switch circuit. See **DTC 31: BRAKE SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
5. Place gear selector in Park or Neutral. If output pattern 35 is retrieved, go to next step. If output pattern 35 is not retrieved, check transmission range switch circuit. See **DTC 35: TRANSMISSION RANGE (TR) SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
6. Drive vehicle at a speed greater than 25 MPH. If output pattern 37 is retrieved, operation mode has passed. Perform condition detection mode. See CONDITION DETECTION MODE. If output pattern 37 is not retrieved, check vehicle speed sensor circuit. See **DTC 37: VEHICLE SPEED SENSOR CIRCUIT** under DIAGNOSTIC TESTS.

CONDITION DETECTION MODE

Using New Generation Star (NGS) Tester

1. Connect New Generation Star (NGS) Tester (49-T088-0A0) and Adapter (49-T088-004) according to manufacturer's instructions. Start vehicle and let idle. Set tester adapter switch to AUX 2. Using NGS tester, select VEHICLE & ENGINE SELECTION and press TRIGGER. Select DIAGNOSTIC DATA LINK and press TRIGGER. Select CCM - CRUISE CONTROL MODULE and press TRIGGER. Select DIAGNOSTIC TEST MODE and press TRIGGER. Select CRUISE CONTROL SELF TEST and press TRIGGER. Press START.
2. If NO CODES RETRIEVED is not displayed on NGS tester, go to next step. If NO CODES RETRIEVED is displayed on NGS tester, go to step 9 .
3. If ACTUATOR OR STOPLIGHT SW-DEFECT is not displayed on NGS tester, go to next step. If ACTUATOR OR STOPLIGHT SW-DEFECT is displayed on NGS tester, check actuator circuit. See **DTC 01: ACTUATOR CIRCUIT** under DIAGNOSTIC TESTS.
4. If STOP FUSE OR WIRING is not displayed on NGS tester, go to next step. If STOP FUSE OR WIRING is displayed on NGS tester, check brake switch circuit. See **DTC 05: BRAKE SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
5. If STOPLIGHT SWITCHES is not displayed on NGS tester, go to next step. If STOPLIGHT SWITCHES is displayed on NGS tester, check brake switch circuit. See **DTC 07: BRAKE SWITCH CIRCUIT** under DIAGNOSTIC TESTS.

6. If SET/COAST SW-DEFECT is not displayed on NGS tester, go to next step. If SET/COAST SW-DEFECT is displayed on NGS tester, check cruise control switch circuit. See **DTC 11: CRUISE CONTROL SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
7. If RESUME/ACCEL SW-DEFECT is not displayed on NGS tester, go to next step. If RESUME/ACCEL SW-DEFECT is displayed on NGS tester, check cruise control switch circuit. See **DTC 12: CRUISE CONTROL SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
8. If CRUISE CONTROL MODULE W-DEFECT is displayed on NGS tester, replace cruise control module. If CRUISE CONTROL MODULE W-DEFECT is not displayed on NGS tester, no cruise control module DTCs exist at this time. Go to next step.
9. To cancel CONDITION DETECTION MODE, turn ignition switch to LOCK position or turn cruise control main switch off.

Using Cruise Indicator Light

NOTE: If RESUME/ACCEL switch is malfunctioning, cruise indicator light will not provide a correct indication when cruise system is inspected. Use NGS tester in condition detection mode.

1. Turn ignition switch to ON position. Turn cruise control main switch on. Ensure cruise indicator light illuminates. If cruise indicator light does not illuminate, service before continuing.
2. Press and hold RESUME/ACCEL switch for at least 3 seconds. Cruise indicator light will illuminate for 3 seconds, and then go out for 2 seconds. Cruise indicator light will flash condition detection mode DTCs (if set). On 2-digit DTCs (output patterns), a short pause separates each digit of DTC (example of DTC 15: long flash, short pause, 5 short flashes). If no DTCs are set, light will not flash. If no DTCs exist, go to step 9 . If any DTCs exist, go to next step.
3. If DTC 01 does not exist, go to next step. If DTC 01 exists, check actuator circuit. See **DTC 01: ACTUATOR CIRCUIT** under DIAGNOSTIC TESTS.
4. If DTC 05 does not exist, go to next step. If DTC 05 exists, check brake switch circuit. See **DTC 05: BRAKE SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
5. If DTC 07 does not exist, go to next step. If DTC 07 exists, check brake switch circuit. See **DTC 07: BRAKE SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
6. If DTC 11 does not exist, go to next step. If DTC 11 exists, check cruise control switch circuit. See **DTC 11: CRUISE CONTROL SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
7. If DTC 12 does not exist, go to next step. If DTC 12 exists, check cruise control switch circuit. See **DTC 12: CRUISE CONTROL SWITCH CIRCUIT** under DIAGNOSTIC TESTS.
8. If DTC 15 exists, replace cruise control module. If DTC 15 does not exist, no cruise

control module DTCs exist at this time. Go to next step.

9. To cancel condition detection mode, drive vehicle at a speed greater than 10 MPH or turn cruise control main switch off. Ensure cruise indicator light goes out.

DIAGNOSTIC TESTS

DIAGNOSTIC TROUBLE CODES (DTC) LIST

DTC	Description
DTC 01	ACTUATOR CIRCUIT
DTC 05	BRAKE SWITCH
DTC 07	BRAKE SWITCH
DTC 11	CRUISE CONTROL SWITCH (SET/COAST SWITCH)
DTC 12	CRUISE CONTROL SWITCH (RESUME/ACCEL SWITCH)
DTC 13	CRUISE CONTROL SWITCH (GROUND CIRCUIT)
DTC 15	CRUISE CONTROL MODULE
DTC 21	CRUISE CONTROL SWITCH (SET/COAST SWITCH)
DTC 22	CRUISE CONTROL SWITCH (RESUME/ACCEL SWITCH)
DTC 31	BRAKE SWITCH CIRCUIT
DTC 35	TRANSMISSION RANGE (TR) SWITCH CIRCUIT
DTC 37	VEHICLE SPEED SENSOR CIRCUIT

NOTE: These tests are only to be used when sent here to from SELF-DIAGNOSTIC SYSTEM .

DTC 01: ACTUATOR CIRCUIT

1. Turn ignition to ON position. Push cruise control main switch to ON position. Using a DVOM, backprobe actuator harness connector terminal "B" (Green/Black wire). See **Fig. 2** . If battery voltage exists, go to step 7 . If battery voltage does not exist, go to next step.
2. Disconnect cruise brake switch connector. Turn ignition to ON position. Push cruise control main switch ON. Measure voltage at cruise brake switch connector terminal 2A (White wire). If battery voltage exists, go to step 5 . If battery voltage does not exist, go to next step.
3. Remove lower panel cover. Remove cruise control module with harness still connected.

Using voltmeter, backprobe cruise control module harness connector terminal "H" (White wire). See **Fig. 7** . If battery voltage exists, repair wiring harness between cruise control module terminal "H" and cruise brake switch. If battery voltage does not exist, go to next step.

4. Disconnect cruise control module. Using a DVOM, measure for continuity between cruise control module harness connector terminal "H" and ground. If continuity exists, repair wiring harness between cruise control module terminal "H" and cruise brake switch. See **WIRING DIAGRAMS** . If continuity does not exist, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL AND INSTALLATION.
5. Measure continuity at cruise brake switch harness connector terminal 2B (Pink wire) and ground. If continuity exists, go to next step. If continuity does not exist, check cruise brake switch. Repair or replace as necessary.
6. Measure continuity between cruise control module connector terminal "M" (Pink wire) and ground. If continuity exists, repair wiring harness between cruise control module terminal "M" and cruise brake switch. See **WIRING DIAGRAMS** . If continuity does not exist, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL AND INSTALLATION.
7. Measure voltage at cruise control module terminals "A" (Red wire) , "B" (Green/Black wire) and "C" (Green/Orange wire). See **WIRING DIAGRAMS** . If battery voltage is present, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL AND INSTALLATION. If battery voltage is not present, go to next step.
8. Measure voltage at cruise control actuator terminals "A" (Green/Orange wire), "C" (Pink wire) and "D" (Red wire). If battery voltage is present, repair wiring harness between cruise actuator and cruise control module. See **WIRING DIAGRAMS** . If battery voltage is not present, go to next step.
9. Disconnect cruise control module and cruise actuator. Measure continuity at cruise control module and cruise actuator harness wiring harness connectors terminals "A", "C", and "D". If continuity exists, repair wiring harness between cruise actuator and cruise control module. See **WIRING DIAGRAMS** . If continuity does not exist, go to next step.
10. Check cruise actuator. See **ACTUATOR** under COMPONENT TESTS. If cruise actuator is okay, replace cruise control module. If cruise actuator is not okay, replace cruise actuator. See **ACTUATOR** under REMOVAL & INSTALLATION.

DTC 05: BRAKE SWITCH

Perform DTC 31. See **DTC 31: BRAKE SWITCH CIRCUIT** . If DTC 31 checks out okay, and DTC 05 is still indicated in condition detection mode of on-board diagnostics, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION.

DTC 07: BRAKE SWITCH

1. Perform DTC 31. See **DTC 31: BRAKE SWITCH CIRCUIT** . If DTC 31 is okay, perform DTC 01. See **DTC 01: ACTUATOR CIRCUIT** . If DTC 01 is okay, go to next step.
2. Disconnect brake switch connector. Using a DVOM, measure voltage on wiring harness side of connector. If battery voltage is present, go to next step. If battery voltage is not present, check brake switches. See **BRAKE SWITCH** or **CRUISE BRAKE SWITCH** under COMPONENT TESTS.
3. Disconnect cruise control module. Using a DVOM, measure voltage at cruise control module connector terminal "K" (Green/Yellow wire) and ground. If battery voltage is present, repair wiring harness between brake switch and cruise control module. See **WIRING DIAGRAMS** . If battery voltage is not present, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION.

DTC 11: CRUISE CONTROL SWITCH (SET/COAST SWITCH)

Perform DTC 21. If DTC 21 checks out okay, and DTC 11 is still indicated in condition detection mode of on-board diagnostics, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION.

DTC 12: CRUISE CONTROL SWITCH (RESUME/ACCEL SWITCH)

Perform DTC 22. If DTC 22 checks out okay, and DTC 12 is still indicated in condition detection mode of on-board diagnostics, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION.

DTC 13: CRUISE CONTROL SWITCH (GROUND CIRCUIT)

Perform DTCs 21 and 22. If DTC 21 and 22 check out okay, and DTC 13 is still indicated in condition detection mode of on-board diagnostics, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION.

DTC 15: CRUISE CONTROL MODULE

If DTC 15 is indicated while performing condition detection mode, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION.

DTC 21: CRUISE CONTROL SWITCH (SET/COAST SWITCH)

1. Access cruise control module, located behind right kick panel. Disconnect cruise control module harness connector. Measure resistance between ground and terminal "L" (Violet wire) at cruise control module harness connector while depressing SET/COAST switch. See **Fig. 7** . If resistance is 198 ohms, system is okay. If resistance is not 198 ohms, go to next step.
2. Remove column cover. Turn ignition switch to ON position. Press cruise control main

switch to ON position. Turn SET/COAST to ON position. Using a DVOM, measure voltage at clockspring connector No. 2, terminal 2C (Violet wire). See **Fig. 3** . If voltage is 2.5 volts, replace cruise control module. If voltage is not as specified, replace cruise control switch.

DTC 22: CRUISE CONTROL SWITCH (RESUME/ACCEL SWITCH)

Access cruise control module, located behind right kick panel. Disconnect cruise control module harness connector. Measure resistance between ground and terminal "L" (Violet wire) at cruise control module harness connector while depressing RESUME/ACCEL switch. See **Fig. 7** . If resistance is 68 ohms, system is okay. If resistance is other than 68 ohms, replace cruise control module. Retest system operation.

DTC 31: BRAKE SWITCH CIRCUIT

1. Turn ignition switch to ON position. Depress brake pedal and observe brakelight operation. If brakelights do not illuminate, go to next step. If brakelights illuminate, go to step 6 .
2. Inspect STOP (15-amp) fuse in instrument panel fuse box. If fuse is okay, go to next step. If fuse is blown, repair short to ground in brakelight system.
3. Ensure STOP fuse is installed. Depress and hold brake pedal. Using a voltmeter, backprobe terminal 1B (Green/Yellow wire) at brake switch harness connector. If battery voltage exists, release brake pedal and go to step 5 . If battery voltage does not exist, release brake pedal and go to next step.
4. Using a voltmeter, backprobe terminal 1A (Green wire) at brake switch harness connector. If battery voltage exists, replace brake switch. If battery voltage does not exist, repair wiring harness between instrument panel fuse box and brake switch.
5. Depress and hold brake pedal. Using DVOM, measure voltage at brake light connector (Green/Yellow wire). See **WIRING DIAGRAMS** . If battery voltage exists, check brakelight bulb and wiring harness between brakelight and ground. If battery voltage does not exist, repair wiring harness between brakelight switch and brakelight.
6. Access cruise control module, located behind right kick panel. Depress and hold brake pedal. Using a DVOM, backprobe terminal "K" (Green/Yellow wire) at cruise control module harness connector. See **Fig. 7** . If battery voltage exists, go to next step. If battery voltage does not exist, repair wiring harness between cruise control module and brake switch. See **WIRING DIAGRAMS** .
7. Disconnect cruise brake switch. Turn ignition switch to ON position. Press cruise control switch to ON position. Using a DVOM, measure voltage at cruise brake switch terminal 2B (Pink wire). If battery voltage exists, go to next step. If battery voltage does not exist, check cruise brake switch. See **CRUISE BRAKE SWITCH** under COMPONENT TESTS.
8. Turn ignition switch to LOCK position. Disconnect cruise control module. Turn ignition switch to ON position. Measure voltage at terminal "M" (Pink wire) at cruise

control module harness connector. If voltage exists, repair wiring harness between cruise control module terminal "M" and cruise brake switch. See **WIRING DIAGRAMS** . If no voltage exists, replace cruise control module.

DTC 35: TRANSMISSION RANGE (TR) SWITCH CIRCUIT

1. Access cruise control module, behind right kick panel. Disconnect cruise control module connector. Turn ignition switch to ON position. Shift transmission to drive or reverse. Using DVOM measure voltage at cruise control module terminal "J" (Blue/Yellow wire). If voltage exists, repair wiring between cruise control module and TR switch See **WIRING DIAGRAMS** . If voltage does not exist, go to next step.
2. Disconnect TR switch connector. Using DVOM, measure voltage at TR switch connector terminal "F" (Blue/Yellow wire). See **Fig. 1** . If voltage is present, repair wiring harness. See **WIRING DIAGRAMS** . If voltage is not present, go to next step.
3. Test TR switch. See **TRANSMISSION RANGE (TR) SWITCH** under COMPONENT TESTS. If TR switch is okay, proceed to next step. If switch is defective, replace or adjust as necessary.
4. Inspect starter motor. See STARTERS - EXCEPT PICKUP article. If starter is okay, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION. If starter is defective, repair or replace as necessary.

DTC 37: VEHICLE SPEED SENSOR CIRCUIT

NOTE: Ensure speedometer cable is operating properly before proceeding with this test.

1. Check speedometer operation. If speedometer is operating correctly, go to next step. If speedometer is not operating correctly, perform instrument cluster input/output check. See INSTRUMENT PANELS - MPV article.
2. Drive vehicle at more than 25 mph. Check for DTC P0500. See SELF-DIAGNOSTICS - MPV article in ENGINE PERFORMANCE. If DTC P0500 is displayed, go to step 4 . If DTC P0500 is not displayed, go to next step.
3. Disconnect cruise control module connector and instrument cluster connector No. 3. Using a DVOM, check continuity between cruise control module connector terminal "N" (Green/Red wire) and instrument cluster connector No. 3, terminal 3O (Green/Orange wire). See **WIRING DIAGRAMS** . If continuity exists, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL & INSTALLATION. If continuity does not exist, repair wiring harness between cruise control module connector and instrument cluster connector No. 3. See **WIRING DIAGRAMS**
4. Check for DTC P0500 with cruise control module connector still disconnected. If DTC P0500 is displayed, go to next step. If DTC P0500 is not displayed, replace cruise control module. See **CRUISE CONTROL MODULE** under REMOVAL &

INSTALLATION.

5. With cruise control module connector and instrument cluster connector No. 3 disconnected, check continuity between cruise control module connector terminal "N" (Green/Red wire) and instrument cluster connector No. 3, terminal 3O (Green/Red wire). If continuity exists, go to next step. If continuity does not exist, repair wiring harness between cruise control module connector and instrument cluster connector No. 3. See **WIRING DIAGRAMS** .
6. Check continuity between cruise control module connector terminal "N" and ground. If continuity exists, go to next step. If continuity does not exist, repair wiring harness between instrument cluster, cruise control module and PCM. See **WIRING DIAGRAMS** .
7. Turn ignition on. Using a DVOM, measure voltage at cruise control module connector terminal "N" and ground. If battery voltage is present, repair wiring harness between instrument cluster, cruise control module and PCM. See **WIRING DIAGRAMS** . If battery voltage is not present, go to next step.
8. Disconnect PCM connector by removing PCM connector retaining bolt. Connect 104-pin breakout box to PCM connector and tighten connector retaining bolt. Using a DVOM, check continuity between instrument cluster connector No. 3, terminal 3O and 104-pin breakout box terminal No. 58. If continuity is present, replace instrument cluster. If continuity is not present, repair wiring harness between instrument cluster and PCM. See **WIRING DIAGRAMS** .

COMPONENT TESTS

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS - EXCEPT PICKUP article. DO NOT apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

ACTUATOR

Function Test

Disconnect actuator cable from accelerator. Start engine to supply vacuum to actuator diaphragm. Apply battery voltage and ground to specified terminals of actuator and observe actuator arm operation. See **ACTUATOR FUNCTION TEST** table. See **Fig. 2** . If actuator arm does not function as specified, replace actuator.

ACTUATOR FUNCTION TEST

Apply 12 Volts To Terminal	Ground Terminal(s)	(1) Actuator Arm Result
B	A, C & D	Pull

B	A & D	Hold
B	D	Extend
(1) With voltage and ground not applied, actuator should release.		

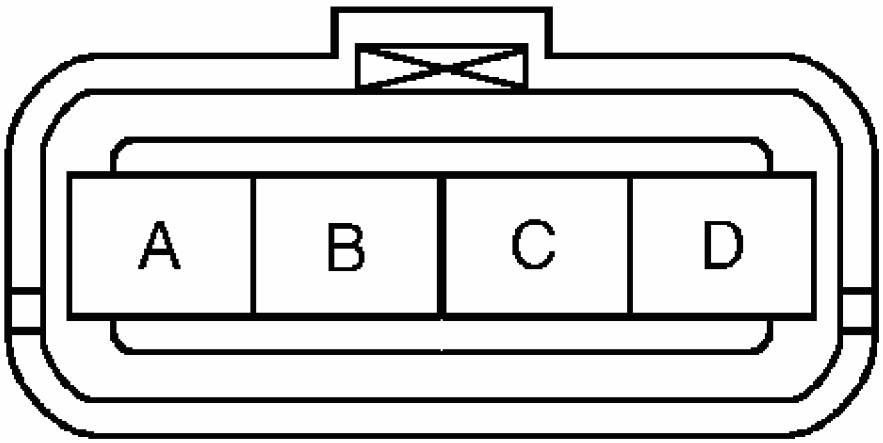

Fig. 2: Identifying Actuator Terminals
Courtesy of MAZDA MOTORS CORP.

BRAKELIGHT SWITCH

NOTE: Brakelight switch can be distinguished from cruise brake switch by color of wires connected to switch. See WIRING DIAGRAMS .

Disconnect brakelight switch harness connector. Check continuity between brakelight switch terminals. With brake pedal depressed, continuity should exist. With brake pedal released, continuity should not exist. If continuity is not as specified, replace brakelight switch.

CLOCKSPRING

1. Remove driver's side air bag. See AIR BAG RESTRAINT SYSTEMS - EXCEPT PICKUP article. Remove steering column lower cover. Disconnect all clockspring harness connectors.
2. Ensure continuity exists between clockspring terminals 1A and 3A. Ensure continuity exists between clockspring terminals 1B and 3B. Ensure continuity exists between clockspring terminals 2A and 4A. See **Fig. 3** .

3. Ensure continuity exists between clockspring terminals 2B and 4B. Ensure continuity exists between clockspring terminals 2C and 4C. Ensure continuity exists between clockspring terminals 2D and 4D. If continuity does not exist across terminals specified, replace clockspring.

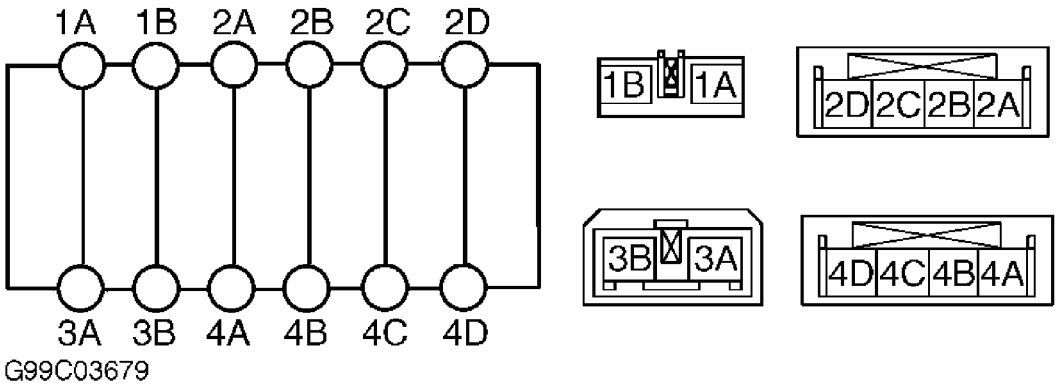

Fig. 3: Identifying Clockspring Terminals
Courtesy of MAZDA MOTORS CORP.

CRUISE BRAKE SWITCH

NOTE: Cruise brake switch can be distinguished from brakelight switch by color of wires connected to switch. See WIRING DIAGRAMS .

Disconnect cruise brake switch harness connector. Check continuity between cruise brake switch terminals. See **Fig. 4** . With brake pedal depressed, continuity should not exist. With brake pedal released, continuity should exist. If continuity is not as specified, replace cruise brake switch.

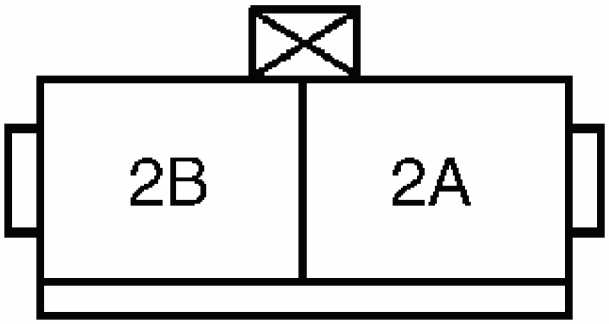

Fig. 4: Identifying Cruise Brake Switch Connector Terminals
Courtesy of MAZDA MOTORS CORP.

CRUISE CONTROL SWITCH

1. Disable air bag system. See AIR BAG RESTRAINT SYSTEMS - EXCEPT PICKUP article. Disconnect negative battery cable.
2. Check resistance between specified terminals of cruise control switch with switch in specified position. See **CRUISE CONTROL SWITCH RESISTANCE TEST** table. See. If resistance is not as specified, replace cruise control switch.

CRUISE CONTROL SWITCH RESISTANCE TEST

Switch Position	Terminals	Specification (1)
Cruise Control Switch On	A & B	Continuity Exists
SET/COAST	A & C	198 Ohms
RESUME/ACCEL	A & C	68 Ohms
CANCEL Switch Held On	A & C	418 Ohms
(1) All resistance values are approximate.		

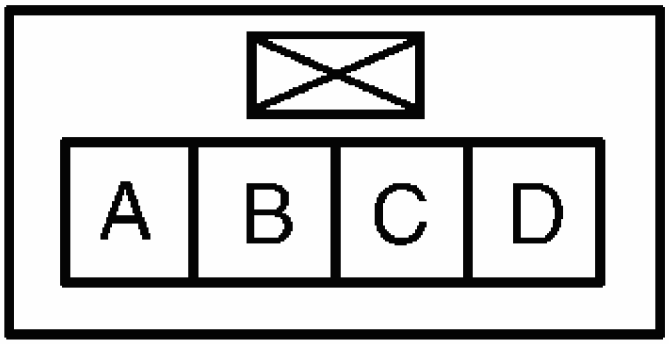

Fig. 5: Identifying Cruise Control Switch Terminals
Courtesy of MAZDA MOTORS CORP.

VEHICLE SPEED SENSOR

Remove vehicle speed sensor from transmission. Connect AC voltmeter (5-volt scale) between vehicle speed sensor terminals. See **Fig. 6** . Rotate vehicle speed sensor driven gear by hand. If voltage pulses are detected, vehicle speed sensor is okay. If voltage pulses are not detected, replace vehicle speed sensor.

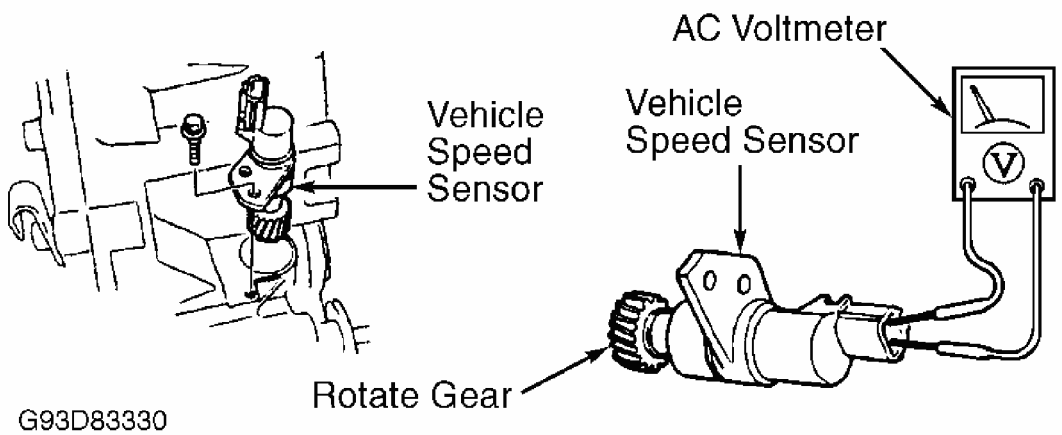

Fig. 6: Checking Vehicle Speed Sensor
Courtesy of MAZDA MOTORS CORP.

CRUISE CONTROL MODULE

1. Locate cruise control module below instrument cluster. Leave cruise control module harness connector attached unless otherwise specified.
2. Using DVOM, backprobe specified terminals of cruise control module harness connector while performing appropriate test condition. See **CRUISE CONTROL MODULE PIN VOLTAGE** table. See **Fig. 7** .
3. If voltage measurements or continuity measurements are not as specified, check related components and wiring. See **WIRING DIAGRAMS** . If related components and wiring are okay, but system is still not functioning properly, replace cruise control module.

CRUISE CONTROL MODULE PIN VOLTAGE

Terminal (Signal)/Test Condition	Value
A (Actuator Control)	
Ignition On, Main Switch On	Battery Voltage
Ignition On, Main Switch Off	Less Than 1 Volt
B (Actuator Control)	
Ignition On, Main Switch On	Battery Voltage
Ignition On, Main Switch Off	Less Than 1 Volt
C (Actuator Control)	
Ignition On, Main Switch On	Battery Voltage
Ignition On, Main Switch Off	Less Than 1 Volt
D (Indicator Light Output)	
Ignition On	Battery Voltage
Ignition LOCK Or ACC	Less Than 1 Volt
E (IG1)	
Ignition On, Main Switch On	Battery Voltage
Ignition On, Main Switch Off	Less Than 1 Volt
G (PCM O/D Off)	
Ignition On	Battery Voltage
Ignition LOCK Or ACC	Less Than 1 Volt
H (Cruise Brake Switch)	
Ignition On, Main Switch On	Battery Voltage
Ignition On, Main Switch Off	Less Than 1 Volt
I (Data Link Connector)	(1)
J (Transmission Range Switch)	
Ign. On, Main Sw. On, Not In Park Or Neutral	Battery Voltage
Ign. On, Main Sw. Off, In Park Or Neutral	Less Than 1 Volt

K (Brake Cruise Switch	
Brake Pedal Depressed	Battery Voltage
Brake Pedal Released	Less Than 1 Volt
L (Cruise Control Switch Position)	
Ign. On, Main Sw. On, SET/COAST Sw. Depressed	2.5 Volts
Ign. On, Main Sw. On, RESUME/ACCEL Sw. Depressed	1.2 Volts
Ign. On, Main Sw. On, CANCEL Sw. Depressed	3.5 Volts
Ign On, Cruise Main Held On	5.4 Volts
M (Brakelight Switch)	
Brake Pedal Released	Battery Voltage
Brake Pedal Depressed	Less Than 1 Volt
N (Vehicle Speed Sensor)	
Ign. On, Cruise Control Main Switch Held On, Front Tires Rotating	Alternating 0-5 Volts
O (Cruise Control Main Switch Input)	
Ign. On, Main Sw. Off,	Battery Voltage
Ign. On, Main Sw. On	Less Than 1 Volt
P (Ground) At All Times	(2) Continuity To Ground

(1) Information is not available from manufacturer.

(2) Turn ignition switch to LOCK position. Disconnect cruise control module harness connector. Measure resistance between ground and appropriate terminal.

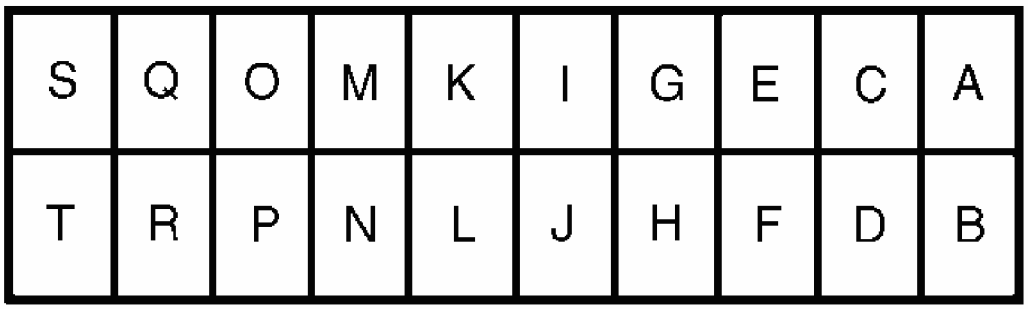

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Fig. 7: Identifying Cruise Control Module Connector Terminals
Courtesy of MAZDA MOTORS CORP.

TRANSMISSION RANGE (TR) SWITCH

Disconnect Transmission Range (TR) switch harness connector. Check continuity between appropriate TR switch terminals with gear selector in appropriate position. See **TR SWITCH CONTINUITY** table. See **Fig. 1** . If continuity is not as specified, replace TR switch.

TR SWITCH CONTINUITY

Gear Position	Continuity Between Terminals
P (Park)	A & E, F & I
R (Reverse)	A & D
N (Neutral)	A & H, F & I
D (Drive)	A & B
2 (2nd Gear)	A & G
1 (1st Gear)	A & C

REMOVAL & INSTALLATION

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS - EXCEPT PICKUP article. DO NOT apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

ACTUATOR

Removal & Installation

Disconnect negative battery cable. Disconnect actuator harness connector. Disconnect actuator cable at actuator. Remove actuator retaining nuts and remove actuator. To install, reverse procedure.

CRUISE CONTROL MODULE

Removal & Installation

Disconnect negative battery cable. Remove lower panel. Remove cruise control module retaining nut. Disconnect cruise control module wiring harness connector. Remove cruise control module. To install, reverse removal procedure. Tighten cruise control module retaining nut to 14-18 ft. lbs. (19-25 N.m).

CRUISE CONTROL SWITCH

Removal & Installation

Disconnect negative battery cable. Remove driver's side air bag. See AIR BAG RESTRAINT SYSTEMS - EXCEPT PICKUP article. Remove cruise control switch bracket. Remove cruise control switch retaining screws. Disconnect cruise control switch harness connector. Remove cruise control switch from steering column. To install, reverse removal procedure.

WIRING DIAGRAMS

Fig. 8: Cruise Control System Wiring Diagram (MPV)