

CRUISE CONTROL SYSTEM

1997 ACCESSORIES/SAFETY EQUIP General Motors Corp. - Cruise Control System

DESCRIPTION & OPERATION

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM procedures in AIR BAG RESTRAINT SYSTEM article.

Cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions. Steep grades may cause variations in selected speeds. System has capability to cruise, coast, resume speed, accelerate, and tap-up and tap-down.

The cruise control module contains an electronic controller and electric stepper motor. Controller monitors vehicle speed and operates electric stepper motor. In response to controller, stepper motor moves a connecting strap that is attached to cruise control cable. Cable moves throttle linkage to vary throttle position in order to maintain desired cruise speed. Cruise control module contains a low speed limit which will prevent system engagement below a speed of about 25 MPH.

Module is controlled by engagement switch located on multifunction lever. Electric brake switches mounted on brake pedal bracket disengage cruise system when brake or clutch pedal is depressed. Cruise control is in standby disabled mode until all conditions inconsistent with cruise control operation are cleared.

ENGAGEMENT SWITCH

The engagement switch turns cruise control system on and off. With switch pushed to ON position and SET/COAST button pushed in, cruise speed should be maintained. With cruise in RESUME/ACCELERATE (R/A) position, cruise speed can be resumed after slowing down or stopping. Also with cruise switch in R/A position, cruise speed can be raised (tap-up) or lowered (tap-down) in one MPH increments. Cruise control engagement switch is located in multifunction lever, which also serves as a turn signal lever and wiper/washer switch.

CRUISE CONTROL MODULE

Cruise control module interprets position of cruise control switches and vehicle speed. In response to these inputs, cruise control module moves accelerator linkage. Cruise control module uses an internal electronic controller and electric stepper motor to vary throttle with each cruise control mode. Cruise control module is located in engine compartment, on center of firewall.

VEHICLE SPEED SENSOR (VSS)

VSS is mounted in transaxle. VSS produces an AC signal with a frequency proportional to the speed at which the transaxle output shaft rotates, which is also proportional to vehicle speed. The AC signal is sent to the Powertrain Control Module (PCM), cruise control module and speedometer, where the signal is converted to a rate of 4000 pulses per mile. These components then convert the number of pulses per mile to pulses per second

None		

to determine the speed of the vehicle.

BRAKE & CLUTCH RELEASE SWITCHES

An electrical release switch on brake pedal bracket and on clutch pedal bracket (on manual transmission vehicles) disengages cruise when brake or clutch pedal is depressed. Switch activates brake cut-out input to cruise control module assembly. Vehicle speed at brake actuation is stored in system memory.

ADJUSTMENTS

BRAKE & CLUTCH RELEASE SWITCHES

1. Fully depress brake or clutch pedal and hold. Install switch into mounting bracket. Press switch until firmly seated. As switch is installed, an audible clicking can be heard as switch is pressed toward brake or clutch pedal. Pull brake or clutch pedal rearward until clicking ceases. Allow pedal to slowly return to fully retracted position. Switch will move within retainer to proper position.
2. Measuring pedal travel from centerline of brake pedal, ensure switch contacts are open at 1/8-1/2" (3.5-12.5 mm) of pedal travel. Nominal actuation of stoplight switch contacts is about 3/16" (4.5 mm) after release switch contacts close. Check brakelights for proper operation.

CRUISE CONTROL CABLE

Disengage adjustment lock on cruise control cable by pressing tabs with needle-nose pliers. Cable should move freely in and out of adjuster when lock is disengaged. Hold throttle plate at closed position. Engage adjustment lock.

TROUBLE SHOOTING

PRELIMINARY VISUAL INSPECTION

1. PCM will disable cruise control if any of the following conditions are detected:
 - Engine is off.
 - Transaxle is in Park, Neutral, Low or Reverse.
 - Engine speed is too high.
 - Vehicle speed is too high.
 - Vehicle acceleration/deceleration rate is too high.
 - ABS or traction control system is active for more than 2 seconds.
2. Check for Diagnostic Trouble Codes (DTCs). If any codes are present, see **G - TESTS W/CODES** article in ENGINE PERFORMANCE section.
3. Ensure cruise control linkage is not binding. Check cruise control cable adjustment. See CRUISE CONTROL CABLE under **ADJUSTMENTS** . Ensure brake switch is installed correctly. See BRAKE & CLUTCH RELEASE SWITCHES under **ADJUSTMENTS** . Ensure center high mounted brakelight is operating.
4. Check fuses, and replace as necessary. Visually inspect for broken or open wires. Ensure any aftermarket

electronic equipment is properly installed.

SYMPTOM TESTS

NOTE: Tests are written specifically for use with GM Tech I or Tech II scan tools. Generic scan tool can be used but may have limited functions.

SYSTEM CHECK

1. Using scan tool, command PCM to enable cruise control system. Set parking brake and start engine. Move main switch to OFF position, then to ON position. After 3 seconds, depress and hold SET/COAST button. Hold slider switch in Resume/Accelerate (R/A) position. Fully depress and hold brake pedal.
2. After 10 seconds, release brake pedal. Engine RPM should increase slightly, then return to idle. Clear any Diagnostic Trouble Codes (DTCs) which may be set.

CRUISE CONTROL INOPERATIVE

1. Turn cruise control off. Disconnect cruise control module. Turn ignition on. Connect a test light between cruise control module connector terminal "F" (Brown wire) and ground. See **Fig. 1**. If test light glows, go to next step. If test light does not glow, repair poor connection or open circuit in Brown wire.
2. Connect test light between cruise control module connector terminals "F" (Brown wire) and "E" (Black/White wire). If test light glows, go to next step. If test light does not glow, repair poor connection or open in Black/White wire.
3. Disconnect multifunction lever. Connect test light between ground and multifunction lever terminal B6 (Brown wire). If test light glows, go to next step. If test light does not glow, check for a poor connection, or open in Brown wire between cruise control module and multifunction lever. If circuit is okay, replace multifunction lever. See **STEERING COLUMN SWITCHES** article.
4. Turn cruise control switch on. Connect test light between ground and multifunction lever terminal B9 (Gray wire). If test light glows, go to next step. If test light does not glow, replace multifunction lever. See **STEERING COLUMN SWITCHES** article.
5. Connect test light between ground and cruise control module connector terminal "A" (Gray wire). If test light glows, go to next step. If test light does not glow, repair poor connection or open circuit in Gray wire between cruise control module and multifunction lever.
6. Connect test light between ground and multifunction lever terminal B8 (Dark Blue wire). While observing test light, press and hold SET/COAST switch. If test light glows, go to next step. If test light does not glow, replace multifunction lever. See **STEERING COLUMN SWITCHES** article.
7. Connect test light between ground and cruise control module connector terminal "B" (Dark Blue wire). If test light glows, go to next step. If test light does not glow, repair poor connection or open circuit in Dark Blue wire between cruise control module and multifunction lever.
8. Connect test light between ground and cruise control module connector terminal "G" (Light Blue wire). If test light glows, go to next step. If test light does not glow, repair short to power in Light Blue wire.
9. Connect test light between ground and cruise control module connector terminal "D" (Purple wire). If test light glows, go to next step. If test light does not glow, repair poor connection or open circuit in Purple wire.

10. Set parking brake. Raise drive wheels. Using Digital Voltmeter/Ohmmeter (DVOM), measure voltage between ground and cruise control module connector terminal "K" (Dark Green/White wire). While observing voltmeter, rotate drive wheels by hand. If voltage varies, go to next step. If voltage does not vary, repair poor connection or open in Dark Green/White wire.
11. Attach a scan tool to Data Link Connector (DLC). Using scan tool, command SMCC to allow cruise. If scan tool displays SMCC INHIBITED, see **G - TESTS W/CODES** article in ENGINE PERFORMANCE section. If scan tool does not display SMCC INHIBITED, verify cruise control module connector is clean and tight. If no faults are found, replace cruise control module.

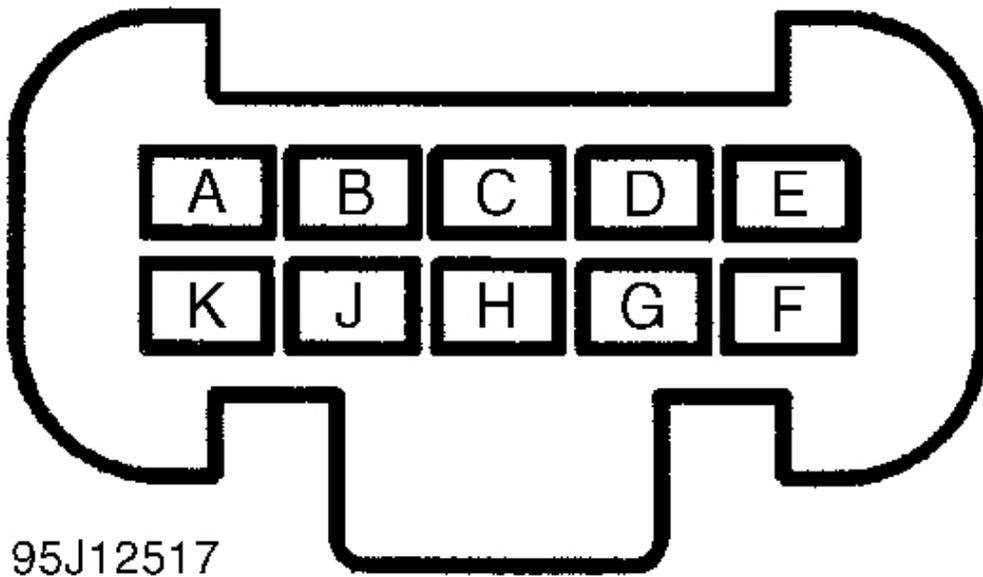


Fig. 1: Identifying Cruise Control Module Connector Terminals
Courtesy of GENERAL MOTORS CORP.

CRUISE CONTROL WILL NOT RESUME, ACCELERATE, TAP-UP OR TAP-DOWN

1. Disconnect cruise control module. Turn ignition on. Turn cruise control on. Connect a test light between cruise control module connector terminal "C" (Gray/Black wire) and ground. While observing test light, press and hold R/A switch.
2. If test light does not glow, check for a poor connection or open in Gray/Black wire between cruise control module and multifunction lever. If circuit is okay, replace multifunction lever. See **STEERING COLUMN SWITCHES** article.
3. If test light glows, check for a short to ground in Gray/Black wire. Also check for poor connection at cruise control module terminal "C" (Gray/Black wire). If connection and circuit are okay, replace cruise

control module.

REMOVAL & INSTALLATION

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

BRAKE & CLUTCH RELEASE SWITCHES

Removal

Disconnect negative battery cable. Remove left sound insulator under left side of instrument panel (if necessary). Remove electrical connector(s) from switch. Pulling switch rearward, remove switch from retainer. Remove retainer from brake pedal mounting bracket.

Installation

To install, reverse removal procedure. Adjust brake release switch. See **BRAKE & CLUTCH RELEASE SWITCHES** under **ADJUSTMENTS**.

CRUISE CONTROL CABLE

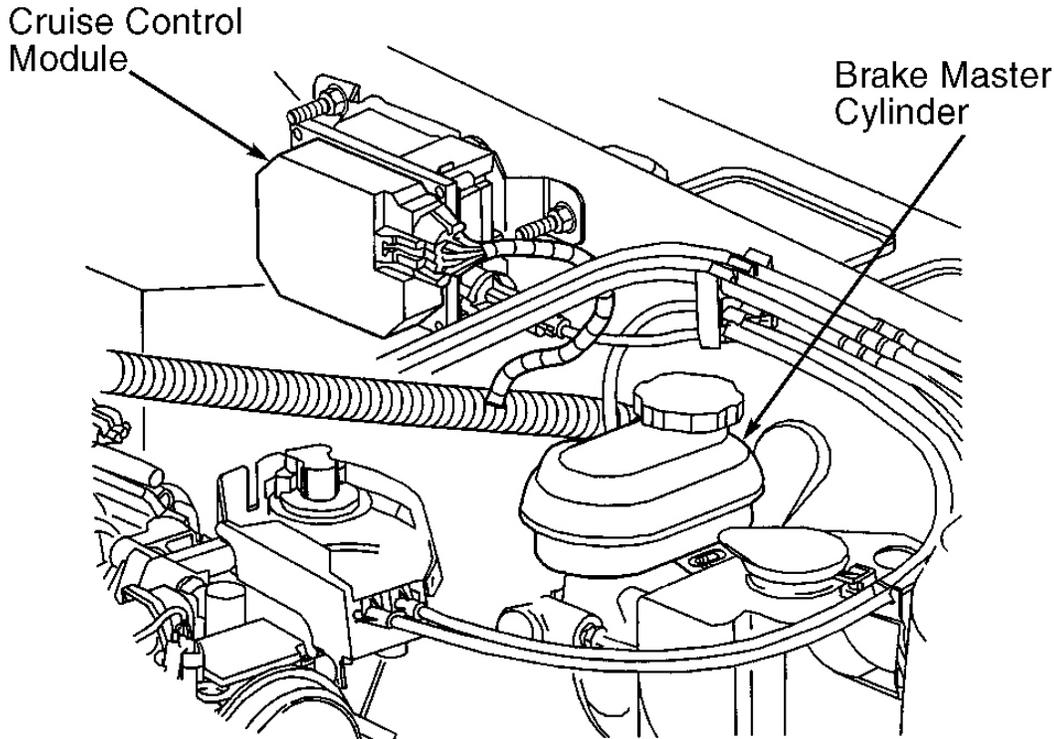
Removal & Installation

Unclip cruise control cable from throttle valve cam and throttle body bracket. Remove cable assembly from control module. Remove cable from retainers. To install, reverse removal procedure. Ensure ribbon into cruise control module is not twisted. Adjust cruise control cable. See **CRUISE CONTROL CABLE** under **ADJUSTMENTS**.

CRUISE CONTROL MODULE

Removal & Installation

Disconnect negative battery cable. Remove cruise control cable at engine bracket and throttle valve cam. Remove cruise control cable from module assembly. See **CRUISE CONTROL CABLE** under **REMOVAL & INSTALLATION**. Disconnect electrical connector from module assembly. Remove 2 nuts from mounting studs. Remove cruise control module assembly. See **Fig. 2**. To install, reverse removal procedure. Tighten nuts to 18 INCH lbs. (2 N.m).



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Fig. 2: Locating Cruise Control Module
Courtesy of GENERAL MOTORS CORP.

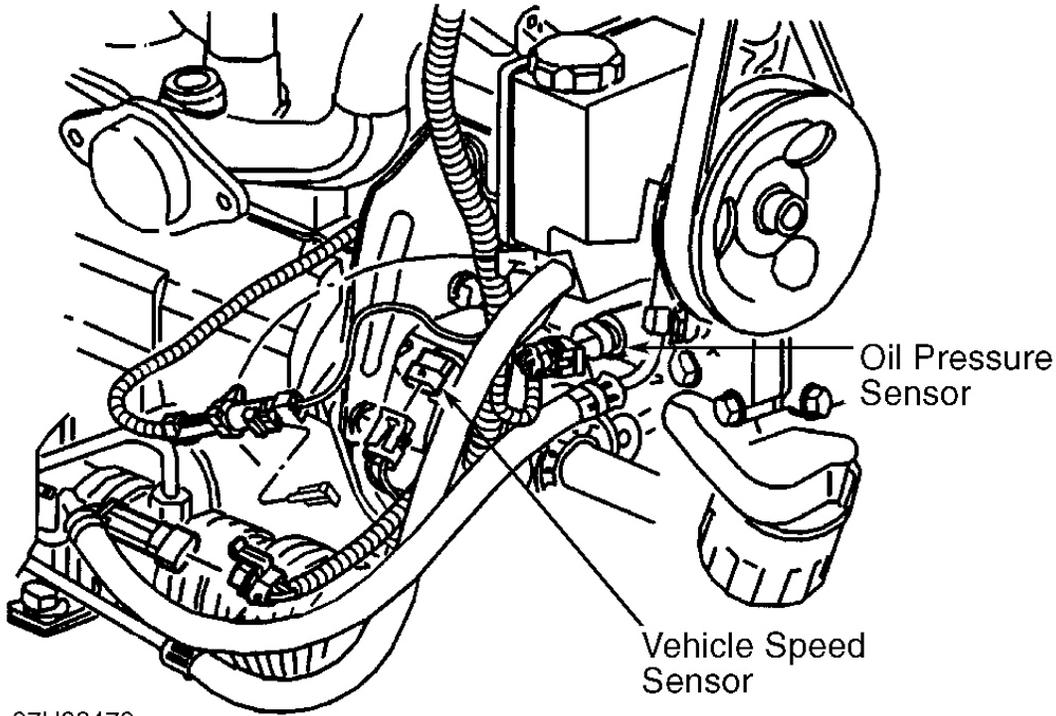
VEHICLE SPEED SENSOR (VSS)

Removal

Disconnect negative battery cable. Disconnect vehicle speed sensor electrical connector. See **Fig. 3** . Remove vehicle speed sensor retainer bolt, retainer and spacer. Remove vehicle speed sensor from transmission case extension. Remove "O" ring.

Installation

To install, reverse removal procedure. Lubricate "O" ring. Tighten speed sensor retainer bolt to 97 INCH lbs. (11 N.m).



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Fig. 3: Locating Vehicle Speed Sensor
Courtesy of GENERAL MOTORS CORP.

WIRING DIAGRAM

1997 Buick Park Avenue Ultra

CRUISE CONTROL SYSTEM '1997 ACCESSORIES/SAFETY EQUIP General Motors Corp. - Cruise Control System

Fig. 4: Cruise Control System Wiring Diagram