

# 2003 ACCESSORIES & EQUIPMENT

## Cruise Control System - Sorento

### DESCRIPTION & OPERATION

#### COMPONENT PARTS AND FUNCTION OUTLINE

Component part		Function
Vehicle-speed sensor		Converts vehicle speed to pulse.
Cruise control module (CCM)		Receives signals from sensor and control switches; CCM controls all automatic speed control functions.
Cruise control indicator		Illuminate when CRUISE main switch is ON (Built into cluster)
Cruise Control switches	CRUISE main switch	Switch for automatic speed control power supply.
	Resume/Accel switch	Controls automatic speed control functions by Resume/Accel switch (Set/Coast switch)
	Set/Coast switch	
Cancel switch	Cancel switch	Sends cancel signals to CCM
	Brake-pedal switch	
	Transaxle range switch(A/T) Clutch switch(M/T)	
Throttle valve		Regulates the throttle valve to the set opening by CCM.

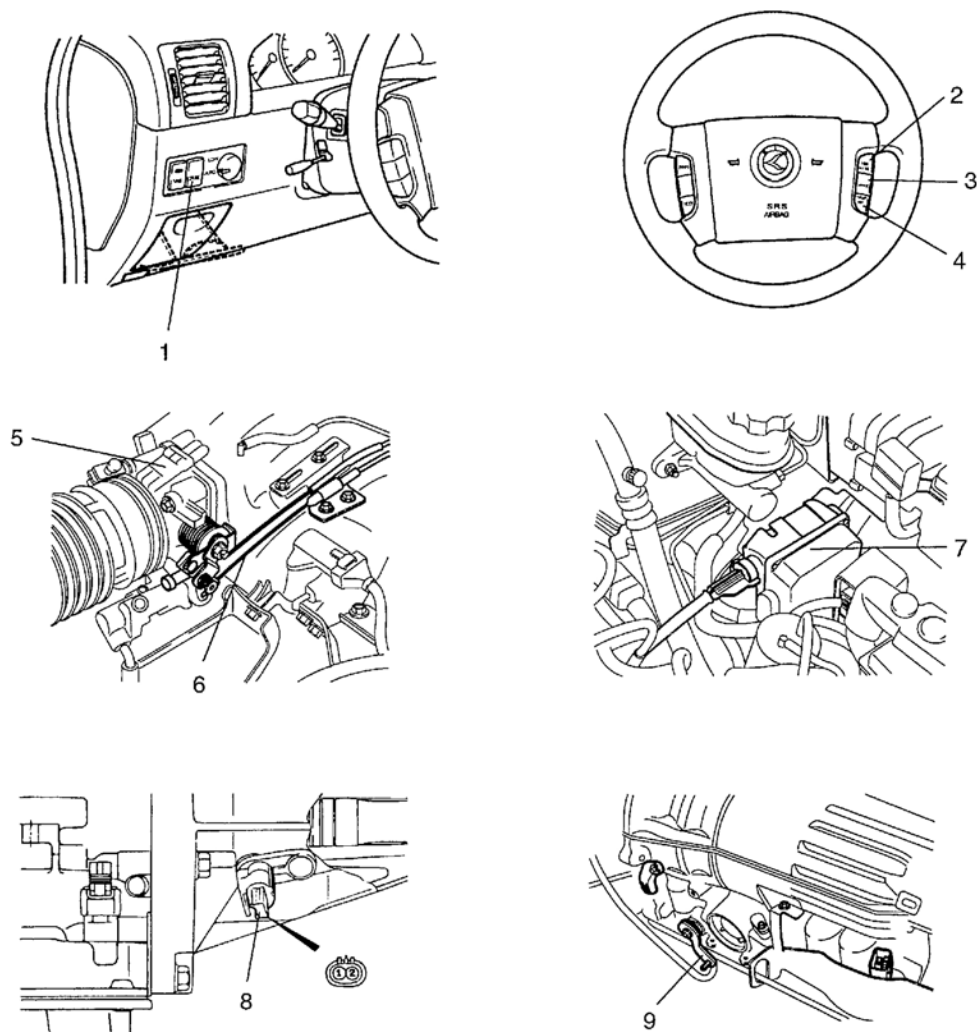
\* CCM : Cruise Control Module

\* CC : Cruise Control

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**Fig. 1: Component Parts & Function Chart**  
Courtesy of KIA MOTORS AMERICA, INC.

#### COMPONENT LOCATION

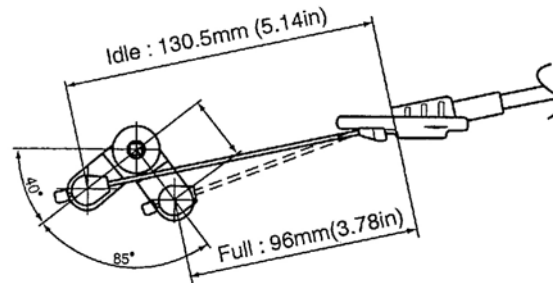
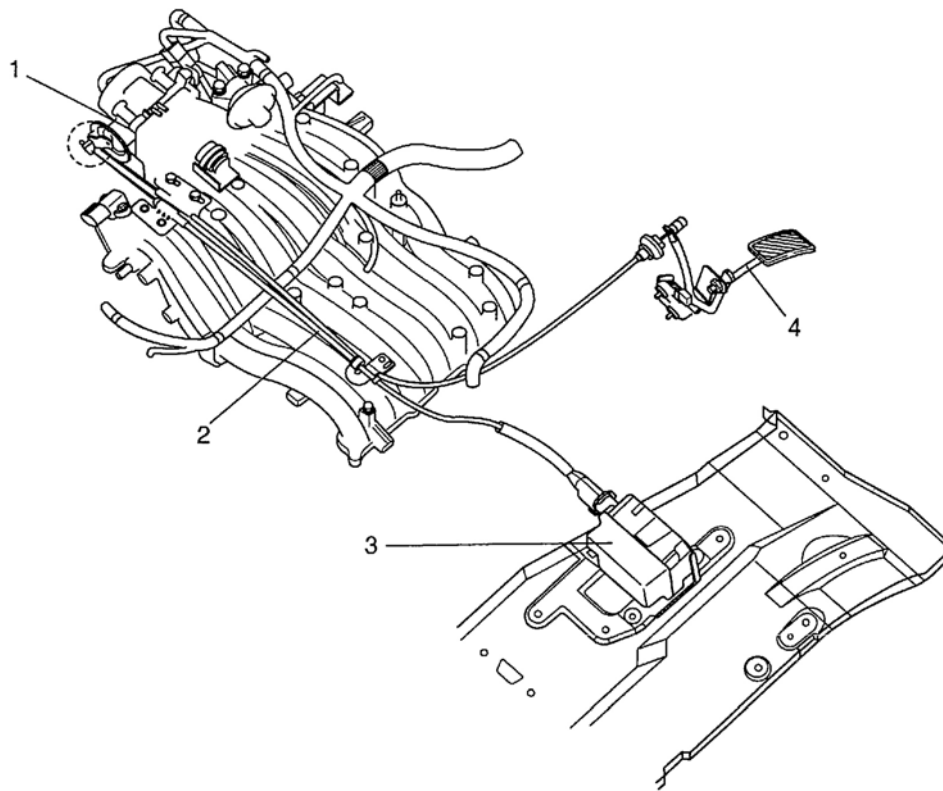


1. Cruise Main switch
2. Resume/Accel switch
3. Cancel switch
4. Coast/Set switch
5. Throttle body

6. Cruise control cable
7. Cruise control module
8. Vehicle speed sensor
9. Transmission range switch

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**Fig. 2: Illustrating Component Location (1 Of 2)**  
**Courtesy of KIA MOTORS AMERICA, INC.**



- 1. Throttle body
- 2. Cruise control cable

- 3. Cruise control module
- 4. Accelerator pedal

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**Fig. 3: Illustrating Component Location (2 Of 2)**  
**Courtesy of KIA MOTORS AMERICA, INC.**

## CRUISE CONTROL

Cruise control system is engaged by "CRUISE" main switch located on center instrument panel, left of steering wheel. System has the capability to cruise, coast, resume speed, and accelerate, and raise "tap-up" or lower "tap-

down" set speed. It also has a safety interrupt, engaged upon depressing brake or shifting select lever.

Stepper Motor Cruise Control (SMCC x.5) is a speed control system that maintains a required vehicle speed at normal driving conditions.

The main components of SMCC system are mode control switches, transaxle range switch, brake switch, vehicle speed sensor, cruise control module and control cable that connect throttle body.

SMCC system uses a cruise control module to gain the required vehicle cruise operation. Two important components of the module are an electronic controller and a electric stepper motor.

The controller monitors vehicle speed and operates the electric stepper motor. The motor moves a ribbon and throttle linkage, in response to controller, to maintain the desired cruise speed. The cruise control module contains a low speed limit which will prevent system engagement below a minimum speed of 40 Km/h (25 mph). The operation of the controller is controlled by mode control switches located on steering wheel.

Transaxle range switch and brake switch are provided to disengage the cruise control system. The switches are on brake pedal bracket and transaxle. When the brake pedal depressed or select lever shifted, the cruise control system is electrically disengaged and the throttle is returned to the idle position.

## **CRUISE MAIN SWITCH**

SMCC system is engaged by pressing "CRUISE" push button. Releasing "CRUISE" push button release throttle, clears cruise memory speed, and puts vehicle is a non-cruise mode.

## **SET/COAST SWITCH**

SET/COAST switch located on inside of steering wheel has two positions - "Normal" and "Depressed" The set position - With SET/COAST switch depressed and then release the cruise speed will be set at the speed the vehicle was going when SET/COAST switch was released. The coast position - With SET/COAST switch fully depressed, driver can lower cruise speed. To decrease cruise speed, Set/Coast switch is held in, disengaging cruise control system. When vehicle has slowed to required cruise speed, releasing SET/COAST switch will re-engage speed at new selected speed.

The tap down - To lower vehicle speed, cruise must be engaged and operating. Tap down is done by quickly pressing and releasing SET/COAST switch. Do no hold Set/Coast switch in depressed position.

Tap down is a function in which cruise speed car be decreased by 1 mph (1.6 Km/h).

## **RESUME/ACCEL SWITCH**

RESUME/ACCEL switch located on inside of steering wheel has two positions - "Normal" and "Depressed".

The resume position - With RESUME/ACCEL switch depressed and then release, This switch also returns cruise control operation to last speed (which is temporarily disengaged by cancel switch or brake pedal), setting when momentarily operating RESUME/ACCEL switch by constant acceleration.

The accel position - With RESUME/ACCEL switch depressed and held in, disengaging cruise control system, when vehicle has accelerated to required cruise speed, releasing RESUME/ACCEL switch will re-engage speed at new selected speed.

The tap up - To increase vehicle speed, the cruise must be engaged and operating.

Tap up is done by quickly pressing and releasing RESUME/ACCEL switch less than 0.75 second. Do not hold RESUME/ACCEL switch is in depressed position. Tap up is a function in which cruise speed can be increased by 1 mph (1.6 Km/h).

**CANCEL SWITCH**

SMCC system is temporarily disengaged by pressing "CANCEL" switch.

Cruise speed canceled by this switch will be recover by RESUME/ACCEL switch.

**SPECIFICATIONS**

Speed control module	
Operating voltage range	DC 11 - 16V
Operating temperature	-40~110°C
Voltage drop between unit and actuator	0.4V
Operating speed range	Low speed limit : 22~24 mile High speed limit : 118~120 mile

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**Fig. 4: Cruise Control System Specifications**  
**Courtesy of KIA MOTORS AMERICA, INC.**

**TROUBLESHOOTING**

**PRE-TROUBLESHOOTING**

Before starting troubleshooting, inspect each of the following sections, and if there is an abnormality, carry out a repair:

- 1. Check if the installation and connection routes of the cable is normal.
- 2. Check if there is no excessive play or tension in each cable.

**TROUBLESHOOTING PROCEDURES**

First, select the applicable malfunction symptom from the "TROUBLE SYMPTOM CHARTS". See **TROUBLE SYMPTOM CHARTS** .

Determine the condition of all function circuits:

1. Make the following preliminary inspections:

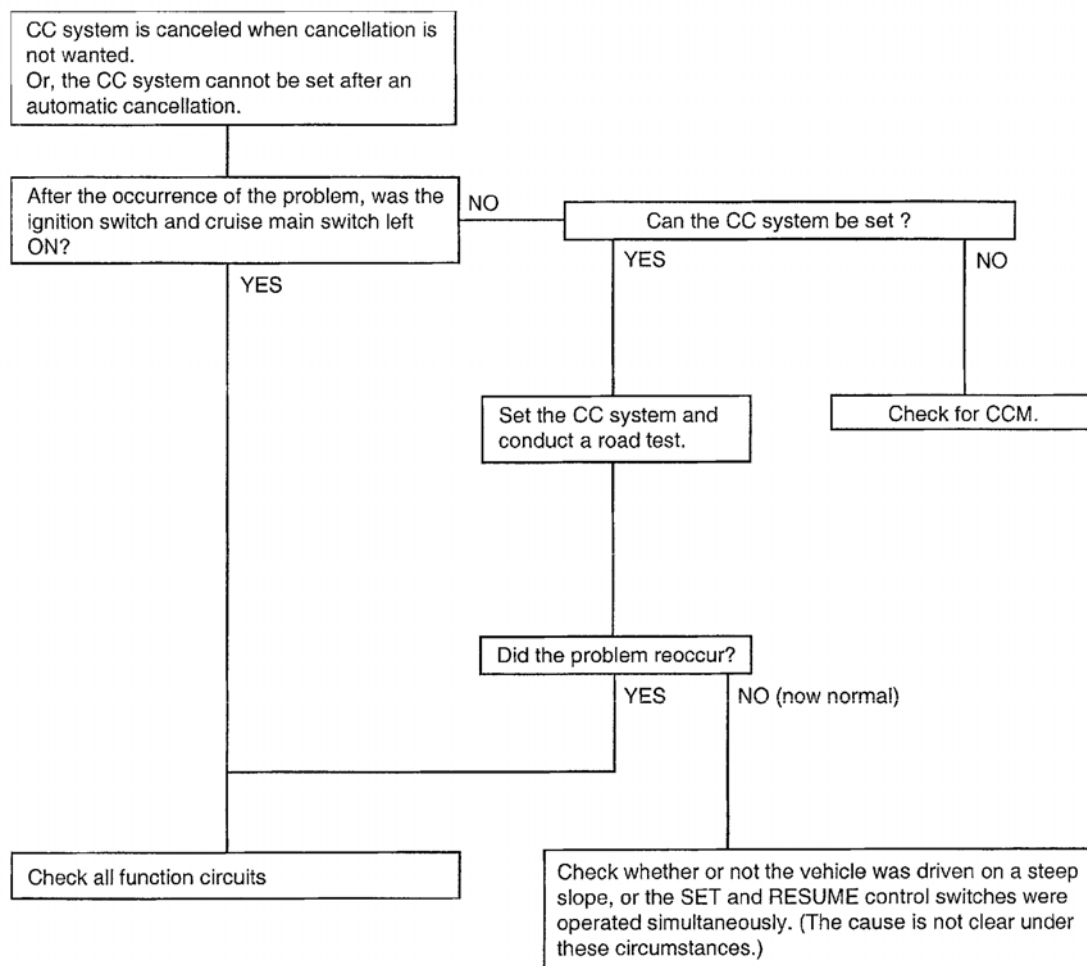
- Check that the installation of the accelerator cable is correct, and that the cables and links are securely connected.
- Check that the accelerator pedal moves smoothly.
- Adjust the cable so there is not excessive tension or excessive play on the accelerator cable.
- Check that the cruise control module (CCM), cruise main and control switch, and the connector of each cancel switch are connected securely.

2. Check in the sequence indicated in the "TROUBLE SYMPTOM CHARTS".

3. If these checks indicate a normal condition, replace the cruise control module.

## TROUBLE SYMPTOM CHARTS

### TROUBLE SYMPTOM 1 - CRUISE CANCELS WHEN NOT WANTED



CC : Cruise Control  
CCM : Cruise Control Module

**Fig. 5: Cruise Cancels When Not Wanted**  
Courtesy of KIA MOTORS AMERICA, INC.

**TROUBLE SYMPTOM 2 - VEHICLE SPEED VARIES**

Trouble symptom	Probable cause	Remedy
The set vehicle speed varies greatly upward or downward	Malfunction of the vehicle speed sensor circuit	Repair the vehicle speed sensor system, or replace the part
"Surging" (repeated alternating acceleration and deceleration) occurs after setting	Malfunction of CCM	Replace the CCM

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**Fig. 6: Vehicle Speed Varies**  
Courtesy of KIA MOTORS AMERICA, INC.

**TROUBLE SYMPTOM 3 - CRUISE DOES NOT CANCEL WHEN BRAKE IS DEPRESSED**

Trouble symptom	Probable cause	Remedy
The CC system is not canceled when the brake pedal is depressed	Damaged or disconnected wiring of the brake pedal switch	Repair the harness or replace the brake pedal switch
	Malfunction of the CCM	Replace the CCM

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**Fig. 7: Cruise Does Not Cancel When Brake Is Depressed**  
Courtesy of KIA MOTORS AMERICA, INC.

**TROUBLE SYMPTOM 4 - CRUISE DOES NOT CANCEL WHEN SHIFT LEVER IS MOVED TO NEUTRAL**

Trouble symptom	Probable cause	Remedy
The CC system is not canceled when the shift lever is moved to the "N" position (It is canceled, however, when the brake pedal is depressed)	Damaged or disconnected wiring of inhibitor switch input circuit	Repair the harness or repair or replace the inhibitor switch
	Improper adjustment of inhibitor switch	
	Malfunction of the CCM	Replace the CCM

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**Fig. 8: Cruise Does Not Cancel When Shift Lever Is Moved To Neutral**  
Courtesy of KIA MOTORS AMERICA, INC.

**TROUBLE SYMPTOM 5 - CAN NOT DECELERATE USING SET SWITCH**

Trouble symptom	Probable cause	Remedy
Cannot decelerate (coast) by using the SET switch	Temporary damaged or disconnected wiring of SET switch input circuit	Repair the harness or replace the SET switch
	Malfunction of the CCM	Replace the CCM

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**Fig. 9: Can Not Decelerate Using Set Switch**  
Courtesy of KIA MOTORS AMERICA, INC.

**TROUBLE SYMPTOM 6 - CAN NOT ACCELERATE OR RESUME SPEED USING RESUME SWITCH**

Trouble symptom	Probable cause	Remedy
Cannot accelerate or resume speed by using the RESUME switch	Damaged or disconnected wiring, or short circuit, or RESUME switch input circuit	Repair the harness or replace the RESUME switch
	Malfunction of the CCM	Replace the CCM

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**Fig. 10: Can Not Accelerate Or Resume Speed Using Resume Switch**  
Courtesy of KIA MOTORS AMERICA, INC.

**TROUBLE SYMPTOM 7 - CRUISE CAN BE SET AT 25 MPH OR LESS**

Trouble symptom	Probable cause	Remedy
CC system can be set while driving at a vehicle speed of less than 40km/h (25mph), or there is no automatic cancellation at that speed	Malfunction of the vehicle-speed sensor circuit	Repair the vehicle speed sensor system, or replace the part
	Malfunction of the actuator and unit	Replace the actuator and unit

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**Fig. 11: Cruise Can Be Set At 25 MPH Or Less**  
Courtesy of KIA MOTORS AMERICA, INC.

**TROUBLE SYMPTOM 8 - CRUISE LAMP DOES NOT ILLUMINATE**

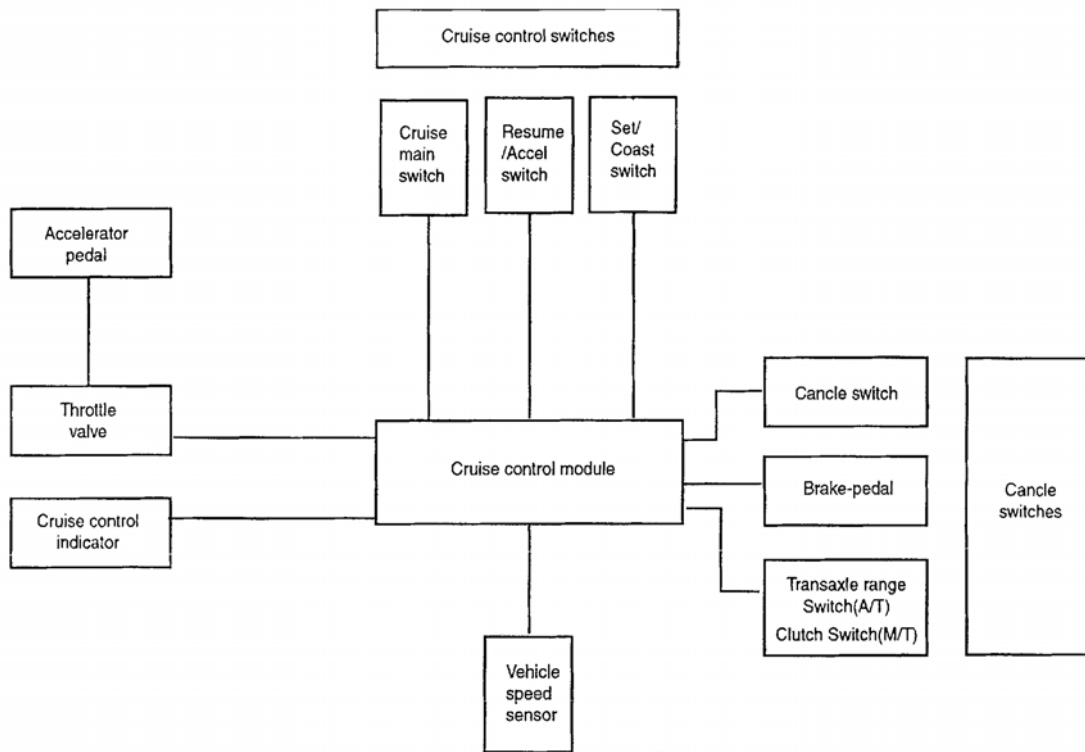
Trouble symptom	Probable cause	Remedy
The cruise main switch indicator lamp does not illuminate (But CC system is normal)	Damaged or disconnected bulb of cruise main switch indicator lamp	Repair the harness or replace the part.
	Harness damaged or disconnected	

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**Fig. 12: Cruise Lamp Does Not Illuminate**  
Courtesy of KIA MOTORS AMERICA, INC.

**SYSTEM BLOCK DIAGRAM**





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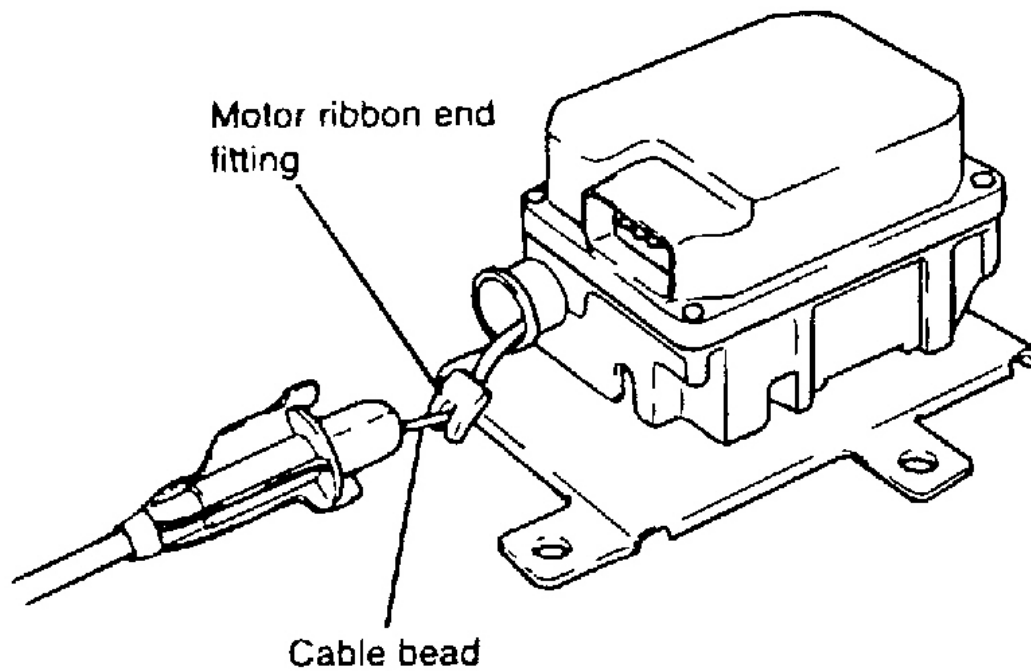
**Fig. 13: Cruise System Block Diagram**  
 Courtesy of KIA MOTORS AMERICA, INC.

## REMOVAL, INSPECTION & INSTALLATION

### CRUISE CONTROL MODULE

#### REMOVAL

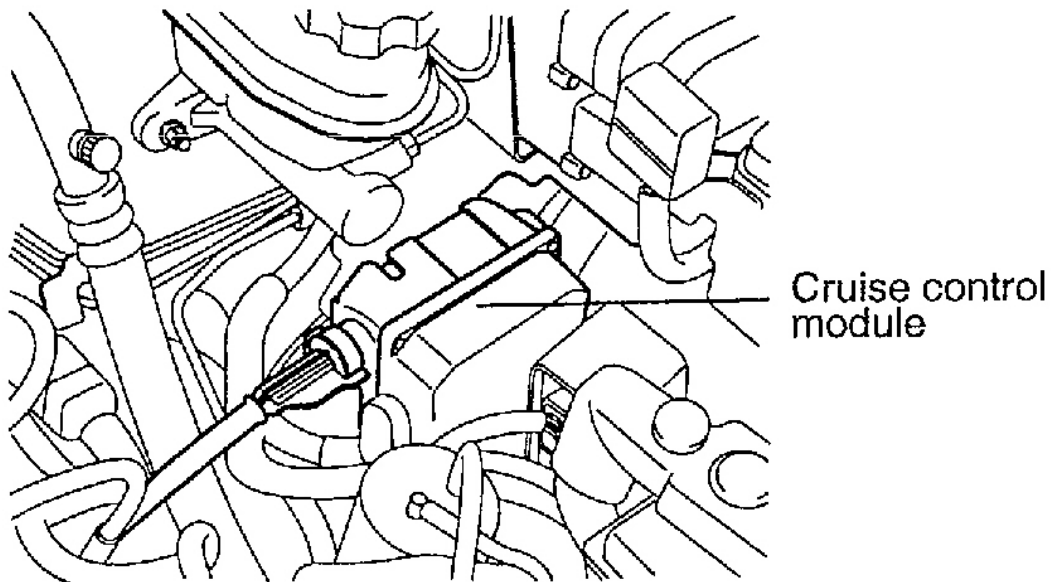
1. Disconnect battery negative cable.
2. Disconnect cruise control cable from throttle body.
3. Disconnect cruise control cable from cruise control module.



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**Fig. 14: Disconnecting Cruise Control Cable**  
Courtesy of KIA MOTORS AMERICA, INC.

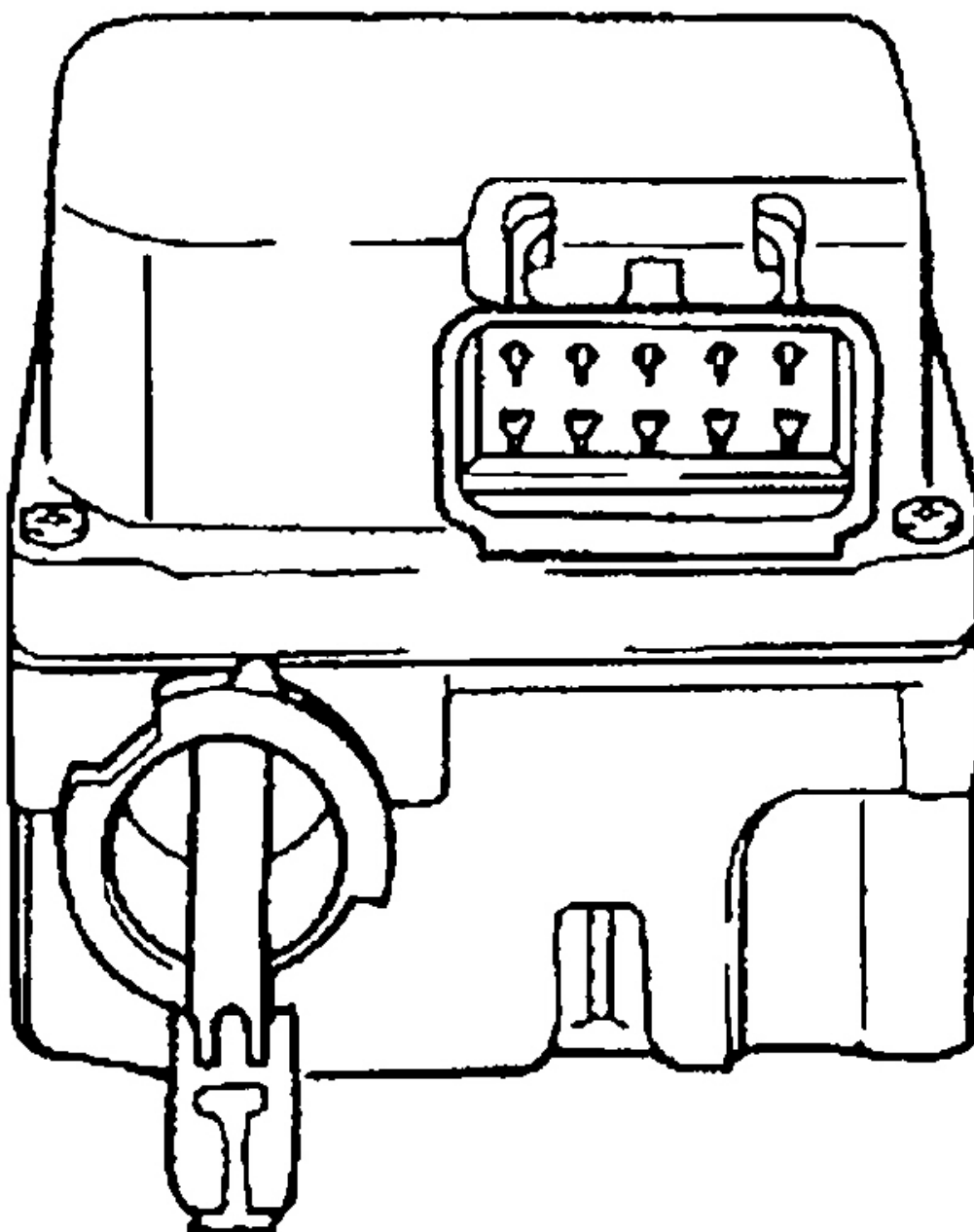
4. Disconnect control module connector from cruise control module.
5. Remove three bolts securing control module with bracket.



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**Fig. 15: Removing Bolts Securing Control Module With Bracket**  
Courtesy of KIA MOTORS AMERICA, INC.

6. Remove control module with bracket from engine compartment.
7. Remove three bolts attaching cruise control module to bracket.
8. Remove control module from bracket.

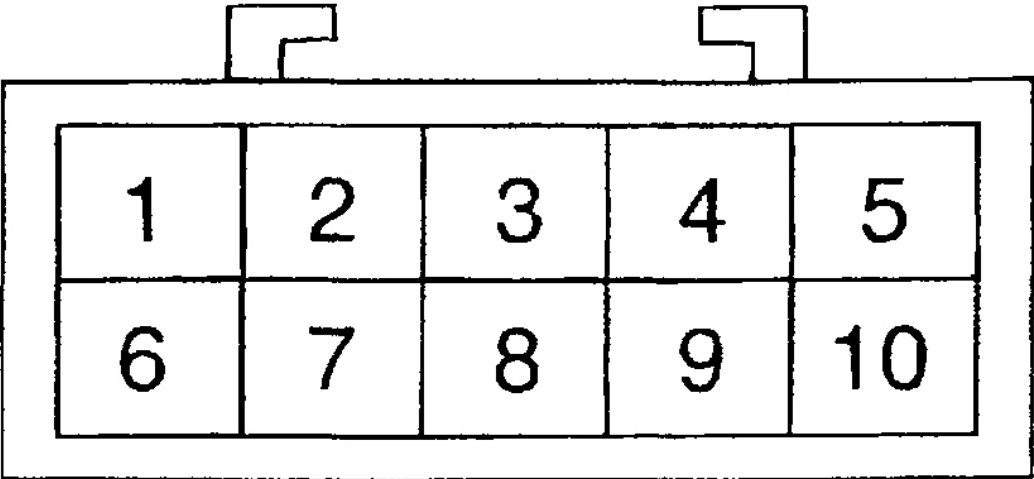


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**Fig. 16: Removing Control Module From Bracket**  
Courtesy of KIA MOTORS AMERICA, INC.

**TESTING**

- 1. Connect a voltmeter between cruise control unit terminals and ground. (Connector Q01 connected.)
- 2. Turn ignition switch "ON" and check that terminal voltages are as described on the following page.



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**Fig. 17: Cruise Control Connector Pinout**  
Courtesy of KIA MOTORS AMERICA, INC.

Terminal	Connected to	Voltage	Procedure
1	Battery	Approx. 12V	Ignition switch ON and START
2 (Output)	Brake pedal switch 2 (N.O.)	Approx. 0V Approx. 12V	Ignition switch ON Brake pedal depressed
3 (Input)	Transaxle range switch(A/T) Clutch switch(M/T)	Approx. 0V Approx. 12V	N or P range and cruise control main switch ON Other range and cruise control main switch ON
4	Cruise control indicator	Approx. 12V	Ignition switch ON
5 (Input)	Vehicle speed sensor	Pluses between 0-5V	Ignition switch ON While rotating the rear tire
6	Ground	Approx. 0V	N.A.
7 (Input)	Brake pedal switch 1 (N.C.)	Approx. 12V Approx. 0V	Cruise main switch ON Brake pedal depressed
8 (Input)	Set/Coast switch	Approx. 12V Approx. 0V	Switch depressed and cruise control main switch ON. Switch not depressed and cruise control main switch ON.
9 (Input)	Resume/Accel switch	Approx. 12V Approx. 0V	Switch depressed and cruise control main switch ON. Switch not depressed and cruise control main switch ON.
10 (Input)	Cruise control main switch	Approx. 12V	Cruise control main switch ON

**Fig. 18: Terminal Testing Chart**  
**Courtesy of KIA MOTORS AMERICA, INC.**

**INSTALLATION**

1. Position control module on control module bracket.
2. Install three bolts.

**Tighten three bolts to: 5.1-9.4 lb-ft (7-13 N.m, 0.7-1.3 kg-m)**

3. Position control module bracket.
4. Secure control module bracket to body using three bolt.

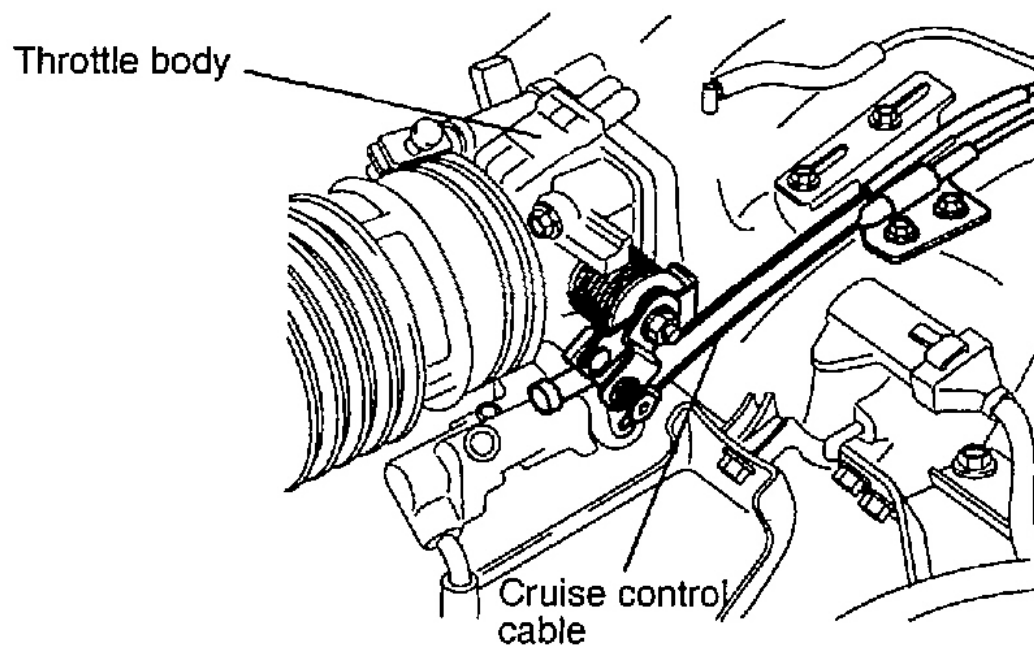
**Tighten three bolts to: 15.2-26.8 lb-ft (21-36 N.m, 2.1-3.7 kg-m)**

5. Connect control module connector.
6. Connect control cable.
7. Connect battery negative cable.

**CRUISE CONTROL CABLE**

**REMOVAL**

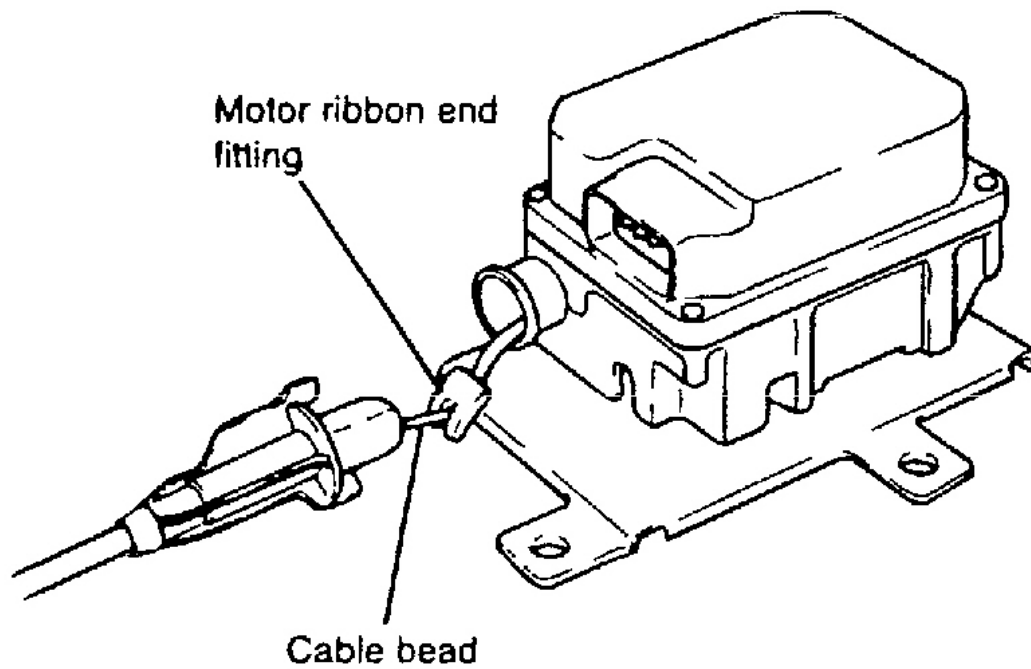
1. Disconnect cable and conduit from engine bracket.
2. Disconnect cable and fitting from throttle body lever stud.



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**Fig. 19: Disconnecting Cable And Fitting From Throttle Body Lever Stud**  
Courtesy of KIA MOTORS AMERICA, INC.

3. Disconnect cable bead from cruise motor ribbon end fitting on cruise control module.



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**Fig. 20: Disconnecting Cable Bead From Cruise Motor Ribbon End Fitting**  
Courtesy of KIA MOTORS AMERICA, INC.

4. Remove cable from vehicle.