

GROUP

37

SPEED CONTROL

SECTION 37-01 Speed Control System

SUBJECT	PAGE	SUBJECT	PAGE
ADJUSTMENTS		REMOVAL AND INSTALLATION (Cont'd.)	
Actuator Cable	37-01-9	Cable/Actuator Assembly	37-01-10
Brake Pedal Height	37-01-9	Clutch Switch	37-01-10
Clutch Pedal Height	37-01-9	Control Module	37-01-10
DESCRIPTION AND OPERATION	37-01-1	Control Switches	37-01-9
DIAGNOSIS AND TESTING		Neutral Switch	37-01-10
Visual Inspection	37-01-3	Stoplamp Switch	37-01-10
REMOVAL AND INSTALLATION		VEHICLE APPLICATION	37-01-1
Actuator	37-01-11		

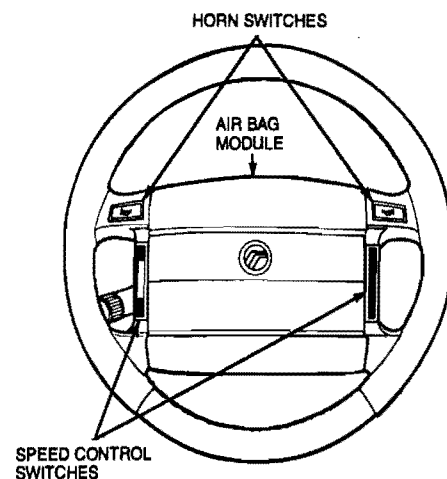
VEHICLE APPLICATION

Capri.

DESCRIPTION AND OPERATION

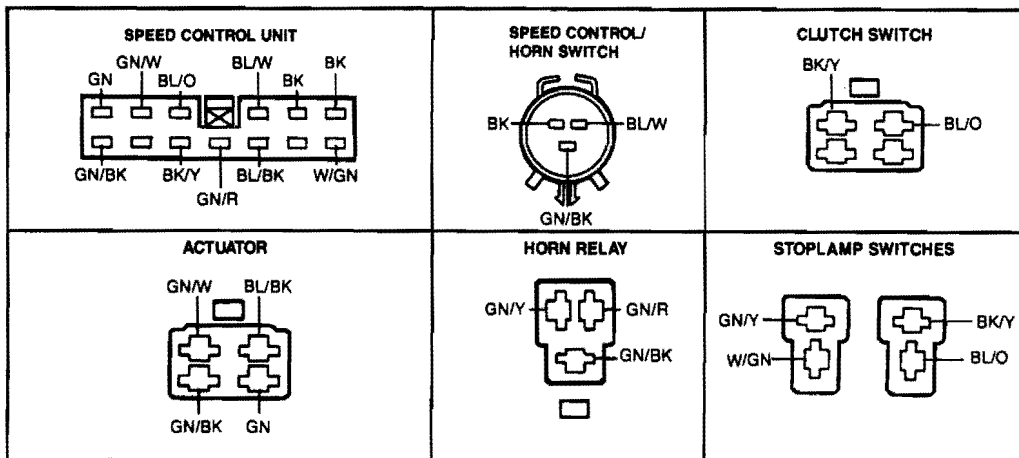
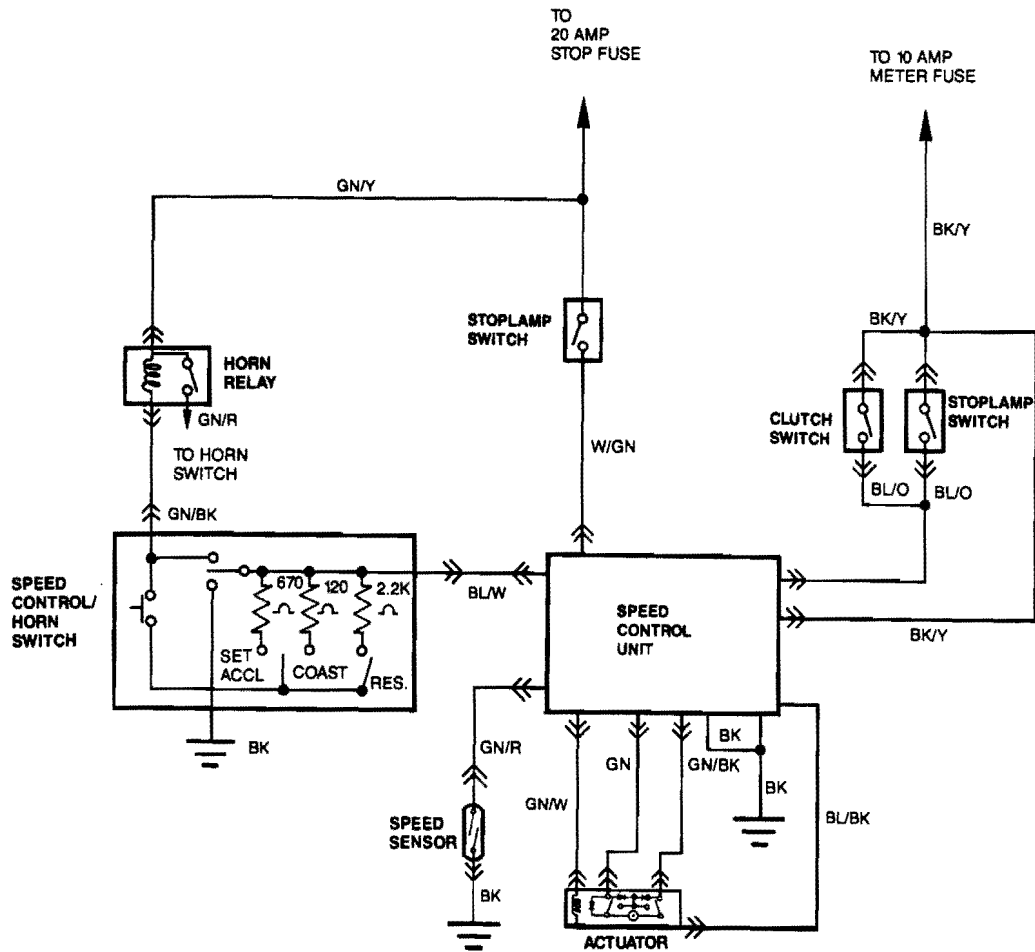
The speed control system consists of operator controls, an electronic throttle actuator, electronic control unit, clutch and brake switches and an electronic speed sensor.

The operator controls are mounted in the steering wheel. The electronic actuator is mounted in the engine compartment and is connected to the throttle by a cable. The clutch and brake switches are mounted to the pedal assembly. The electronic control unit is located behind the instrument panel. The electronic speed sensor is located on the speedometer cable at the upper and lower cable connection in the engine compartment.



L6697-A

DESCRIPTION AND OPERATION (Continued)



L7367-A

DIAGNOSIS AND TESTING

Visual Inspection

1. Visually inspect the components. Check for:

Electrical

- a. Blown fuses (stop and meter).
- b. Stoplamp switch adjustment.
- c. Corroded connectors.
- d. Poor connections.
- e. Clutch switch adjustment.

Mechanical

- a. Cable freedom and adjustment.

- b. Throttle linkage freedom.

- c. Actuator mounting.

2. Exercise the accelerator pedal. Check the actuator cable, accelerator cable and 4EAT throttle valve cable for freedom and proper adjustment.
3. Check the wiring harness for obvious signs of shorts, opens, bad connections or damage.
4. Make sure the speedometer, stoplamps and clutch pedal function properly.
5. If fault is not visually evident, verify condition and refer to the following chart.

CONDITION	POSSIBLE SOURCE	ACTION
● Speed Control System Does Not Operate	● Fuse. ● Speed / horn switch. ● Speed control unit. ● Actuator. ● Speed sensor. ● Circuit.	● Go to CC1. ● Go to CC16. ● Go to CC24. ● Go to CC23. ● Go to CC21. ● Go to CC5.
● Speed Control System Will Not Set Speed	● Speed / horn switch. ● Speed sensor. ● Speed control unit. ● Circuit.	● Go to CC16. ● Go to CC21. ● Go to CC24. ● Go to CC5.
● Speed Control System Works Intermittently	● Actuator. ● Speed control unit. ● Speed sensor. ● Circuit.	● Go to CC23. ● Go to CC24. ● Go to CC21. ● Go to CC5.
● Speed / Horn Switch Position Do Not Operate	● Speed / horn switch. ● Speed control unit. ● Actuator. ● Circuit.	● Go to CC16. ● Go to CC24. ● Go to CC23. ● Go to CC5.
● Set Speed Fluctuates	● Actuator. ● Speed sensor. ● Speed control unit. ● Circuit.	● Go to CC23. ● Go to CC21. ● Go to CC24. ● Go to CC5.
● Speed Control System Does Not Shut Off With Brakes Depressed	● Stoplamp switch. ● Speed control unit. ● Actuator. ● Circuit.	● Go to CC10. ● Go to CC24. ● Go to CC23. ● Go to CC5.
● Speed Control System Does Not Shut Off With Clutch Depressed	● Clutch switch. ● Speed control unit. ● Actuator. ● Circuit.	● Go to CC7. ● Go to CC24. ● Go to CC23. ● Go to CC5.

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
CC1	CHECK FUSES		
	● Key OFF. ● Access interior fuse panel. ● Check the 20 amp stop fuse and the 10 amp meter fuse. ● Are the fuses good?	Yes No	GO to CC4 . GO to CC2 .
CC2	CHECK SYSTEM		
	● Replace blown fuses. ● Key ON. ● Did the fuse(s) blow again?	Yes No	GO to CC3 . GO to CC4 .
CC3	CHECK FOR SHORTS TO GROUND		
	● Key OFF. ● Disconnect the GN/Y wire from the stop fuse. ● Measure the resistance of the GN/Y wire to ground. ● Disconnect the BK/Y wire from the meter fuse. ● Measure the resistance of the BK/Y wire to ground. ● Are the resistances less than 5 ohms?	Yes No	SERVICE wire(s) in question. GO to CC4 .
CC4	CHECK POWER SUPPLY TO SPEED CONTROL UNIT		
	● Locate speed control unit. ● Key ON. ● Measure the voltage on the BK/Y wire. ● Is the voltage greater than 10 volts?	Yes No	GO to CC5 . SERVICE BK/Y wire.
CC5	CHECK SUPPLY TO STOPLAMP AND CLUTCH SWITCHES		
	● Locate clutch and stop switches. ● Measure the voltage on the BK/Y wire at each connector. ● Are the voltages greater than 10 volts?	Yes No	GO to CC6 . SERVICE BK/Y wire.

CL7368-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
CC6	CHECK STOPLAMP SWITCH		
	● Key OFF. ● Depress the brake pedal. ● Measure the voltage on the BL/O wire at the switch connector. ● Is the voltage greater than 10 volts?	Yes No	GO to CC7 . REPLACE stoplamp switch.
CC7	CHECK CLUTCH SWITCH		
	● Release the brake pedal. ● Depress the clutch. ● Measure the voltage on the BL/O wire at the switch connector. ● Is the voltage greater than 10 volts?	Yes No	GO to CC8 . REPLACE clutch switch.
CC8	CHECK LEAD FROM SWITCHES TO SPEED CONTROL UNIT		
	● Locate speed control unit. ● Measure the resistance of the BL/O wire between the switches and the speed control unit. ● Is the resistance less than 5 ohms?	Yes No	GO to CC9 . SERVICE BL/O wire.
CC9	CHECK POWER SUPPLY TO STOPLAMP SWITCH		
	● Locate stoplamp switch. ● Measure voltage on the GN/Y wire at the connector. ● Is the voltage greater than 10 volts?	Yes No	GO to CC10 . SERVICE GN/Y wire.
CC10	CHECK STOPLAMP SWITCH		
	● Depress brake pedal. ● Measure the voltage on the W/GN wire at the connector. ● Is the voltage greater than 10 volts?	Yes No	GO to CC11 . REPLACE stoplamp switch.

CL7369-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE
CC11	CHECK LEAD TO SPEED CONTROL UNIT		
● Key OFF. ● Locate the speed control unit. ● Measure the resistance of the W/GN wire between the stoplamp switch and the speed control unit. ● Is the resistance less than 5 ohms?		Yes	GO to CC12 .
		No	SERVICE W/GN wire.
CC12	CHECK POWER SUPPLY TO HORN RELAY		
● Locate horn relay. ● Key ON. ● Measure the voltage on the GN/Y wire at the horn relay. ● Is the voltage greater than 10 volts?		Yes	GO to CC13 .
		No	SERVICE GN/Y wire.
CC13	CHECK CONTINUITY THROUGH HORN RELAY		
● Measure the voltage on the GN/BK wire at the relay connector. ● Is the voltage greater than 10 volts?		Yes	GO to CC14 .
		No	REPLACE horn relay.
CC14	CHECK LEAD BETWEEN HORN RELAY AND SPEED/HORN SWITCH		
● Locate the speed/horn switch. ● Measure the voltage on the GN/BK wire at the speed/horn switch. ● Is the voltage greater than 10 volts?		Yes	GO to CC15 .
		No	SERVICE GN/BK wire.
CC15	CHECK SPEED/HORN SWITCH GROUND		
● Key OFF. ● Measure the resistance of the BK wire between the speed/horn switch and ground. ● Is the resistance less than 5 ohms?		Yes	GO to CC16 .
		No	SERVICE BK wire.

CL7370-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE														
CC16	CHECK SPEED/HORN SWITCH																
● Disconnect the BL/W wire from the connector. ● Connect the positive lead of the ohmmeter to the BL/W terminal of the connector and the negative lead to ground. ● Verify the resistances on the BL/W terminal of the connector while holding the speed/horn switch in the following positions:		Yes	GO to CC17.														
		No	REPLACE speed/horn switch.														
<table><thead><tr><th>Switch Position</th><th>Resistance</th></tr></thead><tbody><tr><td>OFF</td><td>Greater than 10,000 ohms</td></tr><tr><td>ON</td><td>Greater than 10,000 ohms</td></tr><tr><td>SET</td><td>Approximately 680 ohms</td></tr><tr><td>RESUME</td><td>Approximately 2,200 ohms</td></tr><tr><td>COAST</td><td>Approximately 120 ohms</td></tr><tr><td>ACC</td><td>Approximately 680 ohms</td></tr></tbody></table> ● Are the resistances correct?		Switch Position	Resistance	OFF	Greater than 10,000 ohms	ON	Greater than 10,000 ohms	SET	Approximately 680 ohms	RESUME	Approximately 2,200 ohms	COAST	Approximately 120 ohms	ACC	Approximately 680 ohms		
Switch Position	Resistance																
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ACC	Approximately 680 ohms																
CC17	CHECK LEAD BETWEEN SPEED/HORN SWITCH AND SPEED CONTROL UNIT																
● Key OFF. ● Locate the speed control unit. ● Measure the resistance of the BL/W wire between the speed/horn switch and the speed control unit. ● Is the resistance less than 5 ohms?		Yes	GO to CC18.														
		No	SERVICE BL/W wire.														
CC18	CHECK SPEED CONTROL UNIT GROUND																
● Measure the resistance of the BK wires to ground. ● Are the resistances less than 5 ohms?		Yes	GO to CC19.														
		No	SERVICE BK wire(s).														
CC19	CHECK LEAD BETWEEN SPEED CONTROL UNIT AND SPEED SENSOR																
● Locate speed sensor. ● Measure the resistance of the GN/R wire between the speed control unit and the speed sensor. ● Is the resistance less than 5 ohms?		Yes	GO to CC20.														
		No	SERVICE GN/R wire.														

CL7371-A

DIAGNOSIS AND TESTING (Continued)

TEST STEP		RESULT	ACTION TO TAKE																										
CC20	CHECK SPEED SENSOR GROUND																												
● Measure the resistance of the BK wire between the speed sensor and ground. ● Is the resistance less than 5 ohms?		Yes	GO to CC21 .																										
		No	SERVICE BK wire.																										
CC21	CHECK SPEED SENSOR																												
● Disconnect speedometer cable at the transaxle. ● Disconnect the GN/R wire from the speed control unit. ● Check for continuity between ground and the GN/R wire at the speed sensor. ● Does continuity exist four times per one speedometer cable rotation?		Yes	GO to CC22 .																										
		No	REPLACE speed sensor.																										
CC22	CHECK LEADS TO ACTUATOR																												
● Locate actuator connector. ● Measure the resistance of the GN/W, GN, BL/BK and GN/BK wires between the speed control unit and the actuator. ● Are the resistances less than 5 ohms?		Yes	GO to CC23 .																										
		No	SERVICE wire in question.																										
CC23	CHECK ACTUATOR																												
● Disconnect actuator connector. ● Apply 12 volts and ground to the following terminals. ● Check to see the actuator responds as indicated.		Yes	GO to CC24 .																										
		No	REPLACE actuator.																										
<table><tr><th>GN/W</th><th>GN</th><th>GN/BK</th><th>BL/BK</th><th>Control Cable Operation</th></tr><tr><td>GND</td><td>GND</td><td>+ 12 volts</td><td>+ 12 volts</td><td>Pull cable</td></tr><tr><td>N/C</td><td>GND</td><td>N/C</td><td>+ 12 volts</td><td>Lock cable</td></tr><tr><td>+ 12 volts</td><td>GND</td><td>+ 12 volts</td><td>+ 12 volts</td><td>Extend cable</td></tr><tr><td>N/C</td><td>N/C</td><td>+ 12 volts</td><td>+ 12 volts</td><td>Release cable</td></tr></table> + 12 volts — Apply 12 volts GND — Apply Ground N/C — No connection ● Are the control cable operations verified?					GN/W	GN	GN/BK	BL/BK	Control Cable Operation	GND	GND	+ 12 volts	+ 12 volts	Pull cable	N/C	GND	N/C	+ 12 volts	Lock cable	+ 12 volts	GND	+ 12 volts	+ 12 volts	Extend cable	N/C	N/C	+ 12 volts	+ 12 volts	Release cable
GN/W	GN	GN/BK	BL/BK	Control Cable Operation																									
GND	GND	+ 12 volts	+ 12 volts	Pull cable																									
N/C	GND	N/C	+ 12 volts	Lock cable																									
+ 12 volts	GND	+ 12 volts	+ 12 volts	Extend cable																									
N/C	N/C	+ 12 volts	+ 12 volts	Release cable																									
CC24	CHECK SPEED CONTROL UNIT																												
● Start engine. ● Drive safely at approximately 40 mph. ● Operate speed control system. ● Does system operate correctly?		Yes	RETURN to condition chart.																										
		No	REPLACE speed control unit.																										

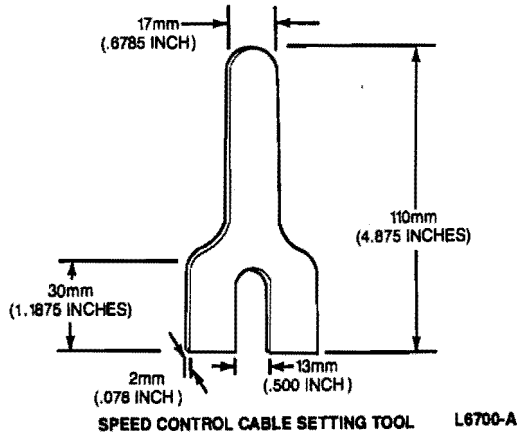
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ADJUSTMENTS

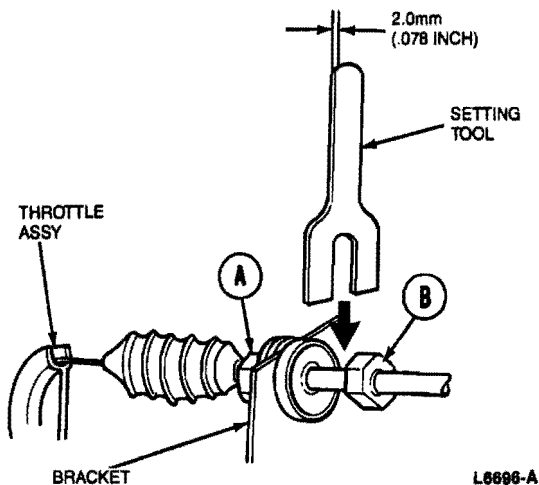
Actuator Cable

Cable at Throttle Body

NOTE: A setting tool must be fabricated as shown to properly adjust speed control cables.



1. Disconnect cable from cruise control actuator.
2. Slightly loosen cable retaining nuts at bracket on cylinder head cover.
3. Insert setting tool between nut "B" and bracket, as shown.



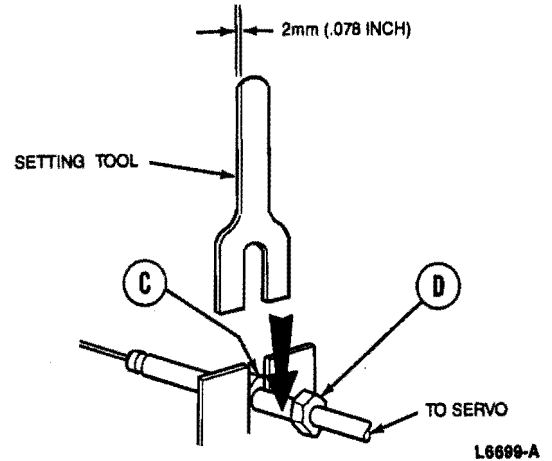
4. Tighten both nuts to eliminate all cable slack.
5. Loosen nut "A" only enough to remove tool. Do not adjust nut "B".
6. Tighten nut "A" without moving nut "B".

Cable at Actuator

NOTE: To be performed after throttle body end adjustment.

1. Slightly loosen cable retaining nuts at bracket.

2. Insert setting tool between bracket and nut "D" as shown.



3. Tighten both nuts to eliminate all slack at throttle body end of cable.
4. Loosen nut "C" only enough to remove setting tool. Do not adjust nut "D".
5. Tighten nut "C" without moving nut "D".

Clutch Pedal Height

Measure the distance from the center of the clutch pedal to lower dash panel (front area of footwell). Pedal height must be 214.5-219.5mm (8.44-8.64 inches). Adjust if necessary as follows:

1. Loosen locknut and turn clutch switch until desired pedal height is obtained.
2. Tighten locknut when clutch pedal height is achieved.

Brake Pedal Height

The stoplamp switch is mounted at the top of the brake pedal. Refer to Section 32-20 for adjustment procedures.

REMOVAL AND INSTALLATION

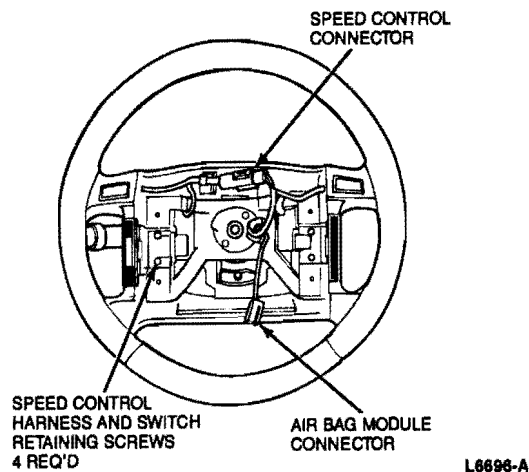
Control Switches

Removal

1. Disconnect negative battery terminal and air bag back-up power supply. Refer to Section 41-58.
2. Remove air bag module.
3. Disconnect speed control harness connector.

REMOVAL AND INSTALLATION (Continued)

4. Using a small flat blade screwdriver, pry out horn switches and disconnect horn wires.
5. Remove speed control switches retaining screws.
6. Remove speed control switches and harness assembly.

**Installation**

1. Position switches and harness assembly in steering wheel.
2. Route horn switch wires to horn switches.
3. Connect horn switches and install.
4. Install speed control switches and wiring retainers.
5. Connect speed control electrical connector. Install retaining screws.
6. Install air bag module. Refer to Section 41-58.
7. Connect back-up power supply and negative battery terminal.

Clutch Switch**Removal and Installation**

Refer to Section 16-02 for removal and installation procedure.

Neutral Switch**Removal and Installation**

Refer to Section 17-27 for removal and installation procedures.

Control Module

NOTE: The control module is mounted under the front of the floor console. The ash receptacle can be removed to gain access to the module for testing.

Removal

1. Disconnect negative battery cable.
2. Remove front console side covers and front console. Refer to Section 45-31.
3. Remove screws retaining control unit.
4. Disconnect electrical connector and remove control unit.

Installation

1. Connect electrical connector and place control unit in position.
2. Install screws retaining control unit.
3. Install front console and side covers.
4. Connect negative battery cable.

Stoplamp Switch**Removal and Installation**

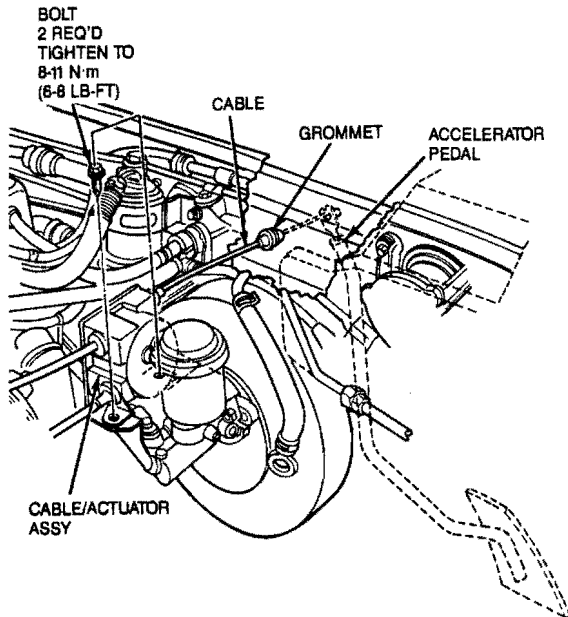
Refer to Section 32-20 for removal and installation procedures.

Cable / Actuator Assembly**Removal**

1. Remove two bolts from cable actuator.

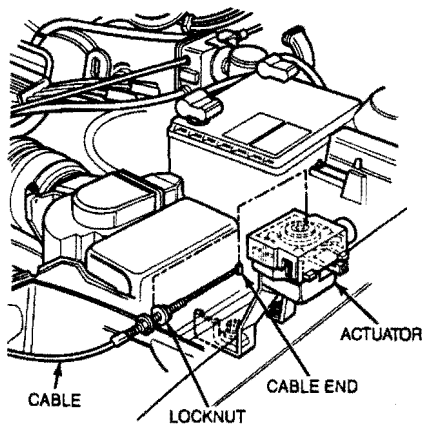
REMOVAL AND INSTALLATION (Continued)

2. Release cable from accelerator pedal and pull cable into engine compartment.



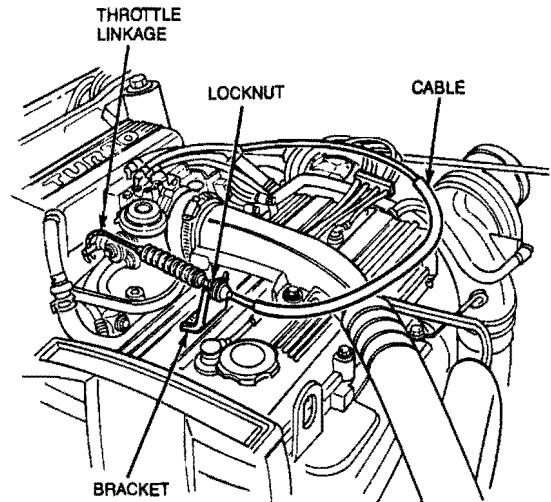
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3. Loosen locknut and remove cable from actuator.



L6736-A

4. Loosen locknut and remove cable from bracket and throttle linkage.
5. Remove cable / actuator assembly.



L6737-A

Installation

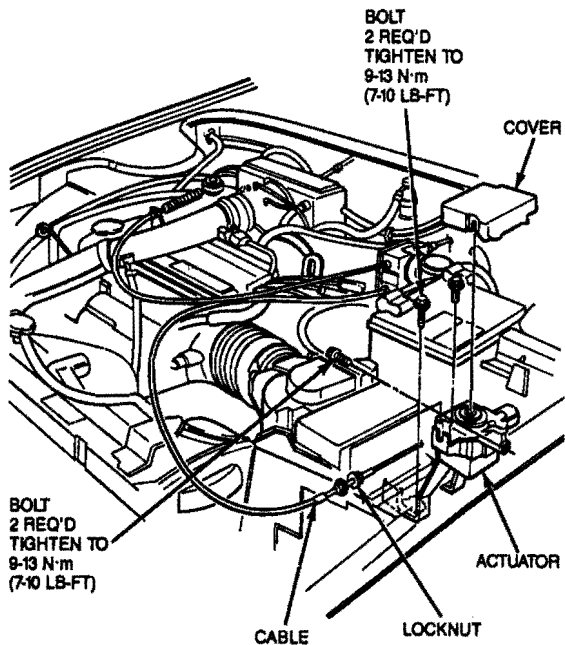
1. Install cable into throttle linkage.
2. Install cable into bracket on valve cover. Tighten locknut.
3. Install cable into actuator. Do not tighten locknut at this time. Install boot.
4. Route cable through dash and install grommet. Connect cable to accelerator pedal.
5. Secure cable / actuator assembly with two bolts. Tighten to 8-11 N·m (5.9-8.1 lb-ft).
6. Adjust cable at actuator as outlined.

Actuator**Removal**

1. Remove actuator cover and disconnect wiring.
2. Loosen locknut and remove cable from actuator.

REMOVAL AND INSTALLATION (Continued)

3. Remove two bolts and actuator.



L6739-A

Installation

1. Install actuator with two bolts. Tighten bolts to 9-13 N·m (7-10 lb-ft).
2. Connect cable to actuator.
3. Adjust cable as outlined.
4. Install cover and connect wiring.
5. Check speed control for proper operation.