

# SECTION 10-03B Speed Control System—3.2L SHO

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## VEHICLE APPLICATION

Taurus, 3.2L SHO, Automatic (AX4S).

## DESCRIPTION

The speed control system consists of a speed control servo (9C735), actuator cable, horn relay, steering wheel switches, a brakelamp switch and a deactivator switch. The system operates independent of engine vacuum, therefore no vacuum lines are required. The speed control servo is mounted in the engine compartment near the brake booster, and is connected to the throttle linkage with an actuator cable. The electronics are integrated into the speed control servo, eliminating the need for any electronic modules in the vehicle.

### Deactivator Switch

The deactivator switch is a normally closed switch and replaces the vacuum dump valve as a redundant safety feature in the system. Normally when the brake pedal is depressed, an electrical signal from the brakelamp circuit to the speed control amplifier (9D843) will disengage the system. Under increased brake pedal efforts (5-10 lbs, engine running), the deactivator switch mounted in the brake line will open and remove power to the speed control servo clutch, releasing the throttle independent of the speed control amplifier control. The deactivator switch is mounted to the underside of the master cylinder.

### Vehicle Speed Sensor

The vehicle speed sensor (VSS)(9E731) is mounted to the transaxle.

## OPERATION

### System Activation

To operate the speed control system, the engine must be running and vehicle speed must be greater than 48 km/h (30 mph). The system is activated by pressing the ON switch in the steering wheel. Then the operator must depress and release the SET/ACCEL switch. Current speed will then be maintained until a new speed is set, the brake pedal is depressed or the OFF switch is depressed.

### Increasing Set Speed

The vehicle set speed can be manually increased at any time by depressing the accelerator pedal until the higher speed is reached and stabilized, then depressing and releasing the SET/ACCEL switch.

#### ACCEL

A continuous depression of the SET/ACCEL switch will cause a smooth increase in vehicle speed. Upon release of the SET/ACCEL switch, the new vehicle speed will be maintained.

#### Tap-Up

Current vehicle set speed may be increased 1.6 km/h (1 mph) by a momentary tap of the SET/ACCEL switch. Multiple taps of the SET/ACCEL switch will cause vehicle speed to increase in increments of 1.6 km/h (1 mph). For example, if the current set speed is 60 mph, 5 taps will increase the vehicle speed and set it at 65 mph.

### Decreasing Set Speed

The vehicle set speed can be manually decreased at any time by momentarily depressing the brake pedal until the lower speed is reached and stabilized, then depressing and releasing the SET/ACCEL switch.

#### COAST

A continuous depression of the COAST switch will cause a smooth decrease in vehicle speed. Upon release of the COAST switch, the new vehicle speed will be maintained.

If vehicle speed is reduced below 48 km/h (30 mph), the driver must manually increase the speed to over 48 km/h (30 mph) and reset the system.

#### Tap-Down

Current vehicle set speed may be decreased 1.6 km/h (1 mph) by a momentary tap of the COAST switch. Multiple taps of the COAST switch will cause vehicle speed to decrease in increments of 1.6 km/h (1 mph). For example, if the current set speed is 65 mph, 5 taps will decrease the vehicle speed and set it at 60 mph.

### RESUME

When the speed control system is deactivated by pressing the brake pedal, the previous set speed may be re-established by momentarily depressing the RESUME switch. The resume feature will not function if the system has been turned off with the OFF switch, or if the vehicle speed has dropped below 48 km/h (30 mph). In addition, when the ignition switch is turned to the OFF position, the speed control memory is erased and RESUME will not function.

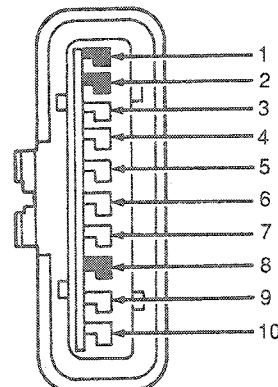
NOTE: Erratic speed control could result from the use of transmitting equipment that is not FCC approved or from driving in areas of high power radio transmitters.

## DIAGNOSIS AND TESTING

### Visual Inspection

Visual inspection should be performed before undertaking any of the following diagnostic procedures. Check the following items:

1. Horn and stoplamp operation;
  - a. Verify proper horn operation. If not, check horn circuit fuse, horn relay and wiring.
  - b. Verify proper stoplamp operation. If not, check stoplamp circuit fuse, stoplamps, stoplamp switch and wiring.
2. Wiring and electrical connections;
  - a. Connections are complete with no loose wires or terminals.
  - b. Wiring is not broken, shorted or corroded.
  - c. Wiring is not misrouted.
3. Actuator cable and throttle linkage;
  - a. The cable is adjusted properly without holding the throttle open or increasing idle speed.
  - b. The throttle linkage operates freely and smoothly when connected to the actuator cable and speed control servo.



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DIAGNOSIS AND TESTING (Continued)

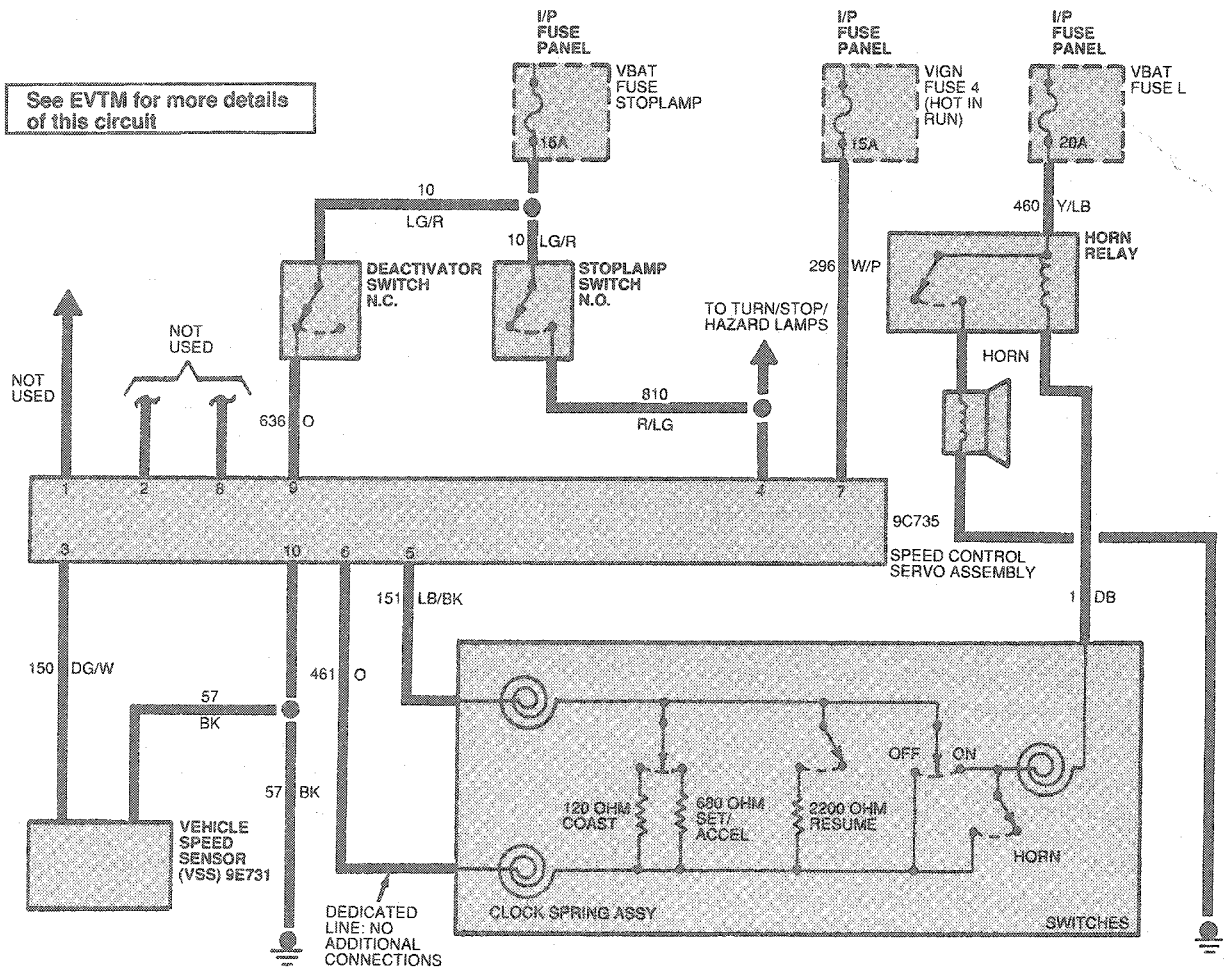
Key to Circuit Numbers and Wire Colors

Description	Pin	Circuit	Wire Harness/Wire Color
Servo Assembly Connector			14290 Harness
Not Used	1		
Not Used	2		
VSS Signal to Servo	3	150	DG/W
Stoplamp Switch to Stoplamps	4	810	R/LG

Key to Circuit Numbers and Wire Colors (Cont'd)

Description	Pin	Circuit	Wire Harness/Wire Color
Command Signal	5	151	LB/BK
Command Return	6	461	O
Fused Accy Feed	7	296	W/P
Not Used	8		
Deactivator Switch	9	636	O
Ground	10	57	BK
Battery Feed	—	10	LG/R

(Continued)



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PINPOINT TEST INDEX

SYMPTOM	PINPOINT TESTS
Speed Control Does Not Work	A
Speed Continuously Changes	B

(Continued)

PINPOINT TEST INDEX (Cont'd)

SYMPTOM	PINPOINT TESTS
COAST/Tap-Down Inoperative	C

(Continued)

**DIAGNOSIS AND TESTING (Continued)**

**PINPOINT TEST INDEX (Cont'd)**

SYMPTOM	PINPOINT TESTS
ACCEL / Tap-Up Inoperative	D
RESUME Inoperative	E
Speed Control Does Not Disengage When Brake is Applied	F
OFF Switch Inoperative	G

**Pinpoint Tests**

**Tools Required:**

- Rotunda Digital Volt-Ohmmeter 014-00407
- The following pinpoint tests require a Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent.

**PINPOINT TEST A  
SPEED CONTROL DOES NOT WORK**

TEST STEP	RESULT	ACTION TO TAKE
<b>A1</b>   VERIFY POWER TO SPEED CONTROL SERVO		
<ul style="list-style-type: none"> <li>● Disconnect 14290 harness connector from servo assembly.</li> <li>● Use a VOM to make the specified measurements at the connector.</li> <li>● With ignition switch in RUN position, measure voltage between Pin 7 (Battery Positive Voltage (B+), Circuit 296) and Pin 10 (GND, Circuit 57).</li> <li>● <b>Is there battery voltage?</b></li> </ul>	Yes No	► GO to A4. ► GO to A2.
<b>A2</b>   CHECK IGNITION CIRCUIT		
<ul style="list-style-type: none"> <li>● With ignition switch in RUN position, measure voltage between Pin 7 (Battery Positive Voltage (B+), Circuit 296) and a ground point on the chassis.</li> <li>● <b>Is there battery voltage?</b></li> </ul>	Yes No	► GO to A3. ► SERVICE ignition fuse or circuit as required.
<b>A3</b>   CHECK MODULE GROUND CIRCUIT		
<ul style="list-style-type: none"> <li>● Measure resistance between Pin 10 (GND, Circuit 57) and a ground point on the chassis.</li> <li>● <b>Is resistance less than 1 ohm?</b></li> </ul>	Yes No	► REPEAT Step A1. ► SERVICE ground circuit.
<b>A4</b>   CHECK DEACTIVATOR SWITCH CIRCUIT		
<ul style="list-style-type: none"> <li>● With no brakes applied, measure voltage between Pin 9 (DEACT, Circuit 636) and Pin 10 (GND, Circuit 57).</li> <li>● <b>Is there battery voltage?</b></li> </ul>	Yes No	► GO to A8. ► GO to A5.
<b>A5</b>   CHECK DEACTIVATOR SWITCH		
<ul style="list-style-type: none"> <li>● Remove 14290 harness connector from deactivator switch. Measure resistance between two pins of switch with no brakes applied.</li> <li>● <b>Is resistance less than 1 ohm?</b></li> </ul>	Yes No	► GO to A6. ► REPLACE switch.
<b>A6</b>   VERIFY POWER AT DEACTIVATOR SWITCH HARNESS CONNECTOR		
<ul style="list-style-type: none"> <li>● Measure voltage between Circuit 10 of deactivator switch connector and chassis ground.</li> <li>● <b>Is there battery voltage?</b></li> </ul>	Yes No	► GO to A7. ► SERVICE blown fuse or open in circuit.
<b>A7</b>   CHECK FOR OPEN CIRCUIT BETWEEN DEACTIVATOR SWITCH AND SPEED CONTROL SERVO		
<ul style="list-style-type: none"> <li>● Measure resistance of Circuit 636 from deactivator switch connector to Pin 9 (Circuit 636) of servo connector.</li> <li>● <b>Is resistance less than 1 ohm?</b></li> </ul>	Yes No	► REPEAT Step A4. ► SERVICE open circuit in harness.
<b>A8</b>   CHECK BRAKE SWITCH		
<ul style="list-style-type: none"> <li>● With no brakes applied, measure voltage between Pin 4 (BRK, Circuit 810) and Pin 10 (GND, Circuit 57).</li> <li>● <b>Is there battery voltage?</b></li> </ul>	Yes No	► REPLACE switch. ► GO to A9.
<b>A9</b>   CHECK BRAKE CIRCUIT		
<ul style="list-style-type: none"> <li>● Measure resistance between Pin 4 (BRK, Circuit 810) and Pin 10 (GND, Circuit 57).</li> <li>● <b>Is resistance less than 10 ohms?</b></li> </ul>	Yes No	► GO to A10. ► SERVICE brakelamp bulbs or circuit.

## DIAGNOSIS AND TESTING (Continued)

**PINPOINT TEST A**  
**SPEED CONTROL DOES NOT WORK (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
A10	CHECK FOR STUCK ON SWITCH		
	<ul style="list-style-type: none"> <li>● With no steering wheel switches depressed, measure voltage between Pin 5 (command, Circuit 151) and Pin 10 (GND, Circuit 57).</li> <li>● Is there battery voltage?</li> </ul>	No Yes	GO to A11. REPLACE switch.
A11	CHECK ON SWITCH OPERATION		
	<ul style="list-style-type: none"> <li>● With steering wheel ON switch depressed, measure voltage between Pin 5 (command, Circuit 151) and Pin 10 (GND, Circuit 57).</li> <li>● Is there battery voltage?</li> </ul>	Yes No	GO to A13. GO to A12.
A12	CHECK FOR OPEN CIRCUIT IN SWITCH GROUND		
	<ul style="list-style-type: none"> <li>● With horn depressed, measure voltage between Pin 6 (command RTN, Circuit 461) and chassis ground.</li> <li>● Is there battery voltage?</li> </ul>	Yes No	REPLACE switch. SERVICE open, blown fuse, failed relay or open in switch return circuit.
A13	CHECK FOR STUCK COMMAND SWITCHES		
	<ul style="list-style-type: none"> <li>● With no steering wheel switches depressed, measure resistance between Pin 5 (command, Circuit 151) and Pin 6 (command RTN, Circuit 461).</li> <li>● Is resistance greater than 3k ohms?</li> </ul>	Yes No	GO to A14. REPLACE inoperative switch.
A14	CHECK SET/ACCEL SWITCH OPERATION		
	<ul style="list-style-type: none"> <li>● With the SET/ACCEL switch depressed, measure resistance between Pin 5 (command, Circuit 151) and Pin 6 (command RTN, Circuit 461).</li> <li>● Is resistance between 646 and 714 ohms?</li> </ul>	Yes No	GO to A15. REPLACE switch.
A15	CHECK VSS CIRCUIT		
	<ul style="list-style-type: none"> <li>● Measure resistance between Pin 3 (VSS, Circuit 150) and Pin 10 (GND, Circuit 57).</li> <li>● Is resistance between 200 and 300 ohms?</li> </ul>	Yes No	GO to A17. GO to A16.
A16	CHECK VSS		
	<ul style="list-style-type: none"> <li>● Remove VSS connector.</li> <li>● Measure resistance across VSS terminals.</li> <li>● Is resistance between 200 and 300 ohms?</li> </ul>	Yes No	CHECK for opens in wiring or short in Circuit 57. REPLACE VSS.
A17	CHECK FOR BROKEN OR BINDING CABLE		
	<ul style="list-style-type: none"> <li>● Remove actuator cable from speed control servo assembly.</li> <li>● Check for broken or binding cable by pulling on cable ball slug to ensure throttle moves freely.</li> <li>● Is cable OK?</li> </ul>	Yes No	REPLACE servo assembly. REPLACE cable.

**PINPOINT TEST B**  
**SPEED CONTINUOUSLY CHANGES**

TEST STEP		RESULT	ACTION TO TAKE
B1	VERIFY CONDITION OCCURS ONLY WHILE USING SPEED CONTROL		
	<ul style="list-style-type: none"> <li>● Verify that engine is properly tuned.</li> <li>● Verify that condition does not occur when driving without speed control.</li> <li>● Does condition occur without speed control?</li> </ul>	Yes No	SERVICE engine as required. GO to B2.

## DIAGNOSIS AND TESTING (Continued)

**PINPOINT TEST B**  
**SPEED CONTINUOUSLY CHANGES (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>B2</b>	<b>CHECK FOR BINDING IN ACTUATOR CABLE AND THROTTLE BODY LINKAGE</b>		
	<ul style="list-style-type: none"> <li>● Check to be sure actuator cable is attached to throttle linkage / speed control servo linkage.</li> <li>● Check for binding or sticking of actuator cable or throttle linkage and throttle plate.</li> <li>● Make sure accelerator cable bracket and speed control servo bracket are not loose.</li> <li>● Are components OK?</li> </ul>	Yes No	► GO to B3. ► SERVICE as required.
<b>B3</b>	<b>CHECK VSS</b>		
	<ul style="list-style-type: none"> <li>● Remove VSS connector.</li> <li>● Measure resistance across VSS terminals.</li> <li>● Is resistance between 200 and 300 ohms?</li> </ul>	Yes No	► GO to B4. ► SERVICE VSS or circuit as required.
<b>B4</b>	<b>CHECK SPEED CONTROL SERVO</b>		
	<ul style="list-style-type: none"> <li>● Substitute known good speed control servo.</li> <li>● Test vehicle for proper operation.</li> <li>● Does system operate properly?</li> </ul>	Yes No	► REPLACE speed control servo. ► CHECK manifold absolute pressure sensor and EVP.

**PINPOINT TEST C**  
**COAST/TAP-DOWN INOPERATIVE**

TEST STEP		RESULT	ACTION TO TAKE
<b>C1</b>	<b>CHECK COAST SWITCH OPERATION</b>		
	<ul style="list-style-type: none"> <li>● Disconnect 14290 harness connector from speed control servo.</li> <li>● With COAST switch depressed, measure resistance between Pin 5 (command RTN, Circuit 151) and Pin 6 (command RTN, Circuit 461) while rotating steering wheel through full range.</li> <li>● Is resistance between 114 and 126 ohms?</li> </ul>	Yes No	► GO to C2. ► REPLACE switch.
<b>C2</b>	<b>CHECK COMMAND SWITCH RETURN CIRCUIT</b>		
	<ul style="list-style-type: none"> <li>● Measure resistance between Pin 6 (command RTN, Circuit 461) and Pin 10 (GND, Circuit 57).</li> <li>● Is resistance greater than 1 ohm?</li> </ul>	Yes No	► REPLACE speed control servo. ► SERVICE short in switch return circuit.

**PINPOINT TEST D**  
**ACCEL/TAP-UP INOPERATIVE**

TEST STEP		RESULT	ACTION TO TAKE
<b>D1</b>	<b>CHECK ACCEL / TAP-UP SWITCH OPERATION</b>		
	<ul style="list-style-type: none"> <li>● Disconnect 14290 harness connector from speed control servo.</li> <li>● With ACCEL / TAP-UP switch depressed, measure resistance between Pin 5 (command, Circuit 151) and Pin 6 (command RTN, Circuit 461) while rotating steering wheel through full range.</li> <li>● Is resistance between 646 and 714 ohms?</li> </ul>	Yes No	► GO to D2. ► REPLACE switch.
<b>D2</b>	<b>CHECK COMMAND SWITCH RETURN CIRCUIT</b>		
	<ul style="list-style-type: none"> <li>● Measure resistance between Pin 6 (command RTN, Circuit 461) and Pin 10 (GND, Circuit 57).</li> <li>● Is resistance greater than 1 ohm?</li> </ul>	Yes No	► REPLACE speed control servo. ► SERVICE short in switch return circuit.

## DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST E  
RESUME INOPERATIVE

TEST STEP		RESULT	ACTION TO TAKE
E1	CHECK RESUME SWITCH OPERATION		
	<ul style="list-style-type: none"> <li>● Disconnect 14290 harness connector from speed control servo.</li> <li>● With RESUME switch depressed, measure resistance between Pin 5 (command, Circuit 151) and Pin 6 (command RTN, Circuit 461) while rotating steering wheel through full range.</li> <li>● Is resistance between 2090 and 2310 ohms?</li> </ul>	Yes No	GO to E2. REPLACE switch.
E2	CHECK COMMAND SWITCH RETURN CIRCUIT		
	<ul style="list-style-type: none"> <li>● Measure resistance between Pin 6 (command RTN, Circuit 461) and Pin 10 (GND, Circuit 57).</li> <li>● Is resistance greater than 1 ohm?</li> </ul>	Yes No	REPLACE speed control servo. SERVICE ground in switch return circuit.

PINPOINT TEST F  
SPEED CONTROL DOES NOT DISENGAGE WHEN BRAKE IS APPLIED

TEST STEP		RESULT	ACTION TO TAKE
F1	CHECK BRAKE SWITCH CIRCUIT		
	<ul style="list-style-type: none"> <li>● Disconnect 14290 harness connector at the speed control servo.</li> <li>● With brakes applied, measure voltage between Pin 4 (BRK, Circuit 810) and Pin 10 (GND, Circuit 57).</li> <li>● Is there battery voltage?</li> </ul>	Yes No	REPLACE speed control servo. SERVICE switch, fuse or open circuit.
F2	CHECK FOR BINDS IN ACTUATOR CABLE AND THROTTLE BODY ATTACHMENT		
	<ul style="list-style-type: none"> <li>● Remove actuator cable from speed control servo.</li> <li>● Check for broken or binding cable by pulling on cable ball slug to ensure throttle moves freely.</li> <li>● Is cable OK?</li> </ul>	Yes No	REPLACE speed control servo. SERVICE as required.

PINPOINT TEST G  
OFF SWITCH INOPERATIVE

TEST STEP		RESULT	ACTION TO TAKE
G1	CHECK OFF SWITCH OPERATION		
	<ul style="list-style-type: none"> <li>● Disconnect 14290 harness connector from speed control servo.</li> <li>● With OFF switch depressed, measure resistance between Pin 5 (command, Circuit 151) and Pin 6 (command RTN, Circuit 46) while rotating steering wheel through full range.</li> <li>● Is resistance less than 4 ohms?</li> </ul>	Yes No	REPLACE speed control servo. REPLACE switch.

## Voltage Measurements

Remove 14290 harness connector from speed control servo. Connect the negative lead of voltmeter to Pin 10 (Circuit 57) of connector. Measure the DC or voltage of the following circuits with positive lead meter.

## DIAGNOSIS AND TESTING (Continued)

## VOLTAGE MEASUREMENT—DC

CIRCUIT NAME	PIN	CIRCUIT	WIRE COLOR	TEST CONDITION	APPROXIMATE VOLTAGE
Fused Accy Feed	7	296	W/P	Ignition in RUN position	Battery voltage (12 V)
Deactivator Switch	9	636	O	No brakes applied Brake applied <sup>1</sup>	Battery voltage (12 V) Less than 1/2 volt
Stoplamp Switch to Stoplamp	4	810	R/LG	No brakes applied Brake pedal depressed	Less than 1/2 volt Battery voltage (12 V)
Speed Control Switch to Servo	5	151	LB/BK	No switches pressed Press and hold ON switch	Less than 1/2 volt Battery voltage (12 V)

## VOLTAGE MEASUREMENT—AC

CIRCUIT NAME	PIN	CIRCUIT	WIRE COLOR	TEST CONDITION	APPROXIMATE VOLTAGE
VSS Output Signal to Speed Control Servo	3	150	DG/W	Vehicle on road about 30 mph Vehicle on road about 45 mph	1.4 volts AC minimum 1.6 volts AC minimum

## Resistance Measurements

Remove 14290 harness connector at speed control servo. Connect an ohmmeter between the designated circuits with ignition in OFF position.

## RESISTANCE MEASUREMENTS

CIRCUIT NAME	PIN	CIRCUIT	WIRE COLOR	TEST CONDITION	APPROXIMATE RESISTANCE
Stoplamp Switch to Ground	4 to 10	8101 to 57	R/LG to BK	Brakes not applied	Less than 10 ohms
VSS Signal to Ground	3 to 10	150 to 57	DG/W to BK	Harness disconnected from servo	200-300 ohms
Command Signal to Command Return	5 to 6	151 to 461	LB/BK to O	No switches pressed Press OFF switch Press COAST switch Press ACCEL switch Press RESUME switch	Greater than 3000 ohms Less than 4 ohms 114-126 ohms 646-714 ohms 2090-2310
Command Signal to Command Return	6 to 10	461 to 57	O to BK	No switches pressed	Open circuit

<sup>1</sup> Increased brake pedal efforts will be required to trigger switch with engine OFF.

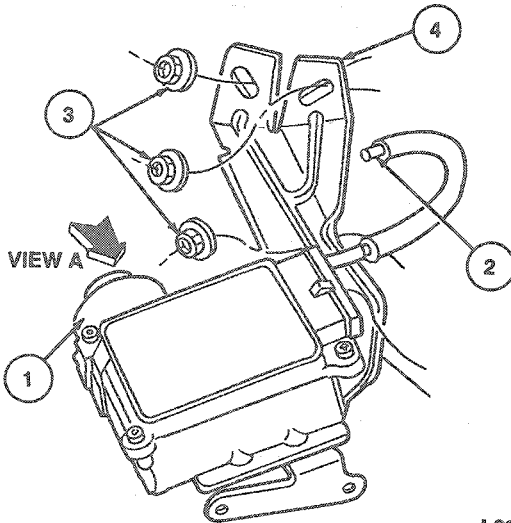
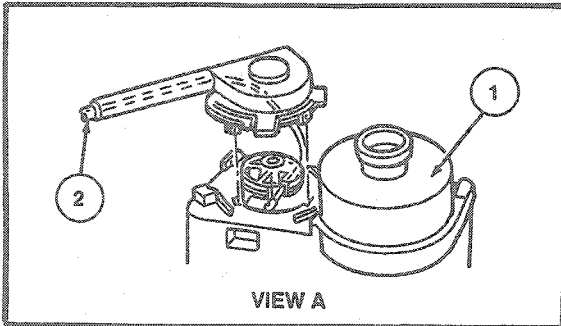


REMOVAL AND INSTALLATION

Servo and Bracket Assembly

Removal

Speed Control Actuator and Servo



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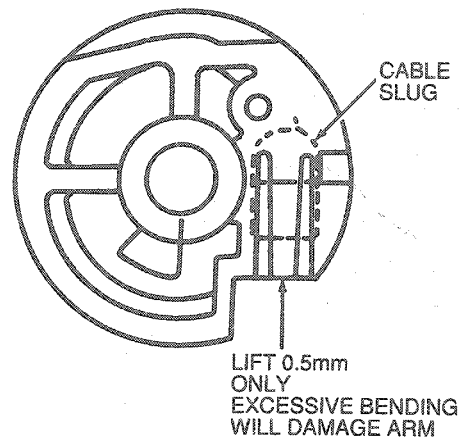
Item	Part Number	Description
1	9C735	Speed Control Servo
2	—	Actuator Assy
3	N620481-S2	Nut (3 Req'd)

1. Remove retaining clip from actuator cable adjuster fitting.
2. Push actuator tube out of adjuster fitting attached to throttle cable.
3. Disconnect 14290 harness connector at speed control servo.
4. Remove three nuts attaching assembly to vehicle.
5. Remove actuator cable cap from speed control servo by depressing cap locking arm and rotating cap counterclockwise.

6. Remove cable slug from servo pulley. Gently pry-up the arm slightly with a small screwdriver, and at the same time push the cable slug out of the pulley slot.

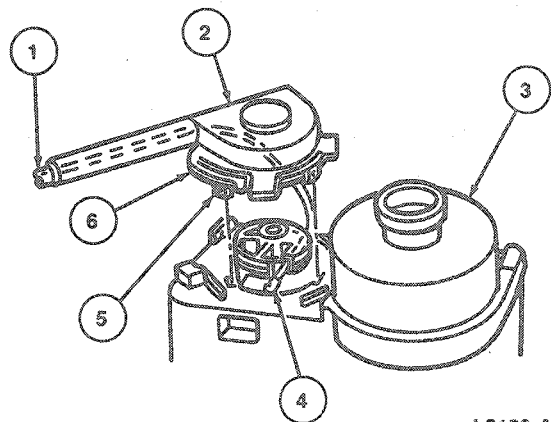
**CAUTION:** Excessive bending of the arm will cause it to break. DO NOT USE servos with damaged or missing locking arms.

PULLEY WITH PLASTIC LOCKING ARM



L8288-A

7. Remove bracket from the speed control servo. Keep bracket and three screws for reinstallation on speed control servo



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Item	Part Number	Description
1	—	Actuator Assy
2	—	Actuator Cable Cap
3	9C735	Speed Control Servo
4	—	Cable Ball Slug
5	—	Cap Locking Tabs
6	—	Locking Arm

**REMOVAL AND INSTALLATION (Continued)**

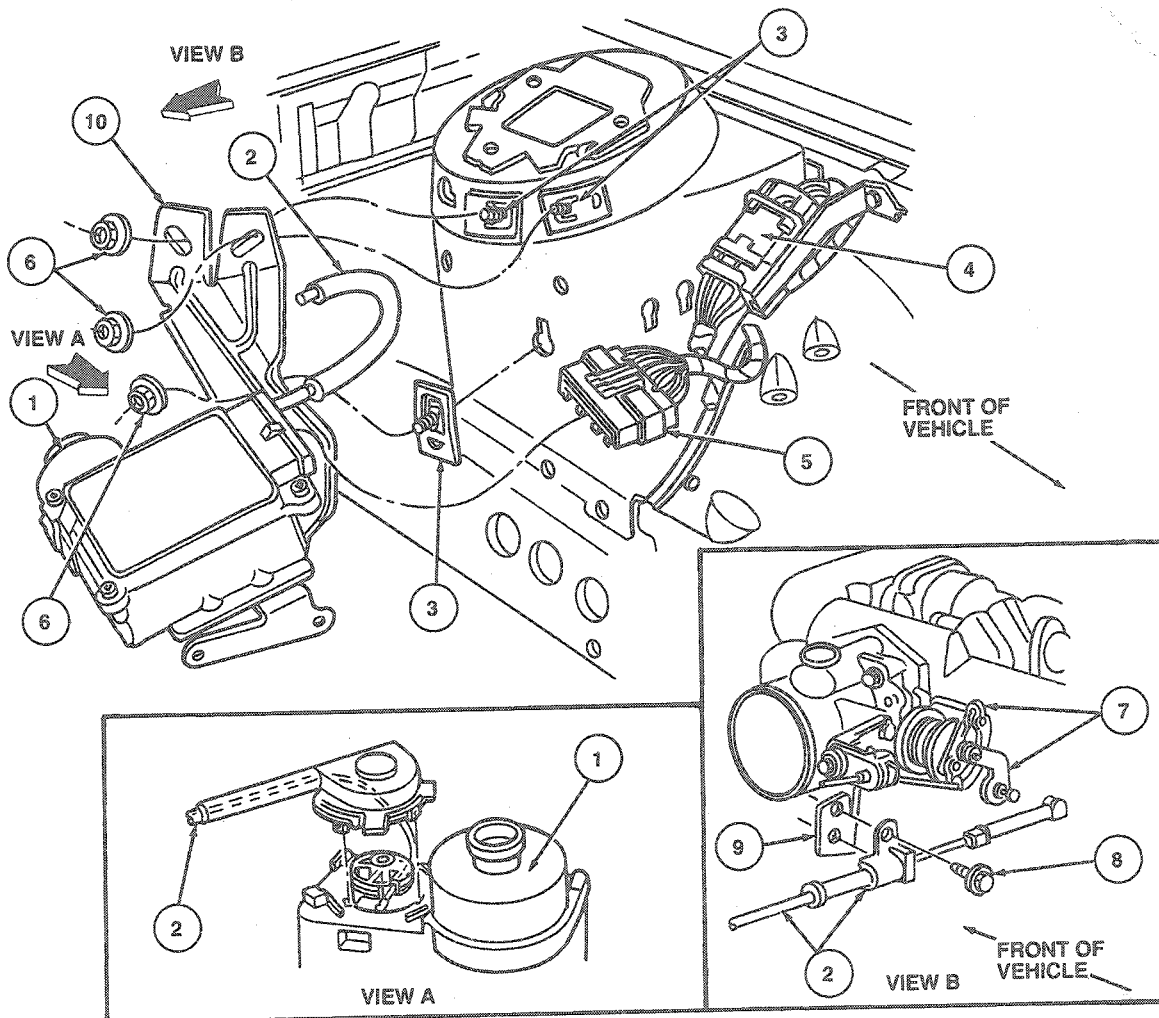
**Installation**

1. Attach bracket to the speed control servo with three screws. Tighten to 8-11 N·m (6-8 lb-ft).
2. Ensure that rubber seal is fully seated on actuator cable tab.
3. Lock cable ball slug into servo pulley slot.
4. Pull on throttle attachment end of cable to draw cable cap on to servo pulley.
5. Insert cable cap locking tabs into servo slots. Rotate cap clockwise until locking arm engages locking tab on speed control servo.
6. Position actuator cable and servo assembly in vehicle. Tighten mounting nuts to 5-7 N·m (45-61 lb-in).
7. Attach 14290 harness connector to speed control servo.
8. Adjust actuator cable as outlined and install retaining clip.

**NOTE:** Incorrect wrapping of cable core wire around servo pulley may result in a high idle condition. Ensure that throttle lever is at idle position after cable installation and adjustment.

**Actuator Cable**

**Speed Control Actuator and Servo**



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REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
1	9C735	Speed Control Servo
2	—	Actuator Assy
3	N804526-S100	Bolt and Retainer (3 Req'd)
4	14401	Wiring Assy

(Continued)

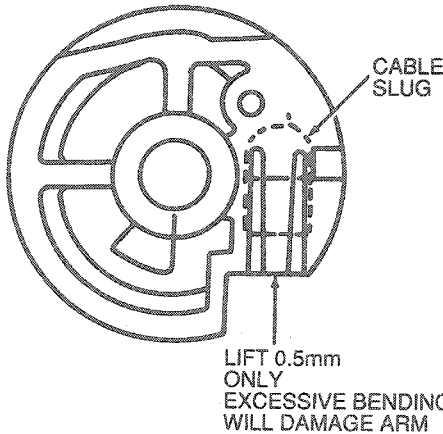
Item	Part Number	Description
5	14290	Wiring Assy
6	N620481-S2	Nut (3 Req'd)
7	—	Throttle Control Assy
8	N611057-S2	Screw
9	9728	Accelerator Shaft Bracket

Removal

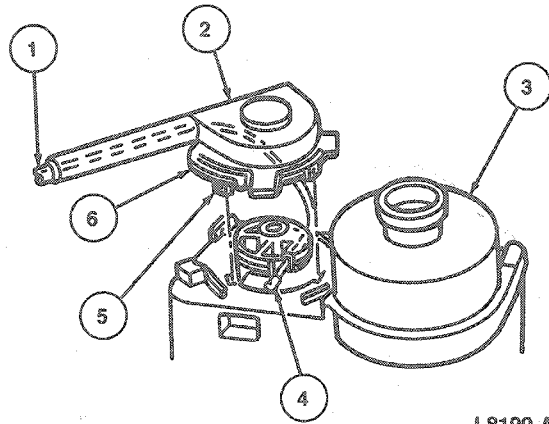
1. Remove screw attaching actuator assembly cable to accelerator shaft bracket.
2. Remove actuator assembly cable from throttle control.
3. Remove actuator cable cap from the speed control servo by depressing cap locking arm and rotating the cap counterclockwise.
4. Remove cable slug from servo pulley. Gently pry-up the arm slightly with a small screwdriver, and at the same time push the cable slug out of the pulley slot.

**CAUTION:** Excessive bending of the arm will cause it to break. DO NOT USE servos with damaged or missing locking arms.

PULLEY WITH PLASTIC LOCKING ARM



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L8199-A

Item	Part Number	Description
1	—	Actuator Assy
2	—	Actuator Cable Cap
3	9C735	Speed Control Servo
4	—	Cable Ball Slug
5	—	Cap Locking Tabs
6	—	Locking Arm

Installation

1. Make sure that rubber seal is fully seated on actuator cable cap.
2. Lock cable ball slug into servo pulley slot.
3. Pull on throttle attachment end of cable to draw cable cap onto servo pulley.
4. Align cable cap tabs with slots in servo housing. Insert cap into the speed control servo and rotate clockwise until the locking arm engages.
5. Snap actuator assembly cable onto throttle control and install screw at accelerator shaft bracket. Tighten to 3-4 N·m (27-35 lb-in).
6. Check cable adjustment as outlined.
7. Ensure that cable is routed properly. Position into retaining clips.

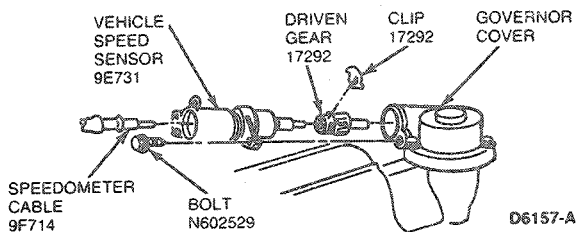
**NOTE:** Incorrect wrapping of cable core wire around servo pulley may result in a high idle condition. Ensure that throttle lever is at idle position after cable installation and adjustment.

## REMOVAL AND INSTALLATION (Continued)

### Vehicle Speed Sensor (VSS) AX4S Transaxle

#### Removal

1. Raise vehicle on a hoist. Refer to Section 00-02.
2. Remove Y-pipe and heated oxygen sensors (HO2S)(9F472) from the exhaust system.
3. Remove VSS exhaust heat shield.
4. Remove bolt retaining VSS mounting clip to transaxle.
5. Remove VSS and driven gear from transaxle.



6. Disconnect electrical connector and speedometer cable from VSS.  
**NOTE:** Do not attempt to remove spring retaining clip from driven gear with speedometer cable in VSS.
7. Remove driven gear retainer and driven gear from VSS.

#### Installation

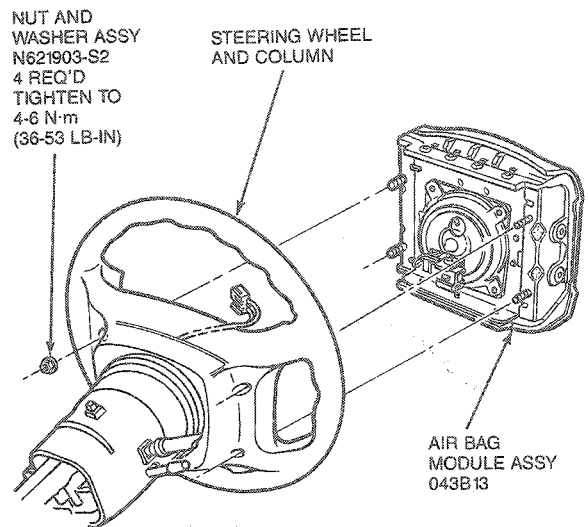
1. Position driven gear to VSS. Install gear retainer.
2. Connect electrical connector to VSS.
3. Ensure internal O-ring is seated properly in VSS housing. Snap speedometer cable into VSS housing.
4. Install VSS into transaxle and secure with retaining bolt.
5. Install VSS exhaust heat shield.
6. Install Y-pipe and heated oxygen sensors to exhaust system.
7. Lower vehicle and verify proper speedometer / odometer operation.

### Control Switches

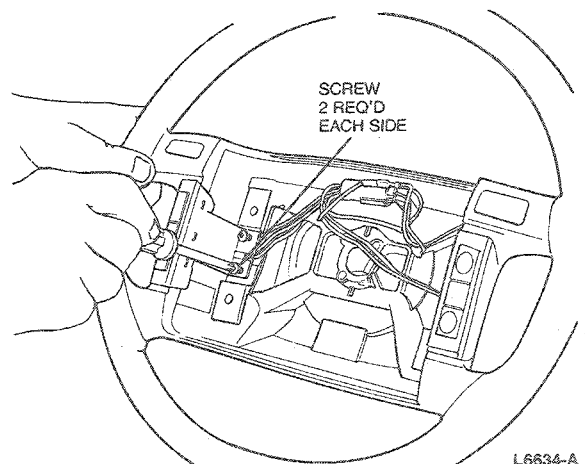
#### Removal

1. Disconnect battery ground cable and air bag backup power supply. Refer to Section 01-20B.
2. Remove four nut and washer assemblies retaining air bag module to steering wheel.

3. Disconnect air bag electrical connector from clockspring contact connector.
4. Remove air bag module from steering wheel.  
**WARNING: PLACE AIR BAG MODULE ON BENCH WITH TRIM COVER FACING UP.**

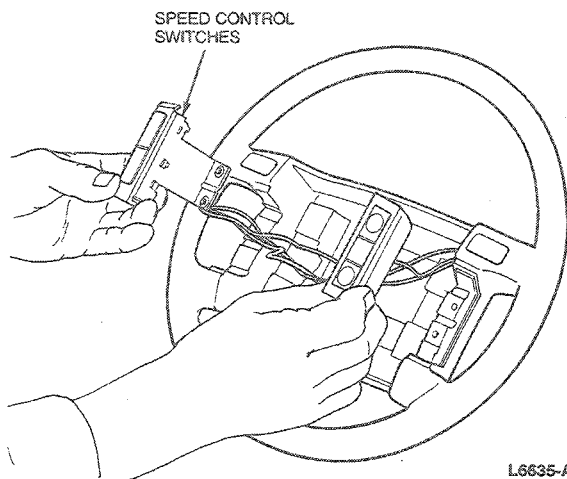


5. Remove horn buttons by gently prying with a small screwdriver. Disconnect horn wiring harness connector.
6. Remove Phillips head screws from speed control switch assemblies.



## REMOVAL AND INSTALLATION (Continued)

7. Disconnect speed control switches from wiring harness and remove switches.



### Installation

1. Position speed control switches onto steering wheel and install Phillips head screws.
2. Connect wiring harness to horn buttons and install horn buttons.
3. Connect speed control switches. Ensure wires are positioned so that no interference is encountered when installing air bag module.
4. Position air bag module on steering wheel so that clockspring contact connector can be connected to the air bag module.
5. Install air bag module on steering wheel and install four nut and washer assemblies. Tighten to 4-5.6 N-m (35-50 lb-in).
6. Connect battery air bag backup power supply and ground cable.

### Clockspring Assembly

#### Tools Required:

- Steering Wheel Puller T67L-3600-A

#### Removal

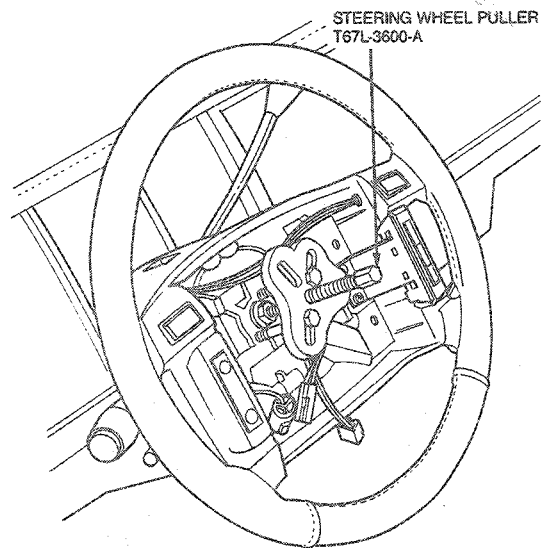
1. Center vehicle front wheels in the straight ahead position.

**WARNING: THE BACKUP POWER SUPPLY MUST BE DISCONNECTED BEFORE ANY AIR BAG COMPONENT SERVICE IS PERFORMED.**

2. Disconnect battery ground cable and air bag backup power supply.
3. Remove four nut and washer assemblies retaining air bag module to steering wheel.
4. Disconnect air bag electrical connector from clockspring contact connector. (Refer to Section 11-04 for clockspring Removal and Installation procedure.)

**WARNING: PLACE AIR BAG MODULE ON BENCH WITH TRIM COVER FACING UP.**

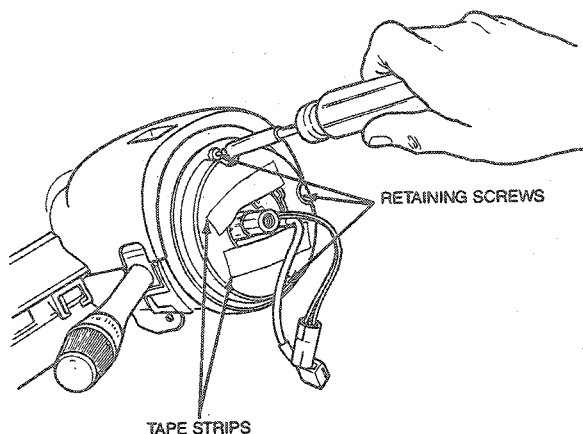
5. Remove air bag module from steering wheel.
6. Disconnect speed control switches and horn switches from contact assembly.
7. Remove steering wheel retaining bolt.
8. Install Steering Wheel Puller T67L-3600-A or equivalent and remove steering wheel.



9. Remove tilt lever if equipped.
10. Remove lower trim panel and lower steering column shroud.
11. Disconnect contact assembly wiring harness.
12. Apply two pieces of tape across contact assembly stator and rotor to prevent accidental rotation.

## REMOVAL AND INSTALLATION (Continued)

- Remove three contact assembly retaining screws and lift contact assembly off steering column shaft.



G5555-A

### Installation

- Ensure that vehicle front wheels are in the straight ahead position and that steering column shaft alignment mark is at the 12 o'clock position.
- Align contact assembly to column shaft and mounting bosses and slide contact assembly onto the shaft.
- Install three screws that retain the contact assembly and tighten to 2-3 N·m (18-26 lb-in). Remove tape from contact assembly.
- Route the contact assembly harness down the column and connect to main wiring.  
NOTE: If a new contact assembly is installed, remove the lock mechanism.
- Install steering column shroud.
- Install lower trim panel.

- Install tilt lever if equipped.
- Position steering wheel on steering shaft and install new steering wheel retaining bolt. Tighten to 31-45 N·m (23-33 lb-ft).

NOTE: Route contact assembly wiring through steering wheel as wheel is being positioned.

- Connect speed control and horn switches to contact assembly.

**CAUTION:** Ensure wiring is positioned so that no interference is encountered when installing air bag module.

- Position air bag module on steering wheel so that clockspring contact connector can be connected to the air bag module.
- Install air bag module on wheel and install four nut and washer assemblies.
- Connect air bag backup power supply and battery ground cable.
- Verify air bag warning indicator.

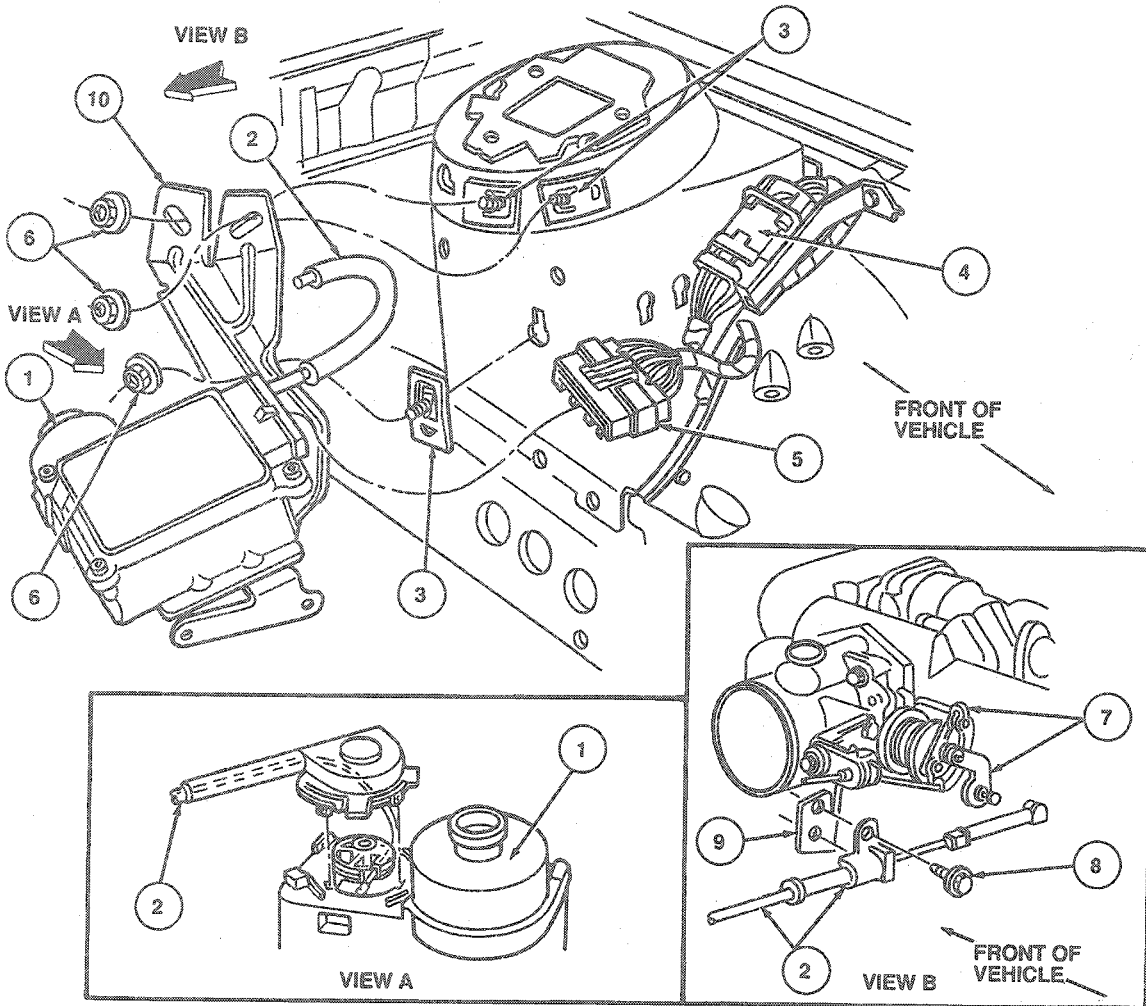
## ADJUSTMENTS

### Actuator Cable

- Remove retaining clip from actuator cable adjuster at throttle.
- Ensure throttle is in fully closed position.
- Pull on actuator cable to take up slack. Loosen at least one notch so there is approximately 3mm (0.118 inch) of slack in the cable.  
**CAUTION:** The cable must not be pulled tight, otherwise speed control may not operate properly.
- Insert cable retaining clip and snap into place.
- Check that throttle linkage operates freely and smoothly.

ADJUSTMENTS (Continued)

Speed Control Actuator and Servo



L8197-A

Item	Part Number	Description
1	9C736	Speed Control Servo Bracket
2	—	Actuator Assy
3	N804526-S100	Bolt and Retainer (3 Req'd)
4	14401	Wiring Assy

(Continued)

Item	Part Number	Description
5	14290	Wiring Assy
6	N620481-S2	Nut (3 Req'd)
7	—	Throttle Control Assy
8	N611057-S2	Screw
9	9728	Accelerator Shaft Bracket

SPECIFICATIONS

TORQUE SPECIFICATIONS

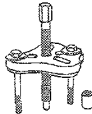
Description	N-m	Lb-in
Servo Nut	5-7	45-61
Cable Cover Nut	4-6	36-53
Air Bag Module Nut	4-5.6	35-50
Contact Brush Assembly Screw	2-3	18-26

(Continued)

TORQUE SPECIFICATIONS (Cont'd)

Description	N-m	Lb-in
Steering Wheel Bolt	31-45	23-33 (Lb-Ft)
Wheel Lug Nuts	115-142	85-104 (Lb-Ft)
Servo Nut	9.5-12	7-8 (Lb-Ft)
Sensor Retaining Nut	3.4-4.5	31-39

**SPECIAL SERVICE TOOLS**

Tool Number/ Description	Illustration
T67L-3600-A Steering Wheel Puller	 <p style="text-align: center; font-size: small;">T67L-3600-A</p>

**ROTUNDA EQUIPMENT**

Model	Description
007-00013	Speed Control Sensor
014-00407	Digital Volt-Ohmmeter
059-00010	Inductive Dwell-Tach-Volts-Ohms Tester

**PARTS CROSS-REFERENCE**

Base Part #	Part Name	Old Part Name
9C735	Speed Control Servo	
9C736	Speed Control Servo Bracket	
9D843	Speed Control Amplifier	
9E731	Vehicle Speed Sensor	Speed Sensor
9F472	Heated Oxygen Sensor	Exhaust Gas Oxygen Sensor
9F479	Manifold Absolute Pressure Sensor	