

SPEED CONTROL SYSTEM

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GENERAL INFORMATION

INTRODUCTION

The vehicle speed control system is electronically controlled by the Powertrain Control Module (Fig. 1) and vacuum operated by a servo. The system is designed to operate between approximately 35 and 85 mph (56 and 137 km/h). On diesel powered models, a separate vacuum reservoir **is not used** to supply the servo. Vacuum for the servo is supplied by an engine mounted vacuum pump. Vacuum from this pump is shared by the heating/air-conditioning system.

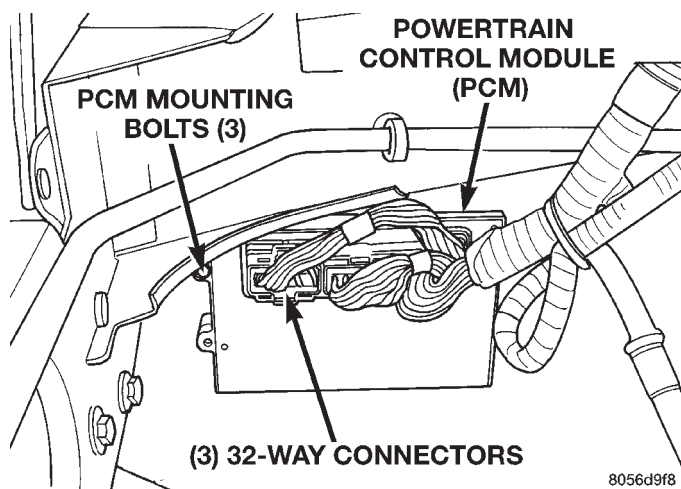


Fig. 1 Powertrain Control Module (PCM) Location

DESCRIPTION AND OPERATION

SPEED CONTROL SERVO

The servo unit consists of a solenoid valve body, a vacuum servo and the mounting bracket. The Powertrain Control Module (PCM) (Fig. 1) controls the sole-

noid valve body. The solenoid valve body controls the application and release of vacuum to the diaphragm of the vacuum servo. A cable connects the servo with the throttle linkage. The servo unit cannot be repaired and is serviced only as a complete assembly.

SPEED CONTROL SOLENOID CIRCUITS

When all of the speed control parameters are met, and the SET button is pressed, the Powertrain Control Module (PCM) (Fig. 1) actuates the vent solenoid and "duty-cycles" the vacuum solenoid to open the throttle and bring the vehicle up to target speed. When the vehicle is at target speed, it will actuate the vent solenoid with the vacuum solenoid de-activated to maintain the vehicle at target speed. When the vehicle is above target speed, the PCM will "duty-cycle" the vent solenoid with the vacuum solenoid still de-activated to close the throttle to return to target speed.

SPEED CONTROL SWITCHES

Two separate speed control switch modules are mounted on the steering wheel to the left and right side of the driver's airbag module. Within the two switch modules, five **momentary** contact switches, supporting seven different speed control functions are used. The outputs from these switches are filtered into one input. The Powertrain Control Module (PCM) (Fig. 1) determines which output has been applied through **resistive multiplexing**. The input circuit voltage is measured by the PCM to determine which switch function has been selected.

A speed control indicator lamp, located on the instrument panel cluster is energized by the PCM via the CCD Bus. This occurs when speed control system power has been turned ON, and the engine is running.

DESCRIPTION AND OPERATION (Continued)

The two switch modules are labeled: ON/OFF, SET, RESUME/ACCEL, CANCEL and COAST. Refer to the owner's manual for more information on speed control switch functions and setting procedures. The individual switches cannot be repaired. If one individual switch fails, the switch module must be replaced.

STOP LAMP SWITCH

Vehicles equipped with the speed control option use a dual function stop lamp switch. The switch is mounted on the brake pedal mounting bracket under the instrument panel. The Powertrain Control Module (PCM) (Fig. 1) monitors the state of the dual function stop lamp switch. Refer to Group 5, Brakes for more information on stop lamp switch service and adjustment procedures.

SERVO CABLE

The speed control servo cable is connected between the speed control vacuum servo diaphragm and the throttle control lever. This cable causes the throttle control linkage to open or close in response to movement of the vacuum servo diaphragm.

POWERTRAIN CONTROL MODULE (PCM)

Speed control electronic circuitry is integrated into the Powertrain Control Module (PCM). The PCM speed control functions are monitored by On-Board Diagnostics (OBD). Both the Engine Control Module (ECM), and the PCM monitor OBD-sensed systems. Each controller (PCM and ECM) monitor OBD functions with the PCM controlling operation of the Malfunction Indicator Lamp (MIL). Each controller (PCM and ECM) will store a Diagnostic Trouble Code (DTC) related to its monitor. Both modules will also set a "companion" module DTC when a fault is set in the other module.

The PCM is located in the engine compartment (Fig. 1). The PCM or the ECM cannot be repaired and must be replaced if faulty.

VACUUM SUPPLY

On diesel powered engines, an engine driven pump is used to supply vacuum for speed control operation. A vacuum reservoir is not used if equipped with a diesel powered engine. Refer to Vacuum Pump in Group 9, Engines for information.

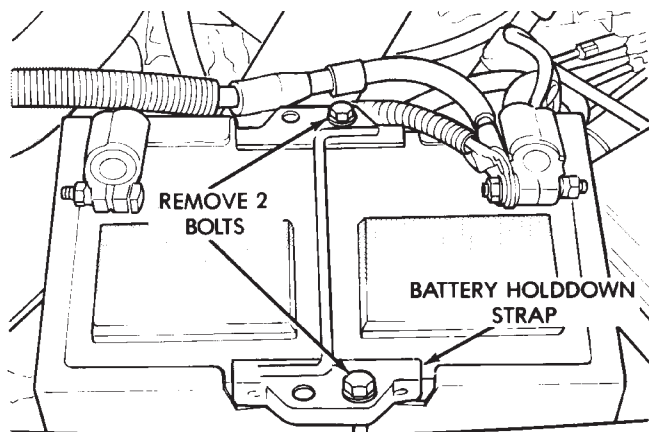
VEHICLE SPEED INPUT

The Vehicle Speed Sensor (VSS) is no longer used for any Dodge Truck.

Vehicle speed and distance covered are measured by the Rear Wheel Speed Sensor. The sensor is mounted to the rear axle. A signal is sent from this sensor to the Controller Antilock Brake (CAB) computer. A signal is then sent from the CAB to the Powertrain Control Module (PCM) to determine vehicle speed and distance covered. The PCM will then determine strategies for speed control system operation.

REMOVAL AND INSTALLATION**SPEED CONTROL SERVO****REMOVAL**

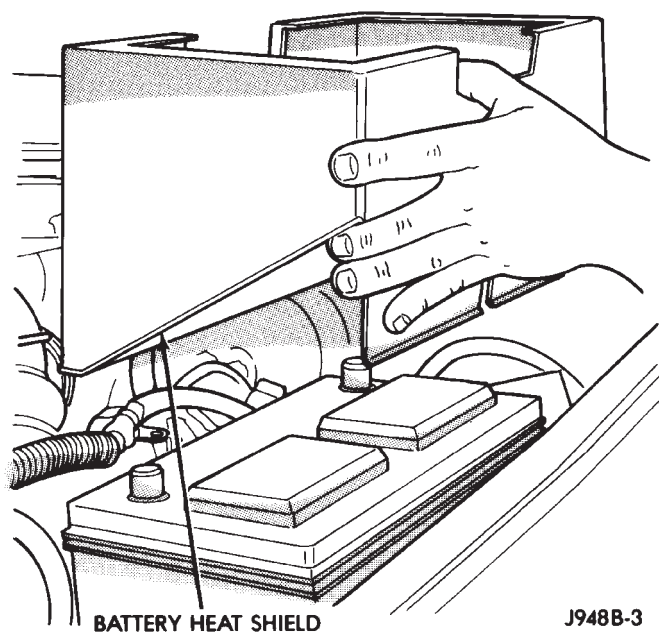
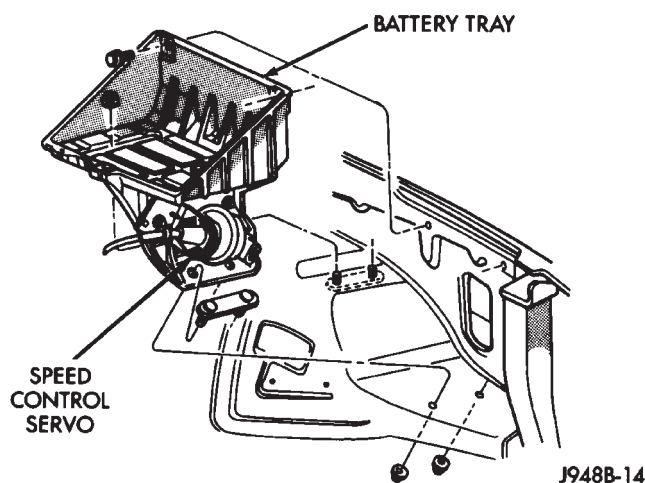
- (1) Disconnect both negative battery cables at both batteries.
- (2) Disconnect positive battery cable at battery (drivers side battery).
- (3) Remove battery holddown bolts (Fig. 2).
- (4) If equipped, pull up on battery heat shield to remove it (Fig. 3).
- (5) Remove battery from vehicle.
- (6) From under vehicle, and in front of left front wheelhouse, remove 2 lower battery tray nuts (Fig. 4).
- (7) Remove 2 nuts and 2 bolts holding battery tray to vehicle (Fig. 5).



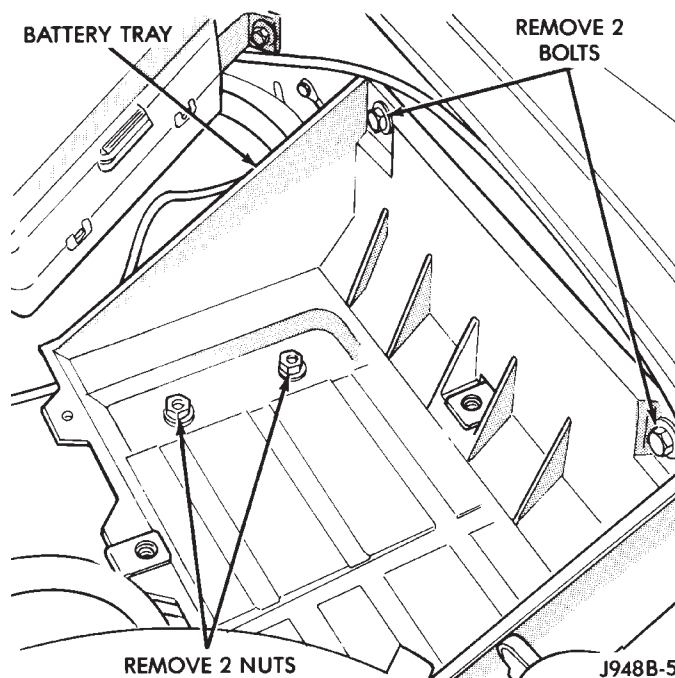
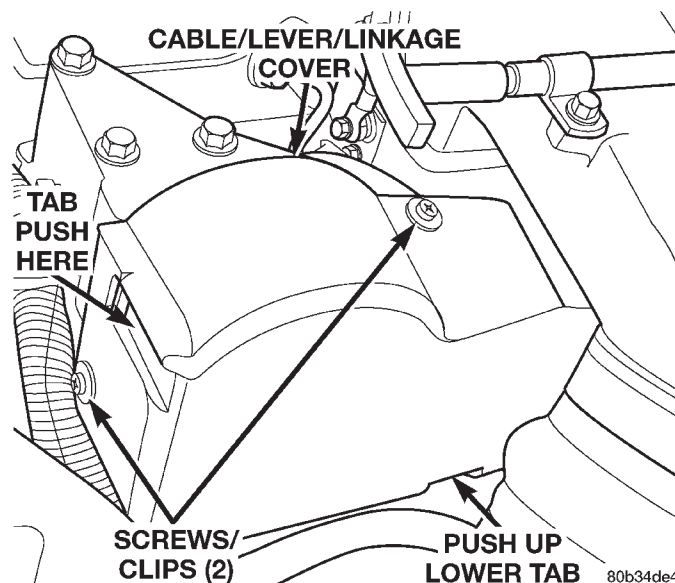
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Fig. 2 Battery Holddown Bolts

REMOVAL AND INSTALLATION (Continued)

*Fig. 3 Battery Heat Shield**Fig. 4 Battery Tray Lower Mounting Nuts*

(8) Remove cable cover (Fig. 6). Cable cover is attached with 2 Phillips screws, 2 plastic retention clips and 2 push tabs (Fig. 6). Remove 2 Phillips screws and carefully pry out 2 retention clips. After clip removal, push rearward on front tab, and upward on lower tab for cover removal.

*Fig. 5 Battery Tray Upper Mounting Bolts/Nuts**Fig. 6 Cable/Lever/Throttle Linkage Cover*

(9) Using finger pressure only, disconnect end of servo cable from throttle lever pin by pulling forward on connector while holding lever rearward (Fig. 7). **DO NOT** try to pull connector off perpendicular to lever pin. Connector will be broken.

REMOVAL AND INSTALLATION (Continued)

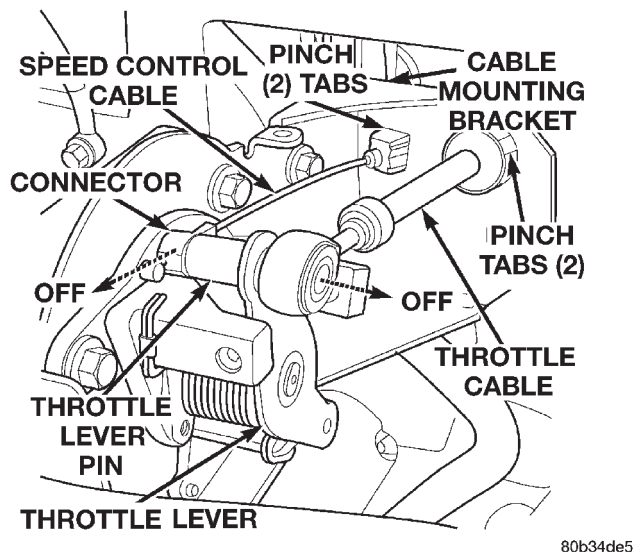


Fig. 7 Servo Cable at Throttle Lever

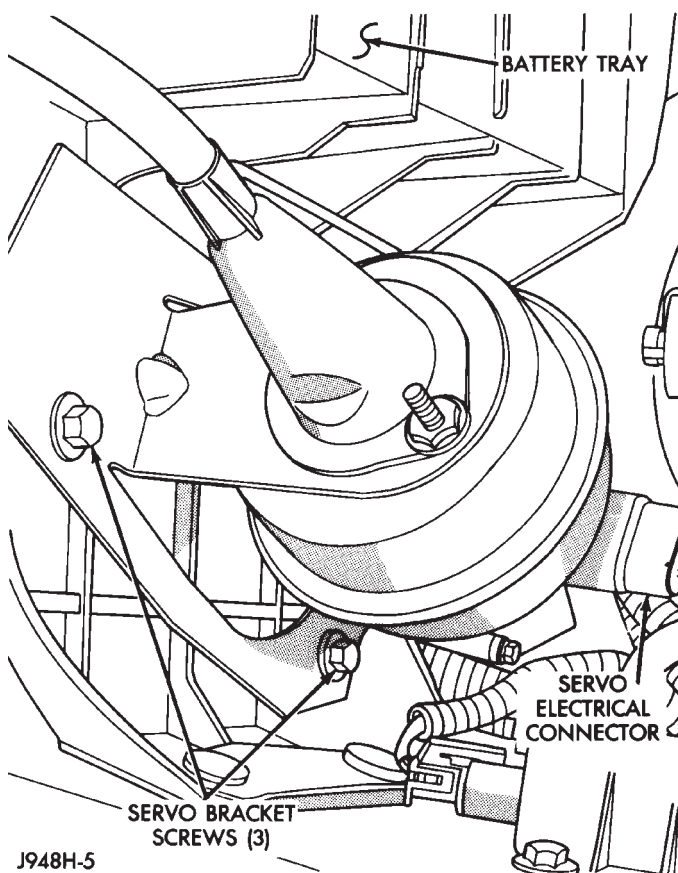


Fig. 8 Servo Location—Removal/Installation

(10) Position battery tray up far enough for access to speed control servo electrical connector and vacuum line.

(11) Disconnect electrical connector and vacuum line at servo.

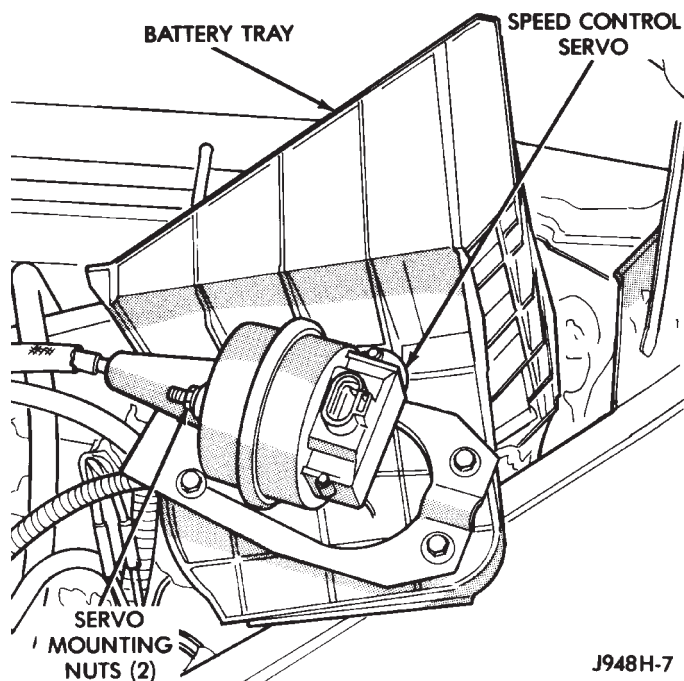


Fig. 9 Servo Mounting at Battery Tray

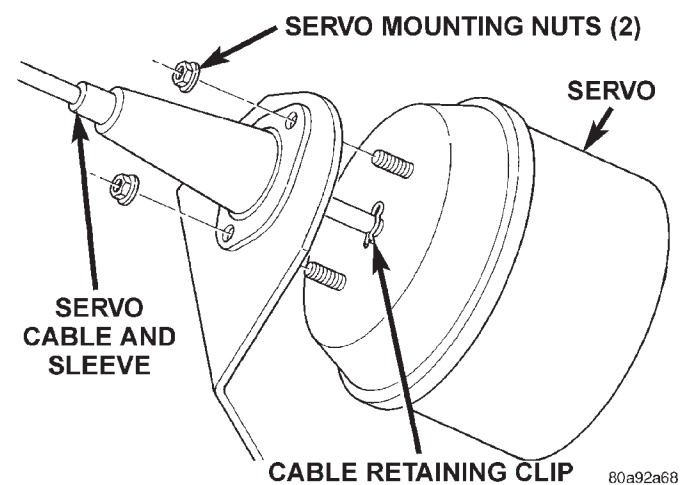


Fig. 10 Servo Cable Clip Remove/Install—Typical

(12) Position battery tray with attached servo assembly to gain access to 2 servo mounting nuts (Fig. 9) or (Fig. 10).

(13) Remove 2 mounting nuts holding servo cable sleeve to bracket (Fig. 10).

(14) Pull speed control cable sleeve and servo away from servo mounting bracket to expose cable retaining clip (Fig. 10) and remove clip. Note: The servo mounting bracket displayed in (Fig. 10) is a typical bracket and may/may not be applicable to this model vehicle.

(15) Remove servo from mounting bracket.

INSTALLATION

(1) Position servo to mounting bracket.

REMOVAL AND INSTALLATION (Continued)

- (2) Align hole in cable connector with hole in servo pin. Install cable-to-servo retaining clip.
- (3) Insert servo studs through holes in servo mounting bracket.
- (4) Insert servo studs through holes in servo cable sleeve.
- (5) Install servo mounting nuts and tighten to 8.5 N·m (75 in. lbs.) torque.
- (6) Connect vacuum line to servo.
- (7) Connect electrical connector to servo terminals.
- (8) Connect servo cable to throttle lever by pushing cable connector rearward onto lever pin while holding lever forward.
- (9) Install battery tray. Tighten all battery tray mounting hardware to 16 N·m (140 in. lbs.) torque.
- (10) Position battery into battery tray.
- (11) If equipped, install battery heat shield.
- (12) Install battery holddown clamp. Tighten bolt to 4 N·m (35 in. lbs.) torque.
- (13) Connect negative battery cables to both batteries.
- (14) Before starting engine, operate accelerator pedal to check for any binding.
- (15) Install cable/lever cover.

SPEED CONTROL SWITCHES

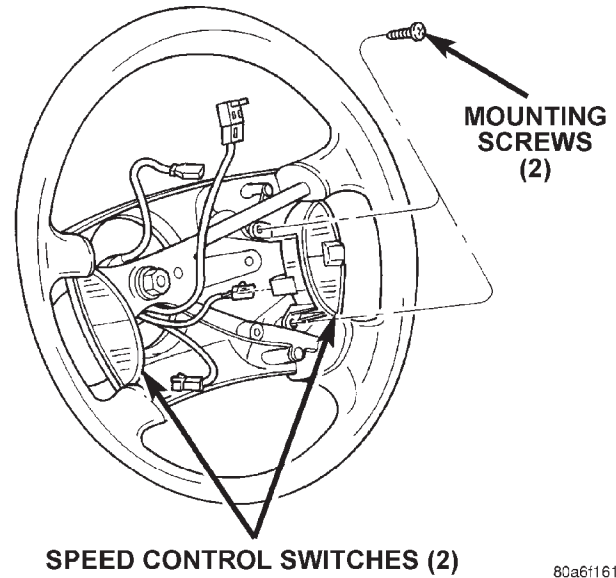
REMOVAL

WARNING: BEFORE BEGINNING ANY AIRBAG SYSTEM COMPONENT REMOVAL OR INSTALLATION, REMOVE AND ISOLATE THE NEGATIVE (-) CABLE(S) FROM THE BATTERY. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. THEN WAIT TWO MINUTES FOR SYSTEM CAPACITOR TO DISCHARGE BEFORE FURTHER SYSTEM SERVICE. FAILURE TO DO THIS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE INJURY.

- (1) Disconnect and isolate negative battery cable(s).
- (2) Remove airbag module. Refer to Group 8M, Passive Restraint Systems for procedures.
- (3) Remove switch-to-steering wheel mounting screws (Fig. 11).
- (4) Remove switch.
- (5) Remove electrical connector at switch.

INSTALLATION

- (1) Install electrical connector to switch.
- (2) Install switch and mounting screws.
- (3) Tighten screws to 3 N·m (26 in. lbs. +/- 2 in. lbs.) torque.
- (4) Install airbag module. Refer to Group 8M, Passive Restraint Systems for procedures.
- (5) Connect negative battery cable(s).



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Fig. 11 Speed Control Switches

STOP LAMP SWITCH

Refer to Stop Lamp Switch in Group 5, Brakes for removal/installation and adjustment procedures.

SERVO CABLE

REMOVAL

- (1) Disconnect both negative battery cables at both batteries.
- (2) Remove cable/lever/linkage cover. Refer to Speed Control Servo Removal/Installation.
- (3) Remove (disconnect) servo cable from servo. Refer to Speed Control Servo Removal/Installation.
- (4) Using finger pressure only, disconnect end of servo cable from throttle lever pin by pulling forward on connector while holding lever rearward (Fig. 12). **DO NOT try to pull connector off perpendicular to lever pin. Connector will be broken.**
- (5) Squeeze 2 pinch tabs (Fig. 12) on sides of speed control cable at mounting bracket and push cable rearward out of bracket.
- (6) Remove cable from vehicle.

INSTALLATION

- (1) Install (connect) end of speed control servo cable to speed control servo. Refer to Speed Control Servo Removal/Installation.
- (2) Install cable through mounting hole on mounting bracket. Cable snaps into bracket.
- (3) Connect servo cable to throttle lever by pushing cable connector rearward onto lever pin while holding lever forward.
- (4) Connect negative battery cables to both batteries.
- (5) Before starting engine, operate accelerator pedal to check for any binding.
- (6) Install cable/lever cover.

SPECIFICATIONS (Continued)

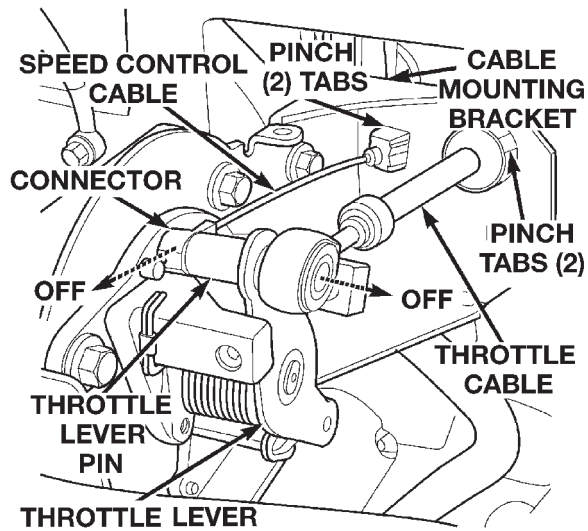


Fig. 12 Servo Cable at Throttle Lever

SPECIFICATIONS

TORQUE CHART

Description**Torque**

Servo Mounting Bracket Nuts . 8.5 N·m (75 in. lbs.)

Switch Module Mounting Screws . 3 N·m (26 in. lbs.
+/- 2 in. lbs.)