

SPEED CONTROL

TABLE OF CONTENTS

	page		page
SPEED CONTROL		SPEED CONTROL SERVO	
DESCRIPTION		DESCRIPTION	6
DESCRIPTION - SPEED CONTROL SYSTEM	1	OPERATION	6
DESCRIPTION - VEHICLE SPEED INPUT	2	REMOVAL	
OPERATION - SPEED CONTROL SYSTEM	2	REMOVAL	6
DIAGNOSIS AND TESTING		REMOVAL - DIESEL WITH AUTO. TRANS.	9
DIAGNOSIS AND TESTING - VACUUM		INSTALLATION	
SUPPLY TEST	3	INSTALLATION	11
DIAGNOSIS AND TESTING - ROAD TEST	4	INSTALLATION - DIESEL WITH AUTO.	
SPECIFICATIONS		TRANS.	12
TORQUE - SPEED CONTROL SYSTEM	4	SWITCH	
CABLE		DESCRIPTION	12
DESCRIPTION	4	OPERATION	12
OPERATION	4	REMOVAL	13
REMOVAL		INSTALLATION	14
REMOVAL - GAS ENGINES	4	VACUUM RESERVOIR	
REMOVAL - DIESEL WITH AUTO. TRANS.	5	DESCRIPTION	14
INSTALLATION		REMOVAL	14
INSTALLATION - GAS ENGINES	5	INSTALLATION	15
INSTALLATION - DIESEL WITH AUTO.			
TRANS.	6		

SPEED CONTROL

DESCRIPTION

DESCRIPTION - SPEED CONTROL SYSTEM

Gas Engines and/or Diesel With Automatic Trans.

The speed control system is operated by the use of a cable and a vacuum controlled servo. Electronic control of the speed control system is integrated into the Powertrain Control Module (PCM). The controls consist of two steering wheel mounted switches. The switches are labeled: ON/OFF, RES/ACCEL, SET, COAST, and CANCEL.

The system is designed to operate at speeds above 30 mph (50 km/h).

WARNING: THE USE OF SPEED CONTROL IS NOT RECOMMENDED WHEN DRIVING CONDITIONS DO NOT PERMIT MAINTAINING A CONSTANT SPEED, SUCH AS IN HEAVY TRAFFIC OR ON ROADS THAT

ARE WINDING, ICY, SNOW COVERED, OR SLIPPERY.

Diesel With Manual Trans.

The speed control system is fully electronically controlled by the Engine Control Module (ECM). **A cable and a vacuum controlled servo are not used if the vehicle is equipped with a manual transmission and a diesel engine. This is a servo-less system.** The controls consist of two steering wheel mounted switches. The switches are labeled: ON/OFF, RES/ACCEL, SET, COAST, and CANCEL.

The system is designed to operate at speeds above 30 mph (50 km/h).

WARNING: THE USE OF SPEED CONTROL IS NOT RECOMMENDED WHEN DRIVING CONDITIONS DO NOT PERMIT MAINTAINING A CONSTANT SPEED, SUCH AS IN HEAVY TRAFFIC OR ON ROADS THAT ARE WINDING, ICY, SNOW COVERED, OR SLIPPERY.

SPEED CONTROL (Continued)

DESCRIPTION - VEHICLE SPEED INPUT**Gas Engines and/or Diesel With Automatic Trans.**

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.

Diesel With Manual Trans.

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 Engine Control Module (ECM) to determine vehicle speed and distance covered. The ECM will then determine strategies for speed control system operation.

OPERATION - SPEED CONTROL SYSTEM**Gas Engines and/or Diesel With Automatic Trans.**

When speed control is selected by depressing the ON switch, the PCM allows a set speed to be stored in PCM RAM for speed control. To store a set speed, depress the SET switch while the vehicle is moving at a speed between 35 and 85 mph. In order for the speed control to engage, the brakes cannot be applied, nor can the gear selector be indicating the transmission is in Park or Neutral.

The speed control can be disengaged manually by:

- Stepping on the brake pedal.
- Depressing the OFF switch.
- Depressing the CANCEL switch.
- Depressing the clutch pedal (if equipped).

NOTE: Depressing the OFF switch or turning off the ignition switch will erase the set speed stored in the PCM.

For added safety, the speed control system is programmed to disengage for any of the following conditions:

- An indication of Park or Neutral.
- A rapid increase of rpm (indication that the clutch has been disengaged).

- Excessive engine rpm (indicates that the transmission may be in a low gear).

- The speed signal increases at a rate of 10 mph per second (indicates that the coefficient of friction between the road surface and tires is extremely low).

- The speed signal decreases at a rate of 10 mph per second (indicates that the vehicle may have decelerated at an extremely high rate).

Once the speed control has been disengaged, depressing the RES/ACCEL switch (when speed is greater than 30 mph) restores the vehicle to the target speed that was stored in the PCM.

While the speed control is engaged, the driver can increase the vehicle speed by depressing the RES/ACCEL switch. The new target speed is stored in the PCM when the RES/ACCEL is released. The PCM also has a "tap-up" feature in which vehicle speed increases at a rate of approximately 2 mph for each momentary switch activation of the RES/ACCEL switch.

A "tap down" feature is used to decelerate without disengaging the speed control system. To decelerate from an existing recorded target speed, momentarily depress the COAST switch. For each switch activation, speed will be lowered approximately 1 mph.

Diesel With Manual Trans.

When speed control is selected by depressing the ON switch, the Engine Control Module (ECM) allows a set speed to be stored in ECM RAM for speed control. To store a set speed, depress the SET switch while the vehicle is moving at a speed between 35 and 85 mph. In order for the speed control to engage, the brakes cannot be applied. The speed control can be disengaged manually by:

- Stepping on the brake pedal.
- Depressing the OFF switch.
- Depressing the CANCEL switch.
- Depressing the clutch pedal.

NOTE: Depressing the OFF switch or turning off the ignition switch will erase the set speed stored in the ECM.

For added safety, the speed control system is programmed to disengage for any of the following conditions:

- A rapid increase of rpm (indication that the clutch has been disengaged).

- Excessive engine rpm (indicates that the transmission may be in a low gear).

- The speed signal increases at a rate of 10 mph per second (indicates that the coefficient of friction between the road surface and tires is extremely low).

- The speed signal decreases at a rate of 10 mph per second (indicates that the vehicle may have decelerated at an extremely high rate).

SPEED CONTROL (Continued)

Once the speed control has been disengaged, depressing the RES/ACCEL switch (when speed is greater than 30 mph) restores the vehicle to the target speed that was stored in the ECM.

While the speed control is engaged, the driver can increase the vehicle speed by depressing the RES/ACCEL switch. The new target speed is stored in the ECM when the RES/ACCEL is released. The ECM also has a "tap-up" feature in which vehicle speed increases at a rate of approximately 2 mph for each momentary switch activation of the RES/ACCEL switch.

A "tap down" feature is used to decelerate without disengaging the speed control system. To decelerate from an existing recorded target speed, momentarily depress the COAST switch. For each switch activation, speed will be lowered approximately 1 mph.

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - VACUUM SUPPLY TEST

Gas Powered Engines

On gasoline powered engines: actual engine vacuum, a vacuum reservoir, a one-way check valve and vacuum lines are used to supply vacuum to the speed control servo.

(1) Disconnect vacuum hose at speed control servo and install a vacuum gauge into the disconnected hose.

(2) Start engine and observe gauge at idle. Vacuum gauge should read at least ten inches of mercury.

(3) If vacuum is less than ten inches of mercury, determine source of leak. Check vacuum line to engine for leaks. Also check actual engine intake manifold vacuum. If manifold vacuum does not meet this requirement, check for poor engine performance and repair as necessary.

(4) If vacuum line to engine is not leaking, check for leak at vacuum reservoir. To locate and gain access to reservoir, refer to Vacuum Reservoir Removal/Installation in this group. Disconnect vacuum line at reservoir and connect a hand-operated vacuum pump to reservoir fitting. Apply vacuum. Reservoir vacuum should not bleed off. If vacuum is being lost, replace reservoir.

(5) Verify operation of one-way check valve and check it for leaks.

(a) Locate one-way check valve. The valve is located in vacuum line between vacuum reservoir

and engine vacuum source. Disconnect vacuum hoses (lines) at each end of valve.

(b) Connect a hand-operated vacuum pump to reservoir end of check valve. Apply vacuum. Vacuum should not bleed off. If vacuum is being lost, replace one-way check valve.

(c) Connect a hand-operated vacuum pump to vacuum source end of check valve. Apply vacuum. Vacuum should flow through valve. If vacuum is not flowing, replace one-way check valve. Seal the fitting at opposite end of valve with a finger and apply vacuum. If vacuum will not hold, diaphragm within check valve has ruptured. Replace valve.

Diesel Engines With Automatic Trans.

On diesel powered engines equipped with an automatic transmission: an engine driven vacuum pump, a one-way check valve and vacuum lines are used to supply vacuum to the speed control servo. A vacuum reservoir is not used.

(1) Disconnect vacuum hose at speed control servo and install a vacuum gauge into the disconnected hose.

(2) Start engine and observe gauge at idle. For vacuum testing and vacuum specifications, refer to Vacuum Pump Output—Diesel Engine in 9, Engines.

(3) If vacuum pump output is OK, determine other source of leak. Check all vacuum lines to: speed control servo, engine vacuum pump and heating/air conditioning system for leaks.

(4) Verify operation of one-way check valve and check it for leaks.

(a) Locate one-way check valve. The valve is located in vacuum line between speed control servo and engine vacuum pump. Disconnect vacuum hoses (lines) at each end of valve.

(b) Connect a hand-operated vacuum pump to reservoir end of check valve. Apply vacuum. Vacuum should not bleed off. If vacuum is being lost, replace one-way check valve.

(c) Connect a hand-operated vacuum pump to vacuum source end of check valve. Apply vacuum. Vacuum should flow through valve. If vacuum is not flowing, replace one-way check valve. Seal the fitting at opposite end of valve with a finger and apply vacuum. If vacuum will not hold, diaphragm within check valve has ruptured. Replace valve.

Diesel Engine With Manual Trans.

Vacuum is not used for any part of the speed control system if equipped with a diesel engine and a manual transmission.

SPEED CONTROL (Continued)

DIAGNOSIS AND TESTING - ROAD TEST

Perform a vehicle road test to verify reports of speed control system malfunction. The road test should include attention to the speedometer.

If a road test verifies a system problem and the speedometer operates properly, check for:

- A Diagnostic Trouble Code (DTC). If a DTC exists, conduct tests per the Powertrain Diagnostic Procedures service manual.
- A misadjusted brake (stop) lamp switch. This could also cause an intermittent problem.
- Loose, damaged or corroded electrical connections at the servo. Corrosion should be removed from electrical terminals and a light coating of Mopar® MultiPurpose Grease, or equivalent, applied.

- Leaking vacuum reservoir.
- Loose or leaking vacuum hoses or connections.
- Defective one-way vacuum check valve.
- Secure attachment of both ends of the speed control servo cable.
- Smooth operation of throttle linkage and throttle body air valve.
- Failed speed control servo. Do the servo vacuum test.

CAUTION: When test probing for voltage or continuity at electrical connectors, care must be taken not to damage connector, terminals or seals. If these components are damaged, intermittent or complete system failure may occur.

SPECIFICATIONS**TORQUE - SPEED CONTROL SYSTEM**

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Servo Mounting Bracket Nuts	8.5	-	75
Switch Module Mounting Screws	3	-	26
Vacuum Reservoir Mounting Screws	2.2	-	20

CABLE**DESCRIPTION**

The speed control servo cable is connected between the speed control vacuum servo diaphragm and the throttle body control linkage.

OPERATION

This cable causes the throttle control linkage to open or close the throttle valve in response to movement of the vacuum servo diaphragm.

REMOVAL**REMOVAL - GAS ENGINES**

- (1) Disconnect negative battery cable at battery.
- (2) Remove air cleaner (all except 8.0L V-10 engine).

(3) Using finger pressure only, remove speed control cable connector at bellcrank by pushing connector off the bellcrank pin (Fig. 1) or (Fig. 2). **DO NOT try to pull connector off perpendicular to the bellcrank pin. Connector will be broken.**

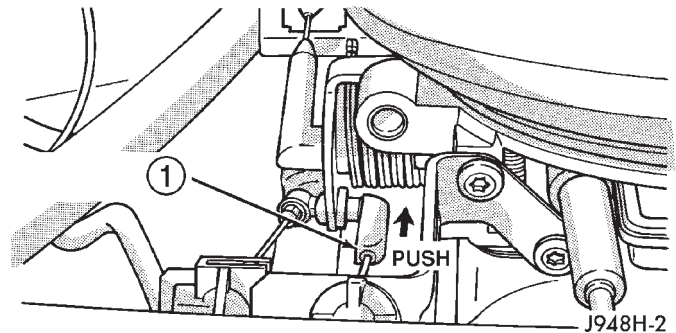
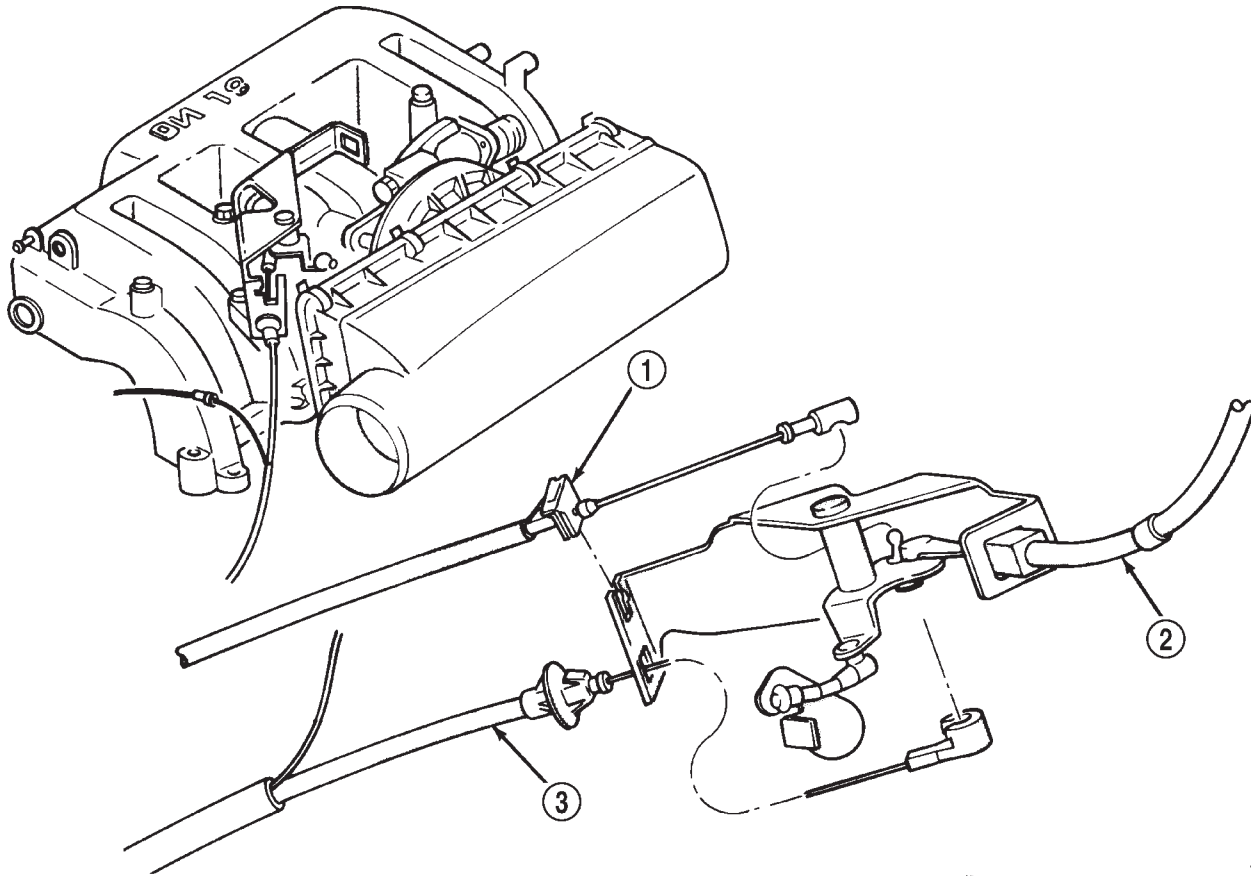


Fig. 1 Servo Cable at Throttle Body—V6/V-8 Engine

1 - VEHICLE SPEED CONTROL CABLE

CABLE (Continued)



J948H-10

Fig. 2 Servo Cable at Throttle Body—V-10 Engine

1 - THROTTLE CABLE
2 - THROTTLE VALVE CABLE

3 - SPEED CONTROL SERVO CABLE

(4) Squeeze 2 tabs on sides of speed control cable at throttle body mounting bracket (locking plate) and push out of bracket.

(5) Remove servo cable from servo. Refer to Speed Control Servo Removal/Installation in this group.

REMOVAL - DIESEL WITH AUTO. TRANS.

(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. 3). **DO NOT try to pull connector off perpendicular to lever pin. Connector will be broken.**

(5) Squeeze 2 pinch tabs (Fig. 3) on sides of speed control cable at mounting bracket and push cable rearward out of bracket.

(6) Remove cable from vehicle.

INSTALLATION**INSTALLATION - GAS ENGINES**

(1) Install end of cable to speed control servo. Refer to Speed Control Servo Removal/Installation.

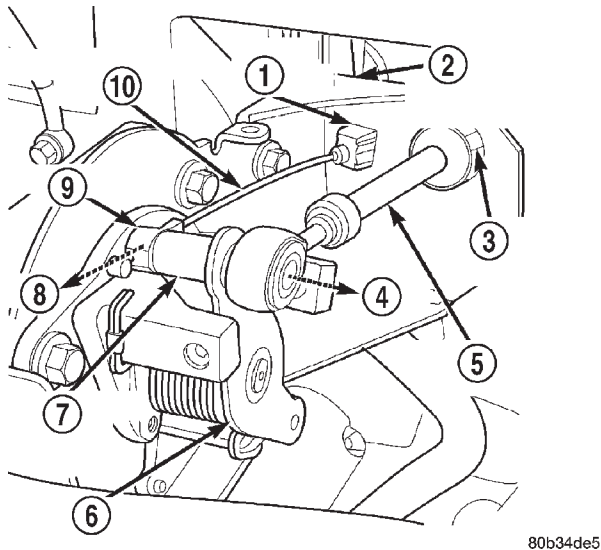
(2) Install cable into throttle body mounting bracket. Cable snaps into bracket.

(3) Install speed control cable connector at throttle body bellcrank pin. Connector snaps onto pin.

(4) Connect negative battery cable to battery.

(5) Before starting engine, operate accelerator pedal to check for any binding.

CABLE (Continued)

**Fig. 3 Servo Cable at Throttle Lever**

- 1 - PINCH (2) TABS
- 2 - CABLE MOUNTING BRACKET
- 3 - PINCH TABS (2)
- 4 - OFF
- 5 - THROTTLE CABLE
- 6 - THROTTLE LEVER
- 7 - THROTTLE LEVER PIN
- 8 - OFF
- 9 - CONNECTOR
- 10 - SPEED CONTROL CABLE

INSTALLATION - DIESEL WITH AUTO. TRANS.

- (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.

SPEED CONTROL SERVO**DESCRIPTION**

A speed control servo is not used if equipped with both a diesel engine and a manual transmission.

The servo unit consists of a solenoid valve body, and a vacuum chamber. The solenoid valve body contains three solenoids:

- Vacuum

- Vent
- Dump

The vacuum chamber contains a diaphragm with a cable attached to control the throttle linkage.

OPERATION

A speed control servo is not used if equipped with both a diesel engine and a manual transmission.

The Powertrain Control Module (PCM) controls the solenoid valve body. The solenoid valve body controls the application and release of vacuum to the diaphragm of the vacuum servo. The servo unit cannot be repaired and is serviced only as a complete assembly.

Power is supplied to the servo's by the PCM through the brake switch. The PCM controls the ground path for the vacuum and vent solenoids.

The dump solenoid is energized anytime it receives power. If power to the dump solenoid is interrupted, the solenoid dumps vacuum in the servo. This provides a safety backup to the vent and vacuum solenoids.

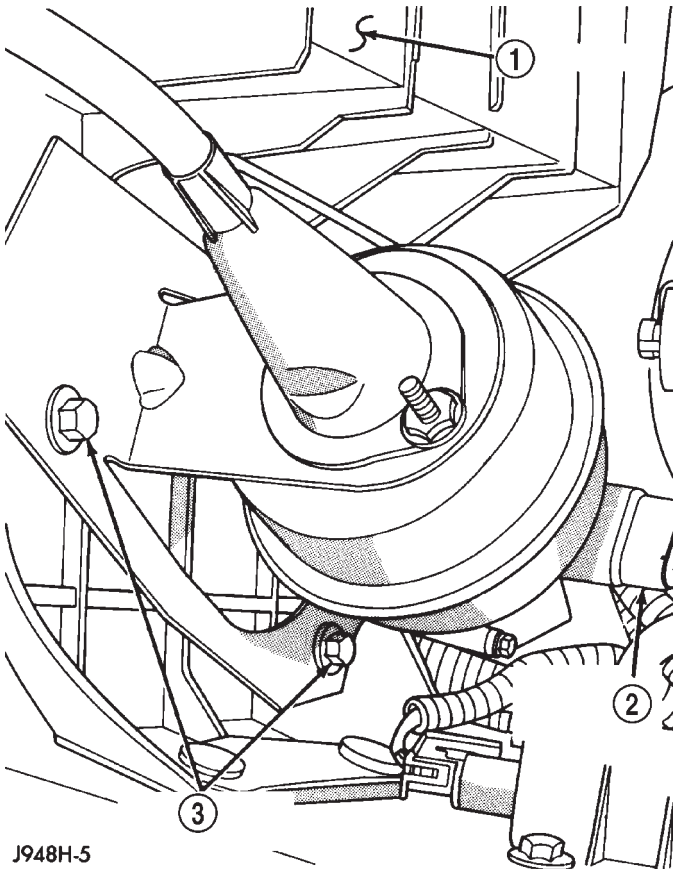
The vacuum and vent solenoids must be grounded at the PCM to operate. When the PCM grounds the vacuum servo solenoid, the solenoid allows vacuum to enter the servo and pull open the throttle plate using the cable. When the PCM breaks the ground, the solenoid closes and no more vacuum is allowed to enter the servo. The PCM also operates the vent solenoid via ground. The vent solenoid opens and closes a passage to bleed or hold vacuum in the servo as required.

The PCM duty cycles the vacuum and vent solenoids to maintain the set speed, or to accelerate and decelerate the vehicle. To increase throttle opening, the PCM grounds the vacuum and vent solenoids. To decrease throttle opening, the PCM removes the grounds from the vacuum and vent solenoids. When the brake is released, if vehicle speed exceeds 30 mph to resume, 35 mph to set, and the RES/ACCEL switch has been depressed, ground for the vent and vacuum circuits is restored.

REMOVAL**REMOVAL****V-8 ENGINE**

- (1) Disconnect negative battery cable at battery.
- (2) Disconnect electrical connector at servo (Fig. 4).
- (3) Disconnect vacuum hose at servo.
- (4) Disconnect servo cable at throttle body. Refer to Servo Cable Removal/Installation in this group.

SPEED CONTROL SERVO (Continued)

**Fig. 4 Servo Location—Removal/Installation**

- 1 - BATTERY TRAY
- 2 - SERVO ELECTRICAL CONNECTOR
- 3 - SERVO BRACKET SCREWS (3)

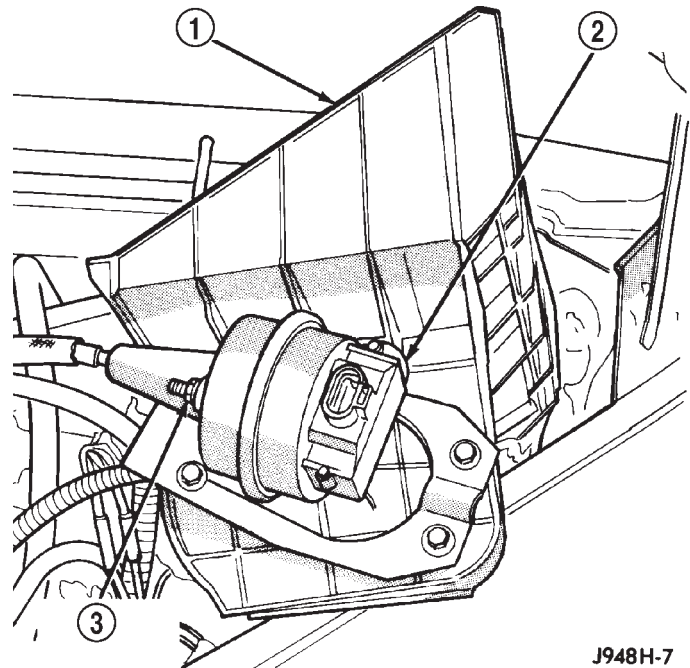
(5) Remove three bolts retaining servo/servo mounting bracket to side of battery tray (Fig. 5).

(6) Position servo assembly to gain access to 2 servo mounting nuts (Fig. 5) or (Fig. 6).

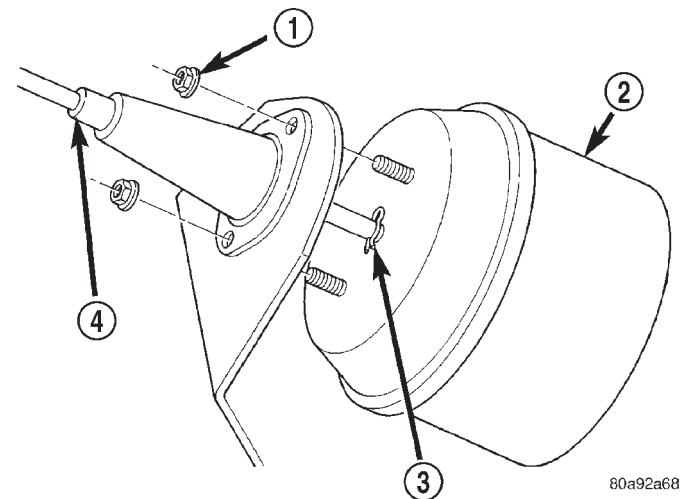
(7) Remove 2 mounting nuts holding servo cable sleeve to bracket (Fig. 6).

(8) Pull speed control cable sleeve and servo away from servo mounting bracket to expose cable retaining clip (Fig. 6) and remove clip. Note: The servo mounting bracket displayed in (Fig. 6) is a typical bracket and may/may not be applicable to this model vehicle.

(9) Remove servo from mounting bracket. While removing, note orientation of servo to bracket.

**Fig. 5 Servo Mounting at Battery Tray**

- 1 - BATTERY TRAY
- 2 - SPEED CONTROL SERVO
- 3 - SERVO MOUNTING NUTS (2)

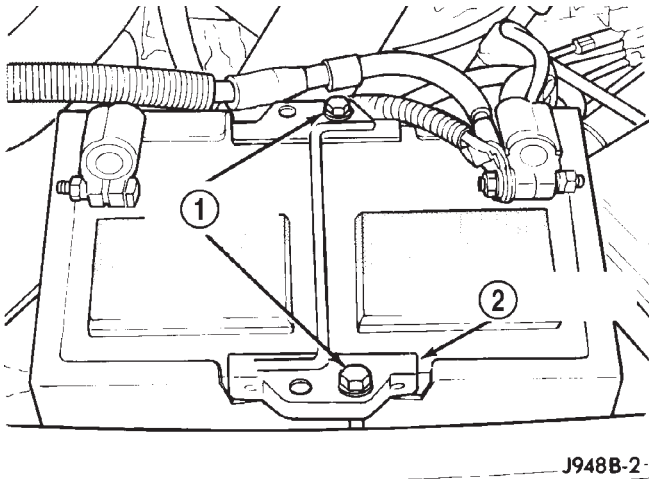
**Fig. 6 Servo Cable Clip Remove/Install—Typical**

- 1 - SERVO MOUNTING NUTS (2)
- 2 - SERVO
- 3 - CABLE RETAINING CLIP
- 4 - SERVO CABLE AND SLEEVE

SPEED CONTROL SERVO (Continued)

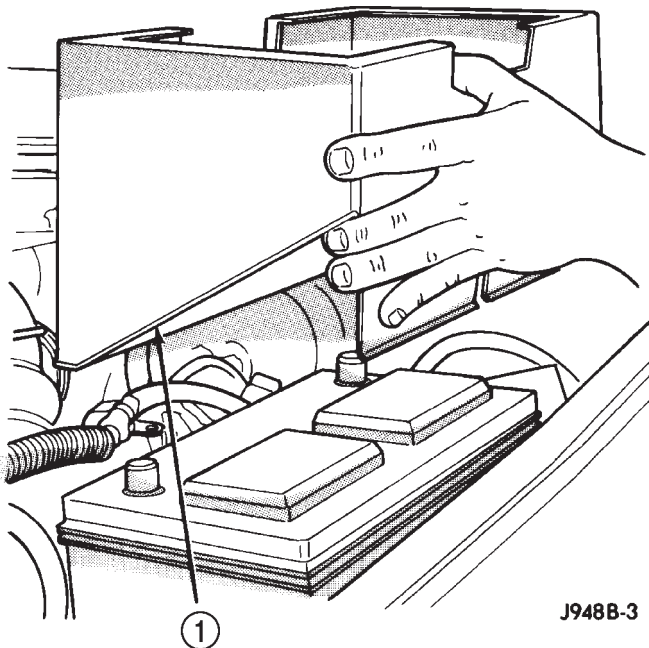
8.0L V-10 ENGINE

- (1) Disconnect negative battery cable at battery.
- (2) Disconnect positive battery cable at battery.
- (3) Remove 2 bolts and battery holddown (Fig. 7).

**Fig. 7 Battery Holddown**

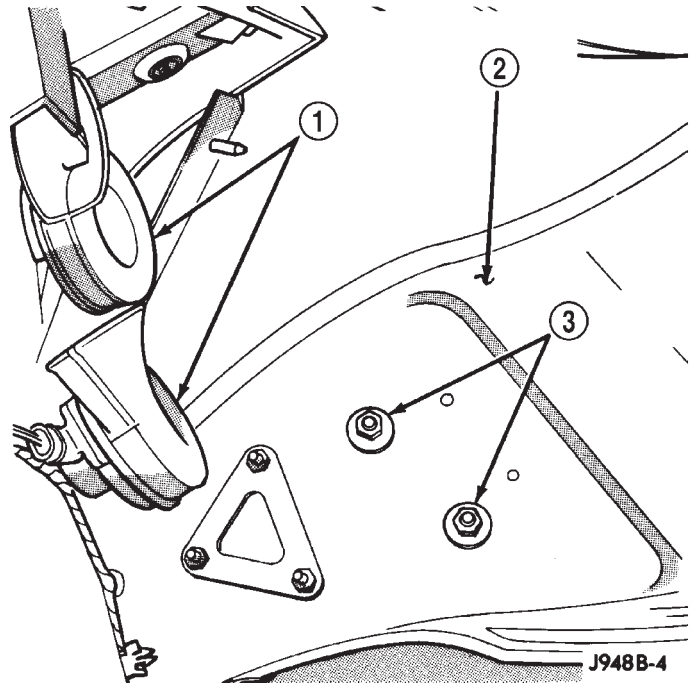
- 1 - REMOVE 2 BOLTS
- 2 - BATTERY HOLDDOWN STRAP

(4) If equipped, pull up on battery heat shield to remove it (Fig. 8).

**Fig. 8 Battery Heat Shield**

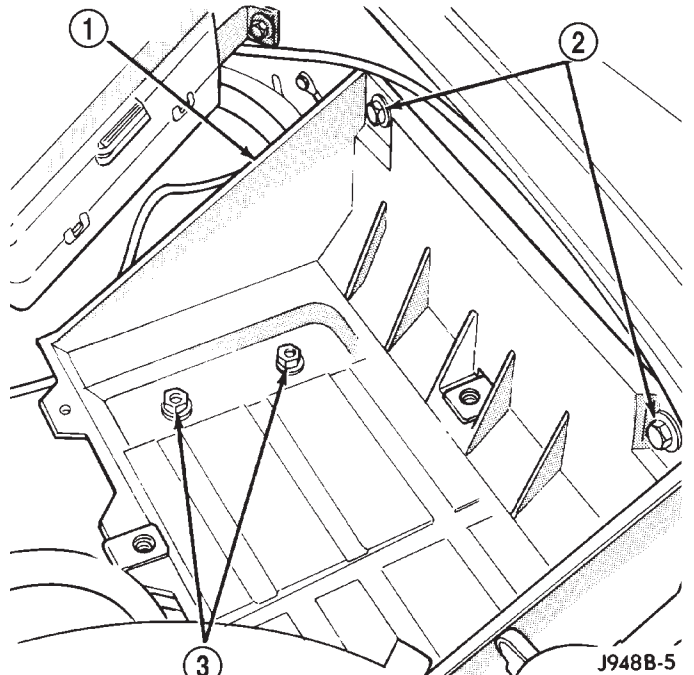
- 1 - BATTERY HEAT SHIELD

- (5) Remove battery from vehicle.
- (6) From under left front wheel opening, remove 2 forward battery tray nuts (Fig. 9).

**Fig. 9 Forward Battery Tray Nuts**

- 1 - HORNS
- 2 - UNDERSIDE OF LEFT FRONT WHEEL OPENING
- 3 - BATTERY TRAY NUTS

(7) Remove 2 nuts and 2 bolts holding battery tray to vehicle (Fig. 10).

**Fig. 10 Battery Tray Mounting**

- 1 - BATTERY TRAY
- 2 - REMOVE 2 BOLTS
- 3 - REMOVE 2 NUTS

SPEED CONTROL SERVO (Continued)

(8) Disconnect servo cable at throttle body. Refer to Servo Cable Removal/Installation in this group.

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

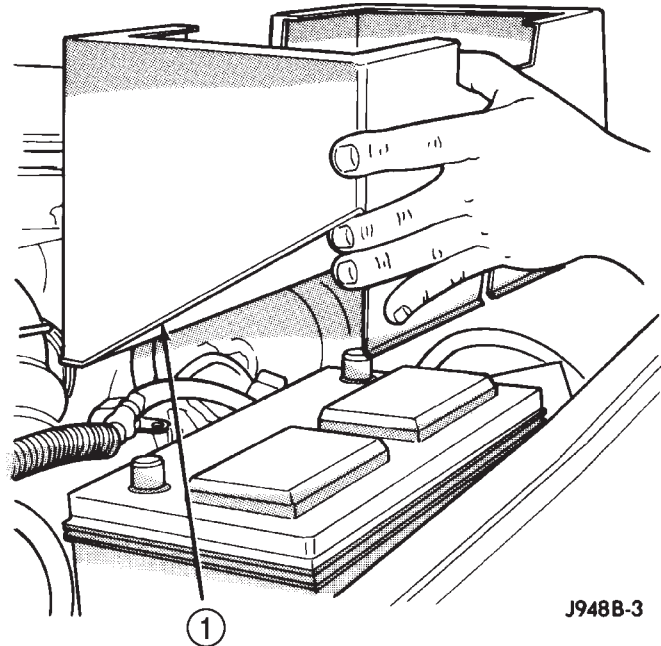
(10) Disconnect electrical connector and vacuum line at servo.

(11) Position battery tray with attached servo assembly to gain access to 2 servo mounting nuts (Fig. 5) or (Fig. 6).

(12) Remove 2 mounting nuts holding servo cable sleeve to bracket (Fig. 6).

(13) Pull speed control cable sleeve and servo away from servo mounting bracket to expose cable retaining clip (Fig. 6) and remove clip. Note: The servo mounting bracket displayed in (Fig. 6) is a typical bracket and may/may not be applicable to this model vehicle.

(14) Remove servo from mounting bracket. While removing, note orientation of servo to bracket.



J948B-3

Fig. 12 Battery Heat Shield

1 - BATTERY HEAT SHIELD

REMOVAL - DIESEL WITH AUTO. TRANS.

(1) Disconnect both negative battery cables at both batteries.

(2) Disconnect positive battery cable at battery (drivers side battery).

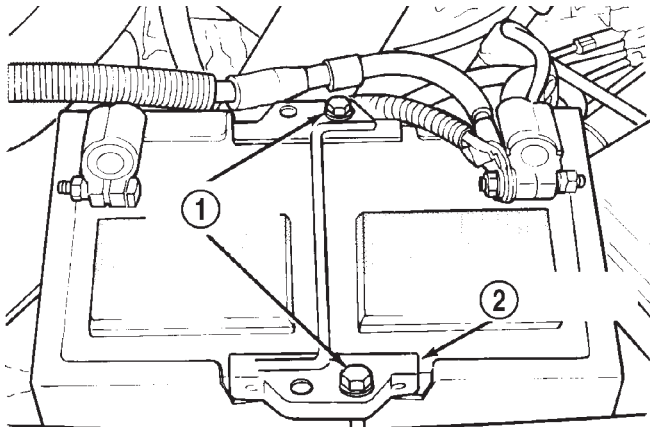
(3) Remove battery holddown bolts (Fig. 11).

(4) If equipped, pull up on battery heat shield to remove it (Fig. 12).

(5) Remove battery from vehicle.

(6) From under vehicle, and in front of left front wheelhouse, remove 2 lower battery tray nuts (Fig. 13).

(7) Remove 2 nuts and 2 bolts holding battery tray to vehicle (Fig. 14).

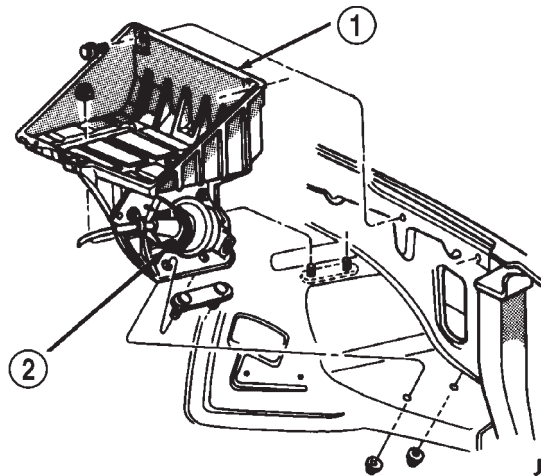


J948B-2

Fig. 11 Battery Holddown Bolts

1 - REMOVE 2 BOLTS

2 - BATTERY HOLDDOWN STRAP



J948B-14

Fig. 13 Battery Tray Lower Mounting Nuts

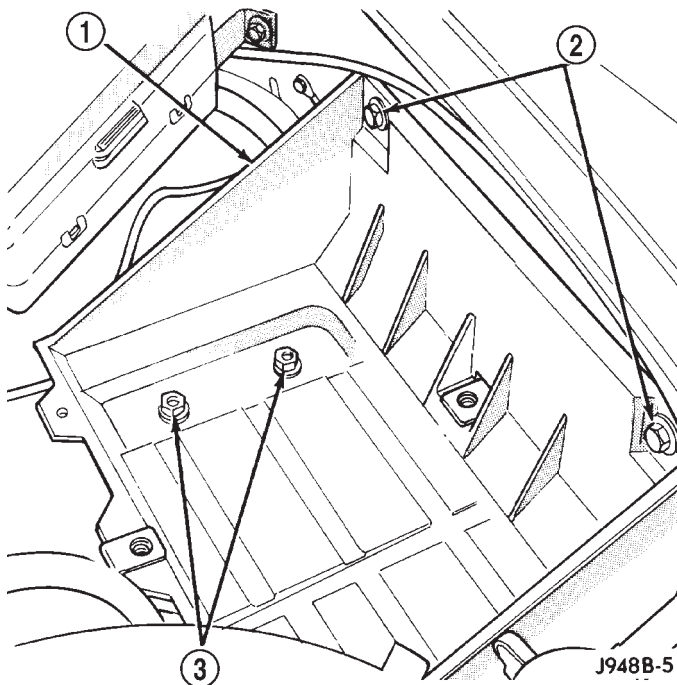
1 - BATTERY TRAY

2 - SPEED CONTROL SERVO

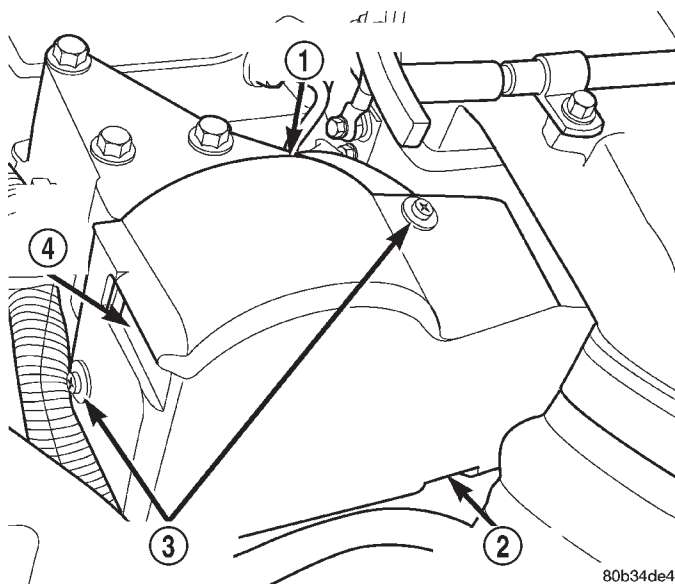
(8) Remove cable cover (Fig. 15). Cable cover is attached with 2 Phillips screws, 2 plastic retention clips and 2 push tabs (Fig. 15). Remove 2 Phillips screws and carefully pry out 2 retention clips. After clip removal, push rearward on front tab, and upward on lower tab for cover removal.

(9) Using finger pressure only, disconnect end of servo cable from throttle lever pin by pulling forward on connector while holding lever rearward (Fig. 16). **DO NOT try to pull connector off perpendicular to lever pin. Connector will be broken.**

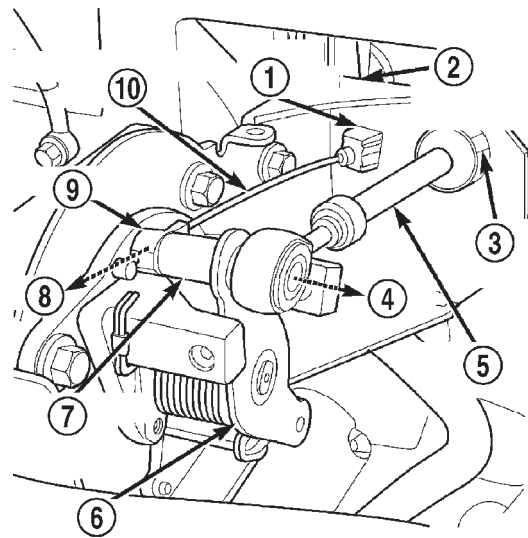
SPEED CONTROL SERVO (Continued)

**Fig. 14 Battery Tray Upper Mounting Bolts/Nuts**

- 1 - BATTERY TRAY
- 2 - REMOVE 2 BOLTS
- 3 - REMOVE 2 NUTS

**Fig. 15 Cable/Lever/Throttle Linkage Cover**

- 1 - CABLE/LEVER/LINKAGE COVER
- 2 - PUSH UP LOWER TAB
- 3 - SCREWS/CLIPS (2)
- 4 - TAB PUSH HERE



80b34de5

Fig. 16 Servo Cable at Throttle Lever

- 1 - PINCH (2) TABS
- 2 - CABLE MOUNTING BRACKET
- 3 - PINCH TABS (2)
- 4 - OFF
- 5 - THROTTLE CABLE
- 6 - THROTTLE LEVER
- 7 - THROTTLE LEVER PIN
- 8 - OFF
- 9 - CONNECTOR
- 10 - SPEED CONTROL CABLE

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

(11) Disconnect electrical connector (Fig. 17) and vacuum line at servo.

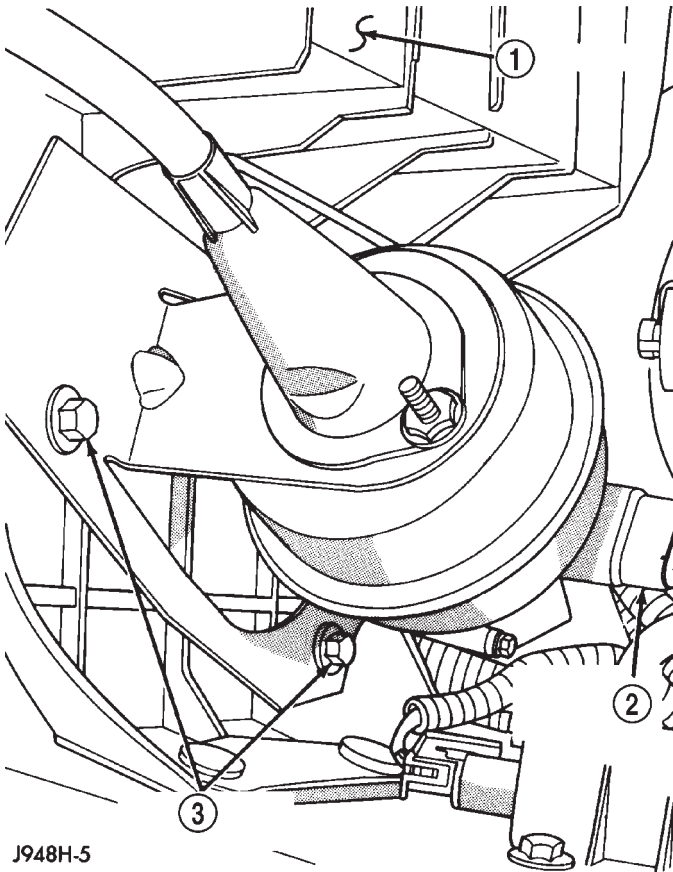
(12) Position battery tray with attached servo assembly to gain access to 2 servo mounting nuts (Fig. 18) or (Fig. 19).

(13) Remove 2 mounting nuts holding servo cable sleeve to bracket (Fig. 19).

(14) Pull speed control cable sleeve and servo away from servo mounting bracket to expose cable retaining clip (Fig. 19) and remove clip. Note: The servo mounting bracket displayed in (Fig. 19) is a typical bracket and may/may not be applicable to this model vehicle.

(15) Remove servo from mounting bracket. While removing, note orientation of servo to bracket.

SPEED CONTROL SERVO (Continued)

**Fig. 17 Servo Location—Removal/Installation**

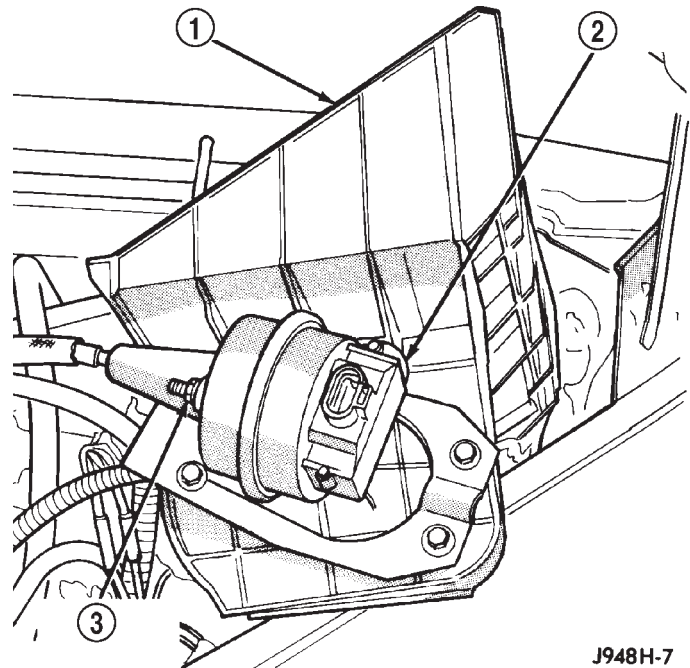
- 1 - BATTERY TRAY
- 2 - SERVO ELECTRICAL CONNECTOR
- 3 - SERVO BRACKET SCREWS (3)

INSTALLATION

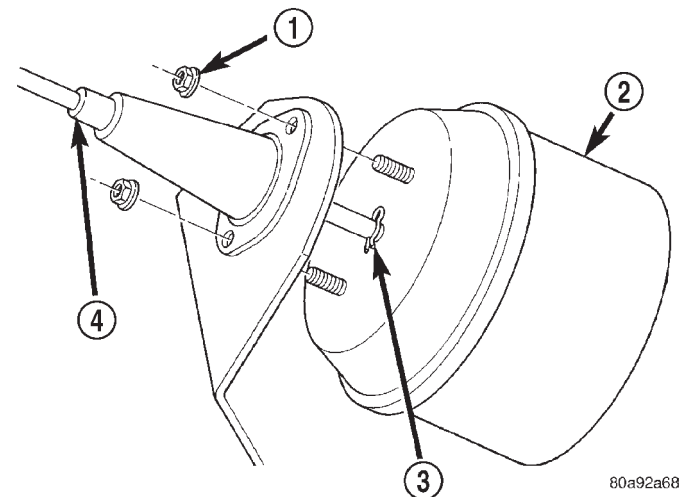
INSTALLATION

V-8 ENGINE

- (1) Position servo to mounting bracket.
- (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) Install three bolts retaining servo/servo mounting bracket to battery tray.
- (9) Connect servo cable to throttle body. Refer to Servo Cable Removal/Installation in this group.
- (10) Connect negative battery cable to battery.
- (11) Before starting engine, operate accelerator pedal to check for any binding.

**Fig. 18 Servo Mounting at Battery Tray**

- 1 - BATTERY TRAY
- 2 - SPEED CONTROL SERVO
- 3 - SERVO MOUNTING NUTS (2)

**Fig. 19 Servo Cable Clip Remove/Install—Typical**

- 1 - SERVO MOUNTING NUTS (2)
- 2 - SERVO
- 3 - CABLE RETAINING CLIP
- 4 - SERVO CABLE AND SLEEVE

8.0L V-10 ENGINE

- (1) Position servo to mounting bracket.
- (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.

SPEED CONTROL SERVO (Continued)

- (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 body. Refer to Servo Cable Removal/Installation in this group.
- (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 positive battery cable to battery.
- (14) Connect negative battery cable to battery.
- (15) Before starting engine, operate accelerator pedal to check for any binding.

INSTALLATION - DIESEL WITH AUTO. TRANS.

- (1) Position servo to mounting bracket.
- (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 positive battery cable to battery.
- (14) Connect negative battery cables to both batteries.
- (15) Before starting engine, operate accelerator pedal to check for any binding.
- (16) Install cable/lever cover.

SWITCH**DESCRIPTION****Gas Engines and Diesel With Auto. Trans.**

There are two separate switch pods that operate the speed control system. The steering-wheel-mounted switches use multiplexed circuits to provide

inputs to the Powertrain Control Module (PCM) for ON, OFF, RESUME, ACCELERATE, SET, DECEL and CANCEL modes. 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 switch fails, the entire switch module must be replaced.

Diesel With Manual Trans.

There are two separate switch pods that operate the speed control system. The steering-wheel-mounted switches use multiplexed circuits to provide inputs to the Engine Control Module (ECM) for ON, OFF, RESUME, ACCELERATE, SET, DECEL and CANCEL modes. 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 switch fails, the entire switch module must be replaced.

OPERATION**Gas Engines and Diesel With Auto. Trans.**

When speed control is selected by depressing the ON, OFF switch, the Powertrain Control Module (PCM) allows a set speed to be stored in its RAM for speed control. To store a set speed, depress the SET switch while the vehicle is moving at a speed between approximately 35 and 85 mph. In order for the speed control to engage, the brakes cannot be applied, nor can the gear selector be indicating the transmission is in Park or Neutral.

The speed control can be disengaged manually by:

- Stepping on the brake pedal.
- Depressing the OFF switch.
- Depressing the CANCEL switch.

The speed control can be disengaged also by any of the following conditions:

- An indication of Park or Neutral.
- The vehicle speed signal increases at a rate of 10 mph per second (indicates that the co-efficient of friction between the road surface and tires is extremely low).
- Depressing the clutch pedal.
- Excessive engine rpm (indicates that the transmission may be in a low gear).
- The vehicle speed signal decreases at a rate of 10 mph per second (indicates that the vehicle may have decelerated at an extremely high rate).
- If the actual speed is not within 20 mph of the set speed.

The previous disengagement conditions are programmed for added safety.

SWITCH (Continued)

Once the speed control has been disengaged, depressing the ACCEL switch restores the vehicle to the target speed that was stored in the PCM's RAM.

NOTE: Depressing the OFF switch will erase the set speed stored in the PCM's RAM.

If, while the speed control is engaged, the driver wishes to increase vehicle speed, the PCM is programmed for an acceleration feature. With the ACCEL switch held closed, the vehicle accelerates slowly to the desired speed. The new target speed is stored in the PCM's RAM when the ACCEL switch is released. The PCM also has a "tap-up" feature in which vehicle speed increases at a rate of approximately 2 mph for each momentary switch activation of the ACCEL switch.

The PCM also provides a means to decelerate without disengaging speed control. To decelerate from an existing recorded target speed, depress and hold the COAST switch until the desired speed is reached. Then release the switch. The ON, OFF switch operates two components: the PCM's ON, OFF input, and the battery voltage to the brake switch, which powers the speed control servo.

Diesel With Manual Trans.

When speed control is selected by depressing the ON, OFF switch, the Engine Control Module (ECM) allows a set speed to be stored in its RAM for speed control. To store a set speed, depress the SET switch while the vehicle is moving at a speed between approximately 35 and 85 mph. In order for the speed control to engage, the brakes cannot be applied.

The speed control can be disengaged manually by:

- Stepping on the brake pedal.
- Depressing the OFF switch.
- Depressing the CANCEL switch.

The speed control can be disengaged also by any of the following conditions:

- The vehicle speed signal increases at a rate of 10 mph per second (indicates that the co-efficient of friction between the road surface and tires is extremely low).
- Depressing the clutch pedal.
- Excessive engine rpm (indicates that the transmission may be in a low gear).
- The vehicle speed signal decreases at a rate of 10 mph per second (indicates that the vehicle may have decelerated at an extremely high rate).
- If the actual speed is not within 20 mph of the set speed.

The previous disengagement conditions are programmed for added safety.

Once the speed control has been disengaged, depressing the ACCEL switch restores the vehicle to the target speed that was stored in the ECM's RAM.

NOTE: Depressing the OFF switch will erase the set speed stored in the ECM's RAM.

If, while the speed control is engaged, the driver wishes to increase vehicle speed, the ECM is programmed for an acceleration feature. With the ACCEL switch held closed, the vehicle accelerates slowly to the desired speed. The new target speed is stored in the ECM's RAM when the ACCEL switch is released. The ECM also has a "tap-up" feature in which vehicle speed increases at a rate of approximately 2 mph for each momentary switch activation of the ACCEL switch.

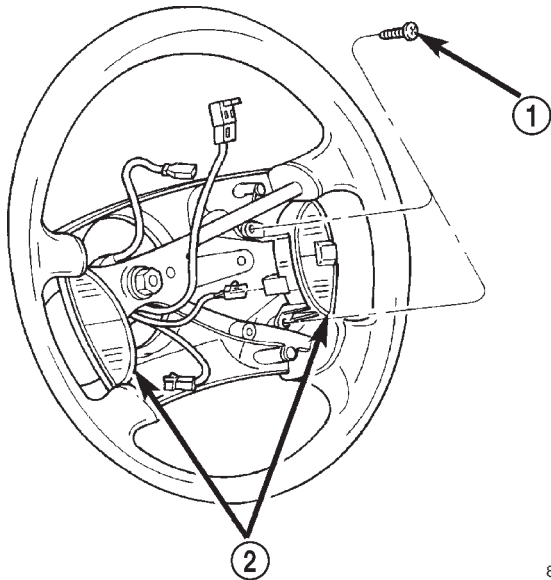
The ECM also provides a means to decelerate without disengaging speed control. To decelerate from an existing recorded target speed, depress and hold the COAST switch until the desired speed is reached. Then release the switch. The ON, OFF switch operates two components: the ECM's ON, OFF input, and the battery voltage to the brake switch, which powers the speed control servo.

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 8, Restraint Systems for procedures.
- (3) Remove switch-to-steering wheel mounting screws (Fig. 20).
- (4) Remove switch.
- (5) Remove electrical connector at switch.

SWITCH (Continued)

**Fig. 20 Speed Control Switches**

- 1 - MOUNTING SCREWS (2)
2 - SPEED CONTROL SWITCHES (2)

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 8, Restraint Systems for procedures.
- (5) Connect negative battery cable(s).

VACUUM RESERVOIR**DESCRIPTION**

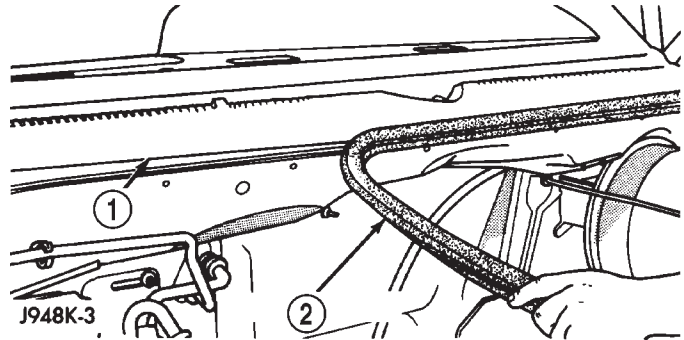
Gasoline Powered Engines : A vacuum reservoir is used to supply the vacuum needed to maintain proper speed control operation when engine vacuum drops, such as in climbing a grade while driving. A one-way check valve is used in the vacuum line between the reservoir and the vacuum source. This check valve is used to trap engine vacuum in the reservoir. On certain vehicle applications, this reservoir is shared with the heating/air-conditioning system. The vacuum reservoir cannot be repaired and must be replaced if faulty.

Diesel Powered Engines With Auto. Trans. : A vacuum reservoir is not used if equipped with a diesel powered engine. Instead, an engine driven pump (vacuum pump) is used to supply vacuum for speed control operation. This vacuum pump is used with the diesel engine only if it is equipped with an automatic transmission. Refer to Vacuum Pump in 9, Engines for information.

REMOVAL

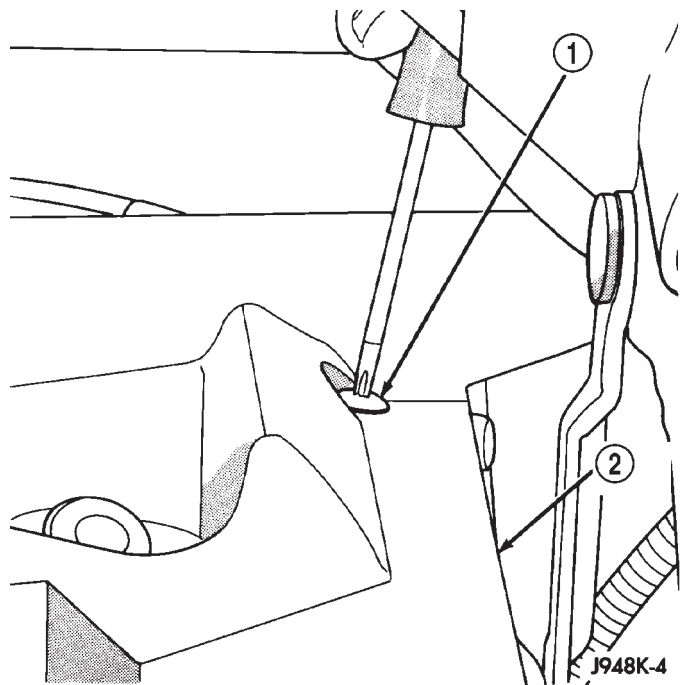
The vacuum reservoir is located under the plastic cowl plenum cover at lower base of windshield. The vacuum reservoir is not used if equipped with a diesel engine.

- (1) Disconnect and isolate battery negative cable.
- (2) Remove both windshield wiper arm/blade assemblies. Refer to 8, Wiper and Washer Systems.
- (3) Remove rubber weather-strip at front edge of cowl grill (Fig. 21).

**Fig. 21 Cowl Grille Panel Weather-strip**

- 1 - COWL GRILLE
2 - WEATHERSTRIP

- (4) Release cowl grill plastic anchor screws (Fig. 22).

**Fig. 22 Plastic Anchor Screws Remove/Install**

- 1 - PLASTIC SCREW ANCHOR
2 - COWL GRILLE

VACUUM RESERVOIR (Continued)

- (5) Lift cowl plenum cover/grille panel from vehicle far enough to access vacuum reservoir.
- (6) Disconnect vacuum supply line from vacuum reservoir (Fig. 23).
- (7) Remove 2 vacuum reservoir mounting screws.
- (8) Remove vacuum reservoir from vehicle.

INSTALLATION

The vacuum reservoir is located under the plastic cowl plenum cover at lower base of windshield. The vacuum reservoir is not used if equipped with a diesel engine.

- (1) Install vacuum reservoir and two mounting screws. Tighten screws to 2.2 N·m (20 in. lbs.) torque.
- (2) Connect vacuum supply hose to vacuum reservoir.
- (3) Position cowl plenum cover/grille panel to vehicle.
- (4) Install and tighten cowl cover fasteners to vehicle body.
- (5) Install rubber weather-strip at front edge of cowl grill.
- (6) Install windshield wiper arms. Refer to 8, Wiper and Washer Systems.
- (7) Connect negative battery to cable.

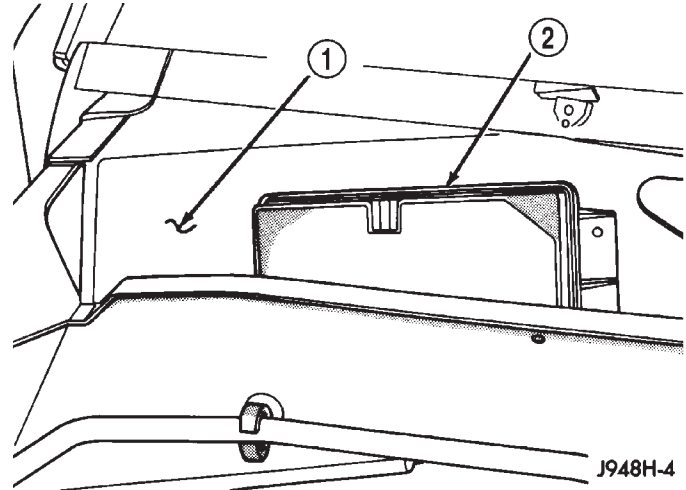


Fig. 23 Vacuum Reservoir Remove/Install

- 1 - COWL PLENUM
- 2 - VACUUM RESERVOIR

