

GENERAL MOTORS ELECTRONIC SKID CONTROL SYSTEM

Cadillac (Track Master)

NOTE — Mobile telephone equipment, citizens band radios, or electronic garage door openers should not affect system operation. Other types of radio transmitting equipment require special installation procedures and should be performed by a qualified radio technician.

DESCRIPTION

System is designed to prevent loss of control during emergency or maximum braking condition. To avoid wheel lock up and resultant skidding with brakes fully applied, system automatically releases and reapplies rear brakes up to four cycles per second. System consists of three major components: Speed sensors, located at transmission; controller, mounted under instrument panel; and modulator, mounted on cowl in engine compartment.

OPERATION

Skid control begins as speed indication impulse (electrical frequency proportional to wheel speed) is sent from sensor to controller. When wheel is not locking during brake application, wheel will gradually decelerate. If wheel starts to lock, wheel will decelerate faster than vehicle speed. Controller determines that frequency is changing rapidly and that vehicle is approaching skid condition. Controller sends an electrical impulse to modulator solenoid. Solenoid will create a sealed hydraulic circuit between master cylinder and rear wheel cylinders. Fluid volume from modulator to rear wheel cylinders is increased, causing partial brake release, eliminating skid possibility. Wheels accelerate and as vehicle speed is approached, controller senses condition and modulator solenoid is de-energized. Brake pressure is increased to wheel cylinders and modulator is positioned until a skid condition is sensed again. During a skid condition, system will continue to cycle until vehicle slows to approximately five miles per hour or until brakes are released.

MALFUNCTION INDICATOR

Warning light located on instrument panel indicates parking brake is applied, loss of pressure in braking system, or a malfunction of skid control system. Light operates in conjunction with modulator travel switch and controller to provide visual indication of a malfunction. When travel switch is open more than four seconds (except during a skid controlled stop), controller turns indicator light on. An exception to this is an open condition in the four amp feed circuit from ignition switch, which is indicated without the four second delay.

MALFUNCTION OVERRIDE

In many types of malfunctions, rear brakes automatically revert to standard operation. For certain malfunctions, restoration of standard brakes is accomplished by a special circuit in controller which prevents generation of output brake release signal if malfunction indication signal exists in system warning light circuit.

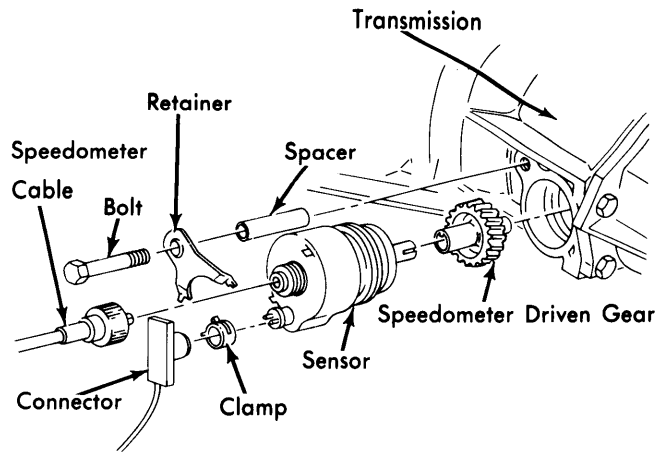


Fig. 1 Exploded View of Transmission Speed Sensor

TESTING

CAUTION — Never operate system unless controller has a good ground. Never reverse battery polarity. Always connect battery booster cables positive to positive and negative to negative. Failure to observe precautions may result in damage to circuitry in controller.

BASIC OPERATIONAL CHECK

- 1) Modulator should cycle one time, making a clicking sound as ignition is turned "ON". Brake warning light should remain off. Raise rear of vehicle and position on safety stands. Start engine and place transmission in "D". Accelerate to 40 mph. Apply brakes slowly until wheels attempt to lock. Skid control should immediately prevent lock. Brake warning light should remain off.
- 2) Decrease speed to 10 MPH and hold constant. Modulator should NOT cycle during constant operation. Brake warning light should remain off. Shift transmission to neutral and apply brakes (100 lbs. pedal force). Brake warning light should remain off.

ELECTRICAL TESTS

Resistance and continuity checks are made at harness connectors with controller disconnected, and power lead disconnected at in-line fuse. Ohmmeter must be calibrated to scale in each test and readings should be equivalent to those indicated in Fig. 3.

TROUBLE SHOOTING

Pedal Pulses Or Bounces During Light Brake Application, Causing Jerky Braking; System False Cycles During Normal Driving; Rattle Or Clicking In Right Side Of Cowl During Normal Driving — Check for loose speedometer cable. Excessive side clearance or binding of sensor drive shaft. If vehicle has mobile transmitting operation, check for interference during transmitting operation. Check for loose or broken controller ground wire. Check sensor, solenoid or modulator switch input. Check sensor or solenoid wire harness.

Brake Systems

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Brake Warning Light On Immediately After Ignition Turned "ON", Brakes Not Applied - Check controller, controller power source, fuses, harness, or for direct short.

Brake Warning Light On 2 To 6 Seconds After Ignition Turned "ON", Brakes Not Applied - Check sensor, solenoid or modulator switch input. Check solenoid or sensor wire harness.

Ignition "ON", Brake Warning Light Stays On After Brakes Applied - Problem in brake pressure differential switch, not related to skid control system.

Ignition "ON", Brake Warning Light Stays On 2 To 4 Seconds After Brakes Applied - Check modulator switch, solenoid, vacuum source, switch harness or pressure differential switch valve.

With Ignition "ON", Brake Warning Light Comes On As Brakes Are Applied And Goes Out As Brakes Are Released - Problem in brake pressure differential switch, not related to skid control system.

Rough Or Jerky Skid Control Performance - Defective shock absorbers or suspension. Low engine vacuum or restrictions in vacuum lines at solenoid. Loose or broken controller ground wire.

Skid Control Does Not Work, Wheels Lock Up, Brake Warning Light Does Not Come On - Loose or broken controller ground wire. Loose speedometer cable. Excessive side clearance or roughness during rotation of sensor drive shaft. Check brake warning light system.

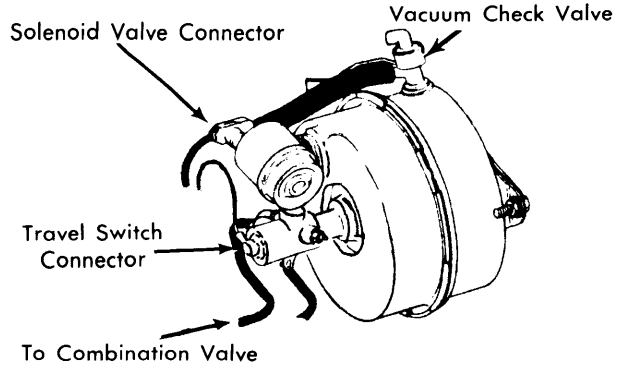


Fig. 2 Modulator Assembly

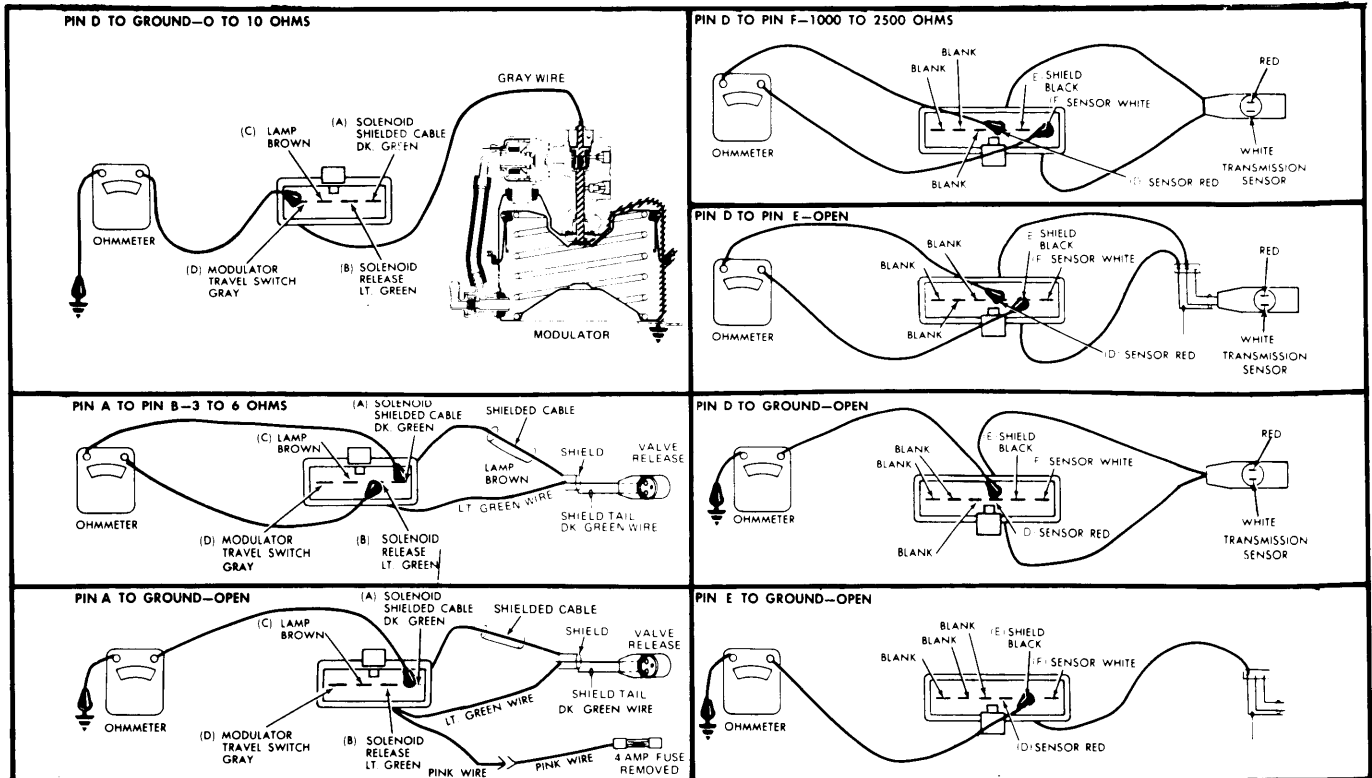


Fig. 3 Schematics of Connections for Resistance and Continuity Checks.

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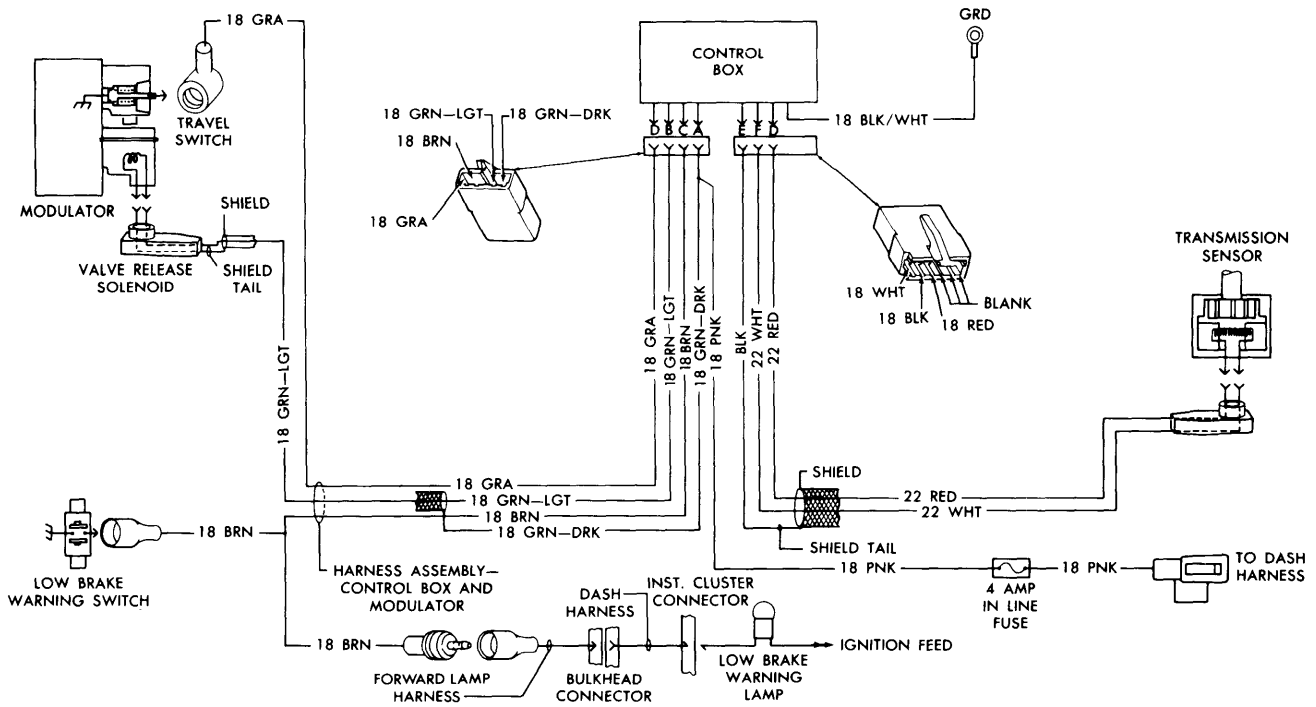


Fig. 4 Schematic of General Motors Electronic Skid Control System