# 1970-73 GENERAL MOTORS ELECTRONIC SKID CONTROL SYSTEM

**Cadillac (1970-73)**
**Oldsmobile Toronado (1970-73)**

## ▶ CHANGES, CAUTIONS, CORRECTIONS

▶ *ELDORADO SPEED SENSOR RE-WIRED:* While the 1972 Track Master System routed speed sensor wires through rear axle housing, the 1973 sensor mounts on brake backing plate where it is more easily serviced. Ensure electrical connection is always greased to prevent water entry.

▶ *VACUUM HOSE ROUTING CHANGED:* The brake vacuum hose routing is changed for all cars. Because of the EGR valve and its high operating temperatures, steel tubing is used in this area, rather than rubber.

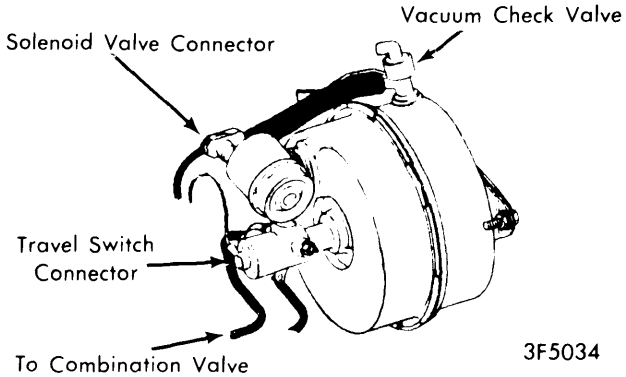
▶ *MOBILE RADIO EQUIPMENT NOTE:* Citizen's band radios, electronic garage door openers and similar devices with five Watts or less input, or mobile telephone equipment installed in accordance with Bell System Procedure 404-300-200 will not affect System Operation. Other types of radio transmitting equipment 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, at each rear wheel (except Cadillac Calais, DeVille, and Fleetwood Brougham Sedan which have sensor located at transmission); Controller, under instrument panel; and Modulator (with integral solenoid vacuum valve), on cowl in engine compartment. *NOTE – Cadillacs equipped with Track Master have a specific brake pedal pad and bezel.*

## OPERATION

During normal driving conditions, AC voltage is sent by wheel sensors to controller. When controller is not sensing an impending wheel lock-up, modulator vacuum solenoid is without ground circuit and normal brake pressure is transmitted to rear wheel cylinders *(see illustration)*. When controller senses an impending wheel lock-up, an electrical signal is sent to energize solenoid and create a sealed hydraulic circuit between check valve and rear wheel cylinders. Modulator displacement piston moves slightly to increase rear brake line volume resulting in a decrease in pressure to the rear wheel cylinders and alleviating lock-up tendency *(see illustration)*. During a maximum braking stop, solenoid valve will continue to cycle, alternately supplying air or vacuum to modulator, until vehicle speed is less than five miles per hour or until brakes are released by driver.




**MODULATOR ASSEMBLY**

### MALFUNCTION INDICATOR

Warning light located on instrument panel indicates parking brake "ON", loss of pressure in front or rear brake system, or malfunction of Skid Control System. Light operates in conjunction with modulator travel switch and controller to provide visual indication of malfunction lasting more than four seconds. Each time ignition key is turned "ON" controller energizes solenoid-modulator through one cycle. An audible click and cycling sound may be heard when exercise cycle occurs.

### 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.

## 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 semiconductor circuitry of controller.*

### FUNCTIONAL TEST

Raise and support rear end of vehicle so wheels are above floor. Start engine. Use following procedure for each rear wheel: rotate wheel at high speed using wheel spinner of Dynamic Wheel Balancer. Remove drive motor from wheel, apply brake firmly and observe rear wheel for cycling. If wheel stops immediately after application of foot brake, system is **not** operating normally.

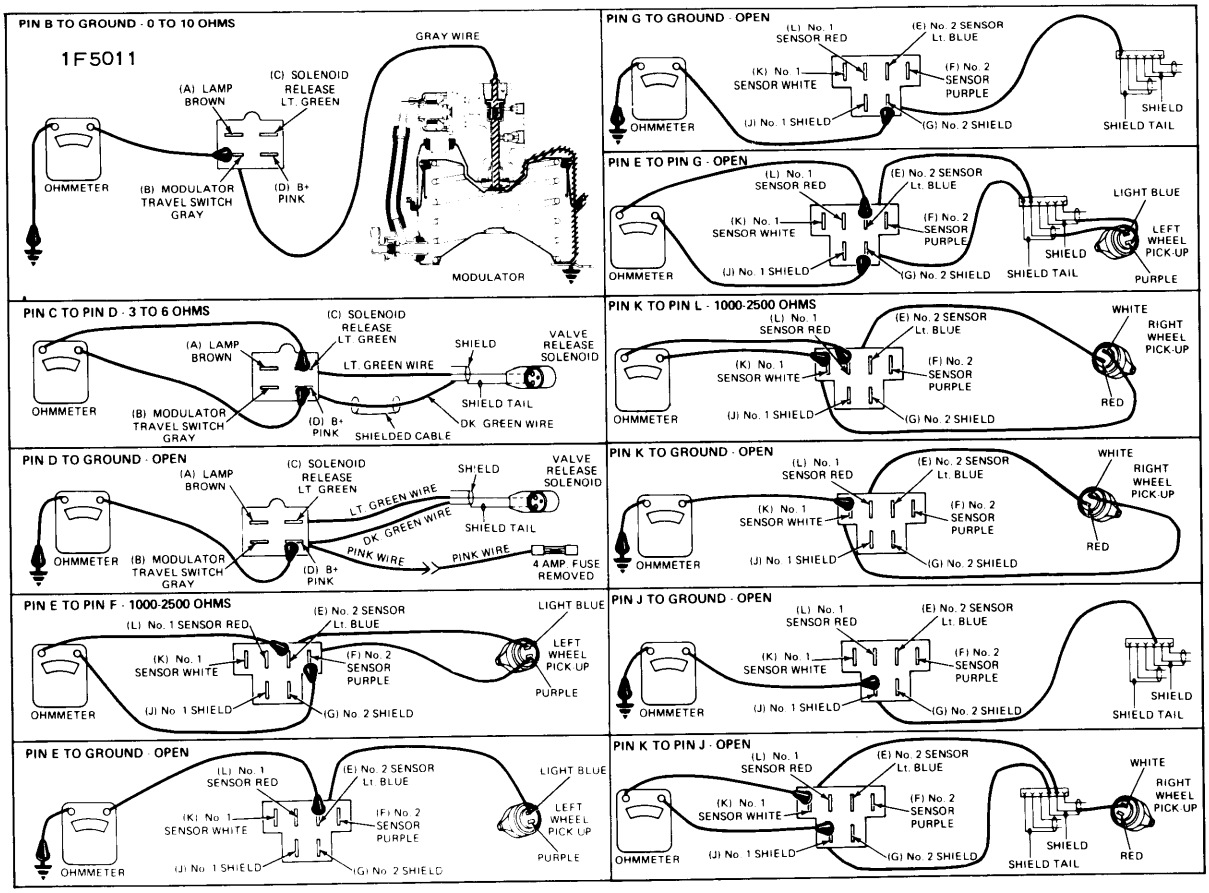
### ELECTRICAL TESTS

Resistance and continuity checks are made at harness connectors with controller disconnected, and power lead disconnected at 4 ampere in-line fuse. Ohmmeter must be calibrated to scale used in each test and readings should be equivalent to those indicated. *See illustration.*

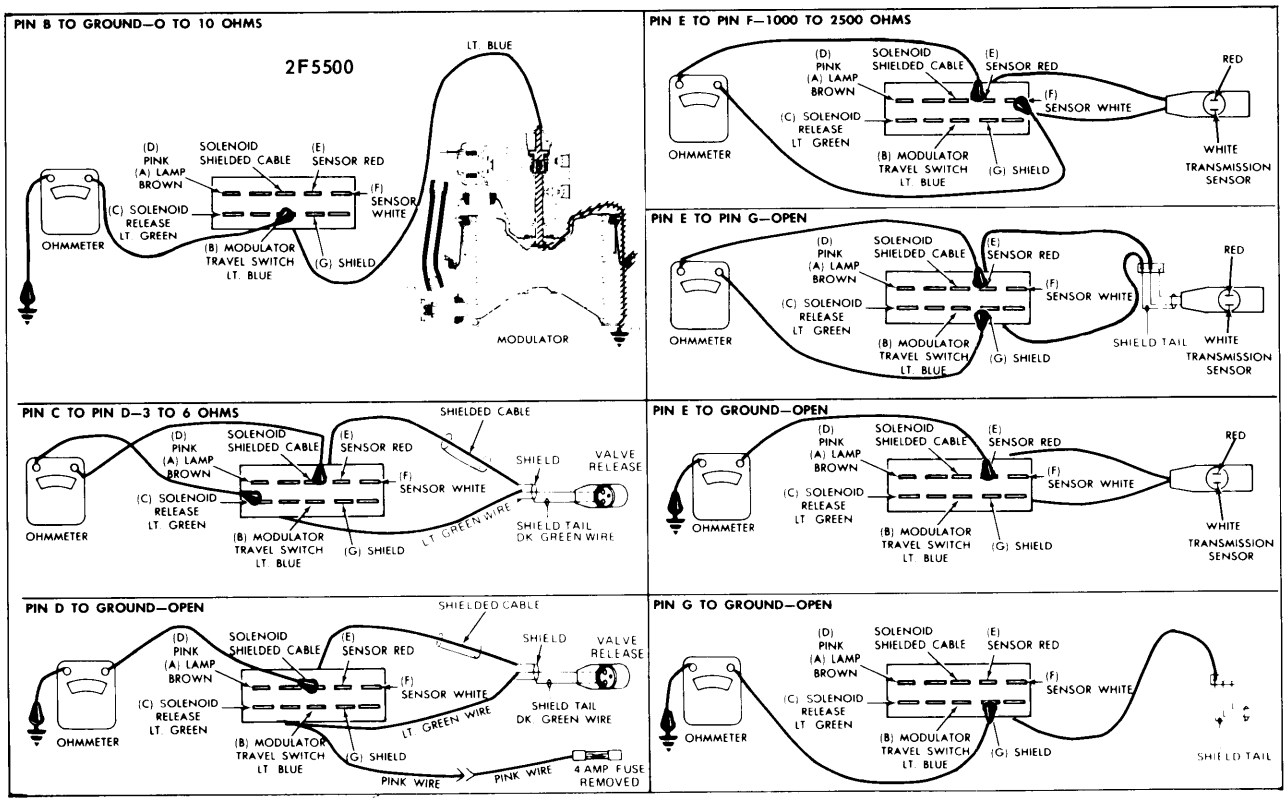
## TROUBLE SHOOTING

**No Brake Light Under Any Condition (Check With Ignition in "START", Cadillac, or "ON", Oldsmobile)** – Burned out bulb. Blown fuse. Open electrical leads: check continuity.

## 1970-73 GENERAL MOTORS ELECTRONIC SKID CONTROL SYSTEM (Cont.)

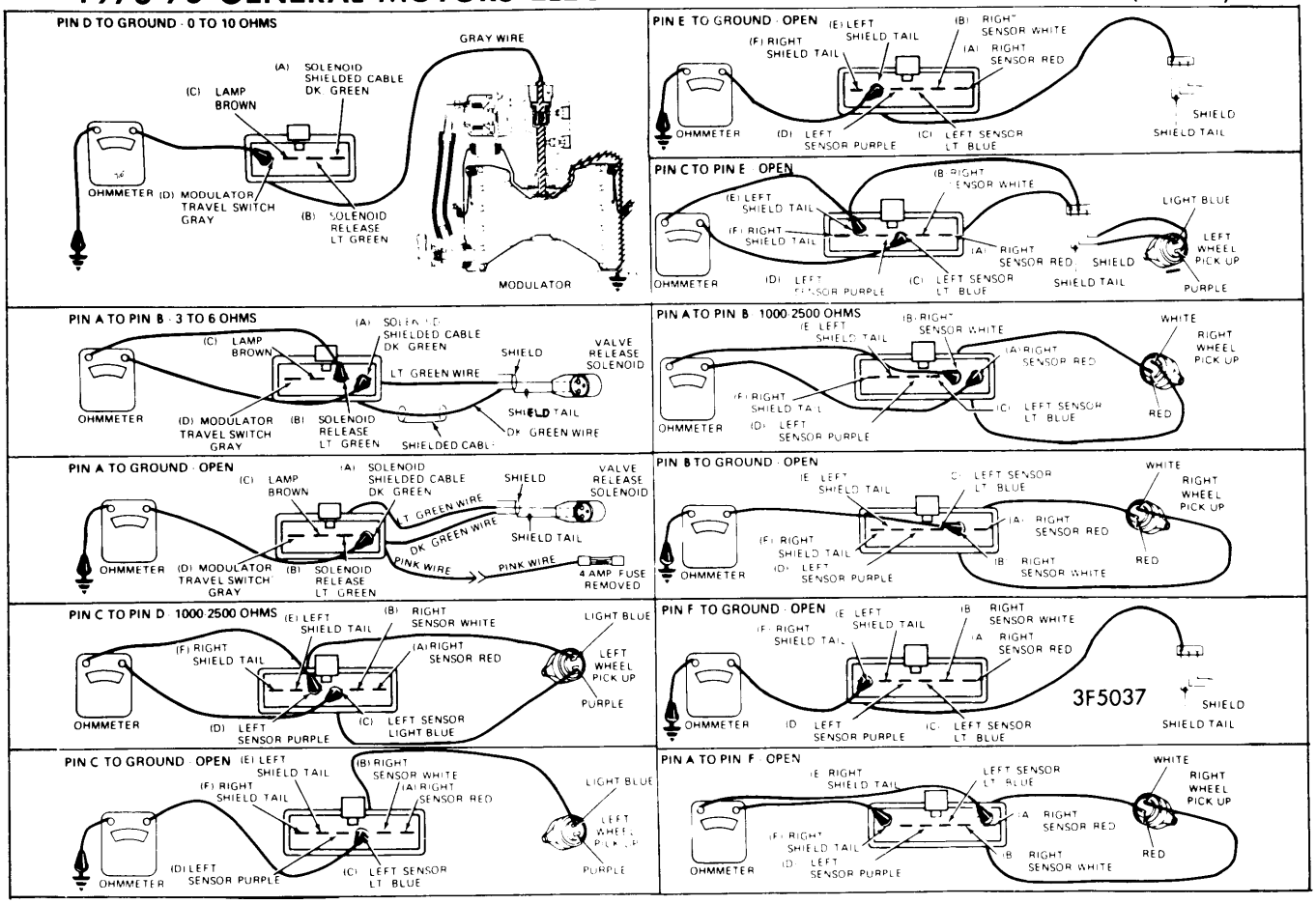



## 1970-72 RESISTANCE & CONTINUITY CHECKS (TORONADO & ELDORADO)

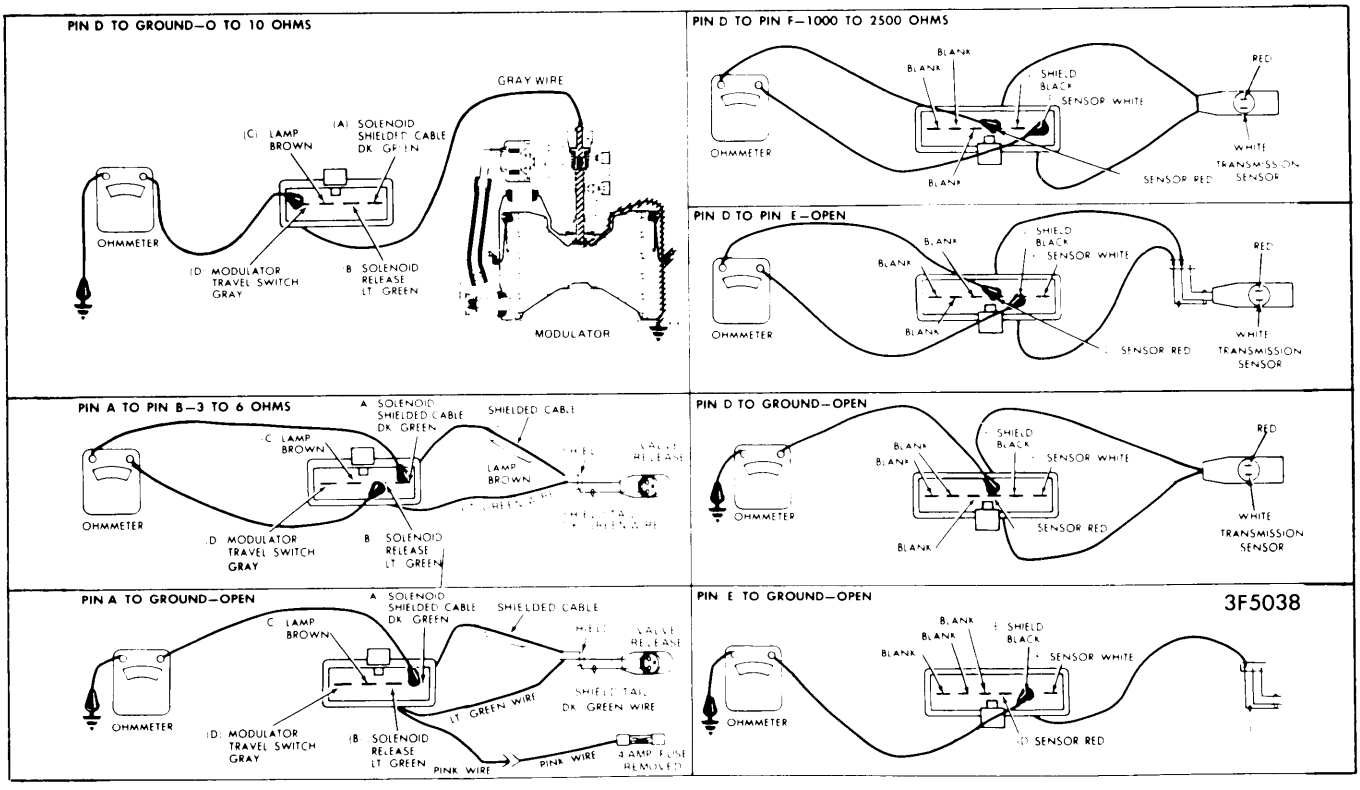



## 1970-72 RESISTANCE & CONTINUITY CHECKS (CADILLAC EXC. ELDORADO)

## 1970-73 GENERAL MOTORS ELECTRONIC SKID CONTROL SYSTEM (Cont.)




## 1973 RESISTANCE & CONTINUITY CHECKS (TORONADO & ELDORADO)



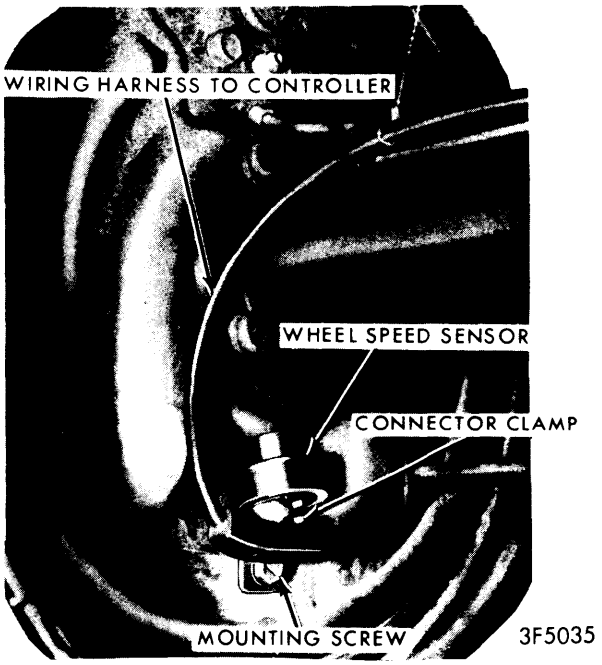

## 1973 RESISTANCE & CONTINUITY CHECKS (CADILLAC EXC. ELDORADO)

## 1970-73 GENERAL MOTORS ELECTRONIC SKID CONTROL SYSTEM (Cont.)

**Immediate Brake Light When Ignition Is "ON"** – Parking brake on. Shorted parking brake switch (system OK). Fuse blown. Shorted differential pressure switch. Shorted solenoid lead to ground (blows fuses). Faulty connections or open circuit: check feed wire (pink) and connectors. Faulty Controller.

*NOTE – For the following conditions, it is assumed that lamp circuit operates normally and there are not hydraulic leaks or air in system.*

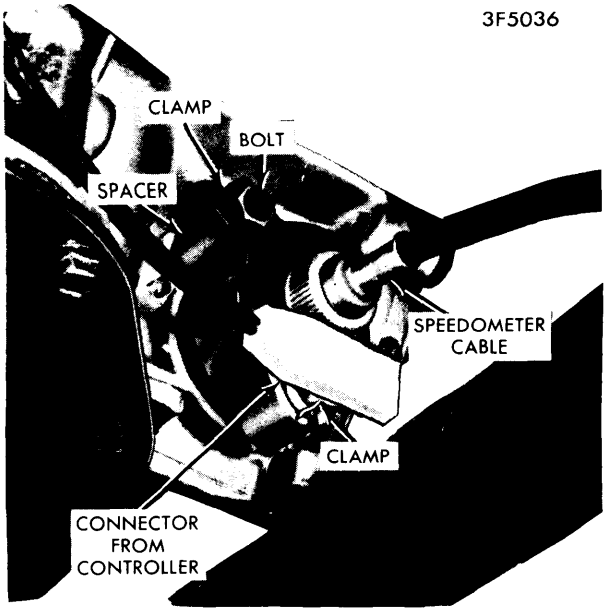
**No Brake Light. System Completely Inoperative (Excercise Cycle OK; Ignition Switch "ON" Or Engine Running)** – Sensor seized or not being driven. Speed Sensors shorted to each other: disconnect Sensor connectors and check resistance across terminals (should be 1000-2500 ohms); remove connectors at Controller and check resistance across SPEED SENSOR CONNECTOR TERMINALS (should be infinite—open). Faulty Controller.




**REAR WHEEL SPEED SENSOR (ELDORADO & TORONADO)**

**No Brake Light. System Completely Inoperative (NO Exercise Cycle; Ignition Switch "ON" Or Engine Running)** – Loss of ground lead connection from Controller: check black/white ground lead; Controller connectors unplugged. Solenoid valve seized in de-energized position: disconnect solenoid lead, momentarily apply 12 volts to solenoid terminal and listen for "click" (if no click, replace solenoid); apply 12 volts to solenoid for two to three seconds and observe if vacuum leak stops after solenoid "clicks" (if not, replace solenoid).

**Brake Light Comes On After 2-5 Second Delay. System Completely Inoperative, But Exercise Cycle OK (Ignition Switch "ON" Or Engine Running)** – Speed Sensor leads




**TRANSMISSION SPEED SENSOR (CADILLAC - EXC. ELDORADO)**

open: check continuity at connectors (should be 1000-2500 ohms; if not, replace Sensors); check resistance at Controller terminals (should be 1000-2500 ohms; if not, replace harness). Speed Sensor leads shorted to ground. Modulator travel switch open: check for 0-10 ohms resistance from terminal to ground (disconnect gray wire). Modulator travel switch connector not making contact with terminal or open circuit in lead: Check continuity of switch lead; remove gray wire and insert jumper to ground (if system operates normally, travel switch is faulty). Controller faulty.

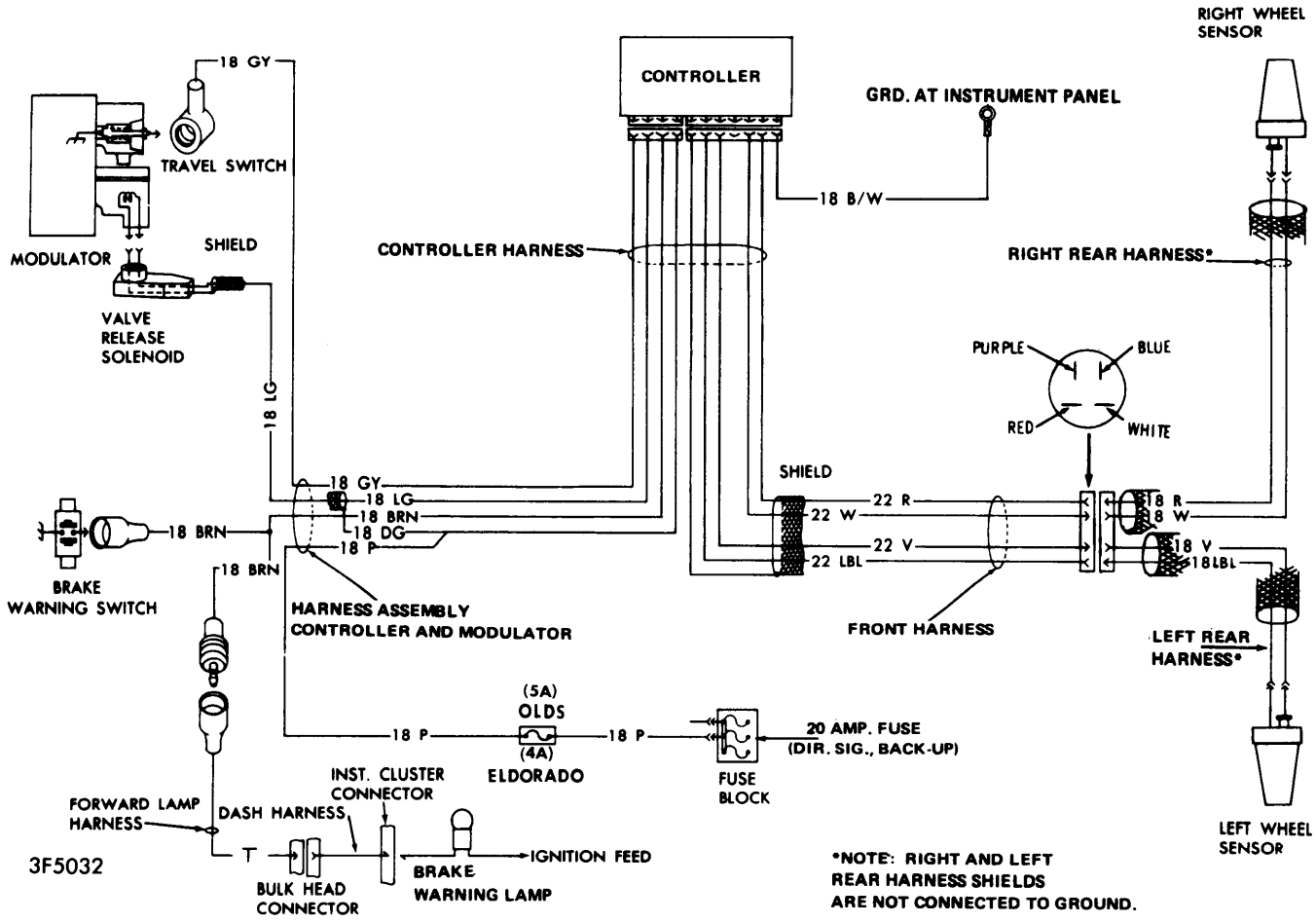
**Brake Light Comes on After 2-5 Second Delay. System Completely Inoperative, But Exercise Cycle OK (Ignition Switch "ON" Or Engine Running)** – Solenoid leads open: Check resistance at solenoid for 3-6 ohms; remove Controller and Modulator harness at Controller, disconnect in-line fuse (pink wire), and check continuity of terminals "C" and "D" (see illustration). Controller faulty.

**Pseudo Cycling While Vehicle Is In Motion** – Frayed shield leads, causing intermittent short. Improperly greased Sensor connector or missing clamp. Sensor damper deteriorated. Bad electrical connections. Controller faulty.

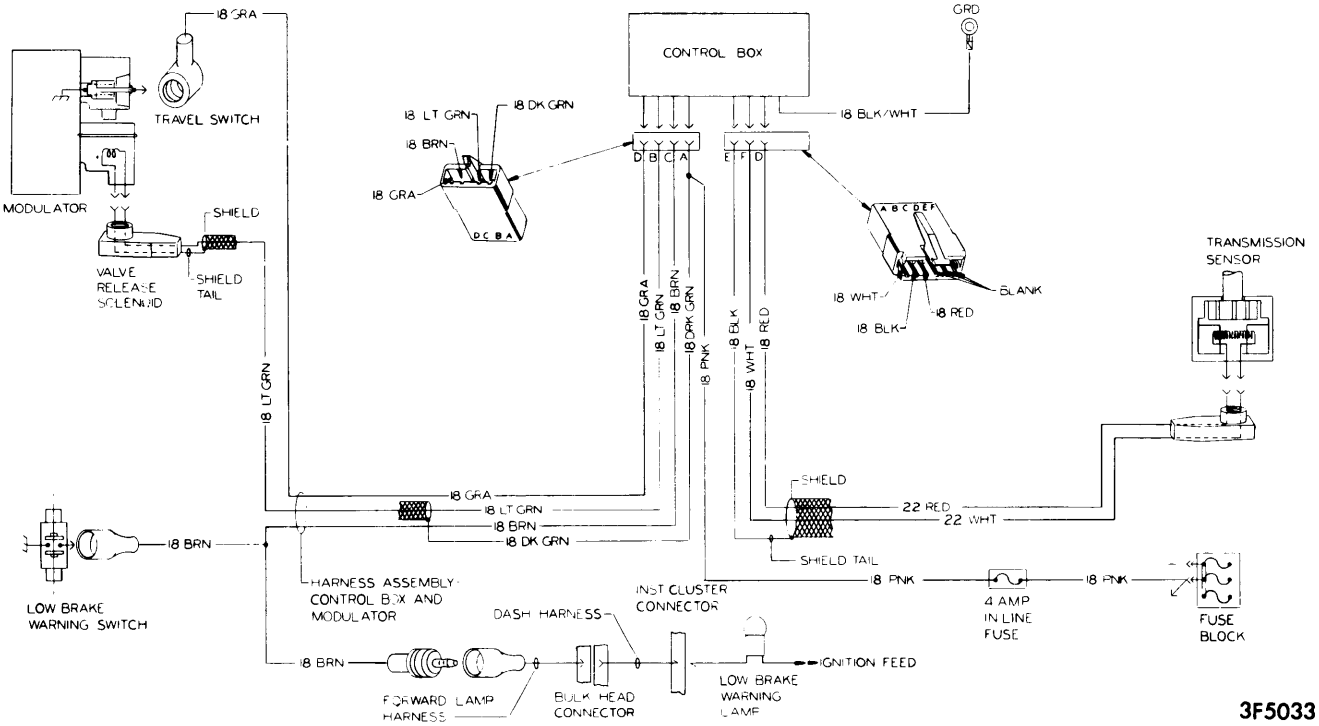
**Does Not Cycle Down to 5 MPH During Maximum Braking Effort** – Insufficient operating vacuum. Controller faulty.

**Brake Light On 2-5 Seconds After High Brake Pressure Is Applies** – Defective brake combination valve (excessive pressure applied to Modulator).

## 1970-73 GENERAL MOTORS ELECTRONIC SKID CONTROL SYSTEM (Cont.)




WIRING DIAGRAM – ELDORADO & TORONADO




WIRING DIAGRAM – CADILLAC (EXC. ELDORADO)