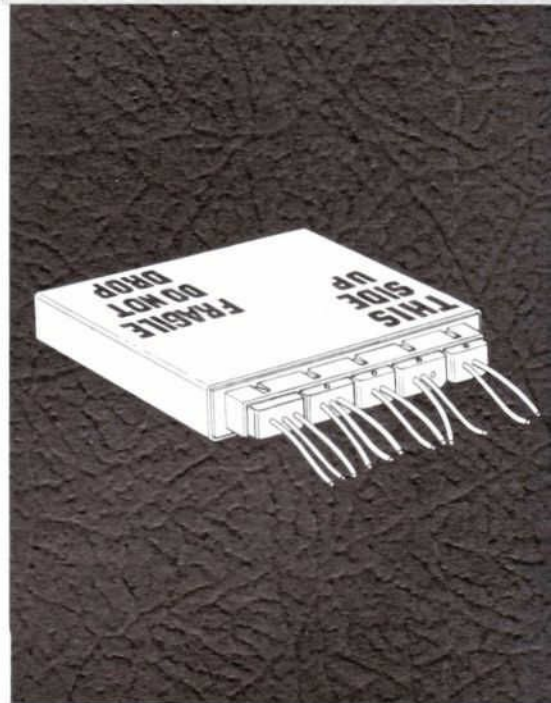


FILM REVIEW BOOK 2004

SURE-TRACK BRAKE SYSTEM



VOL. 69 S5 L2



SURE-TRACK BRAKE SYSTEM

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TABLE OF CONTENTS

Page

INTRODUCTION

DESCRIPTION

- Control Module 1
- Sensors 1
- Actuator 1
- Electrical System 1

DIAGNOSIS

- Functional Check 2
- Isolating System Trouble 5
 - Hydraulic System Check 5
 - Sure-Track System Check 6
- Actuator Air and Vacuum Supply and Engine idle RPM Check 6
- Grounded Brake Warning Light Circuit Check 7
- Sensor Check 7
- Power Source Check 10
- Control Module Loose or Broken Connections Check 10
- System Ground Check 11
- Fuse Check 12
- Actuator Check 12

The descriptions, testing procedures, and specifications in this handbook were in effect at the time the handbook was approved for printing. Ford Motor Company reserves the right to discontinue models at any time, or change specifications, design, or testing procedures without notice and without incurring obligations.

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FORD DIVISION



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INTRODUCTION

INTRODUCTION

The techniques described in this handbook will enable the Service Technician to service the Sure-Track Brake System problems that come to his attention.

Through careful study of the information contained in this handbook, Shop Manuals and Car Diagnosis Manual, you should be able to:

- Diagnose possible Sure-Track Brake System problems.
- Understand and perform various Sure-Track Brake System test and inspection procedures.
- Understand the various problems, and how to isolate and correct them.

This handbook describes the Sure-Track Brake System, its major components and wiring. It also provides diagnosis procedures and methods to be followed for the solution and repair of problems that may arise in the system. A complete diagnosis chart is provided for reference when servicing the system.

DESCRIPTION

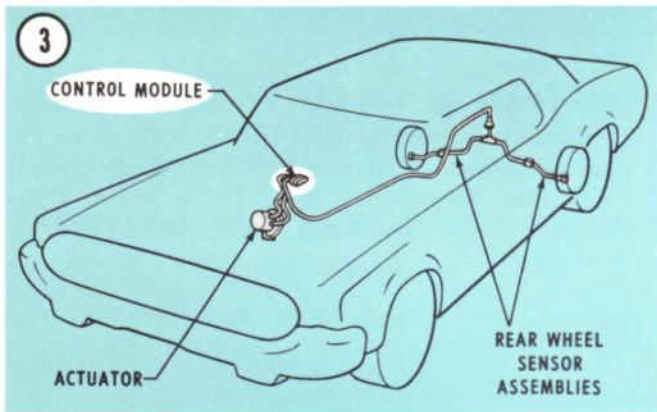


DESCRIPTION

The Sure-Track Brake System has three major components. They are the control module, rear wheel sensors and the actuator.

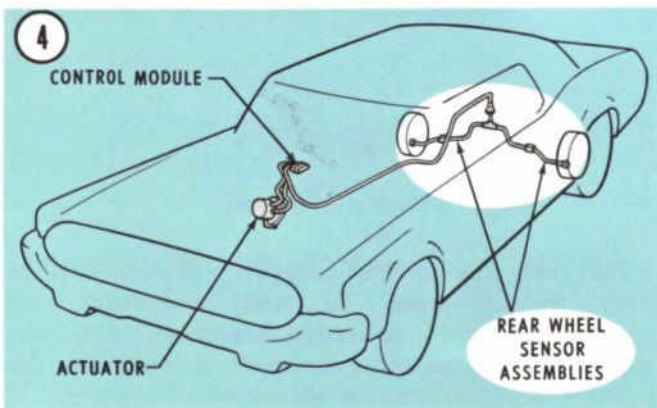
Control Module

The control module is the nerve center for the system. It reacts to the action of the rear wheels to improve directional stability of the vehicle during maximum braking action.



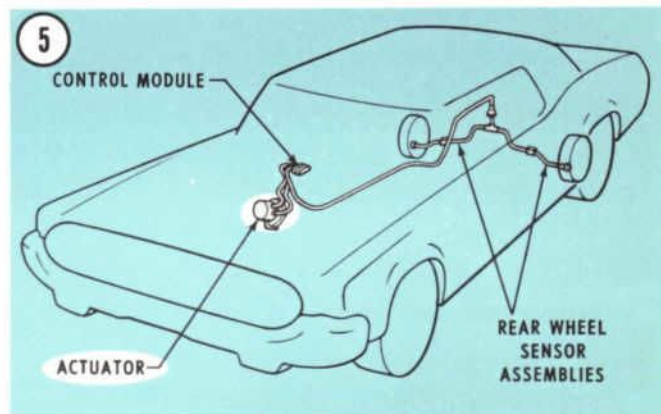
Sensors

Electro-magnetic rear wheel sensors tell the control module how fast the rear wheels are turning or whether the wheels are locked-up. This information helps the control module determine whether to apply or release the rear wheel brakes to reduce sustained rear wheel lockup, during maximum braking effort.



Actuator

The actuator responds to the control module's direction or signal to apply or release the rear wheel brakes, depending on the speed of the rear wheels. This off-on cycling takes place at up to 4 cycles-per-second and continues until the vehicle slows to about 4 miles-per-hour or until the brakes are released.



Complete description, operation, removal and installation procedures can be found in Section 02 — Brakes — of the Ford Car Shop Manual, Volume One, Chassis.

Electrical System

The electrical power for the Sure-Track Brake System is provided through a 3-Amp Fuse. **CAUTION: Use only a 3-Amp (8AG3) Fuse to prevent damage to the system.**





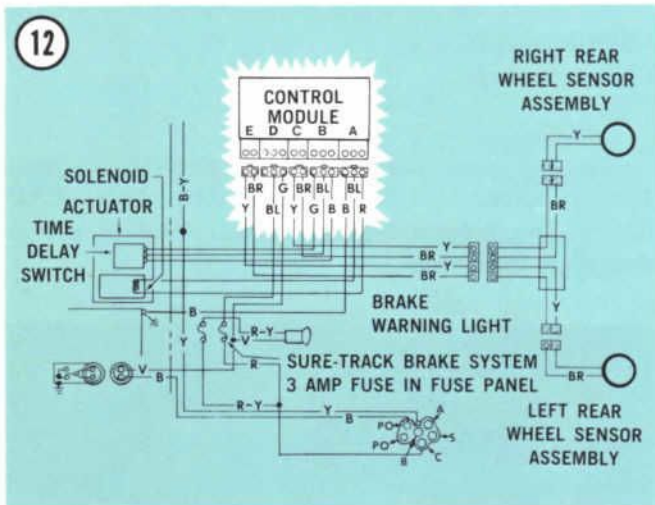
DESCRIPTION

The three major components of the system are featured in the following electrical wiring schematic diagrams of the system.

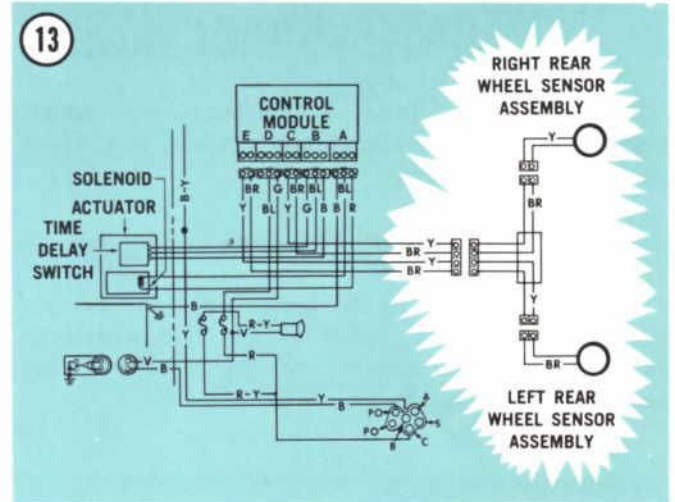
First the control module is featured:

Starting from the right, the control module plugs are identified by letters:

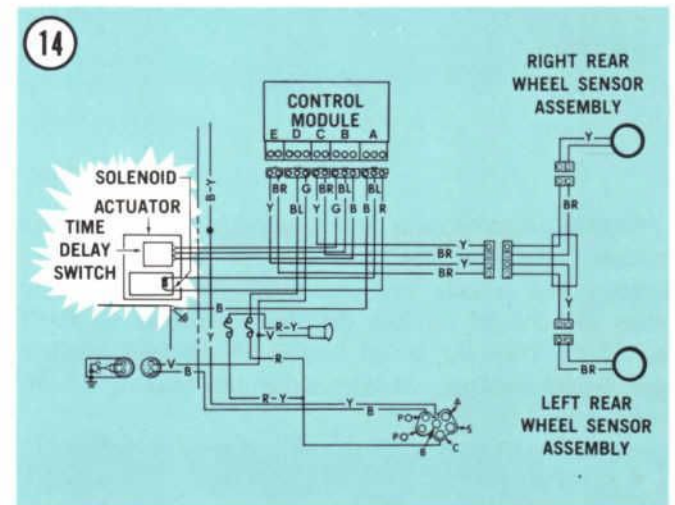
- Plug A has a step on one side and contains the Actuator Solenoid High (Red), Solenoid Low (Blue) and the System Ground (Black).
- Plug B contains the Actuator Time Delay Switch Ground (Black), the Time Delay Switch Positive lead (Blue) and the Time Delay Switch Warning (Green).
- Plugs C and E are the right and left sensor connectors and each contain a Brown and a Yellow lead.
- Plug D has the Brake Warning Light (Green) and the Ignition Switch Hot lead (Blue).



The right sensor leads run from the right rear wheel to the midship connector plug in the trunk to the C plug of the control module. The left sensor leads run from the left rear wheel to the midship plug to the E plug of the control module. The lead wire colors are one Brown and one Yellow for each sensor.



The actuator has two sets of leads; the Solenoid High (Red) and Solenoid Low (Blue); both go to the A plug of the control module. The Time Delay Switch Warning lead (Green), the Time Delay Switch Positive (Blue) and the Time Delay Switch Ground (Black), all go to the B plug of the control module.



DIAGNOSIS

Functional Check

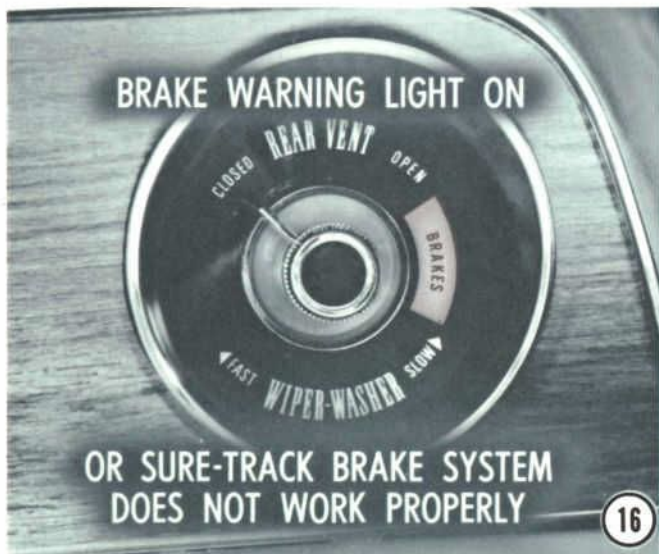
The first step in the diagnostic procedure is to **verify the complaint**. To verify complaints and diagnose the system, perform a functional check. The functional check does not require a road test for maximum braking condition test stops.

DIAGNOSIS



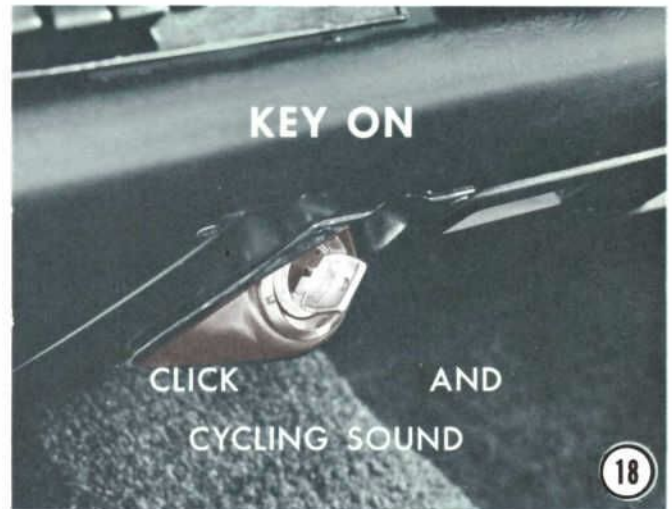
Basically, there are two types of complaints the customer will make about the Sure-Track Brake System. They are:

- The Brake Warning Light Comes On and Stays On, or
- The Sure-Track Brake System Does Not Work Properly.

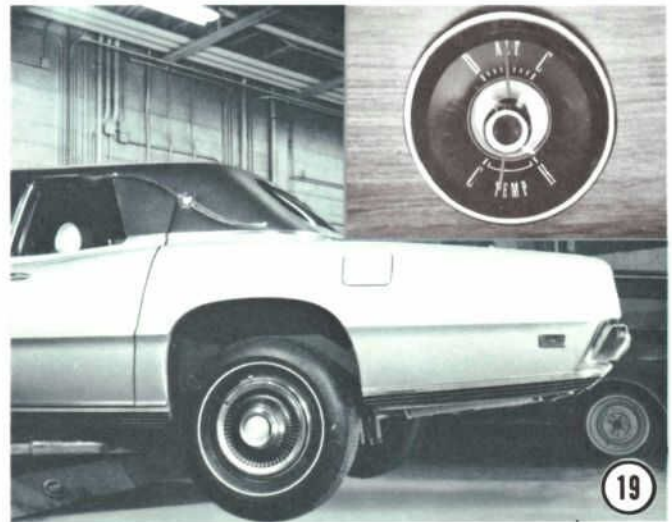


The functional check is performed as follows:

1. Turn the ignition key to the "ON" position. As the key is turned you should first hear the solenoid click, and then the actuator cycle.



2. Position the car on a hoist and raise the rear wheels clear of the floor.
3. Start the car engine and warm up until normal operating temperature is reached.

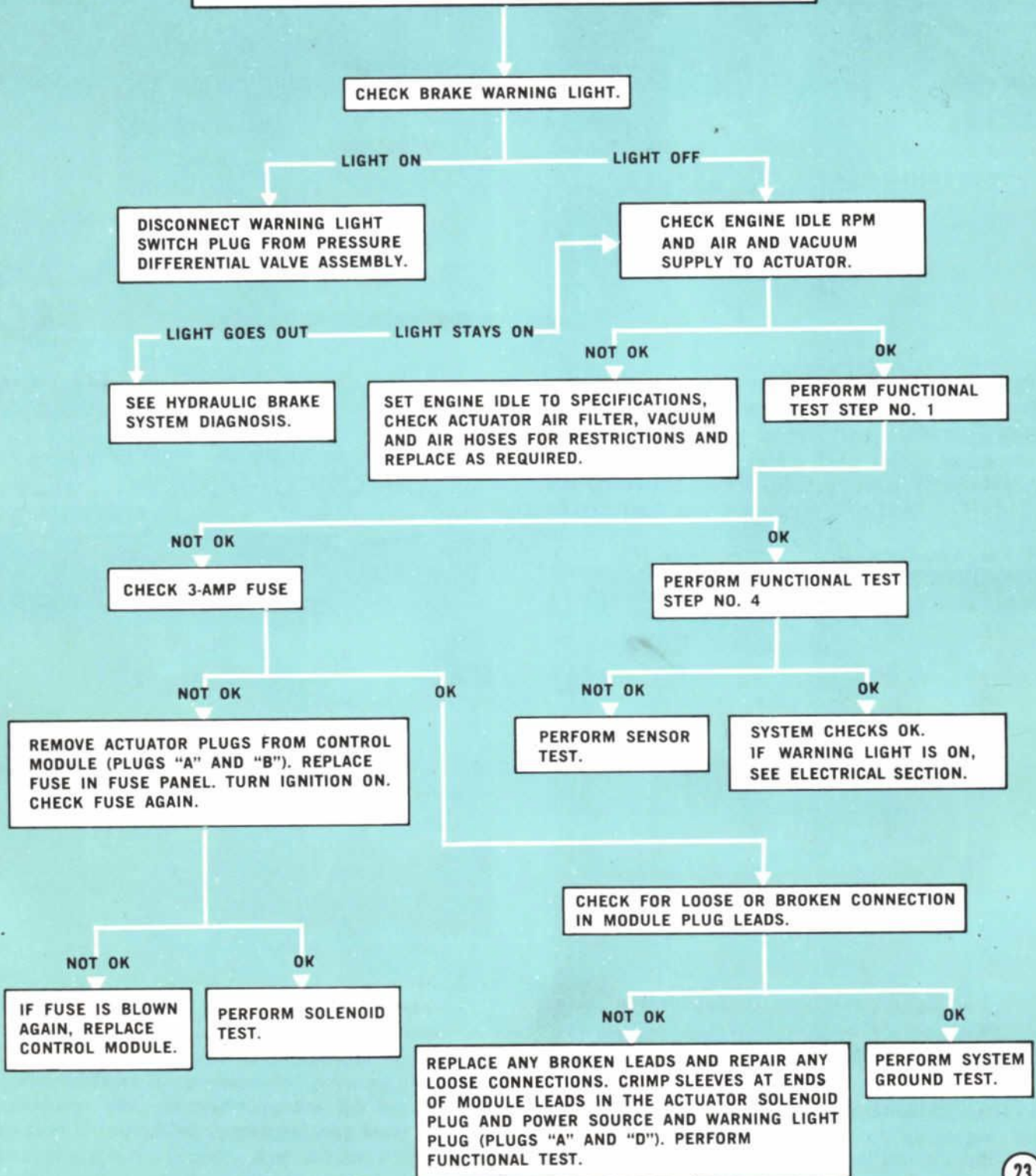


4. Move the transmission selector lever to the "D" drive position, with the engine at normal operating temperature; accelerate to approximately 25-30 miles-per-hour on the speedometer, with both rear wheels turning. **CAUTION: Never exceed 60 miles-per-hour on the speedometer to avoid possible damage to the car.** If both rear wheels **do not** turn, correct any difficulty, such as brakes too tight or rear axle damage, before continuing the functional check.

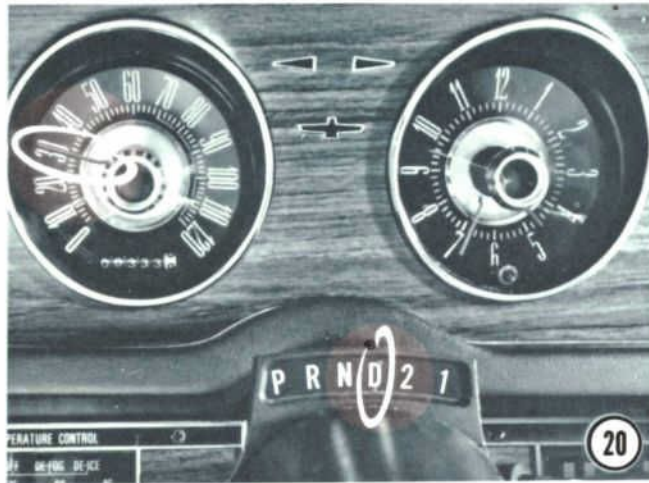


DIAGNOSIS

SURE-TRACK BRAKE DOES NOT OPERATE PROPERLY



DIAGNOSIS

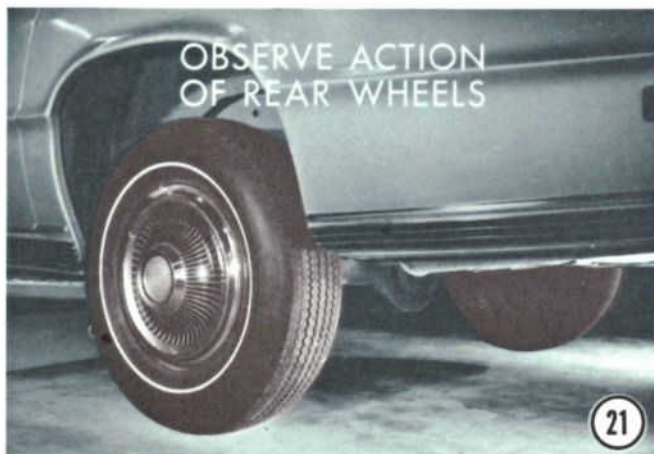


Apply the brakes quickly and firmly and observe the actions of the rear wheels. The rear wheel brakes should cycle 5 or 6 times, or until the brake pedal is released. This cycling action consists of a rapid application and release of the rear wheel brakes, which can be easily seen if the system is working correctly.



Hydraulic System Check

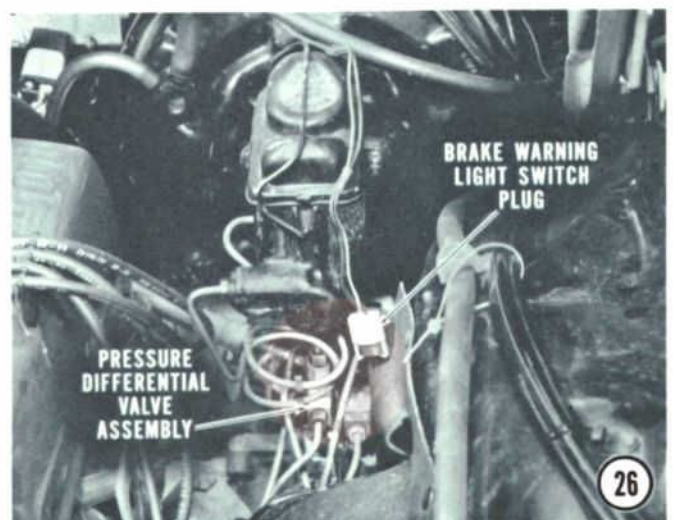
Disconnect the brake warning light switch plug from the pressure differential valve assembly. If the brake warning light goes out, the problem is in the regular hydraulic brake system.



If the functional check verifies the complaint, isolate the trouble by using the diagnosis chart.

Isolating System Trouble

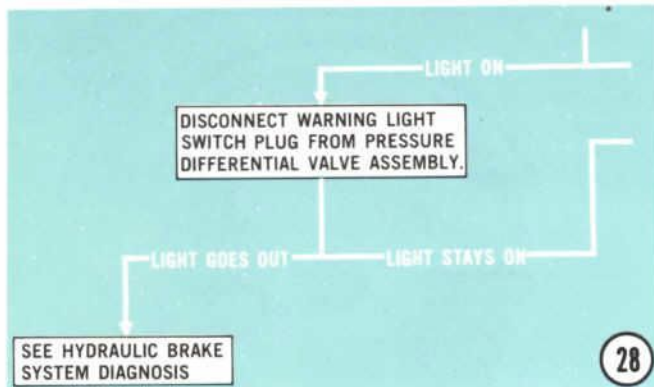
If the brake warning light comes on during the functional check, other than during engine cranking, you must determine if the regular hydraulic brake system or the Sure-Track Brake System is the problem. Perform the following checks to isolate the particular system causing the brake warning light to come on:



If the brake warning light goes out when the brake warning light switch plug is disconnected from the pressure differential valve, the hydraulic brake system should be repaired as required. Then, perform a functional check to be sure the problem is corrected.

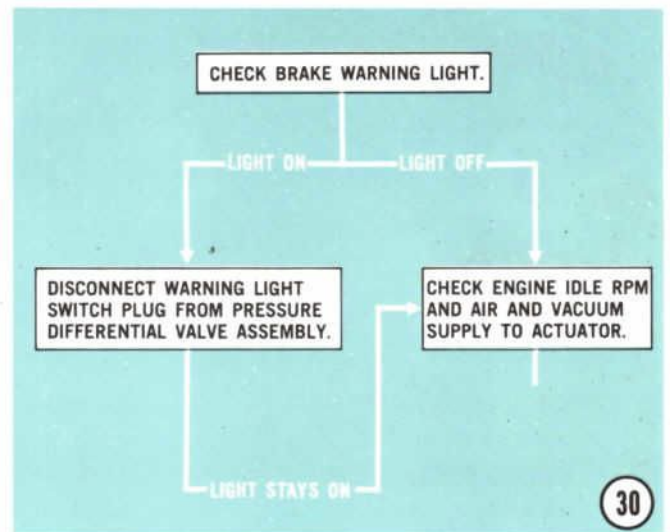


DIAGNOSIS

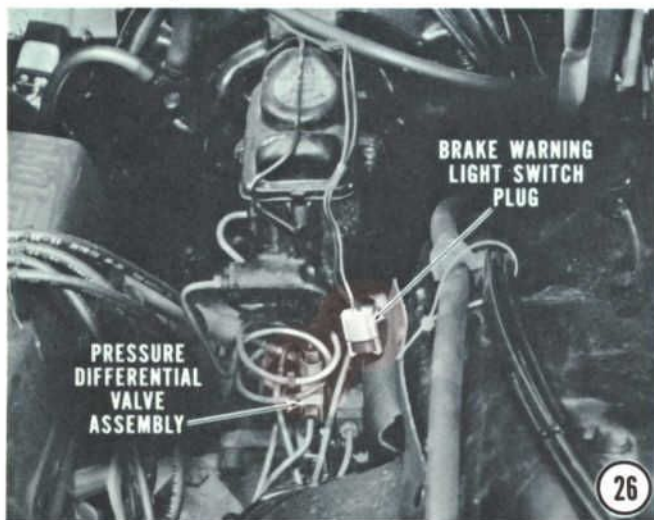


Sure-Track System Check

Disconnect the brake warning light switch plug from the pressure differential valve assembly. If the brake warning light stays on, the trouble is in the Sure-Track System.



Inspect the actuator air filter and the actuator air hose for restrictions and replace as required.



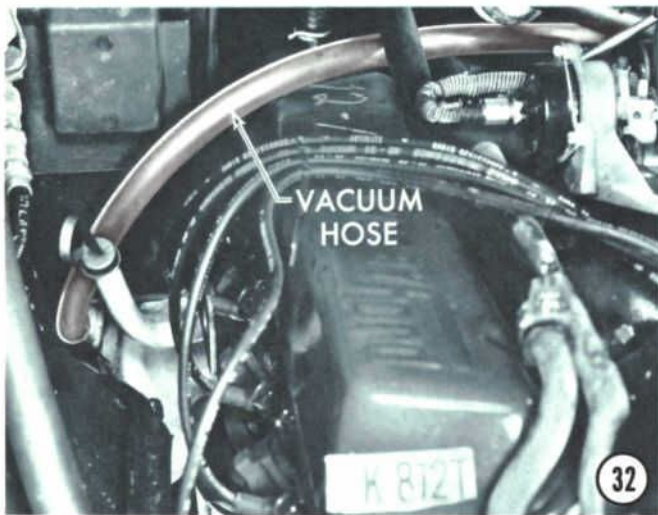
Actuator Air and Vacuum Supply and Engine Idle RPM Check

If the brake warning light is off, or if the brake warning light stays on with the warning light switch plug disconnected from the pressure differential valve, check the engine idle rpm; the actuator air supply, and the actuator vacuum supply. Set the engine idle rpm to specifications.

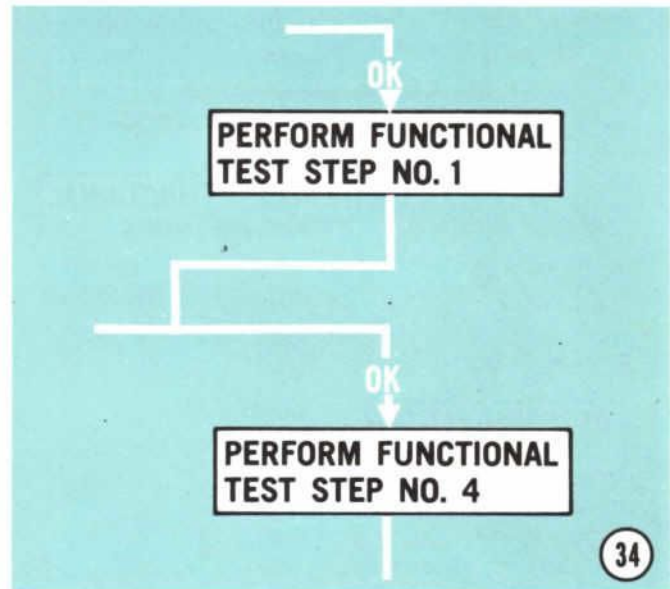


Also, inspect the actuator vacuum hose for restrictions and replace as required.

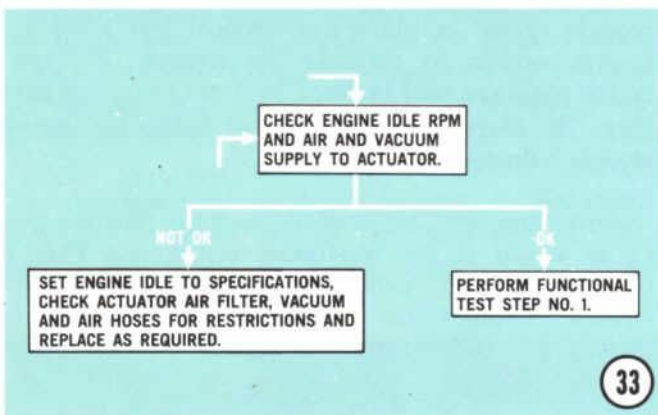
DIAGNOSIS



If the engine idle rpm and air and vacuum supply to the actuator are okay, perform Step 1 of the functional check, which is to turn the ignition key to the "ON" position and listen for the solenoid to click and the actuator to cycle.

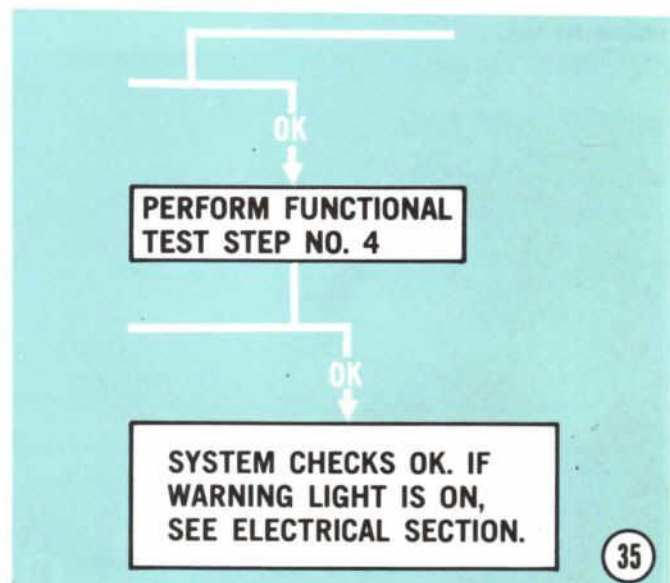


If the system checks okay during the functional test and the brake warning light stays on, repair the grounded brake warning light circuit. Refer to Electrical System Diagnosis in the Car Diagnosis Manual.



Grounded Brake Warning Light Circuit Check

If the solenoid clicks and the actuator cycles, perform functional check Step 4, which is to place the transmission in the "Drive" position and accelerate to 25-30 miles-per-hour on the speedometer. Be sure both rear wheels revolve simultaneously. Apply the brakes quickly and firmly and observe the action of the rear wheels. The system should cycle 5 or 6 times or until you release the brake pedal.

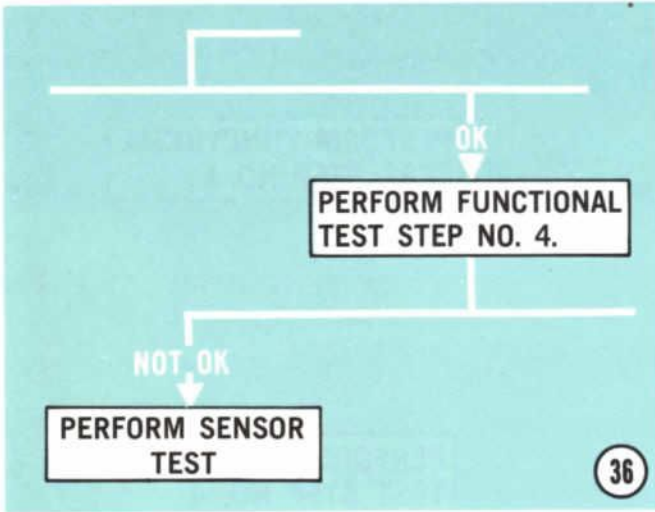


Sensor Check

However, if the system is not okay, perform sensor test and repair. When you perform Step 4 of the functional check, you are checking to see if the sensors are working properly.



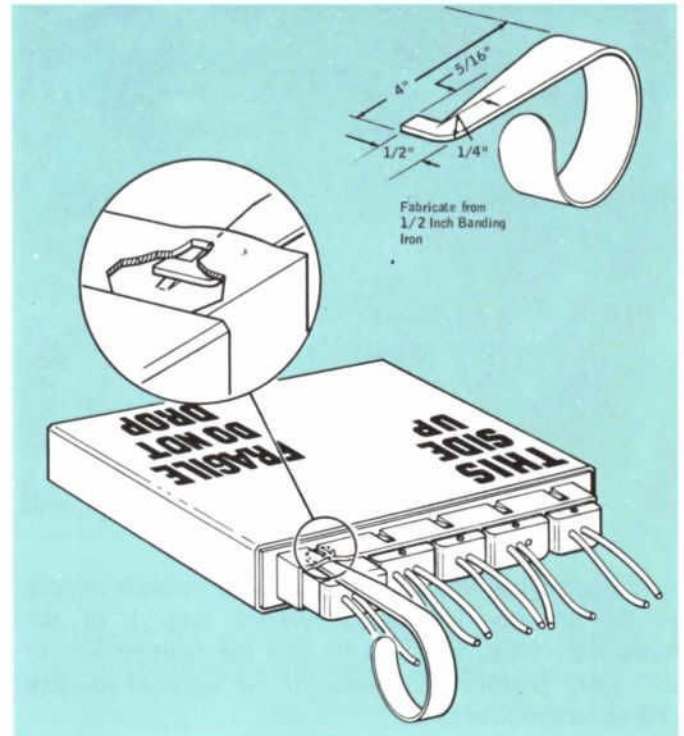
DIAGNOSIS



To diagnose the sensors, you will need an ohmmeter with two test prods 82 to 86 thousandths of an inch in diameter, short rods the previously specified diameter or Molex connector pins to complete the test connections. Prods or rods larger than the specified diameter will enlarge the plug connectors which will result in loose connections. **Always calibrate the ohmmeter to the proper scale before making any ohmmeter test.**

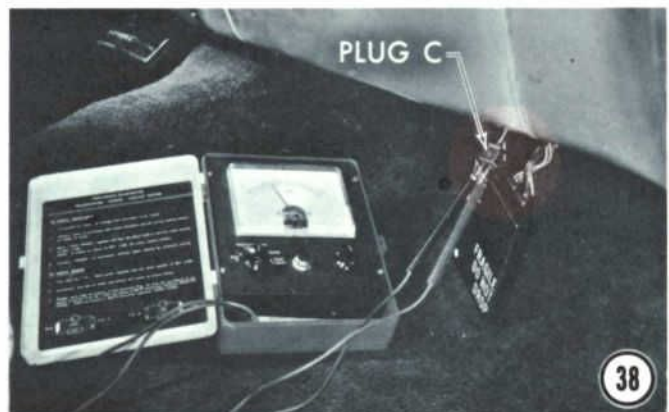


To make removal of the control module plug easier, you may want to fabricate a "Module Harness Connector Remover Tool" from 1/2" Banding Iron. The dimensions for this tool are shown in the following illustration:



Remove the bolt and bracket holding the control module under the glove compartment and lower the control module to diagnose the sensors. The connector plugs are held in place by a tab on top of each module. **The plugs cannot be removed unless the control module is dropped.**

After lowering the control module, remove Plug C, as shown in the illustration below, and Plug E (the Brown and Yellow leads) from the control module. Connect the ohmmeter to one plug as shown, and then to the other plug and record the readings.



DIAGNOSIS

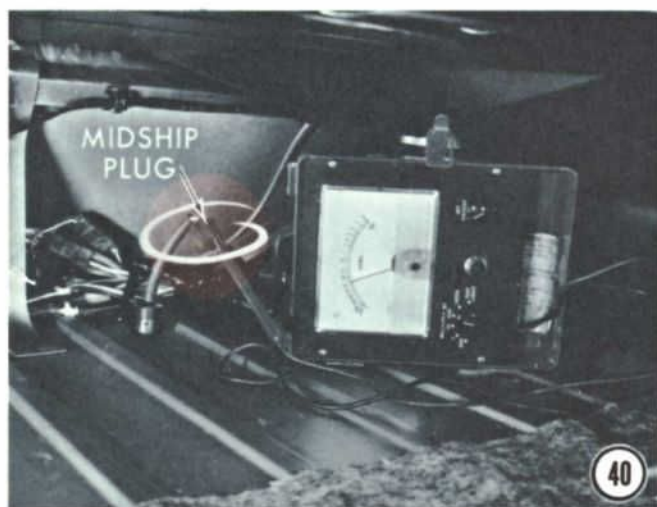


Each plug should give an ohmmeter reading of 2800 ± 500 Ohms, with the ohmmeter on the "multiply by 100" scale. If the readings are to specifications, substitute a new control module and perform a functional check.



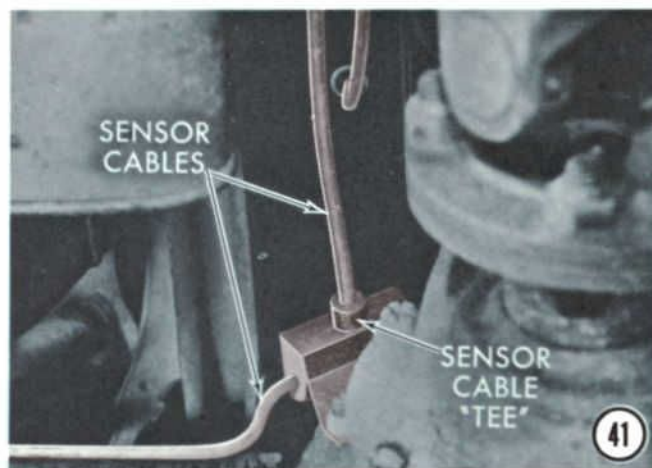
39

If the readings are not to specifications, disconnect the sensor lead midship plug in the trunk forward of the spare tire. Connect an ohmmeter to first one side of the plug for one sensor, as shown in the illustration below, and then to the other side of the plug for the other sensor, and record the readings. The ohmmeter readings should be 2800 ± 500 ohms, with the ohmmeter set on the "multiply by 100" scale.



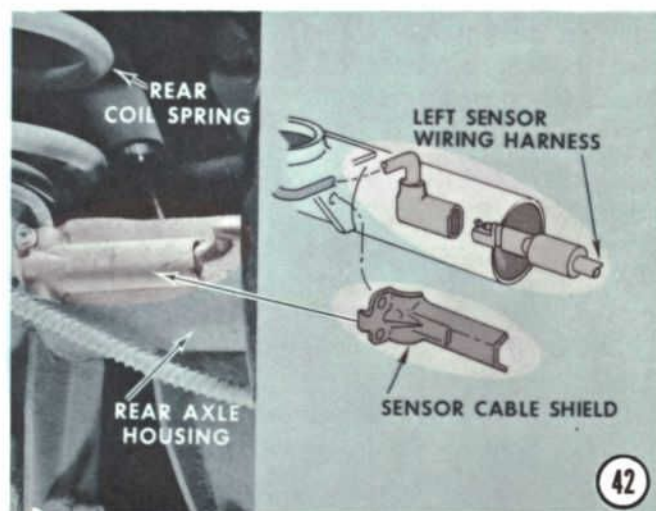
40

If the readings are not within the specifications, inspect the sensor cable through the trunk lower pan to the 'tee' on the rear axle. Then repeat the ohmmeter test at the connector behind the sensor cable shield on the rear axle housing.



41

If the readings are not 2800 ± 500 ohms, repair or replace the sensor cable as required, and perform a functional check.



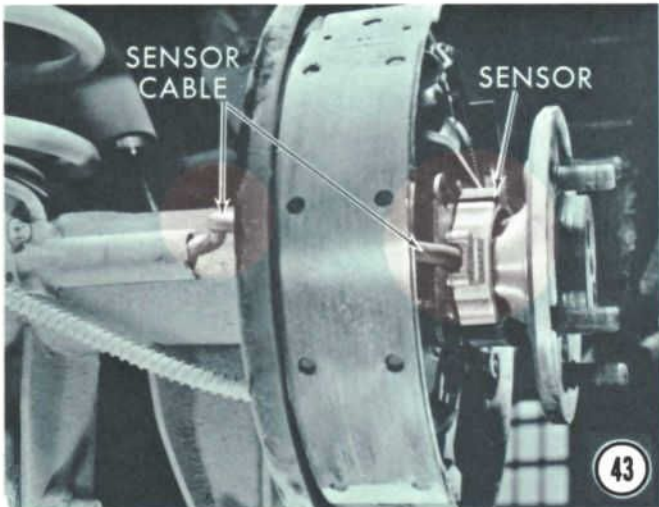
42

If the readings are not within specifications, remove the rear wheel or wheels and the rear brake drum and inspect the sensor cable for physical damage. Inspect the sensor for physical damage, such as; cracks, broken teeth, etc. Repair or replace the sensor assembly as required, and perform a functional check.



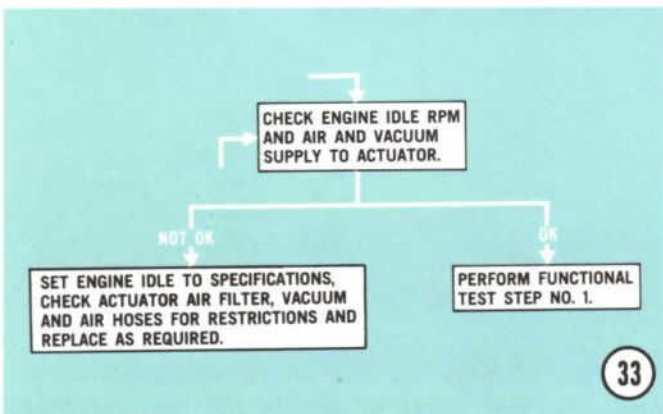
DIAGNOSIS

If there is no physical damage, replace the sensor or sensors and perform a functional check.

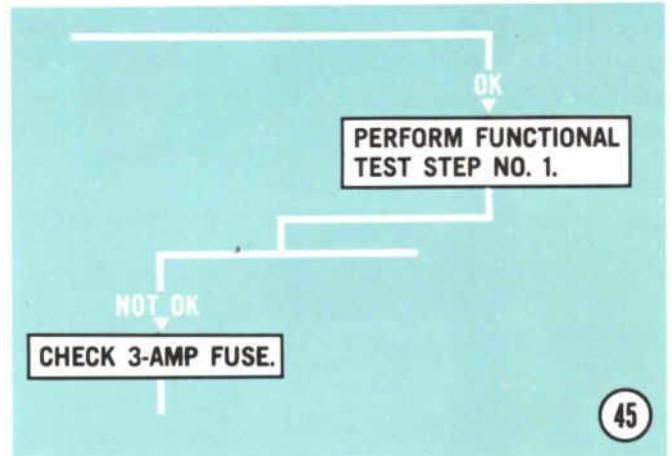


Power Source Check

Now, go back and pick up the other branch of the diagnosis chart as shown below. If the engine idle rpm and air and vacuum supply to the actuator are okay, but there is no solenoid click or actuator cycle when the key is turned to the "ON" position, go immediately to the fuse panel.



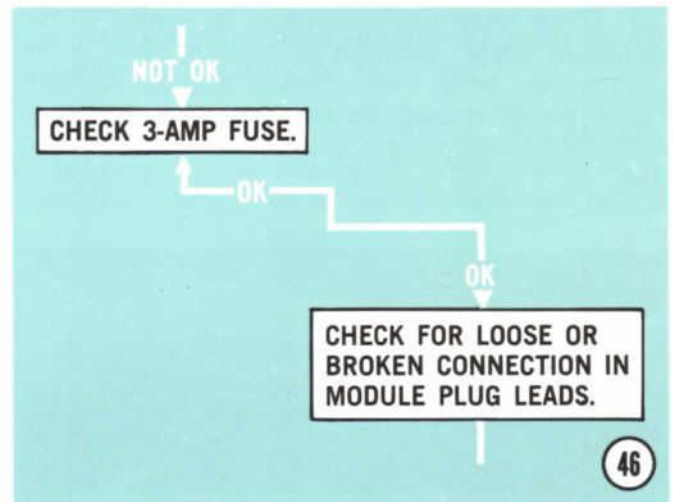
Check the Sure-Track 3-Amp fuse. If the fuse is not blown, follow the next branch in the diagnosis chart, which is to check for loose connections.



Control Module Loose or Broken Connections Check

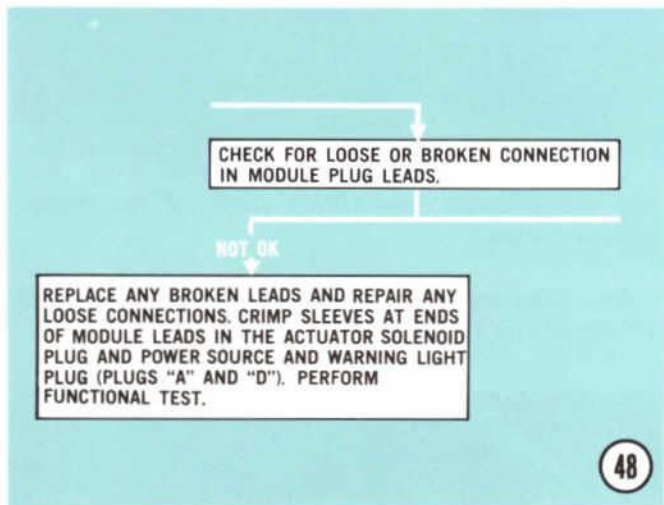
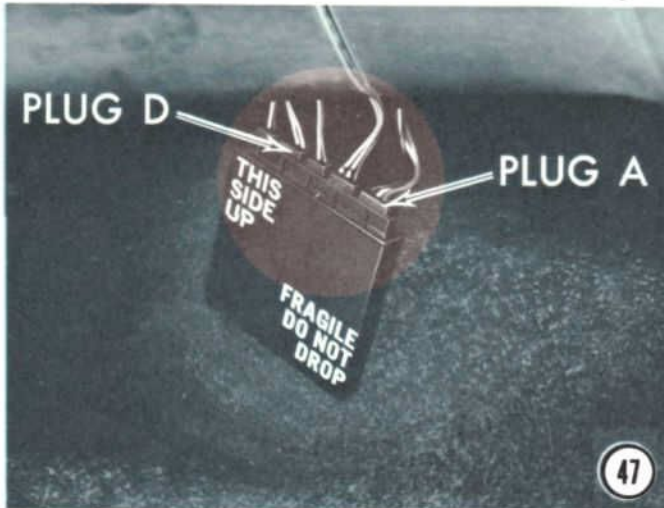
Lower the control module from under the glove compartment to allow removal of the connector plugs.

Check for loose or broken connections in the control module plug leads.

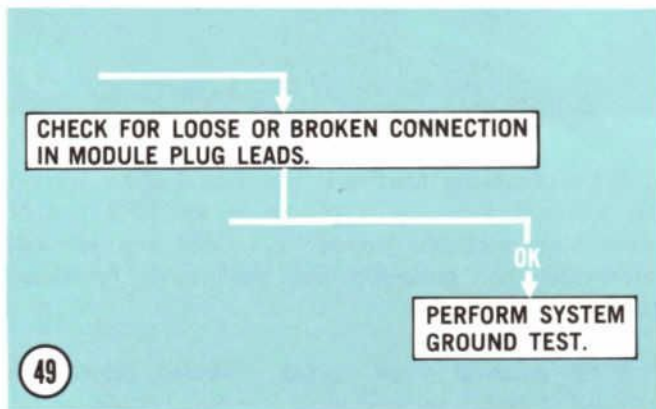


Remove the A and D plugs from the control module, one at a time, and inspect the leads. Look for loose or broken leads in the plug. Crimp the sleeves at the end of the plug leads, as required, to correct any loose or broken connections and perform a functional test.

DIAGNOSIS

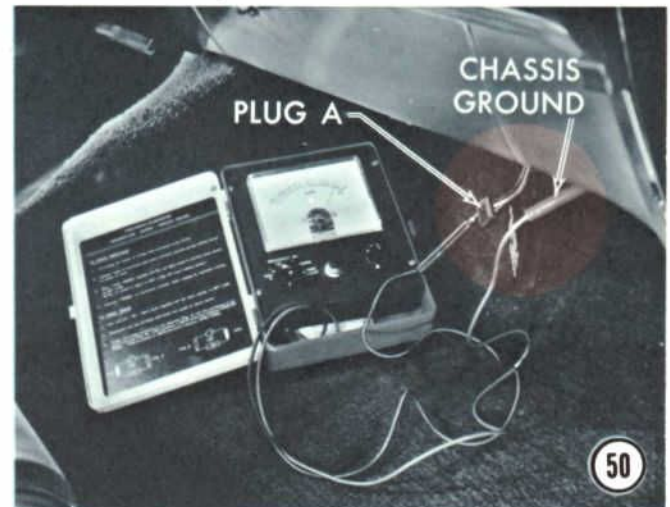


If the control module plug leads are okay, perform a system ground test.



System Ground Check

Connect an ohmmeter between the ground lead (Black) of the A plug and a good chassis ground, as shown in the following illustration. The ohmmeter reading should be one ohm or less, with the ohmmeter set on the "multiply by 1" scale.



If the ohmmeter reading is one ohm or less, the system has a good ground. Therefore, the problem is in the control module; replace the control module and perform a functional check.

If the ohmmeter reading is more than one ohm, repair or replace the system ground wire to obtain the proper ohmmeter reading and perform a functional check.



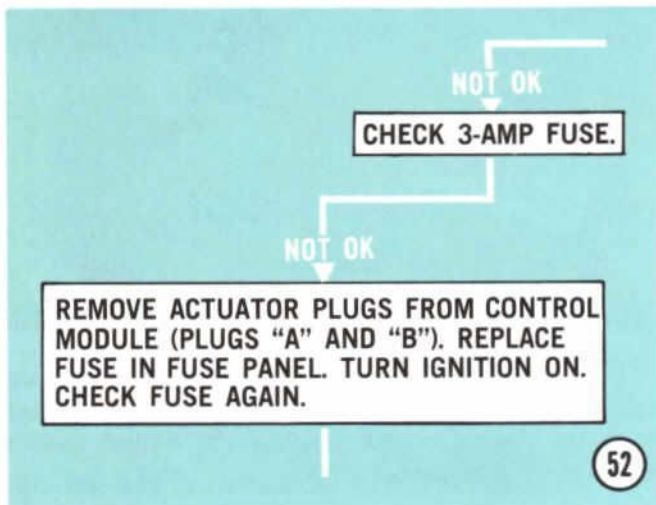


DIAGNOSIS

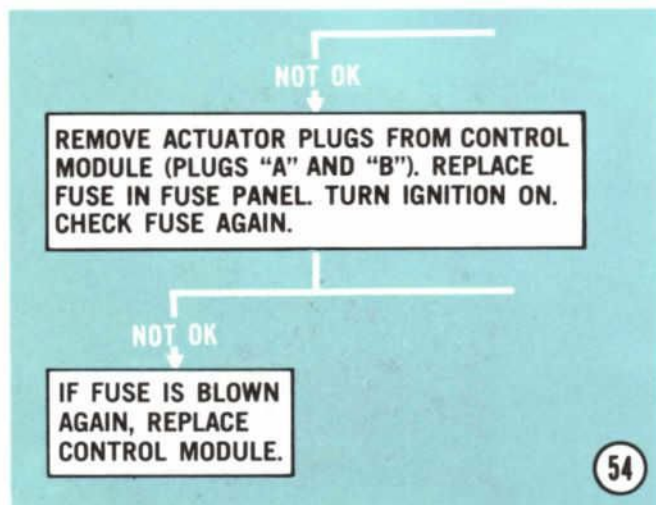
Fuse Check

Now, go back and see where the diagnosis chart leads if the fuse was blown when there was no click or cycling sound with the key turned to the "ON" position.

Check the fuse. If the fuse is not okay, the actuator plugs have to be removed from the control module. Replace the fuse in the fuse panel. Turn the ignition on. Check the fuse again.

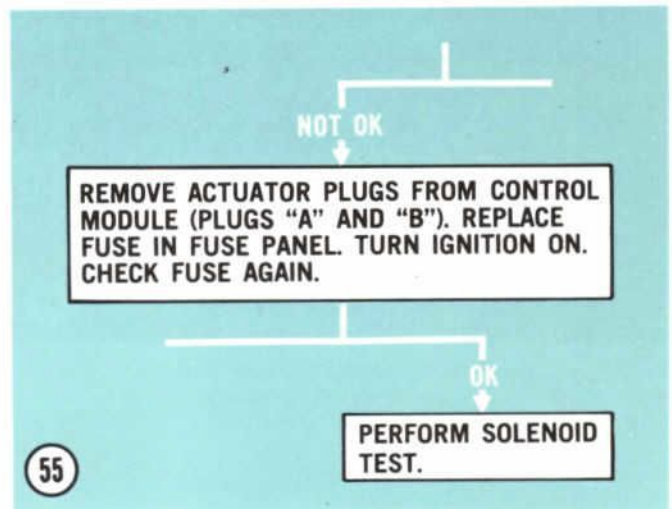


If the fuse blows again, replace the control module. That is right, if the fuse blows again, replace the control module and perform a functional test.



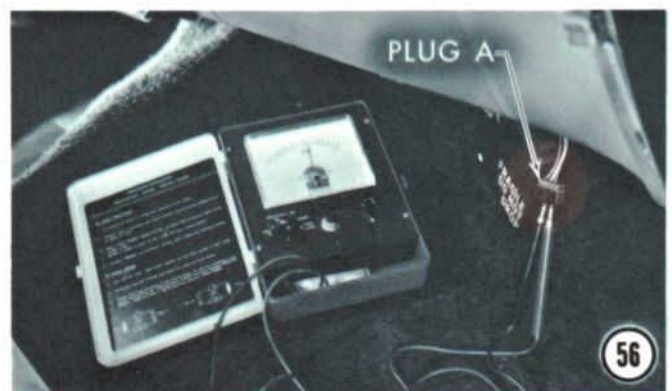
Actuator Check

If the fuse does not blow again, perform a solenoid test.



Connect an ohmmeter to the solenoid high (Red) and the solenoid low (Blue) leads of the control module A plug.

The ohmmeter reading should be 6 ± 2 ohms with a "multiply by 1" ohmmeter scale setting.



If the ohmmeter reading is less than 4 ohms, inspect the solenoid wires for a ground to the floor pan or other body surfaces. Repair or replace any solenoid wires that are grounded and perform a functional test.

If the solenoid wires are not grounded, replace the actuator assembly and perform a functional check.

DIAGNOSIS



If the ohmmeter reading is more than 8 ohms, inspect the solenoid wires for a break. Repair or replace any solenoid wires that are broken and perform a functional check. Replace the actuator assembly if the solenoid wires are not broken, then perform a functional check.

Diagnosis aids for testing the Hydraulic and Sure-Track Brake Systems are outlined in the Ford Car Diagnosis Manual. Use this valuable aid to help you increase your efficiency.

