

## GROUP 8

### ELECTRICAL

#### SECTIONS IN GROUP 8

Section	Subject	Page	Section	Subject	Page
8-A	Power Window Circuits and Trouble Diagnosis.....	8-1	8-B	Power Seats Circuits and Trouble Diagnosis.....	8-10

### SECTION 8-A

## POWER WINDOW CIRCUITS AND TROUBLE DIAGNOSIS

#### CONTENTS OF SECTION 8-A

Paragraph	Subject	Page
8-1	Power Windows.....	8-1

### 8-1 POWER WINDOWS

#### a. Description

The wiring harness for the electrically operated windows consists of three (3) major sections:

1. **Front Cross-Over Harness** - This harness is installed beneath the instrument panel and completes the circuit from the right door to the left door windows. The front harness also includes the wiring for the front door windows. See Figure 8-1. The multiple connector located at the center of the front harness is used only for manufacturing purposes and is not intended to be disengaged in service.

2. **Rear Door or Rear Quarter Window Harness** - A separate harness controls the operation of the right and left rear door or quarter windows. The right and left harnesses are connected to the front cross-over harness beneath the outer ends of the instrument panel. See Figures 8-2 and 8-3.

The power windows are operated by a rectangular shaped 12 volt series wound motor with an internal circuit breaker and a self-locking rubber coupled gear drive. The harness to window motor connector is designed with a locking embossment to insure a positive connection. When disengaging the harness connector from the motor, it is necessary to depress the thumb release. When installing the harness the thumb release must be held

depressed until the embossment on the female connector is locked in the hole of the motor connector.

The power window electrical circuit is protected by a 40 ampere circuit breaker installed at the left shroud.

#### b. Power Window Circuit Checking Procedures

Failures in a circuit are usually caused by short circuits or open circuits. Open circuits are usually caused by breaks in the wiring, faulty connections or mechanical failure in a component such as a switch or circuit breaker. Short circuits are usually caused by wires from different components of the circuit contacting one another or by a wire or component grounding to the metal of the body due to a screw driven through the wire, insulation cut through by sharp metal edge, etc.

It may be necessary to use only one or all of the procedures outlined to locate an electrical failure in the circuit. If the location of the failure is evident, follow only the steps required to check the affected wire or component. If the location of the failure is not evident, follow the procedure as outlined. Be sure to check the harness connectors beneath the outer ends of the instrument panel for proper engagement.

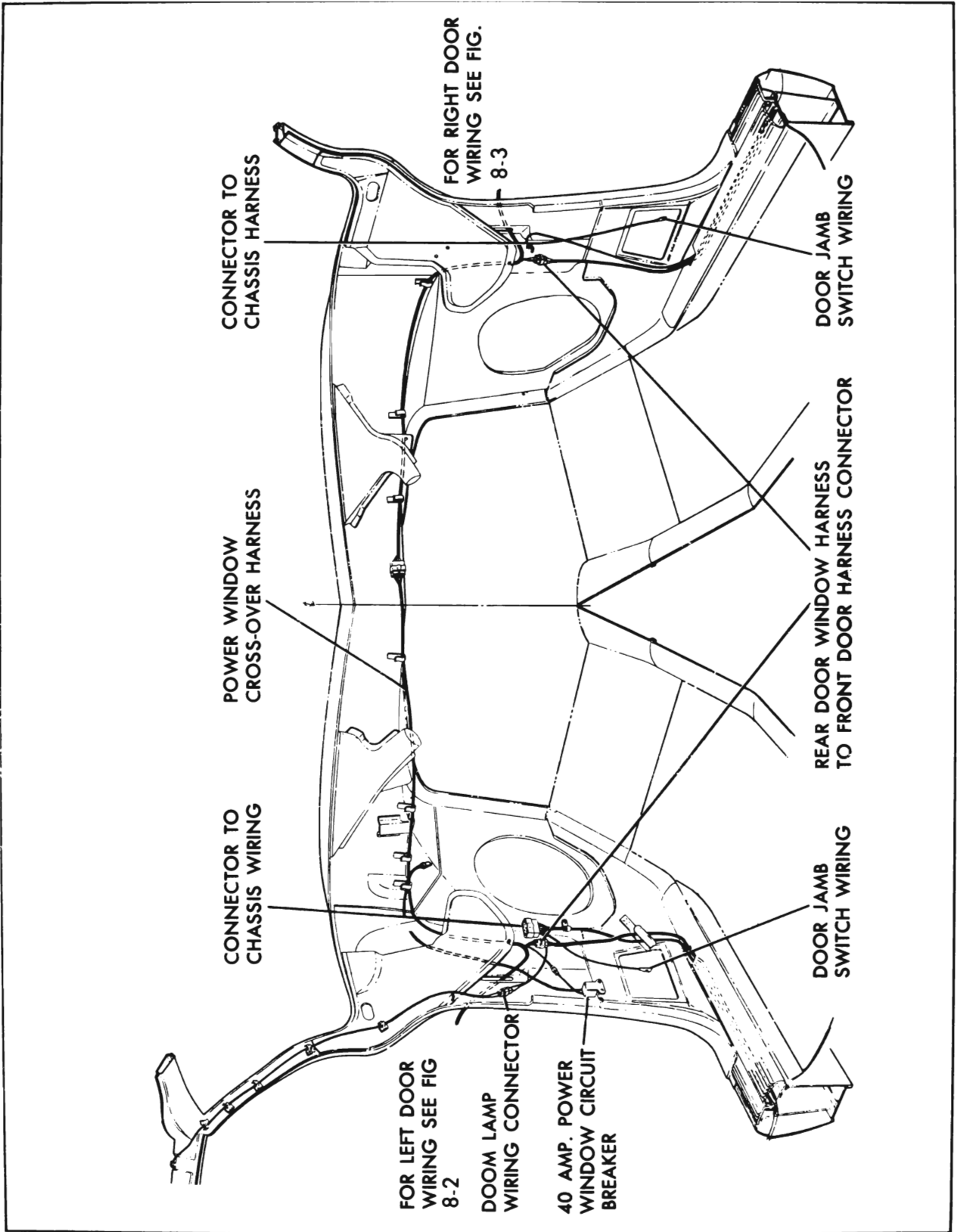


Figure 8-1—Front Power Window and Body Wiring

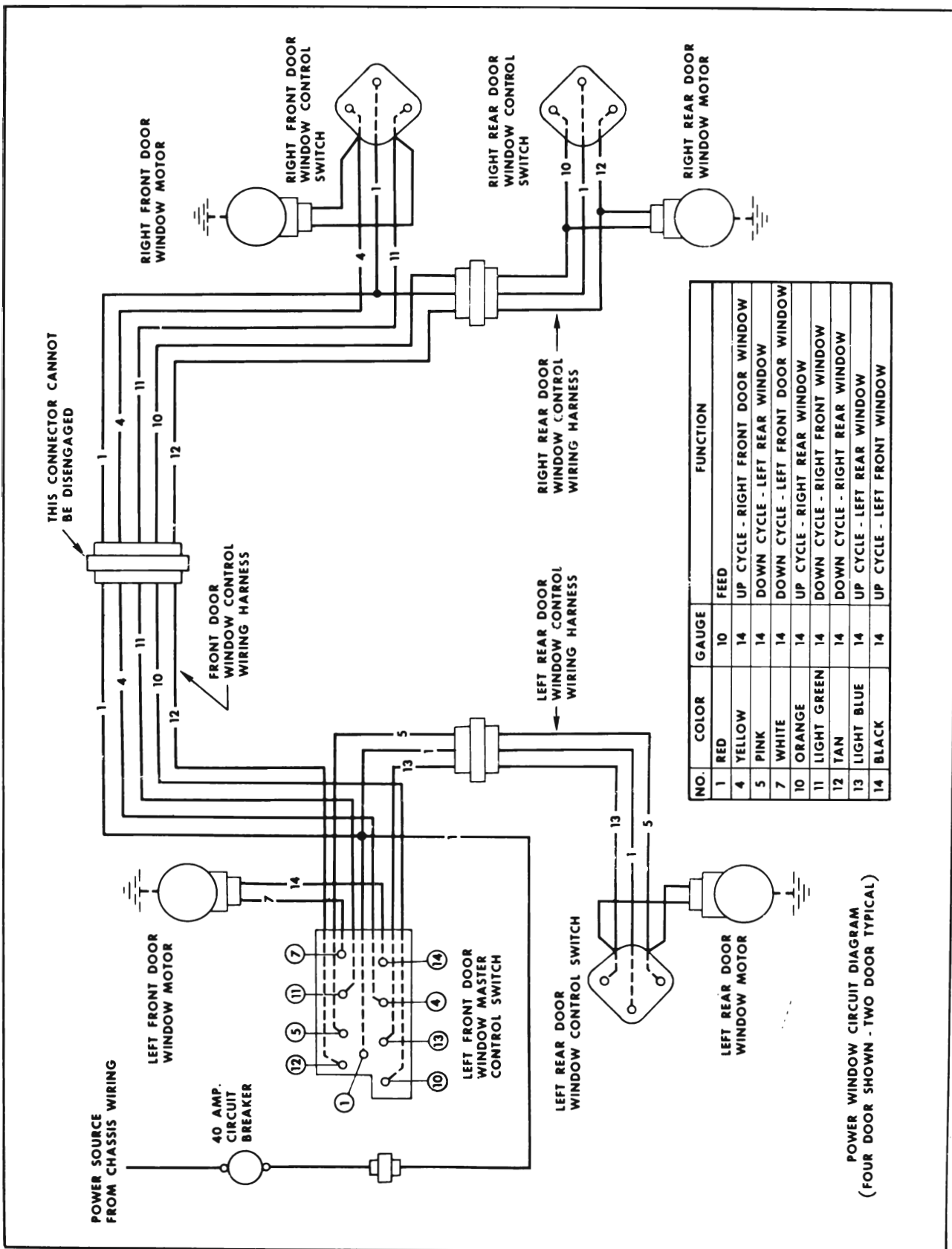


Figure 8-2—Left Side Power Windows and Body Wiring

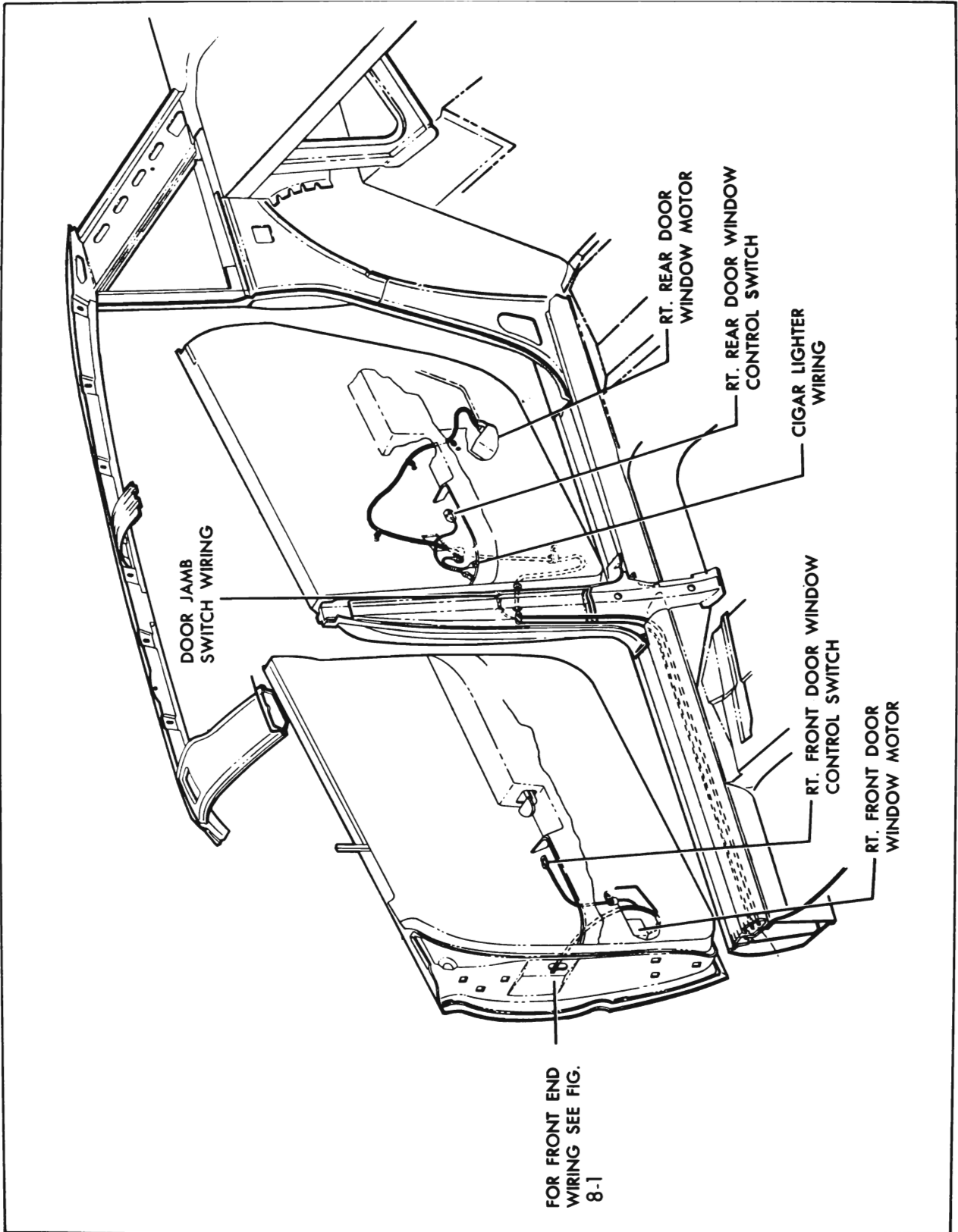


Figure 8-3—Right Side Power Windows and Body Wiring

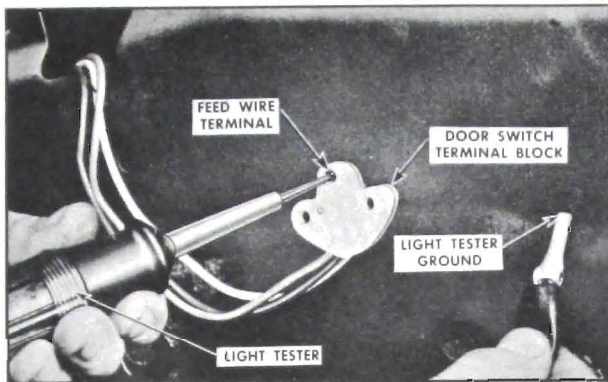


Figure 8-4—Checking Feed Circuit

### 1. Checking Feed Circuit Continuity at Circuit Breaker

a. Connect one light tester lead to battery side of circuit breaker and ground other lead. Circuit breaker is located at left shroud. If tester does not light, there is an open or short circuit in feed circuit to breaker.

b. To check circuit breaker, disconnect the output feed wire (the wire opposite the power source feed to the breaker) from the breaker and with light tester check terminal from which wire was disconnected. If tester does not light, circuit breaker is inoperative.

### 2. Checking Feed Circuit Continuity at Window Control Switch

a. Connect one light tester lead to feed terminal of switch block and ground other tester lead to body metal. See Figure 8-4.

b. If tester does not light, there is an open or short circuit between switch and power source.

### 3. Checking Window Control Switch

a. Insert one end of a #12 gauge jumper wire to the switch feed terminal and the other end to one of the motor lead terminals in the switch block. Repeat this check on the remaining motor lead terminal. See Figure 8-5.

b. If the motor operates with the jumper wire, but does not operate with the switch, the switch is defective.

### 4. Checking Wires Between Door Window Switch and Door Window Motor

a. Disengage harness connector from window motor connector. The thumb release on the

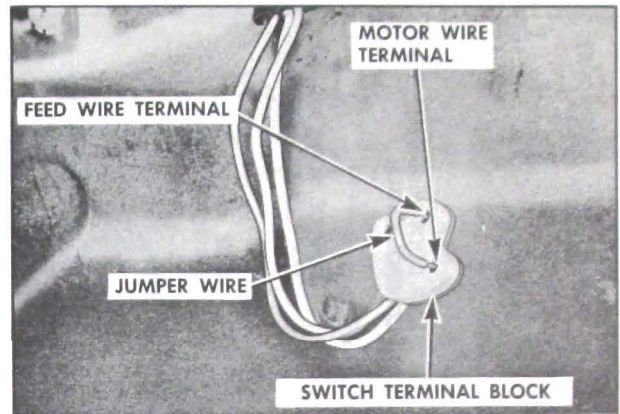


Figure 8-5—Checking Window Control Switch

harness connector must be depressed before it can be disengaged from the motor.

b. Insert one end of a #12 gauge jumper wire to the switch feed terminal and the other end to one of the motor lead terminals in the switch block. See Figure 8-5.

c. With light tester check for current at terminal being checked. If tester does not light, there is an open or short circuit in the harness between the control switch and motor connector. See Figure 8-6.

### 5. Checking Door Window Motor

a. Check window regulator and channels for possible mechanical bind of window.

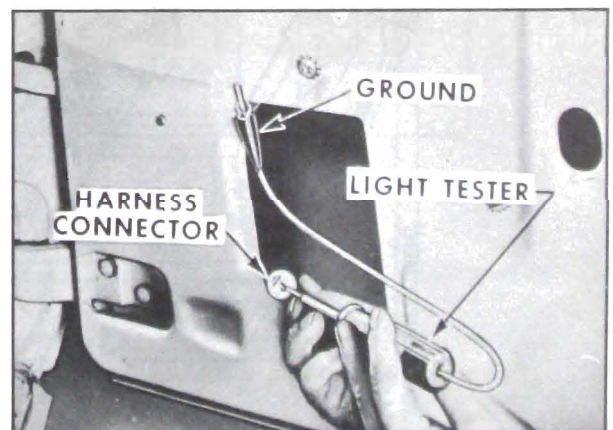


Figure 8-6—Checking Circuit Between Switch and Motor

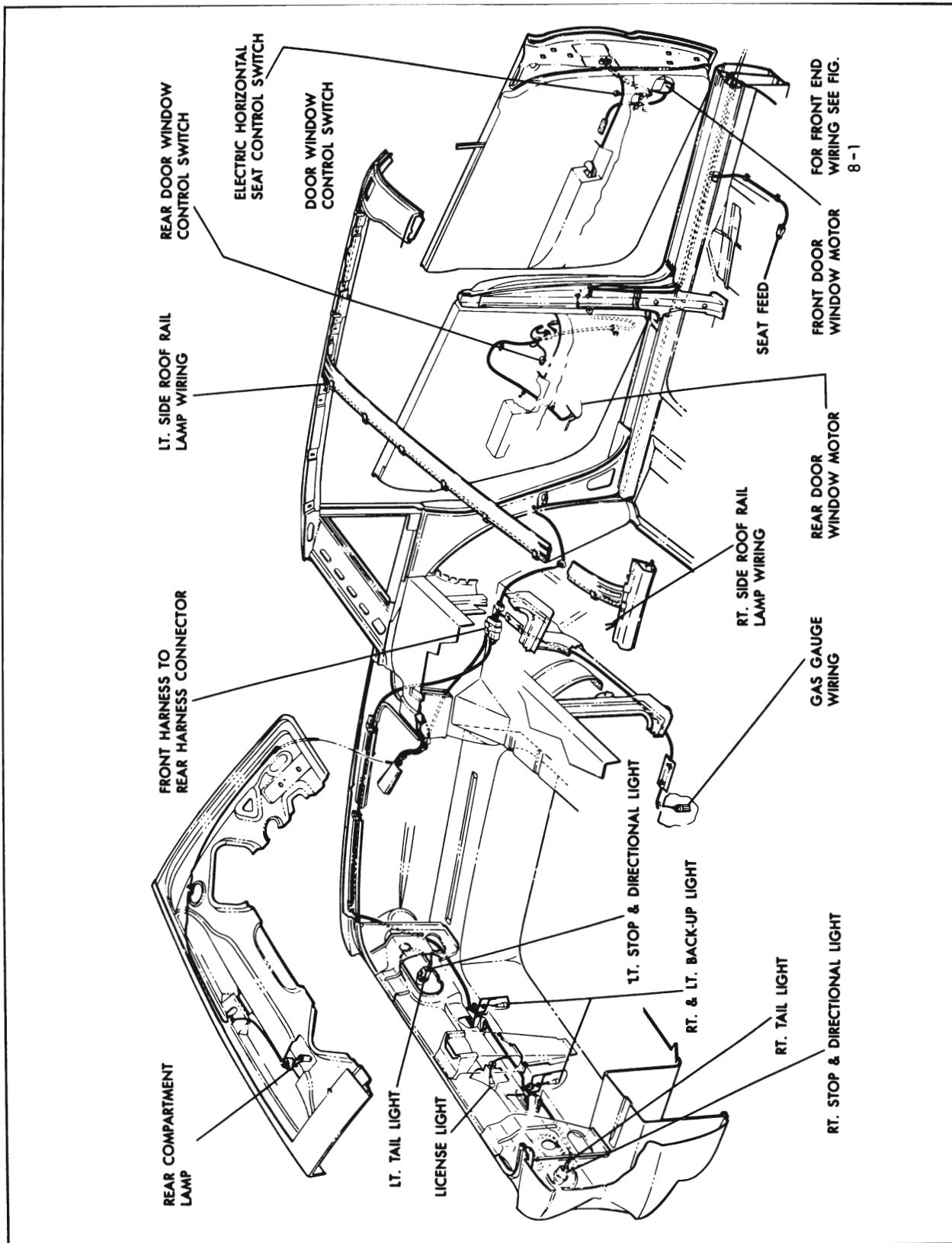


Figure 8-7—Power Window Circuit Diagram

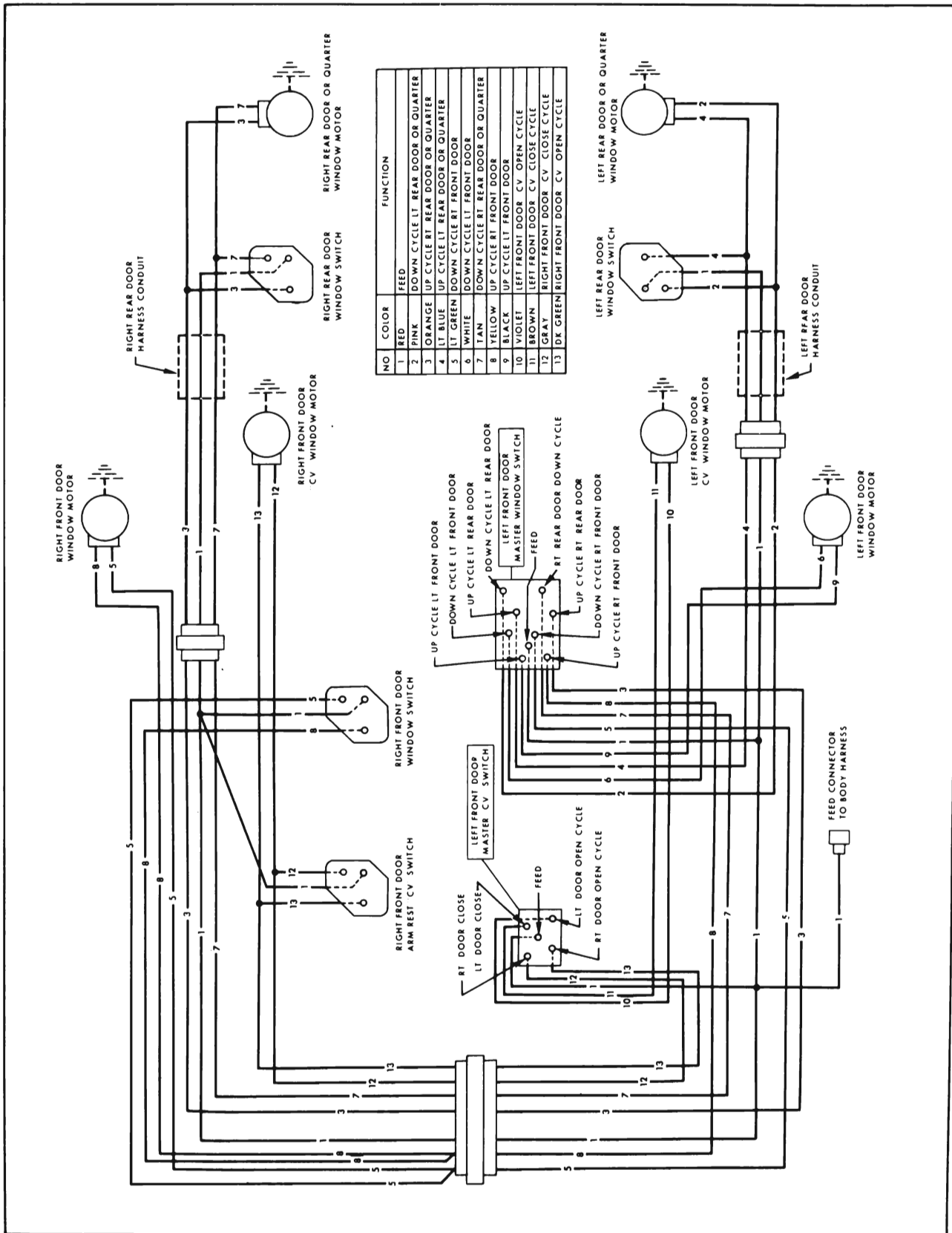


Figure 8-8—Power Window and Vents Diagram

b. Check attachment of window motor to inner panel to insure an effective ground.

c. Connect one end of a #12 gauge jumper wire to the power source and the other end to one of the terminals on the window motor.

d. If the motor fails to operate with a jumper wire, the motor is defective and should be repaired or replaced as required. Check the other motor lead in the same manner.

#### 6. Typical Failures of Power Window

The following typical failures and corrections have been listed as an aid for eliminating electrical failures in the power window electrical circuit. It should be noted that multiple failures in the circuit may lead to a combination of conditions, each of which must be checked separately. See circuit diagram shown in Figures 8-7 and 8-8.

CONDITION AND CAUSE	CORRECTION
<p>a. NONE OF THE WINDOWS WILL OPERATE.</p> <ol style="list-style-type: none"> <li>1. Short or open circuit in power feed circuit.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check circuit breaker operation.</li> <li>2. Check relay operation at left cowl.</li> <li>3. Check feed connector to power harness beneath instrument panel.</li> </ol>
<p>RIGHT REAR DOOR WINDOW DOES NOT OPERATE FROM MASTER CONTROL SWITCH ON LEFT FRONT DOOR OR FROM CONTROL SWITCHES ON RIGHT REAR DOOR. LEFT DOOR WINDOW OPERATES.</p> <ol style="list-style-type: none"> <li>1. Short or open circuit between right rear door harness and power window front harness.</li> <li>2. Short or open circuit in affected window control switch or window motor circuit.</li> <li>3. Possible mechanical failure or bind in window channels.</li> <li>4. Defective window motor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the feed circuit wires for possible short or open circuit.</li> <li>2. Check harness connectors beneath outer ends of instrument panel for proper installation.</li> <li>3. Check wires in power window front harness for possible short or open circuit.</li> <li>4. Check operation of rear door window control switch.</li> <li>5. Check circuit from window control switch to window motor for short or open circuit.</li> <li>6. Check window regulator and channels for possible mechanical failure or bind.</li> <li>7. Check operation of motor.</li> </ol>
<p>RIGHT DOOR WINDOWS WILL OPERATE FROM LEFT DOOR MASTER CONTROL SWITCH BUT WILL NOT OPERATE FROM RIGHT DOOR CONTROL SWITCHES. LEFT DOOR WINDOWS OPERATE.</p> <ol style="list-style-type: none"> <li>1. Open or short circuit in front harness feed wire circuit.</li> </ol>	<ol style="list-style-type: none"> <li>1. Follow up feed wire in front harness for possible short or open circuit.</li> </ol>

#### c. Power Operated Ventilators

The power ventilators are operated by a rectangular shaped 12 volt series wound motor with

an internal circuit breaker. The ventilator harness consists of one section routed from the right to the left door beneath the instrument panel. See Figure 8-9 for circuit diagram.



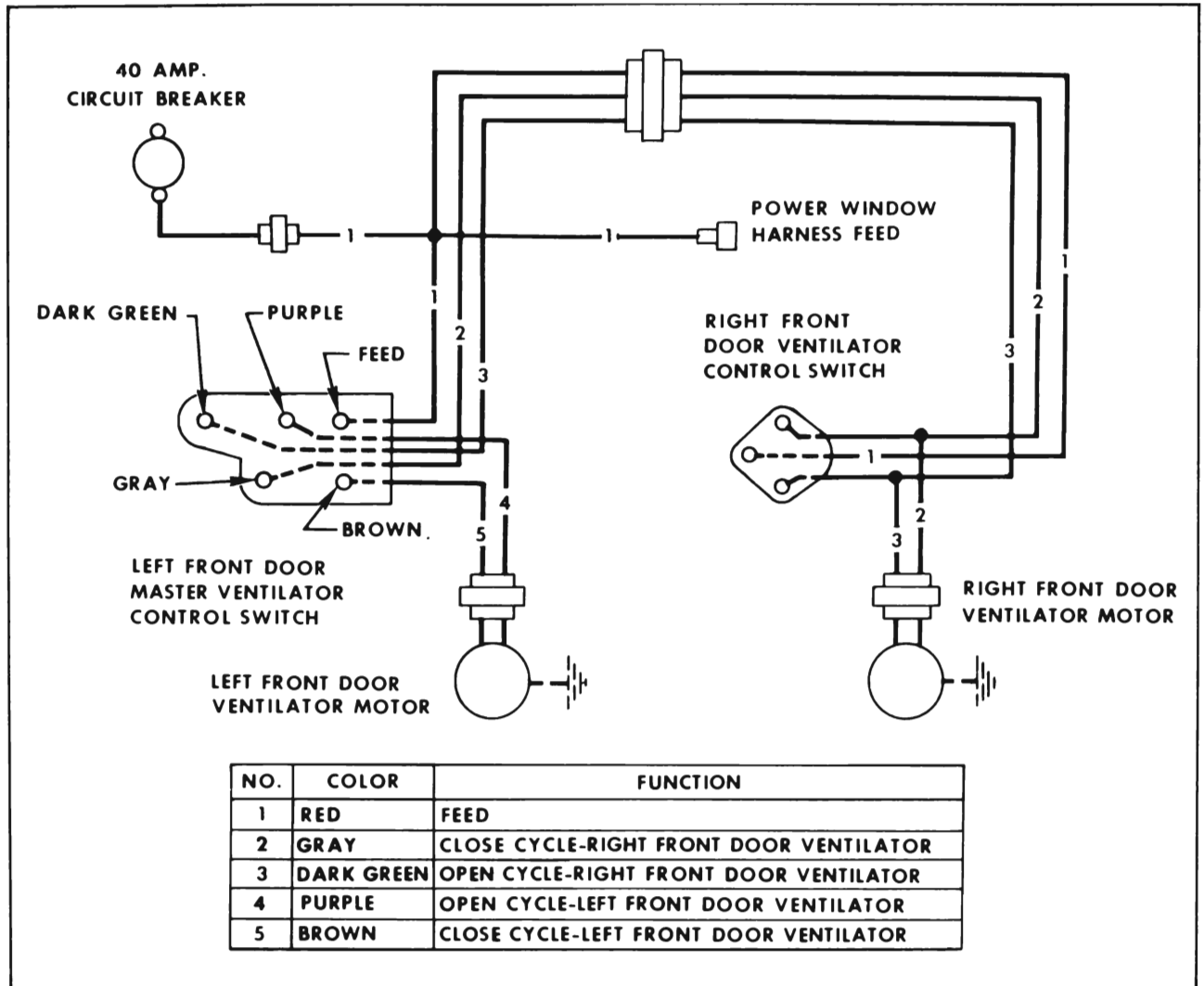


Figure 8-9—Power Ventilator Circuit Diagram