

5 POWER WINDOWS

OPERATION

Power to operate the windows is supplied from the battery terminal of the starter relay (Fig. 10). The lead wire from the starter relay goes to the window relay mounted on the engine side of the cowl panel. One lead from the window relay goes to a 30 ampere circuit breaker under the instrument panel mounted on the left air intake duct. The other lead from the window relay is connected to the accessory terminal of the ignition switch. When the ignition switch is turned on, current flows from the switch to the window relay causing its relay contacts to close, thus providing current through the 30 ampere circuit breaker to the window control switches.

As the window relay is actuated through the accessory terminal of the ignition switch, the windows can only be operated when the ignition switch is in the "ON" or "ACC" position.

When a control switch is actuated, current is supplied to one of the motor field coils and to the motor armature. The motor will turn in either direction, depending on which field coil is energized. The circuit is completed by grounding the field coil and armature through a 15 ampere circuit breaker.

Each motor has its own ground circuit breaker. For the front door window motors, these circuit breakers are mounted under the instrument panel. They are grounded through the mounting bolt. The circuit breakers for quarter window motors are mounted to the floor panel near the quarter panel and ground through a mounting bolt.

TROUBLE SHOOTING

The troubles given here are those most commonly encountered in the power window system. Before making any of the checks, make sure the battery is fully charged, and turn the ignition switch to the accessory position.

ALL WINDOWS DO NOT OPERATE

1. Connect a voltmeter from the power terminal (yellow wire) of the power window relay to ground (Fig.

10). If there is no voltage at this terminal, continue steps 2 and 3. If there is voltage at this terminal, skip to step 4.

2. Connect a voltmeter from the battery terminal of the window relay to ground. If there is no voltage at this terminal, repair or replace the lead wire from the starter relay to the relay.

3. Connect a voltmeter from the ignition terminal (red wire) of the window relay to ground. If there is no voltage at this terminal, repair or replace the ignition switch or the wire (red) from the ignition switch to the relay. If voltage is available at both the red and black wire terminals, replace the relay.

4. Under the left side of the instrument panel, find the 30 ampere circuit breaker which is mounted on the air intake duct. It will have one red-blue band wire on one terminal and one yellow wire on the other terminal. Connect a voltmeter from the terminal with the red-blue wire to ground. If there is no voltage, check the other terminal. If there is voltage at the yellow wire terminal, but none at the red-blue band wire terminal, replace the circuit breaker. However, if there is no voltage at the yellow wire terminal, repair or replace the yellow wire from the circuit breaker to the power window relay.

5. At the window control switches, connect a voltmeter from one of the red-blue wires to ground (Fig. 10). If there is no voltage, repair or replace the red-blue wire from the 30 ampere circuit breaker.

The power window and power seat electrical systems are connected through the same 30 ampere circuit breaker. If failure occurs in all the systems at the same time, the 30 ampere circuit breaker is probably the cause.

ONE WINDOW DOES NOT OPERATE

1. Operate the switch and listen for the noise of the motor running free. If the motor is running, it is not tightly mounted and has pulled away from its rubber coupling. Remount the motor.

2. Short out the ground circuit breaker of the inoperative window, and operate the switch. If the motor runs, replace the circuit breaker.

3. Slightly loosen the wiring connection at the inoperative window switch and, using a voltmeter with test prongs, check the switch for proper operation. **Be sure to check the bus bar connection between the front and quarter window switches for voltage.** Replace the window switch if it is defective.

4. If the switch operates properly, disconnect the armature wire, which is green in color, at the motor and check it for voltage when the switch is operated. If no voltage is available, check and repair or replace the wire from the switch to the motor.

5. If voltage is available at the green wire, check the yellow and the red wires from the switch to the motor for an open circuit. Repair or replace the wires if necessary.

6. Check the black wire on the inoperative door window motor, from the motor to the circuit breaker for an open circuit. Repair or replace the wire if necessary.

7. If voltage is available at the green, yellow, and red wires, replace the motor.

WINDOW OPERATES IN ONE DIRECTION ONLY

1. Check the switch for proper operation and if defective, replace the switch.

2. If the switch operates properly, check the red and yellow wires at the motor for voltage. If voltage is available, a field coil is open and the motor must be replaced.

WINDOW OPERATES OPPOSITE TO SWITCH

When a window goes up when it should go down, the wires are crossed at the motor. Check the wires for proper installation (Fig. 10).

WINDOW OPERATES SLUGGISHLY

1. Check the regulator and window runs for binding. Adjust the runs, repair and lubricate the regulator. Lubricate the runs with silicone lubricant.

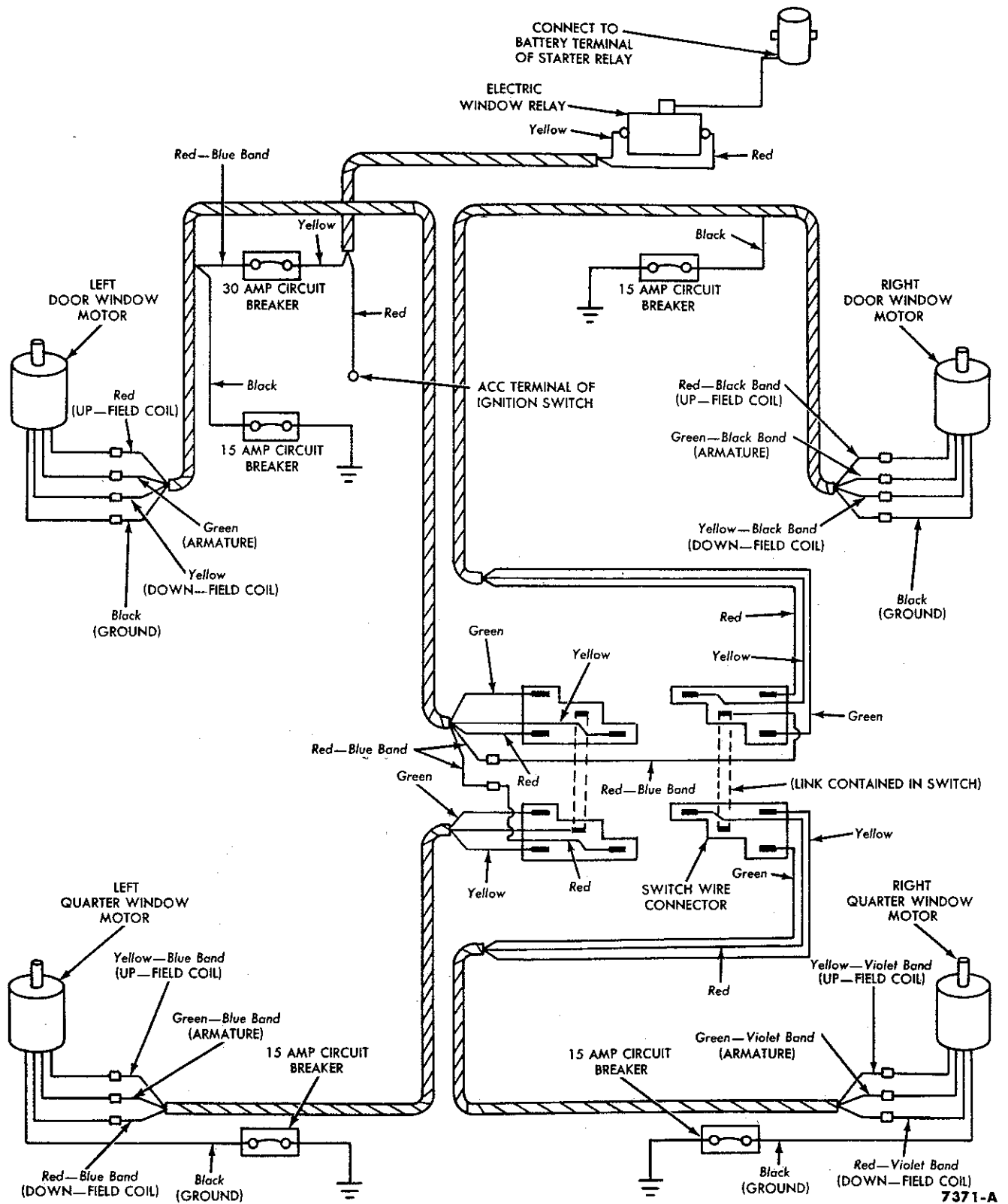


FIG. 10—Power Window Wiring System

2. Check for loose connections which will cause high resistance. Make sure paint is not insulating the ground circuit breakers from the body.

3. Disconnect the motor from the regulator. Connect an ammeter in series with the ground wire, and operate the switch. The motor no-load current draw should be 8-10 amperes at 12 volts. If the current draw is low, the motor brushes are worn or dirty and the motor must be replaced.

REGULATOR MOTOR REPLACEMENT

The power window regulator motor can be replaced without removing the entire regulator from the door or quarter panel. After the trim panel is removed, disconnect the motor wires at the bullet connectors, remove the motor mounting nuts and the motor brace, then pull the motor free of the rubber coupling.

POWER REGULATOR REPLACEMENT

To remove and install the power window regulator assembly, including the motor, follow the removal and installation procedures given for the manual window regulator. Con-

necting the wires presents no problem, as each wire is appropriately color coded.

If the regulator arm tension spring or the drive gear are the only parts of the regulator requiring replacement, they are easily replaced after the regulator assembly is removed.

CONTROL SWITCH REPLACEMENT

When a control switch requires replacement, snap out the control switch panel, containing the four window switches. Pull off the two

wire connectors from the side containing the defective switch, and remove the bus bar connecting the two switches. Press a small punch into the hole on the side of the switch housing and slide the retaining clip from the housing (Fig. 11). This will release the switch from the cover plate. Remove the switch.

To install the switch, press the switch into the plate and slide the retaining clip into position. Install the switch bus bar and the wire connectors. Then, press the switch assembly into the console opening.

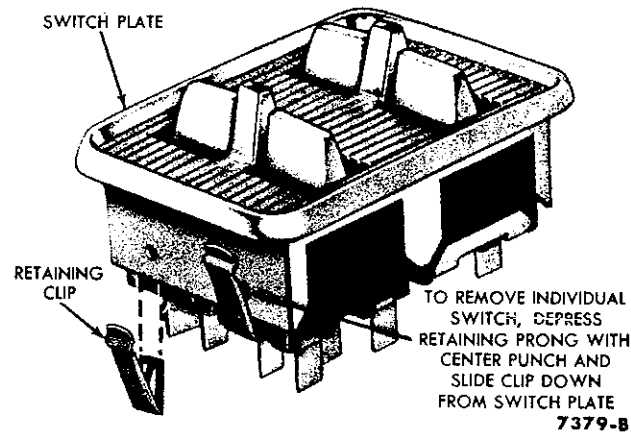


FIG. 11—Power Window Switch