

TM

SECURITY & CONVENIENCE COMPONENTS

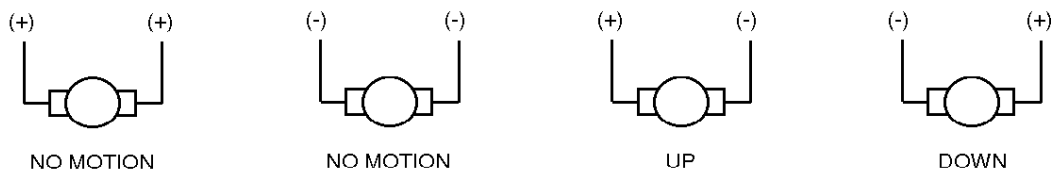
529T POWER WINDOW MODULE

The 529T Power Window Module can control two motors in one direction, or one motor in two different directions at different times. Some vehicle's switch systems will also require one or two outboard relays, P/N 525T or 610T. Some applications are rolling up two windows when a security system is armed, rolling down two windows when a remote control channel of a security system is activated, or closing and opening a power sunroof. The next three pages of this guide describe the switch/motor interface, the next two pages describe interfacing the 529T with a security system, and the last page discusses troubleshooting and lists some unusual vehicles.

NOTE: The module is only activated as long as the activation input(s) are grounded **and** the module "sees" a moving motor on its outputs. Bench tests are ineffective if there is no moving motor present on the outputs!

Before wiring the 529T, it is important to understand how a power window switch works.

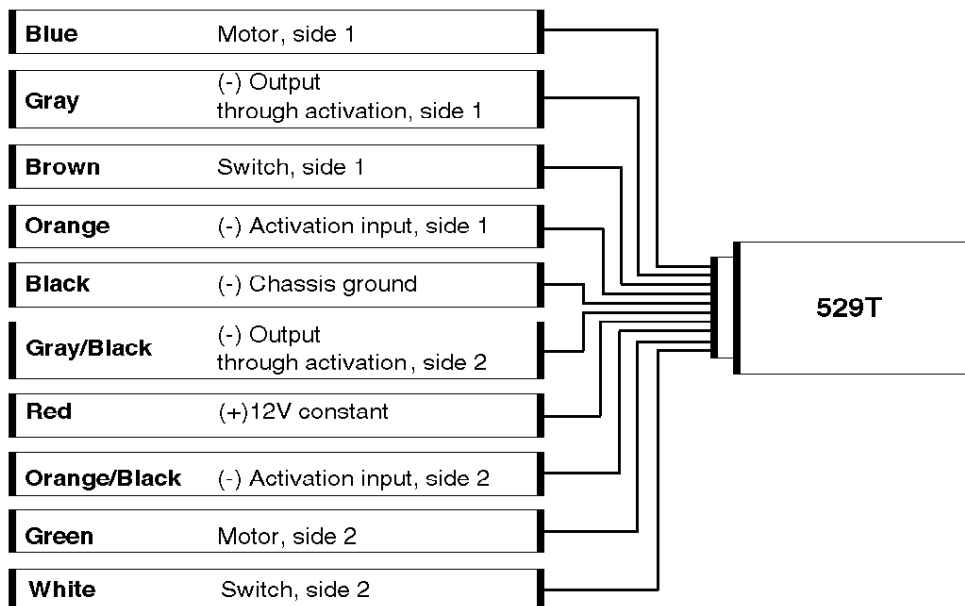
A 12VDC motor must have (+)12V on one of its leads and (-) ground on the other in order for it to operate. Usually, window switches are directly connected to the motor with two wires. The switch, while at rest, may connect both these wires to (-) ground, or both to (+) ignition, or leave both open, but all three types have one thing in common: When activated, the switch will be sending (+)12V on one wire and (-) ground on the other.



Which wire receives (+) and which wire receives (-) depends on which direction you want the motor to travel. The switch must be able to reverse these connections. Both door lock motors and window motors work on this principle, called **reversing polarity**. (Many vehicles reverse polarity to the door lock motors using relays, but few vehicles use relays in their window circuits.) The three most common reversing polarity switch types are listed in the following pages.

NOTE: Vehicles with "one-touch" or "automated motion" on any window switch will require that you interface with the motor leads between the one-touch auto-motion relay box and the motor. Frequently, the auto-motion relay module for the driver's switch is located inside the driver's door. Remember that the module outputs must always be connected directly to the motors, not to a relay or other module.

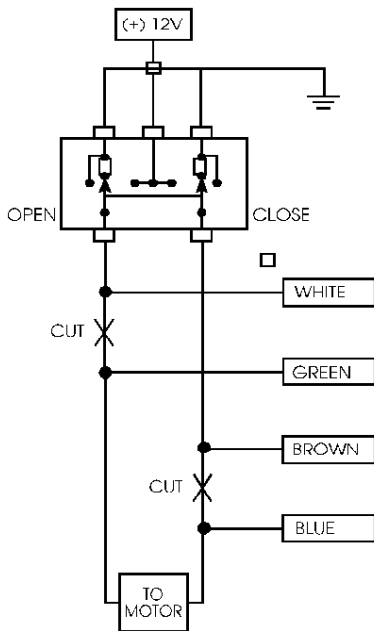
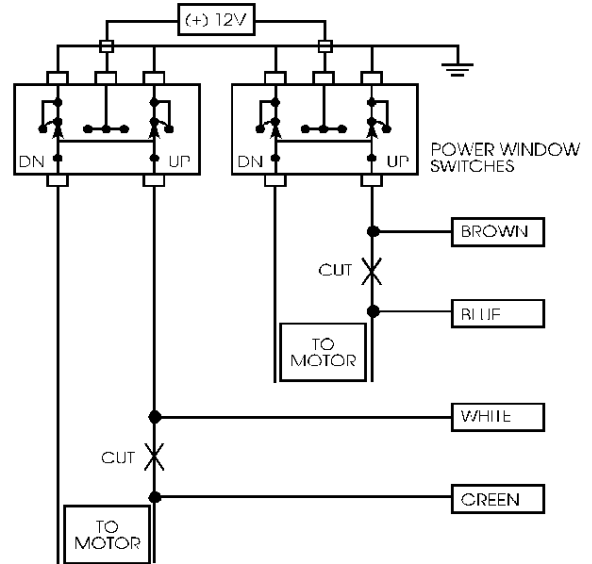
10-PIN CONNECTOR HARNESS WIRES (IN ORDER):



TYPE A OUTPUTS REST AT GROUND

The window switch outputs rest at ground. When the switch is not being used, both wires will show ground when tested. One wire is connected to (+)12V when the switch is in the up position, and the other is connected to (+)12V when the switch is in the down position. This is the most common type for domestic (except Camaro/Firebird and 1992 Corvettes) and Asian vehicles.

NOTE: Switch side and motor side cannot be determined unless the circuit is opened by cutting one or both wires. The switch side is the side that remains grounded after the wire is cut, **and** switches to (+)12V when the switch is activated in the desired direction. Testing at the switch is recommended, although connections can often be made in the kick panel for all but the driver's side wires.



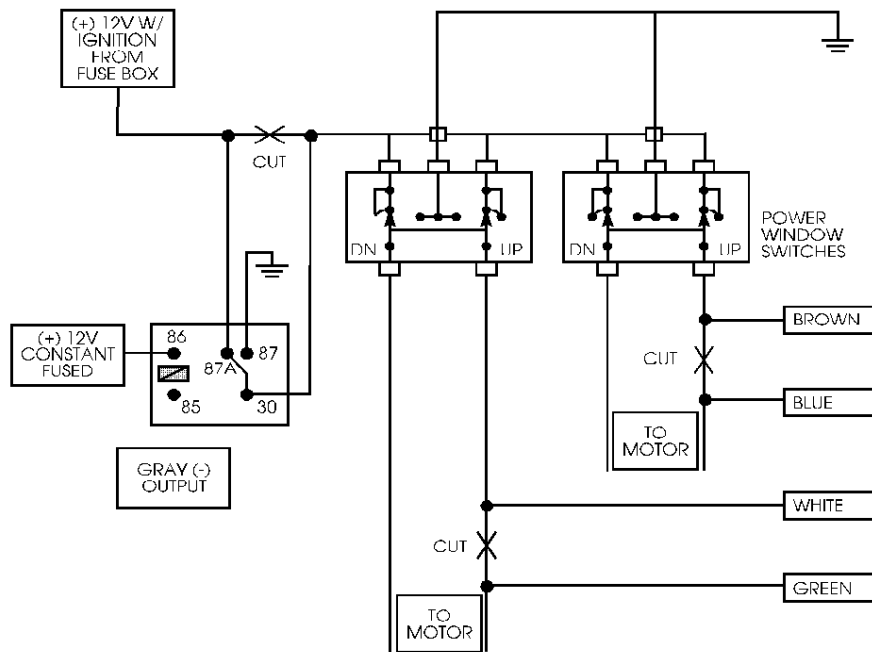
This shows how to wire a Type A-switched-sunroof to close when the security system is armed, and to open with an auxiliary channel. Remember, many sunroof switches drive relays which in turn drive the motor, and so you must often locate the motor leads directly. If the sunroof is not Type A, add relays as shown in the following pages.

TYPE B OUTPUTS REST AT IGNITION

The switch outputs rest at (+)12V with the ignition switch on. This type of switch is very common in Mercedes, Audi, BMW, and other European vehicles, as well as the 1992 Chevrolet Corvette. The switch outputs are grounded with the ignition switch off, and show (+)12V with the ignition switch on.

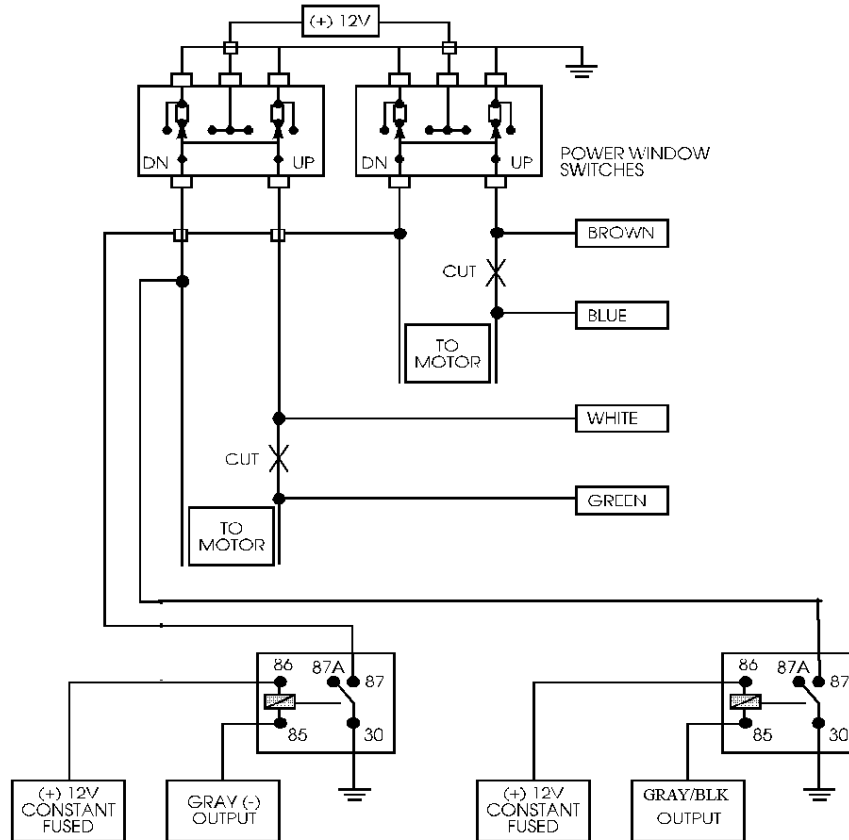
IMPORTANT: This system will have a switched wire that goes to (-) ground as the switch is operated, and another wire which remains at (+)12V with ignition. The wire you want to cut and interrupt is the wire that does not change state, but remains at (+)12V ignition when the switch is operated in the desired direction. Remember that using the relay as shown in the diagram effectively changes the Type B circuit to a Type A circuit during module activation.

NOTE: At least one 525T/610T relay is required, but if the windows are independently fused, one relay per fused ignition supply is required to avoid overloading the factory window circuit's fuses and wiring.



TYPE C OUTPUTS REST OPEN

Switch outputs rest open, and both (+)12V and (-) ground are switched for each direction of operation. This type of circuit requires two 525T/610T relays to supply ground to each motor circuit. This type is rare, but is found in the Chevrolet Camaro/Pontiac Firebird 1983-up.



OPERATION MODE

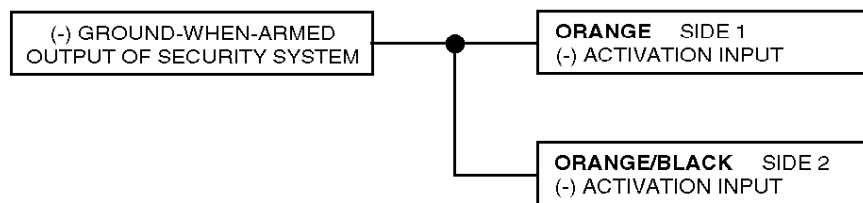
The 529T can operate in either controlled-duration or full-travel mode.

Controlled-duration operation lets the operator stop the window travel manually if desired. Controlled-duration mode works well with DEI's channel three, or any (-) output which remains active throughout transmission. It can also be used on the (-) ground-when-armed outputs of many security systems to roll up the windows when the system is armed.

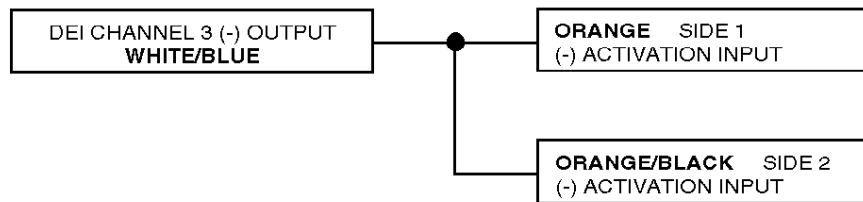
Full-travel mode, once initiated, operates the window until full travel is reached (when the safety circuit shuts down the unit). Full-travel mode allows operation on pulsed (-) outputs such as DEI's channel two. To roll the windows up when the system is armed, a (-) door lock output can be used to activate the 529T in this mode.

CONTROLLED - DURATION OPERATION

To roll both windows up when the system is armed using a (-) ground-when-armed output:

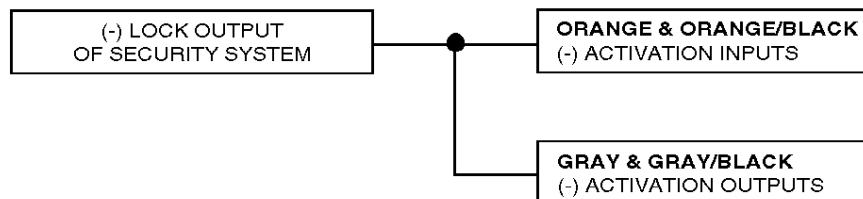


To roll down both windows with a duration-controllable output (such as DEI systems' channel 3):



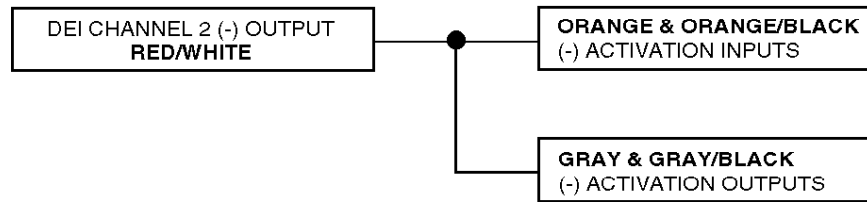
FULL - TRAVEL OPERATION

To roll both windows up when the system is armed using a (-) ground pulse door lock output:



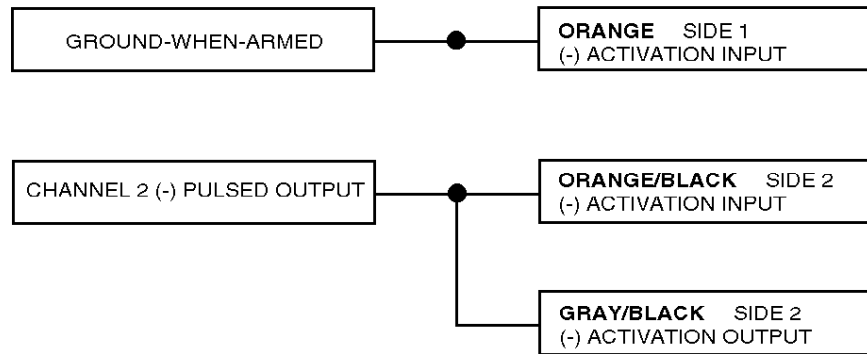
Note: If (-) lock output of security system is tied directly to the vehicle's lock circuit, isolate with a IN4004 diode.

To roll both windows completely down with a pulsed output (such as a DEI systems' channel 2):



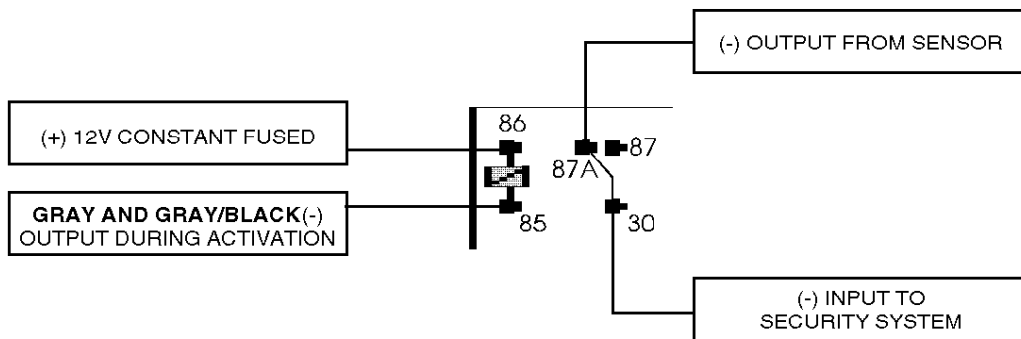
COMBINING BOTH MODES

To activate side 1 when the system is armed, and side 2 with channel 2 (or another pulsed channel):



SENSOR BYPASS DURING OPERATION

Occasionally, the security system may trigger as the windows are moving, or when they reach the top of their track. This is usually due to the shock sensor, or occasionally to a field sensor. Once you have identified the sensor involved, use a 525T or 610T relay as shown to disconnect its trigger output lead as the windows are moving.



TROUBLESHOOTING

The windows do not move, and the 529T's fuse blows.

The switch side and motor side connections may be reversed. Always make these determinations while using the master switch (if there is one), and cut both wires before testing if any uncertainty exists.

The window moves an inch or so, and stops.

Does the window in question have automated full-travel motion? In other words, if you tap the switch in the down direction and immediately release it, does the window roll completely down? If so, go directly to the motor and trace the motor's leads back. You will probably find a module in the door that controls the automation. You must connect to the leads between the motor and the module, not between the module and the switch.

One window works fine, but the other window doesn't move at all.

Reverse Side 1 and Side 2. Does the problem change sides? If so, check the 529T. If not, double-check the switch side/motor side identification on the side affected.

In a Mercedes-Benz, the 529T works fine, but one of the factory window fuses blows whenever both factory switches are used at the same time.

One relay has been used on a two-fuse system. See Type B instructions for using two relays and interrupting the two fused ignition feeds separately.

The 529T is controlling a sunroof. The sunroof only moves an inch or so before stopping.

Many sunroofs use low-current switches to control relays. The 529T must drive a motor directly, not a relay!

The 529T closes the sunroof completely, but then tilts up to vent at the rear. Connecting to the motor directly has bypassed the factory limit switch that prevents this from happening when using the factory control switch.

The factory limit switch can be used to stop the 529T. The 529T must be used in full-travel mode, however, and a 452T pulse generator and a 525T/610T relay is required. Use the 452T to send a pulse when the limit switch sends its constant ground signal. Use that pulse to trip a relay that disconnects the orange (-) activation wire and the gray (-) while-activated output, thus stopping the 529T without using the safety circuit.

I can't find any wires on the switch that seem to work.

Some new vehicles are using unusual control systems. On the following vehicles, 529T installation involves running wires into each door. Some of these vehicles have their own automatic-closing features.

1991/1992 Nissan Maxima, Pathfinder (Maxima uses two different systems, only one is a problem; Pathfinder switches drive relays below the glove box).

Volkswagen Corrado, Passat.

Various 1992 Mercedes-Benz and BMW models.

IMPORTANT! Some vehicles have factory auto-close systems. Many of these systems are activated by holding the key lock in the door to the lock position, and do not have safety systems built in. We recommend always using a 529T for maximum safety.