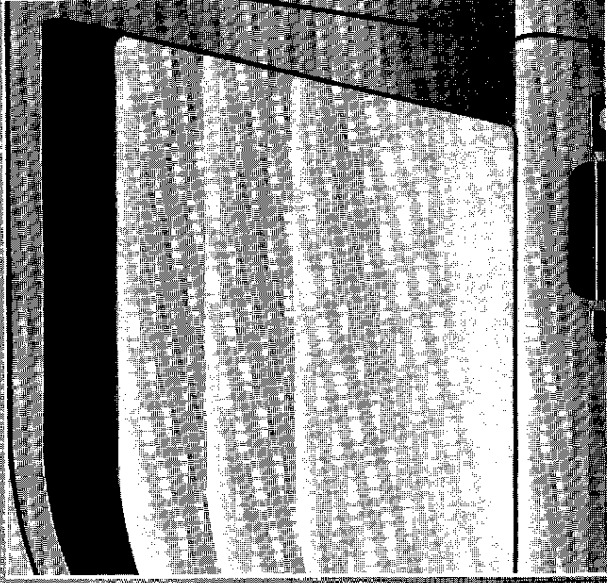


CLIFFORD



SmartWindows II
Installation Manual

IMPORTANT INFORMATION

NOTE: If the vehicle (e.g., a BMW or Jaguar) has computer controlled windows (labeled "5-volt System"), you must install the Clifford MultiPurpose Controller™ (#60-123) instead of SmartWindows II. Although the MultiPurpose Controller does not incorporate all the SmartWindows II features, it will automatically close the windows and sunroof when the alarm is armed.

1. Mount the SmartWindows II control unit in the passenger compartment. DO NOT mount it in the engine compartment.
2. DO NOT disconnect the battery cables. Make battery connections by removing the lug nut from the cable clamp without detaching the clamp (see diagram 1).
3. Turn off the interior light or remove the dome light fuse(s) before starting the installation. Leaving the door(s) open will drain the battery.
4. Make all connections with the supplied butt connectors. DO NOT twist wires together. DO NOT use wire nuts or "scotch lok" connectors.
5. **Keep extensions as short as possible.** Use the same gauge wire for short extensions. Use larger gauge wire for long extensions. DO NOT use speaker wire.
6. Do not mount components or route wires near hot or moving vehicle parts. Clifford components must not impede vehicle servicing or operation.
7. **To verify SmartWindows II wiring, or in the unlikely event of a malfunction, the male and female connectors can be plugged together to restore original window operation.**
8. Route the SmartWindows II RED and BLACK wires directly to the battery.

Wiring Description

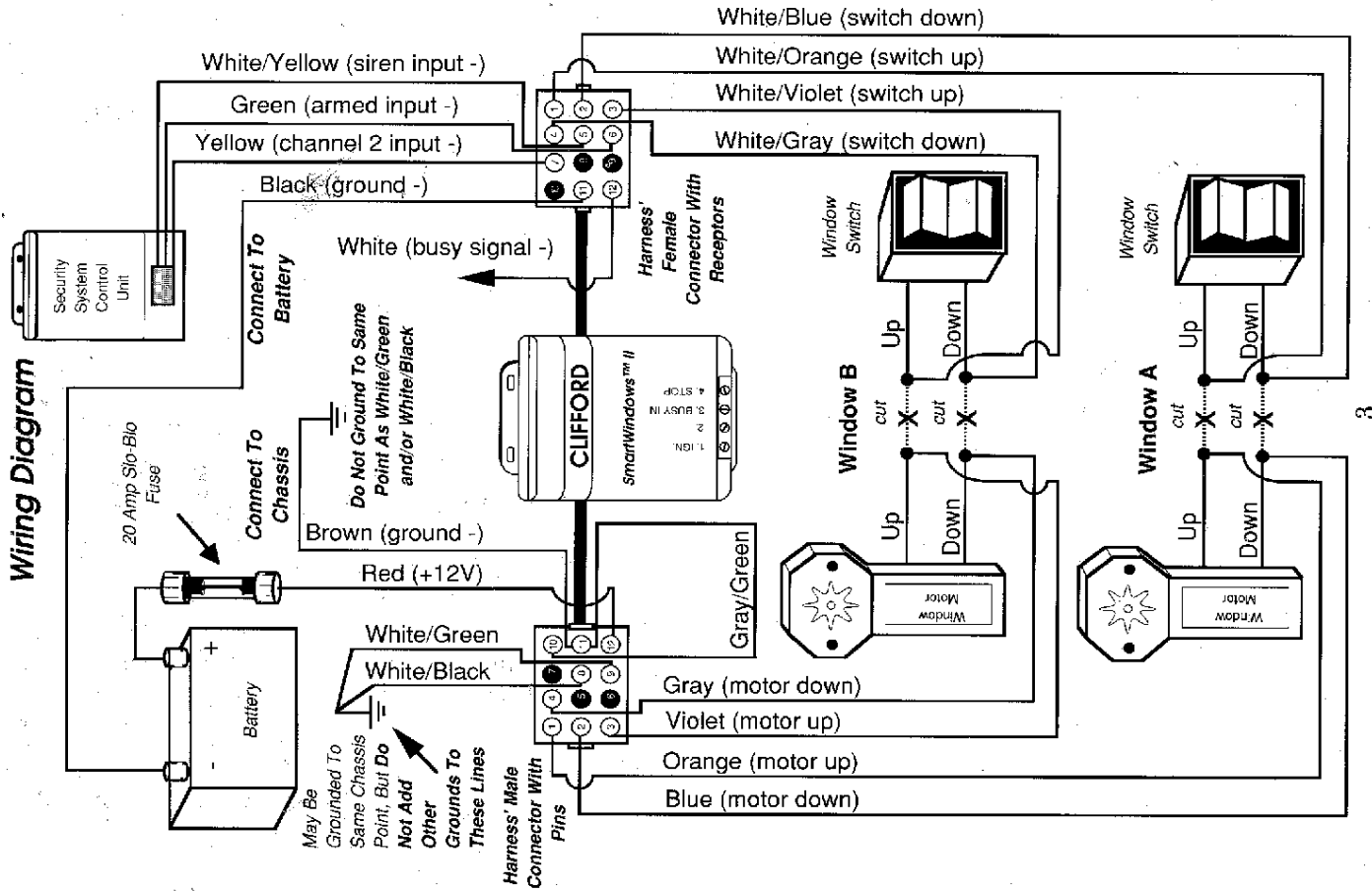
Wire color

| | |
|--------------|-------------------------------------|
| RED | Battery Positive (+) Terminal |
| BLACK | Battery Negative (-) Terminal |
| BROWN | Chassis Ground (-) |
| WHITE/BLACK | Chassis Ground (-) |
| WHITE/GREEN | Chassis Ground (-) |
| GREEN | Alarm's Armed Signal Output (-) |
| YELLOW | Alarm's Channel 2 Output (-) |
| WHITE/YELLOW | Alarm's Siren Output (-) |
| WHITE | Busy Signal Input (SmartWindows II) |
| WHITE/BLUE | Switch Output "Down" (Motor A) |
| BLUE | Motor Input "Down" (Motor A) |
| WHITE/ORANGE | Switch Output "Up" (Motor A) |
| ORANGE | Motor Input "Up" (Motor A) |
| WHITE/GRAY | Switch Output "Down" (Motor B) |
| GRAY | Motor Input "Down" (Motor B) |
| WHITE/VIOLET | Switch Output "Up" (Motor B) |
| VIOLET | Motor Input "Up" (Motor B) |

Terminal Strip Description

| Term. # | Purpose | Type of Input |
|---------|--|-------------------------|
| 1 | For any vehicle with a negative polarity window switch. | Ignition Input |
| 2 | Not Used. Do Not Connect. | |
| 3 | Any time you install more than one SmartWindows II module in the same vehicle. | Busy Input for 2nd unit |
| 4 | For any vehicle with a 3-position ("Open," "Close" and "Tilt") power sunroof switch. | Stop Input |

Wiring Diagram



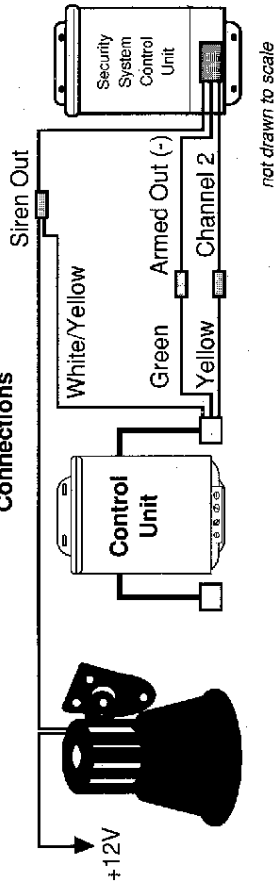
Security System Connections

To get the full feature capabilities of SmartWindows II, the alarm must have a channel 2 output.

1. Connect the SmartWindows II GREEN wire to the security system's armed signal output (-).
2. Connect the SmartWindows II YELLOW wire to the security system's control unit channel 2 output (-).
3. Connect the SmartWindows II WHITE/YELLOW wire to the security system's negative (-) siren output.

Diag. 3

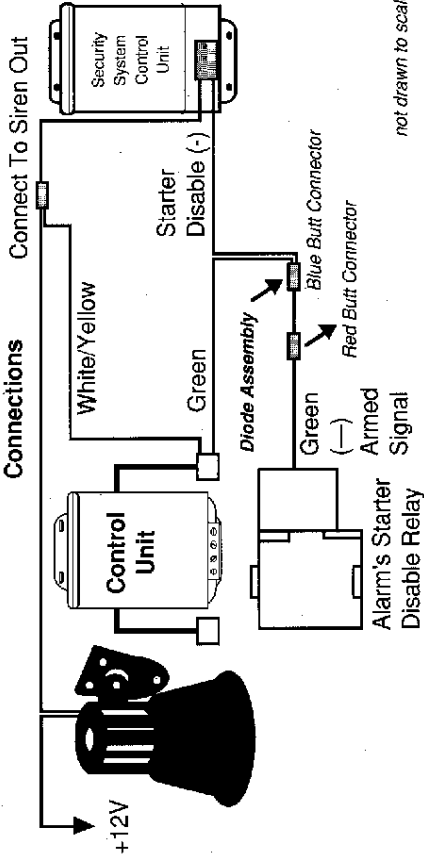
Security System Connections



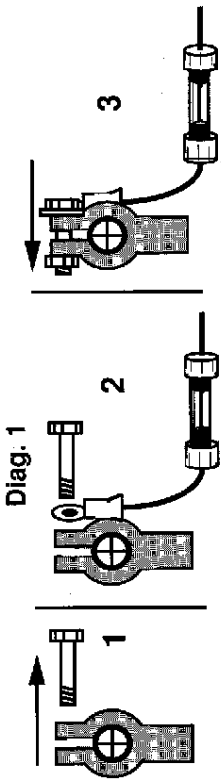
NOTE: If the alarm does not have a **SEPARATE armed signal output**, use the supplied diode assembly and the alarm's wire that goes to the starter relay (diag. 4).

Diag. 4

Engine Disable Relay Connections



not drawn to scale
continued



Power and Ground Connections

1. Route the RED and BLACK wires to the vehicle battery through a grommet in the firewall.
2. Connect the SmartWindows II RED wire to the supplied in-line fuse holder.
3. Connect the fuse holder to the vehicle battery positive (+) terminal but **DO NOT** disconnect the battery cables. Make battery connections by removing the lug nut from the cable clamp without detaching it (as shown in diagram 1).
4. Connect the SmartWindows II BLACK wire to the battery negative (-) terminal.

NOTE: DO NOT connect the BLACK wire to chassis ground.

5. Connect the SmartWindows II BROWN wire to chassis ground.

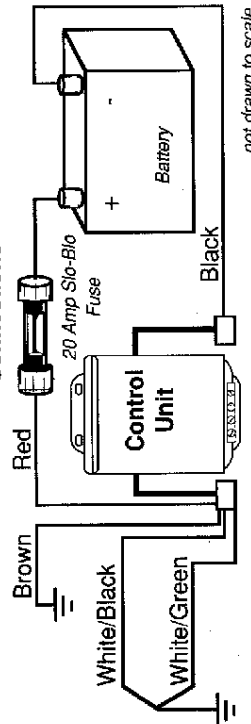
NOTE: DO NOT connect the BROWN wire to the BLACK wire.

6. Connect the WHITE/BLACK and WHITE/GREEN wires to another chassis ground.

NOTE: The WHITE/BLACK and WHITE/GREEN wires may be grounded to the same point, but **DO NOT** add other ground wires to these lines.

Diag. 2

Power/Ground Connections



not drawn to scale

NOTE: If the alarm has no armed signal output OR starter disable relay, an interface module (#60-523) is required.
The alarm system MUST have doorlock outputs in order to work with this interface.

How to Determine Window Switch Polarity

1. Locate the wires going to the vehicle's power window motor.
2. Turn the ignition on.
3. Connect the clip of the test light to ground.
4. Probe the wires **without pressing** the power window switch.
5. If the test light illuminates, press the power window switch. If the test light **then goes out**, it is a **negative polarity** switch. Go to the *Terminal 1* instructions below.
6. If the test light does not illuminate, then the switch is a **positive polarity** switch. Go directly to *Wiring Connections Between the Window's Motor and Control Switch*.

Terminal Strip Connections

The terminal strip has three usable inputs that allow for easy installation when any of the following situations exist:

- A German, Italian or other vehicle equipped with negative polarity window switches.
- If two or more SmartWindows II modules are to be installed in the vehicle.
- If the vehicle has a 3-position ("Open", "Close" and "Tilt") power sunroof switch.

Terminal 1: Ignition input for negative polarity switches

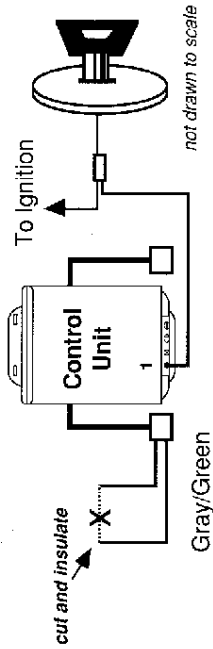
NOTE: Connect terminal 1 ONLY if the vehicle has a negative polarity switch (see How to Determine Window Switch Polarity, above). German (except BMW) and Italian vehicles are usually negative polarity.

- If the windows have a **negative** polarity switch:
1. Connect terminal 1 on the SmartWindows II module to the vehicle's ignition wire. (The ignition wire must retain +12V when the key is in the "ON" position).
 2. Cut and insulate (tape) both ends of the GRAY/GREEN wire.

continued

Diag. 5

Negative Polarity To Ignition



Terminal 2: Not used. Do not connect.

Terminal 3: Busy signal input connections

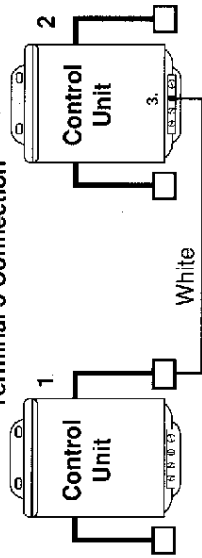
NOTE: Connect the "busy signal" input only if more than one SmartWindows II module is to be installed in the vehicle.

The busy signal input allows for the cascading of 2 or more SmartWindows II modules, i.e., if 4 windows in the vehicle are to be controlled by two modules. The busy signal allows the second SmartWindows II module to automatically initiate its control as soon as the first module has finished its controlling functions. To install two or more SmartWindows II modules in the same vehicle:

1. Connect the **WHITE** wire on the first SmartWindows II module to terminal 3 on the second module.
2. The **GREEN, WHITE/YELLOW** and **YELLOW** wires from both SmartWindows II modules must be connected together to the vehicle's security system.

Diag. 6

Terminal 3 Connection



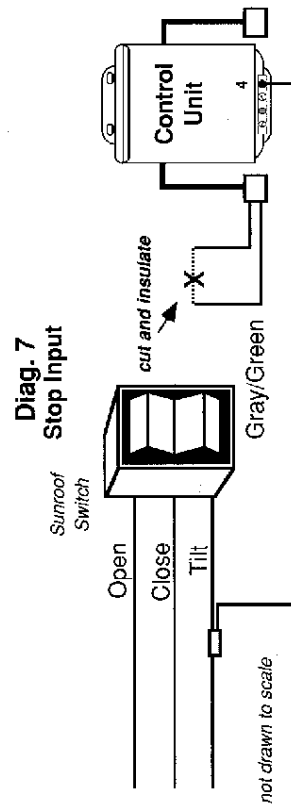
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Terminal 4: Stop input for power sunroof switch with "Tilt"

NOTE: Connect terminal 4 only if the SmartWindows II module is to control a power sunroof that operates in 3 positions ("Open", "Close" and "Tilt"). **The vehicle must have a limiting switch (external to the motor) that rests at ground when the sunroof is fully open and at +12V when fully closed.** If the switch rests at +12V when the sunroof is fully open and goes to ground when fully closed, a Trigger Converter (#60-515) must be used between the switch and terminal 4 of the SmartWindows II module.

- Determine which wire is the tilt output with the following procedure:
 - Connect the test light clip to +12V.
 - Turn the ignition on and probe the switch wires while pressing the switch to its tilt (up) position.
 - Note which wire illuminates the test light.
- Connect a lead from this wire to terminal 4.
- Cut and insulate (tape) both ends of the GRAY/GREEN wire.

NOTE: After the installation is complete, you must program the system. **The sunroof MUST be in the "OPEN" position before programming**



Wiring Connections

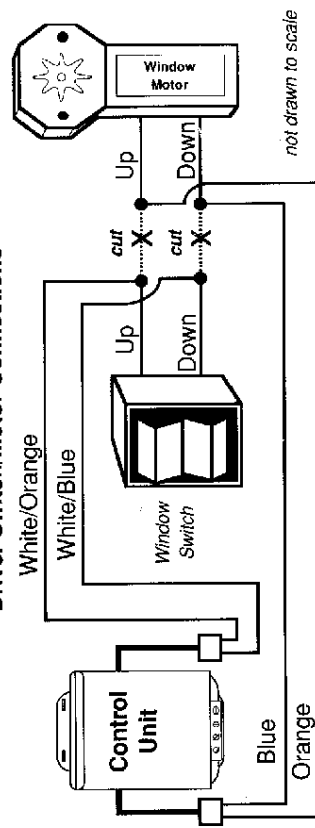
Between the Window's Motor and Control Switch
If the vehicle has power window switches located in the center console ONLY (no switches at the doors), then the SmartWindows II wiring connections for these windows can be made there, without having to make connections at the motors. **If the vehicle has power window switches located in each door,** it will be necessary to make the SmartWindows II wiring connections at each motor.

Driver's Side Wiring (Window A)

To wire the power window control switches, perform the following steps.

- Locate the two wires connected to the driver's side power window motor.
- Determine the "UP" and "DOWN" output wires with the following procedure:
 - Connect the test light clip to ground.
 - Turn the ignition on and probe one of the wires. If the test light illuminates, go to step 2c.
 - Press the switch to its "DOWN" position.
 - If the test light illuminates, then this is the window's "DOWN" wire. If not, it is the "UP" wire. (You may verify this by pressing the switch to its "UP" position).Record the wire colors.

Diag. 8
Driver Switch/Motor Connections



continued

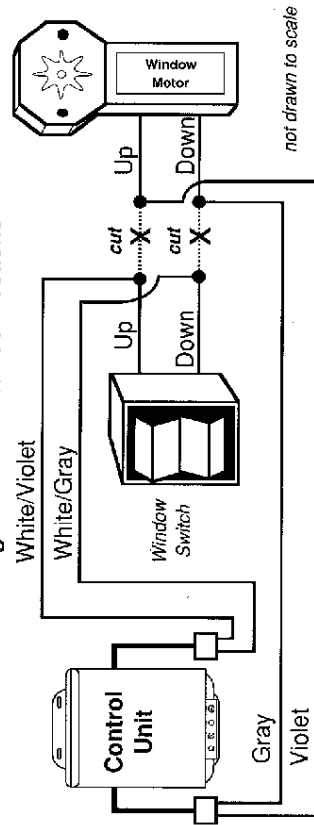
- e) If the test light illuminates while probing either wire **without** pressing the power window switch in either direction, then connect the clip to +12V.
- f) Press the switch to its "DOWN" position.
- g) If the test light illuminates, then this is the window's "DOWN" wire. If not, it is the "UP" wire. Record the colors.
3. Cut the "UP" wire.
4. Connect the WHITE/ORANGE wire to the **switch side** of the "UP" wire.
5. Connect the ORANGE wire to the **motor side** of the "UP" wire.
6. Cut the "DOWN" wire.
7. Connect the WHITE/BLUE wire to the **switch side** of the "DOWN" wire.
8. Connect the BLUE wire to the **motor side** of the "DOWN" wire.

Passenger Side Wiring (Window B)

Use the *Driver's Side Wiring* instructions on page 11 to determine the "UP" and "DOWN" wires.

1. Cut the "UP" wire.
2. Connect the WHITE/VIOLET wire to the **switch side** of the "UP" wire.
3. Connect the VIOLET wire to the **motor side** of the "UP" wire.
4. Cut the "DOWN" wire.

Diag. 9
Passenger Switch/Motor Connections



5. Connect the WHITE/GRAY wire to the **switch side** of the "DOWN" wire.
 6. Connect the GRAY wire to the **motor side** of the "DOWN" wire.
- ### How to Test the Switch/Motor Wiring Connections
1. Plug together the SmartWindows II male and female connectors (DO NOT connect the harness to the SmartWindows II module).
 2. Turn the ignition on.
 3. Use the power window switches to open and close the windows. If the windows do not function properly:
 - a) Make sure that the connections to the power window switches and power window motors are secure and correct. (Colors on the switch side match the colors on the motor side; WHITE/VIOLET to VIOLET, WHITE/BLUE to BLUE, etc.).
 - b) Verify that the SmartWindows II wiring harness connectors are firmly plugged together.
 - c) Verify that the pins on the connectors of the SmartWindows II wiring harness are not recessed, broken or otherwise not making contact with each other.

Final Connections and Automatic Programming

NOTE: If the vehicle is equipped with a power sunroof that is connected to SmartWindows II, it **MUST be in the "OPEN" position before programming.**

1. Turn the ignition on.
2. Connect the two molex plugs together.
3. Completely lower each window.
4. Disconnect molex plugs.
5. Connect SmartWindows II to the molex harnesses.
6. Tap the **passenger** window switch to initiate "TouchUp."
7. Allow the window to fully close.
8. Listen for a relay click in the SmartWindows II module (approximately 10 seconds).
9. Tap the **passenger** window switch to initiate "TouchDown."
10. Allow the window to fully open.
11. Repeat steps 6-10 for the **driver's** window **3 times**.
12. Turn the ignition off.

Interior Operation

SmartWindows II adds the following functions to the vehicle's power window operations while the ignition is on:

- The windows will automatically roll all the way up or down by just tapping the up/down switch once, *even if the ignition is turned off after initiating window movement.*
 - Window motion can be halted by tapping the up/down switch in either direction.
- The conventional standard window operations are controlled as usual by holding the switch instead of just tapping the switch. There will, however, be a slight lag in the window's motion after you press the switch. SmartWindows II **does not** interfere with standard window operations, it adds convenience to them.

Remote Control Operation

1. Press button I on the remote control. The windows will automatically close.
2. Pressing button I again will halt window roll-up.
3. If the alarm's control unit has a channel 2 output and button II is pressed **within 10 seconds after arming** with button I, the windows will open 1 to 2 inches to provide interior ventilation.
4. If button II is pressed **within 10 seconds after disarming** the security system with button I, the windows will open completely.

Optional Programming to Decrease the Ventilation Opening

The incremental window opening allows the owner to remotely open the window just a crack immediately after remote arming and Auto Roll-Up. This feature is activated if button II on the remote control is pressed within 10 seconds of remote arming. If for security reasons the owner desires to decrease the ventilation opening, perform the following procedure.

NOTE: Use extreme caution while performing this procedure.

1. Turn the ignition on, then completely open the windows.
2. Remove the SmartWindows II fuse for at least 1 minute, then re-insert it.

continued

3. Place a phone book or hard non-metallic object across the length of the driver's side window to halt the window's movement before it reaches a completely closed position. (A 2-inch thickness is recommended for the spacer. **Increasing** the thickness of the spacer will **decrease** the ventilation opening.)
4. While supporting the spacer across the top of the driver's side window opening, completely close then open the window **3 times**.
5. Repeat steps 3 and 4 on the passenger side window, except it is only necessary to completely close then open the window **once**.

If the vehicle's owner chooses to restore the SmartWindows II original ventilation opening, simply:

1. Turn the ignition on.
2. Remove the SmartWindows II fuse for at least 1 minute, then re-insert it.
3. Repeat steps 1-12 of Automatic Programming

Trouble-Shooting Guide

Problem: The windows do not operate.

Possible Remedy:

- Check:
1. The fuse.
 2. Power and ground connections.
 3. Plug the male and female connectors together to verify proper switch/motor wiring.

Problem: The windows do not close upon arming the security system.

Possible Remedy:

- Check:
1. Armed signal wire to starter relay does not have diode assembly installed properly.
 2. Siren input.

Problem: The windows do not open remotely for ventilation upon arming, nor completely upon disarming.

Possible Remedy:

- Check:
1. Be sure to press button II on the remote control within 10 seconds of arming or disarming.
 2. Check connection to the alarm's channel 2 output.

Problem: None of the above remedies correct the problem.

Remedy: Call Clifford Technical Support Hotline, (800) 444-4667.