

Frost Fighter®

Clear View Defroster Troubleshooting Guide



The modern automotive rear window defroster is a sophisticated surface heater - but delicate.

Rear Window Defrosters

The grid pattern of thin brown horizontal lines are made from a silver ceramic conductor which is silk screened, essentially painted, onto the inside of the rear window and then baked at high temperatures. These grids are connected to a high amperage circuit to provide rapid heating. The average defroster grid heats to approximately 85° F (29° C) and is very effective in clearing fog and ice from the rear window.



What The Parts Do

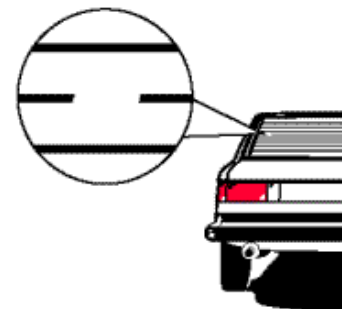
Rear window defrosters are relatively simple but it helps to understand all the components before repairing or replacing the defroster. The thin horizontal lines are the Grid Lines which do the heating when electrical current is applied to the system. The Main Power Side Bars run vertically on each side of the grid lines at each edge of the window. The metal Tab/Clips are normally bonded or soldered to the main power side bars. These tabs make the electrical connection to the defroster via the Main Connectors.

Why Defrosters Fail

Typically there are several ways rear window defrosters fail.

GRIDS

The thin brown horizontal lines can be broken or scratched away from the rear glass, causing the defroster to only partially defrost the rear window. This damage is repaired with the 2100 Frost Fighter Grid Kit. The smallest break or crack in the grid can cause the defroster to fail so careful visual inspection is needed. You can use a volt meter or a 2400 12 Volt Test Lamp as well.



TABS

Defrosters can also fail when the main power tabs are knocked off of the defroster's vertical side bars, causing a total defroster failure. If the defroster is not working at all then this is likely the problem. Separated power tabs are reattached to the defroster using the the 2000 Frost Fighter Tab Kit. When a tab comes off the defroster it can be lost or damaged along with the defroster connectors. Frost Fighter has replacements for these hard to find parts as well.

AGE

Some older defrosters lose their conductivity and become to highly resistive which inhibits their ability to conduct electrical current. These grids simply do not work even though 12-14 volts is present on the main power tabs and on the main power bar. The 2600 Frost Fighter Clear View Kits allow for a complete replacement of the defroster.



WINDOW TINT

When window tint is applied to the glass it comes in direct contact with the defroster and ultimately bonds to the heating element material. Removing the tint can separate small conductive particles from the heating elements causing an increase in resistance and defroster failure. Defroster lines can also be cut during installation. There are other problems that can crop up and these are covered later in this guide.

Defroster Grid Breaks

If the defroster clears only part of the rear window, it's usually a sign of a broken horizontal grid line. The first step in repairing this type of damage is to locate the break by visual inspection. The smallest break or crack can cause the defroster to fail. Be sure to have the work area well lighted.

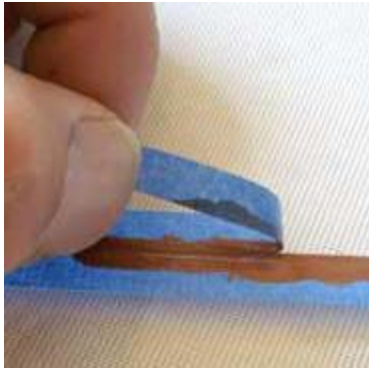
If the break is not obvious after close visual inspection, use a volt meter or 12 volt lamp to help locate the damage. Turn on the defroster and touch one meter lead to each of the wide vertical bars along the sides of the defroster. The reading should be between 12 and 14 volts. If the volt meter shows a negative reading, reverse the leads. A good tip is to use tin foil on the leads to protect the grids from further damage.



Now take readings at various places along the horizontal lines of the grid to isolate the break. When you pass over the break, the reading will change sharply. If you do not have a volt meter you can use the **2400 Frost Fighter Test Lamp**. A really good way to identify broken or "worn out" lines is to switch on the defroster in cold/damp or humid weather to identify which lines are working and which are broken or damaged.

Once a break or breaks in the defroster grid has been located, it's time to consider how to repair the problem. The **2100 Frost Fighter Grid Repair Kit** is designed to repair grid damage.

Use the grid kit to precisely mask off the damaged area of the defroster. There may be more than one break in the grid so locate all the damage before proceeding.



After the damaged areas have been located and masked, apply the repair material using the small cap brush supplied. Frost Fighter grid repair kits use a highly conductive silver polymer repair compound. This polymer bonds aggressively to glass and provides maximum electrical conductivity. The material dries to the touch in 10 minutes and is usable in thirty minutes. The conductor is color matched to the reddish brown colors used in automotive defrosters for nearly invisible repairs.

Removing the masking tape after the polymer dries leaves a uniform highly conductive defroster repair. It is important that repairs be done at normal room temperatures (or hotter) and that the conductor be allowed to fully cure before activating the defroster. Repairs can be completed even more quickly by applying heat to the repair. A lamp or hair dryer can be used to speed curing. Care must be used not to damage the glass or any tinting that may be on the window.

Defroster Tab Repairs

When the electric defroster grid does not work at all, small breaks in the horizontal grid can be eliminated as the problem. In this case, all of the horizontal defroster grid lines would need to be broken and it is very unlikely that this would happen without it being immediately obvious.

Begin trouble shooting a total grid failure by carefully inspecting the thick vertical side bars of the defroster. A break or scratch in one of these bars could cause the defroster to fail completely.

Use the **2100 Frost Fighter Grid Kit** to repair any small breaks or scratches in these critical side bars.



The more likely cause of a total defroster grid failure is a separated main power clip/tab. These critical tabs connect the defroster grid with the vehicle's high amperage defroster circuit and are located on each of the defroster grid's vertical side bars. These all important main power tabs can be knocked off of the defroster causing total defroster failure. Look for dangling wires near the sides of the defroster as a sure indication of this problem.

Once this problem has been identified the challenge becomes reliably reattaching the separated tabs without damaging the back glass or the existing defroster.

To reattach these separated tabs, pull the metal clip out of its connector and use the **2000 Frost Fighter Tab Repair Kit** to repair the problem. The kit uses a fast curing, two part conductive silver epoxy to reattach the main power tabs to the vertical defroster bars. Frost Fighter silver epoxy comes in two syringes for precise dispensing and is mixed at a simple 1:1 ratio.

Next dip the end of the tab into the adhesive making sure to thoroughly coat the area to be re-bonded to the defroster grid.



The simple Frost Fighter tab repair system is safe for all defroster tab configurations and will not cause additional damage to the defroster as soldering or other methods of tab repair can do. Replace the separated defroster tab over the area where it was originally separated and rock gently to seat the tab.

The highly conductive silver filled epoxy cures quickly and bonds aggressively to glass forming both the electrical and structural connection in one simple operation. Repairs are stable in 10 minutes but need 24 hours at 75° F. Tab repairs can be made in 15 minutes when heated and heat is a good idea!

New Tab/Clips and Connectors

If the clip/tab is missing use the **2300 Frost Fighter Uni-Clip Kit** to replace the lost or damaged part. If the connector is missing or damaged use the **2320 Frost Fighter Uni-Con Connector Kit** to replace the missing parts.



Clear View Defroster Kits

If your vehicle did not come with a defroster or the existing defroster is damaged beyond repair then the Frost Fighter Clear View kits may be your solution. **Frost Fighter 2600 Clear View Electric** Automotive Rear Window Defroster Kits are complete rear window heaters that are easy to install.

These kits match the look and performance of factory installed defrosters, melting snow, ice and clearing mist in seconds for safe winter driving.

Available in several sizes, each Frost Fighter Clear View kit includes strong self-adhesive metal heating elements on pre-spaced rolls for easy and accurate installation. These grid lines bond directly to the rear window and are color matched for that factory look with an unobstructed rear view.

Each kit comes complete with all the components needed to install a factory quality rear window defroster including fully illustrated instructions. Clear View kits include the little extras like an automatic timing switch which turns the defroster off after several minutes of operation for factory direct performance and looks. Clear View kits are the ultimate in performance and durability but do require some understanding of 12 volt systems and basic hand tools.



Bus Bar Cover w/ Tab



Relay and Switch

Other Defroster Problems

If the problem isn't a break in the defroster grid or a separated main power tab, begin by trying to turn the defroster system on.

If you hear the system's relay click and the monitoring lamp is on, you know you have current at least to the switch. Now test the voltage at the defroster power clips/tabs (on the defroster) using a volt meter or test lamp with one lead to each of the tabs. If you see 12-14 volts or the light is on then you have a good circuit and the problem is likely with the grid itself. Think separated tabs, scratches or old age.

Switch or Fuse?

If nothing happens when you try and turn the on defroster, check the fuse. Defroster grids draw lots of current and the fuse could easily be blown.

If the fuse checks out the problem may be the defroster "on" switch. Using your vehicles wiring diagram determine which wire runs power to the switch and which runs out to the defroster. If the switch only has two wires then this is easy.

If you jump the switch "in and out" wires and the defroster starts working the problem is the switch. If there is no power to the switch and the fuse checks out then the wire between the fuse and the switch is suspect.

Relay?

So you checked the fuse, defroster switch, main power tabs and the wiring but the defroster still does not work. It is time to take a look at the relay. Sometimes the defroster relay is easy to find and sometimes its under the dash. Some installations combine the timer and relay in one unit. As already mentioned you can normally hear the relay snap when the "on" switch is working. To check the relay be sure the coil side of the rely has continuity and there is power going to it. If this is the case, the relay and power supply are good. If you jumper the relay defroster wires (normally the heavier gage) and the defroster works then the problem is the relay.



Wiring?

If all this checks then the wiring going back to the defroster is suspect. Test the wiring, paying careful attention to the ground side. You can check this by placing the volt meter probes on each side of the wide vertical bars of the defroster grid and moving the negative lead to somewhere on the vehicle's body. If the reading starts at zero and then returns to normal when the lead is moved, the problem is a connection on the ground side of the grid circuit.

If you get a zero reading on the buss bars (and the defroster is on) then test directly on the metal tabs/clips. If its zero on the grid and 12.5 volts on the tab then there is a break in the tab/defroster junction as the base of the tab.

Warning: NEVER BYPASS THE TIMER OR RELAY PERMANENTLY AS YOU CAN OVER HEAT THE CIRCUIT AND POSSIBLY DESTROY YOUR GRID OR EVEN THE VEHICLE!

By using these tips and through careful troubleshooting, damaged rear window defrosters can be easily and economically repaired, saving hundreds of dollars in the process.

The Last Resort?

See our Frequently asked questions or contact Dr. Defroster.

[Frost Fighter Repair Kit FAQ](#) [Clear View Defroster Kit FAQ](#)

If you read through the following defroster troubleshooting guide and still have a defroster problem then our very own Dr. Defroster is standing (ok, more likely sleeping on the couch in the garage) by to help.

Email your defroster questions to the Doc. **[Email the Doc here.](#)**

[See our full online catalog here](#)

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