

## Window tint and tint removal for defrosters

Tint film removal can be the bane of rear window defrosters.

The defroster is made from a conductive paint silk screened to the surface of the glass then fired at high temperature. When tint is applied to the window it sticks to both the glass and the defroster and if removed can pull off the conductive material damaging the defroster sometimes irreparably.

Much depends on how the tint was removed. **Any experienced tint shop can remove the tint normally without damaging the defroster.** On occasion the tint is removed using a razor blade to separate the film from the glass taking the rear window defroster with it. Even if great care is taken to remove the tint and none of the horizontal heating elements or side buss bars are damaged the defroster can still be badly damaged or destroyed by tint removal as the conductive material is pulled from the glass by the tint.

### This is sometimes damage is hard to determine visually

Defroster materials use silver to deliver the electrical properties needed for heating the glass. A pigment is typically added to the silver defroster material to make the brownish red color typical of most defrosters.

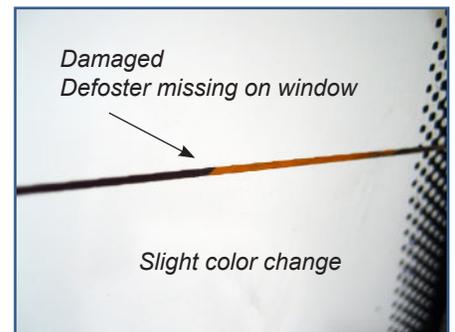
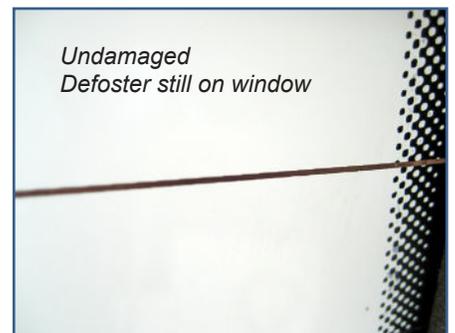
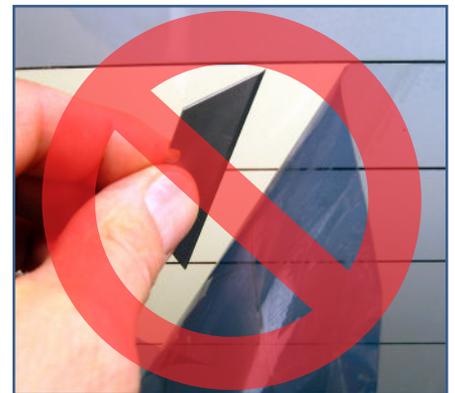
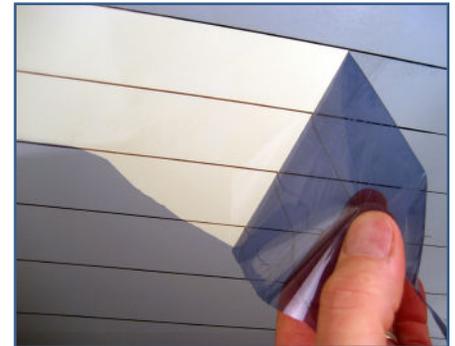
When fired the pigment leeches into the glass and becomes part of the glass so even with the conductive material missing there is still a rather solid line of non conductive pigment in the glass where the heating element was. This vestige of a line is part of the glass and cannot normally be removed.

Some older defrosters lose their conductivity and become resistive which inhibits their ability to conduct electrical current. Over the years with sun, cleaning or scratching some of the conductive silver particles leach out of the binder and come off the glass creating more and more electrical resistance until the defroster stops working all together.

Even if some of the conductive material is still on the window the smallest break will cause that element of the defroster to stop working. If all the heating elements have breaks then the defroster will not work regardless of the power on the buss bar tabs.

### There are several ways to test for this damage

Frist is the visual inspection. In good lighting take a close look at the horizontal heating elements. The conductive defroster material should be visible and blocks light transmission while the pigment in the glass typically allows light to pass through the glass.



In addition the defroster conductor has a physical presence on the glass so there should be a tiny bump on the glass surface that can be felt when moving your finger across the grid line. If everything is perfectly smooth then it's a good bet the defroster is missing.

## Testing with multi-meter or test light

The best way to trouble shoot defrosters is with a multi-meter or trouble light. The first thing to do is determine if the defroster is getting power. Turn on the defroster and connect the probes from the multi-meter or test light to the metal tabs typically on each side of the defroster. You should see 12-13 volts when measured from tab to tab. If no power is indicated then the problem is with the vehicles defroster circuitry. Assuming there is power on the tabs, next test from the base of each metal tab to the defroster surface next to the tab. You should see good continuity between the tab and the defroster surface. It would be unusual if there was not a good connection between the tab and the defroster without the tab being loose or disconnected from the defroster.

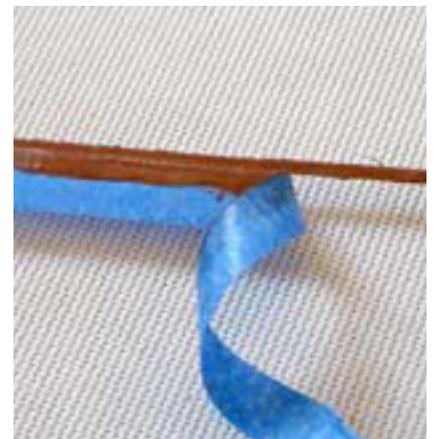
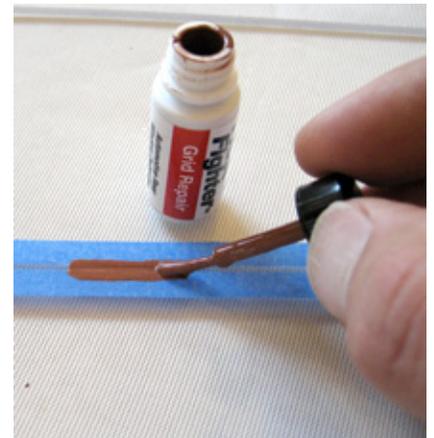


Now with the defroster off and the tab connectors removed, test the continuity between the tabs themselves. A good multi-meter is useful here. Again place the probes on the multi-meter on each tab and set the meter to measure continuity rather than voltage. You should see some continuity

between the tabs. If the reading is zero for no continuity between the defrosters tabs this is a clear indication the defroster is badly damaged. If there is some continuity between the tabs then it is time to start testing individual heating elements for breaks.

Turn on the defroster and connect one lead of the multi-meter to the positive tab on the defroster. Next move the probe along the grids to locate a break. Be very careful not to damage the grid line with the probe. A good trick is to use a small length of tin foil connected to the multi-meter's probe as the contact. When the probe passes over a break you will see a sharp change in the reading.

These breaks can be repaired with the Frost Fighter 2100 Defroster Grid Repair Kit. A good methodology is to repair the breaks you can see with visual inspection and then use the multi-meter or test lamp to identify any other damage. This is not an all or nothing repair. Fix a few grid lines and then test the defroster and repair a few more. The 2100 grid kit a repair kit and not designed to restore complete defrosters. Replacement defrosters are available as the Clear View II defrosters.



**Planned Products LLC**  
4699 Nautilus Court S.  
Suite 201  
Boulder, CO 80301-5307  
303.682.0274 Tel  
info1@frostfighter.com