

### 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.

### Sometimes damage is hard to determine visually

Defrosters use a conductive coating to deliver the electrical properties needed for heating the glass. A pigment is typically added to the paint to make the brownish red color typical of most defrosters.

When cured on the window the pigment leeches into the glass so even with the conductive material missing, a line of pigment shows in the glass where the heating element was. This vestige of a line is part of the glass and cannot normally be removed.

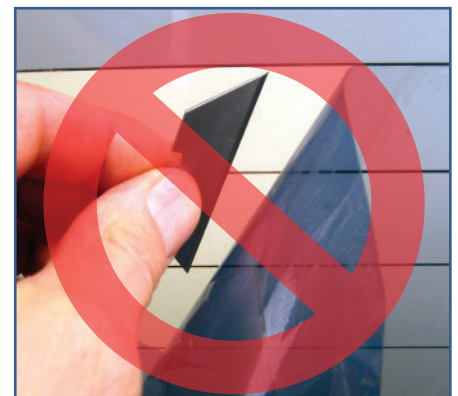
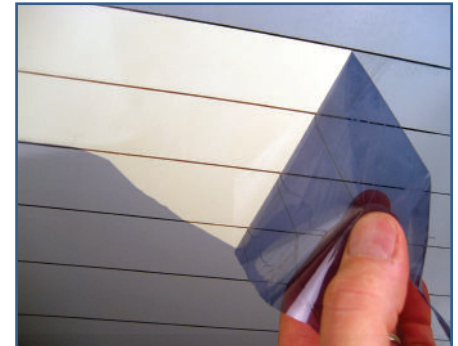
The dark area is where the conductor remains and the light area is where it is missing. The Grid Repair Kit can replace these breaks.

Some older defrosters lose their conductivity and become resistive which inhibits their ability to conduct electrical current and provide the heat needed to defrost. Over the years with sun and cleaning the conductive silver particles leach out of the binder increasing the electrical resistance until the defroster stops working all together.

Even if the conductive material is new the smallest break will cause that element of the defroster to stop working. If all the heating elements have breaks then the entire defroster will fail regardless of the presence of power on the buss bar tabs.

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

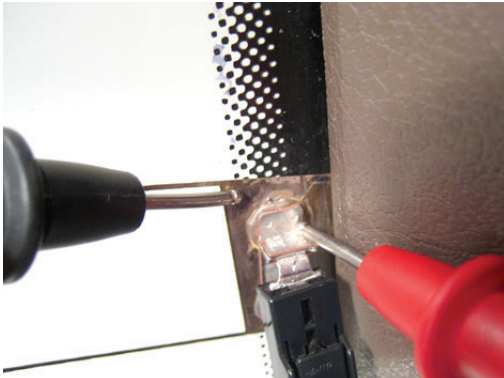
Frist is visual inspection. In good lighting take a close look at the horizontal heating elements. The conductive defroster material should be visible and blocks light transmission while the pigment in the glass typically allows light to pass through the glass.



Second, 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 vehicle's 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 defroster's 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 aluminum 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 is a repair kit and not designed to restore complete defrosters. Replacement defrosters are available as the Clear View II defrosters.



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