



Advanced Protection

New protection systems for vulnerable road users (VRU) energy absorbing windscreen mounting system

FUNCTIONALITY

The new system provides:

- Greater compliance during impacts, particularly at the windscreen edges
- Greater energy absorption capability particularly at the windscreen edges

EXPLOITATION

- Developed as a protective system to address real world head impact locations of VRUs at any location on a car windscreen
- Development as a protective system for VRU head impacts on other vehicles

SOCIO-ECONOMIC IMPACT

- Reduction in the number of VRU sustaining fatal and serious head injuries.
- Reduction in the severity of head injuries sustained by VRU.

TECHNICAL DESCRIPTION

Objective

- To reduce the severity of VRU head impacts on the windscreen;
- Address real world head impacts at all allocations on the windscreen (including beyond the current test positions).

Approach

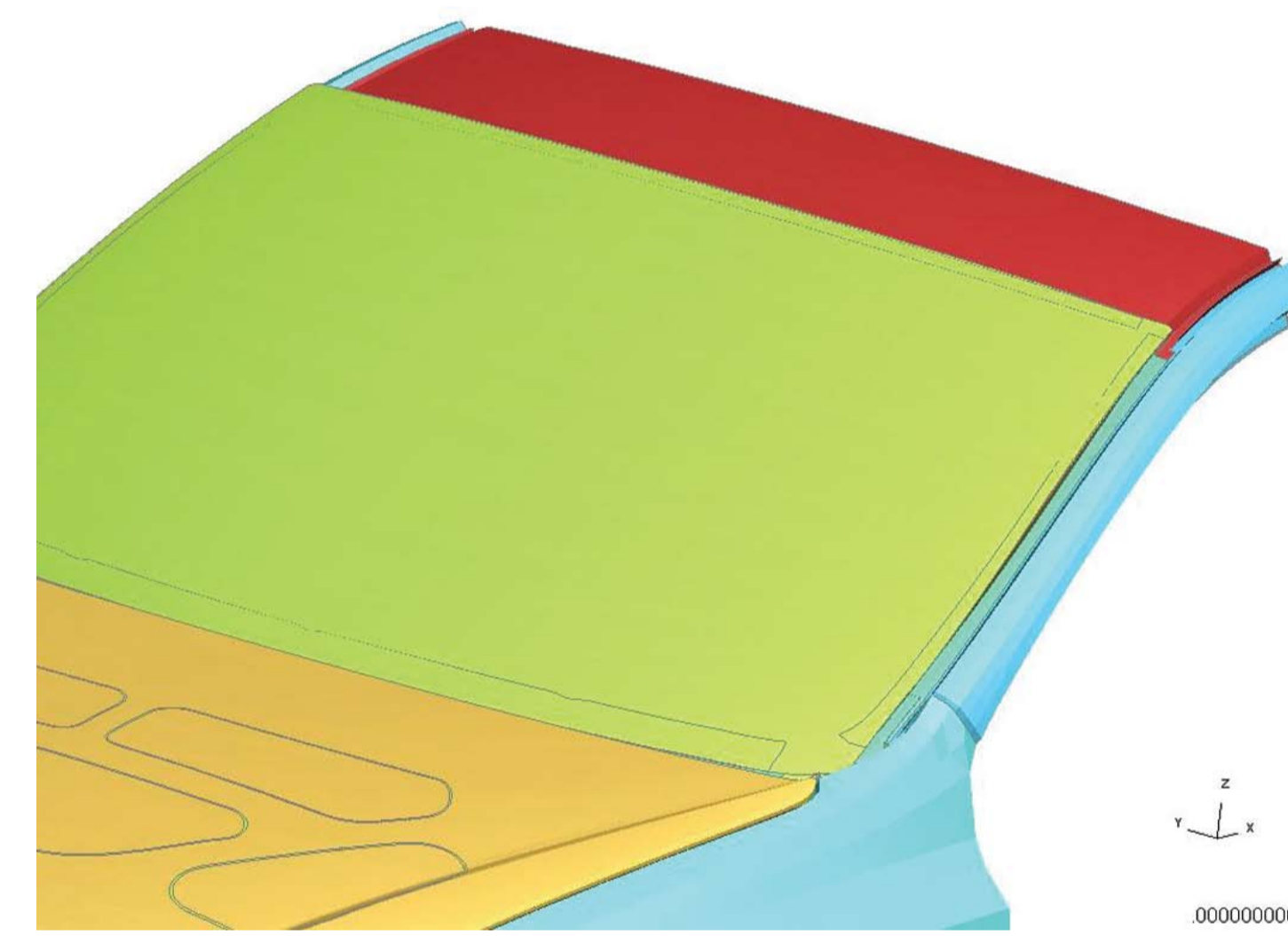
- Develop an energy absorbing system for mounting the windscreen to the car body;
- Identify changes in vehicle design that would be necessary to accommodate the new mounting system.

Accident analysis

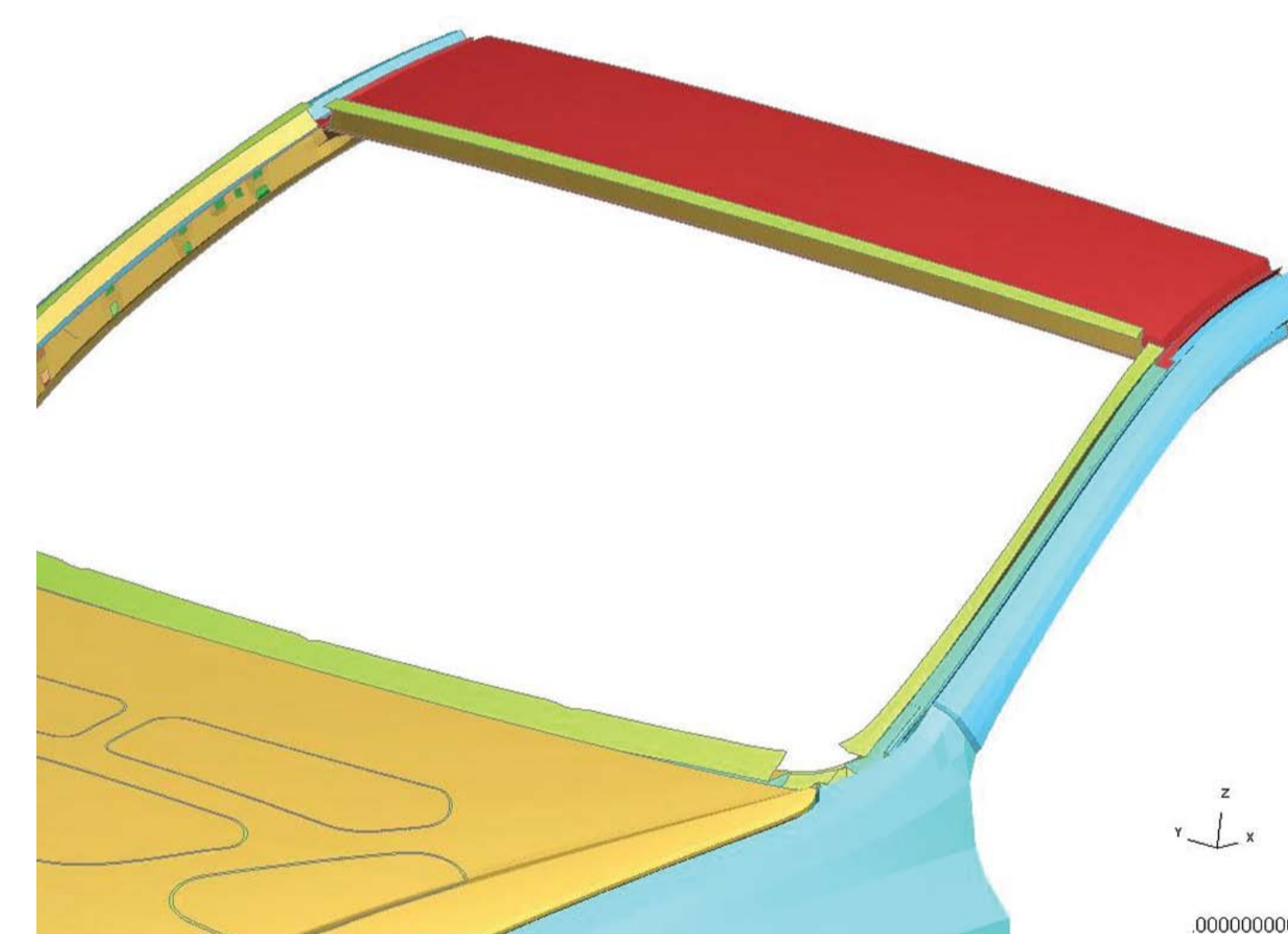
- Head impact locations during real world accidents occur across the whole windscreen (particularly for small/city cars);
- Head impacts are the primary cause of vulnerable road user fatalities.

Principle of work

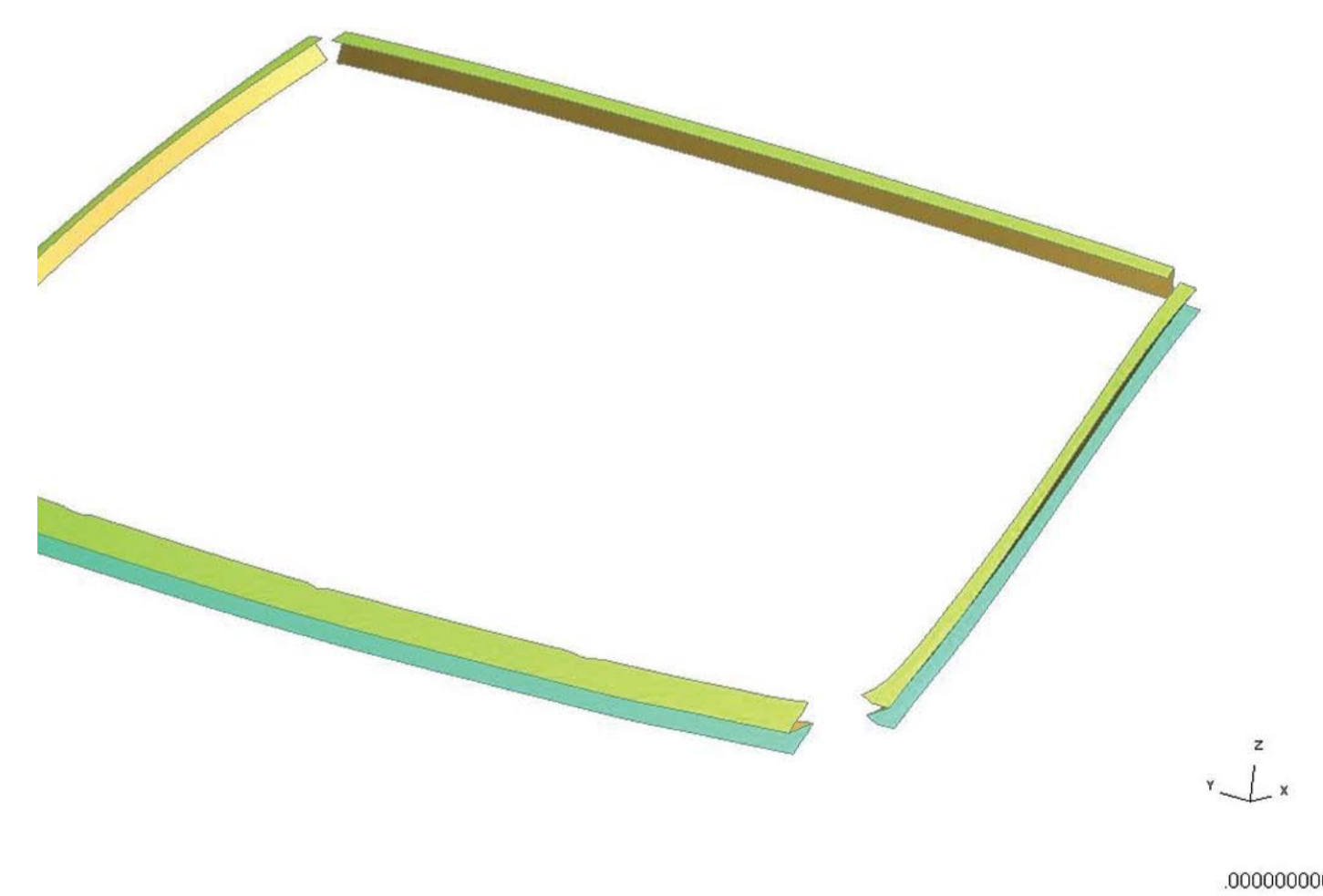
- reduce the apparent stiffness of the windscreen at the edges due to the connection to the surrounding bodywork;
- provide additional means of absorbing the impact energy during head impact;
- system to fit between the windscreen and the current windscreen aperture flanges;
- retain the current technology used to attach windscreens to the vehicle body.
- retain the capability for road-side windscreen replacement.



Windscreen located by new mounting system



New mounting system beneath windscreen



Energy absorbing elements

Results

- Predicted head injury criterion (HIC) values at the edges of the windscreen range from less than one half, to less than one third of those with a standard windscreen mounting where the HIC value was nearly 1700;
- Predicted HIC values nearer the centre of the windscreen were reduced by up to one half;
- The principles of the energy absorbing windscreen mounting system are now the subject of a patent.

Conclusions

- The system provides the potential to reduce real world head impact severity at all locations on the windscreen;
- The system is capable of development for use on vehicles other than cars.

Further work

- Development of the energy absorbing characteristics to suit a range of vehicles;
- Development of the system to provide a viable product for market.

CONTACT

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PARTNERS INVOLVED

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