



The Facts on Windshields

READ YOUR OWNERS MANUAL!

In a crash or roll over, supplemental restraint systems (SRS) or airbags and seatbelts have been documented for saving thousands of lives and reducing injuries. Windshields are a major support system and energy management system of these restraints in vehicles. Windshields also provide protection in a roll over and keep occupants from being ejected. However, if your windshield had been installed, it is critical to the vehicles safety systems that it is installed and done correctly. The exclusive windshield story "Danger Before Your Eyes" appeared on ABC News 20/20 and then was repeated on Fox News in Boston. Over 11 1/2 million have been installed, according to the reporters, many of them incorrectly. These guidelines will help prevent injuries.

WINDSHIELD PROTECTION IN A FRONTAL CRASH:

- Windshields must provide strength to the front of the vehicle in NHTSA FMVSS 212 - The wall crash test.
- Many vehicles must pass the 212 crash test with 100% of windshield retention in NCAP testing
- Previous vehicles must pass the 212 crash test with 75% windshield retention
- A windshield provides and much as 30% of the vehicles strength or structural integrity in a frontal crash, some models up to 60%
- Glass overall is lighter, stronger and less expensive than steel, and deflects energy in a crash around the occupant safety cage
- The dash panel had become thinner in newer cars as the energy management system of the vehicle is deflected into and across the windshield
- A factory installed windshield is done under controlled conditions by the vehicle manufacturer

WINDSHIELD HISTORY:

- The first cars to be manufactured did not have windshields
- In the late 1910's Henry Ford and a French Scientist developed the modern windshield with a laminate
- Modern windshields are made from 2 pieces of glass with a thin laminate in-between the 2 sheets of glass
- Side and back glass continues to be safety glass, AKA popcorn glass
- Some more expensive cars and SUV's may contain dual pane or break resistant glass on the sides and the back glass

WINDSHIELD RETENTION AND A RESTRAINT:

- According to the collision repair industry experts, windshields are Primary Restraints. Seatbelts are secondary restraints and no longer "optional" and airbags are supplemental restraints in a crash
- Windshields must restrain occupants in a frontal crash and prevent them from being ejected in a roll over
- Windshields act as backboard for the passenger side airbag
- Windshields are a timing mechanism for the frontal airbag system (crash pulse)
- **READ YOUR OWNERS MANUAL FOR SPECIFIC USE OF RESTRAINT SYSTEMS!**

See www.airbaginstitute.com for the *ALERT airbag safety class*

North EMS Education @ 800-994-9780 or ABRA @ 800-536-2334

INJURY FACTS ON WINDSHIELDS

North Memorial Medical Center and ABRA Auto Body & Glass (04-2003)

WINDSHIELDS ARE THE ROLL BAR

- In the FMVSS 216 roll over crash test, windshields must support 1 1/2 times the weight of the vehicle or 5,000 pounds
- Windshields are a major part of the roofs support in a roll over
- The interior roof must not collapse more than 5 inches in a roll over inside the occupant compartment
- A cracked windshield offers less protection to the occupants in a roll over

WINDSHIELDS IN CRASHES

- Most should not pop out in a crash or roll over since 1990
- Sticky butyl tape or soft kits should not be used and have very limited application with only a few vehicles
- Butyl tape should not be mixed with urethane glue
- In approximately 20-25% of responders trained in airbag safety classes, responders have indicated windshields have failed or popped out in newer model vehicles. Please complete a NHTSA Special Crash Investigation Form if this occurs. Go to www.nhtsa.dot.gov
- Windshields may be overloaded in a crash or roll over, but urethane retention must be the minimum
- Windshields may be broken or starred in a crash by the deploying passenger side airbag
- Rock chips should be repaired as soon as possible no more than 3 chips in one glass. If the chips are in the wipers view of the front occupants faces, the entire windshield must be replaced

WINDSHIELD INSTALLATION TIPS

- Never have your windshield replaced below 40 degrees F or in the rain
- Primers used to activate the urethane won't flash below freezing
- Changes in shrinking and swelling of the metal surface varies several millimeters when its cold
- Technician must wear nitrile type gloves during the process, not bare hands
- Glass cleaners and primers must be applied with some urethanes to clean the glass and activate the urethane glue to adhere to the metal and the glass
- Original Equipment Manufacturers, OEM adhesive, must match the car companies recommendations for the urethane adhesive to be applied to the glass
- Technician must remove all the old urethane, called a "full cut"
- Technician must remove the cowl or plastic trim if present at the bottom of the windshield
- The urethane glue must dry completely before the car is driven to 600-750 psi strength
- If a single tube or one part urethane is used; temperature and humidity can increase or decrease drying time
- Some two part urethanes are mixed by the installer and cure/dry chemically and dry faster than one part
- Two part urethanes or chemical cure adhesives are preferred in colder northern climates
- Check the Safe Drive Away Time (SDAT) with the urethane manufacturer or installer, the 212 crash test may be less drying times than if the urethane is fully cured and dry. The urethane must dry completely
- Make sure your installers are National Glass Association trained and the company affiliated with the NGA

ADDITIONAL TIPS FOR 911 RESPONDERS

- Make sure the vehicle is out of service and is not taken out on a 911 response call
- Request a two part urethane glue is used, if the vehicle may be taken out on a 911 call at any time

The Best of the Best Cars-What's the Safest Car? *For the most protection in a crash, a vehicle should do well in all three below*

- .NHTSA Gov't **Frontal** Impact Crash Test at 30 mph – Star rating 1 lowest, 5 stars the best. The test for **restraints**
- NHTSA Gov't **Side** Impact Crash Test (18 mph) – Star rating 1 the lowest, 5 stars the best. The test both for **restraints and structural integrity** of the vehicle. See www.nhtsa.dot.gov
- Insurance Institute for Highway Safety – 40 mph **Offset** Crash Test into deformable barrier. The independent test for **structural integrity** of the vehicle. About 75% of frontal crashes are of this type. Ratings from lowest to highest; poor-marginal-acceptable-good. See www.highwaysafety.org
- NHTSA Gov't **Roll-Over** Crash testing; See www.nhtsa.dot.gov Cars and older models see www.crashtest.com