
INSURANCE INSTITUTE FOR HIGHWAY SAFETY

NEWS RELEASE

March 30, 2006

MAJOR CHANGE IN CRASHWORTHINESS EVALUATIONS FOR CONSUMER INFORMATION, BASED ON 10+ YEARS OF SUCCESS OF THE FRONTAL CRASH TEST PROGRAM

ARLINGTON, VA — Frontal offset crash tests conducted by the Insurance Institute for Highway Safety since 1995 have prompted huge improvements in how vehicles protect people in frontal crashes. Now this consumer information program is undergoing a major change.

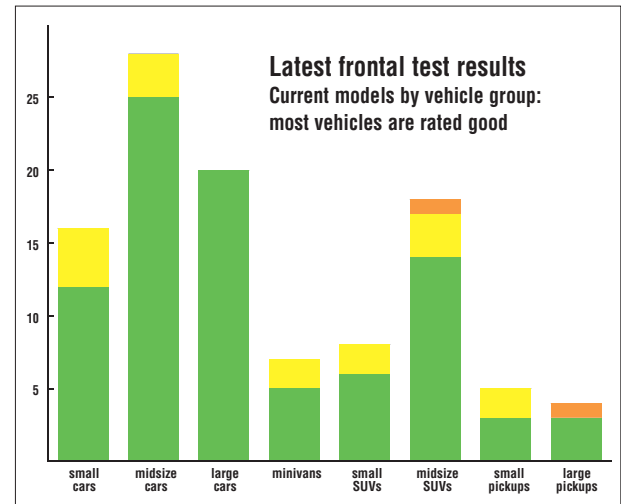
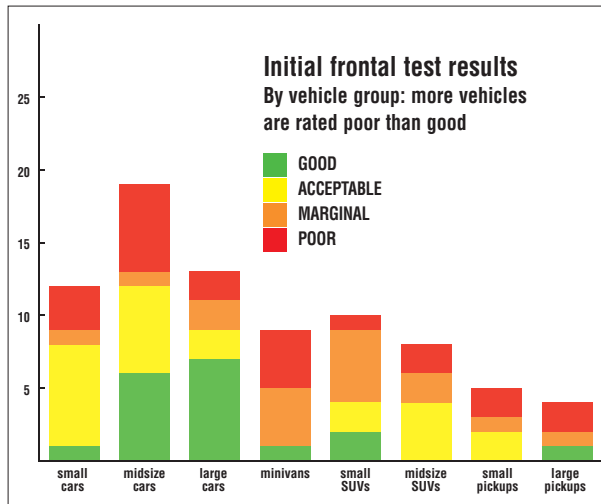
The Institute evaluates the crashworthiness of passenger vehicles based on 40 mph frontal offset tests in which the driver side of the front of a vehicle strikes a deformable barrier. Institute researchers evaluate the crash test performance of each vehicle and assign comparative ratings of good, acceptable, marginal, or poor. More than 200 car, SUV, and pickup truck designs have been rated.

When the Institute began evaluating frontal crashworthiness by vehicle group, beginning in the mid-1990s, about half of the 80 vehicles that were tested earned marginal or poor ratings. More were rated poor than good.

Then manufacturers responded by changing the designs of their vehicles to improve frontal crashworthiness. The result has been a turnaround in the frontal ratings. Eighty-eight of the 106 current passenger vehicle designs the Institute has evaluated earn good ratings. None is poor, and only 2 of the 106 current designs are rated marginal.

"This program has been a huge success," says Institute president Adrian Lund, "and because of this success frontal offset tests no longer are

— MORE —



providing consumers with much useful information to differentiate among vehicles' frontal crashworthiness. We've reached the point where we can declare victory and move on."

Details of test verification: Moving on doesn't mean abandoning frontal offset crash protection. Instead the Institute is initiating a new approach involving evaluations based on manufacturers' own frontal tests of vehicles meeting requirements established by the Institute. The manufacturers are providing detailed information from their offset tests, including video, and the Institute is assessing this information, assigning ratings, and conducting audit tests to verify manufacturers' results.

Only redesigned vehicles with immediate predecessors that earned the top rating of good in previous Institute tests are eligible for verification. Substantially redesigned vehicles with significant changes in size, weight, or body style aren't eligible. The Institute will continue testing these vehicles.

"The verification approach assures that automakers still pay attention to offset crash protection as they redesign their older models and introduce new ones.

This approach is possible because of the manufacturers' actions during the past decade. They have incorporated offset crash test performance plus government-required and other consumer information crash testing into their guidelines. They routinely conduct their own offset tests during the design process," Lund points out.

Recognizing this effort, the verification approach goes a step beyond an Institute policy in place since the beginning of the frontal test program. Manufacturers always have been asked to confirm whether the Institute's ratings could be carried over from one model year to the next. Based on this information, the Institute has been carrying over ratings for vehicles with no significant design changes.

"The manufacturers will assume a bigger role now that our frontal test is a de facto industry standard. This is how it should work. When most every vehicle passes the test, it's time to simply keep an eye out to make sure manufacturers continue the good work," Lund says. "In the meantime we'll keep the pressure on the manufacturers to improve crashworthiness in side impacts and to design seat/head restraints to reduce the risk of whiplash in rear crashes. We'll also look at other areas where crashworthiness improvements still can be made."

Nine vehicles for verification: The vehicles selected for the first round of test verification are all new or redesigned models for the 2006 or 2007 model year. These include a midsize moderately priced car (Toyota Camry), three large family cars (Buick Lucerne, Hyundai Azera, and Chevrolet Impala), one small SUV (Toyota RAV4), three midsize SUVs (Honda Pilot, Ford Explorer, and Mercedes M class), and a large pickup truck (Dodge Ram 1500).

The manufacturers supplied information on basic vehicle and test parameters, measurements of intrusion into the occupant compartment, injury data recorded on a dummy representing an average-size man in the driver seat, and video of

the tests. Institute engineers reviewed this information and rated the vehicles based on the same evaluation parameters that always have been used. Eight of the nine vehicles earn good frontal crashworthiness ratings (see attachment). The Impala is acceptable. A major benefit of this program is that the Institute can provide these and subsequent frontal ratings to consumers earlier in the model year.

Audits keep manufacturers on the up and up: To ensure manufacturers' good faith participation in the new evaluation procedures, the Institute is conducting audit tests. Institute engineers selected the Buick Lucerne for the first audit, and the results of this test confirm the data supplied by the manufacturer from its own test (see attachment).

The Lucerne's structure held up with little safety cage deformation in the test. Most injury measures recorded on the driver dummy were low. The car is rated good.

"This level of performance is the norm now," Lund notes.

How vehicles have been improved: The Institute's test primarily assesses how well a vehicle's front-end crush zone absorbs energy during a crash and, in turn, how well the occupant compartment, or safety cage, holds together. If the compartment remains largely intact, then the restraint systems can control the motion of the crash test dummy and help keep injury measures low. But if there's significant deformation of the safety cage and intrusion into the compartment, then the restraint systems are less likely to keep the measures low.

Newer vehicles have much stronger occupant compartments, in large part because of the steps automakers have taken in the past decade to earn good ratings in the Institute's frontal tests. An example of this improvement is the Mitsubishi Galant. When the Institute tested a 1995 model, the occupant



**1995 Galant:
Occupant compartment virtually collapsed
Overall frontal rating: POOR**



**1999 Galant:
Structure improved dramatically
Overall frontal rating: ACCEPTABLE**



**2004 Galant:
More structural improvement
Overall frontal rating: GOOD**

compartment virtually collapsed. The dummy's movement wasn't well controlled, in part because the safety cage crumpled (above left). The dummy moved around the left side of the inflating airbag, and its left shoulder hit the sharp edge of the buckling window frame. Its left knee pushed through the instrument panel and hit the steering column's attachment hardware, gashing the dummy's vinyl "skin" at the knee.

The dummies in tests of many other vehicles in the mid-1990s didn't fare much better than in the Galant. But this car has been improved since then, and so have other vehicles. The 1999 Galant's performance represented a big improvement (above middle). There was much less deformation of the safety cage. The rating of the structure improved to acceptable, and injury measures weren't as high as in the 1995 test. Even more improvement is apparent in the redesigned 2004 Galant (above right).

"The new model shows what Mitsubishi and other manufacturers have done to improve frontal crashworthiness," Lund says. "From the leading edge of the 2004's front door backward, virtually no deformation occurred in the test. The driver's survival space held up very well, leaving room for the airbags and belts to do their jobs."

Some cars have been good performers from the beginning of the Institute's program. Three successive designs of the Ford Taurus earned the highest rating in the frontal test. But the rating for the recently tested Ford Fusion isn't good. The structure of this car, a brand new design, held up well, but the frontal evaluation is acceptable because of high forces on the dummy's right leg.

"We think this will be rare," Lund says. "Automakers have figured out how to design cars to protect people in frontal crashes, and they're not likely to backslide."

Crash tests versus real-world crashes: Research shows that drivers of vehicles that earn good ratings in frontal offset crash tests have significantly lower risk of fatal injuries in real-world frontal crashes, compared with drivers of vehicles with poor ratings. An Institute study examined 14 years of federal records on crash deaths and identified vehicles that had been rated in the Institute's offset test. Then the researchers related the ratings to fatality risk in real-world crashes. Controlling for differences in vehicle weight, driver age and gender, and other factors, the researchers found that drivers of vehicles with good ratings were about 46 percent less likely to die in frontal crashes than drivers of the poor-rated vehicles they crashed into. Drivers of vehicles rated acceptable or marginal were about 33 percent less likely to die than the motorists in the poor-rated vehicles.

"To ensure that real-world risks continue to diminish, we've got to preserve the vehicle design improvements that have been made in response to our frontal crash test program. This is what test verification is all about. It's about making sure manufacturers continue to design cars that will protect their occupants in serious frontal crashes," Lund concludes.

**End 6-page news release on frontal crash test verification
1-page attachment: audit test results and verification results**

For more information go to www.iihs.org

ATTACHMENT, P. 1 OF 1

**FRONTAL CRASHWORTHINESS RATINGS BASED ON
INSTITUTE AUDIT TEST (40 MPH FRONTAL OFFSET) & VERIFICATION OF AUTOMAKER TEST DATA**

	OVERALL FRONTAL RATING	STRUCTURE/ SAFETY CAGE	INJURY MEASURES			RESTRAINTS/ DUMMY KINEMATICS
			Head/neck	Chest	Leg/foot (left/right)	
BUICK LUCERNE Large family car CADILLAC DTS Large luxury car 2006 models; test vehicle = 3,772 lbs.	G	G	G	G	G A	G
INSTITUTE AUDIT TEST	G	G	G	G	A M	G
MANUFACTURER TEST	G	G	G	G	A M	G

FRONTAL RATINGS BASED ON INSTITUTE VERIFICATION OF AUTOMAKERS' TEST DATA

	OVERALL FRONTAL RATING	STRUCTURE/ SAFETY CAGE	INJURY MEASURES			RESTRAINTS/ DUMMY KINEMATICS
			Head/neck	Chest	Leg/foot (left/right)	
TOYOTA CAMRY Midsize moderately priced car 2007 models; test vehicle = 3,303 lbs.	G	G	G	G	G G	G
HYUNDAI AZERA Large family car 2006 models; test vehicle = 3,761 lbs.	G	G	G	G	G M	G
CHEVROLET IMPALA Large family car 2006 models; test vehicle = 3,770 lbs.	A	A	A	G	G A	G
TOYOTA RAV4 Small SUV 2006 models; test vehicle = 3,569 lbs.	G	G	A	G	G G	G
HONDA PILOT Midsize SUV 2006 models; test vehicle = 4,442 lbs.	G	G	G	G	G G	G
FORD EXPLORER MERCURY MOUNTAINEER Midsize SUV 2006 models; test vehicle = 4,716 lbs.	G	G	G	G	G G	G
MERCEDES M CLASS Luxury SUV 2006 models; test vehicle = 4,817 lbs.	G	G	G	G	G G	G
DODGE RAM 1500 Large pickup truck 2006 models; test vehicle = 5,214 lbs.	G	G	G	G	M G	G

GOOD **G**
ACCEPTABLE **A**
MARGINAL **M**
POOR **P**

Caution: Frontal crash test ratings cannot be compared across vehicle type and weight categories because the kinetic energy involved in the frontal test depends on the speed and weight of the test vehicle, and the crash is more severe for heavier vehicles. Given equivalent frontal ratings for heavier and lighter vehicles, the heavier vehicle typically will offer better protection in real-world crashes.