INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

NEWS RELEASE

December 8, 1999

LATEST CRASH TESTS: MAJORITY OF LARGE LUXURY CARS RATED GOOD; AMONG LARGE FAMILY CARS, THE WINNERS DON'T INCLUDE CHRYSLERS

ARLINGTON, VA — Vehicle crashworthiness is improving. This is the main finding of new crash tests of three large luxury cars and four large family cars. The tests were conducted by the Insurance Institute for Highway Safety.

All three luxury cars are rated good overall for frontal crashworthiness — Buick Park Avenue, Cadillac Seville, and Lexus GS 400/300. This brings the total number of large luxury cars with good overall ratings to five out of the eight current designs the Institute has tested. A notable performer among the recently tested models is the 2000 Seville. The 1997 version of this car was the only poor performer in the group. The new Seville is rated a BEST PICK.

Among the large family cars recently tested, the Buick LeSabre/Pontiac Bonneville and Chevrolet Impala are rated good overall. However, two designs from DaimlerChrysler — Dodge Intrepid/Chrysler Concorde and Chrysler LHS/300M — didn't perform as well.

DaimlerChrysler's 2000 model Intrepid/Concorde earns an overall rating of marginal. During the test, the dummy's movement wasn't well controlled, there was too much upward movement of the steering wheel, and moderately high forces were recorded on both of the dummy's legs — forces that, if experienced in a real crash, would be likely to cause leg and/or ankle injuries.

The LHS/300M fared even worse. It's the only model the Institute tested this time around that earns an overall rating of poor. The LHS's airbag deployed

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late in the offset test, which allowed the dummy's head to hit the steering wheel hard before the airbag fully inflated. This late deployment resulted in the greasepaint from the dummy's face rubbing off on the side of the airbag facing the windshield instead of the side facing the driver. Plus there was too much intrusion of the vehicle's front-end structure into the occupant compartment, which contributed to high forces recorded on the dummy's legs.

"GM vehicles haven't always earned good ratings in our test," Institute president Brian O'Neill says. "But now it's time to salute this automaker for paying serious attention to crashworthiness improvements with its newer designs." All four General Motors cars tested in this series earned good overall evaluations, and three earned BEST PICK designations.

The Institute's crashworthiness ratings — good, acceptable, marginal, or poor — are based primarily on performance in a 40 mph frontal offset crash test into a deformable barrier.

Structural design is key to good performance: The Institute's frontal offset crash test into a deformable barrier is especially demanding of vehicle structure. The driver side of the vehicle hits the barrier, so a relatively small area of the front-end structure must manage the crash energy. This means intrusion into the occupant compartment is more likely to occur than in a full-width test.

"Good structural design is the key to good performance in the offset test," O'Neill explains. "If a car's front-end structure absorbs and manages the crash energy so the occupant compartment remains largely intact, with little or no intrusion, then the dummy's movement is likely to be controlled, and injury measures are likely to be low. In contrast, poor structural design means greater likelihood of poor control of the dummy and high injury measures."

The Seville's improved structural design: The crash test of the 2000 Cadillac Seville, compared with its predecessor 1997 model, provides a good example of improved structural design. The Institute measures intrusion into the occupant compartment in nine locations. "Lower intrusion measures indicate a vehicle's safety cage is doing its job," O'Neill says, and all nine measures improved dramatically for the new Seville design compared with the old one:

Measures of occupant compartment intrusion, 40 mph offset crash test

	A-pillar movement	Footwell intrusion				Instrument panel rear movement		Steering column movement	
	Rearward (cm)	Left (cm)	Center (cm)	Right (cm)	Footrest (cm)	Left (cm)	Right (cm)	Upward (cm)	Rearward (cm)
2000 Cadillac Seville	3	17	15	16	6	4	3	4	2
1997 Cadillac Seville	9	31	37	31	21	16	16	15	11

"The occupant compartment of the old Seville allowed too much intrusion in the offset test," O'Neill also says. "But the new Seville fared a lot better. The occupant compartment held up well, so the dummy's movement was controlled better, and the injury measures were lower."

O'Neill adds that "the way to protect people in serious frontal crashes is to ensure that the occupant compartment, or safety cage, remains intact. When this happens, the restraint system — the safety belts and airbags — can prevent significant injuries, even in serious crashes. But when major intrusion occurs, even the best restraint system cannot prevent all injuries. It's the same concept as shipping a fragile object — it doesn't matter how well it's protected by foam or other packaging inside a box, if the box gets seriously damaged during transit, the object inside is likely to break. Today more of the vehicles we test have good structural designs, and their occupant compartments, or safety cages, remain largely intact."

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The good vehicle designs in the Institute's latest crash tests aren't happening because government regulation is demanding them. "It's because more and more automakers are incorporating offset tests into the vehicle development process. The manufacturers are doing this because they know many car buyers want the best occupant crash protection they can get," O'Neill says.

Institute and government crash tests complement each other: The Institute's crashworthiness evaluations are based primarily on results from the frontal offset crash test at 40 mph. Each vehicle's overall evaluation is based on three aspects of performance — measurements of occupant compartment intrusion, injury measures from a Hybrid III dummy positioned in the driver seat, and analysis of slow-motion film to assess how well the restraint system controlled dummy movement during the test.

The federal government has been testing new passenger vehicles in 35 mph crash tests since 1978. This New Car Assessment Program has been a major contributor to crashworthiness improvements — in particular, improved restraint systems in new passenger vehicles. The Institute's offset tests, conducted since 1995, involve 40 percent of a vehicle's front end hitting a deformable barrier at 40 mph. This test complements the federal test involving the full width of the front end hitting a rigid barrier. Both tests are contributing to improvements in crashworthiness — in particular improved crumple zones and safety cages.

The same 40 mph offset crash test is used to evaluate new cars by the European Union in cooperation with motor clubs and by an Australian consortium of state governments and motor clubs.

End 4-page release on vehicle crashworthiness
2-page attachment: crashworthiness ratings
Video news release Wed., 12/8, 1-1:30 pm EST
(C) Telstar 6/Trans. 8; crash test footage & more

Internet: www.highwaysafety.org

Evaluations

Frontal Offset Crash Test Performance

Large luxury cars	OVERALL EVALUATION	Structure /Safety Cage	Restraints & Dummy Kinematics	Injury Measures: Head/ Neck	Injury Measures: Chest	Injury Measures: Leg/ Foot, Left	Injury Measures: Leg/ Foot, Right	Head Restraint Design	Bumper Performance
a best pick **BMW 5 SERIES** 1997-2000 models; test vehicle wt. = 3,827 lbs.	G	G	G	G	G	G	G	A	P
a best pick **LEXUS LS 400** 1995-2000 models; test vehicle wt. = 3,794 lbs.	G	G	G	G	G	G	G	A	P
a best pick **BUICK PARK AVENUE** 1997-2000 models; test vehicle wt. = 3,794 lbs. NEWLY TESTED	G	G	G	G	G	G	G	P	A
a best pick **CADILLAC SEVILLE** 2000 models; test vehicle wt. = 4,008 lbs. NEWLY TESTED	G	G	G	G	G	G	G	P	M
LEXUS GS 400/300 1999-2000 models; test vehicle wt. = 3,805 lbs. NEWLY TESTED	G	G	A	G	G	A	G	A / M (depends on seat)	P
MERCEDES E CLASS 1997-2000 models; test vehicle wt. = 3,697 lbs.	A	G	P	G	G	G	G	A	P
LINCOLN CONTINENTAL 1995-2000 models; test vehicle wt. = 3,915 lbs.	A	A	G	A	G	P	A	P	G
INFINITI Q45 1997-2000 models; test vehicle wt. = 3,966 lbs.	M	A	M	M	G	M	A	P	P
Crashworthiness evaluations of earlier design:									
CADILLAC SEVILLE 1993-97 models; test vehicle wt. = 3,885 lbs.	P	P	P	G	G	G	P	P	A

Caution: The kinetic energy a vehicle must absorb in a crash test increases with vehicle weight, so barrier tests are more demanding of heavier vehicles. But occupants of heavier vehicles in real-world, two-vehicle crashes typically fare better than people in lighter vehicles (in many single-vehicle crashes, weight offers no safety advantage). This is why **crash test results shouldn't be compared among vehicles with large weight differences.**

Go to www.highwaysafety.org: This publication summarizes the crashworthiness evaluations of large luxury cars. The principal component of each vehicle's evaluation is its performance in a 40 mph frontal offset crash test. Details about each vehicle's test performance, including photographs taken during and after the test, are available online @ www.highwaysafety.org. Or call the Institute for copies.

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Evaluations

Frontal Offset Crash Test Performance

Large family cars	OVERALL EVALUATION	Structure /Safety Cage	Restraints & Dummy Kinematics	Injury Measures: Head/ Neck	Chest	Leg/ Foot, Left	Leg/ Foot, Right	Head Restraint Design	Bumper Performance
a best pick **CHEVROLET LUMINA** 1995-2000 models; test vehicle wt. = 3,331 lbs.	G	G	G	G	G	G	G	P	M
a best pick **BUICK LESABRE** **PONTIAC BONNEVILLE** 2000 models; test vehicle wt. = 3,558 lbs. NEWLY TESTED	G	G	A	G	G	G	G	G	M
CHEVROLET IMPALA 2000 models; test vehicle NEWLY TESTED	G	G	G	G	G	A	A	P	M
PONTIAC GRAND PRIX **BUICK CENTURY/REGAL** **OLDSMOBILE INTRIGUE** 1997-2000 models; test vehicle wt. = 3,466 lbs.	A	A	G	A	G	G	A	A / P (depends on seat)	A
DODGE INTREPID **CHRYSLER CONCORDE** 2000 models; test vehicle NEWLY TESTED	M	A	P	G	G	M	M	A / M (depends on seat)	M
CHRYSLER LHS **CHRYSLER 300M** 1999-2000 models; test NEWLY TESTED	P	M	P	M	G	P	M	M	M
Crashworthiness evaluations of earlier designs:									
a best pick **FORD TAURUS** **MERCURY SABLE** 1996-99 models; test vehicle wt. = 3,331 lbs.	G	G	G	G	G	G	G	P	G
a best pick **FORD TAURUS** **MERCURY SABLE** 1992-95 models; test vehicle wt. = 3,159 lbs.	G	G	G	A	G	G	G	P	M

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