

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

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CRASH TEST RESULTS: GOOD PERFORMANCES FROM 5 OF 11 MIDSIZE SUVs TESTED THIS YEAR; NONE OF 11 IS RATED POOR

ARLINGTON, VA — Among 11 midsize SUVs with new or modified designs that were crash tested by the Insurance Institute for Highway Safety this year, 5 are rated good: Acura MDX, Ford Explorer/Mercury Mountaineer, Toyota Highlander, Suzuki Grand Vitara XL-7, and Mitsubishi Montero Sport (see attached list). The MDX and Explorer/Mountaineer also earn the Institute's top designation, "best pick."

"These performances are encouraging," says Institute president Brian O'Neill. "In the past we haven't seen so many vehicles in a group get good ratings, with none rated poor. Vehicle designs are getting better, as this group of SUVs demonstrates. In particular, vehicle structures are getting better. The structural performances of all 11 SUVs in this group are rated good or acceptable. This means the manufacturers are doing a better and better job of designing their vehicles' safety cages and crumple zones."

Two of the 11 midsize SUVs the Institute tested, the Buick Rendezvous and Isuzu Axiom, are rated acceptable. The other four — Chevrolet TrailBlazer (and its twins, Oldsmobile Bravada and GMC Envoy), Jeep Liberty, Isuzu Rodeo (and its twin, the Honda Passport), and Pontiac Aztek — are marginal. None of the 11 SUVs earns the lowest rating (poor).

The evaluations reflect performances in 40 mph frontal offset crash tests into a deformable barrier. Based on the results of these tests, the Institute evaluates crash-worthiness, assigning each vehicle an overall rating from good to poor. Results for 8 of the 11 SUVs were released on September 11th and are re-released here along with ratings for the 3 SUVs tested since then — Explorer, Liberty, and Rodeo.

— MORE —

MDX is top performer: In the 40 mph frontal offset test, the 2001 Acura MDX's occupant compartment "held its shape extremely well, and the dummy went squarely into the airbag. This is an example of very good performance," O'Neill says. "The dummy injury measures were all low, indicating that a driver in a similar real-world crash should walk away with nothing worse than minor injuries."

Explorer improves compared with earlier design: The Institute delayed testing the Ford Explorer because structural modifications intended to improve offset crash test performance were added after this completely redesigned SUV was introduced earlier this year. "By the results of our recent test, the changes were successful. The Explorer's structure held together very well," O'Neill says.

The last time the Institute tested an Explorer (a 1996 model), "it was the old design, which we rated acceptable. The space around the driver was maintained reasonably well, but there was a serious problem. The driver door opened during the impact, which is unusual and troubling. In contrast, the new Explorer performed very well and earns the Institute's best pick designation," O'Neill says.

New TrailBlazer is rated marginal but much improved compared with Blazer: The performance of the 2002 TrailBlazer contrasts sharply with that of Chevrolet's older midsize SUV design, the Blazer (which hasn't been discontinued). The Institute tested a 1996 Blazer and rated it poor. There was major collapse of the occupant compartment during the offset test, and high injury measures were recorded on the dummy's head, which hit the bottom of the Blazer's window frame and B-pillar. "The performance of the TrailBlazer is a big improvement compared with the Blazer. It wouldn't take much for the Trailblazer to improve to a rating better than marginal," O'Neill says.

Compared with the Blazer, the TrailBlazer's front structure allowed much less intrusion into the occupant compartment. Lower intrusion measures indicate a vehicle's safety cage is doing what it's supposed to do (keep the occupant compartment intact, with little or no intrusion into the driver's space), and 9 of 10 measures of intrusion and steering wheel movement are dramatically lower (better) for the new TrailBlazer design:

MEASURES OF OCCUPANT COMPARTMENT INTRUSION (cm), 40 MPH FRONTAL OFFSET CRASH TEST

	A-pillar Movement	Footwell Intrusion				Brake Pedal Intrusion	Instrument Panel Movement		Steering Column Movement	
	<u>Rearward</u>	<u>Left</u>	<u>Center</u>	<u>Right</u>	<u>Footrest</u>	<u>Left</u>	<u>Right</u>	<u>Upward</u>	<u>Rearward</u>	
2002 Chevrolet TrailBlazer	3	17	22	17	14	26	4	3	3	3
1996 Chevrolet Blazer	18	30	33	32	33	25	20	18	11	9

"The TrailBlazer's occupant compartment held up much better than the Blazer's, but there were problems with the new design," O'Neill notes. "For example, forces on the right lower leg were high, indicating the likelihood of injury."

Structurally modified Montero Sport improves: Another improver is the 2001 Mitsubishi Montero Sport. When the Institute tested a 1999 model (without the structural modifications to the 2001), it earned a poor overall crashworthiness evaluation. The occupant compartment didn't hold up in the offset test, and there was too much movement of the dummy during the crash. Plus the high forces on both legs indicated the likelihood of injury. The 2001 Montero Sport has been structurally modified, now earning a good overall evaluation. The occupant compartment held up well, and the only serious problem in the offset crash test was that moderately high forces were recorded on the dummy's right leg and foot. These improvements are apparent in comparisons of occupant compartment intrusion and steering wheel movement for the old and new designs:

MEASURES OF OCCUPANT COMPARTMENT INTRUSION (cm), 40 MPH FRONTAL OFFSET CRASH TEST

	A-pillar Movement	Footwell Intrusion				Brake Pedal Intrusion	Instrument Panel Movement		Steering Column Movement	
	<u>Rearward</u>	<u>Left</u>	<u>Center</u>	<u>Right</u>	<u>Footrest</u>	<u>Left</u>	<u>Right</u>	<u>Upward</u>	<u>Rearward</u>	
2001 Mitsu. Montero Sport	2	11	10	7	13	12	2	4	3	-1
1999 Mitsu. Montero Sport	13	27	28	21	30	25	11	10	10	8

Two tests of Jeep Liberty: This all-new SUV for 2002 was tested twice, and the structural performances were good in both tests. However, the airbag inflated late in the first test because an airbag sensor wire shorted out early in the crash. This led DaimlerChrysler to develop a fix for this problem that shields the wiring, and the manufacturer has initiated a recall. The Institute tested a Liberty with the fix, and the airbag inflated much earlier "so the fix worked," O'Neill points out. "But the forces on the dummy's head were high. As a result, the Liberty only earns a marginal rating despite its good structural performance."

Isuzu fails to improve Rodeo appreciably: The Institute tested the 2002 model Isuzu Rodeo because the manufacturer indicated it had modified the airbag design and believed this would reduce the high head injury measure recorded in the Institute's previous test of a 2000 model Rodeo. But the airbag changes improved this vehicle's crash test performance "only slightly," O'Neill says, "and measures still indicated the possibility of head injury when the dummy's head loaded the airbag."

How the other five SUVs fared in the 40 mph frontal offset test:

1. The 2001 Toyota Highlander's overall performance was good, although forces on the right leg indicated there could be a risk of lower leg or ankle injury to someone in a crash like this.
2. The 2001 Suzuki Grand Vitara XL-7's overall performance was good, although forces on the left leg indicated the possibility of lower leg or ankle injury.
3. The 2002 Buick Rendezvous' overall performance was acceptable. The occupant compartment was maintained reasonably well, but far too much upward movement of the steering wheel and forward pitching of the driver seat compromised control of the dummy during the impact.
4. The 2002 Isuzu Axiom's overall performance was acceptable. The occupant compartment was maintained well, but there was a possibility of head, leg, and foot injuries.

5. The 2001 Pontiac Aztek's overall performance was marginal. While the occupant compartment held up reasonably well, the airbag inflated relatively late in the crash. Plus the steering wheel moved upward. The result is that high forces were recorded on the dummy's head.

Since 1996, the Institute has tested a total of 30 midsize SUV designs. Only 1 of the 23 current designs, the Chevrolet Blazer, earns a poor overall crashworthiness evaluation. New designs of the Blazer's twin models (Oldsmobile Bravada and GMC Envoy) now share the same design as the 2002 TrailBlazer, so they are rated marginal overall.

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 hits the barrier, so a relatively small area of the vehicle's 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 notes. "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 into the driver's space, 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."

Institute and government crash tests complement each other: The Institute's crashworthiness evaluations are based primarily on results of 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 frontal 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 6-page release on vehicle crashworthiness
3-page attachment: SUV crashworthiness ratings
Video news release Tues. 12/11, 1-1:30 pm EST
(C) Telstar 6/Trans. 8; crash test footage & more
Internet: www.highwaysafety.org**

Evaluations

Midsize utility vehicles 4-door models

	OVERALL EVALUATION	Frontal Offset Crash Test Performance						Other Evaluations	
		Structure/ Safety Cage	Injury Measures				Restraints/ Dummy Kinematics	Head Restraint Design	Bumper Performance
			Head/ Neck	Chest	Leg/Foot Left, Right				
best pick 2001 (mfg. after 6/00)-2002 models test vehicle wt. = 4,665 lbs.	G	G	G	G	G	G	G	A	A
NEWLY TESTED best pick ACURA MDX 2001-02 models test vehicle wt. = 4,339 lbs.	G	G	G	G	G	G	G	M	A
NEWLY TESTED best pick FORD EXPLORER MERCURY MOUNTAINEER 2002 models (mfg. after 10/01) test vehicle wt. = 4,511 lbs.	G	G	G	G	G	A	G	P	P
best pick LEXUS RX 300 1999-2002 models test vehicle wt. = 3,973 lbs.	G	A	G	G	G	G	G	G	M
best pick MERCEDES M CLASS 1999 (mfg. after 3/99)-2002 models test vehicle wt. = 4,445 lbs.	G	G	A	G	G	G	G	A	M
NEWLY TESTED TOYOTA HIGHLANDER 2001-02 models test vehicle wt. = 3,880 lbs.	G	G	A	G	G	A	A	G	M
NEWLY TESTED SUZUKI GRAND VITARA XL-7 2001-02 models test vehicle wt. = 3,682 lbs.	G	G	G	G	A	G	M	A	P
NEWLY TESTED MITSUBISHI MONTERO SPORT 2001-02 models test vehicle wt. = 4,151 lbs.	G	G	G	G	G	M	A	M	P
NEWLY TESTED BUICK RENDEZVOUS 2002 models test vehicle wt. = 4,191 lbs.	A	A	G	G	G	G	M	M	P
NEWLY TESTED TOYOTA 4RUNNER 1996-2002 models test vehicle wt. = 3,942 lbs.	A	A	G	G	G	A	A	M P <small>depends on seat</small>	P
NEWLY TESTED ISUZU AXIOM 2002 models test vehicle wt. = 4,109 lbs.	A	G	A	G	A	M	A	A	P

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Turn page for more crashworthiness evaluations ►

Caution: The kinetic energy a vehicle must absorb in a crash test increases with vehicle weight, so offset tests are more demanding of heavier vehicles. But people in heavier vehicles in real-world, 2-vehicle crashes typically fare better than people in lighter vehicles (in many single-vehicle crashes, weight offers no safety advantage). This is why **test results shouldn't be compared among vehicles with large weight differences**. The weight range (about 1,000 pounds) of the utility vehicles listed here is greater than in most other groups of vehicles the Institute has tested. However, since the weight benefit in 2-vehicle crashes is only slight for vehicles weighing more than 4,000 pounds, and because a greater proportion of midsize utility vehicle occupant deaths (compared with car occupant deaths) occur in single-vehicle crashes in which vehicle weight often offers no advantage, the crash test results for these vehicles can be compared.

Go to www.highwaysafety.org: This publication summarizes the crashworthiness evaluations of midsize utility vehicles. 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 crash test, are available online at www.highwaysafety.org. Or call the Institute for copies.

Evaluations (continued)

	OVERALL EVALUATION	Frontal Offset Crash Test Performance						Other Evaluations	
		Structure/ Safety Cage	Injury Measures				Restraints/ Dummy Kinematics	Head Restraint Design	Bumper Performance
			Head/ Neck	Chest	Leg/Foot Left, Right				
Midsize utility vehicles 4-door models									
MITSUBISHI MONTERO 2001-02 models test vehicle wt. = 4,788 lbs.	A	G	A	G	M	G	M	A	P
NISSAN XTERRA 2000 (mfg. after 9/99)-2002 models test vehicle wt. = 4,162 lbs.	A	G	A	G	G	M	M	M	P
LAND ROVER DISCOVERY SERIES II 1999 (mfg. after 10/98)-2002 models test vehicle wt. = 4,707 lbs.	A	A	G	G	P	A	A	M	P
DODGE DURANGO 1998-2002 models test vehicle wt. = 4,844 lbs.	A	A	G	G	P	G	M	P	P
CHEVROLET TRAILBLAZER OLDSMOBILE BRAVADA GMC ENVOY 2002 models test vehicle wt. = 4,544 lbs.	M	A	A	A	G	P	A	M	A
NEWLY TESTED									
JEEP GRAND CHEROKEE 1999-2002 models test vehicle wt. = 3,968 lbs.	M	M	G	G	M	A	M	M P depends on seat	P
NEWLY TESTED									
JEEP LIBERTY 2002 models avg. test vehicle wt. = 4,100 lbs.	M	G	M	G	A	G	A	A	P
NEWLY TESTED									
ISUZU RODEO HONDA PASSPORT 2002 models test vehicle wt. = 4,021 lbs.	M	G	M	G	A	M	A	A M depends on seat	P
NEWLY TESTED									
PONTIAC AZTEK 2001-02 models test vehicle wt. = 4,098 lbs.	M	A	M	G	G	G	M	M	M
NEWLY TESTED									
ISUZU TROOPER 2000-02 models avg. test vehicle wt. = 4,398 lbs.	M	A	A	G	P	P	M	M	P
NISSAN PATHFINDER INFINITI QX4 1997 (mfg. after 10/96)-2002 models test vehicle wt. = 4,191 lbs.	M	P	A	G	G	G	M	G M P depends on seat	P
NEWLY TESTED									
CHEVROLET BLAZER 1995-2002 models test vehicle wt. = 4,103 lbs. OLDSMOBILE BRAVADA 1996-2001 models GMC JIMMY/ENVOY 1995-2001 models	P	P	P	G	G	A	P	G A P depends on seat	P

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Turn page for crashworthiness evaluations of earlier designs ►

Evaluations (continued)

Midsize utility vehicles 4-door models	OVERALL EVALUATION	Frontal Offset Crash Test Performance						Other Evaluations	
		Structure/ Safety Cage	Injury Measures			Restraints/ Dummy Kinematics	Head Restraint Design	Bumper Performance	
			Head/ Neck	Chest	Leg/Foot Left, Right				
Crashworthiness evaluations of earlier designs:									
MITSUBISHI MONTERO 1996-2000 models test vehicle wt. = 4,400 lbs.	A	A	A	G	G	G	M	G	P
LAND ROVER DISCOVERY 1994-98 models test vehicle wt. = 4,434 lbs.	A	A	A	G	G	A	A	P	P
FORD EXPLORER 1995-2001 models test vehicle wt. = 4,255 lbs.	A	A	A	G	G	G	P	P	P
MERCURY MOUNTAINEER 1997-2001 models									
JEEP GRAND CHEROKEE 1996-98 models test vehicle wt. = 3,805 lbs.	M	A	G	G	P	P	A	P	P
MITSUBISHI MONTERO SPORT 1997-2000 models test vehicle wt. = 4,156 lbs.	P	M	G	G	P	P	P	M P depends on seat	P
ISUZU RODEO HONDA PASSPORT 1996-97 models test vehicle wt. = 4,158 lbs.	P	P	G	G	P	P	P	P	P
ISUZU RODEO HONDA PASSPORT 2000-01 models test vehicle wt. = 4,010 lbs.	P	G	P	G	P	A	M	A	P

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