

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

NEWS RELEASE

June 5, 2005

NEW SIDE IMPACT CRASH TEST RESULTS FOR FIVE MIDSIZE CARS: AUDI A4 IS 'DOUBLE BEST PICK;' CHEVY MALIBU IMPROVES TO GOOD AND 'BEST PICK'

ARLINGTON, VA — Among five 2005 model midsize sedans, the Audi A4 with standard side airbags and the Chevrolet Malibu equipped with optional side airbags earn good ratings. They also earn the "best pick" designation in side impact crash tests recently conducted by the Insurance Institute for Highway Safety. The Volvo S60 earns the second highest rating of acceptable. The Suzuki Verona and Nissan Maxima are marginal. No vehicle in this group is rated poor (see attached ratings).

The A4, which also is a "best pick" in the Institute's frontal offset crash test, becomes only the second car to earn this designation in both tests. Along with the Saab 9-3, it's a "double best pick."

"The Institute's side impact test is severe, reflecting what happens when vehicles are hit in the side by a pickup or SUV," says Institute chief operating officer



The Audi A4 (left) is a "double best pick." That is, it earns the Institute's "best pick" designation in both front and side crash tests. The Chevrolet Malibu with optional side airbags (right) earns this designation for side impact crash test performance. This represents an improvement compared with the 2004 model Malibu, which was rated acceptable for side impact protection.

— MORE —

Adrian Lund. "These latest test results show that more and more manufacturers are improving their vehicles to better protect occupants in side impact crashes."

The Institute now rates nine midsize car designs good for side impact protection.

Testing of the A4 and S60 was delayed from the Institute's first round of side tests of midsize cars conducted last year. The automakers asked for the delay because design changes were under way to improve side impact protection. The Maxima test also was delayed because of planned design changes, but those changes weren't implemented. The Verona and Malibu were retested to update results from last year because the manufacturers added new side airbags, which are standard on the Verona and optional on the Malibu.

Five more midsize models will be tested in side impacts later this year. The Acura TSX, BMW 3 series, and Infiniti G35 will have new design features added to improve side impact protection. The completely redesigned Lexus IS 300 and Volkswagen Passat will be introduced later in 2005.

Institute test is more challenging than federal test: In the Institute's side impact test, a moving deformable barrier strikes the driver side of a passenger vehicle at 31 mph. The barrier weighs 3,300 pounds and has a front end that is shaped to simulate the front end of a typical pickup or SUV. In each side-struck vehicle are two instrumented dummies the size of a small (5th percentile) woman, one positioned in the driver seat and one in the rear seat behind the driver.

The federal government uses a barrier that represents the front end of a car. This barrier was developed in the early 1980s when cars represented most of the vehicles on the road. The height of the barrier's front end is below the heads of the dummies that measure injury risks in side-struck vehicles. These federal tests don't assess the risks of head injury from impacts with vehicles like SUVs and pickups.

The Institute's barrier is 12 inches taller and rides 4 inches higher off the ground. The top of it is at the same level as the heads of the dummies in the

cars that are being tested. This is the scenario in real-world side impact crashes where occupants' heads often are struck by the intruding hood of a striking SUV or pickup truck.

Malibu improves: When the Institute tested the 2004 Chevrolet Malibu with optional side airbags, the car earned an acceptable rating.

"The 2004 model had optional curtain-style head airbags, but protection of the chest and abdomen wasn't good," Lund says. "The optional curtain did a good job of keeping injury measures on the heads of the dummies low, but torso injury measures for the driver dummy were high. This means that in a real-world crash of similar severity, rib fractures and internal organ injuries would be possible. This kept the 2004 Malibu with the optional curtain airbags from earning a good rating in the side impact test."

For the 2005 model year General Motors added torso airbags for front-seat occupants to improve protection of the chest and abdomen with the curtain airbags as an optional airbag package. In the test of the model with these new airbags all injury measures were low. In a similar real-world crash there would be a low risk of any significant injuries to the driver or rear passenger.

"This is very good performance, and the 2005 Malibu with side airbags is a 'best pick' for side crash protection," Lund says. "The results also show that you don't have to buy an expensive luxury car to get good protection for your family in a serious crash."

Based on the Institute's front, side, and rear impact tests, the Malibu with optional side airbags and Volkswagen's new Jetta with standard side airbags are the Institute's two highest rated moderately priced midsize cars overall. The 2005 Malibu without the optional airbags is rated poor in the side impact test.

Volvo is acceptable: The S60's performance was not as good as the A4's or Malibu's. With the standard curtain airbags, head protection was good. But forces on the driver dummy's pelvis were high.

"Even though the S60 has standard torso airbags for front-seat occupants along with the curtains, a fractured pelvis for the driver would be likely in a real-world crash like this," Lund says. "Volvo still has some work to do to improve the S60's performance."

Side airbags are important, but so is good structure: The results for the Verona and Maxima show that vehicles with weak side structures are unlikely to provide effective protection in serious side crashes, even if they're equipped with head-protecting airbags. Both of these cars earned good ratings for driver head protection because of the standard side airbags, but the marginal performances of their structures contributed to high forces elsewhere on the driver dummies in both cars and on the rear dummy in the Verona.

Although the Verona is rated marginal overall, its performance is an improvement compared with the 2004 model. Side airbags weren't available in 2004, and the car's performance was poor in large part because the driver dummy's head was struck by the intruding barrier, which produced high head accelerations.

For the 2005 model year, Suzuki added standard combination head/torso airbags that deploy from the side of the front seats. This time head protection for the driver was good, and forces on the driver dummy's torso were reduced.

"Suzuki should be commended for making side airbags standard in this relatively inexpensive car," Lund says.

How vehicles are evaluated: Each vehicle's overall side evaluation is based on injury measures recorded on two instrumented SID-IIIs dummies, assessment of head protection countermeasures, and the vehicle's structural performance during the impact. Injury measures obtained from the two dummies, one in the driver seat and the other in the rear seat behind the driver, are used to determine the likelihood that a driver and/or passenger in a real-world crash would have sustained serious injury to various body regions. The movements and contacts of the dummies' heads during the crash also are evaluated. This assessment is more important for






























seating positions without head-protecting airbags which, assuming they perform as intended, should prevent injurious head contacts. Structural performance is based on measurements indicating the amount of B-pillar intrusion into the occupant compartment. Some intrusion into the compartment is inevitable in serious side impacts, but any intrusion that does occur should be uniform both horizontally and vertically and shouldn't seriously compromise the driver or passenger space.

**End of 5-page news release on side crash test results
4-page attachment: crashworthiness ratings midsize cars**

**VNR 6/06/2005 at 10-10:30 am EDT (C) IA 5/Trans. 19
and 6/06 at 1-1:30 pm EDT (C) IA 5/Trans. 19; in rotation**

For more information go to www.iihs.org

ATTACHMENT 1: CRASHWORTHINESS EVALUATIONS, p.1 of 2

Midsize luxury/near luxury cars	FRONT EVALUATION	SIDE EVALUATION	REAR CRASH PROTECTION
<p>SAAB 9-3 SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2003-05 models; test vehicle = 3,322 lbs. side: 2004-05 models (mfg. after Dec. 2003); test vehicle = 3,236 lbs. rear: 2005 models</p>	 	 	
<p>NEW SIDE TEST AUDI A4/S4 SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2002-05 A4 models (mfg. after Feb. 2002); test vehicle = 3,569 lbs. front: 2004-05 S4 models side: 2005 models (mfg. after Oct. 2004); test vehicle = 3,675 lbs. rear: 2005 models (mfg. after Oct. 2004)</p>	 	 	
<p>ACURA TL SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2004-05 models; test vehicle = 3,552 lbs. side: 2004-05 models; test vehicle = 3,554 lbs. rear: 2004-05 models</p>	 		
<p>LEXUS ES 300/330 SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2002-05 models; test vehicle = 3,461 lbs. side: 2004-05 models (mfg. after April 2004); test vehicle = 3,487 lbs. rear: 2004-05 models</p>	 		
<p>NEW SIDE TEST VOLVO S60 SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2001-05 models; test vehicle = 3,422 lbs. side: 2005 models; test vehicle = 3,515 lbs. rear: 2003-05 models</p>			
<p>SAAB 9-5 SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT SEAT-MOUNTED COMBINATION HEAD & TORSO AIRBAGS front: 2002-05 models (mfg. after Nov. 2001); test vehicle = 3,602 lbs. side: 1999-2005 models; test vehicle = 3,505 lbs. rear: 2005 models</p>	 		
<p>MERCEDES C CLASS SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT & REAR DOOR-MOUNTED TORSO AIRBAGS front: 2001-05 models; test vehicle = 3,395 lbs. side: 2005 models; test vehicle = 3,347 lbs. rear: 2004-05 models</p>	 		

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 GOOD	 MARGINAL
 ACCEPTABLE	 POOR

ORDER OF VEHICLES REFLECTS RATINGS IN FRONT, SIDE, AND REAR TESTS

















FOR MORE DETAILED CRASHWORTHINESS EVALUATIONS OF MIDSIZE LUXURY/NEAR LUXURY CARS AND EVALUATIONS OF OTHER GROUPS OF VEHICLES, GO TO WWW.IIHS.ORG

FRONTAL RATINGS are based on performance in a 40 mph frontal offset crash test into a deformable barrier. **CAUTION:** Frontal 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.

SIDE RATINGS are based on performance in a crash test in which the side of the vehicle is struck by a moving deformable barrier with a front end that represents the front of a typical SUV or pickup. The moving barrier strikes the vehicle at 31 mph in a perpendicular impact. **NOTE:** Side ratings can be compared across vehicle type and weight categories while frontal ratings cannot.

REAR CRASH PROTECTION RATINGS are based on a two-step evaluation. In the first step restraint geometry is rated. Seats with good or acceptable geometric ratings then are subjected to a dynamic test. Seats with head restraints rated marginal or poor, based on geometry, aren't tested because they cannot protect taller occupants.

ATTACHMENT 1: CRASHWORTHINESS EVALUATIONS, p.2 of 2

Midsize luxury/near luxury cars	FRONT EVALUATION	SIDE EVALUATION	REAR CRASH PROTECTION
<p>JAGUAR X-TYPE SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2002-05 models (mfg. after Dec. 2001); test vehicle = 3,598 lbs. side: 2002-05 models; test vehicle = 3,585 lbs. rear: 2004-05 models</p>	 		
<p>LEXUS IS 300 front: 2002-05 models; test vehicle = 3,395 lbs. rear: 2001-05 models</p>	 	<div style="border: 1px solid black; padding: 2px;"> new 2006 model to be tested later this year </div>	
<p>BMW 3 SERIES front: 2000-05 models (mfg. after Nov. 1999); test vehicle = 3,347 lbs. rear: 2002-05 models</p>	 	<div style="border: 1px solid black; padding: 2px;"> design changes under way; test later this year </div>	
<p>ACURA TSX front: 2004-05 models; test vehicle = 3,278 lbs. rear: 2004-05 models</p>	 	<div style="border: 1px solid black; padding: 2px;"> design changes under way; test later this year </div>	
<p>INFINITI G35 front: 2003-05 models; test vehicle = 3,468 lbs. rear: 2005 models</p>	 	<div style="border: 1px solid black; padding: 2px;"> design changes under way; test later this year </div>	

end of midsize luxury/near luxury cars attachment

 GOOD	 MARGINAL
 ACCEPTABLE	 POOR

ATTACHMENT 2: CRASHWORTHINESS EVALUATIONS, p.1 of 2

Midsize moderately priced cars	FRONT EVALUATION	SIDE EVALUATION	REAR CRASH PROTECTION	
<p>VOLKSWAGEN NEW JETTA SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2005 models (mfg. after Nov. 2004); test vehicle = 3,214 lbs. side: 2005 models (mfg. after Nov. 2004); test vehicle = 3,228 lbs. rear: 2005 models (mfg. after Nov. 2004)</p>	G	BEST PICK side	G	A
<p>CHEVROLET MALIBU SIDE IMPACT TEST CONDUCTED WITH OPTIONAL FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2004-05 models; test vehicle = 3,183 lbs. side: 2005 models; test vehicle = 3,258 lbs. rear: 2004-05 models</p>	G	BEST PICK side	G	A
<p>TOYOTA CAMRY SIDE IMPACT TEST CONDUCTED WITH OPTIONAL FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2002-05 models; test vehicle = 3,276 lbs. side: 2004-05 models; test vehicle = 3,203 lbs. rear: 2002-04 models; 2005 to be tested later this year</p>	BEST PICK frontal	G	G	M
<p>HONDA ACCORD SIDE IMPACT TEST CONDUCTED WITH FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS (OPTIONAL IN 2004 MODELS, STANDARD IN 2005s) front: 2003-05 models; test vehicle = 3,186 lbs. side: 2004-05 models; test vehicle = 3,157 lbs. rear: 2003-05 models</p>	BEST PICK frontal	G	G	P
<p>MITSUBISHI GALANT SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT SEAT-MOUNTED COMBINATION HEAD & TORSO AIRBAGS front: 2004-05 models; test vehicle = 3,395 lbs. side: 2005 models; test vehicle = 3,391 lbs. rear: 2004-05 models</p>	G	G	P	
<p>VOLVO S40 SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2004-05 models (mfg. after Feb. 2004); test vehicle = 3,168 lbs. side: 2005 models; test vehicle = 3,245 lbs. rear: 2005 models (mfg. after Feb. 2004)</p>	BEST PICK frontal	G	A	G
<p>SUBARU LEGACY SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2005 models; test vehicle = 3,298 lbs. side: 2005 models; test vehicle = 3,322 lbs. rear: 2005 models</p>	BEST PICK frontal	G	M	A

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 GOOD	 MARGINAL
 ACCEPTABLE	 POOR




























ORDER OF VEHICLES REFLECTS RATINGS IN FRONT, SIDE, AND REAR TESTS

FOR MORE DETAILED CRASHWORTHINESS EVALUATIONS OF MIDSIZE MODERATELY PRICED CARS AND EVALUATIONS OF OTHER GROUPS OF VEHICLES, GO TO WWW.IIHS.ORG

FRONTAL RATINGS are based on performance in a 40 mph frontal offset crash test into a deformable barrier. **CAUTION:** Frontal 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.

SIDE RATINGS are based on performance in a crash test in which the side of the vehicle is struck by a moving deformable barrier with a front end that represents the front of a typical SUV or pickup. The moving barrier strikes the vehicle at 31 mph in a perpendicular impact. **NOTE:** Side ratings can be compared across vehicle type and weight categories while frontal ratings cannot.

REAR CRASH PROTECTION RATINGS are based on a two-step evaluation. In the first step restraint geometry is rated. Seats with good or acceptable geometric ratings then are subjected to a dynamic test. Seats with head restraints rated marginal or poor, based on geometry, aren't tested because they cannot protect taller occupants.

Midsize moderately priced cars	FRONT EVALUATION	SIDE EVALUATION	REAR CRASH PROTECTION
<p>NEW SIDE TEST NISSAN MAXIMA SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT & REAR HEAD CURTAIN AIRBAGS & FRONT SEAT-MOUNTED TORSO AIRBAGS front: 2004-05 models; test vehicle = 3,472 lbs. side: 2004-05 models; test vehicle = 3,481 lbs. rear: 2004-05 models</p>	 		
<p>NISSAN ALTIMA SIDE IMPACT TEST CONDUCTED WITHOUT OPTIONAL AIRBAGS front: 2002-05 models; test vehicle = 3,150 lbs. side: 2002-05 models; test vehicle = 3,095 lbs. rear: 2005 models</p>			
<p>CHEVROLET MALIBU SIDE IMPACT TEST CONDUCTED WITHOUT OPTIONAL AIRBAGS front: 2004-05 models; test vehicle = 3,183 lbs. side: 2004-05 models; test vehicle = 3,254 lbs. rear: 2004-05 models</p>			
<p>TOYOTA CAMRY SIDE IMPACT TEST CONDUCTED WITHOUT OPTIONAL AIRBAGS front: 2002-05 models; test vehicle = 3,276 lbs. side: 2002-05 models; test vehicle = 3,197 lbs. rear: 2002-04 models; 2005 to be tested later this year</p>	 		
<p>MAZDA 6 SIDE IMPACT TEST CONDUCTED WITHOUT OPTIONAL AIRBAGS front: 2003-05 models; test vehicle = 3,086 lbs. side: 2003-05 models; test vehicle = 3,137 lbs. rear: 2003-05 models</p>	 		
<p>NEW SIDE TEST SUZUKI VERONA SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT SEAT-MOUNTED COMBINATION HEAD & TORSO AIRBAGS front: 2004-05 models; test vehicle = 3,385 lbs. side: 2005 models; test vehicle = 3,347 lbs. rear: 2004-05 models</p>			
<p>DODGE STRATUS/CHRYSLER SEBRING SIDE IMPACT TEST CONDUCTED WITHOUT OPTIONAL AIRBAGS front: 2001-05 models; test vehicle = 3,252 lbs. side: 2001-05 models; test vehicle = 3,126 lbs. rear: 2003-05 models</p>			
<p>SATURN L SERIES SIDE IMPACT TEST CONDUCTED WITH FRONT & REAR HEAD CURTAIN AIRBAGS (OPTIONAL IN 2001 MODELS, STANDARD IN 2002-05s) front: 2000-05 models; test vehicle = 3,192 lbs. side: 2001-05 models; test vehicle = 3,210 lbs. rear: 2001-05 models</p>			
<p>HYUNDAI SONATA/KIA OPTIMA SIDE IMPACT TEST CONDUCTED WITH STANDARD FRONT SEAT-MOUNTED COMBINATION HEAD & TORSO AIRBAGS front: 1999-2005 models (Sonata); 2001-05 models (Optima) test vehicle = 3,131 lbs. side: 1999-2005 models (Sonata); 2001-05 models (Optima) test vehicle = 3,277 lbs. rear: 2001-05 models</p>			
<p>VOLKSWAGEN PASSAT front: 1998-2005 models; test vehicle = 3,170 lbs. rear: 2001-05 models</p>	 	<div style="border: 1px solid black; padding: 2px; text-align: center;"> new model to be tested later this year </div>	

end of midsize moderately priced cars attachment

 GOOD  MARGINAL
 ACCEPTABLE  POOR