

# INSURANCE INSTITUTE FOR HIGHWAY SAFETY

## NEWS RELEASE

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### FIRST RESULTS OF SIDE IMPACT CRASH TESTS: TWO SMALL SUVs EARN GOOD RATINGS; ONLY ONE IS RATED GOOD IN BOTH FRONT AND SIDE CRASH TESTS

ARLINGTON, VA — For the first time, the Insurance Institute for Highway Safety has evaluated vehicles in side impact crash tests to provide consumer information. The best performers among the 12 small SUVs tested (2003 models) are the Subaru Forester and the Ford Escape with optional side airbags. In contrast, 7 other small SUVs



The Institute's side impact crash test represents what happens when a passenger vehicle is struck in the side by a pickup truck or SUV.

The Subaru Forester is the only one of the 12 small SUVs to earn a good rating in not only the side impact crashworthiness evaluation but also the Institute's frontal offset crash test.

earned the lowest rating of poor — the Escape without optional side airbags, Toyota RAV4, Suzuki Grand Vitara/Vitara/Chevrolet Tracker, Land Rover Freelander, Mitsubishi Outlander, Saturn VUE, and Honda Element. The Jeep Wrangler and Honda CR-V are rated marginal, and the Hyundai Santa Fe is acceptable (see Attachment 1 for comparative ratings).

— MORE —

The side impact test represents what happens when a passenger vehicle is struck in the side by a pickup truck or SUV at about 30 mph. The results of this test expand the Institute's testing programs for consumer information. For eight years the Institute has been providing comparative rankings of passenger vehicles based on performance in frontal offset crash tests at 40 mph. Now most new passenger vehicles are being designed to earn good ratings in this test.

"Our side impact crash test is severe," says Institute president Brian O'Neill. "Given the designs of today's vehicles, it's unlikely that people in real-world crashes as severe as this test would emerge uninjured. But with good side impact protection, people should be able to survive crashes of this severity without serious injuries."

O'Neill adds that he expects this new crashworthiness evaluation program to influence consumers' car-buying choices. "This is what happened with our frontal crash test results, and now we expect consumers will use the new test results to help them choose vehicles with good occupant protection in both front and side impacts."

Because consumers pay attention to the Institute's crash test results, automakers are expected to upgrade their vehicles' side impact protection, just as they've upgraded the protection their vehicles offer in frontal crashes.

"Ideally, passenger vehicles should be good performers in both tests — a double good," O'Neill says.

The configuration of the Institute's side impact test is a 31 mph perpendicular impact into the driver side of a passenger vehicle. The moving deformable barrier that strikes the test vehicle weighs 3,300 pounds and has a front end shaped to simulate the typical front end of a pickup or SUV (see p.6). In each side-struck vehicle are two instrumented dummies, one in the driver seat and one in the rear seat behind the driver. These dummies are the size of a short (5th percentile) female or a 12-year-old child.

"This is the first U.S. consumer information test program to use a dummy that represents small females," O'Neill points out.

**Forester is best performer and Outlander is worst:** The side airbag in the Subaru Forester kept the injury measures recorded on the driver dummy relatively low. The dummy in the rear seat also recorded relatively low measures, although its head did hit the pillar behind the back door — an area required by federal standard to limit head impact forces. There was somewhat less intrusion into the Forester than into several of the other small SUVs the Institute tested.

In contrast, the Mitsubishi Outlander was the worst performer in the side impact test. There was more intrusion into the occupant compartment than in many of the other vehicles tested. The Outlander that was tested didn't have side airbags. The barrier struck the driver dummy's head, and the injury measures recorded on the head as well as on the torso and pelvis were very high.

**Ford Escape with and without side airbags:** Ford offers side airbags as optional equipment in the front seats of Escapes. The Institute tested Escapes with and without this option.

"There was a huge difference in the results," O'Neill says. "The driver dummy with the airbag to protect its head and torso recorded low injury measures, while high measures were recorded on the driver dummy in the Escape without side airbags. Even though the Escape with side airbags was a good performer in this test, it was only marginal in our frontal offset test."

**Relative importance of side impacts:** Today's passenger vehicles are more crashworthy than they used to be, especially in frontal crashes. As occupant protection in frontal crashes improves, the relative importance of protecting people in side impacts increases. From the early 1980s until 2000, car driver death rates decreased from 164 to 87 per million cars registered. This represents a 47 percent decline. Most of this improvement was in frontal crashes, in which driver death rates decreased from 86 to 41 per million (52 percent decline). The improvement was much smaller in side impacts — the death rate decreased from 42 to 32 per million (24 percent decline).

In crashes with another passenger vehicle, 51 percent of driver deaths in recent model cars during 2000-01 occurred in side impacts, up from 31 percent in 1980-81.

During the same time, the proportion of deaths in frontal impacts declined from 61 percent to 43 percent (see Attachment 2, Table 1).

These changes are attributable to two effects. There have been significant improvements in frontal crash protection — standard airbags, improved structural designs, and higher belt use rates, for example. At the same time, growing sales of SUVs and pickups have exacerbated height mismatches among passenger vehicles, thereby increasing the risks to occupants of many vehicles struck in the side. Seventy-one percent of the driver deaths in cars struck on the driver side by other passenger vehicles during 1980–81 occurred when the other vehicle was a car. Twenty-nine percent occurred when the striking vehicle was a pickup or SUV. By 2000–01 these percentages had almost reversed — 57 percent of the driver deaths in cars struck on the driver side by another passenger vehicle involved striking SUVs or pickups, while 43 percent involved striking cars (see Attachment 2, Table 2).



Head injuries are a leading cause of occupant deaths in side impacts. For example, the 23-year-old driver of this car died when his head was struck by the intruding front end of a pickup truck. See Attachment 3 for more examples.

“The risks to people in a side-struck vehicle greatly increase if the striking vehicle rides higher off the ground than the struck vehicle. Thus, the risks are much higher when an SUV strikes the side of a car than when the striking vehicle is another car,” O’Neill explains.

**Head protection in side impacts:**

Almost 10,000 passenger vehicle occupants die each year in side impacts, and head injuries are a leading

cause. Side airbags designed specifically to protect the head can reduce such deaths and the even more numerous nonfatal head injuries that occur in side impacts.

Both of the small SUVs with good overall ratings in the Institute's side impact test are equipped with side airbags designed to protect the heads of front-seat occupants. These are standard on the Subaru Forester and optional on the Ford Escape. The Hyundai Santa Fe, which also has standard side airbags with head protection, earned an acceptable rating. In contrast, none of the seven small SUVs with poor ratings is equipped with standard side airbags designed to protect the head.

(Note: The Saturn VUE does have an optional inflatable curtain, but when side airbags are optional the Institute tests vehicles without this option. If a manufacturer selling optional side airbags requests the Institute to conduct an additional test of a vehicle with this option and agrees to reimburse the cost of the vehicle, a second test is conducted. General Motors didn't request such a test for the VUE, but Ford did request a test of the Escape with optional side airbags. The Honda CR-V and Mitsubishi Outlander have optional side airbags to protect the thorax, but neither manufacturer requested a second test with this option.)

None of the small SUVs the Institute recently tested has side airbags to protect the heads of people riding in rear seats. (The VUE's optional head airbag system does cover the rear seating position. However, as noted above the Institute didn't test this vehicle.)

**Availability of side airbags:** More and more manufacturers are offering side airbags as standard or optional equipment, and some cars and larger SUVs are being equipped with newer inflatable curtains designed to protect rear-seat occupants' heads (see Attachment 4).

According to a recent J.D. Power survey of 50,000 people, 34 percent said they "definitely want" side airbags, up from 18 percent in 1997 (2002 Feature Contenting Report). Another J.D. Power survey reveals side airbags at the top of the list of 19 vehicle features respondents said they want. Still, reported sales of optional side airbags are low.

**Institute versus federal side impact crash test:** Since 1997 the federal New Car Assessment Program, which compares crashworthiness among new passenger vehicles, has included side impacts. In these tests, an impactor with a deformable front end representing the front of a car is used to strike the sides of the vehicles being assessed. This moving deformable 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 the side-struck vehicles. These federal tests don't assess the risks of head injury from impacts with vehicles like SUVs and pickups.

The changed vehicle mix and high risks to occupants of side-struck vehicles when the striking vehicles are SUVs or pickups led the Institute to modify the moving deformable barrier used in the federal test so the front end represents the geometry of a typical SUV or pickup. The result is a barrier that's higher off the ground, taller,



FEDERAL MOVING DEFORMABLE BARRIER



IIHS MOVING DEFORMABLE BARRIER

and contoured. The design of this barrier and choice of the test speed (31 mph) reflect extensive developmental tests, including tests comparing the results from side impacts with barriers versus side impacts with SUVs and pickups.

Another difference between Institute and federal side impact tests involves the choice of test dummies. The Institute uses SID-IIIs dummies, which are smaller than the dummy (SID) used in the federal government's tests. SID-IIIs is a newer design than SID, which was developed in the 1970s, and it records more injury measures across more body regions.

SID-IIIs represents a small (5th percentile) female or a 12 year-old. This choice of dummies reflects the fact that small females are more likely than males to suffer serious head injuries in real-world side impacts (see Attachment 2, Table 3). The head of the smaller SID-IIIs driver dummy is in the window area where people's heads are more vulnerable to being struck by the front end of a striking vehicle in a real-world side impact.

**How vehicles are evaluated in the Institute's side impact tests:** Each vehicle's overall side impact evaluation is based on (1) the injury measures recorded on the two instrumented SID-IIIs dummies, (2) an assessment of head protection countermeasures, and (3) the vehicle's structural performance during the impact.

(1) Injury measures are obtained from two SID-IIIs dummies, one in the driver seat and the other in the rear seat behind the driver. These measures are used to determine the likelihood that a driver and/or passenger would have sustained serious injury to various body regions. Measures are recorded from the head, neck, chest, abdomen, pelvis, and leg. These injury measures, especially from the head/neck and torso (chest and abdomen), are major components of each vehicle's overall evaluation.

(2) To supplement head injury measures, the movements and contacts of the dummies' heads during the crash are evaluated. This assessment is more important for seating positions without head protection airbags, which (assuming they perform as intended) should prevent injurious head contacts. Very high head injury measures typically are

recorded when the moving deformable barrier hits a dummy's head during impact. However, a "near miss" or a grazing contact also indicates a potential risk of serious injury in a real-world crash. This is because small differences in occupants' heights or in their seating positions compared with the test dummies could result in a hard contact and high risk of serious head injury. In the rear seat, the potential for serious injury is influenced by whether the seating position puts occupants' heads in proximity to areas designed with padding or something else to reduce impact forces versus areas with hard or unprotected structures. Analysis of the movement and contact points of the dummies' heads during the side impact crash test is used to assess this aspect of protection.

(3) Structural performance is based on measurements indicating the amount of intrusion into the occupant compartment around the B-pillar (between the doors). This assessment indicates how well a vehicle's side structure resisted intrusion into the driver and rear-seat passenger space. Some intrusion into the occupant compartment is inevitable in serious side impacts. Any intrusion that does occur should be uniform both horizontally and vertically and shouldn't seriously compromise the driver and passenger space.

The three factors evaluated in the Institute's side impact test — driver and passenger injury measures, head protection, and structural performance — determine each vehicle's overall side crashworthiness evaluation. The order in which vehicles are listed (see Attachment 1) depends on performance in frontal offset crash tests as well as side impact tests.

**End eight-page release on side impacts. Four attachments:**

- 1. Crashworthiness evaluations (ratings) of 12 small SUVs**
- 2. Occupant deaths & serious injuries in side impacts (tables)**
- 3. Real-world crashes: serious side impacts (with photos)**
- 4. 2003 passenger vehicle models with side airbags (list)**

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**Internet: [www.highwaysafety.org](http://www.highwaysafety.org)**

**ATTACHMENT 1  
CRASHWORTHINESS EVALUATIONS**

Small SUVs	Side impact crash test performance						Frontal offset test
	OVERALL SIDE EVALUATION	Head protection	Injury measures			Structure/ safety cage	OVERALL FRONTAL EVALUATION
			Head	Torso	Pelvis/leg		
<b>SUBARU FORESTER</b> 2003 models avg. test vehicle wt. = 3,192 lbs.	<b>G</b>	Driver <b>G</b> Rear passenger <b>A</b>	<b>G</b> <b>G</b>	<b>G</b> <b>G</b>	<b>A</b> <b>G</b>	<b>A</b>	<b>G</b>
<b>HYUNDAI SANTA FE</b> 2002 (mfg. after 3/2002)-03 models test vehicle wt. = 3,922 lbs.	<b>A</b>	Driver <b>G</b> Rear passenger <b>M</b>	<b>G</b> <b>G</b>	<b>G</b> <b>G</b>	<b>G</b> <b>G</b>	<b>M</b>	<b>G</b>
<b>HONDA CR-V</b> 2002-03 models test vehicle wt. = 3,327 lbs.	<b>M</b>	Driver <b>M</b> Rear passenger <b>A</b>	<b>A</b> <b>G</b>	<b>M</b> <b>G</b>	<b>G</b> <b>G</b>	<b>M</b>	<b>G</b>
<b>FORD ESCAPE MAZDA TRIBUTE</b> <i>WITH SIDE AIRBAGS</i> 2001-03 models test vehicle wt. = 3,417 lbs.	<b>G</b>	Driver <b>G</b> Rear passenger <b>A</b>	<b>G</b> <b>G</b>	<b>A</b> <b>G</b>	<b>G</b> <b>G</b>	<b>A</b>	<b>M</b>
<i>WITHOUT SIDE AIRBAGS</i> 2001-03 models test vehicle wt. = 3,479 lbs.	<b>P</b>	Driver <b>P</b> Rear passenger <b>A</b>	<b>A</b> <b>G</b>	<b>P</b> <b>G</b>	<b>G</b> <b>G</b>	<b>A</b>	
<b>JEEP WRANGLER</b> 1997-2003 models test vehicle wt. = 3,391 lbs.	<b>M</b>	Driver <b>M</b> Rear passenger <b>M</b>	<b>A</b> <b>G</b>	<b>P</b> <b>G</b>	<b>G</b> <b>G</b>	<b>G</b>	<b>A</b>
<b>HONDA ELEMENT</b> 2003 models test vehicle wt. = 3,508 lbs.	<b>P</b>	Driver <b>M</b> Rear passenger <b>M</b>	<b>A</b> <b>G</b>	<b>P</b> <b>G</b>	<b>G</b> <b>A</b>	<b>A</b>	<b>G</b>
<b>SATURN VUE</b> 2002-03 models test vehicle wt. = 3,519 lbs.	<b>P</b>	Driver <b>P</b> Rear passenger <b>M</b>	<b>A</b> <b>G</b>	<b>P</b> <b>G</b>	<b>M</b> <b>G</b>	<b>A</b>	<b>G</b>
<b>MITSUBISHI OUTLANDER</b> 2003 models test vehicle wt. = 3,444 lbs.	<b>P</b>	Driver <b>P</b> Rear passenger <b>A</b>	<b>P</b> <b>G</b>	<b>P</b> <b>A</b>	<b>P</b> <b>G</b>	<b>M</b>	<b>G</b>
<b>LAND ROVER FREELANDER</b> 2002-03 models avg. test vehicle wt. = 3,545 lbs.	<b>P</b>	Driver <b>M</b> Rear passenger <b>A</b>	<b>G</b> <b>A</b>	<b>P</b> <b>G</b>	<b>A</b> <b>G</b>	<b>M</b>	<b>A</b>
<b>SUZUKI GRAND VITARA/VITARA CHEVROLET TRACKER</b> 1999-2003 models test vehicle wt. = 3,280 lbs.	<b>P</b>	Driver <b>P</b> Rear passenger <b>A</b>	<b>P</b> <b>G</b>	<b>M</b> <b>G</b>	<b>A</b> <b>G</b>	<b>M</b>	<b>A</b>
<b>TOYOTA RAV4</b> 2001-03 models test vehicle wt. = 3,113 lbs.	<b>P</b>	Driver <b>P</b> Rear passenger <b>M</b>	<b>A</b> <b>G</b>	<b>P</b> <b>M</b>	<b>P</b> <b>M</b>	<b>A</b>	<b>A</b>

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

NOTE: Order of vehicles reflects performance in front as well as side impact crash tests.

**ATTACHMENT 2  
DEATHS AND INJURIES IN SIDE IMPACTS**

**TABLE 1: DRIVER DEATHS IN CARS 1-3 YEARS OLD,  
PER MILLION CARS REGISTERED, AND PERCENT OF DEATHS  
IN FRONT VERSUS SIDE IMPACTS**

<b>CRASH TYPE</b>	<b>IMPACT DIRECTION</b>	<b>CALENDAR YEARS</b>					
		<b>1980-81:</b>		<b>1990-91:</b>		<b>2000-01:</b>	
		<b>RATE</b>	<b>%</b>	<b>RATE</b>	<b>%</b>	<b>RATE</b>	<b>%</b>
<b>Car and another passenger vehicle</b>	<b>Front</b>	36	61	22	53	12	43
	<b>Side</b>	18	31	18	43	15	51
	<b>All</b>	59	100	42	100	29	100
<b>All car crashes</b>	<b>Front</b>	86	52	62	53	41	46
	<b>Side</b>	42	26	37	32	32	37
	<b>All</b>	164	100	117	100	87	100

Source: Fatality Analysis Reporting System, National Highway Traffic Safety Administration

**TABLE 2: PERCENT OF DRIVER DEATHS IN 1-3 YEAR OLD  
PASSENGER VEHICLES STRUCK ON THE DRIVER SIDE BY OTHER  
PASSENGER VEHICLES, BY TYPE OF STRIKING VEHICLE**

<b>STRIKING VEHICLE</b>	<b>STRUCK VEHICLE</b>	<b>CALENDAR YEARS</b>		
		<b>1980-81</b>	<b>1990-91</b>	<b>2000-01</b>
<b>Car SUV or pickup</b>	<b>Car</b>	71%	61%	43%
	<b>Car</b>	29%	39%	57%
<b>Car</b>	<b>All passenger vehicles</b>	70%	60%	43%
<b>SUV or pickup</b>	<b>All passenger vehicles</b>	30%	40%	57%

Source: Fatality Analysis Reporting System, National Highway Traffic Safety Administration

**TABLE 3: DISTRIBUTION OF SERIOUS & FATAL  
INJURIES, BY BODY REGION, TO DRIVERS OF  
PASSENGER VEHICLES STRUCK ON THE DRIVER SIDE,  
CALENDAR YEARS 1997-2001**

<b>BODY REGION</b>	<b>MALE</b>	<b>FEMALE</b>	<b>TOTAL</b>
<b>Head, face, or neck</b>	29%	34%	31%
<b>Thorax</b>	66%	51%	61%
<b>Abdomen</b>	14%	13%	13%
<b>Upper extremities</b>	15%	18%	16%
<b>Pelvis &amp; lower extremities</b>	33%	38%	35%
<b>Spine</b>	5%	2%	4%

Notes: Serious injuries are AIS (Abbreviated Injury Scale) 3 or greater.  
Drivers frequently suffer AIS 3+ injuries to multiple body regions.

Source: National Automotive Sampling System/Crashworthiness Data System,  
National Highway Traffic Safety Administration

### ATTACHMENT 3 REAL-WORLD CRASHES: SERIOUS SIDE IMPACTS



#### **1993 Plymouth Voyager struck by an ambulance**

66-year-old male driver of the minivan died from massive chest injuries including a transected aorta.

NASS 82-112 (2000)



#### **1991 Geo Storm struck by a pickup truck**

23-year-old male driver of the Geo died from injuries sustained when the intruding pickup struck his head.

NASS 79-123 (1999)



#### **1997 Plymouth Breeze struck by a midsize SUV**

30-year-old female driver died from injuries sustained when the intruding SUV struck her head.

NASS 75-143 (1999)



#### **1993 Pontiac Grand Am struck by a pickup truck**

29-year-old female driver of the Grand Am died from massive injuries to her head, neck, chest, and abdomen. A 72-year-old female passenger in the rear seat also was killed.

NASS 95-050 (1994)



#### **1986 Oldsmobile 98 struck by a pickup truck**

32-year-old pregnant driver of the Oldsmobile was hospitalized with serious injuries including a pelvic fracture and lung contusions.

NASS 48-059 (1997)



#### **1986 Chevrolet Celebrity struck by a pickup truck**

54-year-old female driver of the Celebrity suffered serious injuries to her pelvis and rib cage.

NASS 75-080 (1997)



#### **1997 Ford Escort struck by a midsize SUV**

46-year-old female driver of the Escort was hospitalized with multiple fractures including a pelvic fracture.

NASS 75-061 (1997)



#### **1993 Ford Taurus station wagon struck by a midsize SUV**

45-year-old female driver of the station wagon was hospitalized with injuries to her pelvis, spleen, and rib cage.

NASS 11-022 (1998)

**ATTACHMENT 4 (p.1 of 5)**

**2003 PASSENGER VEHICLE MODELS WITH SIDE AIRBAGS**

	<u>Seating position</u>	<u>Type of side airbag</u>	<u>Standard or optional</u>
<b>ACURA</b>			
3.2 CL / 3.2 TL / 3.5 RL	Front	Torso only	Standard
MDX / RSX	Front	Torso only	Standard
<b>AUDI</b>			
A4 except Cabriolet	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
	Rear	Torso	Optional
A4 Cabriolet	Front	Torso/head combination	Standard
A6 / S6	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
	Rear	Torso	Optional
A8 / S8	Front & rear	Curtain/torso	Standard
Allroad	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
	Rear	Torso	Optional
TT	Front	Torso/head combination	Standard
<b>BENTLEY</b>			
Arnage	Front & rear	Torso	Standard
	Front & rear	Curtain	Optional
<b>BMW</b>			
3 series / M3 except convertibles	Front	Inflatable tube/torso	Standard
	Rear	Torso only	Optional
3 series / M3 convertibles	Front	Torso only	Standard
	Rear	Torso only	Optional
5 series except station wagons / M5	Front	Inflatable tube/torso	Standard
	Rear	Inflatable tube	Standard
	Rear	Torso	Optional
5 series station wagons	Front	Inflatable tube/torso	Standard
	Rear	Torso only	Optional
7 series	Front	Inflatable tube/torso	Standard
	Rear	Inflatable tube	Standard
	Rear	Torso	Optional
X5	Front	Inflatable tube/torso	Standard
	Rear	Inflatable tube	Standard
	Rear	Torso	Optional
Z series	Front	Torso only	Standard
Mini Cooper	Front	Inflatable tube/torso	Standard
	Rear	Inflatable tube	Standard
<b>BUICK</b>			
Century	Front (driver only)	Torso/head combination	Optional
LeSabre	Front	Torso only	Optional
Park Avenue	Front	Torso only	Standard
Regal	Front (driver only)	Torso/head combination	Optional
Rendezvous	Front (driver)	Torso/head combination	Optional
	Front (passenger)	Torso only	Optional
<b>CADILLAC</b>			
CTS	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
DeVille	Front	Torso only	Standard
	Rear	Torso only	Optional
Escalade	Front	Torso only	Standard
Seville	Front (driver)	Torso/head combination	Standard
	Front (passenger)	Torso only	Standard

**ATTACHMENT 4 (p.2 of 5)**

**2003 PASSENGER VEHICLE MODELS WITH SIDE AIRBAGS**

	<u>Seating position</u>	<u>Type of side airbag</u>	<u>Standard or optional</u>
<b>CHEVROLET</b>			
Avalanche	Front	Torso only	Optional
Cavalier	Front	Torso only	Optional
Impala / Monte Carlo	Front (driver only)	Torso/head combination	Optional
SSR	Front	Torso/head combination	Standard
Suburban / Tahoe	Front	Torso only	Optional
TrailBlazer / TrailBlazer EXT	Front	Torso only	Optional
Venture	Front (driver)	Torso/head combination	Optional
	Front (passenger)	Torso only	Optional
<b>CHRYSLER</b>			
300M / Concorde	Front	Torso/head combination	Optional
PT Cruiser	Front	Torso/head combination	Optional
Sebring 4dr	Front & rear	Curtain	Optional
Town & Country	Front	Torso/head combination	Optional
Voyager	Front	Torso/head combination	Optional
<b>DODGE</b>			
Caravan / Grand Caravan	Front	Torso/head combination	Optional
Durango	Front & rear	Curtain	Optional
Intrepid / Neon	Front	Torso/head combination	Optional
Ram pickup	Front & rear	Curtain	Optional
Stratus	Front & rear	Curtain	Optional
<b>FORD</b>			
Crown Victoria	Front	Torso/head combination	Optional
Escape	Front	Torso/head combination	Optional
Expedition	Front & rear	Curtain	Optional
Explorer 4dr / Sport Trac	Front & rear	Curtain	Optional
Focus	Front	Torso/head combination	Optional
Taurus	Front	Torso/head combination	Optional
Thunderbird	Front	Torso/head combination	Standard
Windstar	Front	Torso/head combination	Optional
<b>GMC</b>			
Envoy / Envoy XL	Front	Torso only	Optional
Yukon / Yukon XL	Front	Torso only	Optional
<b>HONDA</b>			
Accord	Front & rear	Curtain/torso	Optional
Civic	Front	Torso only	Optional
Civic Hybrid	Front	Torso only	Standard
CR-V	Front	Torso only	Optional
Element	Front	Torso only	Optional
Odyssey	Front	Torso only	Standard
Pilot	Front	Torso only	Standard
<b>HYUNDAI</b>			
Accent	Front	Torso/head combination	Optional
Elantra	Front	Torso/head combination	Standard
Santa Fe	Front	Torso/head combination	Standard
Sonata	Front	Torso/head combination	Standard
Tiburon	Front	Torso/head combination	Standard
XG350	Front	Torso/head combination	Standard
<b>INFINITI</b>			
FX-Series	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
G35 / M45 / Q45	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
I35	Front	Torso/head combination	Standard
QX4	Front	Torso/head combination	Standard

**ATTACHMENT 4 (p.3 of 5)****2003 PASSENGER VEHICLE MODELS WITH SIDE AIRBAGS**

	<u>Seating position</u>	<u>Type of side airbag</u>	<u>Standard or optional</u>
<b>ISUZU</b>			
Ascender	Front	Torso only	Standard
<b>JAGUAR</b>			
S-Type	Front Rear	Curtain/torso Curtain	Standard Standard
XJ-Series	Front	Torso only	Standard
XK-Series	Front	Torso/head combination	Standard
X-Type	Front Rear	Curtain/torso Curtain	Standard Standard
<b>JEEP</b>			
Grand Cherokee	Front & rear	Curtain	Optional
Liberty	Front & rear	Curtain	Optional
<b>KIA</b>			
Optima	Front	Torso/head combination	Standard
Sorento	Front & rear	Curtain	Standard
<b>LAND ROVER</b>			
Range Rover	Front Rear	Inflatable tube/torso Inflatable tube	Standard Standard
<b>LEXUS</b>			
ES 300	Front Rear	Curtain/torso Curtain	Standard Standard
GS 300 / 430	Front	Curtain/torso	Standard
GX 470	Front Rear	Curtain/torso Curtain	Standard Standard
IS 300	Front	Curtain/torso	Standard
LS 430	Front Rear	Curtain/torso Curtain	Standard Standard
LX 470	Front Rear	Curtain/torso Curtain	Standard Standard
RX 300	Front	Torso only	Standard
SC 430	Front	Torso only	Standard
<b>LINCOLN</b>			
Aviator	Front & rear	Curtain	Standard
LS	Front	Torso/head combination	Standard
Navigator	Front & rear	Curtain	Standard
Town Car	Front	Torso/head combination	Standard
<b>MASERATI</b>			
Coupe	Front	Torso only	Standard
Spyder	Front	Torso only	Standard
<b>MAYBACH</b>			
57	Front & rear	Curtain/torso	Standard
62	Front & rear	Curtain/torso	Standard
<b>MAZDA</b>			
6	Front Rear	Curtain/torso Curtain	Optional Optional
MPV	Front	Torso/head combination	Optional
Protegé	Front	Torso/head combination	Optional
Tribute	Front	Torso/head combination	Optional

**ATTACHMENT 4 (p.4 of 5)****2003 PASSENGER VEHICLE MODELS WITH SIDE AIRBAGS**

	<u>Seating position</u>	<u>Type of side airbag</u>	<u>Standard or optional</u>
<b>MERCEDES-BENZ</b>			
C class	Front & rear	Curtain/torso	Standard
CL class	Front Rear	Curtain/torso Curtain	Standard Standard
CLK class except convertible	Front & rear	Curtain/torso	Standard
CLK class convertible	Front	Torso only	Standard
E class	Front & rear	Curtain/torso	Standard
M class	Front & rear	Curtain/torso	Standard
S class	Front & rear	Curtain/torso	Standard
SL class	Front	Torso/head combination	Standard
SLK class	Front	Torso only	Standard
<b>MERCURY</b>			
Grand Marquis	Front	Torso/head combination	Standard
Mountaineer	Front & rear	Curtain	Optional
Sable	Front	Torso/head combination	Optional
<b>MINI</b>			
Cooper	Front Rear	Inflatable tube/torso Inflatable tube	Standard Standard
<b>MITSUBISHI</b>			
Eclipse	Front	Torso only	Optional
Galant	Front	Torso only	Optional
Lancer	Front	Torso only	Optional
Montero	Front	Torso only	Standard
Outlander	Front	Torso only	Optional
<b>NISSAN</b>			
350Z	Front	Curtain/torso	Optional
Altima	Front Rear	Curtain/torso Curtain	Optional Optional
Maxima	Front	Torso/head combination	Optional
Murano	Front Rear	Curtain/torso Curtain	Standard Standard
Pathfinder	Front Rear	Curtain/torso Curtain	Optional Optional
Sentra	Front	Torso/head combination	Optional
Xterra	Front Rear	Curtain Curtain	Optional Optional
<b>OLDSMOBILE</b>			
Aurora	Front	Torso only	Standard
Bravada	Front	Torso only	Optional
Silhouette	Front (driver) Front (passenger)	Torso/head combination Torso only	Standard Standard
<b>PONTIAC</b>			
Aztek	Front (driver) Front (passenger)	Torso/head combination Torso only	Optional Optional
Bonneville	Front	Torso only	Standard
Montana	Front (driver) Front (passenger)	Torso/head combination Torso only	Optional Optional
Vibe	Front	Torso only	Optional

**ATTACHMENT 4 (p.5 of 5)**

**2003 PASSENGER VEHICLE MODELS WITH SIDE AIRBAGS**

	<u>Seating position</u>	<u>Type of side airbag</u>	<u>Standard or optional</u>
<b>PORSCHE</b>			
911	Front	Torso only	Standard
Boxster	Front	Torso only	Standard
Cayenne	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
<b>SAAB</b>			
9-3 except convertible	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
9-3 convertible	Front	Torso/head combination	Standard
9-5	Front	Torso/head combination	Standard
<b>SATURN</b>			
ION	Front & rear	Curtain	Optional
L-Series	Front & rear	Curtain	Standard
VUE	Front & rear	Curtain	Optional
<b>SUBARU</b>			
Forester	Front	Torso/head combination	Standard
Impreza	Front	Torso only	Optional
Legacy / Outback	Front	Torso only	Optional
<b>TOYOTA</b>			
4Runner	Front	Curtain/torso	Optional
	Rear	Curtain	Optional
Avalon	Front	Torso only	Standard
Camry	Front	Curtain/torso	Optional
	Rear	Curtain	Optional
Camry Solara	Front	Torso only	Optional
Celica	Front	Torso only	Optional
Corolla	Front	Torso only	Optional
Echo	Front	Torso only	Optional
Highlander	Front	Torso only	Optional
Land Cruiser	Front	Curtain/torso	Optional
	Rear	Curtain	Optional
Matrix	Front	Torso only	Optional
Prius	Front	Torso only	Optional
Sequoia	Front	Curtain/torso	Optional
Sienna	Front	Torso only	Optional
<b>VOLKSWAGEN</b>			
Golf	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
Jetta	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
New Beetle	Front	Torso only	Standard
Passat	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
Touareg	Front & rear	Curtain	Standard
<b>VOLVO</b>			
C70	Front	Torso/head combination	Standard
S40 / S60 / S80	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
V40 / V70	Front	Curtain/torso	Standard
	Rear	Curtain	Standard
XC90	Front	Curtain/torso	Standard
	Rear	Curtain	Standard