

# INSURANCE INSTITUTE FOR HIGHWAY SAFETY

## NEWS RELEASE

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### **NEW CAR DESIGNS COME WITH IMPROVED CRASH PROTECTION: 1998 TOYOTA SIENNA, VOLKSWAGEN PASSAT RATED 'BEST PICKS'**

ARLINGTON, VA — The Toyota Sienna and Volkswagen Passat, both new designs for the 1998 model year, earn the highest ratings in the Insurance Institute for Highway Safety's latest round of crashworthiness evaluations. An earlier model of the Passat earned a poor rating. So did the forerunner model to the Sienna, the Toyota Previa.

Crashworthiness evaluations are based primarily on performance in a 40 mph frontal offset crash test. All vehicles are rated in three categories and then assigned overall evaluations of good, acceptable, marginal, or poor. Head restraint design and bumper performance in low-speed crash tests don't affect overall evaluations but are considered when establishing vehicle rankings within each group (midsize four-door cars, passenger vans, etc.).

Three other redesigned 1998 passenger vehicles also were evaluated by the Institute. The Nissan Maxima improved to acceptable for 1998, compared with a rating of poor for the 1995 model. The Toyota Avalon improved from marginal in 1996 to acceptable in 1998. The 1995 Honda Accord, already rated acceptable, kept this rating for the 1998 model year.

"The Passat and Sienna are totally new designs for 1998, so we hoped to see big improvements in crashworthiness, and we got them," Institute President Brian O'Neill points out. "In particular, the Sienna is on a par with the 1997 BMW 540i, previously the vehicle with the least amount of intrusion into the driver's space among the 50-plus vehicles we've tested so far. And the Sienna earned the highest rating of five stars for both driver and passenger in the federal government's 35 mph New Car Assessment Program crash test. So this vehicle demonstrates what can be achieved by a

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manufacturer who's committed to improving crashworthiness performance." (Note: The federal government hasn't released 35 mph crash test results for the 1998 Passat. The 1998 Avalon earned four stars for the driver and five for the passenger, while the Honda Accord and Nissan Maxima earned four stars for both driver and passenger.)

**Sienna and Passat Improvements**

The Institute's frontal offset test is a demanding test of a vehicle's structural performance – how well the front-end crush zone absorbs the crash energy, minimizes damage to the occupant compartment (or safety cage), and prevents intrusion into the driver's space. This aspect of performance is assessed on the basis of measured intrusion into the area where the driver sits.

"The Sienna's structural performance was so good in the 40 mph offset test that intrusion into the driver's space was as little as we've seen in any of our crash tests so far," O'Neill explains (see table). An offset test of the Sienna's predecessor model, the 1996 Toyota Previa, resulted in far more intrusion into the driver space

**Structural Performance in 40 mph Offset Test: Measured Intrusion (centimeters),  
Redesigned 1998 Models Compared with Earlier Models of the Same Vehicles**

	<u>Brake Pedal</u>	<u>Foot Rest</u>	<u>Toe/pan</u>			<u>Dashboard</u>	
			<u>Left</u>	<u>Center</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
<b>1998 Toyota Sienna</b>	8	4	10	6	6	2	3
<b>1996 Toyota Previa</b>	27	22	25	26	29	8	12
<b>1998 Volkswagen Passat</b>	4	12	16	13	10	8	7
<b>1995 Volkswagen Passat</b>	23	25	36	25	20	8	6
<b>1998 Nissan Maxima</b>	20	22	30	28	21	10	7
<b>1995 Nissan Maxima</b>	20	19	28	28	22	7	3
<b>1998 Honda Accord</b>	12	9	18	21	17	2	2
<b>1995 Honda Accord</b>	22	16	25	27	23	7	9
<b>1998 Toyota Avalon</b>	20	12	27	25	17	4	6
<b>1996 Toyota Avalon</b>	22	17	26	26	23	11	9



**1996 Toyota Previa (left) and 1998 Toyota Sienna (right) after 40 mph frontal offset crash tests**

plus too much vertical movement of the steering column. Neither problem is evident for the Sienna (see photos taken after 40 mph offset tests, above).

The Passat improved a lot, too. The structural performance of a 1995 Passat in the Institute's offset test revealed moderate intrusion into the occupant compartment and extensive buckling of the floor under and behind the driver seat. Both of these problems have been substantially improved in the redesigned 1998 Passat.

"Automakers obviously are paying attention to our crash test results," O'Neill says, "and are improving performance in offsets when they redesign their vehicles. We know Toyota and Volkswagen aren't alone. Other manufacturers are doing the same thing, and we expect the improvements to continue as more and more vehicles are redesigned for future model years."

### **How Researchers Assess Vehicle Performance in the Frontal Offset Crash Test**

Institute researchers use 40 mph offset crash tests to evaluate three important aspects of vehicle crashworthiness – (1) how well the front-end crush zone manages crash energy and the safety cage limits occupant compartment intrusion, (2) injury risk measured on a dummy representing an average-size male driver, and (3) how well dummy movement is controlled during impact.

The same 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. In addition, the Institute's crashworthiness evaluations reflect the adequacy of front-seat head restraint designs and bumper performance in 4 crash tests at 5 mph.

Vehicle structure, occupant restraints, and injury measures in the 40 mph frontal offset test are evaluated separately – even though they're related – because good performance for any one of the three by itself in a single test isn't sufficient to reliably indicate good crashworthiness.

### **Institute and Government Crash Tests Complement Each Other**

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 test, which involves 40 percent of a vehicle's front end hitting a deformable barrier at 40 mph, complements the federal test involving the full width of the front end hitting a rigid barrier. The government test is especially demanding of vehicles' restraint systems but not so much so of vehicle structure. An offset test is more demanding of vehicle structure.

**Video news release Wednesday, March 4, 1998:  
10:00-10:30 a.m. EST; Galaxy C4/Transponder 14;  
Re-feed 1:30-2:00 p.m.; Galaxy 9/Transponder 1  
Footage of 40 mph crash tests and related video**

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