
INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

NEWS RELEASE

March 20, 2001

**LATEST CRASH TESTS: CAR CRASHWORTHINESS IMPROVES;
RATING OF DODGE STRATUS IMPROVES FROM POOR TO GOOD**

ARLINGTON, VA — New car designs are performing much better than their predecessors in 40 mph frontal offset crash tests. This is an important conclusion from a new round of tests by the Insurance Institute for Highway Safety involving seven car designs — two small models, one midsize inexpensive model, one large family car, two large luxury cars, and one midsize luxury car.

The offset tests are the primary basis for assigning crashworthiness ratings of good, acceptable, marginal, or poor to new cars. The best performers also earn the highest rating, a “best pick” designation (see attached ratings).

Civic and Focus improve: A 2001 Honda Civic and 2000 model Ford Focus earn good overall ratings for crashworthiness. The Civic also earns a “best pick” designation. Both cars are improved compared with the acceptable ratings assigned to earlier designs — 1997 Civic and 1997 Ford Escort (Focus will replace Escort).

High ratings for luxury models: In 1997 the Lexus LS 400, a large luxury car, earned the highest possible crashworthiness rating, so there wasn’t much room for improvement when Lexus introduced the replacement, a 2001 model LS 430. The new design matches the good overall rating and “best pick” designation earned by the 1997 model, but the LS 430’s airbag and safety belt pretensioners did deploy slightly late in the offset test. This wasn’t serious enough to affect the car’s overall crashworthiness rating, but it did result in a downgraded

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restraint system evaluation from good to acceptable because the dummy's head contacted the steering wheel through the airbag during the test.

"The manufacturer didn't settle for this," Institute president Brian O'Neill points out. "Toyota was searching for perfection and wanted the highest rating in every individual category, not just a good overall evaluation, so the company made a minor change in the wiring to some of the LS 430's airbag sensors and asked for another test. In the second offset test, the airbag and pretensioners deployed earlier than in the first test. As a result, the new model earns good ratings for its restraints as well as for its structural performance and injury measures recorded on the dummy."

The Mercedes E class, another large luxury car, improves from acceptable for the 1997 model to good for the 2001 model, which also earns a "best pick" designation. The 2001 Mercedes C class, a midsize luxury car not previously tested, rates good overall and is a "best pick."

Stratus improves dramatically: A Chrysler LHS improves from poor (1999 model) to acceptable (2001 model), while another car from the same manufacturer, the redesigned Dodge Stratus, posts the biggest improvement in the Institute's latest round of 40 mph offset tests. The 2001 Stratus earns a good overall crashworthiness rating compared with a poor rating for the 1995 Chrysler Cirrus ("twin" of Stratus).

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.

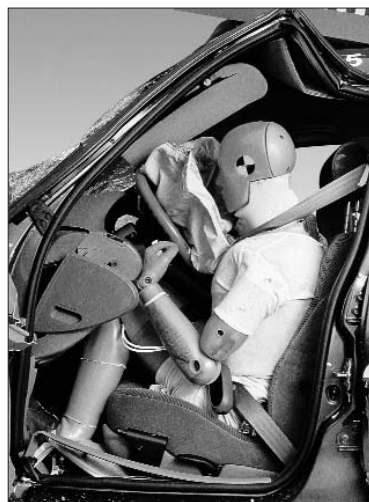
“Good structural design is the key to good performance in the offset test,” O’Neill notes. “If a car’s front-end structure absorbs and manages the crash energy so the occupant compartment remains largely intact, with little or no intrusion, then the dummy’s movement is likely to be controlled, and injury 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 crash test of the 2001 Stratus, compared with its predecessor Cirrus, provides a good example of improved structural design — that is, a design that allows less intrusion into the occupant compartment. Lower intrusion measures indicate a vehicle’s safety cage is doing what it’s supposed to do, and 9 of 10 intrusion measures are dramatically lower for the new Stratus design compared with the old Cirrus:

| | MEASURES OF OCCUPANT COMPARTMENT INTRUSION (cm), 40 MPH FRONTAL OFFSET CRASH TEST | | | | | | | | | |
|----------------------|---|-----------------------|---------------|--------------|-----------------|------------------------------------|------------------------------|--------------|-----------------------------|-----------------|
| | A-pillar Movement <u>Rearward</u> | Footwell Intrusion | | | | Brake Pedal <u>Intrusion</u> | Instrument Panel Movement | | Steering Column Movement | |
| | | <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 Dodge Stratus | 1 | 22 | 24 | 16 | 10 | 16 | 3 | 2 | 9 | 2 |
| 1995 Chrysler Cirrus | 25 | 39 | 39 | 35 | 34 | 36 | 21 | 20 | 6 | 16 |

“The occupant compartment of the old Cirrus essentially collapsed, allowing far too much intrusion,” O’Neill points out. “In contrast, the occupant compartment of the new Stratus held up well, with much less intrusion. As a result, the dummy’s movement was controlled better, and the injury measures were generally good.”

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 sig-



1995 Chrysler Cirrus: huge intrusion



2001 Dodge Stratus: far less intrusion

nificant 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."

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 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 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 5-page release on vehicle crashworthiness
7-page attachment: crashworthiness ratings
Video news release Tues., 3/20, 1-1:30 pm EST
(C) Telstar 6/Trans. 8; crash test footage & more

Internet: www.highwaysafety.org

Small cars Crashworthiness evaluations

| 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 HONDA CIVIC 2001 models test vehicle wt. = 2,507 lbs. NEWLY TESTED | G | G | G | G | G | G | G | A | | |
| | best pick VOLKSWAGEN NEW BEETLE 1998-2001 models test vehicle wt. = 2,762 lbs. | G | G | G | G | G | A | G A | G | |
| depends on seat | | FORD FOCUS 2000-01 models test vehicle wt. = 2,707 lbs. NEWLY TESTED | G | A | G | G | A | G | A | M |
| depends on seat | VOLKSWAGEN JETTA/GOLF 2001 models test vehicle wt. = 2,932 lbs. | | G | A | G | G | A | G | A | M |
| depends on seat | | NISSAN SENTRA 2000-01 models test vehicle wt. = 2,650 lbs. | A | A | A | G | G | A | G | M |
| TOYOTA COROLLA/ CHEVROLET PRIZM 1998-2001 models test vehicle wt. = 2,504 lbs. | A | | A | G | G | M | G | M | A | G |
| | FORD ESCORT 1997-2001 models test vehicle wt. = 2,643 lbs. | A | A | G | G | G | P | G | P | A |
| MERCURY TRACER 1997-99 models | | SATURN SL 1995-2001 models test vehicle wt. = 2,434 lbs. | A | A | G | A | A | G | M | P |
| MAZDA PROTEGE 1999-2001 models test vehicle wt. = 2,577 lbs. | A | | A | G | G | M | P | A | M | M P |
| depends on model year | DODGE/PLYMOUTH NEON 2000-01 models test vehicle wt. = 2,659 lbs. | M | M | G | G | P | A | M | P | A |
| MITSUBISHI MIRAGE 1997-2001 models test vehicle wt. = 2,407 lbs. | | P | M | A | G | G | P | P | A | M |
| | KIA SEPHIA 1998-2001 models test vehicle wt. = 2,593 lbs. | P | M | P | G | M | M | M | A | M |
| depends on seat | | | | | | | | | | |

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

Turn page for more crashworthiness evaluations ▶

Small cars (cont'd.) Crashworthiness evaluations

| 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 small car designs: | | | | | | | | | |
| VOLKSWAGEN JETTA/GOLF late 1999-2000 models test vehicle wt. = 2,932 lbs. | A | A | G | G | A | G | A | M P | G |
| <small>depends on seat</small> | | | | | | | | | |
| HONDA CIVIC 1996-2000 models test vehicle wt. = 2,416 lbs. | A | A | G | A | A | G | G | P | A |
| HYUNDAI ELANTRA 1996-2000 models test vehicle wt. = 2,643 lbs. | A | A | A | G | G | A | A | A | A P |
| <small>depends on model year</small> | | | | | | | | | |
| MAZDA PROTEGE 1995-98 models test vehicle wt. = 2,385 lbs. | A | A | G | G | G | M | M | P | M |
| NISSAN SENTRA 1998-99 models test vehicle wt. = 2,500 lbs. | A | M | A | G | M | G | A | M | G |
| VOLKSWAGEN JETTA/GOLF 1994-early 1999 models test vehicle wt. = 2,725 lbs. | M | M | A | G | P | A | A | P | G |
| DODGE/PLYMOUTH NEON 1995-99 models test vehicle wt. = 2,593 lbs. | P | M | G | G | M | P | P | M | G |
| KIA SEPHIA 1996-97 models test vehicle wt. = 2,584 lbs. | P | P | G | G | P | P | P | P | M |

G GOOD
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 P POOR

End of small car evaluations; turn page for more car groups ►

Midsize inexpensive cars Crashworthiness evaluations

| 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 SUBARU LEGACY 2000-01 models test vehicle wt. = 3,298 lbs. | G | G | G | G | G | A | G | M | A |
| best pick TOYOTA CAMRY 1997-2001 models test vehicle wt. = 3,128 lbs. | G | G | A | G | G | G | G | A | G |
| DODGE STRATUS CHRYSLER SEBRING 2001 models test vehicle wt. = 3,252 lbs. | G | A | G | G | G | M | G | A | M |
| NEWLY TESTED | | | | | | | | | |
| MAZDA 626 2000-01 models test vehicle wt. = 2,866 lbs. | G | A | A | G | G | G | G | P | A |
| MITSUBISHI GALANT 1999-2001 models test vehicle wt. = 3,069 lbs. | A | A | G | G | G | A | A | M | A |
| HONDA ACCORD 1998-2001 models test vehicle wt. = 3,047 lbs. | A | A | G | G | G | P | G | A M | A |
| | | | | | | | | depends on seat | |
| SATURN L SERIES 2000-01 models test vehicle wt. = 3,192 lbs. | A | A | G | G | G | P | A | P | G |
| CHEVROLET MALIBU 1997-2001 models test vehicle wt. = 3,058 lbs. | A | A | G | G | G | A | P | M P | M |
| OLDSMOBILE CUTLASS 1997-99 models | | | | | | | | depends on seat | |
| HYUNDAI SONATA 1999-2001 models test vehicle wt. = 3,131 lbs. | A | M | G | G | A | M | G | A | M |
| NISSAN ALTIMA 2000-01 models test vehicle wt. = 3,025 lbs. | A | M | G | G | M | A | M | P | A |
| PONTIAC GRAND AM OLDSMOBILE ALERO 1999-2001 models test vehicle wt. = 3,080 lbs. | P | M | A | G | G | M | P | A M | M |
| | | | | | | | | depends on seat | |
| CHEVROLET CAVALIER PONTIAC SUNFIRE 1995-2001 models test vehicle wt. = 2,716 lbs. | P | P | A | G | P | G | P | P | A |
| DAEWOO LEGANZA 1999-2001 models test vehicle wt. = 3,192 lbs. | P | P | A | G | P | A | P | M | M |

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

Turn page for more crashworthiness evaluations ►

Midsize inexpensive cars (cont'd.) Crashworthiness evaluations

| 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 midsize inexpensive car designs: | | | | | | | | | | |
| MAZDA 626 1998-99 models test vehicle wt. = 2,866 lbs. | A | A | A | G | G | G | G | P | A | |
| TOYOTA CAMRY 1994-96 models test vehicle wt. = 3,056 lbs. | A | A | A | G | A | G | G | M | M | |
| SUBARU LEGACY 1995-99 models test vehicle wt. = 2,818 lbs. | A | A | G | G | P | G | G | M | A | |
| HONDA ACCORD 1994-97 models test vehicle wt. = 2,897 lbs. | A | A | G | G | P | A | G | M P | A | |
| FORD CONTOUR MERCURY MYSTIQUE 1995-2000 models test vehicle wt. = 2,851 lbs. | | P | M | G | G | P | P | G | M P | P |
| HYUNDAI SONATA 1995-98 models test vehicle wt. = 2,954 lbs. | | P | P | G | G | P | G | M | P | P |
| MITSUBISHI GALANT 1994-98 models test vehicle wt. = 2,912 lbs. | | P | P | G | G | P | A | P | A | P |
| CHRYSLER CIRRUS DODGE STRATUS 1995-2000 models test vehicle wt. = 3,131 lbs. | | P | P | G | G | P | P | M | M P | M |
| PLYMOUTH BREEZE 1996-2000 models | | | | | | | | | | |

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

End of midsize inexpensive car evaluations; turn page for more car groups ▶

Large family cars Crashworthiness evaluations

| 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 | CHEVROLET LUMINA 1995-2001 models test vehicle wt. = 3,331 lbs. | G | G | G | G | G | G | P | M |
| | FORD TAURUS MERCURY SABLE 2000-01 models test vehicle wt. = 3,333 lbs. | G | G | G | G | G | A | A M depends on seat | A |
| | BUICK LESABRE PONTIAC BONNEVILLE 2000-01 models test vehicle wt. = 3,558 lbs. | G | G | G | G | G | A | G | M |
| best pick | OLDSMOBILE AURORA 2001 models | | | | | | | | |
| | CHEVROLET IMPALA 2000-01 models test vehicle wt. = 3,448 lbs. | G | G | G | G | A A | G | P | M |
| | CHRYSLER LHS CHRYSLER 300M 2001 models test vehicle wt. = 3,611 lbs. | A | A | G | G | M A | G | A | M |
| | NEWLY TESTED | | | | | | | | |
| | PONTIAC GRAND PRIX BUICK CENTURY/REGAL 1997-2001 models test vehicle wt. = 3,466 lbs. | A | A | A | G | G A | G | A P depends on seat | A |
| | OLDSMOBILE INTRIGUE 1998-2001 models | | | | | | | | |
| | DODGE INTREPID CHRYSLER CONCORDE 2001 models test vehicle wt. = 3,505 lbs. | A | A | G | G | M M | P | M P depends on seat | M |
| Crashworthiness evaluations of earlier large family car designs: | | | | | | | | | |
| best pick | FORD TAURUS MERCURY SABLE 1996-99 models test vehicle wt. = 3,331 lbs. | G | G | G | G | G G | G | P | G |
| | FORD TAURUS MERCURY SABLE 1992-95 models test vehicle wt. = 3,159 lbs. | G | G | A | G | G G | G | P | M |
| best pick | DODGE INTREPID CHRYSLER CONCORDE 2000 models test vehicle wt. = 3,505 lbs. | M | A | G | G | M M | P | M | M |
| | CHRYSLER LHS CHRYSLER 300M 1999-2000 models test vehicle wt. = 3,585 lbs. | P | M | M | G | P M | P | M | M |

G GOOD **A** ACCEPTABLE **M** MARGINAL **P** POOR
End of large family car evaluations; turn page for more car groups ▶

Large luxury cars Crashworthiness evaluations

| | 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 | | | | |
| | | | | | | | | | |
| <p>best pick</p> <p>LEXUS LS 430 2001 models avg. test vehicle wt. = 4,065 lbs.</p> <p>NEWLY TESTED</p> | G | G | G | G | G | G | G | M | |
| <p>best pick</p> <p>MERCEDES E CLASS late 2000-01 models test vehicle wt. = 3,578 lbs.</p> <p>NEWLY TESTED</p> | G | G | G | G | G | G | G | P | |
| <p>best pick</p> <p>BMW 5 SERIES 1997-2001 models test vehicle wt. = 3,827 lbs.</p> | G | G | G | G | G | G | A | P | |
| <p>best pick</p> <p>LINCOLN LS 2000-01 models test vehicle wt. = 3,818 lbs.</p> | G | G | G | G | G | G | P | M | |
| <p>best pick</p> <p>BUICK PARK AVENUE 1997-2001 models test vehicle wt. = 3,794 lbs.</p> | G | G | G | G | G | G | P | A | |
| <p>best pick</p> <p>CADILLAC SEVILLE 2000-01 models test vehicle wt. = 4,008 lbs.</p> | G | G | G | G | G | G | P | M | |
| <p>LEXUS GS 1999-2001 models test vehicle wt. = 3,805 lbs.</p> | G | G | G | G | A | G | A | A M | M |
| <p>LINCOLN CONTINENTAL 1995-2001 models test vehicle wt. = 3,915 lbs.</p> | A | A | A | G | P | A | G | P | G |
| <p>INFINITI Q45 1997-2001 models test vehicle wt. = 3,966 lbs.</p> | M | A | M | G | M | A | M | G | P |
| <p>Crashworthiness evaluations of earlier large luxury car designs:</p> | | | | | | | | | |
| <p>best pick</p> <p>LEXUS LS 400 1995-2000 models test vehicle wt. = 3,794 lbs.</p> | G | G | G | G | G | G | G | A | P |
| <p>MERCEDES E CLASS 1997-early 2000 models test vehicle wt. = 3,697 lbs.</p> | A | G | G | G | G | G | P | A | P |
| <p>CADILLAC SEVILLE 1993-97 models test vehicle wt. = 3,885 lbs.</p> | P | P | G | G | G | P | P | P | A |

depends
on seat

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

End of large luxury car evaluations; turn page for one more car group ▶

Midsize luxury cars Crashworthiness evaluations

| 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 | | | | | |
| <p>best pick</p> <p>MERCEDES C CLASS 2001 models test vehicle wt. = 3,395 lbs.</p> <p>NEWLY TESTED</p> | G | G | G | G | G | G | G | P | |
| <p>best pick</p> <p>VOLVO S80 2001 models test vehicle wt. = 3,576 lbs.</p> | G | G | G | G | G | G | G | P | |
| <p>best pick</p> <p>BMW 3 SERIES 2000-01 models test vehicle wt. = 3,347 lbs.</p> | G | G | G | G | G | A | A | M | |
| <p>CADILLAC CATERA 1997-2001 models test vehicle wt. = 3,847 lbs.</p> | G | A | G | G | G | A | M | P | |
| <p>SAAB 9-5 1999-2001 models test vehicle wt. = 3,527 lbs.</p> | A | A | G | G | G | P | G | M | |
| <p>AUDI A6 1998-2001 models test vehicle wt. = 3,766 lbs.</p> | A | A | G | G | M | M | A | A | |
| <p>Crashworthiness evaluation of earlier design:</p> <p>VOLVO S80 2000 models test vehicle wt. = 3,576 lbs.</p> | G | G | G | G | G | G | M | G | P |

G GOOD **A** ACCEPTABLE **M** MARGINAL **P** POOR
End of crashworthiness evaluations