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# INSURANCE INSTITUTE FOR HIGHWAY SAFETY

## NEWS RELEASE

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### **ONLY 5 PASSENGER VEHICLES OUT OF 200+ EVALUATED HAVE GOOD HEAD RESTRAINT DESIGNS. MORE THAN HALF ARE POOR.**

ARLINGTON, VA – In the most comprehensive evaluation of head restraint designs, the Insurance Institute for Highway Safety has found that more than half of all 1997 passenger vehicles measured have poor restraints (see attached list). Fewer than 3 percent have head restraint designs with good geometry.

The five vehicles with good head restraint geometry are the Honda Civic del Sol, Mercedes E class with restraints that adjust automatically, the Toyota Supra, and two Volvo models – the 850 and 960. In contrast, dozens of vehicles have head restraints that are neither high enough nor close enough to the back of the head to have the potential to protect many people in rear-end collisions.

"A sad showing," says Institute President Brian O'Neill. "This issue hasn't been a priority among automakers. It's a situation that needs to change because to have a good head restraint design, good geometry is the necessary first step."

Head restraints have been required safety features in cars since 1969. Intended to prevent whiplash and other neck injuries in rear-end crashes, these restraints have to be positioned behind and close enough to the backs of people's heads to have the potential to provide protection. However, most head restraints aren't designed for proper positioning.

#### **What Makes Good Head Restraint Geometry**

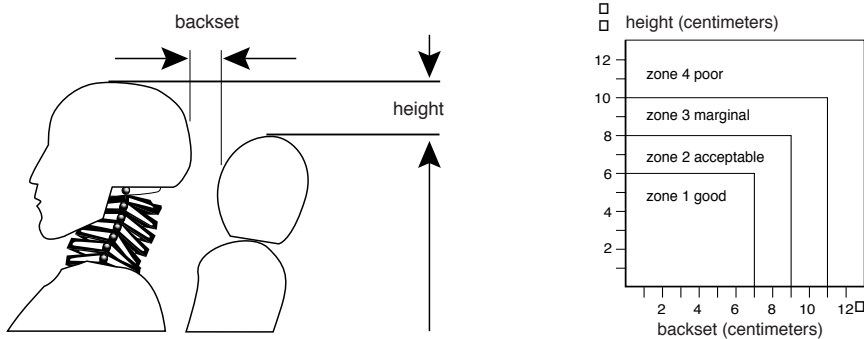
Two criteria determine good head restraint geometry (see illustrations on page 2). The first is height, and a head restraint ideally should be as high as the top of the head. The second criterion is backset, or the distance between the back of an occupant's head and the front of the restraint. This distance should be small – the smaller the better. Backsets of more than about four inches have been associated with increased

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symptoms of neck injury in motor vehicle crashes. The Institute's head restraint evaluations are based on these two criteria.

### How Head Restraints Were Evaluated

Each head restraint was first classified into one of four geometric zones according to its height and backset measures. The rating for a fixed restraint is straightforward – the zone into which its height and backset place it also defines its rating. The rating for a head restraint that adjusts in height and/or backset depends on whether it locks in the adjusted position. If it doesn't, its rating is defined by the zone for height and backset in the "down" and/or rear position. If an adjustable restraint does lock, its height and backset are measured in two positions – the "down" one and the most favorable locked position. The final rating is the better of these except that if the adjusted rating is used, it's downgraded a category because so few motorists adjust their restraints. Some car models from BMW and Mercedes have restraints that adjust automatically. These are evaluated in the position to which they adjust for an average-size male, and the ratings aren't downgraded.



Height and backset were measured with the angle of the torso at about 25 degrees, a typical seat back angle. Many vehicles have more than one seat option, and if seat differences affect the head restraint ratings, more than one rating is shown on the attached list. But if ratings for all seat options in a model are the same, then only one rating is shown. As indicated, some seat options couldn't be found in showrooms to measure.

**Two-page attachment follows. Broadcast-quality video available from the Institute. Readers/viewers may write for a copy of the report: PO Box 1420, Arlington, VA 22210. Head restraint evaluations are available on the Internet: <http://www.hwysafety.org>.**

## Passenger cars

- P Acura CL
- A Acura Integra
- M Acura RL
- P Acura TL
  
- P Audi A4, comfort seat
- Audi A4, sport seat
- P Audi A6
- P Audi A8
- P Audi Cabriolet, comfort seat
- Audi Cabriolet, GIS sport seat
  
- P BMW 3 series
- M BMW 5 series
- A BMW 5 series, midback adjustment
- A BMW 7 series, midback adjustment
- M BMW 8 series, auto adjust
- P BMW Z3
  
- P Buick Century
- P Buick LeSabre
- P Buick Park Avenue, 55/45 split bench
- Buick Park Avenue, bucket seat
- P Buick Riviera, bucket seat
- Buick Riviera, 55/45 split bench seat
- P Buick Skylark, 55/45 split bench seat
- Buick Skylark, bucket seat
  
- A Cadillac Catera
- P Cadillac Deville
- P Cadillac Eldorado
- P Cadillac Seville

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## Legend

- G good
- A acceptable
- M marginal
- P poor
- not measured

The 5 vehicles with head restraints rated good are shown in **bold** type.

- M Chevrolet Astro (fixed)
- P Chevrolet Astro (adjustable)
- P Chevrolet Camaro
- P Chevrolet Cavalier
- P Chevrolet Lumina sedan
- M Chevrolet Malibu
- P Chevrolet Monte Carlo
- P Chevrolet Venture
  
- P Chrysler Cirrus
- P Chrysler Concorde
- P Chrysler LHS, bucket seat
- Chrysler LHS, 50/50 split bench
- P Chrysler Sebring coupe
- Chrysler Sebring convertible
- P Chrysler Town & Country
  
- M Dodge Avenger
- P Dodge Caravan/Grand Caravan
- P Dodge Intrepid
- P Dodge Neon
- P Dodge Stratus
  
- M Eagle Talon
- P Eagle Vision
  
- P Ford Aerostar
- P Ford Aspire
- M Ford Contour, bucket seat
- P Ford Contour, sport bucket seat
- P Ford Crown Victoria
- P Ford Escort
- P Ford Mustang
- P Ford Probe
- P Ford Taurus
- P Ford Thunderbird
- P Ford Windstar
  
- P Geo Metro
- A Geo Prizm
  
- M GMC Safari
  
- P Honda Accord, cloth seat
- M Honda Accord, leather seat
- M Honda Civic
- G **Honda Civic del Sol**
- M Honda Odyssey
- M Honda Prelude
  
- P Hyundai Accent
- P Hyundai Elantra
- P Hyundai Sonata
- P Hyundai Tiburon
  
- M Infiniti I30
- P Infiniti J30
- P Infiniti Q45
  
- A Jaguar VDP
- M Jaguar XJ6
- A Jaguar XJR
- P Jaguar XK8
  
- P Kia Sephia
  
- A Lexus ES 300
- M Lexus LS 400
- P Lexus SC 300
  
- P Lincoln Continental
- P Lincoln Mark VIII
- P Lincoln Town Car
  
- P Mazda 626
- A Mazda Millenia, manual seat
- M Mazda Millenia, power seat
- P Mazda MPV
- P Mazda MX-5 Miata
- P Mazda Protege
  
- M Mercedes C class
- Mercedes C class, multicontour seat
- G **Mercedes E class, auto adjust**
- Mercedes E class, multicontour seat
- A Mercedes S class
- Mercedes S class, multicontour seat
- A Mercedes SL class
  
- P Mercury Cougar XR7
- P Mercury Grand Marquis
- M Mercury Mystique
- P Mercury Sable
- P Mercury Tracer
- M Mercury Villager
  
- M Mitsubishi 3000 GT
- M Mitsubishi Diamante
- A Mitsubishi Eclipse
- M Mitsubishi Eclipse, spyder seat
- A Mitsubishi Galant
- A Mitsubishi Mirage (adjustable)
- M Mitsubishi Mirage (fixed)
  
- A Nissan 200 SX
- M Nissan 240 SX
- M Nissan Altima
- M Nissan Maxima
- M Nissan Quest
- M Nissan Sentra

- Oldsmobile Achieva
- Oldsmobile Aurora
- Oldsmobile Cutlass
- Oldsmobile Cutlass Supreme
- Oldsmobile Eighty-Eight
- Oldsmobile LSS
- Oldsmobile Regency
- Oldsmobile Silhouette
- Plymouth Breeze
- Plymouth Neon
- Plymouth Voyager/Grand Voyager
- Pontiac Bonneville
- Pontiac Firebird
- Pontiac Grand Am, bucket seat
- Pontiac Grand Am, other seat types
- Pontiac Grand Prix, sport bucket seat
- Pontiac Grand Prix, 45/55 split bench
- Pontiac Sunfire
- Pontiac Trans Sport
- Porsche 911 Carrera
- Porsche 911, sport bucket seat
- Porsche Boxster
- Saab 900
- Saab 9000
- Saturn SC1
- Saturn SC2
- Saturn SL1
- Saturn SL2
- Saturn SW1
- Saturn SW2
- Subaru Impreza coupe
- Subaru Impreza Outback
- Subaru Legacy
- Toyota Avalon
- Toyota Camry
- Toyota Celica
- Toyota Corolla
- Toyota Paseo
- Toyota Previa, bucket seat
- Toyota Previa, captain chair
- Toyota Supra**
- Toyota Tercel
- Volkswagen Cabrio
- Volkswagen Golf
- Volkswagen Jetta
- Volkswagen Passat
- Volvo 850**
- Volvo 960**

### Pickup trucks

- Chevrolet C/K series
- Chevrolet S/T series
- Dodge Dakota
- Dodge Ram pickup
- Ford F series
- Ford Ranger, straight bench seat
- Ford Ranger, other seat types
- GMC Sierra
- GMC Sonoma
- Mazda B-series, straight bench seat
- Mazda B-series, 60/40 split bench
- Mazda B-series, sport bucket seat
- Nissan pickup, straight bench seat
- Nissan pickup SE, bucket seat
- Nissan pickup SE, sport bucket seat
- Nissan pickup XE, bucket seat
- Toyota T100, sport seat
- Toyota T100, 60/40 split bench
- Toyota T100, straight bench seat
- Toyota Tacoma, bucket seat
- Toyota Tacoma, sport bucket seat
- Toyota Tacoma, straight bench seat
- Toyota Tacoma, 60/40 split bench

### Utility vehicles

- Chevrolet Blazer
- Chevrolet Suburban, bucket seat
- Chevrolet Suburban, other seat types
- Chevrolet Tahoe, high-back bucket seat
- Chevrolet Tahoe, low-back bucket seat
- Chevrolet Tahoe, 60/40 split bench
- Ford Expedition
- Ford Explorer
- GMC Jimmy, bucket seat
- GMC Jimmy, 60/40 split bench
- GMC Suburban
- GMC Suburban, straight bench seat
- GMC Yukon, bucket seat
- GMC Yukon, other seat types
- Geo Tracker
- Honda CR-V
- Honda Passport

- Infiniti QX4
- Isuzu Rodeo
- Isuzu Trooper
- Jeep Cherokee
- Jeep Grand Cherokee
- Jeep Wrangler
- Kia Sportage
- Land Rover Discovery
- Land Rover Range Rover
- Lexus LX 450
- Mercury Mountaineer
- Mitsubishi Montero
- Mitsubishi Montero Sport
- Nissan Pathfinder
- Oldsmobile Bravada
- Suzuki Sidekick, bucket seat
- Suzuki Sidekick, sport bucket seat
- Suzuki X-90
- Toyota 4Runner, sport bucket seat
- Toyota 4Runner, other seat types
- Toyota Land Cruiser
- Toyota RAV4

### Large vans

- Chevrolet Express
- Chevrolet van
- Dodge Ram van
- Ford Econoline
- GMC Savana