



Changes to the updated moderate overlap front crash test

IIHS adopted a new scoring system for the updated moderate overlap front crash test in 2024 as part of a planned transition that was outlined to automakers before the launch of the program in 2022. This fact sheet provides more details about how the new scoring system affected existing ratings, which have been adjusted on the Institute's website to reflect the new scoring methodology.

How were ratings initially calculated?

For the first year of the updated moderate overlap test program (December 2022-December 2023), engineers used the measurement from the internal compression sensor in the chest of the rear dummy to estimate chest injury risk without adjusting for the position of the seat belt.

At that time, we already knew that this method didn't accurately capture the force exerted on the dummy's chest when the shoulder belt did not cross directly above the internal sensor. As a temporary stopgap we penalized vehicles in which the rear shoulder belt was positioned more than 110 millimeters higher on the chest than the sensor. When the shoulder belt is positioned so high, the force is directed to the dummy's neck instead of its chest. Both these elements were considered as part of the rear dummy chest injury component of the rating.

What has changed in 2024?

In 2024, IIHS engineers began using a formula that they had been vetting over the previous year to calculate how much the internal sensor in the dummy would be compressed if the shoulder belt did pass directly above it. This new method allows us to account for these forces without awarding a false benefit to vehicles with a higher belt position that is still within our acceptable range or unfairly penalizing vehicles in which the belt does pass directly over the sensor. We call this new metric the chest index. (More details about how the chest index is calculated are available in the [rating guidelines](#).)

We still penalize vehicles in which the position of the shoulder belt is too high, as that prevents the restraints from functioning properly. However, the threshold has been raised from 110 mm to 120 mm higher than the internal compression sensor. The associated penalty is also now part of the component rating for restraints and kinematics — which has reduced its impact on the overall rating. We made these additional changes in recognition that restraint systems must be designed to accommodate a range of different occupants and because a high shoulder belt is more directly related to the way the restraints control the occupant's motion than to chest injury risk.

Why did IIHS launch the program and then change the scoring system so quickly?

We launched the updated test knowing that we would adjust the scoring method after a year and informed the automakers of our plans. There were two reasons for this decision. We wanted to confirm the accuracy of the formula we use to calculate the chest index with a wide range of vehicles and vehicle types. However, we did not want to delay the launch of a program that would encourage automakers to incorporate advanced seat belt technologies and other improvements in back seat protection, since we were already certain that those advancements would save lives.

Which vehicles' ratings have been adjusted as a result of the new scoring method?

Prior to the adoption of the new scoring method, IIHS issued updated moderate overlap ratings for nearly 90 small SUVs, midsize SUVs, small cars, midsize cars, minivans, small pickups, large pickups and midsize luxury SUVs. The overall ratings of 13 of those vehicles changed as a result of the new scoring calculations. Rear passenger component ratings for chest injury risk, restraints and kinematics, or both changed for 30 additional vehicles without affecting the overall rating. These changes are detailed in the tables on the following pages.

Vehicles with OVERALL RATING CHANGES resulting from the new protocol

	Size/class	Overall rating change		Chest injury rating change		Restraints & kinematics rating change	
		Initial	New	Initial	New	Initial	New
2023-24 BMW X3	Midsize luxury SUV	A	G	G	No change	M	A
2022 Chevrolet Colorado crew cab	Small pickup	P	M	M	No change	M	A
2022-24 Ford Maverick	Small pickup	A	M	G	A	P	M
2022-23 Ford Ranger crew cab	Small pickup	M	P	M	P	P	No change
2022-23 Jeep Gladiator	Small pickup	P	M	P	M	A	No change
2023-24 Lexus RX	Midsize luxury SUV	M	P	M	P	P	No change
2022-23 Nissan Frontier crew cab	Small pickup	A	G	G	A	M	A
2021-23 Nissan Murano	Midsize SUV	P	M	G	No change	M	A
2022-23 Subaru Ascent	Midsize SUV	G	A	G	A	A	No change
2023 Subaru Outback	Midsize car	A	M	G	A	P	No change
2023 Toyota Corolla sedan	Small car	A	M	G	A	P	M
2021-23 Toyota RAV4	Small SUV	A	M	G	A	P	M
2023 Toyota Tundra crew cab	Large pickup	M	P	M	No change	P	No change

Vehicles with COMPONENT RATING CHANGES ONLY resulting from the new protocol

	Size/class	Overall rating	Chest injury rating change		Restraints & kinematics rating change	
			Initial	New	Initial	New
2023-24 Audi Q5	Midsize luxury SUV	M	G	A	P	M
2023-24 Cadillac XT6	Midsize luxury SUV	P	P	M	P	M
2021-22 Honda HR-V	Small SUV	P	M	P	P	M
2023 Hyundai Sonata	Midsize car	P	P	M	P	M
2023 Kia K5	Midsize car	P	P	M	P	M
2022-23 Mitsubishi Eclipse Cross	Small SUV	P	P	M	M	A
2023 Nissan Altima	Midsize car	M	M	A	P	M
2021-23 Nissan Rogue	Small SUV	M	G	A	P	M
2022-23 Nissan Sentra	Small car	P	M	G	P	M

	Size/class	Overall rating	Chest injury rating change		Restraints & kinematics rating change	
			Initial	New	Initial	New
2023 Toyota Camry	Midsize car	M	M	A	P	M
2022-23 Hyundai Palisade	Midsize SUV	P	M	P	G	No change
2022-24 Jeep Grand Cherokee L	Midsize SUV	P	P	M	A	No change
2021-23 Jeep Wrangler 4-door	Midsize SUV	P	M	G	P	No change
2021-22 Mazda CX-5	Small SUV	P	P	M	P	No change
2023 Toyota Sienna	Minivan	M	M	A	P	No change
2023-24 Volvo XC60	Midsize luxury SUV	G	G	A	G	No change
2023-24 Acura MDX	Midsize luxury SUV	A	G	No change	P	M
2021-23 Audi Q3	Small SUV	M	G	No change	P	M
2023 Chevrolet Silverado 1500 crew cab	Large pickup	P	M	No change	P	M
2021-22 Ford Escape (built before June 2022)	Small SUV	A	G	No change	P	M
2022-23 Honda Civic sedan	Small car	A	G	No change	P	M
2021-22 Honda CR-V	Small SUV	P	P	No change	G	A
2022 Honda Pilot	Midsize SUV	P	M	No change	P	M
2022-23 Kia Forte	Small car	P	M	No change	P	M
2023 Ram 1500 crew cab	Large pickup	P	P	No change	P	M
2023-24 Rivian R1S	Large SUV	M	M	No change	P	M
2022-23 Subaru Crosstrek	Small car	P	P	No change	P	M
2022-23 Toyota Highlander	Midsize SUV	M	G	No change	P	M
2022-23 Toyota Tacoma crew cab	Small pickup	P	P	No change	M	A
Volkswagen Atlas	Midsize SUV	M	M	No change	M	A

For more information, go to [iihs.org](https://www.iihs.org)

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