



Insurance Institute for  
Highway Safety



# **Moderate Overlap Frontal Crashworthiness Evaluation Weighting Principles for Vehicle Ratings**

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## Moderate Overlap Frontal Crashworthiness Evaluation Weighting Principles for Vehicle Ratings

### Components

The weighting scheme is comprised of ratings for the following components: vehicle structure, restraints and dummy kinematics, and occupant head/neck, chest, left leg/foot, and right leg/foot.

### General Principles of Weighting System

The rating system is based on demerits, with every vehicle beginning with a good overall rating. The test is intended to determine if there are reasons to lower the rating. The demerit scheme that matches these principles is given in the table.

<b>Weighting of Individual Components</b>				
<b>IIHS Crashworthiness Evaluation – Frontal Offset Crash Test</b>				
<b>Component</b>	<b>Rating</b>			
	<b>Good</b>	<b>Acceptable</b>	<b>Marginal</b>	<b>Poor</b>
Vehicle structure	0	2	6	10
Head and neck	0	2	10	20
Chest	0	2	10	20
Left leg and foot	0	1	2	4
Right leg and foot	0	1	2	4
Restraints and dummy kinematics	0	1	2	4
<b>Overall rating cutoffs</b>	<b>0-3</b>	<b>4-9</b>	<b>10-15</b>	<b>16-54</b>

*Note:* If leg injury rating is based on high femur loads, then weighting for that leg is same as structure.

Ratings for head/neck and chest are based on risk of life-threatening injuries. A poor rating in either area is a serious demerit that cannot be overcome.

Offset testing is intended to assess structural performance. Marginal or poor structural performance counts very heavily, though not as heavily as head/neck or chest injury measures.

Injuries to the legs typically are not life threatening. Marginal and poor ratings in these injury areas typically result in fewer demerits. However, if high femur forces are involved, weighting is higher and closer to weighting for structure because of greater threat to life (acetabular fractures).

Restraints and dummy kinematics receives about the same weight as measured lower leg injuries. Although this evaluation is more subjective, it raises concerns about serious risk of upper body injury to other size occupants or occupants seated differently.

### Specific Restrictions on Weighting System

If any two of these areas — head/neck, chest, and structure — are rated acceptable, then overall rating is no better than acceptable.

If head/neck or chest is rated marginal or poor, then overall rating is no better than marginal or poor, respectively.

If structure is marginal or poor, then overall rating is no better than acceptable or marginal, respectively.

If either leg or restraints and dummy kinematics are poor, then overall rating is no better than acceptable. If poor leg rating is based on femur load, then overall rating is no better than marginal unless all other ratings are good.

If all areas are rated acceptable, then overall rating is acceptable.

If at least three areas are rated marginal or worse and at least two of those ratings are for one of the following areas — structure, head/neck, and chest — then overall rating is poor, even if other ratings are good.