EURO NCAP

#FORSAFERTRUCKS

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HGV Assessment Protocol
Overall Rating

Implementation November 2024

PREFACE

During the test preparation, vehicle manufacturers are encouraged to liaise with the laboratory and to check that they are satisfied with the way cars are set up for testing. Where a manufacturer feels that a particular item should be altered, they should ask the laboratory staff to make any necessary changes. Manufacturers are forbidden from making changes to any parameter that will influence the test, such as dummy positioning, vehicle setting, laboratory environment etc.

It is the responsibility of the test laboratory to ensure that any requested changes satisfy the requirements of Euro NCAP. Where a disagreement exists between the laboratory and manufacturer, the Euro NCAP secretariat should be informed immediately to pass final judgment. Where the laboratory staff suspect that a manufacturer has interfered with any of the set up, the manufacturer's representative should be warned that they are not allowed to do so themselves. They should also be informed that if another incident occurs, they will be asked to leave the test site.

Where there is a recurrence of the problem, the manufacturer’s representative will be told to leave the test site and the Secretary General should be immediately informed. Any such incident may be reported by the Secretary General to the manufacturer and the person concerned may not be allowed to attend further Euro NCAP tests.

DISCLAIMER: Euro NCAP has taken all reasonable care to ensure that the information published in this protocol is accurate and reflects the technical decisions taken by the organisation. In the unlikely event that this protocol contains a typographical error or any other inaccuracy, Euro NCAP reserves the right to make corrections and determine the assessment and subsequent result of the affected requirement(s).

CONTENTS

1. INTRODUCTION

As part of its mission to achieve ‘Vision Zero’ (eliminating all traffic fatalities and serious injuries), Euro NCAP has turned its testing and safety performance attention to the Heavy Goods Vehicle (HGV) category. Due to their size and weight, HGV crashes are the most severe on European roads. Although trucks account for less than 3 % of the traffic fleet in Europe, they are responsible for almost 15 % of fatalities from road collisions. Furthermore, only 11 % of casualties in accidents involving HGVs are truck occupants. The remaining 89 % are other vehicle occupants or Vulnerable Road Users (VRUs).

HGVs are an economic force for good, fulfilling an essential role distributing 95 % of the goods consumed across the European continent. It is therefore important that the sector is supported while ensuring trucks are safe and do not continue to pose a disproportionate threat to other road users. Euro NCAP’s HGV safety rating programme will create a common and harmonised best practice, around which road authorities, hauliers, drivers, insurers, truck manufacturers themselves and the brands and companies who want their goods shipped safely can all unify.

Euro NCAP introduced the HGV safety rating scheme for 2025. The scheme structure is derived from the Haddon matrix concept for addressing motor vehicle related injuries, further developed specifically regarding vehicle safety technology. HGV safety is assessed in four areas:

1. Safe Driving – vehicle design, technology and information supporting relaxed, safe driving
2. Crash Avoidance – momentary warning and intervention in critical situations to avoid a collision or reduce the severity
3. Crash Protection – to be introduced in a future protocol generation, protecting truck occupants and other road users in collisions
4. Post Crash Safety – supporting first responders treating casualties in the golden hour

Additionally, the CitySafe award recognises high performance across the key elements that serve to protect VRUs in urban areas.

This protocol specifies the method and criteria for calculating the overall HGV safety rating based on the vehicle performance in each of the four above areas of assessment. The method and criteria for the calculating the CitySafe award are also specified.

2. OVERALL RATING CALCULATION

2.1. Method

The overall rating comprises of the scores achieved in each the four pillars of assessment, Safe Driving, Crash Avoidance, Crash Protection and Post-Crash Safety.

For each pillar, a final score is calculated as the sum of the final scores of the individual functions included in the pillar. The overall vehicle score is calculated from the individual pillar scores using weighting factors. These weighting factors reflect the relative importance of the pillars.

The overall vehicle score is only used to rank vehicles for determining the best in sector periodically. Vehicles that show a poor performance in any one of the pillars have their star rating restricted to show that they do not provide good all round safety. A minimum score is required in each box to validate a star rating.

2.2. Weighting Factors

The overall vehicle score is calculated from the individual scores in each pillar using weighting factors. The weighting factors are fixed for the duration of the protocol application but may be updated subsequently as priorities or the contents of the pillars evolve. Table 2-1 summarises the weighting factors applied in the current period.

Pillar	Weighting
Safe Driving	0.4
Crash Avoidance	0.5
Crash Protection	To be introduced in a future protocol generation
Post-Crash Safety	0.1
Total	**1**

Table 2-1 Pillar weighting factors

2.3. Balance Criteria

Balance criteria are applied to the individual pillar final scores to assess all round performance. The limits shown in Table 2-2 are applied after the individual test scores have been rounded.

2025 to 2027	Safe Driving	Crash Avoidance	Post-Crash Safety
5 stars	80 %	80 %	80 %
4 stars	65 %	65 %	65 %
3 stars	50 %	50 %	50 %
2 stars	35 %	35 %	35 %
1 star	20 %	20 %	20 %

Table 2-2 Balance limits for 2025 to 2027

2.4. Final Pillar Scores

2.4.1. Safe Driving

A maximum of 100 points is available for the final Safe Driving score, distributed as illustrated in Table 2-3.

Assessed Feature	Points Available
Seat belt reminder	15 points
Driver state monitoring	10 points
Speed assistance systems	15 points
Direct vision	35 points
Indirect vision	15 points
Longitudinal assistance	10 points
Total	**100 points**

Table 2-3 Safe Driving points distribution per assessed feature

The final Safe Driving score is calculated as the sum of the final scores of the features assessed under Safe Driving.

$$\text{Final Safe Driving score} = \sum \begin{matrix} Final\ seat\ belt\ reminder\ score \\ Final\ driver\ state\ monitoring\ score \\ Final\ speed\ assistance\ systems\ score \\ Final\ direct\ vision\ score \\ Final\ indirect\ vision\ score \\ Final\ longitudinal\ assistance \end{matrix}$$

2.4.2. Crash Avoidance

A maximum of 100 points is available for the final Crash Avoidance score, distributed as illustrated in Table 2-4.

Assessed Feature	Points Available
Frontal collisions – vehicle	35 points
Frontal collisions – VRU	25 points
Low speed near side turn collisions	15 points
Lane departure collisions	25 points
Total	**100 points**

Table 2-4 Crash Avoidance points distribution per assessed feature

The final Crash Avoidance score is calculated as the sum of the final scores of the features assessed under Crash Avoidance.

$$\text{Final Crash Avoidance score} = \sum \begin{matrix} Final\ frontal\ collisions\ vehicle\ score \\ Final\ frontal\ collisions\ VRU\ score \\ Final\ low\ speed\ near\ side\ turn\ collisions\ score \\ Final\ lane\ departure\ collisions\ score \end{matrix}$$

2.4.3. Crash Protection

Crash Protection developments have a long engineering lead time and work is underway developing the HGV crash protection assessment for introduction in a future protocol generation.

2.4.4. Post-Crash Safety

A maximum of 100 points is available for the final Post-Crash Safety score, distributed as illustrated in Table 2-5.

Assessed Feature	Points Available
Rescue sheets	80 points
Emergency response guide	10 points
Advanced e-Call	5 points
Occupant extrication	5 points
Total	**100 points**

Table 2-5 Post-Crash Safety points distribution per assessed feature

The final Post-Crash Safety score is calculated as the sum of the final scores of the features assessed under Post-Crash Safety.

$$\text{Final Post-Crash Safety score} = \sum \begin{matrix} Final\ rescue\ sheets\ and\ emergency\ repsonse\ guide\ score \\ Final\ ZEV\ energy\ labelling\ score \\ Final\ ladvanced\ eCall\ score \\ Final\ occupant\ extrication\ score \end{matrix}$$

2.1. Points Swap

In case of a surfeit of final pillar points above a star rating threshold in one pillar and a deficit of points below a threshold in an adjacent pillar, it is permitted to make one transfer up to a maximum of 20 points from one pillar to an adjacent pillar. These requirements means that for the 2025 to 2027 rating period, points swap is available between the Safe Driving and Crash Avoidance pillars in either direction.

2.2. Overall Vehicle Score

The overall vehicle score is calculated using the weighted sum of the final Safe Driving, Crash Avoidance and Post-Crash Safety scores.

$$\text{Overall vehicle score} = \sum \begin{matrix} Final\ Safe\ Driving\ score * 0.4 \\ Final\ Crash\ Avoidance\ score * 0.5 \\ Final\ Post-Crash\ Safety\ score * 0.1 \end{matrix}$$

2.3. Overall Star Rating

A star rating is assigned to each pillar after any points swap that may be considered necessary to optimise the results through comparison of the results with the thresholds in the balance criteria. The overall star rating is the lowest rating assigned to any pillar (excluding Post-Crash for the 2025 to 2027 rating period).

2.4. CitySafe Award

The CitySafe score is determined from the sum of the final direct vision, indirect vision, frontal collisions VRU and low speed near side turn collisions score.

$$\text{Overall vehicle rating score} = \sum \begin{matrix} Final\ direct\ vision\ score \\ Final\ indirect\ vision\ score \\ Final\ frontal\ collisions\ VRU\ score \\ Final\ low\ speed\ near\ side\ turn\ collisions\ score \end{matrix}$$

The CitySafe award is made where the vehicle star rating is equal to or greater than three stars and the total CitySafe score is greater than 45 points.

2.5. Rounding

The following rounding rules are applied in the calculation of the overall rating:

- Data is entered to two decimal places.
- Intermediate calculations (e.g. calculations needed to derive parameters which are then used to calculate scores) are not rounded.
- Calculation of final points scores for each function assessed are rounded to three decimal places for calculation purposes and presented to one decimal place.
- To calculate the percentage score in each pillar, the three decimal places total of the function scores is divided by the total points available for that pillar and the resulting percentage is rounded down to the nearest integer.
- That integer is then compared with the balance percentage thresholds for the pillar in Table 2-2.

- The overall weighted score is calculated by multiplying the three decimal place score in each pillar by the respective pillar weighting factor.
- The resulting sum is rounded down to the nearest integer.
- This integer is compared with the threshold requirements for star ratings for the relevant year.

Euro NCAP provides an HGV rating calculation spreadsheet on www.euroncap.com

OVERVIEW OF FIGURES