

TÜV Nederland QA B.V. report

Description of the test

2400-B-641 Badé B.V. Caravan Eco

16-05-2018

Summary

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Description of the test Safety assessment of Caravan Eco® 50 kg

Type Caravan ECO / 50 kg

Remarks -

Conclusion The Safety assessment of Caravan ECO® 50kg, 2x 25 kg bikes
The hardware will carry the bikes safely under the conditions of the instruction manual. In case of emergency brake/stop, there is a potential risk of damage to either the car or caravan. Release of the system and becoming a secondary projectile is estimated as low under an emergency brake/stop unless impact forces are applied due to an accidents where G-forces will be excessive.

The instruction shall be improved towards several points as listed in the report

Report by Ing. A.J. Piers



Report date 16-05-2018

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Content

Summary	1
1. Introduction	3
2. Description	4
2.1 Description of the product.....	4
2.2 Testing	4
3. Conclusion / Discussion	6

1. Introduction

Badé B.V. Caravan Eco in cooperation with the manufacturer has commissioned TÜV Nederland QA B.V. with the safety assessment of Safety assessment of: Caravan ECO bike carrier in black version. This report details the tests as executed by TÜV Nederland and contains the results of the tests.

2. Description

2.1 Description of the product

The bike carrier is a tool for use on caravan hitches with which bicycles (up to 2) can be secured. The limitation of the usage is specified in the manual being 25 kg + 25 kg maximum. The load of the total is thus maximum 50 kg. One sample was delivered by the client to evaluate to the original design version. Based on FEM analysis and evaluation by TÜV the following is validated.

2.2 Testing

The bike carrier is set-up according the instructions but the mounting on the Y frame is loose. This means that during the testing the materials will undergo impact forces.



Photo 1.

Based on the specification an static loadtest has been applied on the upstand bar. The weight is set to 50 kg.



Photo 2, top view.



Photo 3, side view

There is no permanent deformation the aluminum frame under static load. This means that the wall thickness of the chosen tubes are withstanding the load.

The next test is a pull test to bring the system in unbalance and visual inspect the results of the dynamic behavior of the materials in case the mounting would be extremely poor executed (worst case : abuse of the system in reference to manual).



Photo 4, situation after mechanical pull side wards (under 50 kg load).

The visual inspection has shown that the integrity of the system is maintained and slight deformation is present. This deformation is however acceptable and a result of the impact effect of the 'loose' mounting.

A very positive safeguard is to be remarked for the locking system of the wheels of the bike. These are made of robust materials and locking system and is fool-proof towards the use.



Photo 5, lock device for the bicycle wheels

3. Conclusion / Discussion

Based on the results, TÜV has awarded Badé B.V. for the product Caravan ECO with the product label as given below. This may be used as long as the product and specification delivered to the market is and remains the same as the reference used for the TÜV testing and yearly confirmation is active according the agreement.



The manual is short and lacks some clarity towards the original. The label may be used after revision of the manual. The usage of lock nuts in case of a replacement/repair could be emphasized in the manual. In case no lock nuts are used, vibrations during usage will unwind the nuts. This shall also be for the pre-mounted gutters on the frame be stated.

The hardware will carry the bikes safely under the conditions of the usage of the original instruction manual. In case of emergency brake/stop, there is a potential risk of damage to either the car or caravan. Release of the system and becoming a secondary projectile is estimated as low under an emergency brake/stop unless impact forces are applied due to an accidents where G-forces will be excessive.

This is the last page of the report.

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