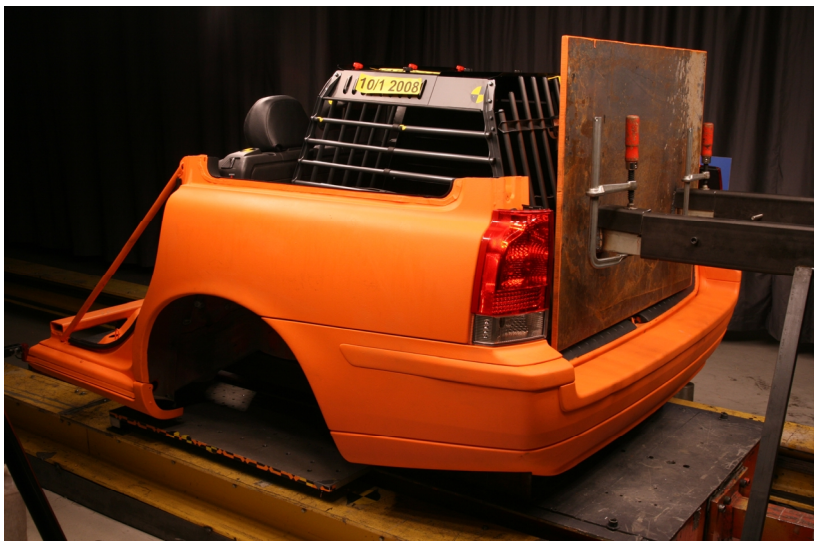
How safe is the Variocage?

MIM Construction AB has evaluated the dog crate Variocage in car crashes from the safety aspect of both the dog and passengers. Out of a variety of crashes the rear-end collision is probably the biggest threat to passenger safety. The luggage compartment is a part of the deformation zone around the passenger compartment that protects passengers from intrusion in collisions. In a rear-end collision the rear-end is pushed forward by the intrusion caused by the hitting vehicle. Objects in the luggage compartment are then pushed forward. The amount of intrusion is limited by the stiffness of the car and the speed and energy of the hitting vehicle. A dog crate placed in the luggage compartment affects the balance of the system. If the crate is too stiff the back of the rear seats will yield and collapse in a rear-end crash.

When passengers occupy the rear seat the change of the deformation zone becomes dangerous if the back of the rear seat does not stop the dog crate. This type of collision is common in all countries. It is thus essential that the crate is constructed in a way that makes it collapse in a controlled way in severe rear-end crashes.

The speed that was used in the rear-end crash test was 30 km/h. It is equal to at a stand still getting hit from behind by a car with the same weight as the hit car doing 55 km/h. Part of a Volvo V70 body was placed on a crash test sled. The crate was then placed in the luggage compartment against the seat back. Two 35-kg dog dummies were placed inside the crate. The crate was pushed forward during the crash by a plate big enough to hit the entire rear-end of the crate. The plate was used to simulate the intrusion of the hitting vehicle.

A Variocage XL dog crate for two dogs was tested. The loading of the seat back was moderate and no visible deformation of the seat structure could be found after the test.



The plate enters the luggage compartment just a little bit above the floor and push the crate forward during the braking of the crash test sled.

The crate was compressed about 150 mm after the test. No sharp edges dangerous to the dog could be found. Both gates could be opened. The emergency gate was not jammed and could be opened.

The crate was compressed approximately 150 mm.
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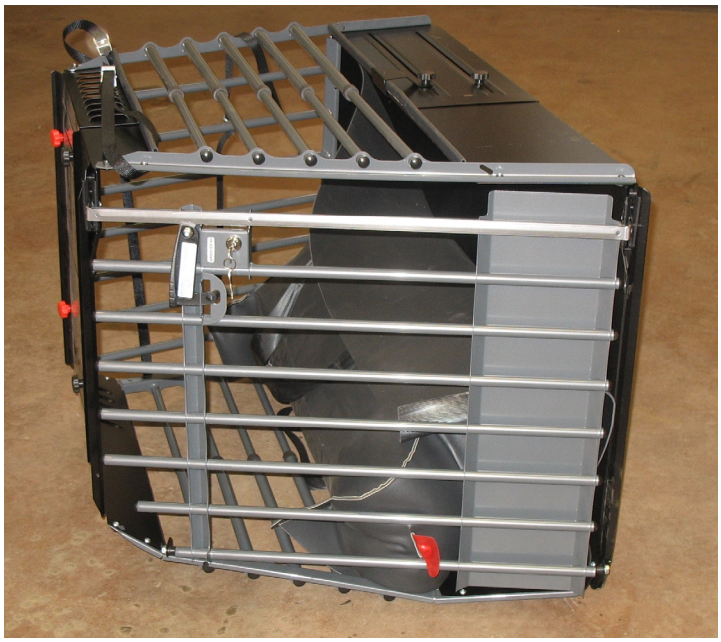
A frontal collision test was also performed. Two 35-kg dummies were placed in a Variocage XL for two dogs. The test speed was 50 km/h and the retardation was approximately 24 g, which corresponds to 2,5 tonnes of loading of the rear seat. The crate was slightly compressed by its own weight during the collision. No sharp edges were found. Both gates could be opened. The emergency gate was not jammed and could be opened. The front wall of the crate was deformed by the dummies during the crash test. That was positive as it took care of some of the energy during impact and it would have helped the dogs in a real crash. No deformation of the seats could be found.

The forces in a roll over are difficult to create in a controlled way in a crash lab. They are randomised and can come from any direction. The falling distance in a roll over is not very high and the crate is close to the centre of gravity. It is thus the impact from the falling that is interesting and easy to create. A Variocage XL single crate was tested in a drop test to see if the crate could handle forces in the corner of the gate. The crate was dropped from a height of 50 cm, which corresponds, to a speed change of 11.3 km/h when it hits the concrete floor. With the lower hinge corner of the crate facing down and a 60-kg dummy inside the impact of the crate is quite rough. The crate handled the impact well and did not open or crack in any other way that would be dangerous to the dog.



The Variocage crate after the drop test was resting on its side.