

## Press Release

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# VOLVO CARS CRASH-TEST LABORATORY CELEBRATES ITS 10 YEAR ANNIVERSARY

Volvo Cars' crash-test laboratory in Torslanda, Sweden, celebrates its 10th anniversary this year and the 3,000 full-scale tests that have been carried out during the high-tech facility's first decade have helped give Volvo owners even safer cars.

"The risk of being involved in an accident or being injured in one of our latest car models has more than halved compared with a Volvo from the 1970s. We are continuously taking new steps towards our vision that nobody should die or suffer serious injuries in a new Volvo car by the year 2020. The crash-test laboratory is a central part of this development," says Thomas Broberg, Senior Safety Advisor at Volvo Cars.

"We can replicate most of the accident scenarios that take place out on the roads. By analysing the results and then testing new safety technology, we can improve the safety level in our cars so that they become even safer in real-life traffic conditions," commented Thomas Broberg.

When the new safety centre was inaugurated by Sweden's King Carl XVI Gustaf in early 2000, it was one of the most advanced in the car industry - a position it has retained over the years due to the continuous implementation of new equipment and new test methods. The latest technology addition is a set of digital high-speed cameras that can take 200,000 frames per second.

"The new cameras give us exceptional scope for studying the tiniest detail of a collision. We also have a number of miniature cameras that are installed inside the cars to capture what happens with various key components in the vehicle," relates Thomas Broberg.

### **Fixed and movable tracks**

The crash-test laboratory has one fixed and one movable test track. The movable track can be adjusted from 0 to 90 degrees. This makes it possible to carry out tests involving a variety of incident and accident scenarios, from frontal impacts to side impacts, between two moving cars approaching at different angles and speeds. More over, avoidance and mitigation of collision can also be tested. The facility can currently handle more than 400 full-scale tests a year.

The two tracks meet above a six metre deep, Plexiglas-covered pit used for filming the collision tests from underneath. Over the years, the Plexiglas shield has witnessed a number of remarkable crash tests. For instance, in 2003 Volvo Cars demonstrated the side-impact protection of the Volvo S40 to media representatives by allowing the compact sedan model to be struck by a far larger XC90 model travelling at 31 mph.

"The degree of precision in a test in which two moving cars collide at 31 mph is 2.5 centimetres. This corresponds to two thousandths of a second. By way of comparison, a blink of the human eye takes about 60 thousandths of a second. This says a whole lot about the laboratory's precision," says Thomas Broberg.

### **Crash tests in the opposite direction**

Crash tests on both tracks can also be carried out in the opposite direction. At the end of the fixed track there is a concrete slab that can be used for various tests including rollovers and tests including avoidance or mitigation of a crash. At the end of the movable track, the surrounding

landscape serves as an integrated part of the crash-test laboratory. Here crash tests are carried out against a variety of objects found in the traffic environment.

The lab's crash block weighs 850 tonnes and is moved around with the help of air cushions. In addition, there are around 20 other fixed and movable barriers covering Volvo Cars' own, stringent test regime as well as various official test requirements.

In addition to the lab's full-time employees there is a team of about 100 silent yet efficient staff members in the form of crash-test dummies: men, women and children of different sizes and ages. The dummies are advanced measuring instruments with different designs and configurations for different crash situations.

"In order to offer cars with a world-class safety level, we must ensure that our safety systems are suitable for different occupant sizes at a wide range of speeds and in various traffic situations. It is this ability to replicate incidents and accidents from real-life traffic situations that makes our Safety Centre special. The crash-test laboratory can also help verify the functionality of collision-avoiding technologies," says Thomas Broberg. He adds: "By analysing these and then testing new safety technology in the crash-test laboratory, we can improve the safety level in our cars so that they become even safer in real-life traffic conditions."

### **Crash-test laboratory - Milestones 2000-2010**

- **2000** - The new crash-test laboratory is inaugurated on 29 March by His Majesty King Carl XVI Gustaf of Sweden. It is one of the most advanced facilities of its kind in the world.
- **2000** - Tests of central road dividers made by wires.
- **2001** - Volvo Cars is appointed Centre of Excellence for safety within the parent corporation, Ford Motor Company. Over the following years, many crash tests are carried out on various models from Aston Martin, Jaguar, Land Rover and Ford of Europe in Volvo's high-tech crash-test laboratory. The laboratory is also used by Volvo Trucks.
- **2002** - A new test rig for roll-over tests is demonstrated. The media are invited to witness a roll-over test of the new Volvo XC90.
- **2003** - Media activity involving a crash test in which the company's largest model, the XC90, drives into the side of the then-smallest model in the range, the Volvo S40, at 31 mph.
- **2007** - The 2000<sup>th</sup> crash test was carried out in May.
- **2008** - A new set of digital high-speed cameras are installed. They can take 200,000 frames a second and this advanced technology provides enhanced scope for studying in minute detail exactly what happens to the test dummies and the car in a collision.
- **2008** - New test rig introduced that creates the unique possibility to film the car from below when it hits a lamppost or tree.
- **2010** - The crash-test laboratory - which is still one of the most advanced in the automotive industry - celebrates its 10<sup>th</sup> anniversary on 6<sup>th</sup> May by performing three different types of complex crash tests in front of 100 invited journalists. Almost 3,000 crash tests have been carried out in the laboratory during its first ten years of operation.

### **Facts from Volvo Cars Safety Centre**

- The Volvo Cars Safety Centre is designed to carry out advanced crash tests that contribute to increased knowledge and the development of safer Volvo cars. The laboratory makes it possible to replicate most of the accident scenarios that occur in real-life traffic.
- The crash-test laboratory was inaugurated in 2000.
- The crash test laboratory has a capacity to carry out more than 400 full-scale tests per year.
- The crash-test laboratory has one fixed (154 metre) and one movable (108 metre) test track. The movable test track can be moved from 0 to 90 degrees to perform crashes such as frontal impacts, rear end collisions, side impacts, and collisions between two moving cars at different angles and speeds.
- On the fixed test track, the maximum speed for a passenger car is 75 mph. On the movable test track, maximum speed is 50 mph. The speeds on each test track can be regulated independently of one another.
- Point of impact precision in a test in which two moving cars hit at 31 mph is 2.5 centimetres, corresponding to two thousandths of a second. By comparison, the blink of a human eye takes about 60 thousandths of a second.
- On the fixed track it is also possible to crash-test trucks at speeds of up to 50 mph.
- Crash tests on both test tracks can also be carried out in the opposite direction. At the other end of the fixed test track there is a 15x70 metre concrete slab that is used for various tests

such as rollovers. At the other end of the movable test track, the surrounding landscape is an integrated part of the crash-test laboratory. Here crash tests are carried out against a variety of objects found in the traffic environment.

- At the point where the two test tracks meet, there is a 6 metre deep, Plexiglas-covered pit for filming crash tests from below. The cameras that film the tests from above are installed in a rig 11 metres above the point of impact.
- There are about 50 high-speed cameras. The fastest can take 200,000 frames per second. The smallest cameras can be used to study the way in which small components inside the cars are affected by the collision forces.
- The laboratory's crash block weighs 850 tonnes. It is moved with the help of air cushion technique. Different types of crash test barriers can be built on three sides of the block.
- There are around 20 other barriers to support Volvo's own extensive testing, based on knowledge from real life situations, as well as the various official test requirements.
- Volvo Cars' also performs crash tests in a unique crash test simulator using a reinforced car body with the actual interior that is to be tested. The crash simulator can recreate the tipping, or pitch, in real-life collisions without destroying the car body. It can also simulate intrusion into the passenger compartment, using ten pistons representing different parts of the car.
- A new car model that is being crash tested in the lab has already been tested thousands of times in Volvo's computers. In the computer a crash test can efficiently be simulated a number of times with different parameters without destroying a car.
- Volvo Cars also has 100 different types of crash-test dummy to represent men, women and children of different sizes, weights and ages. There are different dummies used for different situations and different purpose e.g. frontal crash test dummies, side impact dummies and rear end dummies.

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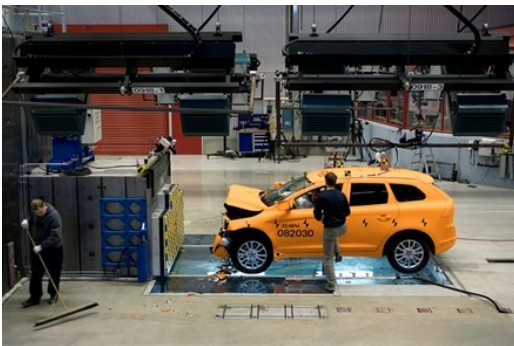
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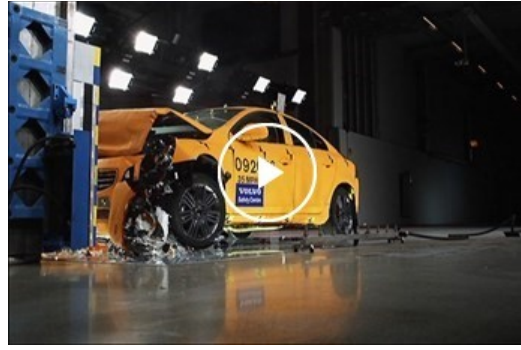
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