

Press Release

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Cold and snowy - Volvo's home patch

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GÖTEBORG (January 21, 2008) -- Volvo Car Corporation's Scandinavian heritage and weather testing framework create a foundation for industry-leading winter performance.

The dedication stems from the belief that customers should be able to rely on Volvo vehicles everywhere, irrespective of climate and road conditions. It's for this reason that Volvo vehicles are tested under the most extreme conditions found on the planet, from Arizona's blisteringly hot desert to the biting cold of the Arctic north.

"Our cars have to be able to withstand ambient temperatures between -40 and +60 degrees Celsius," says Jan Inge Eliasson, head of the Complete Vehicles Testing department at Volvo Cars. "This requirement has been around a long time and is one part of our safety tradition. Our aim is to create the best possible total function for all climates."

Tough demands on the entire car

This extreme weather testing applies to the entire vehicle, down to the smallest part. A Volvo vehicle consists of about 40 main systems such as the engine, climate unit, seats, etc. The main systems are divided into 400 subsystems such as the starter motor, fan, seat heaters and others. The final classification consists of approximately 3000 components, everything from sensors to heating circuits.

Systems, subsystems and components are responsible for thousands of different basic functions and therefore must work as intended. For instance, the seats move forward and back, the fan delivers the desired power, and the windscreen wipers operate at set intervals.

In addition to basic functions, the vehicle also has a long list of supplemental requirements that can be dramatically affected by temperatures. Volvo Cars' requirements outline the minimum amount of time for functions -- such as windscreen demisting or temperature variances between the occupants' head and feet -- at a wide range of temperatures.

"Extreme winter climate is probably the toughest test to which one can subject a car" says Eliasson. "The stresses on the engine, steering, climate unit and other systems are immense. As far as I know, we are alone in carrying out tests down to -40 degrees. The reason is our Scandinavian heritage. Both we and our customers impose extra demands on us since we come from Sweden."

Always on the customer's terms

Volvo Cars was the first manufacturer to start winter testing its vehicles in the Swedish Lapland in the 1960s. Today, the company has a modern proving ground just outside Kiruna where all Volvo models -- equipped with the widest array of options and equipment available -- are put through rigorous tests.

The winter test season stretches from December to April. During this period vehicles are driven up to 200,000 kilometres on a test track and public highways, the equivalent to driving about five times round the world. The tests are carried out by a team of local drivers and Volvo test engineers. The team, composed of both male and female test drivers of different ages, is tasked

with identifying and reporting any faults.

"All testing takes place as close to the customer's everyday reality as possible," says Eliasson. "And even if most Volvo customers never come into contact with this type of extreme climate, the car has to be ready on what may well be the one day a year when the snow suddenly blankets everything."

Safety is in the holistic approach

Completing a carefully designed test program that relies on specific temperatures and conditions sometimes requires additional equipment to create more predictable weather patterns. For example, Volvo Cars employs refrigerator containers for cold start testing. The vehicle is parked inside overnight at thirty degrees below zero. The next morning, the doors are forced open and the engine is started.

"The big challenge lies in getting all the systems to function faultlessly together," continues Eliasson. "The cold slows down the locking systems and various displays. The snow penetrates and blocks filters. Ice covers the windows and lamps. All this and much more has to be dealt with to meet the tough demands that are imposed - not least as regards safety."

Safety-related work does play an integral part of Volvo Cars' cold weather testing. First and foremost, the vehicle must create an environment and an interior climate that keeps the driver alert for long periods of time. Visibility is also critical. As is steering and braking ability in severe snowstorms and on black ice. What is more, the company's all-wheel drive system and protective safety systems -- such as air bags and seat belt pretensioners -- must work reliably in such severe climates.

Nothing can replace reality

For Volvo vehicles, physical cold weather testing takes place late in a product's development cycle. The test team uses pre-production vehicles that look and function exactly like the final model, however, the design has often been put through rigorous testing before arriving at the cold weather test centre. Volvo engineers use computer simulations and wind tunnels to examine the vehicle's performance in artificial snow storms at extreme temperatures.

"The advantage of laboratories is that the tests are predictable and repeatable," says Thomas Persson, head of technology & systems engineering for climate systems for Volvo Cars. "However, there is a danger too. We generally say that the wind tunnel reveals the answers we are looking for. Out on the open road, however, we find answers to questions we never even asked. For us, our reward comes later. When we meet the car on a cold winter's day and we know that the car's occupants are sitting in comfort and safety in their Volvo."

Volvo Cars of Canada Corp. is part of the Volvo Car Corporation of Göteborg, Sweden. The company provides marketing, sales, parts, service, technology and training support to the 42 Volvo automobile retailers across the country. The company's product range includes the stylish and sporty C30, the elegant C70 hardtop convertible, the compact S40 sedan, the S60 sport sedan, the S80 flagship sedan, the versatile V50 wagon and the award-winning XC90 sport utility vehicle. For 2008, the company is introducing two all-new models: the redesigned V70 wagon and the capable and comfortable XC70.

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