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CanadianDriver

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Feature: Electronic stability control: why your car should have it - Part One

By Glen Nicholson

Transport Canada video demonstrating benefits of ESC

Electronic Stability Control ("ESC") is the greatest life saving technology since the safety belt. You can buy ESC from all major auto makers in about half of all vehicle models, yet most Canadians are unaware of ESC and continue to buy vehicles without it. And most stakeholders are doing little or nothing to promote ESC.

First, let's take a look at how ESC works and why it's so important:

What is ESC?

ESC is an active safety technology that helps prevent vehicle crashes by detecting and correcting loss of steering control (skidding) by applying one brake and sometimes reducing engine power.

ESC compares the driver's intended direction (steering angle) to the vehicle's actual direction (vehicle rotation). If the vehicle is not going where the driver is steering, ESC brakes individual front or rear wheels and/or reduces excess engine power to help correct understeer (ploughing) or oversteer (fishtailing).

ESC is very fast, applying the brake in 1/25th of a second, even if the driver's foot is still on the gas. ESC may correct vehicle direction before the driver feels the skid. In most systems, a light on the dash flashes when ESC is active, warning drivers to slow down.

ESC works on dry, wet, icy, and gravel roads and helps motorists avoid wildlife and unexpected road hazards. ESC helps keep vehicles on the road, in their lanes, and under control, and is particularly effective in preventing rollovers by maintaining forward direction. It is most effective in reducing loss of control crashes that cause serious injury or death.

If a crash becomes inevitable, ESC may help the vehicle to "crash safer". Skidding sideways into an object exposes a passenger's head and torso to deadly crushing injuries. ESC helps vehicles crash frontally so passive safety devices such as the bumpers, seat belts, front air bags, and head restraints work properly.

However, ESC does not improve traction or enable vehicles to corner faster. Traction depends on the grip between tires and the road surface. ESC helps drivers maintain control within the limits of available traction.

Driving with ESC

The driver does not have to do anything special to use ESC. It is automatically turned on with the ignition. The driver doesn't experience ESC constantly monitoring steering and direction and it does not intervene in normal driving. ESC acts during oversteer or understeer; i.e when the vehicle is not going where the driver is steering.



A driver demonstrates ESC in a BMW 5 Series. Click image to enlarge

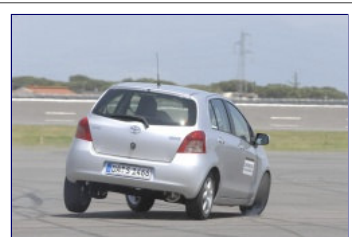
Skid courses teach drivers to steer into the skid, but this is generally not necessary with ESC. The driver simply steers where he/she wants to go and ESC helps the driver maintain steering control. ESC acts no matter what the driver's foot is doing.

When the vehicle skids, the driver may feel the vehicle slow down as ESC applies the brake and/or reduces engine power. If the driver performs a radical steering manoeuvre like jerking the steering wheel on an icy road (perhaps to swerve around a moose), ESC may

brake and slow the vehicle equally aggressively, like a giant invisible hand instantly grabbing the vehicle to help the driver stay on track.

My own driving tests with ESC saw the following results:

- When driving too fast into a slippery corner, the vehicle slowed noticeably and stayed in the correct lane.
- During emergency lane-change manoeuvres on glare ice, ESC snapped the vehicle into correct alignment in the chosen lane.
- While driving in circles on an icy parking lot, ESC slowed the vehicle down to a speed consistent with the available traction and turning radius, resulting in perfect, controlled circles.
- ESC easily managed road hazards such as ridges of slush on the road.
- ESC and ABS worked together in emergency braking situations, maintaining forward direction instead of spinning out of control.
- It took real effort to deliberately lose control. Pushing the vehicle beyond its



A driver pilots a Toyota Yaris at a ChooseESC! event held in Rome. Click image to enlarge

[Click here to read Part 2 of "Electronic Stability Control: why your car should have it" by Glen Nicholson](#)

Related links

- [Transport Canada ESC press release](#)
- [Transport Canada ESC FAQ](#)
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traction limits could cause a four wheel drift, but this was difficult to initiate because ESC intervened early, resisting loss of control. ESC then helped bring the vehicle back under control.

Driving in harsh winter conditions in the British Columbia interior with ESC and good winter tires was significantly easier and much less stressful and tiring than driving without ESC.

Good winter tires are strongly recommended for winter conditions. In winter, it was easy to push all-season tires beyond their traction limit. However, even with all-season tires, ESC still helped bring the vehicle back under control.

The Mercedes 'Moose Test'

Mercedes-Benz brought ESC to the market in 1995 after suffering an embarrassing incident. During a "Moose Test" (swerving around an imaginary animal on the road) a journalist jerked the steering wheel and rolled a Mercedes A-Class small car. However, an East German Trabant navigated the Moose Test that day without incident.

Reporters were amused, but Mercedes was not. Mercedes recalled 130,000 cars and installed ESC. By 1998 Mercedes enjoyed a 21% reduction in driver related crashes and by 2002 that figure reached 42%. Other automakers took notice and started installing ESC in high-end cars, including BMW, Volvo, Audi, and Lexus.

Why is ESC important?

Dr. Claes Tingvall, an ESC pioneer, described the road transport system as "...one of the largest health catastrophes ever seen in the history of mankind." The World Health Organization says vehicle crashes are the leading cause of death among young people aged 2 - 33. Dr. David Bowering, Chief Medical Health Officer for Northern British Columbia says road crashes cause 20% of direct health care costs. The economic and social costs of road crashes in Canada are \$25 billion a year. Transport Canada reports almost 3,000 deaths annually on Canadian highways.

Passive safety devices like seatbelts, airbags, and child seats help people survive crashes. However, the safest vehicle is the one that does not crash. ESC helps prevent crashes.

ESC is the second-most-effective auto safety device, ranking right after seatbelts in the numbers of lives it would save. Research by the US Insurance Institute of Highway Safety (IIHS) reports that ESC would prevent:

- 40% of single vehicle crashes;
- 43% of fatal vehicle crashes; and
- 77-80% of fatal vehicle rollovers.

A recent research literature review by Susan Ferguson, Senior Vice-President for Research at the Insurance Institute for Highway Safety, concluded, "The overwhelming majority of studies find that ESC is highly effective in reducing single-vehicle crashes in cars and SUVs." Worldwide research studies show that ESC reduces:

- Fatal single-vehicle car crashes by about 30-50%;
- Fatal single-vehicle SUV crashes by about 50-70%;
- Serious, fatal multi-vehicle crashes by about 17-38%; and
- Fatal rollover crashes by about 70-90%.

ESC is profoundly effective in preventing rollovers. While accounting for only 3% of crashes, rollovers cause 28% of road fatalities. Rollovers usually result from "tripping" sideways over uneven surfaces such as curbs or shoulders. By maintaining forward direction, ESC prevents most rollovers.

ESC is extremely cost effective in reducing fatalities and serious injuries. ESC costs manufacturers only \$111 per vehicle. Unfortunately, some manufacturers make ESC needlessly expensive for consumers by bundling it with luxury options or offering it only on high-end models. However, one manufacturer, Volkswagen, sells ESC as an option for the retail price of \$450.

ESC will easily pay for itself and pay additional dividends by:

- reducing crash and insurance losses;
- reducing the cost of our the health care system (especially costly emergency facilities);
- reducing the demands for workers compensation and strengthening our labour force;
- reducing delays in our court system; and
- reducing the environmental cost of repairing and recycling damaged vehicles.

Unfortunately, governments, insurance companies and safety organizations are doing surprisingly little to raise awareness about ESC. Next week, I'll discuss what the stakeholders are doing, and not doing, to promote the safety benefits of ESC.

[Click here to read Part 2 of "Electronic Stability Control: why your car should have it"](#) by Glen Nicholson

More Feature articles...

Glen Nicholson is a lawyer in Prince George, British Columbia. He is an independent safety advocate, promoting ESC awareness for free because he believes it will save many lives. He has no financial interest in ESC.

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