Camaro Z/28 Runs Circles Around Lamborghini and Porsche

It's been said a good car can "run rings" around the competition.

That certainly was the case in mid-September when the 2014 Camaro Z/28 turned in a 7:37.40 lap time around the famed Nürburgring road course in Germany.

Chevrolet officials, on Oct. 15, revealed a video of the new 2014 Camaro Z/28 lapping the Nürburgring road course in a time comparable with some of the world's most prestigious sports cars, said GM spokesman Monte Doran.

The Z/28's lap is four seconds faster than the Camaro ZL1, and beats published times for the Porsche 911 Carrera S and the Lamborghini Murcielago LP640, Doran said.

The Z/28's lap was completed in less-than-ideal conditions, with damp pavement and pouring rain near the end of the run.

"One of the challenges of testing at the 'Ring' is that the track is so long that conditions can change radically in a single lap," said Al Oppenheiser, Camaro chief engineer.

"Adam Dean, the development driver for Z/28, did a heroic job driving in deteriorating conditions. Based on telemetry data from our test sessions, we know the Z/28 can be as much as six seconds faster on a dry track."

In terms of lap times, the Z/28's improved speed came from three areas, according to GM officials:

• Increased grip – The Z/28 is capable of a 1.08 g-force in cornering acceleration, due to comprehensive chassis revisions;

• Increased stopping power – The Z/28 features Brembo carbon-ceramic brakes capable of a 1.5 g-force in deceleration, and consistent brake feel lap after lap;

• Reduced curb weight – The naturally aspirated Z/28 weighs 300 pounds less than the supercharged Camaro ZL1, with changes ranging from lightweight wheels to thinner rear-window glass.

The heart of the Z/28 is the 7.0L LS7 engine, Doran said. The LS7 uses lightweight, racing-proven, high-performance components, such as titanium intake valves and connecting rods, CNC-ported aluminum cylinder heads and a forged-steel crankshaft to help produce an SAE-certified 505 horsepower and 481 lb.-ft. of torque. Air-conditioning is available, but only as an option.

A close-ratio six-speed manual transmission is the only transmission offered and power is distributed to the rear wheels via a limited-slip differential featuring a helical gear set, rather than traditional clutch packs.

The new design enables the driver to apply more power and get through corners faster, Doran said, by making the most of the capability of individual-wheel antilock brake function during corner entry braking, mid-corner speed and corner-exit traction.

The team spent a week at the Nürburgring as part of the Z/28's performance-validation regimen, accumulating a total of 10 hours and nearly 1,000 miles on the track. Each lap took less than eight minutes to complete, despite having to overtake slower traffic at times, Doran said.

The hours on the track are part of the grueling 24-hour test, which simulates a full year's worth of track use or amateur-level competition at the hands of an owner.

"Passing the 24-hour test is a requirement for all cars we call 'track capable,'" said Wayne McConnell, director of Global Vehicle Performance. "The test pushes the car at 10/10ths (full bore for both car and driver) on the track for a total of 24 hours. During the test, the only mechanical changes allowed are replacing the brakes and tires."

The 24-hour test is broken into a number of segments over the course of several days – and even at different tracks – to evaluate performance in precisely measured and carefully monitored increments. Crucially, each valid test lap must be run within 2 percent of a target lap speed to count toward the 24-hour total.

The 2014 Camaro Z/28 in Germany.

The 24-hour test was first used in the early 1990s for the fourth-generation Corvette. Back then, the 300-horsepower Corvette was Chevrolet's most powerful vehicle, and the 24-hour test measured 15 channels of data.

Today, the 2014 Camaro LS offers a 323-horsepower V6, while the Camaro Z/28's racing-proven LS7 7.0L small-block V8 delivers 505 horsepower, and the 24-hour test measures 130 channels of data.

"Our cars' performance and capability have advanced tremendously in the past 20 years, which required us to continually improve the parameters of the 24-hour test," said McConnell.

"Today's test pushes the car harder than the vast majority of customers ever will. As a result, when we call a car 'track capable,' we are confident that it will perform reliably and consistently for our customers."

'Oscar' Leads in Developing Impala Seats

Despite all the high-tech tools available to GM designers – seat pressure mapping systems and a multi-part mannequin that feeds data into a comfort dimensioning system – there's no substitute for the human element when fine-tuning where people sit.

General Motors' human factors engineers who understand biomechanics, psychology, quantitative research and ergonomics, applied all these disciplines to help make the seats comfortable in the 2014 Chevrolet Impala, said GM spokesman Chad Lyons.

Customers for each car segment want more or less support and rigidity in their car seats, Lyons said. What the car will be used for – such as commuting, city driving or track racing – helps engineers establish precise parameters of comfort. Finding the "sweet spot" for each vehicle doesn't come easy.

For the new Impala, volunteer seat testers ranging from 5th percentile females (5 feet tall, 110 lbs.) to 95th percentile males (6 feet tall or taller, 223 lbs.) spent hundreds of hours and logged thousands of miles in prototypes of the redesigned flagship sedan to evaluate seat comfort, Lyons said.

Seat testers typically drive or ride in prototype vehicles for several 60-minute intervals at a time recording initial feedback after the first 10 minutes. At each 60-minute interval, they numerically rate every aspect of the seat: cushion, backrest, lumbar support, headrest and side bolsters.

But tester feedback is subjective and design changes are often subtle because seat designs evolve from past programs and reams of data collected with precision instruments, said Jill Green, GM seat comfort lab manager.

"Developing comfortable seats is both an art and a science," said Green. "Knowing how to translate a physiological impression into tangible design elements is the art, and knowing how to execute the design is the science."

Seat tester evaluations alone would have been insufficient to achieve such results, Green said. That's where tools like Oscar come in hand. The mannequin-like tool made of steel, plastic and aluminum is assembled in 18 removable parts weighing up to 170 pounds. Early in the Impala's development, Oscar helped determine the overall dimensional layout of the interior, allowing the best use of space.

State-of-the-art digital pressure-mapping technology was used to scan the rear-end impressions of people of all shapes and sizes over the seat surface, creating a map with more than 4,600 data points, Green said. A laptop computer used the data to generate graphics illustrating how occupants sit in the seat statically or while driving.

The Impala's front seats are heated and ventilated, and bolstered for greater support. The seat cushions are designed to provide a firm feel, Lyons said. LS models feature cloth seats, while LT comes standard with cloth/vinyl seats. Sueded microfiber-trimmed seats are available on LT and LTZ models, which feature standard perforated leather seating. Standard on LT and LTZ models, rear-seat headrests fold to improve rear visibility when there are no backseat passengers.

Car reviewers have noticed the attention paid to Impala's seats, Lyons said.

"After hours in the driver's seat, we found ourselves just as fresh as we were before we set out," wrote Mark Takahashi, automotive editor, Edmunds.com. "The outboard rear seats have enough head- and leg-room for the average adult male to remain comfortable for extended trips as well."

GM seat engineers use high-tech equipment for the Chevrolet Impala.

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2015 Cadillac Escalade

Escalade Expected to Take A 'Major Leap Forward'

Cadillac's 2015 Escalade is a sophisticated luxury SUV designed to establish new benchmarks for hand-tailored craftsmanship and technology, said Cadillac spokesperson Jordanna Strosberg.

The fourth-generation Escalade made its debut in New York City on Oct. 7 and incorporates an entirely new design – yet instantly recognizable, Strosberg said. Much of the story of Cadillac's redesigned flagship SUV is on the interior, she added, where new levels of luxury combine with the latest technology.

"Cadillac's growth provides the ideal stage for the all-new Escalade to take a major leap forward," said Bob Ferguson, senior vice president, Global Cadillac.

"The 2015 Escalade is completely new and elevated in design and technology, inside and out. The clear objective is to once again assume the leadership position among luxury SUVs."

From its introduction, Escalade quickly became the standard among luxury SUVs with a formula of bold design, powerful capability and luxurious accommodations for up to eight occupants, Ferguson said, adding that three succeeding generations led luxury SUV customers to confer icon status on it. The 2015 Escalade, said Strosberg, takes design and technical elements from Cadillac's product expansion to elevate it's signature SUV.

Production of the 2015 Escalade begins next spring in Arlington, Texas. The product line will consist of the standard Escalade model, as well as the extended-length ESV edition, which offers a 14-inch-longer wheelbase and approximately 20 inches more in overall length, maximizing space for third-row passengers and 60 percent more cargo space behind the third-row seat than the Escalade.

Offered with 2WD and 4WD drivetrains, Escalade features a new 6.2L V8 engine that is more powerful and more efficient than previous models, Strosberg said.

Cadillac's Magnetic Ride Control, a fast-reacting suspension system, is now standard and delivers precisely controlled driving performance, she added.

The exterior features new and more sophisticated surfaces, accented by dramatic light-emitting diode, or LED, lighting, Strosberg said. The new interior features cut-and-sewn and wrapped materials, with wood trim options for "elegance and authenticity."

Strosberg said the seats were engineered to be more comfortable and sculpted in appearance, adding that "the new interior is dramatically quieter, too, thanks to a stronger new body structure, new and enhanced acoustic material, and Bose Active Noise Cancellation technology."

CUE, Cadillac's advanced system for connectivity and control, is standard. It features state-of-the-art voice recognition with touch controls common with the world's most popular tablets and mobile devices, Strosberg said.

A standard 12.3-inch digital gauge cluster can be reconfigured with four themes and an available head-up display projects information onto the windshield.