

CORVETTE CHASSIS TECHNOLOGY: THE RIGHT STUFF FOR RACING

As America’s premier sports car, Corvette has been a launching pad for new technology for more than 50 years. Many of the technical features that enhanced performance and enriched the driving experience first appeared in Chevrolet’s two-seat flagship. The catalog of Corvette advancements within the Chevrolet product line includes fiberglass and composite body components, four-wheel independent suspension, four-wheel disc brakes, serpentine accessory drive belts, concealed headlights, aluminum suspension components, composite springs, anti-lock brakes, traction control, run-flat tires, and driver-adjustable shock absorbers – to name just a few. Many of these high-performance components were developed and tested in the racing arena.

As Corvette began its transition from boulevard cruiser to serious contender, Chevrolet engineers made sure that Corvette racers had the right stuff. In an era of drum brakes and three-speed gearboxes, Corvette drivers enjoyed the advantages of factory-designed performance packages.

The Corvette heavy-duty parts program was the result of Zora Arkus-Duntov’s plan to position Chevrolet as the performance leader. On Dec. 16, 1953, Duntov composed a memorandum to Maurice Olley at Chevrolet Research & Development. His memo, which he titled “Thoughts Pertaining to Youth, Hot Rodders, and Chevrolet,” became the manifesto of Chevrolet’s performance program.

Duntov reasoned that enthusiasts could be persuaded to race Chevy’s upcoming small-block V-8 if the factory offered proven heavy-duty engine and chassis parts. “Since we cannot prevent the hot rodders from racing Corvettes or Chevys,” Duntov wrote, “maybe it’s better to help them do a good job at it.” With these words, Duntov outlined the strategy that ultimately made the Chevrolet small-block V-8 the most successful production-based engine in motorsports.

One of the first manifestations of Duntov’s plan was Regular Production Option (RPO) 684, a competition suspension package for Corvettes. RPO 684 included stiffer front and rear springs, a larger front stabilizer bar, firmer shocks, a fast-ratio steering linkage, a limited-slip differential and ceramic-metallic brake linings. In combination with a fuel-injected 283ci small-block V-8 and a four-speed Borg-Warner transmission, the RPO 684 package turned a 1957 Corvette into a factory-built race car.

Duntov’s group developed a similar package for the second-generation Corvette in 1963. RPO Z06 included a fuel-injected 327ci small-block V-8; a four-speed manual transmission; a limited-slip differential; finned brake drums; a heavy-duty suspension and – in short, everything a Corvette owner needed for a day (and night) at the races. A total of 199 Z06-equipped coupes were produced.

Corvette’s domination of showroom stock road racing in the ’80s was a continuation of Chevrolet’s philosophy to provide Corvette racers with the tools they needed to win. Competition also improved the breed by accelerating the development of high-performance parts for the street.

“A 24-hour race is the equivalent of 100,000 road miles on a suspension,” said Kim Baker, owner of the Bakeracing Corvettes that won back-to-back drivers and team championships in the SCCA Escort Endurance Championship in 1986 and 1987. “Corvette’s lightweight aluminum cylinder heads, low-drag pistons, disc brakes, power steering cooler and heavy-duty suspension bushings are examples of racing’s contribution to production models.”

The 1996 Corvette’s Z51 Performance Handling Package option was another expression of Chevrolet’s commitment to grassroots racers. Available exclusively on Corvette coupes, the Z51 package was tuned for autocross and gymkhana competition with heavy-duty shock absorbers, stiffer springs, a 30-mm front and 24-mm rear stabilizer bar, high-rate suspension bushings, P275/40ZR-17 tires and a heavy-duty power steering cooler.

Corvette’s rich racing heritage also inspired special editions, such as the Grand Sport model offered in 1996, the final year of production for the fourth-generation Corvette. The 1996 Grand Sport evoked memories of its predecessors with metallic blue paint, white racing stripes and red hash marks on the left front fender. Grand Sport emblems, five-spoke black aluminum wheels, black brake calipers with contrasting Corvette lettering and embroidered seats distinguished the Grand Sport from a standard model. Grand Sport coupes were outfitted with special fender flares to cover extra-wide P285/40ZR17 rear tires.

The production C5 Corvette provided a solid foundation for the championship-winning C5-R Corvette race cars. While the Corvette C5-R was a purpose-built racing machine, it employed several production components – as well as the engineering and technology required to craft a world-class automobile.

“Corvette has always been at the cutting edge of sports car performance,” said Tom Wallace, Performance Cars vehicle line executive and Corvette chief engineer. “The general architecture of the road car contributes to its success at the track. The low center of gravity and optimized weight distribution that make the Corvette a very stable vehicle at speed also contribute to making it a comfortable street car.”

Production hydroformed steel frame rails provided a strong foundation for the Corvette C6.R’s roll cage, and the race car’s body design was based on the production car CAD data.

Racing develops people as well as hardware. The discipline to meet deadlines, the ability to resolve problems quickly and the mental agility to outwit the competition are prerequisites for winning on the race track and in the showroom. For more than 50 years, a formidable combination of horsepower and brainpower has made Corvette a winner on and off the track.