

# **“PEAKING” IN THE REARVIEW MIRROR**

**By Ken Peak, RCC Historian**



## **CORVETTE’S CHIEF ENGINEERS**

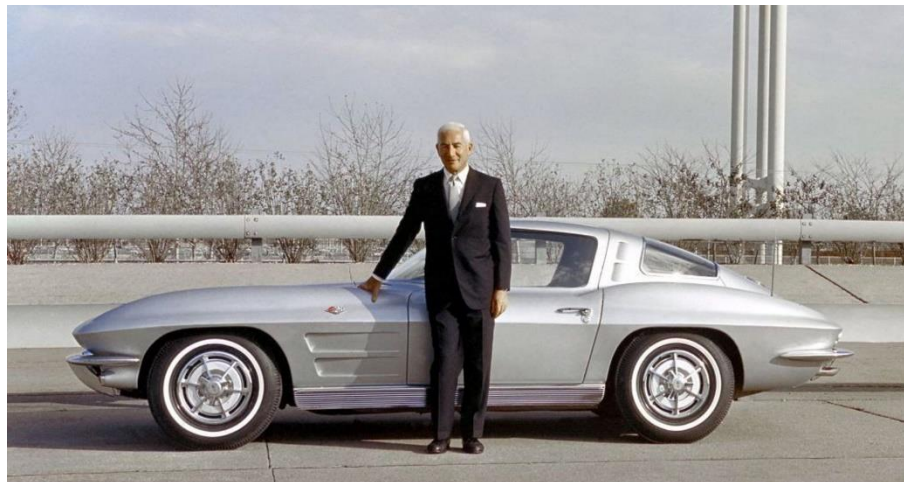


### **PART 1**

#### **INTRODUCTON**

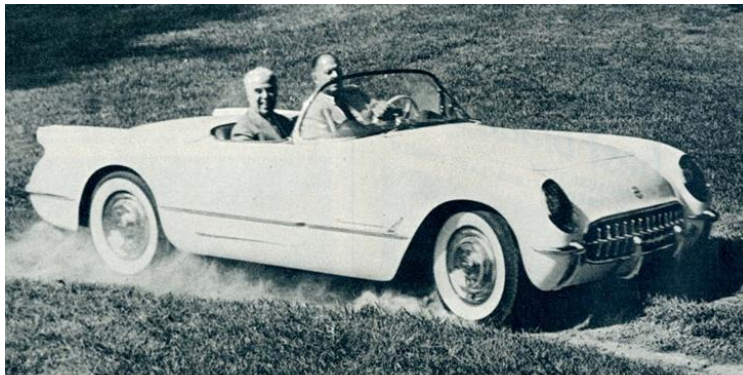
**Six men have held the prestigious title of GM’s Chief Engineer for Corvette (one had the title of Executive Chief Engineer). These men are all superstars within the automotive world in general and the Corvette community in particular. This article will discuss the following chronologically as they held the position: Zora Arkus-Duntov, Dave McLellan, Dave Hill, Tom Wallace, Tadge Juechter, and Tony Roma.**

#### **ZORA ARKUS-DUNTOV, 1967-1975**



**Several names loom large in Corvette’s history. Two who were instrumental in the car’s early existence were Tom Keating (group executive vice president and director of General Motors passenger car division) and Harley J. Earl (GM head designer and later vice president, anointed by the National Corvette Museum (NCM))**

as the “father of the Corvette”). These men were responsible for Corvette’s existence.



T. H. Keating, Chevrolet's top man, takes "cornering" demonstration in the Corvette, first mass-produced plastic-body car. Designer Harley Earl is at the wheel.

**Tom Keating, left, and Harley Earl. Photo credit: Life Magazine**

But today there is a third, equally celebrated man: Zora Arkus-Duntov. Although he can’t be termed the “father” of the Corvette (although many people have dubbed him as such) because he didn’t conceive the car’s original design, he could well be deemed its “godfather” (in this context, godfather being one who is influential or pioneering in a movement or organization).

Duntov saw his first Corvette in January 1953 at the GM Motorama in New York City (actually, it was the EX-122 concept car; the first production Corvette debuted in June 1953 in Flint, MI), and it was an instant love affair. He admired its sleek design - but was unimpressed when he looked under the hood at its mild 6-cylinder, 150 hp “Blue Flame” engine. Still, he realized that he had to join the Corvette team in order to try to “move the needle.”

Given his background as a mechanic and race driver, his studies in mechanical engineering at the Charlottenburg Technical University in Berlin, and his experience gained while working with Porsche and other car companies, Duntov was hired as assistant staff engineer at age 43 in 1953. He soon began sending memos to higher-ups containing ideas and laying out plans to make the Corvette a high-performance sports car with a variety of more powerful engines.

Duntov’s passion was always vehicle performance, having raced both Porsches and Mercedes-Benzes. He knew that Ford had a reputation for performance that Chevrolet did not possess, and an inline 6-cylinder Corvette was doing nothing to change that view. But he thought the car could do better. As a result, he would

eventually be nicknamed by some as “the Corvette’s Nostradamus” (because of the type of car he predicted the Corvette would become).

Duntov wrote a letter to both Ed Cole (president of GM and Chief Engineer of Chevrolet) and Maurice Olley (head of Chevrolet Research and Development entitled “Thoughts Pertaining to Youth, Hot Rodders and Chevrolet,” pointing out that hot rodders preferred Fords:

The majority of hot-rodders are eating, sleeping, and dreaming modified Fords. They know Ford parts from stem to stern better than the Ford people themselves. As they progress in age and income, they graduate from jalopies to secondhand Fords, then to new Fords. Should we consider that it would be desirable to make these youths Chevrolet-minded?

Duntov added that:

The existence of the Corvette provides the loophole. If the special parts are carried as RPO [Regular Production Order] items for the Corvette, they undoubtedly will be recognized by the hot rodders as the very parts they were looking for to hop up the Chevy. Since we cannot prevent the people from racing Corvettes, maybe it is better to help them to do a good job at it.

Thankfully for the brand, Cole allowed Duntov to provide a V8 engine for the 1955 Corvette - an optional 265 ci with a 195-hp engine (only 693 built, with about \$130 added cost; the first model to use the “Duntov cam,” after being tested on the EX-87 “mule”); in 1956, the standard 265 ci/210 hp engine could be ordered with a 240 hp with dual carb setup (adding \$172; 3,080 such engines built) and optional high lift cam (\$188); for 1957, the standard 283 ci offered several hp options, up to 283 hp (optional fuel injection added \$484; 713 built; optional airbox and mechanical tach added about \$250).

Then, in the late 1950s Duntov developed several concept cars that included a mid-engine layout: the 1960 CERV-I and the 1964 CERV-II. These ideas went nowhere.



**Duntov's 1960 mid-engine CERV-1 (for Chevrolet Experimental Research Vehicles). Photo credit: GM Authority**

The fuel injection system we know today (termed Ramjet Fuel Injection) was also Duntov's idea, 1957 being the milestone year and model. He also developed the first four-wheel disc brakes, multiple carburetors, four-speed transmissions, bigger engines, stiffer frames, and independent rear suspension, and other "firsts." (Not to be overlooked is his early 1960s brainchild, the Grand Sport program, intended to create a special lightweight Corvette to race on international tracks against the Shelby Cobra and other GT car and racing prototypes from Ferrari, Ford and Porsche.)

Duntov retired as Chief Engineer in 1975 but remained active in the Corvette community. A member of several racing and automotive halls of fame, he attended the rollout of the one millionth Corvette at Bowling Green in 1992 – and in later interviews still lamented the fact that the Corvette's engine was still located in its front.

The NCM has described Duntov as "a risk taker, a daring race driver, a brilliant engineer, and an opportunist. Reckless, Resourceful, and Resilient, Renegade," adding that "Zora changed the Corvette from a turntable darling into one of the most respected sports cars in the world." The NCM inducted him into its Hall of Fame in 1998.

As famed national columnist George Will stated after his death in April 1996 in Grosse Pointe, MI, at age 86 (his ashes were entombed at the NCM), "If you do not mourn his passing, you are not a good American." *The New York Times* cited him as the man who "turned the Chevrolet Corvette into one of the most popular muscle cars in the United States." It might also be fairly said that he saved Corvette from the trash heap of history, arguing for its continuation amid falling sales (which ticked up significantly with the beefier engines and helped GM to begin turning a profit). J. Michael Losh, GM's chief financial officer, believes that "Zora was the legend behind the legend."

The foregoing description of Duntov's contributions to Corvette are only the proverbial tip of the iceberg in terms of his dedication, talent, and contributions to the brand. *Motor Trend* put it this way: "Arguably, there had never been a chief engineer of an American car the likes of Zora Arkus-Duntov. His insistence that

**Corvette be tied to racing kept the car from becoming, as one wag put it, “Chevy’s Thunderbird.”**



**Photo credit: GM Authority**

**DAVE MCLELLAN, 1975-1991**



**Photo credit: National Corvette Museum**

**Dave McLellan understood that he had huge shoes to fill when chosen in 1975 to replace Zora Arkus-Duntov as Corvette Chief Engineer. A graduate of Wayne State University in mechanical engineering, McLellan was hired at GM in 1959 to work at its Milford Proving Grounds/Proving Ground Noise and Vibration Laboratory (which opened in 1924, has 4,000 acres, and is responsible for product development and durability testing). He next led a team that finished the 1970 1/2 Camaro. Then, after attending MIT in 1973, McLellan returned to GM and was assigned to work with Duntov until taking over as his replacement.**

McLellan took the reins at a time when the auto world was undergoing a sea change, trending away from performance cars to safer cars with reduced emissions. Not even Duntov could have predicted this change or altered the new order of things. However, even as performance went down, Corvette orders climbed (as examples, 33,836 units were built in 1975, followed by 46,558 in 1976 and 49,213 in 1977). GM was happy, but the Corvette itself was getting stale.

Immediately upon taking the new position, McLellan witnessed the end of the convertible model (to reappear in 1986), catalytic converters being added, and bumpers being redesigned. Customer choices in 1975 were a 350 ci/165 hp engine with only one higher (and yet weak) option: an L82 350 ci, 205 hp engine. With the comparatively long C3 Corvette generation (1968-1982) now roughly at what would become its midpoint, McLellan believed that this generation's models needed to be replaced; the chassis had been designed in about 1960 and many stylistic and performance upgrades were needed. Some people favored a mid-engine Aerovette to become the C4, but Chevrolet continued to reject all mid-engine platforms.



The 1973 mid-engine Aerovette concept car. Photo credit: GM Authority

When the all-new C4 debuted in January 1983 (40,274 units built), it received rave reviews despite the fact that engineers later admitted that they had given it a stiff suspension. By 1985, the suspension was softened and the 350 ci engine could be had with 220 hp; this 150-mph Corvette won Car and Driver's "Fastest Car in America" award. Porsche even bought a Corvette to have it stripped down to see how the car was unbeatable.

At this point, GM management assumed that the Corvette was so popular it didn't require heavy outlays of funds to effect significant changes. However, McLellan was able to change that philosophy, even bringing into the Corvette a modern electronic, computer-controlled performance car. Then, his 1978 "fastback" model (40,274 coupes, 6,502 pace cars built) featured a large redesigned rear window (but not a hatchback), more luggage space, and "25th Anniversary" emblems - the most extensively redesigned Corvette since 1968.



The 1978 "fastback" model. Photo credit: GM Media

But a major issue remained with the car: quality control. The St. Louis assembly plant produced three other Chevrolet models and workers were often unfamiliar with the special needs of the Corvette. This issue would not be remedied until the assembly line was moved in June 1981 to the 212-acre, 1.7 million sq. ft. Corvette-only Bowling Green, KY facility.

Then, after the successful rollout of the C4, McLellan took on four very serious performance projects for the Corvette:

- The Callaway Twin-Turbo option (work done in Limerock, CT, cost \$19,999); this package had 345 hp (stock Corvettes had 240 hp)
- the ZR1 performance model (first appearing as a C3 in 1970, the C4 version was dubbed "ZR-1" from 1990-1995, cost \$27,016 above base cost in 1990, and \$31,258 additional in 1995; it had a Lotus-engineered, all-aluminum, double-overhead cam engine (many people have speculated that "ZR1" stood for "Zora Racer One," but GM maintains that it is simply an option code).
- the LT5 Lotus/Mercury Marine performance engine; and

- the 1990 mid-engine CERV-III, McLellan's vision of Duntov's mid-engine Corvette, with electronics galore. The car had a carbon-fiber, Lotus-style backbone chassis; four-wheel steering; active suspension; a transverse-mounted 650-horsepower twin-turbocharged LT5 ZR-1 engine, and a four-speed transaxle. All led to a top speed of 225 mph.



The 1990 mid-engine CERV III concept Corvette. Engineers wanted it to become the C5, but it was deemed too expensive to produce. Photo credit: GM Authority

Dave McLellan would be best known for his work with the C4 Corvette; however, prior to that, he was challenged with having to keep the C3 Corvette alive during the low performance years of the late 1970s – the era of ever-increasing government emission regulations beginning with the aforementioned catalytic converter in 1975. At the same time, however, he was working on the all new C4, which would have an all-new chassis suspension and brakes, tuned-port injection, anti-lock brakes, a return of the convertible model (in 1986), and traction control. Perhaps his major achievement was releasing the aforementioned ZR-1 model in 1990, which set world racing records of over 175 mph for both 24 hours and for 5,000 kilometers.

McLellan also oversaw a three-year refreshing process which began in 1990 with an all-new electronic dash; 1991 brought new front and rear bumper covers; and in 1992, the 245-horsepower L98 was replaced with the 300-horsepower LT1. In 1990, McLellan won the Society of Automotive Engineers' Edward N. Cole Award for Automotive Engineering Innovation.



In 1991, with 17 years as Chief Engineer and GM offering early retirement packages heavily loaded with benefits, McLellan took the offer and handed over his package of engineering solutions for the C5 to the newly appointed Corvette Chief Engineer, Dave Hill. McLellan stayed on as a consultant, was on hand (along with Duntov) to see the one-millionth Corvette roll off the Bowling Green assembly line, became a highly sought automotive consultant, and appeared as a guest of honor at many Corvette events.

Dave also wrote and illustrated a respected book, *Corvette from the Inside: The 50 Year Development History*. He was inducted into the NCM's Hall of Fame in 1999, and has a podcast where he discusses the Corvette, accessed at: <http://www.corvettechief.com/>.

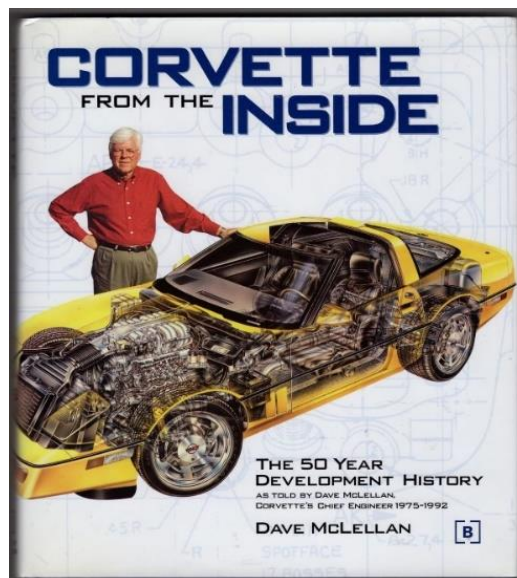


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