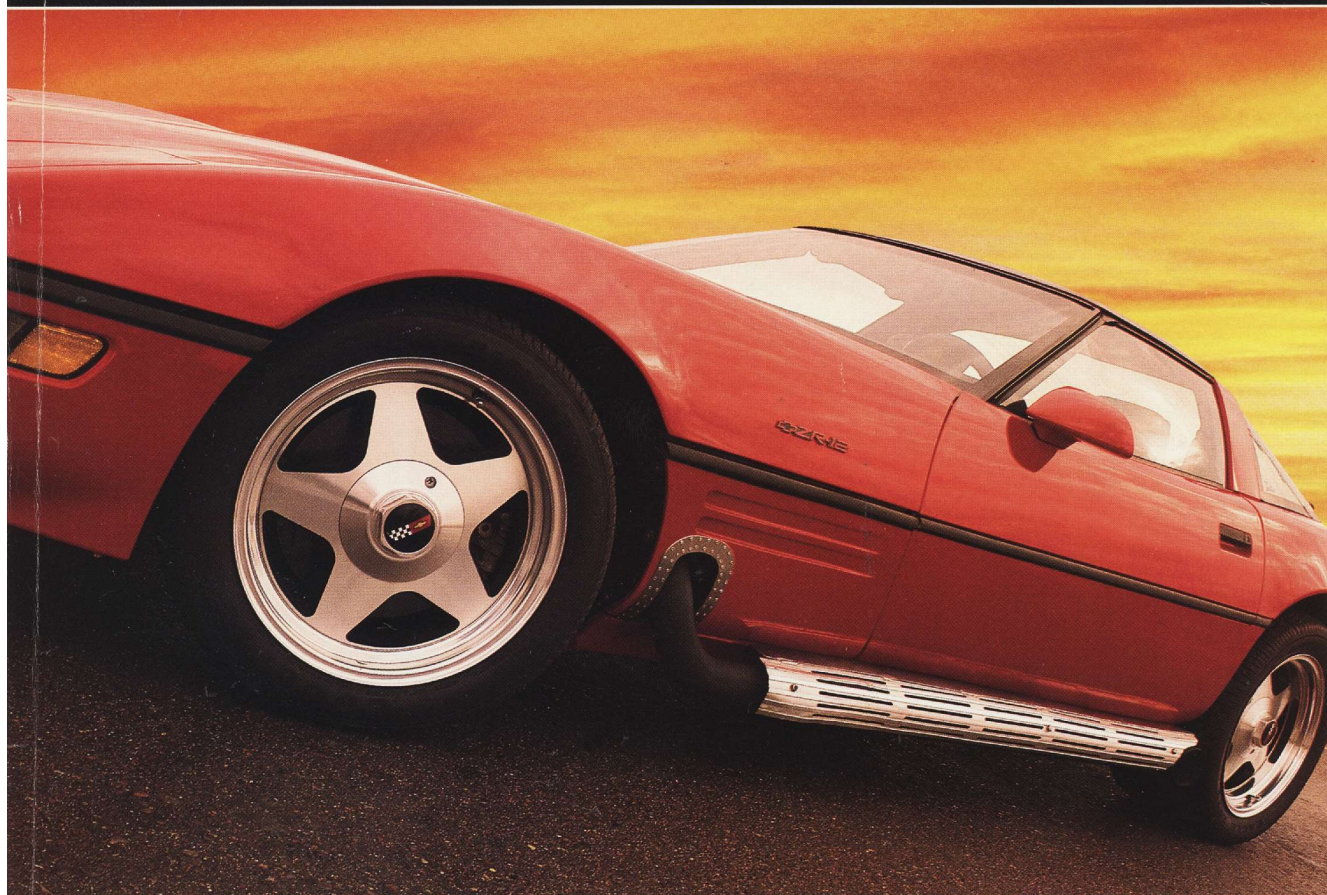


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# SECRET CHEVYS

## A HIGH-SECURITY TRIP INTO GM'S INNER SANCTUM

PHOTOGRAPHY BY SCOTT KILLEEN AND C. VAN TUNE



**SECRET.** From James Bond movies to Contra-level government activities, the word secret connotes excitement. Little do we civilians know just what covert, undercover, secret activities are being carried out all around us. Car companies do it, too. All the time. Right now, on some desolate American highway, a group of engineers is making the first test of a car that won't be seen by the rest of us until 1995—or beyond. Even if you rescued them from a grizzly bear attack, they couldn't tell you about the car. That project could be worth millions. A true industrial secret.

So, imagine being able not only to see some of these secret projects, but also to get to drive them. And take photos. It'd be like letting our country's top agents loose in Saddam's file room, with the lunatic ruler holding the flashlight for us.

Couldn't happen? Don't you bet on it. In fact, two of our best deep-cover operatives just returned from what was code-named "Chevy Desert Thunderstorm": a one day, one chance only, opportunity to collect up-close and in-

side information on future products from Chevrolet.

Under the steely gaze of GM's high-security personnel at a clandestine location in Arizona, our two agents scouted, peeked, prodded, and drove nearly a dozen experimental cars and trucks being evaluated for possible future production. The vehicles may look stock on the outside, but lift their hoods, and stand back. Eyebrow-raising items such as big-block Camaros and Corvettes. Nitrous-oxide-assisted V-8s. Magnesium small-blocks. Clutchless six speeds. Ever: a 686-horsepower 600-cubic-inch, V-12 Corvette.

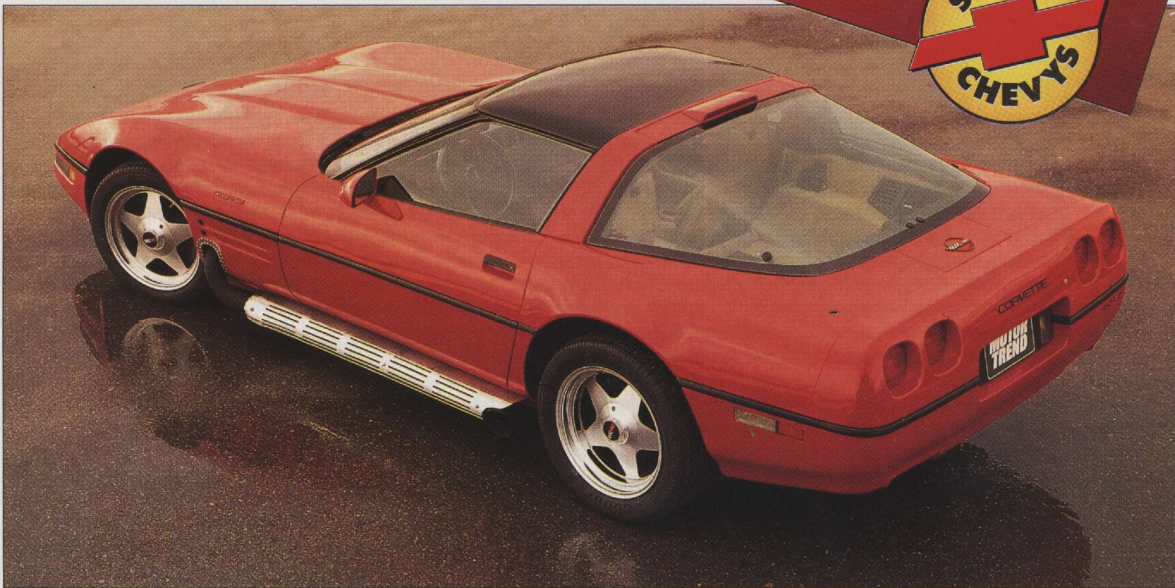
Each successive car was more mind-boggling than the last. At the end of the day, our agents were ushered into a nondescript tent and shown a half dozen special vehicles they can't talk about. Under penalty of death (actually, damn close to it) for squealing, they were allowed to see Chevrolet's next-generation cars and trucks. Questions could be asked, and answers given, but no note-taking, no photos, and no information could leave the premises.

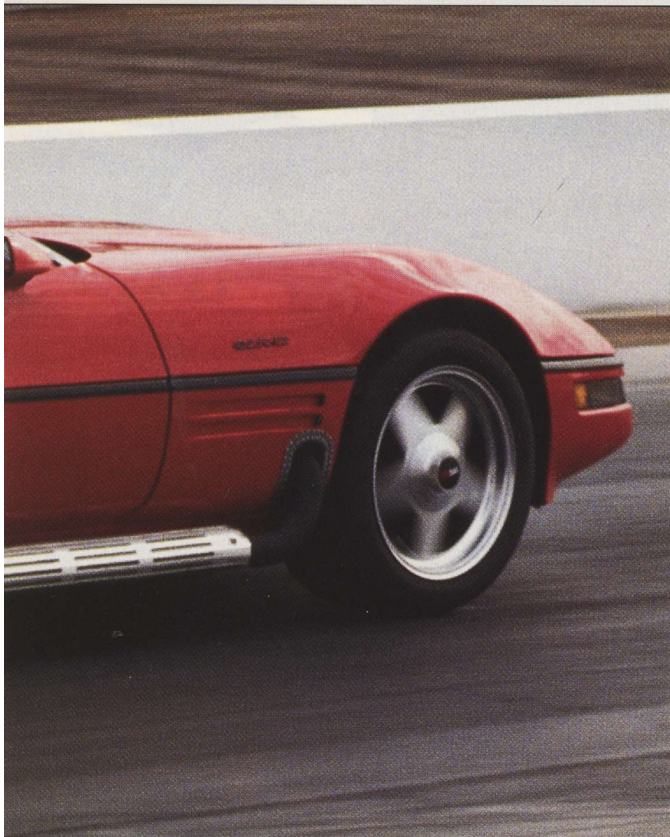
All we can say from what was learned that memorable day is, prepare for some exciting times ahead.



**CONAN  
THE  
CORVETTE**

**CHEVROLET ZR-12**





**T**he existence of the Dodge Viper sport roadster hardly has gone unnoticed by Chevrolet and the hot-rod community at large. In the grand American spirit of oneupsmanship, the Corvette group has created an experimental V-12-engined monster to answer the most perennial of all posers, "what if?"

Twin black side pipes rattle the atmosphere with an exhaust blast that sounds like Satan's own serenade. There are no mufflers or catalytic perverters to sap the

Although the breathtaking sight of the 600-cubic-inch all-aluminum V-12 is what first steals your gaze, look a bit closer. The section forward of the firewall has been lengthened by 8 inches to accommodate the megamotor's added dimensions. This V-12 engineering special is a ground-pounder par excellence, with a mind-altering 686 horsepower and building-toppling 680 pound-feet of yank. Large-diameter exhausts feed unencumbered (no cats) into raspy side pipes, resulting in a loud, lumpy idle capable of intimidating anything short of a Pro Stocker. In comparison, Dodge's Viper looks rather wimpy.

audible energy generated by a dozen fat pistons pumping through 600 cubic inches per crankshaft revolution. With 686 horsepower and 680 pound-feet of torque on tap, the ZR-12, as it's coded, has quite enough pure pull to yank the fangs out of Dodge's Viper.

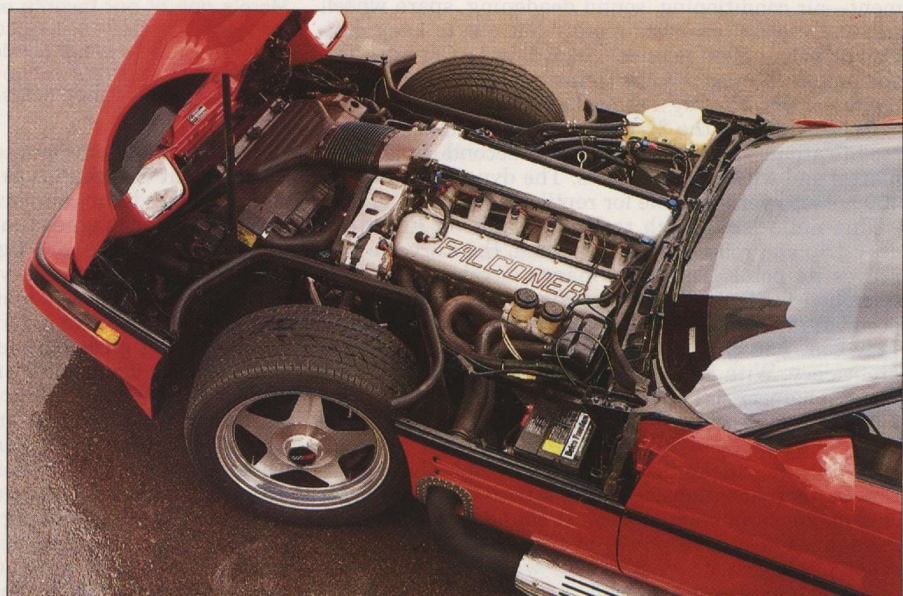
The V-12 engine is an all-aluminum derivative of the classic Chevrolet small-block V-8. Manufactured by Ryan Falconer Industries, this powerplant is aimed primarily at truck and marine applications, but a few intrepid builders also are bolting them into hot-rods and P-51 fighter replicas. For the sake of commonality, the Falconer V-12 uses a 90-degree V-angle (instead of a theoretically correct 72-degree V-angle), which results in uneven firing intervals. Cylinder heads exploit the played-valve technology currently favored by Chevy racers. Dry, cast iron cylinder sleeves provide durable bore surfaces and piston displacements ranging from 300 to 641 cubic inches. Fuel and air combine within a short-runner intake manifold plumbed with electronically controlled injectors. Per Falconer, this tower of power weighs but 523 pounds, about the same as an iron-block Chevy V-8.

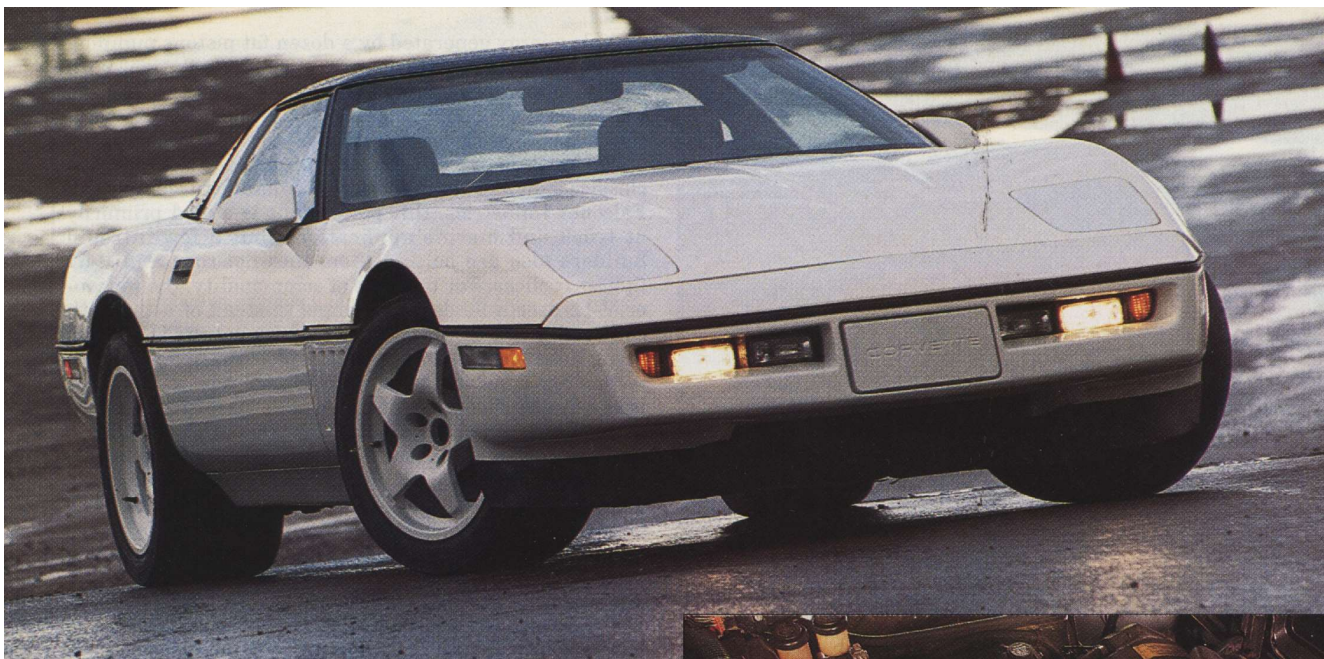
SportsFab in Wixom, Michigan, stretched a Corvette 8 inches to accommodate the Falconer V-12. (The extra quartet of cylinders adds 8.8 inches to a Chevy V-8 engine's overall length.) While the resulting structure is hardly ready for the assembly line, the increase in curb weight was less than 100 pounds.

Unfortunately, the ZR-12 was not yet ready for prime time when it was unveiled to the salivating scribes at Firebird Raceway. Jim Minneker, Corvette powertrain systems manager, made a few impressive passes down the dragstrip—with fat rear tires alight for half the quarter mile—and then parked the car due to overheating. The development program continues.

Realistically, Chevrolet isn't likely to produce a long-wheelbase 10-liter V-12 Corvette in our lifetime. Viper or no Viper, this engine is deemed overkill by the Corvette group. But don't let that frustrate your insatiable desire to own one. The Falconer V-12 is already in limited production (currently at \$42,000-45,000 per copy for Chevy/GMC Truck Suburban use), so if you harbor a hankering to create your own Conan Corvette, don't hesitate to call the manufacturer, Ryan Falconer, at 408/758-8434.

—Don Sherman



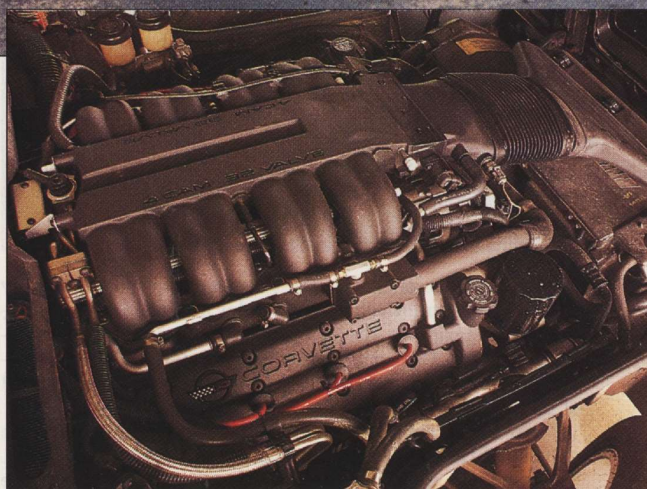


## SNAKE SKINNER

**A**s the nickname suggests, this Corvette engineering study demonstrates yet another way to defang the Viper. Acceleration is, according to Sir Isaac Newton, horsepower divided by curb weight. To increase the rate of velocity change, one need only add power and deduct weight. Toward that end, Snake Skinner has a Kevlar-composite hood and a plexiglass rear hatch. The wheels, bellhousing, roof-panel frame, and mirrors are cast magnesium. Brake rotors and frame rails (behind the rear axle centerline) are aluminum. Some equipment—air conditioning, sound deadening, spare wheel, exhaust resonators—was simply left out to keep curb weight below 3000 pounds. According to Corvette Development Manager John Heinrich, crash dieting has lightened this ZR-1 by a remarkable quarter-ton.

To boost power, the 32-valve V-8 has intake-manifold modifications (ported passages, no secondary throttle plates) and wilder cam profiles. The dyno sheet reports 450 horsepower available for reptile abuse.

This mule isn't much to look at, but on Firebird's dragstrip and road course in Arizona, the Corvette Lite proves its point. The performance envelope has been stretched far beyond U.S. postal regulations. This experimental Chevy accelerates furiously, brakes like an Indy Car, and clips apexes with Edward Scissorhands proficiency. With a 0-60 time below 4 seconds flat (says Chevy engineering) and hummingbird-like agility, this machine would certainly rankle the Viper's scales. One interesting piece of weight-saving technology not included in the Snake Skinner but available for evaluation in another (otherwise unmodified) Corvette was a cast magnesium engine block. It sounded just like any garden-variety L98-powered Corvette and, for the most part, drove normally as well. However, the weight savings is substantial. Jim Minneker, Corvette



Here's one of our favorite equations: Take one Corvette, add one pumped-up LT-5 engine. Subtract 400 pounds from the Vette's weight. Add mag wheels, Kevlar hood, and a plexiglass rear window. Start engine and hang on. The result is 0-60 mph in less than 4 seconds.

powertrain systems manager, states the mag block saves about 100 pounds over a conventional iron block and 23 pounds in comparison with a cast aluminum block. Neither magnesium nor aluminum is as stiff as cast iron, so the above figures include the extra section thicknesses necessary to achieve sufficient rigidity with the alternative metals. In addition, the experimental magnesium engine block uses a one-piece main-bearing girdle to minimize cylinder-case distortions. While driving the mag-block-powered Corvette on the road course, we noticed somewhat less understeer, thanks to the lighter burden on the front tires.

Of the two dozen experimental cars and trucks presented at Firebird, Snake Skinner was my personal favorite by a wide margin. My only fear is that the Corvette group is having so much fun playing with this prototype, it might never be perfected for the production line. If I were judge and jury, that crime would be punishable by snakebite.

—D.S.

## ZR-1 PRETENDER OR CONTENDER?

by Ron Grable

PHOTOGRAPHY BY  
SCOTT DAHLQUIST

**A** long-held axiom in motor racing is that "there's no substitute for cubic inches," sometimes qualified by "except for cubic money." The ZR2 you see on these pages is an attempt to apply that axiom in reverse, by replacing the engine in any L98 Vette with Chevy's 454-cubic-inch V-8 Marine engine. In theory, the 454 should produce ZR-1 (cubic money) performance in any late-model Corvette at significantly lower cost—replacing cubic money with cubic inches.

Scott Leon, Corvette development coordinator at GM's desert proving grounds, told us that, as an additional goal, those involved in the project wanted the 454 installation to be simple enough that an individual could do it in his garage using the Chevrolet parts book and a little resourcefulness. With a couple exceptions, all the parts used to fit the 454 under a Vette hood have Chevy part numbers and are available through your local dealer. Some small amount of machine

# Corvette ZR2



work is needed, but nothing exotic or more difficult than could be handled by any machine shop.

The cost for all the parts to complete the transformation should be in the range of \$5000-6000, including a new MK-V 454 engine. Looking at the economics of it all, a used '86 Vette should be available in the neighborhood of \$15,000; if you're lucky enough to find one with a used-

up motor, \$12,000 might make it yours. A few months of nights spent in the garage and at

your local Chevy parts counter, and you'd have a ZR-1 equivalent Vette for approximately one third the cost of a real one—at least if you don't count labor. When the Chevrolet folks invited us to the proving grounds to drive the one they'd made, we couldn't resist. After all, the cost of a ZR-1 keeps it out of the range of all but a lucky few, but a \$20,000 equivalent . . . hmmm.

At the end of a quick trip to the Arizona desert, we found the ZR2 sitting there in a dim garage, resplendent in a very un-Vette orange paint. The only noticeable differences were a slightly higher hood bulge, big ZR-1 Goodyear tires and wheels, and a subtle ZR2 badge on the rear panel.

A stealth Vette, no less.

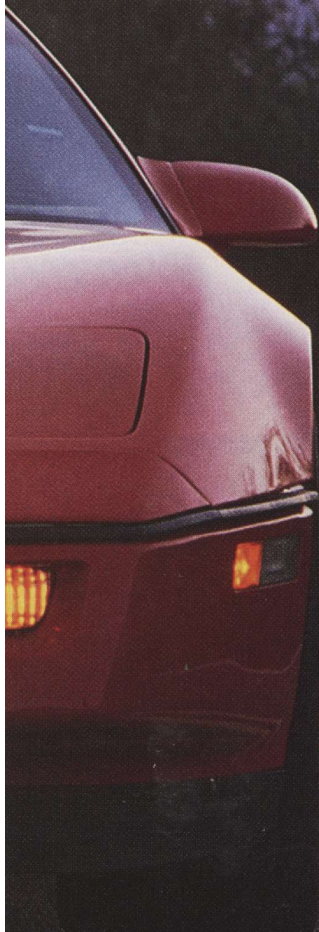
Think of the havoc  
you could

wreak on unsuspecting "normal" Vette owners!

There's actually some precedent for the ZR2 nameplate. In 1971, Corvette offered both a ZR-1 and ZR2. The ZR-1 was a small-block Vette with a special handling package, of which a total of eight were sold. ZR2 was a big block, also with a special handling package that sold in big numbers—14. Guess handling wasn't selling well in the '70s.

The Corvette group's experience with the ZR2 at various shows and Vette gatherings was that, even when the hood was up, people wouldn't notice anything unusual. Generally, comments were "nice paint, dude, how come the hood's up?" Strolling around the back, they'd look at the ZR2 emblem and walk off. Ten paces away the light

would come on, followed  
by a  
dou-



ble take and a quick return for a closer look. It's certainly one measure of the success of the project that it's subtle enough to be overlooked by avowed Vette freaks.

First order of business was to document the real performance level of the ZR2, so it was out to GM's test area for some instrumented testing. This car hadn't yet been fitted with a catalytic converter so, when the starter brought the big motor to life, the sound was exhilarating, to say the least. Big blocks have their own special sound, somewhere between a Grand National Stocker and a DC-3. Scott explained that they didn't have the calibration quite right on the ECM chip yet, and that this engine had an aftermarket cam installed. The resulting loping idle, combined with the non-stock exhaust, made the ZR2 sound exactly like a big-engined, '50s hot-rod—see the goosebumps rise.

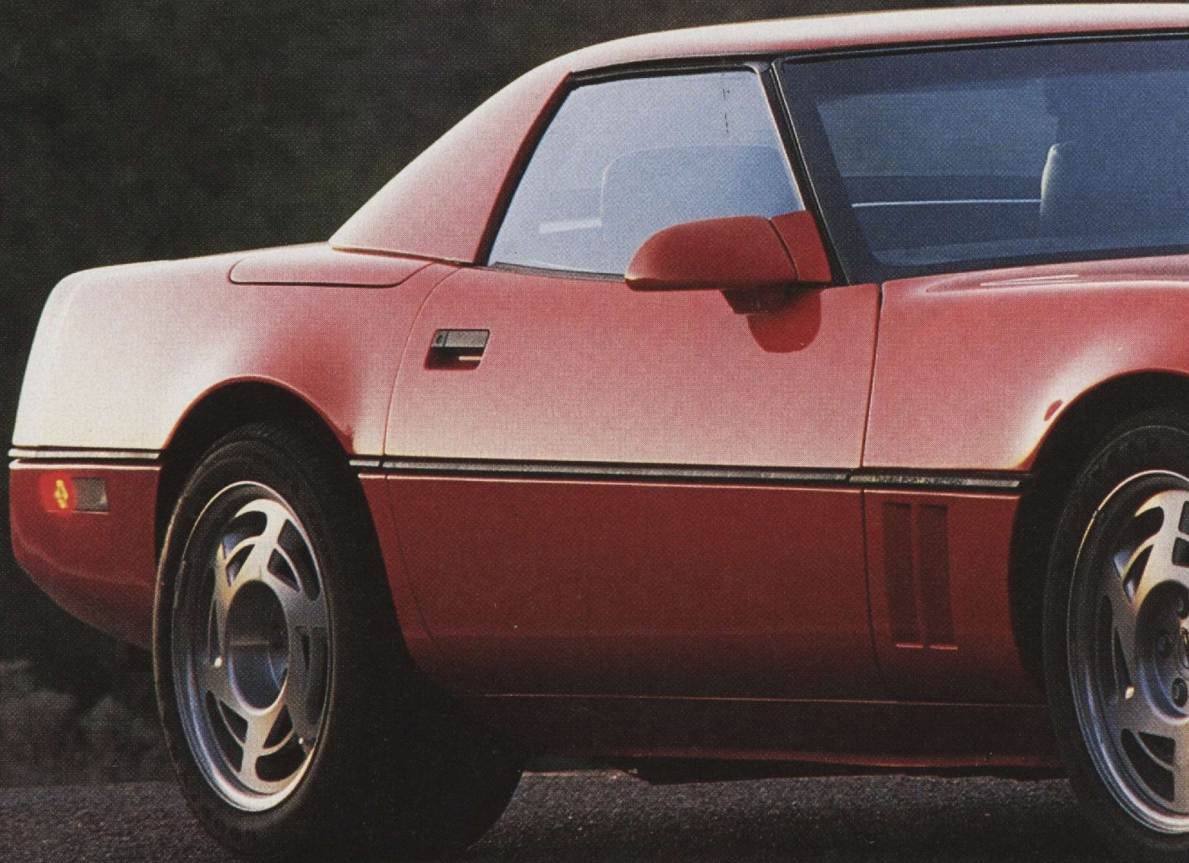
After some instructions on shift points and starting techniques, we were turned loose with all those cubic inches at our command. Peak power comes at 6000 rpm, so we accounted for the slight lag of the electronic tach by shifting at 5700. The best balance between massive wheelspin and bogging the engine occurred if the engine was held at 3000 rpm for the leave. The big Vette would slither around for the first 50 feet or so, and then just hook up and be outta there. Less than 5 seconds after the clutch bites into the flywheel, 60 mph is history, and at just a click over 13 seconds, the quarter-

mile marker flashes by—the Vette's speed almost 107 mph.

The character of the acceleration is vastly different from that of a ZR-1. It's more constant and seamless, without any peaks or valleys in the torque curve. The high-pitched moan of the ZR-1's complex intake-air system is replaced by a felt-more-than-heard low-frequency pulsation from the monster 454 motor. The four-cam Lotus engine makes its power at higher rpm, and doesn't have quite the immediacy of the pushrod 454. In its marine application, the big engine produces 330 horsepower and 440 foot-pounds of torque, but the intake and exhaust systems plus the high-lift cam used in the ZR2 have increased its performance significantly. Best estimates from the guys who built it are that it's now making about 400 horsepower at 6000 rpm and near 500 foot-pounds of torque down near 3000 rpm.

Skidpad and slalom performance are about on par with ZR-1 capabilities. On the skidpad, near its 0.90 g limit,

predictable understeer characterizes the ZR2, with oversteer only a twitch of the right foot away. In the slalom, the car was well balanced, recording an excellent speed of 70.9 mph. This vehicle started life as an '89 roadster, pressed into service by the Corvette group because of its six-speed transmission. The deep overdrive sixth gear and 3.08:1 differential were desirable in case the project ever gets to the EPA



testing phase. With this combination, 100 mph in sixth gear only stirs the engine up to 2000 rpm.

The chassis was set up with Z-51 springs and shocks, and 30 millimeter front/25 millimeter rear anti-roll bars. Anti-roll bar diameters were determined by the TFAR ("that feels about right") method—easy when you have an unlimited choice of bars available in the parts room. The only other chassis change was the addition of the ZR-1 wheel/tire set, which required some slight machining to the rear brake calipers to move the wheels inboard for fender clearance. The Vette feels better balanced than its skidpad time would indicate, probably because on the day we tested, the GM skidpad was covered with a thin layer of desert sand.

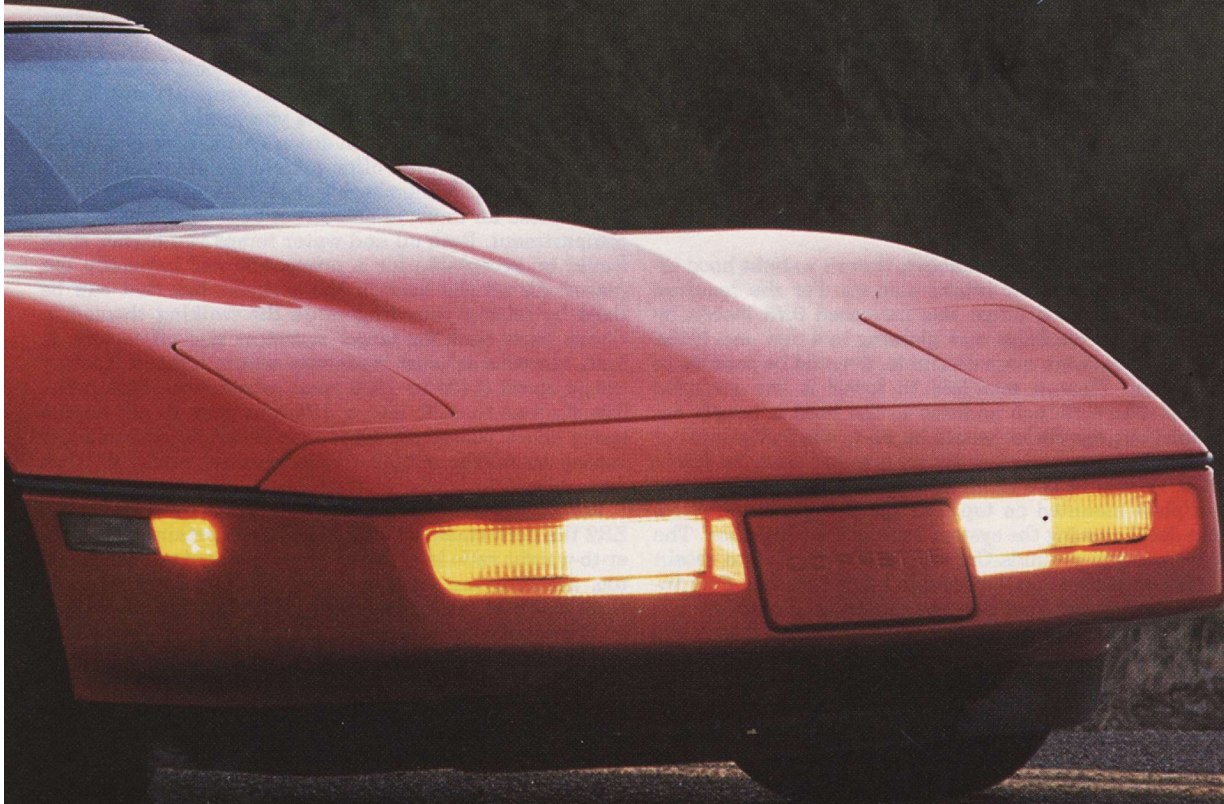
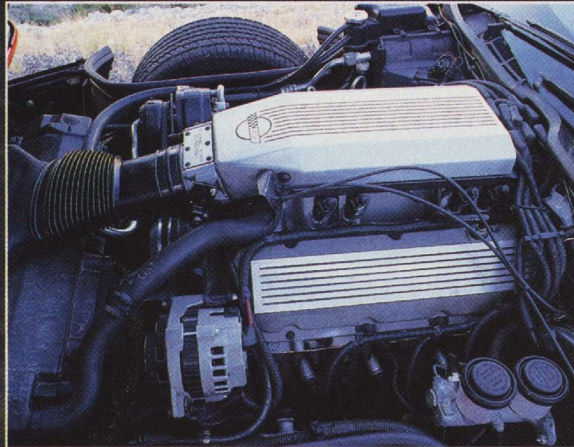
The actual mechanics of replacing the small-block engine with the 454 Marine engine are interesting. The Chevrolet parts book will cough one up, cast iron throughout, but aluminum heads are also available from the Chevy Power Book, and were used on this installation. The motor mounts fit and the engine bolts to the L98 bell housing perfectly. Depending on the vintage on the chassis, some slight mods may be required to the frame rails and firewall for clearance, but we're talking

hammer and grinder, nothing as serious as cutting and welding. Headers from a '69 big-block Vette fit easily and connect to LT-5 exhaust pipes (no catcons on this one) and mufflers. The radiator is LT-5, and an '82 Corvette air-conditioning compressor slips right into place. The alternator bracket comes from a '69 Vette and the power steering pump from the 454 truck parts book.

The most difficult chore is in the accessory drive area, where some creativity is required. The ZR2 on these pages has a special pulley machined for the water pump that's driven off the crankshaft by a Poly V-belt. All the accessories are then driven from the water pump pulley.

The Marine 454 is a carbureted (remember those?) en-

gine, and Vettes are fuel injected, a seeming impasse, but aftermarket to the rescue. Weiland sells a manifold for the 454 (for one or two carburetors) that has a bolt-on plenum for the carburetors. This manifold was adapted for fuel injection by welding aluminum bosses on each intake runner to accept GM fuel-injector nozzles. At the top of the manifold where the carburetor plate attaches, a sheet aluminum plenum was fabricated that mounts the L98 airflow sensor at its front end.



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