

CAR BUILDER'S PRICE GUIDE

CARS[®] magazine

THE HI-PERFORMANCE & CUSTOM MONTHLY

HOW TO PINSTRIPE

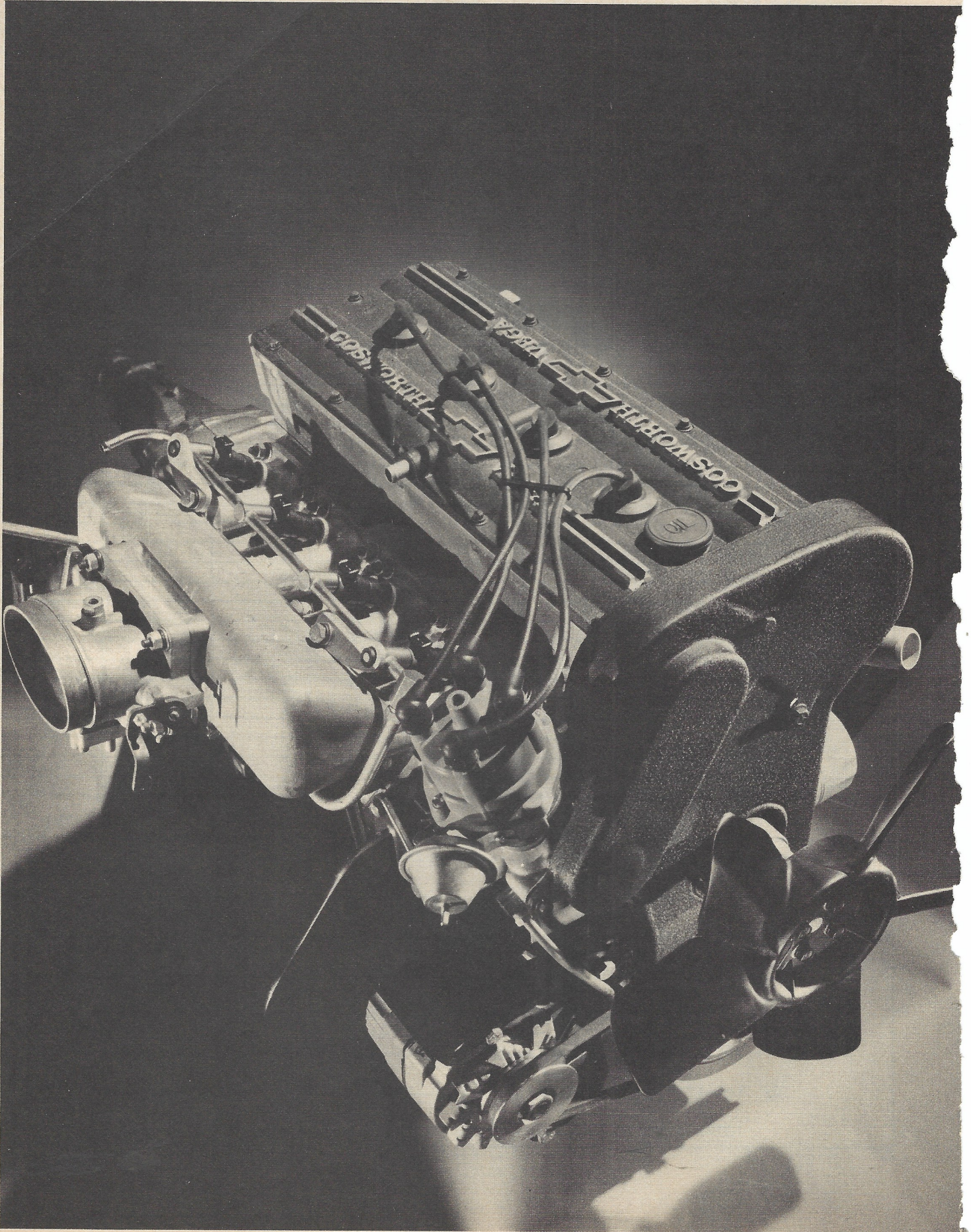
NOVEMBER '74 \$1.00

K48245



FIRST REPORT: 75½
COSWORTH
VEGA

THE RIGHT GAS TO USE
302 MUSTANG TEST • NOSTALGIA: '49 FORD
THE P.R.O. RACE • PIKE'S PEAK OLDS
STREET ROD NATS WINNER: '33 CHEVY SEDAN DELIVERY



RETURN OF THE COSWORTH VEGA

Are you ready? It looks like the Cosworth Vega will finally be available this February—with a few unexpected twists

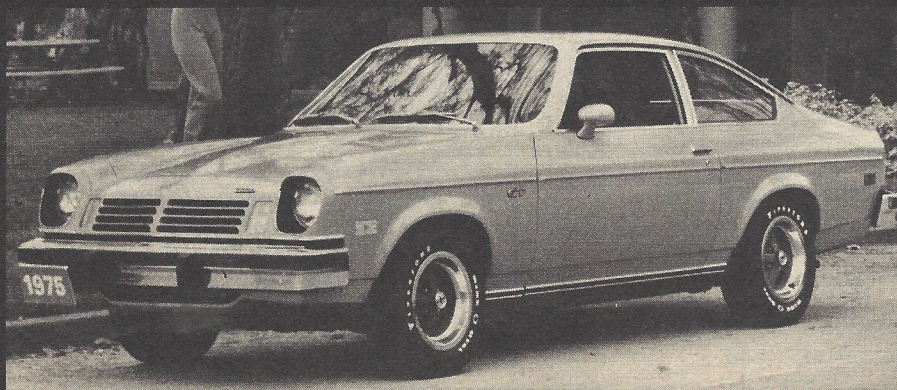
BY GARY L. WITZENBURG

A scaled-down Z-28? A glimpse of the future? A mini-muscle car for the fuel-starved '70s? The first Detroit-built European-Type "supercoupe"? It's all these things and more—if only the Feds will let it roll this time around.

Okay, so the "fuel crisis" is over—for the moment. But we're not likely to see any new refineries in this country for at least four years, we're still a long way from any practical and efficient alternative to the gas-burning engine and, let's face it, those sneaky dudes in the sheet-suits could turn off the tap again any time.

So are we doomed to become a nation of Beetle-pedalers, banished to sweltering freeways full of tinny, underpowered cracker-boxes? Hopefully not. But there's no question that the average displacement (and horsepower) of American cars is on the slide, mainly because of widespread concern about the cost and future availability of fuel.

Perhaps the answer for the performance enthusiast is the "supercoupe." The Europeans have had them for years (Alfa Romeo GTV, BMW 2002 Tii, etc.), since they've had to cope with dollar-a-gallon gas for as long as they can remember. Not super-exotic and expensive GT cars or tiny, two-seater sports cars, supercoupes are small, light and agile, with room for four or more people (in a pinch) and powered by spirited, high-revving, small-displacement engines. Combining smooth shifting, cornering and braking with lively straight-line performance, the idea is plenty of excitement at a reasonable



Exotic CosVeg was scheduled for a 1974 model year intro amid a ton of publicity, however the engine couldn't make it through the EPA's 50,000-mile emission durability tests. 'New' Cosworth Vega is currently in the middle of another 50,000-mile test and is expected to make it. Although Chevy is gun shy about making any kind of introduction announcements because of '74 disaster, the car is scheduled to be at dealers' showrooms some time this February. Car will be based on '75 Vega hatchback at left.

cost and 20-plus miles per gallon.

Yet fuel-injected Alfas and BMWs are rare and costly in the states these days, and even if you can find one and afford it, you may have trouble getting parts and service for the little beauty. Some would lump Mazdas, Opel Mantas, Capris and even V-6 Mustang IIs into the supercoupe category—but none of those really has the necessary combination of power, handling and fuel economy to make the grade by the classic definition. The new GM 2+2s (Chevrolet Monza, Olds Starfire and Buick Skyhawk) may be the closest yet from this side of the ocean, but I'll have to reserve judgement on these until I get an extended test with each.

But the only *real* supercoupe yet built by Detroit in the true European tradition—the Cosworth Vega—is still sitting at Chevrolet Engineering, a victim of the infamous EPA 50,000-mile emissions durability test. The CosVeg is a beefed-up Vega hatchback on fat radial tires and gold-spoked aluminum mags, painted jet black with subtle gold pin-striping (like the world-famous Lotus racing cars) and sporting an exotic, Euro-American, 4-cylinder, fuel-injected twin-cammer under the hood.

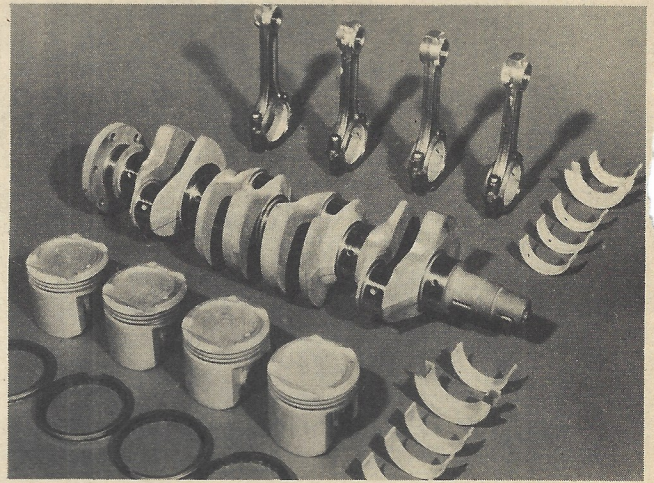
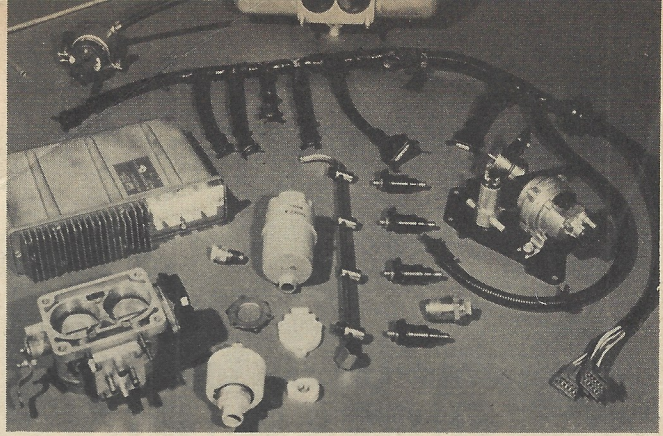
This engine is a technical masterpiece. Its dual overhead cams sit atop the specially-designed aluminum crossflow head, one working intake and the other exhaust valves. Like many racing engines, the CosVeg has four valves per cylinder. Both intakes and exhausts are canted at 20 degrees from the cylinder bore centerlines, forming a "pent-roof" combustion chamber with a 40 degree angle between the valves. The spark plug is centrally located at the chamber's peak.

The reason for the four-valve per cylinder design is to achieve the largest total valve area for a given combustion chamber size. The twin intake valves produce very good turbulence for more complete burning, high efficiency and low emissions, while the two exhausts can do a better job of scavenging than one. This design was heavily influenced by Cosworth Engineering of England (hence the name "Cosworth Vega"), which is internationally known for its high-power, small-displacement racing engines—particularly those of the dual-overhead-cam, four-valve per cylinder design.

The Bendix electronic fuel injection incorporates an on-board computer, which continually monitors engine and atmospheric conditions to deliver precisely the right air/fuel mixture at any given time. The computer is fed information on intake manifold air pressure and temperature, coolant temperature, throttle body position and engine speed from strategically-located sensors—and it also keeps track of outside atmospheric pressure. This collection of instantaneous data helps determine the signal it sends to the individual fuel nozzles in each port of the aluminum intake manifold. An electric fuel pump supplies the injection nozzles at a constant 40 psi.

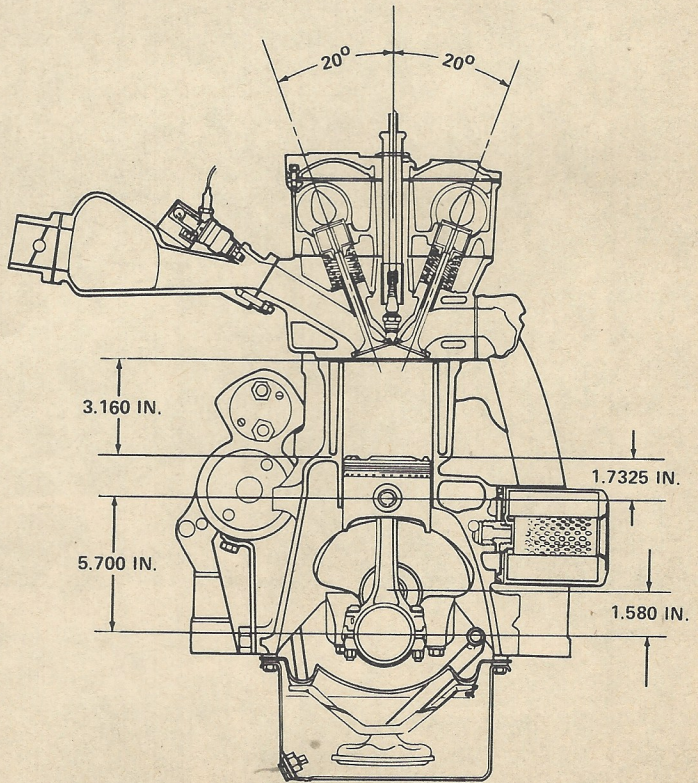
The bottom end is heavily reinforced, with a tuft-ridged forged steel crankshaft, specially-built connecting rods and forged aluminum pistons with notches for valve clearance. The compression ratio is held to 8.5:1, however, for emissions purposes and so that low-octane and unleaded fuel may be burned. Also, to enable the engine to "fit into existing "under two-liter" international road racing classes, the CosVeg is destroked to 2000cc (122 cid), which should improve durability by decreasing the piston speed at high rpm.

Over a year ago, Chevy said it was getting some 135 horsepower out of the 2000cc CosVeg—an increase of 63 horses over the 2300cc stock Vega's 72 hp. If the weight

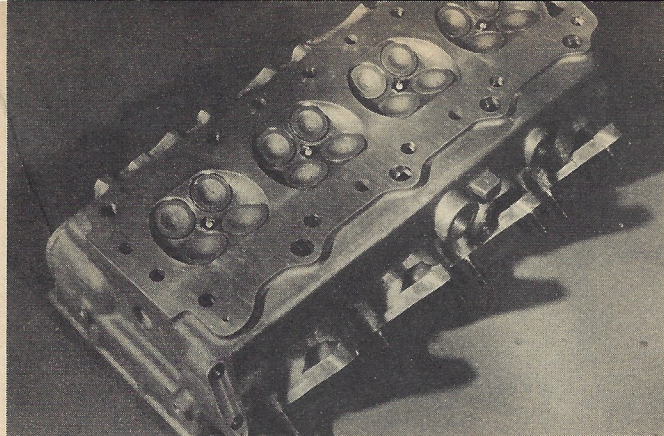


Cosworth Vega option package will be expensive but well worth it to the buff. One of the features is Bendix electronic fuel injection.

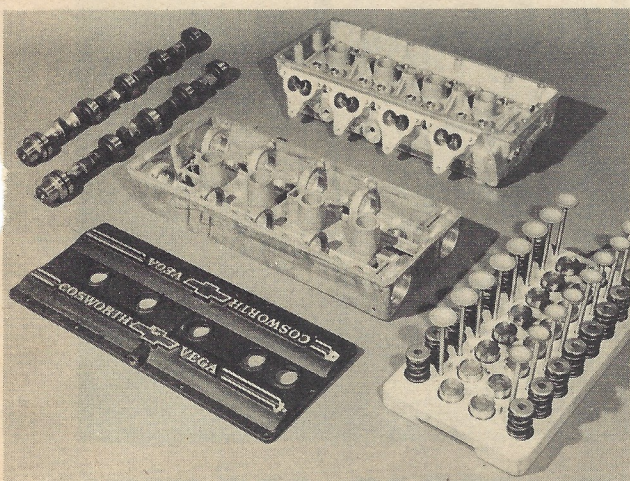
BASIC DESIGN DIMENSIONS



Engines currently being tested are developing 135 horsepower at 6000 rpm. Fuel consumption is said to be around 20 to 22 mpg.

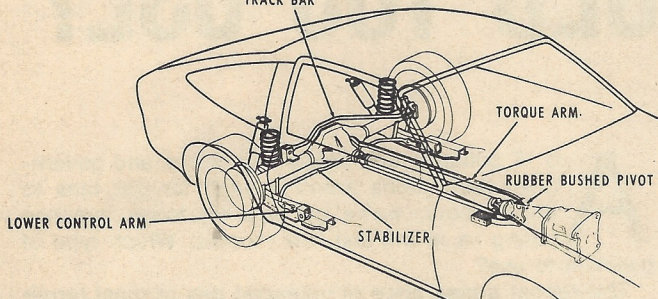


Four valves per cylinder gather around centered plug to form 'pent-roof' chamber.

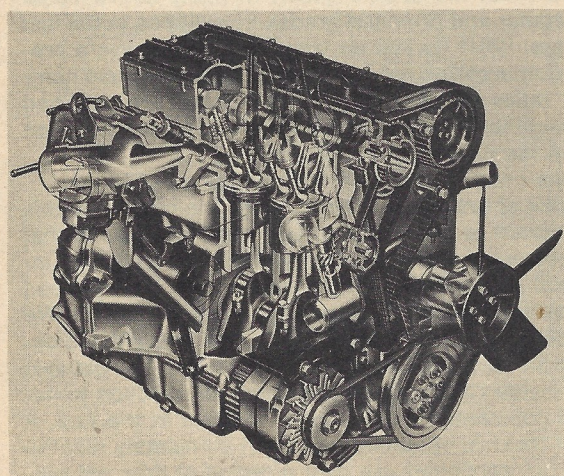


NEW TORQUE ARM REAR SUSPENSION

TRACK BAR



Cosworth head is aluminum. Torque arm rear suspension from the new Monza will be added to the Vega running gear.



All Cosworth Vega engines will be produced at Chevy engine plant in Tonawanda, N.Y. Tests are running on schedule at this writing.

of the car is kept down around the original target of 2300 lbs., it should be capable of sub-nine-second 0-60 times and 17-second quarters right off the showroom floor, using the standard 7000-rpm redline. That may not sound too impressive by today's supercar standards, but remember that it also stops and corners like a sports car and gets 20-25 miles per gallon all day long.

Chevrolet had hoped to have the CosVeg out a year ago to steal some of the limelight from Ford's Mustang II introduction, but the 50,000-mile test cars didn't quite pass the tough EPA certification test. The major problem was burned valves, which contributed to an increase in exhaust emissions and a decrease in power as the 50,000-mile mark was approached.

As word about the test failures (and the fact that no further testing was planned at that time) got out, there was much groaning and wailing by small-car enthusiasts about the American supercoupe's death. Even as recently as last August the project seemed doomed in the eyes of most observers.

But the CosVeg had not died. True, it spent many months on the operating table and the only word from Chevy was that its condition was "critical but stable." In fact, it seemed illogical for Chevy to spend any more time and money on it in light of the planned Monza 2+2 introduction this fall—and besieged as the industry was by pressure from all sides. Size and weight reductions and economy improvements were the crash programs of the hour. Nobler experiments, it seemed, would have to wait.

Yet, barring any unforeseen relapse, the CosVeg will probably be on sale by February. The wonder-drugs were apparently found and Marcus Welby himself must have administered them, because the car seems miraculously revived and healthier than ever. New 50,000-mile tests were begun late in the summer and (according to insiders at Chevrolet) should be completed by midwinter.

The '75 version looks unchanged from the '74 shown, but several major engineering improvements have been made. A split manifold and throttle body improvements provide better cylinder-to-cylinder air/fuel distribution, which in turn improves the emission characteristics and allows a more efficient spark advance curve. A power-robbing air pump is avoided by the use of "pulse air" valves, which feed extra air to the area behind the exhaust valves (to burn excess hydrocarbons) using the exhaust pulse itself to suck the air in. One development engineer called this a "major breakthrough" since the devices are simple, cheap and durable and create a dramatic decrease in hydrocarbon emissions with near-zero loss of power.

Camshaft and exhaust header modifications provide an increase in low-end power and stellite valve-seat inserts have solved the valve-burning problem—at least so far in extended dynamometer testing. Like all '75 GM cars, the CosVeg will get a catalytic converter, but the large capacity "big car" unit will be used to keep the power loss from back-pressure down to an almost negligible one horsepower. Also, the CosVeg will benefit by inheriting the slick torque arm rear suspension from the new Monza. Besides the central torque arm, this set-up includes a pair of control arms and a lateral Panhard rod to leave the springs and shocks free to do nothing but spring and shock. The rear axle ratio will be 3.73, which is not a stock Monza or Vega number.

I drove a CosVeg at the GM Proving Ground in August, 1973 and felt it needed only some suspension refinements, a five-speed box and a limited slip to be a near-perfect su-

(Continued on page 73)

of paint and begin again where you left off. To retain proper and clean continuity of line, it is advisable to put the brush back on the line a half-inch or so before you ended. This way you can rearrange the proper line width easily. Arriving at a uniform line depends on how steadily the brush is held and how accurately the fingers and brush are manipulated. A series of grip and support combinations must be utilized in order to achieve the diversified effects in the realm of pinstriping. Straight lines are relatively simple to execute as opposed to curved lines or radii. Curves require a different means of brush support and manipulation, hence, a round handle is a welcome asset on a brush as it can be revolved, a necessary movement when one is running the brush in an arc. Curves, circles, etc., can be quite tricky; laying a perfect radius is no simple achievement, especially for a beginner. Curves are best negotiated by holding the brush lightly but securely between the thumb and forefinger, then rotating the entire hand on an axis which is usually provided by the pinkie of the same hand. As the arc is painted, the brush is revolved ever so slightly. The brush is rolled outward when a curve is pulled inward. This procedure can be applied to both right or left curves, but it is imperative that proper pressure and control be constantly maintained. The accompanying photographs showing pinstriping expertise as practiced by ace pinstriper Richard Canto of Wakefield, Mass., will further serve to aid the novice, delineating proper pinstriping approaches and procedures. A correctly executed pinstriping job will do much to enhance the overall appearance of the custom van. Pinstriping expertise is not out of the realm of the novice, provided that he is willing to gain the proficiency that comes with constant practice. With patience and much practice, you too can attain prowess in pinstriping equal to that of the professional. 🚗

CARS BUILDER'S GUIDE

(Continued from page 20)

If you're after speed, deal with a speed shop that has a proven track record, as evidenced by one or more of their own successfully campaigned cars. Remember, if you go to 12 different speed shops they'll all promise you the fastest car. When you finally decide on one shop, stick with it until you have a reason to be dissatisfied. If you jump from shop to shop, each one will tell you the other guy is steering you wrong.

One last bit of advice: If you think you're going to be over your head in something—*don't do it*. Just because Motor Honker says you can tear apart your automatic transmission in two

easy lessons, don't bet on it. There's nothing that'll turn you off faster on a project car than having a million bits and pieces lying all over the place and not having the vaguest idea where they all go. You'll also pay a heck of a lot more when you bring in a basket case into a shop than having them do the job from scratch. (The extra money they charge for fixing your mistakes is a service to cleanse the guilt of incompetence from your soul.)

The CARS CAR BUILDER/MODIFIER'S PLANNING GUIDE is very simple to use. It's much easier than filling out your income tax, for example, and a lot more fun. You can use the complete chart or just those items that are applicable to your particular project. If you're starting out with a complete engine and plan no further modifications, just enter a zero or a dash for total engine cost. If you plan just to change spark plug wires, for example, then total engine cost will be just the price of the wires. "Labor" is for any shop work that will be done. There's no labor cost for what you do yourself.

When all the figures are added up, it will, hopefully, be less than your total budgeted amount. If not, you've got all the figures right in front of you to shave and shape until they fit. Or, if there's an unopened piggy bank lying around someplace, you can always up your budget. 🚗

COSWORTH VEGA

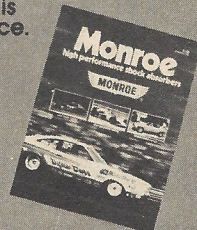
(Continued from page 27)

percoupe. If all goes well, 5000 will be built in '75 on a special assembly line at Lordstown, Ohio. The suspension improvements have been made, the Borg-Warner five-speed will be available in the spring and the posi-traction will be an extra-cost option (which every buyer should order). I also think that a second color choice should be offered, but Chevy will stick with black only since "it will stand out in the parking lot"—especially with those gold wheels. The black is impressive but excruciating in hot weather. Gold-on-white and blue-on-white are overused on specialty cars, but how about a silver CosVeg, with either bright-blue or burgundy-red striping and matching interiors?

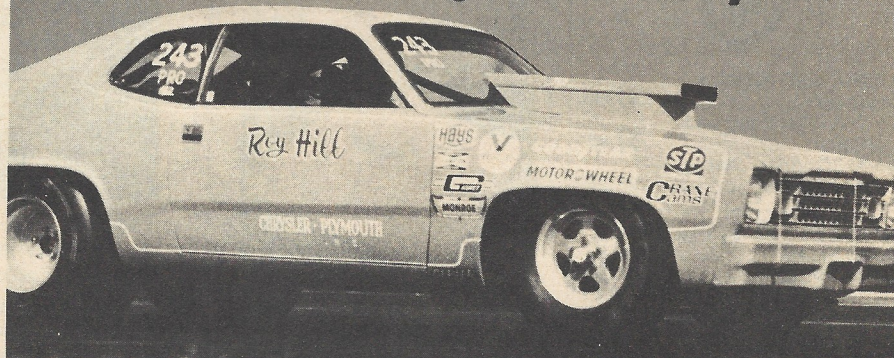
The price? No announcement has been made, but I'm betting on \$5000 minimum, with options adding a few hundred bucks more. If you think that's steep, look at the engineering involved and then go price some Alfas and BMWs. Come to think of it, the Wankel rotary-engined Monza will arrive at about the same time and will be priced in the same ballpark. That'll be a double-whammy from Chevrolet I'm anxious to see. 🚗

Monroe has the right shocks for Roy Hill.

On track or street, proper shock selection is vital for maximum traction and performance. And Monroe offers the widest choice of performance shocks available. Which Monroe high performance shock is right for you? Find out in our new 36-page Performance Manual, the only complete guide to performance shock selection. Get yours today for just \$1.00 from Monroe Manual, Monroe, Michigan 48161. You'll see why we say...



Monroe has the right shocks for you.



MONRO-MAX the complete line of performance shocks
 Monroe Auto Equipment Company Monroe, Michigan 48161 **MONROE**