

375-hp "396" puts Chevelle at the top of the list of hot ones

Almighty Malibu!

by John Ethridge, Technical Editor

WHEN CHEVROLET Motor Division makes up its mind to do something, it never goes *halfway*. As you'll see, an excellent case in point is the Chevelle Malibu Super Sport with RPO Z16 (we'll call it the Chevelle "396" to get the message across in the fewest words).

While awaiting its new engine, Chevrolet had a chance to watch other divisions' and competitors' hot performance cars. All were doing well, and some were selling like skateboards, so Chevy decided to come out with one of their own. Not merely an engine swap, the Chevelle "396" was re-engineered from the ground up to take Chevy's hot new engine. The wait evidently paid off, because the Chevelle "396" is without a doubt the hottest and finest car of its type ever made.

The engine chosen, the 375-hp "396," is very much like the 425-hp version. In fact, their only real difference is in the cam and valve gear. The 425-hp engine uses solid lifters, while the 375-hp job comes with hydraulic lifters. So far, this engine's available only as part of the RPO Z16 package for the Malibu SS. This engine has all the goodies the more powerful one has: impact-extruded pistons, molybdenum-coated rings, special-alloy con rods, and four-bolt main caps.

Specially designed for high revs, the hydraulic valve gear on our test car permitted as many as 6000 rpm without complaint. We didn't try taking it beyond this, because we felt there was no need. This is well beyond where most hydraulic setups will cry "calf rope." Valve timing for this cam is: Intake opens 56 degrees BTC and closes 106 degrees ABC for 342 degrees duration. Exhaust opens 110 degrees BVC, closes 66 degrees ATC for 356 degrees

duration. Valve overlap is 122 degrees, with intake lift .461 and exhaust .500 inch. Single valve springs with internal dampers close the valves.

A big Holley 4150 carb with 1.69-inch barrels squats on the intake manifold. A large, oil-wetted, paper-element air cleaner with two intake pipes tops it off.

There's a dual exhaust system to get rid of the burned gases. The exhaust manifolds lead into huge, 2.50-inch laminated pipes. Twin reverse-flow mufflers and 2.25-inch-diameter tailpipes, which

exit underneath each rear fender, complete the job. These emit an authoritative sound, but you wouldn't say they're noisy.

A large, thick radiator and a staggered, five-bladed fan with thermo-modulated cutout take care of the increased cooling chores imposed by the big "396."

An 11-inch, centrifugally assisted diaphragm-type clutch with 2300-2600 pounds' plate pressure carries the torque and power to the Chevy four-speed manual transmission. This box uses the

2.56 low (instead of 2.20), with the other ratios being 1.91, 1.48, 1.00, plus 2.64 reverse. A single-piece, 3.25-inch-diameter propeller shaft connects the transmission and the heavy-duty rear end. This uses a large, 8.88-inch-diameter ring gear and a *non*-limited-slip differential. Standard ratio is 3.31—the only one listed at present.

In designing the rear suspension, Chevy engineers made a massive assault on the problems inherent in live-axle designs, and it looks like they've carried the day. They use a total of four



(RIGHT) Charging off line with both rear tires smoking got lowest times. New suspension makes this possible without limited-slip differential or locked rear end.

control arms to locate the rear-axle assembly. The two short upper ones attach near the differential, with two long lower ones attached outboard near the coil springs and shocks. The inboard pair are angled outward as they go forward to take care of axle tramp. Together they pretty much eliminate any tendency for the rear axle to twist on its own axis or to steer the car.

There was still one problem left for the engineers to work out, however. When the propeller shaft twists the final drive gears, the whole axle assembly wants to rotate in the opposite direction, lifting the right rear wheel. Chevy's antidote for this is a big, fat anti-roll bar attached between the lower control arms and passing below the differential housing. Now when a wheel tries to lift, this bar exerts a torque on the opposite wheel linkage trying to lift it, too. But the weight of the car is holding that one down, so the first wheel is held firmly in place. The fact that you can light *both* rear tires on acceleration without benefit of a limited-slip differential is ample proof that the principle works. They needed something sturdy to attach the suspension to, so they used the reinforced convertible frame with some extra beefing at suspension tie points.

The front got its share of attention, too. Besides a 1.06-inch-diameter anti-roll bar, it got cast-steel wheel hubs and shot-peened ball studs. A fast car like

this has to be able to change directions quickly, so it got fast, 15-to-1 power-assisted steering.

The standard Chevelle brakes had to go, and big-Chevy 11-inch brakes took their place. Stiffer springs and shocks all around finished the suspension. Six-inch-wide wheels and 7.75 x 14 improved nylon gold-stripe tires were the final touch (made by Goodyear). These tires stick like glue and are an important part of the package. A trip to the proving grounds convinced the engineers that what they'd done was good.

And on the seventh day, they rested . . . while the styling people took over. Besides the usual emblems and identification, these boys came up with one of the most handsome and authentic-looking simulated custom wheels we've seen. You have to get on your hands and knees and pick at them with your fingernail to tell they're not the real thing.

We'd anxiously been awaiting arrival of our test car for what seemed like a long time, but it was more like a couple of weeks when we heard the good news: Chevy had finally turned its Kansas City plant into an arsenal of sorts and produced 200 of these bombs for distribution to strategic locations. Our Chevelle "396" was the first deployed to the Los Angeles area.

While we were putting some miles on the car before performance testing, we had a chance to get acquainted with it and to get some general driving impressions. The engine's docile in traffic, idling at 800 rpm. It's a quiet car, and

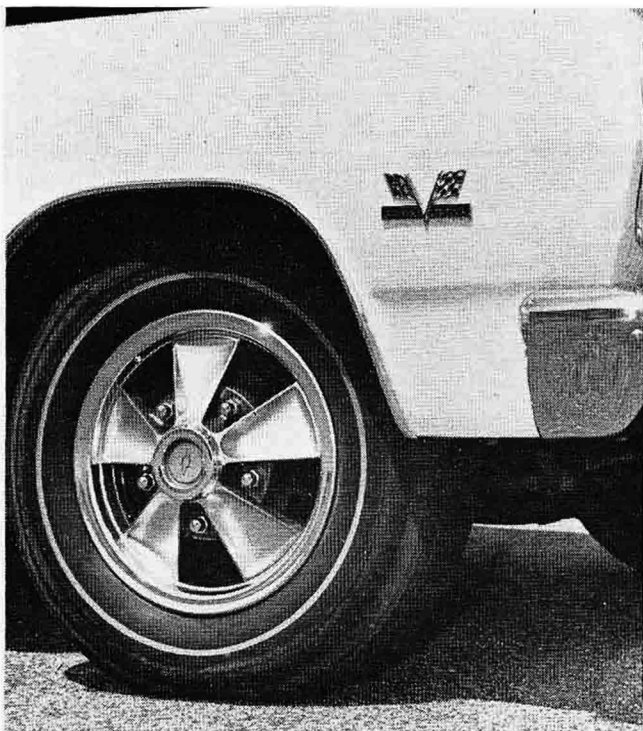
you won't have any trouble enjoying the AM-FM with multiplex stereo that's thrown in as part of the \$1501.05 RPO Z16 package. Even when using maximum power, engine and gear noise are still at a low level.

The way horsepower figures are banded about nowadays, we never know what to expect. But this one's got it—from idle to red line, it's definitely got it. There's no brief range where it feels like it comes on the cam. It puts out gobs of romping, stomping torque throughout the entire range of useful rpm.

Performance figures in our spec panel are extremely impressive, but they're inadequate inasmuch as they don't tell the story of how this car will accelerate over 100 mph. The needle doesn't hang there, but goes on wiping the face of the 160-mph speedo until the engine red-lines. With proper gearing, we wouldn't be at all surprised to see the Chevelle "396" peg its speedometer.

With all that power on tap, we were surprised when gasoline mileage didn't fall below 10 mpg during performance testing. Our high was 13.8 mpg, which we got when soft-pedaling on freeways. Average for the entire 942-mile test was 11.1 mpg.

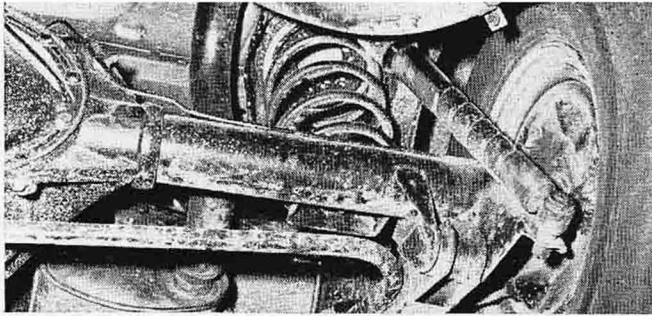
We expect the demand for copies of our test car to exceed the supply for quite a while. Expect to wait and expect to pay sticker price when yours does arrive. It's the hottest of the hot intermediates. In fact, it's king of the road. /MT



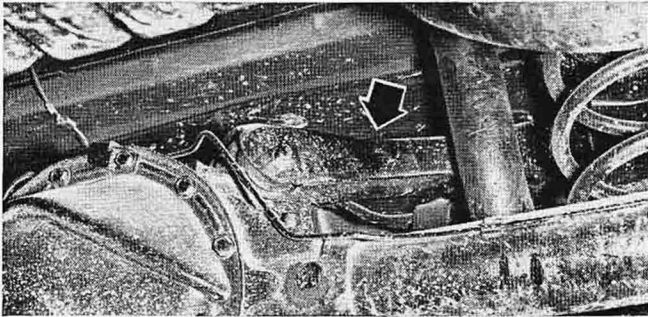
(ABOVE) Inflating the front tires to 42 psi and rears to 35 psi produced nearly neutral steering in tight turns. Grab of improved nylon gold-stripes made for pleasant going at all times.

(LEFT) Stamped-steel simulated wheel, actually a wheel cover, exclusively adorns Chevilles with "396" powerplant. Somebody's sure to put a lug wrench on false nuts, because they look so real.

PHOTOS BY DARRYL NORENBE



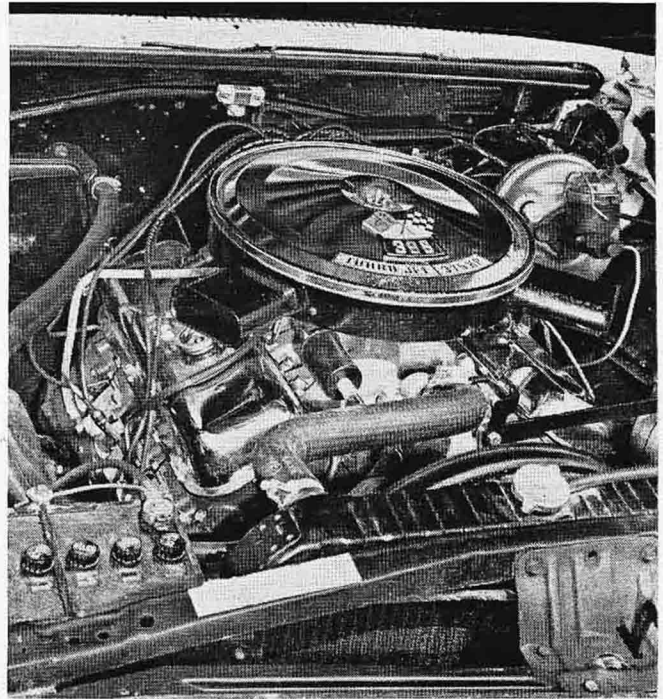
Not actually an anti-roll bar, stabilizer bar between lower control arms comes into play only when rear wheel tries to lift.



Upper control arms (arrow points to right one) locate rear axle assembly laterally, as well as helping to prevent axle wind-up.



160-mph speedometer, on left, isn't there just for window dressing (see text). Easy-to-see tach occupies the center slot.



CHEVELLE MALIBU SS "396"

2-door, 4-passenger hardtop

OPTIONS ON TEST CAR: RPO Z16 package, power windows, vinyl roof, bumper guards, tilting steering wheel, tinted glass

BASE PRICE: \$2647

PRICE AS TESTED: \$4586.40 (plus tax and license)

ODOMETER READING AT START OF TEST: 857 miles

RECOMMENDED ENGINE RED LINE: 5800 rpm

PERFORMANCE

ACCELERATION (2 aboard)

0-30 mph	2.9 secs.
0-45 mph	4.5
0-60 mph	6.7

PASSING TIMES AND DISTANCES

40-60 mph	2.7 secs., 198 ft.
50-70 mph	3.7 secs., 326 ft.

Standing start 1/4-mile 15.3 secs. and 96 mph.

Speeds in gears @ 5800 rpm

1st	53 mph	3rd	93 mph
2nd	69 mph	4th	135 mph (observed)

Speedometer Error on Test Car

Car's speedometer reading	30	45	50	60	71	81
Weston electric speedometer ...	30	45	50	60	70	80

Observed mph per 1000 rpm in top gear

Stopping Distances — from 30 mph., 32 ft.; from 60 mph., 150 ft.

SPECIFICATIONS FROM MANUFACTURER

Engine

Ohv V-8
Bore: 4.09 ins.
Stroke: 3.76 ins.
Displacement: 396 cu. ins.
Compression ratio: 11.0:1
Horsepower: 375 @ 5600 rpm
Horsepower per cubic inch: 0.95
Torque: 420 lbs.-ft. @ 3600 rpm
Carburetion: 1 4-bbl.
Ignition: 12-volt coil

Steering

Semi-reversible, recirculating ball nut, with coaxial power assist
Turning diameter: 41.9 feet
Turns lock to door: 3.5

Wheels and Tires

14x6 5-lug, short-spoke steel disc wheels
7.75x14 2-ply gold-stripe nylon tires

Brakes

Hydraulic, duo-servo, with integral vacuum power assist; cast-iron rim, steel-web drum
Front: 11-in. dia. x 2.75 ins. wide
Rear: 11-in. dia. x 2.00 ins. wide
Effective lining area: 183.4 sq. ins.
Swept drum area: 328.3 sq. ins.

Body and Frame

Welded perimeter frame with 3 crossmembers, reinforced between upper and lower control arm pivots
Wheelbase 115.0 ins.
Track: front, 58.0 ins.; rear, 58.0 ins.
Overall length: 196.6 ins.
Overall width: 74.6 ins.
Overall height: 52.8 ins.
Curb weight: 3720 lbs.

Gearbox

4-speed manual, all synchro; floorshift

Driveshaft

1-piece, open tube

Differential

Hypoid, semi-floating
Standard ratio: 3.31:1

Suspension

Front: Independent SLA, with coil springs, double-acting tubular shocks, and anti-roll bar
Rear: Live axle with 4-link control arms—2 upper and 2 lower—with stabilizer bar between lower control arms, coil springs and double-acting tubular shocks