



SCOTT MALCOLM PHOTOS

# CHEVELLE 396

**W**HEN OLDSMOBILE and Buick jumped onto the big-engine, small-car bandwagon with Pontiac, it was pretty certain that Chevrolet wouldn't be far behind. The only surprising part was that Chevrolet wasn't among the leaders in this scheme; after all, Chevy has been a respected member of the high-performance club for 10 years now, even if it isn't allowed to say so publicly.

Pontiac led the way with its GTO, a combination of Tempest chassis and styling with 389-cu. in. engine; Oldsmobile brought along its 442, an F-85 with a hot 330-cu. in., and later a 400-cu. in. V-8; then, last spring Buick announced the Gran Sport, a 401-cu. in. V-8 powered Special. The question remained, what could Chevrolet do?

The answer wasn't long in coming. The Chevelle, which shares its basic structure with its GM A-body counterparts (Tempest, F-85 and Special), obviously only needed a whopping big engine and some trimwork to be competitive. When Chevrolet unveiled its new 396-cu. in. V-8 early in 1965 the whopper was available. Presto! Change-O! The Chevelle 396 Super-car!

The surprise was that it wasn't instantly made available to the general public. Certainly Chevrolet management must recognize the demand potential inherent in runaway GTO, 442 and GS sales. However, because of some obscure problem, such as the unavailability of large quantities of 396 blocks, the Chevelle 396 is at present a limited edition. Only 200 have been produced and these went into what the zone men call "Brass Hat" service; i.e., they are being driven (and tested) by the press, shown and clucked over by various VIPs, and, in a few cases, run in dragstrip competition. The general car enthusiast can't buy one—yet.

There's little doubt that Chevrolet will produce Chevelle 396s in sufficient quantity during the 1966 model-year. There's also little doubt that it will differ much from the package examined here; there may be slight styling changes, of course, but the mechanical format will be the same. And there is no doubt that a long line will form for these particular cars at Chevrolet dealerships: The things that make the car appealing probably outweigh the things that detract.

As it stands, ready to streak the street with burnt rubber marks, the Chevelle 396 is a Malibu SS hardtop coupe equipped with a 375-bhp variation of Chevrolet's new 396-cu. in. V-8 engine, a 4-speed manual shift transmission, much larger than normal power brakes, better springing and a rear-end anti-roll stabilizer, quickened power steering, an am/fm/stereophonic radio system, wide-base wheels and Firestone Super Sport tires, and a set of the homeliest, phony "mag-wheel" hubcaps imaginable.

As an image-builder it should serve Chevrolet well. Box-boys at the local supermarkets (you know the type—drop-outs who have to wrestle grocery-sacks to make their new-model car payments) fell down in awe at the sight of the "396" labels on the Malibu's flanks. "Wot'll-She-Do-in-the-Quarter!" was their favorite question and one told us he'd already tried to order a 396 Chevelle only to have the dealer tell him it couldn't be done; so he was buying a 327 Chevelle. None of the other Supercars CL tested (May issue) drew as much attention, but then there are infinitely more Chevrolet fans around. When the 396 Chevelle

## Both a Prototype and an Image-Builder, This is the First of the Red-Hot Malibus!

is entered in serious competition at the dragstrip, it should further add to the performance image. The engine potential is enormous and, this, after all, is the most important factor in straight-line competition.

As a car, it suffers from the same banality of bigness that afflicts its GM cousins. It seems to accomplish things more by brute force than by sophistication of its systems. It is strong on straightaway performance but only mediocre at covering curving roads at velocities more than 40% of its potential. In short, it does what others of its ilk do, not much better nor much worse.

The 396/375 engine in this series Chevelle is directly related to two other 396s tested by CL in recent months. The 396/325 which powered a Caprice (July issue) and the 396/425 in a Corvette (August) are essentially the same engine in different stages of tune. It would seem that this new engine line is particularly responsive to the normal pepping up techniques, and is big and beefy enough to be bored and stroked to well beyond the next increment of 427 cu. in. (these are already competing on NASCAR

circuits); maximum displacement from the current blocks appears to be nearly 470 cu. in.

COMPARATIVE SPECIFICATIONS			
Bhp @ rpm	325 @ 4800	375 @ 5600	425 @ 6400
Torque @ rpm	410 @ 3200	420 @ 3600	415 @ 4000
Comp. ratio	10.25	11.00	11.00
Carburetion	1x4 Holley	1x4 Holley	1x4 Holley
	or Rochester		
Primaries, dia.	H-1.388	1.686	1.686
Secondaries, dia.	R-1.562	1.686	1.686
Valve lifters	hydraulic	hydraulic	mechanical
Intake valve dia.	2.07	2.19	2.19
Exhaust valve dia.	1.72	1.72	1.72
Valve timing	42-98, 89-51	56-106, 110-66	61-107, 102-66
duration	320°	342/346°	348°
overlap	93°	122°	127°
Timing, initial	6°	8°	10°
Dist. centr. adv.	24°	28°	28°
vacuum adv.	15°	15°	15°
Exhaust system	single	dual	dual
Exh. pipe dia.	2.5	2.5	2.5
Tailpipe dia.	2.0	2.25	2.0

The 396 was examined in considerable detail in *Car Life's* March '65 issue and outside of the few details in tuning outlined in the preceding specification table, the information in that article would still apply. Note, however, that the 375 version is the best, at least theoretically, of the two worlds. It combines the flexibility and quiet operation of hydraulic lifters

from the 325 with the long, strong camshaft, bigger intake valves and Holley carburetor of the 425. Although horsepower is less, torque is greater and the engine is less fussy about which rpm range it is being driven in. Where the 325 will rev to 5000 rpm, the 375 runs up to 6000 before lifter pump-up; however the mechanical-lifter 425 tops 7000 rpm without damage.

As installed, the 375 begins to run out of power at just about its rated rpm, so that further flogging to a higher rpm gains naught in acceleration. This, of course, is due to the restrictions of air cleaner and exhaust system, without which the power rating is achieved in the dynamometer room. The addition of a nice set of extractor headers and a cold-air duct to the carburetor should measurably improve the 375's performance, if such is desired. We found no pressing need for additional power as the car's over-the-road capabilities are impressive enough as is. Quarter-mile acceleration to nearly 100 mph in just under 15 sec., and a top speed of double the allowed highway speeds of most states should suffice everyone but the lunatic fringe.

The initial series of Chevelle 396





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was produced with a 4-speed manual-shift transmission only; no automatic nor 3-speed manual. Doubtlessly, the GM 3-speed automatic and the new Warner Gear all-synchromesh 3-speed manual will be offered when the car goes on sale to the general public (they already are available with the 396/325); after all, the GTO, 442 and Gran Sport have such options. The transmission in the test car was the "Muncie" gearbox of late Chevrolet design, with the 2.56 first gearset. Although the close-ratio 2.20 first set might provide better dragstrip gearing, the 2.56 is ideal for the 396 Chevelle's all-around performance characteristics. Shift points for optimum acceleration work out to 50, 70 and 90 mph (before speedo correction) with the 3.31:1 rear axle ratio.

Power is transmitted through a significantly larger clutch when the car is 396-equipped. Where the normal Chevelle V-8 (283 cu. in.) with 4-speed transmission has a 10.4 in. clutch disc (103.5 sq. in. effective area) and a 2100-2300 lb. pressure plate, the 396 V-8 needs an 11-in. disc (123.7 sq. in.) and a 2300-2600 lb. pressure plate. Both are a diaphragm, bent-finger type of clutch with centrifugal action to increase plate pressure as rpm increases. Release bearings are single row ball and clutch operation is smooth and positive. Pedal pressure tends to be on the stiff side, although not objectionably so from an enthusiast's standpoint.

Linkage to the transmission is an-

other matter—at least on this particular test car. Somewhat stiff and sticky, it would hang up in neutral whenever full-on shifts were attempted. The problem was particularly severe in the 2-3 shift—which was when we found the engine would rev to 6000 rpm without damage. Chevrolet has rid itself of the characteristic buzzing linkage rattle apparent in all older design 4-speeds, but in the process has made the shifting process more difficult—a tragedy for such a fine 4-speed transmission. Another point of criticism is the long throw between gates. Perhaps both situations could be rectified with the installation of one of the better commercial shifter systems, such as Hurst or Drag-Fast.

Along with the more sturdy clutch and transmission, for the 396 Chevelle, a far stronger rear end was obviously needed. Where the normal Chevelle has a 8.125-in. ring gear, the 396 has the 8.875-in. gear out of the larger Chevrolets. As the 396 Chevelle maintains its standard-model 58-in. track (both front and rear), complete rear axles are not interchangeable, only the third members. Doubtlessly any ratio available for the larger Chevrolet—2.73, 3.07, 3:55, 3.73, 4.11, 4.56—could be substituted to further adapt the Chevelle to specialized performance usage.

Larger brakes are borrowed from the big Chevrolet, too, and here the Chevelle 396 rises yards above its GM cousins and its own more mundane counterparts: This Chevelle has brakes! They are the 11-in. diameter drums, with 2.75-in. wide shoes in front, 2.00-in. shoes in the rear, from the big

Chevrolet. Their swept area is 328.3 sq. in., as compared with the normal Chevelle's 268.6 sq. in. from 9.5-in. drums. A vacuum-boosted power assist is included in the 396 package option, and this provides 717 lb. of pressure to the 1.00-in. master cylinder for 100 lb. of pressure on the brake pedal.

Subjecting these brakes to *Car Life's* usual series of stops produced normal-rate decelerations. Braking as hard as possible, without skidding the tires, we achieved three consecutive stops at 21 ft./sec./sec. deceleration from 100 mph, with only a minute or so of cool-off time between. The fourth such stop produced considerable fade and a greatly reduced rate of deceleration; however, few cars we test survive more than two all-on stops from 75% of their maximum speed. Chevrolet rates a chromium-plated medal for making bigger, better brakes part of its performance package.

It should be mentioned that Chevrolet continues to offer sintered iron brake linings for both Chevelle and big Chevrolet. These are in both drum sizes, so that the enthusiast seeking optimum braking for his Chevelle 396 could make a switch from organic to metallic linings and thereby achieve virtually fade-free operation. Of course, Chevrolet also has the best domestic braking system yet produced on its Corvette, but conversion of the production sedans to the Corvette's all-disc set-up might be prohibitively expensive. Until the discs are available for the sedans, the power-boosted sintered iron remains the best, and safest, compromise for the hard driver.

The 396 Chevelle's suspension lay-

out is basically the same as the other Chevelles, with two noteworthy changes. One, of course, is the substitution of stiffer springs to take care of the increased vehicle weight; the other is the placement of an anti-roll stabilizer at the rear end as well as the front. The normal Chevelle V-8 has spring rates of 250 lb./in. front and 100 lb./in. at the rear; the 396 calls for 320 front, 120 rear. Both front and rear anti-roll bars are 1.06 in. diameter HR steel; the standard Chevelle has a 0.812-in. bar in front only. The two bars give considerably more roll stiffness to the chassis, without the use of unduly harsh springing. Added roll resistance helps maintain optimum traction under cornering conditions as it keeps the chassis-tire-pavement geometry in better relationship; that is, the tires can better be kept perpendicular to the road surface, thus retaining their maximum effectiveness, when the body

does not roll too much on the suspension. It also helps combat the torque reaction "unloading" of the right rear tire, and subsequent slippage, under hard acceleration.

The Chevelle's rear anti-roll stabilizer follows the pattern established for the Olds 442. It is a simple piece of bar-stock steel, shaped in a large U, with ends flattened and drilled so that they may be bolted to the horizontal, lower suspension links. The middle of the U passes directly under the differential case.

The effect of this roll stiffness is to ameliorate, to some degree, the detrimental effect on good handling that the very front-heavy chassis must have. It makes cornering seem, because of the lack of body roll and its attendant "plowing" sensation, much more stable than it really is. Despite some 58% of the vehicle's weight on its front wheels, which produces a strong

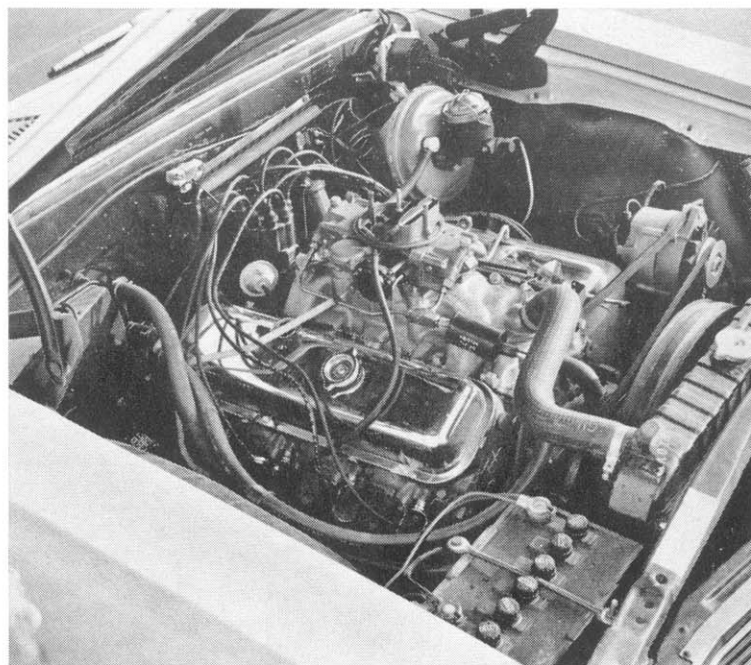
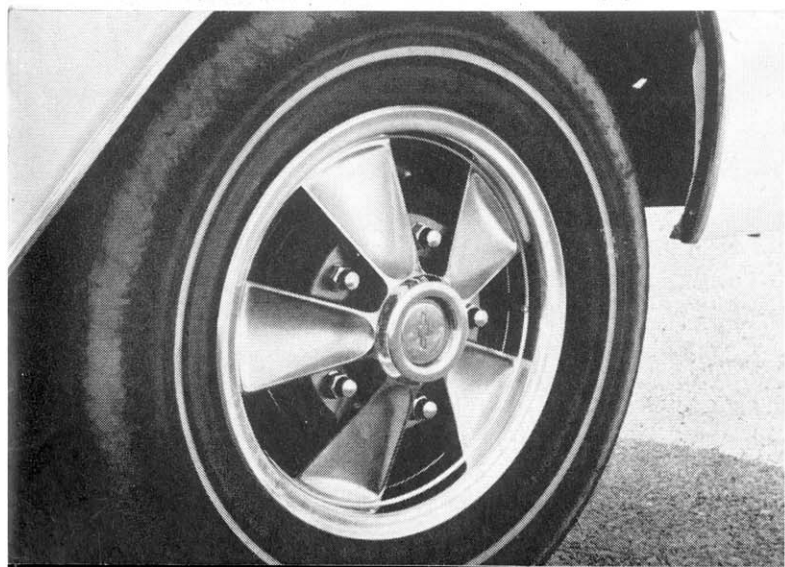
understeering condition, the disguising effect of power steering and the lack of body roll make low-speed cornering seem positively nimble. It is when less than smooth roadway is encountered that the instability becomes apparent. When cornering is attempted on a rippling pavement, the rear wheels hop, skip and jump toward the outside of the roadway in their own sort of non-track meet; the front, of course, stays anchored by that preponderance of weight.

The gross inequity of the weight distribution manifests itself in yet another manner: Pitching. When the car is driven down a secondary road, the front and rear ends pitch up and down in dissimilar cycles. This is caused by the widely differing spring rates and shock absorber valving necessary because of the weight imbalance. This vertical oscillating, if not totally objectionable, is at least annoying. To be



**INSTRUMENT PANEL** features full set of gauges, tachometer in middle. Stereo controls are just above shift-lever.

**MAGNESIUM** wheel? No, just the latest fakery in hubcaps. Gold-stripped 7.75-14 Firestone tires are standard equipment.



**CHROMED COVERS** over rockers and air cleaner dress up the 396 installation. Big engine fills all of the compartment.

**GENEROUS-SIZED** trunk of Chevelle could be equipped with a concrete floor mat to counterbalance over-heavy front end.







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fair, we must cite similar motions in the 442 and Gran Sport, caused by the same condition.

Heart of this weight problem is the engine; it weighs 690 lb., where the 283-cu. in. V-8 is a good 100 lb. less and the standard 6-cyl. another 100 or so under that. Such items as the heavy-duty radiator, larger battery and power accessories all add weight to the end where it is least needed. Hence, the curb weight of this test Malibu hardtop is 385 lb. greater than that of a 6-cyl. Malibu tested when CL first evaluated the Chevelle line (March '64), and all of it is on the front wheels. That Six had a 52/48 distribution of 3265 lb. (curb weight), a 283 Malibu had a 56/44 spread of 3390 lb., this one has a 58/42 of 3650. A CL editorial last spring likened such distribution to a "10-lb. sledge on a 3-ft. handle" and warned against the advisability of the design of such cars. The driver, we feel, should be aware of these things *before* he buys the car.

That the car does as well as it does on curving roads is due in good part to the tire/wheel combination speci-

fied. This is a 7.75-14 Firestone Super Sport high-speed nylon cord tire on a 6.00 x 14 rim. These rims are an inch wider than would normally be used and this width helps increase tire sidewall stability, although, the tiremen say, at the expense of a slightly harsher ride. CL's testers applied additional inflation, to 28 psi front, 24 psi rear, to compensate for the weight differential, (normal inflation is 24/24) and this, we thought, also slightly improved the handling. We had the opportunity to drive these tires on rain-slickened streets and they were surprisingly good—unlike certain other "high-speed" tires which are pretty "low-speed" in the wet! Wide-base wheels and suitable tires should be the first items on everyone's list of chassis improvements.

This Chevelle also has speeded-up steering which uses 15:1 gearing rather than the normal 17.5:1 in the coaxial power system. Steering wheel turns required to move the road wheels from lock to lock are reduced from 4.0 to approximately 3.5. Along with power steering, the equipment included the Saginaw tilting steering wheel, which gives a choice of seven positions over a 5 in. arc; we would have preferred

another Saginaw development, the telescoping wheel, which can be better adjusted to suit the driver's armlength.

Other interior equipment included bucket seats, the usual, useless, chrome-plated between-seat, tunnel-top console, a full set of instruments, a tachometer and that fabulous am/fm/stereo radio system offered by Chevrolet and Delco. CL's editors raved over this electronic marvel in the Caprice Road Test and further exposure to it only heightened our enthusiasm. "There's nothing in this world, Charlie, like slipping down the turnpike being belted in the back by 375 horsepower and in the ear by 4-speaker Bach-power!" to quote our old friend Tom McMolehill.

Criticism of the interior centers on two points: The size and readability of the tachometer and instruments. The tachometer has a 90° needle sweep on a relatively small face. Although it is located high enough to be readable, the markings are close together; and accurate, quick-glance reading is impossible. The substitution of a 270° sweep instrument should be the first order of business. All instruments are glass-covered and these faces are so angled that they become excel-

lent reflectors of ambient light. Consequently, the instruments are particularly difficult to read on anything but the duller day.

The exterior differences between the 396 Chevelle and the 194, 283 or 327-equipped car are minor. Outside of the small "Malibu SS 396" nametag on the rear and the crossed-flag "396 Turbo-Jet" insignia just ahead of the front wheel-wells, nothing distinguishes it from the more mundane.

Perhaps Chevrolet could re-name the package-equipped cars, such as

Pontiac *et al* have done. Since "Super Sports" has already been usurped, Chevrolet nomenclature experts might simply resort to the option code of "Z-16." After all, the fellow who puts out the kind of money this equipment costs wants something that shows it; what's the use of buying it if no one can tell it from the neighbors' Power-slide Slick-Six? It has to say, "I'm a Z-16 Chevy, and king of the road," or the name may not be worth the game.

The price of our test car is misleading. The special package for this

series is listed at \$1501 extra and includes all those previously mentioned. Without power equipment, special radio and those grotesque hubcaps, the price probably could be cut in half. As reference points, consider that the 396/425 adds only \$292.70 to the price of a Corvette but \$376.60 to a big Chevrolet while the 396/325 costs about \$300 more than a Six in the standard sedan. It would appear that the basic horsepower is pretty cheap—it's all that modification necessary to make it usable that costs. ■

## CAR LIFE ROAD TEST

### 1965 CHEVROLET Chevelle Malibu 396

#### SPECIFICATIONS

List price.....	\$2647
Price, as tested.....	4586
Curb weight, lb.....	3650
Test weight.....	3990
Tire size.....	58/42
Tire capacity, lb. @ 24 psi.....	7.75-14
Brake swept area.....	4480
Engine type.....	328.3
Bore & stroke.....	V-8, ohv
Displacement, cu. in.....	4.09 x 3.76
Compression ratio.....	396
Carburetion.....	11:1
Bhp @ rpm.....	1 x 4
equivalent mph.....	375 @ 5600
Torque, lb.-ft.....	130
equivalent mph.....	420 @ 3600
equivalent mph.....	83

#### EXTRA-COST OPTIONS

Special Z-16 option (engine, power steering, 4-speed, special suspension & wheel covers, power brakes, am/fm stereo radio), tinted glass, tilt wheel.

#### DIMENSIONS

Wheelbase, in.....	115.0
Tread, f & r.....	58.0
Overall length, in.....	196.6
width.....	74.6
height.....	52.8
equivalent vol., cu. ft.....	448
Frontal area, sq. ft.....	21.9
Ground clearance, in.....	4.7
Steering ratio, gear.....	15:1
turns, lock to lock.....	3.5
turning circle, ft.....	44.7
Hip room, front.....	2 x 22
Hip room, rear.....	58.7
Pedal to seat back, max.....	44.0
Floor to ground.....	8.5
Luggage vol., cu. ft.....	16.7
Fuel tank capacity, gal.....	20.0

#### GEAR RATIOS

4th (1.00) overall.....	3.31
3rd (1.48).....	4.88
2nd (1.91).....	6.32
1st (2.56).....	8.47



#### CALCULATED DATA

Lb./bhp (test wt.).....	10.6
Cu. ft./ton mile.....	149
Mph/1000 rpm.....	23.1
Engine revs/mile.....	2600
Piston travel, ft./mile.....	1630
Car Life wear index.....	42.3

#### PERFORMANCE

Top speed (5600), mph.....	130
Shifts @ mph (manual)	
3rd (5600).....	88
2nd (5600).....	68
1st (5600).....	51
Total drag at 60 mph, lb.....	140

#### SPEEDOMETER ERROR

30 mph, actual.....	29.8
60 mph.....	59.3
90 mph.....	87.4

#### ACCELERATION

0-40 mph, sec.....	3.8
0-50.....	4.8
0-60.....	6.5
0-70.....	8.4
0-80.....	10.3
0-90.....	12.7
0-100.....	15.4
Standing 1/4 mile, sec.....	14.9
speed at end, mph.....	98

#### FUEL CONSUMPTION

Normal range, mpg.....11-14

