

# HOT CHEVY



## Road Test



UNDERSTEER AND BODY LEAN ARE ON THE SEVERE SIDE UNDER HARD CORNERING CONDITIONS BUT TIRES STICK WELL, SQUEAL LITTLE.

*Now you can buy lower ET's right over the counter—  
with Chevy's 350-hp Super Turbo-Thrust Special V-8*

*by Chuck Nerpel, Technical Editor*

**T**HE 1961 CHEVROLET IMPALA two-door hardtop that oozed quietly up to the starting line of the Riverside Raceway quarter-mile drag strip looked brand new. It was virtually showroom-fresh, except for 1267 careful miles, an oil change and a final tune-up. But this was no ordinary Impala—and yet it was. Street tires and a quiet muffler system concealed the goodies under the hood, the four-speed floor-shift transmission and a 4.56:1 Positraction rear end.

Two long black streaks of rubber and 15.8 seconds later, the Impala was clocking 91 mph through the quarter-mile traps. Not too long ago, ET times in the 15's for stockers or super stocks required a lot of ingenuity, special equipment, and internal modifications, but this Impala, equipped by the MOTOR LIFE testing staff with options that can be bought over-the-counter from your Chevrolet dealer, puts the street machine right up in contention on the drag strips.

Naturally, such an over-the-counter package is just a starting point for higher trap speeds and lower ET's, but there is a lot more to begin with than starting from scratch. Here's what you get with the 348-cubic-inch V-8, remembering of course that this option is available only with the three-speed or four-speed manual transmission. The highest compression ratio offered by Chevrolet as an option, 11.25:1, is combined with an extra-deep-breathing special high-speed valve system. The performance cam shaft has lobes that open the valves farther and keep them open longer, providing a greater flow of air/fuel mixture to the combustion chambers and increasing the scavenging of exhaust gases.

High-compression cylinder heads are designed to accommodate larger valves, and to insure good smooth valve passages. The cores used in casting these heads are chrome dipped. As a result the finished head has the appearance of a hand-ported job.

To handle the high rpm of an engine whose horsepower peak is at 6000 rpm level, fast acting mechanical valve lifters and dual valve springs are provided. Valve faces are alu-

minized to increase their durability, and shields are installed to prevent oil leakage down the stems and into the combustion chambers. Special pistons with heads half-flat and half-slanted provide the high compression ratio but do not interfere with valve action. Upper rings are chrome to increase durability.

Stock headers, somewhat more restrictive than full-flow systems offered by several private manufacturers, are used on the Super Turbo-Thrust Special, and larger dual exhaust and tail pipes help speed up the flow of burned gases.

To accommodate the deep breathing capacity of this engine, triple two-barrel carburetors in tandem are linked in such a way to allow the center carburetor to be operated by mechanical linkage to the foot throttle, with vacuum control, depending on manifold demand, actuating the throttle valves of the front and rear carburetors. Under normal traffic or highway driving, fuel economy with this system is surprising, logging 17 mpg on the highway and freeways, dropping to 13.5 to 14 in the city—and this with the extremely low 4.56:1 rear axle ratio.

Punching the throttle in any gear and at any speed snaps open those end carburetors and the car takes off as though a rapid downshift and a big push had occurred, both at the same time. To make absolutely sure those carburetors have an adequate supply of fuel for such full throttle demands, an extra heavy-duty fuel pump is supplied.

Now in order to make sure that these high-performance engine modifications provide a high degree of reliability under the severe use for which they were intended, all connecting rod and main bearings, except the rear main bearing, are heavy-duty premium type. As all Chevrolet V-8's have a heavy-duty rear main, the capacity of this bearing is well above the load requirements of the special engine. In addition, valves, rocker arms, push rods, pistons, pins, connecting rods, and crank shafts—which have passed the inspection of regular production quality control—are further checked for

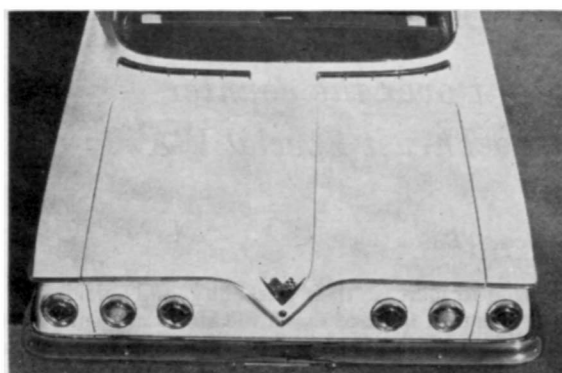




*Sculptured pattern stamped in hood panel breaks up wide area of sheet metal without use of chrome trim, increases rigidity.*

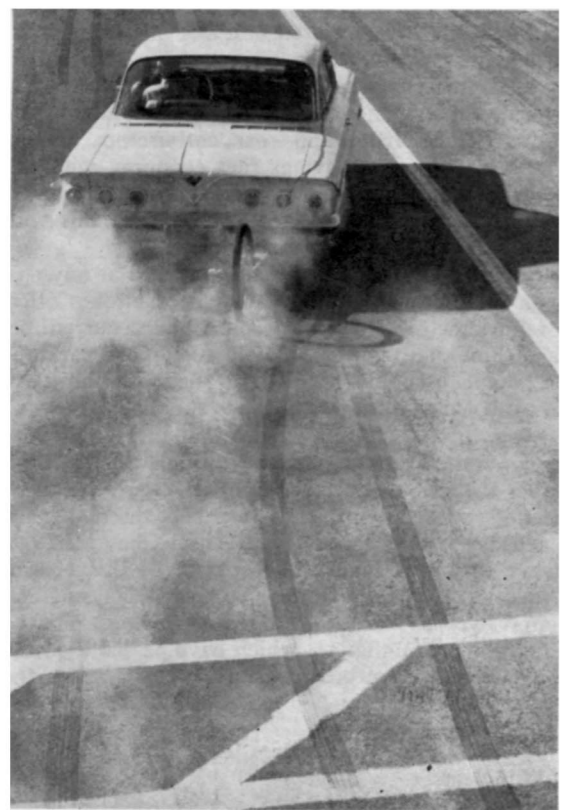


*Dual headlights flush with grille line and license plate set in compartment under bumper presents blunt but clean front end.*



*Impala sport coupe has long rear deck line, triple tail lights, and simulated exhaust ports under window.*

*All-out acceleration with the front wheels purposely turned poses no handling problems for the Impala with Positraction rear end and stock Tyrex cord street tires.*



## Hot Chevy

*continued*

dimension, material, soundness, and surface finish, resulting in a practically hand-built engine.

Handling the coupling chores for Chevrolet's most powerful engine, and in keeping with the idea of engineering all components for compatibility and good service, a 370-ft. lb. torque capacity clutch is standard equipment with the Super engine that develops 364 ft. lbs. of torque at 3600 rpm and 350 hp at 6000 rpm. With spring pressures of 1775 to 1875 lbs., the 10.5-inch single-dry-plate, semi-centrifugal clutch has premium grade facing and will take many, many high-rpm starts before giving up.

Transmission of power from high-performance engines to the driving wheels, where maximum use of the power peak is so dependent on the gear ratio, is best accomplished by a gearbox that can be manually controlled. Furthermore, the narrower the spaces between gear ratios, the more uniform is the acceleration curve, with a minimum loss of engine speed at shift points. The easiest way to get this smooth curve is to increase the number of forward speeds, to provide good positive shifting linkage, and to place the control handle in a spot where the driver can get at it.

The four-speed all-synchro gearbox offered for the standard Chevrolet is identical in principle and design with the famous Corvette box, except in this instance the gear ratios are different and the case is cast iron instead of aluminum. Ratios provided are 2.54:1 for first, 1.92:1 for second, 1.51:1 for third, and 1.00:1 for fourth. A short chrome shift lever, located to the left center of the tunnel, operates in a standard four-speed pattern. Reverse position is spring-loaded to prevent any accidental and costly wrong selection. As all speeds are fully synchronized, downshifting even into first is quick, quiet, and easy — great for downhill brake-saving deceleration.

Wheel hop and axle wind-up under the high torque forces of modern engines is still a problem with many late model cars, but Chevrolet's four-link rear end design virtually locks the rear axle and wheels in their designed position — yet allows the free-and-easy spring action necessary for comfort. Major rear suspension components include two lower control arms, a single upper control arm, and a panhard rod. They relieve the coil springs of any work other than cushioning the ride. Made of heavy steel channel, the control arms

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are pivotally mounted (in rubber bushings) to chassis frame and axle housing, and transmit driving and braking forces to the frame. A solid steel control bar (panhard rod), similarly mounted in pivotal rubber bushings, connects the right side of the axle housing to the left side of the chassis frame, and controls sidewise movement of the axle. Diagonally mounted tubular shocks help reduce sway and roll, although we would like to see a little firmer spring and a harder shock. The car rolls a bit too much under hard cornering conditions.

For pure drag strip acceleration, tires that "bite" are extremely important, but more basic than this is first to provide for a power transmission to the tires so that they can each do their share of the work. On the highway — under conditions of poor traction such as snow, mud and loose gravel — one wheel doing too much work while the other contributes nothing can result in a tow-car job regardless of tire "bite."

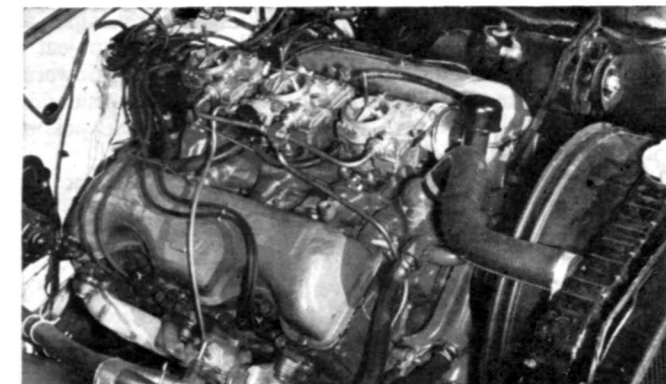
MOTOR LIFE's test car was equipped with Positraction differential, and turned good ET's on the drag strip with

stock street tires. While we purposely made some standing starts under full power with the front wheels turned slightly, the car wanted to go straight and was easy to handle off the line at full throttle. Positraction provided for unequal distribution of torque to the rear wheels only when one wheel lost traction. Multiple disc clutches, splined on axle shafts between differential side gears and the differential case, are held tightly by transmission of torque, which presses the clutch disc against the side gears. Any loss of traction of either wheel instantly reduces pressure on the set of clutches on that side in proportion to the wheel slippage, allowing the other wheel to absorb more torque. Even if you are not a drag racing participant, but enjoy driving off the beaten path or by necessity in snow or mud, Positraction is the thing. These optional units are available in the same gear ratios and for the same power teams as conventional differentials.

Now that we have expressed our enthusiasm for Chevrolet's most powerful engine, the Super Turbo-Thrust Special,



*Centerfold front seats, well padded but firm, are wide enough for three adults; divided back has angled hinges to aid rear entry.*



*Chevrolet's most powerful engine option, custom-assembled from selected parts, develops 350 hp from 348 cu. ins. at 6000 rpm.*



**STOCK SUSPENSION AND SHOCK ABSORBERS ARE MORE THAN ADEQUATE TO KEEP CAR LEVEL UNDER MAXIMUM ACCELERATION OR BRAKING.**

*Contoured seats with chair height cushion provide comfort and good over-wheel vision, with easy access to controls, stick shift.*

*Deep luggage compartment made possible by relocating fuel tank under spare tire stowage shelf has total capacity of 28.2 cu. ft.*





# Hot Chevy

continued

let's get into the analysis of the car itself. Constructed on an integrated body/chassis frame design that combines a Unisteel body and an X-type girder frame, the 1961 models are fine examples of rigid and rugged cars with low centers of gravity, built for thousands of miles of safe, rattle-free driving. Plenty of interior room and a low floor tunnel insure comfort and chair-high seating. A two-piece drive shaft that passes through the junction of the X-member in the frame is joined at the center of its length by a permanently lubricated needle-bearing universal joint. The front half of the drive shaft connects to the transmission output by a similar U-joint, and just ahead of the center joint is supported by a rubber-mounted bearing attached to the frame. These two relatively short sections of drive shaft are easier to balance and are more rigid and less subject to whipping than a single long shaft. In addition to lowering the interior tunnel height, the split shaft system considerably reduces drive line noise and vibration — and the possibility of this developing as normal wear sets in.

While styling and engineering have been able to produce a lower and long-looking car, the wider door openings, lower door sills, and better placement of seats make entrance and exit a lot easier than in previous models. One objection we have had to the Chevrolet driver's compartment was the high position of the steering wheel for persons of short stature. This year eye-line vision over the wheel rim is possible without adding seat cushions or jacking up the seat so that the wheel is too close to the driver. At the same time instrument visibility is not obscured by poorly placed wheel spokes.

MOTOR LIFE's test car with the high-performance engine was unencumbered with any power accessories, so that we could get maximum engine output to the driving wheels. Unassisted steering was not as effortless as we like (despite a very low steering gear ratio of 24:1) and required a lot of wheel turns to effect very little change of direction. We had considerable work in heavy traffic and while parking.

At highway speeds the steering effort is light and positive, with most of the highway shocks that get by the front suspension absorbed by a flexible coupling in the steering column just above the steering gearbox. Ball joints with provision for pressure lubrication have nylon bushings and the entire steering system is designed toward minimum wear to retain the positive "like-new" action over a long period of time.

While on the subject of power accessories, or the lack of them on the test car, the brakes on the 1961 Chevys are

excellent. Pedal pressure requirement without power assist is somewhat heavier than the feather-light touch that GM's vacuum servo units provide, but certainly well within the capabilities of the frailest woman driver. Standard brakes for the entire Chevrolet line are 11 inches in diameter with a composite drum consisting of a pressed steel web and a cast alloy iron rim with a flared edge that projects into the under-car air stream and steers cooling air over the drum surface. Slotted wheels and hub caps to match further aid cooling by allowing the air to circulate over the drum and out the wheel.

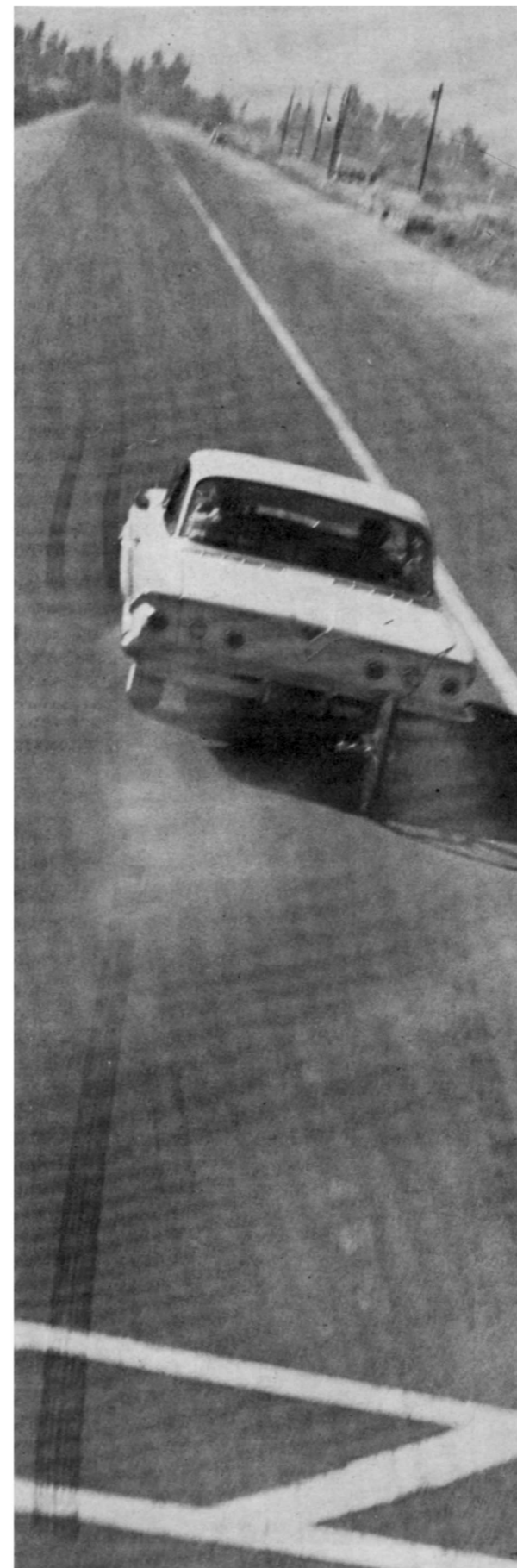
Drums are spring-wrapped to reduce squeal and chatter and the linings are molded asbestos bonded to the shoes. A total of 185.6 square inches of effective braking area gives good stopping power with little pedal pressure, as the self-energizing design causes the action of the drum to wedge the linings against them as they are applied. Repeated use during slow-downs from our 91-mph acceleration tests did not cause excessive fade nor require more than normal pedal pressure. We were making two-way acceleration runs, each segment about two minutes apart, purposely using the brakes hard at the end of each run through the quarter-mile traps. The brakes got hot, not hot enough to smoke or smell, but they kept stopping uniformly and without veering to the left or right.

As we said earlier, the 4.56:1 rear end ratio is not exactly the one to use for normal highway cruising, especially with such a high-performance engine, but we did drive the test car many miles over freeways and country roads and enjoyed every minute of it. With 7.50 x 14 tires our engine was turning 1000 rpm for every 17 mph of speed, but operation was smooth, engine noise low, and high-gear passing speed acceleration was fantastic.

Naturally, highway driving was with the standard king-sized air cleaner that fits over all three of the two-barrel carburetors. The engine had been tuned to run without this air cleaner and it is interesting to note that acceleration with the air cleaner was seven mph and nearly a full second slower than subsequent runs with it removed.

Chevrolet's quality control is excellent this year, with good fits and sealing around doors, windows and trim. Quality on the production line is a direct function of design, and the GM designers have virtually eliminated the possibility of raw edges and poorly fitted parts.

Body styles run the full range of coupes, sedans, convertibles and station wagons, with a choice of engines from the Hi-Thrift Six to the one we just tested, the 350-hp Super Turbo-Thrust Special. Three-speed and four-speed manual transmissions, with overdrive for the three-speed — plus two automatic transmissions and a wide range of optional rear end ratios — make it possible for the buyer to just about custom-build his Chevy right out of the catalog. For family car or drag strip — just pick out the options and order. •



## CHEVROLET IMPALA

2-door hardtop, 6-passenger

**OPTIONS ON CAR TESTED:** Super Turbo-Thrust Special engine package, 4-speed manual transmission, Positraction rear end with 4.56:1 ratio, radio, heater

**ODOMETER READING AT START OF TEST:** 1267 miles

### PERFORMANCE

**Acceleration (2 aboard)**

0-30 mph .....	3.0 secs.
0-45 mph .....	5.2
0-60 mph .....	8.0

Standing start ¼-mile, 15.8 secs. and 91 mph

**Speeds in gears at 6000 rpm**

1st .....	41 mph	3rd .....	72 mph
2nd .....	54 mph	4th .....	102 mph

**Speedometer Error on Test Car**

Car's speedometer reading .....	32	47	53	64	75	86
Weston electric speedometer .....	30	45	50	60	70	80

Miles per hour per 1000 rpm in top gear (Tires 7.50 x 14) 17 mph

Stopping distances — from 30 mph, 44 ft.  
from 60 mph, 182 ft.

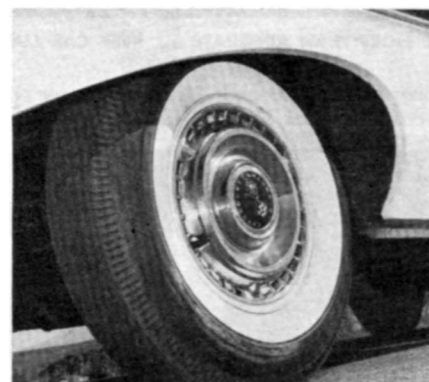


### SPECIFICATIONS FROM MANUFACTURER

<b>Engine</b>	V-8 ohv Bore: 4.125 ins. Stroke: 3.25 ins. Displacement: 348 cubic inches Horsepower: 350 @ 6000 rpm Compression ratio: 11.25:1 Ignition: 12-volt battery/coil	<b>Rear:</b> Solid axle, single upper, 2 lower control arms, lateral control arm, coil springs
<b>Gearbox</b>	4-speed manual, all-synchro, floor-mounted shift	<b>Wheels and Tires</b> Pressed steel disc 14-inch wheels 7.50 x 14 tubeless tires
<b>Driveshaft</b>	Open type, 2-piece, split at center with U-joint	<b>Brakes</b> Drum type, molded linings Front and rear: 11-in. diameter with 185.6 sq. ins. effective area
<b>Differential</b>	Limited-slip Positraction; special ratio 4.56:1	<b>Body and Frame</b> Unisteel body integrated with X-type box girder frame Wheelbase 108 ins. Track, front 60.3 ins., rear 59.3 ins. Overall length 209.3 ins. Dry weight 3665 lbs.
<b>Suspension</b>	Front: Independent, unequal controls arms, coil springs	



Large diameter air cleaner/silencer with resin-impregnated paper filter cuts drag strip speed seven mph, adds second to ET.



Decorative, functional slots around wheel cover match wheel holes, allow under-car air to pass around brake and aid cooling.



Recessed single-spoke steering wheel is angled well for comfort and forward vision, allows good view of deeply hooded gauges.