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Turbo-Skyhawk
Turbo-Firebird
Turbo-Accord

(*America's Latest Kar Kraze!)

...ce of display-allowance plan is within last three pages."

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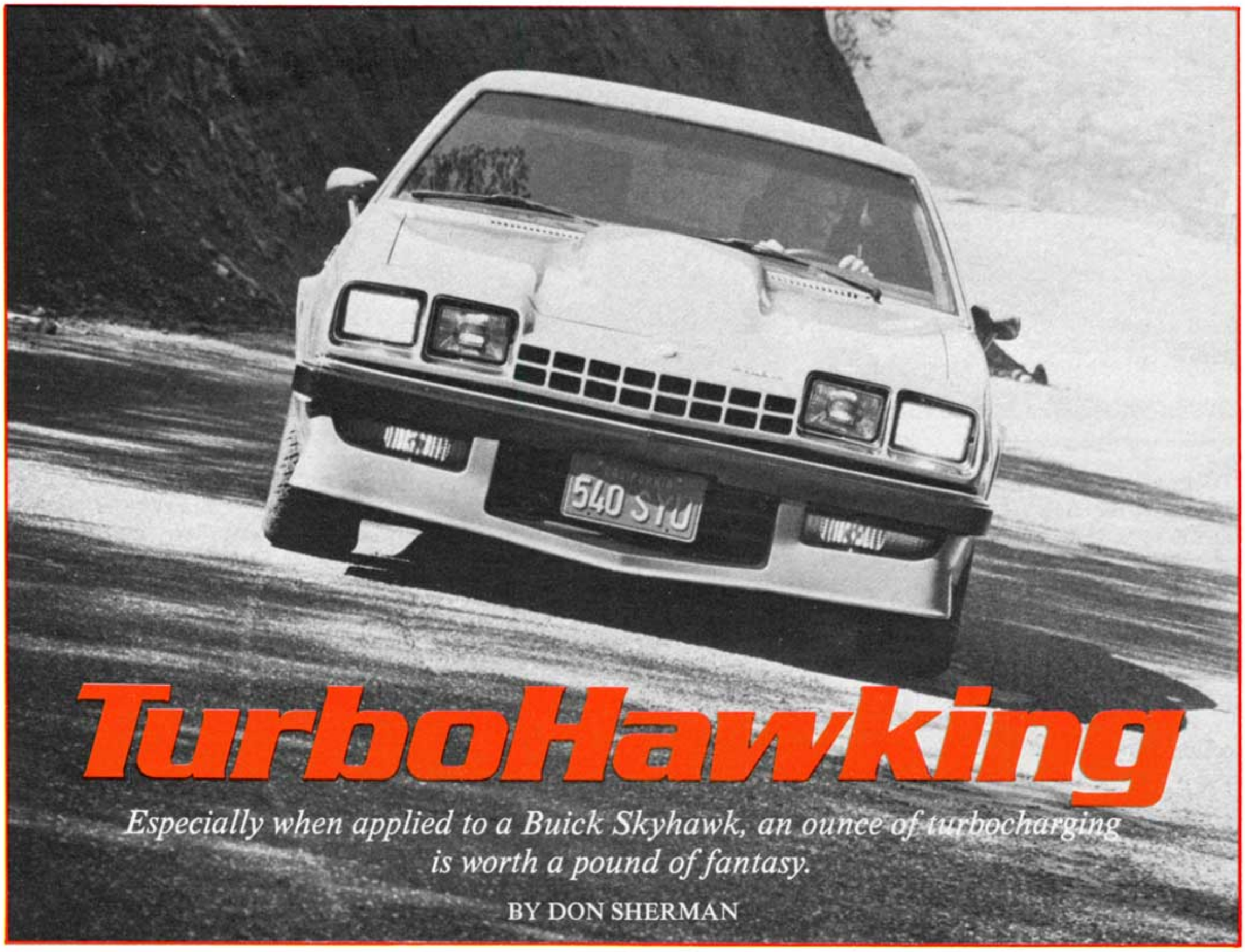
FEBRUARY 1978

REPORT FROM HOT ROD HEAVEN:



TurboHawking

Especially when applied to a Buick Skyhawk, an ounce of turbocharging is worth a pound of fantasy.

BY DON SHERMAN

• Hot-rodding is a unique American institution. It is the only phase of the automotive system that thrives during good times or bad. When Detroit built pavement pounders, we bought them in great numbers and lovingly stroked them toward ever-lower ETs. One adversity after another cropped up to bite holes in factory acceleration—safety, emissions, insurance, low-octane gasoline, bumpers and now fuel economy—but this only toughened our devotion. We briefly retrenched, massed forces and came back modifying our wheels more ways than previously imaginable.

Old quarter-mile warriors are now much-loved retirees, and whole new auto-alteration schemes are radiating from basic transportation's nucleus. Self-expression has recast lowly utility vans into rolling sanctuaries. Light trucks have evolved into weekend toys. Our motor sports run the gamut from sand drags to Formula One. Our street cars model every possible competition guise from bracket racer to Bonneville flyer. And the hunger for function, be it one more sleeping berth in the van or a few more revs at the end of a freeway spiral, has spawned a huge industry in America to refit machinery fresh from the assembly plant. We are the center of an exploding automotive universe.

John Thawley, proud owner of the super Skyhawk you see lavishly portrayed on these pages, has for years been a deacon of the car freak congregation. As Technical Editor of *Hot Rod* Magazine from 1968 to 1970, he preached the Chevrolet religion. Smokey Yunick was his patron saint and we all sang hymns of roller cams, porcupine heads and fire-slot pistons with this team directing the choir. Lately, Thawley's interests have broadened and he's built what might be considered a state-of-the-art streetster. It is by no means the radical leading edge of any movement, but rather a unique conglomeration of many trends we've covered here in *Car and Driver.*

If you were to very carefully program a computer to spit out one custom-made car best suited for all of today's enthusiast's obligations—striking appearance, stirring performance, mechanical sophistication, deep-seated comfort, economy and affordability—something very close to this Skyhawk would pop out. Of course, it's never done that way. Hot rods are nurtured through fits of passion; burning lust for the perfect sweep of a fenderline, an addiction to omni-directional acceleration and the pride of owning a jewel envied by four lanes of freeway traffic. The affair may begin with an intangible yearning for a car that doesn't even exist. As the world's car

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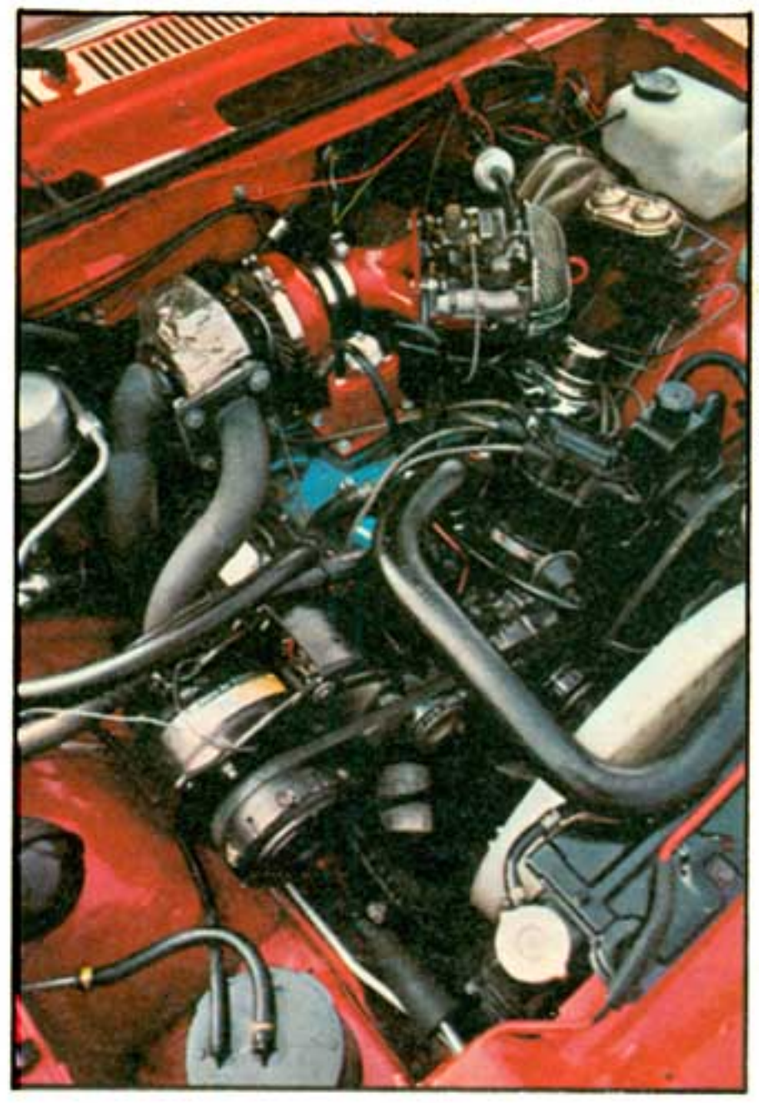

PHOTOGRAPHY: HUMPHREY SUTTON

factories cycle through the scheme of automotive evolution, more and more needs are fulfilled. John Thawley matched up with a Buick Skyhawk as if by computer dating.

In the greater scheme of today's performance thought waves, a first association to the words "Buick" and "V-6" is, naturally enough, "turbocharger." You've probably wondered why Buick's fat-cat Riviera and dilettante Regal are doled turbochargers for 1978, while the racier Skyhawk is left wanting with but 105 hp. The simple answer is that the turbo-V-6 package doesn't fit under the hood of a Skyhawk, or more properly between the fenders. Buick would have to assemble such a car off-line to get it out the plant, an expense that has not yet been justified. This "can't be built" condition is a red cape in the eyes of an enterprising hot-rodder, and John Thawley charged head first into creating what Buick wouldn't.

There's very little similarity between this Turbo Hawk system and Buick's turbo Regal. The key factory components—an AiResearch TO3 turbocharger with integral waste gate and the Delco electronic control center—are carefully barred from aftermarket use at this time. Instead, Thawley has chosen a kit developed by Doug Roe Engineering in Phoenix, Arizona, soon to be marketed by Kenne-Bell Enterprises (212 San Lorenzo, Pomona, California).

We've delved into the fine art of turbocharging at every level from backyard to factory, and this system happens to be one of the finest installations we've seen anywhere. It's not as foolproof or as sophisticated as Porsche's, Saab's or Buick's best efforts, but it's as well engineered as any-

In this case, red means go. The little white knob determines how fast.

thing you can buy from aftermarket shelves, mainly because it doesn't stumble over any of the cardinal rules of successful turbocharging.

Simply stated they are:
1/Intake passages must be as short as possible; 2/fuel-air mixture should travel ever downward; 3/there must be a limit to maximum boost (other than the driver), and 4/there must be protection against detonation throughout the load and rpm range. The technology behind these requirements has filled many a textbook, but basically the first two are necessary for drivability and starting, while the second two help forestall a broken engine. Violate any one, and turbocharging can be a nightmare rather than a blessing.

Doug Roe's vast engineering experience during and after his years at Chevrolet Division is built right into this Skyhawk kit. The turbocharger mounts on top of the engine where it fits neatly under the stock hood line, compatible with all factory options such as air conditioning, power steering and power brakes. Intake passages are both downhill and extremely short. The stock intake manifold supports a short adapter that channels the turbocharger's output to the engine. Feeding the compressor is a compact Y-section and a side-draft Dellorto carburetor. On the turbine side, a tubing header bolts to the inlet and a single dump tube carries exhaust out the car.

There is no waste gate or intake-tract controller on this V-6, as is common practice. Instead, Doug Roe has very diligently investigated intake and exhaust restrictions and specified a combination that automatically limits maximum boost to nine pounds per square inch. This is a reasonable compromise between horsepower gain and engine life, but it does require additional safeguards against detonation. A pressure-retard diaphram (from a turbocharged Corvair) backs off spark advance with boost, and the stock windshield washer system has been replumbed to inject a calibrated flow of water into the engine above five pounds of manifold pressure. Premium fuel is a must and water consumption is high, but there is no detonation in this engine's useful rpm range.

Since we have intercepted this Turbo Hawk in midflight, our testing was, in fact, part of its development program. We discovered a massive performance boost of about 2.5 seconds chopped from 0 to 60 and quarter-mile times, along with about twelve mph added to quarter-mile and top speed. This was more than enough to bring the rather somnolent V-6 to life, particularly when it could use its rather limited rpm range for a strong pull through the upper speed ranges. Between sixty and ninety, this Turbo Hawk hauls like a Freightliner down the Grapevine pass. We also discovered that it has some foibles—a pipe-to-body interference, a coarseness in the exhaust tuning and a disarmed emissions system. Development is, however, going on and the system's fit with the car

will be perfected before aftermarket introduction. Doug Roe also hopes to certify his handiwork with California's Air Resources Board for legal use in that state. Results, so far, have indicated that this kit can generate both eight pounds of boost and legal emissions by retaining the catalytic converter and standard GM EGR equipment.

America's hot-rod establishment may not yet be ready to face up to the trials and tribulations of a clean exhaust, but it has made a fine art of clean styling. This Skyhawk emulates early IMSA GT dress with a deep airdam in front and a neatly molded spoiler in front. It's all practically off-the-shelf stuff (Monza Mirage in front and Monza Spyder in back), but the attention to detail is exemplary. The rear lip is neatly faired into side sculpturing and front fenders are customized with a vent extension behind the wheel.

Even taxi-cabs roll around on mag wheels in California, so John Thawley had to dig for something well beyond bean-holes. The gold Cromodoras wrapped in Pirelli CN-36 rubber are in perfect harmony with the Ferrari/IMSA GT theme and the look, which is the primary obligation of a SoCal hot rod. It has the visual torque to twist jaded California heads.

The ground-hugging look is still "in" around LA, and is partially justified by the world's most extensive network of smooth freeways. Thawley has lowered his Skyhawk by the simple expedient of cutting one coil from all four springs. This should be considered the absolute maximum, and for best handling, the springs should in fact be left alone. This chassis has so little suspension travel and tire clearance even in standard trim that you can't afford to give any up. John Thawley is new to the sport of sliding entrance ramps, but he's learning quickly. What he's found so far is a skid-pad adhesion limit of 0.76 g, which is little more than a stock Skyhawk. The problem is too-narrow rear rims, a rear tire interference and heavy understeer with this particular sway-bar selection (Monza Spyder, 1.12-in front, 0.85-in rear). A large hammer has solved the interference problem and bigger bars with wider rear rims will help edge the program toward 0.80 g.

Of course, a hot rod is never *really* finished. The Recaro LS seats, Formuling steering wheel and re-sculpted bodywork are probably the only "perfected" changes to the car so far. Turning the screw, polishing the gem and adding those tiny little touches of brilliance are the living—breathing part of hot rod romance. That's why it's become such an institution. That, and cars like Thawley's Turbo Hawk. ●

BUICK TURBO SKYHAWK

Manufacturer: John Thawley
Thousand Oaks, California

Equipment on test car: base Buick Skyhawk, Doug Roe Engineering turbocharger kit, Chevrolet Monza anti-sway bars and shock absorbers, Pirelli tires, Cromodora wheels, Hurst shifter, Stewart-Warner instrumentation, Recaro seats, Formuling steering wheel, custom body work.

ENGINE

Type	Turbocharged V-6, water-cooled, 4-main bearings
Bore x stroke	3.80x3.40 in, 96.5x86.4mm
Displacement	231 cu in, 3781cc
Compression ratio	8.0 to one
Carburetion	1x2-bbl Dellorto DHLA 40
Power (estimated)	150 bhp

DRIVETRAIN

Final drive ratio ..... 2.93 to one

Gear	Ratio	Mph/1000 rpm	Max. test speed
I	3.11	7.5	34 mph (4500 rpm)
II	2.20	10.7	48 mph (4500 rpm)
III	1.47	16.0	72 mph (4500 rpm)
IV	1.00	23.5	112 mph (4750 rpm)

DIMENSIONS AND CAPACITIES

Wheelbase	97.0 in
Track, F/R	54.7/53.6 in
Length	179.3 in
Width	65.4 in
Height	48.1 in
Ground clearance	3.5 in
Curb weight	3050 lbs
Battery capacity	12 volts, 2500 watts
Alternator capacity	520 watts
Fuel capacity	18.5 gal
Oil capacity	5.0 qts
Water capacity	12.0 qts

SUSPENSION

F:	ind, unequal-length control arms, coil springs, anti-sway bar
R:	rigid axle, torque arm, 2-trailing links, Panhard rod, anti-sway bar

STEERING

Type	recirculating ball, power-assisted
Turns lock-to-lock	2.8
Turning circle curb-to-curb	35.8 ft

BRAKES

F:	10.0-in dia vented disc, power-assisted
R:	9.5x2.0-in cast iron drum, power-assisted

WHEELS AND TIRES

Wheel size	6.5x13-in
Wheel type	Cromodora cast aluminum alloy, 4-bolt
Tire make and size	Pirelli CN-36, F: 215/60HR-13 R: 235/60HR-13
Test inflation pressures, F/R	30/30 psi

PERFORMANCE

Zero to	Seconds
30 mph	3.2
40 mph	4.6
50 mph	6.6
60 mph	8.9
70 mph	11.6
80 mph	15.1
90 mph	19.5
100 mph	25.9
Standing ¼-mile	16.9 sec @ 85.5 mph
Top speed (observed)	112 mph
Road holding, 200-ft dia skidpad	0.76 g

Continued