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We Test the

TURBINE CORVETTE

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The Turbine Corvette

". . . because he likes to go fast"

by Peter Frey

BOB D'OLIVO

Road Test

It seemed a most unlikely thing that we were doing. On a typical sunny California afternoon, we were howling down Sunset Strip in a turbine-engined Corvette, leaving a wake of shimmering air and astounded onlookers. Under the hood, the source of the

jet-plane noise the car made, was the same engine that powered the very first turbine Indy car, the one in which Parnelli Jones led the 1967 race for 198 of the 200 laps before the transmission broke. At the wheel was a man who had been a crewman on that car during the race: Vince Granatelli, son of Andy, mechanic extraordinaire in his own right and, for awhile, our chauffeur into a jet-powered fantasyland.

These days, Granatelli owns a company called Pit Stop Service in Van Nuys, California, that specializes in one-at-a-time projects such as building turbine-engined Corvettes. Cars with turbine engines are not a new idea, but they are still unusual and are most frequently built for racing, or by a manufacturer in search of alternative powerplants and publicity. In this case, however, the car exists to satisfy the passions of two men. Vince Granatelli always wanted to build one, and a wealthy friend of his named Herb Orlowitz wanted to own one and had the discretionary income to afford it. Orlowitz owns a company called Corprajet that leases executive jets. Like most men involved with jet airplanes, he has a passion for fast cars and has a stable of high-velocity machines, two of which Granatelli built for him. One is a turbocharged Chevrolet Monte Carlo, and the other is a Corvette with a 535cid engine and nitrous oxide injection for those times when the normal 500 horsepower just isn't enough.

Granatelli explained that the project was born when Orlowitz called him and said he wanted a new car, one that was *really* fast. "I told him that I had restored one of the Indy turbine cars that we ran there in '68, and I offered to sell it to him, figuring that he could rent a racetrack some weekend and give himself a real thrill without being too dangerous. Then he asked me if we could make it street legal, and I figured I'd better not sell him the car or that's what he'd do with it. I had four engines left over from the Indy program, so I told him that if he wanted a turbine-engined street car, I'd build him one."

A Corvette was chosen as the basis for the project for two reasons: its high-performance capabilities were a known factor, and the front end was long enough. The Pratt and Whitney ST6B

Turbine Corvette

gas turbine engine is almost three times as long as a conventional V-8, so the distance between the firewall and the front of the car was a critical dimension, and the Corvette fit the requirement, if only barely. In order to make room for the engine, the entire nose of the car was turned into a fiberglass shell with all internal structural components, bumpers, chassis panels and the radiator removed.

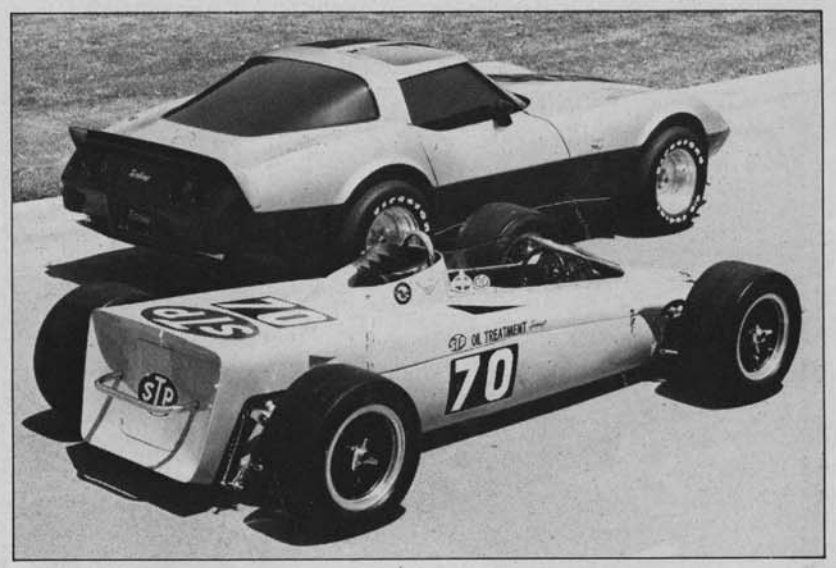
The engine actually was designed as a stationary powerplant, such as those used to run generators in oil fields, rather than for use in a plane or car. Off the shelf in 1966, it cost $37,000. Today, that same engine, if bought new, would cost $107,000, and as a further example of the soaring costs of aircraft-related parts, Granatelli states that what would be comparable to a major overhaul for a normal gasoline engine would cost $35,000 for the turbine.

The operation of the engine itself, as intimidating as it might seem, is the essence of simplicity. The internal shaft to which the turbine blades are fastened is in two halves. The front half is where the combustion takes place, and the back half is powered by the force of the expanding gasses from the front half. At 100% throttle, it turns 37,500 rpm and produces 880 horsepower and 1161 pounds-feet of torque. A Pratt and Whitney reduction gearbox is attached to the back half of the engine, bringing the rpm down to a manageable 6230 rpm at the output shaft. The power is transmitted through a modified Turbo 400 3-speed automatic transmission, a much-strengthened driveshaft, and a 3.08:1 rearend.

The installation of the engine required some fairly extensive engineering, although according to Granatelli it was all fairly straightforward and presented no real problems. To compensate for the front end structure that was removed, special subframe bracing had to be added underneath. The exhaust system is a story in itself, with Granatelli citing the example that if eight turbocharged Indy Cosworth motors were run at top speed, they would produce the same amount of exhaust gas flow as the turbine—which ruled out any sort of a conventional exhaust system. He solved the problem by constructing a flat box that covers almost the entire underside of the car, attaching to the engine exhaust port at one end and exiting the gasses through a rectangular opening that stretches all the way across the rear of the car.

Massive ventilated NASCAR-style disc brakes were fitted to all four corners, a move made necessary by the fact that the car will, on level ground, idle at 60 mph. In around-town driving, the speed was controlled by applying the brakes rather than the throttle. Behind the seats, occupying all of the car's luggage space, was a carpeted box containing the six batteries needed to give the engine the massive jolt of electricity needed to start it.

All of this unlikely hardware was concealed beneath a stock-looking body done in an absolutely beautiful black and silver paint. With the blacked-out windows, Centerline racing wheels and huge tires, it looks at first glance simply like a mean-looking Corvette. An observant onlooker might wonder about the strange box underneath the car, but he would have no real clue that there was something unusual about the car until he got a look at the dashboard. The panel in front of the driver now contains three very aircraft-looking gauges labeled Speedometer (which performs the normal function) and Gas Generator and Output Shaft (which measure the output of the two halves of



the engine). The remaining gauges have been replaced with digital readouts, and there is a control panel on the console that contains the three buttons that start the engine and a gauge that monitors the critical Turbine Inlet Temperature. Adjacent to the driver's right knee is a chrome T-handle that controls the fuel supply to the engine.

Starting the engine was a procedure that we preferred to let Granatelli handle, even after he had explained the process. It required a careful timing of button-pushing and gauge-watching, which produced a series of pumping, whining and whistling noises. The final procedure was to push in the fuel control T-handle, and the engine lit up with a roar. The idle was so smooth that, were it not for the noise, it would have been difficult to tell that the engine was running.

During our first ride in the Turbinevette, Vince gave it a little squirt of throttle on a lightly trafficked stretch. The acceleration was impressively strong, and the turbine noise level added considerably to the impression of speed. When we commented on how

Parnelli Jones offers his analysis . . .

Parnelli Jones is a man who has figured prominently in the lives of two generations of Granatellis. Looking only slightly older now, twelve years after his near-historic run in Andy Granatelli's STP turbine car, his trim physique, maintained by five-mile runs at sunrise, he has a justifiably self-assured attitude and a subtle something that says he is every bit the man he was. He still looks as though he can take any machine to its limits and give as good as he gets, and then some, in any battleground, be it boardroom or race track.

As a part of the pre-race pageantry before the 10th annual running of the California 500 at Ontario Motor Speedway, Jones was the driver of Vince Granatelli's turbine-powered Corvette for a 5-mph parade lap, then for two exhibition laps around the 2.5-mile oval "at speed."

He emerged from the car smiling, and offered the instant, exuberant reaction, "It's fantastic!" Elaborating, he analyzed the car as " . . . a real hot rod. It's not something you would turn just anybody loose in, but the engineering of the car is so good that it feels like a tremendously fast street Corvette that happens to be powered by a turbine engine."

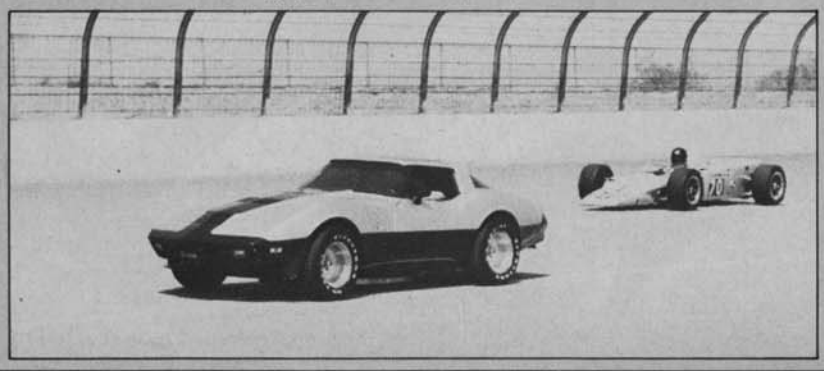
Jones stated that he had driven the car previously on an evening when Granatelli showed up at his house and the two men had gone for a checkout drive. "I was impressed with how fast and smooth it felt, but I didn't really have a chance to get on it too hard." When questioned about how hard he pushed the car during the exhibition laps, he replied, "I only ran it up to about 160 mph down the front straight. With street tires on the car, that's about as fast as I care to go, but the car felt like it was loafing along. There was plenty of top end left that I never got into."

He analyzed the car's driving characteristics, commenting that, "Straight-line stability was good, and it handled through the turn pretty much like any Corvette." Jones went so far as to compare its performance with racing cars, saying that, "I've raced at this track in NASCAR-type stock cars, and with their racing tires and more highly modified suspensions, they turn better lap times, but they don't accelerate as fast as the Corvette, and they don't come out of the corners anywhere near as quick. The torque of this engine is tremendous."

When questioned about his feelings on the potential of turbine engines in cars of the future, Jones offered that, "I know several manufacturers are experimenting with turbines, and the success of this project, coming from a comparatively small operation like Vince's, should show them that it can be done if they really want to do it."

Since the car was specifically designed to be the fastest, most exotic, most overwhelming machine possible, a question about its emotional effect on him, in light of all his experience, seemed an appropriate closer. He replied, "I've built and driven some of the fastest racing cars in the world, and I gotta tell you, I got a real kick in the butt out of driving that Corvette." —*P.F.*

"Now listen, Parnelli, if you break the sound barrier, the neighbors are gonna complain, so just give it half throttle." Car builder Vince Granatelli (Andy's son) gives Parnelli the word before they hit Ontario oval for pre-California 500 spin in turbine Corvette. Below, Parnelli and Vince take a low line as uncle Vince Granatelli (Andy's brother) goes by in Indy STP turbine car driven to near victory by Joe Leonard in 1968.



fast the car felt, Granatelli replied, "That was only about 75%. Wait until we get out to the dragstrip before you form any impressions."

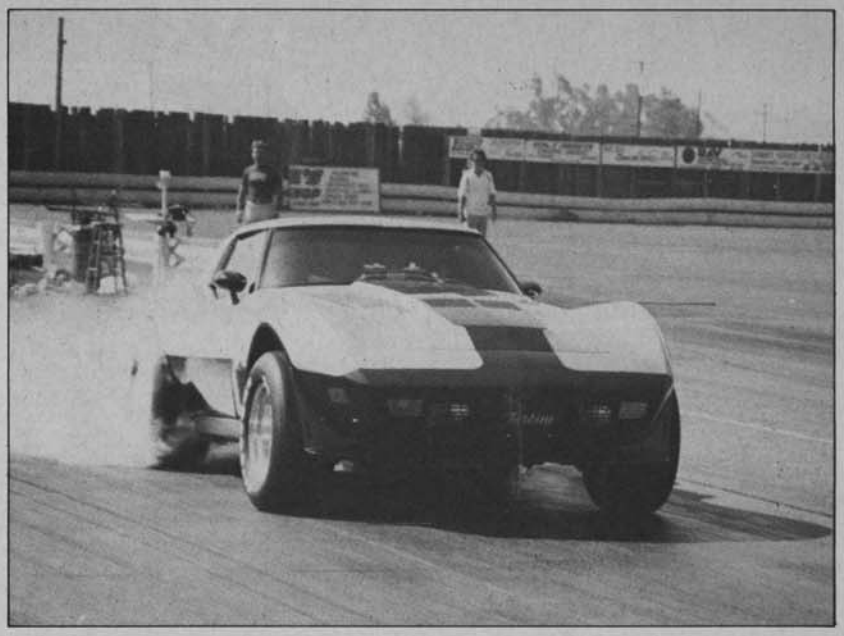
Our first session was marred by a series of problems—first with our test equipment, then with the car. We had made a number of tire-smoking starts off the line—which the car is not designed for—and finally broke a retaining clip in the driveshaft U-joint. A subsequent session, with a more restrained starting procedure, produced a quarter-mile time of 12.0 seconds and a speed of 111 mph, which, for a street car with a 180-mph top end, is impressive.

Our best run, which achieved a delicate balance of acceleration and wheelspin, left a pair of parallel streaks down the race track for 1270 feet, with darker patches that indicated the transmission shifts. Though the numbers are impressive, they cannot convey the tremendous rush of sensations that occurs when the car is at full throttle. There is almost no vibration from the engine, but there is a waterfall of noise, and acceleration that literally pinned us back in the seats. It took a definite effort to keep both hands on the wheel. About 3 seconds after launching off the line, the scenery out the side windows became a rushing blur.

The street portion of our test was an afternoon's jaunt that took us down Sunset Boulevard to the beach, up the Pacific Coast Highway to a canyon road that winds through the Malibu Mountains, and back down to the highway again. It was a completely invigorating run proving that while the car is not totally practical in the turbine-powered-transportation-for-the-masses sense, it is perfectly streetable and does exactly what it was designed to do: go faster than almost anything else on the road today.

The ride quality was on a par with a normal Corvette, as was the handling, once the necessary two-footed driving technique was mastered. On the highway, the element for which it was specifically designed, it was an effortless cruiser that would, with just the barest application of throttle, cause the other cars on the road around us to appear to be backing up. The whine of the engine, which was intrusive at first, eventually became no more than background noise that was scarcely noticed amid all the other sensory inputs the car provided.

Driving the car down the highway back to the office after having had enough time in it to finally begin feeling comfortable, we came to the point of envying the man who will have it at his disposal, to drive whenever the urge strikes him. Granatelli justifies the existence of such a car: "I built it for my friend Herb, because he likes to go fast." If that is in fact the case, Herb should like this car a lot. As for Granatelli, he's a great believer in the future of turbine power for passenger cars. And he still has a couple of engines remaining . . . MT



SPECIFICATIONS

GENERAL

Vehicle type	Front-engine, rear-drive, 2-pass. coupe
Base price	N.A.
Options on test car	Gas turbine engine, air conditioning, tilt/telescopic wheel, glass roof panels, AM/FM cassette, power windows, power antenna
Price as tested	N.A.

ENGINE

Type	5T6B gas turbine, compressor type: front axial, rear centrifugal
Compression ratio	6.0:1
Fuel system	Bendix DPF2 fuel control
Recommended fuel	Jet A
Emission control	N.A.
Valve gear	N.A.
Horsepower (SAE net)	880 at 6230 rpm
Torque (SAE net)	1161 lb.-ft. at stall
Power to weight ratio	3.86 lb./hp

DRIVETRAIN

Transmission	3-speed automatic
Final drive ratio	3.08:1

DIMENSIONS

Wheelbase	98.0 in.
Track, F/R	58.7/59.5 in.
Length	185.2 in.
Width	69.0 in.
Height	48.0 in.
Ground clearance	4.0 in.
Curb weight	3410 lb.
Weight distribution, F/R	41/59%

CAPACITIES

Fuel capacity	25 gals.
Crankcase	2.0 gals.
Cooling system	N.A.
Trunk capacity	N.A.

SUSPENSION

Front	Independent, unequal-length A-arms, coil springs, stabilizer bar, hydraulic shock absorbers
Rear	Independent, transverse leaf spring, lateral struts, control arms, stabilizer bar, oil/air shock absorbers

STEERING

Type	Recirculating ball, power assist
Turns lock-to-lock	2.9
Turning circle, curb-to-curb	37.0 ft.

BRAKES

Front	12.187-in. vented discs, power assist
Rear	12.187-in. vented discs, power assist

WHEELS AND TIRES

Wheel size	15 x 8.5 in.
Wheel type	Aluminum alloy
Tire make and size	Firestone HR 60 x 15
Tire type	Radial

TEST RESULTS

Recommended pressure, F/R ..... 28/28 psi

ACCELERATION

0-30 mph	1.8 secs.
0-40 mph	2.8 secs.
0-50 mph	3.2 secs.
0-60 mph	3.6 secs.
0-70 mph	4.7 secs.
0-80 mph	5.9 secs.
Top speed	180 mph
Standing quarter mile	12.0 secs./111 mph

BRAKING

30-0 mph	42 ft.
60-0 mph	160 ft.

FUEL CONSUMPTION

EPA city	N.A.
MT 73-mile test loop	N.A.

SPEEDOMETER

Indicated	30	40	50	60
Actual mph	30	40	50	60

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