

Cars with Jet Engines

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In the late 1940s, the U.S. auto industry started an exciting experiment and spent decades on it. One result came in '63, when the Turbine was introduced by Chrysler Corp., now a part of Fiat Chrysler Automobiles (FCA).

In appearance, the two-door, four-passenger car looked like a regular car, but it wasn't. Under its sleek shell, the car had a jet engine.

The engine was the experiment, an effort to learn whether a jet engine—that is, a gas turbine—could be used as a car engine.

This experiment involved many cars and major technical problems, but it can be represented with just three cars. In '54, the car was a General Motors test vehicle, the XP-21 Firebird. It used a gas turbine, but it wasn't like a regular vehicle. The one-seater car looked like a jet plane on wheels.

That was OK, though. In a '54 brochure, GM explained it built the XP-21 "only for the proving ground and test track."

By '56, GM had made strides with its turbine-powered car and introduced the XP-21's successor, the Firebird II. Back in the April issue, the Firebird II was featured as an early effort toward creating an autonomous vehicle. And it was that, but the car was also part of the jet engine experiment.

In the Firebird II, one major stride was: the car looked more like a regular car. In its brochure, the Firebird II was billed as "the gas turbine family car," a four-seater, comfortable and effective for a family. It still looked a lot like an airplane, though.

Another major stride was the operation of the turbine engine. Actually, the engine consisted of two turbines: the gas turbine and a power turbine. In its XP-21 brochure, GM said the gas turbine "closely resembles a complete small jet engine."

Reading the XP-21 brochure and the Firebird II brochure, you get a good explanation of how the turbines worked together.

At the front end of the gas turbine was its compressor, where air entered the car's engine. After the compressor, the air passed into the turbine's two combustion chambers and was heated by burning the car's fuel. Then, the hot gas was funneled through the turbine's back end.

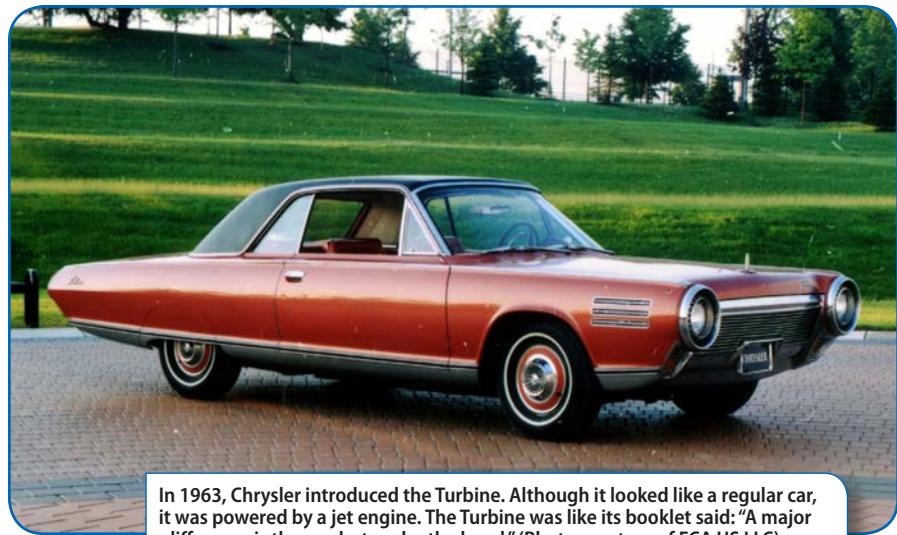
In a jet plane, the gas would've been forced through a tailcone, creating the high-velocity thrust so the plane could fly. In the Firebirds, the gas was funneled toward the other turbine. The power turbine was designed like a windmill, it spun as the gas rushed by, and it was connected to the car's driveshaft, which sent power to the rear-wheel transmission.

In a car, though, a gas turbine presented problems. It burned a lot of fuel, lost a lot of heat, and made a lot of noise.

Those problems, encountered in the XP-21, were fixed in the Firebird II, and the solutions were discussed in the Firebird II brochure. The engine was changed so it would take heat from the exhaust gas and recirculate it back to the gas turbine's compressor. There, the heat combined with the cooler, incoming air, warming it part of the way to the engine's operating temperature. The engine then burned only enough fuel to bring the air the rest of the way up to that temperature.

As GM noted, the Firebird II's recirculating system recovered more than 80 percent of the heat in the exhaust gas, so the engine offered "fuel economy approaching that of present piston engines."

The system also solved the heat problem. GM noted "that exhaust temperature is lowered as much as 1000



In 1963, Chrysler introduced the Turbine. Although it looked like a regular car, it was powered by a jet engine. The Turbine was like its booklet said: "A major difference is there—but under the hood." (Photo courtesy of FCA US LLC)

degrees," making the exhaust "pleasantly warm."

GM fixed the noise problem by modifying the Firebird II's front end to include a "silencer"—GM's word—so "the car is as quiet as most automobiles of today."

After the Turbine in '63, the jet engine experiment included other cars and continued for years. The three cars, though, suggest the auto industry's interest in the experiment. After all, it's no small thing to take a turbine-powered car from test-track experiment to production vehicle. The Turbine was only a limited production car, though. And eventually, the experiment ended.

Still, working on those cars must've been great for the auto engineers. Each day, they worked on a project that challenged their skills and fired their imaginations. Exciting days, no doubt. **PTE**