Oxnard's GoTek hopes to power fuel efficient vehicles

Oxnard-based company gets patent for rotary engine

BY: Allison Bruce
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OXNARD, Calif. - A new engine from an Oxnard-based company could one day power more fuel-efficient vehicles.

The DynaKinetic rotary engine from GoTek Energy Inc. recently received its first U.S. patent covering the base engine, compressor and pump. Having a patent gives the company additional credibility with investors and potential clients going forward, company leaders said.

Having a patent increases the value of the company, said Scott Farrenkopf, GoTek's executive vice president.

"It's a validation that the technology is unique and novel," Farrenkopf said, "and it gives us monopoly rights to develop it."

The DynaKinetic engine is a rotary engine, far different from the piston engines found in vehicles today. It is also considerably different from other rotary engines that have been on the market, such as the "Wankel engine" Mazda put into production in 1965.

GoTek chief executive officer and engine inventor Steve Herbruck remembers driving a Mazda RX-7 with a Wankel engine.

"The engine was so smooth, I thought it would overtake the piston engine," he said.

But, issues, including seals wearing out and high fuel consumption, arose and kept

the Wankel engine from being widely adopted by the automotive industry.

Better engine

Herbruck was finishing a project for an oil and gas company in 2007 when he decided to revisit his interest in creating a better engine. He built his first prototype in 14 months and under budget, but had concerns that almost made him abandon the project.

He took three days off and "on Day 2, a new design popped into my mind," he said.

That design resolved the earlier concerns — and resulted in the engine that recently received a patent.

Investors and advisers recognize the perseverance of GoTek's leaders as they work to create a viable engine.

"It is just a different approach to internal combustion engines," said Jackson Stewart, president of Unitech Racing. Herbruck approached him several years ago to discuss his ideas for a better engine.

"He seemed to have some unique ideas and only time would really tell if they would play out in the real world," Stewart said.

Demand for fuel-efficient internal combustion engines will continue to grow, according to a 2012 report by MarketResearch.com.

The report notes most conventional internal combustion engines convert only 30 percent of fuel into usable mechanical energy in ideal conditions, with the number dropping to 15 to 20 percent in most normal operating conditions. The rest is wasted in friction, heat, incomplete burning and other inefficiencies, according to the report.

"That's kind of a travesty," Farrenkopf said. "It's been that way for hundreds of years. Most of the improvements have been on accessories, not really been on the base engine itself."

What sets GoTek's engine apart is how it is designed and built. Rather than sliding, cylindrical pistons, the engine has "pivoting rockers" that are more efficient when converting combustion into rotational energy to power a drive train or pressurize and move gases and liquids, according to the company. The DynaKinetic's circular rotor inside of a circular housing addresses problems found with the Wankel engine, reducing the wear on seals and making more efficient use of fuel, GoTek reports.

The DynaKinetic engine also works well with gasoline, diesel, natural gas and other fuels, making it "fuel agnostic," according to the company.

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This adds up to an engine that is likely to gain attention across industries, from stationary power generation to vehicle engines to compressor and pump applications, such as agricultural pumping.

"It's applying new innovation to old ideas and coming up with a solution," said Jamey Power, an investor who sits on GoTek's strategic advisory board. "It's more than an adaptation — it's a new engine design."

Power, a former executive vice president with J.D. Power and Associates, said his involvement with GoTek stems from his background and interest in the automotive industry, his curiosity about new technology and GoTek's innovative approach.

The DynaKinetic engine has fewer moving parts than piston engines, making it more streamlined to manufacture and less likely to break down. The engine also is significantly lighter than a piston engine, which means better fuel efficiency.

Power said the engine stands out because it has a simple design.

"There's an elegance in simpler designs that are more efficient," he said.

Herbruck said they designed the engine with the manufacturing process in mind and fewer parts mean more manufacturing savings.

"We didn't design the engine and then figure out at the 23rd hour how we were going to make it," he said.

Much of the funding for GoTek so far has come from mid-size corporate strategic investors who see the potential and could end up being suppliers, partners or customers. Because of these strategic partnerships, GoTek is able to draw on resources from those companies as it develops the engine.

For example, GoTek has to date worked out of Willis Machine in Oxnard, relying on that company's employees and machines to manufacture parts to test in the engine.

While GoTek plans to hire around 10 people in areas such as engineering, machining, drafting and quality control with its next round of funding, the use of the Willis location has helped contain costs. Willis, in return, gets the opportunity to be an initial supplier for GoTek.

Owner and President Harlan Willis said Herbruck approached him with the idea for a new rotary engine, and the pairing seemed right, since Willis had the machining capabilities GoTek needed.

"I've got to admire them because of the dedication and the time they put into this," Willis said. "It's gratifying to see somebody with the fortitude to go after something they believe in."

Having started Willis Machine in his Ventura County garage nearly 30 years ago, Willis said it's nice to be able to support a local startup.

"They just won't quit," he said. "They just keep tackling one hurdle after the other. Nothing discourages them."

Another partner, Venco Western, sees potential for the engine in its street-sweeping vehicles. That gives GoTek a fleet of vehicles where it can eventually test its engine.

Different fuels

The partnership with Venco Western led to the realization the engine could run on different kinds of fuel. While fuel was not an initial consideration in the design, when Venco's owner asked if it could work with natural gas to create a fleet of vehicles with lower emissions than the current diesel fleet, they found the engine could work well with natural gas and other fuels.

That's because the design doesn't have a lot of moving parts that need lubrication from the fuel the way a piston engine does, making it ideal for fuels that don't lubricate the way gasoline or diesel does.

While the company would love to stay local, it may depend on where future strategic partners are based and what their needs are for the engine, Farrenkopf said.

GoTek's leaders expect to build the engines where they will be used. "We hope to get some U.S. customers excited first," Farrenkopf said. "Once we have that, it would be the cookie cutter to duplicate everywhere else in the world."

GoTek Energy

Headquarters: Oxnard

Incorporated: February 2011

Company: Private California C-corporation

Product: DynaKinetic engine, which has applications including as a vehicle engine, stationary power generation, pump and compressor.

Leadership: Steve Herbruck, chief executive officer, is an inventor and entrepreneur who previously led WellSonic;

Lydia Cole, chief operating officer, is an entrepreneur who previously owned a production and tooling machine business and owns an executive high-technology recruiting firm;

Brian Aikens, chief financial officer, has more than 30 years experience overseeing finance and accounting for corporations working with federal, state and local governments;

B. Scott Farrenkopf, executive vice president, has worked at Schneider Electric Corp., Delphi Corp. and General Motors Corp., runs his own consulting firm and

invested in and advised several startup companies.

By the numbers

According to GoTek Energy, when compared with a piston engine, the company's DynaKinetic rotary engine is:

Estimated to be 15 percent more efficient

Weighs 71 percent less

Runs at 50 percent of the RPM

Has 76 percent less moving parts

Source: GoTek Energy

This story is part of an occasional series on how Ventura County technology companies are impacting people. If your company fits that profile and you would like to be part of the series, send information about your company and a contact number to DeAnn Justesen at dajustesen@vcstar.com.@vcstar.com.


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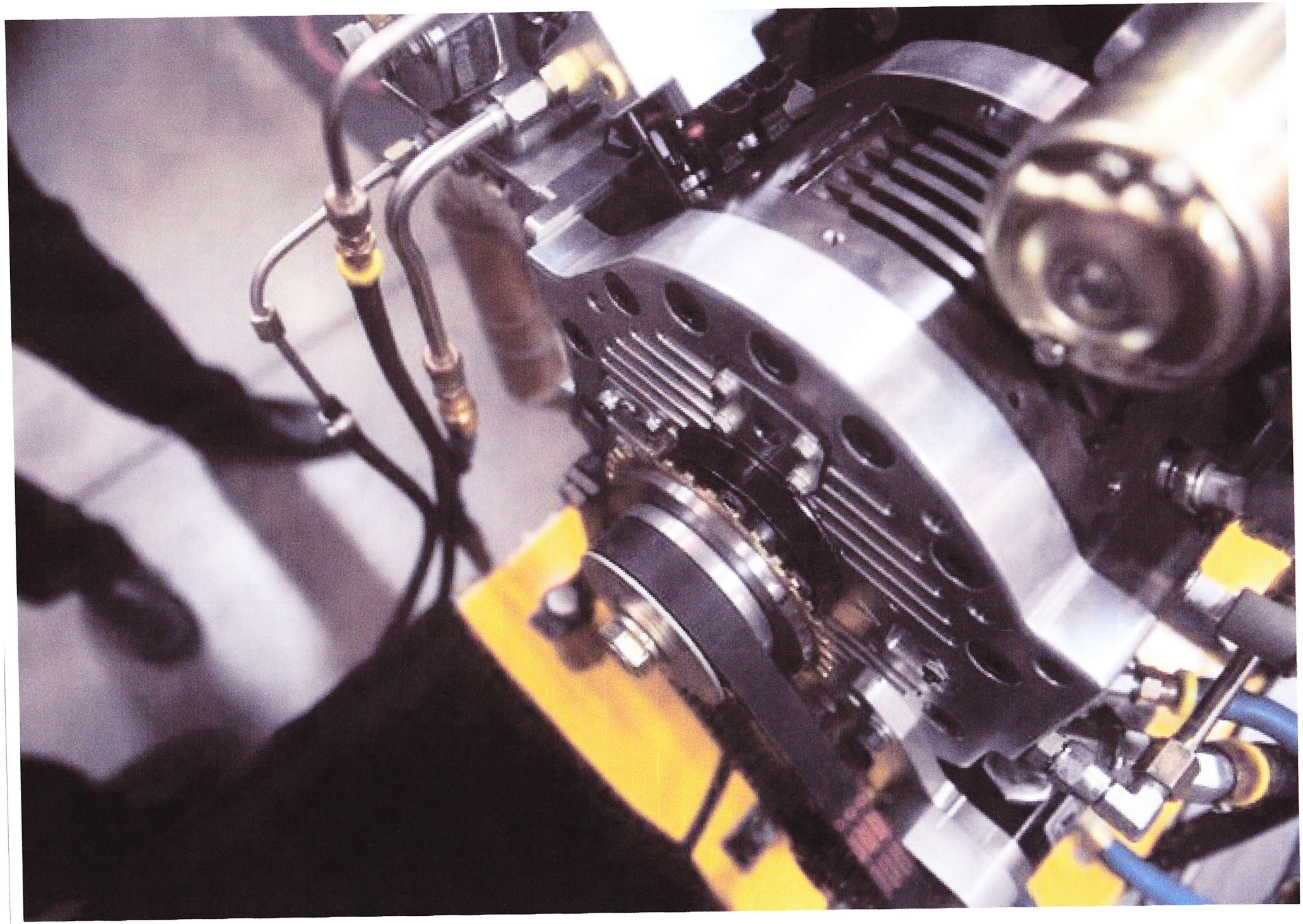

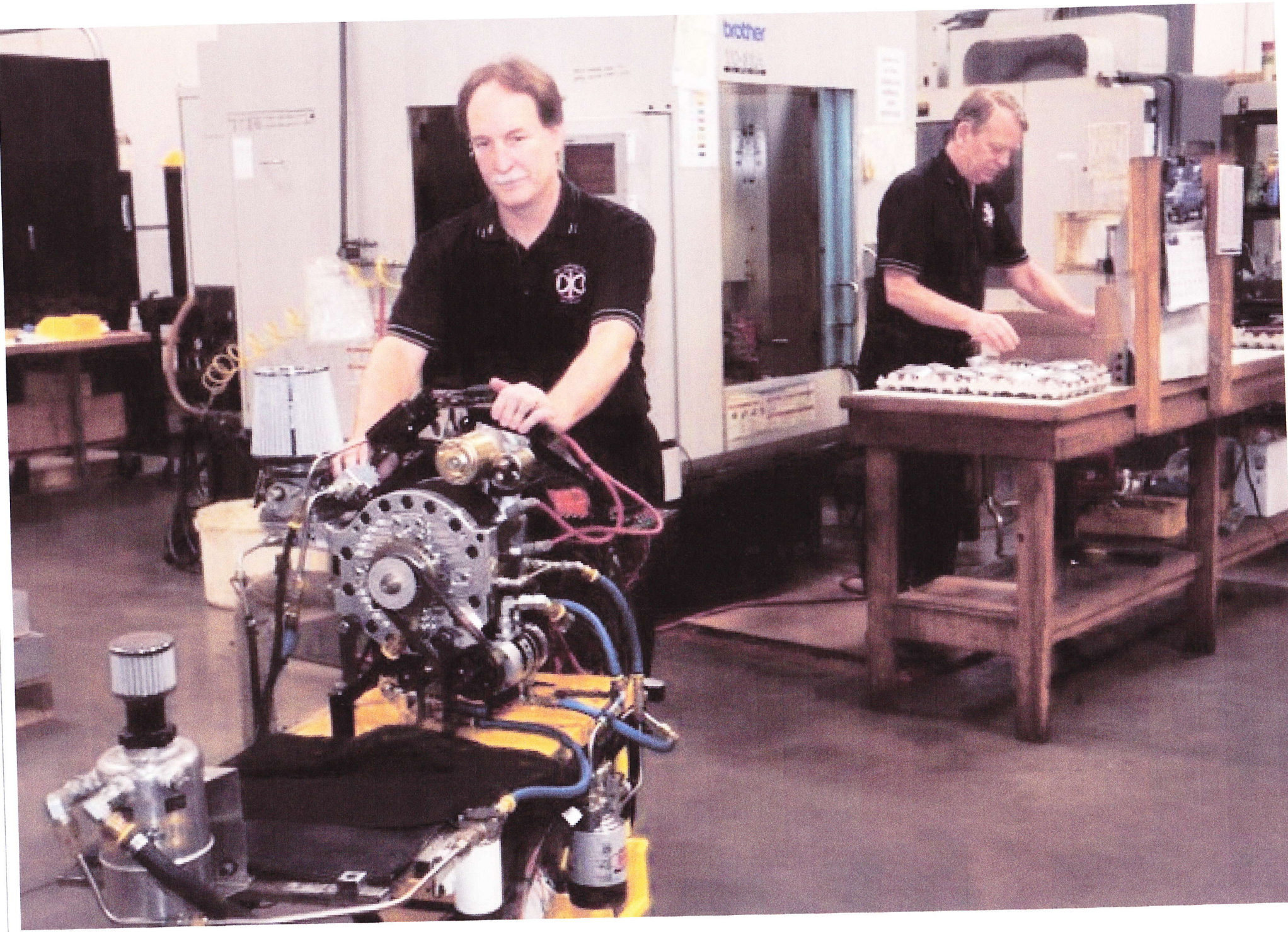
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