



Leading the charge

Konrad Krusche converted a 1974 Triumph Spitfire from gas-fuel to electricity for school project

Words by Bruce Campbell
Pictures by Brent Calver

So much for the traditional baking soda volcano school project. Sure, watching the phony lava pour over the top is cool, but it has nothing on a project by Strathcona-Tweedsmuir School Grade 11 student Konrad Krusche. He took a flood-damaged 1974 Triumph Spitfire and converted it from gas to electric power for his Grade 10 MYP personal project.

"It was just something new and cool," said Krusche, who lives in the Millarville area. "It's also fuel efficient and good for the environment. We also realized the potential of electric cars in the future."

It was a chance to restore one of his father Jack's college sweethearts.

"My dad had the car for a lot of his university years when he was at Dartmouth," Krusche said. "It was working until the 2005 flood."

Konrad was able to get the vehicle up and running last summer. It is currently sitting in Tyler Smith's autoshop, The Shop, in Turner Valley.

The project turned out to be a bigger grind than a new driver changing gears on a standard, which the Spitfire also happens to be.

"When I approached Mr. Deis (STS teacher Luke Deis) he seemed to think it would be really cool, but it would be kind of ambitious. It turned out he was right."

Initially, it wasn't cool at all — it involved getting on the internet to study and pulling books, not pulling wrenches.

"The first thing we did was about six months of research," he said. "We spent a lot of time looking at other builds and had to decide on every part — lead acid or lithium ion battery that was one of the biggest decisions. It was a lot of research."

Before they took on assembling the vehicle, a thorough cleaning job had to be done.

"We had to completely clean it one more time because of all the stuff from the flood – and then we took out all the gas related things I was sure that we weren't going to use. I think the first thing I removed was the gas tank."

The engine was hoisted out with the help of Smith at The Shop, where the majority of the mechanical work was done. Smith, a 2002 graduate of Oilfields High School, has worked on trucks which have raced in the Baja, but this was the first time he had worked on an electric car other than in training to keep up his expertise.

Smith and Jack Krusche had raced together in the Baja. It was the mechanic's second kick at the Spitfire.

"Jack had brought in the Spitfire after the flood to see if we could restore it, but we realized the brakes and everything were seized," Smith explained. "To get a chance to work on it again was exciting – that's what I like to do is make things work."

Konrad and his dad did months of work before ordering any parts. One of the first things that had to be decided was whether to keep the standard transmission. Since it was already there, why not?

"My theory was it has a clutch and if it has a clutch you have a disconnect," Smith said with a chuckle. "If you ever have a problem you can push in the clutch. That makes sense – especially for an experiment that you aren't sure is going to work."

There was a problem though — the transmission and the motor, which had to be connected, both had male electrical connections.

"We went to a machine shop and they made a piece and he was able to connect them both," Krusche said.

The controller, which sits on top of the motor, also had to be installed.

"It's kind of the brains of the entire car," he explained. "It allows you to hook up to your computer. You can change all the settings for the motor, speed, acceleration that was really fun."

"Then as we went along, we found out we were missing a few nuts and bolts and that all got smoothed out. Most of the actual physical work was quite simple, because we had Tyler with us. He was just amazing."

Finally, it was time to get the Spitfire rolling. The first time it got fired up, it moved but glaciers and snails would have left the classic Triumph eating their dust.

"We hooked up the wires, we finally think we have things in the right order, I jump in and they tell me to back it up and it's reading four rotations per minute," he said with a smile. "Most RPM monitors, when it reads '4' it means 4,000. We were doing four."

"Obviously, we had something wrong, but it was moving. We backed up about



Above: A bank of batteries and an electric motor replace the gas engine in a 1974 Triumph Spitfire being converted to run on electrical power.

Below: The original badge adorns the weathered hood of the roadster.



Right: Srathcona Tweedsmuir School student Konrad Krusche and Turner Valley mechanic Tyler Smith have made a project out of the electric Spitfire.



three inches, stopped and we had another three weeks of troubleshooting... It was just a lot of wiring and fiddling around. I learned to be patient with this project."

Krusche said getting the lights to work was the most frustrating part, due to Mother Nature and a 12-year-old flood.

"It was the last part before driving around — we are there, ready to drive, but we can't signal, reverse, brake — well, you can, but none of those lights work," he explained. "We couldn't do anything formal for quite some time.

"Because it was in the flood, the old wires started to rust and corrode, most of the lights were burned out, some of the fuses would blow out, so we just started to replace things. I got a set of headlights for Christmas in December (2017)."

The car actually got up and running last summer at The Shop in Turner Valley.

"I drove it — Tyler and I drove it around the block — we had lots of video of the 'victory lap,'" said Krusche, who had his learner's licence at the time. "I was so excited. Then it was back in the garage and working on it again."

At present, eight car batteries power the vehicle. When it is started, it is silent, like turning on a light switch. Although it is insured and has licence plates, there is some fine-tuning to be done, with the heater, windshield wipers (the wipers use the same little motor from before the 2005 flood) and other details before Krusche hits the road. He plans to drive it from home to school, about a 44km round-trip, in the spring and for his senior year.

"It's a fun little car to drive," Krusche said. "There's a cool feeling to driving an electric car, because you

are not burning fuel. It also accelerates very quickly. It feels like a sports car, which is what we were aiming for."

Smith said the Spitfire is capable of speeds of its 1970 days, well over 100km-per-hour — though not recommended for the winding roads from Millarville to STS.

Krusche estimates it takes about 11 hours to charge. He is currently plugging into a typical wall socket.

"We're estimating will get about 100 km per charge, that will get me to school and back a few times," he said.

The student's effort wowed his instructor, STS teacher Luke Deis, who said he went beyond the call of duty.

"Konrad and I were paired up for his MYP Personal Project because of our shared interest in cars," he said.

"The research required to convert an old Triumph Spitfire from its original power plant to an electric replacement would have been easily sufficient to meet the criteria for the assignment. Konrad not only did this research, he actually converted an old British sports car to electric propulsion.

"He and his dad committed a tremendous amount of time to realizing their plan, and the ups and downs along the way provided Konrad excellent learning opportunities. I hope Konrad is very proud of his work. Soon, he'll be able to drive to school in an orange electric Spitfire.

"How cool is that?"