

Waterloo Boy K Memories

Check out Emma Riese's impressive restoration of her late father's 1921 Waterloo Boy K 2 HP water-cooled engine.

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Emma Riese was only 14 years old when she started the restoration of her late father's 1921 2 HP Waterloo Boy, a gift to her mother, Lynda Riese.

1921 2hp Waterloo Boy K

Manufacturer: Waterloo Gasoline Engine Co., Waterloo, Iowa

Year: 1921

Serial no.: 210665

Horsepower: 2 HP (no rpm specified)

Bore & Stroke: 3-1/2 x 5in

Flywheels: 18-1/4in x 1-3/4in

Ignition: Webster Magneto with igniter

Governing: Throttle

Fuel: Kerosene

Cooling: Hopper Cooled

After her father, Bryon Riese, died two years ago, Emma Riese landed on an unusual way to pay homage to him: restoring one of Bryon's gas engines in his memory. She was 14 years old.



The engine's original tag looks a little worse for wear, but shined up nicely.

And not just any engine, but a rare 1921 Waterloo Boy K 2hp water-cooled engine that Bryon bought to restore for his wife, Lynda, Emma's mother.

Emma did have something of a background in gas engines. "When I was young, I always went to shows with my dad, helping him load and unload the engines, fill them with oil and grease," the now-16-year-old high school junior says.



Emma Riese with the Waterloo Boy before the start of restoration. It took two years to get the engine into its present, restored condition.

For the restoration, she had a willing helper: her father's best friend, Jim Faith.

The 1921 was in very poor condition, with broken pieces, Emma says, which meant getting needed parts from a donor engine. Finding one of the correct vintage with the correct and necessary parts took a while. The engine they found was a Wonder engine built by Waterloo for the Wonder Construction Machinery Co. in Waterloo, Iowa, for their cement mixers.



Emma and volunteer Mike Albright work on stripping the Waterloo Boy's engine base. Here they're shown coaxing the gas tank from the base.

Emma says finding the donor engine was the most difficult part of the project. "After Jim's workers found one, I was pretty excited, because we could get started restoring my dad's engine at Jim's workshop." The donor engine had to be taken apart, which, Emma says "was pretty hard, because the engine was extremely rusty. We removed pieces and put them on a table with the parts in groups or separated as needed so they wouldn't get mixed up. I did mostly simple stuff, like putting penetrating oil on the rusted bolts and using muscle to remove them. It also took a while to get the stuck key out of the flywheel. Until then I hadn't realized a key kept the flywheel attached to the crankshaft, and I was surprised by the flywheel's weight. It was pretty heavy, that's for certain."



Joel Faith uses one of Faith Engineering's massive lathes to clean up the flywheels. Most of us could only dream of having access to such fine equipment!

Then Emma sandblasted the donor parts to see which ones were usable. "We only had to make a couple of parts, so that Wonder was a pretty good engine for us."

Sandblasting was her favorite work, and she was surprised how clean the parts looked after they had been sandblasted, as she'd never done that work before. "They were silver under all that rust. Who knew?" She adds that painting parts was a close second for enjoyment for her.

Working the Engine

Machining the block on the Waterloo Boy was the biggest part of the project, Jim says. “The cylinder was completely worn out, so we bored it out and pressed a sleeve into it. We also machined and resurfaced the head itself, and where the side of the block unites the governor linkage to the governor ignitor. We machined the pistons and put new rings in it, and machined and trued the flywheels up, too. We made new valves and valve guides to tighten up the valves.”



Emma with the Waterloo Boy, stripped, cleaned and ready for reassembly.

Jim says getting the Waterloo Boy right was a lot of work. “Because it has a Webster magneto, which added even more complexity. So we made up a new sidearm and new side linkage, because the shaft that runs front to back was gone, and we had to make it all new. We put all new springs on everything, and we had to redo the bore and the carburetor.”

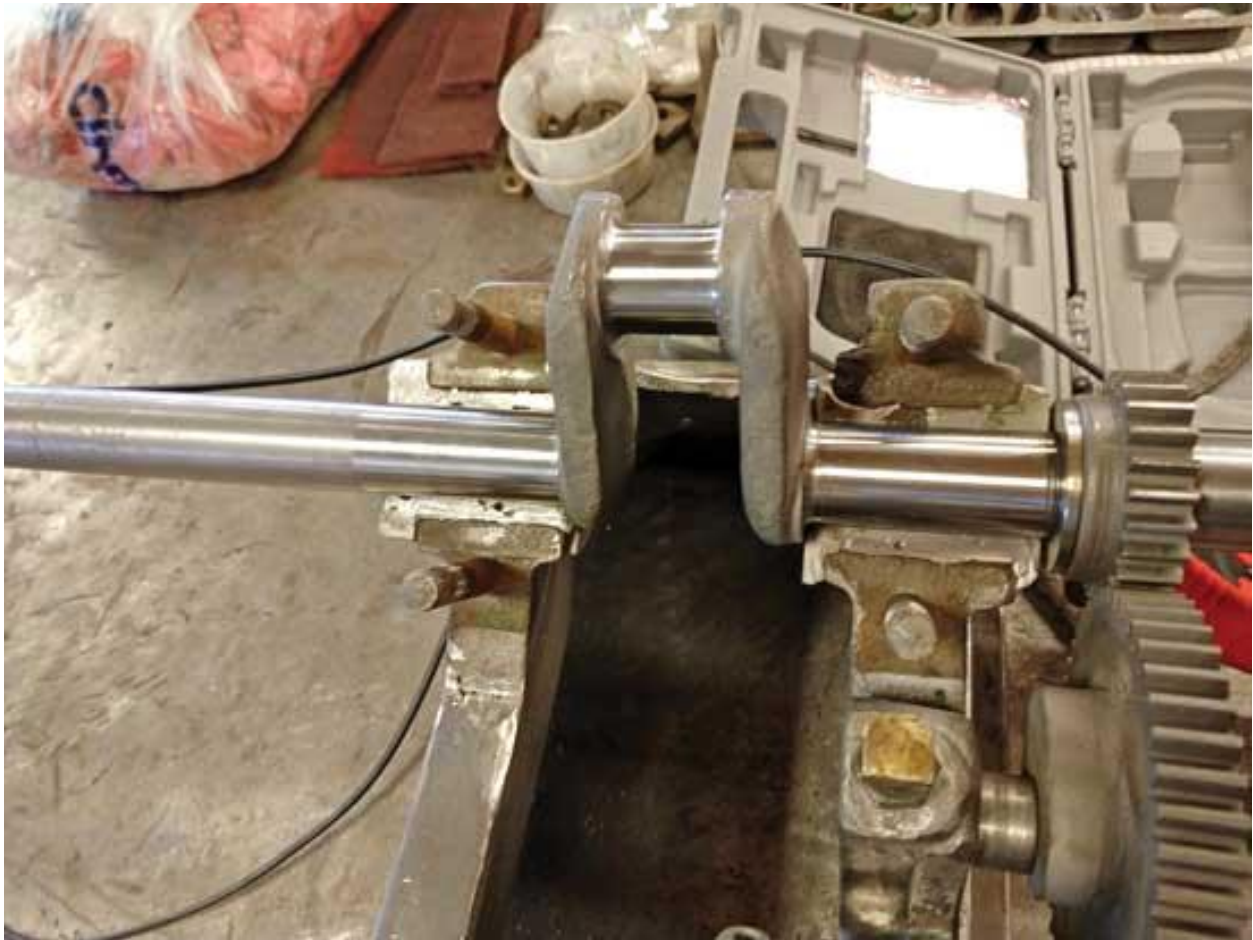


The engine starting to come together. The attention to detail in preparation is stunning.

The good news was that the bearings were in good shape. “We blued and rescraped the rod bearings and main bearings,” Jim says. “The connecting rods are really light, and this one had a broken connecting rod that had been welded. A lot of them blew apart due to the design and complexity of the governing mechanism. The real tricky thing here was the crank fender. Nobody makes aftermarket crank fenders, which are the guards on the back of the engine. So we had to hand-form a guard working from a picture, using an anvil and a block of wood. Otherwise we tried to use as much of the original parts as we could, including the original fasteners that came with it, with exception of one or two, and the grease cup.”

The Final Pieces

Once everything was finished, Emma helped put parts back on, including the gas tank oilers. “Simple stuff like that,” she says. At the start of the project, she knew a few engine parts. By the end, she knew them all, and what they did, thanks to quizzing from Jim, and the booklet he made with information on the engine and the work they’d done, along with photos for Emma and for the judges who will view the work she’s done as an FFA (Future Farmers of America) project. “Before it became an FFA project, it was just something we wanted to work on, as a memory to my father,” Emma says.



The Waterloo Boy’s crankshaft getting fitted to its bearings after cleaning and dressing.

After everything was set together, the big moment came to start the engine, Emma says she was pretty excited when it started. “I was excited, but worried that it would leak something somewhere. It did leak water a little bit, but nothing big.” At that point, Emma says she felt like her dad was with her. “I felt that every once in a while.” Jim agrees, saying there were times he sensed that his friend Bryon was there watching.



Emma checks the engine's cylinder bore using a digital micrometer as Mike looks on.

She says Jim and his guys did most of the hard work, finding the donor engine, machining all the parts and making the parts that needed to be made. "Working with Jim was fun, because I knew him before as one of Dad's close friends, so I knew him for a while before we started working on everything."



Getting close! Mary Jacobs did the beautiful pin striping and Rudy Adrian at Adrian's Magneto Service restored the magneto.

Emma said working on the engine, which they did over two years, working on Saturdays, never felt like too much. "I never felt like, 'I don't want to do this anymore,'" Emma says. It took two winters of work to get it finished.

Mom Is All for It

Emma's mother, Lynda Riese, said she was extremely happy when she learned Emma was going to work on the engine. "I wanted to see her continue with her father's engine, but also keep an interest in stationary engines," Lynda says. "Emma is the fourth generation of Rieves to work with the Rock River Threshere at Edgerton, Wisconsin," where Bryon's engines will be kept.



Emma and Mike trial fit the crank guard that had to be made for the Waterloo Boy. They're usually missing or in poor condition.

"She worked on the engine with a smile on her face. I wanted Emma to continue to have the understanding of what it would take to work on stationary engines. I wanted her to take it apart and put it back together so she knows how to make them run. It was Bryon's hobby, and I was good at handing him oil, gas or grease cans, but if a problem came up, I had no idea how to solve it. I wanted her to finish the engine in the Riese tradition, so I'm ecstatic that she wants to continue with it," Lynda says.

The fact that Emma enjoyed working on the engine wasn't a surprise to Lynda. "She likes getting greasy, so she was always in the dirt. I think she figured the dirtier she was, the happier she was. She liked playing with the tools and helping dad whenever he was working on farm

equipment, and she learned how to take care of the equipment, keeping it greased, and why. She learned that it's more than turning a key and going." Lynda says she's going to learn how to run the engine. "I knew about the engine before he passed. He never got around to do it, but now it's done. It's a pretty special feature in our family."

Showtime

When the engine was finished, Jim set up a presentation. "Jim presented the engine to me," Lynda says. "He had everyone who worked on the engine, and touched it there for me once it was completed and running. Oh, I was pretty ecstatic, and emotional. It was wonderful to see it running. It felt right."



The finished crank guard in place, work turned to finish assembling the mixer.

Many people already knew about the engine through Facebook, Jim says. "Once people found out that a girl was working on it, I couldn't believe the number of people who told me they were following the progress of the engine."



And it runs! The engine's first start, bolted to its new trucks and ready to present.

Lynda says she couldn't be more proud of her daughter. "I'm just very proud of her and where her interests are, and where she's at as a young person. I'm proud of her work ethic, seeing jobs through." Lynda wants to wholeheartedly thank Jim and Mike and the crew. "Kudos to them," she says. "Emma wouldn't have been able to do it without their help, time, energy and love. There's a lot of love in this engine, among everybody who knew Bryon, and doing it for me. I would like to thank them," Lynda says.

Appreciation

Jim says the time that he spends with his young charges is what he appreciates. "Kids don't get that as much as they used to, like in industrial arts and shop classes. If you take an interest in youth, they're willing to listen, and it's very rewarding," Jim says.

Jim says sometimes the work is easy, and sometimes it's not. "I try to let them do as much of the work by themselves as possible. I help with the fine details. Emma did all the disassembly, all the parts on the back, sandblasting and describing what we were doing. I ask questions of them as they're going through the process, so they're learning what's going on."



Lynda Riese with Emma after being presented with her late husband's restored engine. "It was wonderful to see it running," Lynda said.

Emma helped with the assembly, and helped paint it, Jim says. “The governor and linkages, a lot of that I helped with because it’s complex. But she also knows how to bump start it. With a smaller engine you don’t typically bump start it, but this engine did have a primer cup on it, though the original was broken. But we got her to do that in Baraboo, and videotaped it.”

Jim says he tries to work with each student at their level. “Some pick things up quick, and others struggle. Some will remember everything from the last session, and others will have forgot everything we just talked about. Emma took notes and wrote stuff down. At the end we do a bill of the material, of all the parts bought. We keep track of parts and receipts, which go into their photo binder, along with pictures taken throughout the project, so when they’re in competition at the fair they can explain the book to the judge, as well as a formal write-up about the process.”

Jim says people in the gasoline engine hobby are great. “There are a lot of really good people that I’ve had a chance to meet around every corner. There is a lot of connection with other owners, and I don’t know if there’s another hobby like this. Gas engine people are unique. We’re all doing different things, but are all involved with gas engines.”

Jim says the big thing in restoring the Waterloo Boy was to give tribute to Bryon Riese. “This engine was originally bought as a gift for his wife Lynda. So it’s kind of a cool story that after he passed away I got to work with his daughter, Emma, and at the end give it to her mom. It’s a neat story behind all of it, and it turned out really nice. This sucker was a challenge, but it’s a wonderful piece now.”

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Video of it running: https://youtu.be/T_cFKHz2vT0