

# Paralyzed Welder Gets A Lift

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MINOT, N.D. (AP) — Jordan Kay is proving that no job is out of reach.

Kay, a welder training in Minot, was in kindergarten when he was paralyzed in a car accident. His dream to become a welder in a mechanics shop might have been dashed but for the help and ingenuity of instructors at North Dakota State College of Science in Wahpeton.

Many fabrication welding tasks require someone to stand to reach equipment or work on machines. Faculty members at the college created a wheelchair with a lift mechanism that enables Kay to stand on the job. The chair designed especially for Kay was the subject of an article published in the September issue of the Welding Journal.

"It's a lot heavier, but it is really helpful," Kay said of his customized "Cadillac."

The wheelchair weighs about 50 pounds more than a standard chair and comes with special belts, braces and a pneumatic system. NDSCS instructors Jay Schimelfenig and Joel Johnson, who took lead roles in the project, spent most of a year developing it.

Although Kay can use his regular wheelchair for some of the jobs at the Minot city shop, tasks come up at least a couple of times a day that require the lift wheelchair.

"They bring in a lot of big trucks. You have to be up pretty high to weld on them," Kay said.

Kay has wanted to be a welder since he was young.

"My dad works as a mechanic in a shop. He let me try welding there, and I liked it," he said.

He took auto mechanics and a couple of welding courses at Minot High School. When he enrolled at Science in fall 2007, school officials immediately began thinking about how to accommodate him. The first change was to install an elevator to make second-story welding labs accessible.

The first year's courses required simple adjustments to table heights and equipment. Johnson said faculty members knew they faced bigger obstacles during the second year of the welding program, when students do fabrication work.

"All our equipment is for a standard person, standing up. And it is heavy

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equipment," he said. "We knew we were going to have to do something to get him up to the equipment. We couldn't make those modifications to the equipment. It was just impossible."

Initially, instructors considered raising Kay's wheelchair. In discussing Kay's physical capabilities, they switched the focus to a standup wheelchair. Ordering one was too expensive and involved a risk of explosion in bringing a battery-operated chair into a welding environment.

So they decided to build a wheelchair, an idea that got a cool reception from Kay at first.

"Understandably, he was apprehensive," Johnson recalled.

Instructor Jay Schimelfenig said he spent about 250 hours in design and drawing time. He used SolidWorks, a 3-D modeling software, that enabled him to check for interference and design problems before actual construction. He also measured Kay to make sure the chair would fit him and would be comfortable.

Once Kay saw a semifinished product, he became more involved. He worked closely with Johnson and Schimelfenig on the construction.

"It was a lot of work," Kay said. "Sometimes it wasn't fun."

"If you ask Jordan how many times he's taken the chair apart to change a little something, he probably couldn't tell you," Schimelfenig said of the frequent makeovers. "He could probably take that thing apart in his sleep by the time we got it done."

The power mechanism for the chair comes from air pressure. The aluminum chair sits on two parallel links with air cylinders hooked to those links. A switch on the arm rest enables Kay to control the line pressure.

When engaged, the undercarriage first moves down to lift the front wheels off the ground to keep the chair from rolling. The seat lifts to about a 75 degree angle, which puts Kay in a standing position and still allows him to keep his weight back on the main frame of the chair.

A seat belt holds his upper body in place, and a leg brace secures his knees as his legs support his weight.

The chair was built on the axle and wheels from another chair Kay had. The Science autobody department upholstered the seat cushions and back rest using an old leather jacket donated by Schimelfenig.

Goodrich Corp. in Jamestown donated most of the scrap aluminum used in the chair. Tri-State Aviation and MDI in Wahpeton donated some specialty aluminum. The Wahpeton Mayor's Committee for People with Disabilities donated money for parts. Independent Cycles of Rapid City, S.D., donated a miniature 200 PSI air compressor

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and components.

In Minot, Kay's supervisor equipped his chair with carbon dioxide tanks to give him mobility.

Kay said he was "a little excited, a little nervous" to use the wheelchair for the first time. Johnson said Kay needed support until he got used to the feeling of standing in his chair.

Kay found the wheelchair provides therapy for keeping his body limber.

"It stretches my legs out," he said. "It's a pretty good workout for my stomach, too."

Kay graduated with an associate's degree from Science and began work in Minot in June through Job Service North Dakota Workforce Investment Act Youth Program. He completes the program at end of this month.

"We are pretty excited to have him," said Dennis Hoff, the city's shop foreman. "He's a neat kid. He's a hard working kid."

Kay has helped make city buildings more friendly for people in wheelchairs, he said.

"We have had him sit in on our safety meetings. We get a real good perspective," he said.

Hoff said Kay has the skills and motivation to do well and doubts he would settle for a job that would keep him sitting at a work station.

"He needs to be challenged. I think he's going to need to fabricate to do that," Hoff said.

Kay is grateful for the work of the Science staff. Schimelfenig said instructors may build another chair to have one hand should another student need it. A welding school in Florida has asked for the design to make a chair for one of its students, he said.

"It's a great feeling, " Schimelfenig said. "We like happy endings."

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