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CONTENTS



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Nic Ashby

A Rockstar Ride

Nic Ashby's fierce work ethic has guided him through the rough terrain of his youth, the battlefields of Iraq and the high-energy world of custom car building.

12

Boys Town New Direction

The iconic 100-year-old institution gives the trades a second chance.

22



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34



38



42

ASK THE EXPERTS

The experts at Lincoln Electric answer your welding questions

10

BEGINNER TIPS & TRICKS

Preventing burn-through and other tips

30

PROJECT SPOTLIGHT

Jimmy DiResta: Your bandsaw, three ways

34

ARCS & CULTURE

Animal-proof fabrication

38

FLASHBACK

December 1940: Stack Savings

42

EDUCATOR SPOTLIGHT

Doyle Roy; Teaching supplemental lessons

32

MASTER CLASS

Steps to produce x-ray-quality welds on aluminum

40



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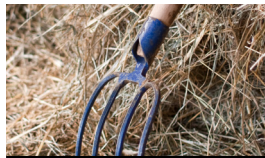
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LETTER FROM THE EDITOR

DISCUSSING DISADVANTAGES



In this issue of *ARC Magazine*, we get a glimpse into a program at Boys Town that provides skills training to students at the school, all of whom are — as a condition of acceptance to the school — significantly “disadvantaged.” They are kids from around the country who are labeled “at risk” for a variety of reasons: behavioral issues, lack of family structure, drug problems, legal run-ins, victims of physical and sexual abuse.

These kids are students in an introductory welding class that is part of the school’s Trade Life program, designed to show them a path to a better life through skills training, and then provide post-graduation support to help ensure they stay on that path.

In one of my proudest professional moments, I had the opportunity to address these students. I talked to them about disadvantages. My expertise on the subject comes from two places: first, as a “positive outcome” of a state foster care system; and second, as an active member of the movement to

re-establish trades not as a back-up alternative, but as a viable primary choice for a career.

I talked to them about what a disadvantage everyone outside of this school was faced with: that they would never value their achievements as much as the seven students in this class and the rest of the students at Boys Town would. Success would never taste as sweet.

I talked to them about the disadvantages many of their “normal” peers would face, because they were never taught the value of being able to make and fix anything, and they would call a mechanic for every car squeak, a plumber for every drip, and an electrician for every faulty light switch.

I told them about how disadvantaged their neighbors will feel when they tell them, “I wish I knew how to make my house this nice,” or ask, “How do you know how to do all this stuff?”

I asked them not to make all those people feel bad for their lack of knowledge.

I told them about the disadvantages that kids and young adults who didn’t go to Boys Town faced. They might not have the opportunity to get counseling, advice, guidance and support from a community dedicated to people just like them — a community of people who wanted them to do well and who fully understood them after they graduated.

I told them about the disadvantage of being connected to family only by DNA. That being shown the value of family by living with and learning from a group of strangers not only extends the reach of family, but enhances the meaning of the word.

I talked to them about how proud they should be and how tall they should walk because they are part of an elite fraternity — less than one percent of the nation’s population — that knows how to join and cut metal with electricity.

Without question, Nic Ashby, the subject of our cover story, is an American hero. He is a veteran who served with honor and a true rock star in the fabrication world. But this issue, my tip of the hat goes to the superheroes who are the inaugural class of Boys Town’s first welding program in 30 years, who I hope will take advantage of every opportunity that comes their way.

Craig Coffey, Publisher
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ASK THE EXPERTS

Welding experts at Lincoln Electric answer your questions about equipment setup, processes, techniques, safety and more.

Looking for guidance with technical issues? Contact us at questions@arcmagazine.pub

The rule of thumb when using SMAW and GMAW consumables is that 2/3 of the heat energy is on the negative side (cathode), which means more heat and more penetration is achieved with DCEP reverse polarity. But when welding with a non-consumable electrode such as that used in GTAW, why does this phenomenon seem to switch and create better penetration with DCEN straight polarity?

- Joel MacLeod, Stratford, Ontario

▶ The polarity changes because with stick welding you get more penetration with positive polarity, and with TIG welding you get more penetration with negative polarity. That's because there's no transfer of metal across the arc in the

TIG process. The current in a welding circuit flows from negative to positive. So when the tungsten is negative, the work is positive. So you have to insist on flow and heat from the tungsten to the work. If you run positive polarity on TIG, that will make the tungsten positive and the work negative. This polarity would drive the electron flow to the tungsten, which would in turn melt the tungsten.

I'm just getting started TIG welding early Harley Davidson aluminum engine and transmission cases. Any tips on filler rod and cleaning procedures?

- Mike La Marca, Bloomfield, New Jersey

▶ Generally, I would clean with a dechlorinated brake cleaner. That's the most standard. You don't want anything chlorinated, because it creates phosphine gas during the welding process. So with that in mind, a 4043 TIG filler rod generally works well, because you'll most likely be working with a silicon-based casting. Or you can choose a filler made with the same material as the casting, depending on what that material is. But 4043 will almost always work well.



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Does the sharpness of your tungsten angle change your arc or change the weld bead/profile in any way?

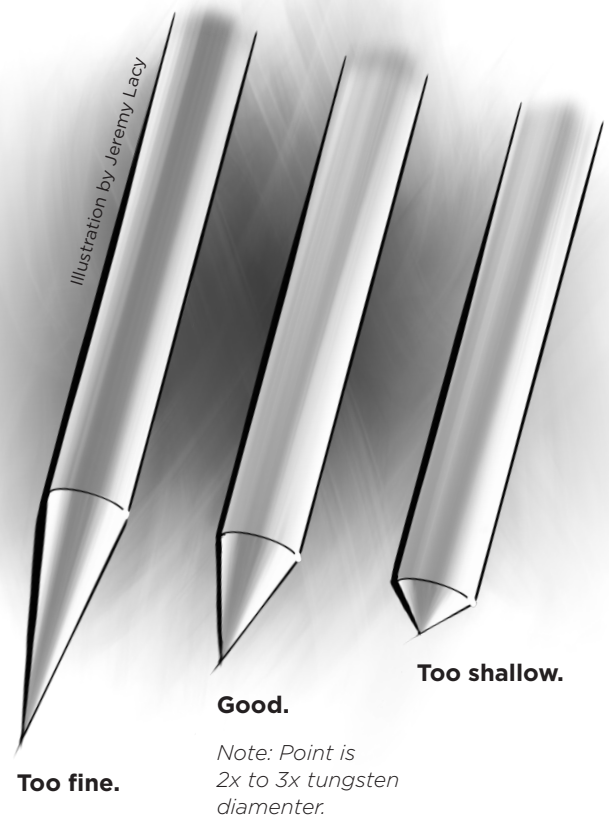
- Jared Stauch, Fort Erie, Ontario

► The sharpness of the tungsten does change the weld profile. The sharper the point on the tungsten, the more the arc will reflect out. The smaller and more blunt the point, the more penetration you'll have. We generally recommend the conical end of the tungsten to be two to three times that of the tungsten diameter. So if you're welding 1/16-inch tungsten, you want a 3/16-inch long tip. If you're welding 1/8-inch tungsten, you want a 3/8-inch long tip. That's not to say that a longer, sharper point is wrong, but if it's too fine a point and you touch it to the surface, you end up losing the tip, and that will contaminate the weld. Conversely, if you have a really shallow point on the tungsten and you touch it with the filler, it's going to flatten out and you'll lose your tip. But the middle ground between the two - a moderately conical angle with a flat spot - will give you a more stable arc.

I am required to pass an 8-inch heavy wall carbon steel coupon test, ASME (7211), TIG root and hot pass, and stick 7018, fill and cap in the 6G position. Some people swear by the lay-wire technique and walking the cup or moving only forward and back. Others say the keyhole and fill technique is the best. Which would you suggest?

- Robert Mahoney, Centereach, New York

► Each technique you've mentioned has its advantages. But if you're looking for a more consistent or more uniform bead, your best bet would be the lay-wire walking cup technique, because there's very little movement involved. You're just laying it in and walking the cup. Less movement results in better consistency, versus the free-hand method, which could result in less consistency.



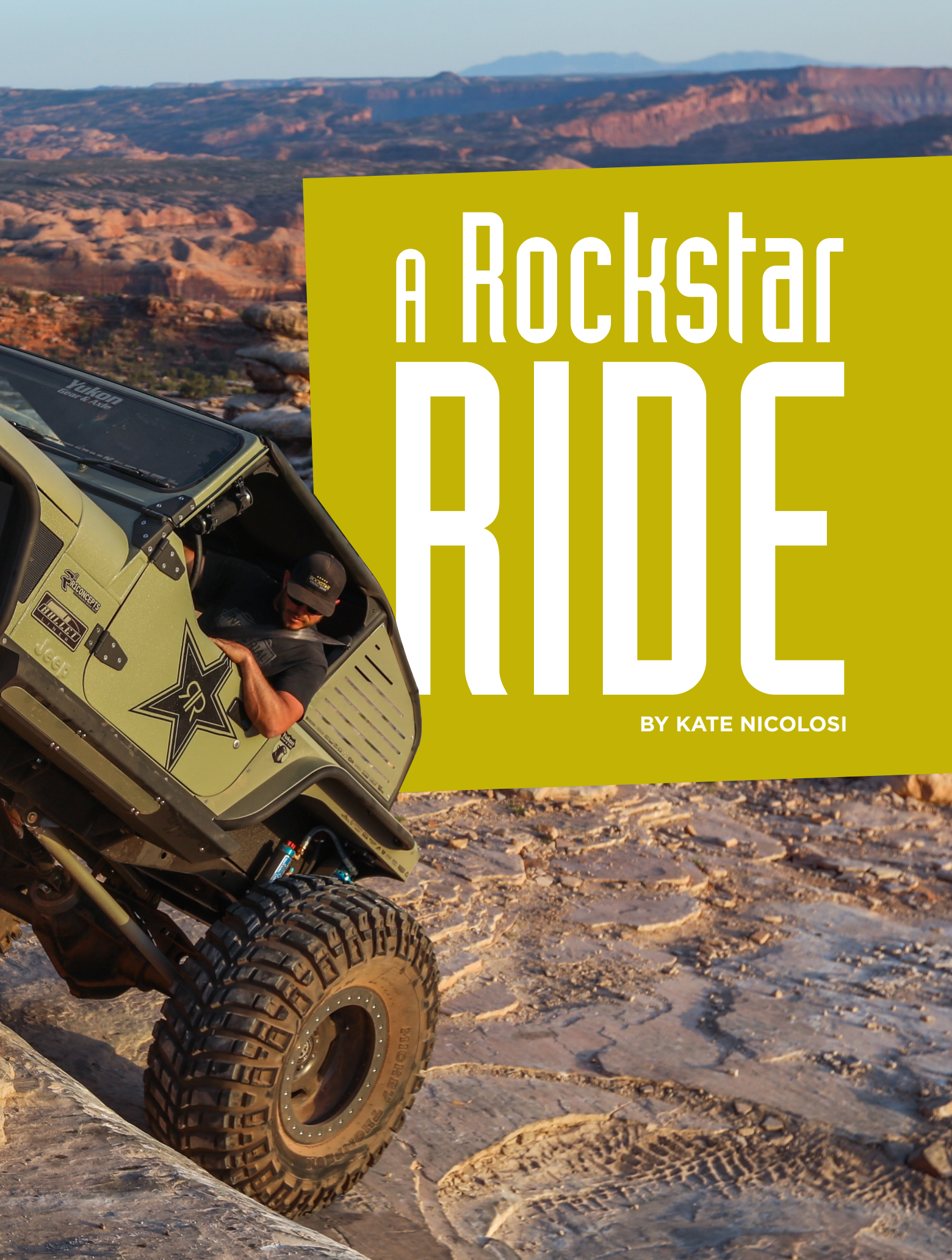
When watching some TIG welders, I've noticed they use mesh in their gas cup. What is this for and how does it work?

- Nick Skokut, Beloit, Wisconsin

► The screen is known as a gas lens. A typical TIG welding cup fills up and directs the gas flow. Without a screen, the gas is just going to roll out uncontrolled. But when you insert a lens, the gas comes out in a laminar flow - meaning that it breaks up into separate, parallel streams, which provide better coverage. Think of the wind blowing through a screen in an open window or water flowing through a screen at the end of a faucet. Without the screens, the flow of wind and water is more forceful and less controlled. With the screens, it's more steady and even. That's what lenses do with gas. Most TIG welders prefer them. They may be a little more expensive, but they give you a better weld.



Nicholas Ashby's character and sixth sense have guided him through dropping out of high school, dodging bullets in Iraq and ultimately navigating the world of custom-car building. His extreme cars — and his Boy Scout enthusiasm — have inspired admiration among fans while demonstrating his craftsmanship and grace. This dichotomy is one of many reasons why Ashby — and his Rockstar Performance Garage — have a loyal following among car enthusiasts, corporate partners, patriots and anyone who loves a great American story.



A Rockstar RIDE

BY KATE NICOLosi

“He was always the go-getter. He’d make things happen.”





Far left: GRDLOC, Ashby's custom Jeep, taking on the rough terrain in Moab, Utah. Top left: Ashby with Dennis Barahona, video manager for LDRSHIP Designs. Bottom left: Guiding Rockstar Garage brand ambassador, Kate Fry and her pink Jeep through naturally occurring obstacles in the Utah desert. Below: Plasma cutting for the GRDLOC build.

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OPENING ACT

As the owner of Rockstar Performance Garage, a custom-car building joint venture with Rockstar Energy Drink, Nicholas Ashby creates one-of-a-kind cars and trucks in his garage in Southern California. His path to success with the venture was a long and winding journey through some rough terrain.

Ashby's twists and turns make for "kind of a weird story," he says. But it's actually a heartening tale of courage, grit, patriotism and old-fashioned American values.

It began in a small town just north of St. George, Utah, which Ashby describes as "nothing but a speck on a map on some interstate." After spending his summers working his family's ranch and construction, high school "felt like a waste of time." He admits that he had "an attitude problem," which was part of his decision to drop out of school at 17.

If he wasn't going to school he would learn the value of "swinging a hammer," his father said. With compensation maxing out at \$20 an hour in construction, Ashby learned there are no shortcuts to success.

"He'd pour concrete at 4 a.m. to make extra cash and then work all day framing houses," says childhood friend Josh Adams, a concrete contractor who worked with Ashby. "He was always the go-getter. He'd make things happen."

LIVING ON THE EDGE

The terrorist attacks of Sept. 11, 2001, reminded Ashby that the world is a much larger place. Maybe it was time to explore it, follow in his grandfather's footsteps and join the military.

Before he could enlist, he earned his GED at night. He scored off the charts in his military job placement test and was top in his basic training class, which gave him an edge. Still, he chose a job where you "blow things up" on the front lines. "It sounded badass."

The job was combat engineer, which had a life expectancy of 12 seconds on the battlefield. Despite warnings from his family and friends ("I thought he was crazy," Adams laughs), Ashby began his role as enlisted soldier — and later a non-commissioned officer — in the Army National Guard.

"We have a saying in the military: Officers write the rules, and non-commissioned officers make it happen," Ashby says. "I wanted to be the guy who worked with the troops to get the job done."

He packed his bags and headed to Long Beach, California, where he continued working construction and gave the National Guard a weekend every month and two weeks a year. Everything changed when Ashby was deployed to Iraq in 2004.

HONING HIS CRAFT

During the next 14 months, Ashby participated in more than 400 combat missions. His company was one of the first to set foot in Iraq and leave blood on the battlefield. Ashby lost several friends and experienced the devastation of war first-hand.

He couldn't shake the feeling that he needed to do more. So he signed up for mission after mission, thinking he'd rather be the one whose life was at risk than bury another friend.

Some casualties could have been prevented by better equipment, Ashby claims, especially when it came to the Humvees he was issued. "There was no armor or protection from bullets," he says. "Explosives were coming through doors. We were putting sand bags in the vehicles to protect us from bullets."

He translated his carpentry skills to metal fabrication and built what would essentially be his first custom car. "I grabbed a plasma cutter and cut metal in the shapes of Humvee doors," he says. He and his fellow soldiers "Mad Maxed" their vehicles by creating and installing metal-fabricated reinforcements.

It was then that Ashby began to learn about welding and its awesome possibilities. "That's when I caught the bug for automotive builds," he says.

ON TOUR WITH A FUTURE ROCKSTAR

Once home from Iraq, Ashby was haunted by the loss of his friends who "gave their lives for us" and yet whom no one remembered. Inspired to honor the soldiers who never came home, and to engage in his own personal catharsis, he set out to build a commemorative custom car.

"Whatever happened [in Iraq] that got him down, he didn't let it hold him back," Adams recalls. "Nic had to do something to think positively. He goes 110 miles an hour at all times."

Scraping together the little money he had, he bought and re-built a 2004 Infiniti G35 (the same model year as the year in which he served), and turned it into a "Fallen Heroes" hot rod.

"It took everything I had to build this car," Ashby remembers. The slick custom

airbrushed paint job featured a mural of each of Ashby's fallen comrades: Second Lt. Andre Tyson, Spc. Patrick McCaffrey and Sgt. 1st Class Michael Ottolini.

The car was a show-stopper, winning awards at industry events. The Army took notice and asked him to be an ambassador for the National Guard, traveling the country while "building cool cars," says Ashby.

Ashby was young, loved his country, was passionate about cars and had a contagious enthusiasm. His job was to translate his zeal into corporate sponsorships. Automotive companies gave him parts and then enjoyed the free publicity.

Part of his tour included speaking to high school students about the benefits of the military. "There is a lot of good with a lot of bad, but [you] are doing something," he says. "It's structured. You are not on the sidelines. You have a mission."





ROCKING THE CUSTOM CAR INDUSTRY

One of Ashby's personal missions was to turn his custom car work into a full-time career. LDRSHIP Designs was born in 2009, representing the seven core Army values: loyalty, duty, respect, selfless service, honor, integrity and personal courage. The company would be the vehicle, so to speak, for Ashby's life work.

Soon after, Ashby retired from the military. But he wasn't solo for long. He gained more recognition at a SEMA (Specialty Equipment Marketing Association) show when he unveiled a sleek, black Camaro called The Moment.

The custom build represented the moment "we all have in our lives where we know there's something bigger [about to happen]."

The car put Ashby on the map among car enthusiasts. The carbon-fiber, tricked-out Camaro — which he bought from Chevrolet for \$1 — was a "raw, in-your-face, 700-horsepower, super-charged" muscle car. Its beauty and precision demonstrated Ashby's talent, winning General Motors design awards and catching the eye of a company that would soon rock Ashby's world.

Kenny Adams, licensing manager for Rockstar Energy Drink and a fan of

Ashby's work, set up a meeting. To show the marketing execs what he's made of, Ashby built a 2011 Dodge Challenger that became the Rockstar Energy Challenger. They took notice of the black suede interior, subdued logos and 24-karat gold paint job. "Nic saw an opportunity and ran with it," says Adams.

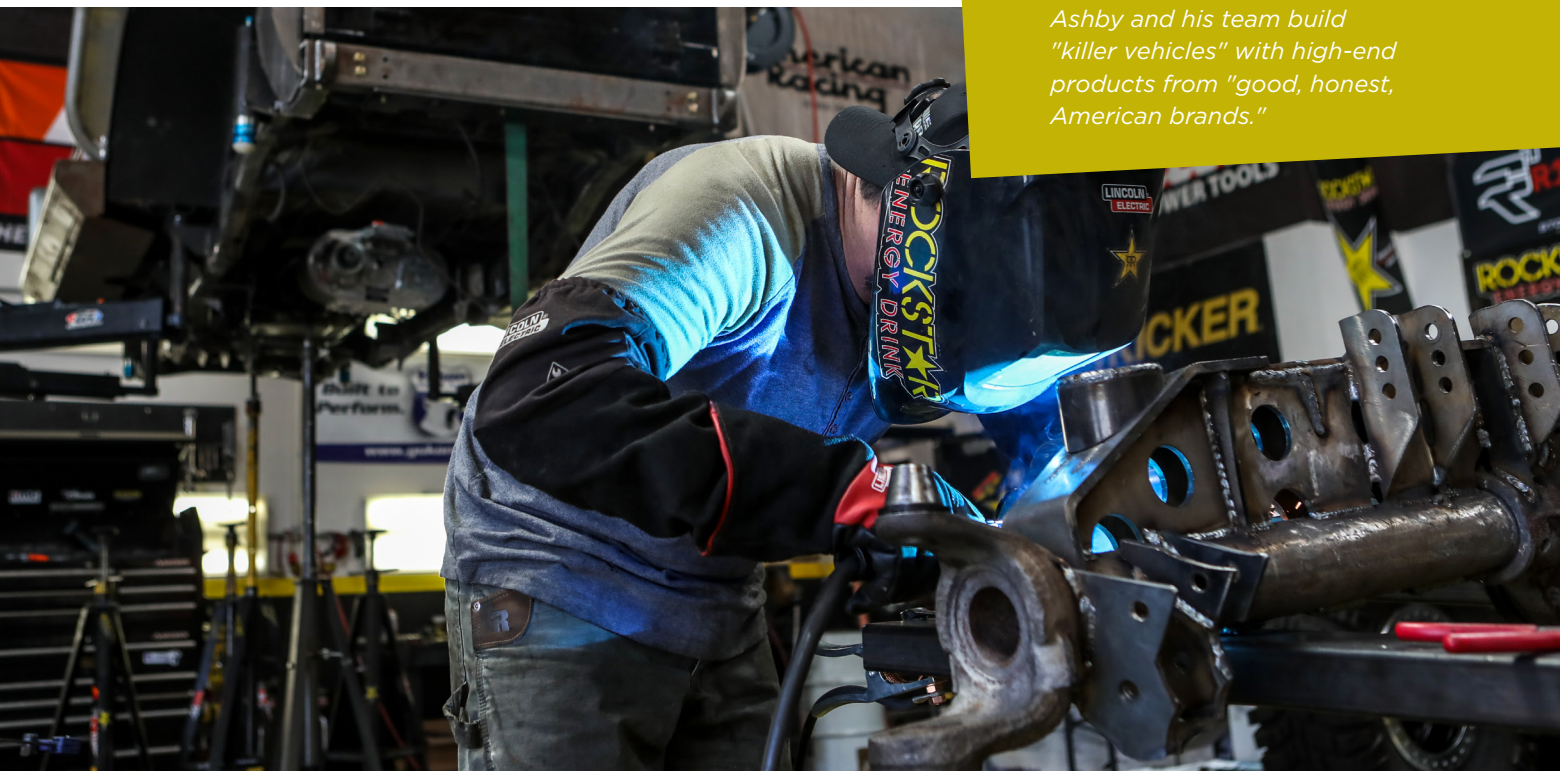
The extra effort paid off. Rockstar Performance Garage was born in 2011 out of a partnership between Rockstar Energy and LDRSHIP Designs. Ashby would become an automotive ambassador, build cool cars and ultimately create a unique business.

The partnership quickly morphed into "something that Rockstar never anticipated," says Adams. He thought Ashby would "make them a cool car" for the SEMA show, which takes place every October. Ashby went above and beyond.

"He's proactive," says Adams. "A marketing machine. He saw the value in partnering with Rockstar to leverage his brand. But he has helped us as much as we've helped him."

THE ROCK STAR PROGRAM

Today, about an hour south of Los Angeles, on Jefferson Avenue in



Ashby and his team build "killer vehicles" with high-end products from "good, honest, American brands."



Murietta, California, you will find a private garage filled with state-of-the-art equipment and only the finest car parts and components on the market.

But five years ago, Ashby's faith in his new gig was tested. He was "sitting alone in an empty 8,000-square-foot shop." He and his wife were expecting a son, and he was working construction on the side to pay the bills. He sold the aforementioned Camaro for a cash infusion and steadily engaged partners who were willing to donate parts and machinery. Each of them saw in Ashby what many others had before — an earnest whiz kid with a vision.

One of those people was Ross Esposito, president of RIPP Superchargers, a company that manufactures a line of superchargers for Jeep. A supercharger is an air compressor that boosts horsepower in muscle cars by pushing additional air into the engine.

Esposito's first encounter with Ashby

could hardly be considered a meeting. Ashby called to solicit Esposito's products and Esposito hung up on him. Once he learned that Ashby was a SEMA-accredited car builder, he softened. "Naturally, I have a huge respect for him as a custom-car maker," Esposito says.

In fact, he signed up to be Ashby's first client. That means RIPP Superchargers, along with 19 other global brands like Lincoln Electric, Odyssey Battery and Lucas Oil, donate their products for use in Ashby's custom car garage. In return, they take part in a "cool family-oriented pyramid," says Esposito, where each brand is showcased through Ashby's custom creations at industry events.

The latest addition to Rockstar Performance Garage is a full-time media crew that creates promotional videos of extreme vehicles being put to the test. "We go out on the trails," says Ashby. "We use and abuse them and shoot video." His partners can access the videos for their own marketing needs.





Keep calm and ROCK ON

Enthusiasts can watch the Gavel JK Jeep crawl over boulders, the Scosche Denali tackle snowy terrain or the Colossus JKU conquer the most extreme landscape. The cars ooze style and painstaking detail, and showcase products such as King shocks, Genright armor kits, Currie axles, Mickey Thompson tires and Spyder Auto lighting — not to mention the most extreme metal fabrication and paint jobs in the industry.

Esposito, whose company is based in New York, sees the venture as a win-win: Ashby gets to build “killer vehicles” with select, high-end products. He favors “good, honest, American brands.”

Working on shocks and suspension, with help from assistant Rex Bartolome. Ashby spends 60 to 80 hours a week in Rockstar Performance Garage, with only a few assistants.

In return, partners get an organized marketing blitz for a “fraction of the cost of hiring a full-time marketing agency.” They also gain attention in the West Coast market, which is the heartland for custom car creation.

FINDING HIS GROOVE

Ashby, who works 60 to 80 hours a week, has only a few assistants who support him in the fabrication work. He leans on outside shops for mechanics and graphics. A typical build takes about 30 days to complete, and Ashby always has another car — or 10 — in the works. He’s preparing more than a dozen for this year’s SEMA show.

The venture has been so successful that Ashby is now licensing parts for retail distribution. “Whenever he comes up with an idea, we try to make it happen,” says Kenny Adams. “He knows this world. He’s the brainchild of the deal,” which includes Rockstar branded Scosche batteries and Mishimoto cooling products.

Ashby also pays it forward. He reaches out to “industry enthusiasts” and gives them a boost on their own creations. He has been known to donate as much as \$100,000 worth of products to builders, making them “celebrities” in their communities. “It’s only fair to give back,” Ashby says.

ENCORE PERFORMANCE

Since its inception five years ago, Rockstar Performance Garage has completed more than 50 builds and has gained fame in the automotive industry through partnerships and grass roots growth.

Now Ashby has his eye on ways to amp up interest in welding among teens and those recently discharged from the military. He envisions a corporate youth initiative where pros or ambassadors in the welding industry “show off their builds” and find a way to energize interest in the trade.

“[Some] kids are leaving high school during their most impressionable years,” he says. “We will continue to lose great opportunities to inspire the next Jesse James, Chip Foose or Jessi Combs unless we help light that spark.”

At 35, how has Ashby turned his self-professed “attitude problem” around to become one of the most celebrated car builders in the industry? Military service gave him a sense of direction, but war gave him perspective.

“I always tell people: Don’t get stressed,” he says. “If someone’s not pointing a gun at you and trying to kill you, it will work itself out.”

The drive hasn’t always been blue skies and open highway, but Ashby’s journey continues to evolve. The impression he has made on fans along the way has most to do with a lesson from his father: It doesn’t matter what’s swirling around you, “you need to work hard and get the job done.”

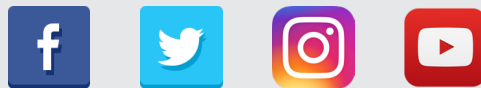
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NEW ← DIRECTION

BOYS TOWN GIVES KIDS — AND THE TRADES — A SECOND CHANCE.

By Paul Engleman



Probably no American institution is more closely associated with rescuing children from neglect and helping them rebuild their lives than Boys Town, the residential village in Omaha, Nebraska.

Founded a century ago by Father Edward Joseph Flanagan, Boys Town was planted firmly in the national consciousness by a popular 1938 Hollywood film that earned Spencer Tracy an Academy Award and presented a young Mickey Rooney as a kid gone bad but trying hard to do good.

Over the years, Boys Town has expanded to include a residential treatment center, a national research

hospital, elementary and high schools in Omaha, and group homes at 12 other locations around the country, along with a wide range of family-related services on the Internet and through a free nationwide crisis hotline. In addition to their various residential programs and sites, Boys Town also helps 95 percent of its kids and families in their own homes and communities through in-home care, parenting training and school programs.

The institution holds the highest possible rating — four stars — from Charity Navigator, an organization that evaluates non-profits based on their financial health, transparency and accountability.

About 25 years ago, Boys Town High School went along with the prevailing trend in youth education when it phased out its trades classes and turned its focus to college preparation. At the time, critics of vocational education were making the case that fewer traditional trades jobs were available, and low income and minority students who were being steered toward vocational education were being steered away from opportunities to attend college. As late as the 1980s, in addition to offering such traditional shop classes as construction and auto mechanics, Boys Town had a bakery, a delicatessen, a barber shop, and a shoe shine stand. It was, after all, a village, a designation officially adopted in 1936. And it still is one today.

But four years ago, Boys Town took a decisive step toward reviving its trades education focus by launching a career readiness program that has come to include course offerings in construction, small engines, and communications and media, adding to a vocational option that enables students to become Certified Nursing Assistants. In January 2017, it started offering a welding class. For the 2017-18 school year, it is adding auto mechanics and an advanced welding course to its curriculum.

TRADE REVIVAL

“Career technical education today is very different from what middle-aged people understood as vocational education back when they were in school,” says Chris Nizzi, Boys Town’s manager of career and work transition. “It’s no longer about making a lamp in shop class. It’s about skilled employment and an opportunity to earn a better wage, to have a career instead of a job.”

Nizzi is in his second stint at Boys Town. He and his wife served as parent teachers, living in a house with boys for seven years in the late '80s and early '90s. In the interim, he was a high school teacher and counselor. “The trade market needs workers,” he says. “We owe it to our kids to provide this training so they can either go right to work with some

experience and be a strong job candidate or continue their education in an apprenticeship or at a community college. They’re more likely to succeed because of their experience learning with us.”

Jim Clements, who teaches welding, small engines, construction trades and an introduction to trades course, doesn’t pull any punches in talking about the role of trade education. “As a society, we lied to our kids for a long time,” he says. “We told them, ‘You should go to college, and if you’re not good enough, you go into the trades.’ We’re trying to reverse that psychology. What matters is whether you’re skilled enough to be a tradesman.

We don’t try to talk kids out of college. We try to enlighten them. We’re trying to show them that if their talent lies in working with their hands, in becoming a craftsman, that’s not a consolation prize.

“It’s a shame that so many kids, instead of earning a degree, end with a pile of debt,” says Clements, who, like Nizzi, also served as a parent-teaching couple with his wife for five years. “That’s why trade education is such a winning choice. If you take a welding class, even if you decide it’s not for you, the knowledge doesn’t go away. You’ve learned something valuable, something useful.”

WELDING ANYONE?

The introductory welding class at Boys Town is a one-semester elective course, with classes lasting two periods (88 minutes) each day. Clements says he’s developing the curriculum in coordination with the head of the welding program at



Learning welding from Jim Clements (bottom left): “We don’t try to talk kids out of college. We try to enlighten them.”

Chris Nizzi (bottom right) puts his money on better odds: “They’re more likely to succeed because of their experience learning with us.”

Metro Community College of Omaha, the likely option for students who want to continue their education after graduation. “We’re trying to expose kids to enough different processes so that when they leave here, they’ll be set up for some level of success,” he says. “We walk them through SMAW welding, FCAW, GMAW. We talk a little about oxy-acetylene and plasma cutting.”

Clements says the first welding course was limited to seven students, but more than 30 students applied to take it. “We wanted the class to be special,” he explains. “And we were finishing our welding shop as we taught the course. It was almost like building a bridge while you’re driving across it. All seven students





absolutely loved it. Two are considering careers in welding, and one has made arrangements to attend Metro.”

For the 2017-18 school year, with an advanced welding class added, he expects to have “probably four times as many students. If we had 50 spots open, I think we could fill every one.”

Nizzi says that when he visits the welding shop, “I’ve never seen some of these kids so focused. There’s nothing like sparks and metal ... and steam coming off something that you’re cooling and you continue to weld. They just really buy into that. Some kids are ready to take off with this stuff.”

But the enthusiasm goes beyond that. “I can teach a kid how to weld, how to hold an electrode,” he says. “What’s more difficult is to find that spark inside them. When I started, I didn’t know if they were going to like it or buy into it. It turns out

they are hungry for this info. I can’t give it out fast enough. We could have this class for eight hours.”

Cameron “Cam” Martin, who describes himself as “a very hands-on guy,” is one of those enthusiastic kids. “When I have something in front of me that I’m doing, I can just zone in on it,” says Martin, who’s been at Boys Town since February 2016. “Welding is an amazing thing. You can join two metals permanently. That’s really cool to me. Being able to do that every day is a stress reliever. It’s fun.”

Somewhere amid the fun, some very important learning has taken place. “If I hadn’t come to Boys Town, I would have been much different than the way I am now,” Martin says. “After I came here, I blossomed, for lack of a better term. The trades program has taught me a lot — not only about the trades but about work ethic, what to do and what not to do on a job, and teamwork and leadership.”

THE BOYS TOWN CHALLENGE

Although Boys Town began admitting girls in 1979, it has retained its original name. According to Dr. Bob Reznicek, Boys Town’s superintendent of schools, girls make up about 37 percent of the high school’s total enrollment of 330. About one-third of the school’s students are enrolled in trades courses. Among these, says Reznicek, girls make up about 60 to 70 percent of students in nursing, communications and media.

“Presently in the trades of welding, construction and small engines,” he says, “the gender ratio is predominantly male, but we are encouraging girls to enroll in those trades.”

One of the major challenges that Boys Town must overcome is working with what Reznicek calls a “fluid” population. Boys Town residents are “one hundred percent at-risk kids,” he says. “We have

Boys Town's introductory welding class covers SMAW, FCAW, GMAW and cutting, along with some virtual reality training. Nizzi: "I've never seen some of these kids so focused."

kids on contract placed by health and human services and juvenile justice. The length of stay averages 16 months. Some kids stay four or five years, some stay as few as eight months."

Parent-teacher Ryan Meehl says the house that he and his wife supervise, a residence for eight teenage boys, welcomed three new students in a two-month period last winter. And he says he has seen a definite uplift in the overall spirit and attitude of kids like Cameron Martin. Meehl adds that he and other Boys Town parent-teachers have a very positive view of the new focus on trades education.

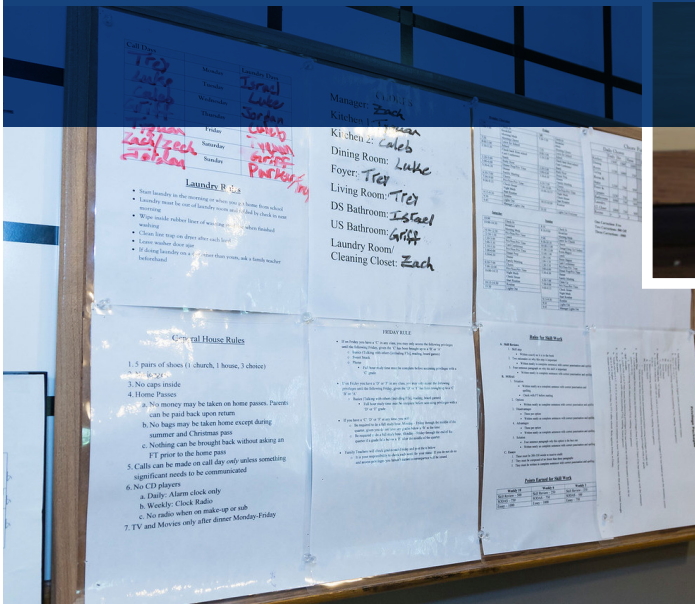
"Our kids have experienced setbacks of their own doing or not of their own doing," says Nizzi. "But they are very industrious. Having a skill allows them to translate their desires into a better wage and a better life."

"We used to send a third of our graduating class to the military, which was a good opportunity to have a place to live, learn a career, or continue their education afterward. We don't send nearly as many kids. We send about one a year now."

"In some ways, we have it easier than other schools," says Clements. "Our program teaches soft skills — how to show up on time, how to show respect, how to complete an assignment. Because that's such an integral part of what we do, I think it sets our kids up for success more than some other program. When our kids get to a job site, they already have those soft skills."

Many students arrive at Boys Town with little or no direction, says Clements. "Seeing their interest in working with welding equipment or small engines, some have finally started giving thought to their lives," he says.





"They need English, science and social studies, of course. But all of that is for naught if we don't show kids how to plan for their future. Even if they don't want to weld, if it gets them thinking about their future, that's a success."

He adds: "Our kids come from rough backgrounds, bad neighborhoods, places where they don't have opportunities. It's an honor to take kids who may fall through the cracks of society and give them tools to take with them when they walk out of here. I drank the Kool-Aid of



Boys Town soon after I came here. I love what we do. We help kids figure out how to grow up."

Gage Havens has done some of that growing up since arriving at Boys Town in April 2016. "My mom has told me that if it wasn't for Boys Town, I'd probably be in jail or dead," he says. "It's probably true. Boys Town has gotten me clean and sober. Getting introduced to the trades program has showed me there are other things that can make you happy in life. When you make something, when you have a finished product and you look at it, it makes you feel happy inside. You tell yourself, 'I can't believe I have that talent.'"

TRADING UP

Looking beyond high school, Boys Town has developed a program called Trade Life that provides financial support and counseling to graduates in their transition to adult life.

Considering the challenges that Boys Town students have to overcome, the program name seems apt. It could be viewed as trading a life that appeared destined to be lost for one that can be productive and rewarding.

"Trade Life is more than just our teaching here," says Reznicek, who has been at Boys Town for seven years after a long career in public education as a school administrator in the Omaha area. "We expose the kids in high school, and now we need to keep them moving forward. We are networking like crazy. We've made numerous contacts with various businesses, construction companies, plumbers and local community colleges. When our students graduate, we will

invest in housing and equipment. We are hoping to place kids with employers, through apprenticeships, and we are going to track them."

"The transition from high school to young adulthood can be a challenge," says Nizzi. "Some of our young people don't have many supports. Trade Life is a way to link the education they receive in our career center with going out into the real world and living independently."

Nizzi says that 25 graduating students were enrolled in Trade Life in its first year. "First time through," he says, "we had some kids who went to a four-year program after graduation, so it wasn't all trade-related. For next year's class, we want to have it strictly focused on the trades."

Considering its prominence and reputation for rehabilitating neglected youth, does Boys Town know something about trades education that other institutions don't? Reznicek says the decision to place a new and strong emphasis on trades was based on the needs and opportunities for Boys Town students.

"Omaha has a very low unemployment rate," he says. "Some companies are hiring workers from Kansas City, which is two-and-a-half hours away. So they are very vested in this. And kids see that welding offers good pay and benefits."

Clements adds: "The world of welders and skilled tradesmen is getting older, and there's nobody to fill their shoes. As more technology comes into welding, that opens up more opportunities. Kids may want to be the guy who actually puts together two pieces of frame on a building. They may want to design the programming that teaches them to use the equipment. The core principles of welding, the basics of joining metal together, that's never going to change. There is never going to be a shortage of need for people who do good old fashioned traditional welding." **ARC**

From left to right (top photo): Troy Fernside, Trey Haggard, Ian Cowan, Cameron Martin, Alberto Diaz, Trevor Meyer, Gage Havens, Jim Clements

The long-term view, from Robert Reznicek (middle left, jacket and tie): "We are hoping to place kids with employers, through apprenticeships, and we are going to track them."

BEGINNER TIPS & TRICKS

Make It Easier to Weld Your Workpiece.

PREVENTING BURN-THROUGH

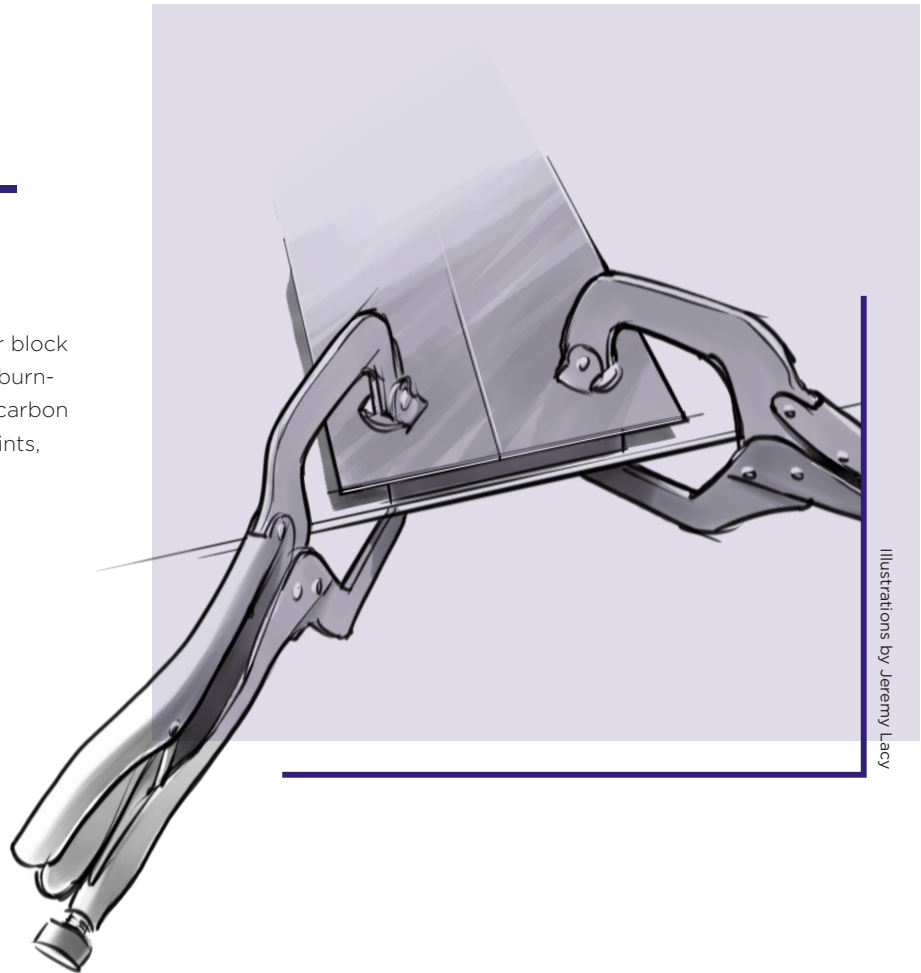
– JOE JORDAN, DUNN, NORTH CAROLINA

▶ When welding thin stainless steel, clamp a strip or block of aluminum to the backside of the joint to prevent burn-through (sugar). When welding thin aluminum, use carbon steel or stainless steel for the backing. For corner joints, use angle material.

THIN AS POSSIBLE

– RODGER MOORE, HUNTSVILLE, TEXAS

▶ When a metal craftsman lays out a project, it's important to use a marking instrument with the thinnest line possible to maintain accuracy. It's also important to use the smallest cutting tip capable of doing the job if oxy-acetylene welding or plasma cutting will be used. The thinnest line ensures accuracy and the smallest tip ensures a thin cutting line.



Illustrations by Jeremy Lacy

HAVE A TIP OR A TRICK YOU'D LIKE TO SHARE WITH BEGINNERS? LET US KNOW!

Send us your tip or trick and we just might feature it in an upcoming issue!

Feel free to submit more than one tip, but please be as specific and detailed as possible. The more details you provide, the more likely we are to use your tip. Note: We reserve the right to edit responses for the sake of grammar, appropriateness and/or available space.

And ... if we do use your submission, we'll send you a FREE Lincoln Electric Welding Gear Ready-Pak®.





When opening a valve, the bottle should always be facing away.

OPEN YOUR VALVE

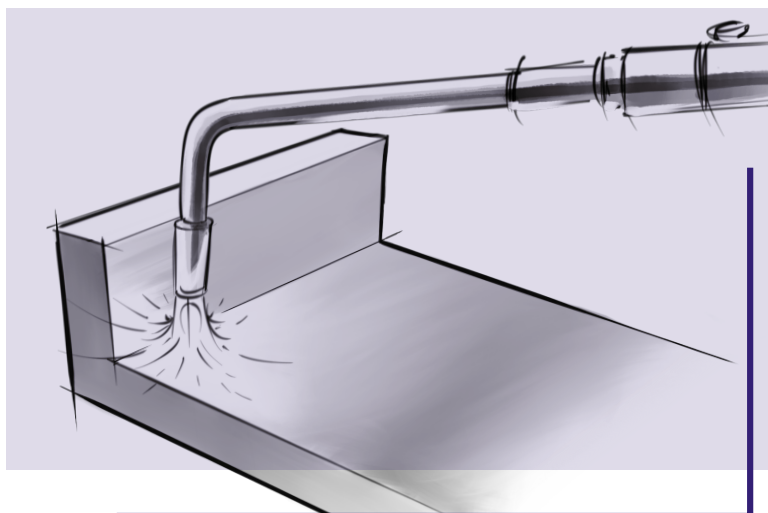
- TOM WORRICK, BOALSBURG, PENNSYLVANIA

- ▶ Always open the valve on your tank before installing the regulators in case some debris has found its way into the valve. Just a quick open will do the trick.

PREHEAT HIGH-STRENGTH STEEL

- DAN SMITH, SEVIERVILLE, TENNESSEE

- ▶ To make sure you have a good weld on high-strength steel, preheating the weld area is critical. If you know what kind of high-strength steel you're welding (carbon content), it will be easier to figure out how much preheat you need. The more carbon in the metal, the more preheating is necessary. Preheating your weld slows the cooling process, which will help prevent the weld from cracking. (See *ARC Magazine's* Summer 2015 Master Class on preheating steel for details.)



TRYING TO KEEP POLARITY STRAIGHT? THINK ABOUT CONGRESS

- MIKE LOWE, WARE, MASSACHUSETTS

- ▶ When speaking about welding polarity in the direct current (DC) circuit, there is direct current electrode positive (DCEP) and direct current electrode negative (DCEN). DCEP is also known as reverse polarity and DCEN is also known as straight polarity. A good way to remember what these stand for is to think about Congress. In Congress, there are representatives and senators. The first three letters of each word are REP (reverse electrode positive) and SEN (straight electrode negative). So when someone says straight or reverse polarity, you'll know what they're talking about.

EASY-TO-MAKE TOOL CADDY

- TIMOTHY APITIUS, WESTWOOD, NEW JERSEY

- ▶ To make life easier, don't discard the 50-pound metal container of electrodes after opening it and removing the contents. The container can make a nifty caddy to hold all essential welding tools. All you have to do is ground the can, burn a small hole in the center of one of the longer sides of the rectangular top, and make a hook so it can hang. The caddy is easy to move from point to point, and it makes life much easier by keeping your tools in one place and easily accessible.

EDUCATOR SPOTLIGHT

DOYLE ROY

SUPPLEMENTAL LESSONS

By John C. Bruening

Doyle Roy doesn't just teach students at Grayson College how to weld. He teaches them how to have a career and a life.

For the past three years, Roy has taught stick, MIG, TIG and oxy-fuel welding — from introductory to advanced levels — at the community college's south campus in Van Alstyne, Texas. In that time, he's also taught a few unrelated skills that actually have more to do with welding than one might think.

He himself is a 2009 Grayson alumnus with an associate degree in applied science of welding technology. After graduating, he spent five years in a variety of stainless and aluminum TIG welding jobs, along with a couple jobs as a welding instructor. In 2014, he brought all that experience back to Grayson to teach full-time.

"I try very hard to set an extremely high standard of quality in everything the students do," says Roy. "My philosophy is, if I can create the most challenging situations for them that I possibly can, and give them the hardest welds that I can possibly give them — including some stuff they'll probably never encounter in the real world — then when they go to a prospective employer and do a typical welding test, they'll be calm. They'll be relaxed. They'll do the test and say, 'Oh, this is easy compared to what I did in school.'"

But Roy, a 28-year-old husband and father of two daughters, has learned a few things along the way about commitment and responsibility. In the classroom, he doesn't hesitate to spend time on the life skills — things like how to prep for a job interview, or how to properly present yourself in the workplace.

"Some people's self-confidence may not be where it should be when they enroll in welding school," he says. "But if they can

build up those soft skills and work every day toward speaking better and presenting themselves in a more positive way, their level of engagement gets better every day."

Colten Roberts, a 2016 Grayson graduate with an associate degree and multiple certifications, may have had a hand in steering Roy's teaching style in that direction. Currently a pipe welder at Principle Technologies in Plano, Texas, Roberts recalls asking Roy frequent questions about unlikely topics like maintaining a positive credit score, getting financing from a bank to buy a car or a house, and other practical matters that are part of being a grownup.

Roberts and a fellow student "were always interested in that stuff, but we had no experience with it because we were so young. All those life skills Doyle learned along the way were things he was able to teach us. It actually really helped."

But Roberts recalls one piece of advice above all the others when he was in the process of landing his current job. "Doyle said one thing that really stuck with me," he says. "He told me, 'Just walk in there and act like you know what you're doing. Just be confident.' I've taken that advice a lot of places. It's gotten me far. It's amazing what confidence will get you. I think that's exactly what Doyle taught me: be confident in your welds. Be confident in everything you do, and the sky's the limit." **ARC**





"I TRY VERY HARD TO SET AN EXTREMELY HIGH STANDARD OF QUALITY IN EVERYTHING THE STUDENTS DO."

▶ CONNECT WITH DOYLE



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Project Spotlight

YOUR BANDSAW, THREE WAYS

By Jimmy DiResta

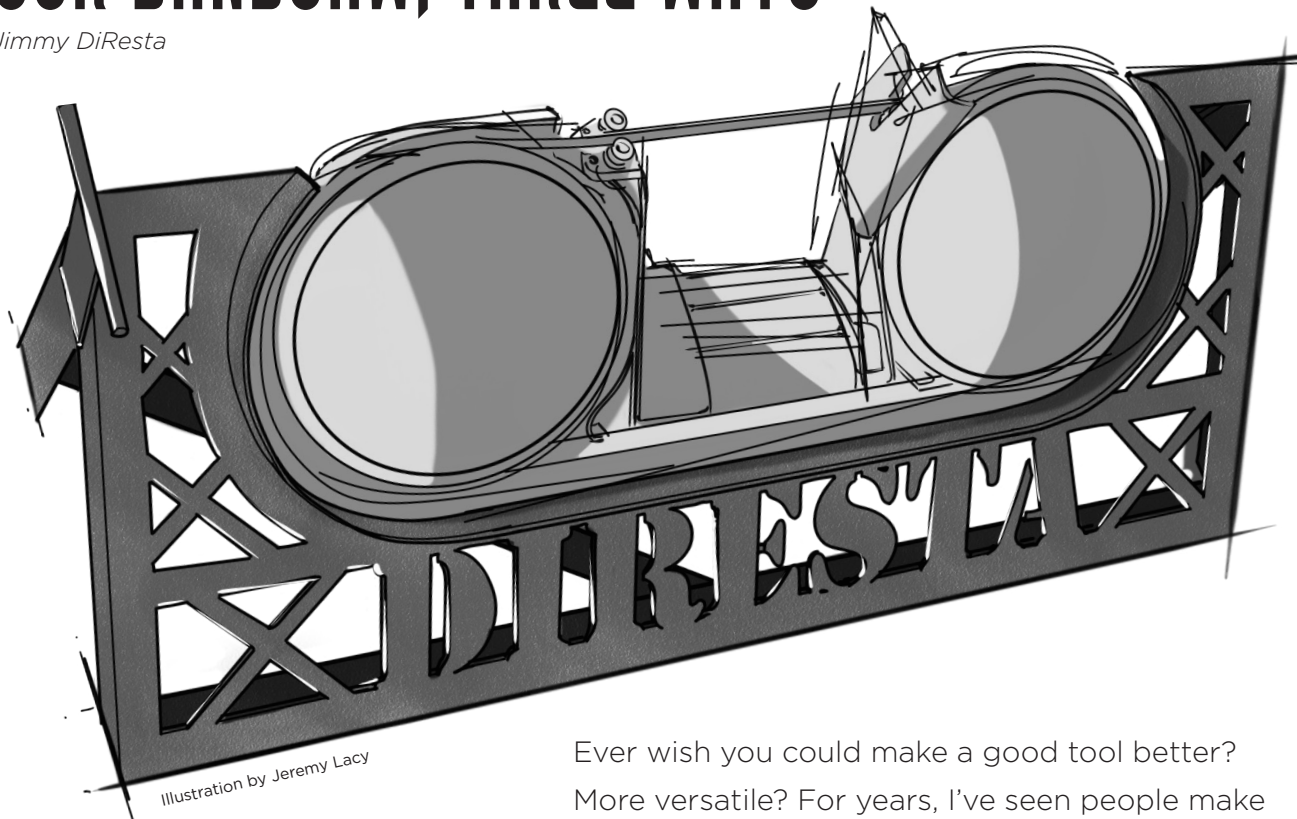


Illustration by Jeremy Lacy

Ever wish you could make a good tool better? More versatile? For years, I've seen people make accessories and add-ons for portable bandsaws to provide more options for making accurate, repeatable cuts. This is my take, which allows you to use a bandsaw as a hand-held, vertical and horizontal cutting tool.

Depending on the make and model of your portable bandsaw, you may need to make adjustments to the design shown in this project. Also, while I've been able to pre-cut many of the parts for this project using CAD software and my Lincoln Electric Torchmate® 4400 Plasma cutting table, all of these parts can be cut with either a handheld plasma torch or some other mechanical method. All of the design files and specs can be found at arcmagazine.pub.



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© Jimmy DiResta

SAFETY FIRST

Before you start any project involving welding, make sure you have the right Personal Protective Equipment (PPE), which includes, at least, an ANSI-approved welding helmet, safety glasses, appropriate welding gloves for the process you're using, and a flame-resistant shirt, jacket, or sleeves to protect from UV rays and burns. You should also keep a fire extinguisher close at hand. Use adequate ventilation when welding. A properly approved respirator should be used whenever fumes may enter your breathing zone and general area.

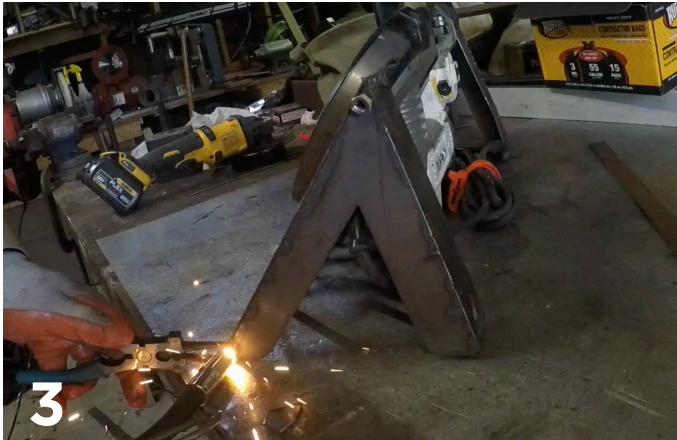
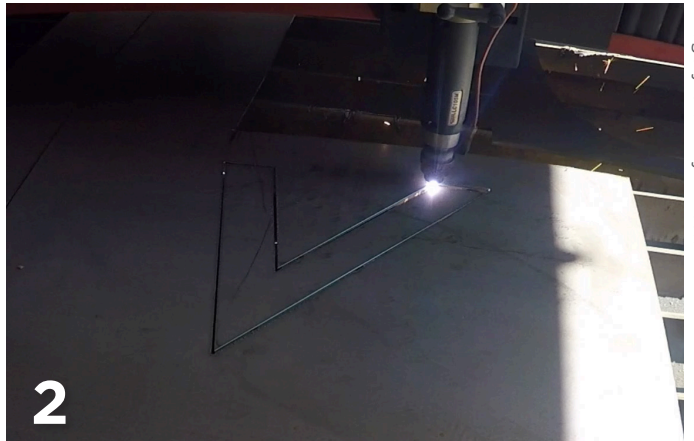
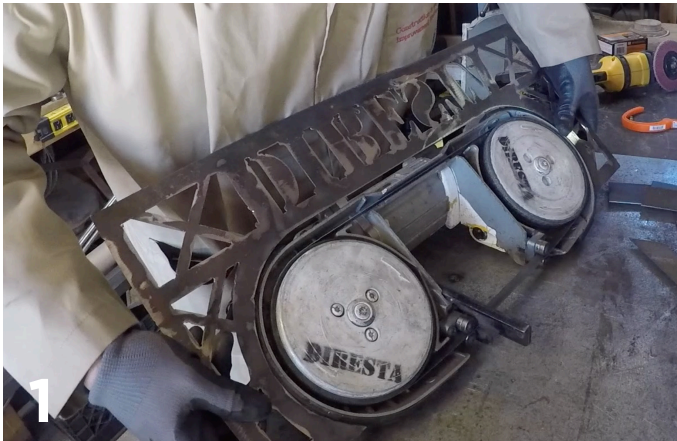
MATERIALS

- 16-gauge sheet metal
- 1/4-inch, 12-foot x 12-foot and 3/8-inch rod
- Sheet Metal Screws
- Spray paint

WELDING/CUTTING EQUIPMENT AND TOOLS

- Lincoln Electric Torchmate® 4400
- Lincoln Electric POWER MIG® 210 MP
- Bandsaw with metal-cutting blade
- Shears
- Palm sander
- Cordless drill
- Clamps

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Step 1: The main frame

Start by creating a squared-off, elongated C-shape that matches the profile of your bandsaw from 16-gauge sheet metal. Using a piece of bar stock with a notch cut into it as a bending jig, create a series of small bends in a piece of 16-gauge flat stock to match the inside curve of your C-shape, attaching with a series of tack welds. When complete, this frame should fit around the blade guard of your saw.

Step 2: Making the vertical frame

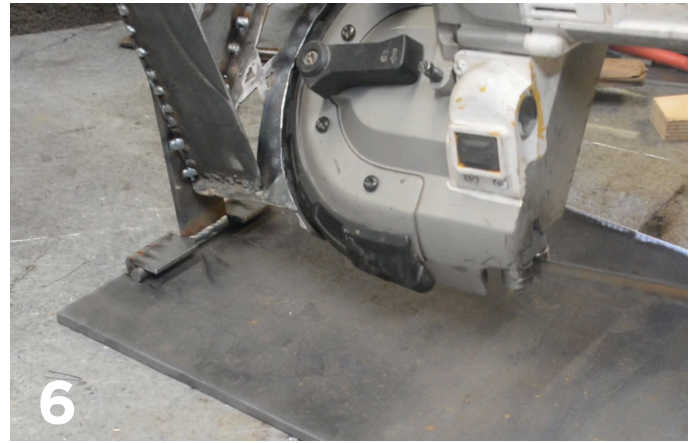
Create two V-shaped “legs” and weld them to the main frame, welding pieces of 16-gauge stock to the backs to strengthen them. A pair of lateral braces adds more rigidity and completes the sub-assembly.

Step 3: Contact points

To ensure the frame makes good contact with the bench when used vertically, tack small “feet” to each corner of the base V. In this case, a few metal nuts of the same size will do nicely.

Step 4: Attaching the saw to the frame

With the bandsaw in place in the C-shaped cradle of the frame, drill a series of holes through the frame and into the blade guard of your bandsaw. Attach the bandsaw to the cradle with self-tapping screws, being careful that the screws are short enough to avoid contact with the blade or any other moving part. Now your saw is set to use vertically.



Step 5: Pivot point

To create the pivot for using the tool as a horizontal bandsaw, first weld a length of 1/4-inch round bar stock to a length of 1/8-inch flat stock. Weld this sub-assembly to the point so it extends from the point of the top 'V' of the frame.

Step 6: Horizontal stage

To create the 'cutting stage,' cut a rectangular piece of 1/4-inch plate that is short of the total length of the bandsaw and frame. Assemble the mating hinge for the pivot from the same 1/4-inch round bar stock, topped with a piece of flat stock to create a deep recess for the pivot to insert into. Tack all pieces to the piece of plate, removing the center section to accommodate the pivot.

▶ A detailed drawing and cut list for this project can be downloaded at arcmagazine.pub.

Step 7: Establish the cutline

To ensure accurate cuts, build up the working end of the table with a piece of flat stock and a piece of 1/2-inch square bar stock, welding both to the plate in that order, perpendicular to the saw blade. With the bandsaw in place with the pivot in its receiver, turn on the saw and lower it onto the square bar stock. This will establish the cut line and kerf thickness for repeatable, stationary cuts.

Step 8: Finish

Remove the bandsaw from the frame and finish with your favorite spray paint to prevent corrosion. Finally, add a custom fit plate to the OEM table, for more accurate vertical cuts. Now you'll be able to use the machine as a bench-standing bandsaw, for chopping in the table cradle, and it will always be at the ready to be picked up standing on its head.



ANIMAL-PROOF FABRICATION

The Houston Zoo fabrication team of Brendan Joseph, Jason Isenberg and Anthony Cantu must construct habitats, cages and “play toys” that won’t fail at the first thump from a multi-ton creature.

The team has a number of responsibilities, from daily maintenance to working with zoo keepers to fabricate enrichment projects, which are designed to encourage and stimulate the animals’ natural behavior. The objective is to help keep the animals active, healthy and happy. And when the animals are happy, so are patrons, who come to the zoo expecting to see active creatures. **ARC**





Photography: Stephanie Adams / Houston Zoo

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Master Class

A discussion of advanced materials and techniques for the seasoned welder.

STEPS TO PRODUCE X-RAY-QUALITY WELDS ON ALUMINUM

By Charlie Lariche, Welding School Instructor, The Lincoln Electric Company



An X-ray-quality weld on aluminum is a superior weld — the highest caliber. Proper steps must be followed to achieve such a weld.

Hydrogen is the most abundant element in the universe, so trying to completely escape its presence is difficult, if not impossible.

But minimizing the effects of hydrogen is critical to achieving the highest caliber weld on aluminum — one of X-ray quality. Following the proper steps will result in clean base metal and wire, proper gas coverage and the appropriate welding technique that will sustain gas coverage, whether welding with the MIG (GMAW) or TIG (GTAW) process.

Quality welds depend on a number of factors, including lack of fusion, cracking and tungsten inclusions (for TIG). This article will concentrate on steps to avoid porosity.



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Clean Material

The metallurgical properties of aluminum are such that it absorbs nothing from the atmosphere — including hydrogen — in its solid state. However, the metal's ability to absorb hydrogen substantially increases as it heats up.

The source of hydrogen in the atmosphere is humidity (H₂O), which can exist on both the base metal and wire. On the base metal, the presence of oil, grease, water and other contaminants can result in the buildup of hydrogen. The metal should be degreased using a substance such as acetone, non-chlorinated brake cleaner or citrus cleaner.

While aluminum can be brushed to reduce the oxide layer, which absorbs hydrogen, it's important to remember that brushing is not synonymous with cleaning. Brushing will smear contaminants over a larger area of the material.

A high-quality, clean consumable is a must. It should be properly stored before and after use to keep it free of contaminants. As with the base metal, an oxide-layer buildup on the consumable will contain hydrogen.

To achieve X-ray-quality welds on aluminum, the filler metal should also be aluminum.

Shielding Gas

In most cases, the shielding gas will be 100% argon. Some heavy aluminum materials may necessitate an argon-helium blend (the helium adds heat to the puddle). The gas shielding will help prevent humidity from getting inside the weld.

Appropriate Welding Technique

Angles are important when trying to achieve X-ray-quality welds. The work angle (angle to the workpiece) should be 45 degrees, and the travel angle should be 10 to 20 degrees. The objective is to maintain gas coverage. Coverage will be lost if the angles are off, leading to porosity. The correct work and travel angles will maximize the level of gas coverage to ensure nothing from the atmosphere gets into the weld puddle.

The push technique (rather than drag) is required because the shielding gas needs to purge the area ahead of the weld.

Travel speed is critical as well. Go too quickly and the weld will be colder with little or no penetration. Too slow and the weld will ball up. In both cases, a lack of fusion will occur.

An X-ray-quality weld is a superior weld, widely considered to be the gold standard in skill. Achieving such a quality weld takes time and experience. Do-overs will be common, especially early on, so don't be afraid to continually practice the technique on coupons. Before laying such a weld that will be put into use, hobbyists and fabricators should test their technique on scrap material.

Thanks to Filip K. Bidzinski, Director, Global Sales and Technical Services for Indalco® Alloys, a Division of The Lincoln Electric Company of Canada LP, for contributing to this article. ARC

Flashback

Stack Savings



December 1940 — Workers from G.A. Richards Co. in Grand Rapids, Michigan, weld a circumferential seam in a steel smoke stack for use at Fort Custer, a military training center located about 50 miles away near Battle Creek, Michigan. A total of 600 stacks were fabricated using a motor generator and the carbon arc welding process. Welding the stacks rather than riveting resulted in an estimated 60% savings. The stack sections were butt-welded together, whereas riveting would have required a 1-inch overlap. All told, welding saved 768 square inches of material per stack, or approximately 17 pounds of metal. **ARC**

Have any vintage (pre-1975) photos you'd like to share? Email them in jpeg format to editor@arcmagazine.pub with a date the photo was taken (actual or approximate), a brief description (three or four sentences), and an email address where we can reach you for additional information.

SHOW US THE ONE
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Inactive State Active State – Shade 8 MIG

