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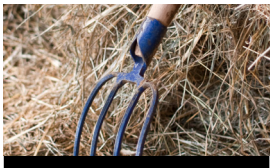
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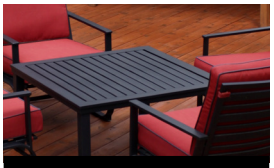
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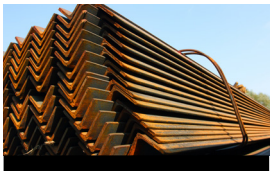
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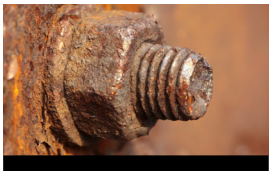
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LETTER FROM THE EDITOR

THE GIFT OF BALANCE

Once again, we're into that last stretch of the calendar that's often called the most wonderful time of the year. Individual opinions about that assessment may vary, but at the very least, it can be the most paradoxical time of the year.

On one hand, the pace of life accelerates. There are last-minute projects to wrap up – either on our jobs or in our shops, and oftentimes both – and there are holidays to prepare for. There's usually a long and daunting list of things to do in order to make the season what we want it to be.

But on the other hand, if we're lucky enough to finish all of our required tasks, we get to put on the brakes at this time of year and slow down for at least a little while. That's when the meaningful stuff happens. That's when we finally get a chance to connect with our families and friends and all the people in our communities who mean the most to us.

Ryan Nierop, the subject of our cover profile in this issue, has figured out how to make that family connection a priority – not just at this time of year, but all year long.

Ryan is a rig welder from just outside of Vancouver, British Columbia. He works a variety of jobs in the city as well as the outlying rural areas. He's in high demand, thanks to a solid and diverse skill set, a depth of experience and a high level of visibility resulting from a robust social media presence with international reach. He currently juggles more than fifty clients in and around Vancouver, but he never lets the demand get so great that it outweighs his commitment to his wife and their three young children.

"Anyone can work unlimited hours and make a lot of money," Ryan tells *ARC* writer Jeff Herrington. "I take more pride in providing for, and being with, my family. That's time you'll never get back, and because that time's so precious, I'll never regret spending as much of it with them as I can."

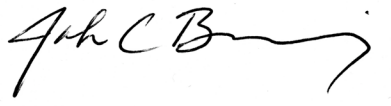
Amid the hundreds of photos on Ryan's Instagram page (@r_nierop) featuring him engaged in projects in his shop or at various worksites, you'll also find pictures of him with his wife and kids, as well as a few glimpses of him just hanging with friends. Sometimes the best lessons we can learn about how to make welding a part of our lives have to do with a lot more than just welding.

Elsewhere in this issue, be sure to check out our 2023 Holiday Gift Guide. You'll not only find an array of welding equipment and gear to take you into 2024, but also some fun apparel and accessories that tell the world that welding is a central part of your life and your identity.

As always, we at *ARC* and Lincoln Electric wish you and your families the best of the holiday season. As you make your way through the last weeks of 2023, be sure to slow down for a minute and save one gift for yourself. Give yourself the gift of balance.

See you in the New Year.

— John C. Bruening, Editor-in-Chief
Editor@arcmagazine.pub



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A Healthy Balance

Thanks to his mobile welding rig, Ryan Nierop easily manages work projects and family time.

By Jeff Herrington

“I take more pride in providing for, and being with, my family.”

Forget Keto.

Never mind Paleo.

Intermittent fasting? Surely you’re joking.

Most nutritionists agree the best approach to a healthy lifestyle is to eat a balanced diet.

If that’s true, then Ryan Nierop has found the occupational equivalent of the food pyramid. A mobile welder based just outside Vancouver, British Columbia, Nierop is a Class A contractor tending to 50-plus clients in person and – more recently – 100,000-plus followers on Instagram.

Some of his clients are in the city. Others are along its fringes. Some days he’s welding a gas boiler or irrigation system. On others, it’s a crematorium (yes, a crematorium).

And yet, most evenings, he wheels his rig into his driveway by six, ready to enjoy dinner and a LEGO® movie with his wife and three kids. Because to Nierop, keeping a healthy balance means far more than managing numerous welding projects every week.

“Anyone can work unlimited hours and make a lot of money,” he says. “I take more pride in providing for, and being with, my family. That’s time you’ll never get back, and because that time’s so precious, I’ll never regret spending as much of it with them as I can.”

Balancing welding with family time came early, and naturally, to Nierop. His father was a prominent rig welder, whom Nierop describes as a hard worker and a perfectionist.

"As a kid, I worked beside him, grabbing rods and the like," he says. "Meanwhile, I'd watch TV shows like *Monster Garage*, which fueled my interest in welding even more."

But it takes more than a family pedigree and lots of television time to turn someone into a serious welder. Tyrone McDonald, a buddy since the second grade, remembers Nierop demonstrating early on a wicked amount of natural talent.

"Ryan's family had a tennis court," McDonald recalls, "and he'd weld some rails there we'd skateboard on. Or he'd build go-karts for us to drive. Still, we were kids. It just didn't register with me that his talent went way beyond what was normal for our age."

Nierop didn't intend to pursue welding as a career. But at 19, he bought a house with his sister and suddenly mortgage payments and property taxes became a deal. "I knew welding, and I had the industry connections," he says. "So, I decided that was my best option."

Nierop showed a proficiency for welding, the tools for doing it, and relationships with clients that might benefit from his expertise. But to become a welder in Canada, one must either apprentice with someone for three years or combine more than three years of work as a welder with college-level (or professional) courses. Although the work he'd performed alongside his father would have easily satisfied the apprentice requirement, Nierop opted to take college courses as well.

Rod Walters, a welding instructor at the British Columbia Institute of Technology, recognized Nierop's raw talent from the get-go. "I could tell the minute he walked in that Ryan was a pure welder through and through," he says. "He loved everything about welding. And, he had the motor skills and attitude to match.

"A lot of younger welders believe they know more than the instructor does, says Walters, and given his background, that kind of assumption could have come easily to Ryan. But he never once exhibited that attitude. He always listened, asked smart questions, then applied whatever you taught him. Plus, he was always a pleasant, thoughtful guy to be around."

Walters adds: "Sort of the perfect balance for a welder."

Low clouds blanket Langley, one of Vancouver's many exurbs. Something between a mist and a drizzle dampens the windshield of Ryan Nierop's mobile rig as he exits his driveway to visit a few clients.

His rig – a Dodge Ram 4500 Heavy Duty – is the latest and swankiest in a series of rolling offices Nierop has operated since starting his rig welding journey almost twenty years ago. His first truck was a 1993 Ram 150 with a regular cab, limited tools and a V6 propane engine. As his business grew, the Ram 150 gave way to a 2001 Ram 3500 with a welding deck. For his next upgrade, Nierop removed the deck from the 2001 model and secured it to a new 2010 Ram 5500 – which served as his mobile workplace for nine years before settling on the current 4500 model in 2019.

Like most everything in Nierop's life, this current rig strikes an important balance between practicality and productivity.

"This is no monster truck," he emphasizes. "I'm clear that fifteen-thousand dollars more in rims and tires won't bring me more business. It's only a single cab, but when I'm parking in the city, trust me, smaller is better."

Nevertheless, the rig is "a true, rolling shop, with a custom-built deck and every tool I could want," he adds. "I have 5x Aluma reels, 2x lead reels, one oxy-fuel reel, one purge gas reel, one six-wire power/remote reel and one 120-volt power reel. And a Lincoln Electric welding machine and lots of cabinets.

But all that gear makes the truck heavy, he admits. "It's not made to take off-road and perform welding at, say, a pipeline site."

Nierop's first stop is a farm growing bell peppers hydroponically. Its glass greenhouse – with pepper plants towering several feet tall – spans 36 acres, the size of 100 ice hockey rinks. The farm produces around 30 kilos (65 pounds) of peppers from each square meter (11 square feet) and for many years now, the farm has commissioned Nierop to handle any welding required on its two wood boilers, its gas boiler and its hot-water storage tank.

At a security gate, a long-time employee named Carl saunters over to shake Nierop's hand and admit him into the production area. "You know, it was Ryan's father who envisioned putting our hot water zone pumps in the boiler room rather than the greenhouse," he says. Asked if Nierop does a good job of managing their welding needs, Carl smiles coyly.

"Well," he replied, "he's the only welder we'll allow on-site."

Nierop believes that's partly due to his being a turnkey solution

for the farm. “In addition to welding, I supply all the parts and manage the paperwork, so I know everything has arrived and nothing is missing,” he says.

It’s also partly due to the breadth of knowledge Nierop can apply to most any job on the site. “I was working on one of their boilers,” he says, “and they asked if I could also work on an auger adjacent to it. I said, ‘Sure.’

“That’s why I’m big on welders getting certified in several procedures. I’m certified in shielded-metal arc welding, gas-tungsten arc welding and structural-steel welding procedures. Having that balance of skills, that versatility in the services I can provide, is a key reason I’ve succeeded.”

“Having that balance of skills, that versatility in the services I can provide, is a key reason I’ve succeeded.”

His business with the pepper farm completed, Nierop points his truck toward the heart of Vancouver. The vastness of the farmland on the city's outskirts eventually gives way to glittering skyscrapers, traffic lights and clusters of pedestrians and vehicles going about their day. But making this urban landscape different from most others are (on the near horizon) the azure waters of English Bay and Vancouver Harbour and (beyond) the rugged terrain of the North Shore Mountains.

"My certifications only apply to British Columbia," Nierop says. "I can't travel and weld in Alberta, or even the U.S., which is just 15 minutes away. However, by having clients in the suburbs and in downtown Vancouver, my workday is more varied than if I were limited to a single workshop location.

"And because I'm mobile, I can follow a longer project with several shorter ones to bring even more balance to my workflow."

The project Nierop has come to check on is his reconstruction of a fire boiler located inside a power plant tucked discreetly amid Vancouver's downtown skyscrapers. The boilers are essential because they provide power to more than 200 connected buildings in the city's core.

Nierop fist-bumps a power plant employee as he strides toward the two-story boiler configuration, which resembles a set piece from a science-fiction movie. "The exterior shell on one of the boilers overheated," he explains as he inspects his work. "We had to cut the shell off and reconstruct and reinsulate the boiler. That took us about three weeks."

But Nierop emphasizes that how long it takes to get a job done is nowhere near as important to him as how well it's done.

"What I learned most from my father and mentors is to never half-ass anything," he says. "They were all perfectionists, and I was taught – and it resonated with me immediately – that one-hundred-percent effort is the only acceptable effort."

That perspective definitely doesn't surprise a long-time mentor Nierop looks up to.

Glenn Rachel has been a welder for more than 45 years, a welding business owner for more than 20 years and an occasional welding colleague of Nierop for the past 15 years. "In this business, you can tell those truly dialed into welding from those just on the fringe," Rachel says. "From when I first met Ryan, he's exemplified the belief that second-best isn't good enough, both with his welding and his customer service.

"Customers often don't understand what needs to be

done. But Ryan will take the time to explain what must be done and why what a previous welder did wasn't good enough. Because of that, I think he has the skills and personality to teach. He'd go the extra mile with students to help them get over the hurdles they encounter and succeed."

Nierop has not taught any welding classes thus far. But he is an instructor and mentor of sorts through his popular Instagram page (@r_nierop). His content ranges from videos of him welding with the spectacular scenery of British Columbia in the background, to photos showcasing a new wireless remote setup backdropped by the music of Fleetwood Mac, to holiday shots featuring his wife, Emily, and his children, Jackson, Naomi and Lyla.

Nierop wasn't an early adopter of social media and isn't fazed by the newfound fame it's produced.

"I don't think of myself as some influencer," he insists. "I'm not selling some brand I wouldn't use otherwise. I was skeptical of Instagram at first, but over time, I've seen the benefits that a social media presence can produce, even if it's just highlighting what excellent welding looks like or answering questions from others about it.

"My advice to rookie welders has always been to talk less and ask more questions. Learn from someone who knows more about the trade than you and can show you how to do it right. Social media can be a good place for that."

Those who've known Nierop for years, like boyhood friend Tyrone McDonald, are nothing less than awestruck by how he's gone viral.

"I'm blown away by how his Instagram page has snowballed," says McDonald. "And I am super happy that so many others appreciate what I've always seen in Ryan but never understood because I'm not a welder."

The showers have retreated, and the sun is peeking through the gloomy overcast as Nierop points his rig homeward to Langley. The day's over, but he's already contemplating future career opportunities.

"I'd like to consult the R&D departments of companies that make welding equipment," he admits. "I'd have a lot of worthwhile suggestions for them."

But his most important suggestion is the one he offers to his fellow welders. A suggestion on how to maintain a work-life balance.

"Just get work done," he says, "then come home early." ARC

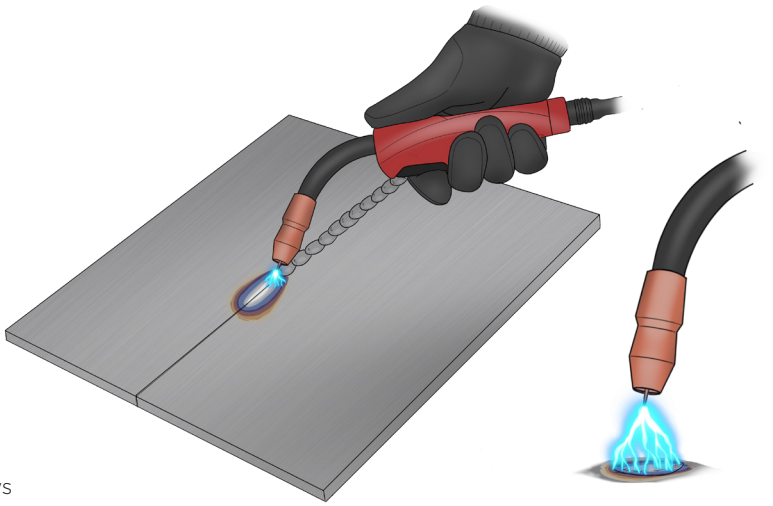
"Just get work done, then come home early."

QUESTION MARK

ARC taps into the vast experience of veteran tradesman, educator and author Mark Prosser (CWI/CWE). In addition to many years as a welder for the automotive and motorsports industries, Mark has also spent the last 15 years teaching welding at the college level, where he fields challenging questions from his students every day. He shares some of those questions – and his answers – with *ARC* in every issue.

What is "Pulse" MIG Welding and how is it different from MIG welding?

Pulse welding is a process that has been used for decades in different applications within the welding industry. It was not as well known throughout the industry until the power supplies designed for pulse welding became more affordable and available. More recently, most welding equipment manufacturers build MIG welders with pulse capabilities that melt the filler metal and transfer it across the arc in a different way than the traditional transfer methods.



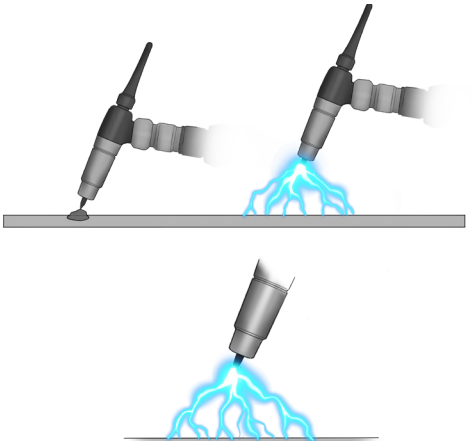
Illustrations by Wishva Hettiarachchi

Short circuit metal transfer – also known as "short arc" welding – has been used for many years to build a variety of fabricated parts. This process is excellent for all-position welding on a variety of material thicknesses. It creates a very controllable puddle with good fusion on thinner materials. Short arc welding always operates on the lower end of the amperage/voltage relationship and produces a fair amount of spatter. Lack of fusion is common on thicker materials – especially when the operator's skills are limited – and it is a slower process compared to others.

Spray metal transfer welding has also been a common process for many years. Spray metal transfer creates a fluid and deeply penetrating puddle that results in excellent fusion with thicker materials. Spray transfer can also reduce spatter significantly, and can be beneficial in high-production operations. While these are all desirable characteristics, the one major drawback to spray transfer welding is that the puddle is so fluid and slick that the process is only practical in flat and horizontal welding positions. This is where pulsed MIG welding has changed things.

Pulsed MIG welding offers the best of both worlds. The process requires a power supply capable of pulsed welding, and it is considered a modified spray transfer. This is a spray type arc with all the positive attributes of spray transfer, but the machine pulses the arc and the melted electrode. This creates an arc that is completely controlled in all welding positions. This process is excellent on thin or thick materials. Pulsed spray provides excellent fusion, minimal spatter, and a fast process with excellent controllability. If you can make the step up with the purchase of your next welder, pulse MIG welding offers significant advantages.

What are the causes of an erratic TIG welding arc?



Illustrations by Wishva Hettiarachchi

An erratic arc can create frustration when TIG welding, especially if you're just learning the process and techniques. There are several reasons for "arc wandering" when TIG welding, and they need to be identified and addressed in order to improve consistency with your welds.

One common mistake is the way the electrode is prepared. The tip of the tungsten electrode needs to be prepared correctly in order to maximize electrical flow. The grooves produced on the tip by a grinding or sanding wheel must be in line with the grain of the tungsten and not around the tungsten. The roughness of your grinder can also promote arc wandering. If the grinding wheel is too rough and the grooves in the electrode to big, the arc will be less consistent.

Once you start welding, make sure you keep the tip clear of corrosion and contamination, as these are common causes of an erratic arc. Even if the tip looks clean to the naked eye, it probably isn't. If you look at it under magnification, you'll see spikes that send the electrical flow in different directions, creating an erratic arc that is hard to control. When in doubt, stop what you are doing and use the grinder to keep the tip sharp and clean.

Too much gas flow is another common cause of arc wandering. Turning up the cover gas is never a good idea. It's best to use enough gas to protect the weld but not more. With TIG welding, the volume of cover gas is more important than the pressure. With beginners, the travel angle of the torch is often too great, which can allow atmospheric gases to pull in behind the nozzle and contaminate the cover gas. You may feel inclined to turn up the pressure on the gas, but don't. This practice can contribute to an erratic arc.

These are the most common reasons for arc wandering, but there are others that can make TIG welding harder than it needs to be. Make sure to set up your equipment properly and practice your technique – and if you run into arc problems, check all connections, clean the electrode, and watch the gas flow.

Why is it important to clean the base metal before welding?

Illustrations by Wishva Hettiarachchi

Clean base metal is always an important consideration when welding. Resorting to a hotter arc won't burn surface impurities from the metal. If you weld over rust, your welds will have rust in them. This is why proper cleaning of the base metal is important. How clean the material needs to be depends on the welding process.

Metal parts are often coated with a thin layer of manufacturing oil that needs to be removed from the area where the weld takes place. Solvents such as simple green or acetone can be used to wipe off the oils. However, you do need to be careful with cleaning agents, as many will leave a residue on the surface that can produce phosgene gas during the welding process. Inhaling these gases can be very dangerous. Do your research into acceptable cleaners for removing based metal surface impurities. Most of the time, even a simple wipe-down with a clean rag will help.

Other surface impurities such as rust or mill scale can cause problems. TIG welding does not handle surface impurities as well as the other processes. MIG is better than TIG in this regard, but the flux electrodes handle impurities the best. In order to make an industry-standard weld, all mill scale needs to be removed from the weld joint area. Depending on the application, failure to do this could result in a sub-standard weld. So it's always worth the extra minute or two that it takes to clean the base metal according to the application.

Processes such as stick welding or flux core have cleaning scavengers and deoxidizing agents in the flux to help clean impurities from the weld puddle. This is why these processes can handle surface impurities much better than MIG or TIG. With stick and flux core, the impurities are pulled out of the puddle and isolated in the flux more efficiently than with the other processes.

Generally speaking, the cleaner the base material, the better the quality of the weld. The level of cleaning depends on the required level of quality, but standards and requirements notwithstanding, a cleaner weld is a better weld in any situation.

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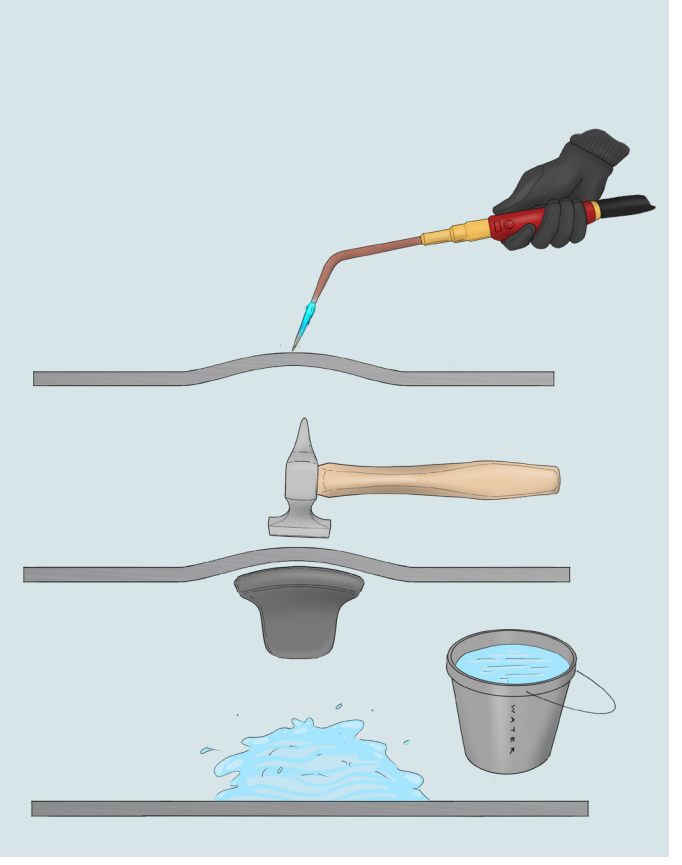
SHOP TRICKS AND TOOLS

ARC brings you time-saving, money-saving ideas to improve the quality of your projects and the process by which you complete them.

HEAT SHRINKING DAMAGED ALUMINUM

In a previous issue of *ARC* (Summer 2022), we showed you how to anneal aluminum panels before trying to shape or form the metal. Another skill that can be beneficial for those who work with thin aluminum is the ability to heat shrink thinner grades of the material when shaping or repairing damaged areas. The ability to minimize the overstretching of metal or eliminate the oil-can effect is critical to returning the material to its original shape.



Illustrations by Wishva Hettiarachchi

We're seeing an ever-increasing use of aluminum panels in automotive, marine and motorcycle manufacturing. When the panels are damaged, the displaced metal has to be reversed, which is a process of determining how to relax stress in the panel. We usually start with removing the area that has sustained the worst damage. The deepest part of the dent or gouge has undergone the most stress, and the metal in the area surrounding the dent has also been affected.

We can start this process with hammers and dollies, which will raise the low areas and lower the raised areas. This is the most appropriate process to use when fixing or shaping steel or aluminum. When repairing stretched metal, it is common to run into overstretched areas that no amount of hammering can flatten. This is where heat shrinks can work wonders when it comes to putting the metal back into position.

Heat shrinks on aluminum work the same way as heat shrinks on steel, but the process is much faster because aluminum melts at half the temperature of steel. The first step is to identify the oil can effect or the high area that is overstretched.

Heat shrinking will require an oxyfuel torch setup with a small tip, a hammer and dolly, and a rag with water to quench the material immediately after heating. Turn the torch in to the metal and position it quickly to heat a small area about the size of a dime. The area will raise with the heat and then contract, in much the same as it does when it is welded. After heating the small area, hammer and dolly the metal flat, then quickly quench it with the wet rag.

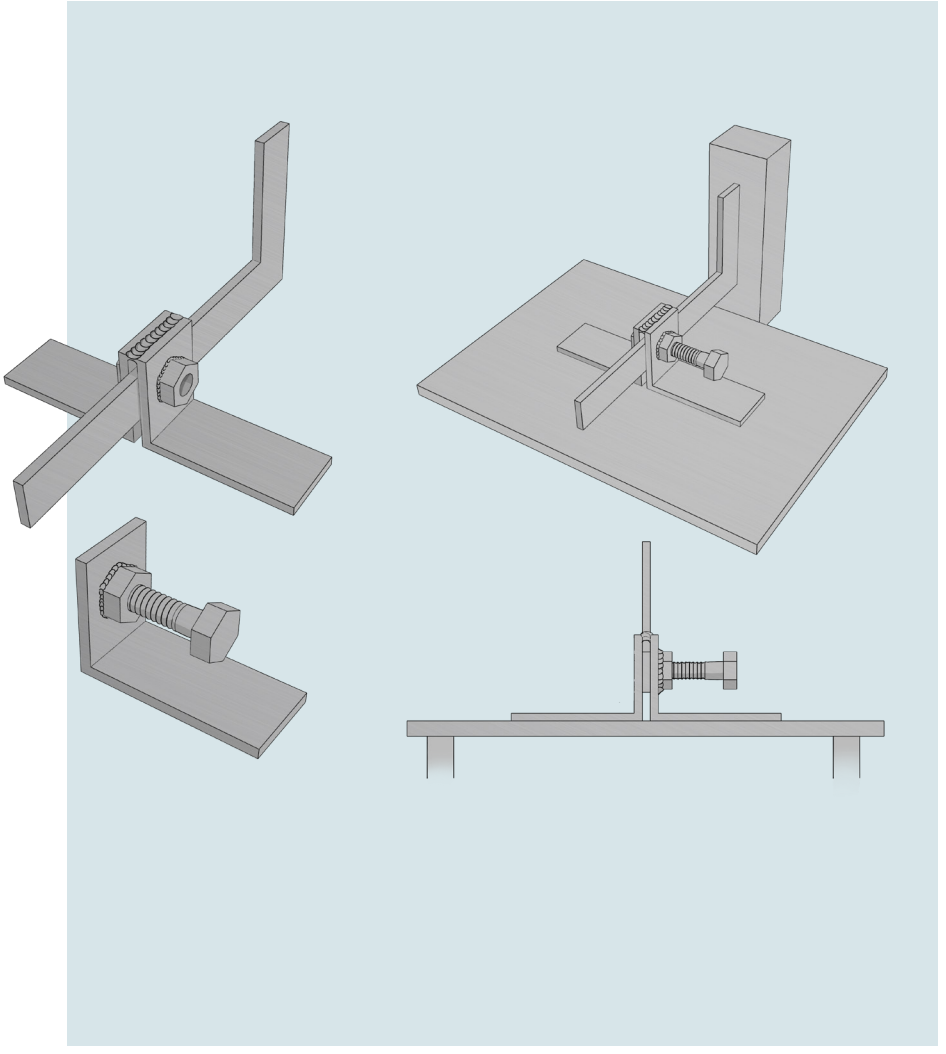
These dime-sized shrinks can be performed repeatedly to remove the oil can in your panel or tighten up overstretched metal. You won't be able to see the aluminum heat up like you can with steel. There is no color indicator, so you need to be quick with the heat-hammer-quench sequence. After a little practice, you'll be able to remove significant amounts of damage from any aluminum panel. This is an excellent skill to learn if you work on newer cars, boats, or anything with aluminum panels that are subject to dents or other damage.

AN EXTRA HAND FOR YOUR SQUARES:

We all love simple tools to help us with fabrication projects in the shop. Some of these tools come from manufacturers, but some can be made right in your shop – either for a one-time use or for repetitive use. A square is an effective tool that can be constructed from common items laying around the shop and this is the focus here.

The mere act of talking (or writing) about a square can be clumsy. When building an object with 90-degree angles, we need to use a tool called a square, and the act of ensuring that the angles are properly set is called squaring. In other words, we use a square to square our squares. And the process itself – holding two pieces of metal at 90 degrees in addition to holding a square to check for squareness – can be just as tricky for those of us who only have two hands to work with.

This simple tool will relieve you of the task of holding the square as you build. It can be constructed in any size you desire and modified as needed.



Illustrations by Wishva Hettiarachchi

Start with two pieces of 1/8-inch to 3/16-inch flat bar, and bend each piece at 90 degrees. The upper-leg length and the lower-leg length will depend on how stout the tool needs to be to suit the purposes of your project. For holding a large metal square, the vertical leg should be tall enough for the square to slide under or into, with a gap wide enough for the square to slide through. The horizontal legs can be 3 inches, 4 inches, or whatever you see fit.

Drill a 3/16-inch to 1/4-inch hole through one of the pieces and weld a nut onto the outside of the hole. This will allow you to run a bolt through one side and tighten the bolt to hold the square in place. Weld the top edge of the two angles together.

This assembly enables you to slide the square through the bracket, then tighten the bolt to hold the square in place wherever you need to. The bracket can be held in place with magnets or tack welded in place, or simply set on the table.

This square will enable you to hold three or four items in place with only two hands. There's plenty of room to exercise some creativity and modify the size and configuration of the tool as needed.

SAMANTHA FARRUGIA

INSTRUCTION BY INSPIRATION

By John C. Bruening

Samantha Farrugia has been at the helm of Women Who Weld since she launched the organization in her hometown of Detroit in 2014. Nearly ten years later, whether she's wearing the administrator hat (most of the time) or the instructor hat (not as often as she'd like), she still prefers the lean and hungry nonprofit startup energy that got the organization off the ground in the first place.

"I am the only full-time employee," she explains. "I'm answering emails, I'm taking calls, I'm doing meetings, I'm engaged in business networking, admin work, all of that. So I oversee all aspects of the business behind the scenes, which I really enjoy...I kind of like a little bit of chaos, but because I'm extremely organized, I can navigate it really well."

For as multi-faceted as the daily demands might be, the overriding objective at Women Who Weld is simple: teach women how to weld and find employment in the welding industry. The organization's introductory and intensive welding training programs prepare women for full-time jobs, apprenticeships, or continuing education opportunities in welding and manufacturing. In addition to the teaching component, Women Who Weld is also committed to developing economic opportunities for women and promoting diversity in the workforce – not just in the Detroit metropolitan area but nationwide.

Farrugia's journey has been unlike that of most welding instructors. She had no exposure to welding when she was growing up. Even after finishing her undergraduate degree in advertising public relations and business at Michigan State University in 2009, it was nowhere on her radar. Instead, she worked for a few years at an advertising technology startup in New York City, then traveled around South America and parts of Europe with her husband.

It wasn't until she came back to Detroit to pursue a graduate degree in city planning and design from the University of Michigan that she caught the bug, thanks to a two-hour introductory welding course that was part of the school's architectural curriculum.

"I loved it," she recalls. "From the moment I put down my first weld, within the first ten seconds, I was thinking, 'I need to do this more. This is amazing. And why aren't more women in the fabrication lab with me learning how to weld? How can I inspire them?' I literally didn't even know what I was doing, and I was already trying to get people trained and inspired and learning how to weld."

With the help of a small grant from the university, Women Who Weld took its first small steps while Farrugia was still in grad school. Almost ten years later, the organization is still based in Detroit, but has since opened a second facility in New York City. The organization teaches welding to about 100 participants each year.

Despite Farrugia's various administrative responsibilities throughout most of the year, she and her co-instructors get the most satisfaction from time spent in the booth with their participants – doing the work, passing along the knowledge and steering them toward the inevitable "ah-ha" moment.

> "WHY AREN'T MORE WOMEN IN THE FABRICATION LAB WITH ME LEARNING HOW TO WELD?"

"When a participant recognizes the weld puddle, and their ability to control the weld, that's always a great moment," she says. "If you don't see the weld puddle, and you don't realize you are controlling it, then you're kind of lost. Sometimes that moment comes right away, and sometimes it's a few days in."

Ten years after launching Women Who Weld, Farrugia is encouraged by what she sees as an increase in the number of women pursuing a career in welding. Even more encouraging, though, is the shift she's seen in perceptions about who belongs in the trade and who doesn't.

"When I started Women Who Weld," she recalls, "and I reached out to a few local businesses and told them what I was doing, and that I would have women who were skilled in welding and would be looking for jobs, sometimes people would just say, 'Oh, this isn't the path for women, but thanks for calling.'

"I don't hear that at all anymore." ARC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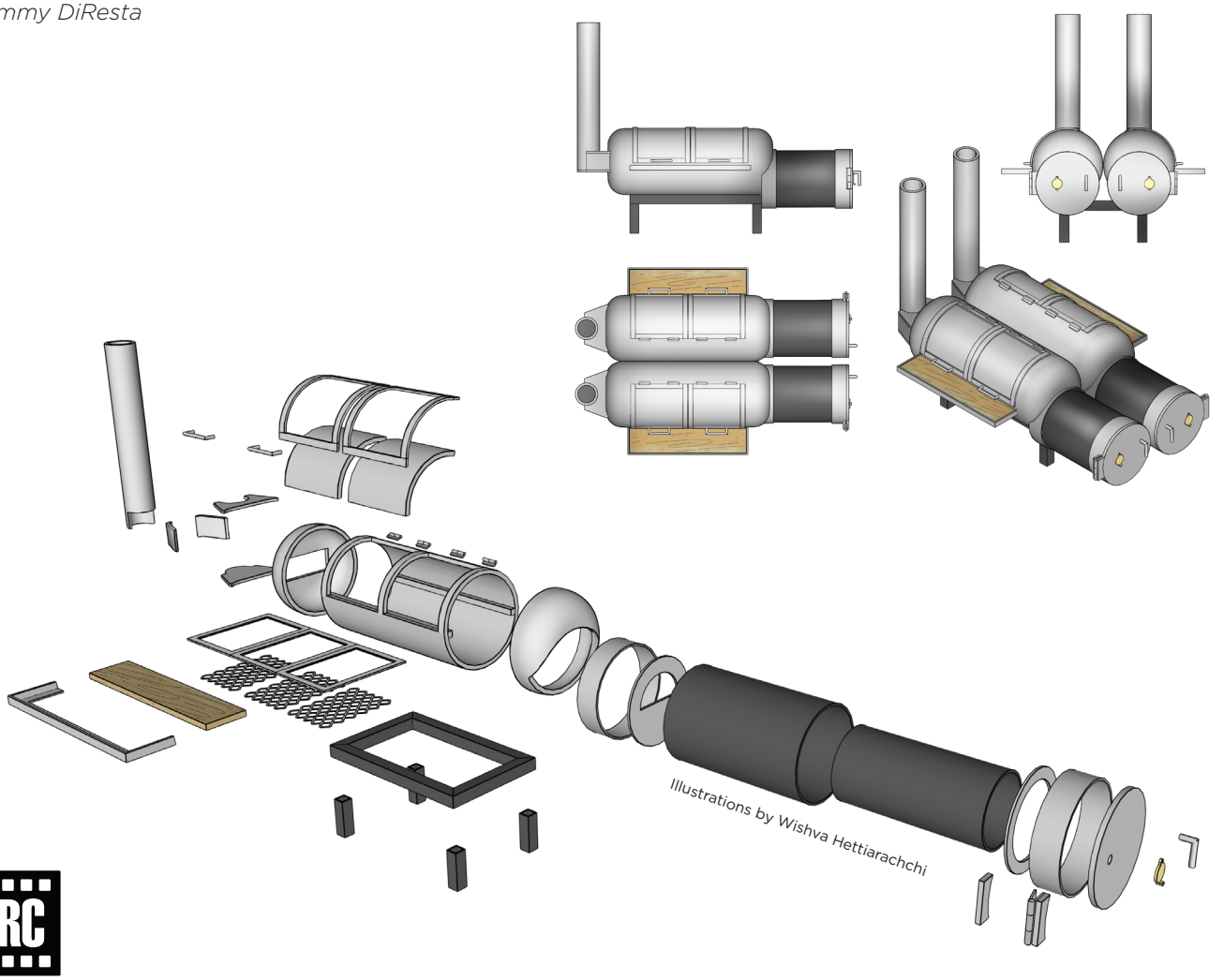
A PAIR OF DOUBLE-BARRELED TEXAS SMOKERS

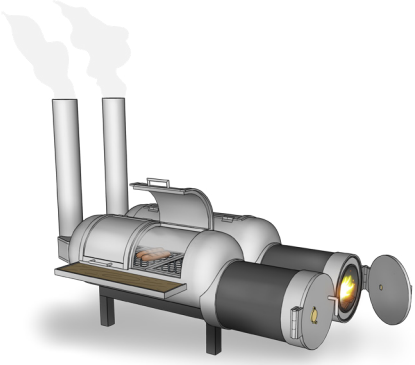
By Jimmy DiResta



Illustrations by Wishva Hettiarachchi

Watch exclusive footage at arcmagazine.pub

The summer is in the rearview mirror, but many of us continue to hone our outdoor cooking skills well into the fall and winter months. In this issue, we build a double-barreled Texas-style smoker that will keep things cooking and smelling good on the patio or in the back yard throughout the holiday season and beyond. As for the double-barreled design the strategy is simple: Why have just one menu option when you can have two at the same time? Enjoy the season, and be sure to keep things warm and tasty all year long.



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. Use an approved respirator if exposure to welding fume cannot be controlled, or if welding outside and natural air movement is not sufficient to keep welding fume out of your breathing zone.

MATERIALS

5 feet of 9-inch pipe (Schedule 40)
(8) 9-inch pipe caps
30 inches of 6-inch pipe (schedule 40)
12 feet of 1x1-inch square tube
(16) small gate hinges
30 inches of 4-inch stove pipe
Flat stock
Insulation wool
Wood blocks

WELDING/CUTTING EQUIPMENT AND TOOLS

Lincoln Electric Power MIG 215 MPi
Precision TIG® 225 TIG welder
Lincoln Electric Torchmate 4400 plasma cutting table
Tomahawk® hand-held plasma cutter (1500?)
Band saw
Hand-held belt grinder
Angle grinder

Imagery © Jimmy DiResta

Step 1:

Assemble the smoking chambers by cutting the 9-inch pipe into 15-inch sections. Tack the caps onto either end of both sections of pipe, then run the bead all the way around. Grind the welds and polish them flat. If a cleaner and smoother finish is your preference, use the grinder to strip all the paint off the chambers. Tack the chambers together in two pairs.

Step 2:

Use the angle grinder to cut the panels (two on each section) that will become the doors for each smoking chamber. Keep track of which cutaway panels correspond to which openings, as this will make the best matches later when assembling the doors. Polish the burrs and rough edges off each door and each opening.

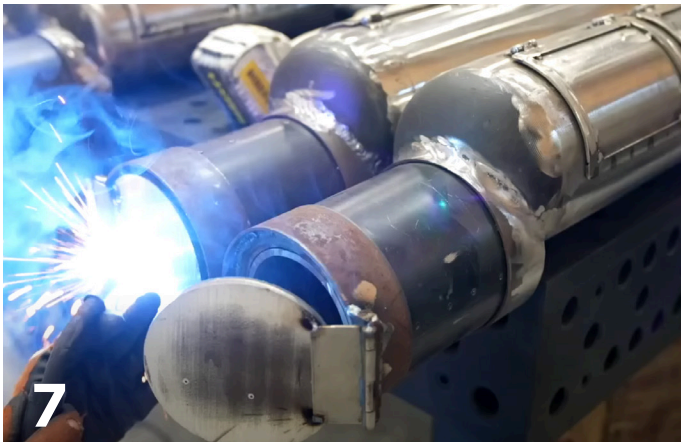
Step 3:

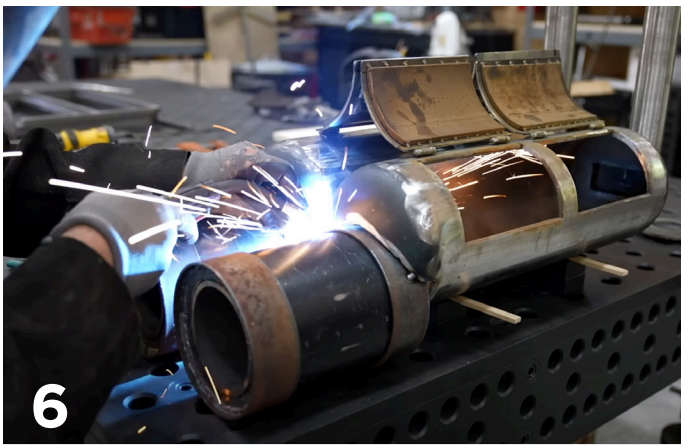
Cut the extrusions, straight and curved, to fit as flanges (or doorjambs), and tack them to the doors. Polish all the door welds to create a smooth finish throughout. Cut the gate hinges to fit the smoking chamber doors and tack the hinge pins to the doors and the chamber walls.

Step 4:

Cut and weld the panels to create the connecting units between the smoking chambers and the exhaust chimneys. Cut and polish the four lengths of chimney tubing, then cut the notch in each length of tubing to accommodate the connectors. Weld the connector assemblies to the chimney tubes. Cut open the exhaust ports on the smoking chambers, then weld the chimney assemblies to each chamber.

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





Step 5:

Cut the 4-inch pipe to create the interior layers of the fire chambers. Cut the 6-inch pipe to the same length to serve as the exterior shell. Cut the bands to create the attachment points at either end of the fire chambers. Cut the rings to fit the top and bottom of the insulation layer between the inner and outer layer of the chambers. Tack the rings to the inside layers of the chambers, then weld the outside layers to the rings. Stuff the wool insulation into the space between the inner and outer layers, then tack the rings onto the open ends of the chambers. Tap the bands into position around each chamber.

Step 6:

Use the Tomahawk to cut the semi-circular opening in each of the fire chambers, then cut the openings on the smoking chambers where the fire chambers will attach. Tack the fire chambers to the openings in the smoking chambers, then weld a full bead.

Step 7:

Cut the quarter-inch steel to make the fire chamber doors. Cut the hinges and weld them to the edges of the chambers. Weld the doors to the hinges, and weld a handle onto each door. Assemble the base for each smoker by cutting 45-degree notches in the square pipe and then folding and welding each piece into a rectangular configuration. Weld the legs onto each corner of the base. Mount the smokers on the bases and weld them down.

Step 8:

Cut the 1/8-inch steel into square frames that will support the grill inside the smoker chambers. Tack the grill pieces into the frames. Tack the food prep frames onto the sides of each smoker pot, then cut the wood blocks to fit inside each of the frames. Cut four brass eyelets to cover the air intake vents. Drill a hole in each smoker chamber door, then screw the eyelets onto the doors over the holes (leaving them loose enough to turn as needed). Bend eight door handles and TIG weld one to each of the smoking chamber doors.

MICHIGAN METAL

By John C. Bruening

For Mike Bass and Heather Mossing, ScrapFest is a year-long event. Every year.

In reality, the repurpose-focused art festival spans one weekend every summer on Turner Street in the historic Old Town district of Lansing, Michigan. Central to the event is a scrap metal artwork competition that began in 2008 primarily on a local level. In more recent years, however, it has attracted artists from all over the country. This past summer, ScrapFest included large and small pieces submitted by 37 artists hailing from as far away as Pennsylvania and Texas.

"I couldn't believe the caliber of the pieces this year," says Bass, who co-directs ScrapFest with Mossing. "We had more sculptures and more teams participating than any other year that we've done this. And everyone just brought the heat. The artists just outdid themselves. It was so great to see that."

Some of this year's artists and teams have been ScrapFest competitors since the very beginning, says Mossing. "Just seeing their improvement from the beginning to now," she says, "and just watching these artists grow throughout the last fifteen year, that has been an incredible experience."

But ScrapFest has become something much more than just a metal sculpting competition. It's a community-oriented event that has continued to grow and expand over the course of its 15-year history. Other events include: an 8K run/walk dubbed The Great Scrap Run, a Refashion Show that showcases recycled clothing and accessories, eco-art vendors, live music performances, and a variety of other family-friendly activities.

All of which is why Bass and Mossing spend most of their year either debriefing from their most recent ScrapFest or prepping for the next one. More often than not, they're doing both at the same time.

Also on the festival's annual agenda is a partnership with a different local charity each year that does important work without the luxury of a high profile or deep pockets. This year, a portion of ScrapFest proceeds went to the Mikey23 Foundation, an organization that teaches trade skills to local youth to help map out a career path that might not be available to them otherwise. The foundation enlists the help of certified contractors – welders, electricians, plumbers and others – who put trainees to work on local building and renovation projects in the greater Lansing area.

"They've actually had a number of kids who have gone through this program then go on to have careers in whatever trade or area that they specialized in," says Bass. "We try to partner with great local nonprofits that are doing great work, but don't have that many eyes on them. Mikey 23 was a good example of that."

David Such, a Lansing-based videographer and a metal sculptor in his own right, recently captured the ScrapFest vibe in a documentary he produced earlier this year. In a sense, the film brings the 15-year story full circle. Such first envisioned the festival in 2008 when he started digging into the piles of raw materials at Friedland Industries, a Lansing-based scrap processing facility owned by Bass's family. Such's experience sparked the idea of a gathering where fabricators and sculptors could convene and display their creations. Friedland Industries has spearheaded ScrapFest ever since.

The documentary is scheduled for release by the end of 2023. Bass hopes to eventually expand the film into an ongoing series that will showcase specific artists and their personal stories.

After several years of turning ScrapFest into an event of national scope, Bass and Mossing have learned that recycling can mean many things. Scrap metal can be re-melted in a foundry and turned into new metal that manufacturers can use to make new products. It can also be reused in its existing form to create something entirely different with an entirely new aesthetic.

"It's cool to be able to sift materials out of the scrap stream and give them a completely different path in the form of artwork," says Bass. "I think there's something about being able to take things that already exist and turn them into something else that has been incredible for people to witness. It has made people come away from the experience feeling very different about everything they look at." ARC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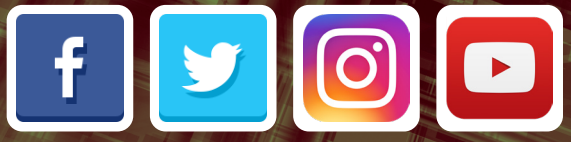

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ARC MAGAZINE

Tooth Repair

May 1945

A maintenance worker welds the worn tooth of a steel sprocket at Bowman Dairy Co. in River Forest, Illinois. The sprocket was back in service in just thirty minutes, at a total cost of $2 ($34 in 2023 dollars). A new sprocket would have cost about $25 ($426 in 2023 dollars), and would have taken at least three weeks to be delivered.

ARC

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