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Building a winning motorsports weld shop

Reaching the finish line first starts with the right equipment, consumables

By Jim Watson

Off-road truck racing used to take place in the desert, where blazing-hot summer temperatures and the wide-open landscape made the sport a challenge for spectators to access. With the development of short-course closed tracks complete with stadium seating and concession stands, being a spectator is now a lot more fun. These days off-road truck racing is not only garnering corporate sponsorships and television deals, it's also attracting racing legends like Jeremy McGrath, King of Supercross.

In July 2013 McGrath, a seven-time AMA Supercross champion, started his own off-road truck racing team to participate in the fast-growing Lucas Oil Pro2 Off-Road Truck Racing Series. Located in Lake Elsinore, Calif., Jeremy McGrath

Motorsports (JM2) is within miles of several amateur and professional racetracks, making it an ideal location for testing and scouting talented mechanics and fabricators.

Welding in the Motocross World

JM2 is located in the heart of McGrath's old stomping grounds in Southern California's Inland Empire, where his father Jack has owned and operated an auto repair shop since the 1970s. It's his family history that made McGrath different from his competitors, especially in the days before televised races and big corporate sponsorships, because he and his dad always had to maintain their own equipment. Rather than losing valuable track time sending engines and parts to local contractors for repair, they did it all themselves, though there was not a lot of welding required with Motocross.



Off-road trucks take a beating. That's why it's important to have a fully stocked fab shop that can handle every possible repair necessary.

The world of off-road trucks is very different than Motocross in the amount of manpower, necessary skills, and the space needed to keep everything running.

"With trucks, welding is a daily thing," McGrath explained.

The JM2 team is housed in a 7,000-sq.-ft. shop equipped with all the metal fabrication tools needed to build and maintain these highly engineered, purpose-built race trucks and the supporting race equipment.

A professional-grade shop like McGrath's has a plasma cutter, press brake, bead roller, lathe, tube bender, belt sander, disc sander, tube notcher, a press, and, ideally, a large welding table with fixturing accessories, not to mention brushes, levels, shaping hammers, shaping dies, and angle finders. They have equipped themselves to fix anything. Most repairs are for broken mounting brackets; front, rear, and side bumpers; and nerf bars, but they never really know, so they have to be prepared for a variety of maintenance issues.

"We beat the truck up pretty bad, so every time we come in from a race weekend we have to go through every component," McGrath said.

If you're setting up a motorsports welding and fabrication shop for the first time, take a few cues from McGrath's experience. Remember, you don't have to be a renowned off-road truck racer to have a professional-grade motorsports fabrication shop.

Safety Comes First (Especially in Motorsports)

Safety trumps everything, including wins and losses on the racetrack, and it should be one of the first things you think about when setting up shop. Look for welding jackets and sleeves made of flame-resistant fabric. Some of the newer fabrics are lightweight and de-

signed to feel and wear like cotton, a good choice if you work long hours.

It's also a good idea to have a few pairs of gloves on hand. Because gloves are constructed for the specific fabrication or welding task, you'll want to have a pair designed for metalworking, which are more rugged, as well as a pair specifically for gas tungsten arc welding (GTAW), which are thinner and allow more dexterity.

Don't forget your helmet to protect your eyes and face. An autodarkening helmet that fits a respirator can provide protection against airborne particles that can damage your lungs over time.

While it may seem like a lot of work before you even start welding, it's this kind of attention to detail, to preparation, and to making sure you get the most out of your equipment that results in the best-quality welds. As McGrath said, "Knowing that I'm safe, in a good truck, with quality material and welds is very important."

Essential Equipment for Arcs and Sparks

Whether you are gearing up to serve a large, high-profile operation or you're supporting a weekend racing hobby, you will need a dedicated gas metal arc welding (GMAW) power source, a GTAW power source, a plasma cutting unit, and an oxyacetylene setup.

The plasma cutting machine at JM2 had all of the front-end parts in place and was ready to use, but the GMAW power source needed some additional items to amp it up for more professional use. If you're in the same boat, consider a table-mounted GMAW gun holder with a set of pliers to cut the welding wire, clean the nozzle, and replace the tip. Consider incorporating a GMAW gun holder that has a reservoir for nozzle dip. Don't forget simple tools like a cart, which simplifies hauling the mobile GMAW power source to the track on race days.

Chassis and other components may require GTAW, so make sure your torches are dialed in to optimize performance in the shop. Accessory kits are available

Who Is Jeremy McGrath?

- Nickname: "Showtime"
- Signature Aerial Move: The Nac Nac
- Supercross Wins: 72
- Supercross Championships: 1993-1996; 1998; 1999; 2000
- 125-West Region Supercross Championships: 1991; 1992
- 250-Outdoor National Championship: 1995
- FIM World Championships: 2
- X Games Medals: 5
- Inducted into the Motorcycle Hall of Fame (2003)
- Inducted into the BMX Hall of Fame (2010)



Chassis and other components may require GTAW, so make sure your torches are dialed in to optimize their performance. Accessory kits can guarantee your air-cooled and water-cooled GTAW torches can accommodate as many welding applications as possible.

that can guarantee your air-cooled and water-cooled GTAW torches can accommodate as many welding applications as possible. Don't limit yourself.

Verifying water flow in your water-cooled GTAW torch is a bit more "old school" and involves a bucket and a timer. Disconnect the water return hose and run the cooler with the hose in a bucket for one minute. Water flow should be 1 quart per minute and no more than 45 PSI. Don't be surprised if you have to make adjustments, because most water coolers are factory-set for 65 PSI, which is too much pressure for your GTAW torch and can result in hose failure and water leaks.

When choosing GTAW consumables, consider rare-earth tungsten electrodes—one of the newer tungsten blends that are engineered to perform on all metals. Not only will you get a quality weld, it's much easier to manage inventory with only one type of tungsten to worry about.

To verify shield gas flow at the torch, where it matters most, be sure to use a flow tester, which often shows a different rate than what's displayed on the gas flowmeter. By testing, you can make adjustments based on results.

Finally, never underestimate the value of a good collection of hand tools—a side grinder, pry bars, high-quality hammers, a strong bench vise, metal cutting hand shears, spring clamps, and C-clamps. These tools prepare the material to be welded or assist you in building a replacement part.

Don't Forget the Skilled Craftsmen

For the Pro2 series, McGrath and his team manager, Lawrence "Lew" Lewis, have put together a highly qualified crew that includes a lead fabricator who graduated from Universal Technical



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Remember, you can have the best of the best in terms of state-of-the-art equipment and facilities, but if you don't

have skilled, responsible, and accountable craftsmen, those things will be of little to no help. 

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Most repairs performed at JM2 are for broken mounting brackets; front, rear, and side bumpers; and nerf bars.

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