



Fabricating **FORMULA FIX**

By [Nick Wright](#)

Wielding welders and wits, IndyCar restorer brings sprint cars back to brickyard shape

July 2013 - Since FabTech 2012, and especially in the last few months, [Joshua Shaw](#) has been tough to track down.

Up until the end of May, he'd been putting in late hours at Zakira's Garage in Cincinnati, where he's worked as a vintage race car restorer since 2010. His specialty is rebuilding former Indianapolis 500 racers—the scrappy, powerful metal roadsters that resemble rockets more so than the ad-laden carbon fiber whips of today.

This year, he modified his 1949 Kurtis by adding a flywheel and ring gear he fabricated to engage the starter, something the original engine was designed without.



"It's not easy. You've got to figure out all the geometries of the starter gear since it never had a self-contained starter," he says.

At the same time, a 50-year-old Offenhauser engine that was intended for Indy had starved itself for oil, and seized up. For that, Shaw and the crew at Zakira's had to weld new cast aluminum camshaft caps, or races, along which the steel camshaft spins. It's a poor design, but these engines were not built for 100,000 miles like today's street engines. Five hundred miles was the standard. In effect, the caps function as the camshaft bearings. This all had to be put back together in a day.

"It all came together well. Now we're back to a normal grind," Shaw says.

The cars, some of them Indy 500 winners, are displayed at the vintage and historic car show accompanying the race, held each Memorial Day weekend. But it's more of a sideshow, where the cars are run for maybe a half hour as a prerace event.

There's a small market for vintage sprint car restoration work. Shaw estimates there are five to 10 shops in the country that are doing full restoration work on the level they need to be done at the level the cars are worth. Each shop tends to have a couple main customers—typically wealthy hobbyists who have entire car collections—who supply the business. Some of the cars have sat in garages, mangled from wrecks and gathering dust for years. Others get a tweak or upgrade each year.

"One guy can make a living taking care of these race cars," he says.

Shaw originally had his own restoration operation, Shaw Hot Rods. He ended up at Zakira's through word of mouth after one of its employees left for back surgery. At the time, there was a 1923 Miller, the winning car from that year, driven by Tommy Milton (the first two-time winner of the Indy 500)

that wasn't going to restore itself. He was brought on as a hired gun to get it in shape. With a two-month deadline, Shaw thrashed day and night to get it running again for the show.

"We took it to Indy, and when we got back they asked me on full time," Shaw says. "At first I was here three days a week, but I enjoy this so much that I throttled back my other work to one customer and now I'm here full time."

Although the Indy 500 vintage car event isn't that weekend's main attraction, the restored racers do get their spotlight at the [Miller Meet](#), the vintage race car equivalent of the Super Bowl. It's held at the [Milwaukee Mile](#).

"Milwaukee is our Indy, our Daytona 500. Everyone has to have their stuff ready for it," Shaw explains. "You run vintage cars as hard as you want there, and it's where all the [Harry] [Miller](#) cars



come out."

Getting noticed

At Zakira's, each mechanic needs to know how to do everything, from assembly and metal fabricating to machining and diagnostics. "Although I'm the only painter," Shaw laughs. Zakira's is housed in a former Cincinnati Bell telephone maintenance building, partitioned into 10 work stalls. One side of the

shop deals with Indy cars, while the other side handles other jobs like maintenance, body work, or rare and foreign vehicles. It also has a dynamometer to break in engines and check their power, and a surgery-like clean room for engine assembly.

The shop's equipment parallels the eras of some of the cars that come and go. There are English wheels, planishing hammers and an old Linde welder "the size of a Honda," Shaw says. For newer tools, Shaw is fully equipped with Victor Technologies welders and plasma cutters—a sponsorship he accepted after the company's reps noticed Shaw's teaching prowess at a vocational event for kids.

"Every year I talk to the kids and tell them about building hot rods and you can make a living doing it," he adds.

If there's one group whose restoration rules Zakira's needs to follow, it's the Antique Automobile Club of America (AACA). The AACA gives race cars their certifying papers. However, the meticulous rules you'd expect don't mandate much beyond ensuring that at least 60 percent of the original chassis is present. Because race cars change every season—new engines, suspension, reworked crashed bodies—the frame is what matters. For everything else, Shaw usually has to fabricate parts from scratch as parts disappear year after year. He can match old torch welds with a TIG weld, and magnesium weld rare Halibrand wheels.

"Stuff is so rare now that where we're out, we can't just get another one. We've got to fix what's here," he says.

Shaw's expertise manifests itself in a certain perfection that undercuts the common notion of a greasy, grimy mechanic. He used to race modified sprint cars full time, as well, retiring on a championship year in 2000. After taking a few years off to focus on restorations, he got into vintage racing.

"And this past season I got hired to drive a midget car full time. Racing keeps me busy. Luckily I'm just a hired driver, I don't own it," he laughs. **FFJ**

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