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volume 31 • number 2 • April 2014

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- Factory Five 818 project
- Volvo 240 • Wiring tech

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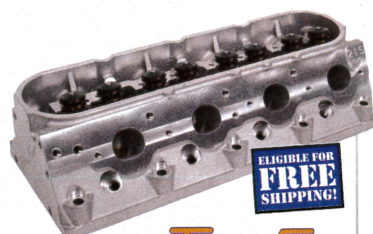
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# THE GOOD STUFF

Heading on track? Then you need to be properly protected. Here are some of the latest offerings we saw at this winter's PRI Trade Show for keeping your mind sharp and your body intact. Remember, kids: Play safe.



Sparco says that their new Extrema RS-10 is the lightest racing suit available. The unique fabric features a honeycomb-like structure. It feels closer to linen than traditional driving suit material. Retail price for this FIA 8858/2000-spec suit is \$2300.



The Z-Tech head-and-neck restraint from Zamp Racing features an entirely modular construction, meaning it can be tweaked to fit nearly any driver size or seating position. Suggested retail is \$429.95.

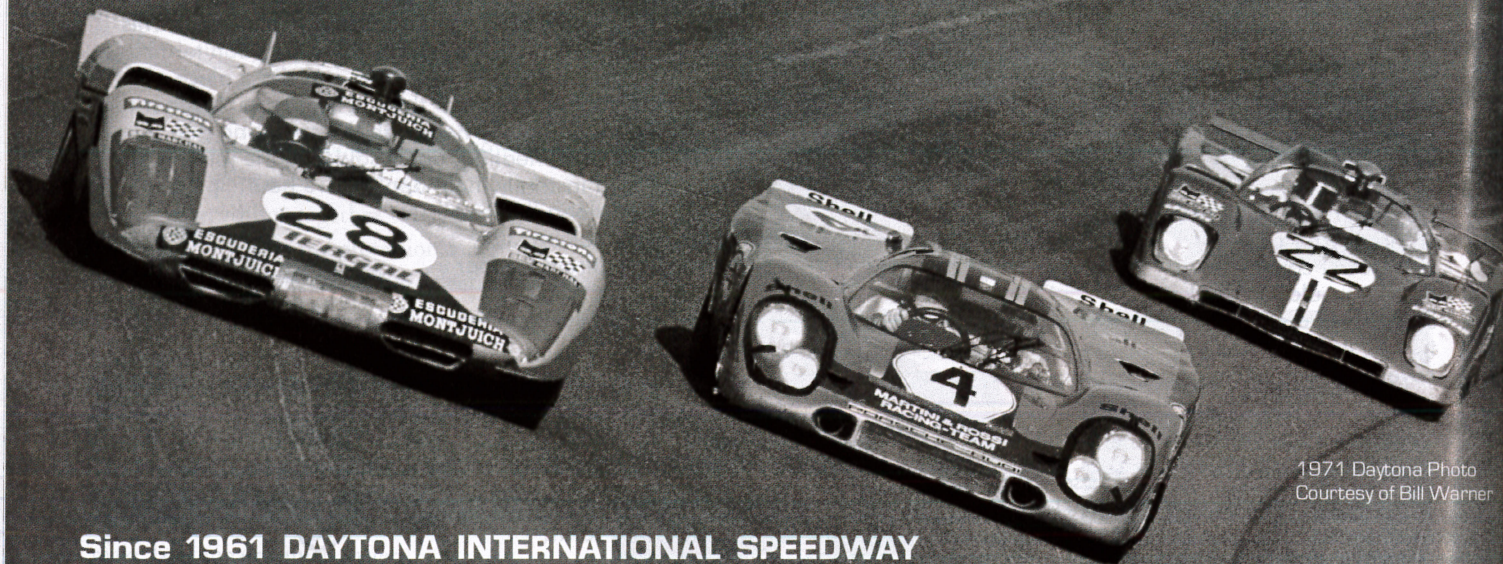
Not all helmet innovations are aimed at the pointy end of the field. Bell Racing's new Sport EV should retail for about \$300. The advantages? Typical Bell details plus a giant eyeport.



Momo's Advance Driver Cooling system uses a bladder, not lines, to circulate coolant past the driver's skin. Momo also offers suits designed to accommodate the cooling system's lines.

# A CLASSIC 24-HOUR RACE

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1971 Daytona Photo  
Courtesy of Bill Warner

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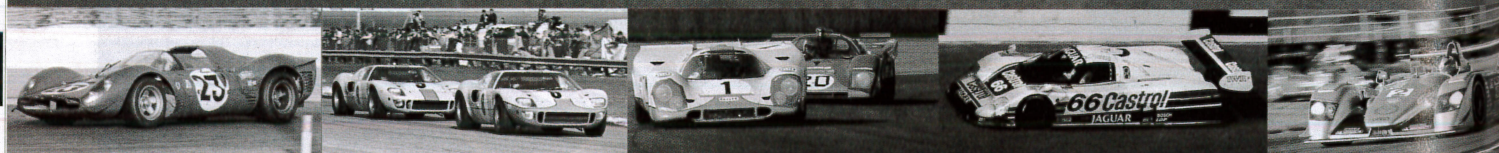
For car eligibility list and more information go to  
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Period Photos from Bill Warner

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**Mid-Ohio Historic Races**  
September 18 - 21  
Mid-Ohio Sports Car Course  
Lexington, Ohio

**Savannah Speed Classic**  
October 24 - 26  
Grand Prize of America Track  
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Savannah, Georgia

**Daytona Historic Races**  
November 11 - 16  
Daytona International Speedway  
Daytona Beach, Florida

**Sebring Historic Races**  
December 4 - 7  
Sebring International Raceway  
Sebring, Florida

## DATA SHEET

**project:** building and living with the first-ever Factory Five 818 kit car.

**part 1:** the origins of 818 (December 2013).

**part 2:** stripping the donor car (February 2014).

**part 3:** starting the build—finally (this issue).



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**SOME  
ASSEMBLY  
REQUIRED**

**Part 3: Let the Building of Our Factory Five 818 Begin**

story and photos by tom suddard

**O**ur last installment was full of sweaty dudes disassembling a wrecked, 10-year-old Subaru. We know, we know—riveting entertainment. What happened to the Factory Five Racing 818 we were writing about anyway?

Thankfully, the mid-engined, WRX-powered kit car is back on center stage. After completely stripping our donor car—a 2004 Subaru Impreza WRX—of all the parts we needed, we spread them out on the floor of Very Cool Parts, the shop that generously offered to help us build our 818.

Why the outside help? First of all, this is one of the first 818s in the public's hands. Also, we had a tight schedule: The plan was to turn this into a running, driving car in three weekend sessions. Having a shop dedicated to Factory Five builds would be our ally.

Our Factory Five 818 already looks like a car. Okay, this is really the starting point of the assembly process. The 818 arrives loosely screwed and taped together, both to protect the bodywork and to minimize its shipping cost.

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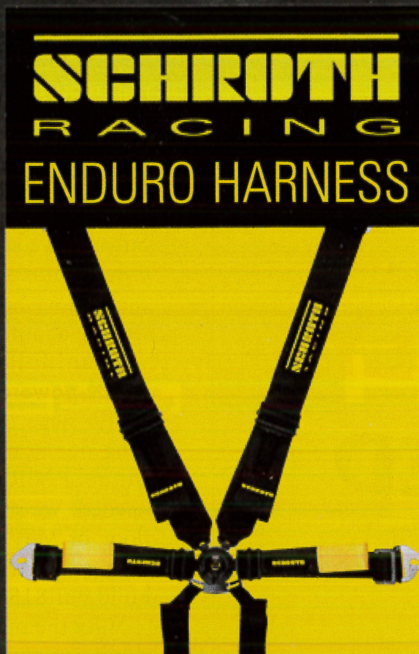
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## Pieces and Parts

We then sorted the parts into piles based on their needs. What needed paint? What needed replacing? What needed nothing?

We lucked out, as our donor didn't need much in the way of replacement parts. However, this would be our last chance to clean and paint everything, so we spent a few hours with a wire brush, a can of CRC Brakleen, and a can of Rust-Oleum semigloss black. Publisher Tim Suddard was a machine in this department, and we kept a steady stream of both new and old parts flowing through the painting zone. Few of the 818 kit's numerous brackets and adapters come painted, and we didn't want any bare metal to start rusting back home in Florida's salty air.

On the other side of the shop, ace mechanic Jere Dotten and shop assistant Bill Robinson were bolting the parts onto the 818. First up? The car's suspension. The front and rear suspensions are a mash-up of Subaru and Factory Five parts, with the result being adjustable double A-arms up front and a multi-link setup in the rear. Rod ends are abundant on the 818, and it's clear that the car isn't nearly as delicate as its weight class would suggest. Koni shocks also come standard. This should be a huge improvement over a stock WRX's MacPherson strut on each corner, and something we're keen to test out on track.

While Jere was working on the suspension, Bill was focusing on the 818's aluminum paneling. The car has a lot of it, and it all comes in a box so heavy that we couldn't even lift it.

What do these panels do? A couple of things. First and foremost, they keep water and crud from entering the car. Second, they act as a firewall to keep, well, fire away from the driver. And, last but not least, they stiffen the car's chassis. This wonder-metal is attached to the car with rivets and glue, and we went through lots of each over the course of the build. Factory Five supplies everything with the 818 kit, right down to



Dozens of videos detailing our 818 build can be found in the Project Cars section of our website, [grassrootsmotorsports.com](http://grassrootsmotorsports.com).



**CLOCKWISE FROM TOP LEFT:** We marked and photographed everything before removing the body from the chassis. // Factory Five supplies every single piece needed to build the 818—minus the Subaru donor parts, of course—right down to individually labeled nuts and bolts. We covered an entire table with the kit's hardware. // After we stripped the donor car—covered in the last issue—we laid everything on the floor and looked for broken or worn components. // Neatness counts. The 818 kit comes with all sorts of little brackets like this, and we cleaned and painted each one before assembly. Some projects are just too big to fit in a magazine. We videotaped every step of the 818's build, and you can watch the series for free on our website. The donor car's parts were in good shape, but filthy. We disassembled, cleaned and painted each assembly. // A little cleaning and paint can make old parts look like new. We're not sure these brakes will be adequate, but they're free. We'll use them for our initial shakedown. If we need more, a Wilwood kit and Brembos from an STI are available.

# The Fast Track

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## The All-New Factory Five 818

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Road & Track Magazine



The New Factory Five 818S Starting at \$9,990

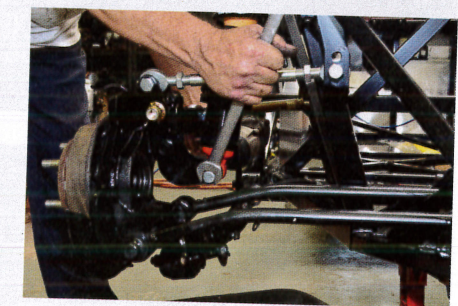
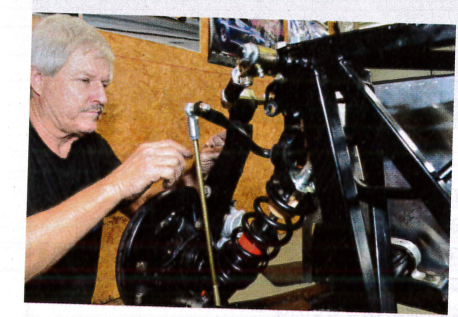
Introducing the all-new Factory Five 818 Sports Car. Designed in collaboration with the Grassroots Motorsports community, it is an 1,800 lb., Subaru WRX-powered, build-it-yourself sports car. Available in two models, the 818S Street Car and the 818R Track Car. The kit starts at \$9,990 and all you need to complete your car is running gear and parts from a 2002-2007 Subaru Impreza or WRX.

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the last rivet (and a few extra, in case you're as clumsy as we were).

**Digital Domain**  
Through all this, Factory Five's digital instruction manual was open on a giant monitor on the wall of the Very Cool Parts garage. The instructions had clear photos and concise language, though we did find a few teething errors during the build of our prototype car.

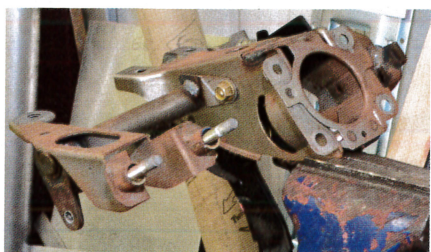
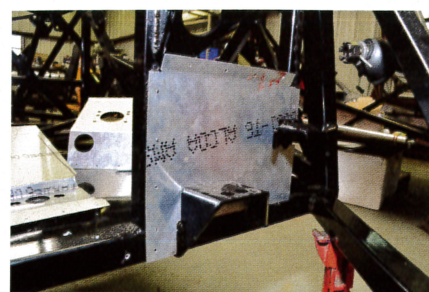
If you're planning to build an 818, we'd highly suggest picking up an old desktop PC and a cheap HDTV to use in the garage. We went even further, though, and had a walking, talking instruction manual. Wayne Presley, the shop's owner and experienced Factory Five builder, spent much of this stage crisscrossing the shop and giving orders, as somebody had to keep us all on the right track. Without him, we'd probably still be working on the car today.

**Braking Through**  
After a few hours, most of the parts were clean and painted, and the car had four

**COUNTERCLOCKWISE FROM TOP:** Factory Five used stock Subaru pieces in all sorts of weird places. Here we added a shock mount to the stock front control arm, since the kit's front suspension is a double A-arm. This approach saves the builder money, while making replacement parts easy to find. // Through some clever packaging and two very long links, the 818 uses a stock WRX rear anti-roll bar up front. Like the front, the rear suspension uses a mixture of Subaru and Factory Five components. Note the bent lower control arms—we think our donor car was lifted by a forklift at one point. // Koni coil-overs replace MacPherson struts on each corner.

### SOURCES

- AiM Sports, LLC:** digital dash, [aimsports.com](http://aimsports.com), (800) 718-9090
- Braille Battery, USA:** battery, [braillebattery.com](http://braillebattery.com), (941) 312-5047
- eBay Motors:** donor car, [ebay.com/motors](http://ebay.com/motors)
- Electromotive, Inc.:** engine management, [electromotive-inc.com](http://electromotive-inc.com), (703) 331-0100
- Factory Five Racing, Inc.:** 818 kit, [factoryfive.com](http://factoryfive.com), (508) 291-3443
- Koni North America:** shocks, [koni-na.com](http://koni-na.com), (859) 586-4100
- Mach V Motorsports, LLC:** wheels, [machv.com](http://machv.com), (571) 434-8333
- S.P.E.C., Inc.:** clutch and flywheel, [specclutch.com](http://specclutch.com), (800) 828-4379
- Very Cool Parts:** construction help, [verycoolparts.com](http://verycoolparts.com), (760) 403-6266
- Yokohama Tire Corporation:** tires, [yokohamatire.com](http://yokohamatire.com), (800) 722-9888



corners of suspension bolted onto it. It was time for brakes, and time for another decision. Factory Five offers a Wilwood big-brake kit for the 818, or we could bolt on the rotors and calipers from our donor car.

We opted for the cheaper, second option, though we did clean and paint everything, replace the pads with AutoZone specials, and turn the rotors. Only track testing will tell if these brakes are adequate, but we figured we'd see if the bare minimum was good enough.

We also used the donor car's master cylinder and pedal box, as everything seemed to be in great shape. Our 818 doesn't have power brakes like a WRX, so we redrilled the pivot on our brake pedal. We'll now have to move the pedal farther, but we shouldn't have to push as hard.

There was only one more piece to the braking system puzzle: lines and fittings. The kit came with these, but we did have to spend some quality time with a tubing bender before we could install them.

Sure, the car still couldn't move under its own power. But now it could roll slowly, then stop. Isn't that the most exciting part anyway? No? Good news, then: We tackle the engine in the next installment. **GRM**

**CLOCKWISE FROM TOP LEFT:** Very Cool Parts, an established Factory Five build center, hosted our marathon build sessions. Wayne Presley, the shop's owner, was always looking over our shoulders. Each aluminum panel was drilled for rivets before being glued on the car. // Very Cool Parts has a number of custom tools that are perfect for building kit cars, including this homemade drilling guide. // Aluminum panels are abundant on the 818, and this was the first one we installed. The first five panels were difficult, but once we figured out a system, the rest were easy. // We bought an inexpensive air riveter and couldn't imagine building one of these cars without one. // Bill Robinson wanted to look nice for the cameras, so he made his own *Grassroots Motorsports* T-shirt. Proper versions can be found in our online store at [grassrootsmotorsports.com/store](http://grassrootsmotorsports.com/store). // To decrease brake-pedal effort, we redrilled the pedal's pivot point. This should increase leverage and make up for the lack of power brakes.

SURE, THE CAR STILL COULDN'T MOVE UNDER ITS OWN POWER. BUT NOW IT COULD ROLL SLOWLY, THEN STOP. ISN'T THAT THE MOST EXCITING PART ANYWAY?

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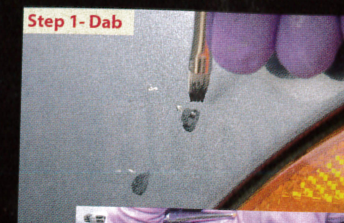
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guys, like John Lazorack and his LS-powered 1988 Chrysler Conquest TSi.

The event is broken down into five elements: street driving/road rally, autocross, acceleration/braking, road course, and performance/design competition. The road rally cuts through the Nevada desert, so it weeds out those who didn't bring a true street car. The three performance-based elements judge how well the car performs, while the final venue puts to the test the car's actual design work.

The Invitational also doesn't allow hired guns. Instead, the "builder of record" must drive the car in every event.

The Optima Ultimate Street Car Invitational can be called the best example of a show-and-go competition. These cars are nothing short of works of art—yet they can also perform on a supercar level. Several of these cars, just 24 hours prior, were in big, shiny booths under the lights on the SEMA floor. On the day of the Invitational, they're covered in dirt, brake dust and desert debris. Give them a wash, and they'll be show cars again.



3. Before the competitors took to the course, Randy Pobst piloted the E63 AMG wagon camera car around Spring Mountain Motorsports Park to set the bar for the day. 4. The event isn't limited to older cars, but BBI Autoport's Porsche 997 Turbo carried throwback colors. 5. Multi-time SCCA and NASA champ Danny Popp never disappoints on track. He set the fastest time of the day—his 1:46.599 time was more than a second faster than anyone else's—in his Lingenfelter-equipped 2010 Camaro. 6. A very select few kit cars were allowed to enter the OUSCI, with Bret Voelkel's 427-cubic-inch Factory Five '33 Hot Rod being one. 7. After finishing third in 2011 and second in 2012, Brian Hobaugh and his 1965 Corvette finally took top honors for 2013.



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Subaru WRX Top Mount camber/caster plate shown.



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