

# HAYABUSA 1300

We Drive  
1,000  
Pounds of  
Insanity



# SAND BUGGY

STORY AND PHOTOS BY  
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I'd been waiting a long time to drive a car like this: a very small, lightweight sand buggy with a screaming, powerful motor, and mega suspension. You can buy cars similar to this (from companies like Tom Pro Designs, Sand Bullet, Sand Fever, and King), but Brian Campbell's machine here is virtually all custom. He based the front two-thirds on an existing car, but built everything himself with help from DC Sand

Rails and Rick DeCosta. Back in the 1990s, Brian raced quads in the prestigious Mickey Thompson Gran Prix stadium series, and so I was pretty confident anything he had built was gonna rip.

Powering his car is a methanol alcohol-burning engine from a 2005 Suzuki Hayabusa GSX1300R street motorcycle. Even in bone-stock form, the 1299cc, inline four cylinder with 16 valves and EFI is claimed to produce 185 horsepower and Oprope! the motorcycle to 194 mph. When it was released, Suzuki called it the "fastest

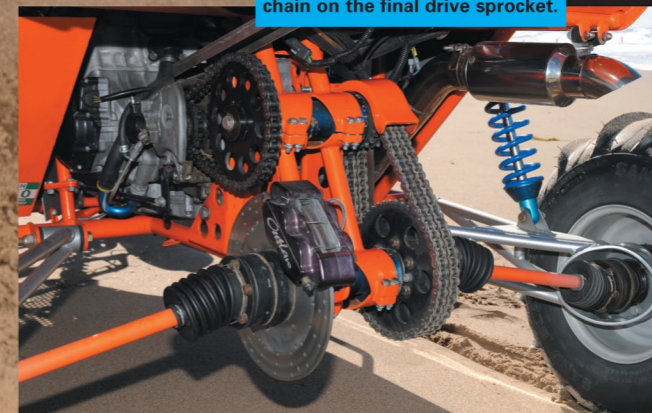
production street bike on the planet."

To boost output even further, Brian added a Power Commander (EFI controller), oversize fuel injectors, and a custom air intake. For use in the car, Brian added a custom wiring harness with weatherproof switches for the ignition, fuel pump, and lights. Exhaust headers are from S&S. Redline on the tach is 14,200 rpm, and peak horsepower is between 9,500 to 10,000 rpm.

Because speeds approaching 200 mph would be just a bit fast for off-road, Brian



The 1299cc motor comes from a Hayabusa street motorcycle and, with oversize injectors and an EFI controller, it can burn alcohol or a combination of alcohol and gasoline. The C&R radiator, with a fan underneath, is just behind the motor. A custom jackshaft assembly, below, lowers the overall gearing in stages, and eliminates the need for a huge rear sprocket on the final drive. Both bearing carriers, with chain adjusters, are from a Honda 450R quad. Notice the beefy, twin-row chain on the final drive sprocket.



geared down the car to hit a "mere" 110. And, downhill at Sand Mountain in Nevada, he's had it almost that fast: 105 on his GPS. Brian tells us that, in dune hillclimbs, he runs with Hayabusa-powered cars with turbos. Another close competitor (most dune hillclimbs are unsanctioned), are sand cars powered by Honda's VTEC 3.5 liter car engine. Speeds compared to production quads? Brian says while his Honda 450R reaches 51 mph up the long, steep wall of sand, his car has reached 71 mph.

## THE BUILD

Brian's goals for his Hayabuggy (Dunabusa? Busabuggy?) were to make it look good, be able to generate the power of other small sand cars, and tackle big jumps. With two-feet of wheel travel, the little car's been launched about 75 feet, attaining a height of almost 15 feet. Most of the cars his size can't match this, Brian says.

Considering that many of the components were hand-crafted, the build went surprisingly fast, just four months, working 20-25 hours a week. "Just getting the motivation to start such an undertaking was tough," Brian says. "The hardest part of the build itself was figuring out a rear drive system. To gear down a motorcycle motor, quads typically run a very small front sprocket and huge rear sprocket. But this can cause two big problems. A front sprocket that small simply can't stand up to high horsepower and its teeth start sailing into space. The other problem for a long-travel car with independent rear suspension is maintaining enough ground clearance, and a big rear sprocket limits its suspension travel."

We tested Brian's buggy at the Pismo Dunes. The car stays very flat in turns and it corners precisely. The rear mounted engine helps keep the car from nose diving on jumps, but steering doesn't suffer. Control cables are routed underneath the seat. The small but mighty car is 7'-10" wide, 11'-8" long, and it has a 105 inch wheelbase.







Brian's ingenious solution was a four-sprocket, dual-chain jackshaft system to gear down the car in stages. Each of the two drives runs more reasonable gearing, 17 teeth front and 40 teeth rear. But it still needed some tweaks. Brian explains, "The secondary system takes more of the load and it kept breaking the 520 chain. I went to a 630 and the car still pulled that one in half. Finally, I paired each front and rear sprocket of the final drive with a duplicate, right along side the original, and ran two 530 chains side by side. That works!"

## DRIVING IT!

My excitement about driving the car was dampened somewhat when I learned how I was supposed to operate the 5-speed transmission. I already knew that, for shifting, motorcycle powered cars like this use a mechanically operated right hand lever; forward to upshift, back to downshift. So, that was no surprise. But then I noticed a lever I didn't expect. Damn! Instead of a clutch pedal like a car, Brian's buggy runs a clutch lever attached to the shift lever. Pull in the

lever with your fingers and shift with the rest of your hand.

I finally got used to shifting with the right hand, but not simultaneously operating a clutch lever with the same hand, all the time traveling at warp speed through the dunes. Actually, Brian uses the clutch only in first gear to get moving. After that he simply backs off the throttle between shifts; no powershifting.

Fortunately, Brian, riding with me, was able to operate the system with his left hand allowing me to concentrate on simply backing off the throttle (which cued him to shift

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With the exception of King shocks, every suspension and frame component you see here is custom, including the spindles. Front tires are AMS, rears are STU and wheels are DWT with OMF bead locks. Owner/builder Brian Campbell liked the Hayabusa motor so much that he bought another, put it into a Bombardier DS 650 chassis (above) and duplicated the car's graphics. Notice that he's fabricated custom removable side rails to facilitate engine removal. Because it's half the weight of the car, it's quite a bit faster. Brian tells us he radar'd it at 94mph going up the steep comp hill at Sand Mountain, NV. "The entire run is over in a flash," Brian says. Check out our feature story in the March/April 2010 issue.

