MONSTER GARAGE™

HOW TO FABRICATE DAMN NEAR ANYTHING

KEN VOSE

DWAINE JUNGEN

"To be experienced, you need to experience life's lessons."

For future off-road fabrication maestro Dwaine Jungen, his career journey began, as it so often does, by following in the footsteps of others, in his case as his father's "tool-go-fer" on various projects.

For Dwaine the DARPA Challenge is yet another in a series of unexpected adventures, like the two *Monster Garage* builds, that have presented themselves over the years. Whether the Scorpion-Fox wins the two million or not, you can bet it won't be the end of the story.

As a youth, Jungen hauled junked parts home in his wagon to be, as he puts it, "dissected and scattered," then loaded into Dad's company truck and hauled off to the dump. "The turning point," he says, "was when I learned to reassemble and make the junk work. I sold quite a few 'repaired' lawnmowers."

Jungen counts his father, Bill, Uncle Tom, and select others as his mentors and teachers in things mechanical and life in general.

"All of my training has come from life lessons at the 'school of hard knocks,'" he says. "I graduated in the top of my class in high school and turned down a college scholarship because I wanted to be an engine builder. A college education is important, but it's not necessarily for everyone. College does not teach talent, ability, or desire, the way it can be learned by living."

Jungen's company, Preferred Chassis Fabrication Inc., is the owner and manufacturer of the Scorpion off-road vehicle—a remarkable machine that can cope with just about any terrain it traverses. For the past year, he has been working with the Center for Applied Research & Technology (CART) to design and construct the Scorpion-Fox, an unmanned, robotic version of the vehicle built expressly to compete in the 2005 two-million-dollar DARPA Challenge. Sponsored by the Department of Defense's Defense Advanced Research Projects Agency (DARPA), the DARPA Challenge vehicles must cover a 175-mile course through rugged desert terrain guided only by their on-board computer systems.

The Scorpion-Fox: Ready to rumble.

Here are specifications for the Scorpion-Fox that Jungen has created:

- **Chassis:** Fabricated .125-inch wall DOM tubing
- **Length:** 150 inches
- **Width:** 80 inches
- **Height:** 61 to 73 inches, variable
- **Engine:** 4BT-3.9, 4-cylinder diesel
- **Transmission:** Team RAMCO built, GM 700-R4
- **Transfer case:** Advanced adapters; 2, 4.3 gear ratio
- **Drivelines:** Tom Woods custom
- **Axles:** 4:10 gear ratio with ARB differentials
- **Wheels/Tires:** Mil spec bead lock/16/38.5x16.5
- **Shocks:** Bilstein 7100
- **Suspension:** Scorpion air
- **Brakes:** Actuated 4-wheel vented disc
- **Steering:** Dual power with electronic control
- **Throttle control:** Electronic
- **Power options:** Pure sine inverter
- **Air system:** Dual air systems
- **Control interface:** AV power products/preferred chassis fabrication (Supplies control power, sensor monitoring, and enables vehicle functions to be controlled through RS232 communication links)
- **Sensor array:** Center for Applied Research and Technology (180-degree field of view and 90-degree field of view laser measurement sensors, vehicle guidance system, global positioning system, and stereoscopic cameras
- **Navigation system:** Center for Applied Research and Technology (Four Pentium processors, cabled networking hub, and the intelligence of the autonomy control program)

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"Through desire, the love of what I do, and the help of many skilled people willing to share their talents, I've been able to have the success I have today," he says.