



## Mud, Snow, Sand, Meet Technology (Updated)



Trey Hermann's creative impetus for starting Pronghorn Overland Gear came from his need for a bumper for a 1989 Toyota Land Cruiser. He found everything available came in steel, was ugly and very heavy. An experienced industrial designer, Hermann knew that when engineered and fabricated correctly, aluminum was a much better solution. He started designing the bumper using Cobalt™ CAD and 3D modeling software. Soon, one friend after another asked him to build one for their truck. After about the fourth, Hermann realized he had a viable business idea.

A traditional steel off-road bumper, weighing in at roughly 300 pounds (135 kilos), greatly affects the fuel economy, braking, acceleration, handling and off-road performance of a relatively light vehicle like a 4200 pound (1900 kilo) Jeep. Reducing the weight was a major consideration for Pronghorn's design team. He tells us:

***"Using Cobalt and our engineering staff we've been able to go in and very easily optimize the designs and remove material where we don't need it. It's enabled us to very easily visualize where we are over-engineering our product and to take out material where it's simply not doing any good."***

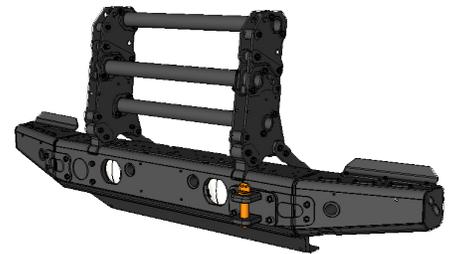
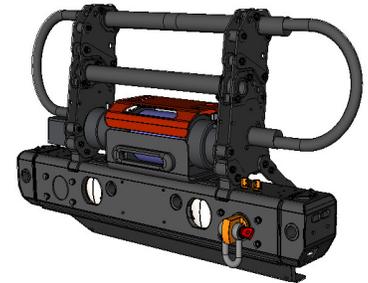
Made of optimally-engineered aluminum, the Pronghorn bumpers are not to be confused with a flimsy soda can. When aluminum is properly designed, it is strong and light just like an aircraft.

Pronghorn's first product to market is the Modular Front End System for the Jeep JK. This is a front bumper system available in 18 different configurations. Starting with either a standard full width or stub outer bumper (preferable with large diameter tires) the options include grill guards, headlight guards, skid plate, winch mounts, rotatable shackles and other goodies. Made of 6061-T6 and 7057-T6 aluminum, the lightest Pronghorn bumpers start at only 42 pounds (19kg) and with all the options will weigh only about 98 lbs (45kg), less than half the weight of the comparable steel bumper.

The Pronghorn modular aluminum bumper system has a number of competitive advantages in addition to improved handling. The first is shipping costs. A similarly configured product in steel is six feet long and must be delivered on a pallet at around US \$250. A Pronghorn Modular Front End can be sent in three boxes via Fed Ex ground for about \$75 total. Another advantage is Pronghorn's no-modification installation system that reduces or even eliminates labor costs. Hermann credits being able to use CAD files supplied by the auto-makers directly in Cobalt to design one of the few "no-cut no-drill" bumpers available on the market. Finally, aluminum doesn't rust on salty winter roads.

Hermann says Cobalt's precision sped Pronghorn's development process tremendously, allowing them to go from specification to final prototype in seven to eight weeks. Its ease of use allows him to design with confidence without thinking about how to run the software. Hermann tells us:

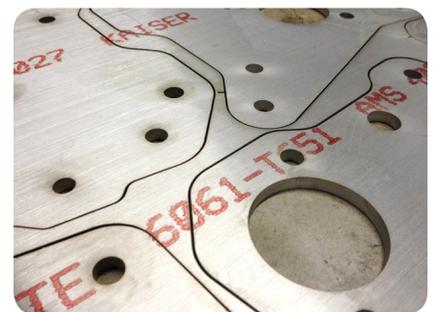
***"It was really the combination of the compatibility with the Macintosh platform and the ease of use. Cobalt is so fast and so easy to use that I think it gives us a huge advantage."***



Two of 18 configurations of Pronghorn's Modular Front End System rendered in Cobalt CAD and 3D modeling software.



Working in the real world.



Aluminum sheets for Pronghorn's multiple configurations are laser and water jet cut according to Cobalt drawings.

**Continued...**



## Story Update

With the success of the Modular Front End System for the Jeep, Pronghorn turned to the Toyota Tacoma, another vehicle popular with the overland and expedition crowd. Utilizing the huge time investment in the first platform, Pronghorn easily translated their system to the new vehicle. Hermann tells us that the most labor-intensive part was creating a CAD model of the Tacoma frame and bodywork since Toyota wouldn't supply the digital files. He says:

***"While the Jeep system took us two years to develop, it took us two and a half months to translate the Jeep system in Cobalt over to the Toyota Tacoma. It was so easy. It was just a matter of getting into Cobalt and moving pieces around."***

Hermann continues to marvel at the efficiency of using precision 3D models created in Cobalt for high-fidelity rapid prototypes.

***"I'm still amazed that I can send an STL file off and a week later I get a big chunk of metal that's folded and welded and powder coated, and it's here on my desk. And it looks fantastic. Twenty years ago we couldn't have pulled that off."***

They are applying their hard-won victories in engineering, manufacturing and finding suppliers to other platforms as well. In addition to the Jeep and the Tacoma, Pronghorn has Modular Front End Systems in the works for the Toyota Land Cruiser, the Land Rover Defender and the Mercedes Geländewagen. These new markets are projected as excellent revenue multipliers to their bottom line.

In the process of translating the Front End System to the Tacoma, Pronghorn maintained their reputation for, as Hermann puts it, "taking the traditional off-road mentality and throwing it out the window." For the Tacoma they introduced a low-mount recovery winch. By mounting the winch as low and as close as possible to the suspension system they solved a number of issues that greatly impact the truck's handling, especially on soft surfaces.

But in the process, Hermann learned first hand about consumer pushback on conventional ideas by being on the innovative side of the equation. The concept of responsive handling is rather alien to those preferring trucks to sports cars. He tells us, "We can tell that it's a good idea because we're getting just as many people flaming us for it as people screaming how much they like it. I know when we've ruffled that many traditional feathers, I must be doing something right."



Pronghorn easily translated their Modular Front End System from the Jeep JK (above) to the Toyota Tacoma (below) using Cobalt CAD and 3D modeling software.



The translation between vehicles, from design to prototype, took less than three months.



Pronghorn's low-mount winch for the Tacoma.

### Background/Contact

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