PHOTOGRAPHY *by* MARK URBANO

by ERIC TEGLER

MRAP ATV

MINE RESISTANT AMBUSH PROTECTED

BEST LIFESAVER

A WAR TRUCK THAT CAN FOUR-WHEEL INTO HARM'S WAY . . . AND HOPEFULLY, COME BACK OUT AGAIN.

★ Ten minutes ago the sound of live ordnance echoed in the distance. Now the soundtrack has changed to a mix of humming turbo-diesel, minor rattling, and shouted expletives of amazement. We're at the Aberdeen Test Center (ATC), located on the 73,000-acre Aberdeen Proving Ground Army base in northeastern Maryland. The sounds are from 25,000 pounds of tactical vehicle hurtling across ATC's Perryman No. 3 off-road course, a half-mile-long super-whoops section that would make Finland's World Rally organizers jealous. We launch off an eight-foot-high mogul at about 30 mph, landing hard enough to break anything we've ever driven. But the truck just brushes it off and charges toward the next berm.

"It's so easy to go fast in this thing," technical editor Michael Austin yells from the seat behind the driver. "You don't have that wincing moment when you're thinking, 'Oh, this is going to sound horrible!'"

It almost makes you forget the significance of the machinery. We're driving what is arguably the most significant new military vehicle in a generation: the MRAP (mine resistant ambush protected) All-Terrain Vehicle, which shortens up nicely to M-ATV. It's the sorely needed replacement for the ubiquitous Humvee (M1114), and by the time you read this, about 2000 of them will have been airlifted to Afghanistan. Why?

The unarmored Humvee has served admirably but has also proven vulnerable. U.S. Marines and Army soldiers found that out in Iraq, where roadside bombs, known as IEDs (improvised explosive devices) accounted for 60 percent of American casualties in 2006 and 2007. The situation was so dire that units were fabricating and bolting steel plates to their Hummers for protection. America responded quickly, producing MRAP armored trucks, 40,000 pounds and up. Along with better tactics and intelligence, they dramatically reduced IED casualties. But Afghanistan is different.

Afghanistan really has no roads. Fewer than 8000 miles of pavement exist according to the CIA *World Factbook*. (The U.S. has 2,615,870 miles.) Instead, narrow dirt trails wind through mountain passes, most covered in a foot of fine sand that American troops call "space dust." Steep grades, tight turns, jagged rock, and stream crossings present a stiff challenge to the cumbersome Cougar and Caiman truck-based MRAPs in use. Humvees handle the off-road terrain well but not the space dust. It cloaks IEDs.

As of last spring, roadside bombs were responsible for 75 percent of coalition casualties in Afghanistan. Each time a Marine or Army unit leaves its base on a motorized patrol, it is in peril. Mission success, in large measure, is when all troops RTB (return to base) unharmed. That is what the more nimble M-ATV has been built to do.

The one we're hammering at ATC reveals just 116.3 miles on the odometer. When the government issued an urgent RFP (request for proposal) for an off-road-capable MRAP in November 2008, none existed. Seven months later, Oshkosh Defense of Oshkosh, Wisconsin, was selected from a group of four bidders and awarded a $1 billion contract. By the time we drove the Oshkosh M-ATV late last year, more than 40 were already in Afghanistan.

"The United States hasn't mobilized the industrial base to produce anything this fast since World War II," Dave Hansen declares.

Hansen is the deputy program manager for the Joint MRAP Vehicle Program, the M-ATV portion of which is led by Marine Corps Systems Command.

"Survivability is not just the armor that you have," Hansen explains. "Survivability can also be tied to your lack of predictability. If you go out on a particular road and they know you're coming back on that road, they can lay IEDs. If you can get off-road with something like this, you can be less predictable and more survivable because [insurgents] don't know which way you'll be coming back."

Of course, some trusty ol' armor vastly improves survivability, and the M-ATV has it in a layered combination, the details of which we don't have the clearance level to know. We'd guess the doors weigh a couple hundred pounds each, but just as important, the M-ATV sports a V-shaped hull that deflects blasts and prevents IEDs from penetrating the cabin. Central tire inflation and huge run-flat Michelins are survivability enhancers as well. The M-ATV must be able to drive at least 30 miles at 30 mph with one or two flat tires. It can also take a 7.62-millimeter round to the engine oil/coolant/hydraulic system and drive on for at least another kilometer.

What the M-ATV can take, it can also give. Its roof turret can accommodate anything from an M240 7.62mm machine gun to a Mk 19 grenade machine gun or TOW antitank missile launcher. All can be operated from the turret or remotely from inside the cabin, where the driver has a low-visibility/night thermal-imaging display that flips down like a sun visor. In addition to a complete gauge package, the driver faces two batteries of rocker switches that control everything from transmission and transfer-case modes (road, cross country, 2wd/4wd) to tire inflation and a rearview, or "check six," camera. Traction control and anti-lock brakes are enabled depending upon the mode.

The six-speed automatic Allison 3500 transmission is operated via a vertical row of pushbuttons, and there's blessed air conditioning accessed by familiar rotary HVAC controls. The real bonus for entertainment-deprived troops is cigarette-lighter-style power ports for iPods and CD players. (Otherwise, soldiers simply cut and splice into the wiring, so M-ATV designers figured they'd make everyone happy.)

From the driver's seat, it feels as if the M-ATV will take you home over any route you choose. We drove it as the Marines would, in full flak jacket and helmet. Strapped into a five-point harness, each of the four occupants rides in a bucket seat anchored to the floor and tethered to the ceiling for stability. The M-ATV rides far better than you'd expect. Over all but the most precipitous drops on Perryman No. 3, it offered more than acceptable levels of jounce and required minor steering inputs to stay the course. Before we'd even hit the whoops section, we'd left a Chevy Silverado 2500 chase vehicle in the dust as its driver (and our photographers) struggled not to break the truck in half on the preceding off-road stretch.

Hansen and Doug Griffin, the ATC test director, describe the M-ATV driving experience as SUV-like. "If you were to get in a larger MRAP, it would be very different," Hansen says. "The other MRAPs drive like big, honking trucks."

Credit the TAK-4 independent suspension that every M-ATV (and many MRAP vehicles) rides on. Developed by Oshkosh and tested by the Joint MRAP Vehicle Program and the Nevada Automotive Test Center, the TAK-4 is a heavy unequal-length

THE NUMBERS

VEHICLE TYPE > front-engine, rear/4-wheel-drive, 4-passenger, 4-door truck
ESTIMATED PRICE AS TESTED > $1,437,000 (estimated base price: $437,000)
ENGINE TYPE > turbocharged and intercooled pushrod 18-valve diesel inline-6, iron block and head, direct fuel injection
DISPLACEMENT > 442 cu in, 7242cc
POWER (SAE NET) > 370 bhp @ 2400 rpm
TORQUE (SAE NET) > 925 lb-ft @ 1440 rpm
TRANSMISSION > 6-speed automatic with manumatic shifting
DIMENSIONS:
WHEELBASE > 154.8 in LENGTH > 246.8 in
WIDTH > 98.1 in HEIGHT > 105.0 in
CURB WEIGHT > 25,000 lb

C/D TEST RESULTS

ZERO TO 60 MPH > 32.8 sec
STREET START, 5–60 MPH > 30.0 sec
STANDING ¼-MILE > 24.5 sec @ 54 mph
TOP SPEED (GOVERNOR LIMITED) > 65 mph
BRAKING, 60–0 MPH > 269 ft
ROADHOLDING, 200-FT-DIA SKIDPAD > 0.46 g

control-arm setup with coil springs. Completely modular, it bolts up easily and offers 16 inches of independent wheel travel. Compare that with Ford's new F-150 SVT Raptor R Baja-type production-based racer, which offers 15 inches of travel, and you'll understand how the M-ATV can speed across off-road terrain with aplomb.

Power is courtesy of a Caterpillar C7 7.2-liter, inline-six turbo-diesel. Found in a variety of military and commercial vehicles, it makes more than standard grunt in the M-ATV (370 horsepower and 925 pound-feet of torque versus the stock 330 horsepower and 850 pound-feet).

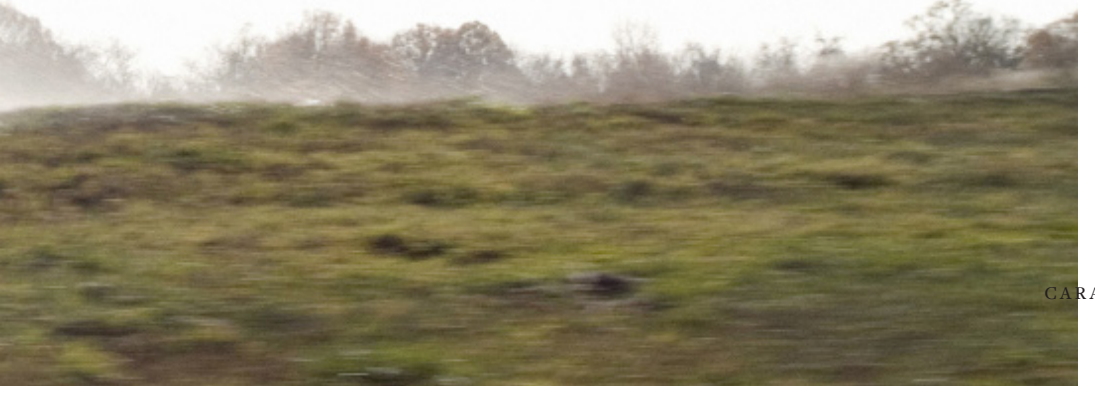
"This is kind of a juiced-up C7," Griffin says with a smile. "They essentially did a turbocharger and chip upgrade." The quip reflects the character of ATC's test staff, who grasp the importance of their work but are also car guys to a man.

This combination of enthusiasm and rigor shows up on Perryman No. 5, another test course. It would resemble the paved chassis twist-ditch stretches found at many manufacturer proving grounds—if they were unpaved and designed by the insane. A quarter-mile of two-to-three-foot-deep asymmetrical sinkholes tests the TAK-4 suspension and the M-ATV's chassis and steering severely. Cringing in anticipation, we crossed it at 5 mph. The M-ATV's light steering, chassis stiffness, and lack of bump steer are impressive. The thing just chugs over the mess.

On-road, it'll do a maximum of 65 mph. You wouldn't call it nimble, but there's little steering slop and the sense that if you hit something it's not going to matter so much anyway. Acceleration is tank-like (although 0 to 60 in 32.8 seconds is quicker than an actual tank), and it's noisy, with a little throttle lag.

Big brake drums require significant pedal pressure, but panic stops are drama-free. The nose dives, and you can actually see the anti-lock brakes pulse the M-ATV to a halt. An ATC test driver managed 0.46 g on our improvised 200-foot-diameter skidpad (an airfield helicopter ordnance-loading pad), the M-ATV tilting obscenely and actually lifting the unloaded front wheel. But really, your mom could drive this thing.

And that's the point. The M-ATV is for fighting as well as driving. Ease of operation means experienced MRAP drivers need only about 14 hours of instruction, complete novices just 40 hours. The M-ATV has no formal name yet, though we're tempted for obvious reasons to call it the "B'Gosh." In Afghanistan, the M-ATV will endure months and perhaps years of the most arduous duty, where it must bring as many soldiers home as possible. Maybe they should just call it the RTB. ★



Mini Headline

Early reviews from the front suggest the M-ATV will put the Humvee out to pasture.

"THE MARINE CORPS IS DEFINITELY GOING IN THE RIGHT DIRECTION AS FAR AS SUSPENSION, MOBILITY, GETTING BACK ON THE OFFENSIVE. THIS VEHICLE IS GOING TO BE A PLUS FOR THE MARINE CORPS."

—GUNNERY SGT. MICHAEL BANDY, MOTOR TRANSPORT CHIEF, MARINE EXPEDITIONARY BRIGADE-AFGHANISTAN

"GOING UP HILLS IS NOTHING FOR THE M-ATV. OTHER VEHICLES TAKE FOREVER TO GO UP. NOT THIS ONE."

—LANCE CPL. MARIO RIVERA, MOTOR TRANSPORTATION OPERATOR, BRIGADE HEADQUARTERS GROUP, MARINE EXPEDITIONARY BRIGADE-AFGHANISTAN

"THE M-ATV IS EQUIPPED WITH AN INDEPENDENT SUSPENSION, WHICH WILL ALLOW MARINES TO GET INTO MORE RESTRICTIVE TERRAIN. WE THINK IT'S GOING TO BE A HUGE BENEFIT. WE'RE LOOKING TO GET OUR MARINES OUT OF THOSE HUMVEES AND INTO M-ATVS, WHICH IS GOING TO GIVE US MORE MOBILITY AND SURVIVABILITY."

—CHIEF WARRANT OFFICER 4 ROBERT RAMSEY JR., MOTOR TRANSPORT OFFICER, MARINE EXPEDITIONARY BRIGADE-AFGHANISTAN

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