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November/December 2007



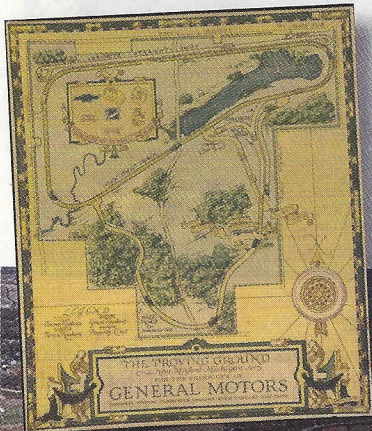
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Where Pickup Trucks Come From

Today's Tough
Trucks Aren't
Tested in Labs

by gary witzenburg



GM MILFORD PROVING GROUNDS

The road to the test tracks at General Motors' Milford, Michigan, Proving Grounds (MPG) crests a hill with a sumptuous view of what might otherwise be 4000 acres of rich Michigan farmland. Then it plunges down to a fast, slightly banked left-hander worthy of a great road-racing course. It takes tremendous willpower for skilled, experienced engineers and drivers to restrain themselves from taking that turn as if it were on a racecourse. Sometimes they do.





GM MILFORD PROVING GROUNDS



We were visiting MPG to drive a series of comparison tests that would demonstrate the superiority of Chevy and GMC full-size pickups over their Ford, Dodge, Toyota, and Nissan rivals. The tests were fair and the competition well represented, but we knew we wouldn't be doing side by sides, where Silverados and Sierras would get their wide-opening doors blown off.

We rotated among tests that ranged from towing heavy loads up a hill to flogging through an autocross-like cone course. All but the hillclimb were conducted on portions of the huge 67-acre Vehicle Dynamics Test Area, aka Black Lake, which earned its name because of the view from the air. This watered-down stretch of asphalt looks so much like water that ducks and geese crash-land on it.

Not surprisingly, the GM trucks won most of the contests. For example, GM's StabiliTrak was much quieter than Toyota's system in a slick-surface launch and enabled a stabilizing upshift that the Toyota didn't. Also, for some reason,

the Tundra's stability control switches off in 4WD. In climbing a steep ramp on a split-coefficient surface (slick on one side, dry on the other), the GM trucks, equipped with the available Eaton G60 locking differential, clambered up easily while competitive trucks with ordinary limited-slips struggled.

AWESOME FACILITY

Meanwhile, spread throughout the MPG acres we didn't see that day were thousands of dedicated engineers, drivers, and technicians carrying out carefully conceived development and validation tests. Development is continuous improvement between prototype and production. Validation verifies that specified requirements will be met over time and miles.

GM's MPG was established in 1924 with an oval track and an 11.6-percent test hill. Because Milford, a now-trendy town northwest of Detroit, was a long drive from headquarters, engineers bunked for days or weeks in a building that's now the cafeteria, and

the manager lived there with his family. The last on-site manager's house near the entrance is named for its final resident, Louis C. Lundstrom, who ran MPG from 1956 to 1965.

Today's MPG is crammed full of 5000 employees, 124 buildings, and 130-plus miles of test surfaces, 15 of them unpaved. At its far western edge runs a limited-access straightaway—2.6 miles of level surface in each direction separated by a double guardrail with a banked loop at each end—where high-speed runs and aerodynamic coast-downs are conducted. A natural valley at its southern end provides an opportunity for spy photographers shooting from a hill across the road, so future vehicles testing there have to be well disguised.

The somewhat lumpy, old 3.8-mile banked oval was supplemented in 1963 by an ultrasmooth 4.5-mile circular track. A brain-rattling Belgian Block Loop built in 1929 still tests rough-road endurance. Test hills up to 27 percent challenge parking brakes and powertrains. Twist-ditches and potholes test tire, wheel, suspension, and chassis durability, a salt-bath simulates years of Midwestern winters, a fully enclosed crash facility propels hundreds of vehicles into barriers and each other, and countless other carefully designed roads and surfaces challenge every component and system.

MPG racks up 12 million test miles a year and continues to evolve. In 2003, less than a year after GM product czar Bob Lutz arrived, a gently rolling truck loop was converted to a world-class road course (complete with a Nürburgring-style banked carousel) for "limit-handling" development. Engineers can rent racetracks (including the original Nürburgring in Germany), but having one's own safe and secure hard-cornering test track is a huge advantage. Another recently renovated area is a Hummer-tough off-road course for development of 4WD pickups, SUVs, medium-duty work trucks, and military vehicles.

PROVING GROUNDS ABOUND

As customer and competitive needs evolve and vehicles become more complex, test priorities gradually shift from roads to laboratories. But labs and tubes can't effectively simulate long-term durability and such important subjective qualities as ride, handling, long-range comfort, and noise, vibration, and harshness, so automakers will always need safe and secure proving grounds for rigorous testing of current and future vehicles.

Ford has two Michigan proving grounds. The first is a 3880-acre com-

Proving Grounds

plex in Romeo, north of Detroit. There's also a small (365-acre) but recently renovated and useful Dearborn Development Center nestled next to Ford's design and engineering facilities across the freeway from its world headquarters. DDC began life as an airport in 1925 and became a proving ground in 1936 when test roads were laid out around the runways. Chrysler's Chelsea Proving Grounds occupies a 3850-acre site near the town of that name west of Ann Arbor.

Michigan has climate issues that can make vehicle testing difficult or impossible, so all three domestics and some foreign makers maintain proving grounds in the Southwest (most near Phoenix, Arizona) and dispatch armies of Michigan-based engineers and technicians there each winter to continue testing. Automakers also need to test cooling systems, materials, and more in high-sun and extreme-heat conditions, so these facilities stay busy all year long.

Complicating things in recent years is that Phoenix is one of America's fastest growing areas. Due to encroaching development, several years ago GM announced plans to abandon its long-established Mesa, Arizona, Desert Proving Grounds and move hot-weather testing to a facility to be built in Mexico. But that poorly thought-out plan didn't comprehend the need for extensive year-round vehicle development, or the high cost and difficulty of shipping vehicles, equipment, and people in and out of Mexico so DPG has remained operational. GM finally did sell it in November 2006, but will lease it until a new complex can be completed in 2009 on part of the U.S. Army's high-security Yuma, Arizona, proving grounds. In addition, Chrysler sold its Wittman, Arizona, proving grounds in 2006, and Ford recently sold its Yucca, Arizona, complex to Chrysler.

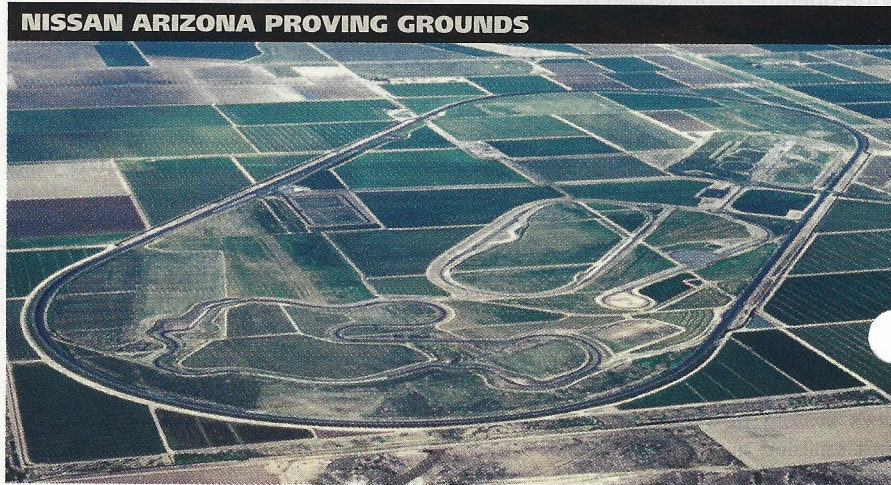
Toyota and Nissan also have Arizona proving grounds, Toyota's occupying 12,000 acres in Wittman, Nissan's on 3050 acres near Stanfield. Honda bought the privately developed Transportation Research Center in East Liberty, Ohio, in 1988 and built a hot-weather facility in California's Mojave Desert in 1990.

Large global automakers also operate proving grounds in major markets around the world. GM has them in Germany, England, Australia, and Brazil; new ones in Mexico and China, plus access to partner Isuzu's in Japan; cold-weather facilities in Kinross, (northern) Michigan, and Kapuskasing, Ontario, Canada; and a high-altitude test center on Pikes Peak in Colorado. Ford counts facilities in Mexico, Brazil, Eng-

FORD DEARBORN DEVELOPMENT CENTER



NISSAN ARIZONA PROVING GROUNDS



CHRYSLER CHELSEA PROVING GROUNDS



land, Belgium, and Australia as well as Naples, Florida, and Thompson, Manitoba, Canada, plus the 1498-acre Volvo Arizona Proving Grounds in Wittman that was built in 1985 before Ford purchased that Swedish automaker.

Testing cars and trucks can seem like fun and games for enthusiasts, but the critically important, deadly serious work that goes on at these and countless other facilities worldwide, much of it 24/7 and year-round, can be as grueling and demanding for the engineers as it is for the vehicles themselves. It remains the only way automakers can ensure that they satisfy customer and federal requirements. As long as companies are building cars and trucks, there'll be hard-working engineers, technicians, and drivers abusing the daylights out of them behind the tall fences at purpose-built proving grounds, studying and developing the trucks we love. **TT**

