



The **Dynojet Chassis**
Dyno Has Helped
Make the Aftermarket
More Honest About
Power Claims.
Here's the Story
Behind Its Creation.

By Jeff Hartman
Photography: Jeff Hartman

It's a story as old as hot rodding itself. It starts with the sales pitch—"Buy my widget and your engine will gain 50 hp"—and ends with a disappointed customer with a car that sure doesn't feel like it picked up 50 hp. A dragstrip doesn't offer much proof one way or the other on incremental changes because there are too many variables involved, so the seat of the pants was for a long time the only way to tell if a modification or part really helped. That all changed in the '90s with the introduction of the Dynojet, a portable chassis dyno that was in the financial grasp of most every mom-and-pop performance shop. Finally, power claims were proved or disproved as soon as the stuff was installed. And with the emergence of custom computer tuning, the Dynojet has proven invaluable to these shops; they can now tune the car with-

out ever having to blast up and down a city street. They can thank Mark Dobeck, the machine's creator.

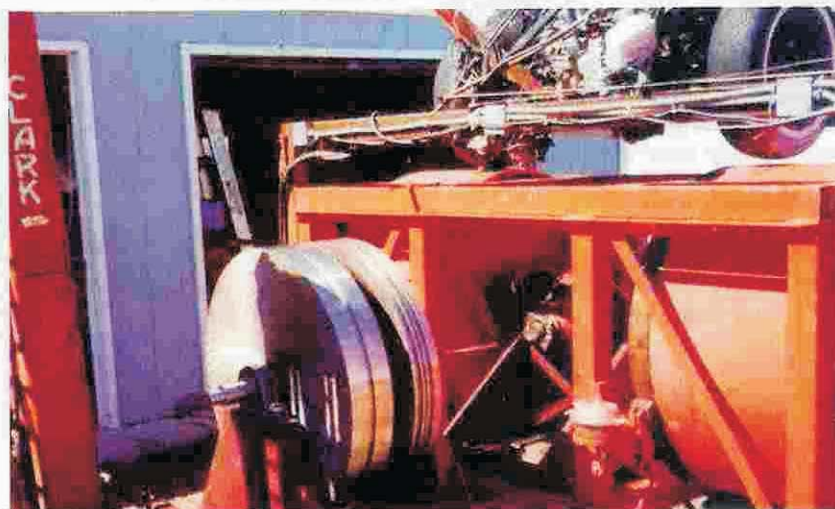
Dobeck got his start tuning English sports cars in a Portland, Oregon, garage in the late '70s. He had hot-rodded the shop's Sun infrared exhaust analyzer to improve response time and became a wiz at using exhaust-gas carbon monoxide to optimize power on the go. The trouble came later when he moved on in 1980 to open a motorcycle shop in Wisconsin. Cars were one thing, but there was no way to haul a gas analyzer as big as a TV set on a motorcycle. So Dobeck talked his inventor/fabricator father into building a stationary rolling-road that could support the rear wheel of a motorcycle on a moving drum so he could continue tuning while "driving" with the big infrared analyzer.

THE TRUTH

> **Top right:** On the road, Dobeck tested a bunch of cars in secret so he could watch the Dynojet 248 in action without too many people knowing what he was doing. The Dynojet often disappointed optimistic enthusiasts and tuners, but it just as often helped find free power. > **Right below:** The front end of a Chrysler K-car—the cheapest vehicle Dobeck could find—was used to spin up this research chassis dyno at Dynojet. A robotic controller could use the K-car to the spin the dyno drums to high speed to observe balance issues and then leap off the drums to remove all drag.



“I spent time with the dyno at events in ‘low areas’ where I could operate below the radar, places that weren’t going to ask me for insurance, and wouldn’t care about anything.”
—Mark Dobeck



The rolling road was designed with a hydraulic system that could be adjusted to work a bike engine harder at a given speed, something like the resistance controls on a Stairmaster machine. But because Dobeck and his dad were mechanics rather than mathematicians, they made the rolling drum heavy, and the homebuilt dyno had a surprising amount of inertia. It was accidentally pretty good at simulating a motorcycle's ability to accelerate.

Dobeck's new bike shop opened just in time for the arrival of Japanese superbikes equipped with constant velocity (CV) carbs, which were new to motorcycling. CV carbs provided good performance, economy, and emissions, but they could not be tuned and jetted using traditional methods. Many people recommended replacing them, a \$600 solution. But Dobeck understood CV carbs

from the days of wrenching on English cars and modified them to allow the new motorcycles to run with performance pipes and air cleaners. Before long, bikers were traveling from all over the upper Midwest for Dobeck's dyno-jetting service. Meanwhile, in the evenings, Dobeck read magazine stories of hot rod bikes running exhaust-system shootouts on the torque-cell dynos of famous California super tuners.

Performance magazines loved dynamometers because they brought science to hot rodding. But torque-cell dynos, which load an engine by forcing it to pump water or generate electricity, are expensive, and using them has often required removing the engine from the vehicle.

“I started to realize I was doing something that no one else was doing,” says Dobeck, who was using his homebuilt inertial dyno

to tune bikes with the goal of improving acceleration and responsiveness. “Eventually I built a few jet kits to see what we could do with them.”

Dobeck named his company Dynojet. His first big customer was K&N Filters, and it wasn't long before he was selling lots of jet kits. His company grew at a rapid pace, and sure enough, a competitor sprang up with a similar product. “Their advertising was working,” Dobeck says. “They were taking away sales. But the product didn't work. Not at all.” To prove it, he called several of the top engine-dyno suppliers to see if they would help him develop an affordable version of his homebuilt inertial chassis dyno that could live in the shops of Dynojet dealers to show the world what worked and exactly how well. “Every one of them laughed at me,” Dobeck remembers.

THE METETER

THE TRUTH METER



> Demonstrating the Dynojet 100 bike dynamometer in communist China, Dobeck entertained these bikers in the hills above Macao.

One of the biggest headaches of Dynojet's go-it-alone chassis-dyno project was figuring out how to assign meaningful power numbers in the face of unknown inertia from the moving parts of the hundreds or thousands of engine, drivetrain, and tire combinations. Wrestling to fully understand inertia and powertrain losses, Dobeck and his team quickly realized that the standard physics formula of weight, time, and distance for converting acceleration into horsepower simply didn't work—the derived number was always lower than accepted numbers. They poured on resources and burned up time and money investigating it, but no matter what they did, the math never added up.

Dynojet's final number-fudge was arbitrarily based on a number from the most powerful road-going motorcycle of the time, the '85 1,200cc Yamaha VMax. The VMax had 145 advertised factory horsepower, which was far above the raw 90hp number spit out by the formula. Meanwhile, existing aftermarket torque-cell engine dynamometers delivered numbers that clustered around 120. Always a pragmatist, Dobeck finally ordered his Chief Engineer to doctor the math so that the Dynojet 100 measured 120 hp for a stock VMax. And that was that: For once and forever, the power of everything else in the world would be relative to the '85 Yamaha VMax and a fudged imaginary number. Dobeck's engineering staff was dismayed by the decision, but the Dynojet 100 exclusively measured surplus power available to accelerate the vehicle's mass—no more, no less—and that was true even if the modification was a low-inertia flywheel or lightweight wheels. As long as the inertial dyno's numbers were repeatable, the critical question (did a particular modification make the engine accel-

erate faster or slower?) would be answered correctly.

Dobeck then turned his attention to providing the dyno to bike shops across the country. The first 20 early adopters of Dynojet kits were customers who had defeated the replace-your-CV-carbs drumbeat seven years earlier. "These guys believed in what we were doing," says Dobeck. "I called, said I've got this dyno, and it costs \$6,500. And they said, 'Send it.'"

When a small network of the most important dealers had dynos, Dobeck took to the road with a mobile bike dynamometer mounted in a trailer. He would ask performance-shop owners, "Aren't you sick of being the scapegoat for stuff that doesn't work as advertised?" They were, and they started buying dynos. In subsequent years, Dobeck demonstrated his bike dynamometer everywhere from Montana to communist China. Then he took on the world of cars.

"This guy asked me why he should buy a Dynojet. I said because for 25 grand you can make better products and develop them. He laughed and said 'I can spend five grand on a full-page ad, sell absolute garbage, and make 15 grand. Why would I spend 25 grand to know that?'"—Mark Dobeck

The pre-Dynojet world of hot rods circa 1993 had a lot of information, misinformation, and disinformation. You can't feel a 5-10hp boost on a car, so many engine modifications were faith-based efforts made with a screwdriver and a prayer. Hot rodding had left more than a few hapless victims with fading dreams of glory and empty pockets. The onset of computerized engine controls in the '80s made increasing horsepower even more complicated—escalating the opportunities for the unscrupulous or incompetent to fleece those with the need for speed: Install this electronic doohickey, double your power. Car guys needed a cost-effective, repeatable B.S. meter every bit as much as bikers. Dobeck hired his dad and put several engineers on the project to handle critical design issues and the team

constructed the original Dynojet 248A using two 48-inch-diameter, 1,200-pound rollers, later increased to 1,600 pounds.

When it came time to market the new car dynamometer, Dobeck realized that although his company was big-time in the motorcycle universe, no one in the door-slammer crowd had ever heard of him. So he went on the road again. The import crowd embraced the new Dynojet first, since they were the victims of a lot of bogus power claims from unscrupulous manufacturers. Then Dobeck visited some of the bigger aftermarket companies. The Dynojet often brought bad news to hot rodders and manufacturers—now everyone on the street knew exactly how much power the parts were worth. But the good news was, in the right hands, the dyno could find "free power" through tuning 8 out of 10 times.

With the automotive aftermarket sold on his Dynojet, Dobeck wanted to relax. By 1996, he was running on fumes and on the road way too much working like a madman. "I had no normal life," he says. An investor group was looking at buying the company, but it was on the fence, so he chased after a NASCAR licensing agreement. Back in the trenches he went, this time to offer his Dynojet to the NASCAR teams in North Carolina. They bit, and after a while, NASCAR agreed to his humble terms and made it "The Official Dynamometer of NASCAR" for three years. The NASCAR teams bought dynos, and Dynojet designed fabulous NASCAR chassis-dyno rooms that purportedly generated six times the revenues of the dyno itself. At that point, he sold the company for six million dollars in cash.

Over the course of his 27 years of work, Dobeck helped make hot rodding more honest. Performance consumers now expect to know dyno results for speed parts, and dyno tuning and development has become essential for serious racers and hot rodders. Chassis dynos from Mustang, Superflow, and others now provide an alternative to Dynojet, but Dobeck's little bike dynamometer is the one that started it all.

What's he doing now? Dynojet was recently sold again, terminating Dobeck's non-compete clause, so he's back at it with Dobeck Performance. He reassembled technical talent from the old Dynojet days and has created a handheld gas analyzer (The Sniffer) and a computer interceptor that allows fuel tuning in an EFI car or bike (The Fuel Nanny). He's also looking at a new chassis dynamometer based on proprietary patented inertial and torque measurement technology. Meanwhile, he's on the road, as always. "Again, I did the routine that works: I put myself right out there in the pits, at the track level, playing around." **HRM**