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WORDS *by* KARAN SINGH

DYNO KING

We head to Mumbai to check out N1 Racing's brand new dynamometer and, for a change, dyno test our electric Kona

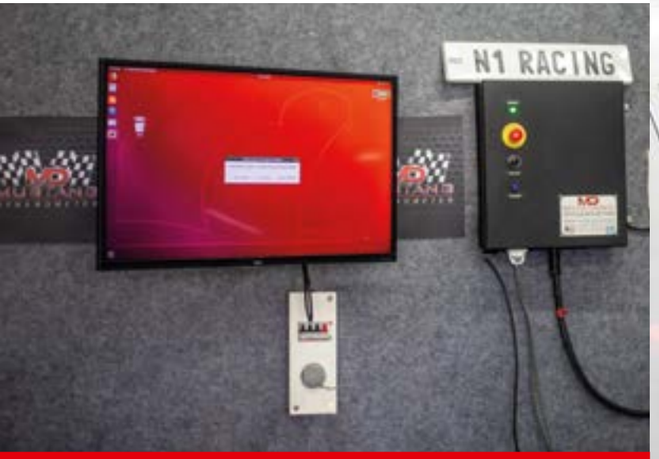
THE TUNER CULTURE IN INDIA IS definitely taking off, and with it there are tuning shops popping up all over the place. An old habit of any tuner, from the biggest to the smallest, are bold claims. In the old days your local tuner would sell you a cold air intake and promise 10bhp more, or slap on an exhaust and claim 50 more horses. As for proof, the less said the better. That's where dynos (dynamometers) come in. They are essentially a treadmill for your car, to measure how much power and torque it is actually putting out to the wheels. Now one of western India's most prominent tuners — N1 Racing Equipment in Mumbai — has just got their shiny new load-bearing dyno up and running, so we had to head there to check it out!

Before we get into what a load-bearing dyno is, let's quickly brush you up on the most common type of dynos, the inertia-type. Inertia-type dynos have a fixed load that they put on the engine which is then used to calculate its power, torque and rpm. The advantage of these is cost and repeatability. An inertia-type dyno is a more affordable addition to a workshop, compared to a load-bearing one, and is relatively simpler in its construction. Repeatability comes from the fact that inertia-type dynos have no brake or absorber, it is only a flywheel that the engine is accelerating and the mass and inertia of the flywheel is used to calculate performance figures. This means that every time you put your car on a particular dyno, it should give you the same figures. You may not get the most accurate results, but they will probably be more consistent. However, a downside of this is that it doesn't really represent a car's real world performance and often inflates figures. Worse still is that when a tuner uses an inertia type dyno to tune a car, it is essentially being programmed for a best case scenario and at full throttle; without being tuned through the changing loads and varying conditions, a tuned car can't really perform well on the road. This is well and good for racecars and drag cars, but our cars are run on the road where full throttle is perhaps used for a fraction of the time. On most days, and for most people, their car is run through traffic and on highways and ghats, all of which have varying degrees of throttle inputs and engine loads due to inclines, declines and the rest.

That's where load-bearing dynos come in, offering a way to do 'steady state tuning'. N1 Racing Equipment's Mustang Dynamometers MD-150 is a state-of-the-art eddy current chassis dyno, with a peak measurement capacity of 1200bhp and a max-speed capacity of 265kmph. Currently the setup only supports two-wheel-drive cars, either rear- or front-wheel-drive, and N1 Racing has also got it set up for bikes. Other cool features on this dyno include a roll lock, which locks up the rollers when taking the vehicle off the dyno or putting it on. It runs on a bespoke software called HoleShot, which moves away from the clunky laptops and 80s graphics you might have seen at your nearest tuner's shop. This has a clean and simple interface, with a 'Virtual Road Simulation' setting to realistically simulate various road conditions.

LOAD-BEARING DYNOS OFFER A WAY TO DO 'STEADY STATE TUNING'

Facing page: The Kona Electric is not a common sight (or sound) on dynos! **Top, L-R:** The dyno's hardware looks neat; strapped in and ready to roll!



The software also allows the tuner to livestream the feed of the car on the dyno directly to a customer lounge, so the owner of the car can see how it's performing without having to get an ear transplant. However, the main difference between the MD-150 and other inertia-type dynos is the 'eddy current' bit. Now I'm no Einstein, so I'll let you head over to Google University to check out what an eddy current is, but I'll explain what it means for a dyno.

Eddy current dynos use an electro-magnetic brake to provide dynamic load to the engine, instead of a hydraulic brake or an alternating current. A big advantage of eddy current dynos is that they can change the load on the engine very rapidly and accurately. So in theory, you could simulate various road conditions while doing tests, and even replicate wind resistance. The HoleShot software I mentioned earlier also doubles up as a global database of vehicles which gets updated continuously. This database has accurate readings for the car's wind resistance at various speeds, and it uses that data to tell the eddy current brake, how much load to apply onto the car. For example, if you put a G 63 AMG onto this dyno, it will face more 'wind resistance' than something sleeker like a Porsche 911. But the real advantage of this comes when tuning a car. While inertia-type dynos are useful for tweaking a single part or doing repetitive runs, load-bearing dynos actually help replicate real-world conditions and therefore the car can be tuned for those conditions. Moreover, with the ability to change up the load on the engine, the car can also be tuned specifically for various load conditions, instead of one perfect world scenario. "When tuned correctly, a car tuned on a load-bearing dyno will perform as tested, and not fall flat on its face", says Mihir Prabhu of N1 Racing.

Now it is commonplace to find souped up tuner cars strapped to a dyno — a turbo'd City, a Supra, an Octavia vRS, but it isn't common to find electric cars on them, at least not in India. And since electric cars seem to be the future, we took our long term Hyundai Kona to find out how it performs on N1 Racing's dyno. If you ever wanted to know what an electric car sounds like on a dyno — it essentially sounds like a massive industrial-grade washing machine trying to take flight — *"veoooooooo."*

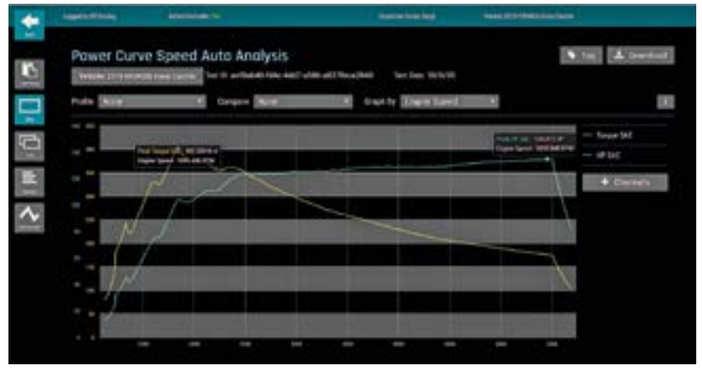
The Kona managed a peak power output of 134.8bhp and a peak torque output of 402.3Nm. Yes, Hyundai claims almost the exact same power figure at 136bhp, but the claimed torque is 395Nm, not 402Nm. The extra 7Nm of torque is down to the fact that we were in a rush and couldn't calibrate the dyno properly. The thing with the HoleShot software is that it needs a few runs to calibrate the dyno, and adjust for the drivetrain losses. Since we had sweat dripping from the range anxiety, we decided to just do demo runs and skipped the calibration entirely. These figures can now be uploaded in my profile that will be saved on the HoleShot software, along with the figures for any other cars I might have taken on to the dyno. I can also compare these figures with other Kona Electrics around the world, with my own cars or even with other people who have tried out the dyno. It also has a drag race mode to accurately simulate your car's quarter mile times!

IT CAN ACCURATELY SIMULATE YOUR CAR'S QUARTER MILE TIMES

To summarise, an inertia-type dyno is just fine for smaller tuners and for those tuning cars for use in competition, the added cost of a load-bearing dyno doesn't make sense. Load-bearing dynos offer a more accurate simulation of real world conditions and can be used to construct a more comprehensive tune for your car. Another plus point for this particular dyno is Mustang Dynamometers' HoleShot software. It breaks away from the age old tuning software everyone's been using till now, you don't need a laptop from the 90s or Windows 98. It is simpler, modern and offers features that are very useful to a tuning shop.

This Mustang Dynamometer MD-150 is installed at N1 Racing Equipment in Mumbai. If you want to test your car or bike, you can get in touch with them and book a slot on the dyno. Charges for renting the dyno range between ₹3,500 to ₹10,000 for individuals, depending on the purpose and the car itself. Tuning companies can also rent it out for ₹30,000 for a four-hour session.

N1 Racing Equipment can be contacted at info@n1-racing.com or +91-9821221791



Right: The Kona's graph looks jagged because power had to be fed in gradually. **Below:** N1 Racing Equipment always has some tasty cars lying around