

Dynamometer Systems & Electric Motor Inertia Simulation (EMINS)

Presenting the new age of testing with
higher **performance**, **capacity** and **flexibility**.

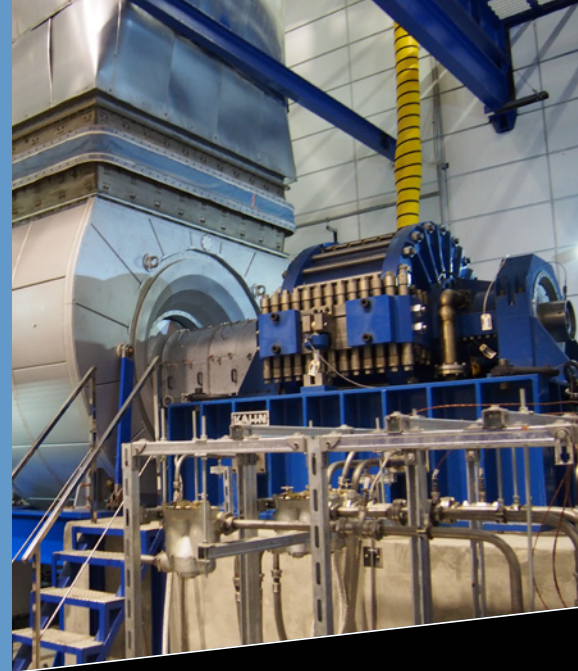
EMINS pushes dynamometer-based testing to new limits.

We understand that for test facility owners and operators, uptime, test time and facility utilization are important factors that are heavily dependent on the capability and capacity of your equipment. Electric Motor Inertia Simulation (EMINS) is a next generation electric dynamometer system with a unique feature set that will allow you to overcome those limitation.

At the core of EMINS technology is unparalleled performance and flexibil-

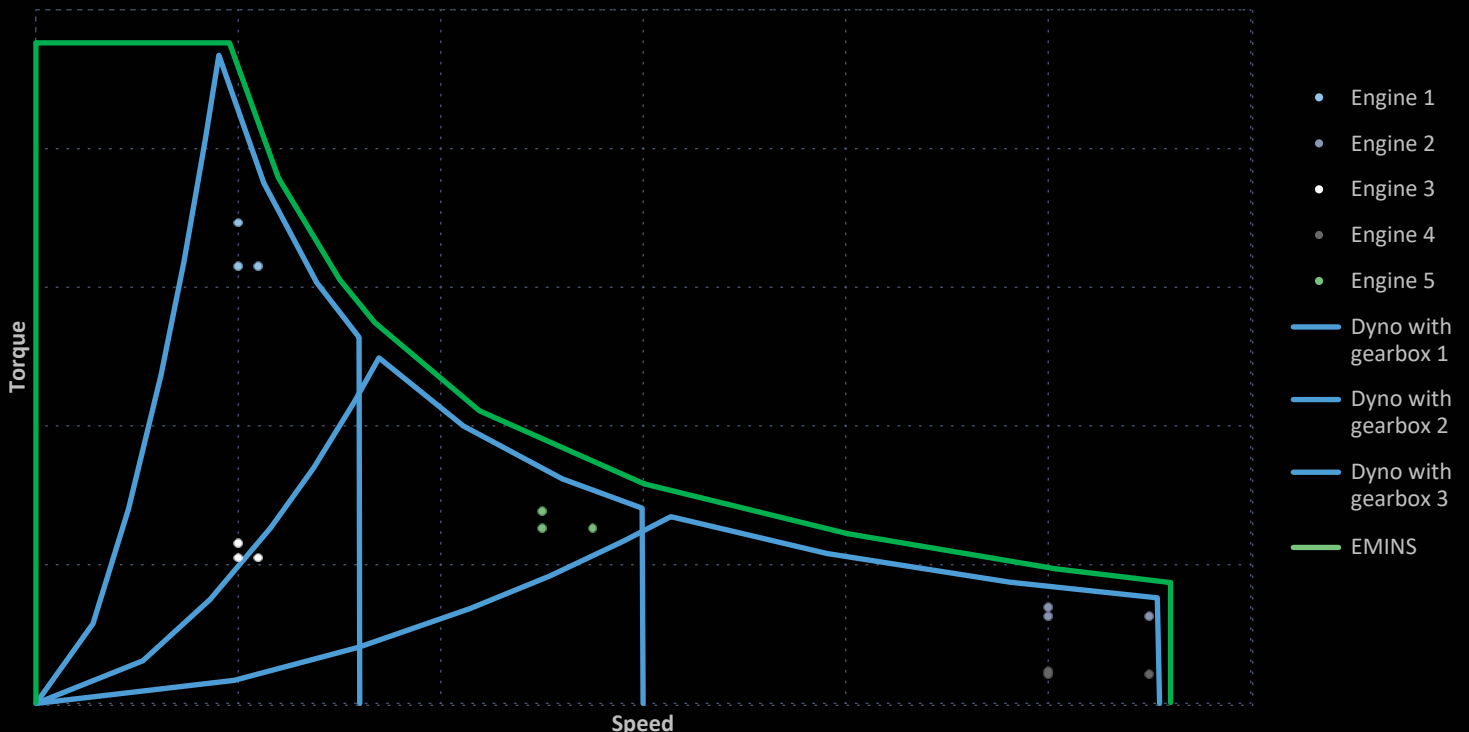
ity. With dynamic response typically 100 times faster than industry standard technologies, you can test the capabilities of your engines without being limited by the capabilities of your load absorption.

Inertia simulation through an advanced control system is the underlying technology that enables this performance, allows you to build your test capacity and to test more engines in a single driveline.



EMINS helps focus your investments in testing and its underlying purpose – **gathering data.**

You can push the limits of your engine test with EMINS and acquire more data at the extremes of your engine operations – allowing for more specialised performance testing. As a system that operates in four quadrants for absorption and motoring in both directions, and with its unique features set, EMINS unlocks great potential to increase uptime, test time and utilization.



The diverse features of EMINS can unlock new possibilities for testing and offers an expanding operating envelope to cover a wide range of power, torque, and speed. In this example, a single EMINS configuration is able to cover an operational range otherwise tested using multiple driveline configurations.

Test the capabilities of your engines without being limited by the capabilities of your load absorption.

Features & Benefits



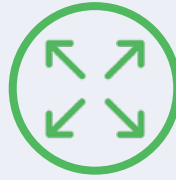
Inertia
Simulation



Higher
Performance



Increased
Flexibility



More
Capacity



Increased
Capabilities



Energy
Recovery

Equipping you with the tools to grow your business, MDS takes a holistic approach to offer options that fit your current and future testing needs, bringing the same level of integrated engineering thinking, whether it is for the world's largest test cell, or a small test system.

Inertia Simulation

Inertia simulation is the fundamental underlying technology that enables the ability to simulate higher and lower inertia. The EMINS dynamometer system can be sized for the largest engine to test, and electronically configured to simulate the inertia of a much smaller dyno for testing smaller engines – approximate ten times the scalability range.

With inertia simulation, greater control of driveline dynamics is possible including reducing torsional vibrations which help reduce the risk of failures.

Higher Performance

As an electric dynamometer system with advanced control systems, the dynamic response of the EMINS dynamometer system is 100 times faster than industry

standard technologies, enabling unique testing capabilities. The extremely short torque rise times translates to more accurate control of transient testing, possibilities for more dynamic simulations and specialized ground testing.

The electronic control reduced or eliminates the burdens of physical driveline setup changes (e.g. flywheel changes) when different dynamic responses are required.

Increased Flexibility

Alongside unparalleled performance, the inertia simulation technology enables the ability to test a wider range of engine powers, resulting in more diverse testing in a single driveline setup. The broad operating speed range of the EMINS dynamometer system enables the ability to test larger engine operating envelopes and gather more data at the test article limitations. The nature of this flexibility not only opens new possibilities to consolidate multiple driveline test setups or increase facility utilization to impact O&M costs, but also helps ensure future engines can be tested in existing facilities.

More Capacity

The flexibility of EMINS extends itself as a capacity-building and data-generating asset – being able to test more (e.g. broader operating ranges, specialized dynamic tests) and also conduct more tests (e.g. consolidating into a single driveline and reduces the need for physical driveline setup changes).

Increased Capabilities

As a full-featured dynamometer system, the features enabled by high performance and flexibility open new possibilities of more dynamic ground testing like autorotation, “one-engine-inoperable” and starter motor functionalities.

Energy Recovery

As an electric load absorber with four-quadrant capabilities, the mechanical energy absorbed is converted to electric energy that can be put to work. Energy produced can be regenerated to the grid, or used for local applications using battery storage, electrolysis, or other technologies. With increasing pressures to reduce waste and be more environmentally conscious to address climate change, energy recovery is expected to become the norm.

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