PROJECT SPOTLIGHT

Electric Vehicle End of Line Testing

MUSTANG ADVANCED ENGINEERING
Fearless Innovation™

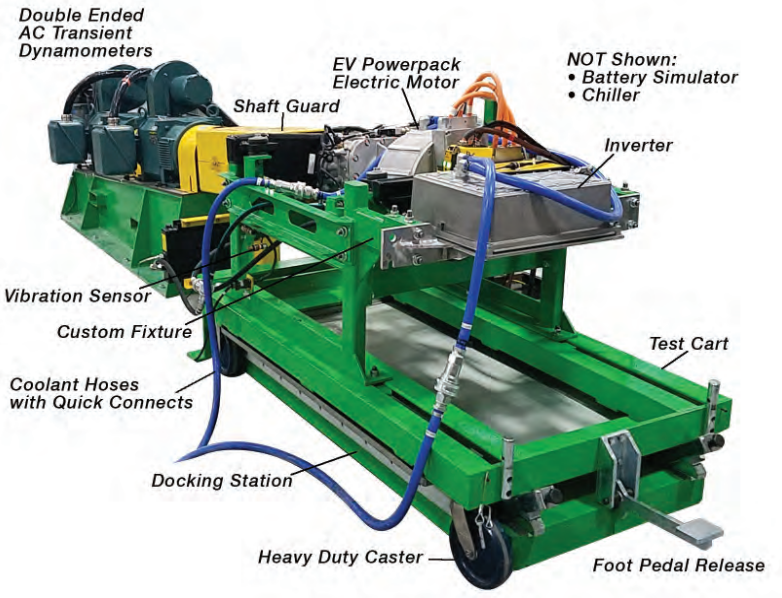
Mustang Advanced Engineering (MAE) designs and manufactures made-to-order test stands for various electric vehicles (EV's), including drivetrains (electric motor, power supply, and inverter) and electric axle testing projects. MAE recently delivered a test stand to Proterra, a leading manufacturer of zero-emission heavy-duty EV's based in California, for end-of-line and/or research and development testing of Proterra's electric drivetrains. The system MAE delivered included a 350 HP regenerative AC dynamometer, 350-700 VDC programmable battery simulator, a cooling circuit with chiller and digital controller, vibration measurement, data acquisition, and MAE's TestCell software package tailored to meet the customer's unique needs.

SNAPSHOT

Project:	End of Line Testing for EV Electric Drivetrain (Motor, Power supply, Transmission)
Customer:	Proterra
Where:	South Carolina Facility
Product:	Custom EV EOL Test Stand
Benefits:	• Fully loaded testing of drivetrains by a regenerative AC dynamometer • Flashing drivetrains with the appropriate firmware based upon model/barcode

Problem vs Solution

Proterra's engineers needed to test their electric drivetrains safely and accurately to better engineer a more efficient line of electric buses. Stressing the safety, they turned to Mustang Advanced Engineering for an answer. The custom designed test stand has multiple levels of precautions such as laser based proximity interlocks, physical barriers and robust assurances against electrical shock.



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The Scope of the Project

For Proterra's South Carolina facility, MAE designed and built a test stand that tests their electrified powerpacks. These tests are under fully loaded conditions and every drivetrain is tested prior to being installed in the vehicle to insure the most stringent quality standards are met prior to the product being delivered to Proterra's customers. MAE provided the capability to flash the drivetrains with the appropriate firmware and test it under in-use conditions. "MAE specializes in making test stands that are made to clients' specific needs, and the Proterra drivetrain test stand demonstrates this expertise. There is no project that is too big or too small for the MAE team" said David Ganzhorn, V.P. Sales. "Mustang designed this stand to be as safe as possible using advanced technologies we've developed here at Mustang for testing EV components", added Ganzhorn.

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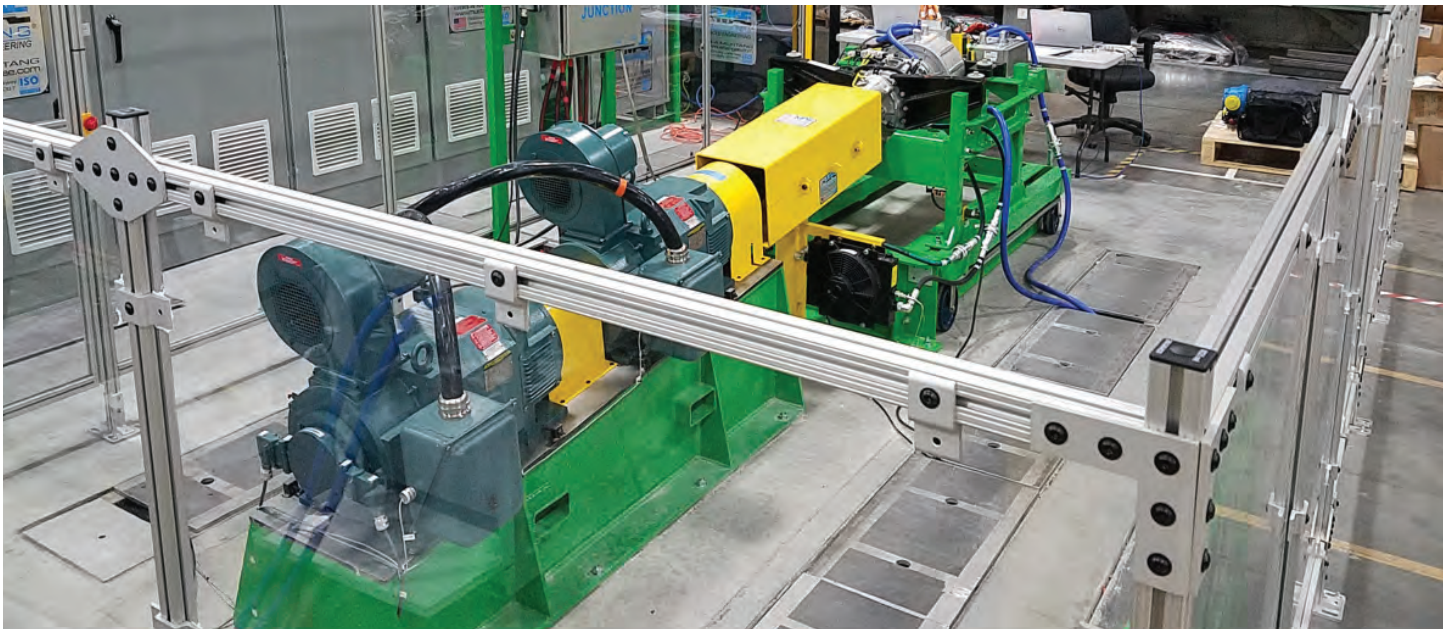
>
> *- David Ganzhorn, V.P. Sales*

Features/Benefits

MAE's EV drivetrain end of line test solutions provided tests that are:

- Fully loaded testing of drivetrains by a regenerative AC dynamometer
- Flashing drivetrains with the appropriate firmware based upon model/barcode
- MAE's TestCell software package configured to Proterra's requirements
- Complete compliment of safety provisions including laser based proximity interlocks, physical barriers and robust assurances against electrical shock



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About MAE

Mustang Advanced Engineering is a leading supplier of advanced, custom engineered testing and measurement systems. Located in Twinsburg, Ohio since 1986, MAE delivers world-class testing solutions, custom design support, technical assistance, backed by a dedicated factory service team, making them a trusted source of expertise for the global industrial market. Visit MustangAE.com for more information. Follow them on Facebook, Twitter, LinkedIn, and Instagram.