Tow Dynamometers

Testing Solutions

The Largest And Most Extensive Product Offering Of Tow Dynamometers Available

MAE MUSTANG ADVANCED ENGINEERING
Fearless Innovation™

Converted vehicle into a mobile style tow dyno

Power absorber units and weights

Customized tow dynamometers

Industry Leaders

MAE offers the largest and most complete lineup of tow dynamometers available for test engineers in the industry. Using advanced controls and air-cooled eddy current power absorbers, tow dynamometers are capable of testing vehicles and simulating road profiles taken from pre-recorded data of road grades, hills and mountains without ever having to leave the safe and controlled confines of the flat test track. MAE's advanced control system allows for grade control, speed control, drawbar control, manual control, polynomial drawbar control as a function of velocity, Mountain Climbing Test as a function of distance, Cycle Testing as function of distance or time and Engine Speed Control - to name a few.

As the industry leader in tow dynamometer technology, MAE was the first company to offer a heavy-duty, Class 8, 5th wheel style tow dynamometer with Auto-Shift capability. MAE's Auto-Shift technology allows you to "Shift on the Fly"! No need to stop and change gear ranges. Thus, during heavy draw bar testing at low speeds, to medium drawbar loading at medium speeds, and light drawbar loading at high speeds, the operator does not have to stop the tow dynamometer and shift gears to allow the tow dynamometers to achieve the next speed range.

SAE J2807 and Davis Dam Test

MAE's tow dynamometers are designed to meet the tow test of the Society of Automotive Engineers (SAE) J2807 Propulsion System Performance Requirements, combination vehicle acceleration and gradeability for automotive and commercial vehicles.

Some of the benefits from Mustang's tow dyno capabilities:

- Tow-Vehicle Gross Combination Weight Rating and Trailer Weight Rating
- Level Road Acceleration
- Launch on Grade
- Highway Gradeability
- 12% grade, forward reverse
- Tow Vehicle Trailer Rating
- GCWR (Gross Combination Weight Rating)
- TWR (Trailer Weight Rating)
- TVTW (Tow Vehicle Total Weight)
- GVWR
- Launch on Grade
- Flat-Out Acceleration
- Total Control
- Braking Performance
- Davis Dam test

All based on the International Society of Automotive Engineers – SAE J2807 tow tests. Imagine being able to pass the Davis Dam test, but on a flat test track, using a tow dynamometer.

Simulation

With a tow dynamometer from MAE, you can test to meet the Davis Dam test without having to take a vehicle to Nevada. Imagine not even having to take the vehicle on an incline. With the simulation of the SAE J2807 Davis Dam test, test procedure can be performed consistently on a flat test track.

SAE J2807 Surface Vehicle Recommended Practice

High-Load, Low-Speed Tow Dynamometer

Categories Of Tow Dynos

Car/SUV

Light Truck

Medium Truck

Heavy Truck

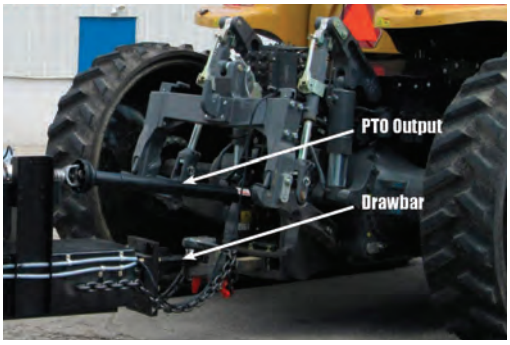
Tractor/Off-Road

Vehicle Conversion & Refurbish

Converted vehicle into a mobile style tow dyno

Swing connection for mobile style tow dyno

Tractor/Off-road tow dynamometer



Power-take-off (PTO) loading options

Mobile Style

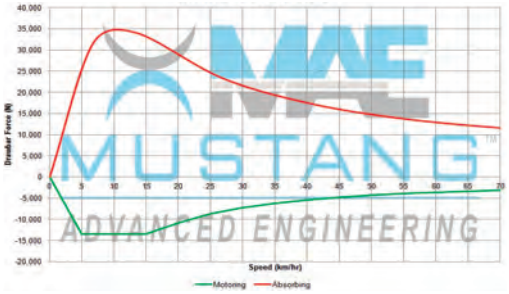
The Mobile Style is a self propelled towing dynamometer. Designed from an existing motorized vehicle chassis or a custom designed chassis. This unique mobile configuration allows the tow dynamometer to be self powered with an engine for use in transportation between the garage and test site. Additionally the engine can be used for load biasing if required. In many cases, we convert existing vehicles (customer-supplied, new or used). Mustang also designs and fabricates custom mobile dynamometer vehicles for extreme applications or to customer specifications.

Trailer Style

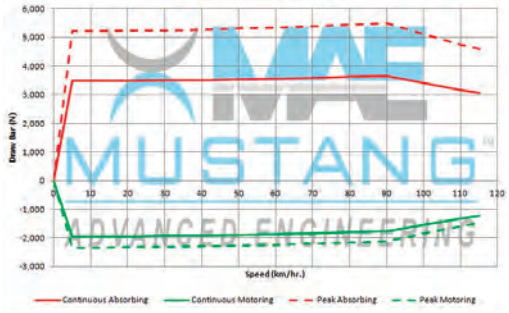
The trailer style is the traditional style of tow dynamometer. The trailer style tow dynamometer is configured to be towed behind a vehicle with a rigid connection via a ball, clevis, pinto hook or 5th wheel between the test towing vehicle and the trailer tow dynamometer. The trailer tow dynamometer is more economical in price and only requires a single operator. The disadvantage is that a separate vehicle is required to move the unit from garage to site or site to site.

E-Series Push/Pull

Mustang's E-Series tow dynamometers provide the ability to not only accurately simulate uphill grades, but to also simulate downhill grades and to provide zero drawbar force. Mustang offers E-Series tow dynamometer models designed for testing a wide range of vehicles; from compact cars to off-road trucks. The Mustang E-Series tow dynamometers offer performance benefits not found on competitor's machines; absorbing time (uphill simulation) only limited by generator fuel supply, motoring (downhill and zero drawbar simulation) only limited by fuel supply.



Push-Pull MDT-35KN-E Drawbar Performance



Push-Pull Dynamometer Drawbar Performance

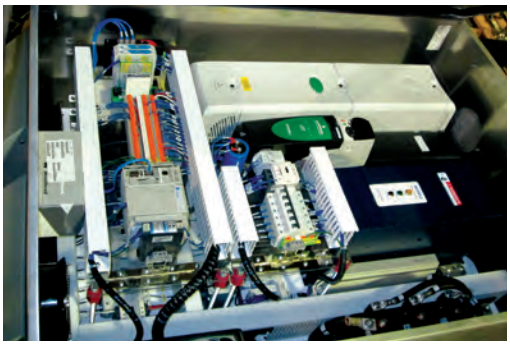
Options

While Mustang can design a tow dynamometer to meet virtually any application, there are several standard options available with all Mustang tow dynamometer systems including:

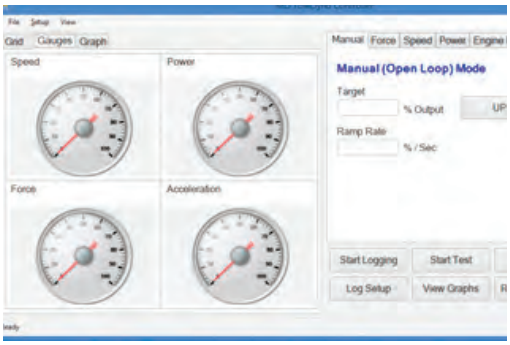
- CAN and/or OBDII interfaces
- Additional analog and digital inputs/outputs
- Engine RPM System (OBDII, J1708, J1939, or analog)
- Automated adjustable hitch
- Fifth wheel adapter
- Super single axles
- Rear towing hitch
- Fuel consumption measurement system (OBDII, J1708, J1939, or analog)
- PLC based control system
- VBOX (gps system) integration provides accurate grade simulation, ground speed, and extremely easy profile generation
- Winch testing provision
- Touchscreen display

Converted vehicle into a mobile style tow dyno

Trailer Style Tow Dynamometer



Inside a control box



Software screen

Control all four dynamometers within one room

Controls and Software

"Load Control" and "Speed Control". When the Tow Dyne is in "Load Control" mode, the driver of the test vehicle controls the speed. Conversely, when the Tow Dyne is in "Speed Control" mode, the driver controls the load. The DAC/PC based tow dynamometer control system is a member of Mustang's latest generation of embedded micro-controller based electronic systems. All control and monitoring functions are performed by an embedded 16 bit digital micro-controllers. All calibrations can be performed using the on-board LED or enclosure mounted LCD display and keyboard, with calibration values stored in on-board non-volatile FLASH memory. Testing values such as load or speed set points can be entered by the operator in exact unit values. In keeping with our previous system design features, the new control system is configured to supply analog output signals proportional to system speed and loading force, using operator supplied output scaling values. Mustang's new control system provides faster and more stable load control than previous analog control systems and can be interfaced to a laptop computer via wireless connection or RS-232 serial cable to provide data logging and advanced control functionality.

Standard Features

- Manual, Constant Torque, Constant Speed, Constant Power, Vehicle Simulation, Grade Simulation, and Trailer Weight Simulation modes.
- Metric or Imperial units
- Easy to use data acquisition and graphing capabilities, including Excel compatible import & export
- Time or distance based scripting with an easy to use script builder, with one click script execution
- OBDII, J1708, and J1939 support
- Convenient wireless operation
- Seamless capability to control multiple tow dynamometers (allows daisy chaining dynamometers)
- Simple 'one click' calibration procedure
- Driver's aid
- Open loop scripting for testing cruise control systems
- Real time grade compensation available
- Full compliance with Nebraska Tractor Test Procedures
- Full compliance with Chinese National Testing Standard GBT 12537-1990
- Full compliance with Bureau of Indian Standards IS 5994:1998, 12036:1995, and 12226:1995
- 'Plug & Play' controller support for fleets allows any controller to be used with any tow dyne
- 16 bit, 1 MHz commercial data acquisition module
- 16 analog inputs with thermocouple support (easily expandable to 64 analog inputs)
- Four (4) 16 bit, 1 MHz analog outputs
- 24 high speed digital I/O channels
- Four (4) 32 bit counter input channels with quadrature encoder capability
- Over-speed and over-temp protection standard

MDT Series Tow Dynamometers

Mustang tow dynamometers are recommended to be operated on the safe and controlled confines of a test track. Although all Mustang tow dynamometers are road worthy, Mustang does not advocate testing on public roads due the fact a tow dynamometer is a piece of test equipment operating in a dynamic environment dependent upon operator input, road conditions, as well as external variables. If the customer desires to perform testing on public roads then all activities are at the customer's risk, the customer agrees to hold Mustang harmless, and it is the customer's responsibility to obtain any and all required approvals/licenses.

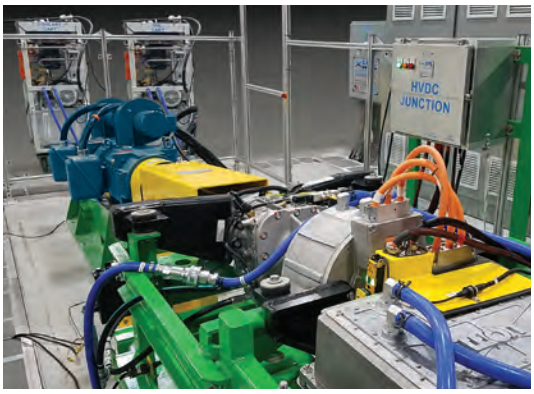
Agricultural MDT-90KN tow dynamometer

Type of Tow Dynamometer	Model Number	Trailer Tow	Mobile Engine Powered	Cont. Drawbar	Max Speed	Number of Loading Axles
Car/SUV						
	MDT-1.8KN-UL Ultralight	-T	NA	1,800N (400 lb)	112 km/hr (70 mph)	1
	MDT-3.6KN-UL Ultralight	-T	NA	3,600N (800 lb)	112 km/hr (70 mph)	1
	MDT-5.4KN	-T	NA	5,400N (1,200 lb)	112 km/hr (70 mph)	1
	MDT-8KN	-T	NA	8,000N (1,800 lb)	130 km/hr (80 mph)	1
Light Truck						
	MDT-10KN	-T	NA	10,000N (2,250 lb)	130 km/hr (80 mph)	1
	MDT-12KN	-T	NA	12,000N (2,700 lb)	130 km/hr (80 mph)	1
	MDT-20KN	-T	NA	20,000N (4,500 lb)	130 km/hr (80 mph)	2
Medium Truck						
	MDT-30KN	-T	-M	30,000N (6,745 lb)	112 km/hr (70 mph)	2
	MDT-40KN	-T	-M	40,000N (9,000 lb)	112 km/hr (70 mph)	2
	MDT-60KN	-T	-M	60,000N (13,500 lb)	112 km/hr (70 mph)	2
Heavy Truck						
	MDT-90KN	-T	-M	90,000N (20,250 lb)	135 km/hr (81 mph)	2
	MDT-100KN	-T	-M	100,000N (22,500 lb)	120 km/hr (75 mph)	2
	MDT-135KN	-T	-M	135,000N (30,350 lb)	120 km/hr (75 mph)	2
	MDT-170KN	-T	-M	170,000N (38,215 lb)	120 km/hr (75 mph)	2
Tractor/Off-Road						
	MDT-80KN	-T	-M	80,000N (17,985 lb)	32.2 km/hr (20 mph)	2
	MDT-100KN	-T	-M	100,000N (22,480 lb)	32.2 km/hr (20 mph)	2
	MDT-125KN	-T	-M	125,000N (28,100 lb)	32.2 km/hr (20 mph)	2
	MDT-200KN	-T	-M	200,000N (44,960 lb)	32.2 km/hr (20 mph)	1 or 2
	MDT-250KN	-T	-M	250,000N (56,200 lb)	32.2 km/hr (20 mph)	1 or 2
	MDT-300KN	-T	-M	300,000N (67,440 lb)	32.2 km/hr (20 mph)	1 or 2

*The above models are Mustang's standard products. If higher or different speed or power ranges are required then custom design is available

Mustang Advanced Engineering

EV Powertrain Test Cell



Global Leaders in EV Testing

MAE is a test cell system integrator capable of supplying turnkey, fully functional, integrated test cell solutions. MAE draws on more than 35 years of equipment production and test cell integration experience to provide customers the perfect test cell for their requirements. MAE leverages our vast test cell experience and our safety minded engineers to develop test cells that are safe and meet local and national safety requirements. Safety is achieved through physical barriers, electrically lockable access barriers monitored until conditions are safe to unlock, guards, dual hand touch pads, light curtains, electrical lockable doors/covers, pressure pads, lights, lamps and sound. Safety is also designed into the high-power electrical systems with lock-out/tag-out requirements, arch flash analysis and facility interface design.

EV e-Axle Test Stand

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

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