

MAE-MRAP-EOL-4000 Test System Heavy Duty End of Line Test System for MRAP Vehicles

General

Our MAE-MRAP-4000 End of Line Test System (EOL) tests Heavy Duty Mine Resistant Ambush Protected (MRAP) Military Vehicles including General Dynamics, Force Protection (now General Dynamics), Navistar and Oshkosh manufactured vehicles among others. The 4000 series is available in 6x6 (also tests 6x4, 6x2, 4x4, 4x2) and 8x8 configurations.

The 4000 is a combination Road Tester /Anti-lock Braking System (ABS) Test system with the ability to test the MRAP's road worthiness, general performance, brakes and ABS system as well as to prompt the operator for visual and functional tests. The MAE-MRAP-EOL-4000 is a "one-tester-does-all" system with only one station being required for all testing needs – saving time, money and space. The system is comprised of a sophisticated roller test rig, control system with associated components, software and a user interface computer system.



Specifications for the Standard 6x6 Configuration

Frame

Structural Steel Frame: Consisting of three separate roller sets one for each axle. The middle roller set is fixed while the front and the rear/rear will be moveable. The Movable Roll Sets adjust to accommodate for various wheelbases. An air holding lock/brake holds the movable roller sets in place during testing. Top Plates cover the top of the 4000 so the vehicle has easy ingress and

egress across the Roll Tester. The Top Plate System is constructed of steel Diamond Plate and includes sliding plates and false floor plates to cover all gaps regardless of testing configuration. Vehicle anchoring is achieved using heavy duty D-rings and/or in floor anchors along with adjustable chains and ratchet binders. Vehicles will need to be anchored in the front and rear during testing. We include a sturdy vehicle restraint system. The system is designed to accommodate vehicles having an axle weight of 35,000 lbs as standard with higher axles weights available as an option.



Rollers

- Roll Diameter: 17.5"
- Minimum Top Speed: 100 mph
- Rollers are supported by pillow block bearings with grease fittings
- Roll Face Width: 40"
- Outside Roll Track: 120"
- Inside Roll Track: 40"
- Rollers are independent from one another for brake testing purposes (each roller/wheel is independent of one another and not coupled during ABS brake testing)
- Roll Surface: High co-efficient of Friction
- Minimum Axle Weight Capacity: 35,000 lbs.



Wheelbase

The Wheelbase system will be activated to move the moveable axle systems to pre-determined lengths based on the vehicle being tested in the system. The center roller set is fixed while the front and rear most rollers adjust to accommodate the wheelbase variations. Sliding plates are furnished so that there are no gaps in the top plating for any one particular wheelbase position.

Roller Lock System

The roller lock and lift system is controlled from the main control system. An over ride switch is incorporated into the system in case the main control system becomes inoperable. There is also a system in place that does not permit testing to commence until the roller lock and/or lift system is in “test” or down position.

Calibration Hardware

Calibration hardware is included for calibrating the torque sensors. Calibration arm/hanger and weights are also included. For storage purposes a roll around caddy is supplied with suitable casters.

Standard Vehicle Cooling Fan

- 24-inch tubeaxial fan, portable with handles
- Aluminum Propeller
- Direct Drive
- 3 HP, TEFC motor (1750 RPM)
- Wire Inlet and Outlet Guards (meet OSHA standards)

- Rotatable 180 degrees on horizontal axis
- Vertically adjustable
- Two 3" rigid plate casters
- Silver-gray enamel paint
- Minimum 10,800 CFM

Power Absorbers

- A total of six (6) are included with the standard 6x6 system or one for each roller set/wheel
- Measurement of torque and speed for each roller set
- Electric based
- Air cooled
- In conjunction with the control system able to simulate vehicle weight and road loads including simulating a 5% grade
- Peak Absorption per roller at max speed of 100-mph should be at least 700-Hp
- Power Absorption @ 20 mph \geq 200 HP per axle

Brake Testing

The Roll Tester shall be capable of testing the brakes, including measuring the brake effort as well as testing the ABS system for proper installation and functionality. The tester shall be able to communicate with the vehicle's ECM and ABS system for this purpose of checking the ABS system for wiring flaws.

- Measures brake torque and speed independently at each roller set, or each wheel
- Maximum Brake Effort Capacity: \geq 8,750 lbs of force per axle, or 4,375 lbs. force per roller set/wheel
- High torque Motors are used to independently power each roller set/wheel during the test
- Testing is performed at low speed (7-mph nominal)
- Validates speed sensor and ABS brake valve assignments at each wheel
- Measures brake effort independently at each wheel

- Calculates Brake Balance
- Measures ovality
- Measures brake Drag

Controls

The system is controlled using a Programmable Allen Bradley Micro Logic Logic Controller, or PLC.

The control system includes the following.

- Hard wired E-Stop for control room
- Wired Hand Pendant with E-Stop for in cab use
- Motor Controls
- Low Voltage Signal Cables
- High Voltage Cables
- Torque Sensors
- Speed Sensors
- Controls and Sensors for the wheelbase adjustment
- PLC control system mounted in NEMA enclosure (CE approved)



Computer: (Vertical Tower) Minimum Specification (Subject to change)

- Intel Core i5-3450
- Microsoft Windows 7 Professional (64-bit)
- Two (2) USB

- 8GB DDR3-1333 RAM
- 2TB 5,400RPM Hard Drive
- SuperMulti DVDRW Drive
- Multi-in-One Memory Card Reader
- Intel HD Graphics 2500
- 10/100/1000 Network
- 802.11b/g/n Wireless
- Wireless Mouse and keyboard
- Barcode Reader
- Back up External Desktop Type Hard Drive with USB 3.0 connection, 3.0TB storage capacity
- Color Laser Printer/Copier/Fax, 25ppm, 256 MB memory, 2400 x 600 dpi print resolution

LED Color Monitors/Displays

- Qty=2
- Primary Display 22" Flat Panel LED
- Driver's Display 40" Flat Panel LED mounted on portable display stand.

Vehicle ECM Bus and ABS Communications Interface Cables and Protocol

Testing Parameters are collected from the Vehicle's ECU. At a minimum, J1939 and J1708 protocol shall be supported. Additionally, the system shall communicate with the vehicles ABS braking system for ABS testing. All ECM interface cables are furnished.



MRAP End of Line Testing System Software

- The system includes the End of Line MAE-MRAP-EOL-4000 Testing Software written in Visual Basic which is a mature, commercially available software package from Mustang AE. The system does not have any reoccurring fees and includes all the program's features.
- No annual maintenance fees or time based licensing fees
- Prompts the Operator through a pre-defined test sequence
- Includes security levels, calibration routines, and maintenance schedules which can be configured by the user
- Test sequences can be modified and changed by the user, including changing pass/fail criteria
- Visual Inspections are configurable with the ability add or remove the inspections by the user
- The software selects the proper test sequence based on the vehicle being tested
- Software is capable of adding new vehicles and for adding the ability to test 8X8 vehicles in the future
- Includes a test out record and hard copy printable report

Exhaust Extraction Option

Fan

- 5-hp, 3000 CFM @ 4" SP Exhaust Fan
- Vibration Isolation Platform
- Shaft Cooler
- High Temperature Bearings
- High Temperature Paint
- Inlet Tee/Flex
- Venturi / Screen
- Manual Controlled Damper
- Back Draft Damper, weather Cover and Drain Connection
- Single Down Drop Assembly including flange set, blast gate and female coupler connection for 12" duct/hose collection
- 10" x 12" High Temperature Hose with adaptor, elbow, heat handles and coupler connection

Optional Aboveground Installation

The optional aboveground installation is available for installation where a traditional pit installation approach is not desired or feasible. We can fabricate the system to include a variety of above-ground layouts. Please contact your sales person for details.

Optional Turnkey Installation

Optional turnkey installation is available which includes foundation design, installation labor, and project management. Please contact your sales person for details.

Manufacturing Processes

Mustang is an ISO 9001:2008 certified manufacturer. Equipment manufactured by Mustang conforms to OSHA and NFPA standards including OSHA1910, OSHA Standard 29 CFR, NFPA 70, and NFPA 79. Weldments comply with AWS D1.1/ D1.1M, AWS D1.2/D1.2M, and AWS D1.3. Equipment is painted with a high wear resistance paint containing no hazardous materials.