

The new AMSOIL mechanical testing laboratory includes three 480-sq. ft. dyno cells.

# MECHANICAL TEST LABORATORY

The new AMSOIL mechanical testing laboratory features three 480-sq. ft. dyno cells capable of housing a minimum of two dynamometers each. Encompassing 8,500+ square feet of the AMSOIL Center, the facility allows the company to rigorously test engine oil performance on-site, allowing quicker and more thorough test results for current products, developing products and competing products in both normal and extreme operating conditions.

## The Dyno Cells

**Cell 1** houses the SuperFlow 902 dynamometer, a water brake dynamometer capable of absorbing up to 1,500 hp at the crankshaft. Critical engine parameters are measured and stored with the SF WinDyn data acquisition software. The cell is currently equipped with a two-cycle, twin-cylinder, liquid-cooled engine for the measurement of two-cycle oil detergency properties. Snowmobile in-chassis testing, hand-held power equipment testing and small gasoline-engine testing will also be conducted on this dyno.

**Cell 2** houses the Midwest 1014 dynamometer, an eddy current dynamometer capable of absorbing up to 175 hp at the crankshaft. Using an electromagnetic brake for absorption, it provides precise load control that

allows identification of very small differences in engine performance. Critical engine parameters are measured and stored with the Midwest Lab View software. The GM 3800 Series II 3.8L V6 gasoline engine in this cell provides extremely hot temperatures and allows in-depth testing and measuring of deposits, wear and oil durability.

**Cell 3** houses the SuperFlow CycleDyn dynamometer, an eddy current dynamometer capable of absorbing up to 200 hp at the rear wheel, with critical engine parameters measured and stored with the SF WinDyn data acquisition software. A 25 hp fan is interlocked with the CycleDyn roller to simulate air speeds in excess of 65 mph during testing sequences. Designed for in-chassis testing of equipment such as motorcycles and ATV's, it currently holds a Harley-Davidson motorcycle.

## Controlled Test Environment

Programmable Logic Control (PLC) automation of the air, water and fuel systems allows precise control of the testing environments within each cell, providing repeatable test results.

### Air

PLC integration of intake and exhaust fans allows the setting of intake air pressure, and the combustion air system provides 3,000 cfm of temperature and humidity-controlled air directly to the test engines. Intake air volume is adjustable to 20,000 cubic feet/minute (cfm), and in-cell air can turn over 3.8 times per minute, ensuring excellent air quality throughout testing. Carbon monoxide and hydrocarbon sensors are installed in each cell to warn of any air quality issues.

### Water

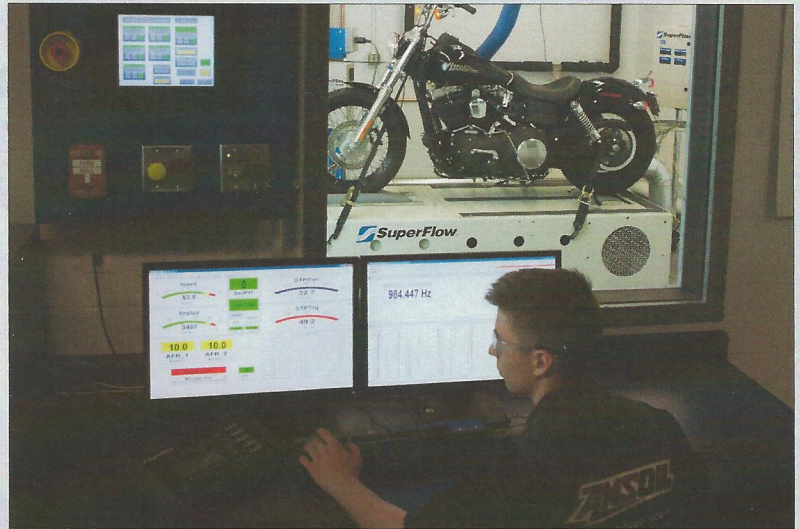
A 4,000-gallon water supply tank provides ample process water to maintain engine temperatures throughout test sequences. All process water returns to the in-floor sump tank, and once it reaches a set level, it is pumped back to the supply tank. A roof-mounted cooling tower ensures the water returns to the supply tank at a preset temperature.

### Fuel

An outdoor fuel supply tank stores 2,000 gallons of premium unleaded fuel for the dyno cells. All lines are fully welded for safety, and a pressure sensor is installed to detect system pressure loss, allowing shutdown of the fuel supply pump in the event of an unexpected fuel line breach.

## Fire Safety

Each dyno cell is protected from unexpected fire by the FM200 fire suppression system. This waterless system effectively extinguishes combustible, electrical and flammable liquid fires quickly without causing collateral damage to equipment or personnel. The FM200 system includes five in-cell ceiling mount heat sensors as well as manual pull stations inside and outside of each cell.



The SuperFlow CycleDyn dynamometer is designed for in-chassis testing of equipment such as motorcycles and ATVs.



A 4,000-gallon water supply tank provides ample process water to maintain engine temperatures throughout test sequences.



A Harley-Davidson motorcycle undergoes dyno testing.



The GM 3800 Series II 3.8L V6 gasoline engine hooked up to the Midwest 1014 dynamometer allows in-depth testing and measuring of deposits, wear and oil durability.