

Engine Research Cell 5

Dynamometer:

DC, 600 Hp Absorbing, 500 Hp Motoring, 2000 RPM Base Speed, 3000 RPM Maximum Speed

Dyno and Throttle Controllers:

Dyn-Loc IV Dyno Control
DTC-1 Throttle Control

Data and Control System:

LabView-based data acquisition system.

- Thermocouple Inputs (32 pre-wired)
- Pressure Inputs (16 pre-wired)
- Analog and Digital inputs and outputs

Fuel Control:

Day-tanks plus in-ground fuel feed for commonly-used fuels. Fuel flow measurement and handling using a positive-displacement fuel metering system.

Combustion Air Control:

Engine intake air conditioned to maintain desired temperature and humidity. (Maximum air flow is 2000 CFM.) Engine air consumption is measured with Meriam laminar-flow elements.

Emissions Instrumentation:

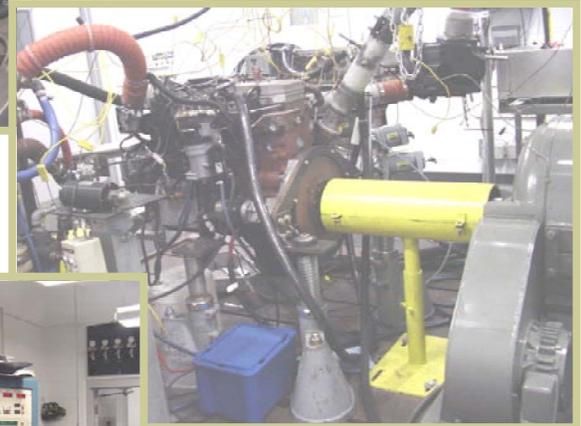
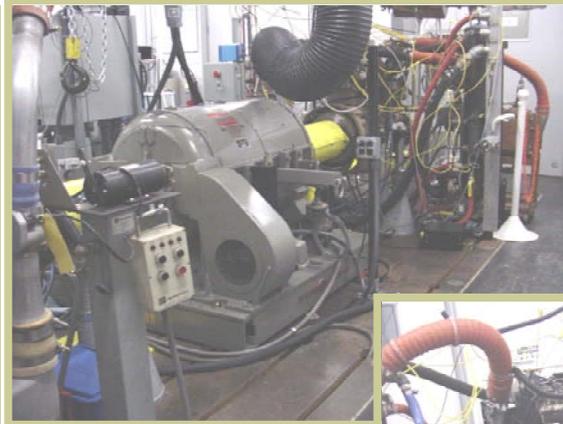
Micro-dilution tunnel is available for dilute samples including bags and filters.

2 main flow paths with standard instruments:

- Heated Chemiluminescence (NO_x)
- Heated Flame Ionization (HCs)
- Non-dispersive Infrared (CO , CO_2)
- Paramagnetic (O_2)

ECM/NGK Air/Fuel Ratio Meters

More advanced instrumentation is included in a pool shared among engine cells. (FTIR, TEOM, SMPS, GC-MS, etc.)



Currently Installed Engines:

Two engines are currently installed in Cell 5. A 2003 John Deere 4.5 liter diesel engine with common-rail fuel injection and a 2003 Cummins 5.9 liter ISB diesel both support active CRADAs.

Current Projects:

The John Deere 4.5 liter engine is used to develop improvements in NO_x and PM control, with emphasis on engine controls and aftertreatment technologies for off-highway vehicles. Under a CRADA with Cummins, the 5.9 liter ISB engine is being used to characterize engine-out hydrocarbon species distribution for two fuels, with- and without engine-managed NO_x trap regeneration strategies.