Automotive Engineering
Engine Fuel Map Design

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Overview

- Rutgers Formula SAE Team
  - Engine Theory
  - Lawnmower Engine on Dynamometer
  - Formula Engine Fuel Mapping
The Engine
Fuel Systems

Electronic Fuel Injection
Electronic Control Unit

- Receives Information from Sensors
  - Engine Speed
  - Throttle Position
  - Amount of Air
  - Unburned Fuel
Phenomena

- Knock
- Stalling
Dynamometer
## Formula Car Results

![Volumetric Efficiency Table](image)

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<th>Speed (km/h)</th>
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*Note: The table above represents the volumetric efficiency of Formula Car results at various speeds.*
Formula Car Results

Volumetric Efficiency Table

MAP Value = 41.00 kPa
Engine Speed Value = 750 RPM

Use + or - Keys to Adjust Graph Values.
This Graph does not use ONFLY.

MAP (kPa)
Engine Speed (RPM)
Volumetric Efficiency (% FPW)
## Formula Car Results

### Ignition Advance Table

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What You Need

- ECU
- Sensors
- Computer
- Dynamometer
Keep In Mind…
- Start tuning from a rich mixture and proceed to lean.
- Be patient. Make small corrections at a time.
- Be cautious. Engines can detonate.
Special Thanks to…

- The NJ Governor's School of Engineering and Technology
  - Donald M. Brown, Director
  - Blase Ur, Program Coordinator
  - Rutgers University School of Engineering
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  - Dr. Thomas Farris, Dean
  - NJ Governor's School Board of Overseers.

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  - Motorola Foundation
  - Morgan Stanley
  - PSEG
  - Silver Line Building Products
  - Families of 2001-2008 program alumni.

Team Auto

- Mark Sproul, Randy Miles, Jaime Ennis, Daniel Cobar, Rutgers Formula SAE Team, & all 2009 GSET counselors
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