

2011 Clarkson University Winter Knights



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Design Intent

- Utilize the benchmark in the industry to further reduce the environmental impact of snowmobiles on the environment
- Develop a simple, yet cost effective method to achieve new standards
- Easy adaptation for various concentrations of ethanol fuels
- Further reduce chemical emissions and noise pollution
- Maintain or improve stock performance characteristics





2011 Ski Doo MXZ Sport 600ACE

- EPA estimated 29 miles per gallon
- Light weight Rev XP Chassis, less than 500 pounds
- New 600ACE four-stroke engine
- New eDrive Clutch
- Desirable riding ergonomics



Red – Old Rev Platform

Blue – New Rev X Platform





Design Approach



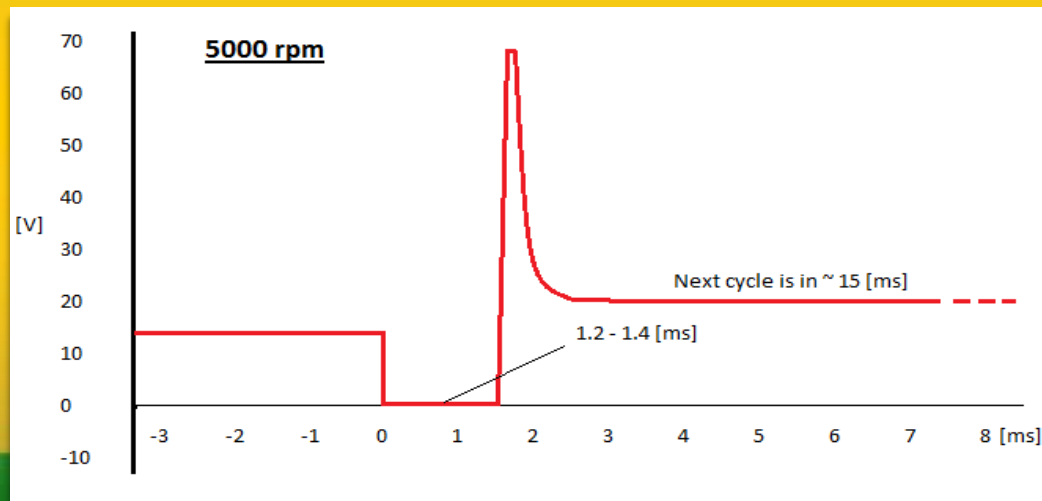
- Custom BoonDocker EFI controller
- Modified exhaust system with tuned headers with dual catalyts
- Utilize stock muffler for performance, simplicity and lower cost
- DynoJet WideBand2 sensors and LCD-200 display for calibration data logging





Fuel System

- BoonDocker fuel controller to modify fuel mapping at the press of a button
- Open loop system for simplicity and lower costs



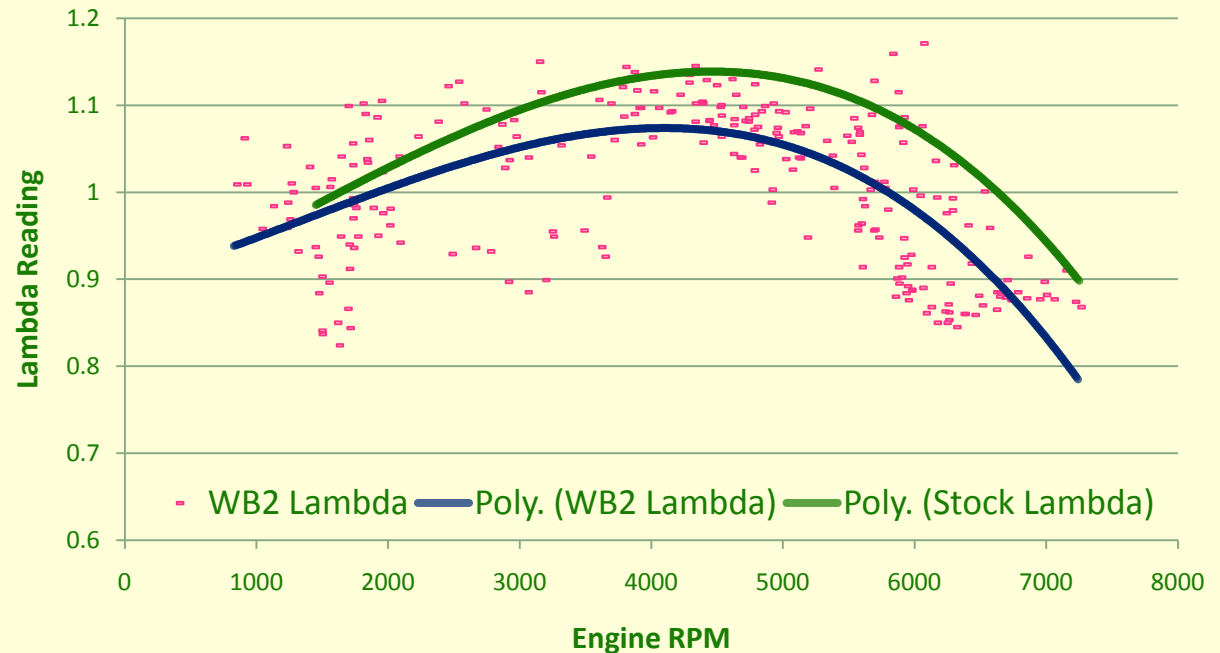


Fuel System Calibration

- Calibration for optimal catalyst efficiency and fuel mileage at cruising speeds

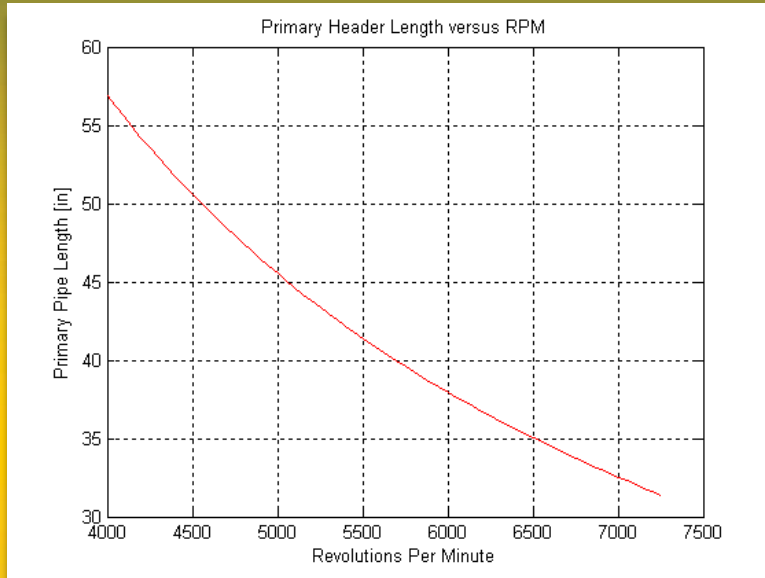
- Lambda values close to stock mapping

Lambda calibrations for E25 with stock overlay





Exhaust System



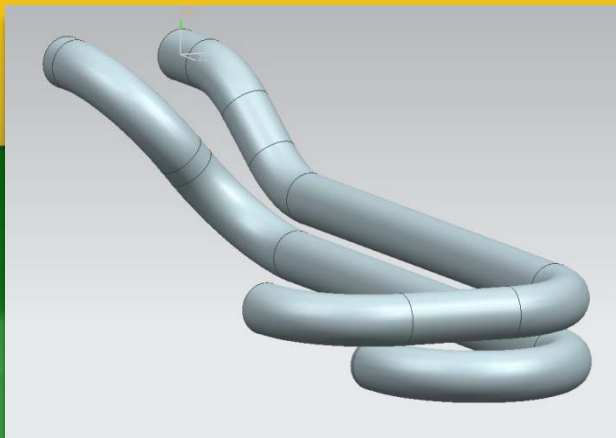
- Maintain stock muffler for simplicity and easy maintenance

- Tuned primary headers for increased engine torque

$$L = \frac{a * T}{RPM}$$

- High flow Dual Catalytic converters by EMITEC and coating by Aristo

- Exhaust heat wrapping to reduce vibrations, noise, and maintain exhaust gas temperatures





Marketability

- Reliable Ski Doo brand
- Easy to use OEM controls and Gages
- MSRP < \$10,000
- Low Emission 4-Stroke Engine
- Low Noise Pollution ~70 dba
- Average MPG > 20
- Lightweight < 500 lbs (dry weight)
- Fun light entry level sled
- Electric Start
- Attractive appearance with Wrap Kit





Thank You!

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