



UNIVERSITY OF MINNESOTA DULUTH



University of Minnesota – Duluth Design Presentation

2007 Clean Snowmobile Challenge



Design Strategy:

To reengineer a snowmobile to run on E85 to reduce exhaust emissions while maintaining the stock performance and reducing noise.

Design Components

- E85 fuel delivery system conversion
- Catalytic converter to reduce engine out emissions
- Heated air injection system
- Chassis noise dampener
- Weight reduction via a polycarbonate hood
- Utilization of stock components to reduce cost

Baseline Snowmobile

- 2006 Polaris FST
 - 750 cc 4-stroke
 - Turbocharged
 - Fuel injected
 - Bosch closed loop ignition
 - 135 hp
 - 15"X128"X1.25"
Camoplast Ripsaw track
 - 580 lbs dry weight



Build Goals

- Reduce exhaust and sound emissions
- Increase durability
- Minimize build costs
- Increase cooling system efficiency

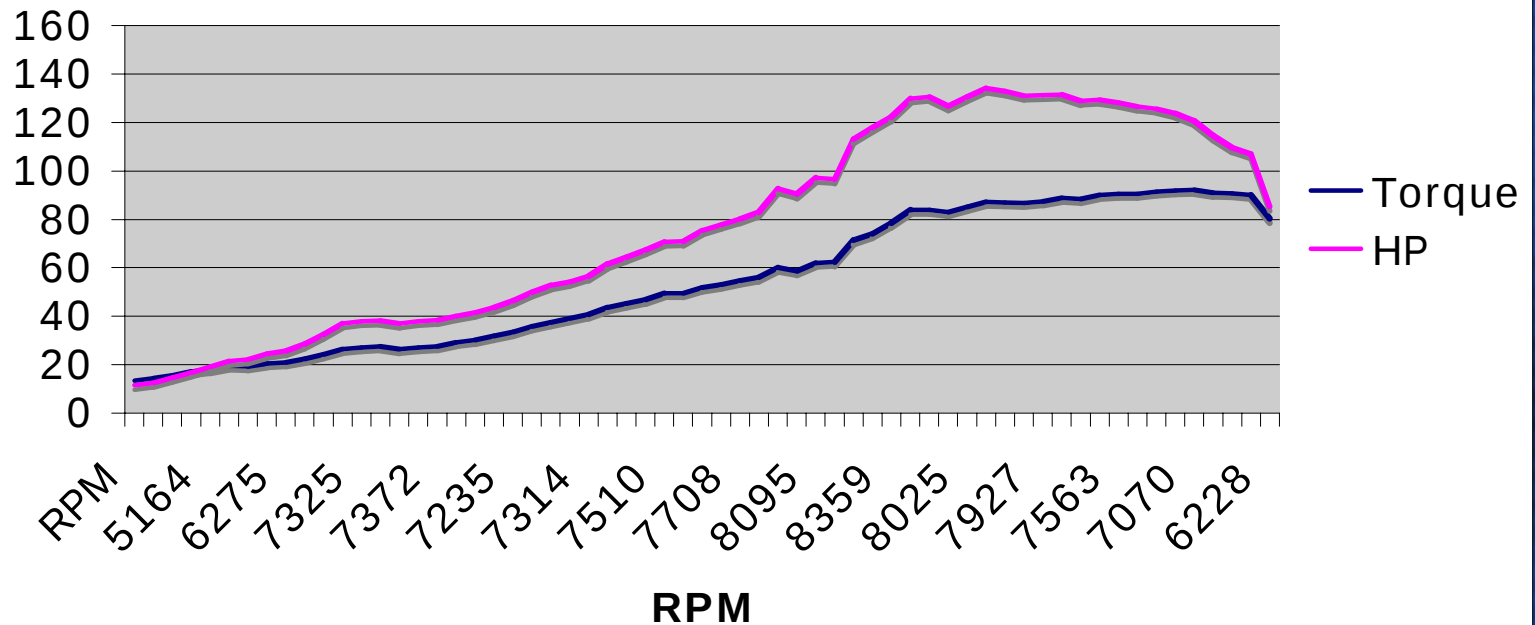
E85 Conversion

- E85 compatible inline electric fuel pump
- E85 compatible high pressure rubber fuel lines
- Higher volume flow injectors
- High pressure fuel regulator



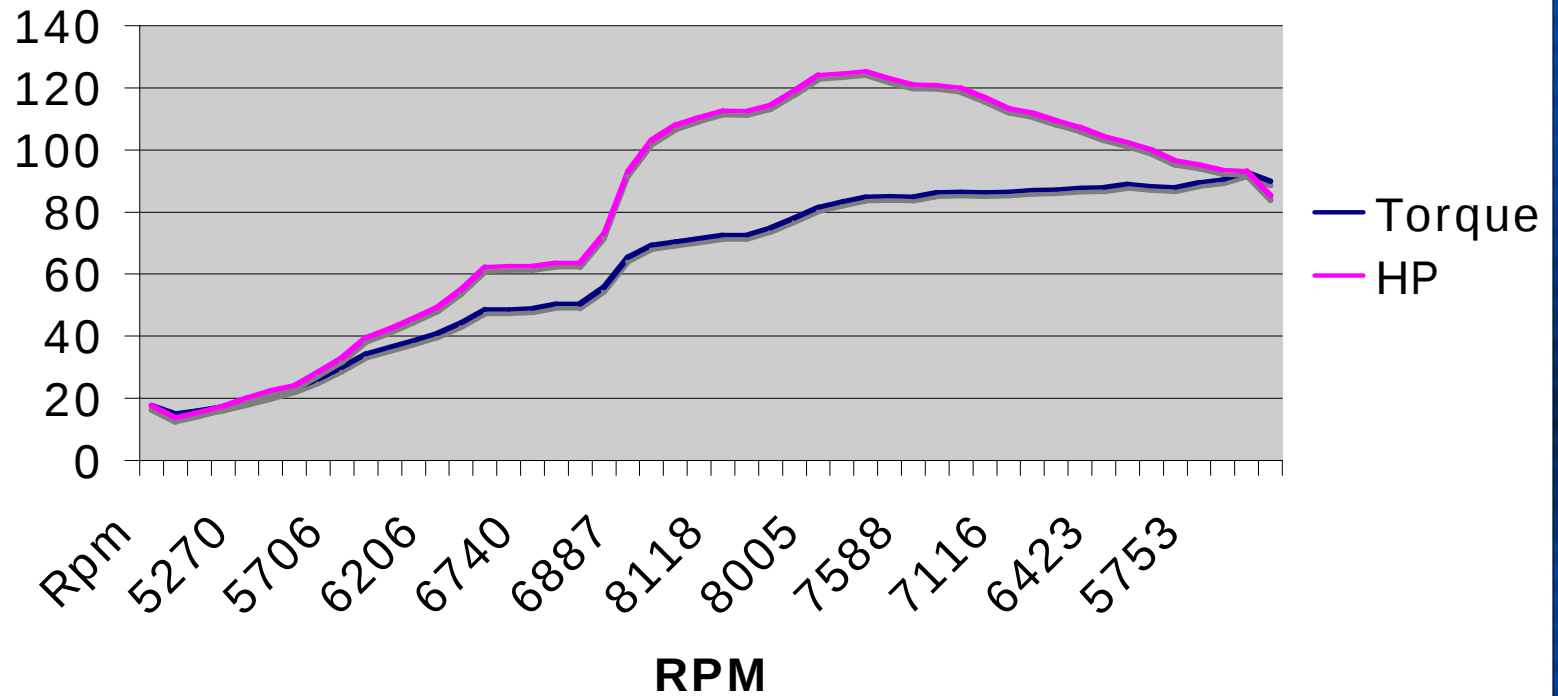
Performance

E85 with Stock Exhaust



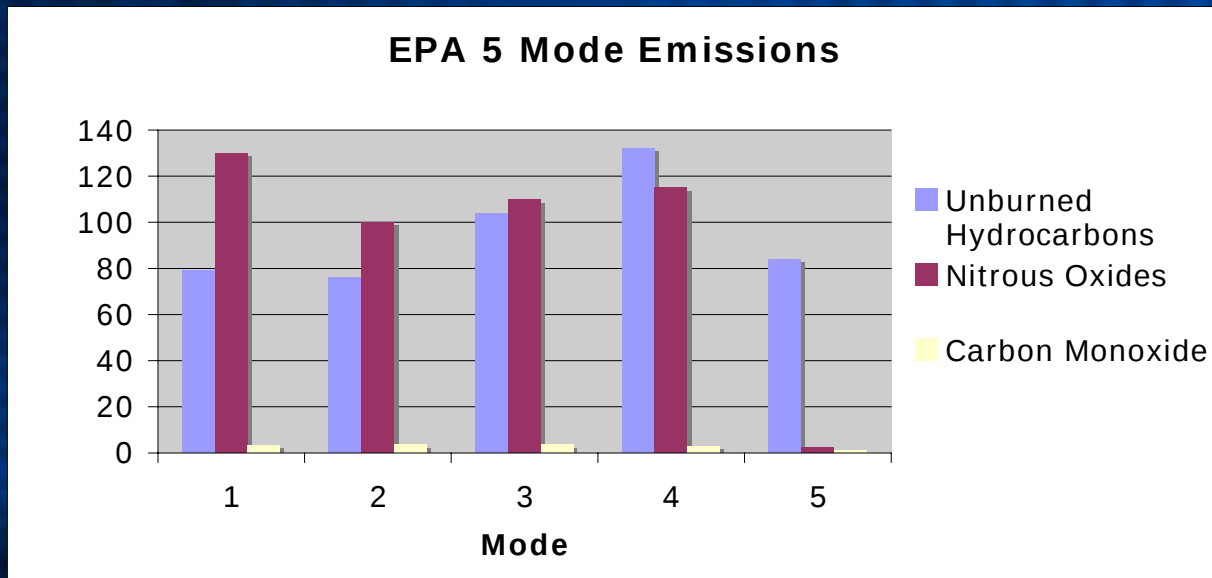
Performance

E85 with Catalytic Converter



Emissions

- E85 conversion
- Catalytic converter
- Heated air injection



Cooling

- Conversion to E85
 - Higher heat of vaporization
 - Absorbs approximately 2.5 times more heat than E10
- Chassis noise dampener (skirt) and lengthened snowflap

Exhaust

- Addition of catalytic converter
- Lengthened/expanded exhaust system
- Exhaust temperature control
- Utilization of stock silencer



Noise

- Exhaust noise dampening
- Rubber chassis noise dampener
- Sound absorption foam



Weight Reduction

- Polycarbonate hood
- Halogen headlights
- Removal of intercooler and cooling fans
- Removal of Polaris Rider Select
- Rerouted (shortened) air intake

Future Design Improvements

- Variable air injection
- More durable chassis noise dampener
- Antilock Braking/Traction Control system

Questions?