

Noise Reduction

To reduce direct mechanical noise a new cowling was made of fiberglass and lined with acoustical foam. The new cowling had only two air vents to reduce noise while still providing adequate ventilation.



To reduce noise caused by the track of the snowmobile a new quiet track was installed.



Acknowledgements

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Applied Thermal Sciences, Sanford ME
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SAE Clean Snowmobile Challenge



**University of Maine
Mechanical
Engineering
Orono, Maine**



Design Approach and Objectives

The University of Maine team focus is on a robust design with modifications to a very basic platform that will result in the cleanest quietest snowmobile possible for touring applications. Race tuning is avoided in favor of fail safe, reliable hardware. This does not preclude high tech materials or advanced engine controls, instead it demands complete testing and engineering justification for all of the decisions.

Modeling of the performance gains for each modification precedes design and testing. No modification to the drive system is used unless it has been proven to be robust in extensive testing. This year the focus has been on continued improvements to acoustic performance of the snowmobile as well as the development of a first generation piggyback for the engine control unit.

The 2005 University of Maine CSC Team has a practical and relatively low cost package that is well suited for environmentalists as well as the general snowmobile rider. The 2003 Arctic Cat 660 Trail Four-Stroke provided a good baseline sled for competition modification. The philosophy behind the design for the sled allows production in large quantities, proving cost effective for the consumer and manufacturer.

Exhaust Emissions

Since one SAE Clean Snowmobile Challenge focus is on exhaust emissions reduction, the 2005 team has incorporated their design with the 2004 catalytic converter design. The team has developed a microcontroller piggyback to work with the engine's Electronic Control Unit (ECU) in order to adjust the Air/Fuel ratio depending on operating conditions.



When coupled with a catalytic converter, the optimal operating Air/Fuel ratio was found through testing, and emissions were reduced significantly from 90% from the stock 4-stroke.

