



University of Idaho

Clean Snowmobile Challenge 2001

Making the BMW / Arctic Cat Connection

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Presentation Outline

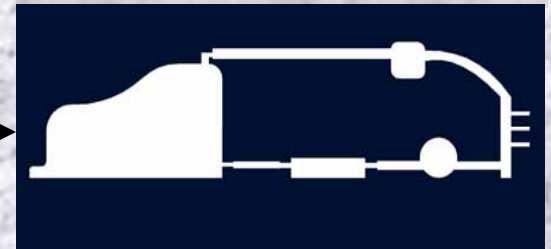
Chassis Selection



Exhaust System



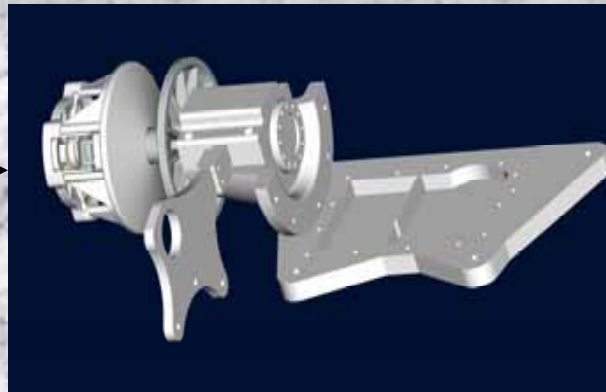
Fuel System



Engine Selection



Drivetrain



Electrical System



Team

- ❖ 8 Mechanical Engineering Students

- ❖ 7 Undergraduate
- ❖ 1 Graduate
- ❖ 1 Faculty Advisor

- ❖ Division of Labor

- ❖ Chassis group
- ❖ Engine group
- ❖ Exhaust group
- ❖ Clutch group
- ❖ Electrical group
- ❖ Public Relations / Fundraising group



Chassis Selection

Arctic Cat 2001 Sno Pro



- ❖ Light weight
- ❖ Durable
- ❖ High Performance Suspension
- ❖ Minimal Accessories

Engine Selection

750cc BMW K75 Engine

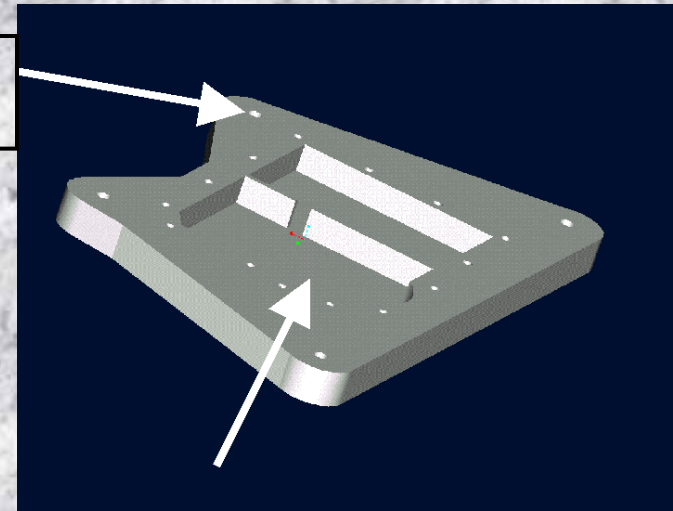
- ❖ Sport Touring Engine
- ❖ Four-Stroke
- ❖ Bosch LE-Jetronic Fuel Injection
- ❖ Modular Drivetrain



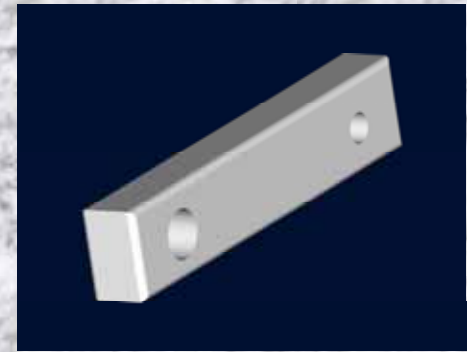
Engine Mounting

- ❖ Removed the Oil pan
- ❖ Determined Chassis Mount Location
- ❖ Set Clutch Spacing
- ❖ Template Pan / Chassis Patterns
- ❖ Combined Oil Pan Into Engine Plate

Engine Mount holes



Oil Pan Cut Out



Drivetrain

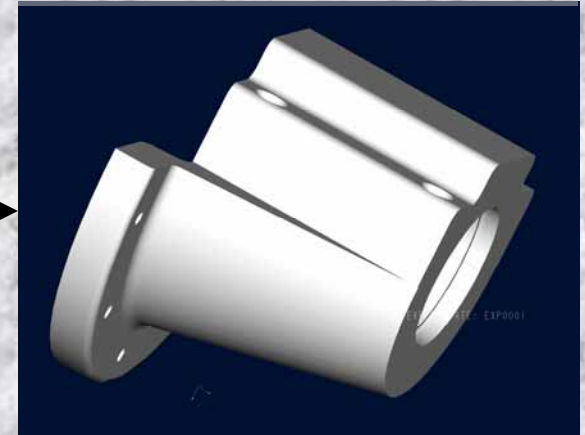
Engine Output



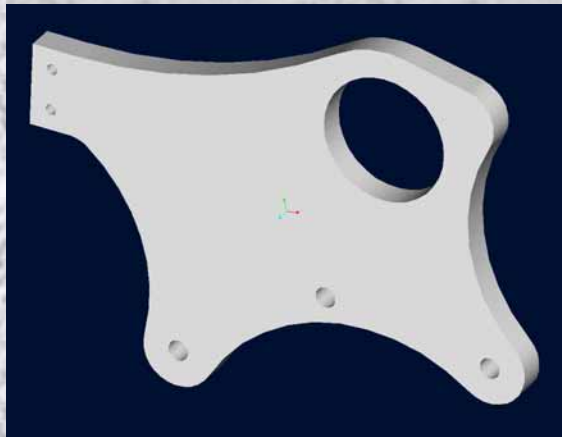
Adapter Shaft



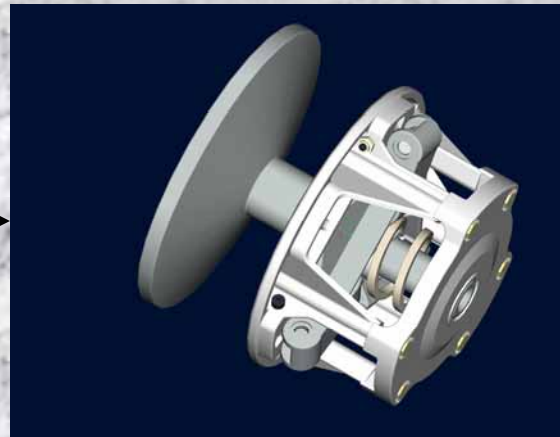
Bearing Carriage



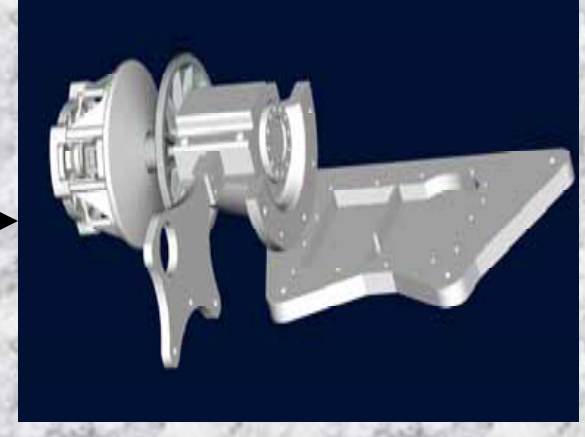
Carriage Support



CVT



Drivetrain Solution



Exhaust System

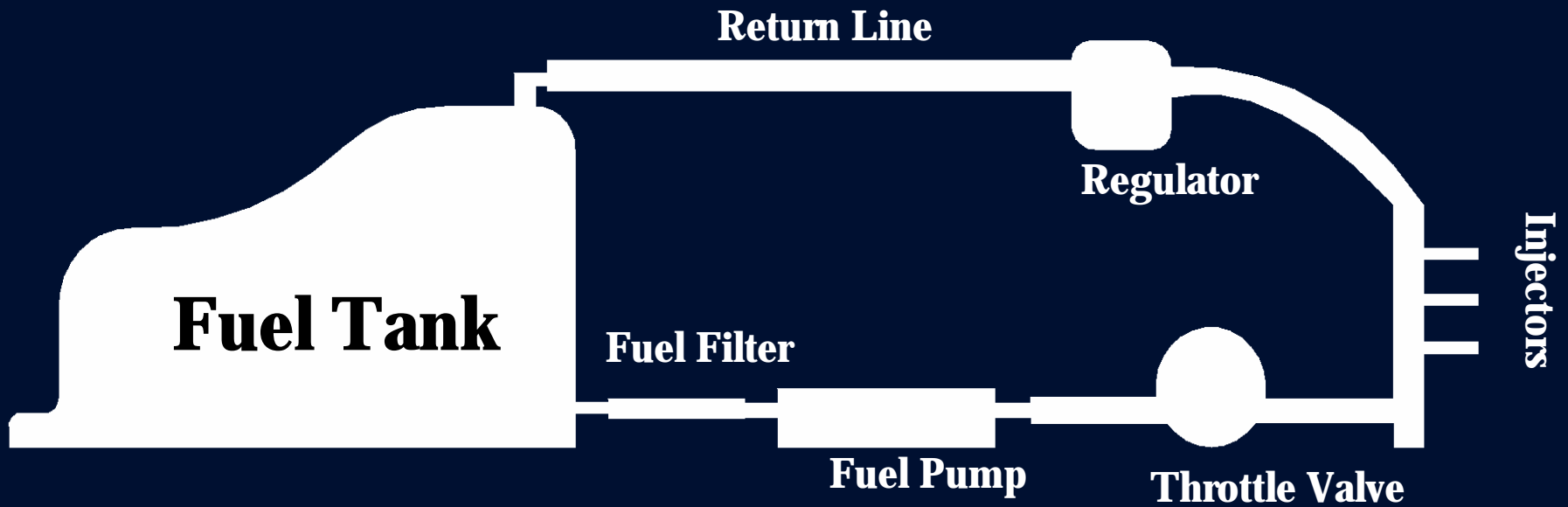
- ❖ Custom Headers
- ❖ Single Stage Catalyst
- ❖ Stock BMW Muffler



Fuel System

❖ Modification

- ❖ Added External Fuel Pump
- ❖ Incorporated Arctic Cat Fuel tank into BMW Fuel cycle



Electrical System

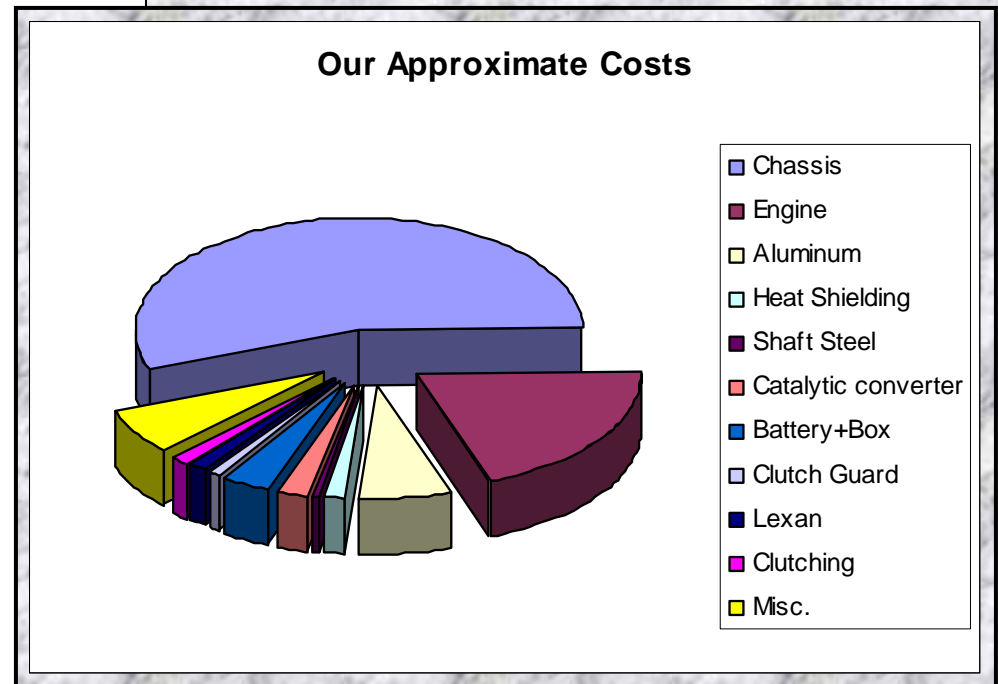
- ❖ Streamlined BMW Electrical Harness
- ❖ Odyssey Dry Cell Battery
- ❖ Bosch LE-Jetronic (open loop)
- ❖ Modified Tether Switch
- ❖ Isolated Battery Box



Cost Analysis

❖ Chassis	\$4,100
❖ Engine	\$1,500
❖ Aluminum	\$500
❖ Heat Shielding	\$100
❖ Shaft Steel	\$60
❖ Catalytic converter	\$160
❖ Battery+Box	\$270
❖ Clutch Guard	\$60
❖ Lexan	\$100
❖ Clutching	\$100
❖ Misc.	\$500

Total Cost=\$7,450



Conclusions / Recommendations

- ❖ Keep It Simple
- ❖ Careful Planning Goes A Long Way
- ❖ Bigger Is Not Always Better
- ❖ Contingency Plans
- ❖ Sleep Helps

- ❖ Lambda Loop Feedback
- ❖ Application Specific Exhaust System
- ❖ Increase Chassis Efficiency
- ❖ Chassis / Engine Dynamometer Testing
- ❖ Further Noise Analysis
- ❖ More Sponsors

Sponsors

Associated Students of the University of Idaho

BMW Motorrad

Flagg Ranch Repair Shop

Idaho State Department Of Water Resource

National Institute for Advanced Transportation Technology (NIATT)

Mac's Cycle

Mac's RV

Melody Muffler

Millhorn Farms Incorporated

Starting Line Products

Tony's Repair

Tri State Outfitters

Union Bay Racing