Kettering University

2010 Clean Snowmobile Challenge

Kettering Yamaha Nytro

Project Goals

- Flex-fuel capability
- Exceed 2012 emissions standards
- Substantially decrease noise
- Increase driveline efficiency
- Increase Fuel Economy
- Cost effective

Engine Replacement

- 2010 Yamaha Vector Genesis 120
- 1049 cc displacement
- 4 stroke
- Inline 3 cylinder
- 11.3:1 compression ratio
- 3 valves per cylinder
- Naturally aspirated
- Stock Engine Controller

Vehicle Modifications

- E20-E29 Flex-Fuel
  - Fuel lines
  - Fuel Pump
  - Fuel Filter
  - Fuel Regulator
  - 10.1 Gallon Tank

Vehicle Modifications Cont.

- Exhaust
  - Catalyst
  - Two mufflers
  - New exit location

- Operator features
  - Operator interface relocation
  - GPS

Vehicle Modifications Cont.

- Body
  - Body Panels
  - Exhaust cover
  - Radiator Relocation
- Track/Suspension
  - Single-ply track
  - Snow Flap

Noise Reduction

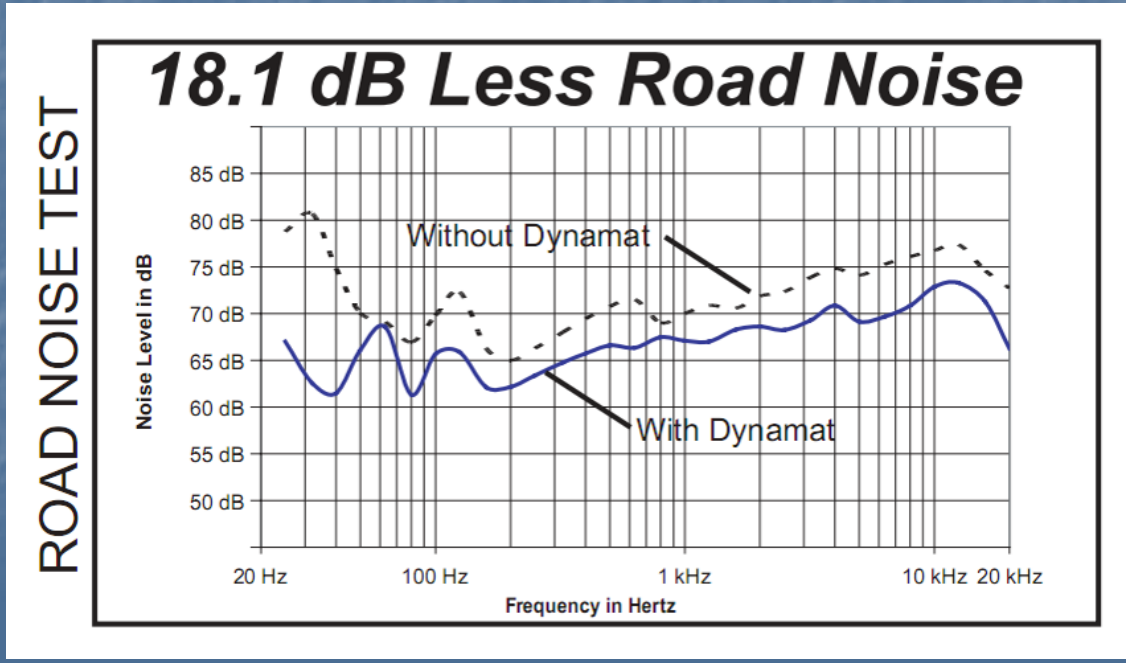
- Largest problem areas
  - Radiator fan
  - Side panels
  - Primary clutch

Noise Reduction Cont.

- Reduction Measures
  - Tunnel coating
  - Sound deadening
  - Exhaust cover
  - Soft Snow Flap

Noise Reduction Cont.

- Dynamat Sound deadening
  - 2008 Honda Element
  - 18.1 db reduction



Source: Dynamat Promotional Material

Driveline Efficiency

- Drag testing
  - Track idler wheels
  - Slides
  - Statistically inconclusive

Cost and Performance

- Cost
  - Base snowmobile MSRP—$10,669
  - Modified snowmobile MSRP—$12,297
- Performance
  - Power
  - Weight
  - Handling

Accomplished Goals

- Extensive modifications
- Desirable product
  - Decreased emissions
  - Decreased noise
  - Increased efficiency
  - Reasonable cost

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