



Airflow Solutions

*Airflow Solutions for an
Environmentally-Conscious World*

Fan Clutches for Cold Environments

Russ Gross
Jon Nelson



Agenda

- Cold Environment Issues
- Past “Fixes”
- The Horton Solution
- Horton Benefits



Cold Environment Issues

- Slow or Incomplete Engine Warmup
 - Crank Breather Freezing
 - Engine Failure
 - Wet Stacking (Incomplete Combustion)
 - Excessive Wear or Engine Failure
 - DPF Unable to Regenerate
 - Engine De-Rate or Shutdown

Continued on Next Page



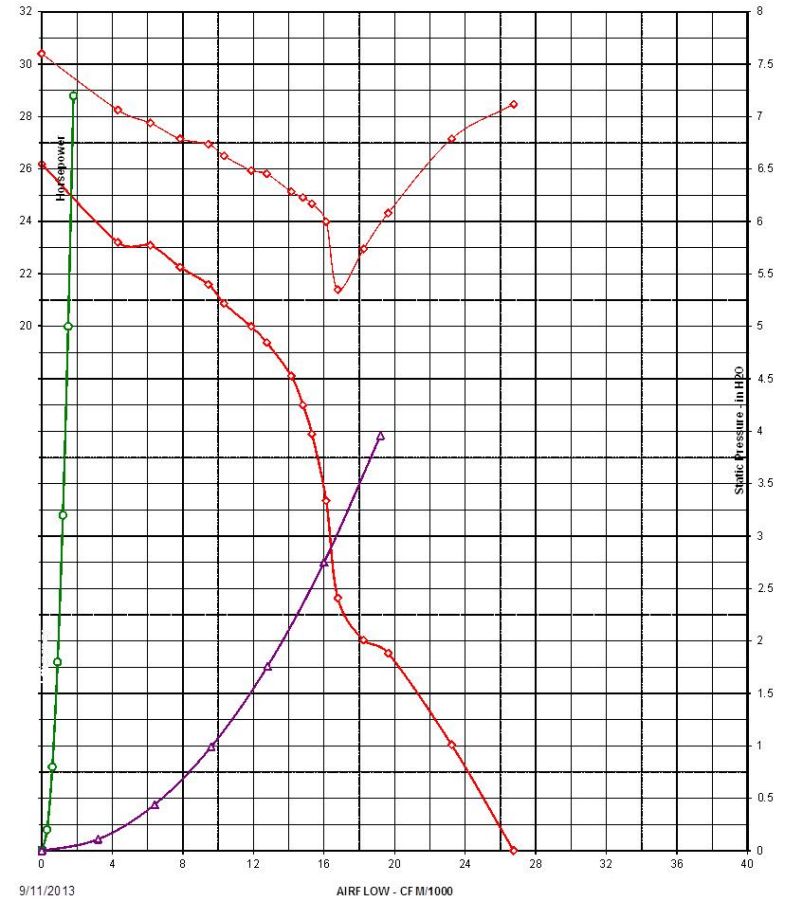
Cold Environment Issues

- SCR Catalyst Plugging
 - Engine De-Rate or Shutdown
- Running at Less Than Full Load - Stationary
- Snow and Rain Ingress – Stationary
 - Accessibility Issues and Damage Due to Ice



Past “Fixes”

- Louvers/Blankets/Cardboard
 - Inefficient
 - Fan Stall
 - Rob Engine of Power
- Heat Tape
- Swap Blower Fan for Sucker - Stationary



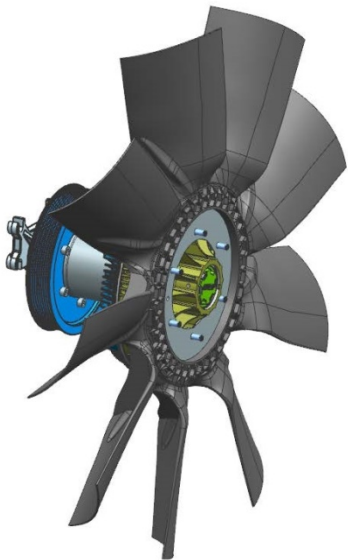
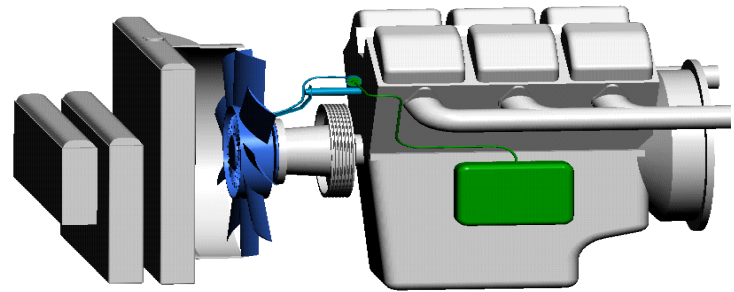
The Horton Solution

Don't Spin the Fan Any Faster
Than Necessary!



The Horton Solution

- Add a Fan Clutch
 - On/Off or Two Speed
 - Fully Variable Viscous



Airflow Solutions

The Horton Solution

- Fully Variable Viscous Fan Clutch
 - Electronically Controlled
 - Speed Modulated



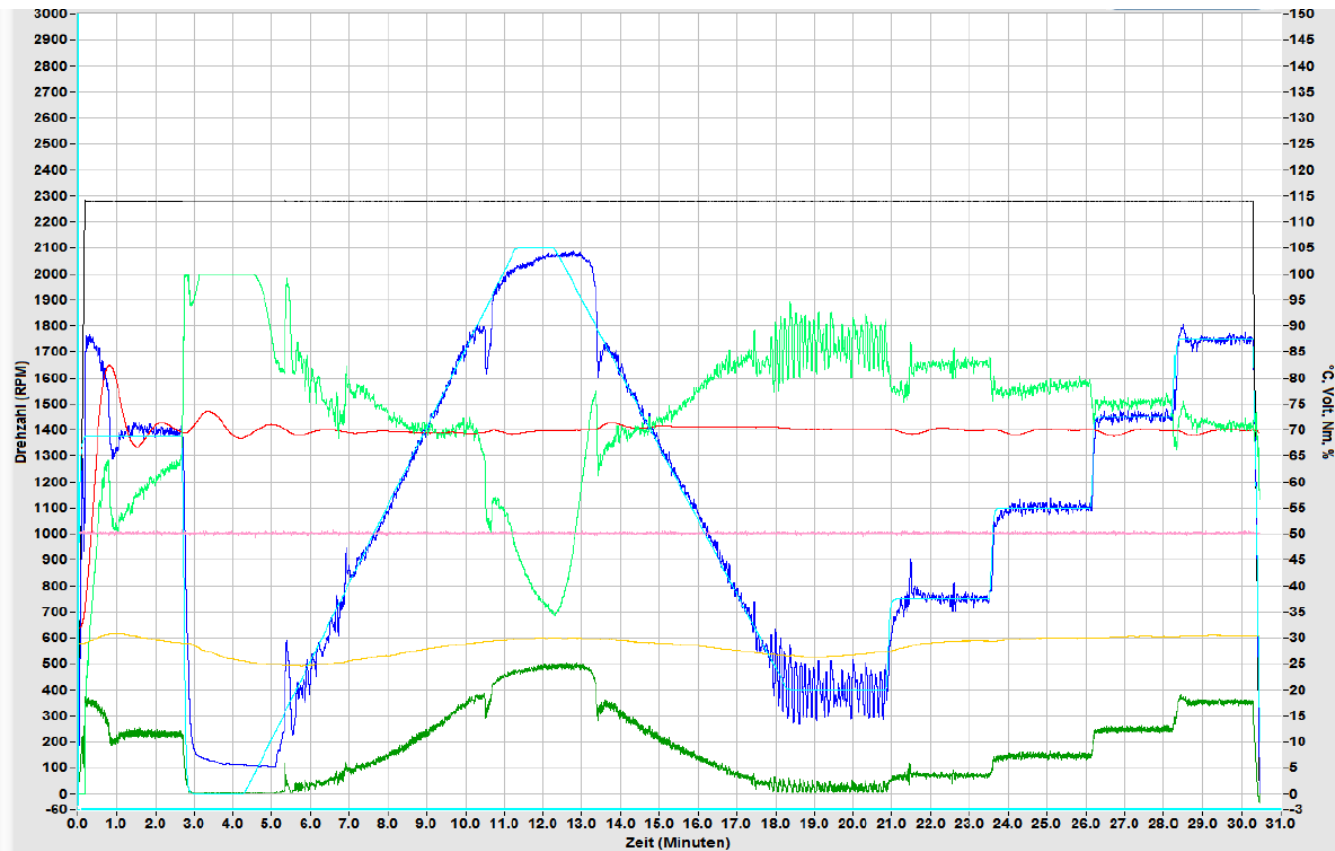
Modulator[®]

03/16/2015

HORTON[®]
Airflow Solutions

The Horton Solution

- How Does It Work?



■ Input Speed ■ Fan Speed ■ Torque ■ PWM signal



Airflow Solutions

Horton Benefits

- Keeps Engine at Optimal Temperature
- Helps to Prevent Overcooling
- Saves Fuel
- Reduces Noise
- Reduces Radiator Clogging



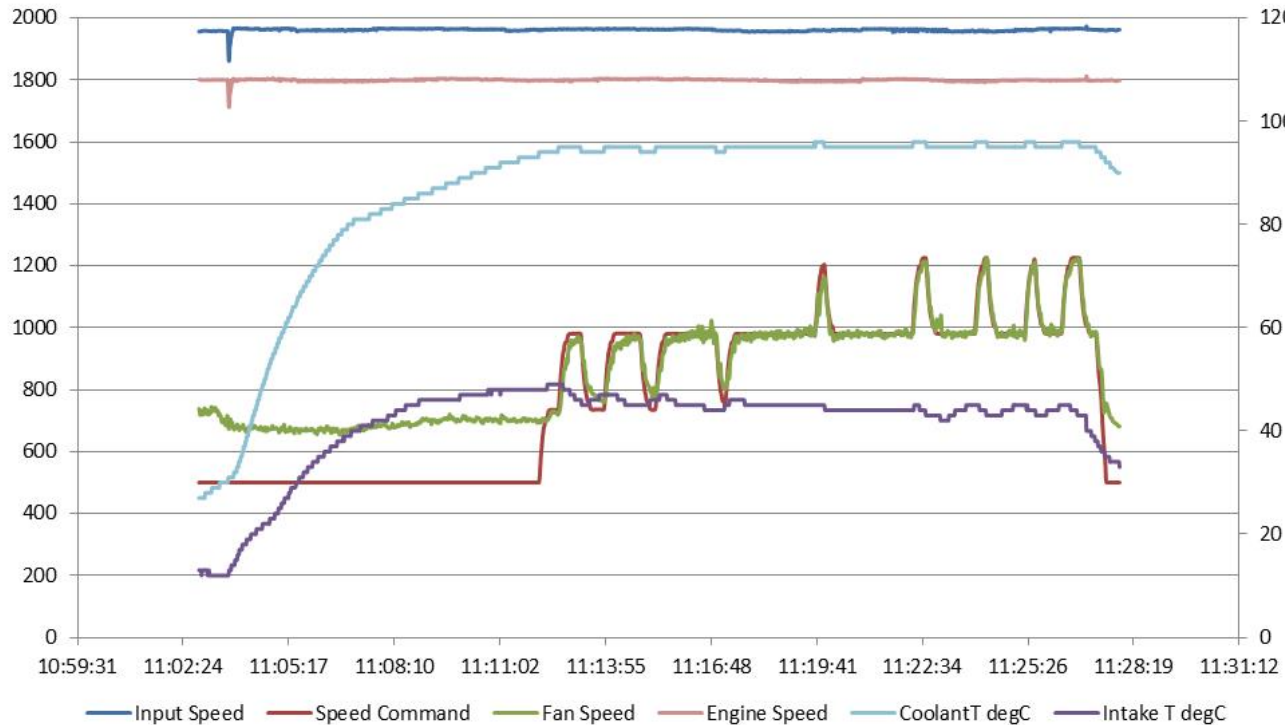
Prevent Overcooling

- Customers Have Reported Longer Operating Times Between Regen Cycles
 - Some Applications Cannot Regen in the Field
- Louvers/Blankets/Cardboard Not Required
 - More Available Power
 - Louvers Can Freeze Up



Save Fuel

- 156 kVA Genset
 - Full Load, 65° Ambient



Average Fan Speed
Is Approximately
60% of Full Speed

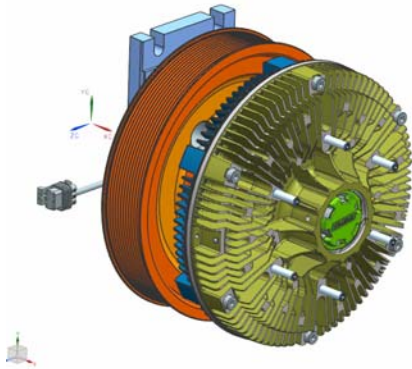
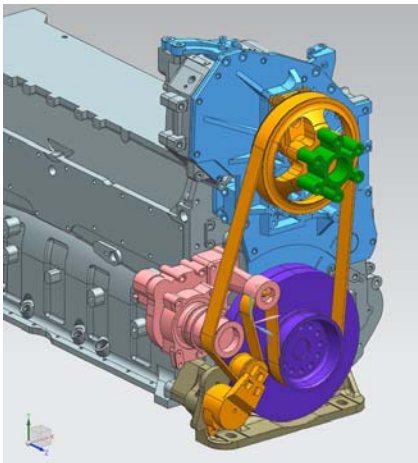
Fuel Savings
Is Approximately
5%



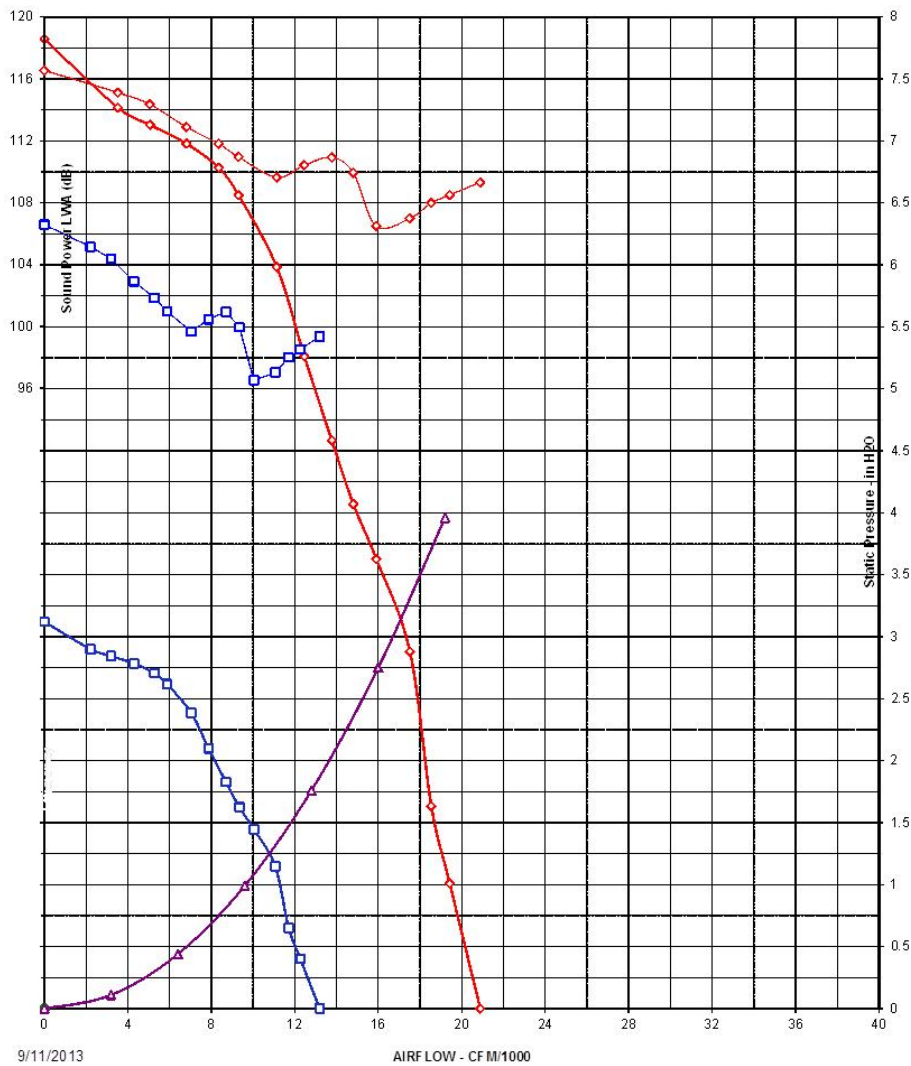
Save Fuel

- 15L Air Compressor

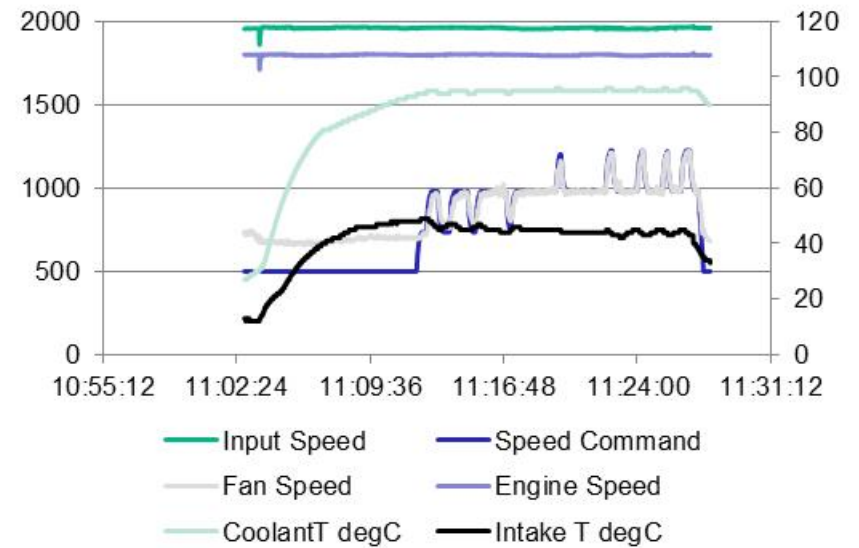
Engine Speed	Fan Command	Fan Speed	Fan Slip %	Engine Torque (Nm)	Engine Torque (ft-lbs)	Engine HP	Normalized Fueling
1748	100	1120	1.4%	1537	1133	377	100%
1748	90	1034	9.0%	1510	1114	371	99%
1748	70	829	27.0%	1440	1062	353	96%
1748	50	635	44.1%	1406	1037	345	94%
1748	30	443	61.0%	1360	1003	334	93%



Reduce Noise



156 kVA Gen Set Noise Reduction



Almost 10 dBA Reduction
at 65° Ambient



9/11/2013

03/16/2015

The Horton Solution

- Install a Horton Fan Clutch
 - Prevent Overcooling
 - Save Fuel
 - Reduce Noise
- Available for Both Initial Install and Retrofit on Electronically Controlled Engines



Horton Clutches

For More Information, Visit Us at Booth M40

- Russ Gross – Manager, Off Highway Aftermarket Sales
- Jon Nelson – Sales Engineer, Engine Manufacturers and Distributors

Thank You!

