Alternative Fuel Data Analysis
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Objective:
Perform dynamometer tests on a 4.5L John Deere diesel engine to obtain total performance maps from the following data:
- Torque
- Horsepower
- Specific Fuel Consumption

Procedure

1. Pre-Startup

2. Startup

3. Warm-up Cycle

4. High Idle

5. Testing
   ~Throttle Setting at 100%, 75%, 50%, & 25%
   ~Decreasing by 200 rpm’s from 2500 to 900

6. Shut Down

7. Data Analysis

For a more detailed description, please refer to the Full Procedure packet below.
Diesel Without Hydrogen Assist

- Maximum Torque Output: 214.6 ft-lbs @ 1100 rpm
- Maximum Horsepower Output: 76.1 hp @ 2300 rpm
- Fuel Efficiency: 0.072 gal/hphr @ Maximum Torque

Diesel With Hydrogen Assist

- Maximum Torque Output: 215.9 ft-lbs @ 1100 rpm
- Maximum Horsepower Output: 76 hp @ 2300 rpm
- Fuel Efficiency: 0.065 gal/hphr @ Maximum Torque

20% Bio-diesel Without Hydrogen Assist

- Maximum Torque Output: 211.2 ft-lbs @ 1100 rpm
- Maximum Horsepower Output: 75.3 hp @ 2100 rpm
- Fuel Efficiency: 0.062 gal/hphr @ Maximum Torque
20% Bio-diesel With Hydrogen Assist

- Maximum Torque Output: 218.5 ft-lbs @ 1100 rpm
- Maximum Horsepower Output: 74.9 hp @ 2300 rpm
- Fuel Efficiency: .069 gal/hphr @ Maximum Torque

Canola Oil Without Hydrogen Assist

- Maximum Torque Output: 208.7 ft-lbs @ 1100 rpm
- Maximum Horsepower Output: 70.0 hp @ 2100 rpm
- Fuel Efficiency: .064 gal/hphr @ Maximum Torque

Canola Oil With Hydrogen Assist

- Maximum Torque Output: 209.0 ft-lbs @ 1100 rpm
- Maximum Horsepower Output: 69.2 hp @ 2100 rpm
- Fuel Efficiency: .060 gal/hphr @ Maximum Torque