

Alternative Fuel Data Analysis

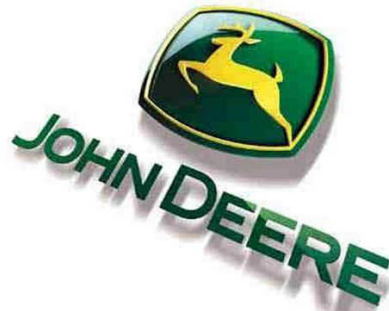
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Objective:

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%

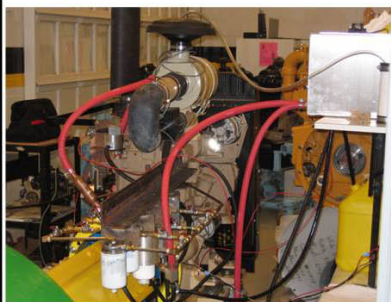
~Decreasing by 200 rpm's from 2500 to 900

6. Shut Down

7. Data Analysis



← Engine Parameters Page

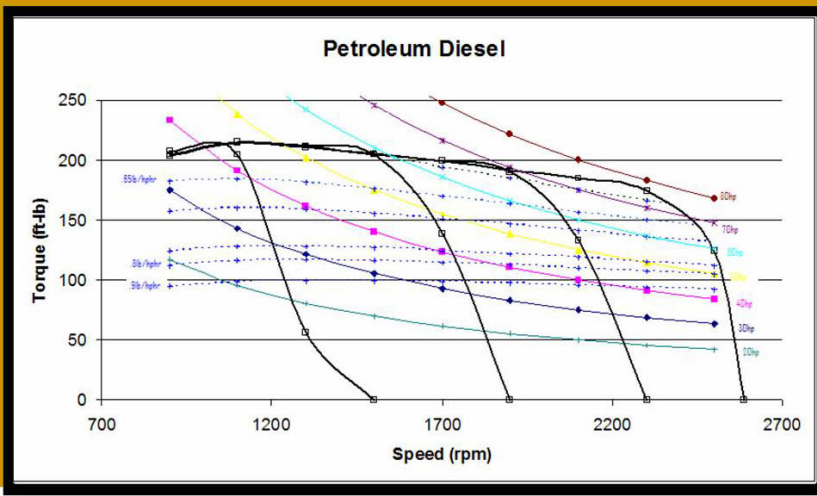


Computer Data Collection Center



← Alternative Fuel System Layout

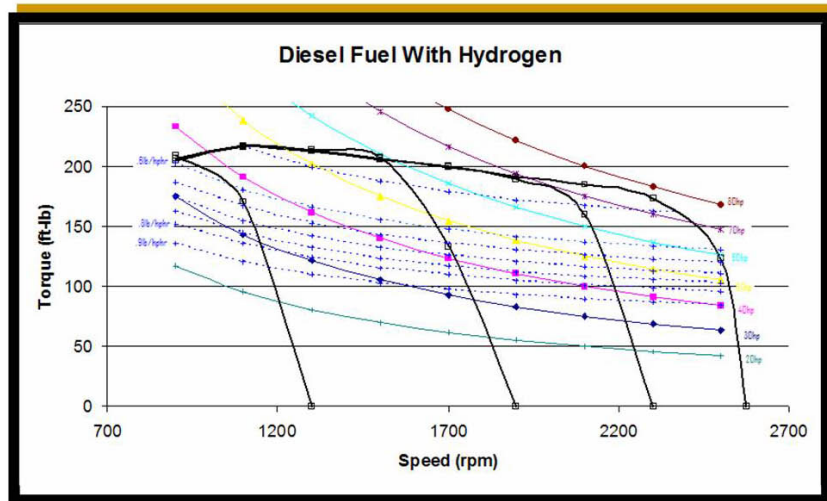
Diesel Without Hydrogen Assist



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



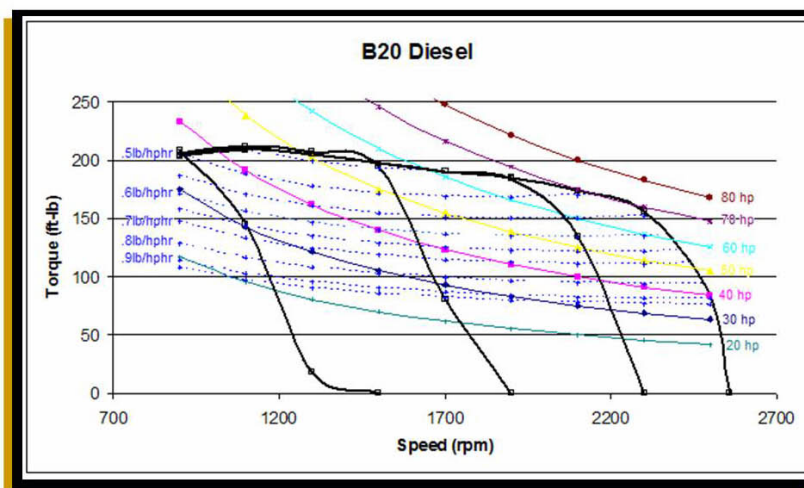
Diesel With Hydrogen Assist



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



20% Bio-diesel With Hydrogen Assist

•Maximum Torque Output:

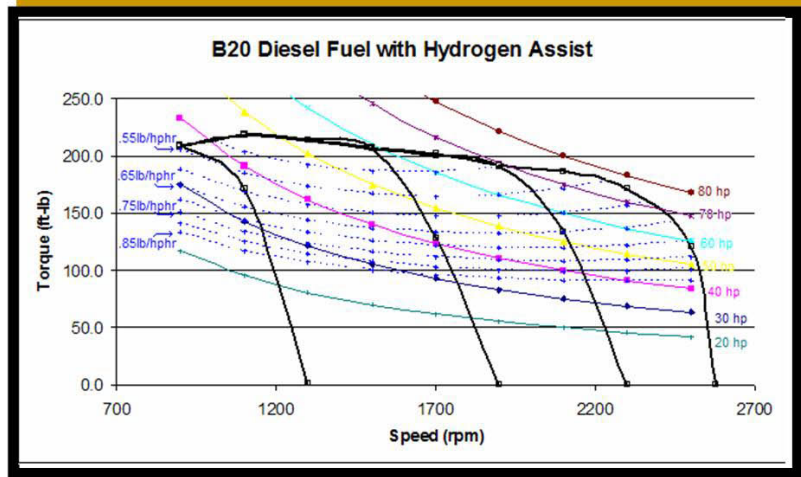
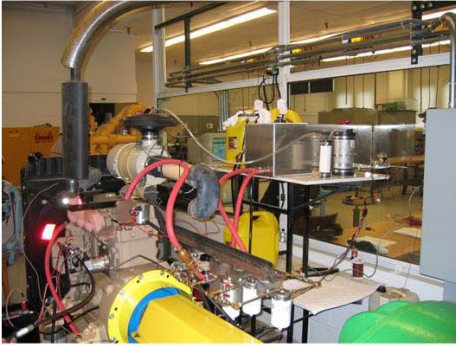
218.5 ft-lbs @ 1100 rpm

•Maximum Horsepower Output:

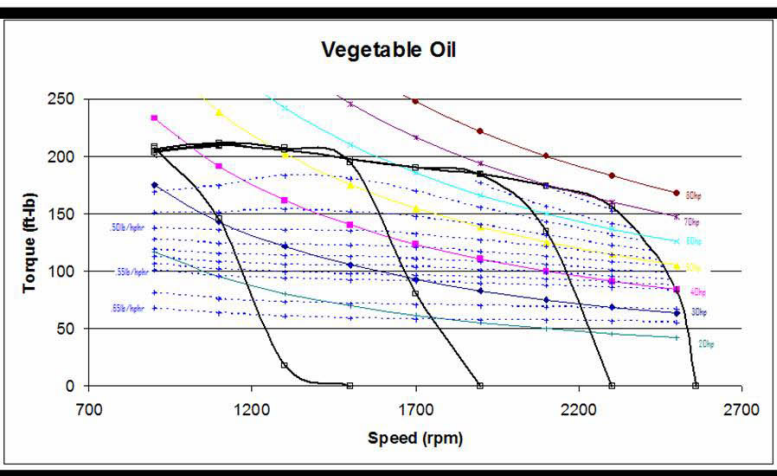
74.9hp @ 2300 rpm

•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

•Maximum Torque Output:

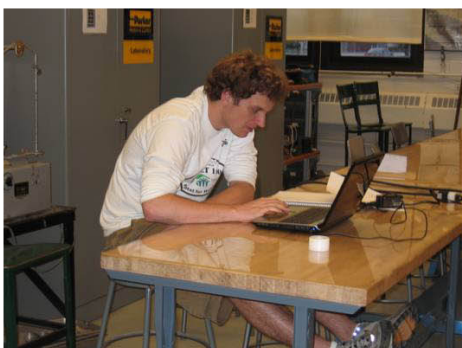
209.0 ft-lbs @ 1100 rpm

•Maximum Horsepower Output:

69.2 hp @ 2100 rpm

•Fuel Efficiency:

.060 gal/hphr @ Maximum Torque



Canola Oil With Hydrogen Assist

