



***Peterbilt Motors
Hydraulic Hybrid
Development***

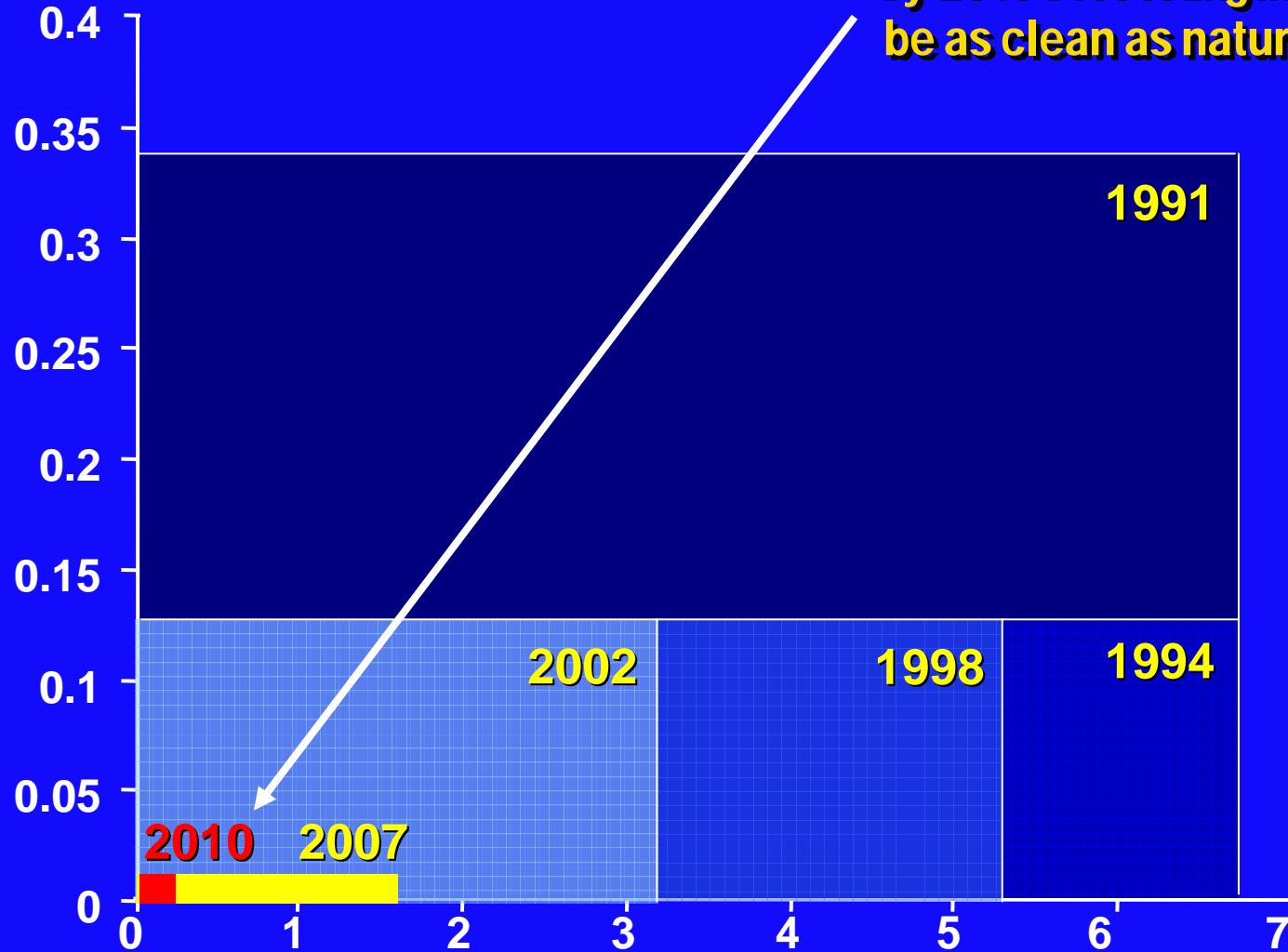
Bill Kahn

Engineering Manager

Advanced Concepts

Emissions Reduction

Particulates (g/kWh)



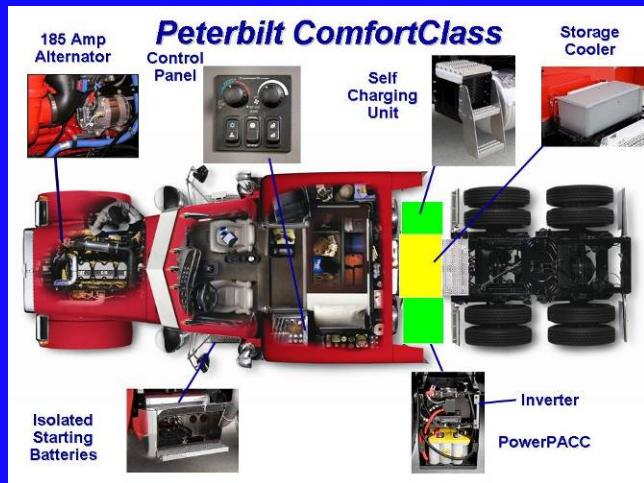
By 2010 Diesel Engines will be as clean as natural gas



NOX (g/kWh)

Peterbilt GHG Reduction

Project	GHG Reduction (Tons)
Model 386 / EPA SmartWay	260,000
Comfort Class	67,000
Hybrid Programs	21,700
LNG	32,000
Total	402,000



Peterbilt Hybrid Programs

Model 330 HEV



Model 335 HEV



Hydraulic Hybrid Vehicle



Heavy Duty HEV

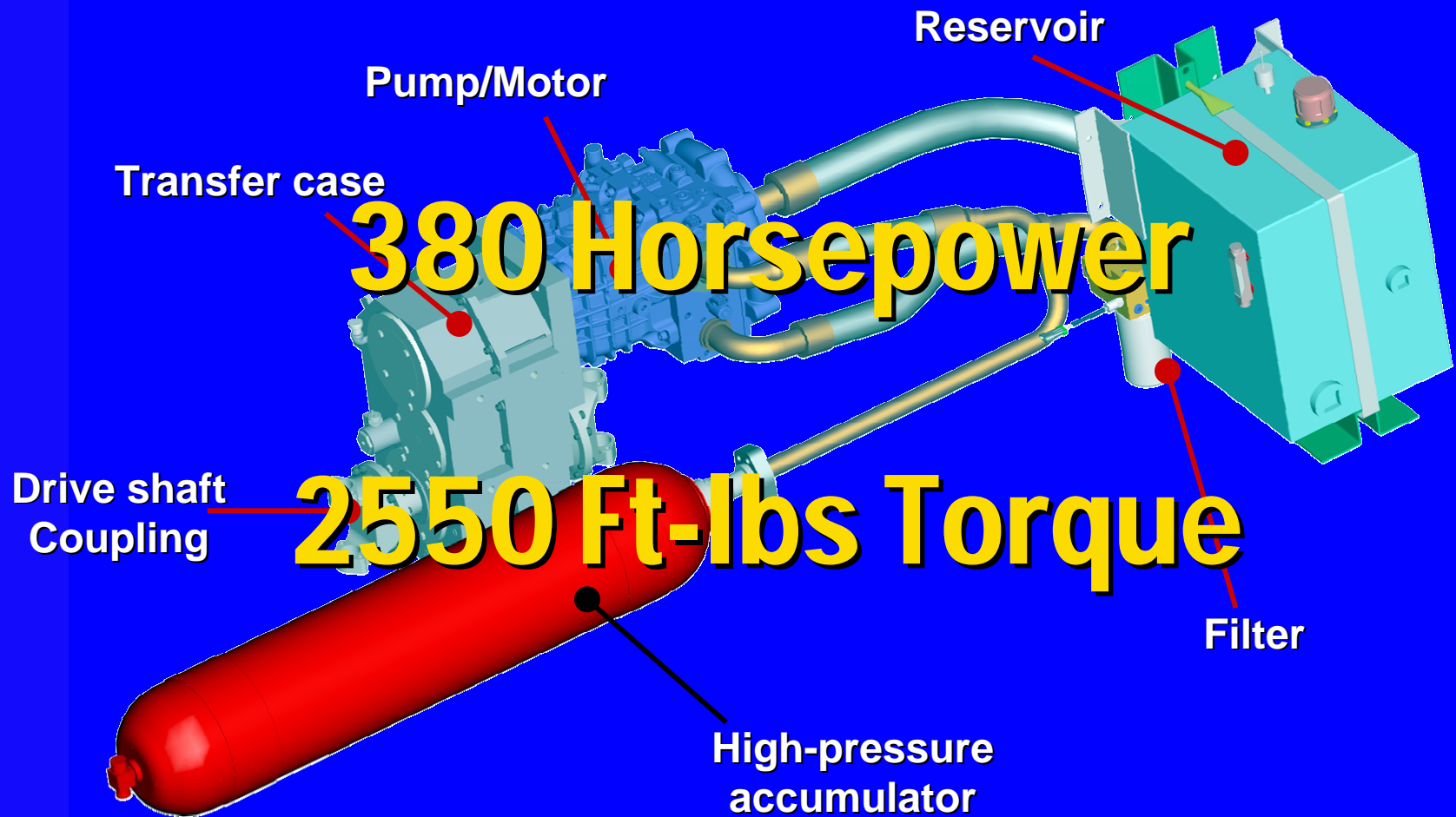


Hydraulic Hybrid Benefits

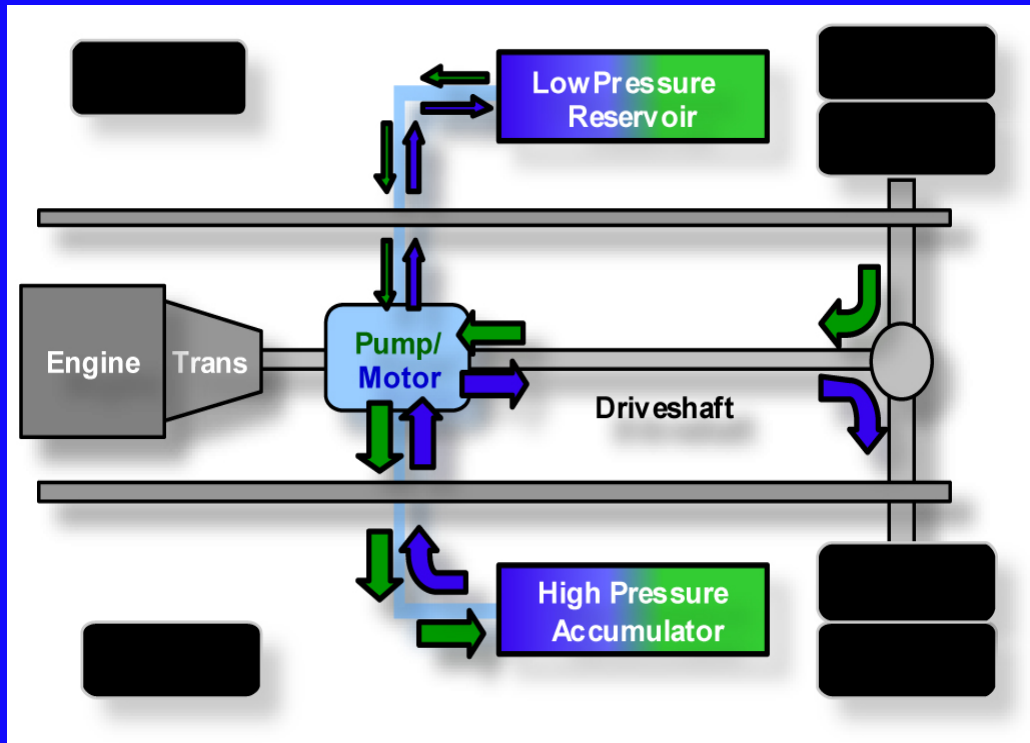
- Stores massive amount of energy in short period of time, then uses to launch vehicle
 - Improved fuel economy
 - Reduces emissions
 - Regenerative braking
 - Reduce maintenance cost
 - Lowers particulate matter



Hydraulic Launch Assist System



How does the HLA System work?



Regeneration Mode

During braking, the vehicle's kinetic energy drives the pump/motor as a **pump**, transferring hydraulic fluid from the low pressure reservoir to the high pressure accumulator. The fluid compresses nitrogen gas in the accumulator and pressurizes the system.

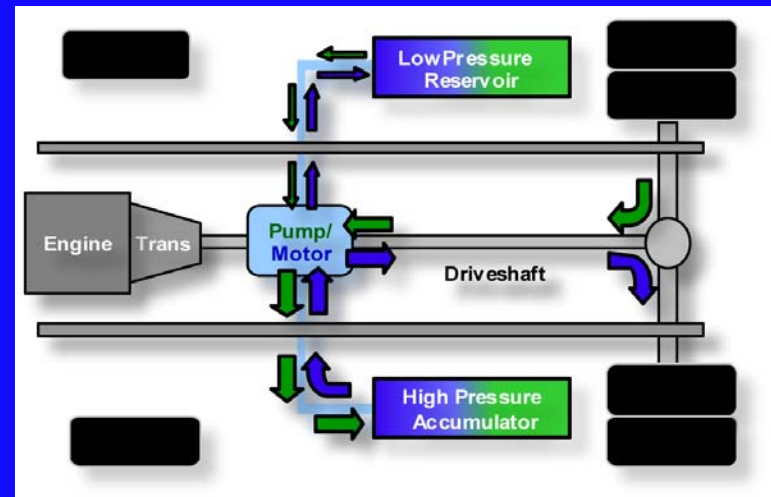
Launch Assist Mode

During acceleration, fluid in the high pressure accumulator is metered out to drive the pump/motor as a **motor**. The system propels the vehicle by transmitting torque to the driveshaft.



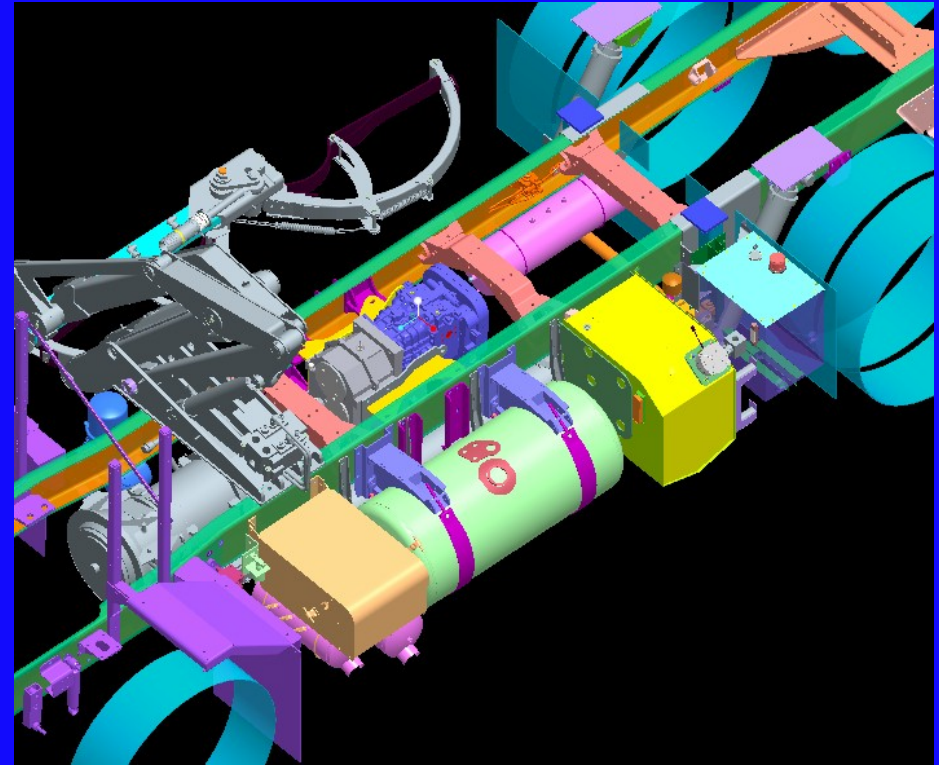
Parallel Hybrid Configuration

- Retains the engine to rear axle driveline
- Capable of launching the vehicle without pressure
- Can downsize the engine
- Able to launch to 16 mph without engine assist



Integration Requirements

- Hardware
 - Pump / Motor
 - Steel Accumulator
 - Reservoir
- Minimum 210" wheelbase tandems
- Pump/Motor 6" above frame
- 1000 lbs. weight increae



Model 320 Hydraulic Hybrid

20-30% Fuel Economy

30-40% Emissions Reduction

50% Reduction in Brake Wear



Model 320 Hydraulic Hybrid

25-30% Acceleration

50% Reduction in Brake Wear



Fleet Trial

- Houston Advanced Research Center
- 12 Truck Fleet Evaluation
- Customers
 - Waste Management (4)
 - City of Houston (2)
 - City of Dallas (4)
 - City of Denton
 - City of Denver

Texas ENVIRONMENTAL IMPROVEMENT
Environmental Research Consortium THROUGH RESEARCH AND SCIENCE

◀ | H | A | R | C | ▶





Thank You

