



*Run Smart*SM

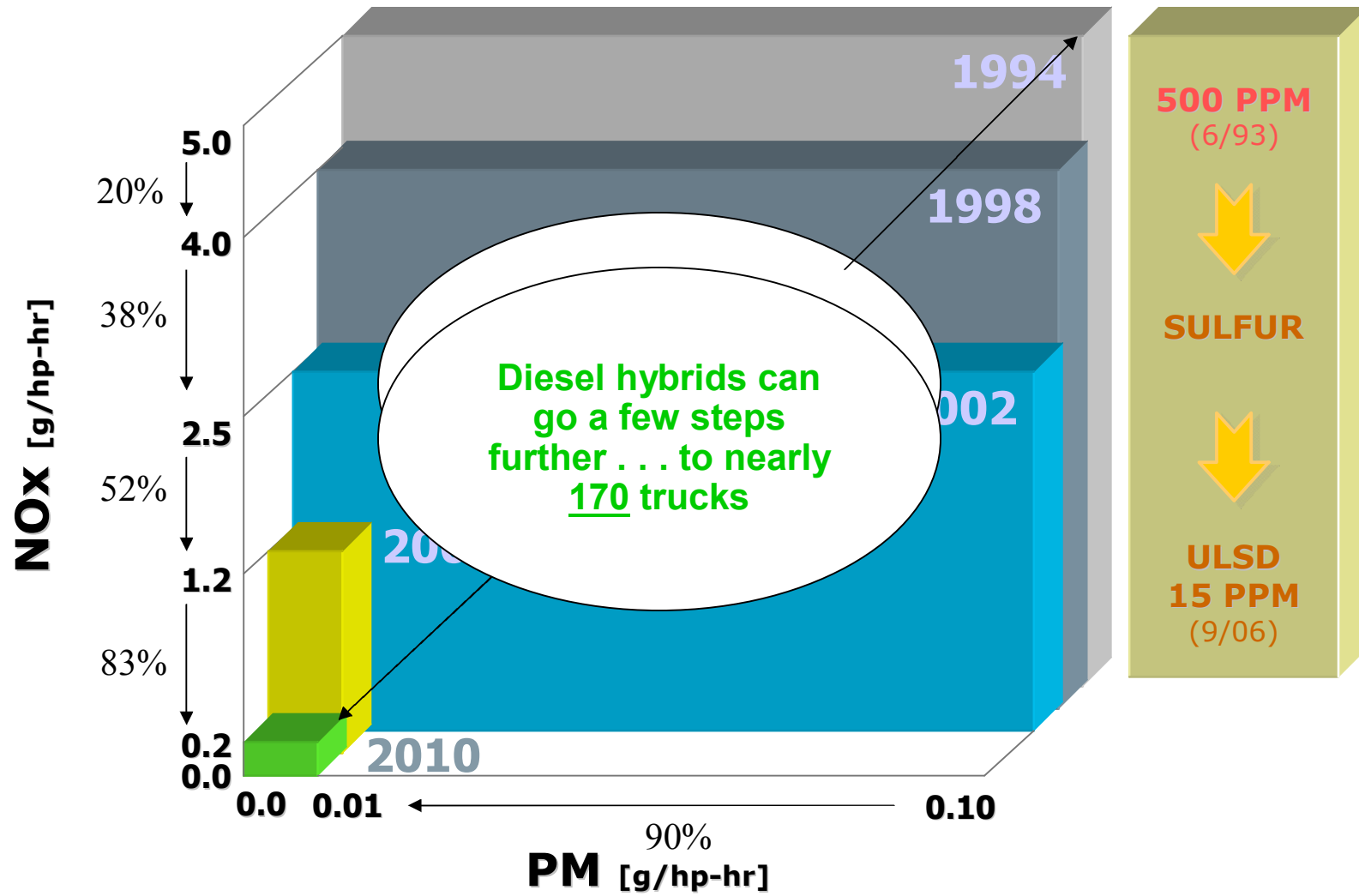
BUSINESS CLASS[®]
M2^e
Hybrid



Hybrid and Natural Gas

David Bryant
Vocational Sales Manager, Hybrids and Alternative Fuels
April 2009

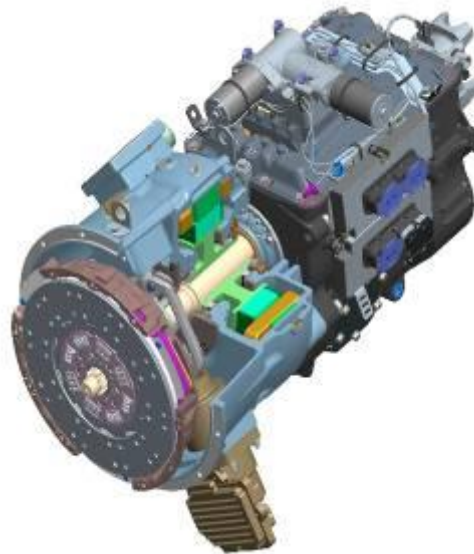
Clean Diesel Progress



Primary Hybrid System Components



Diesel Engine



Hybrid Drive Unit (HDU)



Power Electronics Carrier
(Battery Box)



Inverter



Hybrid Cooling
System



DC/DC Converter
(ePTO only)



5kW APG (optional)

M2e City Delivery Hybrid (342-1RX)



Key Specs (342-1RX, EH-8E306-CD)

- M2-106 straight truck
- **GVW – up to 33K**
- Cummins ISB – 200 to 300hp / 520 to 660 ft-lb
- Eaton Parallel Electric Hybrid Drive – 60hp/310 lb-ft peak
- 6 speed Ultrashift transmission
- Air Brakes

Performance

- **Fuel Economy Improved 25% - 40%**
- Brake Life Increased 2 to 3x
- **CO2 Output Reduced 10 to 14 Tons/Year**

Financial

- Federal Tax Credit
- Class 6 = \$6K
- **Class 7 = \$12K**
- Annual savings \$3,500 to \$5,000



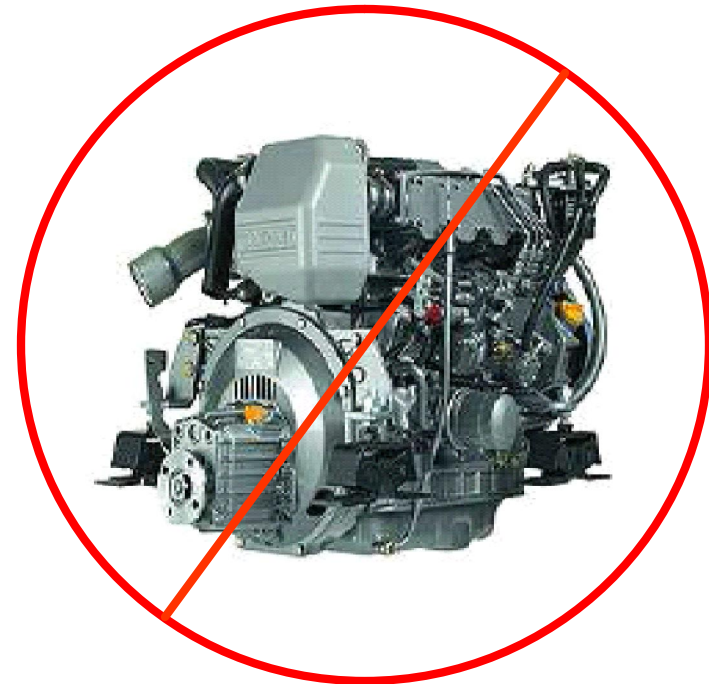
Freightliner M2e Hybrid



Eaton Hybrid and 5kW APG



Aura Systems/Oasis Refrigeration



Reduce

- Fuel Consumption
- Maintenance
- Noise
- Weight
- Emissions

M2e Utility Hybrid (342-1R4)



Key Specs (342-1R4, EH-8E306-UP)

- M2-106 straight truck
- **GVW – up to 40K**
- Cummins ISB – 200 to 300hp / 520 to 660 ft-lb
- Eaton Parallel Electric Hybrid Drive – 60hp/310 lb-ft peak
- 6 speed Ultrashift transmission
- Air Brakes

Performance (dependent on stationary PTO usage)

- **Fuel Economy Improved 40% - 60%**
- Idle Time Reduced 4 to 5 Hours per Day
- CO2 Output Reduced 13 to 17 Tons/Year

Financial

- Federal Tax Credit
- Class 6 = \$6K
- **Class 7 = \$12K**
- Annual savings \$4,500 to \$6,000

Southwest Research Dyno Testing – ePTO Cycle

GVW	Fuel Reduction	CO2 Reduction	NOx Reduction
19,000 to 26,000	82%	82%	61%
26,000 to 33,000	83%	83%	65%

M2e Hybrid Tractor (342-1T3)



Key Specs (342-1T3, EH-8E306-T)

- M2-106 tractor (4x2)
- **GCW – 55K (diminishing loads such as beverage)**
- Cummins ISB – 280hp / 660 ft-lb
- Eaton Parallel Electric Hybrid Drive – 60hp/310 lb-ft peak
- 6 speed Ultrashift transmission
- Air Brakes

Performance

- **Fuel Economy Improved 15% - 30%**
- Brake Life Increased 2 to 3x
- CO2 Output Reduced 12 to 19 Tons/Year

Financial

- Federal Tax Credit
- **Class 8 = \$6K**
- Annual savings \$3,500 to \$5,000





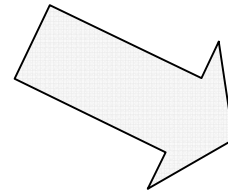
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DTNA is committed to continued support of the NG Market with the introduction of the Freightliner M2-112 with Natural Gas

Sterling SB 113

Production discontinued March 2009



M2 112

2009 SOP



8.9 L Stoichiometric EGR engine

- Uses high EGR rates in combustion process in place of excess air (Lean Burn).
- End result is an oxygen free exhaust allowing for the use of a three way catalyst vs. DPF/DOC.

ISL G meets 2010 emissions standards

- .20 NOx
- .01 PM
- CARB Clean Idle Certified

New Electronic Control Module

- Provides full monitoring and control of engine sensors, fuel system and ignition

Other Features

- Low installed weight (1570 lb wet)
- Higher efficiency
- Improved reliability
- Cummins diesel parts commonality
- Service and support by Cummins distributor network



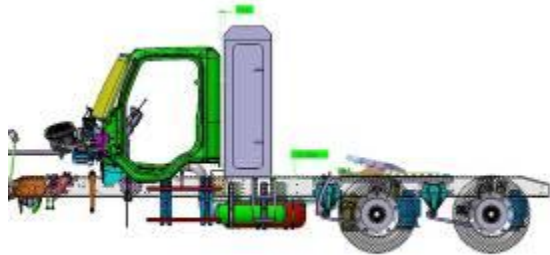
- LNG travels from the tank to a heater or vaporizer where it is converted back to a gaseous form. (expands at a rate of 600 to 1)
- Ice forming on fuel lines is normal
- Fuel is delivered to the engine in a gaseous form



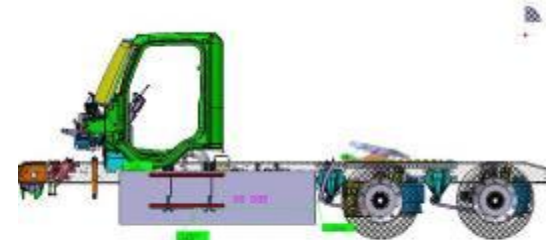
65 DGE LNG tank
505 lbs empty
883 lbs full



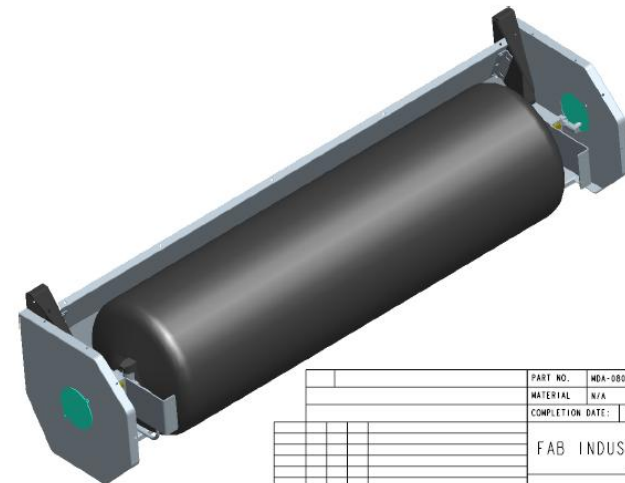
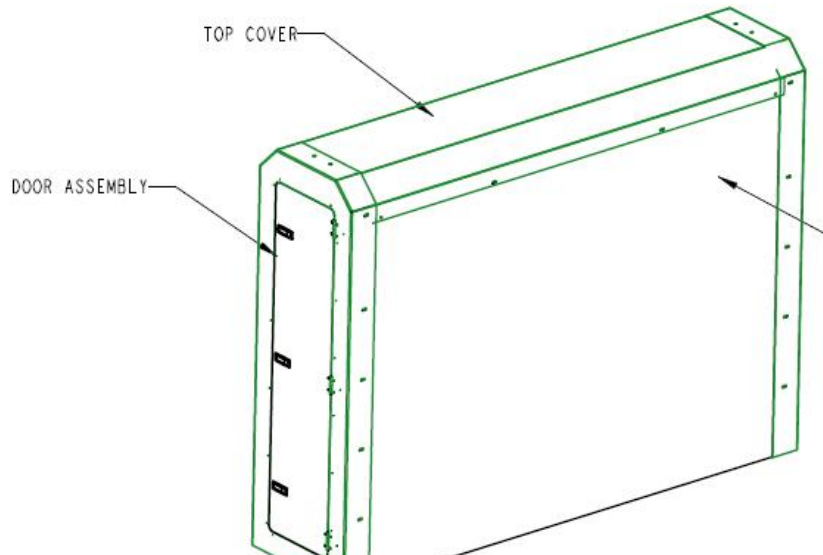
CNG Fuel System(s)



2 to 3 BOC Mounted CNG Tanks (50-75 DGE)



1 Rail Mounted CNG Tank (25 DGE)



PART NO.	MDA-000166
MATERIAL	N/A
COMPLETION DATE:	17-Dec
FAB INDUSTRI	
MICHIGAN, MI	

System Specifications*			
Empty Weight	Full Weight	Total SCF **	Total DGE ***
1340 LBS	1828 LBS	10608	76.2
*Weights are approximate **SCF (Standad Cubic Feet) *** DGE (Diesel Gallon Equivalent) NOTES: FULL WEIGHT MOUNTING ANGLES INCLUDED.			

System Specifications*			
Empty Weight	Full Weight	Total SCF **	Total DGE ***
404 LBS	571 LBS	3629	26.1
*Weights are approximate **SCF (Standad Cubic Feet) *** DGE (Diesel Gallon Equivalent) NOTES:			

- Passive 3-way catalyst
- No regeneration required
- Maintenance Free, just like your car
- No additional aftertreatment required for 2010
- Can be moved similarly to EPA04 mufflers



- Methane sensors mounted in cab, engine compartment and outside cab near fuel tank
- Visually and audibly warns driver of fuel leaks
 - Trace amount (no concern)
 - Significant amount (potential explosion concern)
- NG will ignite when there is a 5%-15% mixture in the air
- Asphyxiation can occur when concentration reaches 21%+ (visible vapor cloud)
- Concentrations of this level cannot occur in unconfined spaces (outdoors)
- Provided on both LNG and CNG configurations



In overhead console

M2-112 w/ISL-G Payback Analysis



	Mileage Basis	Diesel Model	CNG Model		Mileage Basis	Diesel Model	LNG Model
MPG		5.64	5.50			5.64	5.50
Fuel Price (dgc)		\$ 2.39	\$ 1.50			\$ 2.39	\$ 2.00
Annual Fuel Consumption	65,000	11,525	11,818		65,000	11,525	11,818
Annual Fuel Costs		\$ 27,544	\$ 17,727			\$ 27,544	\$ 23,636
Annual Fuel Savings vs. Diesel			\$ 9,817				\$ 3,908
Payback Period (years)			2.9				5.9
Incremental Cost	\$ 60,000			<i>Example</i>	\$ 55,000		
Tax Credit	\$ 32,000				\$ 32,000		
Net Vehicle Increase	\$ 28,000				\$ 23,000		

Priority Tractor Configurations – production start in North Carolina mid 2009

- M2-112 6x4 LNG Tractor
- M2-112 6x4 CNG Tractor
- M2-112 4x2 CNG Tractor



Priority Truck Configurations - production start in North Carolina late 2009

- M2-112 4x2 CNG Truck @ 33K to 39K GVW
- M2-112 6x4 CNG Truck @ 54K to 66K GVW
- M2-112V 6x4 CNG Truck @ 54K to 66K GVW



- Factory options for Hybrid and LNG/CNG
- Lower operating cost than traditional diesel
- Reduced criteria pollutants and GHG emissions
- Available for Federal and Regional incentives

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BUSINESS CLASS
NATURAL GAS **M2**



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