



**EMISSIONSOLUTIONSINC**



**Tomorrow's Technology Today**

**Ira Dorfman  
Eastern Regional Manager  
Emission Solutions Inc.**

***“The Compelling Case for Natural Gas Vehicles”***

**Fleet & Transportation Policymakers' Workshop**

**Tampa, Florida**

**November 17, 2009**



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# **NATURAL GAS ENGINES for INTERNATIONAL® TRUCKS**

**Dump Trucks/Plows  
Refuse/Recycling Trucks  
School Buses  
Beverage Trucks  
Utility Trucks**



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# **Emission Solutions Inc. (ESI)**

- **Incorporated in 2003**
- **Proprietary Technology Developed by Former NASA Engineer**
- **Headquartered in McKinney, TX**



# The ESI Engine Technology

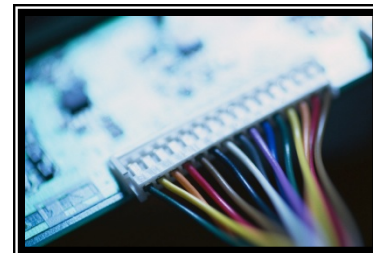


- ***NEW* natural gas engine utilizes International<sup>®</sup> (Navistar) diesel engine block design**
- **The engine appearance is very similar to the diesel: pistons, rings, injectors, spark plugs, head and electronics are the primary modifications**
- **No changes required to transmission, cooling system, axle ratios**



## Phoenix NG 7.6L

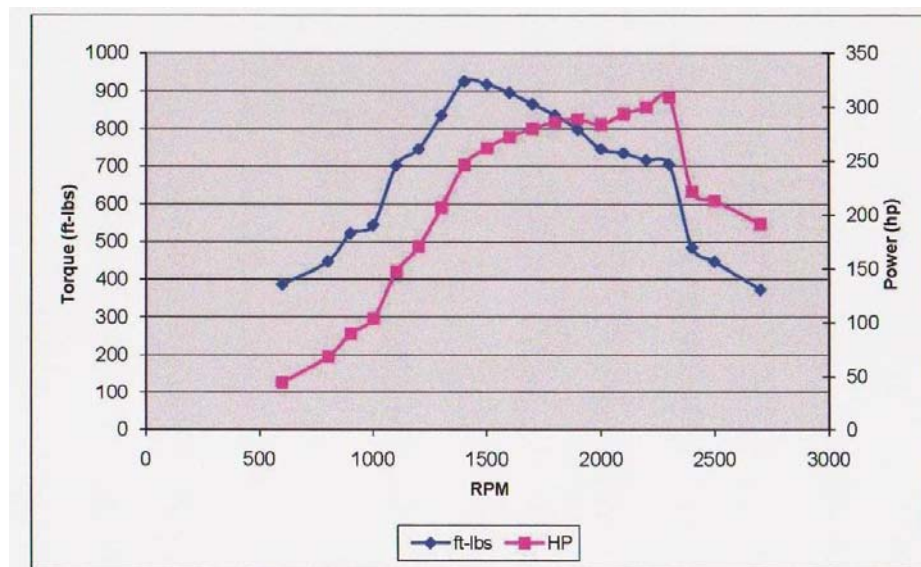
- Major combustion components are ***CRYOGENICALLY*** treated to increase durability.
- Stoichiometric, closed loop adaptive learn technology.
- Computerized control management for on-demand peak performance and emission control.





# ESI 7.6L NATURAL GAS ENGINE PROVIDES SAME HORSEPOWER & TORQUE AS DIESEL BUT AT LOWER RPM

*Up to 300 HP, 900 Ft. Lbs. Torque*

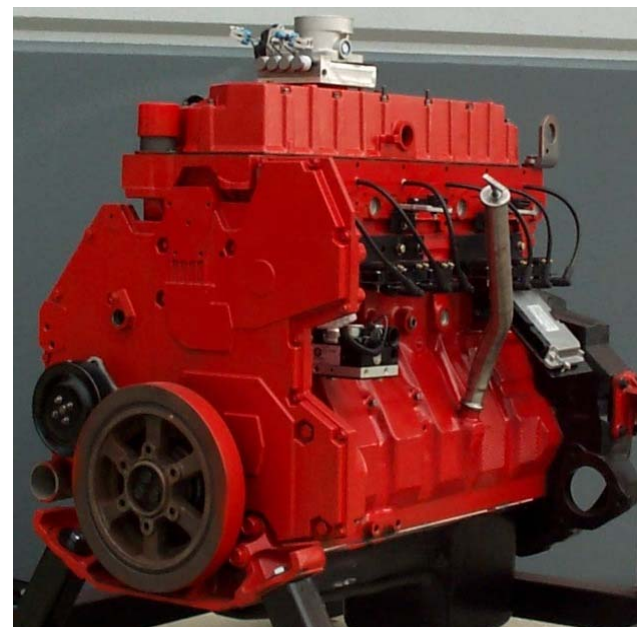




# **The ESI Engine Technology**

**Since engine appearance and most of its parts are common to the diesel engine, diesel technicians are quickly and easily trained**

- **Training provided by ESI personnel**
- **Diagnostic tools for use with laptop computers make troubleshooting easy**





# The ESI Engine Technology

- *Diesel technicians quickly and easily trained*
- **Service and warranty provided through local International<sup>®</sup> dealerships and authorized upfitters**



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- **Comparable performance, fuel economy and range to replaced diesel**



# The ESI Engine Technology

- *Diesel technicians quickly and easily trained*
- *Service and warranty provided through local International<sup>®</sup> dealerships and authorized upfitters*
- *Comparable performance, fuel economy and range to replaced diesel*
- **Engines available for NEW International<sup>®</sup> (Navistar) trucks and buses AND to repower EXISTING International<sup>®</sup> trucks and buses.**






# **The ESI Engine Technology**


- **New Engine Warranty of 2 years – Unlimited Mileage or 4,000 hours**
- **Extended Warranty Available**

# The ESI Engine Technology

**VERY CLEAN EMISSIONS**

**THE ONLY  
MEDIUM/HEAVY-DUTY  
ENGINE TO RECEIVE  
EPA & CARB 2010  
EMISSIONS  
CERTIFICATION  
WITHOUT THE USE OF  
EXHAUST GAS  
RECIRCULATION (EGR)**

 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY OFFICE OF TRANSPORTATION AND AIR QUALITY WASHINGTON, DC 20460		 CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY	
CERTIFICATE OF CONFORMITY 2010 MODEL YEAR			
Manufacturer:	EMISSION SOLUTIONS, INC.		
Engine Family:	AEMSH07.6NGE		
Certificate Number:	EMS-ONHWY-10-01		
Intended Service Class:	MHDD		
Fuel Type:	NATURAL GAS		
FELs:	NMHC+NOx: N/A	NOx: N/A	PM: N/A
Effective Date:	2/20/2009		
Date Issued:	2/20/2009		
 Karl J. Simon, Director Compliance and Innovative Strategies Division			

 California Environmental Protection Agency <b>AIR RESOURCES BOARD</b>	EMISSION SOLUTIONS, INC.	EXECUTIVE ORDER A-366-0002-1 New On-Road Heavy-Duty Engines
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Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Division 26, Part 5, Chapter 2, and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-02-003,

IT IS ORDERED AND RESOLVED: The engine and emission control systems produced by the manufacturer are certified as described below for use in on-road motor vehicles with a manufacturer's GVWR over 14,000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	ENGINE SIZES (L)	FUEL TYPE <sup>1</sup>	STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS	ECS & SPECIAL FEATURES <sup>3</sup>	DIAGNOSTIC <sup>6</sup>
2010	AEMSH07.6NGE	7.6	CNG	Diesel	MHDD	TWOC, CAC, TC, TBI, ECM, HO2S, O2S	N/A
PRIMARY ENGINE'S TEST <sup>2</sup>		ADDITIONAL IDLE EMISSIONS CONTROL <sup>5</sup>					
EXEMPT		N/A					
ENGINE (L)		ENGINE MODELS / CODES (rated power, in hp)					
7.6		ESI0306 (260), ESI0326 (297)					

# \$32,000 Federal Tax Credit

**IRS Letter Confirms  
that the ESI 7.6L  
engine is eligible for  
the Federal \$32,000  
tax credit**



DEPARTMENT OF THE TREASURY  
INTERNAL REVENUE SERVICE  
WASHINGTON, D. C. 20224

LARGE AND MID-SIZE  
BUSINESS DIVISION  
Heavy Manufacturing and Transportation  
111 Wood Avenue South  
Iselin, New Jersey 08830

June 8, 2009

Emission Solutions, Incorporated  
Mr. J.R. Moore, President  
2001 Central Circle, Suite 106  
McKinney, Texas 75069

Dear Mr. Moore,

We have reviewed the certification received dated March 9, 2009 prepared by Emission Solutions, Incorporated which was submitted under Notice 2006-54 relative to the Model Year 2010 engine family AEMSH07.6NGE of engines. This certification asserts that vehicles equipped with the specified engine family of engines meets the requirements of the Alternative Motor Vehicle Credit as a Qualified Alternative Fuel Motor Vehicle.

New or used vehicles with gross vehicle weight class of equal to or greater than 26,000 lbs. re-powered to operate solely on natural gas with ESI's AEMSH07.6NGE engine family series of engines - credit amount - \$32,000.00

We have determined that a purchaser(s) of the Qualified Alternative Fuel Motor Vehicles described below may rely on the certification concerning the vehicle's qualification for the Qualified Alternative Fuel Motor Vehicle Credit.

Should you have any questions, please contact Senior Program Analyst, Robert Lew (732) 452-8109 at your earliest convenience.

Very truly yours,

  
Charlie Brantley  
Industry Director  
Heavy Manufacturing and Transportation

Attachment:  
- Copy of Emissions Solution, Inc. Certification

## EMISSION REDUCTION POTENTIAL

2010 ESI-Certified Phoenix NG 7.6L vs.  
EPA Diesel Standard for 2003 HDV

<u>EMISSIONS (G/BHP-HR)</u>	<u>2010 Phoenix NG 7.6L</u>	<u>2003 EPA Standard</u>	<u>% Reduction</u>
• <b>NO<sub>x</sub></b>	<b>0.196*</b>	<b>4.0</b>	<b>95.1%</b>
• <b>Non-methane HC</b>	<b>0.06</b>	<b>1.2</b>	<b>95.0%</b>
• <b>PM</b>	<b>0.01</b>	<b>0.1</b>	<b>90.0%</b>

**\* 2010 EPA NO<sub>x</sub> STANDARD IS .20 G/BHP-HR**



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***COMING SOON***

**9.3L Natural Gas Engine**

**350 HP**

**1200 Ft. Lbs. Torque**



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# Tulsa Public Schools Tulsa, OK





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**Tomorrow's Technology Today**

# **Mansfield Independent School District, TX**





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# Smithtown Highway Department Smithtown, NY



# Anheuser-Busch Long Island City, NY





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# **Refuse/Recycling Applications**

**Long Island, NY**

**Burlington, VT**





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# **City of Kansas City Kansas City, MO**





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# Silver Eagle Distributors Houston, TX





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# Pepsi Bottling Company Salt Lake City, UT





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**THANKS!**

***IRA DORFMAN***  
***Emission Solutions Inc.***

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**[www.emissionsolutionsinc.com](http://www.emissionsolutionsinc.com)**