



EMISSIONSOLUTIONSINC



Tomorrow's Technology Today

Emission Solutions Inc.

The Compelling Case for Natural Gas Vehicles

Arlington, VA

May 26, 2010



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Tomorrow's Technology Today

NATURAL GAS ENGINES for INTERNATIONAL® TRUCKS

Refuse/Recycling Trucks

Dump Trucks/Plows

School Buses

Beverage Trucks

Utility Trucks

Specialty Vehicles

Tractors



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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[®] (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**



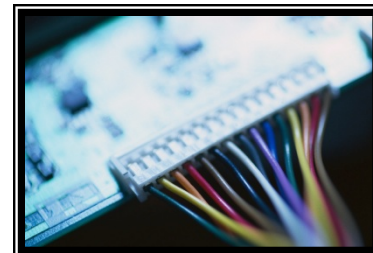
ESI 7.6L Natural Gas Engine (based on DT-466 diesel)

<i>Horsepower</i>	<i>175-300 hp</i>
<i>Peak Torque</i>	<i>460-900 lb-ft</i>
<i>2010 Certification</i>	<i>YES (CARB/EPA)</i>
<i>EGR</i>	<i>NO!</i>
<i>Delivery from PO</i>	<i>60 Days</i>



Phoenix NG 7.6L

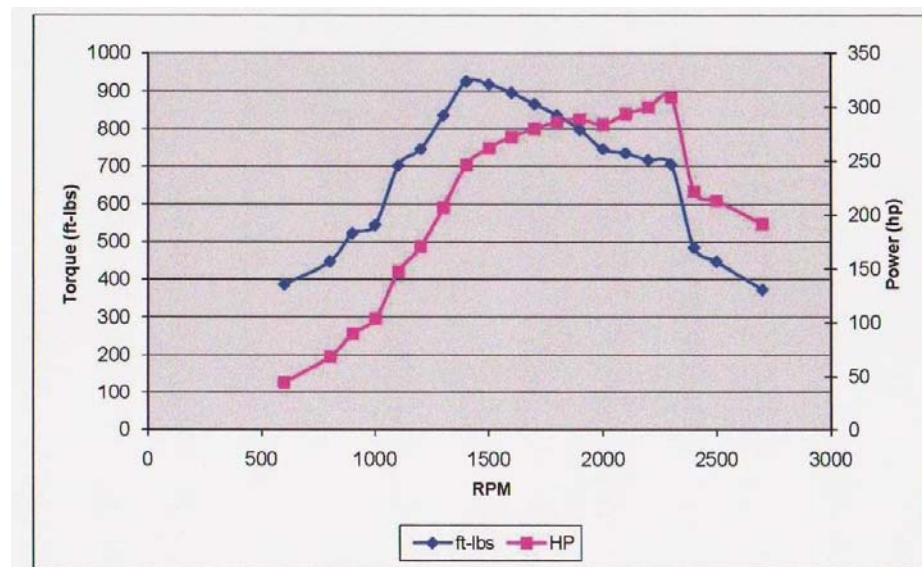
- Major combustion components are **CRYOGENICALLY** treated to increase durability.
- Stoichiometric, closed loop adaptive learn technology.
- Computerized control management for on-demand peak performance and emission control.





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

Up to 300 HP, 900 Ft. Lbs. Torque

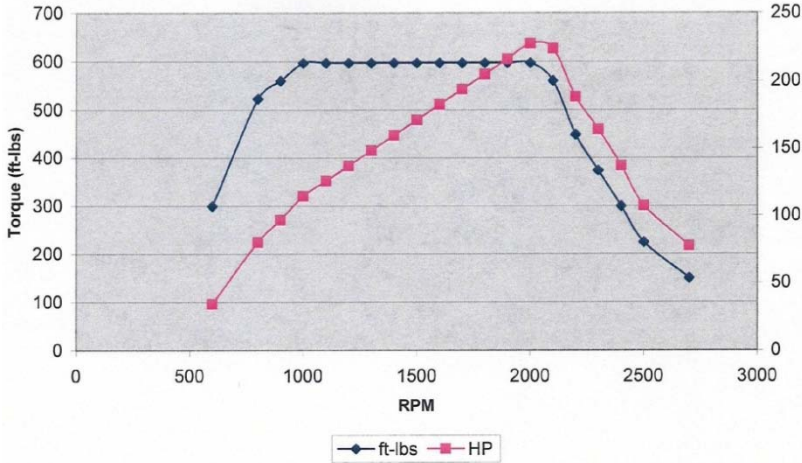




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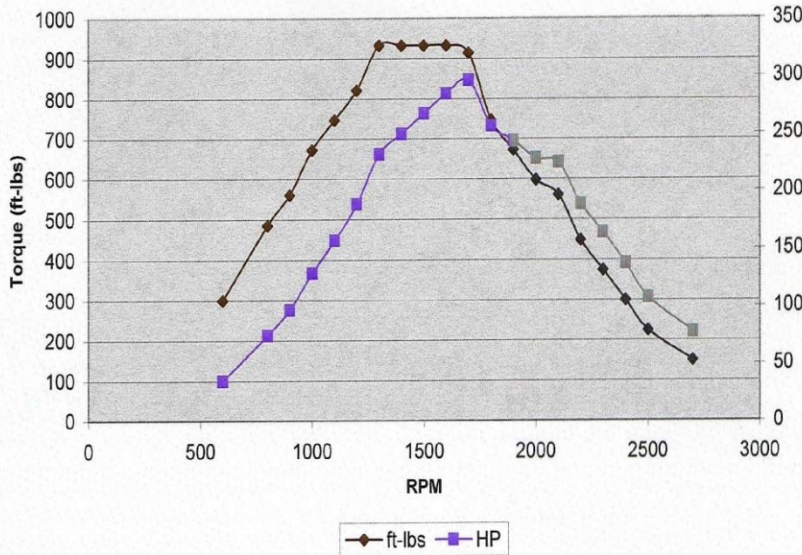
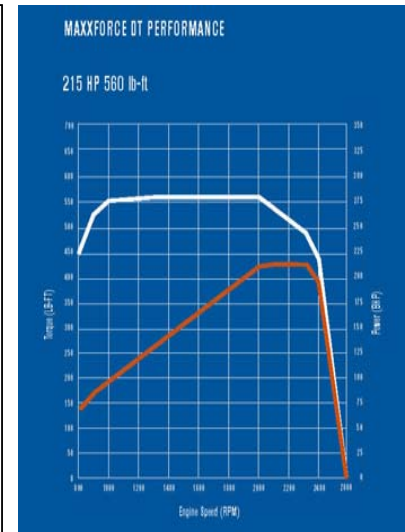
MY2010 Phoenix NG 7.6L ESI0326 Performance Curves

MY2009 MaxxForce DT® DT Performance Curves



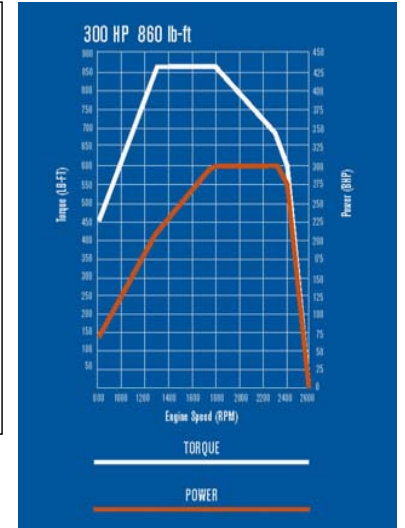
215 hp
@
600 lb-ft

215 hp
@
550 lb-ft



300 hp
@
900 lb-ft

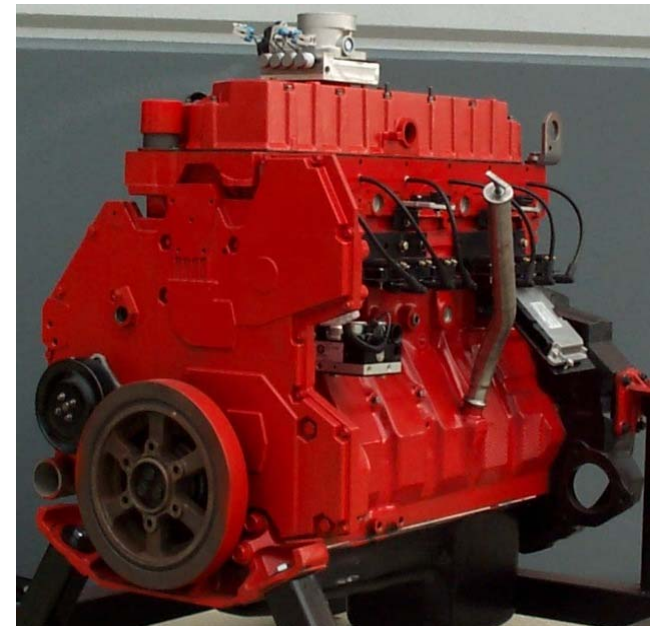
300 hp
@
860 lb-ft



Training, Warranty and Support

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








Training, Warranty and Support


- *Diesel technicians quickly and easily trained*
- **Service and warranty provided through participating local International[®] dealerships and authorized upfitters**

Clean Emissions without EGR

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

 California Environmental Protection Agency AIR RESOURCES BOARD	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 ¹	STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS ²	ECS & SPECIAL FEATURES ³	DIAGNOSTIC ⁴
2010	AEMSH07.6NGE	7.6	CNG	Diesel	MHDD	TWOC, CAC, TC, TBI, ECM, HO2S, O2S	N/A
PRIMARY ENGINE'S TEST EMISSIONS CONTROL		ADDITIONAL IDLE EMISSIONS CONTROL ⁵					
EXEMPT		N/A					
ENGINE (L)		ENGINE MODELS / CODES (rated power, in hp)					
7.6		ESI0306 (260), ESI0326 (297)					

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>
• NO_x	0.196*	4.0	95.1%
• Non-methane HC	0.06	1.2	95.0%
• PM	0.01	0.1	90.0%

*** 2010 EPA NO_x STANDARD IS .20 G/BHP-HR**

\$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



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COMING 4th QTR 2010

9.3L Natural Gas Engine

based on

MaxxForce[®] 10 Platform



ESI 9.3L vs. Cummins ISLG 8.9L Natural Gas Engines

ESI 9.3L

ISLG 8.9L

Horsepower

285-350 hp

250-320 hp

Peak Torque 850-1,200 lb-ft

660-1,000 lb-ft

2010 Certification

YES*

YES

EGR

NO

YES

****late fall 2010***



ADDITIONAL 2010-2011 PRODUCT DEVELOPMENT PLANS

- **6L Hino LPG Engine (India)**
- **13L Natural Gas Engine**
- **7.6L Propane Engine**
- **444E (7.3L) Natural Gas Engine**



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Refuse/Recycling Applications

Oyster Bay, NY (repowers)

Burlington, VT (new)





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City of Dallas, TX





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Tomorrow's Technology Today

NY Botanical Garden





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Tomorrow's Technology Today

City of Kansas City Kansas City, MO





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Pepsi Bottling Company Salt Lake City, UT





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City of Dallas, TX





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Tomorrow's Technology Today

Coca-Cola, Salt Lake City





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Tomorrow's Technology Today

Silver Eagle Distributors Houston, TX





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THANKS!

IRA DORFMAN, Eastern Regional Manager

202-255-6050

Emission Solutions Inc.