



Tomorrow's Technology Today

Company Overview

➤ Emission Solutions, Inc. (ESI)

- Privately Held Texas S Corporation –Founded 1998, Formed Sept, 2002 – Dallas, TX
- Manufactures & sells CARB & EPA MY2010 OEM, Heavy-Duty, CNG/LNG Engines.
- Niche Market (Navistar-International, Class 6,7 Trucks and School Buses with DT466e or MaxxForce® DT engines)
 - Food & Beverage Distribution
 - Municipalities and School Districts
 - Refuse
 - Transits





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MY2010 PHOENIX NG 7.6L

Medium/Heavy-Duty Natural Gas Engine Model ESI0326 300hp (224kw)

FEATURES

- * **2010 CARB/EPA certified requiring only a maintenance-free passive three-way Catalyst and NO EGR**
- * Stoichiometric, Turbocharged, closed loop adaptive learn combustion technology
- * New computerized control management (SAE J1939, J1587, ATA data links) for on-demand peak performance and emission control
- * Best power- to- weight ratio in its class
- * Designed with wet-type cylinder liners and hardened combustion components for improved heat dissipation and heat resistance and extended engine life
- * Extensive ECU operational management logs & easy-to-use diagnostic capabilities

BENEFITS

- * Lowest tailpipe emissions of **ANY** medium/heavy-duty engine
- * \$32,000 federal tax credit (IRS letter available)
- * Eligible for federal, state and local incentives in many states
- * Engineered with lower engine compression ratio for extended engine life
- * Improved fuel efficiency using an electronic throttle body and stoichiometric fumigation.
- * **NO** complex emission Aftertreatment – **NO costly DPF, EGR or SCR** –substantially reduces maintenance costs

ENGINE SPECIFICATIONS

Horsepower	175-300hp
Peak Torque	460-900 lb-ft
Combustion System	Dedicated spark-ignited, Throttle-body injection, Turbocharged
Displacement, Compression Ratio	7.6 Liters, 10.5:1
(NOx + NMHC Emissions)	0.18 g/bhp-hr
PM Emissions	0.01 g/bhp-hr
Aftertreatment	Passive three-way Catalytic Converter
Dry Weight	1,290 pounds
Fuel Type	CNG & LNG – Domestic fuel – validated to MN 75

MAINTENANCE INTERVALS

Oil and Filter: 20,000 miles or 1,000 Hours
 Spark Plugs: 50,000 miles or 2,000 Hours

WARRANTY*

Standard two year or 4,000 hours with full parts and labor; extended warranty available
 * which ever occurs first

Specifications and design subject to change without notice

**2010 Technology Today
 Without
 Complex Exhaust Treatment**

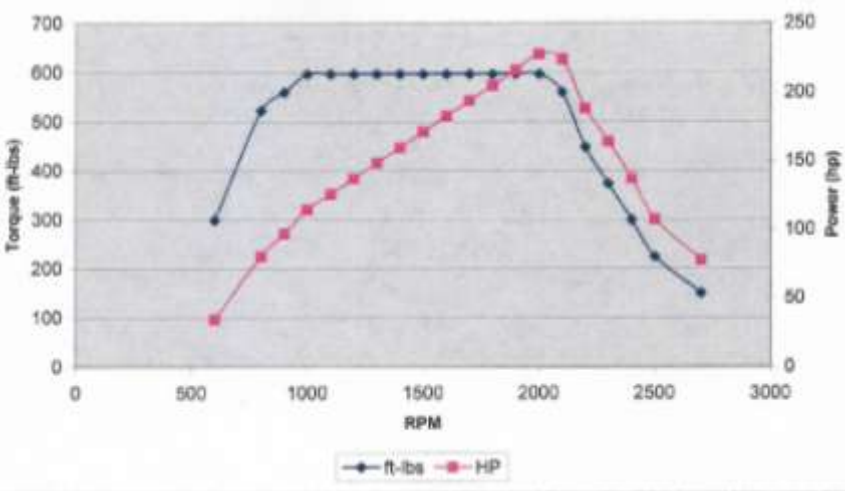


Patent No.: US 6,910,269

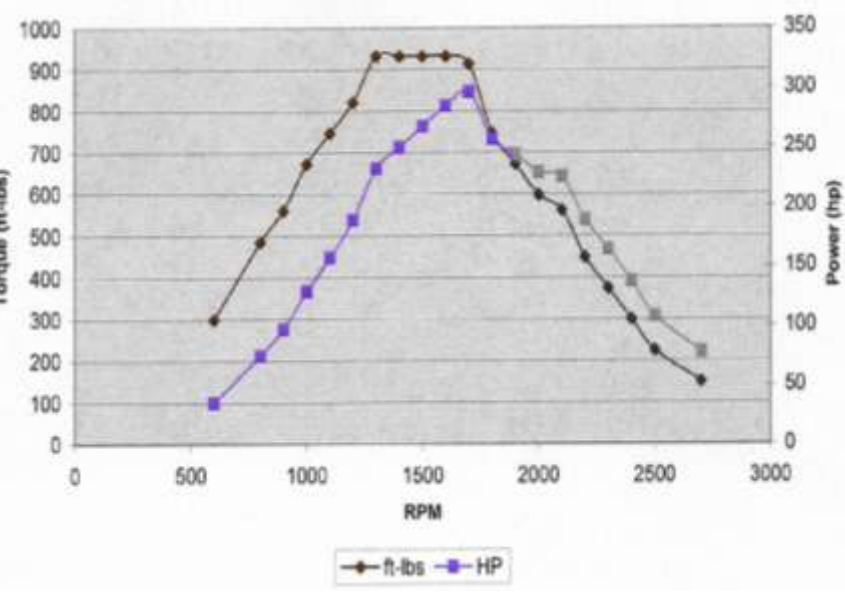
MY2010 Phoenix NG 7.6L ESI0326 Performance Curves



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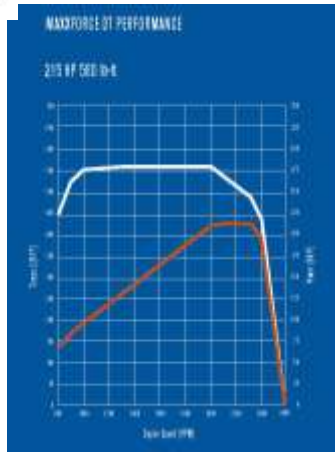


215 hp@600 lb-ft

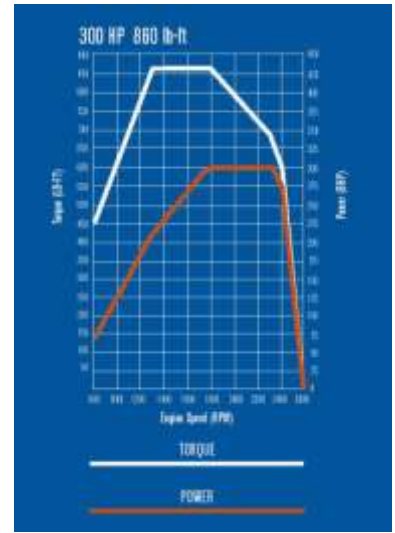


300hp@900lb-ft

MY2009 MaxxFace DT® DT Performance Curves



215 hp@550 lb-ft



300 hp@860 lb-ft



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ENGINE SIMPLICITY

- 1) Throttle Body
- 2) Coil per Spark plug
- 3) 33 lb passive three way catalyst
- 4) No EGR
- 5) Simple cng deregulator
- 6) Open System ECU Software
- 7) Simple wiring harness
- 8) For replacement or new chassis



BENEFITS:

- 1) IRS authorized VETC (\$32,000)
- 2) Eligible for Fed/State Funding
- 3) Lowest NOx+NMHC= 0.18 g/bhp-hr
- 4) Best Power:weight ratio in its class
- 5) Extended life cycle (10 years)
- 6) No major tools or training required
- 7) No service center changes
- 8) Less Service Intervals, fuel savings



Current ESI Clients (partial list)

- ***Tulsa Public Schools – CNG Pioneer:*** 2 CE Repowers, Contract for 140 CNG repowers
 - 2 CE product evaluation completed
 - 70% Conventional, 30% Front end
- ***Anheuser Busch Corp (AB), New York:*** 1 CNG repower, 24 CNG repowers on order
 - 1 straight trucks
 - 22 single axle tractors
- ***Silver Eagle Distributors-Houston:*** World's largest AB distributor: 2 CNG repowers, 32 funded
 - 2 single axle tractors
 - 32 single axles tractors
- ***Mansfield ISD, TX:*** 6 CNG repowers on International Bus rear-end pushers
- ***City of Kansas City, MO:*** 19 new MaxxForce DT to Phoenix NG 7.6L CNG engine upgrade
 - Single Axles tractors
- ***County of Monterey, CA:*** 2 CNG repowers on dump trucks
- ***Tulare County, CA:*** 1 CNG repower on dump truck
- ***Pepsi Bottling Group, Salt Lake City, UT:*** One CNG repower, product evaluation
 - Single axle
- ***City of Dallas:*** Awarded 24 each MY2009 Refuse Trucks
- ***Elgin Sweeper:*** In process – MY2007 diesel to cng upgrade (Broom Bear)
- ***WESTRUX International Truck DEMO:*** Municipal & Food/Beverage



350 hp (261 kW)
Phoenix NG 9.3L
Design Specification

Durability through innovative design

General Data

Ratings:	285-350 hp
(hp/torque mapped to meet critical payloads)	950-1,200 lb-ft
Combustion System	Dedicated Spark-Ignited
After Cooler	Air to Air
Engine Configuration	Four Cycle, In-Line Six
Aspiration	Turbocharged-Throttle Body
Compression Ratio	11.5:1
Displacement	9.3 Liters

Features and Benefits

Delivers up to 350 hp with superior torque rise (up to 1,200 lb-ft) for quicker response, improved acceleration and pulling power. Designed with Wet-Type cylinder liners and cryogenically hardened combustion components for Improved heat dissipation and heat resistance to extend product and emission Life cycle. Two year parts and labor (unlimited miles).

Fuel System

- Stoichiometric, closed loop adaptive learn technology
- Computerized control management for on demand peak performance and emission control
- Adaptive fuel types: CNG, LNG, Propane
- EPA/CARB Emission MY 2010 Certification: December 31, 2009



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EMISSION SOLUTIONS INC



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ESI—A TECHNOLOGY PARTNER WITH SCAQMD

- **To achieve MY2010 CARB Executive Order on our current 7.6L engine**
- **To develop larger dedicated natural gas engines (i.e. 9.3 L)**
- **To further reduce criteria pollutants through the use of Hydrogen Fuel Mixtures**
- **To reduce petroleum dependency, greenhouse gases and lower carbon fuel standards through greater use of natural gas in the transportation sector**
- **To develop a consortium comprising public, private and government entities to achieve the aforementioned SCAQMD goals through upgrading diesel fleets to cng and to conduct a broad base California school bus crash test project**