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# **Diesel-to-Natural Gas Engine Conversions**

**“A cost-effective alternative to new natural gas vehicles”**

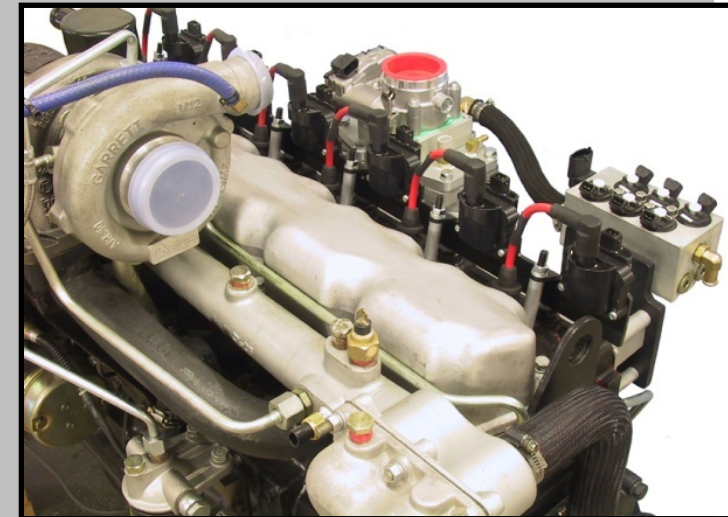
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## Engine Conversions

**– A feasible and affordable option!**

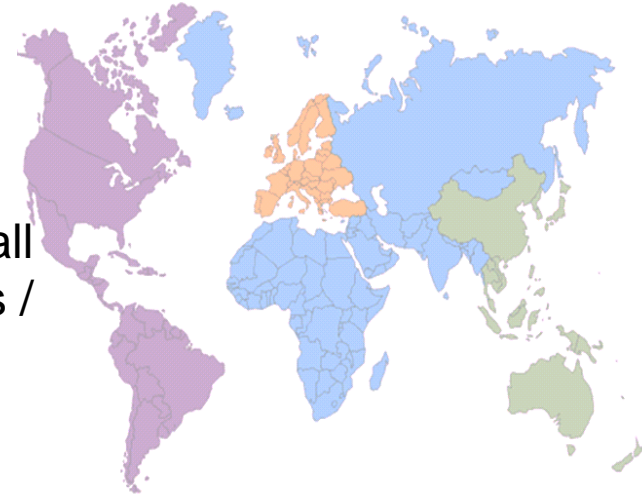
### Omnitek Solution

- Omnitek has developed a technology that can be used to convert most diesel engines into 100% dedicated natural gas engines, at a fraction of the cost of a new natural gas engine.
- Patented technology assures low emissions, low fuel consumption, high engine power and reliable engine operation.



US Patent Nr. 11/810,620

- Diesel-to-natural gas engine conversion technology validated with over 5,000 engine conversions worldwide.
- Technical support is available in 12 countries.
- Technology can be used to convert diesel engines of all sizes: Trucks / Buses / Generators / Industrial Engines / Locomotives / Ships
- Advanced Omnitek technology can be used with:
  - Compressed Natural Gas (CNG)
  - Liquid Natural Gas (LNG)
  - Biogas (RNG).



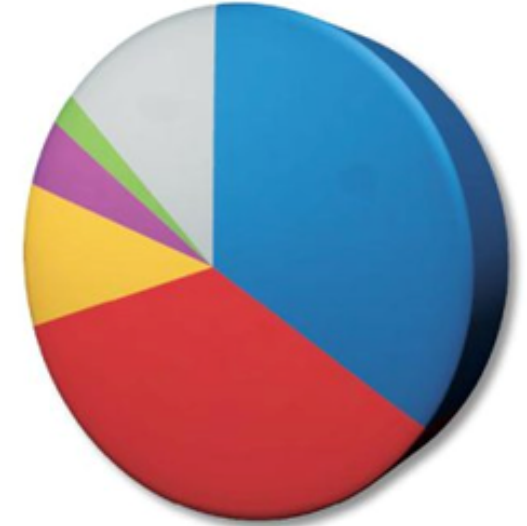
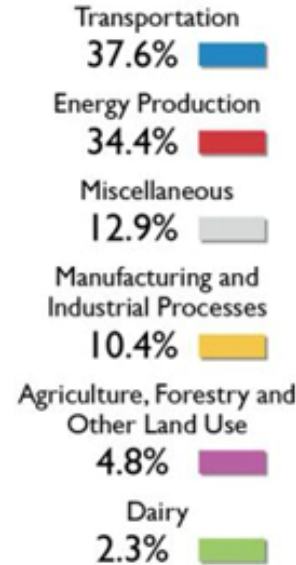
## Why use Natural Gas? – Reasons vary!

- Inexpensive fuel
- Clean burning
- No PM emissions
- Low CO<sub>2</sub> emissions
- Supports policies for a sustainable energy future
- Low-Carbon Economy



**Fleets looking to transition to Natural Gas**

## Greenhouse Gas Emissions in California



Source: California Air Resources Board



## How to transition a fleet from diesel to natural gas?

### The Alternative

- New Natural Gas Trucks & Buses
  - Limited product offerings (Cummins)
  - High cost

## A Better Solution is Diesel-to-Natural Gas Engine Conversions

- Diesel engines have a service life of up to 20 years, so why replace them early?
- Convert diesel engines to natural gas and capitalize on their long service life!
- Affordable and cost effective option



- Given their long service life, every year thousands of diesel engines undergo routine overhauls.
- Convert engines to natural gas.
- Engine conversion not unlike an engine overhaul.
- With the Omnitek technology diesel engines are “overhauled” into 100% dedicated natural gas engines -- the difference in cost is minimal.
- ROI 1 to 2 years

**Engine manufacturers offer no solution for millions of in-use diesel engines!**



## EPA certified DNG engines:

Navistar DT466 - 1996 to 2003

Navistar DT530 - 1996 to 2003

Mack E7 - 1994 to 2006

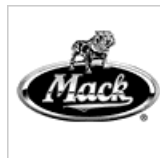
Detroit Diesel 60S - 1988 to 2009

Caterpillar C15 - 1993 to 2006



MANY MORE ENGINES AVAILABLE FOR  
NON-EPA & EXPORT MARKETS!

New DNG engine conversion kit development  
Approximately 3 – 6 month.





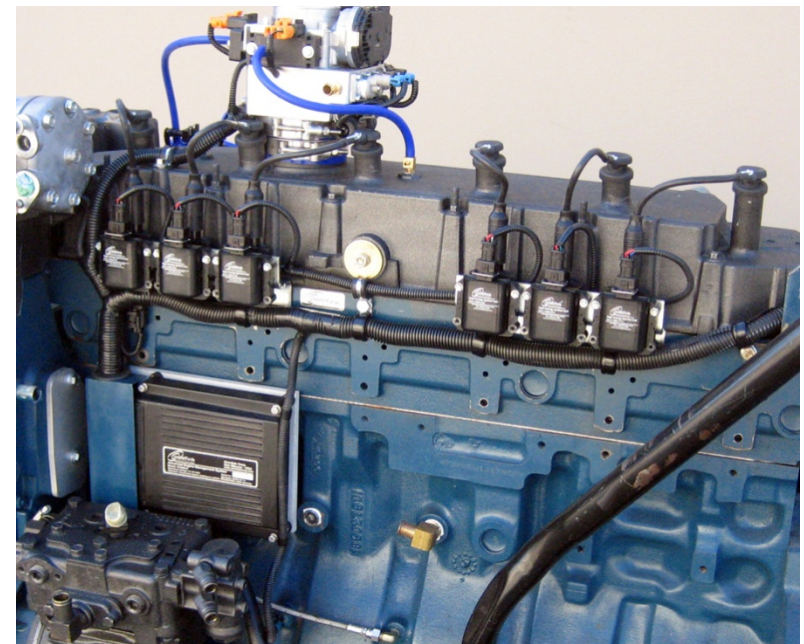
# "Drop-In" DNG Engines

## Diesel-To-Natural Gas Converted Engines (DNG)

- Strategic alliance Omnitek / Reviva
- "Drop-in" natural gas converted engines, remanufactured to as-new condition
- Assembly line remanufacturing/conversion process assures consistency and highest quality
- Engines are 100% dyno tested and configured for quick installation - short fleet conversion process.
- Warranty on Parts and Labor:  
3 Years / 100,000 Miles / 2,000 Hours



Engine Remanufacturing Company



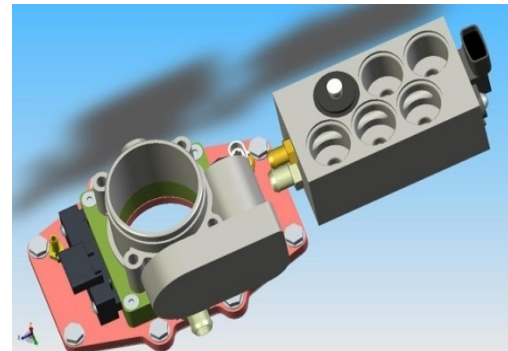
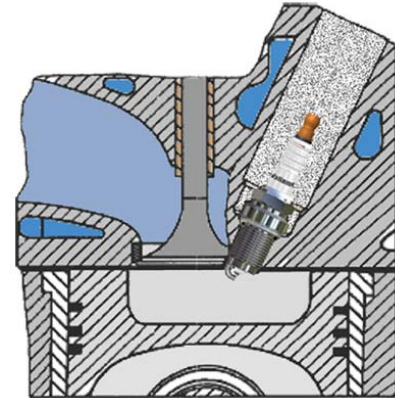
EPA Approved  
Navistar DT466  
Engine Conversion



Engine conversion just like an engine overhaul.

## Conversion Steps

- Disassemble engine
- Check components and replace accordingly
- Install low-compression NG pistons
- Install high-temperature resistant valves and valve seats
- Modify cylinder head for spark plugs
- Reassemble engine
- Install various sensors and fuel injectors
- Install ignition system
- Install catalytic converter
- (Natural gas storage system can be CNG or LNG)



## Not every vehicle is a good candidate for a DNG engine conversion!

- > Driving Range
- > Availability of fuel
- > Power Needed
- Space for CNG or LNG tanks?
- CNG or LNG
- On some engines power is reduced.  
Can safely offer 30 - 35 hp/liter,  
or 120 lb-ft/liter

Challenges: Integration with AT Transmissions,  
Gauges and Body Control Modules  
(CANbus, J1939, J1587)

Fleets must invest in training drivers.

Maintenance departments must invest in training technicians and upgrade maintenance facilities.

Expectations must be reasonable:

- Money savings potential
- Engine power
- Driving range
- Access to fueling infrastructure



## FLEETS BE AWARE!

- Natural gas engines require specific maintenance items and procedures.
- Training on the Omnitek System!

### Service Items:

- Natural Gas Engine Oil - VERY IMPORTANT
  - > oil testing can extend oil change intervals
- Premium Spark Plugs
- Ignition Coils
- Oxygen Sensor
- Natural Gas Filter - Removes oil mist and particulates
  - > replace often



Omnitek DNG engine conversion technology - economical solution for fleets looking to transition vehicles to 100% natural gas.

## **Convert diesel engines to natural gas**

- No more EGR, DPF, SCR or Diesel Exhaust Fluid (DEF)
- Keep your engine brand
- Accelerates transition to natural gas
- Capitalize on the long service-life of diesel engines



CNG Locomotive



Biogas Genset



CNG Bus



CNG Truck



# Thank You!

## Contact

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