

Westport CNG Fuel System

MODEL

VOLVO VNL 300

ENGINE

VOLVO G13 500 HP - 1,850 LB/FT TORQUE

TRANSMISSION

VOLVO I-SHIFT 14 SPEED AMT

FRONT AXLE

14,600 LBS

REAR AXLE

46,000 LBS

SUSPENSION

46,000 LBS

GLOBAL REAR AIR SUSPENSION

WHEELBASE

180"

OPTIMIZED FOR CNG • RNG HYDROGEN

HIGH-PRESSURE DIRECT INJECTION + COMPRESSION IGNITION DELIVERS:

- Maximum efficiency
- Maximum power
- Minimal maintenance
(no spark plugs)

FUTURE PROOF.



CLEAN FUEL POWER. DIESEL EFFICIENCY.

Designed for North America, this unique solution provides fuel flexibility across natural gas, renewable natural gas (RNG), and hydrogen blends. Westport delivers diesel performance at a significantly lower total cost of ownership, helping fleets reduce fuel costs and emissions without compromising power or reliability.

**UP TO 10
MILES PER
GALLON***

**500
HORSE
POWER**

**1,850
LB-FT OF
TORQUE**

**NO
SPARK
PLUGS**

Our Latest Project

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Volvo VNL 300 with Cespira HPDI™ Technology



Volvo VNL 300

500 hp

1,850 lb-ft

up to 10.0 mpg*

CNG, RNG or
Hydrogen

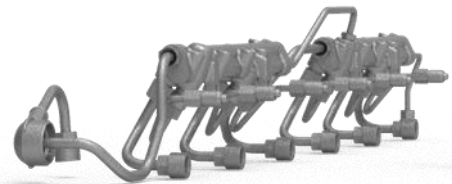


OVER 10,000 VOLVO HPDI TRUCKS ON THE ROAD GLOBALLY

- Austria
- Belgium
- Bulgaria
- Chile
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- India
- Italy
- Japan
- Lithuania
- Netherlands
- Norway
- Peru
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- South Africa
- Spain
- Sweden
- Switzerland
- United Kingdom

* Diesel Gallon Equivalent

IN PRODUCTION



Fuel Rails
& Pipes



HPDI Fuel
Injector



Gas Rail Control
Module



Diesel Rail
Control Module



HPDI Control
Software

CESPIRA HPDI TECHNOLOGY

IN DEVELOPMENT



High Pressure
Fuel Systems

Why HPDI Powered Engines?

Using CNG, RNG or Hydrogen (including blends)



ULTIMATE FLEXIBILITY

Enables **multiple fuels** with a single system approach:

- **No base engine changes** required from diesel
- **No power or torque limitations beyond those for the diesel engine**
- **Modular design** for easy adaptation

ADVANTAGES VS. SPARK IGNITION

Maintains diesel's performance advantages:

- **No changes to transmission, aftertreatment, cooling system** are needed
- Significantly **better real-world fuel efficiency**
- **Reliable and durable** system with no spark plugs
- **Full power and torque maintained**
 - **Same compression ratio as diesel**
- **Engine braking** maintained



Leverages Existing Diesel Platform



Engine

Same as diesel
*with HPDI fuel
injection system*

NO CHANGE TO:

- Compression ratio
- Pistons
- Manifolds
- Power curve
- Torque curve
- Engine heat
- Engine braking
- Propensity for knock and misfire



Aftertreatment

Same as diesel



Transmission

Same as diesel



Axles

Same as diesel

- Easier to integrate the system on the engine and truck
- No change to cooling system
- No change to transmission or axle
- Same engine oil as diesel
- Very similar maintenance schedule
- Fewer changed parts means easier to service and less specialized parts inventory

Provides a Superior Solution for Trucking



Evolving the diesel engine to run on clean fuels

Category	HPDI	Spark Ignited Competition
Horsepower	Same as diesel	Same as diesel
Torque	Same as diesel	Same as diesel
Fuel consumption	Same as diesel	30% to 40% higher
Subject to knock / misfire	No	Yes
Engine heat	Same as diesel	Higher than diesel
Engine braking	Same as diesel	Less than diesel
Aftertreatment system	Same as diesel	3-way catalyst
Transmission	Same as diesel	SI specific
Cooling system	Same as diesel	Upgraded
Engine component changes	Minimal	Significant
Service and maintenance	Same as diesel	Spark plug replacement

- Due to their design, spark ignited engines run on an Otto cycle like a gasoline engine. The result is lower efficiency and many compromises
- HPDI is a true diesel engine with compression ignition and minimal change from the diesel-fueled base engine.

Hydrogen Compatible

Engine	Yes	No
Fuel storage system	Yes	No