

2005 SYNUS CONCEPT Powertrain



*"Ford Motor Company is the only manufacturer actively engaged in research and development of hybrids, hydrogen internal combustion engines, hydrogen fuel cells and clean diesel technology."
– Graham Hoare, Director, Powertrain Research and Advanced Engineering*

Diesel engines are known for long-range driving economies, but they are also an excellent fit for urban dwellers. The SYN^{US} is motivated by Ford's 2.0-liter 16-valve Duratorq TDCi diesel engine, which drives the front wheels through a five-speed manual transmission and is calibrated to run on a 20 percent mixture of bio-mass diesel fuel. Bio-mass diesel is formulated by mixing a blend of diesel derived from renewable, organic sources with traditional, petroleum based diesel.

Bio-mass is a clean-burning alternative to fossil-derived petroleum products. It can be used in compression-ignition (diesel) engines with little or no modifications. Bio-mass is simple to use, biodegradable, nontoxic, and essentially free of sulfur and aromatics. It is less toxic than table salt and biodegrades as fast as sugar. Since it is made in the USA from renewable resources such as soybeans, its use decreases our dependence on fickle oil markets. Ford is a leader in research into alternative powertrains and is the only manufacturer actively engaged in development of four emerging technologies including gasoline-hybrid, hydrogen internal combustion engines, hydrogen fuel cells, and advanced diesels.

DIESEL GRUNT FOR URBAN LANE CHANGE COMBAT

Getting to the next lane or rounding the corner for that open parking spot requires three things: eyes of a hawk, quick reflexes and a vehicle that can respond as quickly. Unlike some overhead cam engines with torque arriving somewhere near the top of the tachometer, the Duratorq diesel puts the torque right where it's needed, at 1800 rpm. Turbocharged and intercooled diesel employs an advanced common-rail direct-injection system for exceptional efficiency and responsiveness. Sophisticated, electronically controlled injectors are central to the SYN concept's common-rail system. The system delivers fuel at extremely high pressure – up to 20,300 psi (1400 bar) – to the injectors with precision and control that results in greater performance, torque and excellent fuel economy. The engine generates 134 horsepower at 4000 rpm and an ample 236 foot-pounds of torque at only 1800 rpm. This reduces the need to reach down two gears just to merge into midtown traffic.

The new Duratorq TDCi engine is incredibly quiet. Using new Noise Reduction Technology called

"accelerometer pilot control", the TDCi engine "listens" to itself to monitor noise levels. By precisely controlling the combustion process, Ford engineers have been able to control the amount of diesel clatter which also contributes to its quiet operation. A ladder frame at the bottom of the engine block improves rigidity and reduces noise and vibration. Duratorq also uses a smaller, lighter and stronger forged steel crankshaft to further lower noise.

The Duratorq represents a quantum leap over traditional diesel engines. It manages to be quiet, clean, and refined, while holding true to diesel's traditional selling points: admirable grunt, modest thirst and low maintenance. As such it is the perfect fit for potential challenges that Ford SYNUS concept drivers could face.