2011 Fiesta Powertrain

- The all-new Ford Fiesta arrives with a responsive 1.6-liter DOHC I-4 engine, featuring Twin Independent Variable Camshaft Timing (Ti-VCT) to deliver the optimum balance of power and fuel efficiency
- Fiesta offers buyers a choice between an advanced PowerShift six-speed automatic or traditional five-speed manual transmission
- Fiesta brings European road holding and sharp handling characteristics to redefine North American small car driver expectations

Ford Fiesta arrives with a sophisticated drivetrain – striking a balance between responsive and responsible – delivering both European driving dynamics and projected 40 mpg highway fuel economy to challenge the North American small car status quo.

"The Fiesta powertrain redefines performance, fuel economy and flexibility for the small car segment," said Barb Samardzich, vice president of Ford global powertrain engineering. "The Fiesta delivers a fun-to-drive experience that will set it apart from the competition."

Power to the people
The Ford Fiesta's 1.6-liter DOHC I-4 engine delivers 120 horsepower and 112 ft.-lb. of torque, giving customers responsive performance. Big results from a small package are possible with several new technologies in this new, global engine.

Fiesta features Twin Independent Variable Camshaft Timing (Ti-VCT) which allows the engine to be downsized for fuel economy while continuously optimizing camshaft phasing for throttle response, performance and flexibility.

Ti-VCT gives variable – yet precise – control of valve overlap or the duration of time in which both intake and exhaust valves are simultaneously open. Valve overlap management by sophisticated controller mechanisms is critical to eliminating intake and exhaust flow compromises.

This technology also optimizes phasing on both intake and exhaust camshafts by spinning them ever so slightly to advance or retard valve timing, resulting in improved throttle response at initial throttle tip-in, reduced emissions at part throttle and enhanced efficiency at higher rpm. The outcome is more power, responsiveness and fuel efficiency from less overall cylinder displacement.

During development of this global engine measures were taken to keep overall powertrain weight as low as possible.

The block, cylinder head and oil pan – traditionally the heaviest engine components – are aluminum castings. To increase rigidity, these elements are ribbed for additional strength and durability. Pistons are cast aluminum, as well, with the light weight helping to reduce reciprocating mass and adding to fuel efficiency.

Composite material is employed to keep intake manifold weight to an absolute minimum while allowing for induction routing to increase thermal efficiency and improve low-end torque characteristics.

Another Fiesta powertrain innovation is the new Front End Accessory Drive (FEAD) belt with stretchy dynamics, to improve the engine's thermal properties. The elasticity in this new drive belt eliminates the need for a tensioning device. This decreases under-hood complexity and weight, helps increase fuel economy, and eases belt replacement at specified mileage intervals.

Transformational transmission

Fiesta launches with an all-new, North American industry-exclusive PowerShift six-speed automatic transmission combining the responsive performance of a manual shift with the convenience of a traditional automatic.

Fiesta's PowerShift transmission gives better fuel efficiency than a traditional torque convertor automatic or manual shift transmission.

"PowerShift is a transmission that changes the game," said Samardzich. "Our fuel economy leader is now a PowerShift automatic. Traditionally, a small car driver needed a stick shift and a clutch pedal to enjoy the greatest fuel efficiency."

Twin internal clutches keep the PowerShift in constant mesh, continuously optimizing for maximum responsiveness and fuel efficiency, depending on engine speed, vehicle speed and input from the driver's foot on the accelerator pedal.

PowerShift is a dual dry clutch transmission, operating with sealed internal lubrication, reducing friction and adding to Fiesta's fuel economy. The lack of pumps and hoses reduces complexity, saves weight and contributes to fuel efficiency.

Simpler, more responsive and more fuel efficient than a conventional four-speed automatic transaxle, PowerShift represents an innovative small car breakthrough.

Do-it-yourself alternative
For some small car drivers, the experience isn't complete without being given the choice of shift points.

Fiesta offers customers a standard five-speed manual transaxle with the ideal combination of gearing to provide swift acceleration from rest, responsive power at mid-range speeds and relaxed highway cruising in the overdrive fifth gear. Hydraulic actuation makes for smooth engagement with an easy-to-modulate clutch pedal, reduces the potential for slip and helps fuel economy.

Fuel-efficient power steering, with benefits
Fiesta features Electric Power Assist Steering (EPAS), which decreases complexity, saves weight and improves fuel economy by significantly reducing parasitic drag on the engine in comparison to traditional hydraulic power-assisted steering. EPAS is speed-sensitive, providing optimized assist based on vehicle speed, steering wheel angle, cornering forces and acceleration or deceleration.

For the Fiesta application, EPAS is tuned to provide an engaging driver experience.

EPAS enables Pull-Drift Compensation to help Fiesta track true. This software-based technology detects road conditions – such as a crowned road surface or blustery crosswinds – and adjusts the EPAS system to help the driver compensate for the pulling and drifting these conditions can cause. Pull-Drift Compensation is designed to be imperceptible to the Fiesta driver.

In addition, EPAS enables Active Nibble Cancellation. This technology senses for irregularity in wheel balance and the related steering wheel vibration – or "shimmy" – it can cause. Like Pull-Drift Compensation, Active Nibble Cancellation is designed and integrated to be seamless and unnoticeable to the driver while sensing and compensating for rotational oscillations due to wheel balance issues or uneven brake rotor wear.

Euro dynamics
The front-wheel-drive Ford Fiesta features MacPherson Strut front suspension. Tuned front shock absorbers – combined with a 22-mm front stabilizer bar – work in harmony with the EPAS system to preserve Fiesta's European road holding and handling dynamics.

In addition, Fiesta features a twist-beam rear axle that provides the optimum combination of

responsive handling, smooth ride and excellent space utilization. Specially tuned rear shock absorbers complete the package. Like its European and Asian counterparts, the North American Ford Fiesta features front disc and rear drum brakes with ABS functionality.

Depending on series level, Fiesta offers 15- and 16-inch wheel options, fitted with grippy, all-season tires. A 17-inch Ford Racing wheel package is offered as well.

Fiesta's powertrain and driving dynamics combine to provide the ideal balance between exceptional fuel economy – up to a projected 40 mpg highway – and responsive performance with world-class handling and responsiveness.