

2011 F-Series Super Duty Overview

ALL-NEW POWERTRAINS, CLASS-LEADING CAPABILITY REINFORCE 2011 FORD SUPER DUTY'S TOUGH TRUCK STATUS

- 2011 F-Series Super Duty boasts all-new powertrains, led by the Ford-designed, Ford-engineered and Ford-built 6.7-liter Power Stroke® V-8 turbocharged diesel engine, which delivers best-in-class torque of 735 ft.-lb. (at 1,600 rpm) and best-in-class 390 horsepower (at 2,800 rpm) – 85 ft.-lb. and 40 horsepower more than the outgoing product. The new diesel does this with best-in-class fuel economy and biodiesel compatibility up to B20
- All-new 6.2-liter V-8 gasoline engine also best-in-class with 385 horsepower and 405 ft.-lb. of torque – 85 more horsepower and 40 ft.-lb. more torque than the current 5.4-liter V-8 gas engine – combined with class-leading fuel economy and E85 compatibility
- Each new engine is mated to the all-new 6R140 heavy-duty TorqShift® six-speed automatic transmission, which has been optimized for the increased torque of the new diesel engine and the higher speeds of the new gas engine. The new transmission features SelectShift Automatic™ capability, with segment-exclusive Live Drive Power Take Off (PTO) available for diesels
- The all-new powertrains are the backbone of the new 2011 F-Series Super Duty, which has class-leading towing capability of 24,400 pounds and best-in-class payload capability of 6,520 pounds; the new Super Duty averages an 18 percent improvement for pickup models and up to 25 percent improvement for chassis cabs over outgoing model

Ford Super Duty customers expect and demand capability from the best-selling heavy-duty truck in America. For most Super Duty owners, it's the core asset of their business. Day after day, year after year, it's expected to deliver results in the most demanding situations. No nonsense. And never any excuses.

“Our Super Duty customers do some of America’s toughest jobs,” said Mark Fields, Ford president of The Americas. “Every day they’re out there working with little fanfare and all they ask is the right tool for the job. The new 2011 Super Duty offers them a truck with best-in-class towing and payload, all-new powertrains and even more capability than ever to help them do their jobs.”

Ford’s F-Series has been the best-selling line of trucks in the U.S. for 33 straight years. With class-leading torque, horsepower, fuel economy and towing and payload capability, the new Super Duty further underscores Ford’s Built Ford Tough legacy.

“The 2011 Super Duty offers the widest array of solutions for the widest array of heavy-duty work truck customers,” said Chris Brewer, chief engineer. “The Super Duty lineup offers a variety of bodystyles and powertrains, from diesel and gasoline engines, each with a new six-speed transmission, to pickup trucks and chassis cabs, each with the towing and payload capabilities that define Super Duty.”

New diesel and gasoline engines deliver improved torque, horsepower, fuel economy
For 2011, Super Duty features both all-new diesel and gasoline engines that are mated to a new transmission. The new 6.7-liter Power Stroke V-8 turbocharged diesel was designed, engineered and built by a Ford team dedicated solely to delivering this class-leading diesel to the next-generation Super Duty to enable continued best-in-class towing and payload.

The result: The new Power Stroke pumps out a best-in-class 735 ft.-lb. of torque at 1,600 rpm and 390 horsepower at 2,800 rpm, enabling the 2011 Super Duty’s class-leading towing capability of 24,400 pounds. The 2011 Super Duty also has class-leading payload capability at 6,520 pounds.

Benefits of the new 6.7-liter Power Stroke diesel engine:

- First use of a compacted graphite iron (CGI) engine block in a Super Duty-class vehicle in North America; CGI is stronger than cast iron, and Ford successfully has used the material in engine blocks in products around the world. The block structure was optimized for reduced weight and maximum strength to meet the demands of higher torque and more horsepower, and enable class-leading fuel economy.
- Unique inboard exhaust and outboard intake architecture, an automotive-industry first for a modern production diesel, reduces overall exhaust system volume, which leads to better throttle response; a reduced exhaust system surface area minimizes heat transfer to the engine compartment and improves NVH (noise, vibration and harshness).
- The turbocharger features an industry-first dual-sided compressor wheel that works in a single housing. The unit is uniquely center-mounted on a pedestal low in the back of the valley for improved NVH. The design allows the single unit to deliver the advantages of a twin-turbocharger system in a smaller, more efficient package, combining the benefits of a small turbocharger (faster response) and a large turbocharger (ability to compress and force more air into the engine for more power) in one unit.
- The high-pressure fuel system injects fuel at more than 29,000 psi. The system delivers up to five injection events per cylinder per cycle using eight-hole piezo injectors to spray fuel into the piston bowl. The direct-injection system is calibrated and phased for optimum power, fuel efficiency and NVH.
- Aluminum cylinder heads for reduced weight; the mid-deck construction with dual water jackets provides increased strength and optimal cooling; six-head bolts, instead of four as found on other engines, help improve sealing and maintain cylinder integrity even with the higher firing pressures.
- Compatible up to B20 fuel, allowing greener fueling options of up to 20 percent biodiesel and 80 percent petroleum diesel.

“Developing the new 6.7-liter Power Stroke V-8 turbocharged diesel engine was an awesome endeavor,” said Adam Gryglak, lead 6.7-liter diesel engineering manager. “The extensive engineering and testing made us confident this engine ensures the new Super Duty’s leadership in capability, reliability and productivity.”

The engine and aftertreatment system for the 6.7-liter Power Stroke V-8 turbocharged diesel powertrain ably meets the new, more stringent 2010 federal emissions requirements for nitrogen oxides (NOx), which have to be lowered by approximately 80 percent, making this the cleanest Super Duty diesel ever.

New gasoline engine delivers class-leading power and fuel economy as well

Ford tapped into a bit of its proud racing heritage to create the new 6.2-liter V-8 gasoline engine, which uses big-bore architecture to produce best-in-class torque, horsepower and fuel economy. The new gasoline engine delivers 405 ft.-lb. of torque (at 4,500 rpm) and 385 horsepower (at 5,500 rpm) on regular gasoline. The new V-8 also is E85 compatible.

These numbers represent an increase of 40 ft.-lb. of torque and 85 horsepower over the outgoing 5.4-liter V-8. The V-8’s large bore (102 millimeters) allows for larger intake and exhaust valves for improved engine breathing, and the short stroke (95 millimeters) allows higher engine speed for increased horsepower.

Benefits of the new 6.2-liter V-8 gasoline engine include:

- **SOHC valvetrain with roller-rocker shafts:** The single overhead camshaft (SOHC) per cylinder head design results in a stiff valvetrain that allows optimized camshaft lift profiles and

results in great low-speed torque. The roller-rocker shafts allow valve angles to be splayed, resulting in optimized intake and exhaust port layout for better breathing.

- **Dual-equal variable cam timing:** Intake and exhaust valve opening and closing events are phased at the same time to optimize fuel economy and performance throughout the engine speed range and throttle positions.
- **Two spark plugs per cylinder:** Due to the large bore size, two spark plugs per cylinder are used to more efficiently burn the fuel-air mixture in the combustion chamber, enabling better fuel economy and increased engine torque. The twin plugs also help the engine maintain a smooth, stable idle.
- **Dual knock sensors:** A knock sensor on each bank of cylinders of the V-8 engine allows the spark timing of each cylinder to be individually optimized real-time, throughout the engine speed range. The engine learns the optimum timing via an adaptive algorithm.
- **Better engine crankcase “breathing” and efficiency:** Significant development work and computer-aided engineering optimized the cylinder block for more efficient airflow in the crankcase as the pistons move up and down in the bores, resulting in improved torque at higher engine speeds. Piston-cooling jets squirt oil on the underside of the pistons to keep the piston crowns cool under extreme operating conditions. The cooling jets also allow for a higher compression ratio for better engine efficiency and faster engine oil warm-up on cold starts, also improving fuel economy.

New TorqShift transmission harnesses and manages the power; Live Drive PTO available

The all-new 6R140 heavy-duty TorqShift six-speed automatic transmission was designed to manage the high low-end torque produced by the new diesel engine. The same basic transmission also is mated to the new gasoline engine, giving customers of either engine the ability to efficiently get the increased torque and horsepower to the ground. Engineered for greater efficiency and fuel economy, improvements include refined architecture to provide relatively low clutch speeds, which results in lower drag losses, and optimized fluid levels and drainback to reduce churning of fluid while also providing superior lubrication.

In addition to hardware-based improvements, the new transmission features enhanced Tow Haul mode with integrated engine exhaust braking and SelectShift Automatic capability, which includes Progressive Range Select and a manual mode, allowing customers to select the gear to suit their needs.

The new TorqShift transmission also enables the first application of Live Drive PTO (Power Take Off) in a Super Duty-class vehicle. On 2011 Super Duty diesels with the PTO prep option, the PTO output gear is linked through the torque converter to the engine crankshaft. This allows the transmission to power auxiliary equipment such as snowplows, aerial lifts, tow truck lifts, cement mixers or dump trucks. The power is available any time the engine is running.

Pioneered on agricultural applications, the Live Drive feature is particularly useful when mobile PTO function is required during start-stop operations, such as salt spreading or snow plowing. “A fully functional Live Drive mobile PTO will allow Super Duty customers to take full advantage of the equipment on their trucks,” said Al Bruck, 6R140 transmission engineering manager.

Best-in-class towing and payload; new towing options

Putting all that power to work is what defines Super Duty. The 2011 Super Duty builds on its best-in-class towing and payload capability and also offers more towing options from inside the bed. New is the first-ever factory-installed and warranted fifth wheel and gooseneck substructure directly attached to the frame.

“Our system is factory-installed and comes with a limited warranty from Ford. The electrical connection is mounted in the side of the bed wall, providing a clean installation,” said Peter

Frantzeskakis, vehicle engineering manager.

Particularly noteworthy are productivity enhancements to the F-450 pickup to benefit the heaviest-duty trailer tow customers. Unneeded weight was shed, helping to improve fuel economy and top speed. Even with these changes, the F-450 Super Duty pickup maintains its class-leading gross combined weight rating of 33,000 pounds.

Addition of Trailer Sway Control leads safety enhancements

Ford's lauded Trailer Sway Control (TSC) system joins the Super Duty lineup, giving those customers segment-first capability. TSC is integrated with AdvanceTrac® with Roll Stability Control™, which now is standard on all single rear wheel (SRW) configurations.

The AdvanceTrac control module uses additional software to monitor the truck's motion when a trailer is attached. TSC can determine from the yaw motion of the truck if the trailer is swaying and take measures – such as applying precise braking or reducing engine torque – to help reduce the trailer sway.

For further peace of mind, the available integrated trailer brake controller, factory-installed and covered by a Ford limited warranty, offers smoother and safer operation due to its ability to interface with multiple vehicle systems.

Normal braking is proportional to driver brake pressure for smooth brake stops at all speeds. If the vehicle's Anti-lock Brake System (ABS) is engaged, the special trailer brake kicks in to minimize the potential for trailer wheel lockup. In Super Duty trucks with Trailer Brake Control towing trailers with electric brakes, the Ford system can, during a sway event, also apply brakes to the trailer to help stabilize it.

Other enhanced towing, off-road control features and safety improvements include:

- Hill Start Assist, which applies brakes to prevent rollback
- Hill Descent Control™, which uses the accelerator and brake to set, and then hold, the speed
- Electronic Locking Differential, which provides maximum traction by forcing the rear wheels to turn at the same speed
- Standard tire pressure monitoring system on all SRW models
- Optional side air bags and air curtains
- A new available 4.2-inch LCD screen includes information on specific features such as Trailer Brake Control and Tow Haul

Improved ride, handling and steering for a more comfortable experience

In addition to increased towing and payload capability and improved fuel mileage enabled by the new powertrains, customers of the next Super Duty also will benefit from improved ride, handling and steering. For 2011, the engineering team optimized the frame and suspension of the current Super Duty, particularly the leaf springs and spring rate, as well as adjusting the internal valving in all the shock absorbers to enable greater towing and payload capability with further ride refinement.

The steering gear also is new. The 4x2 F-250 and F-350 Super Duty feature modified steering system geometry to take better advantage of the twin I-beam suspension, which combines the performance of an independent suspension with the durability of a beam axle suspension. Improved response, precision and better on-center steering and control come from making the steering gear symmetric left to right.

The result is greater customer comfort, confidence and control in all situations.

“A big part of the comfort in Super Duty trucks comes through controllability,” said Dan Gompper, vehicle dynamics supervisor. “No matter if the truck is loaded or unloaded, full trailer or empty

trailer, customers can be fully confident.”

Bold exterior; new flow-through console highlights interior

The new hood of the 2011 Super Duty, with its prominent inverted power dome, complements the new diesel and gasoline engines lurking beneath. “Super Duty” is stamped on the upper grille, with a larger Ford oval proudly gracing the front.

Inside, customers will benefit from a new reconfigurable flow-through console that improves the functionality of the truck. Storage space is increased about 60 percent, and at least 70 different configurations are possible. A 12-volt powerpoint is available at the rear of the console and another is located inside the main bin, which is lockable. A 110-volt power inverter is standard with all console configurations.

Improved productivity through Ford Work Solutions

For many customers, the Super Duty cab also serves as a mobile office. Industry-exclusive Ford Work Solutions™ is part of available technology to help customers stay connected with their business from the job site and track tools.

A new available 4.2-inch LCD productivity screen allows customers to take full advantage of the 2011 Super Duty’s capabilities; an off-road message center has been added as well. The five-way button on the steering wheel allows customers to navigate through various menu options – several relating to fuel economy and towing convenience – never before available on a Super Duty truck.

Continuing the legacy of quality

With all-new powertrains enabling greater towing and payload capability, safety enhancements such as Trailer Sway Control added, and greater functionality with available Ford Work Solutions, the new 2011 Ford Super Duty is poised to continue its legacy as America’s premier work truck.

The accolades the current Super Duty has received, based on 2009 model year GQRS (Global Quality Research System) data, include:

- Best-in-Class TGW (Things Gone Wrong) for All Pickup Truck Segments
- Best-in-Class Customer Satisfaction among Heavy Duty Pickups

“With all-new powertrains and increased capability, the 2011 Super Duty improves on its proud heritage as the ultimate work truck,” said Brewer.