

2018 FORD F-150 POWER STROKE DIESEL FIRST LOOK: LIONHEARTED

New light-duty diesel promises market's best economy, towing



This spring Ford will introduce a new flagship engine to its perennial best-selling and recent Motor Trend Truck-of-the-Year-winning F-150 pickup line—a 3.0-liter 250-hp, 440-lb-ft Power Stroke turbodiesel V-6 capable of hauling 2,020 pounds or towing 11,400. We asked what took so long because Ford essentially started work on this “Duratorq/Lion” series engine in 1999 and has been building and selling it since 2004 (in Jaguars, Land Rovers, Peugeots, Citroëns, and an Aussie Ford SUV). In response, engineers downplayed the association with these earlier engines, claiming that North American diesel engineers from the 6.7-liter Power Stroke V-8 program thoroughly redesigned it, and when pressed on the timing they suggested that the stars have only just fully aligned with the arrival of the 10-speed automatic in the aluminum truck.

So how new is this “lion-hearted” engine? The compacted graphite iron block and 16.1:1 compression ratio carry over, but the crankshaft, crank and rod bearings, fuel injection system, turbocharger, and exhaust crossover pipe all required re-engineering to withstand the more severe duty cycle this engine was expected to face in an F-150. The crank receives different machining and heat treatment to increase its strength, and the bearing material alloy is altered to improve durability. Common-rail fuel injection pressure increases from 26,100 to 29,000 psi, and multiple pilot-injection events reduce the idle clatter that plagues many diesels. The single Honeywell variable-nozzle

turbocharger is revised to better withstand sustained high heavy loads (such as towing 11,400 pounds up the Davis Dam), with boost pressure peaking around 20-22 psi. That crossover pipe gets new metallurgy and a redesign of its accordionlike flexible section in anticipation of greater thermal cycling. All in, with a 6.5-quart oil sump, the new engine weighs 620 pounds—about 150 more than the aluminum 3.5-liter EcoBoost.



These reinforcements lower peak output by 4 hp and 3 lb-ft relative to the [Land Rover Discovery](#) variant, which makes 254 hp at 3,750 rpm (500 rpm higher than the Ford engine's peak) and 443 lb-ft at 1,750 rpm (same as Ford's). Powertrain warranty coverage matches that of the F-150's other engines: five years/60,000 miles—a year and 10,000 miles longer than [Land Rover's](#).

Fuel economy figures are not yet available, but we're told the engine is on track to meet its target of a 30-mpg highway rating, besting the 2017 [Ram EcoDiesel's](#) 27 mpg. The new-for-2019 [Ram 1500's](#) diesel offering will trail Ford's to market, probably by just enough to ensure definitive leapfrogging of power, torque, payload, and towing ratings. (In 2017 the ratings were 240 hp, 420 lb-ft, 1,590 and 9,210 pounds, and the new Wrangler fitment of this engine's successor makes 260 hp and 442 lb-ft.) Helping to

achieve that lofty highway rating is an auto start/stop system, separate grille shutters for the radiator and the charge-air cooler, and cooled exhaust-gas recirculation. A retrograde economy move, but one deemed essential for cooling at max load, is a mechanical cooling fan capable of drawing about twice the air any currently available 12-volt electric fan system can. At least a visco-electric clutch reduces most of its drag when it's not needed.

Aft of the engine, Power Stroke F-150s get a strengthened flywheel ring gear to cope with auto start/stop, a toughened torque converter, and revised axle ratios (the 10 transmission ratios are shared with other F-150 fitments). This 3.0-liter doesn't get a "Jake brake" exhaust retarder like its 6.7-liter sibling, but gearing is such that descending the Davis Dam with an 11,400-pound trailer requires minimal brake-pedal application. A 5.4-gallon diesel-emissions fluid tank should last 10,000 miles. Interior changes are limited to a DEF gauge, some optional diesel information screens borrowed from the 6.7L Power Stroke models, and a water-level warning light for the water-separating fuel filter.





Ford will start taking orders for the 3.0-liter Power Stroke (in the U.S. and Canada only for now) this month, with deliveries expected in Spring 2018. Retail customers will be able to order the engine on Lariat, King Ranch, and Platinum trim levels on SuperCrew cabs with 5.5- or 6.5-foot beds or on Lariat SuperCabs with a 6.5- or 8.0-foot bed. The option will add \$4,000 to the Lariat trim price (which includes a standard 2.7-liter EcoBoost V-6), or \$3,000 to the two higher trim levels (which get a 5.0-liter V-8 as standard). In both cases the diesel price represents a \$2,400 premium over the 3.5-liter EcoBoost V-6. Fleet customers only will be able to order the engine on XL and XLT SuperCab or SuperCrew cabs with 6.5- or 8.0-foot beds (fleet pricing wasn't shared).

Bottom line: Ford expects the Power Stroke to account for roughly 5 percent of sales and to sell to folks who expect to tow frequently. Some simple math using current national average prices for regular unleaded and diesel fuel suggests that unladen highway driving in a 30-mpg Power Stroke would need 154,000 miles to pay back the \$2,400 premium over an equally tow-capable 21-mpg-highway rated 3.5-liter EcoBoost. But engineers tell us that payback speeds up by a factor of five when towing a heavy trailer. Stay tuned for the eagerly anticipated Ford/Ram diesel Head-2-Head.

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