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FCA US Launches Third-generation EcoDiesel V-6, Proliferates Rev-matching in Model Year 2020

- New 3.0-liter EcoDiesel V-6 boasts 14 percent torque increase, 8 percent horsepower bump
- Innovative dual-loop EGR system benefits fuel efficiency
- New water-cooled turbocharger boosts efficiency and responsiveness
- Rev-matching improves driving experience in all Jeep Cherokee powertrain configurations

August 31, 2019, Auburn Hills, Mich. - The third-generation 3.0-liter EcoDiesel V-6 embodies the philosophy that has made FCA US powertrains a dominant auto-industry presence.

"Our goal is to design, engineer and deliver compelling products that exceed the expectations of our customers, while contributing to greater environmental sustainability," says Micky Bly, Head of Powertrain Engine Engineering, FCA – North America.

In the 2020 Ram 1500, where it makes its debut, the 3.0-liter EcoDiesel V-6 is rated at a best-in-class 480 lb.-ft. of torque at 1,600 rpm, a 14 percent increase from the previous-generation EcoDiesel V-6 that peaks 400 rpm earlier. Horsepower increases 8 percent to 260 hp at 3,600 rpm.

Several significant changes contribute to the new EcoDiesel's improved dynamic and fuel economy performance:

- A new-generation water-cooled turbocharger with variable geometry turbine (VGT) increases efficiency and responsiveness during transient conditions
- Redesigned cylinder head intake ports improve swirl and flow, increasing performance and fuel economy
- The exhaust gas recirculation (EGR) system design has been updated to a dual loop (low- and high-pressure) system. The added low-pressure circulation system draws gases after the diesel particulate filter, thus minimizing turbocharger energy losses, which increases fuel economy
- The compression ratio has been optimized to 16.0:1 from 16.5:1
- High-pressure (29,000 psi/2,000 bar) direct-injection fuel injector nozzles were redesigned to match the newly designed and optimized combustion chamber
- Lightweight aluminum alloy pistons were completely redesigned to include thinner rings and
- low-friction coating on the pin and side skirts to reduce losses
- NVH has been reduced by offsetting piston pin by 0.3 millimeters from the centerline; thus, minimizing mechanical noises
- The lower portion of the two-piece oil sump uses a lightweight sandwiched polymer/metal material that further reduces NVH
- The dual vacuum pump system uses electric and a new mechanical low-friction pump with new blades that improve overall system efficiency

The upgrades build on the EcoDiesel V-6's previous success, the attributes and performance of which made it a winner of "Wards 10 Best Engines" for three consecutive years (2014, 2015, 2016).

The 3.0-liter EcoDiesel V-6 uses dual overhead camshafts (DOHC) with four valves per cylinder and a 60-degree angle between the cylinder banks. The block is cast with compacted graphite iron, which provides strength to dampen vibrations, but weighs less than grey cast iron. A compacted graphite iron bedplate adds rigidity to the block.

The EcoDiesel V-6 uses a forged steel crankshaft and connecting rods for strength and durability. The aluminum alloy pistons are cooled on the underside via oil jets.

Heat-treated aluminum cylinder heads use individual bearing caps to reduce friction and minimize NVH. The chain-driven overhead camshafts employ roller-finger followers.

The 3.0-liter EcoDiesel V-6 is produced at the FCA Cento facility in Ferrara, Italy.

Meanwhile, FCA US continues to transform its breakthrough nine-speed automatic transmission by enhancing its performance in the 2020 Jeep Cherokee. Whether its mated with the lively 2.0-liter I-4, the 2.4-liter I-4 or the 3.6-liter Pentastar V-6, the transmission will benefit from rev-matching.

Engineers developed new transmission shift-control and engine-control algorithms that align the transmission and engine speeds during situations such as a hard acceleration on the highway.

When a throttle input mandates a downshift, the transmission sends a signal to the engine to adjust its speed accordingly. The resulting response can shave nearly a second off a multi-gear downshift.

Rev-matching already enhances the 2.4-liter I-4 in the Jeep Compass, and the 1.3-liter I-4 in the Jeep Renegade and Fiat 500X

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