

2014 Fiat 500L: Powertrain

- Innovative 1.4-liter MultiAir Turbo engine provides the Fiat 500L with fuel efficiency combined with an output of 160 horsepower and 184 lb.-ft. of torque
- New Euro Twin Clutch six-speed transmission delivers precision and fuel efficiency with up to 33 miles per gallon (mpg) on the highway
- Italian car enthusiast-desired six-speed manual transmission features precise shifts for more driving enjoyment

June 27, 2013, Auburn Hills, Mich. - **Compared with the Fiat 500, the all-new 2014 500L is simply more of a good thing**

As a complement to the Fiat 500L's spacious and versatile interior, its 1.4-liter MultiAir Turbo engine delivers more standard horsepower per liter than its competitors, along with an available Euro Twin Clutch six-speed transmission for fuel efficiency, precision and convenience.

"The FIAT brand brings with it the expectation of a lively driving experience," says David Schmidt, MultiAir and MultiAir Turbo Engine Chief Engineer — Chrysler Group LLC. "With class-leading standard horsepower per liter, along with MultiAir valve technology for reduced emissions and maximum fuel efficiency, the all-new Fiat 500L will not disappoint."

High-performance engine design with high-performance output and fuel economy

First seen on the track-proven Fiat 500 Abarth, now the fuel-efficient 1.4-liter MultiAir Turbo four-cylinder engine finds its way into the Fiat 500L as the single engine offering, delivering 160 horsepower, 184 lb.-ft. torque and up to an EPA estimated 33 miles per gallon (mpg) on the highway with either the six-speed manual or Euro Twin Clutch transmission.

The new 1.4-liter MultiAir Turbo engine transmits its power through high-strength components throughout the drivetrain, including its equal-length half shafts.

Selected as the "Best International Engine in 2010" by a panel of 72 journalists from 36 countries, the new 1.4-liter MultiAir Turbo engine is designed to meet the rigorous demands of performance driving throughout its 6,500 rpm range.

Structurally, the 1.4-liter MultiAir Turbo engine starts with a durable cast-iron block and a structural aluminum bedplate. The bore is 72 mm and stroke 84 mm for a total displacement of 1,368 cc. At the bottom end, a forged-steel crankshaft with select-fit main bearings is supported across five main journals. The crankshaft has been designed with lightened counterweights to reduce overall mass for high engine rpm operation. Durability is ensured with the use of lightweight forged-steel connecting rods that have been designed with a unique cross section to minimize the longitudinal and lateral bending of the rod.

Lightweight cast-aluminum pistons, with a compression ratio of 9.8:1, contribute to the overall efficiency of the reciprocating assembly and the engine's high rpm capability. Full-floating piston pins are used for added strength. Piston cooling jets, located at the bottom of each cylinder, contribute to fuel economy by squirting oil on the bottom of the pistons to help maintain cylinder temperatures and reduce the possibility of hot spots along the cylinder walls or at the top of the piston, which could lead to spark knock.

This high-performance 1.4-liter engine also is fitted with a structural aluminum oil pan with a crankcase capacity of 4 quarts and a dry filter. Synthetic 5W-40 engine oil is recommended, due to higher overall temperatures with the

turbocharger. Oil change intervals are set at 10,000 miles.

Innovative MultiAir cylinder head

The high-performance 1.4-liter MultiAir Turbo engine features FIAT's exclusive MultiAir intake valve technology. Unlike engines that rely on direct action from fixed lobes on the camshaft to control intake valve opening and closing, MultiAir is an electro-hydraulic system that can control intake air, cylinder by cylinder and stroke by stroke, depending on the precise operating conditions and the demands from the driver and engine control system.

The actual opening of the valves is controlled by a small actuating piston and hydraulic fluid running through a narrow passage that is controlled by a dual-action solenoid. When the solenoid is closed, under highway speeds or full acceleration, intake valves are fully open much like a traditional engine for maximum power. At lower speeds, the solenoid opens precisely during the intake stroke, allowing oil to bypass the passage, thus decoupling the valves. This allows for infinite control of the valves and controls the amount of fresh air into the cylinders, reducing wasted energy that is common with fixed intake lobes on a camshaft.

Spent exhaust gases are released through exhaust valves operated by traditional lobes on the camshaft and exit through a cast stainless steel exhaust manifold. Ignition is through a single output, coil-on-plug system. Spark plugs are dual precious metal for durability and smooth idle. Fuel delivery is sequential, multiport and electronically controlled with injectors located to direct the fuel spray at the intake valves in a wide spray pattern that increases fuel atomization and enhances complete combustion for a smooth driving experience.

MultiAir technology on normally aspirated 1.4-liter engines provides up to a 15 percent increase in low engine rpm torque, up to 7.5 percent improvement in fuel efficiency and a 7.5 percent reduction in carbon dioxide emissions.

Intercooled turbocharger provides 160 horsepower

The boost to 160 horsepower on the all-new Fiat 500L is largely due to its single turbocharger that operates off engine exhaust and uses energy that would normally be wasted through the tailpipe.

Like its track-proven and endurance-tested Fiat 500 Abarth stablemate, the all-new Fiat 500L's turbocharger spins up to 23,000 rpm to convert exhaust heat and pressure into rotation that drives a compressor. The compressor draws cool air and pumps it into the intake manifold at increased pressure. The result is more air in the cylinders, hence more torque and power. Boost pressure is dynamically managed to provide a broad torque curve over a wide variety of ambient conditions, with a peak pressure of 21 psi at 4,000 rpm.

The 1.4-liter MultiAir Turbo's induction system includes a single intercooler that is designed to remove heat in the air charge that the turbocharger generates while compressing incoming air. Removing heat provides a cooler, denser air charge that helps increase the potential for more power. A cooler air charge also reduces the potential for engine knock.

High-performance engine components

Delivering more power also required a number of powertrain improvements to the engine and transmission components needed for the demands of high-performance driving.

On the intake side, the 1.4-liter MultiAir Turbo engine features a fresh-air intake system with high-flow air filter, redesigned air box for improved airflow and smooth-flowing plumbing for maximum power and low induction noise. A low-restriction exhaust system delivers minimal exhaust gas backpressure for maximum power. The powertrain control module (PCM) integrates all of the MultiAir Turbo engine's control functions, including management of the MultiAir system.

An upgraded electrical system includes a high-output 140-amp alternator and 500-amp cold-cranking, maintenance-free battery for increased vehicle system charging.

Two six-speed transmissions deliver up to 33 mpg highway

The all-new Fiat 500L can be equipped with either a six-speed manual or six-speed Euro Twin Clutch transmission paired with its 1.4-liter MultiAir Turbo engine. Sharing a common design, including a 6.68 ratio spread, the transmissions feature final-drive ratios of 4.12 for the manual and 4.118 for the Euro Twin Clutch for quick acceleration and faster top speed while maintaining fuel economy. And with its first-gear overall launch ratio of 18.4:1

and precision-controlled shift points, the Fiat 500L delivers precise gear changes consistent with the brand's fun-to-drive cachet.

The innovative Euro Twin Clutch is standard on the Fiat 500L Lounge model and is available on the Fiat 500L Easy and Trekking models. With the Euro Twin Clutch six-speed transmission, the Fiat 500L delivers an EPA estimated 24 mpg city, 33 mpg highway and 27 mpg combined rating. Similarly, the Fiat 500L with the enthusiast-desired six-speed manual transmission delivers an EPA estimated 25 mpg city, 33 mpg highway and 28 mpg combined rating.

Designed to handle the increased torque loads, both transmissions on the Fiat 500L include a tubular intermediate shaft with equal-length half shafts to mitigate torque steer. The bar shafts are designed for increased strength to reduce torsional stress in the driveline during performance driving. To handle the power and torque of the new 1.4-liter MultiAir Turbo engine, large constant velocity joints with high torsional strength of 2,600 N•m deliver durability and refinement. Inboard joints, without shudders, are also used for refinement.

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