



Engines and Transmissions



June 8, 2007



NEW ENGINE 1.9 JTD TWIN STAGE TURBO

THE ENGINE

The 1.9 JTD TWIN STAGE TURBO is the latest development within the FPT Diesel Family with a specific power close to 100 HP/l.

This engine has been developed with the target to add to FPT Diesel portfolio an engine with high power & torque density, excellent low-end-torque and already capable to meet the future Euro 5 emission standards.

Based on the current 1.9 JTD_M 16v engine, the engine will be available in two versions:

-  180 HP @ 4000 rpm
-  190 HP @ 4000 rpm

both with 400 Nm torque @ 2000 rpm.

The engine will be sold to both captive and non-captive customers, with the higher power output reserved to FGA applications.

The low-end-torque has been improved by 50%, with 300 Nm available already from 1250 rpm.

These outstanding performances have been achieved basically through the introduction of an advanced charging technology, such as the Two Stage Turbocharger, together with proper design changes, to increase the thermo-structural resistance with increased peak cylinder pressure (up to 180 bar) and exhaust gas temperature (up to 800 deg. C).

The Two Stage Turbo (TST) technology allows to remove the usual constraints that the engineers have to face when the size of the turbocharger must be selected, that usually means to accept a compromise between power and low-end-torque.

With TST we have a small turbocharger operating at low rpm for optimal low-end-torque and response from low vehicle speed. This small turbo is by-

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passed when the required power output increases and a second turbocharger with higher size comes into operation.

Besides the improvement of overall performances, the TST technology allows increasing the EGR rate without penalties on fuel consumption and therefore gives a relevant contribution towards NOx emission reduction.

The engine has been designed to comply with Euro 5 emission standards. This target has been achieved thanks to:

- ✍ reduction of the CR from 17.5 to 16.5 and adoption of low-voltage metallic glow plugs
- ✍ improved EGR cooler (with by-pass) and EGR valve
- ✍ adoption on Lambda sensor with DPF
- ✍ new design of inlet ducts

As far as start of production, the 180 HP version is forecast in July this year; the 190 HP version is forecast in June 2008.

THE PLANT

The new engine is produced, as the other "Family B" engines, in the FPT plant of Pratola Serra, in the Avellino province.

Created from "green field", the plant started its production activities in 1993 and has a yearly production capacity of 600.000 engines.

At Pratola Serra both gasoline (1.6 16v, 1.8 16v, 2.0 16v, 2.0 20v, 2.4 20v) and diesel engines (1.9 8v JTD, 1.9 16v JTD, 2.4 20v JTD) are produced.

The plant has been awarded important international recognitions, such as ISO 9002, ISO 14001, ISO TS 16949, but above all the Excellence in Consistent TPM Commitment 1st Category, which represents a coveted recognition as far as Preventive Maintenance and stands for the high level of excellence of the plant and its products.

In Pratola Serra are currently working some 1700 employees, with a quite low average age of 33 years.

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FIAT POWERTRAIN TECHNOLOGIES

Born in March 2005, Fiat Powertrain Technologies is the sector of the Fiat Group including all the Powertrain activities previously carried on in:





-  Fiat Auto (Fiat Powertrain)
-  Iveco (Iveco Motors)
-  Centro Ricerche Fiat and Elasis

With its annual output of around 2,8 million engines and 2,1 million transmissions, FPT is one of the most significant players in the powertrain sector on a worldwide basis.

FPT can satisfy almost any powertrain request thanks to an extremely wide range of products:

-  engines (with a power from 20 up to 1200 hp and displacements from 1,000 to 20,100 cc)
-  transmissions (covering from 145 to 950 Nm)

and applications:

-  automotive (cars, commercial vehicles, trucks, buses, special vehicles)
-  industrial (construction equipment, agricultural machinery and stationary applications)
-  marine (pleasure and professional applications)
-  power generation (generating sets)

The activities of research and advanced engineering ensure the technological excellence of the Company. All these activities are included in the Powertrain Research & Technology function.

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