

FPT INDUSTRIAL PRESENTS ITS E-POWERTRAIN SOLUTIONS AT IAA 2018 EXHIBITION IN HANNOVER

Turin, September 19, 2018

At the IAA 2018 exhibition in Hannover, FPT Industrial launches its new **e-Powertrain organization** while displaying (Hall 16, Booth A42) its **electric powertrain solutions**. With this announcement FPT Industrial confirms its positioning in the market as a **multi-power solutions provider**, able to meet customers' needs with a wide range of **tailor-made alternative propulsion** solutions. Visitors to IAA can discover **FPT Industrial's new E-Powertrain Concept** with the new **E-Axles**, as well as its **Diesel-Hybrid and Gas-Hybrid Powertrains** (F1A Euro VI Step D and F1C NG engines combined with an electric engine). A **Hydrogen Fuel Cell Concept Powertrain** developed by FPT Industrial for IVECO is also displayed on the IVECO stand (Hall 17 – Booth A01), representing an on-going concept study for a long-term future.



PRESS RELEASE

E-POWERTRAIN CONCEPT WITH NEW E-AXLES



The core example of the new FPT Industrial development in the Electric field is the **E-Powertrain Concept with new E-Axle**. A fully integrated Electric Motor – with package protection for power greater than 250 kW – managed by a compact inverter unit, it transfers power and torque to the wheels through the **gears unit**, resulting in a modular concept which can be easily adapted to various vehicle layouts and weight capabilities.

In this system, the **dual stage gear reduction** grants **98% efficiency** in the main working conditions, and features an **integrated differential** and a **parking system** which includes all the safety functionalities. As mentioned, the principal benefit of the solution is the fact that is **easily adaptable** to different customers' needs. It can support three vehicle layouts - **front, rear and all-wheel drive** – with different **suspension systems** – **independent** or **rigid** – just by changing external shape, without impacting the core components. Even the **load capability** can be different: the **e-motor scalability** and the specific **gear design**, that grants **robustness** and a **wide ratio range**, enable it to be used in different vehicles categories, such as passenger, light and heavy commercial. Finally, thanks to the small **compact design**, the E-Axle can even be installed in vehicles with **very tight layouts**.

DIESEL-HYBRID AND GAS-HYBRID POWERTRAINS



FPT Industrial F1A engine

The **Diesel-Hybrid Powertrain** on display is composed of an **F1A Euro VI Step D engine** – now suitable for **heavy duty homologation** – with a power range between **136 hp** and **156 hp**. The engine, shown with this specific homologation configuration for the first time, is presented in a **parallel-hybrid configuration**, one which enhances the already low emissions. The other powertrain elements are the FPT Industrial **2835.6 manual transmission**, the **transfer box** and the **NDA rear axles**.

The engine, has a displacement of 2.3 liters and combines the **lowest emission rate in its category** (RDE ready) with the qualities of a regular Diesel engine. It features outstanding

durability and **real-driving low NO_x emissions** due to higher displacement than other manufacturers. It was **completely re-engineered** in 2016 and the developments focused on the reduction of friction, the optimization of the cooling system and the adoption of a variable displacement oil pump, which led to a **reduction** of both **fuel consumption** and **TCO**. Furthermore, with regards its LCV application, the F1A equips the IVECO Daily Blue Power, winner of the *International Van of the Year 2018*. To further improve fuel consumption and performance a **new electronic Variable Geometry Turbocharger** has been introduced.

Finally, it is not only **Europe's best-selling engine** in the LCV segment (GVW >2.8 tons), its leading **durability** comes courtesy of its heritage: it derives from an industrial engine.



FPT Industrial F1C NG engine

The other hybrid on display, also derives from an industrial engine, the **F1C NG**, here combined with an **electric system** (Siemens ELFA e-drive) offers the perfect solution for **urban bus applications**.

Being mostly used in city centers, this hybrid features **smart energy management** and several benefits in terms of **emission reductions**, involving **fuel consumption**, **noise** and **CO₂**. This system can power buses up to 12-meters that can enter **Zero Emission Vehicles areas** –found more frequently in big cities and metropolitan areas – thanks to the **100% electric mode option**.

Savings come from both reduced **fuel consumption** and the **CO₂ emissions**, the latter being reduced by up to 30%. The F1C NG is fitted to the International Van of the Year 2018 winner. It features a three-liter displacement and power up to **136 hp** with 350 Nm of max torque.

The F1C NG – as with every other FPT Industrial Natural Gas engine – can be fueled with **CNG**, **LNG** and **bio-methane**, that can lead to near zero CO₂ emissions. The engine also delivers the same **robustness** and **reliability** as its Diesel equivalent and provides major benefits over competitors' similar products such as **higher torque**, **better transient response** and lower noise and vibration, thus resulting in **better driving comfort**.

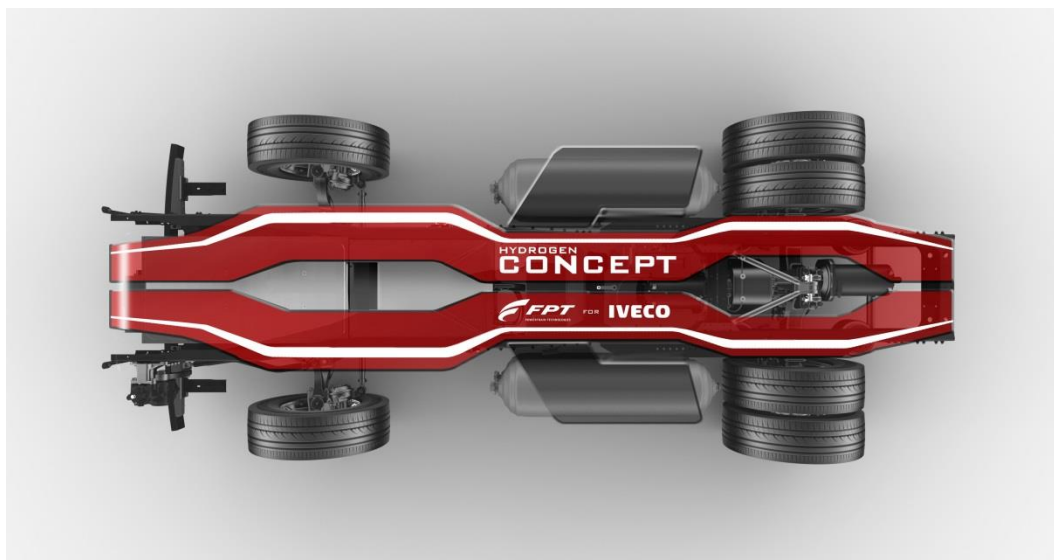
F1A DIESEL EURO VI STEP D HEAVY DUTY Specifications

Architecture:	In-line 4-cylinder engine
Intake:	Electronic Variable Geometry Turbocharged with Aftercooler
Injection:	Common Rail 1600 bar
Valves per cylinder:	4
Displacement (l):	2.3
Bore (mm):	88
Stroke (mm):	94
Power range in hp (kW):	136-156 (100-114) @ 3,600 rpm
Torque range in Nm	350-380 @ 1,500 rpm
Service interval (km):	up to 50,000 (depending on mission)
Weight (in kg):	204
ATS:	High-Pressure EGR + ClosedCoupled DPF + SCR

F1C NATURAL GAS specifications

Architecture:	In-line 4-cylinder engine
Intake:	Wastegate Turbocharged with Aftercooler
Injection:	Multipoint with Stoichiometric combustion
Valves per cylinder:	4
Displacement (l):	3.0
Bore (mm):	96
Stroke (mm):	104
Power range in hp (kW):	136 (100) @ 3,500 rpm
Torque range in Nm	350 @ 1,500 rpm
Service interval (km):	up to 40,000 (depending on mission)
Weight (in kg):	245
ATS:	3 way catalyst

HYDROGEN FUEL CELL POWERTRAIN CONCEPT



The new **Hydrogen Fuel Cell Powertrain Concept** developed by **FPT Industrial for IVECO** is displayed at the IVECO stand (Hall 17 – Booth A01). The powertrain features an electric engine and a fuel cell, fueled with Hydrogen: **a possible long term ‘zero emissions’ solution for heavy duty applications**, suitable for both buses and trucks. It represents an on-going concept study. Further information is available in the dedicated press release.

FPT Industrial is a brand of CNH Industrial, dedicated to the design, production and sale of powertrains for on and off-road vehicles, marine and power generation applications. The company employs more than 8,000 people worldwide, in ten manufacturing plants and seven R&D Centres. The FPT Industrial sales network consists of 73 dealers and about 800 service centres in almost 100 countries. A wide product offering, including six engine ranges from 42 hp up to 1,006 hp, transmissions with maximum torque of 200 Nm up to 500 Nm, front and rear axles from 2 to 32 ton GAW (Gross Axle Weight). FPT Industrial offers the most complete Natural Gas engines line-up on the market for industrial applications, including engine ranges from 136 hp up to 460 hp. This extensive offer and a close focus on R&D activities make FPT Industrial a world leader in industrial powertrains. For further information, visit www.fptindustrial.com.

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