FPT
POWERTRAIN TECHNOLOGIES

# OFF ROAD
# CONSTRUCTION

**Our efficiency.**
**Your edge.**

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# Index

# THE STAGE V CHALLENGE

Technological excellence and product innovation are at the core of FPT Industrial's mission. We have focused our R&D activities in order to become the innovation leader in the industrial powertrain field and a go-to provider of the most advanced and increasingly sustainable solutions.

Compliance with emission standards comes with minimal impact on vehicle architecture. HI-eSCR is a breakthrough technology bringing vast performance and efficiency benefits. This FPT patent makes the most of a 25-year, 1-million-unit experience.
To comply with Stage V standards, the second-generation HI-eSCR2 system guarantees competitive advantages, including best-in-class performance and low running costs.



## FPT's Stage V Solution

- High Productivity
- Reduced operating costs
- "For life" after-treatment systems
- Enhanced reliability
- Maximised uptime

| | |
|---|---|
| **High Performance** | Best in class power and torque density. |
| **Low Operating Costs** | Best in class fluid consumption. Maintenance-free after-treatment system: no replacement costs over lifecycle. |
| **Ease of Use** | Extended service intervals. |

# Emission Standards Scenario

During the combustion process, the chemical energy of the fuel is converted into mechanical energy. Because of the chemistry of combustion, several pollutants are produced, of which the most harmful are Nitrogen Oxides (NOx) and Particulate Matter (PM).

Since 2011, when Tier4 Interim/ Stage IIIB came into force, many efforts have been made to reduce such pollutants damaging the environment.

Tier4 Final/Stage IV regulation, introduced in 2014, implied a further significant reduction of NOx (-80% Vs. Tier4 Interim/Stage IIIB levels) while PM was not affected by further reductions.

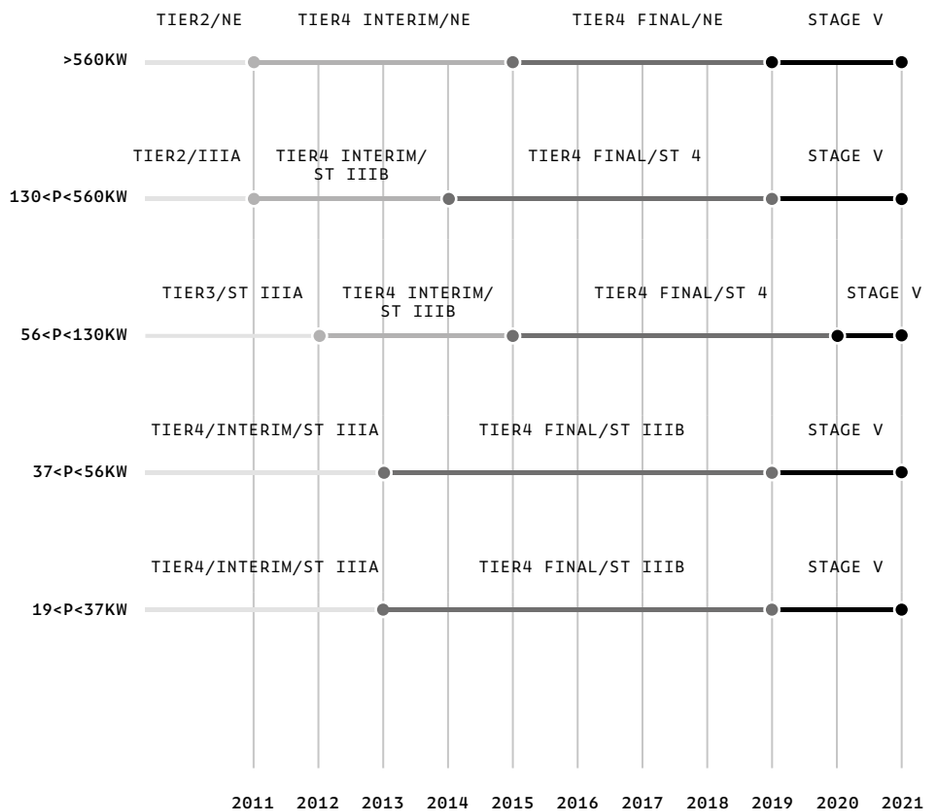
Stage V, the new regulatory step introduced in Europe in 2019/2020 (depending on engine power level), further tightens the limits on PM emissions: the admitted PM quantity has been reduced by 40% compared to Stage IV and a new limit has been set on the number of emitted particles (Particle Number Limit, PN).

In addition, Stage V regulation involves power ranges which, up until now, have been subject to lighter or no legislation at all in Europe (power ranges below 37 kW or above 560 kW).



# Emission Regulations — Roadmap

EUROPEAN NON ROAD MOBILE MACHINERY, AGRICULTURAL AND FORESTRY TRACTORS & USA NON ROAD COMPRESSION & IGNITION ENGINE EMISSION STANDARDS




**Legend**

After the introduction of Tier4 Final/Stage IV emission limits in 2014-2015, a further regulation re-enforcement will be introduced for European Non-Road applications in 2019 or 2020 depending on power levels.
Emission Durability Period: 8000 hours, 10 years.
No new type approval in Europe for existing emission stage permitted in the year before new emission stage introduction

**Construction is about imagining a future and creating it step by step. This is what we do too, every day.**

# HI-eSCR2

**Tier 4 final/ Stage IV**

FPT Industrial's patented HI-eSCR system is able to reduce the NOX levels more than 95%, offering best-in-class conversion efficiency; moreover, thanks to no DPF, the FPT solution is maintenance free and improves productivity by avoiding downtime during operation for filter cleaning or replacement.

**Stage V**

To maintain the advantages of the unique and unbeaten HI-eSCR technology, FPT Industrial will integrate a maintenance-free filtering device on its SCR catalyst, thus allowing to comply with tightened limits on PM emissions within a compact package.

The HI-eSCR system, applicable for engines above 56 kW and below 560 kW, where different emission limits apply, maintains the same dimensions of the current Tier 4 Final / Stage IV applications, requiring no machine redesign or layout changes to make it easier to comply with the next emission level.

Thanks to optimized combustion, leadership on performance and fuel efficiency is confirmed, while maintenance-free after-treatment ensure low running costs avoiding unplanned downtime.





**Benefits**

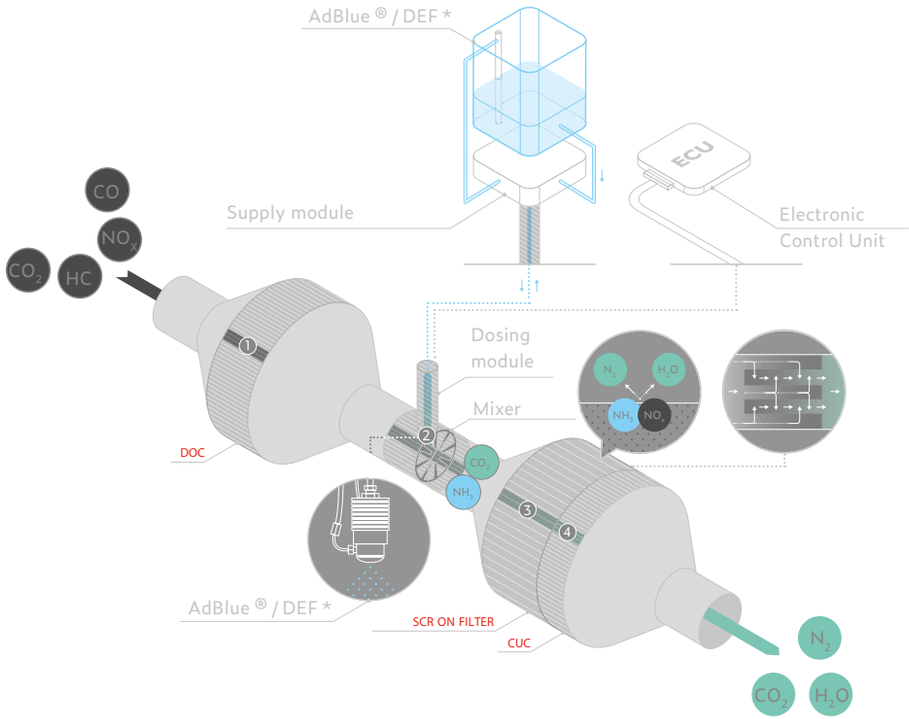
- High performance for increased vehicle productivity.
- No additional complexity and lean design for easier installation and maximum reliability.
-

Low operating costs thanks to high efficiency and long service intervals.

By way of continuous technical advantages our state of the art engine range allows our customers to have class leading features, such as minimized total cost of ownership and outstanding performance. Key to the optimization of engine efficiency is EGR-free combustion on NEF and Cursor engine families, together with high cylinder pressure and high injection pressures: engines adopting the latest generation of Common Rail system feature peak nozzle pressures of up to 2200 bar.

To achieve these targets, crankcase and cylinder head design has been improved to ensure increased structural stiffness. An Electronic Control Unit manages engine parameters and guarantees an accurate control of the after treatment system.

Extended service interval, together with a maintenance-free after-treatment solution reduce running cost for end users.




**1.**
**Diesel Oxidation Catalyst**
NO → $NO_2$
HC, CO and PM oxidation

**2.**
**AdBlue* / DEF Injection**
Hydrolysis → $NH_3+CO_2$

**3.**
**Selective Catalytic Reduction on filter**
NO and $NO_2$ reduction by $NH_3$ to $N_2$ and $H_2O$
PM oxidation with $NO_2$

**4.**
**Clean Up Catalyst**
Residual $NH_3$ oxidation

AdBlue®/DEF
= $CO(NH_2)_2 + H_2O$

**Legend**

PM Particulate Matter
HC Unburnt Hydrocarbons
$NO_x$ Nitrogen Oxides

CO Carbon monoxide
$N_2$ Nitrogen

$CO_2$ Carbon Dioxide
$H_2O$ Water





## Main Components

The whole system is fitted with a network of integrated sensors to control temperature, pressure and NOx levels.

Exhaust gas flow coming from the engine enters the DOC, where NO is oxidised to NO2, in order to maximize SCR catalyst's efficiency conversion.

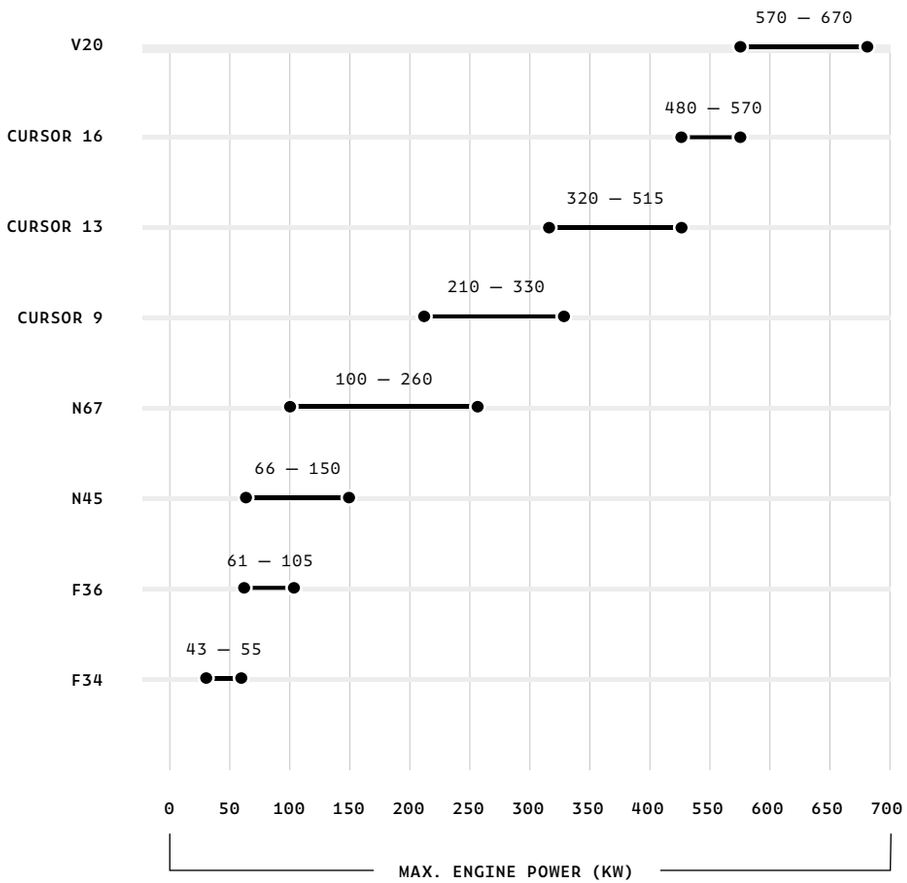
The ECU (Engine Control Unit), the brain behind the HI-eSCR2 system, checks, through integrated sensors network, the amount of Water-Urea (DEF/AdBlue) solution to be injected in the exhaust pipe. To increase the durability of the injector, Dosing Module is cooled by the engine coolant.
The HI-eSCR 2 after-treatment system adopts a filtering device on its SCR catalyst. At the same time as trapping and oxidizing the Particulate Matter, the catalyst converts NOX into Nitrogen (N2) and water (H2O) thanks to the chemical reaction of Ammonia (NH3) generated from DEF/Adblue.
In the end, the integrated CUC eliminates the remaining Ammonia (NH3). The result is a reduction of NOx superior to 95% and the PM levels within Stage V emission limits.

## Patents

- Closed loop control with proprietary algorithms and dedicated sensors to provide accurate monitoring of exhaust gas composition and optimized DEF/AdBlue dosing strategy.
- Thermally insulated high turbulence mixer to allow homogeneous DEF/AdBlue evaporation and urea hydrolysis ensuring correct distribution in exhaust gas flow.
- Optimized exhaust gas thermal management to ensure emission compliance in all working conditions.
- All after-treatment components are packaged in a compact and fully enclosed structure, providing flexible layout options to simplify installation on machines.

# FPT Off Road Engine Portfolio

STAGE V






# THE F5 SERIES

## From 43 to 105kW

**Architecture**
4 CYL, 3,4 - 3,6 L displacements.

**Torque**
Up to 600 Nm.

**After Treatment System**
HI-eSCR2 (above 55kW).

**Service**
600 hours service intervals.



**In construction equipment, constant innovation is key. Even as size requirements for compact vehicle grow more demanding, ever-higher productivity is needed on the fields. New technology boosts performance within existing layout constraints.**

**FPT Industrial's solutions increase engine displacement with no change in external dimensions. Better turbocharger and piston designs bring more power and outstanding torque density for the F5 series. Our innovative products liberate resources by reducing costs and providing simpler maintenance over the lifecycle.**

F36

F34

# Engine Specifications

| Model | Cyl Arrangement Air Handling | Turbocharging | Injection System | Displacement (Liters) | Power (kW) | Power (hp) | Power (RPM) | Torque (Nm) | Torque RPM | Emission Standard | Exhaust System |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F36 | 4L/TCA | WG | Common Rail | 3,6 | 105 | 143 | 2300 | 600 | 1500 | Stage V | HI-eSCR2 |
| F36 | 4L/TCA | WG | Common Rail | 3,6 | 90 | 122 | 2200 | 490 | 1400 | Stage V | HI-eSCR2 |
| F36 | 4L/TCA | WG | Common Rail | 3,6 | 75 | 102 | 2200 | 430 | 1400 | Stage V | HI-eSCR2 |
| F36 | 4L/TCA | WG | Common Rail | 3,6 | 61 | 83 | 2300 | 334 | 1500 | Stage V | HI-eSCR2 |
| F34 | 4L/TCA | WG | Common Rail | 3,4 | 55 | 75 | 2200 | 424 | 1200 | Stage V | DOC+DPF |
| F34 | 4L/TCA | WG | Common Rail | 3,4 | 43 | 58 | 2500 | 250 | 1400 | Stage V | DOC+DPF |

**Legend**

Preliminary engine data for F36 above 56kW.
Max engine capability indicated for F34 below 56kW.

**Air Intake**
TCA Turbocharged After Cooled

**Turbocharging**
WG Fixed geometry turbocharger with WasteGate valve

# The Power of Density

Diesel engines are continuosly challenged to deliver growing performance within existing layout constraints, improving power and torque density through new technologies.
The FPT solution for light and midrange applications above 56kW (75hp) is the new F36 Stage V, increasing engine displacement from 3,4 to 3,6 L with no changes in external dimensions, thus ensuring unchanged compactness.
Improved engine hardware includes new turbocharger and optimized piston design to cope with higher performance, increasing power output by 14% (up to 105kW / 143hp) and torque by 20% (up to 600 Nm), setting best in class torque density in its class.

The lowest EGR rate in the market (<10%) enables to reduce after-treatment dimension by up to 20%; overall after-treatment packaging is unchanged between Stage IV and Stage V, avoiding machine redesign across emission stages.
Sharing the same robust design approach, F34 with 3,4 L displacement covers application below 56kW (75hp) with prompt engine response and high torque output to ensure quick engine reaction to variable loads in compact machineries. Up to 600 hours oil change interval and one-side service ability reduce operating costs and simplify maintenance operations over lifecycle.



# Key Advantages

| | Features | Benefits |
|---|---|---|
| **Performance** | New 3,6 L displacement with 14% higher power and 20% more torque vs. Stage IV.<br>Torque density leadership (+15% than competitors' avg.). 424 Nm output for 34. | Higher output within same engine dimensions.<br>Prompt engine response for all applications, also below 56kW. |
| **Compactness** | The lowest EGR rate in the market (<10%).<br>No changes in engine and ATS dimensions nor in cooling package. | 20% reduction in ATS and urea tank dimensions for F36 above 56kW.<br>Same installation for Stage IV and Stage V footprint. |
| **Ease of use and low cost of ownership** | Best in class 600h service intervals with one-side filters access.<br>Maintenance-free HI-eSCR2 system. | Safe, easy and fast maintenance operations.<br>Reduced operating costs & maximized vehicle uptime. |

# THE NEF SERIES

## From 66 to 260kW

**Architecture**
4 CYL, 4,5 L displacement / 6 CYL, 6,7 L displacement.

**Torque**
Up to 1420 Nm.

**After Treatment System**
HI-eSCR2

**Service**
1200 hours service intervals.



Our NEF series boosts productivity.
More than 1.7 million engines sold attest to FPT Industrial's leadership since 2001.

NEF boasts best-in-class power and torque performance, fuel efficiency and reliability. It is highly flexible, with 4 and 6 cylinder configurations, featuring non-structural design.

The new Stage V NEF series marks an additional leap in efficiency.
With no change in engine size and layout, innovative designs in cylinder head, pistons and turbochargers raise the performance further, leaving the competition behind.



N45

N67

# Engine Specifications

| Model | Cyl Arrangement Air Handling | Turbocharging | Injection System | Displacement (Liters) | Power (kW) | Power (hp) | Power (RPM) | Torque (Nm) | Torque RPM | Emission Standard | Exhaust System |
|---|---|---|---|---|---|---|---|---|---|---|---|
| N45 | 4L/TCA | WG | Common Rail | 4,5 | 150 | 204 | 2100 | 800 | 1400 | Stage V | HI-eSCR2 |
| N45 | 4L/TCA | WG | Common Rail | 4,5 | 125 | 170 | 2200 | 712 | 1500 | Stage V | HI-eSCR2 |
| N45 | 4L/TCA | WG | Common Rail | 4,5 | 103 | 140 | 2200 | 637 | 1500 | Stage V | HI-eSCR2 |
| N45 | 4L/TCA | WG | Common Rail | 4,5 | 89 | 121 | 2200 | 539 | 1250 | Stage V | HI-eSCR2 |
| N67 | 6L/TCA | eVGT | Common Rail | 6,7 | 260 | 354 | 1800 | 1420 | 1400 | Stage V | HI-eSCR2 |
| N67 | 6L/TCA | WG | Common Rail | 6,7 | 212 | 288 | 2200 | 1160 | 1500 | Stage V | HI-eSCR2 |
| N67 | 6L/TCA | WG | Common Rail | 6,7 | 191 | 260 | 2200 | 1159 | 1500 | Stage V | HI-eSCR2 |
| N67 | 6L/TCA | WG | Common Rail | 6,7 | 151 | 205 | 2200 | 940 | 1500 | Stage V | HI-eSCR2 |
| N67 | 6L/TCA | WG | Common Rail | 6,7 | 129 | 175 | 2200 | 802 | 1500 | Stage V | HI-eSCR2 |

**Legend**

Power refers to engine rated speed, except for max engine capability (260kW peak)

**Air Intake**
TCA Turbocharged After Cooled

**Turbocharging**
WG Fixed geometry turbocharger with WasteGate valve
eVGT Electronic Variable Geometry Turbocharger

# Productivity Leader

Developed to satisfy the most demanding productivity requirements in the construction and industrial sectors, the NEF Series is testimony to FPT Industrial technological excellence since 2001, with more than 1.7 million engines produced. Featuring best-in-class power and torque performance, fuel efficiency and reliability, the NEF Series stands out for its flexibility, available in 4 (N45) and 6 (N67) cylinders configurations, with non-structural and structural design.

In its continuous commitment to provide leading products and improved solutions, FPT Industrial introduces the new Stage V NEF Series setting a further step towards higher productivity. Maintaining the same engine dimensions and layout of previous versions, cylinder head, pistons and turbochargers have been redesigned for performance increase: up to 150 kW on N45 (+15%) and up to 260 kW on N67 (+13%) to deliver best in class power and torque density (up to +15% Vs. competitors average).

New filters with increased capacity and clogging sensor are capable of up to 1200 hours service interval, the longest in the market and twice the previous interval. This new feature comes along with the innovative HI-eSCR2 after-treatment system, which comply with Stage V regulations with a maintenance-free, contributing to low operating costs.

Proven and further enhanced EGR free combustion guarantees the fuel efficiency of NEF Series, together with additional improvements in fluid consumption, leveraging on reduced frictions for leading efficiency compared to competitors using EGR and DPF.

Lean design with no EGR and single stage turbocharging, available both as fixed or variable geometry, is a made-to-last solution ensuring maximum reliability. Thanks to the dimension-neutral approach granted by HI-eSCR2, Stage V solution features unchanged packaging and same cooling requirement compared to Stage IV.



# Key Advantages

| | Features | Benefits |
|---|---|---|
| **Performance** | Best in class power and torque density : up to +15% vs. competitors average in 6 L engine range. | Performance increase with same engine displacement and no layout changes. Maximized power, torque and transient response |
| **Low TCO** | New high capacity filters with clogging sensor. Maintenance-free ATS. New piston rings design & advanced machining process | Best in class service interval up to 1200 hours. Low running costs over lifecycle. Reduced oil consumption. |
| **Reliability** | Lean design with no EGR and single stage turbocharging solution. | Ensuring robustness and durability. Proven system reliability. |
| **Flexibility** | No changes in cooling package required. | Unique solution across emission stages (StageIIIA to StageV). |

# Our wide range of solutions for construction machines offers optimum flexibility, improves efficiency and boosts productivity

# THE CURSOR SERIES

## From 210 to 570kW

**Architecture**
6 CYL , 8,7 - 12,9 - 15,9 L displacements.

**Torque**
Up to 3320 Nm.

**After Treatment System**
HI-eSCR2

**Service**
600 hours service intervals.



The CURSOR family responds to the most demanding heavy-duty needs in a wide range of construction sector applications from 210 to 570 kW. Through ongoing innovation, these engines have constantly kept up with a growing demand for performance and with stricter emission regulations.

Research-driven advances have led to innovative technical contents, including variable-geometry turbochargers, high-pressure common rail injection, new materials and breakthrough after-treatment technologies.



CURSOR 9

CURSOR 13

CURSOR 16

# Engine Specifications

| Model | Cyl Arrangement Air Handling | Turbocharging | Injection System | Displacement (Liters) | Power (kW) | Power (hp) | Power (RPM) | Torque (Nm) | Torque RPM | Emission Standard | Exhaust System |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cursor 9 | 6L/TCA | WG | Common Rail | 8,7 | 245 | 333 | 2100 | 1510 | 1500 | Stage V | HI-eSCR2 |
| Cursor 9 | 6L/TCA | WG | Common Rail | 8,7 | 265 | 360 | 2100 | 1620 | 1500 | Stage V | HI-eSCR2 |
| Cursor 9 | 6L/TCA | WG | Common Rail | 8,7 | 305 | 415 | 2100 | 1800 | 1500 | Stage V | HI-eSCR2 |
| Cursor 13 | 6L/TCA | WG | Common Rail | 12,9 | 346 | 471 | 2100 | 2000 | 1400 | Stage V | HI-eSCR2 |
| Cursor 13 | 6L/TCA | WG | Common Rail | 12,9 | 384 | 522 | 2100 | 2258 | 1400 | Stage V | HI-eSCR2 |
| Cursor 13 | 6L/TCA | WG | Common Rail | 12,9 | 407 | 554 | 2100 | 2400 | 1400 | Stage V | HI-eSCR2 |
| Cursor16* | 6L/TCA | WG | Common Rail | 15,9 | 480 | 653 | 2100 | 2751 | 1500 | Stage V | HI-eSCR2 |

**Legend**

* Max performance on Cursor16: 570 kW @ 2100 rpm/ 3320 Nm @ 1500 rpm
Power refers to engine rated speed

**Air Intake**
TCA Turbocharged After Cooled

**Turbocharging**
WG Fixed geometry turbocharger with WasteGate valve

# Designed to Go Beyond

Developed for the most demanding heavy-duty needs, the Cursor series features a robust design for highly intensive work in a wide range of construction sector applications from 210 to 570 kW. First launched in 1998, the Cursor range has gone through continuous improvements to keep pace with growing market requirements in performance and efficiency, while complying with stricter emission regulations and always offering innovative technical contents, such as variable-geometry turbochargers, high-pressure common rail injection, new materials and breakthrough after-treatment technologies.

All Cursor engines share 6 cylinder architecture and EGR-free technology, ensuring optimal engine output with highly efficient combustion, resulting in effective performance and low cooling requirements, unchanged from Stage IIIA to Stage V for smart synergies across machine layouts. Moreover, all engines meet Stage V regulation with maintenance-free HI-eSCR2 system, the latest generation of FPT's longstanding experience in after-treatment technology, proven by more than 1 million systems sold to date. With no need to replace the filter during the lifecycle and oil change intervals of up to 600 hours, running costs are minimized.

Cursor 9, with 8,7 liters displacement, is a compact and yet powerful solution in 210 to 330 kW range, adopting a 1800 bar common rail system, fixed or variable geometry turbocharger resulting in prompt engine response and leading power density (up to 7% better than market average).

With 12,9 liters displacement, Cursor 13 features heavy-duty 2200 bar common rail system and newly designed engine hardware for maximized robustness and durability. Cursor 13 also covers the power range from 320 to 515kW thanks to its single and high performance two-stage turbo.

Awarded as Diesel of the Year in 2014, Cursor 16 is the latest addition to the Cursor range, with 15,9 liters displacement and up to 570kW delivering 18 liters-like performance in a 13 liters package, with leading power-to-weight ratio (0,5 hp/kg). 2200 bar common rail system, innovative ball-bearing turbocharger, high-resistance cylinder head in compacted graphite iron (CGI) and more than 20.000 hours of bench-test specifically dedicated to off-road missions, make the Cursor16 a strong, reliable yet compact solution.



# Key Advantages

| | Features | Benefits |
|---|---|---|
| **Performance** | Portfolio for any mission. Leading power density with up to +7% Vs. market average in 9 L range. No EGR architecture. | Wide engine range covering up to 570kW. Effective performance. Maximized power, torque and transient response |
| **Low Operating Costs** | EGR-free combustion. Maintenance-free ATS. Extended oil service intervals. | Optimized fluid efficiency. Low running costs over lifecycle. Maximum uptime: 600 hours service intervals. |
| **Reliability** | Heavy-duty design with high pressure common rail injection. Lean design with no EGR and single stage turbocharging solution. | Proven system reliability. |
| **Flexibility** | No changes in cooling package required. Unique solution across emission stages. | (StageIIIA to StageV). |

# THE V SERIES

## Up to 670kW

**Architecture**
8 CYL V, 20 L displacement.

**Torque**
Up to 4095 Nm.

**After Treatment System**
HI-eSCR

**Service**
600 hours service intervals.



**The V20 engine is a testimony to FPT Industrial's excellence in hi-tech, reliable products that create value for users in the field. The new flagship 20-litre engine has a lean V8 architecture, with a highly compact layout and low engine weight. Superior efficiency is combined with reduced engine friction. An innovative Stage V after-treatment solution curbs operating costs and downtime.**

**Robust engine design is coupled with new cast-iron components and advanced materials. Solidity goes hand in hand with unfailing performance, in all conditions.**

V20

# Engine Specifications

| Model | Cyl Arrangement Air Intake | Turbocharging | Injection System | Displacement (Liters) | Power | | | Torque | | Emission standard | Exhaust System |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (kW) | (hp) | (RPM) | (Nm) | RPM | | |
| V20 | 8V/TCA | WG (1 x bank) | Common Rail | 20.1 | 670 | 910 | 1800 | 4095 | 1500 | Stage V | SCR |

**Legend**

**Arrangement**
V V-configuration (90°)

**Air Intake**
TCA Turbocharged After Cooled

**Turbocharging**
WG Fixed geometry turbocharger with WasteGate valve

**Exhaust System**
SCR Selective Catalytic Reduction

# Power without Compromise

In order to provide hi-tech reliable products designed for the toughest missions, FPT further extends its offering with the new V20, a compact yet high-performing engine with up to 670kW power output.

The brand's new flagship 20-litre engine features an enhanced V8 architecture, with a 90° angle between cylinder banks, resulting in highly compact layout and low engine weight to ensure space-optimized installations while guaranteeing the right power is available in every condition, thanks to advanced engine hardware and two turbochargers optimized for any working point.

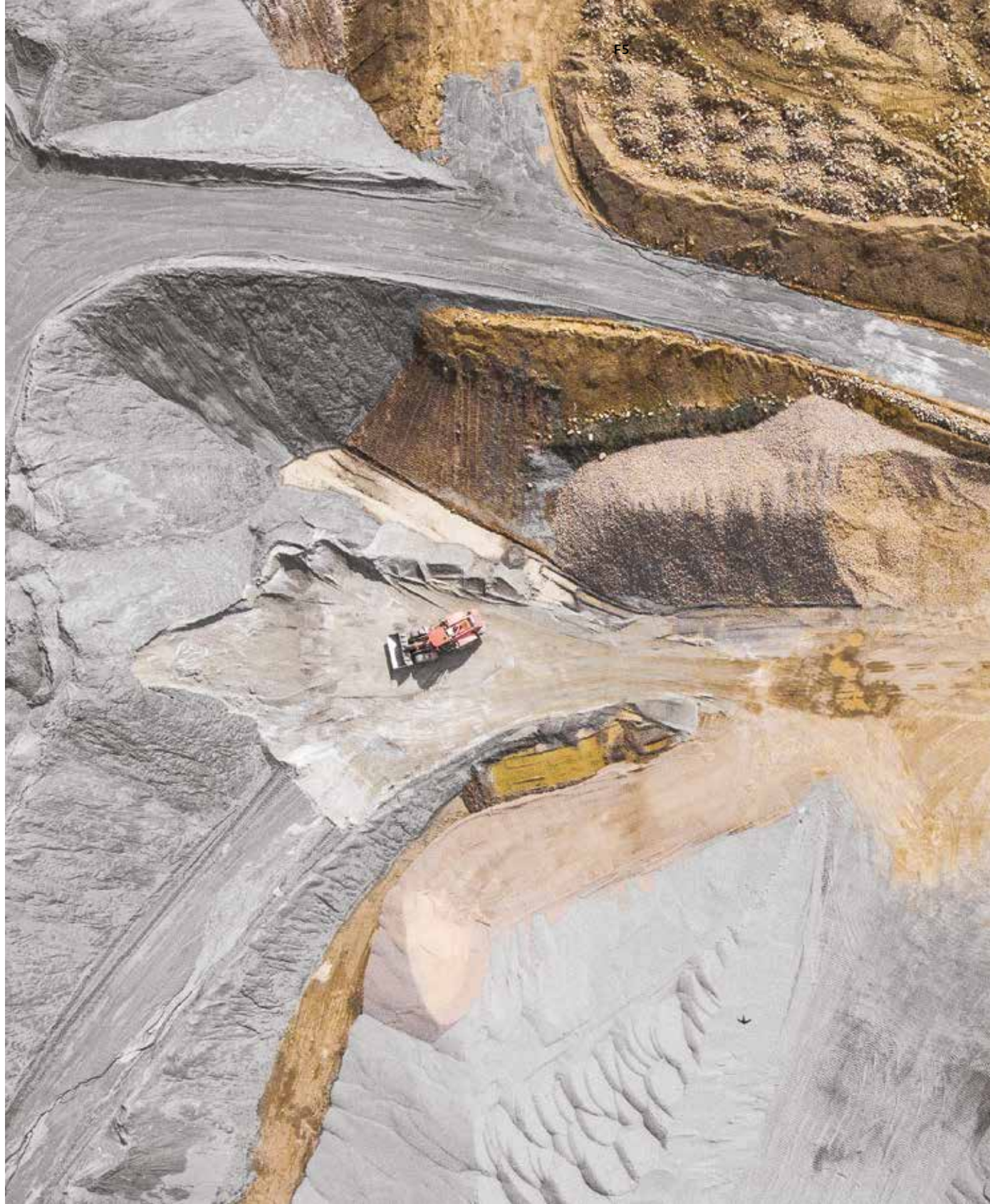
With its EGR-free, optimized combustion, the V20 boasts superior efficiency, together with V8 layout reducing engine friction compared to more complex V12 architectures. Operating costs and uptime are ensured by the maintenance-free Tier 4 Final and Stage V-ready after-treatment solution, an SCR-only system based on longstanding FPT experience in SCR technology, requiring no need for maintenance over lifecycle.
To grant the highest robustness, engine design shares 2200-bar common rail system and key components with reliability-proven Cursor engine series; furthermore, the newly designed 220 bar in-cylinder pressure-capable engine structure adopts new cast-iron components and advanced materials on valves, crankshaft and compressor wheel.



# Key Advantages

| | Features | Benefits |
|---|---|---|
| **Performance** | 0,6 hp/kg power-to-weight ratio (+13% & Compactness Vs. avg. V12 competitors). No EGR & 220 bar of in-cylinder pressure. Turbochargers resistant to high temperatures. | The most compact high-performance engine optimized combustion. Uncompromised performance output in all conditions. |
| **Efficiency & Total Cost of Ownership** | EGR-free architecture & 2200 crankshaft bar-capable Common Rail system. Cross-bank turbocharger configuration. | Maximum engine efficiency. |
| | "Fit and Forget" DPF-free after-treatment system. Optimized fluid dynamics. | No need for maintenance - maximum uptime. |
| **Robustness & Reliability** | Steel pistons and high-pressure injection system from Cursor series. New advanced materials on valves, turbochargers, head. | Proven reliability. Optimized engine structure. |
| | SCR-only and DPF-free after-treatment solution. | Effective emission-compliance. |

**Our commitment to results has made us a leading player in engines, axles and transmissions for the industrial sector.**



# THE POWER PACK

## ATS Smart Installation Package



The Power Pack is our new, smart installation solution. All key after-treatment components fit into one compact, pre-assembled set. This comes as engine-mounted solution, providing a ready-to-use solution, or as loose pack to allow OEMs to design their own layout. A wide set of options can be easily custom applied to fit a wide range of applications.

This is an ideal response to the lower emission limits entailed by Stage V legislation. Compliance and machine upgrade become easier, for both mobile and stationary applications.

THE POWER PACK

# Emissions Compliance Made Easy

Stage V legislation will bring a further reduction on emission limits and extend regulation also to stationary applications and power ranges currently at Stage IIIA, thus requiring a wide range of applications to upgrade to this next emission step.

For both mobile and stationary applications, FPT introduces a new, smart installation solution, enclosing all key after-treatment components into a single package: DOC, SCR on Filter, AdBlue injection system and all required sensors, together with manifolds, are included in a compact and pre-assembled pack avoiding the need of a dedicated exhaust system design. The pre-packed solution, moreover, offers FPT's pre-validated design in terms of fluid-dynamics, manifold layout and sensors position in order to make final validation process lean and easier.

All electrical signals and connection are managed by a single cable for fast, reliable, and quick connection to engine and machine electronic management system.

All productivity benefits of FPT Industrial technology, in terms of performance and efficiency, together with the innovative HI-eSCR2 system ensuring Stage V compliance with a maintenance-free solution, comes in a simple and flexible package.



# Key Advantages

| | Features | Benefits |
|---|---|---|
| **Robustness** | Fully pre-packed solution. | No specific exhaust system design. |
| **Installability** | Loose ATS pack or engine-mounted solution.<br>Flexibility of installation.<br>From 12 after treatment components to 1 package/all signals into a single cable. | Quick installation solution. |
| **Flexibility** | Robust pre-validated package.<br>Lean application sign-off. | Smart installation package.<br>Easy emission upgrade. |

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