

FISH-EYE \_\_\_\_\_

DOOSAN DX800LC AND PERKINS

# A STAGE V TOP-NOTCH EXCAVATOR

*Standing at the top of Doosan tracked excavators range for operational weight and performance, the DX800LC-7 relies on the 403 kW 6-cylinder Perkins 2506J engine, Stage V version*



**PERKINS**

## The engine: Perkins 2506J

Perkins based its comeback in industrial applications on two pillars: the Syncro series compact engines, in particular the 2.8 and 3.6 litres (which are ideal for telehandlers) and the displacements inherited from Cat and reworked in Peterborough, those between 9 and 18 liters. The latter family also includes the 6-cylinder, 2.5-litre cylinder displacement, 2506J-E15 model used by Doosan in the 402 kW at 1,800 rpm rating. Default power rates are set at 433 and 444 kW at 2,650/2,700 Nm. The 16 litres displacement range is crowded with a quite a large number of competitors: the only V 8-cylinder engines are Liebherr and Scania. Compared to the competitors, in fact, the 2506J does not shine for specific curves but rather for absolute density, that is the weight/dimension ratio. The 15.1 litre, featuring a liter less than many opponents, wins the lightness Index.



## Main pumps and main control valves

Bosch Rexroth provided both the main pumps and main control valves, key elements indeed within the hardware of the Doosan D-Ecopower+ suite. The two variable displacement tandem axial piston pumps ensure maximum flow of 504 liters per minute each, with a pressure of 100 bar at 1,800 rpm. Through the electronic signal of the EPA system, the amount of the hydraulic flow necessary for each device will be controlled individually, precisely calculated and delivered. As a result, less fuel is consumed and, at the same time, higher productivity is possible. Bosch Rexroth's main control valves ensure an increased flow due to the larger caliber spool (+14 percent). Friction is decreased and speed of hydraulic flow is increased. In situations with rapid flow changes, a cavitation phenomenon may occur within the cylinder and cause damage to the hydraulic system. The machine uses the EPPR valve. Thanks to its electronic control, the system adjusts the width of the hydraulic oil outlet. It is thus able to maximize productivity and prevent damage due to cavitation, also maintaining the equipment to its optimal conditions.

**A** rather wide range – we are talking about Doosan crawler excavators from Korea, quite a benchmark in construction machinery – which adds a notable model, featuring a Stage V engine and filling a gap at the top in terms of operational weight, power and performance. The Doosan crawler excavators range now spans from 1 to 80 tons. Its name is DX800LC-7, the serial code referring to the almost 80 tons operating weight that matches a 4.6 cubic meters bucket capacity and a digging force of 37.6 tons (bucket) and 33.5 tons (boom). The Korean manufacturer highlights the work done to optimize hydraulic flow, thanks to Doosan D-Ecopower+ technology and some wise choices regarding key components.

The Doosan DX800LC-7 excavator is intended for «mining and quarrying applications, removing overburden and loading large amounts of material into articulated dump trucks or rigid frame trucks. The DX800LC-7 may also be operated on large construc-

**Perkins' 2506J Stage V engine entails an aftertreatment system made of SCR, DOC and DPF. The latter is capable to automatically regenerate every 25 hours without affecting the excavator in action**

tion and infrastructure projects, particularly where considerable amounts of material need to be excavated and stockpiled or loaded into trucks to be moved».

In a nutshell, a machine needing considerable power precisely to reliably carry out rather burdensome tasks. Also and especially thinking about this – but of course without neglecting sustainability – Doosan chose the Stage V version of the reliable Perkins 2506J engine, delivering slightly more than 400 kW (403, to be precise) at 1,800 rpm. This entails an aftertreatment system which includes EGR valve, SCR, DOC – diesel oxidation catalyst – as well as a particulate filter (DPF) - which according to Doosan «automatically regenerates every 25 hours and the excavator continues to work unaffected du-

ring this regeneration phase. The operator can check the status of the DPF via the display on the gauge panel in the cab».

Also worth mentioning is the collaboration between Doosan and carefully selected component or accessory suppliers. Three names above

all, the Italian Berco for the undercarriage, Doosan Mottrol (here Doosan plays at home...) for the rotation mechanism and finally Bosch Rexroth for hydraulics key components, improved to match hydraulic flow with the great power delivered by the engine. We refer in particular

to the main pumps and the distributor which we delve into in a specific box. The new DX800LC-7 features a closed-center VBO (Virtual Bleed Off) system based on the proprietary D-Ecopower+ technology delivering 1,008 litres per minute, well over the 872 litres per minute of the previous model, the DX700LC (a 16 percent more).

«A closed center main control valve minimizes pressure loss, while the electric pressure-controlled pump manages and optimizes engine power more effectively. Software is utilized to electronically reproduce the full benefits of an open centre hydraulic system with very little energy loss. The hydraulic system and engine output are fully optimized and synchronized, further reducing losses within the system», adds Doosan.

