

# Imagining the future of hydraulic excavators

All around us—in residential construction and road-building applications, commercial building sites and demolition operations—we see hydraulic excavators at work. While their basic function has not changed in decades, the technology applied to these machines has changed dramatically in recent years.

CNH, with interests in **Sumitomo** and **Kobe Steel**, is the power behind the **Case**, **Kobelco**, **New Holland**, and **Link-Belt** brands of hydraulic excavators. With engineers who touch every aspect of product development, CNH is in a unique position to comment on developments in excavator technology.

As recently as the 1970s, the operator used mechanical controls to swing the housing, raise and lower the boom, and curl and uncurl the bucket. All this maneuvering was usually done from an open-air, pedestal seat, and significant training and practice were needed for effective operation.

The idea of an enclosed cab was optional, so for most operators, loud noise and exposure to adverse weather came with the territory. To keep abreast of the machine's running condition, the operator checked (or ignored) a set of mechanical gauges, which were limited to oil pressure, temperature, and voltage/amperage.

Today's excavators stand in sharp contrast to past machines. Now, the operator rides on a suspension seat in a controlled HVAC environment.

Hydraulic and electronic pilot controls and electronic instrument clusters make the operator's job easier, with variable hydraulics, integrated power controls, and optional modes of operation matching power supply to demand. We actually refer to our Case excavators as "thinking machines" because of the onboard diagnostics and advanced electronic controls that assist the operator, increasing productivity both for highly skilled and less-skilled operators.

Reduced weight structures and improved kinematics characterize today's excavators, which helps to improve fuel

economy and reduce operating costs. Other improvements that lower operating costs include extending service intervals and enhancing the ease with which equipment can be serviced, which also increases the likelihood that it will be properly maintained.

Today's excavators are quieter and cleaner, with reduced noise inside and outside the machine and reduced emissions complying with tough standards in countries around the world. They are also more considerate of the environment with the use of bio-friendly oils and leak-control designs. And they are designed with improved visibility so it is easier for the operator to see and react to bystanders.

Future excavators will have sophisticated climate-control systems that will deliver even better temperature, humidity, and air-quality control. We will be using "smart" glass that, in addition to being self-tinting, will offer improved water repellent and noise abatement features.

Tomorrow's excavators will feature 360° visibility, with assisted and unassisted solutions. Also in the works are active noise and vibration suppression. Operators will enjoy more ergonomic handling with automatically controlled dynamic stability.

Expect major changes in the power system as diesel/electric hybrids and alternative bio-fuels come off the drawing boards. High-pressure, variable hydraulics, electric-motor-powered kinematics, and regenerative systems are just some of the power enhancement systems to look for. Composite materials will be used more in future excavator power systems, reducing weight and adding strength.

Equipment noise will be lower than operating noise. Zero-exhaust emissions will become a reality, and machines will be fully recyclable.

How soon are you likely to see any of these technologies? CNH is already at work on innovations like these, as are other major equipment manufacturers. You can take a look at the future at the next construction equipment trade show ... or you can keep an eye on the construction sites near you. **OHE**



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Case CX210



Kobelco ED190