HYBRID EXCAVATOR
PRODUCT FOCUS

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KOBELCO SK210H HYBRID EXCAVATOR

Whilst hybrid technology is fairly commonplace in cars, excavators have a greater demand for power so face some further challenges. Kobelco have addressed these and implemented an impressive system that not only improves the fuel efficiency of the machine, but also boosts its power and production capabilities. Proving that efficiency doesn't have to compromise performance.

The Kobelco Hybrid system works in a number of ways to improve efficiency and power output.

1. During slew acceleration - the motor is powered solely by an electric motor and lithium-ion battery

2. During Slew Deceleration - the braking energy generated is converted back into electricity and stored in the lithium-ion battery.

3. During High load operation - The electricity accumulated in the lithium-ion battery allows the generator to assist the engine and boost power by 25kw. Assisting the engine also see's fuel consumption reduced.

4. During Low load operation - The Engine power is used to generate electricity in the generator motor, and this electricity is stored in the lithium-ion battery.

Fuel Saving over conventional excavator - 12.1% to 16.7%

Operating Weight - **23,100kg** Dig Depth - **6.7m** Dig Reach - **9.73m** Machine Width - **2,990mm**
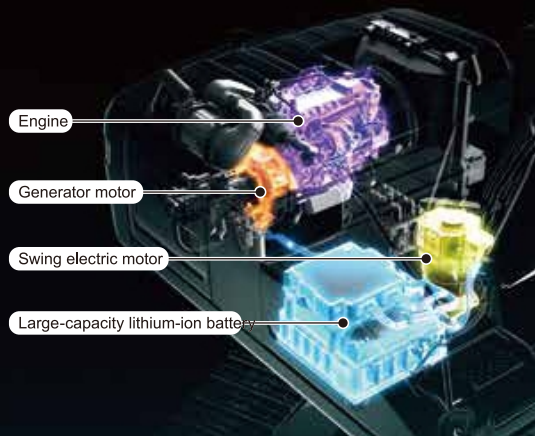
New Hybrid System NEW

KOBELCO's original hybrid system has further evolved. The newly adopted swing electric motor provides operability unique to a hybrid machine. Furthermore, the large generator motor driven by the large-capacity lithium-ion battery constantly assists the engine, greatly reducing the engine load. The new hybrid system eectively supports fuel eciency and power for swing, digging, and traveling, thus realizing a workload which far exceeds that of conventional machines.

Engine

Generator motor

Swing electric motor

Large-capacity lithium-ion battery

TRIAL RESULTS

Fuel Consumption	Kobelco SK210H	Tier 4 22t Excavator
Run 1	11.4	17.1
Run 2	12.1	16.8
Run3	11.7	16.9
Average	11.73	16.93

Time taken Seconds	Kobelco SK210H	Hitachi ZX210/6
Run 1	158	162
Run 2	154	165
Run 3	162	161
Average time	158	163

Average fuel used per load litres	0.51	0.74
100 loads	51.50	74.32
Saving		22.82 Litres
Cost (80ppl)	£0.41	£0.59
100 loads	£41.20	£59.45
Saving		£18.26

The intelligent hybrid system fitted to the Kobelco not only utilises an electric slew motor, but a sequence of lithium-ion batteries that can be charged both from the power of the diesel engine and the deceleration motion of the slew ring. This electricity can be used both to power the slew motor or be regenerated back into the diesel engine to remove strain and save fuel, it can also be used to boost the Diesel engine power by up to 25KW.

2021 will see more of these top of the range excavators added to our 600 strong hire fleet, giving our customers access to best practice equipment that will not only provide them with a fuel and time saving, but will wipe 53,000 tonnes of CO2 per year from their carbon footprint, that's the equivalent of taking 22 range rovers off the road!

So about the test, we tested the excavators in identical conditions giving them the same task to complete on the same stockpile. The excavator was to load one of our Ashvale Haulage 8 wheel tipper lorries with un-screened road stone. Slewing from 180 degrees, and loading 18 tonne to the lorry and alerted by the on-board weigh loader once this weight was achieved.

The results showed that both machines took a similar amount of time to load the lorry, however the Hybrid on average was marginally faster by 5 seconds, showing that the hybrid is every bit on par with the conventional excavator in terms of speed and power. For fuel consumption the average saving for the Kobelco Hybrid was 5.2 litres per hour better off, meaning that over 100 loads 22.8 litres less diesel is used.

Having carried out these back to back comparisons we can see the direct benefit of these excavators and there is definitely a place for them here on our fleet. This Hybrid excavator is just one example of a way we minimise our impact on the environment, and through 2019 we will be showcasing more of the initiatives we are using here at the M O'Brien group