Breaking New Ground

Mark Anthony reports on a specialist mining equipment company that has taken a fresh look at hydraulic hammer design to produce a unit that is claimed to be quieter and significantly more powerful than a conventional breaker of a similar size.

Save for making them a bit quieter, a tad more powerful, a smidgeon more hydraulically efficient and a soupcon more aesthetically pleasing, hydraulic hammers have remained largely unchanged in the 40-odd years that they have graced the demolition industry.

For all the technological wizardry at the disposal of the modern equipment designer and manufacturer, the hydraulic hammer remains, ostensibly, a piston striking one end of a hunk of steel, transferring that force through the steel to the appropriately-shaped tip to fracture and break the chosen material.

Is that proof that the basic design of the original hydraulic breakers was just so good and ahead of its time that, aside from a few cosmetic tweaks, it's impossible to improve? Or does the design, development and manufacture of these vital demolition tools merely need a fresh set of eyes? Ian Webster of Webster Equipment certainly believes it is the latter, and has set out to prove as much with his RH-4500 high energy hydraulic breaker. And based upon our initial impressions of his new baby, he might just be right.

RUN ON TICK-OVER

Webster, best known for his line of Rock Wheel attachments, says he has been working on the design of the new breaker on and off for around 15 years. And, with patents still pending on the revolutionary design, he is somewhat cagey about what lies within the RH-4500's

sound suppressed and distinctive 'tubular' body. "It does not work at all like a conventional breaker," he says. "We utilise a larger weight and the hydraulics are used merely to prime it. As the weight is travelling downwards, there is no additional strain placed upon the carrier, just a slight kickback as the energy is released Slight kickback is an apt description, as Webster claims he can stand a glass of water on the breaker while it is working. "The water will move about a bit but it won't splash everywhere or fall off," he asserts. Although few contractors are ever likely to feel the need to operate their breaker with a cool beverage on top, that simplistic test illustrates another key factor in the RH-4500's armoury. "In a conventional breaker, the hydraulic oil works really hard. This is clearly seen when a hammer has been operating for a prolonged period and the hoses get too hot to touch," Webster explains. "Our system utilises considerably less energy. Not only does that help safeguard the hydraulic hoses and oil, it also means that we can operate our breaker on engine tick-over, greatly reducing carrier fuel consumption."

SHOTGUN VS UZI

The first thing you notice about the RH-4500 is the noise it generates or, more specifically, the style of noise it produces. While it is virtually impossible for the human ear to accurately pinpoint variations in decibel levels, the quality and frequency of sound from the RH-4500 is markedly different to that from a conventional hammer. Imagine the "bang-click" sound of a pump-action shotgun compared to the constant Uzi-style clatter of a traditional hammer and you have some idea of the difference.

Based on a simple test on a block of concrete, that difference in sound is replicated in a difference in breaking ability. While a traditional hammer relies upon repeated, high frequency blows, the Webster unit opts for a less-is-more approach, hitting less frequently but hitting considerably harder. According to Webster's trials, a standard 850 kg hammer will deliver a blow energy of 1,720 Joules at the tip of the steel for a 2:1 power to weight ratio. The 650 kg RH-4500 develops 4,500 Joules to deliver a thumping 7:1 power to weight ratio equivalent to seven Joules per kilogram.

JOIN THE QUEUE

This story does come with a kicker, however. As it stands today, a new style hydraulic hammer that might revolutionise the sector is not currently available to buy. Recognising the global potential for his new product, Webster believes he will require additional investment to bring the product to market, whether that be as Webster Equipment or with a strategic partner. Either way, he remains confident that his breaker – and he is working on 150 (1,000 J), 450 (2,500 J) and 2,000 kg (12,500 J) derivatives – will be available in 2013.

Just remember where you read about it first.

To view an exclusive video of the Webster RH-4500 in action, please visit: http://tinyurl.com/dyfy2u9