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NEW vs OLD COMPARED



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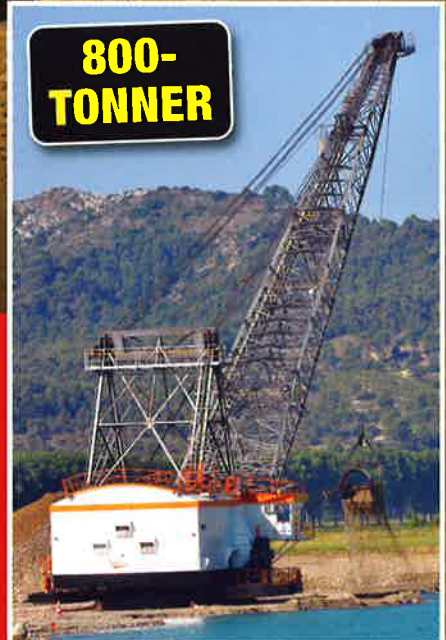
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NEW vs OLD

To mark an important milestone in British engineering, Dan Gilkes compares a 35-year-old JCB backhoe with its modern equivalent.

The iconic British brand JCB is celebrating 60 years of backhoe-loader production. Having sold more than half-a-million examples, the firm certainly has much to shout about.

The idea for the JCB backhoe-loader first came about when Joseph Cyril Bamford was on an overseas trip in 1953, selling his Major Loadall tractor-loader. He spotted a backhoe attachment in Norway, purchased one and took it apart, looking for ways in which it could be improved. It had a limited slew envelope, so expanding it to a full 180 degrees was high on the agenda. He then mounted it to the back of the Major Loadall, creating what was to be named as the JCB Mk1 backhoe-loader.

We've certainly come a long way from that early machine, though despite all of the more recent developments the backhoe-loader remains a four-wheeled base machine with loader arms at the front and a backhoe at the rear. While it has become more of a versatile tool carrier than a simple digger these days, operators of those early JCB backhoe-loaders would probably still recognise the machines of today.

But how would they compare? We weren't able to get our hands on an original Mk1, as very few still exist outside museums, but we did manage to locate a pristine 1978 3C MkIII. The machine will be exhibited at shows around the country, but this is probably one of the very few chances to actually dig with it.

The 3C MkIII consolidated JCB's position as a major backhoe-loader manufacturer throughout the 1970s and is one that will no doubt be very familiar to **EARTHMOVERS** readers of a certain age. Certainly the first JCB that I ever drove was a 3C III.

The 3C series was an incredibly important machine for JCB, bringing the sideshift backhoe mounting to the market and contributing to record turnover year on year throughout the late 70s. Indeed, by 1979 the 3C III was said to be outselling all of its global competition put together.

But could it really stand alongside today's Stage 3B emissions-compliant 3CX, from a backhoe-loader range that continues to dominate the global market? To find out, we decided to pit the machine against the latest 3CX Sitemaster model at JCB's Ashbourne proving ground.

To make a valid comparison, we called upon local owner-operator Chris Wheawall to drive both machines. The owner of a 3CX Contractor, Chris's father started out in the business in the 1950s with a JCB 4, while Chris first took the controls at the age of 11, in a 3C Mk II.

RESTORATION

The 3C III belongs to JCB's worldwide backhoe-loader marketing manager Julian Carder. No stranger to renovations, Julian purchased the machine in February 2003 as what was described as a 'barn find'. Though a runner, much of the machine had rotted away and the painstaking restoration has taken months to complete, as parts were sourced from around the world.

Taking on a bare metal restoration is never an easy task, but for Julian the 3C III has become a labour of love. He hadn't actually been looking for a project when the machine caught his eye, but the high specification, and relatively low use resulted in a bid.



Main Picture: Getting back to basics: how does a 1970s JCB 3C MkIII backhoe-loader compare with a modern 3CX Sitemaster?

Right: Julian Carder with his immaculately-restored 1978 3C MkIII, which features the rare torque converter transmission.





The 3C III offers a maximum backhoe digging depth of 4.12m and a load height of 3.35m.

The 3C III had been built in 1978 for the London Borough of Lewisham's Environmental Services Department. It was mainly used on sewer and drain repairs, and in the winter months was used to load gritter lorries. This had resulted in serious corrosion on the front end and the loader arms of the machine.

Originally priced at £19,400 ex-works, the machine was specified with a torque converter transmission, six-in-one front bucket and a hand-held breaker mounted on the side. Typically for a local authority machine, the JCB had not been worked hard, though a broken hour meter makes it impossible to know exactly what the machine has done.

The council sold the machine in 1990 at auction and a trader in Northampton then sold the machine to a chicken farmer, who used it to clear snow in the winter. For many years the machine sat in a barn, unused, and Julian paid for £4500 for it. The good news was that the 3C III was in decent mechanical order. The hydraulic, torque converter and transmission oils were also very clean.

Julian said, "The steering was good and the brakes. The transmission worked and the bushes and pins were all good. That was an indication to me that it had been looked after."

The cab however was rotten, and many panels were virtually non-existent. The seat base had also been consumed by corrosion and the council salt had taken its toll on one side of the front of the machine.

"Sourcing all of the parts took a long time, as I wanted to keep it original," said Julian.

However, being in charge of marketing within JCB's backhoe loader division he obviously had a head start and was able to find parts buried deep within the stores of JCB dealers in Ireland, Cyprus and Denmark. Oddly enough, most of the missing parts that could not be sourced from dealers, were found on the US side of eBay, including the wiring harness and all the lighting.

All of the metal fenders were fabricated by a company in Stoke, along with re-plating of the loader arms and a full refurb of the front bucket. All of the



Above and Above Right: The Leyland engine delivers 70hp backed up by 258Nm of torque at 1300rpm, compared with the ultra-modern JCB motor rated at 91hp and 433Nm of torque at 1400rpm.



Right: Older readers will be familiar with this view; for younger readers this was the height of sophistication in the late 1970s.



hydraulics were fine, and all but two of the rams were in good condition, though all hoses were replaced and the cylinder resealed. The wheels were not original however, so Mr Carder sourced a replacement set from eBay.

"The big thing was doing the metalwork," he said. "It cost thousands."

Indeed rebuilding the cab alone took £5000 of work and as Julian is not a welder it meant calling on outside contractors to do the job. Once complete, the entire machine was cleaned and shot-blasted before repainting. Even here there were problems though, as it is no longer possible to buy the original lead-based JCB paint.

He did however find someone who could mix the paint to the correct colour and the machine looks stunning, with its glossy paint showing real depth in the winter sunlight. Once painted, every sticker and decal had to be recreated from original drawings.

"Some of the guys here in our office actually remembered designing the machine, which helped," said Julian.

The result is a faithful restoration that returns the JCB to its original glory of a very high specification, local authority 3C III, complete with hand-held breaker, 6-in-1 shovel with forks and the rare torque converter transmission.

HEAD TO HEAD

Standing side by side it is easy to see the shared ancestry of the two JCBs. While memory says that the 3C III was a heavy, solid machine, it looks almost delicate next to the modern model. The huge white cab dominates the machine, with its sliding upper window and swing-out lower barn door providing relatively easy access.

Inside the cab is where the real culture shock takes place: a bare metal floor with rubber mats and with its floor-hinged pedals and the three separate levers to operate the front loader. But even here, though, you can see some similarities, e.g. large buttons that can be operated while wearing gloves in both the old and new machines.

Fire up the engine in the 3C III and the second shock is the noise, along with the occasional puff of smoke; this is pre-Stage anything in terms of emissions.



Although there is not a huge difference in actual eye level of the operator, the modern ergonomic design of the 3CX provides much better all-round visibility.





Above (Two Pictures): In this configuration, the modern 3CX still comes with the same X-pattern backhoe levers as the older machine.

Despite its age though, the four-cylinder Leyland motor puts out a healthy 70hp backed up by 258Nm of torque at just 1300rpm. It's accompanied by a 'potato-potato' soundtrack that is somehow more reminiscent of an early Harley-Davidson than a digger.

As mentioned, this 3C III has the rare torque converter transmission, rather than the standard nine forward gear manual (three-speed with three ranges). This was a popular choice with local authorities wanting to use the machine primarily as a loader, as the torque converter provides instant direction changes and additional tractive effort when pushing and loading.

Compare that driveline to the modern 3CX ECO and you can see how things have moved on. JCB's Ecomax Stage 3B engine delivers 91hp in the Sitemaster, though that increases to 108hp if you opt for Contractor specification. That's accompanied by a serious 433Nm at 1400rpm, or 516Nm with the higher-powered engine, delivering serious pushing power for the loader end.

This drives through a choice of Synchroshuttle manual gearbox, or optional Powershift and Autoshift transmissions. Top speed of the latest model is 41.8mph, something that would have been difficult to imagine, and even more difficult to achieve in the 3C III.

Of course the big benefit of the backhoe-loader was the addition of the excavator end at the rear of the machine, and closer inspection shows that things really haven't changed that much over the years here. Indeed knock the pins out of the bucket on one machine and it will quite happily fit on the other. JCB's pin diameters and tipping link geometry remain unchanged between the two models, demonstrating that some bright engineer got their sums right all those years ago.

Sitting in the 3CX cab is certainly a big step forward from the 3C III, as optional air conditioning puts out warm air through multiple outlets and a comfortable suspension seat takes the worst bumps out of the road ahead, contributing to the ability to move at higher travel speeds.

Servo loader controls greet the modern machine operator, but the 3CX still comes with the same X-pattern backhoe levers as the older machine. Comfort, visibility and noise levels are unrecognisable in the newer machine though.

Having spent more on the machine than it would cost to buy a new 3CX, Julian kindly agreed to let Chris get behind the controls and do some digging for us. Once Chris had got to grips with operating the two machines, and he did have to get used to the Sitemaster too, as his own JCB is a Contractor model with Easy Control servo levers, we put the two backhoes to work.

Set the task of digging a trench one bucket wide and bucket-height deep over a five-minute period, we expected the modern machine to disappear over the horizon in comparison to the 3C III.

How wrong could we be? Of course, the 3CX was by far the most productive, but the older model had no trouble cutting a clean trench alongside its younger stablemate, and managed a remarkable trench length in the given time. Indeed if it had been a bit faster lifting its stabiliser legs and moving forward, things might have been closer still.

The 3C III offers a backhoe digging depth of 4.12m at the rear, compared to the 3CX Sitemaster's dig depth of 4.24m or 5.46m with Extradig extending dipper. The older model can easily load into trucks too, with a load height of 3.35m. This compares to 3.84m for the 3CX, rising to 4.72m with Extradig.

Chris said, "I certainly wasn't expecting to dig so far with it. It's a bit basic inside and the visibility isn't as good over the wings when going forward. You sit too low in the machine as well; on the new machine you are much higher and feel like you are sitting above the machine, which gives a much better view of the work area. The older machine was heavy to operate, cumbersome and slow. It was also noisy and just heavy going. I wouldn't want to drive it all day, but you could still do it."

Of course, the 3CX Sitemaster is light years ahead of the 3C III. However, getting back to basics and excavating a simple trench, it is also easy to see why the late 1970s 3C III was such a success and a pivotal machine in JCB's history.

Main Picture: It's not often that old and new can be put to work side by side, and it came as a major surprise just how well the old 3C MkIII excavated a trench.

