

Technic Excavators

By Manticore

After the article about the best Technic cranes designed by LEGO® we couldn't start building our city without a good army of excavators of the same type. So here we are again, ready to do a review of what, in my humble opinion, are the best excavators of the Technic theme.

I won't describe every single detail of each set. To me Technic is a challenge I prefer to enjoy without worrying too much about how to make complex functions. I am very much an 80s sets guy and everything that has come out in the 21st century I simply enjoy as a builder. I prefer giving my personal (rather than a professional) opinion of all the excavators I have had the pleasure of enjoying.

But why excavators? It seems clear that to a child with advanced knowledge, the Technic theme is a step up in play. The possibilities it gives for building construction vehicles with mechanisms is a unique experience for LEGO fans. And as far as construction vehicles are concerned, what better examples than cranes and excavators. They provide the best playability within a theme that is generally marked by the contrary. Because despite being family guy and AFOL, after building a Technic excavator I play with it Don't you? None of you? Really?... I believe we could skip the last comment.

The first thing we should do is define the concept of what is an excavator and the different types that exist. How do we classify them? There are many models where size and design are concerned, but fundamentally they are classified by the way they dig:

- Front loader: with a wide bucket facing up and capable of moving large volumes of earth or other materials.
- Excavator/Backhoe: with the bucket facing down, with a smaller capacity but able to dig deeper, like in pits, ditches or foundations.
- Bulldozer: not exactly an excavator as these are used mainly to push or pull earth or other materials. It cannot carry materials as it has no bucket, but it has a larger capacity for pushing than excavators.

Following this classification, the LEGO models we will remember in this article are the 8265 front loader, the 8043 excavator, the 856 and 8275 bulldozers and 8856, 8455 and 8069 which are backhoes, excavators that in addition to a rear bucket typical of excavators have a front bucket similar to a front loader and so could be classified as both at the same time.

Following my personal tradition with Technic sets, most of them were flagships in their time. The 8069 doesn't exactly fit in though. I have included it, despite its medium size, since the relationship between size, functions and price is quite

surprising. But let's get a move on; as always, in chronological order.

856 / 951

The first Technic excavator, model number 856 (951 in the USA) dates back to 1979. Its official name is "Bulldozer", although the front bucket makes it look more like a front loader. Just 386 pieces. Compared to any of the current sets, this number of pieces may look insignificant. However, Technic fans who witnessed the duels between Magic Johnson and Larry Bird have a certain age, and know that the first Technic sets from the late 70s and early 80s and current sets are as different as chalk and cheese. The Technic pieces were basically a bunch of bricks with holes, pins, axles and gears. As an example, the elevation movement of the front bucket was done with a couple of interconnected gears that slid in the inner structure of the vehicle. When they slid forwards, the arms of the bucket were lifted.



The elevation of the bucket as well as the mechanism for tipping it was controlled by two wheels at the back of the vehicle. The bucket was built with a couple of plates 4x12 and specific parts for the sides (Vehicle Tipper End) which appeared in black in set 912 and later in set 744. What sets are these? If the editors of this magazine keep on paying me as generously as they do now, I may talk about these sets at a later time.

To avoid the bucket tipping over due to its weight, a couple of rubber bands were used. The treads of 106 links weren't seen in another Technic set for many years; and they gave the set an incredibly realistic look for its time. To me it's endearing and the set fills me with nostalgia. As I've already mentioned,

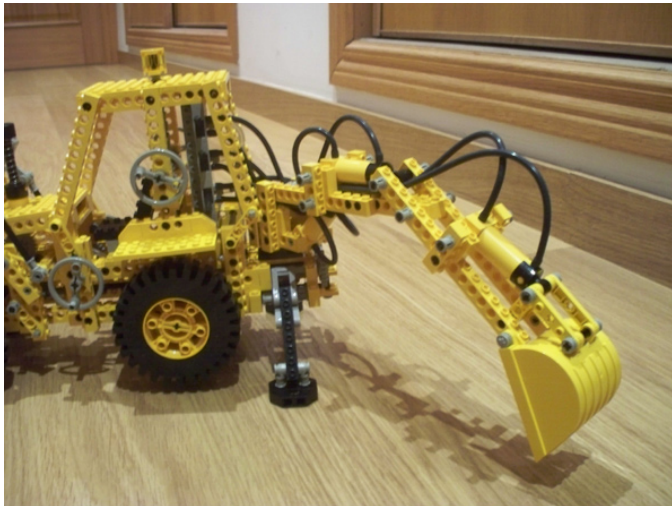
I quite a bit older than Justin Bieber, and I received this set as a Christmas present in 1979. It was my first Technic set and it gave me countless hours of fun.

8862

The only thing I missed in the 856 was the rear arm and bucket. The gods of the Olympus heard my prayers, although I had to beg them for 10 years before anything similar was seen again. The answer was the 8862 Backhoe in 1989, a set with 671 pieces.

The official name was Backhoe Grader and simply by the set number you can already see this one was special. If you don't believe me, just take a quick look at all the Technic sets that begin with 88.

The first thing that drew my attention, apart from the obvious (the combination of front loader and rear arm), were the two rear wheels 24x43. Anyone who knows anything about these sets knows what I am referring to. These are THE wheels for large scale vehicles (the first three supercars for example). And yellow to boot. Apart from this fact, the excavator incorporated the Pneumatics system, which was very much in vogue in the late 80s, to control the movement of the rear arm.



Three cylinders were used to lift the main arm, expand or contract the secondary arm and to control the rear bucket. But that was only the beginning. In addition to these three functions, the vehicle had 4 control wheels for the 2 stabilizers and the movement of the front bucket, in a similar way to its predecessor, but in this case using a worm wheel for the lifting mechanism. The bucket was not built, but was a single piece. True, it was much more realistic, but some of the innocence its predecessor radiated was lost.

As if that were not enough, the steering could be controlled by a Hand Of God (HOG) mechanism, transferring the control of the front axle to a control wheel at the top of the vehicle, camouflaged as a Tr-Yellow siren.

The two stabilizers opened at the same time; They lower the rear wheels slightly to give the excavator added stability. The transmission of the movement from the lateral control wheels through gears of different sizes results in a reduction of 48:1. At the front of the vehicle a brick 2x6x2 is installed to

compensate for the weight of the rear arm when it is extended.

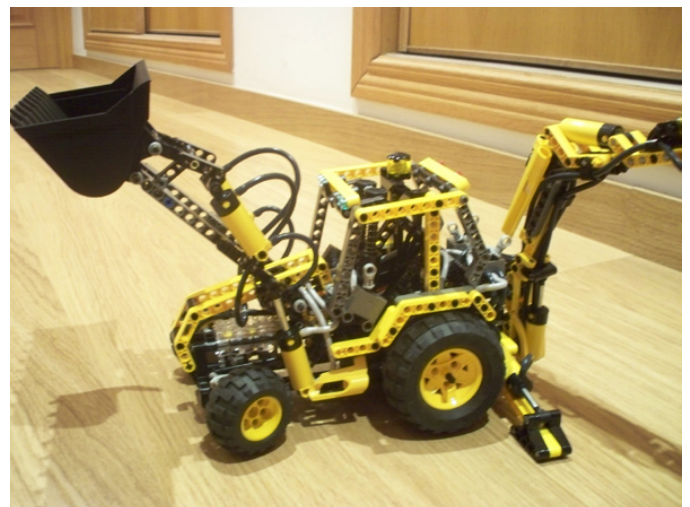
And that's all my experience with 20th century excavators. Because, despite the fact that LEGO® marketed more models before 2001, they are not included in this review which focusses on sets of a certain size and complexity.



8455

We had to wait until 2003 to contemplate THE Pneumatics set. Backhoe Loader, 8455. 704 pieces and with a look that is quite similar to its predecessor, 8862, but with absolutely all functions controlled by pneumatic cylinders. Except for the steering on the front axle which is done with a "Hand Of God" mechanism through a control on the top of the cabin. All other movements, including the front and rear bucket, are controlled by a total of 10 pneumatic cylinders.

Two for the stabilizers, one to turn the rear arm, three for that very same rear arm (lifting/lowering of the first and second stages of the arm and opening and closing of the bucket), two for lifting the front arm and another two for controlling the front bucket.



The incredible thing is not just the fact that everything is controlled with Pneumatics. It is a veritable work of engineering art to see all this included in a set that is quite compact

Including all those tube is not a task for the impatient. By way of an aside, I have built this set three times and the first two times I had to take it apart again because not all the cylinders worked as was intended. It is true that in the instructions the tubes appear colour coded, but even so it is quite complicated not to make any mistakes and end up with bad connections. As a result you may end up with air going where it was not supposed to and functions combining in odd ways, like a stabilizer expanding while the rear arm rotates. Anyway, after over 30 years it turns out I'm not the Technic expert I thought I was.

In order to generate the necessary air pressure, the set included two pumps that are used together. They are well integrated in the front part of the cabin, avoiding in this way the appearance of two "exhausts" which would have looked quite strange.

Another aspect in which this set is an improvement is the three-cylinder engine.... indeed, three. It is a little strange, but there wasn't any space for more in this set. It's predecessor (8862) can't really be criticised for not including an engine as when it came out (in 1989) the compact Technic Engine Cylinders did not exist.

The wheels are also different, "balloon" type on both axes. Yes, they are more attractive for younger generations, but for me the Technic 24x43 wheels are absolutely spectacular. As a fun fact I will tell you this set includes a single brick, of the round type. So the entire structure is built with liftarms and a couple of panels as decorative elements. As much as I dislike it, we can't evolve without accepting some changes. You know what they say: If you can't beat'em, join'em.

In summary: a complete, functional, compact highly playable excavator, controlled entirely with Pneumatics. The only drawback might be the lack of precision of the cylinders, but that is inherent to the Pneumatics system. A set with ten linear actuators would be a Utopia. Its size would greatly increase and it would lose the compact look of this "little beast".

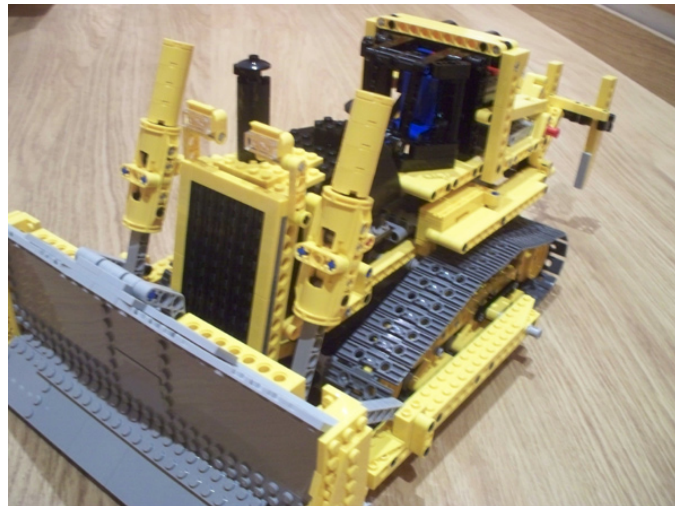


8275

Some years later (in 2007), LEGO® surprised us with the Power Functions system. And what better way to celebrate this new material that by including it in a Technic mega set. There you have it: 8275, Motorized Bulldozer. 1382 pieces that together make for a large set that can be completely remote controlled. Yes, that's right. Aside from the technical

advantages of the PF motors over their predecessors, finally something any LEGO fan will have dreamed about comes true: wireless control of the motors.

This set completely changed the way my wife looked at LEGO Technic. When she forgets her slippers in the living room I no longer need to get up to get them, thanks to the enormous shovel on the front that lets you push a variety of objects, including my wife's Hello Kitty slippers, with considerable force.



The two Power Functions XL Motors are connected individually to either track. I must admit that the nice links of the first Bulldozer are no match for the new ones. Aside from the fact that they are bigger, they provide better traction. There's nothing for it but to adapt to modern times.

The two Power Functions M Motors control the lifting and lowering of the ripper at the back and the blade at the front. Although they are less powerful, they manage to elevate the heavy machine some centimetres off the floor, leaving the tracks in the air.



Two infra-red receivers receive the signal and communicate it to two motors each. One of the channels allows you to control the two XL motors and move the Bulldozer almost at will. Turning is done in the same way as in tanks, turning both treads in opposite directions.

The other receiver controls the two M motors: the front blade and the rear ripper.

They say comparisons are odious, but it is at least curious to compare this Bulldozer with its predecessor, the 856:



8265

Two years later, returning to the typical LEGO® Technic designs, the 8265 was marketed: Front Loader. 100% front loader. No rear blade or bucket, no stabilizers, just a huge vehicle with the single purpose of loading and moving material.



The huge wheels 81.6 x 38 R Balloon push this excavator up and hill of material that is ready to be loaded. The bucket is once again a single piece, but a huge one. Of course it is much more realistic (and the 856 bucket tended to come apart under heavy usage).

Despite the lack of rear arm, it also uses cylinders to move the front bucket. However, no Pneumatics this time, but Linear Actuators (LA). In stead of transmission by air pressure, transmission by gears. Much more precise than the Pneumatics system, but it is more complicated to transmit the movement by means of axle and gears than with flexible tubes. Personally I am 100% in favour of this new system. The LAs have been a real revolution. This set in particular includes 3. The two that are located at the sides lift the main arm, and with the third, located in between, the movement of the bucket is controlled.

The only negative aspect of this set is that it does not include a PF motor. You can of course add one, which is what I, and probably every Technic fan, have done. The battery box is added to the base of the excavator without many trouble.

There should be a law against marketing excavators and cranes without motors. The PF motor kit includes a couple of LEDs to increase realism if you want to work in the dark. The pity is that with a single motor you can only control the movements of the arm and bucket. The excavator itself doesn't move.

Steering is once again controlled from the top of the cabin (HOG), but in this case it is not the front axle that turns as the wheels on that axle stay in the same position. The steering wheels makes the entire front structure of the vehicle turn. I wonder how this works in the real vehicles, as I've seen they use the same system.



8043

Arriving to 2010, and thinking we had seen it all, LEGO markets "the beast": the 8043: Motorized Excavator. 1125 pieces, 4 PF motors, two remote controls!! With a formidable look and, more importantly, realistic and functional as no other Technic excavator set had been before. Already in 2008 LEGO gave warning with the 8294. An excavator with a similar look and an arm controlled by an LA, but much smaller and without any motors.

The first thing that comes into your mind upon seeing this set built and moving is that it looks real. It is as if someone had shrunk a typical excavator like the ones you can see on construction sites.



With the same treads as the 8275 Bulldozer, and with the same turning system (same as in tanks), but that is the only similitude at first glance. This is a true excavator, without any strange elements. Just what you see. The top structure can turn 360° thanks to the motors; and everything is controlled by infra-red. Wait a moment.... motors? Yes, the set includes four PF M motors that are used to control 6 different functions. That explains the need for two remote controls if you want to control up to three mechanisms at the same time.

The most novel thing is the way the other three functions are accessed. Using Technic Knob Wheels, the fourth motor makes a gear change in the gear box. In this way the movement of the three remaining motors is used for the other three functions. The fourth motor has a single function: changing from one set of functions to another. Let me explain: the first set of functions are the movement of the two treads and the turning of the upper structure. In this way you can better place the excavator to do its job. After placing it you select the second set of functions and you can control the main arm (which can be raised and lowered with two LAs due to the weight of the structure), the secondary part of the arm and the large bucket (with another two LAs, one for each function). LEGO® had some issues with the first sets due to the LAs. They were not strong enough to support the enormous pressure the arm generated. Of course customer service solved the issue quickly making new LAs that were more resistant.

As I have said, the result is virtually impossible to improve. Absolutely everything in the excavator is remote controlled. And it's a great kitchen help... to put the chickpeas in the pot! But seriously, it's a perfect set, and it sets the bar very high if ever LEGO wishes to make an even better one. As a matter of fact, I have only built it twice, the second time 2 years ago. And it is still in the display cabinet in my living room, right next to the Lladró figurines. It is obvious which is the most highly valued element in the display case, isn't it?

COMPILATION

By way of epilogue, I would like to highlight a more humble set of smaller size that I haven't mentioned so far. It isn't motorised, but it has all the mechanisms that will provide hours upon hours of fun building and playing. It is set number 8069. With a front bucket, rear arm, stabilizers and mini LAs. An exceptional price/quality relationship.



Little can I add to what I have said so far. Some sets provoke nostalgia (856 and 8862), others are powerful, functional and real (8265, 8275 and 8043), others are complex (8455), but they all add something to the history of this mythical theme. #

