This is a translation of compact loader test, that Finnish magazine Koneviesti made in March 2017. Original article is published 5.3.2017 in Koneviesti 5/2017. Text is translated by Accent Språkservice/WBD for Norcar.

Cf. compact loaders for property care

MADE FOR YEAR-ROUND

Compact loaders have traditionally been regarded as auxiliary machines in agriculture and used in narrow barns. The machines are now increasingly also used for property maintenance and green landscaping. We compared four machines, focussing on winter tasks.

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The magazine, Koneviesti, last compared compact loaders in 2010 and the target was then loaders from 1,600 to 2,000 kg. Since then, both the models and areas of use have changed, in line with spaces in urban areas becoming narrower. Within the same time, their traditional use in agriculture has also changed thanks to production premises becoming larger, also giving working space for larger machines.

Manufacturers of compact loaders have also endeavoured to find new customers in the property maintenance and landscaping industries, which has begun to show partial results. Giant, for example, already sells as many loaders to property maintenance as it does to agriculture. Sales of other brands to other industries have also increased.

This time we also invited loaders with a rated operating weight of approximately 2,000 kg that are fitted with a heated, enclosed cab. This requirement weeded out a few of the participants, as not all of those interested had access to a suitable demo machine equipped with a cab.

We ended up with four machines to be tested: Avant 760i, Giant D337T HD, Norcar A7545 and Weidemann Hoftrac 1160. As far as the operating weight is concerned, the loaders were well within the same range, as the difference in weight stated in the brochures was only 120 kg. The spread was greater in the case of their power. The rated power for the Avant is 42 kilowatts, while the Weidemann, with standard equipment, has a rated power of 17.9 kilowatts.

USE

Machines on test:
- **Avant 760i**
- **Giant D337T HD**
- **Norcar A7545**
- **Weidemann Hoftrac 1160**

Giant and Weidemann, which are equipped with separate axles and are articulated, are structurally reminiscent of traditional wheel loaders. Avant differs from the above two models, because the driver sits in the front unit and the machine's centre joint is not articulated. Norcar's power train is similar to Avant's, but its centre joint acts as a wheel loader.

Based on a property maintenance perspective

The tests began with VTT Vakola's measurements in Vichtis, in which professionals in testing and certification measured the machines' pulling force and lifting capacity/ tipping Load with the relevant equipment. The loaders were then moved to more snowy conditions in Central Finland where, in which the machines could be used in actual conditions for ploughing snow.

In addition to Koneviesti's editors, Timo Honkaniemi, Hannu Jantunen, Mikko Jokinen and Jukka Liimatainen also acted as test drives, all of whom have many decades' experience of different tasks within the construction and property maintenance sectors. Honkaniemi and Jantunen also participated in the previous mini-loader comparison tests that we carried out seven years ago.

The machines' driving characteristics were assessed using a 40-points form, in which the various characteristics were given points from 1 to 10. Important characteristics, such as ride comfort were graded by 3, while the radio, for example, was graded with 1. Other characteristics that were considered included comparison of the accessibility of the control levers and the service points. The theoretical maximum number of points for the test was 1,000 points.

In the final calculation, the operating characteristics assessed by the test drivers were 60% of the total points and the technical points amounted to 40%. The technical measurements emphasised e.g. the performance and speed of the power train.

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Easy

The expression "compact loader" gives a direct association to a roughly shrunk wheel loader. The driver still sits in the rear unit and the working tools are still located on the other side of the articulation. This is, however, not always the case, as in the Avant, the driver sits in the same unit as the working tool and loader. Those who are used to wheel loaders can encounter surprises, and even fairly scary situations. When reversing with Avant, the movement to begin feels as though it is going in the wrong direction when the rear axle moves in the right direction and the rear of the front unit, moves slightly in the opposite direction. You get used to this characteristic fairly quickly.

In general, the compact loaders are surprisingly plain and simple to use. Those who have little experience of machine work can quickly learn how the tool is connected and how the hydraulics are used. As far as the location of the controls is concerned, it would be good to get a standard and common location. In one machine, the lock button for the tools was on the dashboard, in another on the roof, which is not exactly intuitive.

The symbols for the control lever were essentially OK, but there was also room for improvement there.

Compact loaders are small but that does not mean necessarily that the operators are small. The production technology and weight requirements for the loaders naturally limit manufacture of the machines. But a 190 cm tall guy, weighing over 100 kilos with size 48 shoes may have some problems getting in and out of the cab. His boots jammed several times in the floor and it took some manoeuvring to find the right position. There are significant differences between the different makes.

After a few days of test runs, an inexperienced drivers could final note that use of compact loaders was surprisingly easy. All four machines were designed to take account of the operator, including operators who had no previous experience of these small gizmos.

Many people are probably considering buying a compact loader, but doubt their own skills as a driver of such a machine. To him or her, I can safely say: Do not be afraid, compact loaders quickly obey their drivers.

Visa Vilkuna

Dimensions and measurements

■ Arto Turpeinen

VTT Vakola measured the machine's lifting capacity, which in practice, however, is often limited by the tip load. The measurement was performed on two different heights. At the lower level, the lifting capacity was 47 cm and at the higher level it was 140 cm, which in principle is the height of a trailer bed. The biggest surprise was Norcar's tipping load, especially at the lower level.

Vakola also measured the machine' pulling force at speeds between 0 and 5 km/h. The slower area had been chosen as the speed range. During the measuring, the loaders were braked by a tractor, while a measuring instrument measured the pulling force. The results are interesting because the starting force of Weidemann was by far the greatest, but this value decreased dramatically after 2.5 km/h. For the other loaders, the pulling force was greatest at around the halfway mark of the measurement test.

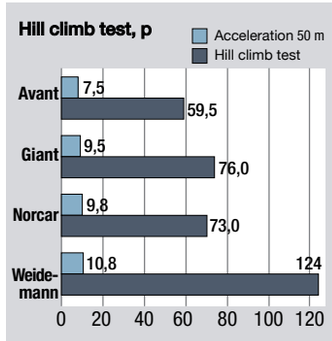
The sustainability of the power train was also tested uphill. The loaders started from stop and drove up a 400 metre long, steep slope. Thanks to its strong power, Avanti was also fastest when driving uphill. For Weidemann, there was not enough power in the steepest parts, giving it the poorest time. Norcar could also climb strongly, and left Giant behind, even though the Dutch loader's top speed was clearly higher.

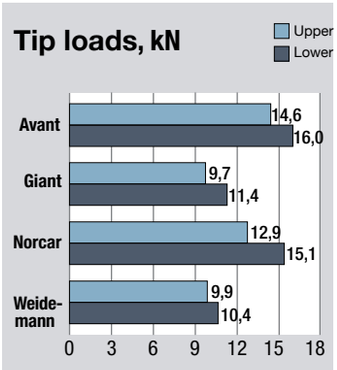
Noise and din

The view from the small cabins was usually good, but noise levels are often high. We measured the test loaders' decibels levels using the Rion NL-62 measuring instrument at the same height as the driver's ears. All in all, Avant was the quietest loader, as the noise level exceeded 80 decibels level only during road driving. The quietness was due to the design; where the drivers in the other loaders sit, in principle, over the engine, the Avant cab is connected to the front unit. The noise level is clearly highest for Norcar, because the engine cover plates for this model are directly under the seat and are not soundproofed.

Speed is, of course, an esteemed property in tight spaces. The turning circle diameter, measured at the outer wheel, was clearly greatest for Avant. In this machine, which is placed in the front unit, the forward edge of the driver's cab is around 15 cm outside the wheel line, which the driver must be aware of, especially when turning close to walls. As far as the turning

VTT Vakola measured the machines' pulling force and tipping loads. The lifting heights were 47 cm and 140 cm.





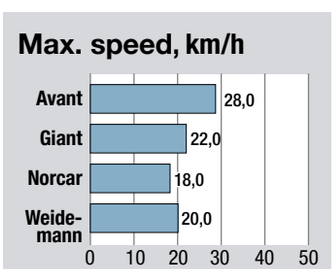
Turning circle, cm

	left	right
Avant	518*	535
Giant	479	499
Norcar	494	472
Weidemann	490	477

* +15 cab angle

Space needed for angle swivel, cm

Avant	250
Giant	263
Norcar	230
Weidemann	242



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Work cycle, p

Slowest / Fastest

	Avant	Giant	Norcar	Weidemann
Lifting	4,0	3,6	4,0	3,5
Lowering	4,5	2,7	2,5	2,4
Bucket tilt	2,1	1,8	2,0	2,3
Reset bucket	2,7	2,0	2,6	2,2
Extension out	3,1		2,5	
Extension in	2,1		3,2	
Total without extension	13,3	10,1	11,1	10,4

Noise value, dB (A)

Highest noise level / Lowest noise level

	Avant	Giant	Norcar	Weidemann
Idling	69,0	71,7	79,5	68,0
*Idling**	71,5	74,8	80,3	74,0
Working noise	78,5	86,5	85,5	82,0
Road driving	82,0	88,0	88,0	84,5

** Fan on full power*

Fuel consumption, l/h

Most / Least

	Avant	Giant	Norcar	Weidemann
Load snow	4,4	2,8	3,0	2,6

Pulling force

circles' mean value, Norcar and Weidemann are, in practice, at the same level.

With the space that an angle swivel requires we understand the situation in which, for example, you have to make as tight a turn as possible at a curb stone, e.g. In T-junctions. We measured at the point where the edge of a loading bed turns farthest from the swing line. In addition to the turning radius, the property is also affected by the dimensions of the boom. Furthest from the turn was the load bed to Giant, the difference to Norcar's result was 33 cm. Under very tight conditions, the scarce space need for the turning angle reduces the need for gearing.

Fuel consumption was measured with a simple snow load test that was easy to repeat. One way that would seem natural for the machine type was ploughing snow, but the early spring denied us the appropriate conditions. Weidemann was least thirsty with a consumption of 2.6 litres per hour. The value is partly explained by its engine having the lowest power. Thirstiest was Avant, whose hand throttle constantly keeps the rpm at a high level, even when not required. On the other hand, the engine did have the highest horsepower. In practice, the work can still be performed at lower horsepower by Avant.

Small machines - small spaces

■ Jussi Laukkanen

In a small machine, the engine compartment is also small. This forms the basis for service work on machines of this size.

In these machines is those performing the service are in a very similar position to those servicing modern cars. It is all part of the daily life of a service technician that the engine is not visible, even when the bonnet is open. Nor is the engine particularly visible in these compact loaders.

However, the loaders we were testing all had made notable efforts to make servicing easier. Norcar was a particular example, in which the engine's oil filter and fuel filter have been put in a very easily accessible location at the side of the engine compartment. (Norcar even features fuel pre-filter, see below)

Another commendable arrangement is the tilt function for Weidemann's cab. It does, admittedly, entail unscrewing two nuts and bolts, one of which is somewhat difficult to reach.

The cab tilt function does not require much force. After tilting, the machine's technology is as available as is possible for a machine of this type. Unfortunately, access to the battery requires the cab to be tilted.

As far as dimensions and the technical solutions are concerned, Giant and Weidemann are very similar. When it comes to service, these machines clearly differ, because Giant's cab is fixed and the engine is only accessible from a hatch under the seat.

It is somewhat difficult to open the hatch, because the seat collides with the windscreen. The available space is cramped, and replacement of the power line hose, for example, would probably require the seat to be lifted out.

Most of Avant's service points are located at the rear of the machine, where there is not cab above to complicate the work. In principle, you would think that the technology is easily accessible, in practice however this is not the case. The floor of the cab comes very close to the hydraulic pumps at the front of the engine.

The service hatch for the engine compartment under the seat is not a particular good solution. (Giant)

The compact loaders have around 20 grease nipples that have to checked weekly, or every 20 hours. The photo shows the nipples on the frame hinge in Avant.

Both of the Finnish machines require a little work on the cover panels to get to the engine technology.

The rear mounting bolt and nut in the Weidemann's tilting cab are, unfortunately, located in a narrow slot.

There is an easily removable plastic cover with a quick release lock on the engine. There aren't many secrets hidden under the cover, so you have to get a screwdriver and unscrew the panels distributed around the engine compartment. This is a good idea and the easily removable panels are, in themselves, positive. The engine compartment is cramped, and not even all the regular service tasks are made easy.

A certain product development has taken place at Avant which has reduced the number of hoses and components for power transmission. In the long term, this is likely to reduce the need for repair, as each hose is an additional risk as the machine gets older.

Just like Avant, Norcar also uses panels around the engine that are attached with screws. If you unscrew them, you can you see the mechanism from different sides. You should take that last sentence quite literally, because you can actually see the technology. You can't perform any major tasks through the small gaps.

The fuel filter we mentioned earlier is usefully placed on the outer edge of the engine compartment. Sadly, Norcar also has another fuel filter, which is removed by taking off the floor plate. The filter is located under the floor and even under the filter. Both dexterity and inventiveness are required to fill the engine's sump.

The Norcar service problems only apply to the version with a cab. In the cabless version, the entire engine compartment is visible when you lift the entire engine bonnet covering the entire mechanism.

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Good and less good

■ Jussi Laukkanen,
Arto Turpeinen

The machines' manufacturers must make choices when it comes to the innumerable details that they offer. Mainly, the solutions are successful, but sometimes the machines' users can feel especial gratitude for an excellent implementation - sometimes, however, the opposite applies.

Our test group highlighted a number of points. Most of the machines' functions and solutions have generally been implemented well. This is the starting point and these details are not addressed here.

From their inception, compact loader have been manufactured without cabs. The modification to an enclosed driver's cab has entailed a number of compromises and sometimes even to completely obvious disadvantages. One example of a less successful compromise is the location of Giant's windscreen washer bottle in the centre of the switch panel in the rear of the cab.

The windscreen wipers are small in both Norcar and Avant and do not wipe not a particularly large area. In contrast, on Giant and Weidemann they are virtually perfect. Visibility from Wiedemann's cab is good in all directions, but why on earth have the lights been placed in such a position that they obstruct the view of the bayonet hitch pin?

Understandably, there is no storage space in the small cabs. Only Norcar has a small storage compartment by the door.

In Giant and Weidemann there is a heater in the lower right-hand corner of the windscreen. The heaters appear to be modest, although - as our test showed - they were by far the most effective.

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Avant has several cover plates, but they are easy to remove because the mounting screws are large.

The engine must be warmed up for at least 30 minutes. Norcar contains a very efficient engine heater.

Storage space is at a premium in small machines. Norcar has a handy pocket.

When the bonnets in Giant and Weidemann have been opened, it is possible to access the engine air filter, radiator and hydraulic oil tank, as well as the hydraulic return filter.

Giant's windscreen washer bottle is located in a special place in the cab between switches.

Two different schools

The power train in a compact loader is now virtually always hydrostatic. This was consistent in every machine we tested this time.

Giant and Weidemann had arrived at a very different solution than Avant and Norcar with regard to method. The two latter represent a purely hydrostatic solution, because the diesel engine-driven pump feeds the flow to a separate hydraulic motor in each wheel hub.

These motors are radial piston engines that do not require support by any reduction gear, thanks to their large torque. This simplifies the machine technology, which at the same time reduces manufacturing costs.

Instead, Giant and Weidemann use traditional axles for working machinery, and a drive shaft that transfers the power from the rear of the machine to the front unit. The axles are driven by a cog wheel reduction gear. It is first in this stage that the hydrostatic transmission date becomes possible, because the reduction gear is driven by a hydraulic motor.

In Giant and Weidemann, the hydraulic motor is an axial piston pump that does not need any reduction gear. In all four machines, control of the hydraulic operation works according to the same principle: the machine's electrical control system controls the pump angle using the accelerator pedal.

In practice, this means that there is continuously variable power transmission throughout the pump's speed range: a small angle generates a large flow and at the same time a low speed, but the pressure, i.e. the torque is high. A large angle, on the other hand, generates a large flow and at the same a high speed, but a lower pressure.

In the Avant, the accelerator pedals work according to a different logic. In the accelerator pedal does not change the speed of the diesel engine, only the pump angle. In the other models, the accelerator pedal also operates as the throttle for the diesel engine.

Due to the diesel engine and the limited speed range of the pump, several manufacturers add a further speed range to their loaders by using a mechanical gear in connection to the final reduction gear, or by using the hydraulic motors, whose structure makes it possible to run within speed ranges.

Jussi Laukkanen

By Norcar's battery there is an oil filter for the engine and a fuel filter. Excellent! But not everything is just good: There is a also a prefilter in the machine located under the cab floor and the engine air filter.

That's where it is, the engine. There is not much that can be done from here. It is possible, however, to pour in oil through the filler hole in the engines valve cover, but it requires patience.

There is an interesting flap on the lower edge of the Avant's door. It protects the door against damage if the machine turns while the door is open.

A heater with a modest appearance - but efficient. (Weidemann)

Weidemann's headlights completely obscure the view of the bayonet hitch's pins.

Only Weidemann has a rear screen that can be opened. Unfortunately, the radio antenna is in the way.

Surprising results in the cold

■ Arto Turpeinen

We tested how the cabs are heated and how the windscreen is defrosted in VTT Vakola's cool hall. It could have been obvious that the Finnish loaders managed this task excellently. The end result was, however, a surprise.

VTT Vakola's service also includes cold tests of various devices that are conducted in the cold hall. When comparing the compact loaders, the heating of the machines' cabs and the defrost rate of the windscreen was tested at minus 15 degrees Celsius. Before the test itself, the loaders were cooled down in the hall for around twelve hours.

The test took 60 minutes and during the test the engines' rpm was maintained at around 1,400 rpm. Fans were set to their middle setting, with the nozzles pointing at the windscreen. Before the test, their surfaces were sprayed with a standard amount of water mist, calculated according to the windscreen area so that the screen would freeze. The temperature rise in the cab was checked at six different locations, and the defrosting of the windscreen was checked continuously.

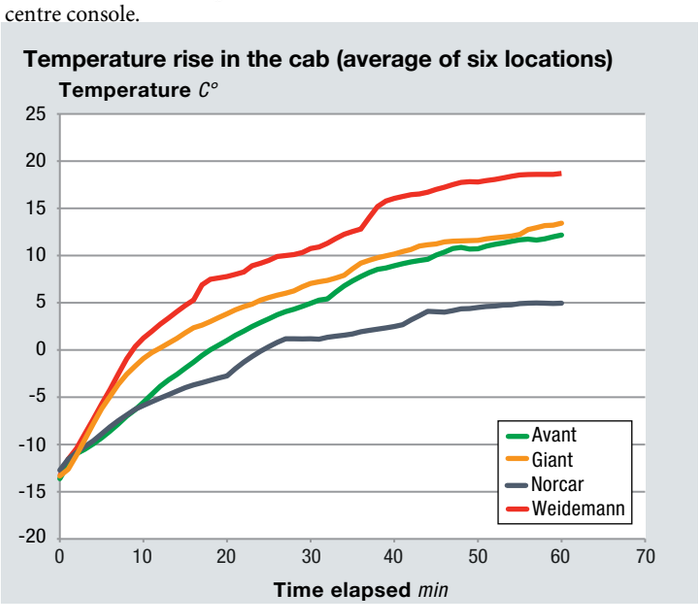
Huge differences in the defrosting process

Giant and Weidemann had identical heaters. There are only two large nozzles directed at the windscreen to the right of the centre console.

Somewhat surprisingly, the windscreens defrosted very well, even with only a few nozzles. The field of vision was opened after approximately 30 minutes in both machines. In Giant, only the lower left edge did not defrost. In Weidemann, a slightly larger area on the bottom remained, but on the other hand, the upper part defrosted more rapidly.

Avant and Norcar had far more nozzles. Unfortunately, there was only one nozzle in the centre in both machines, which was only sufficient to defrost a small area in the lower edge. This was partly due to the poor heating of the engines, which is why the temperature of the defrost air was clearly lower that with the European representatives.

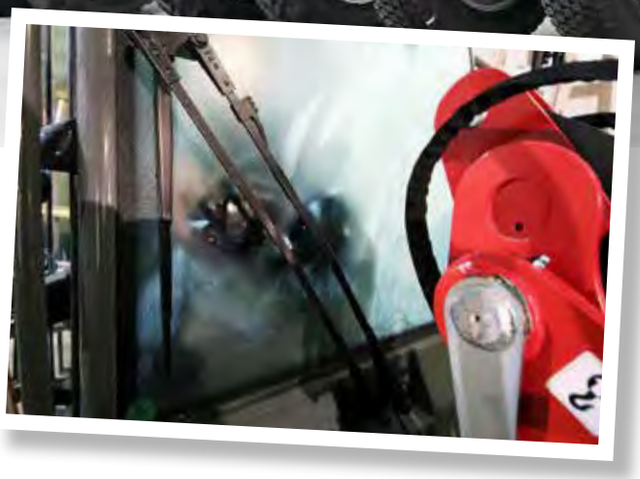
For example, Avant has an engine with the new emission levels, which requires the hydraulics to be under load for the heating to take place more quickly. As a solution for the slow heating of the engine and exhaust air, the manufacturer proposed, among other things to load the supplementary hydraulics. During the test, we took a realistic situation as our starting point; the machine is started on a cold morning and is left to heat up while you drink your morning coffee.



Heating and draughts

Thanks to its small cab, Weidemann came out on top for heating the cab. The mean value of the average value of the six different measuring points was 18.7 degrees Celsius, while the

Before the test, the windscreens were sprayed with a water mist that was then allowed to freeze for 30 minutes.



corresponding value for Norcar, which was worst, was only five degrees.

Weidemann's and Avant's cabs however were relatively poor, and draughts of air entered the cabs during driving. In Weidemann there are draughts on the feet from around the door, and in Avant from a slot under the floor carpet. There were also draughts at knee height, because the wind blew in through the control lever. During road driving, Giant was the warmest and cab did not appear to let in any draughts.

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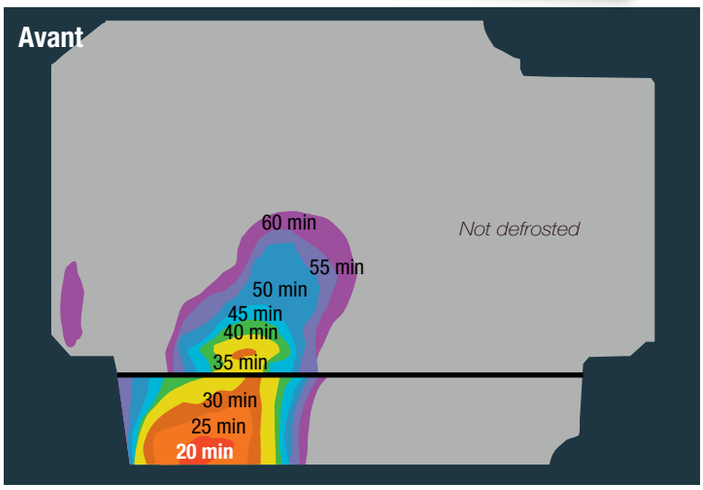
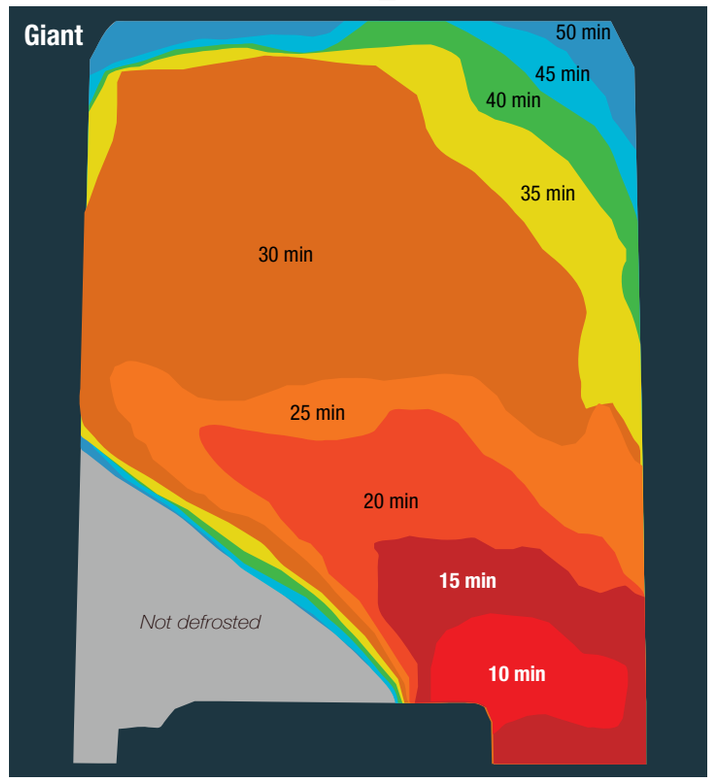
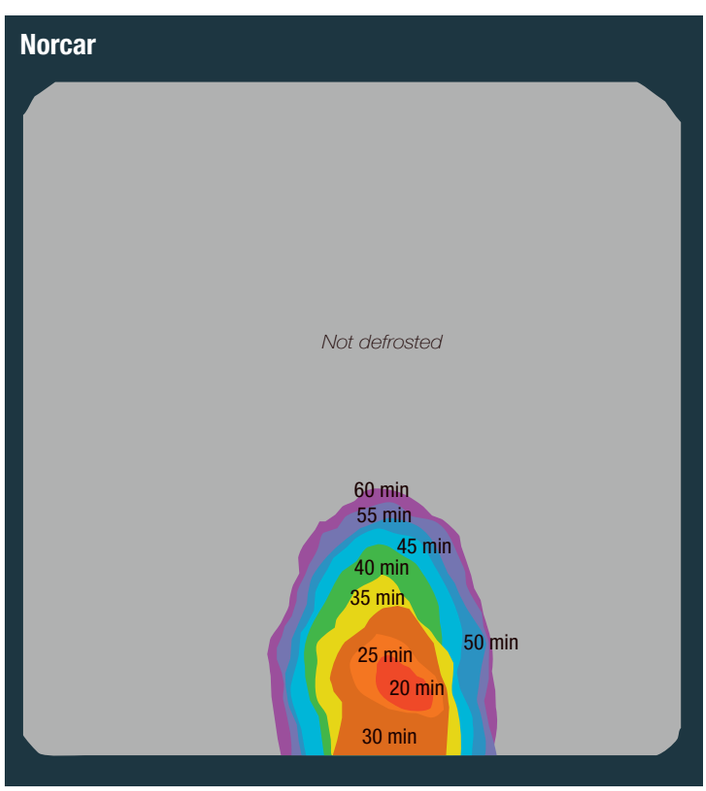
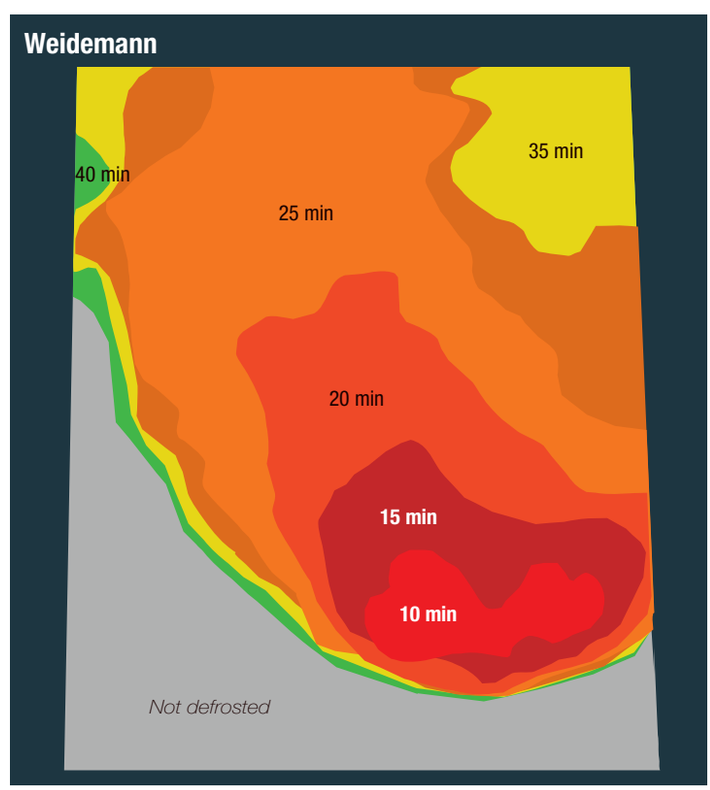




The heaters in Giant and Weidemann were exactly the same and located to the right of the centre console. The windscreens defrosted well with only two nozzles, even if both of them left an icy area on the left edge. The Finnish machines' engines did not get really hot, and despite the nozzle pointing directly at the windscreen they did not defrost the screens very well. In order to warm up the engine with the new emission requirements, Avant's hydraulics must be under load. Norcar's next version will be delivered with a larger heating element.





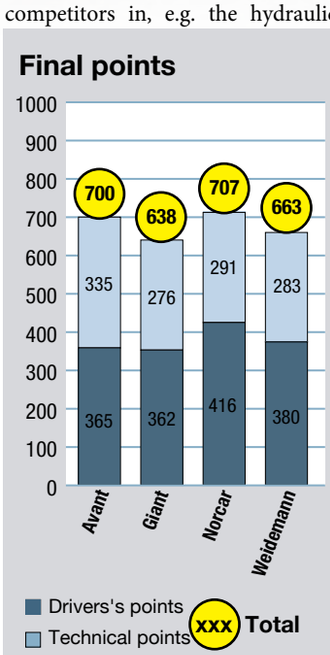
Domestic machines at the forefront

Compact loaders are used for very different types of work. For this reason, manufacturers have to make compromises to make the machines suitable for as many customers as possible. Traditionally, compact loaders were purchased for farm work, but their use in environmental and property maintenance has now increased, which imposes completely new demands on the loaders.

We can take a quick trip back in history: according to the drivers who participated in the comparison between the compact loaders in 2010, Norcar had already managed to achieve several good characteristics, although its entirety was not enough to achieve a victory. This time it won, which proves that even a manufacturer that has a smaller product development budget can take a step forward.

Above all, Norcar got a lot of points from the drivers, because the rapid power transfer and the precise hydraulics, in combination with clear controls and a good view, was something they liked. It was notable that it was in particular the drivers who were used to wheel loaders who fell for Norcar. The drivers that were used to the Avant loader type preferred the cab and handling equipment's location on the front unit. As far as the technical points were concerned, Norcar lost above all because the noisy cab and slow driving speed.

On the other hand, Avant is a safe solution for those who are used to this type of machine. Use of dual accelerator pedals and the hand throttle operated worked reliably. The most efficient engine in the test gives a boost, in particular for power transfer and the lifting capacity was high. Visibility from the cab was good with the exception of the control unit, and its slightly clumsiness drew down its points total. On the other hand, Avant stands out from most of its competitors in, e.g. the hydraulic flow and the selection of optional accessories.



Weidemann achieved third place, which is a narrow and quick machine for smaller tasks. Visibility was acceptable for many tasks, but the tyres on the test machine were not suitable for snow removal jobs. Its engine power limits the scope of the tasks it can manage.

For some reason, Weidemann had been fitted with hard tyres intended for skid steer loaders. On the uneven surface, the drive was really bumpy.

Giant is a robust machine, whose low price makes it an interesting option. As far as its properties are concerned, Giant is suitable for many different tasks.

Both the two best loaders offered a substantial package of extra accessories, which results in a significantly higher price. The accessories do not, however, affect the basic characteristics. The rapid power transfer in Norcar is, for example, a factory fitting.

As we have already stated in the previous tests, choice of a machine is made according to needs and its object. Whichever machine you choose, not everything can be provided in a single package - our comparison showed, however, that this class of machine is suitable for property care all year round. round. ■

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Technical data:

Machine	Avant 760i	Giant D337T HD	Norcar A7545	Weidemann Hoftrac 1160
Working weight	2 100 kg	2 100 kg	1 980 kg	2 100 kg
Engine	Kohler KDI 1903 TCR	Kubota D1105-T	Kubota 1505 Turbo	Perkins 403 D-11
Power	42 kW (57 hv)	24 kW (33 hv)	33 kW (45 hv)	17,9 kW (24 hv)
Torque	225 Nm @ 1 500 rpm	–	119 Nm @ 2 000 rpm	–
Hydraulic flow/pressure	80/	45/170	66/230	36,4/
Top speed	30 km/h	18 km/h	20 km/h	20 km/h
Maximum lift height	3 100 mm	2 806 mm	3 504 mm	2 948 mm
Standard tyres	400/50-15 TR	31x15,50-15 AS	320/55-15 GR	10.0 / 75 - 15.3 AS ET10
Country of manufacture	Finland	Netherlands	Finland	Germany
Price with standard equipment (VAT 0 %)	EUR 42 200	EUR 37 627	EUR 46 590	EUR 38 045
Price with test equipment	EUR 56 700	EUR 37 627	EUR 58 349	EUR 38 045
Importer/Manufacturer	Avant Tecno	Kurikan Hyväkone	Norcar BSB	Konekesko

WACKER NEUSON

MANSEN MÖRINÄT
7.–8.4.2017

118 hv

40 km/h

WL70 pyöräkuormaaja

- – työpaino 7100 kg
- – täysin uusi moottori, Perkins 854E, 118 hv/450 Nm
- – entistä tehokkaampi hydrauliikka
- – 25 % suurempi murtovoima
- – 20 % suurempi lisähydrauliikan tuotto
- – 15 % pienempi polttoainekulutus
- – 25 % suurempi kaatokuorma

KATSO ESITTELY-VIDEO TÄSTÄ

Alk. 79.900 € + Alv

Pyöräalustaiset kaivukoneet 6–11 t

- – markkinoiden suosituimmat koneet
- – täyttävät uusimmat päästönormit
- – huippuluokan polttoainetaloudellisuus
- – yksilöllinen varustelu, puskulevy tai tassut
- – huippuluokan ominaisuudet
- – ajonopeus 30 ja 40 km/h

Hinta sisältää:
- – rototilt
- – puskulevy
- – letkurikkoventtiilit
- – LED työvalot + vilkkumajakka
- – tieliikennevarusteet

UUTUUS

EZ80

- – työpaino n. 8100 kg
- – kaivuetäisyys 7,2 m
- – pienempi kokonaiskorkeus ja
- – matalampi painopiste, entistä vakaampi
- – 20 % pienempi polttoaineenkulutus
- – ei peränylitystä
- – 20 % lisää kaivuutehoa
- – täysin uudistunut ohjaamo
- – vakiona mm. ilmaistuin, autom. ilmastointi
- – peruutuskamera...

Maantiivistäjät 50–500 kg

Entistä parempi ergonomia, saksalaista laatua yli 80 vuoden kokemuksella.
- – ensiluokkainen käyttömukavuus

UUTTA
- – helppo apuvirran syöttö
- – tuntimittari
- – tiiveysmittari lisävarusteena

HAV = 24h

Markkinoiden paras tärinänvaimennus käsille

OSA-MAKSULLA Ilman käsirahaa

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VARAOSAT
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Katso luotettavat Wacker Neuson vaihtokoneet:

WWW.EDECO.FI

Norcar A7545

A cheeky domestic alternative

Somewhat surprisingly, Norcar was the test winner. The loader lost slightly to Avant in technical measurements, for example with noise levels being relatively high. On the other hand, the loader's tipping load was higher than its Finnish colleague's lifting capacity, even without additional weights. The telescopic boom on the loader's centre line has a wide reach and the lift height is good. The bucket's tilt angle in the raised position is, however, relatively small.

The test drivers liked, however, the loader's fast power transmission and availability. For short acceleration, it felt a bit like rally driving, because the turbocharged engines is sensitive to rpm and the driving is rough. Norcar could, however, do with a high top speed - the driving speed was the lowest in the test all four machines.

Norcar's design has, from the beginning, probably been focused on a version with roll-over bar, because the enclosed cab makes service and inspections considerably more difficult. The engine's oil level is checked by tilting the seat, under which the engine is located. You find the dipstick by feeling your way forward with your hands on the opposite side. Another alternative is remove the plates that are fixed with small screws.

However, the filters and battery are relatively easy to reach behind the hatch, where a quick-release lock and hinges would, however, make the tasks faster. Norcar's equipment includes a load management system that is familiar from telescopic loaders, even if the system was not enabled on the test machine.

Purchasers ought probably to invest in a Deluxe seat as an accessory, because the test machine seat left much to be desired and the seat's pre-tension did not work. The windscreen wiper was also poor due to the small wiper blade. It also took a long time to get the cab warm and defrost the windscreen. The accessories available for the test machine included a direction selector switch on the control stick and a hydraulic bayonet hitch. The control lever was clear and easy to use, but the small buttons on the control lever could, however, have been replaced by, e.g. rocker switches. With slight modifications, Norcar would lift itself to an even higher level. The manufacturer has already informed us of certain modifications to the model, including a longer dipstick and a larger heating element in new models.

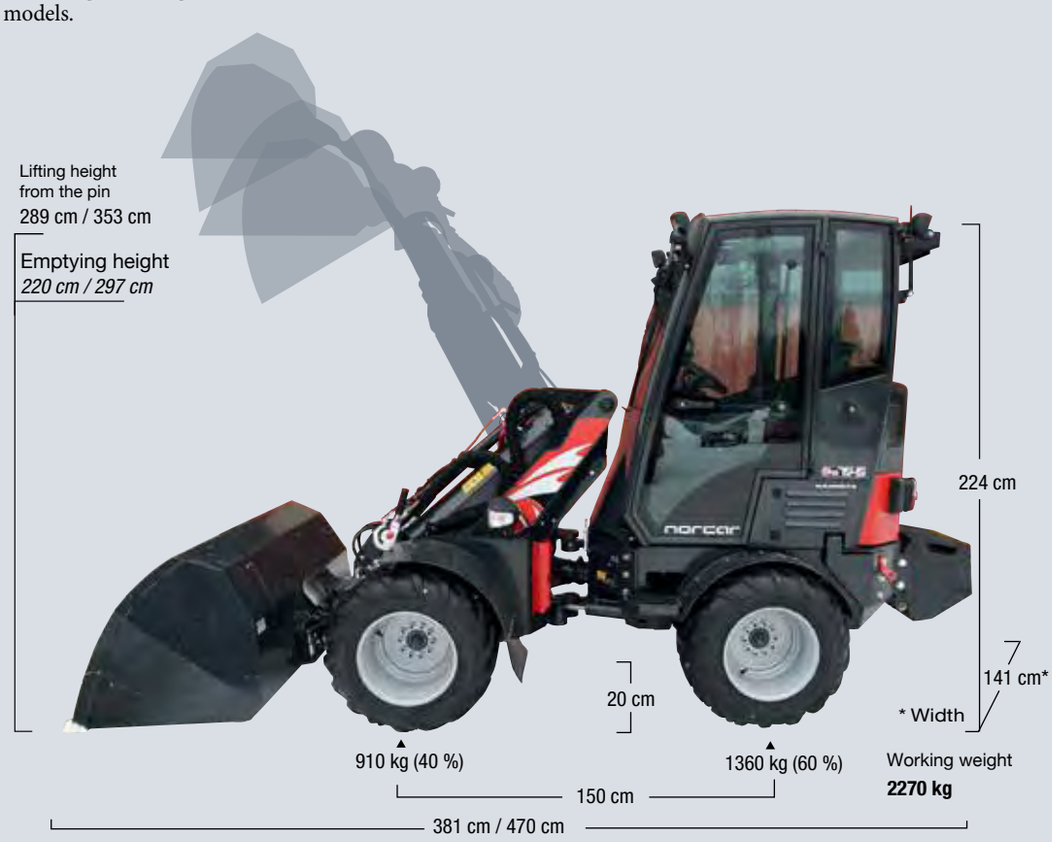
707 points

Price per point **82,50€**

Likes & dislikes:

+
- A quick and easy-to-manage power train
- Clearly visible controls
- View forward

–
- Slow road driving
- High noise levels in the cab
- Cab heating and windscreen defrosting



Avant 760i

A safe choice

Avant, which is the market leader among compact loaders puts its trust in the cab placed over the front axle. The machine is stable, thanks to its fixed articulation and rear-end weight.

With Avant, work in confined spaces requires especially sharp and different driving techniques by the operator if the cab is not to give surprises during turning. It requires particular familiarity during reversing.

The machine is controlled according to the traditional Avant method using two separate accelerator pedals - the engine speed is controlled by the hand throttle. In fast work, in other words, the engine keeps its rpm high, even if the work situation does not require it. This was also shown during the snow load test, as its fuel consumption was the highest in the test. In this way, the machine can be handled easily even if the driver is inexperienced.

As far as road driving is concerned, Avant is the most suitable machine for property maintenance, because its top speed is by far the highest and noise levels during driving keep to a reasonable level. Level shifts with the test machine lead to smooth bouncing, because the elasticity required comes from the tyres, due to the rigid articulation joint.

You need a certain pendulum technique to enter the cab through the door opening, which is a parallelogram. Thanks to the single-axle sliding boom the view of the bayonet hitch is the best in the test, especially when the boom is extended, but unfortunately the windscreen is so small that the front corners remain completely in the dark. With no skylight, the view upwards is also poor.

Compared with its competitors, the skin feels a little plastic, because both the cab and engine compartment are covered with plastic panels. For users, it is positive that the plastic parts are also available as an HD version of polycarbonate and these resist even hard use. The cab is not the warmest, as there is a clear gap underneath the floor carpets. In addition, draughts can enter the cab through the control column and window hole.

For those who are familiar with the design, however, Avant is a safe choice. The test machine was fitted with many accessories that increase the price by 14,500 Euro. The eight function control lever and the Deluxe cab are recommended as equipment for winter working.

Continued on next page ▶

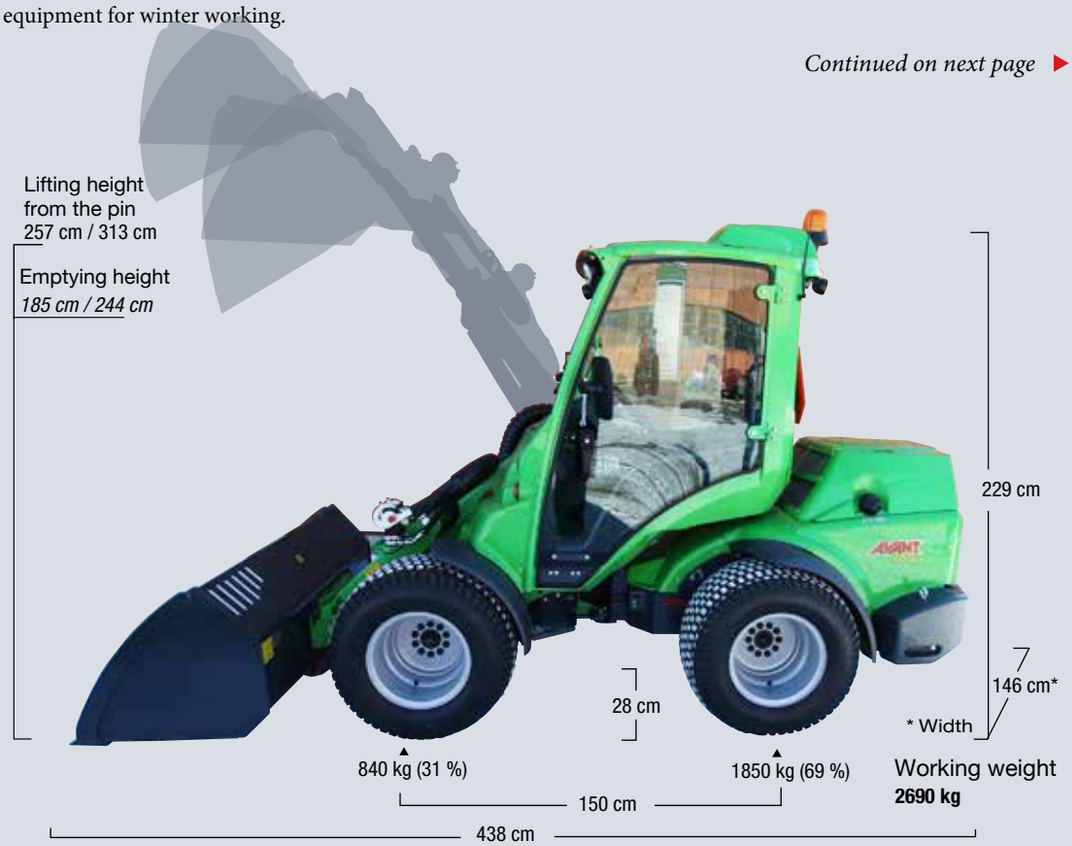
700
points

Price per point **81€**

Likes & dislikes:

+
- Driving speed
- Low noise level in the cab, compared to its competitors
- The test machine's even driveability

–
- Poor visibility of the front corner areas
- Fuel consumption
- A cold and draught cab



Weidemann Hoftrac 1160

Handy little machine

The Weidemann machine was fitted with the test's smallest engine, only 17.9 kW, which was confirmed by the technical measurements. The top speed was relatively high, but the lack of power was demonstrated clearly during acceleration and the hill test. On the other hand, fuel consumption was the lowest during the snow load test.

There is also a more powerful motor available for the Weidemann of 23.4 kW, as well as 30 km/h power transmission. There are also several axle options and the loader can be equipped with a rear lifting tool. The test machine's handling was weakened by the rigid tyres, that are usually intended for skid steer loaders. On an uneven yard surface, the drive was relatively bumpy.

Weidemann's hydraulics are sensitive and the work cycle is relatively speedy. Work comfort is, however, impaired by the control lever which is placed in an inaccessible position in the rear section, which gives an uncomfortable working position. The handling characteristics for the hydraulics are also complicated, at least during ploughing, because the solution for control of the blade using a change button, for example when using a "V" plough blade is cumbersome.

The cab in the test's narrowest machine is tight. The control panel is also small and a thermometer has, among other things, not been considered as necessary. Visibility from the small cab is excellent to the rear and to the sides, but the Z booms and the headlights, which are fitted in a very clear line of sight location, prevent the visual contact with the control unit and the pins on the bayonet hitch. The cab heated up well during the cold test and the field of vision on the windscreen was opened almost completely. When the engine was idling, the cab was the quietest in the test.

The battery and filters are only accessible when Weidemann's cab is tilted to the side. The service and repair objects are visible only after two bolts have been loosened and the cab has been tilted. ■

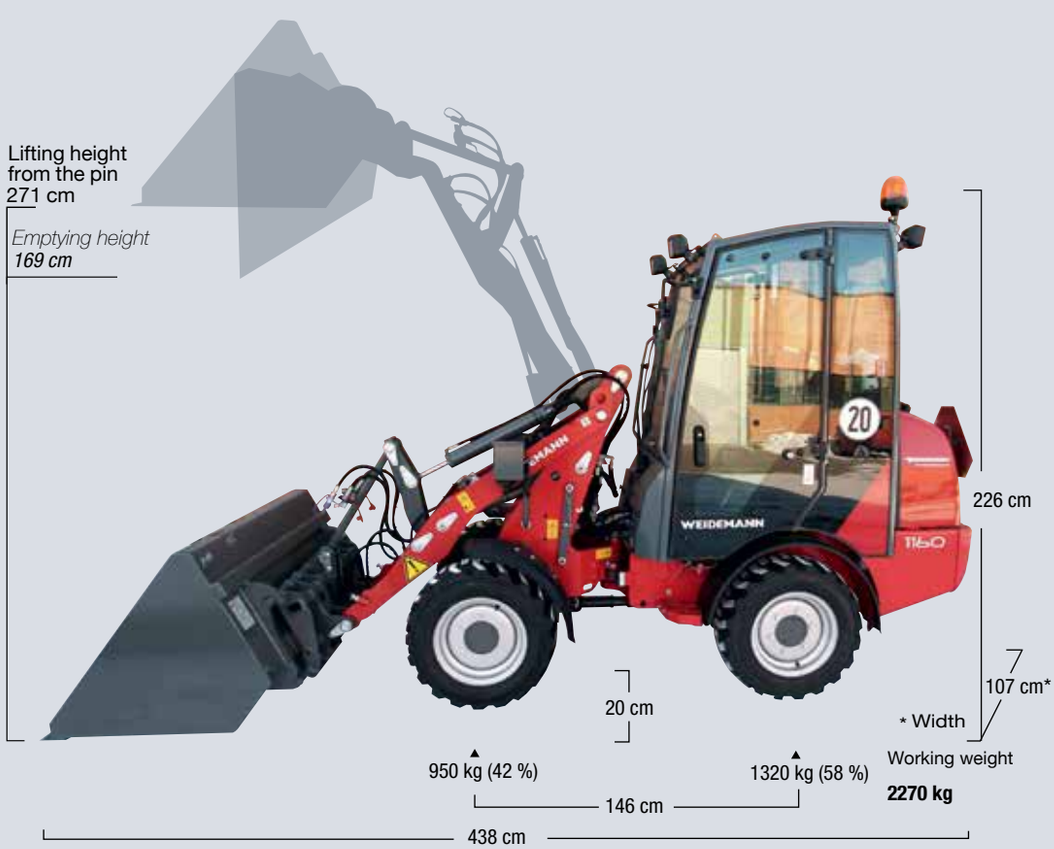
663 points

Price per point **57,4€**

Likes & dislikes:

+
- View to the sides and rear
- Cab heating
- Sensitive movements

–
- Performance
- Location of the headlights
- A tight cab



Giant D337T HD

Value for money

The Dutch loader Giant offers a robust metal design. Servicing is also relatively easy to perform, because the engine is located in the rear half of the cab. The condensers are, for example, relatively easy to clean. The fuel tank is the only thing located in the front unit of the machine, which means that Giant does not have as much rear-end weight as its competitors.

Giants top speed was the second best in the test, and it also managed to climb slopes quite well. However, the cab suffers high noise levels both during work and when driving on the road. The noise level in the cab is disturbing because of the high frequency noise. The starting force was the lowest during the measurements, at slightly higher speeds only Weidemann was worse.

When fitted with the bucket that was supplied, Giant had the largest total length in the comparison. The lifting height was relatively good. On the other hand, the turning radius and angular rotation required a lot of space. However, the Dutch loader gets additional points for the test's quickest work cycle. The bucket's filling angle remained somewhat incomplete.

The cab can be entered from both sides. During the cold test, the windscreen defrosted excellently. The visibility to the control unit is restricted by the Z booms, although the unit is visible between gaps in the structure. The manufacturer's own bayonet hitch is easy to fit tools to its pins. Giant's control lever is, at least when it is new, stiff to operate, and also in other areas work with the loader feels stiff. The control lever position seemed inconvenient and you could quickly feel work with Giant in your shoulders.

In its test version, Giant is very close to the standard equipped machine. The loader was the test's most affordable because the price difference with Norcar, for example, was even more than 20,000 Euro before VAT. Its range of standard equipment and low price are precisely what gives Giant its competitive edge.

638
points

Price per point **59**€

Likes & dislikes:

+
- A sturdy design
- Defrosting of the windscreen during the cold test
- The price - quality ratio
- With standard equipment

–
- The position of the control lever and stiffness in the work
- High noise levels in the cab
- Pulling force at low speeds