

Fendt 1167 Vario MT:

Efficient lugger

Fendt is currently the only manufacturer to offer a stepless-transmission tracked tractor in the 600hp plus category. So, what does this mean for drawbar power, fuel consumption and comfort? We find out.

Way back in 2017, Fendt released its first stepless-box tracked tractors with the three-model 900 Vario MT, topped by the 317kW/431hp 943MT. Fast forward on to 2021, and it was the turn of the four higher horsepower tracked units (376kW/511hp to 495kW/673hp max outputs) to get the Vario treatment. But it wasn't just the transmission that saw a fundamental change, as there was also a change in engine: rather than AGCO Power's own 12-cylinder, 16.8-litre motor, Fendt opted for a six-cylinder MAN with the low-revving concept (1,730rpm), which we've seen rolled out across many of the firm's bigger wheeled tractor models.

While the 1151, 1156 and 1162 have the D3876 engine with a 15.2-litre displacement, the top tractor, the 1167 Vario MT with a rated output of 439kW/588hp is equipped with the mighty MAN D4276, which has a bore of 142mm instead of 138mm along with a larger 16.2-litre displacement. Given these big stats we were expecting a big performance, especially as there is no restrictions on the engine output even in pto-only work.

Nebraska measurements

Usually around now we would be packing our test 1167 off to the DLG test centre in Groß-Umstadt. But since the DLG cannot

accommodate a big tracked tractor on the rolling road test bed for those key Powermix measurements, we are going with the pto and drawbar power measurements from Nebraska Tractor Test Lab (NTTL) in the USA, which also carries out tests to the OECD standard.

And to keep with the American theme, it's worth noting the Fendt Vario MT tractors are still being manufactured at the former Challenger plant at Jackson, Minnesota.



According to the tractor maker, the 1167 has an output of 495kW/673hp at its 1,730rpm rated speed. Arguably even more important, the test engineers in Nebraska measured 446.5kW/598.7hp at the shaft ... a very good result. And since Fendt specifies the engine's maximum output as 495kW/673hp, the pto output at 1,600rpm was about the same at 451.1kW/604.9hp. With the sensationally low diesel use of 212 or 207g/kWh (+4g/kWh AdBlue), the Vario transmission more than lives up to its reputation of having very good pto efficiency. The torque curve shows just how serious the engineers are about the low-speed concept: the MAN engine reaches its maximum torque

of almost 2,850Nm at just 1,050rpm. And since the ground speed can be infinitely adjusted at any time, the torque rise of just 15.5% isn't a disadvantage, even with the heaviest draft work with abruptly changing loads.

Continuously pulling

However, the exciting question about how much drawbar power can the Vario muster remains. After all, the pto shaft on the 1167 is just one option, which, in practice, is very rarely used to obtain its full power. A track machine is bought to pull stuff, so our test

KEEPING IT BRIEF

The Vario transmission works well and, together with the MAN engine, is a very efficient combination.

In wet conditions or on slopes, the twin-track tractor can reach its operating limits sooner than an articulated machine.

FendtOne is not yet available on the MT, but it does have great suspension.

Is manufactured at Jackson, Minnesota, USA

With its continuously variable transmission, the 1167 Vario MT is not only pleasant to drive but also proved to be highly efficient.



TRACTOR TEST

tug had to show what it could do in front of the brake truck.

It should be noted that, according to Fendt, the 1167 differs from the 1162 'only' by a boost of 55hp for hydraulic and pto work. However, when comparing the amount of diesel injected, there seemed to be no real restrictions on the drawbar power, with a measured test result of 382.3kW/512.6hp. A good result, just not quite as good as its competitors such as the John Deere 9620RX (409kW/548.5hp) and Case IH Quadtrac 620 (419kW/561.9hp).

More economical than a powershift

On the other hand, the Fendt excels in terms of fuel use. Here, the combination of a low engine speed and CVT seems to fit very well, with 246g/kWh making the 1167MT more economical than its four-track competitors with their powershift transmissions, which achieved 255g/kWh.

As for the gearbox, in terms of operation and handling, we don't have to say a whole lot, especially to anyone who has operated a Vario Fendt. Even though the VarioDrive TA400T has its own housing on the tracked machine, the other main components have already proven themselves in the high-end wheeled models. The large crawler can now be accelerated steplessly up from 0.02 to 40km/hr (reverse is limited to a maximum speed of 14km/hr), can cruise control, can be programmed etc., all by using the joystick or pedal. And most seasoned track drivers probably won't miss a shuttle on the left-hand side under the steering wheel.

Over 140kW hydraulic power

Fendt promises oil delivery at a rate of up to 440l/min when the tractor has the two independent swashplate pumps. Indeed, the NTTL measured 233.5 plus 234.4l/min from the test machine, which adds up to exactly 467.9l/min. The usable hydraulic power of 72.3kW plus 71.6kW at the rear couplers also sits well with monster-tractor billing – that's an almost unimaginable 195hp.

There are up to eight double-acting spools on machines without a linkage; if you add lift arms the spool tally drops to six. We like the fact that the Fendt genes have prevailed in the shape of the DUDK couplers, which can be coupled under pressure and provide flow rates of up to 140l/min.



All of the tractor's Stage V exhaust emission gubbins (the DOC, DPF and SCR unit) are located in the huge stack on the right-hand side.

This same Fendt familiarity factor applies to the labelling, as well as to how you set up the tractor's time and flow rates.

The question of the MT's rear linkage is unnecessary for many users who are just after pulling power. Nevertheless, we'd like to point out the measured continuous lift capacity of 9,930daN. You can lift sizeable kit with that.

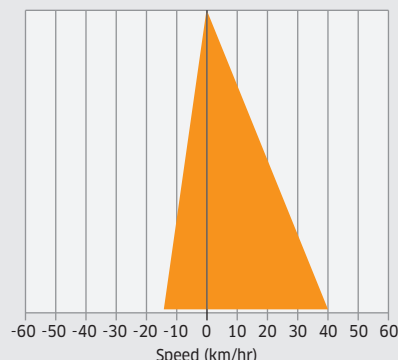
However, it's the swivelling Cat V drawbar that seems much more relevant. It not only allows a vertical load of up to 6,800kg, but the design can also swing sideways by +/- 28°. This set-up greatly simplifies headland turns for the MT's twin tracks and trailed implements.

FENDT 1167 VARIO MT SPEED RATIOS

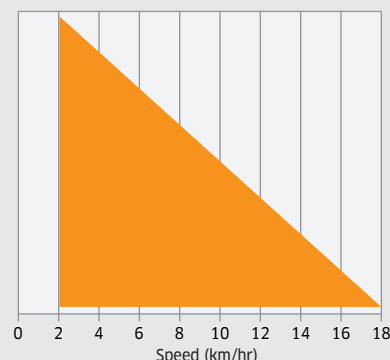


Thanks to the Vario Drive TA 400T, the machine travels seamlessly from 0.02 to 40km/hr when going forward. Direction changes are carried out with the stick on the armrest.

Stepless forward/reverse



Stepless from 4-12km/hr



The six-cylinder MAN engine under a similarly large bonnet is both quiet and economical. The tractor's radiator pack is completely sealed off from the engine.



The cab is nice and quiet too at 69.5dB(A), but it could do with offering extra space and being more comfortable.



Mustard Challenger drivers will be familiar with the steering wheel, which hasn't changed.



While the armrest will be familiar to Fendt drivers, the newer FendtOne controls are a long time coming.

Suspended tracks

In order to keep the 1167 within 3.0m, only the 698mm wide tracks can be fitted on a the track width of 2.29m. Alternatively, a 768mm belt can be fitted, which pushes the overall width out to 3.15m.

In addition, there are many ways to ballast the tractor, which has an unladen weight of almost 20t up to almost 27t. You just need to know where to add the ballast in order to transfer the power to the ground in the best possible way via the 3.0m long tracks.

The manufacturer's 'SmartRide+' suspension of the undercarriage with hydraulic height compensation of +/-9cm has also proved helpful. The springs not only improve the driving comfort, but, thanks to the additional cylinders, the MT can always be optimally aligned with the push of a button, depending on the towing point and ballasting. As long as the ground is right and your halfway on the level, the crawler pulls like a winch. This is what the tractor proved – at the time still in Challenger livery – when it was compared

with five other high horsepower tractors with different means of putting power to the ground (*profi 4/2017*).

No FendtOne

The 1100 series cab is identical to that on the 900 Vario MT. That means there is the distinctive multifunction steering wheel, yet the armrest, including the touch screen and joystick, have been carried over from the older Fendt tractors. And, although the steps are nice and big, for such a huge tractor the



Neatly labelled connectors with relief levers – as they should be. Optionally up to eight double-acting spools and 440l/min oil flow are possible.

- As far as maintenance is concerned, oil change intervals are 500 hours for the engine and 2,000 hours for the separate transmission and hydraulic circuits.

How much?

In the basic version, the 1167 Vario MT is available in the configurator for exactly £517,299, but the list of possible additional options is long. The rear linkage (£26,206), and pto (£15,084) make a particular impact, followed by items such as the 2.0t front weight (£9,330), the RTK GPS (£4,532), the chassis suspension (£5,293) or the second hydraulic pump (£4,272) and six instead of four spools (£4,713). All in all, the price for our rather completely kitted out test tractor is £586,729.

Summary

Compared with the large, articulated tracked tractors in the league, the 1167 impresses with its understated dimensions and weight. Despite having a stepless transmission it still transmits a surprising amount of power to the drawbar, and it's efficient and comfortable to use.

Is there still demand for big tracked tractors in the UK? Not that many years ago, twin- and four-track tractors were a common tool on UK farms in our machine management articles. However, there now seems to have been a swing to tyres for models in the sub-400hp sector. Which means the big 1167 has a place, even if this place is getting smaller.

Hubert Wilmer

cab could really do with a bit more room. Hopefully this will get a refresh at some point and maybe even gain the FendtOne controls.

That said, the overall noise levels are pretty impressive with a low 69.5dB(A) measured by the test team. And the ride comfort is also very much OK with the optional cab suspension. The same applies to the topic of headland management, from TeachIn to the TI Headland auto turn system, with operators well catered for.

Other details

- The tracks can be pre-tensioned by the on-board hydraulic system. Depending on the operating conditions, the tracks are expected to last 3,500 (+/-500) hours, and, according to Fendt, fresh 30in rubber will cost around £29,480.
- A basic autosteer package is standard, and there is a choice of antennas from Novatel



The linkage lifts almost 10t, but, like the pto, it'll be an unnecessary extra for many users. The main attraction here is the Cat V drawbar pin.

and Trimble. Optionally, there are various upgrades for the correction signal and machine control.

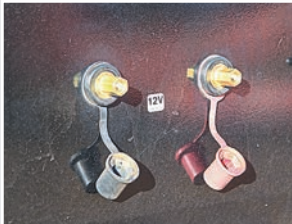
- In addition to the LED beacon, standard kit includes the dual circuit air brakes.

FURTHER DETAILS FROM OUR FIELD TEST

This is not a summary but a list of positive and less positive details.

+ POSITIVE

- + External cab lights for servicing
- + Comfortable passenger seat
- + Holder for diesel nozzle while you climb the steps
- + Clear sight glass caps on idler wheels



External battery terminals help if you need to jump start.



Ejector plates keep the rims free of soil and plant trash.



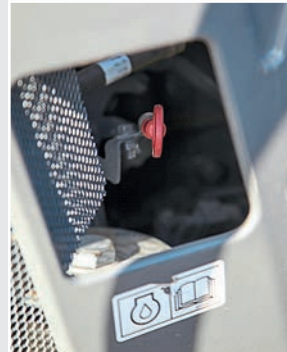
Sensibly positioned catwalks and handrails are top notch.

- NEGATIVE

- No indicator for the filling level, self-cleaning air filter
- No factory-fit DAB+ radio option
- Self-cancelling indicators are not practical



There is no external spool control on the right.



Hello old friend ... there's no sensor, just a dipstick.



Accessing the cab filters is a spanner operation.



Width: 299cm; Length: 676cm;
Height: 355cm

FENDT 1167 VARIO MT

TECHNICAL DATA

ENGINE: 455kW/618hp (acc. to ECE-R 120) nominal/max output (1,730/1,600rpm); 495kW/673hp with boost; MAN six-cylinder engine, 16.2-litre, Stage V with DOC, DPF and SCR; 1,320l diesel and 135l AdBlue

TRANSMISSION: Stepless VarioDrive TA 400T, 0.02 to 40km/hr, 14km/hr in reverse, shuttle, TMS control, cruise control

BRAKES: Wet multi-disc brakes, hydraulic actuated, auto parking brake, air system

ELECTRICS: 12V, battery 3 x 77Ah; 325amps alternator; starter 24V, 9kW/12hp

LINKAGE: Cat. IV N; ELC with lower linkage control and vibration damping (optional)

HYDRAULICS: Axial piston pump with 220l/min and 200 bar; optionally 2 x 220l/min and up to eight spools; 100l oil reserve

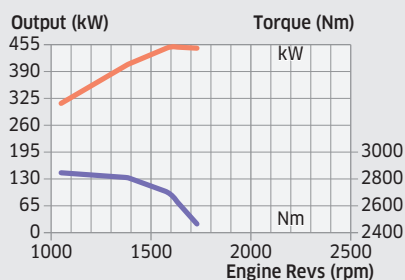
PTO: 1,000/1,000E (optional) Cat. IV flange with 55mm and 22 splines, electro-hydraulic control; front pto not available

AXLES AND RUNNING GEAR: Tracks with central beam suspension, 8° pendulum angle; 70.4cm track width (76.8cm opt., then 3.15m total width) Camso AG 5500

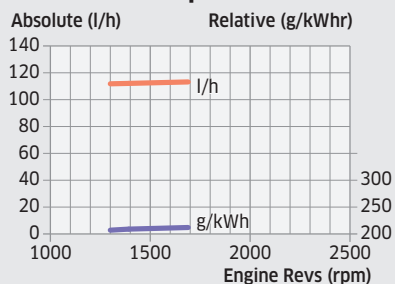
SERVICE AND MAINTENANCE: 45l engine oil (500hr change interval); 120l transmission oil (2,000hr); 125l hydraulic oil (2,000hr)

PRICES: Base specification £517,299; full specification with pto (£15,084), rear linkage (£26,206), RTK steering with TI Headland etc. (£7,247) and "Smart Ride" suspension (£5,293). Along with various other extras, this adds up to £586,729.

Output and Torque



Fuel Consumption



MEASUREMENTS FROM NNTL

PTO OUTPUT	
Maximum at 1,600rpm	451.1kW
At rated speed (1,730rpm)	446.5kW

FUEL CONSUMPTION	
At max power	207+17.5g/kWh
Rated speed	212+19.7g/kWh
Absolute max/rated speed	111.8/113.2l/hr

TORQUE	
Max	2,846Nm (1,050rpm)
Torque rise	15.5%

TRANSMISSION	
No. of gears in 4-12km/hr range	Stepless

REAR LIFT (90% max. oil pressure, corr.)	
Bottom/centre/top	9,930daN
Lift height	86cm (23 to 109cm)

HYDRAULIC OUTPUT	
Operating pressure	210 bar
Max flow rate	233.5+234.4=467.9l/min with optional double pump
Output	72.3kW (228.2l/min, 190 bar) 71.6kW (224.7l/min, 191 bar)

DRAWBAR POWER	
Max 382.3kW at 1,729rpm	246g/kWh
376.4 kW at 1,600rpm	243g/kWh

NOISE LEVEL (under load at the driver's ear)	
Cab closed	69.5dB(A)

TURNING CIRCLE	
Turns around vertical axis	6.76m (veh. length)

TEST WEIGHT	
Kerb weight	19,885kg
Fully ballasted	26,762kg
(max) GVWR total weight	27,000kg
Payload	7,115kg

DIMENSIONS	
Wheelbase	300cm
Track width front/rear	229cm
Ground clearance	35.9cm

* NNTL (Nebraska Tractor Test Lab)
OECD Tractor Test 2247
Since the tracked tractor could not be measured on the rolling testbed at the DLG Test Centre, we have to make do without a number of our customary DLG test measurements.

Fuel consumption at typical performance

APPLICATION	Out-put	Speed	g/kWh	l/hr
Standard pto shaft 540	100%	-	-	-
Economy speed pto 540E	100%	-	-	-
Standard speed pto 1,000	100%	1,614	207	111.8
Economy pto 1,000E	100%	-	-	-
Engine in top speed range	100%	max	251	109.6
High output	80%	90%	-	-
Transport work	80%	90%	-	-
Low output, ½ speed	40%	60%	-	-
High output, ½ speed	40%	60%	-	-

TEST ASSESSMENT

ENGINE +	
Performance characteristics	+
Fuel consumption	++
Pto output/drawbar power	+++
Very good pto performance, good tractive power and very low consumption; good power traits with stepless transmission	

TRANSMISSION ++	
Gearbox ratios/functions	++
Shifting	++
Clutch, throttle	++
Pto	++
Stepless, good engine-gearbox control, unprecedented operation with cruise control etc. in this league; right-hand shuttle only, two pto speeds with full power transmission	

AXLES AND RUNNING GEAR +	
Steering	++
Four-wheel drive and diff lock	n.a.
Hand- and footbrake	+
Suspension chassis/cab	++
Weight and payload	++
Controllable tank steering with very small turning circle, comparatively low unladen weight, but very good ballasting possibilities and high payload	

LINKAGE/HYDRAULICS ++	
Lift power and lift height	+
Operation	++
Hydraulic output	++
Spool valves	++
Hydraulic couplers	++
Good lifting power, enormous hydraulic power; exemplary operation, spools and connectors, maximum eight spools	

CAB +	
Space and comfort	+
Visibility	+
Heating/ventilation	+
Noise level	++
Electrics	+
Build quality	+
Maintenance	+
Space, comfort and visibility are OK but not luxurious; noise level is OK, very good control armrest and display terminal	

ABILITY	+	++	+++
Basic standards			•
Average standards			•
High standards		•	
Field work			•
Grassland work	•		
Transport work	•		
Loader work	n.a.		
ON-FARM PRICE	LOW		HIGH
£424,950-£435,000			•

Grading: ++ very good, + good, ○ average
• below average, ○○ poor
Individual marks are merely excerpts from our assessments and do not necessarily result in a mathematically conclusive overall mark.