

Fendt 942 Vario:

Packs poke, sips juice

With the previous 900s, Fendt's big horsepower crown was starting to sit at a precarious angle as its competitors closed the technology and versatility gap. But, with this sixth generation, the German tractor maker is bang back on form with features that are genuinely useful in the field and on the road, plus a new motor that packs power and sips juice. Or at least that's what our test team thinks

The new generation Fendt 900 family has more in common with the larger 1000 series line-up than it does with its predecessor. Or that was certainly our thoughts from our driving impression in the 8/2019 issue.

In the UK and Ireland, the older 900s have always proved popular, especially the 930 and 936. With the introduction of the new generation, it is the 936 and 942 that have taken over as the key sellers, with over 130 units having already now landed here since the launch in July 2019. And these are not just going to existing owners, says Fendt, as it looks to tempt Magnum and 8R buyers over to the German tractor brand.

The five-model range (217kW/296hp 930 to the featured 305kW/415hp 942) employs a MAN motor, replacing the Deutz lump in the previous (202kW/275hp 927 to 291kW/396hp 939). This is a 9.0-litre, six-cylinder compared to the 12.4-litre version in the 1000 series. Unlike its bigger brothers, the 900s have the

fan located behind the radiator pack, a less complex arrangement that also allows a front pto to be fitted.

The MAN engine boasts four valves per pot, common rail injection at 2,500 bar and a variable geometry turbo with an incorporated linkage. To comply with Stage V regs, it uses a particulate filter, oxidation catalyst and selective catalytic converter, but it manages without exhaust gas recirculation.

The new 900s also adopt the firm's low engine speed concept. This means full power is always available in the 1,500 to 1,700rpm band. To see how much of a difference this makes, we packed our test 942 off to the DLG test centre to discover just how much of the 305kW/415hp (rated to ECE-R 120) arrives at the tractor's tail end. Even when purring at 1,500rpm, almost 207kW/277hp is available at the pto. This ramps up to 277kW/377hp when the engine is working at its rated speed of 1,700rpm. Accordingly, the torque increase is also very modest at just under 17%.

No extra power, no boost

We have seen the same engine characteristics of no extra power and no boost on the 1050 that we tested in the 6/2018 issue (subscribers can access this for free on our test centre) where it proved to be an ideal match for the stepless transmission. The engine can operate at a consistent 1,500rpm, for example, while the transmission compensates for fluctuations in power requirements by altering its ratios. And there is more than 1,800Nm of torque on tap all the way down to 1,200rpm ... to provide the necessary performance stability even for pto jobs.

The low engine speeds result in record-low consumption levels – only 211g/kWh (+23.7g/kWh of AdBlue) at maximum pto output are top-of-the-league stats. Given this initial result we were keen to see how the 942 would perform in our Powermix tests on the DLG's rolling



road. With a total consumption of 237g/kWh (+32g/kWh AdBlue) the big Fendt takes a leading position.

It is 15% more economical than our tractor test average, with only the Fendt 1050 putting in a better performance (233g/kWh). The John Deere 8400R model is also in this horsepower bracket, and, when we tested it in the 11/2017 issue of *profi international*, it used 238g/kWh of diesel and sipped just 9g/kWh of AdBlue. But it is worth noting the Deere had a Stage IV engine coupled to the E23 powershift transmission, which, due to its more mechanical driveline, has a slight advantage in heavy draft and pto work. However, the 942 regains the advantage on mixed work.

The Fendt also comes into its own on transport work where it sips its way through 383g/kWh at 40km/hr, which is still impressive after you add the 45g/kWh of DEF. In the same test the 8400R had a bigger appetite and worked through 428g/kWh (+14g/kWh of DEF).

NEAT TOUCHES

The 942 has several practical details that are quite unique. Here are some examples:



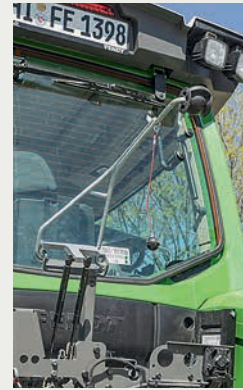
You can retract the electric telescopic mirrors when things get tight.



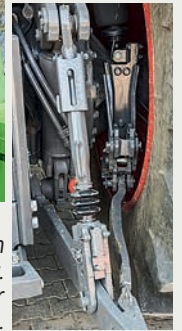
The seat uses air from the brake system rather than having a separate compressor. There is also an outlet to blow out the cab.



The warning panels have an integrated indicator, and there's a third brake light at the rear of the cab roof.



The top link holder has gas struts to make handling more convenient.



Fixing the drop arm in their 'up' position is easy. There's also a scale for adjusting the length.

The grooves help position the top link when fitting the pin. An accumulator for coupling the top link is said to be in the pipeline.



KEY POINTS

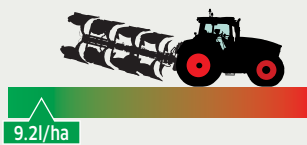
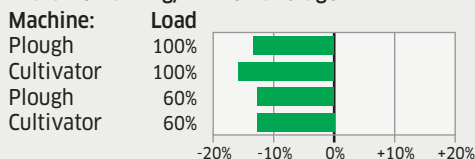
- ▶ As on the 1000 series, the 900 now features a MAN engine and a new continuously variable transmission that eliminates having to change between 'road' and 'field' ranges.
- ▶ Despite being Stage V, engine power and fuel economy rank alongside those of the top three tractors in this league at Stage IV.
- ▶ Fendt still has number of unique selling points such as its factory-fit integrated reverse-drive system and double-acting rear linkage.



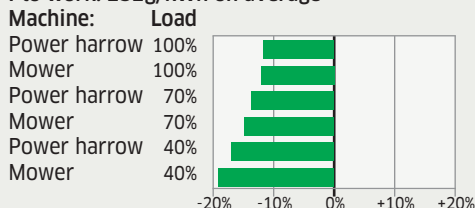
FENDT 942 VARIO

FUEL CONSUMPTION IN FIELD WORK

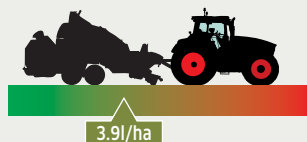
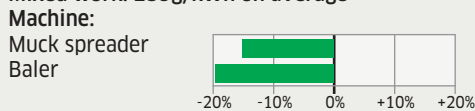
Draft work: 244g/kWh on average



Pto work: 232g/kWh on average



Mixed work: 239g/kWh on average

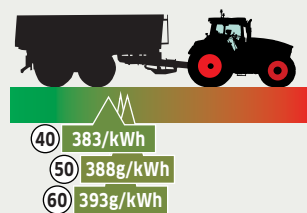


Powermix:



FUEL CONSUMPTION IN TRANSPORT WORK

On flat ground:



Uphill:



Transport mix: AdBlue: 11.4%

The Fendt 942 with its Stage V engine is more frugal in all types of work – arable, grassland and on the road – than the average rate of all of the tractors tested to present (with higher emissions). In light work it uses 20% less fuel than the average rate in the test group, while, for transport work, consumption is as much as 10% less than the average rate.

Better 'lug' than before

This takes us on to tractive power. The new 900s have the same transmission as the 1000 Vario, and, when harnessed to the DLG brake truck, the 942 managed 241.1kW/323.3hp. Yes, this is 15kW/20hp more than the 939 we previously tested (profi 11/2015), but it's still significantly less than the Claas Axion 960 (259.4kW/347.9hp) or the John Deere 8400R (275.1kW/368.9hp).

With a specific fuel consumption rate of 244g/kWh, the 942 is also efficient when lugging. In fact, it's in the top three, although the 30g/kWh of AdBlue needs to be taken into account.

The transmission is referred to as the TA300 (the 1000 series has the TA400) with the size of the axle and ratios matched to the 900. There is no longer a need to change between field and road driving ranges (a longstanding gripe we've had with the original Vario driving concept). The 900s also benefit from the all-wheel-drive set-up first seen on the 1000 series (profi 6/2018). As far as the pto is concerned, there are just two speed options: either 540E/1,000 or 1,000/1,000E.

No matter if it is on tarmac or in the field, Fendt has honed the engine and transmission so that the entire powertrain is working in harmony. We do think that changing between driving on the stick and on the pedal is still unnecessarily complicated.

Top-notch hydraulics, linkage

There are separate transmission and hydraulic oil circuits, with the latter having 90 litres on tap that can flow out through the 140l/min couplers (170l/min spools are an option), and we wouldn't be surprised if there was the buyer option for two separate power beyond circuits in the future.

The standard swash plate pump is rated to 165l/min, but our test tractor was fitted with the £826 optional 220l/min pump. It delivered 225.5l/min to the couplers with over 66kW of usable hydraulic power – very good. If you need even more output there is a two-pump option, which is said to produce a total of 430l/min.

The rear linkage also did very well, with over 8.6t of continuous lifting power to a lift height of almost 85cm. There is little to complain about, and, while the traditional stabiliser design does its job just fine, we still think it is worth investing £1,388 in the hydraulic stabilisers as it's a neat solution for overcoming the tight space, particularly on tractors with 900 tyres. Fendt is the only maker offering a double-acting rear linkage for this size of tractor. The engineers have not been able to



The six-cylinder, 9.0-litre MAN engine has a variable turbo. It reus at a fuel-friendly 1,700rpm.



The accommodation is identical to what's on the 1000 series, but it's mounted on three suspension points.



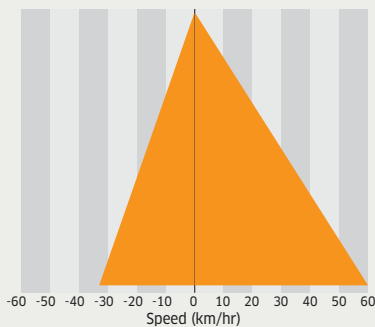
The dash replaces the A-post display. The handbrake lever is positioned a long way forward – luckily, it's not used too frequently thanks to the tractor's excellent parking lock.

SPEED RATIOS

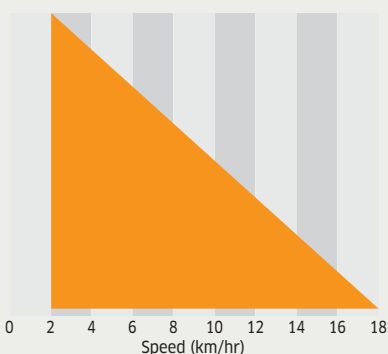
The transmission has only one travel range that works from 0.02km/hr to 60km/hr. Other spec extends to cruise control, shuttle controls left and right as well as an automatic parking brake.



Infinitely variable forward and reverse



Stepless control in 4 to 12km/hr band



The main controls around the cab will be familiar to Fendt operators and are well proven. The new Fendt One operation system is only on the 300 and 700 series tractors ... for now.

simplify handling the very heavy hydraulic top link, but we are told a solution is on the way. The beefy pick-up hitch is sourced from Bennett Engineering

Rather than using load-sensing pins for draft control, the 900 series relies on a combination of the transmission oil pressure and GPS data as a control parameter. This means that the entry-level 'Power' version without GPS has no draft control.

Familiar cab ...

Moving to the cab, like the 1000 series the 942 has a 'grand staircase' with 45cm wide steps. Inside, all previous 900 series Fendt drivers will feel immediately at home, as the interior and controls are not too different. The new Fendt One control system is only being introduced on the 300 and 700 series for now. But there are a number of details, such as the infotainment package (a digital radio, four speakers, subwoofer and eight

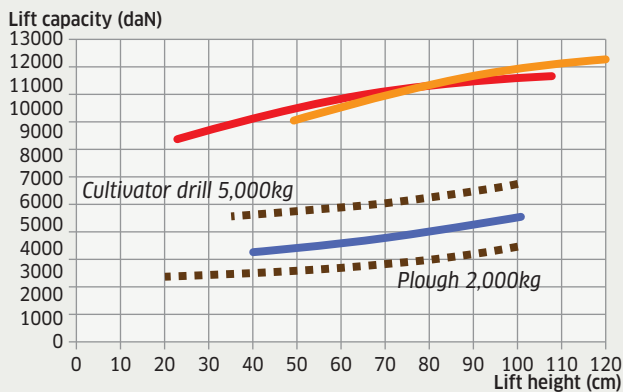
microphones), that make the 942 office a pleasure to sit in, although these do add £1,972 to the price. You will also find practical user features such as the 'TI Headland' that allows completely automated turning at the end of the field – provided you've fathomed it and provided the fields are nice and square. Note that U-turns into the next bout require a headland of 20m.

... and operator comfort

In terms of comfort, we can also give the 900 top marks. Compared to the Vario 1000, the cab has three rather than four suspension points. Our tractor had the pneumatic cab suspension – a £1,597 extra.

Our test tractor did seem to produce a lot of noise from the steering. And the recorded 73dB(A) under load is not a record result. But the feeling of gliding along at 60km/hr at less than 1,500rpm is sensational. The LED-based lighting system with headlight levelling and

LIFT POWER AND LIFT REQUIREMENT



Fendt 942 Vario: The linkage is identical to the set-up on the 1000 series tractors. Lift power steeply increases on the way up, so the 942 and other 900s can hoist heavy kit without a fuss.

- Front linkage: continuous 3,816daN; 60.7cm lift height
- Long rear lift arms: continuous 8,622daN; 84.9cm lift height
- Short rear lift arms: continuous 9,414daN; 76.8cm lift height



The linkage and hydraulic system tick all of the boxes in terms of output and operation.

66,000 lumen all round is equally impressive. Thanks to generous adjustment options and different diffusers, you really can turn night into day – but you also have to spend £2,154 for the full lighting package.

Talking of night, a third brake light up in the roof (which also lights up when you decelerate with the throttle) and the indicators built into the warning signs are all nifty touches. The telescopic wing mirrors that can be electrically retracted at the touch of a button (£717) add to that premium feeling.

Almost 13 tonnes of unladen weight

Our 942 tipped the scales at 12,795kg, not exactly lightweight. Comparing stats, the new range weighs almost 2,000kg more than the old 900 and 1,000kg less than the 1000 Vario. With a gross of 17t (60km/hr), the payload is a humble 4.2t. This can be boosted to 19t at 50km/hr and 20t at 40km/hr.

One of the reasons for this extra weight is the tractor's longer wheelbase of 3.15m (previously 3.05m), which makes it possible to fit 2.20m tall rear tyres. There are also no restrictions for up to 75cm wide duals on the rear (60cm on the front).

The 942 is available with wheel weights up to 1,000kg per side and the VarioGrip tyre pressure control system. The two-cylinder compressor with 720cm³ is water-cooled and now operates at 12.5 bar to eliminate the need for air tanks in the wheel arches. The list price for adjusting tyre pressures at the touch of a button is £14,261, which Fendt says leads to better tyre performance and saves both wear and fuel.

Oil changes after 1,000 hours

In terms of service and maintenance, we liked the replaceable oil filter inserts and the long 1,000-hour service interval for the MAN motor. To do this, the sump of the six-cylinder sump

swallows 43 litres. Sadly, while the electronics indicate the level of contamination in the air filter, they don't show the oil level. The air filter under the bonnet now sucks the air from the top, so it does not ingest dirt from the reversible fan.

The coded ignition key has been an option for some time. Now each tractor has its own individual lock for the doors, diesel tank, bonnet and ignition. While certainly a move in the right direction, keyless entry would be even better.

Each horse costs £850

Lastly, the 2021 prices. An entry-level 'Power' version of the 942 starts at £318,701, while the 'ProfiPlus' model (larger joystick, terminal, auto-steer ready and telemetry package) is £338,064. Then there are options such as the front linkage (£2,418), three additional spools (£1,881 each), VarioGuide RTK with NovaTel receiver (£1,784) and 900 IF tyres that were fitted to our test 942 and bumped the price up to £346,692. Using the list price figures, this works out at nearly £850 per horsepower.

Summary: With the sixth generation of the 900 series, Fendt has achieved a quantum leap in terms of the engine and transmission. In addition, there are many details that make working with the Dieselross a real pleasure. Compared to the then flagship 939 we tested five years ago, the list price has rocketed by over £100k ... or around £60k if you look at the ball park on-farm figures for the two tractors within their technical data sheets.

Hubert Wilmer/Mervyn Bailey



The front axle is permanently engaged at speeds up to 25km/hr.

FURTHER DETAILS FROM OUR FIELD TEST

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

+ POSITIVE

- + Practical cable exit point
- + 300° front wiper
- + Standard rear wiper
- + Daytime running lights
- + One alternator with greater output



Wiper to clear the side window.



Toolbox deluxe. Icing on the cake would be a storage area for lift arm balls and other items.



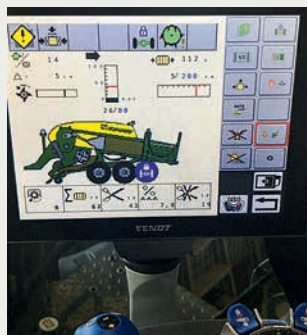
Steps are wide, with the handles in the right places.

- NEGATIVE

- Handbrake lever is too far forward. Auto brake is an option
- Toolbox is located on the right and is a lofty 1.50m from the ground
- No air vents in the cab's overhead area



Standard climate-cooled box will hold a bottle on its side.



ISObus terminal display is not very sharp in resolution.



The 942's key is coded.



FENDT 942 VARIO

Width: 299cm; Length: 589cm
(with front linkage); Height: 348cm

Technical data

Engine: 305kW/415hp (to ECE-R 120) rated output at 1,700rpm (no power boost). MAN water-cooled six-cylinder 9.0-litre motor; Stage V with DPF, DOC and SCR; 625-litre fuel tank, 70-litre AdBlue tank

Transmission: Infinitely variable VarioDrive gearbox TA300, 0.02 to 60km/hr forward, max of 33km/hr in reverse, powershuttle, 60km/hr at 1,450rpm engine speed

Brakes: Wet multi-plate disc brakes in the rear axle, four-wheel engagement; standard with air brake system

Electrics: Two 12V, 180Ah batteries; 24V, 7kW starter motor; 14V, 275amps alternator

Linkage: Cat. III, electronic lift control without load-sensing pin, manual stabilisers, front linkage/front pto is an option

Hydraulics: Standard 165l/min swash plate pump, 220l/min on test machine (220 + 210l/min is also an option), 200 bar, up to eight spools with time/flow control; 90 litres available oil for attached implements

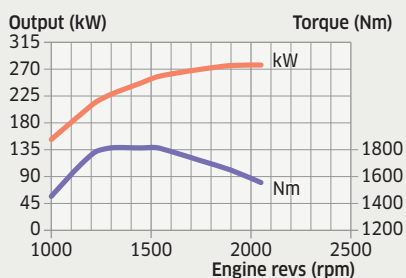
Pto: 540E/1,000 or 1,000/1,000E, 1 $\frac{3}{4}$ in, six or 21 splines, electro-hydraulic engagement

Axles and running gear: Flanged axle (adjustable axle is an option), multi-plate diff locks, permanent four-wheel drive; tested on 710/60 R34 front and 900/60 R42 rear tyres

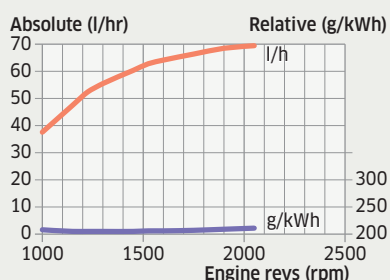
Service and maintenance: 43 litres engine oil (1,000-hour intervals); 67 litres of transmission oil and 122 litres of hydraulic oil (2,000-hour intervals); 70-litre cooling system

Prices: Base specification £318,701 (excl. VAT); test specification £346,692.

Output and torque



Fuel consumption



Results from test station

Pto output	
Max (1,700rpm)	276.9kW
At rated speed	276.9kW

Diesel/AdBlue consumption	
Max output	211+23.7g/kWh
Rated speed	211+23.7g/kWh
Absolute max/at rated	69.4/69.4l/hr

Torque	
Max	1,816Nm (1,350rpm)
Torque rise	16.8%
Engine speed drop	21%
Start-off torque	105%

Transmission	
No. of gears in 4-12km/hr range	stepless

Rear lift capacities (90% max oil pressure, corr.)	
Bottom/middle/top	8,622/10,523/11,304daN
Lift range under load	84.9cm (22.8-107.7cm)

Front lift capacities (90% max oil pressure, corr.)	
Bottom/middle/top	3,816/4,433/5,319daN
Lift range under load	60.7cm (40.0-100.7cm)

Hydraulic output	
Operating pressure	198 bar
Maximum flow	225.5l/min
Output	66.6kW (220.4l/min, 181.4 bar)

Drawbar power	
Max 241.1kW at 1,700rpm	244g/kWh
At rated speed 241.1kW	244g/kWh

Noise level (under load at driver's ear)	
Cab closed/open	73.0/82.4dB(A)

Braking	
Maximum mean deceleration	4.6m/s ²
Pedal force	35.7daN

Turning circle	
4WD engaged	14.90m

Weight of test machine	
Front/rear axle	5,690/7,205kg
Kerb weight	12,795kg
Max axle load (f/r)	8,500/11,500kg
GVWR (60/50km/hr)	17,000/18,000kg
Payload (60/50km/hr)	4,205/5,205kg
Power-weight ratio	42kg/kW

Dimensions	
Wheelbase	315cm
Track width front/rear	205/207cm
Ground clearance	50.0cm

Fuel economy at typical performance

Working areas	Output	Speed	g/kWh	l/hr
Standard pto shaft 540	100%	-	-	-
Economy speed pto 540E	100%	1,274	205	57.5
Standard speed pto 1,000rpm	100%	1,604	210	68.7
Economy pto 1,000E rpm	100%	1,286	205	57.5
Engine in top speed range	80%	max	216	56.8
High output	80%	90%	209	55.3
Transport work	40%	90%	236	31.1
Low output, 1/2 speed	40%	60%	212	28.0
High output, 1/2 speed	60%	60%	206	40.7

Test assessment

Engine	
Performance characteristics	1.2
Fuel consumption	1.2
Pto output/drawbar power	1.7
Reasonable overall performance, low engine rpm design concept, good fuel economy, good drawbar power and pto output.	

Transmission	
Gearbox ratios/functions	1.0
Shifting	1.0
Clutch, throttle	1.2
Pto	1.5
The current 'box' benchmark in terms of engine/transmission control for CVT tractors; 60km/hr is an option at a low 1,450rpm.	

Axles and running gear	
Steering	1.5
Four-wheel drive and diff lock	1.1
Hand- and footbrake	1.5
Front axle-/cab suspension	1.2
Weight and payload	2.9
Excellent steering, above average turning circle, very good front axle/cab suspension, strong brakes, massive kerb weight; a higher payload at 40/50km/hr is possible.	

Linkage/hydraulics	
Lift power and lift height	1.6
Operation	1.2
Hydraulic output	1.3
Spool valves	1.3
Hydraulic couplers	1.0
Very good lift power, hydraulic output and controls. Spools are easy to program; very good and convenient couplers.	

Cab	
Space and comfort	1.8
Visibility	1.7
Heating/ventilation	2.0
Noise level	1.9
Electrics	1.5
Build quality	1.5
Maintenance	1.5
Good space and noise level; top quality; good comfort. Storage could be better, and the same applies to hand brake ergonomics etc.	

Ability					
Meets basic standards					
Meets average standards					
Meets high standards					
Field work					
Grassland work					
Transport work					
Loader jobs					n.v.

Price	Low	High
£230,000 to £240,000		

Ball park on-farm price excl. VAT for a low to high spec tractor.

Grading system:
 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.