DLG PowerMix test | Deutz-Fahr 6160 P

The Swabian brand's fuel efficient range

In late 2012, Deutz-Fahr introduced the 6 Series and the large 7 Series TTV tractors. The manufacturer's current range also includes the 6160, available as four and six cylinder variants.
We put the six cylinder variant through its paces in a practical test and the DLG PowerMix test: these are the results.

For more information:
the video of the test and further information are available from: www.traction-magazin.de

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Deutz-Fahr is going full speed ahead with new tractor models in higher performance classes and a new production plant in Lauingen. The pace at which the Lauingen-based brand is moving is simply astonishing.
But we decided that we'd like to see the real world results of this for ourselves.
In 2013 we chose one of the first 6160 P models (which still had the old cowl design) as a test tractor. With around 160 HP on tap, this tractor takes both the open field and the road easily in its stride.

This is the third smallest model in the series, and the largest model available as both a long wheelbase six cylinder variant and a lighter, short wheelbase four cylinder version. All models in the series are offered with the Powershift transmission or the TTV continuously variable transmission.

TEST BENCH RESULTS ON PAR WITH THE CLASS AVERAGE
The heart of the 6160 P is a 6.1 litre Common Rail engine with four-valve technology and turbocharged forced induction with intercooler and wastegate. The exhaust after-treatment system consists of an SCR catalytic converter at the lower end of the exhaust pipe. The manufacturer declares a power output of 115 kW/156 HP at a rated speed of 2,100 rpm, tested according to ECE R-120 standards (with no ancillaries). However, as engine speed drops to 1,800 rpm, the power of the six-cylinder engine goes up to 122 kW/166 HP. Maximum torque according to Deutz-Fahr specifications is 672 Nm at 1,600 rpm.
Deutz is universally acknowledged as a builder of high quality engines - although these days, there is also some serious competition around. We were therefore very surprised by the results of the tests conducted by the DLG test centre. At rated engine speed, the test engineers at Groß-Umstad measured an output shaft power of 102.6 kW with a fuel consumption of 264 g/kWh (or 32.2 l/h), which are on a par with averages for the class. Maximum power, measured at a lower engine speed of 1,800 rpm, was precisely 107.3 kW. In this case, fuel consumption was 238 g/kWh, or 30.4 l/h. While not an excellent result, this is adequate for the class. We were, however, impressed with performance at the maximum power engine speed of 1,800 rpm, which was exactly as declared by the manufacturer.
While around the average for this power class, the maximum torque measured of 613 Nm at 1,500 rpm (750 rpm PTO speed) was substantially lower than the manufacturer's specifications - by almost 60 Nm or 10%. However, the torque reserve calculated for the 6160 P was a respectable 31%. The torque band of the engine is from 1,300 to 1,600 rpm.
AdBlue consumption must also be calculated on top of the fuel figures. The DLG test centre measured a consumption of 2.1 l/h at rated speed, 2,14 l/h at maximum power engine speed and 1.7 l/h at maximum

torque engine speed, equating to an acceptable 6.5 to 7 percent of diesel consumption. However, AdBlue consumption increases at 2,000 rpm; where the 6160 P uses 2.86 l/h of the additive - a hefty nine percent of the quantity of diesel used. Like its predecessor, the 6160 P has no boost mode for PTO or transport usage.

A GREAT MIDFIELDER

The DLG test centre thoroughly tested the power and consumption of the Deutz-Fahr 6160 P

Engine power
Power (kW)
Torque (Nm)
Rate (l/min x 100)

On par with the class average: The power curve is flat within a range between 1,700 and 2,100 rpm. Below 1,700 rpm, power drops off in almost linear fashion, but not significantly. At 1,500 rpm, the six-cylinder unit still delivers 100 kW. Torque values are adequate, but not above average. Maximum torque figures of 613 Nm (at 1,500 rpm) and 467 Nm at rated speed are not outstanding, but completely within the norm for the class. Bear in mind, however, that the six-cylinder unit produces both of these figures with no boost function.

Consumption
Absolute consumption (l/h)
Specific consumption (g/kWh)
Rate (l/min x 100)

Take your foot off the accelerator: the 6160 P consumes significantly less fuel at lower engine speeds, making it not only an outstanding machine for jobs in the field with the PTO, but also for transport applications at lower engine speeds.

The specific consumption values measured on the test bench of 264 g/kWh at rated speed and 238 g/kWh at maximum power speed (1,800 rpm) were just slightly above average for the class. In real life use, this means: use a lighter foot on the accelerator and stay around the maximum power engine speed of 1,800 rpm, especially when working in the field.

Key SCR – Selective catalytic reduction (exhaust after-treatment system with urea injected into exhaust gas); AdBlue – urea solution used for SCR system; torque reserve – value by which torque increases from rated engine speed to reach maximum torque (percentage); Common Rail – electronically controlled fuel injection system, with the quantity of fuel injected controlled independently of engine speed; LS – Load Sensing (hydraulic system which automatically adjusts the delivery of each distributor in relation to effective hydraulic power demand).

CONVINCING POWERMIX RESULTS

The 6160 P fared even better in the PowerMix test than in the PTO bench test. This was especially true in challenging towing operations, where this tractor benefits from the simple Powershift transmission with limited power losses. In almost all applications, the 6160 P returned fuel consumption figures a whole point lower than competitors of the same class, with a work cycle only just above average. At the end of the day, the 6160 P has an advantage of 2.5% over rivals in the same category, earning itself a leading place its power class.

Bear in mind, however, that our comparison results only consider tractors of the same power class and with the same Tier 4i compliance. We think that it is pointless to consider older tractors or tractors in other power classes in the comparison, as they are irrelevant in the decision of which tractor to buy. Obviously, AdBlue consumption must also be added to the PowerMix test values. The DLG test centre measured a figure of 23.1 g/kWh. Accounting for the different densities of the fluids, this equates to an overall AdBlue consumption of 6.5% relative to the diesel used, which reflects the manufacturer's specifications for Tier 4i engines.

Fuel consumption in DLG PowerMix test

		excellent	good	satisfactory	adequate	poor	Reference*
TOWING OPERATIONS: 268 G/KWH OR 23.5 L/H							
Heavy load (100%)	Tilling	258 g/kWh					-5.1%
	Cultivator	282 g/kWh					+1.1%
Medium load (60%)	Tilling	264 g/kWh					-4.3%
	Cultivator	268 g/kWh					-6.0%
OPERATIONS WITH PTOs ENGAGED: 270 G/KWH OR 19.7 L/H							
Heavy load (100%)	Rotary harrow	247 g/kWh					-2.0%
	Mower unit	245 g/kWh					-1.5%
Medium load (60%)	Rotary harrow	290 g/kWh					-5.4%
	Mower unit	257 g/kWh					-4.4%
Light load (40%)	Rotary harrow	261 g/kWh					-2.4%
	Mower unit	320 g/kWh					-1.5%
MIXED OPERATIONS: 285 G/KWH OR 21.4 L/H							
	Manure spreader	271 g/kWh					-2.1%
	RB bale press	299 g/kWh					-4.5%
	Transport	not measured					
OVERALL AVERAGE: PowerMix 272 g/kWh or 21.3 l/h							**- 2.5%**

Key: Values measured by DLG Technik & Betriebsmittel test centre in Groß-Umstadt. Average for power class is for machines complying with current Tier 4i exhaust emissions regulation. Difference relative to class average for machines compliant with Tier 4i exhaust emissions regulations also takes AdBlue consumption (priced at €0.40/litre) into account.

Top of the class: the 6160 P delivers excellent fuel economy in all applications - with an average consumption of 272 g/kWh in the PowerMix test, it is the tractor with the lowest consumption in its class tested to date by DLG. The six cylinder unit is particularly economical in heavy duty jobs. As well as diesel, the 6160 P also consumes AdBlue additive to treat the exhaust gas and achieve Tier 4i compliance. Average consumption of AdBlue is 23.1 g/kWh (equating to 6.3% of the diesel used).

PROS AND CONS

Overview of specifications and features of the Deutz-Fahr 6160 P

+ A maximum steering angle of 52 degrees and six degrees of caster make the 6160 P extraordinarily manoeuvrable. Driver comfort is excellent, with a suspended front axle and self-levelling suspension.

+ The superior lifting capacity, possibility of up to seven dual action distributors and 4 speed PTOs offer substantial advantages, while the wide range of adjustment for the tow hook is also a benefit.

+ The engine is easily accessible for maintenance and repairs. The single piece cowl opens up over a generous angle, while the tidy hoses and lines allow unobstructed access to the entire engine.

+ The cab is airy and pleasant. The feeling of space is emphasised by the extensive glazed roof (standard), which is particularly useful when operating the front loader.

+ The renowned Shuttle lever ensures easier, smoother direction inversions, while the wheel at the top of the lever itself (which also appears in other Deutz-Fahr tractor families) lets the driver select more or less aggressive shuttle action.

+ The dials for setting time and flow quantity for the distributors have been a familiar feature in Deutz-Fahr tractors for years, and do their job extremely effectively.

- As always, the gear lever selector gate is rather stiff and makes shifting quickly difficult. Gear shifts themselves, however, are extremely smooth.

- The accelerator pedal is difficult to modulate, especially on rough terrain, while the surface of the pedal itself is slippery.

- The cowl fastener snags when opened, and gets in the way when closing the cowl. The AdBlue tank can only be filled from the right hand side.

Technical data

ENGINE	
Deutz six cylinder engine	TCD 6.1 L064V
Rated power (ECE R-120, 2,100 rpm)	115 kW/156 HP
Max. power ECE R-120	122 kW / 166 HP
Exhaust after-treatment (Tier 4i compliant)	SCR with AdBlue injection, and exhaust gas recirculation
Other	Four valve technology, wastegate, RME+B100
Max. torque	672 Nm (1,600 rpm)

Torque reserve Torque band	32% approx. 200 rpm
Engine capacity	6.1 l
Cylinders/type/cooling	6/turbo/water
Diesel/AdBlue capacity	280 l/35 l
Engine oil change interval	500 operating hours
TRANSMISSION AND PTOs	
ZF	40 x 40 LS
Top speed	50 (factory specifications 40) Km/h
PTO speed	540/540E/1,000/1,000E
HITCH AND HYDRAULICS	
Type	Cat. II/III
Max. rear lifting capacity	9,240 kg
Maximum continuous rear lifting capacity	n.a.
Standard/optional distributors	4/7
Pump output	120 L/min
Max. delivery per distributor	100 L/min
Max. delivery pressure	200 bar
Max. quantity of usable oil	40 l
OTHER SPECIFICATIONS	
Dry weight	6,200 Kg
Max. gross weight	10,000 kg
Wheelbase	2.65 m
Height at top of cab	3.02 m
Cab noise level	72 dB(A)
WEIGHTS AND DIMENSIONS	
Base price, 40 Km/h version	€106,800
Compressed air	Standard
Power Beyond	€300
Front hitch + PTO	€6,900
Front axle suspension	€4,400
ISOBUS compatibility	€1,600
3 supplementary distributors with FKH comfort pack	€3,650
Total price of tractor tested	**€123,650**

OUTSTANDING STRENGTHS

The standard configuration of the 6160 P is conceived for maximum lift capacity and hydraulic system performance - the two hallmark characteristics of Deutz-Fahr. However, the 4 speed PTOs featured as standard also lived up to our expectations.

360° visibility The S Class^2 cab introduced in 2012 has revised and is significantly better than the outgoing version. In spite of the B pillars, the cab offers satisfactory all-round visibility.

FOUR RATIO POWERSHIFT TRANSMISSION

The 6160 P is equipped with the well-known 40 x 40 speed, four ratio Powershift transmission by ZF. The transmission in the new model, however, has benefited from a number of modifications over the previous

version. Advantages: the all-new LS control with proportional valves ensures perfectly smooth, linear shifting.
The new transmission does in fact feel significantly different to use than the transmissions in previous models. The double H shift gate has been tilted even more towards the driver, and features a new linkage point devised to facilitate gear selection. As before, however, gear selection is not very precise. If the lever is not exactly aligned with the selector gate, the driver has to push the lever into position forcefully with the right arm, which is hardly ideal when driving. As always, the driver can select ratios from either the gear lever or from the multifunction lever. An automatic transmission is also offered which, depending on individual settings, either selects all four ratios or just two or three. The advantages in terms of comfort were especially evident when cutting fresh fodder, where it is necessary to adjust ground speed rapidly to match the speed of the forage harvester-chopper.
The APS setting dial under the right hand armrest lets the driver set shift response to choose either more fuel economy or more engine power. Downshifts under load (when a lower speed is selected to decelerate from high transport speeds) are, however, always performed with a slight delay. The 6160 P also offers a Speed Matching function, which automatically adjusts engine speed to match the ratio selected. The wheel at the top of the Shuttle lever lets the driver set inversion response (from smooth to aggressive), offering the advantage of being able to
optimise Shuttle action for the job in hand. Direction inversions can also be performed from the multifunction lever when the Shuttle lever is in Neutral. While swapping between the Shuttle lever and the multifunction lever can be a little complicated, it is not a serious problem.
Overall, the spacing between ratios is satisfactory, while the highest ratio is very tall. 40 Km/h is achieved at just 1,600 rpm, while 50 Km/h is reached at just below 2,000 rpm: all in all, a good result.
A few brief words on the PTO: the Agrotron 6 Series already rolls out of the Deutz-Fahr factory with an excellent four speed PTO as standard, which can also be operated from duplicated external controls on the right and left of the tractor.

As usual, speed is pre-selected from lever controls, while the PTO itself, with overload protection, is activated from a rocker switch. Double clicking the control to start the PTO is no longer necessary, fortunately, while the extensively adjustable hitch yoke is another advantage, as it allows plenty of room for attaching U-joint driveshafts.

Total versatility: The 6160 P is a true all-rounder which offers significant advantages in terms of fuel economy and hydraulic performance.

THE VERDICT OF TRACTION'S EXPERT TESTERS

These two experts have already had extensive experience working with the Deutz-Fahr Agrotron 6160 P. In their reports in Traction magazine, they explain what they liked about the tractor, and what they thought could still be improved.

Uwe Tolksdorf, farmer from 53506 Heckenbach-Cassel: “In early 2013, as I found that my 150 HP tractor was no longer up to the job, I started looking for a new all-round machine for my pastures and horse breeding farm. In the end I went for the 6160 P, because the dealer is very close to my business. The price and specifications suited me, and the tractor could be delivered straight away. I mainly use the 6160 P for mowing with my 7 metre reversible mower with no conditioner, and for manure-spreading with a 12 tonne Strautmann spreader, as well as for maintenance jobs and for sowing grass seed to fill patches. In addition

to these farm tasks, I also have to use the tractor for many hours for transporting backfill soil. To date, the tractor has clocked up almost 800 operating hours without a single problem."

"The 6160 P uses very little diesel. Average consumption for the jobs I use it for is 10 l/h. AdBlue consumption is also minimal: I used a 200 litre drum for 500 operating hours (ed: this equates to around four percent of diesel consumption). The work light pack lets me carry out manure spreading tasks precisely even at night, letting you clearly see where land that has already been treated and land that hasn't. The controls are simple to use, and the performance of the air conditioning is excellent."

"The ratios should be easier to select, and the shift lever should be closer to the driver. The air sprung cab suspension bounces excessively, and the AdBlue filler neck is too small."

Klaus and Roberto Lenhard, farmers in 66484 Schmitshausen: "In April 2013 we chose to rent a Deutz-Fahr 6160 P, which we then bought in the spring of 2014. The very advantageous rental terms offered by Deutz-Fahr played a decisive role in this choice, as was the fact that there was an authorised service centre close to us. The tractor works used alongside a 130 HP John Deere in our dairy farm and our fields, and is used mainly for transporting, sowing and in combination with a 14 m^3 manure tanker. We chose for almost all the options available, including the iMonitor. The tractor was originally still fitted with the old shift lever, which Deutz-Fahr changed in 2013 with the new part. Since then, selecting ratios has been easier."

"Fuel consumption is very low. When towing the manure tanker over long distances, the 6160 P uses just 12 to 13 l/h of fuel. Compared with tractors from other brands, visibility is excellent - especially because of the short, compact engine cowl. Comfort is satisfactory and the controls are simple to use. Overall, the tractor offers fair value for money. To date, our 6160 P has already racked up 600 operating hours, some of which with farming contractors, with no significant problems. The only work has been to change the engine software after 50 operating hours, as the tractor often simply refused to start."

"The PTO speed selector lever is very stiff, and it takes effort and patience to change speed. You also have to get used to the fact that the AdBlue filler cap is on the right."

Become a traction expert!
In the next issue, we'll be testing the Fendt 516 Vario and 716 Vario. Have you already tried either of these tractors?

Send us your opinion to redtrac@dlv.de, or get in contact with us via the traction Facebook page.

POWERFUL HYDRAULICS

This brings us to one of the most powerful "green" tractors from the Swabian brand. Excellent lifting capacity has always been a Deutz-Fahr strength, and this tractor offers a maximum rear and front lifting capacity of 9,240 and 4,000 Kg respectively (manufacturer's specifications). The generous travel of the rear hitch was always an advantage in practical use.

The hydraulic system is also impressive, and comes as standard with four dual action rear distributors. The 6160 P may be equipped with up to seven distributor control circuits, each one of which capable of activating the front hitch. Even in the standard configuration, delivery rate is already more than adequate,

with 120 l/min for the hydraulic system (with an axial piston pump) and 42 l/min for the power steering system.
One of the distributors may also be controlled externally from buttons on both rear mudguards.
Coupling and disconnecting hydraulic lines is simple. However, the union block on our test tractor became heavily soiled over time.

LIGHT AND AIRY CAB

The S-Class^2 cab is extremely inviting, and we were highly impressed by the light coloured, visually pleasing and superior quality materials.
The closing action of the left door was troublesome, as if the rear window is closed, there is no pressure compensation. The handle is also placed very high up. Access on the right, however, is satisfactory.
The interior of the cab is spacious enough. On the left of the seat are two lateral compartments, one of which refrigerated. The light coloured materials get dirty very easily, however. The passenger seat with folding cushion offers excellent comfort for a passenger, although the padding could perhaps be softer.
The right hand armrest includes a number of already familiar controls, such as the PowerCom S multifunction lever (for controlling ratios, direction inversion, the hitch and two distributors). This looks very dated compared with the new control lever in the 6 Series TTV and 7 Series TTV - it does not fit the hand very well, and is no longer up to today's ergonomic standards.
The other functions, such as the engine speed memory, hand throttle and differential lock, are intuitive and easy to find. Below the armrest, as usual, are the controls for the hydraulic distributor settings (for setting time and flow), the APS automatic transmission and the ASM Headland Management system, which may be programmed and used even without the iMonitor (which was not included on our test tractor). The screens relative to stored and recalled functions are shown on a monochrome display at the centre of the steering wheel console. We would have liked to have had an additional small display on the A-pillar, as included as standard in TTV versions.
Unfortunately, only manual air conditioning system offered, with no option for an automatic system. However, the options available offer plenty of choice for driver comfort. As well as a suspended front axle, the tractor may also be ordered with mechanical or air sprung cab suspension. We used the more basic mechanical variant, and were very impressed with the results.
A driver seat with dynamic suspension is also available as an extra cost option.
Front and rear visibility are excellent, while lateral visibility is also satisfactory between the closely spaced B and C pillars. The large glazed roof (with roller sun blind) proved to be very useful, especially when performing front loader tasks.

Overview of values measured

PTO MEASUREMENTS		
Rated power (2,100 rpm)	102.6 kW	+
Torque at rated engine speed	466.6 Nm	+-
Consumption at rated engine speed	264 g/kWh	+-
Maximum power (1,800 rpm)	107.3 kW	+
Consumption at maximum power speed	238 g/kWh	+
Max. torque (1,500 rpm)	613 Nm	+-
Consumption at maximum torque	227 g/kWh	++

speed		
Torque reserve	31%	+
Consumption in PTO 1,000 mode (2,000 rpm)	252 g/kWh (32 l/h)	+-
TEST ROUTE IN PARTIAL LOAD CONDITIONS		
Max. drawbar power at max. power engine speed Max. drawbar power at rated power engine speed	98.4 kW, 262 g/kWh 90.0 kW, 300.0 g/kWh	
A Drawbar power at 8.8 Km/h (ratio H2 selected) Consumption (2,120 rpm)	85.4 kW 303 g/kWh (26 l/h)	75% partial load
Drawbar power at 11.9 Km/h (ratio M3 selected) Consumption (2117 rpm)	85.4 kW 301 g/kWh (26 l/h)	
Drawbar power at 14.3 Km/h (ratio H3 selected) Consumption (2,108 rpm)	86.2 kW 310 g/kWh (27 l/h)	
B Drawbar power at 8.8 Km/h (ratio S2 selected) Consumption (1,766 rpm)	85.5 kW 268 g/kWh (23 l/h)	75% partial load, highest ratio
Drawbar power at 11.8 Km/h (ratio H3 selected) Consumption (1,758 rpm)	84.9 kW 274 g/kWh (23 l/h)	
Drawbar power at 14.3 Km/h (ratio S3 selected) Consumption (1,771 rpm)	86.1 kW 271 g/kWh (23 l/h)	
C Drawbar power at 9.0 Km/h (ratio H2 selected) Consumption (2,147 rpm)	58.5 kW 360 g/kWh (25 l/h)	50% partial load
Drawbar power at 12.2 Km/h (ratio M3 selected) Consumption (2,148 rpm)	57.6 kW 356 g/kWh (20 l/h)	
Drawbar power at 14.7 Km/h (ratio H3 selected) Consumption (2,146 rpm)	58.0 kW 363 g/kWh (21 l/h)	
D Drawbar power at 9.0 Km/h (ratio S2 selected) Consumption (1,790 rpm)	58.5 kW 302 g/kWh (21 l/h)	50% partial load, highest ratio
Drawbar power at 12.1 Km/h (ratio H3 selected) Consumption (1,782 rpm)	57.1 kW 304 g/kWh (17 l/h)	
Drawbar power at 14.6 Km/h (ratio S3 selected) Consumption (1,795 rpm)	57.8 kW 318 g/kWh (18 l/h)	
++ = excellent, + = good, +- = average, - = poor, --= very poor		

Our verdict

OVERALL, AN EXCELLENT PACKAGE

The Deutz-Fahr Agroton 6160 P fared predominantly well in our test. Consumption and torque tested on the test bench were largely on par with averages for the category, while the tractor scored excellent results throughout the DLG-PowerMix consumption test, with a class-beating 272 g/kWh.

The transmission is a familiar unit which has been optimised. We were very impressed by the smooth shift action of the transmission, but did not like the double H shift gate, however.
The tractor scored more points for its PTO, front and rear lift capacity and hydraulic system.
Even the standard configuration of the hydraulic system largely met our expectations; so the fully equipped configuration should keep even the most demanding users happy.
Here, we only had a few reservations about details.
Significant improvements over the previous version have been made in the cab, especially in terms of fit, finish and trim quality. The cab is also very airy and well lit (with a glazed roof and light coloured materials) and offers great visibility.
The multifunction lever is now dated. In future, we'd like to see the same Work Display installed as standard in the TTV variant included in the standard equipment here. For the time being, only the large iMonitor is offered as an option. Driver comfort is excellent.

Score from 0 to 10*

Engine	
Power	9.0
Torque	9.0
Tractability	9.0
Consumption (partial load)	10.0
Consumption (full load)	10.0
Consumption (transport)	9.5
Maintenance	9.5
Transmission and PTOs	
Ratios and spacing	9.0
Shift action	8.5
Transport speed	9.5
PTOs	10.0
Hitch and hydraulics	
Lifting capacity	9.5
EHR control	8.5
Hydraulic power	10.0
Hydraulic hitch control	9.5
Cab	
Volume	9.0
Space	9.5
Ergonomics	8.5
Comfort	9.5
Visibility	9.5
Other	
Turning circle	9.0
Handling	9.5

* Evaluation grid: 0 points = poor; 5 points = average; 10 points = excellent