



K-IVT Tech

The Gearbox of the future

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to an interested licensee

Your sign:
Our sign: kj

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**K-IVT technology - especially for tractors, trucks and construction machinery,
as well as automobiles, racing and all electric vehicles etc.,
continuously variable transmission with improved efficiency, infinitely variable ratio
changes continuously under full load!
also possible to use in existing devices!**

Dear Ladies and Gentlemen,

I would like to briefly present my invention to you in the appendix.
The patent AT 519 361 was granted and published on 15.06.2018.
The PCT procedure is already underway.

The **K-IVT technology** (= continuously variable gear arrangement) allows a **simple gear design** as known from Fendt (AGCO Group). However, a Fendt Vario gearbox must always change the driving range from 1 to 2 and vice versa when stationary or unloaded. In addition to the **improved efficiency** (up to 57% less hydro component) compared to Fendt, the K-IVT transmission can actually carry out **all ratio changes from backwards to forwards without any traction interruption under full load**.

The Fendt company has always used very similar gear arrangements or the same components in its tractors, and therefore I would like to show you the essential advantages - with concrete gear examples, with details of gear wheel sizes, speeds, torques and the reduced proportion of hydrostatic components.

Let me show you a comparison with a Fendt Vario tractor transmission. Hydrostats and planetary sets are also used in the transmission here.

The gear consists essentially of 2 planet sets, each of which is laterally connected to a pair of shafts.

The power splitting is therefore based on a 100% mechanical construction on both sides. The transmission ratio is clearly determined when influencing only one gear.

For this purpose, the output or drive is returned to the gear at least once. This allows extremely high ratios without changing the driving range, as previously known.

Only the control causes a small hydraulic part.

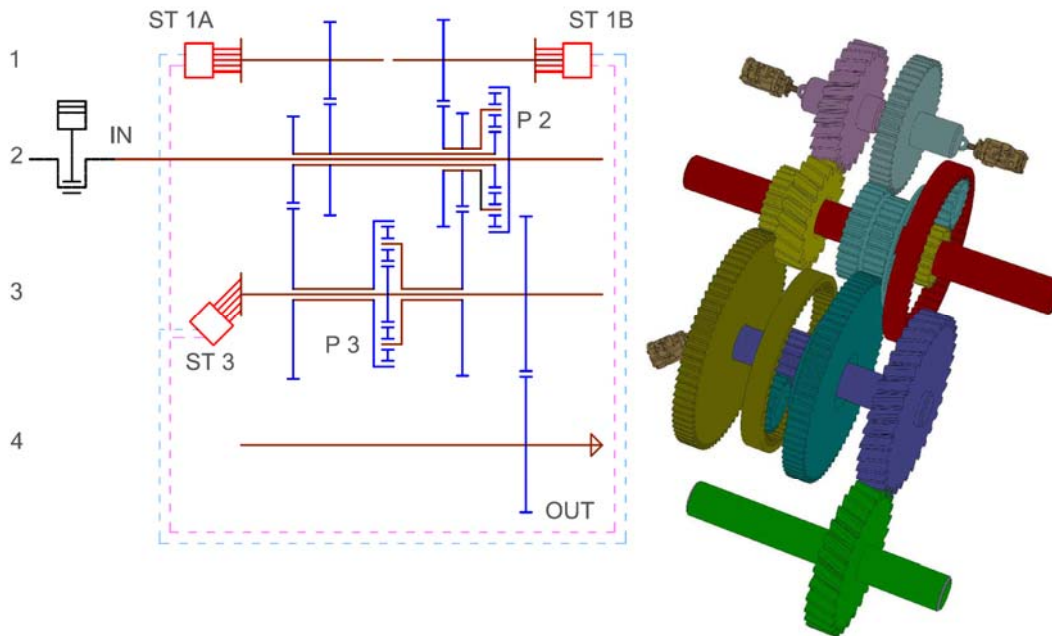
Functionality:

In the following example, both shaft pairs with different transmission ratios were connected to the gearbox output by means of hydrostats.

K-IVT for Fendt 516 Vario

Standard with 1450 rpm

1) Gearbox - Scheme



The acceleration process occurs as follows:

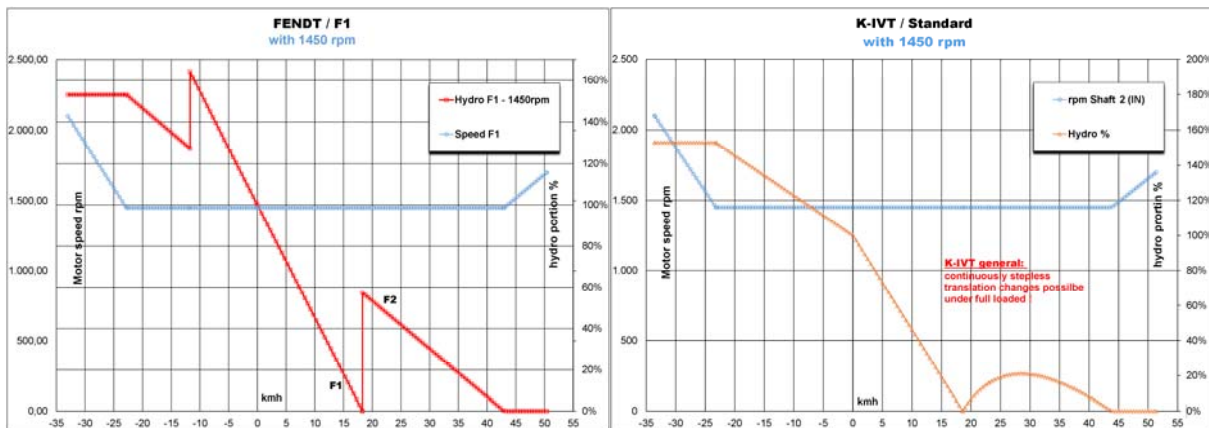
Initially from standstill of the output drive (ST3=0) to standstill of one of the shaft pairs (ST 1A) (see 1 travel range of Fendt),

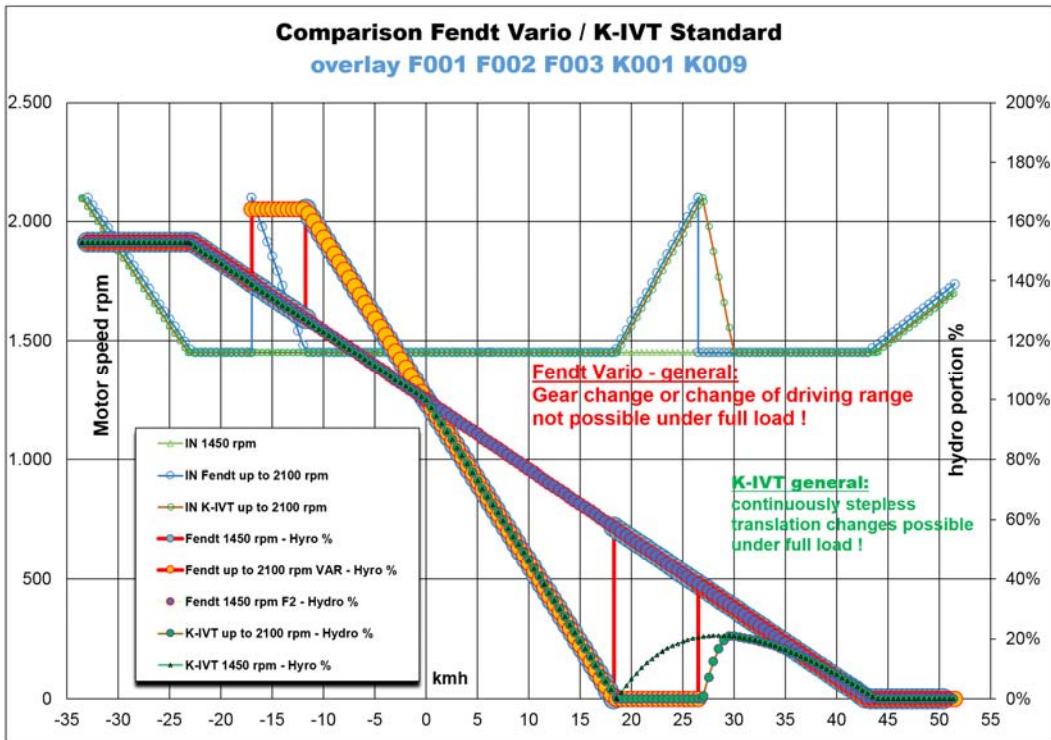
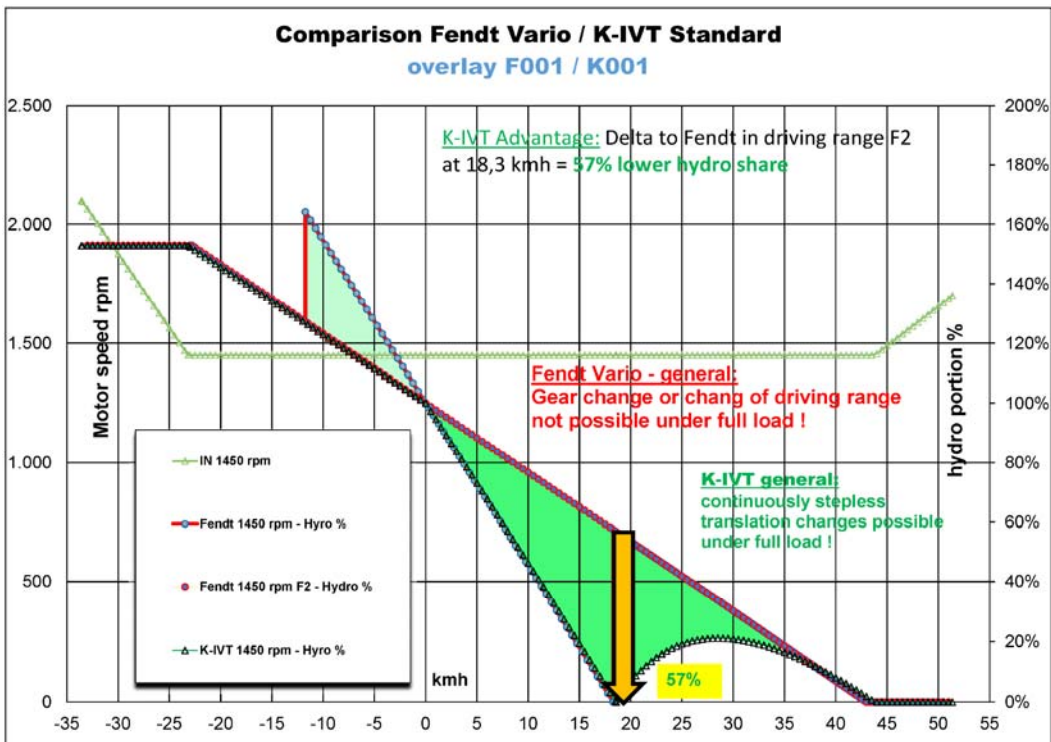
then the change from standstill of one pair of shafts (ST 1A=0) to standstill of the second pair of shafts (ST 1B=0) (cf. 2 travel range of Fendt).

The change of the standstill from one shaft pair to the standstill of the second shaft pair enables the stepless transition from a 100% mechanical transmission (see 1 travel range) to the next 100% mechanical transmission (see 2 travel range).

This change from Fendt so-called driving range 1 to driving range 2 is therefore not only more economical than previously at Fendt, but also takes place under full load.

Of course this is also true in reverse direction. (travel range 2 to travel range 1)





Strategic patent analysis with information advantage is a decisive success factor for achieving and maintaining technical market leadership.

In order to give as many sectors as possible the opportunity to benefit from this new technology, it is very important to me to bring this gear arrangement based on the AT 519361 patent to your attention.

The technology is very flexible.

e.g. the K-IVT technology can also be used on existing tractors!

This is shown in the enclosed example of the construction for the Fendt 516 Vario.

The construction was designed and adapted so that the K-IVT transmission can be installed or replaced in existing Fendt tractors.

In the K-IVT examples, the position of the shafts and their distances (planetary drive, pump shaft, summing shaft and group shaft) are absolutely identical with those of the Fendt gearbox.

The input and output speeds as well as the directions of rotation also remain unchanged.

The Fendt gearbox already contains all the components required for K-IVT technology. It is assembled only slightly differently.

The K-IVT transmission works with improved efficiency.

Axis 4 can be omitted on new tractors.

Additional gear wheels are mounted on axis 2 so that the existing distance can be maintained on shaft 1 and the desired speeds can also be transmitted.

In general, there is no gear change (for Fendt tractors - called driving range change) and therefore no problems known with it, especially when driving downhill with corresponding thrust from behind when changing from F2 to F1.

In addition, it is currently almost impossible to switch from driving range F2 to driving range F1 without first bringing the tractor to a standstill in the case of incorrectly estimated uphill drives. At Fendt, a change can generally only be made at around 15kmh.

An unfortunate change of driving range is currently taking place at the expense of the service life of the transmission.

The Fendt transmission works with a powerful driving range 1.

Driving range 2 is significantly less economical, but achieves 100 % mechanical performance in the designed final speed range.

As already mentioned, the current problems with the change between FB 1 and FB 2 is well known.

The main advantage of the K-IVT transmission in Fendt tractors is that it also has the economical and powerful driving range 1, but then **without shifting and at full load, without train interruption into** an economical driving range 2 passes.

With the K-IVT technology, no abrupt speed changes are necessary due to the continuous swivelling of the individual hydrostats, as there is no switching and no load interruption.

Theoretically any number of intermediate points with 100 % mechanical power are possible (whereby in principle only a maximum of 2 pumps can be controlled at any one time).

By the improvement of the overall efficiency this technology becomes additionally interesting for the end customers by unsurpassed user friendliness, besides by fuel saving, environmental relief, reduction of maintenance and repair costs.

Priority, however, should be given to avoiding the currently required change of driving range - which should be the aim of Fendt transmissions at a standstill in order to protect the transmission or, if achievable, in a load-free range.

I kindly ask you to read the comparisons between K-IVT transmissions and Fendt transmissions regarding traction, hydrostatic torque and speed.

Please do not ignore the essential advantage that the translation can be changed continuously without power interruption under full load.

For equipment, such as construction machinery, where there is also a lot of reverse travel, the advantages of forward travel can be used very easily with the same or reduced final gear ratio also without shifting.

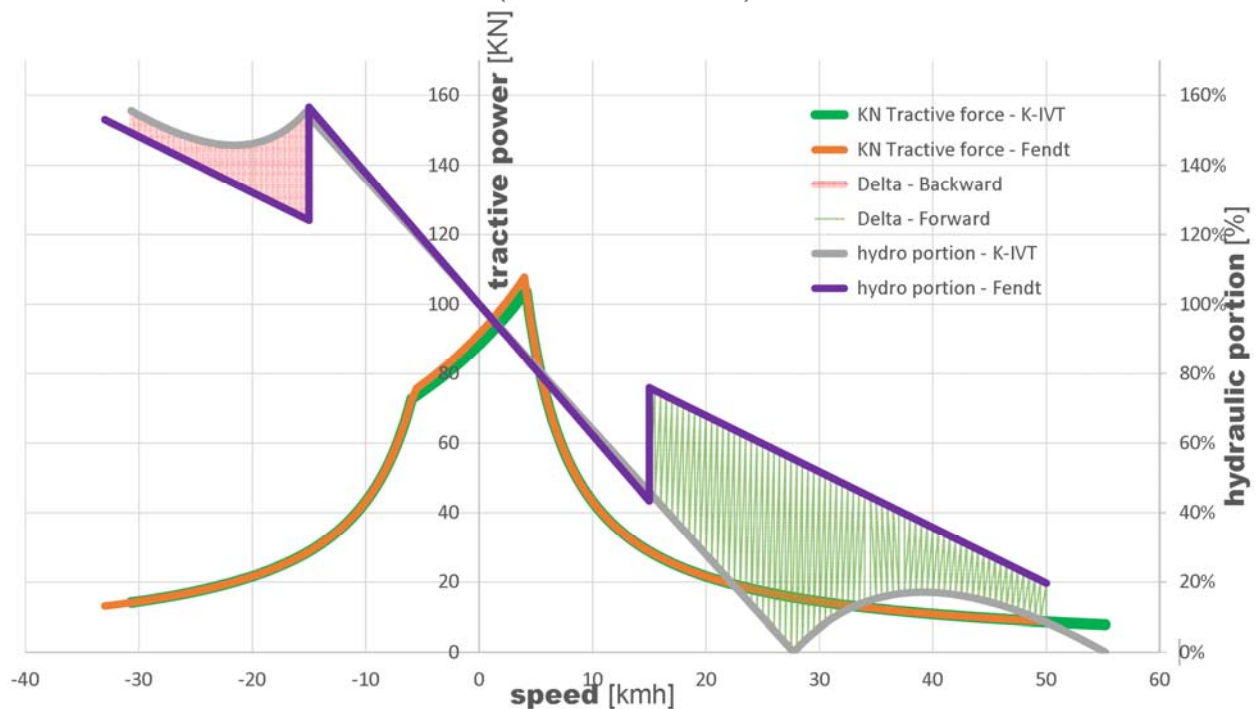
As a result, the K-IVT technology can also be used very economically in cars and electric vehicles.

Already Prof. Dr.-Ing. Ferit Küçükay of the Technical University of Braunschweig (Institute for Vehicle Technology) convinced in an interview a few years ago that electric cars will also use at least 2 to 4 or more gears for optimal use in series production in the future.

Enclosed I send you a detailed example with a very high tractive force, as known from the Fendt tractors.

K015

Fendt 516 Vario / K-IVT
Tractive force and hydraulic share
with required travel range change
 (Fendt at ~15kmh)



With the K-IVT technology, it is also possible to carry out all gear changes steplessly and absolutely without interruption of tension under full load.

In addition, the hydraulic content is also significantly lower.

In this example, the hydrostats can be fully utilised up to the power limit of torque and maximum speed.

By selecting larger hydrostats, the tensile forces can be further increased if required.

Finally, I would like to inform you that I would like to make the advantages of the K-IVT technology available to your company.

I kindly request that you forward the documents (including download) to your specialist department for appraisal.

I hereby offer to design a K-IVT gearbox according to your needs and/or specifications without obligation.

Please let me know, if you are interested in the simple and very effective K-IVT technology and if you see a possibility of cooperation.

Thank you in advance for your answer.



Johann Kropfreiter

Inserts	Advantages K-IVT Technology
Download	Ü001 – Overview design example
	F001-F003 – Fendt gearbox for comparison
	K001–K012 – K-IVT Konstruktionsbeispiele im Detail
	K015 – K-IVT Example with very high tensile force
	Patent certificate 519 361

Link to download the detailed documents (EN):

request link by e-mail office@getriebe.co.at

IMPORTANT HINT:

The representations contained in this document do not originate from the sources of the Fendt company.

The content of this document has been prepared by K-IVT to the best of its knowledge.

The representations contained therein may therefore differ from those of Fendt.

It is by no means the intention to damage Fendt or the AGCO Group with these presentations, but the essential advantages of the K-IVT technology shall be presented here objectively.