



Modul 1: Hydrostatic-mechanical power-split transmission

Introduction

The hydrostatic-mechanical variable transmission (HVT) is a power split transmission. This transmission is an evolution, in the transmission technology and falls under the banner of continuous variable transmissions. The HVT offers better fuel efficiency and is the first power-split transmission in an 8WD-forwarder on the market. This innovation to forwarders offers a lower fuel consumption, lower CO₂ footprint, lower vibration, better and more comfortable handling of the machine for the forest machine operator. This technology is an already proven concept on Heavy Material Handling devices like Reach Stackers, where in the product has been in production from 2015 and has contributed to an annual average of 80,000 kg of CO₂ less per machine/year.



Comparison of DRTS HVT vs. standard transmission

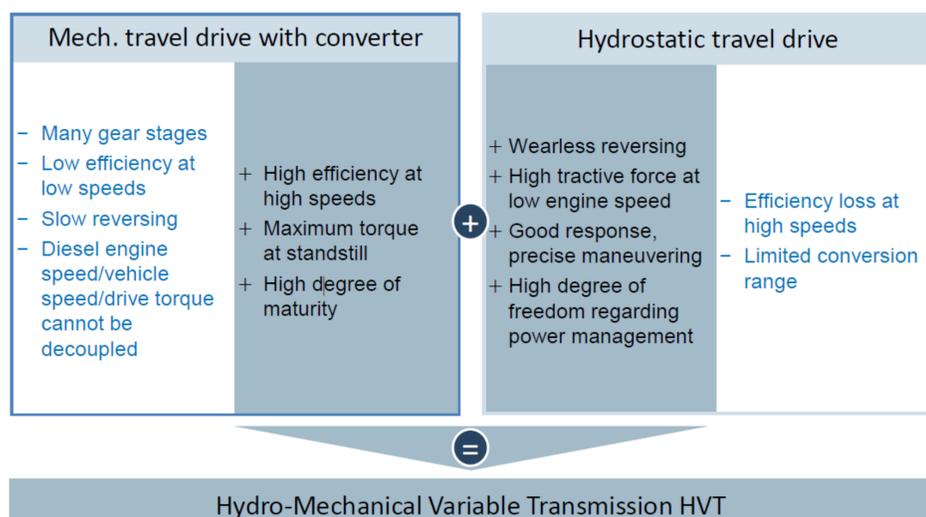


Figure 1: The best of both worlds: DRTS Hydro-Mechanical Variable Transmission © Dana Rexroth Transmission Systems S.r.l.

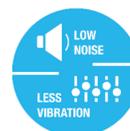
Impact

The impact of this module on the working process is that longer hauling distances can be economically forwarded and the need for more forest roads is reduced.

It uses less fuel thereby reducing the refueling time and overall increases productivity.



It reduces the engine speed and the noise emission. Thereby offering a comfortable working environment - less noise and vibrations for the operator. This also contributes to reducing driver fatigue.



Functioning of the HVT

The HVT produced by DRTS is a semi power split, asymmetric, input coupled transmission. It has two paths a hydraulic path and a mechanical path. The hydraulic path is used in the 1st drive range, this offers high tractive effort, fine positioning and precise control. The 2nd and 3rd range are power split ranges, where in both the mechanical and hydraulic paths are coupled to provide the functionality of the transmission. The HVT completely disconnects vehicle speed from the engine speed thereby allowing the engine to be run at lower rpms and at its best operating point there by further lowering fuel consumption

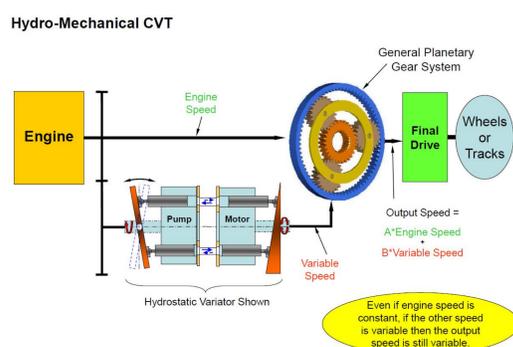
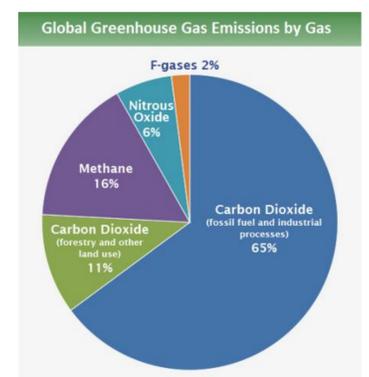


Figure 2: The Dana Rexroth Hydromechanical Variable Transmission HVT improves fuel savings up to 25% compared with standard torque converter transmissions

The HVT reduces the fuel consumption of the machine by operating the engine at its best point and thereby lowering the actual fuel consumption of the engine. There is a complete disconnect of the engine speed and the wheel speed, so although the engine is operating at 1500 rpm the machine can travel at 40 kph. The most interesting point is the reduction in CO₂ emissions which is a very important topic in today's world. A machine filled with HVT can on average lower the CO₂ emission by 25%



CO2 Reduction	Fuel Saved
25%	25%



Partners



Technik die Freude macht.



"The HVT is the most advanced transmission developed for the forest applications. It makes sense because it reduces fuel consumption and also reduces the CO₂ emissions released into the environment. The HVT obtains its unique advantage by complete synergy of all components. The Forwarder 2020 is an excellent example of achieving the best results through strategic partnerships facilitated by the EU Horizon 2020."

Anthony Alvin from Dana Rexroth Transmission Systems

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