High Efficiency Traction Control
HET

RE 15225-04
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An energy efficient hydrostatic wheel drive system for traction on demand in difficult terrain.

Introduction

High Efficiency Traction (HET) is an energy efficient wheel drive system for four wheel drive vehicles. HET offers economical operation on road and optimal drive characteristics off road for a wide variety of vehicle types such as municipal vehicles, wheel loaders (30 kW to 90 kW) and mini dumpers (payload 1000 kg to 3000 kg). Other potential applications include material handling and municipal vehicles which are required to work in poor ground conditions.

HET is automatically engaged only when necessary; this ensures that the vehicle operates at its most efficient on the road whilst maintaining an immediate off road capability.

HET is a plug and play solution that builds upon Rexroth's proven standard drive components and can be used with both single speed and two speed (switchable reduced displacement) MCR motors. Its compact design and low installation cost makes the HET system ideal for vehicle OEMs.

Functional description

The circuit consist of an HET valve block and four MCR motors in a closed loop transmission system

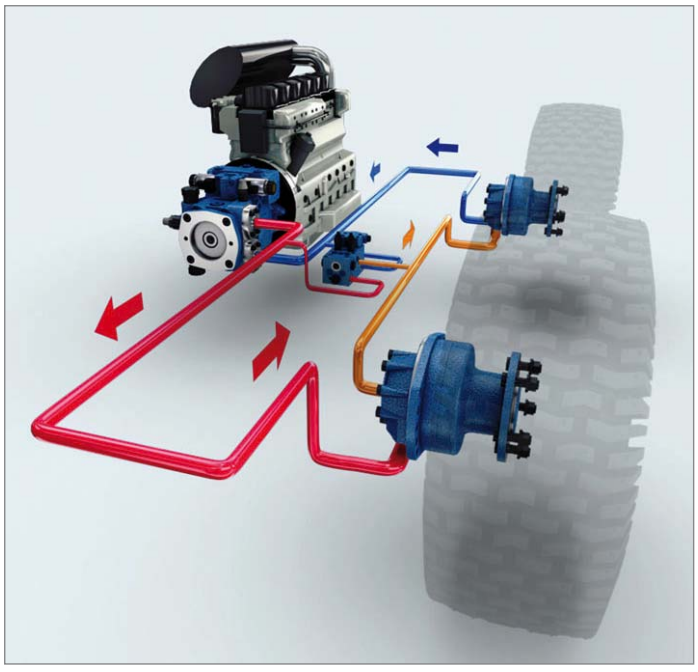
In a traditional series configuration the oil flows through the wheel motors one after the other. As the torque distribution is balanced the pressure drop is also balanced therefore there is a high back pressure on the first motor in the series leading to poor efficiency.

The HET block takes a constant flow from the connection between the front and rear wheel motors and directs it to the low pressure side of the hydrostatic drive.

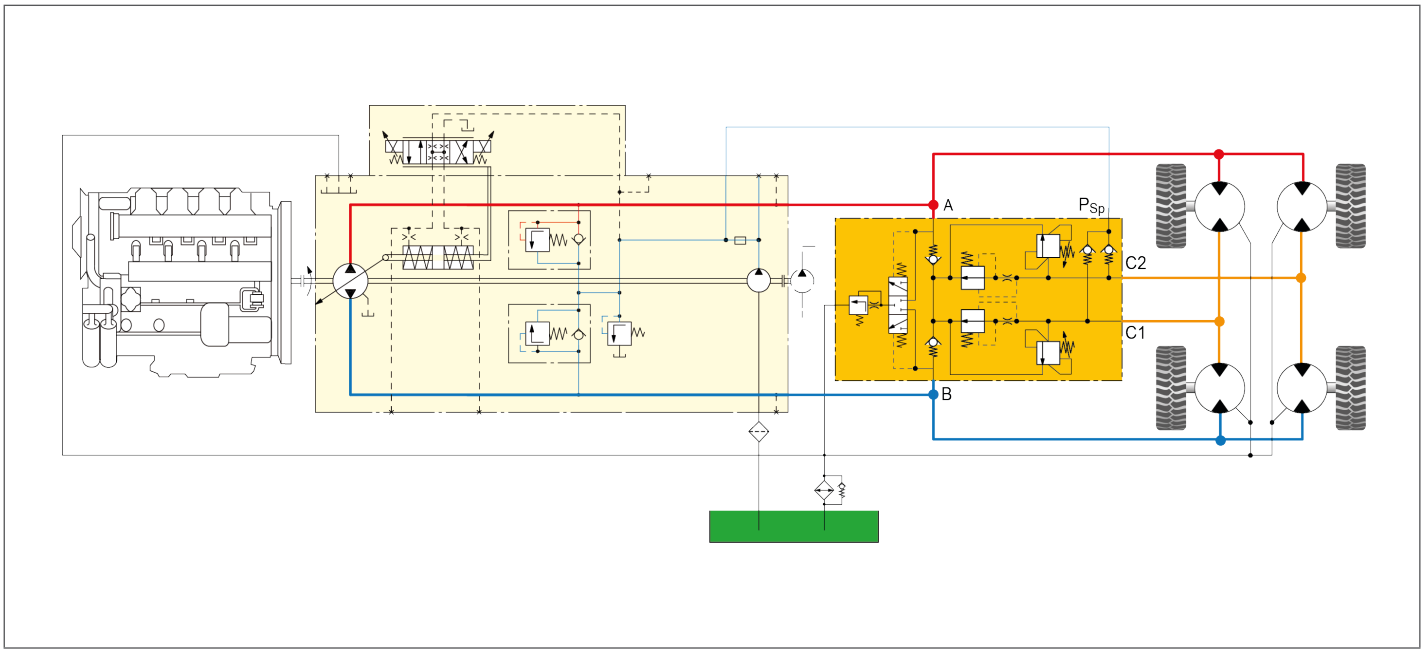
This ensures the entire torque is delivered by the first wheel motor in the series (normally the rear) and therefore maintains optimum efficiency.

If the vehicle encounters a difficult surface such as icy ground, the rear wheels may lose traction. If this occurs then the small speed differential between first and second motor (set by the flow rate through the HET valve block) is maintained this transfers the pressure to the second motor which will generate the torque until the rear wheel regains grip.

The entire procedure happens automatically without any intervention from the driver.



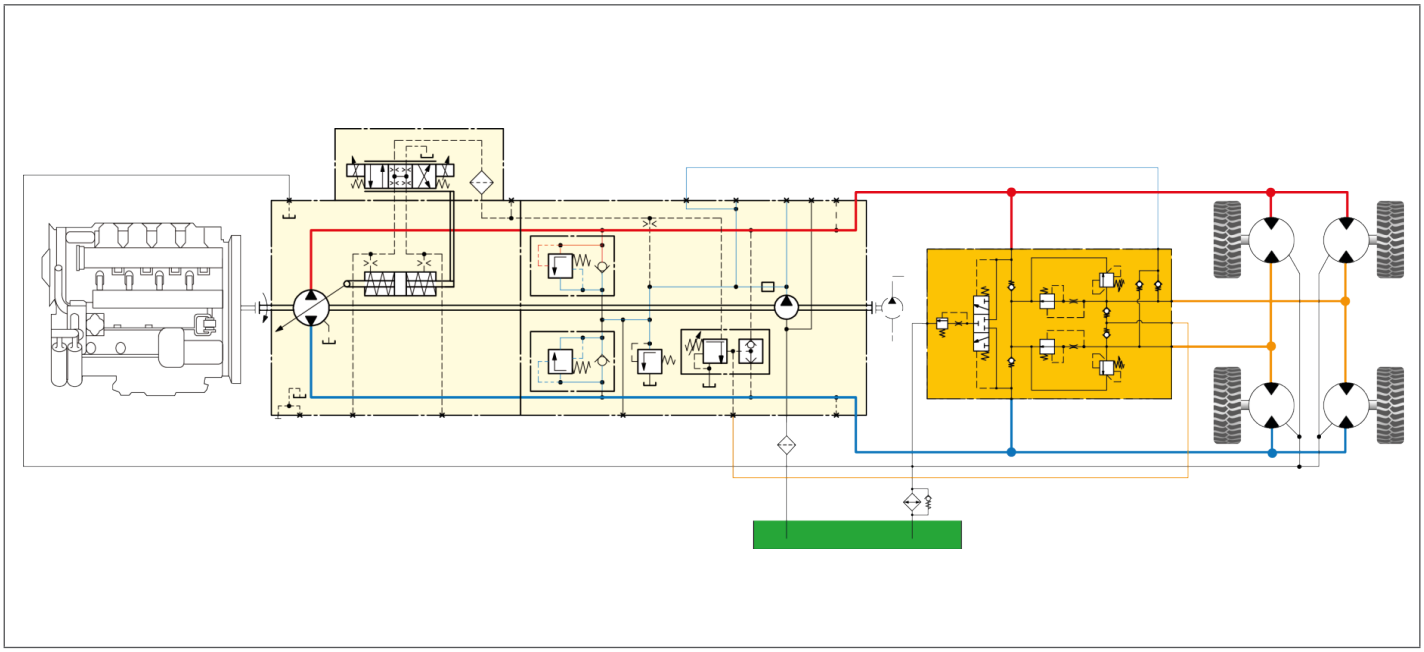
HET transmission concept 4x4 with MCR motors



Other functions provided by the block address the requirement for anti cavitation and relief valves in the series lines connecting the two motors. Loop flushing has also been integrated into the block.

Vehicles with articulated steering are also catered for using the connection to the M_H port on the pump. This allows for steering without compromising the traction control.

HET transmission concept for articulated steering



Technical data

HET control block	
Pressure range	350 and 420 bar
Variable axial piston pump A4VG series 32	
Sizes	28, 40, 56, 71, 90, 125, 180, 250 cm^3
Maximum pressure	450 bar
Variable axial piston pump A10VG series 1	
Sizes	18, 28, 45, 63 cm^3
Maximum pressure	350 bar
Radial piston motor MCR-F, MCR-W	
Sizes	160 up to 3000 cm^3
Maximum pressure	420 / 470 bar

		Running efficiency: % of maximum torque	**Starting efficiency: % of maximum torque**
All wheels grip		100	100
Front slip		100	100
		100	100
Rear slip		95	93
		90	85
Diagonal slip		95	93
Side slip		0	0
Legend	■ = Traction □ = Slip		

Please contact Rexroth for “right/left difflock” solution.

References

- MCR-F, data sheet 15198
- MCR-W, data sheet 15200
- A10VG series 1, data sheet 92750
- A4VG series 32, data sheet 92003

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