

# Transmitting power efficiently

## Turbo Retarder Clutch VIAB



# The new standard for wear-free starting and braking

With the VIAB wear-free integrated starting and braking system, Voith combines the advantages of hydrodynamics with the high efficiencies of mechanical drivelines. For heavy transports, on construction sites, as well as in cranes and special vehicles, the VIAB scores with high comfort through sensitive starting and maneuvering. In addition, the VIAB also features a powerful primary retarder.

The VIAB is an innovative system with a fill-controlled, hydrodynamic coupling (turbo coupling) as the main component. The VIAB combines the functions “hydrodynamic starting” and “hydrodynamic braking” in one element.

## Operating principle

During starting, power is transmitted to the transmission input shaft via the hydrodynamic circuit with impeller and turbine wheel as well as a subsequent one-way clutch. A conventional friction clutch is arranged as a lock-up clutch in parallel to the circuit. During braking, the turbine wheel is fixed with the turbine brake, and the system becomes a highly efficient primary retarder while the friction clutch is closed. The characteristics of the unit can be steplessly varied by filling and draining the hydrodynamic circuit.

## Maximum benefit without compromise

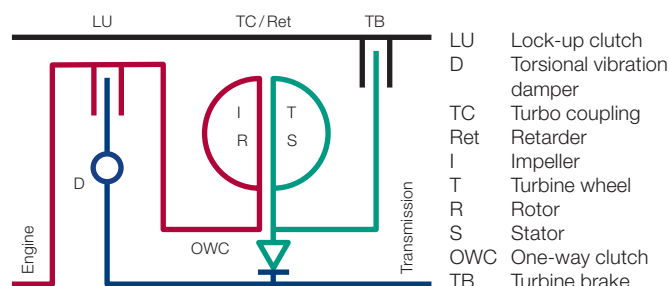
Starting, braking, maneuvering, creep speed, driving or standstill: The VIAB offers impressive benefits in any situation.

Compared to conventional torque converters, the VIAB allows full utilization of the maximum engine torque at any operating point. This results in low starting speeds and optimized fuel consumption. Moreover, the VIAB is overload-proof and excels by its high thermal stability even when maneuvering.

VIAB: Turbo coupling and retarder in one unit



Design scheme





Powerful starting and safe braking – with no wear and for loads up to 250 tons.

Source: Daimler AG



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### Benefits for end users

- + High comfort due to sensitive, hydrodynamic starting and maneuvering
- + Wear-free transmission of torque and thermal stability ensure maximum vehicle availability, even with heavy loads, frequent starts, long periods of maneuvering or extremely low velocity
- + Maximum starting tractive effort even at low engine speeds
- + Full utilization of engine torque up to traction limit
- + Wear-free driving
  - Significantly longer service life of friction clutch
  - A higher gear for starting-up can be selected avoiding an early shifting with tractive power interruption (advantage on loose road surfaces)
  - Lower axle drive ratio possible (up to 2 stages), speed level and fuel consumption reduce
- + Lower fuel consumption compared with conventional converter solutions
- + Integrated powerful retarder
- + Primary retarder allows maximum braking power even at low velocity
- + Retarder function also in reverse gear

### Advantages for vehicle manufacturers

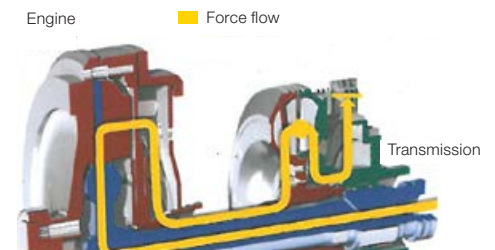
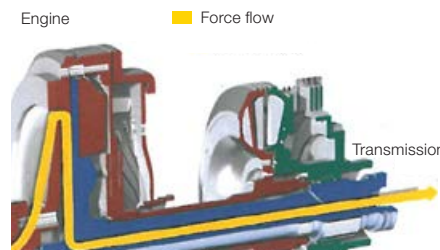
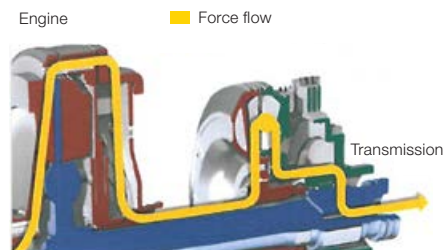
- + Starting behavior can be optimally adapted to engine characteristics
- + One VIAB model suits different engine versions
- + Input torque up to over 3000 Nm
- + Starting and braking with the same hydrodynamic circuit
- + Low weight, low installation space requirements
- + New, efficient automatic transmission concept in combination with automated manual transmission

### Operating modes

Starting, maneuvering, creeping speed (turbo coupling)

Driving with friction clutch

Braking with primary retarder



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