

# VLC 200 GT TURNING/GRINDING MACHINE FOR CHUCKED PARTS

think  
VERTICAL



# MODERN GEARBOXES HAVE HIGH REQUIREMENTS

**Modern (hybrid) drive units are real miracles of engineering.**

This complex interaction of diverse components demonstrates everything that is possible with internal combustion engines. A study, "The Change in Drive Units" performed by the VDMA predicts, this drive system will still be dominant in 2030, primarily in the form of hybrid systems. Given the complex range of components and the high unit volumes required, flexible manufacturing solutions are necessary. The next few pages will go into detail on the perfect production solution for the hard machining of these components.

## GEAR WHEELS

+ **Soft Machining (Turning)**

**Machines:** VLC 50 TWIN/VL 3 DUO

+ **Gear Hobbing of Gear Wheels**

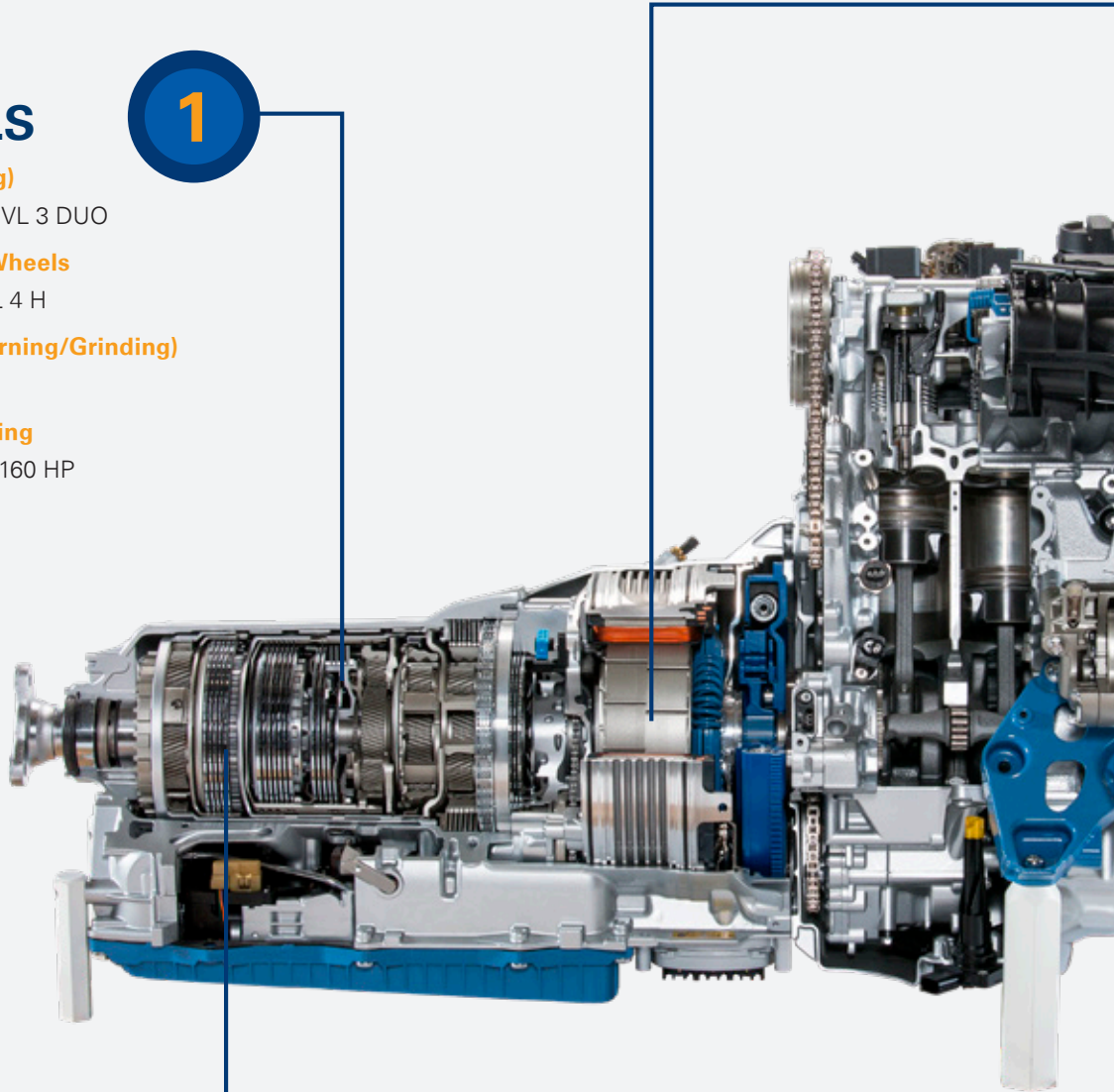
**Machines:** HLC 150 H/VL 4 H

+ **Hard Finishing (Hard Turning/Grinding)**

**Machine:** VLC 200 GT

+ **Joining and Laser Welding**

**Machines:** ELC 160/ELC 160 HP



## TRANSMISSION SHAFTS

+ **Soft Machining (Turning) of the Shaft**

**Machines:** VT 2/VT 4/VTC 100/VTC 200

+ **Gear Hobbing of Gear Wheels**

**Machine:** HLC 150 H

+ **Induction Hardening of the Seats**

**Machine:** eldec MIND

+ **Hard Finishing (Hard Turning/Grinding)**

**Machines:** VTC 100 GT/VTC 315 DS/HG 204/HG 208

# S FOR MACHINING WORK

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## ELECTRIC MOTOR

**+ Turning Rotor/Stator Carriers**

**Machines:** VL 6/VL 8

**+ Electrochemical Deburring**

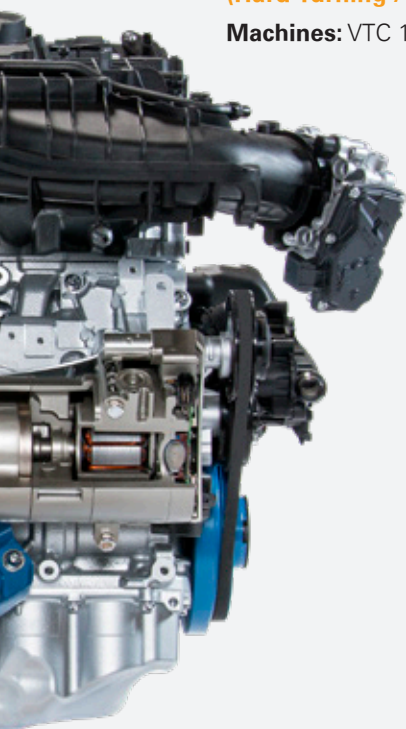
**Machine:** CI 400

**+ Turning**

**Machines:** VT 2/VT 4/VTC 100/VTC 200

**+ Hard Finishing  
(Hard Turning / Grinding)**

**Machines:** VTC 100 GT/VTC 315 DS



## STUDY: THE CHANGE IN DRIVE UNITS

The VDMA study shows that the current changes in mobility are continuing to move forward at full speed. Although the transformation process contains a number of uncertainties, there is no doubt that demand is trending toward completely electric vehicles.

The study predicts that by 2030, 22% of vehicles will be completely electric and 78% will have combustion engines – primarily hybrid. This prediction means that the production industry will continue to increase in complexity, and enormous opportunities will be available for manufacturers to secure market shares.

TECHNISCHE DATEN	VLC 200 GT	VLC 350 GT
Chuck diameter	210 mm 8 in	400 mm 16 in
Swing diameter	270 mm 11 in	400 mm 16 in
Max. workpiece diameter	160 mm 6 in	350 mm 14 in
Workpiece length, max.	100 mm 4 in	200 mm 8 in
Travel distance X (total stroke from pick-up to turret)/Z	1,700/250 mm 67/10 in	2,390/350 mm 94/14 in



This video demonstrates more of the possibilities with the VLC 200 GT.

# COMPLETE ALL THE HARD MACHINING PROCESSES

By combining the hard turning and grinding processes faster cycle times, higher machining quality and lower tool costs will be achieved. These benefits become obvious when we look at the production of gear wheels. First, the shoulders are hard turned, and then the borehole and the cone are pre-turned. These processes leave a residual oversize of just a few micrometers on the gear wheel allowing for a significant reduction in the grinding process using corundum or CBN grinding wheels. The machining quality also benefits from the turning/grinding combination because if there is only a small amount of material to be ground after the turning process, the grinding wheel can be designed more specifically to achieve the final quality required. Allowing us to achieve finish values with a mean peak-to-valley height Rz of less than 1.6 micrometers using the VLC 200 GT.



## Integrated Pick-Up Automation

The VLC series has a parts storage area for raw and finished parts, and working spindle that is automatically loaded/unloaded. This means minimum downtimes and high productivity.

## Internal Grinding Spindle

Depending on the machining requirements, the machining area may feature one or two (internal) grinding spindles. Standard spindles are available for the configuration, which can cover a wide range of speeds and capacities.

## External Grinding Spindle

CBN can be used to increase productivity. CBN grinding wheels are conditioned with a rotating diamond dressing roller for the machining task.

# ES IN A SINGLE CLAMPING OPERATION



## THE BENEFITS

### + REDUCED MACHINING TIME

The combination of hard pre-turning and grinding reduces machining time, enabling scroll-free surfaces to be achieved.

### + MINIMUM GRINDING WHEEL WEAR

The grinding wheel is subjected to less wear and is required to be dressed less frequently because the amount of material cut is minimized. This results in a significant increase in productivity.

### + FOR GRINDING WHEELS PERFECTED FOR THE PROCESS

As only a small amount of material needs to be removed with grinding, the grinding wheel can be designed specifically to achieve the desired final machining quality.

### + COMPLETE MACHINING IN A SINGLE CLAMPING OPERATION

Flat surfaces on the rear are difficult to machine by grinding due to their poor accessibility. This machining problem can be solved very simply by hard turning.

### + USE OF CBN GRINDING WHEELS (OPTIONAL)

CBN can also be used to increase productivity. CBN grinding wheels are optimally conditioned with a rotating diamond dressing roller for the machining task.

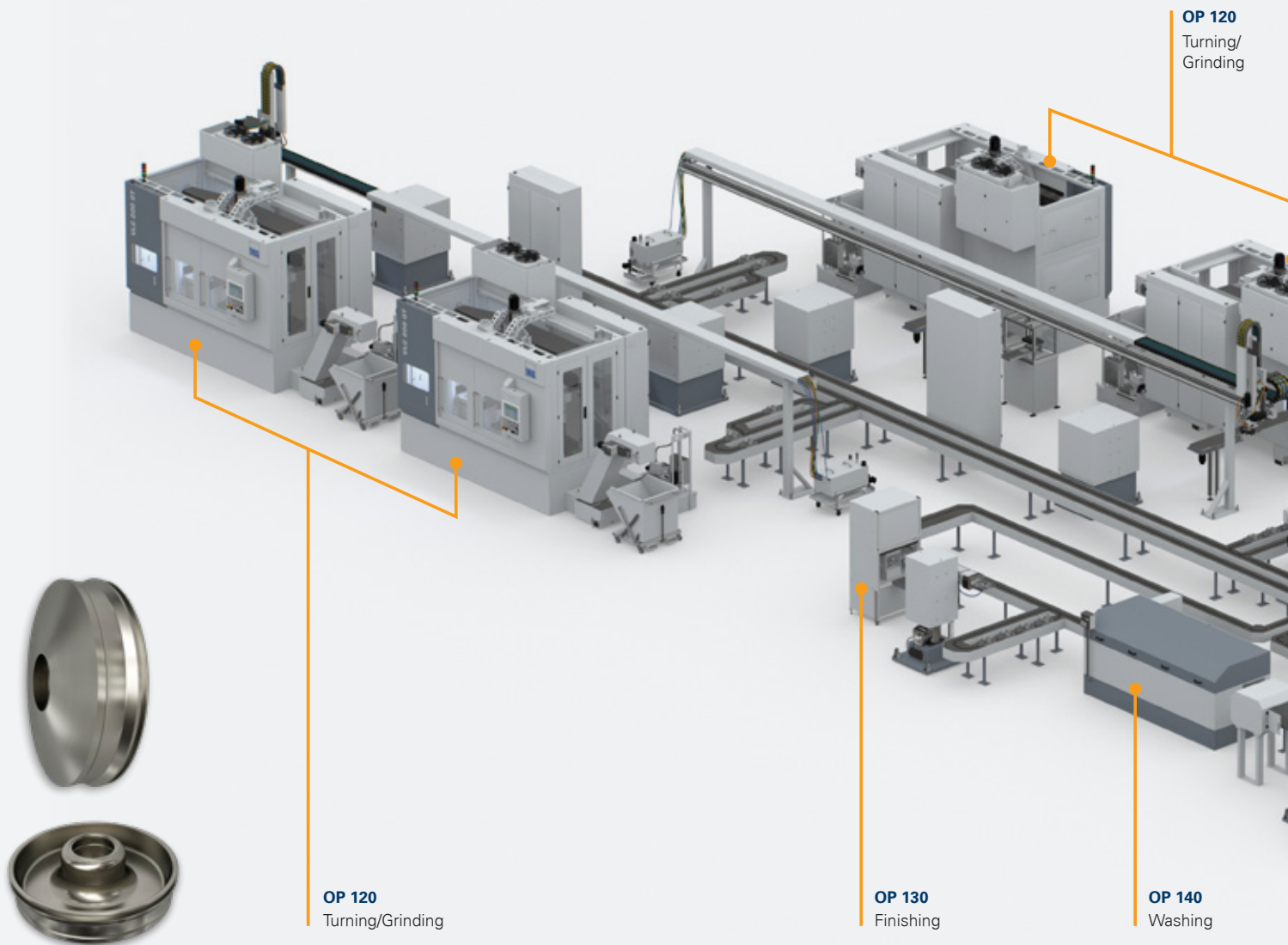
### EMAG Tool Turret

By combining the EMAG tool turret with 12 tool positions (featuring either VDI, BMT or CDI interface) and a direct drive (torque motor), it is possible to achieve machining processes that are as fast as they are accurate.

### Probe

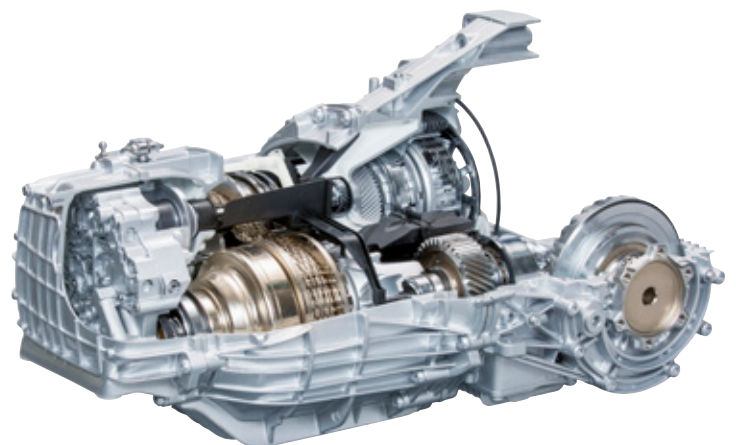
The machine can be fitted with a probe for rapid quality control while the workpiece is clamped in. This probe is located between the machining area and pick-up area to ensure that it is protected from dirt.

# MANUFACTURING SYSTEMS FOR CVT GEAR BELT

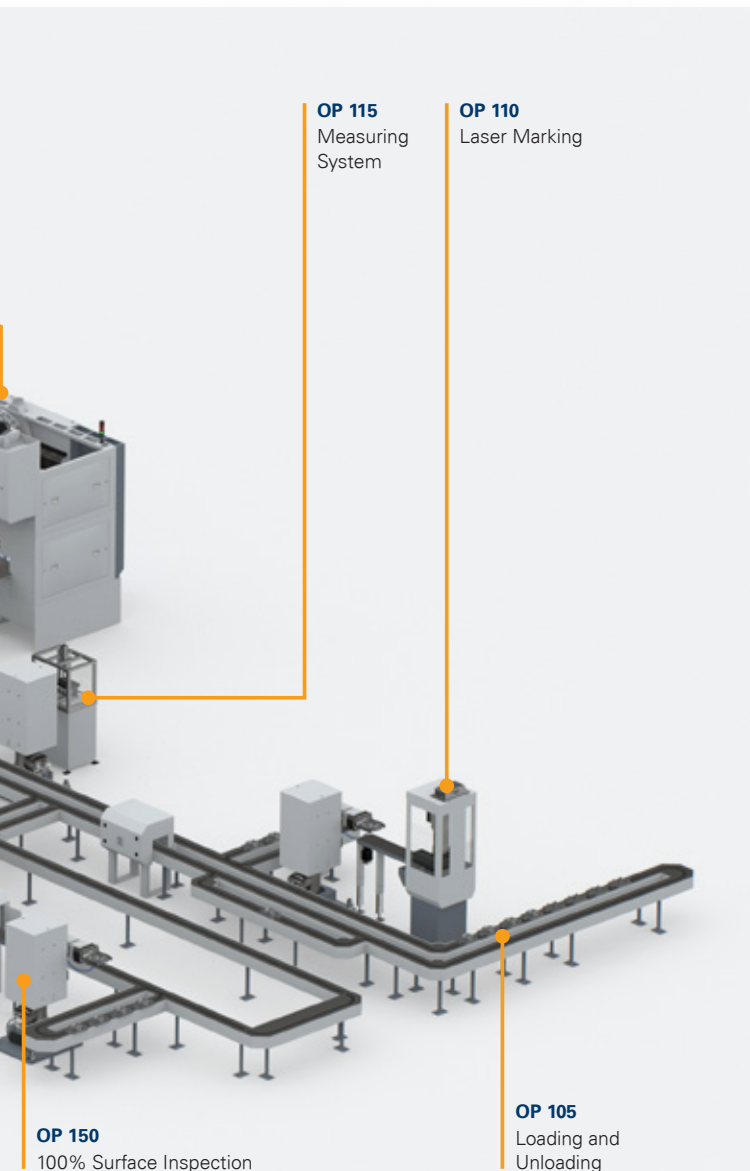


**The abbreviation “CVT” stands for “Continuously Variable Transmission”.**

This technology is frequently being used with hybrid drive systems and is an important component for the future of e-mobility.



# PULLEYS



## NEW VLC 200 GT FILM

This video shows how flexible the design for the VLC 200 GT is and how that can benefit you.

## CVT IN HYBRIDS

At the same time as the electrification of the drivetrain, the CVT has also become established in passenger cars. This is mainly due to the high efficiency gearbox, whose infinite adjustment of the ratio without interrupting the traction ensures the perfect use of the energy supplied to it, lowering fuel consumption values.



## IMPROVED HARD MACHINING FOR SHORT CYCLE TIMES

For the production of the CVT disc, in addition to the tool turret, the VLC 200 GT has been fitted with an external grinding spindle with its capacity and the configuration of the grinding wheel customized to the workpiece.

The results of this combination of processes include lower tool costs and shorter cycle times.

The grinding wheel wears more slowly, and therefore has to be dressed less frequently. A long production cycle is made possible with an extensive tool turret with 12 tool positions. This means that sister tools can be used.

# AT HOME, AROUND THE WORLD!

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