



CLAAS Industrietechnik makes double-digit million investment

Infinitely variable CLAAS transmission comes from Paderborn

Harsewinkel / Hanover, November 2013. CLAAS Industrietechnik (CIT), a subsidiary of the CLAAS group headquartered in Paderborn, is striking out in a new direction by developing and manufacturing a new infinitely variable transmission for tractors in the 140 to 184 hp power class. It is also adding to its infinitely variable CMATIC family of CLAAS tractors with the ARION 500/600 CMATIC.



The new EQ 200 infinitely variable transmission is the fruit of many years' experience in transmission development, expertise in manufacturing and production, and a demanding testing and validation centre. CLAAS has made a double-digit million investment in the latest manufacturing technology and an assembly line that conforms to ISO automotive standards.

Perfect assembly

The main idea behind assembly is zero-defect production. This is the technical term for extremely modern production systems that not only optimise the work that technicians carry out, but also allow thorough quality and safety checks to be made during the assembly process. Alongside their design and development work, the project team at CIT has built a highly efficient assembly line and manufacturing facility for the new infinitely variable transmission.

Covering an area of 1300 m² this comprises five areas for pre-assembling components, 12 stations for main assembly work and an end-of-line test stand. In zero-defect production, workers typically follow detailed step-by-step instructions on a screen telling them which parts they should assemble using which tools and with what forces applied to what positions. Furthermore, the tools used are capable of electronically monitoring the torques, angles of rotation, pressing forces and many other parameters that the workers actually employ. If any of the actual parameter values do not match the ones that have been preprogrammed at one of the assembly stages, the processes at the particular workstation are automatically stopped and do not resume until the error has been rectified.

Thorough quality checks

At the end-of-line test stand, each and every fully assembled transmission is subjected to a test run lasting just under 30 minutes. Here two electric motors are used to simulate all possible load conditions – one motor accelerates and the other decelerates. The test covers basic functions as well as driving and accelerating in the different ranges. A number of measuring devices monitor the oil temperatures, revolutions, vibrations and various other parameters during the test, thus ensuring even tighter quality control.

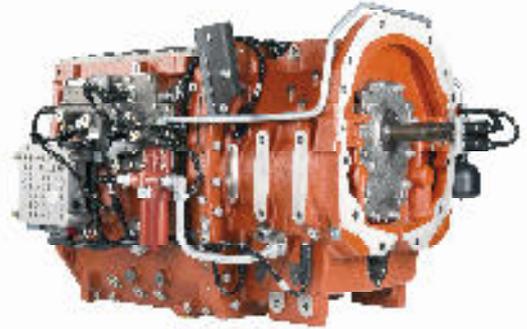
Quality assurance also requires the very highest standards of cleanliness. This is why all components are delivered in closed containers and assembly workers wear gloves. A central pass-through washing station has also recently been

set up. Here all gears manufactured by CIT are first demagnetised, then washed and dried, and finally packed in corrosion-resistant VCI bags for internal transportation.

The cast components of the transmission are deburred just as carefully: They are processed by robots in a flexible production centre before being assembled, then they are deburred using high pressure and finally washed.

Reality-simulating tests

CIT has a large number of test stands in its own testing centre for the testing and validation work, which was also carried out in parallel with the design and development work for the CLAAS infinitely variable transmission. First the various single components, then the assembly groups, and finally the complete transmission had to pass numerous load tests at these stands. The majority of the continuous load tests that the new transmissions underwent were run on a state-of-the-art test stand with four powerful electric motors, which can generate up to 1000 hp drive power or braking power and reach 150,000 Nm maximum torque. The test stand realistically simulates static and dynamic loads in test runs. These mimic the pressures that the transmission will have to withstand in reality.



The new infinitely variable transmission from CLAAS passed all these tests, which can last several hours. In total it spent not only 80,000 hours in development but also 17,000 hours being tested on the test stands. A further 15,000 hours of tests in practical field work and driving along roads were incorporated into the tractor.

