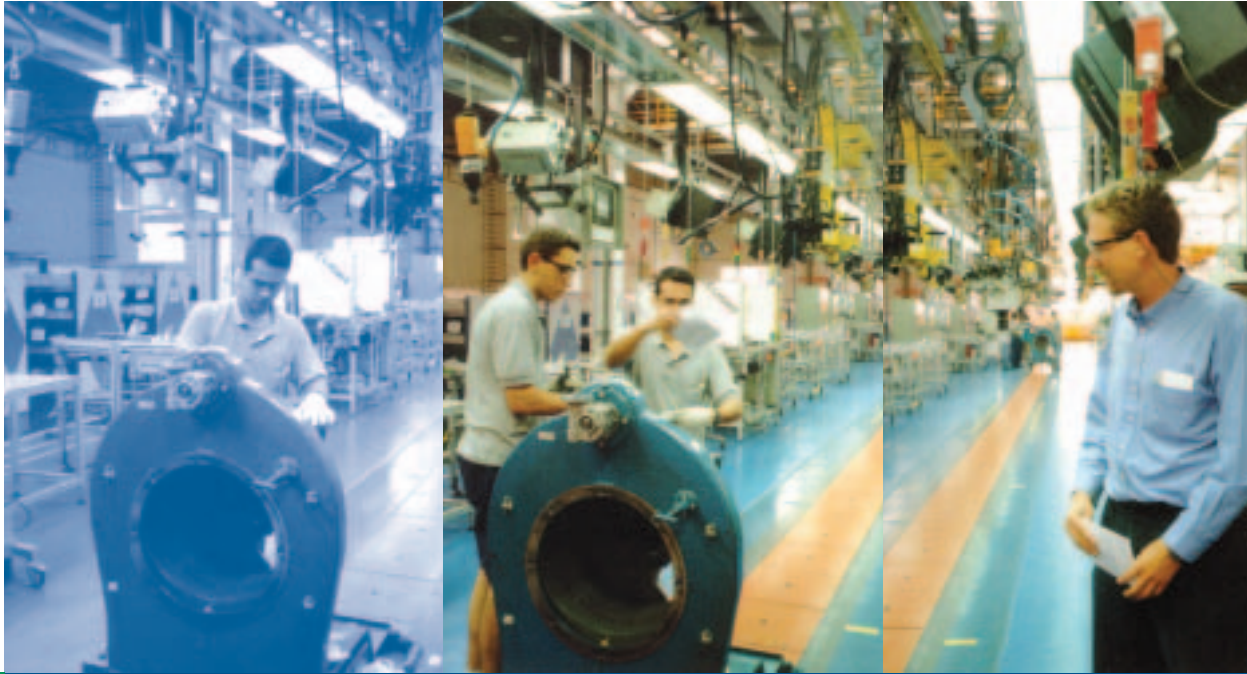


Innovative engine production at DaimlerChrysler Brazil



In the first half of 2001 DaimlerChrysler Brazil began operation of a new production line for CDI engines – an innovative project, in which a whole series of new approaches were integrated into a familiar manufacturing process. Almost all of these innovations had previously been integrated into various processes at DaimlerChrysler Brazil and tested. The new challenge was to bring them all together within one project.

Ethernet on the factory floor

The DaimlerChrysler factory in São Bernardo do Campo, São Paulo, is the central production location for buses and trucks. 9,500 employees currently work there in three shifts. In addition to the traditional production of commercial vehicles, the company has now extended its production to include saloon cars through investment at another site.

The new production system in São Bernardo do Campo has combined a number of different approaches, such as carousel assembly in which the two fitters assemble the engine from the beginning to the end of the process, the constant-speed assembly line, "Poka-Yoke-Kits" – a kind of tray precisely offering those parts required at a particular station – and the "supermarket", a central stores close to the assembly line, where all the kits and parts required to supply the line are made available or are pre-assembled.

New assembly line for CDI engines

"We are assembling a new engine here, using new technologies that we have been developing for 10 years. The engine was originally built for automobiles, and then was adapted in Germany for use in transport vehicles and light trucks. The project began in 1997. It involved an assembly line that contained a range of innovations: in-line quality tests (dynamic tests and leakage tests) and a trolley for transporting the engines that allows 360 degree access to the engine parts", explained André Wulfhorst, team leader in the engine production planning department.

The new and very compact assembly line has no more than 10 assembly stations, and when it is fully operational it will be able to produce 160 engines per day in two shifts. The target for the early months of 2002 is around 80 engines per day. In order to communicate the confirmed production sequence information from the mainframe computer to the production area, the employees in the São Bernardo do Campo factory developed the EPM (Engine Production Management) system.

Scada software passes the parameter data to the machines on the assembly line, including the total of 27 nutrunners. Different parameters must be transferred for the different types of engine.

Conexel – Beckhoff's partner in Brazil

Conexel is a Brazilian company with head offices in São Bernardo do Campo, in the federal region of São Paulo. Conexel's products are designed to co-operate with sensors/actuators and control devices. This is why Conexel is often referred to as the "interface partner". The product range primarily consists of electrical and electronic items. Electrical products include terminals, PCB contacts, crimping, cutting and insulation removal tools, marking systems for cables and plugs and a large number of accessories.

The electronic products include relays and opto-couplers, insulators and signal conditioners, power supply units, interfaces for direct connection of PLC I/Os, building automation modules based on LONWorks, industrial automation products using PC-based control technology, over voltage protection equipment, monitoring modules, time relays and passive component arrays (resistor arrays, diode arrays etc.).

Most of these electrical and electronic products are developed and manufactured at the company's 12,000 m² production works. The site is situated in the largest industrial region of São Paulo, in the immediate neighborhood of international companies such as Volkswagen, Mercedes-Benz, Ford, General Motors and others.

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BC9000 Bus Terminal Controllers solve communication problems

Automation components from Beckhoff solved the communication problems between the individual nutrunners and the Scada software. Because the nutrunners are not themselves capable of communication, they can neither receive parameters from the PC via the Scada software nor send it.

A decision was made to use the Beckhoff BC9000 Bus Terminal Controller that can communicate over an Ethernet network with Bus Terminals. There were a number of reasons why DaimlerChrysler Brazil took this decision: compact hardware that could be separately attached to each nutrunner was required. The hardware needed to be capable of handling a variety of signal types – digital inputs and outputs, and an RS232 channel. The solution also needed to offer the best possible cost/performance ratio.

A team of engineers from DaimlerChrysler Brazil, Debis-Humaitá and Conexel, Beckhoff's exclusive representatives in Brazil, developed the application for this assembly line together. Because there are four different types of nutrunner, the team developed different modifications of the application software. This software can run on the BC9000 Bus Terminal Controllers with Ethernet interfaces. The BC9000 allows information to be exchanged between all the other assembly lines at DaimlerChrysler Brazil, because it is connected via an Ethernet switch to the company network.

→ DaimlerChrysler Brazil:
www.daimlerchrysler.com.br

