MAKA
CNC-Spezialmaschinen

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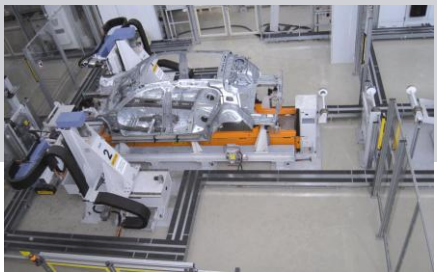



MAKA integrate first CNC machine into intermittent assembly line *Alwin Schmitt 07/2009*

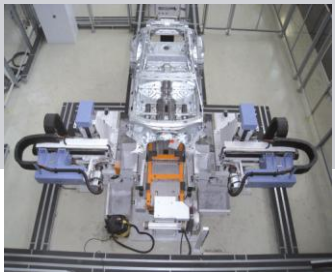
Panamera – that's the name of Porsche's new sports limousine to be launched in Germany in three different versions on 12. September 2009. For the finishing of the Panamera body, MAKA Nersingen have integrated two CNC machining centres into the car builder's production line. With the integration of a CNC machine into a time-depending intermittent assembly line, the company has entered new technical territory.

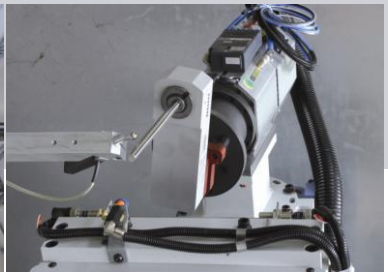
The new Porsche Panamera first of all will be offered as an eight-cylinder with a capacity of 400 and 500 PS, rear and all-wheel drive. The offer later on will be rounded off with a six-cylinder gasoline-engine car and a hybrid version. With the Panamera model all these technical novelties will be introduced in a serial top-of-the-range car for the first time. Beside the Porsche's double-clutch transmission "PDK" and the first start-stop-system in connection with an automatic gear box, the new adaptive air suspension with a switchable auxiliary volume in each spring, shall complete this contraption. The top model Panamera Turbo furthermore will be fitted with active aerodynamics and a multi-dimensionally adjustable rear spoiler.

In view of driving performance, vehicle dynamics and efficiency the Gran Turismo clearly sets new standards. That's where Porsche's traditional core competences and long-time motorsport experiences will take effect. Efficient high-output motors, a lightweight construction and optimized aerodynamics also might play a quite decisive role on the race track. All Panamera models are fitted with direct gasoline injection motors, low-friction drive systems and weight-optimized lightweight construction bodies. Customers may choose between a steel spring suspension or an adaptive air suspension - both equipped with a regulated muffler system - for their chassis. Thanks to its intelligent driving concept, the Panamera combines the driving comfort of a luxury limousine with the dynamics of a Porsche sports car. Depending on the personal driving style or the specific traffic situation, drivers may choose between decidedly- comfortable or predominantly-sporty driving characteristics by the press of a button.

The car body – lightweight construction and functionality
To get the Panamera car body as light as possible, Porsche have set on a well-balanced pick-and-mix of material. The exterior part comprises plastics, aluminium and magnesium which covers 25 per cent of the raw construction. The car body represents the synthesis of a sports-car-typical lightweight construction with high comfort, generous space and quite efficient aerodynamics. Modern manufacturing procedures and various materials are successfully put to specific use depending on the application required. The processed material comprises steel of different quality classes, light metal like aluminium and magnesium, but also plastics. The lightweight-construction doors dispose of a carrying structure of a laser-treated aluminium pressure casting, an outer aluminium cover as well as a door-window frame of a thin-walled magnesium pressure casting. This most intelligent light-weight construction among others makes the Panamera S only weigh 1.770 kilogram.

Competence is everything





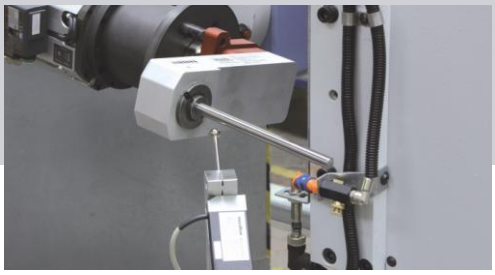
MAKA-CNC for cutting performances
MAKA have integrated two CNC machines into the intermittent assembly line for body shells in the chassis area at Porsche's production site in Hannover. With the integration of a CNC unit into a time-depending cycle line, the company has entered new technical territory. The machine unit had to be flexibly adapted to the cycle times of the complete assembly line, whereas especially the over-all co-ordination of interfaces kept being a challenge.

MAKA all in all have provided a complete supplier's package, consisting of a CNC machine with operating programs, project assistance and continuous training until the start of the serial production. Rainer Jilge, MAKA key account and project supervisor of the Panamera project explains „We have obtained a cycle sequence, or rather a working station, in the intermittent assembly line. On this technical basis we will take responsibility for the cutting performances carried out, or more explicitly, for a combined drilling and routing procedure at the chassis suspension of the front area". The machine concept comprises two CNC units, positioned on the LH and RH side of the vehicle passing through. „This special machine construction complements the mix of a highly-flexible component system with totally new developments" Rainer Jilge continues. The unit is completely networked into the production line. Both CNC machines work synchronously and are supervised and controlled with the aid of a CNC control panel. Each machine permits a fully-uncoupled, independent operation. The working station disposes of a total size of 50 m² and is able to take-up car bodies of a maximum width of 2 meters. The machine is housed in a sound protection cabin with high-capacity lifting gates for the in- and outfeed of the car body through a customer-provided transport system.

The quality demands on this machine unit are considerably high. In order to fulfill the automotive industry's high requirements, users quickest-possible may rely on two integrated techniques at projected intervals or in obvious special cases.

1. Optical tests with the aid of special test devices /plug gauges; Accuracy: 0,1 mm
2. An electronic measuring system, uninfluenceable by external control technology, provides recorded results in a prompt and timely manner. The system serves as the machine's check-up and adjustment unit.

It hereby deals with a special development conceived by MAKA - it is also applied for measuring, adjustment and data logging of and for 5-axis machines. MAKA's flexible machine concept permits an easy and economic response to possible changes of operating positions, construction modifications, tool demands or working procedures. High flexibility for the chassis production of other vehicles in the same production line is guaranteed just the same. The unit also may be expanded into a more sophisticated 5-axis machining centre.



„We have delivered a complete technical package"
Alwin Schmitt/AP interviews Rainer Jilge, MAKA Key Account

AP: The CNC machine is a special solution with countless novelties. What's it all about? What and where are the technical challenges?
RJ: The concept of this unit is absolutely innovative. For the first time we have integrated two CNC machining centres into a complete production line. Compared with single or working cycle automats we are talking about a full-value CNC machine with maximum operating security. In order to achieve the positions demanded, we have entered new technical territory, especially in view of the arrangement of the working unit or the construction type. The integration into an intermittent assembly line including connection and chaining into a higher-level control- and monitoring system also provided a technical challenge.
AP: You have provided a complete supply package, which included the CNC unit and the necessary operating programs. What kind of support and services can you offer?
RJ: Our supply package comprised a complete technical package including production assistance until the start of the serial production. The service package covers planning, conception, development and project management. We have organized a comprehensive and extended project transfer – besides this we have carried out training courses for CNC, services, maintenance and 5-axis technology.
AP: The CNC machine for the processing of the Panamera car bodies at the same time serves as a reference machine. Do you expect further orders from the same market sector in succession of this fruitful project?
RJ: We hope and trust to receive further orders from this project. We can look back to many years of experience - our individual project solutions for customers of the automotive have led to many valuable contacts and orders. It all started with projects like the Audi A8 and other numerous renowned manufacturers of the automotive industry. They all appreciate our machines for the construction of prototypes and other automotive equipment. The business went on with the production of the Audi R8 and our current projects like the two Alcoa Italy machines, on which they produce Ferrari spaceframes for current models and new series (Editor's note: see AP issue 08/2008).
AP: One of the most important markets for aluminium machining centres is the automotive industry - a quite demanding clientele. Which technical improvements can be expected of CNC machines in the future?
RJ: The technical development of aluminium processing machines has moved forward enormously. This also results from the ever growing requirements of our customers, who expect high availability at maximum flexibility. MAKA's developers have anticipated this trend and conceived special solution models for the requirements and high demands of the aluminium-processing industry. Developments like tool shuttle and high-speed units on the basis of conventional drive technology have been originated from the afore-mentioned projects - we keep refining and developing them further continually.

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