

Body shop Mercedes-Benz A-Class

Starting point / Task definition

DaimlerChrysler's Mercedes A-class body shop employs a variety of joining processes. For example, about 3,900 spot welds have to be made on 290 different sheet metal parts. DaimlerChrysler was looking to automate these processes through the use of robots; at the top of the priority list were short cycle times, which required high acceleration capability.

Implementation / Solution



Today the work in the body shop of the Rastatt, Germany plant is shared by a total of 330 KUKA robots. An additional 50 KUKA robots are employed there in the assembly and finishing shops, where they bond window glass and seal seams. The primary joining process is resistance spot welding, in which the robots make up to 28 spot welds within 60 seconds. This is supplemented by clinching, stud welding, adhesive bonding and bolt fastening.

The tool used for welding is a water-hydraulic spot weld gun. In addition to generating the required high gun forces, at the same time the hydraulic spot weld gun provides soft electrode impact and smooth pressure buildup. Another benefit was reduced indentation depth and thus higher weld strength, as well as improved appearance, which is also dependent on the length of pressure application.

Another process used in Rastatt is spot-weld bonding. This method combines spot welding with a structural adhesive which is applied before welding, and which cures after the weld is made. Structural bonding, which likewise improves the visual appearance of the body, is used on the doors in place of welding. In connecting the side panel to the underbody, spot-weld bonding is once again used. Robots achieve excellent standards with regard to quality and continuous path velocity during adhesive and sealant application – standards which cannot be obtained manually.

System components / Scope of supply

- :: 380 KUKA IR 360/125 and IR 360/150 robots
- :: KUKA robot controllers
- :: Weld guns and other tools
- :: Robot programming
- :: Interfaces in conformity with DaimlerChrysler internal standards
- :: Commissioning

Results / Success

- :: Greater flexibility

DaimlerChrysler uses KUKA IR 360/125 and IR 360/150 robots throughout. These two robot types are of modular construction and are mechanically identical; they differ only in their load-bearing capacity, which the manufacturer raises from 125 to 150 kg simply by means of an additional counterweight. This flexibility with regard to carrying capacity was decisive in awarding the contract, since it allows DaimlerChrysler to react quickly and economically to changes requiring heavier tools and/or less favorable mass centers of the workpieces.

- :: High cost-effectiveness

High continuous-path accuracy, long service life, an availability of nearly 100 percent and easy programming by means of teaching all add up to high cost-effectiveness over the robots' entire service life. Also contributing to economic efficiency is the fact that the robots all belong to the same payload class; this makes maintenance, servicing and employee training simpler, and allows the number of spare parts kept on hand to



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R 142

Industry:
Automotive
manufacturers

Application:
Assembly
Coating and bonding
Handling
Welding
Spot welding

Product:
Robots
High payloads (100-240
kg)
Heavy duty (360-570 kg)
Controller
KR C (Robot Controller)

Implementation:
10.02.1997

Customer:
DaimlerChrysler AG,
Rastatt, Germany

be reduced.

:: Minimized space requirements

A prime example of the minimized space requirements of KUKA robots is a cell in which two robots are installed, each with a working range of 360°. In an extremely confined space, the robots have to make bolted connections, remove aluminum cross-members from two carriers, and also attach the mobile data storage media for production control of the A-class.



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