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Trendsetter

Versatile, reusable all-rounder

Multi-functional measuring and matching fixture holds individual parts and assemblies of six different passenger car side panels

Use of standard components enables retooling

Before a new passenger car model is considered to be ready to manufacture in series production, it usually has a multitude of design modifications behind it. When the finished design is finally ready, the fitting accuracy and join ability of individual parts must be examined in every detail.

Examining the single parts and assemblies can take place in different ways. One common approach in the automotive industry is the use of e.g. matching fixtures, which can vary strongly from each other depending on task, version and manufacturer.

On matching fixtures both externally and internally manufactured body parts are submitted to intensive checking procedures and both individual parts and assemblies can be examined on a common fixture. Witte, manufacturer of different fixturing systems, goes even further and for this particular application developed one matching fixture which can be used for three different passenger car models. With only one fixture the outer contours of six different side panels of hatchback, caravan and sedan are checked.

Further fixture elements are mounted to support parts like roof and rear walls. Since the rear walls of the three models are different, the respective rear wall sub-assemblies are exchanged and moved towards the side panel/roof structure.

A fixture like this enables a visual and surface feel analysis, checking of gaps and flushness as well as mounting points for real parts and considerably contributes to elimination of all error sources before series production starts. A further goal is it to minimize quantity and volume of measuring fixtures.

Approach

After all individual parts have been checked, measuring of assembled parts takes place.

Whether the parts actually fit accurately to each other is determined here for the first time. Even if all individual parts have been manufactured within the demanded tolerances, if several individual parts have exhausted those tolerance limits, the aggregate total in assembly can lead to complications. The data collected is used to carry out corrections on press tools. In an effort to avoid that right from the

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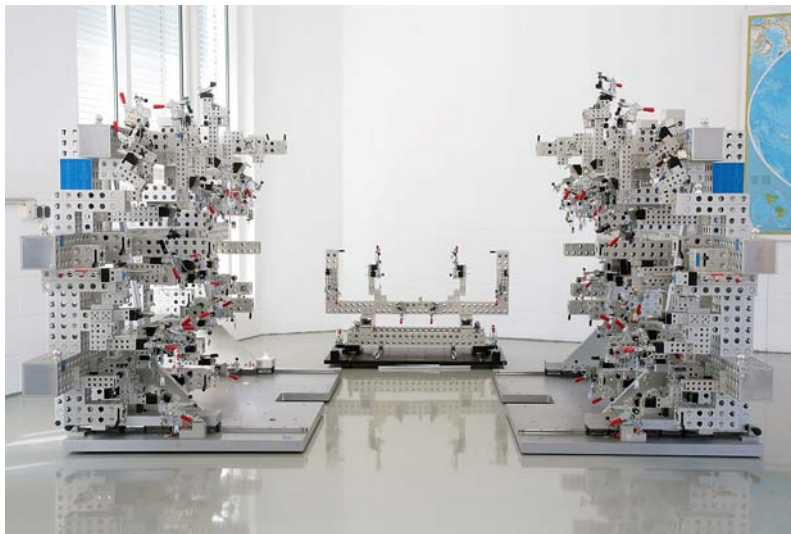
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start, first individual parts are mounted then underbody groups and finally the entire body is joined and measured.

For the side panels basic frames in Alufix Classic were assembled. The frames are fixed on aluminum base plates, which are equipped with steel guides. The same principle is used to join the side panels, roof and rear wall after adding individual parts and/or mounting sub-groups directly.

Conventionally this process is often done using welded steel structures. Design and manufacturing of such solid structures is time consuming and can take up to 30 weeks. Handling is difficult due to their extremely heavy weight. The largest problem however is the inflexibility, they cannot be changed quickly and easily nor can they be reused for future models.

As this matching fixture consists mainly of standard components from the Alufix range, high reusability of individual components is ensured. The entire matching fixture was assembled with 80 per cent standard elements, which can be reused later as retooling material for other fixtures. Witte America, has established a special retooling program for the Alufix Modular Fixturing System. „For many of our customers the retooling possibility is gaining substantial significance – economically and ecologically - in addition to the high precision and multiple application possibilities of Alufix“ explained Guillermo Rodriguez, Managing Director of Witte America.



A 53 Without parts: Alufix-Side panel fixtures with rear wall sub assembly fixture mounted on guide rails

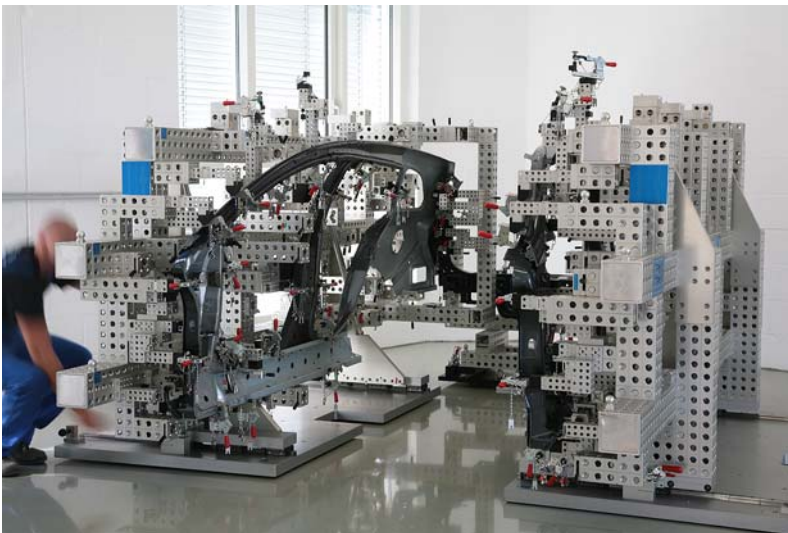
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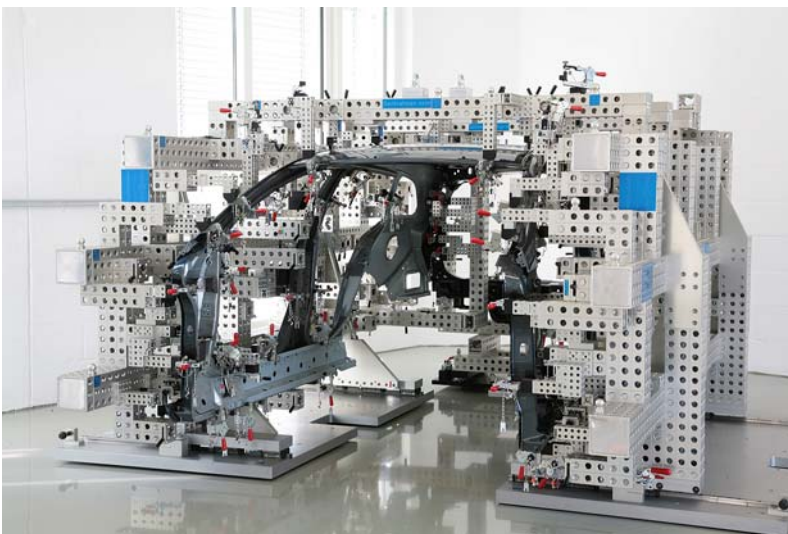
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A 53 Mounting side panels: Staff mounting car side panels on to the fixture



A 53 Side panels and rear wall: Fixture elements are moved into position

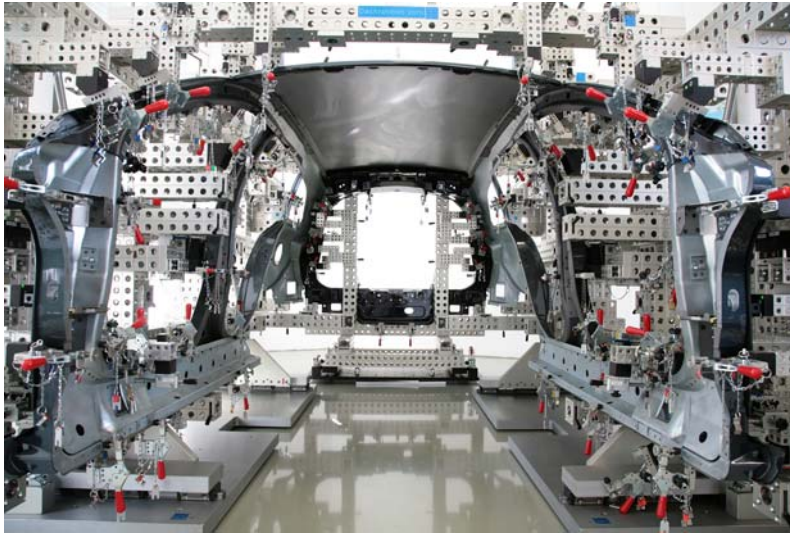


A 53 With roof frame: Side panels, rear wall and roof frame are joined together

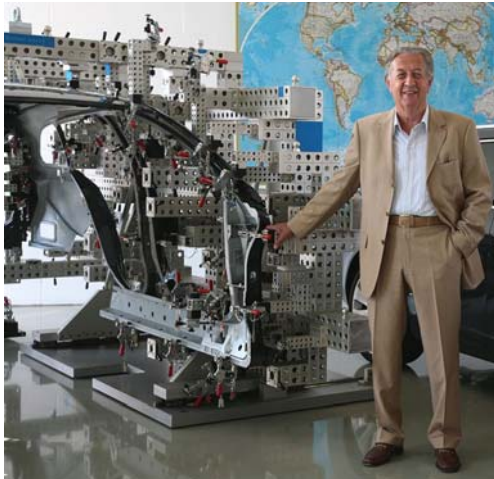
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A 53 Inside view of outer skin: A look inside the car body



A 53 HW: Horst Witte: „This matching fixture has high retooling potential. A good 80 percent of the Alufix components can be reused for later measuring or matching fixtures“

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