

Controlled triple pressing process in one stroke

Achieve individual and efficient as well as economical and high quality press-in solutions with few standard components

Reproducible precise setting and pressing of three press-in nuts simultaneously in one working stroke, including quality control of the component to be fitted with the press-in nuts: this was the supposedly simple task posed by a Hungarian automotive supplier to his production system supplier. As the component is also regarded as main component of the engine oil cooler for a luxury vehicle, adding to the assembly task were also challenges with regard to quality. For this reason, the production system supplier obtained process-competent help with the clinching and press fitting specialists of the technology company TOX[®] PRESSOTECHNIK GmbH & Co. KG, D-88250 Weingarten, or their representative in Hungary respectively, Lang & Társai Kft. in Pecs. Following a requirement analysis and clarifications with the automotive supplier and its German end customers, the proposal for a complete solution was made, which considers the above mentioned aspects. The partially automated pressing machine is based on a standardised TOX[®]-4-Column Press, an electromechanical servo drive TOX[®]-ElectricDrive, a TOX[®]-Control STE and a TOX[®]-Base Frame UUM as well as the workpiece-specific triple press-in tool and workpiece mounting.

Achieving a complete press fitting solution tailored to customer requirements with teamwork

In order to ensure the quality from the start also on component side, the end customer requested a camera-supported monitoring system, which based on a coloured dot already applied during prefabrication detects whether the component inserted in the workpiece mount for press fitting is ok and thus ready for assembly. The entire pressing process is very simple and reliable for the workers: Insert the lid for the engine oil cooler into the workpiece mount, insert three press-in nuts into three die mounts, confirm the 2-hand control, which then actuates locking of the workroom and the subsequent pressing process. Following the press fitting and the return stroke of the upper tool fitted with three press-in stamps, the lift door opens, providing access to the workroom of the press for removing the complete component. TOX[®] PRESSOTECHNIK also integrated the camera system provided by the end customer into the completely supplied press system including press-in tool and component holder. The TOX[®]-Press Frame of the MAG type works for press forces up to 150 kN. The 4-column press consists of solid precision machined tool steel plates and four largely dimensioned steel columns. An electromechanical servo drive TOX[®]-ElectricDrive of type EPMK is installed as combined stroke/press force unit with a stroke of 300 mm and a press force of max. 100 kN.

System solution competence, process know-how, production equipment

The 4-column press is set up on a base frame UUM which also works as mounting support for the safety enclosure to which the STE control is attached. The press-in tool is designed as triple unit in order to compress

all three press-in nuts in one single stroke. Base element of the press-in tool system is a 2-column mount with recirculating ball bearing guides as well as an upper and lower plate. The workpiece mount and three dies are arranged on the lower plate according to the plug positions of the press-in nuts. The upper tool houses the respectively positioned press-in punches. Furthermore, the above mentioned camera for detecting the coloured dot on the lid and sensors for detecting the correctly inserted press-in nuts are integrated into the tool system. The exact setting and precise stroke and force-controlled simultaneous pressing of three press-in nuts ensure high productivity as well as a reproducible press-in quality.

Controlled precision for reproducible quality

The servo drive EPMK has a central function here by ensuring an exact stroke during the pressing process as well as a precise press force generation which consequently ensures the reproducible high-quality press fitting. With a positioning repeat accuracy of ± 0.01 mm and a lifting speed between 0 and 200 mm/s, the servo drive not only works highly precisely, but also dynamically, which helps to reduce unproductive idle times. In connection with the triple press fitting, users can achieve high efficiency, which simply renders further and respectively expensive process automation obsolete. It is also beneficial for the automotive supplier to have obtained this complete solution from one source, thus having just one responsible contact person.

Image descriptions:

Image 1 shows the complete system

Image 2 shows the press workroom with press-in tool system

Image 3 shows the servo drive TOX[®]-ElectricDrive type EPMK

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