

Case Study: Planning Phase

Concept evaluation: Double vs quadruple spindle



Problem

During the planning of a new vehicle, the tightening of a trailer coupling posed a challenge: implementing a large number of high-torque joints with different degrees of accessibility (in X and Y alignment) and different torques in two stations with a limited cycle time.

In addition to the tightening process, the subsequent procedure involved picking up the trailer coupling with a load suspension device, pre-assembling it, and attaching it to the vehicle.

Solution

The process was recorded together with the involved sections in the customer's development department on the prototype as well as the final plant, taking into account the existing line situation. Based on the findings, four assembly variants were then developed. These ranged from a simple, low-cost solution with hand-held tightening technology, to concepts with double and quadruple spindles, to a fully automatic station with a robot. All concepts were digitally investigated by us in terms of ergonomics and feasibility. In addition to the acquisition and maintenance costs, our assessment of the concepts also took the required cycle time and personnel requirements into account. Of the original four concepts and their sub-variants, two final concepts were established after several on-site discussions with the customer. For the final decision, these were presented to management using a decision matrix (consideration of investment, cycle time, personnel costs, stability of the process). The selected concept was implemented together with our in-house mechanical engineer. We handled coordination of the project as well as on-site management of the customers' interfaces.

REDUCTION OF THE
CYCLE TIME BY

25%

Added value for the customer

We were commissioned to holistically assess the overall situation in terms of process, environmental situation, technology to be used, and budget. With the help of our consulting service, the customer was able to select the most suitable concept from a wide range of options. The implemented concept met the requirements of the end product due to the existing process and reduced both cycle time and personnel requirements. The higher investment could thus be justified by a relatively short ROI (return on investment). Subsequently, in-house implementation enabled seamless project execution without any information loss.



INCREASING RETURN ON INVESTMENT
THROUGH SAVINGS ON PERSONNEL
DEPLOYMENT < 1 YEAR



**PLANNING AND IMPLEMENTATION
FROM A SINGLE SOURCE**
PREVENTS UNWANTED LOSS OF
INFORMATION



CYCLE TIME SAVINGS
REDUCTION OF THE STATION FROM 3
TO 2 EMPLOYEES BY OPTIMIZING THE
STATION WORKLOAD



ERGONOMIC WORK
WITHOUT REACTION TORQUE

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