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To Whom It May Concern:

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Using Existing Presses to Construct Optimal Forming Systems
for High-Strength Steel Material

Development of a High-Strength Steel Forming System That Supports the Production of Lighter Automobiles

AIDA Engineering, Ltd., (President and Representative Director: Kimikazu Aida; hereafter referred to as 'AIDA') has delivered a newly developed high-strength steel forming system to Sankei Giken Kogyo, Ltd. (Tsu City, Mie Prefecture, Japan) that can support the trend towards the production of lighter-weight automobiles.

High-strength steel material is made by subjecting standard steel to special processes that increase its strength properties.

There have been ever-increasing demand for the usage of light and strong high-strength steel in automotive body frame parts, but this material is hard and, much like a spring, has a tendency to revert to its original shape, which makes it a very difficult material to form.

Included in such materials is 100 kg-class high-strength steel, which is referred to as *super*-high-strength steel. If this overwhelmingly strong 100-kg class material were classed as 'steel,' then conventional steel plate could almost be considered equivalent to 'lumber.' Just like the impossibility of cutting steel with a wood saw, forming 100 kg-class high-strength material requires a press system that is completely different from a conventional press system.

The forming system we are announcing here uses a newly-developed dedicated high-strength steel forming press at the first forming stage where the shape of the 100 kg high-strength steel is set, thereby achieving powerful and accurate forming that was impossible using conventional methods. The second and subsequent stages utilize AIDA's unique high-speed transfer technology to effectively leverage the existing equipment to enable efficient production. This new system is leading the way to a new chapter in high-strength steel metalforming history.



Foreground: SMX-10000(LD) dedicated high-strength steel forming press (Capacity: 10,000 kN)
Background: Existing transfer press (Capacity: 15,000 kN)

■ Development History of This Dedicated Press

Lightweight high-strength steel has superior strength characteristics and its usage ratio in automotive body members such as pillars has risen sharply. Normal steel material can only withstand forces of 30 kg or less per square millimeter, but some high-strength steel materials can withstand forces up to 100 kg. And since the same strength as normal steel can be achieved with thinner material, it enables the production of even lighter vehicles with have even better impact safety characteristics, which improves vehicle gas mileage and reduces CO₂ emissions.

However, this material is hard and has poor shape-fixability characteristics and thus there were many problems when conventional forming methods were used, including unstable product accuracy, the requirement for a high-capacity press, and shorter die life.

AIDA gathered basic data about 980 MPa high-strength steel, and through extensive testing and measurements was able to complete the optimal "high-strength steel forming system" for the forming of high-strength steel materials, and it was recently delivered to Sankei Giken Kogyo, Ltd.

■ High-Strength Steel Forming System Features

This system is composed of a dedicated high-strength steel forming press, an existing transfer press, and a press-to-press high-speed conveyance system.

1) Eliminates off-center loads.

The first forming stage--the stage that requires the most forming force--was separated from the existing transfer press and a dedicated high-strength steel forming press was added to the line. Eliminating the off-center loading applied on the slide improves product accuracy and the durability of the dies and the press.

2) Solidly supports high forming loads

This dedicated high-strength steel forming press uses a highly rigid frame equivalent to a forging press frame, a slide with an independent gib design, and die cushion pads to perform the stable, high-accuracy forming of high-strength steel material.

3) Greatly Improves Formability

A compact energy-saving "hydraulic servo die cushion" (capacity: 3000 kN) is built into the bed. This die cushion provides high-precision variable pressure control features that are not possible using conventional pneumatic die cushions. Moreover, it is also equipped with a surge-prevention feature that restrains impact loads that result from the cushion's own hydraulic media.

4) Enables the high-speed conveyance of large parts

The conveyance of workpieces between the dedicated high-strength steel forming press and the existing transfer press is performed by newly developed press-to-press high-speed conveyance equipment that delivers up to 2.5G acceleration.

5) Enables the effective utilization of the existing press

We can modify the existing transfer press regardless of the manufacturer. The existing press is synchronized with the dedicated high-strength steel forming press to enable continuous operation. This enables the high-accuracy forming of high-strength steel at 20 SPM.

Moreover, by making the first forming stage an independent stage, it also extends the life of the existing transfer press.

■ Product Overview

Press Designation: SMX-10000(LD)

Capacity: : 10000 kN

List Price: : As this is a custom-built press, pricing will vary depending on the desired specifications.

Initial Product Launch: : October 2010

Sales Target: 3 units per year.

< Inquiries Relating to This Subject >

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