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### surface loading & hauling

## Hang 'em high

*Competition is fierce in the mine shovel market - Mike Woof*

As ever shovel maintenance is a major cost issue and a new concept for both hydraulic and cable shovel repairs, is proving its worth. Peruvian-based engineering firm Martin Bachmann Keller is offering a novel system for use in shovel maintenance and rebuild contracts that is faster, safer and cheaper than the conventional method using mobile cranes. The firm claims its equipment reduces maintenance time and improves safety levels for repair or service jobs that require a shovel to be undecked. The firm has supplied one of these synchronised lifting packages to Southern Peru Copper's Cujajone operation and this has already been used successfully to undeck a P&H 2800 shovel for routine slew gear maintenance.

The conventional way of carrying out an undecking operation on a large mining shovel would be to use three heavy-duty mobile cranes but these machines are costly to hire in and take up a good deal of room on site. Worse still, synchronising crane operation is not a straightforward job and even with an experienced crew, there may be some horizontal movement of the shovel's upper structure when it is in the raised position, which makes reassembly difficult. By comparison, Martin Bachmann Keller's system is based on the use of computer-controlled hydraulic cylinders, which are comparatively cheap for a mining firm to buy, easy to synchronise and fast in operation. The system incorporates four double acting hydraulic cylinders each with stroke lengths of 1.865 m/73" a split flow pump supplying 4x2.5 litres/min to the cylinders and a PC to control operation. Running on a laptop, the program receives signals from the stroke and pressure sensors in the cylinders and activates the necessary valves, allowing the load to be raised with an accuracy of +/- 5 mm, displaying relevant data on-screen.

The firm says the custom-designed program allows engineers to enter a specified stroke movement for lifting or lowering motions and the cylinders can be moved in synchronisation, or singly for initial levelling. The load can be monitored for each individual cylinder, which helps in balancing the shovel with the counterweight and the system also displays the stroke of the cylinders. Raise times are said to be quick at 4 cm/min and the lifting process is controlled using a laptop by one person, while the upper structure remains centred at all times and there is no need for additional supports. According to Martin Bachmann Keller, this equipment allowed the upper structure of Southern Peru Copper's P&H 2800 to be raised by 65" in just 40 minutes, with the whole undecking procedure requiring three hours. During this process the firm says the cabin was always kept on the level to an accuracy of +/- 0.1 mm.



**BACHMANN TURNER OVERDRIVE: Martin Bachmann Keller's computer-controlled hydraulic hoists takes a chunk out of shovel maintenance time**

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