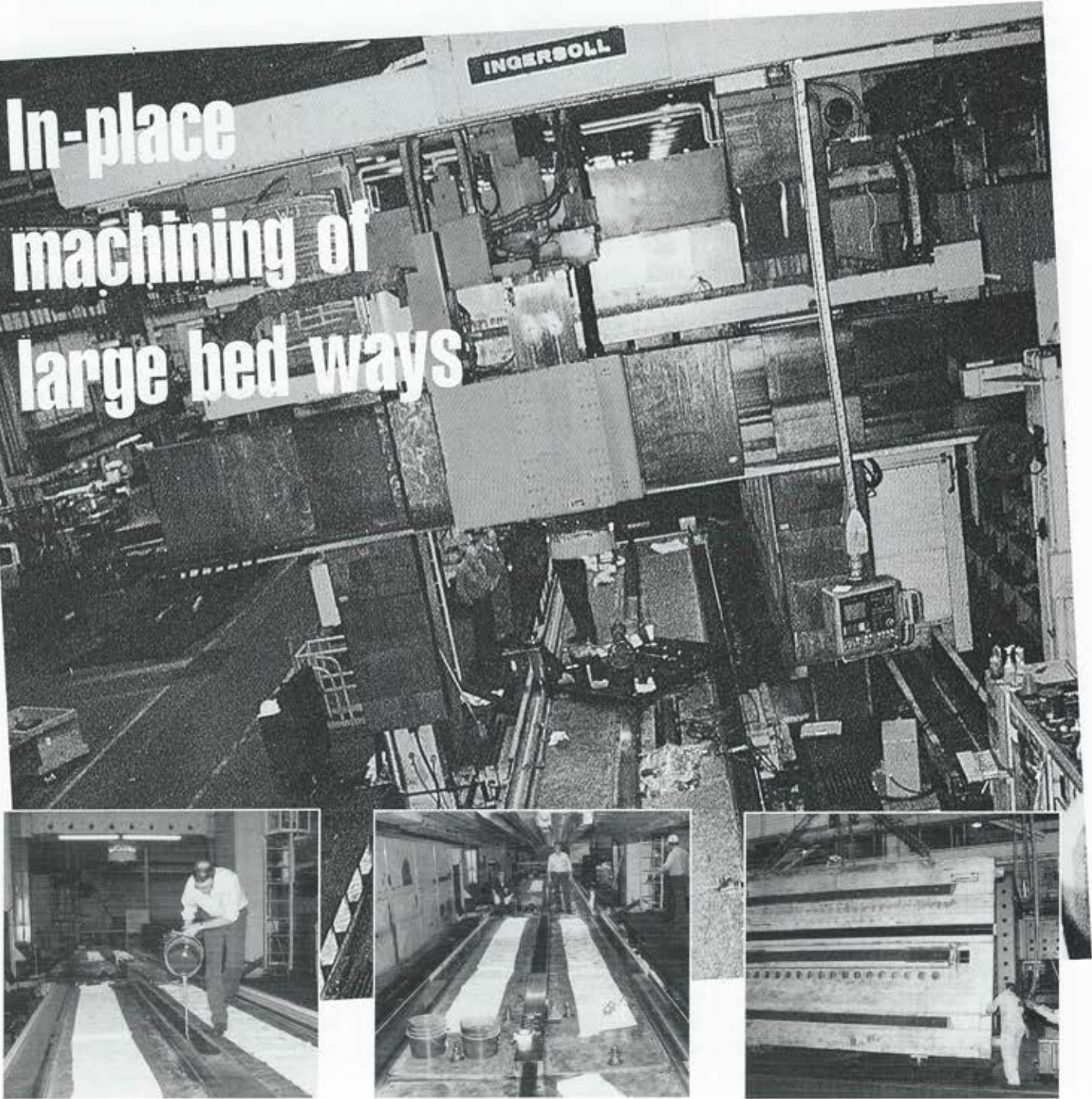


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# AMERICAN MACHINIST

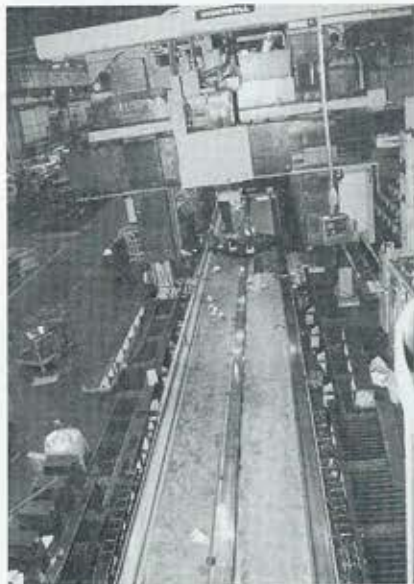
THE INTERNATIONAL MAGAZINE OF MANUFACTURING TECHNOLOGY

In-place  
machining of  
large bed ways



## *In-place repairs of machine bed way saves time and money*

A groove had been gouged in a bed way of a large adjustable rail milling machine at the Metal Fabricating Division of General Motors in Mansfield, Ohio. This machine is used in the die manufacturing operation within GM-Mansfield, working in new die construction, with some repair work on already produced dies.



*Large Ingersoll planer mill with gouged steel hydrostatic bed ways.*

This gouge greatly impacted the machine's performance. The milling machine was equipped with hydrostatic table bearings that employ oil-pressurized pockets in the ways of the tables. The oil pressure is controlled to float the table 0.003 in. over the bed surface for essentially zero static friction, allowing the machine to precisely position very large dies.

But the groove that had been gouged in the bed caused the hydrostatic pressure to escape and the table to touch down on the bed. Because the machine was not designed for the extra friction of

sliding contact way surfaces, the table drive system was put under extra load, resulting in jerky table motion and positioning problems. This jeopardized the costly

dies and the table drive system itself. "Since the ways were an integral part of the bed of the machine," recalls David Cunningham, maintenance support supervisor at the plant, "the OEM recommended that they remove and send the three bed sections to them so the ways could be remachined." But that was not a feasible solution since each bed section weighed more than

20 tons, and the center section had complicated hydraulic and electrical services related to the hydrostatic worm drive. Field Alignment Services & Training, Inc. (FAST), based in Aston, PA, specializes in on-site machining and rebuilding of way surfaces in precision metal cutting machine tools. A

key ingredient in its in-place resurfacing process is the use of Moglice, a long-wearing, low-friction slide-way replicating material. Unlike other slide-way materials, Moglice is molded to a finished bearing surface while the components are correctly

**Before:** Fixing a gouge in a milling machine that effected hydrostatic pressure meant shipping the 60-ton, 3-bed section out for remachining.

**After:** The company saved time and money by hiring a rebuilder to machine the damaged way in place on the machine.

aligned, eliminating many time-consuming gluing, machining, and scraping operations. This technique allows FAST to quickly fit custom-fab-

ricated milling carriages to unusual guiding surfaces. After the milling, Moglice enables FAST to fit the large mating components to the new bed surfaces, quickly and economically in the field.

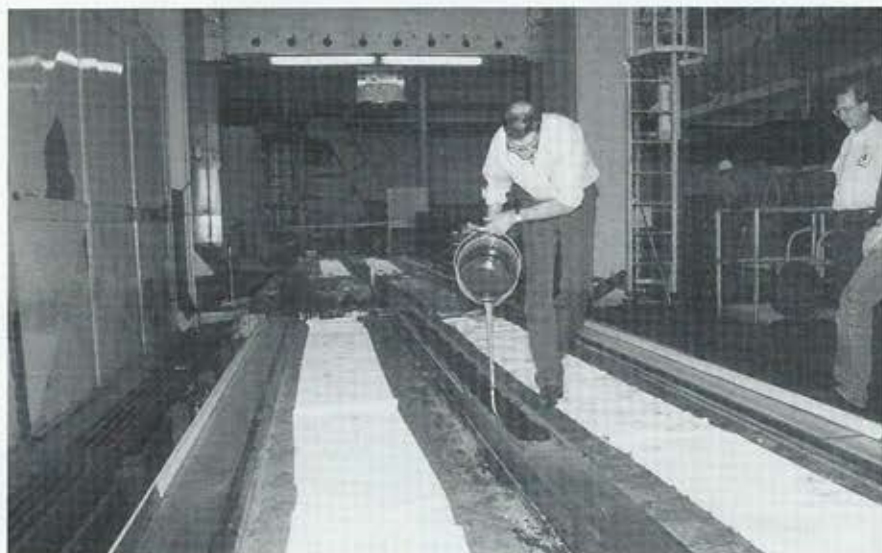
"FAST was the only source to recommend machining the damaged way in-place on the machine," notes Cunningham.



*Ingersoll finishing face mill in a 50 taper spindle mounted to a temporary carriage milling a bed way.*



FAST fabricated a custom machining carriage that was fit to the unscored areas of the way surfaces with Moglice and driven with a portable drive system. A milling head was mounted on the carriage and used to mill a temporary way



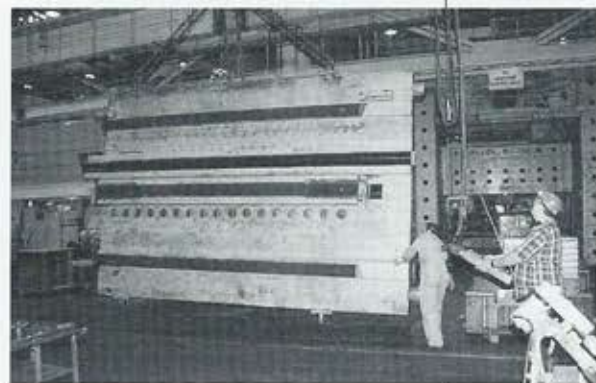
*Moglice is poured into dammed off areas on the bed way*

surface about 2.5 in. wide into the bed of the machine as near to the damaged way as possible. Then the carriage was refit with Moglice to ride on the temporary way surface. All 80 feet of the bed way was machined in one continuous cut to within original machine specifications.

Work then focused on the table, which was in two dockable segments, each 20-ft. long. The phenolic wear material on the table ways was starting to become delaminated. So, GM-Mansfield decided to replace the way material on all three ways. The phenolic was removed and precured Moglice shims, the exact thickness of the removed phenolic, glued to the table way surface. The table way surface that mated to the machine bed way had shims applied that were thicker to account for the material that had been machined off the bed. The first table segment was then set back on the bed and the previously documented corner

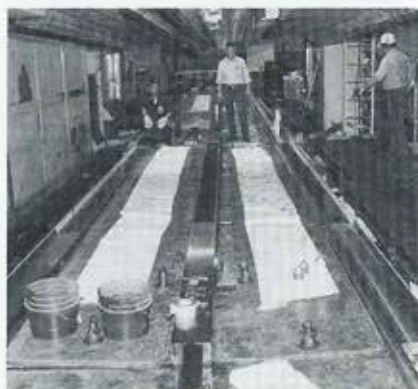
elevations were verified. The flatness of the table top and parallelism with the bed way were checked with electronic levels. Adjustments were made by scraping the Moglice shims.

The Moglice was applied to the table via the pour-and-set application method. Next, the table was set into the Moglice, coming to rest on the preadjusted shims. Table alignment was verified and the Moglice allowed to cure for 18 hours. The next day, the table segment was lift-



ed from the bed and rolled over. Excess Moglice was trimmed off the edges and the hydrostatic pockets were routed in. The same proce-

dures were followed on the second table segment. Because the Moglice cures to a perfect replica of the bed ways while the table is in its current position, it eliminates the need to machine or scrape the table way surfaces to fit the bed ways, therefore the tables were ready for reinstallation. "The whole process was completed in less than three weeks," reports Cunningham. "The FAST approach of in-place machining meant minimum manpower and disruption to the area, not to mention a time factor of weeks as opposed to months.



*The table is set into the Moglice coming to rest on pre-adjusted alignment pads*

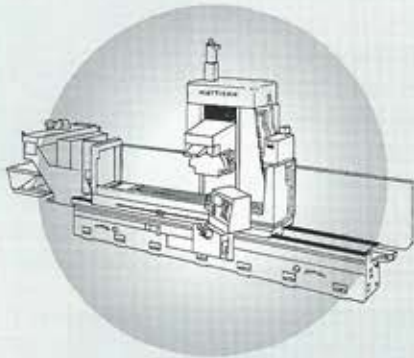
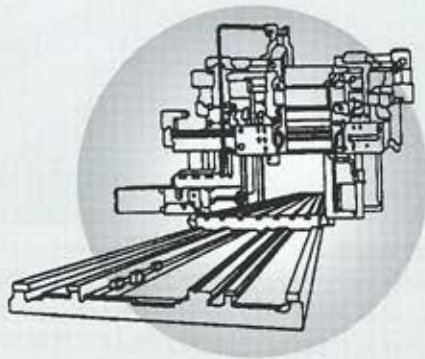
*After 18 hours of cure, the table is removed, trimmed and is ready for re-assembly*

# **FAST**

Field Alignment Services & Training

## **On Site Rebuilding of Large Cast Iron Way Surfaces**

100' bed ways can be machined in-place and tables fit to fresh bed ways in less than 3 weeks. Ingersoll heads can be refit in 3 days without purchasing new gibs.



Large surface grinder bed ways are machined in place and the tables refit in less than 10 days to new machine specifications.

**FAST has developed innovative techniques for machining large bed ways in-place. These techniques drastically reduce the time and expense of requalifying large machine tools.**

**F A S T**

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