

Caterpillar enhances ergonomics, eliminates double handling with these lifts.

Developing a new assembly line for making hydraulic excavators, Caterpillar Inc. wanted to find more efficient and cost-effective materials handling procedures.

But several problems had to be solved, explains Ernie Swafford, assembly systems technician: (1) How to lift and lower heavy components of the 20 to 75 metric ton, earth-moving machines. (2) How to perform these steps with full assurances of safety and improved ergonomics. (3) How to avoid double handling (lift and lower, then lift again later) as done in the past using an overhead crane.



A single component for an excavator tips the scales at 10,000 lb, at least, explains Mike Firmand, staff engineer. To bring one of these components to the head of the line from staging-in a prior assembly process-the company had used a large forklift. Then the unit was set on sawhorses. Next, an employee performed work underneath the unit, crawling on hands and knees or else lying on his back on a mechanic's dolly. Finally, the component was loaded by crane onto an assembly dolly, or transport cart, to move further along the line.

"One goal was to minimize our handling costs," recalls Firmand, "while also holding down our capital expenditure for this step in assembly." Caterpillar had a tight schedule to complete the project. Floor space for staging components was limited. And safety and ergonomics were uppermost in manager's minds.

After investigation options and rejecting several that required highly customized equipment, Caterpillar installed three electro-hydraulic material lifts (see photo). The basic design of this four-column-lift, with only very slight modifications, "took care of our safety concerns," Firmand reports. The lift's ready availability without much customization helped with the tight timetable. Cost was far below bids for custom equipment. Each lift unit column has a hydraulic cylinder for raising or lowering the load. When the load is at a correct, ergonomic height, the operator presses the "park" button. This step engages a pneumatically-operated, mechanical safety pawl.

The lift units have definitely reduced handling time and the space needed for staging. "They gave us the improved operator ergonomics and safety we wanted," adds Swafford.

From a maintenance aspect, the lifts have been "terrific," he adds, noting that throughput on the assembly line has nearly doubled from what originally was expected. The lifts "have been very reliable," concurs Firmand.