

Large Slurry Pump Housing Milling Fixture

Application Note

Dedicated fixture reduced setup time by 50% and machining time by 45%.

A manufacturer of large pumps for mining slurry applications needed large (over 108" wide) pump housing castings machined including milling, drilling, and boring. Each pump consisted of a right & left half, each half requiring an A and B load -- which meant four setups for a complete set of parts. The manufacturer contacted Advanced Machine & Engineering Co. (AME) to do the machining on the parts.

Problem

AME delivered high-quality machined pumps on time, but by using non-dedicated fixturing, setup was taking far too long per part, resulting in higher costs. Change-over took as long as six (6) to eight (8) hours each time. Locating and clamping the pump housings was tedious, and the methods used raised safety concerns. Clamping forces were less than optimal, which had a negative effect on the manufacturing cycle time and tool life. AME needed to significantly reduce the total setup and machining time, and improve operator safety.

Solution

AME designed a single, dedicated fixture (see image 1) to hold each pump half for both A and B loads that reduced setup time to less than 50% of the previous method. Additionally, due to improved locating and clamping methods, milling and drilling operations were optimized, resulting in a 45% reduction in the machining cycle time. These savings were shared with the customer. In addition, machining quality was improved by using only one fixture, instead of multiple, separate fixtures, allowing tolerances to be maintained more easily. Machine operator safety was also improved due to the standardized lifting, locating and clamping methods that were employed (see image 2).



Slurry pump housing mounted to a dedicated fixture



Image 1: CAD models of the two halves of the slurry pump housing on the fixture.



Image 2: The slurry pump housing half mounted on the fixture, mounted on a horizontal boring mill.

