Cat Dealer’s Hydraulic Shop Salvages Cylinders With Tube Hone

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Rebuilding heavy equipment makes good economic sense, particularly for the hydraulic components on construction and earth moving machinery. In fact, the trend since 2008 has been strong enough to support the addition of a machine shop as part of the existing hydraulics shop at Caterpillar dealer Whayne Supply. Key among the shop’s equipment is a Sunnen HTA tube hone, which allows Whayne to resurface scratched and rusted cylinder barrels, saving customers 80 percent or more over the cost of a new barrel. Brought in as part of a beta test of Sunnen’s new all-electric machine design in 2009, the hone has been used to process more than 1,000 barrels. Bringing this previously outsourced machining work in-house has helped the company add revenue and staff, while also improving control of delivery schedules and costs for customers.

Whayne has 14 locations and approximately 1,300 employees, with 200 located in Corbin. The company has rebuild centers in both Louisville and Corbin, and all exchange/re-sell goods are processed in these shops. The shop has five cylinder service bays, one for suspension cylinders, one for lift cylinders on small loaders, and three for high-force cylinders. “We can replace the barrel, rod, rod eyes, head/seal areas, hydraulic lines and connections, or custom fabricate new cylinders to spec,” says Michael Carter, Service Coordinator. There are four hydraulic cylinders on the average Cat machine, so the shop stays busy, processing about 1,000 cylinders in 2011. “During the summer, we may have a hundred or more cylinders outside our shop waiting to be rebuilt, because our indoor storage is full,” Carter adds.

The shop’s old hone consisted of a drill motor on a sliding carriage, and lacked the power, capacity, and rigidity needed for doing serious work, according to Carter. “It could produce a surface finish, but not remove metal.” Whayne agreed to beta test Sunnen’s new all-electric HTA cylinder hone, and later purchased the machine with a 12-foot (4 m) part capacity.

The HTA tube honing system handles parts weighing up to 8,000 lbs. (3629 kg) with ID ranges from 2.5 inches to 21 inches (63.5 to 533 mm). It is designed for resurfacing and repair work where light-duty stock removal up to 0.030 inches (0.76 mm) is required. Standard models are sized for 6-foot (2 m) and 12-foot (4 m) part lengths, and custom lengths are available.

The HTA is equipped with a Siemens drive and PLC-control with touch-screen HMI for setting machine parameters such as stroke reversal point, spindle/stroking speed and crosshatch angle calculation. The control features a load meter to determine areas of bore tightness, and provides the ability to dwell the tool in

multiple areas to correct part geometry. A touch screen-controlled hone provides a safer working environment and reduces operator fatigue. It also provides better quality parts by producing a controlled crosshatch pattern, which allows the honed surface to retain oil or grease, ensuring proper lubrication and ring seal of pistons in cylinders.

"We were not sure about downtime for a new machine, but it has proven extremely reliable and we've used it to hone cylinders from 2.5 to 17 inches (63.5 to 432 mm) diameter, and six inches (152 mm) length to over 21 feet (6.4 m)," Carter adds. "We simply created a table with an adjustable-height V-block to support parts that overhang the machine. We have used up to a 21-foot drive-shaft length on the machine, and we can hone from both ends of the part if need be. Our cycle time for most barrels is about 30 minutes, which includes setup, honing, and washing the part."

Whayne uses both roughing and finishing abrasives, removing scratches and rust, and imparting a specific crosshatch surface finish on the barrel bore. "We can increase the cylinder bore diameter up to 0.254 mm (0.010 inch) in relatively short time, removing rust and all but the worst scratches, and remain within Cat machine specifications," Carter says. "Our old hone simply could not do this. It's been a very reliable system, too, with no appreciable downtime.

"We scrapped a lot of hydraulic barrels or sent them out to other shops prior to acquiring this machine," Carter adds. "Now we can salvage a cylinder with honing, and the cost and time for the customer is a fraction of replacement. In the current economy, customers appreciate this."

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