

CAT DEALER'S HYDRAULIC SHOP SALVAGES CYLINDERS WITH TUBE HONE, SAVES CUSTOMERS MONEY

RE-SURFACED CYLINDERS SAVE CUSTOMERS 80 PERCENT OR MORE OVER COST OF NEW BARREL. CYLINDERS UP TO 21-FEET LONG HONED SUCCESSFULLY.



Caterpillar dealer Wayne Supply has honed hydraulic cylinders up to 21 feet long, saving customers 80 percent over the cost of a new barrel.

CORBIN, KY – 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 Wayne Supply. Key among the shop's equipment is a Sunnen HTA tube hone, which allows Wayne to resurface scratched and rusted cylinder barrels, saving customers 80 percent or more over the cost of a new barrel. Brought in as part



The HTA hone is designed for optimum performance with Sunnen ANR275 tooling and abrasives, sold with matching coolants and gauging as part of the machine package.

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.

Wayne is the worldwide leader in Cat-certified rebuilds of complete machines, having produced more than 400 on 33 different machine models since 1985. The company was honored for completing the five thousandth Cat-certified rebuild in 2011. Wayne has 14 locations and approximately 1300 employees, with 200 located in Corbin.

"Simple economics dictate that customers are going to be rebuilding machines until the economy – and the coal industry in our region – both strengthen significantly," said Mike Harbin, Manager of Wayne's Power Rebuild Center. "We have customers who are tearing down machines in the field and completely rebuilding them. The machine shop and the honing system have helped us stay on top of this trend. We have added five people in our shop alone to handle the increased volume."

Wayne has rebuild centers in Louisville and Corbin. All exchange/re-sell goods are processed in these shops. The hydraulics shop in Corbin has eight cylinder technicians, three full-time machinists, three pump experts, plus a foreman and service coordinator. The Corbin operation added a machine shop to its hydraulics shop in 2009 that included two vertical mills, two lathes, drill press, rotary surface grinder, welders, and saws. The shop stocks various sizes of chrome-plated bar and DOM tubing, some of it pre-cut for standard Cat sizes. The shop has five
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Whayne honing operator inserts the tool at start of a cycle. Whayne has honed cylinders with bore ID up to 17 inches. 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).

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," said 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 added.



Whayne honing operator changes abrasives to perform both roughing and finishing of the bore.

Honing cylinders for customer savings and shop profit

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 part lengths up to 32.8 feet (10 m), with custom lengths available to 65.6 feet (20 m). 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 touchscreen-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 added. "We simply created a table with an adjustable-height V-
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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."

Wayne 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 said. "Our old hone simply could not do this. The HTA hone is easy to setup also. The control calculates the correct crosshatch angle. 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 added. "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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