

The welding operation at KTH Parts Industries has undergone modernization, shifting from manual to automated welding. It now incorporates more than 325 robots in 25-plus welding lines for a resistance-welding automation level of 90 percent.

TIER ONE AUTO SUPPLIER TAKES OFF

Boosted by investment in stamping, welding and sensor technology—and the employees who use it—KTH Parts Industries keeps Honda happy and well-stocked.

BY LOUIS A. KREN, SENIOR EDITOR

“Nothing here is concrete except the concrete itself.” So goes the saying at KTH Parts Industries. Planting its seed in the farm fields of St. Paris, in southwestern Ohio, KTH has grown...and grown...and grown. The KTH-St. Paris plant, built in 1985 as a 200,000-sq.-ft. facility with 150 employees, initially supplied frame components for the Honda Accord. Since then, the operation expanded at least eight times, say officials. Now, KTH performs stamping, welding and other assembly operations in 526,000 sq. ft. of space,

courtesy of more than 750 associates. It meets Honda’s North American needs for frame components for Accords, Civics and Acuras to the tune of \$350 million per year, supplying about 20 different parts for each model. The plant joins three others under the KTH banner: KTH Shelburne Mfg. Inc., Shelburne, Ontario Canada; Kalida Mfg. Inc., Kalida, OH; and the recently built KTH Leesburg Products Inc., Leesburg, AL. Together, the four plants employ 1400 workers to serve Honda (a KTH stockholder) nearly exclusively.

Constant model introductions and Honda’s ever-increasing hunger for parts keeps KTH in transition. Throw in the fact that KTH embodies the just-in-time and quality-control attributes of Honda, and it’s easy to see why the parts-maker and assembler emphasizes new technology and a highly trained workforce.

Tooled to Succeed

KTH has gone to great lengths to upgrade all elements of its manufacturing operations.

For example, the company has invested heavily in its stamping sector, which runs three shifts, Monday through Friday. A typical stamping run produces 5500 parts, enough to supply about three-and-one-half days of inventory for assembly operations. The equipment roster includes one 2500-ton, two 1800-ton and three 1500-ton transfer presses as well as two 400-ton blanking lines. In 2001, the plant added a tryout press, and other additions include a handling-simulation machine to examine transfer setup offline.

"Those items really help as all the new dies come in for model launches," says Larry Jenkins, vice president and plant manager. "A new model launch brings in hundreds of new dies, and we must set them all up and run die trials—normal die maturation. We just can't shut a mass-production press down to do that."

KTH averages a die-change time of 10 min. from last part off to first part stamped. This comes courtesy of rolling bolsters and other quick-die-change technology.

Like die change, material use is rapid, as coils received in the morning typically find their way into presses by the same-day second or third shift.

Like its stamping counterpart, the welding operation at KTH also underwent modernization as the St. Paris plant has shifted from manual to automated welding. It now incorporates more than 325 robots in 25-plus welding lines for a resistance-welding automation level of 90 percent. KTH welds in a two-shift operation, with a skeleton crew performing maintenance

functions on third shift. Early on, dedicated automated welding was the norm—a welding line would produce a particular part and that's it, according to Jenkins.

"But in our most recent model launches, we've installed lines that provide multiple-model capability," Jenkins explains. "Robotic rollover fixtures can be pulled out of rear-frame production for one model and into rear-frame production for another model."

"Ideally, we'd build a frontside frame and a wheelhouse on the same line, although we don't do that right now," he continues. "But we do strive for flexibility and Honda drives that. The automaker wants to move toward building just about anything just about anywhere. That way, if the market changes, Honda can react quickly. And if you supply Honda with parts, you had better be able to do the same thing."

Always eyeing improved cycle times and the resultant rise in productivity, KTH is considering laser welding to produce tailor-welded blanks, and whether that function should be performed in-house or outsourced.

Hardy Sensors Required

With such high welding volume at KTH Parts, the company needs sensors that perform accurately for a long period of time. With its JIT and lean-manufacturing nature, the company can't afford to have its welding cells shut-down frequently for proximity-sensor changeout. And the high-volume welding environment demands sensors that last, according to Sam Roberts, an engineering staff associate responsible for quality control in welding operations.

"My responsibility is all the detection sensors on welding stations where we load small parts. The sensors check for part presence and correct orientation prior to resistance welding," he explains. "We can't send Honda a stamping or a frame with missing components. Associates load parts into a welding jig, clamp them, and as soon as they hit the start buttons for that weld sequence to begin, the sensors have completed their job."

KTH agreed to trial and evaluate 700-Series stainless-steel inductive proximity sensors from Contrinex, Fort Lee, NJ. Previously, KTH employed hundreds of Teflon-faced inductive sensors



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in its welding cells. Sheetmetal parts damaged the sensor faces during transfer into and out of the cells, as did weld expulsion resulting from resistance welding. The life expectancy for these sensors ranged from a couple of days to a month, according to Roberts and Matt Specht, sales engineer from J.H. Bennett & Co., Inc., Brecksville, OH, a Contrinex distributor. With cost ranging from \$35 to \$80 depending on size and range, constantly replacing the sensors became expensive, and downtime required to replace those sensors brought added costs.

The new sensors, with their stainless-steel faces, proved much more hardy during trials.

"Nothing sticks to the face of the new sensor," offers Roberts. "Weld spatter flying in the air as little hot balls would burn right into the old sensor facing and would stick on it, effectively ruining the sensor."

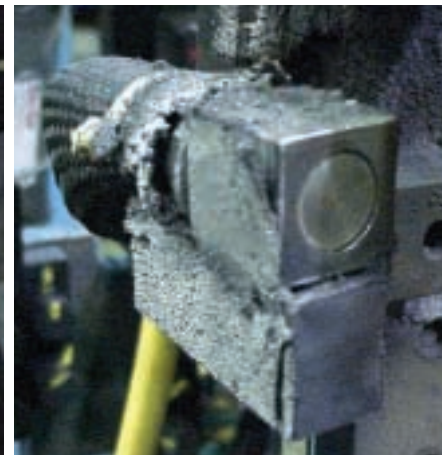
The new sensor's ability to resist collision damage also impresses Roberts.

"As required by Honda, we conduct driver checks, where we must check our welds every half hour within the welding cell," he explains. "Using what looks like a screwdriver and a hammer, in between the metal we pound three times into a weld to make sure it doesn't break. Sometimes, we hit the sensor by mistake. To show the ruggedness of the new sensor, Matt Specht mounted it onto a hammerhead and pounded nails into a two-by-four without damaging the sensor."

Roberts sees the cost savings. Though the new sensors cost 20 percent more than the old, they'll be worth the investment, he believes.

"Imagine going through a sensor per week as opposed to a sensor per year," he says. "They pay for themselves in a hurry."

Roberts began a trial run with six Contrinex sensors in October 2001, and eight months later, no sensors had required replacement. Since, Roberts has ordered more than 200 new sensors, replacing the old sensors on a gradual basis.



New stainless-steel-faced sensors prove reliable at KTH, functioning in a high-volume resistance-welding environment and withstanding constant part hits. Note, in the photo at right, that despite accumulation of weld spatter on the welding jig, it does not stick to the sensor face.

Other Sensing Improvements Aid QC Quest

That Roberts occupies the position he does offers another example of KTH Parts' commitment to new technology and in-plant expertise to back it up. He began concentrating on sensors for KTH eight years ago, using third-shift downtime to ply his trade. His first order of business: checking all sensors in the welding group, making sure they worked and were properly positioned, and replacing any missing sensors. After a couple of years, satisfied with sensor setup, he developed a programming system.

"I call it 'sensor-stuck-on' programming," he explains. "Before, if weld spatter reached the sensor face, the operator might continue loading parts and welding would continue, negating the quality-control function of the sensor—the whole reason we use the sensor. So I created programming where I run a pulse over every sensor after the part exits the partholder. A break in the pulse connection indicates a bad sensor in need of cleaning or replacement."

Another improvement: When Roberts first started working for KTH, L-shaped brackets and nuts typically held sensors in place in the weld fixtures. In this arrangement, associates initially position sensors correctly, but the sensors and related fixturing loosen over time.

"An operator, seeing the loose sensor, may tighten it up but not always in the correct orientation," he says.

To combat that, Roberts employs threaded holding blocks, often welded into place, to flush-mount the sensors. The rigid block and packed-down wiring ensures that, should the sensor begin to unthread or loosen, it simply can be threaded back into place, in the right location.

In the tough KTH welding environment, the holding block, also supplied through J.H. Bennett, may wear from being hit by the parts, but the new stainless-steel-faced sensors remain undamaged.

"We can't afford downtime," says Roberts, "and we've decreased our downtime considerably by employing the steel-faced sensors and addressing the sensor mounting."

Expertise to Make It All Work

With the influx of welding, stamping and assembly technology, KTH needs an educated workforce to run the sophisticated arsenal and make sure that all technology works together to make sure the company meets its JIT mission.

"We are adopting lean manufacturing and JIT philosophies to produce components only six to eight hours ahead of when Honda needs them," explains William Post, senior manager of general administration. "So uptime

on equipment is very important as are the technical skills of people who keep it running and the knowledge of production associates in quickly identifying quality problems.”

To that end, several years ago the company identified a need to develop its technical people in the welding and stamping areas. To strengthen its training commitment, KTH joined with a local joint vocational school and community college to develop a KTH-specific apprenticeship program, typical of any four-year apprenticeship program, according to Post. On-the-job training combines with formal training, and KTH adjusts compensation as associates navigate the program. To date, of the 29 associates in the maintenance department, 75 percent have reached the four-year level, according to Post. The KTH commitment to associate training brings reciprocal commitment, as the company notes very low turnover among those undergoing training.

“We have training programs for facilities, maintenance, die makers and tool-and-die designers,” says Post, listing a portion of departments benefiting from company-sponsored training. “To complement that, we have skills training for our group leaders and production associates.”

Another KTH initiative is the Associate Circle Program (ACP), a grassroots program where a group of associates can identify a problem, determine the root cause and work on solutions using quality-control tools. Exceptional teams compete at regional and worldwide Circle competitions open to all Honda suppliers—one represented KTH at the worldwide competition held in Japan this past December .

Initiatives such as ACP reflect KTH management policies.

“One is to remain competitive through continual improvement in the development of technological and managerial skills,” explains Post. “Our

favorite policy: Enhance individual capabilities through constant research and self-development. That means to foster self-improvement, which we encourage at all levels.” The company’s certification to QS 9000 and ISO 14000 demonstrates these commitments to quality control and self-improvement.

Beyond Honda?

Company officials say KTH seeks to one day move beyond service to a single customer—Honda is the customer for more than 99 percent of KTH-produced parts—but current factors fight that move. A big one: No excess capacity exists at KTH as no stamping or welding lines sit idle waiting for business. A plant addition would require a major customer commitment. With all the model launches and its current workload, KTH may diversify down the road and continues to entertain options, but now’s not the time, say company officials. MF