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Transitioning to Rotary Transfer Technology

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A Hydraulic Fitting Manufacturer's Time of Transition(s)

This hydraulic fitting manufacturer uses innovative tooling, tool presetting, automated parts collection and its own expertise in custom workholding to enable its first CNC rotary transfer machine to effectively run smaller batches of parts than you might expect for this type of machine platform. This at a time when it also finds itself in a period of leadership succession planning.

➔ For me, every visit with a manufacturer to profile in *Production Machining* is like an image caught in time. The ever-evolving Air-Way Manufacturing is no different.

Headquartered in Olivet, Michigan, family-run Air-Way is the largest independent hydraulic fitting manufacturer in the United States. As it celebrates its 75th anniversary this year, the company also finds itself in transitional periods in terms of leadership succession and adoption of new CNC machining technology.

I was able to visit in the midst of all that.

Per the former, John Hamm, president of manufacturing and engineering, is eyeing retirement. He represents the third generation

← Alex Garrett, manufacturing technology manager for Air-Way Manufacturing, says the company has run 50 different components on its new CNC rotary transfer machine thus far since its installation in 2023. Source (all photos): PM

of family leadership, a business his grandfather, Raymond Hamm, started with help from business partner, Edward Jacob. The company was eventually passed to Hamm's father, Ronald John Hamm, Sr. John now holds the reins after joining Air-Way full time in 1975, a company he began helping out at when he was 12.

In fact, he plans to semi-retire this May, perhaps working only three days a week compared to his traditional full schedule. The succession process is still fluid at the moment, but he has been preparing for his personal exit for at least six years, while knowing for decades that young, talented people represent the future of the



← Air-Way is the largest independent hydraulic fitting manufacturer in the U.S.

company, many of which I got to meet during my visit. These include his sons, RJ and Kyle, who have similarly worked at Air-Way since they were very young. The Jacob family also remains active with many senior and up-and-coming young family members as part of the business.

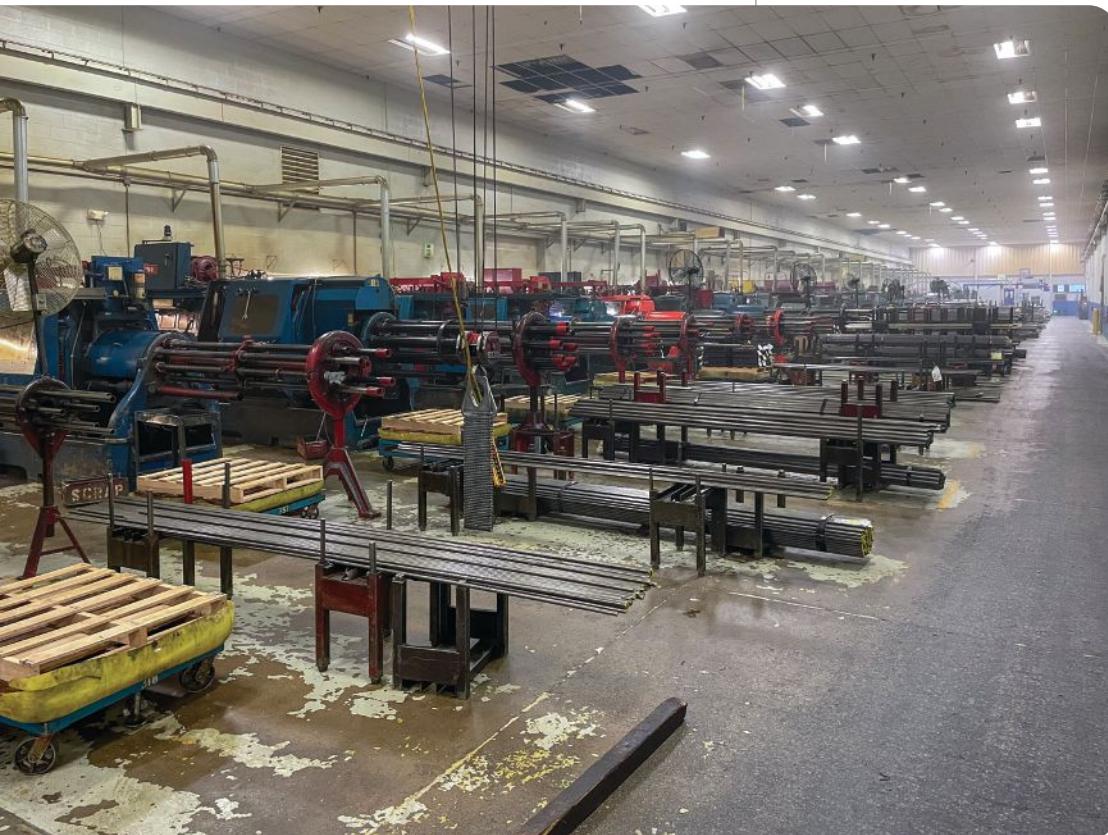
In terms of new machining technology, the company has recently added its first CNC rotary transfer machine from Italy's Buffoli, which was installed in its Hamilton, Indiana, production facility in February 2023.

This type of machining platform has traditionally been used for low-mix/high-volume production. Air-Way's Buffoli CNC rotary transfer machine, a bar-fed, horizontal-axis trunnion model, certainly produces a high volume of parts. (The average time to complete a part is just 6.5 seconds.) But, in keeping with Air-Way's history of manufacturing innovation, its machine is engineered to run smaller batches of parts by way of innovative tooling, tool presetting, automated parts collection and its own expertise in manufacturing custom workholding devices.

To date, some 50 different part numbers have run across this machine with batch sizes commonly held to 5,000 pieces.

Hamm notes that not only does this rotary transfer machine match the capacity of five screw machines but it also it provides a level

← The company still has a number of Acme screw machines in both its Hamilton, Indiana, facility (shown here) and Olivet, Michigan, headquarters. Long setup times and inefficiencies are leading the company to adopt newer CNC technology such as its Buffoli rotary transfer machine, however.



→ Buffoli modified the design of its standard bar-fed, horizontal trunnion machine to fit inside Air-Way's Hamilton facility. It also created an automated parts collection device with multiple part baskets to keep up with the machine's fast production rates.

of flexibility and reliability that those machines can't offer.

Then and Now

Air-Way was founded in 1950 in a former airplane hangar located on an airway in Romeo, Michigan (hence, the company name). Hamm's grandfather, who learned his machining skills at Hudson Motors and V.L. Graff, devised the idea of manufacturing shaped, brazed fittings, which became an industry staple (90-degrees, 45-degrees, T's and crosses). Another standout moment came in 1986 when Air-Way launched its Flare-O tube fittings, which included an elastomeric seal that provided a leak-proof, drop-in replacement for traditional 37-degree SAE/JIC flared tube fittings.

The company has four U.S. production facilities. Two are located in Olivet, one is in Hamilton and the other is in Edgerton, Ohio, where final assembly and packaging occurs. The Olivet operation has 24 Acme screw machines and 26 CNC machine tools. The Hamilton location has 26 Acmes and 15 CNCs. Two U.S. production facilities are located in Olivet as well as Hamilton. The Olivet operation has 24 Acme screw machines and five CNC machine tools. The Hamilton location has 26 Acmes and 15 CNCs.

Hamm had advocated for CNC technology when he joined the company, and Air-Way began adopting that equipment in the 1980s in part to move on from the legacy turret lathes it had been

using. That, of course, represented a big change. The new CNC rotary transfer machine is similar in that regard.

But why a rotary transfer machine? The company has traditionally run jobs in relatively small batches. At one point, it moved work

→ This rotary transfer platform enables parts to be machined on either side without flipping them. Air-Way has found that 5,000 pieces per batch is its sweet spot thanks in part to workholding elements the company has developed in-house to enable fast changeovers.



in the range of 50 to 3,000 pieces previously run on Acmes to single-spindle CNC lathes. This made sense as the setup time for a screw machine (perhaps eight hours) to run 3,000





← Tool presetting using this Zoller Smile 420 as well as tool kitting on carts helps speed change-overs on the new rotary transfer machine.

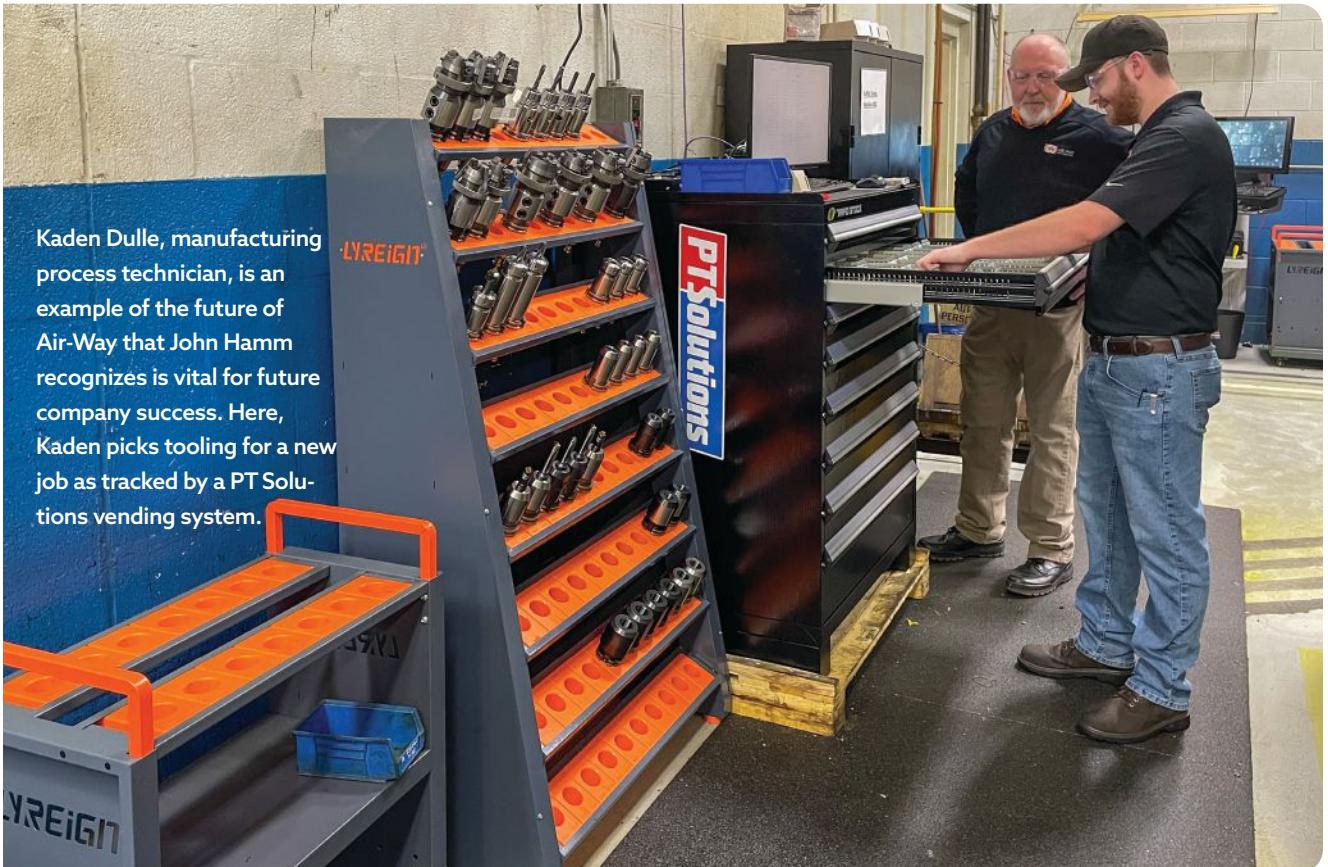
to get away from spinning long bar stock. “Something significant I’ve learned over the years is that spinning a long bar causes problems,” he says. “We’ve found that it’s better to spin a tool around a slug such as we do on our new CNC rotary transfer machine. Even spinning a slug is a better solution compared to long stock.”

He points to issues the company had with chatter due to long bars bouncing inside a screw machine’s stock tube or bar feeder as well as poor steel bar straightness. Operators would make many adjustments to dial in the process, which would finally happen once a portion of the bar was consumed. However, the issues would arise anew when new bar stock was loaded.

“With the Buffoli, the first operation is to cut a slug from

pieces could be longer than the production run itself.

The company then looked for a machine suited to batch sizes of 3,000 to 10,000 pieces. But Hamm also wanted



Kaden Dulle, manufacturing process technician, is an example of the future of Air-Way that John Hamm recognizes is vital for future company success. Here, Kaden picks tooling for a new job as tracked by a PT Solutions vending system.



a bar,” Hamm says. “So, we don’t have to worry about any of that.”

He also appreciates that this horizontal-axis trunnion machine offers the ability to machine parts from either side without having to flip them. Plus, it can accommodate bar stock diameters ranging to 55 mm. That’s important because the company runs many different bar stock sizes.

In fact, Edoardo Buffoli, president of Buffoli Transfer S.p.A in Italy, modified the machine’s standard design to decrease its footprint to fit inside Air-Way’s Hamilton facility. This he did after a visit to the Hamilton facility to see the available space first-hand. Then, once the machine was installed, Buffoli representatives spent a couple months at the facility helping Air-Way get up to speed with this new machine. Alex Garrett, Air-Way’s manufacturing technology manager at the Hamilton facility, was the point person in this regard.

Buffoli also created an automated parts collection device with multiple part baskets to keep up with the machine’s fast production rates. This enabled machine operators to perform other duties such as inspection or tooling preparation for upcoming jobs rather than frequently handling completed parts. To simplify part

inspection, the company added a Keyence IM series visual inspection system that performs measurements automatically in place of optical comparators, calipers/micrometers, measuring microscopes and optical CMMs.

Hamm notes that one important aspect of the decision to go with the Buffoli rotary transfer machine is its maximum bar stock size of 55 mm, offering the ability to run hex stock as big as 1.875 inches. Air-Way also has the expertise to create its own workholding components — not an easy task — to accommodate the wide range of stock sizes required by its customers. Over the years, the company has gained a wealth of experience designing and producing custom workholding devices in-house often using its FANUC wire electrical discharge machine (EDM).

To further speed changeover times, Air-Way tries to use standard tooling whenever possible. Garrett cites value in Genesee Manufacturing’s line of adjustable, inserted hollow mills, too. This enables the machine to hollow mill from the end of a part, with multiple

↑ [Genesee Manufacturing’s line of adjustable, inserted hollow mills can machine parts of varying diameters.](#)



indexable inserts. There is no need to interpolate or single point and no additional set up is necessary after indexing. The result is reduced cycle time, increased productivity and faster feed rates. A hardened, ground adjusting ring enables uniform, precision adjustment of insert holders. Therefore, parts having different diameters can be produced with one tool.

Tool presetting is also key for fast changeovers. Air-Way added a compact Zoller Smile 420 presetter so operators can measure tools for upcoming jobs offline and then kit those tools on carts that can be delivered to the machine. A sticker with measurement data is printed for each tool which operators can simply scan to input that data into the CNC during setups rather than manually entering that data.

Second Machine En Route

At the time of this writing, a second, similar machine was near completion at Buffoli's production facility in Italy. This will be installed alongside the first machine and one person will tend both.

↓ Like their father, John, Kyle (left) and RJ (right) started working for Air-Way when they were young and have assumed significant leadership roles within the company.



↑ Air-Way's second Buffoli rotary transfer machine, here shown during assembly in Italy, will be delivered early 2025.

The second machine differs only slightly from the first. One difference is that its recess head has a longer stroke. This facilitates machining of fittings with large jump sizes (that is, large fittings with small ports).

Another difference is that the second will feature a dedicated mist collector mounted atop the machine, which will activate when the machine is powered on. With the first machine, Air-Way believed it could simply add it to its existing facility-wide mist collection system. However, it quickly found out that the volume of the mist created from the rotary machine overwhelmed that system. So, it purchased a mist collector that is dedicated to that machine, which is mounted on a nearby wall.

A Culture of Continuous Improvement

Leadership succession and the addition of new machining technology certainly represent significant transitional moments for Air-Way. That said, the company continues to foster a culture of continuous improvement. Air-Way has always been in refinement mode, adopting processes to make it more efficient and effective, such as lean manufacturing including 5S workplace organization.

Its workforce is key to this, too. Hamm recognizes that the youth is the key to the company's future success as is employee collaboration. As he is known to say, "Not a one of us is as smart as all of us." **PM**

- | Air-Way Manufacturing • air-way.com
- | Buffoli North America • buffoli.us
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