Assembly in Action

Pailton Steers Clear of Universal Joint Assembly Problems

Every vehicle needs a good driver to steer it in the right direction and away from dangers on the road. For 50 years, Pailton Engineering Ltd. has been manufacturing the steering systems that give drivers of all types of vehicles this assurance as they travel from place to place.

One of the most important components of each steering system is the universal joint, or U-joint, that connects various parts. This joint consists of a pair of hinges that are close together, oriented at 90 degrees to each other and connected by a cross shaft. The U-joint is not a constant-velocity joint, but must be able to rotate at an angle to accommodate rotation, tilt and telescope functions within the steering system.

Bearings within the joint assembly enable smooth rotation over the lifespan of the steering system. This is particularly important when the vehicle has different drivers who regularly adjust the steering tilt and telescope for optimum comfort and safety.

Pailton has made universal joints since 1982. Last year, however, the company invested in a custom press from BalTec (UK) Ltd. to more accurately and consistently install bearings in each joint, as well as increase joint production.

BalTec was chosen for this project because of its decades-long expertise in joining technology machinery. The supplier makes a wide range of assembly presses, roller forming units, screwdriving systems and riveting machines.

Several manufacturers, in fact, use the benchtop BalTec EN20 orbital riveting and RN 181 radial riveting machines to install bearings in automotive drive systems. The EN20 has a working stroke of 5 to 40 millimeters and produces 5 to 20 kilonewtons of riveting force. By comparison, the RN 181's working stroke is 5 to 30 millimeters and it produces 1.8 to 6.6 kilonewtons of force.

The custom press accurately installs bearings in each universal joint.

BalTec equipment is also used by automotive manufacturers to insert bushings. Five years ago, the supplier provided an automated riveting system to assemble the linkages that raise and lower the roof of a popular convertible. The system consists of two indexing dials with BalTec radial forming machines and custom servo press systems (not supplied by BalTec). The presses automatically insert bushings into the stampings, which are then sent to the riveting systems for final assembly.

Pailton manufactures two series of single-steering U-joints, as well as double-steering U-joints and custom joints of special sizes, shapes and serrations.

Pailton Engineering Ltd. uses this press to accurately and consistently install bearings in universal joints for steering systems. ***Photo courtesy BalTec (UK) Ltd.***

Makers of snowplows and other road-maintenance vehicles use Pailton steering systems. ***Photo courtesy Pailton Engineering Ltd.***

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The 19-millimeter single joint has an operating angle of up to 50 degrees and comes with an optional regrease component. The 15-millimeter single joint has an operating angle of up to 35 degrees, and its end hole can be supplied plain or serrated.

Founded in 1969, Pailton manufactures all steering system components, including columns, bevel boxes, sliding shafts, suspension links, drag link assemblies and drop arms. The company's customers include OEMs in the hauling, construction, bus, military-vehicle and emergency service sectors. Makers of road-maintenance vehicles (road sweepers, sand and salt spreaders, refuse trucks, snowplows) also use Pailton steering systems.

For more information on presses and riveting machines, call 724-873-5757 or visit http://baltecorporation.com.

Automation Helps Clothing Distributor Reduce Injuries

Ralawise is a large-scale apparel distributor, holding over 16 million items of stock, made up of 114,000 products from 182 brands. From its warehousing center in Flintshire, U.K., the company processes an average of 3,000 cartons per day into its pick system for product replenishment. In a bid to minimize accidents and better the health and safety for its workers, Ralawise began investigating ways it could reduce the use of knives on its warehouse floor without reducing throughput.

The most common injuries were lacerations caused by the cutting tools used in warehouses to open cartons and remove packaging. These cartons are often secured with nylon branding and wrapped with multiple layers of stretch film. To process these cartons effectively, Ralawise employs a team of warehouse operatives to cut, unwrap and unpack these boxes quickly, before moving them onto the next part of the distribution process.

The IBOD One used by Ralawise can cut the tops off cartons at a rate of up to 450 cartons per hour. *Photo courtesy TM Robotics*

Ralawise began investigating ways to remove employees from harm's way, by searching for an automated system for box opening. TM Robotics, the European distributor of Toshiba Machine industrial robots, suggested the Intelligent Box Opening Device (IBOD), the only patented automated box opener on the market.

The IBOD is a case cutting and extraction machine. Using built-in intelligence, the machine can measure the size of every incoming case to find the programmed cut lines on each carton. Because the machine can automatically feed and align boxes using a conveyor, it does not require a human worker to tamper with boxes or blades.

"Improving health and safety was a key priority when searching for a box opening robot," explains Gary Clibery, facilities and projects manager at Ralawise. "However, having seen the machine in action when visiting an automated warehouse in the U.S., we soon

The IBOD has a blade wear monitor that tracks the life of the blades and automatically changes the blade cartridge within seconds when the blades reach the end of life threshold. *Photo courtesy TM Robotics*