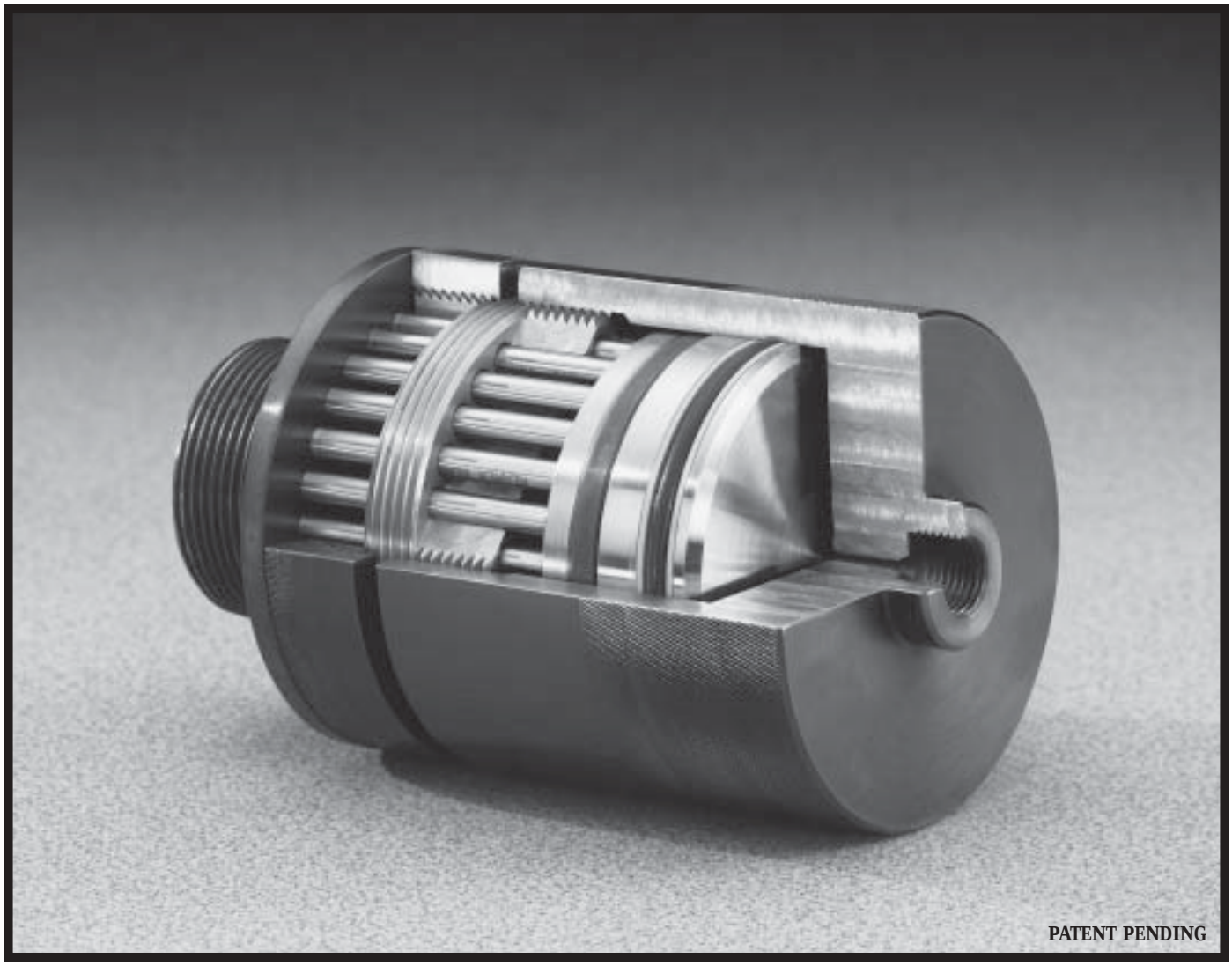
HRT TENSIONING SYSTEM



Recognizing the specific need for a tensioning system designed for high ambient temperature and minimum envelope, Riverhawk offers the HRT Tensioning System.

The Riverhawk HRT Tensioning System is an enhancement of Riverhawk's line of standard hydraulic nuts and tensioners which already offer the industry versatility, flexibility and modular design. The most pronounced attribute of the Riverhawk HRT system is that it is directly retrofitable to existing installation requirements. A trait that is accomplished in a minimum envelope.

No longer of concern are design-limiting considerations such as temperature limiting seals and lubricants, coatings, and coefficient of friction due to torquing.

The concept of the HRT Tensioning System was born of the need for a tensioning solution that could be readily retrofitted to existing studs and suitable for high temperature applications. Further, a method of tensioning was needed that did not require special features on the stud for gripping. Using the outside diameter of the nut as a gripping surface for tensioning satisfies this need.

High load capacity is achieved by virtue of placing the hydraulic cylinder above the stud and nut maximizing the hydraulic working area for a given cylinder outside diameter.

With the Riverhawk HRT Tensioning System, studs can be accurately tensioned to the required load. Any number can be linked together to simultaneously provide a smooth uniform load on the flange connection. Fast, easy installation is assured.

Key advantages of the HRT:

- High Load Capacity
- Easily Retrofitable
- Stud Extension Not Required
- High Temperature Capability
- Hydraulics Separate From Nut
- Fully Simultaneous Tensioning Capability
- Minimum Footprint Required

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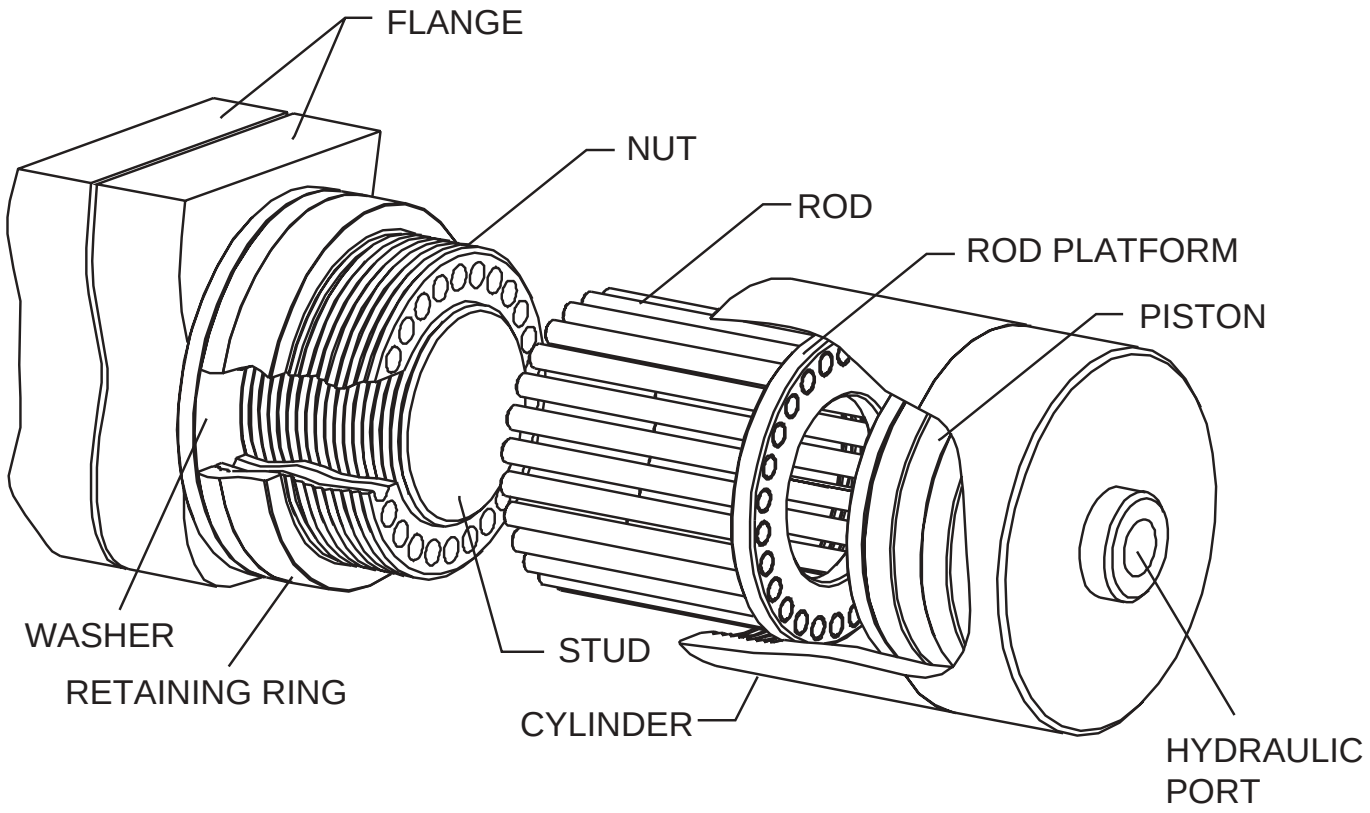
OPERATIONAL OVERVIEW

In operation, hydraulic pressure is introduced via a port in the cylinder. The reactive force thus generated is transmitted through the cylinder and, in turn, through the nut to pull on the stud. In this system, a circle of axial ports pass through the nut. Contained within these ports is a series of rods which transmit force from the bottom of the piston through a common washer to the flange face. When the stud is tensioned to a predetermined shank stress, a retaining ring threaded on the outside diameter of the nut, is spun down into contact with the flange. The retaining ring serves to maintain the separating force between the nut and the flange. The load cell portion of the system including the tensioner piston, tensioner cylinder and rods is removed after tensioning is complete. This eliminates temperature limitations that seal materials and oil would impose if they were to remain in the assembly during service as is the case in other hydraulic nut configurations.



Riverhawk Company, an engineering driven manufacturer, specializes in hydraulic mechanical technologies. We meet the daily challenges of the rotating equipment industry by offering auxiliary equipment such as air driven and manual hydraulic pressure kits and pusher piston cylinders for the installation of coupling hubs, thrust discs, and compressor wheels. Riverhawk also designs and manufactures hydraulically tensioned studs and nuts, tensioning tools, hydraulic nuts, and plug and ring gages. We also provide source inspections and training seminars. Our equipment is proudly supplied to the top OEMs and end users of the turbomachinery industry. Riverhawk is a member of the American Petroleum Institute (API) and sits on the coupling committee of the American Gear Manufacturers Association (AGMA).

For more information about Riverhawk's HRT Tensioning System or any of our other products and services call:

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