

Always “Go With The Flow” in Selecting The Proper Workholding

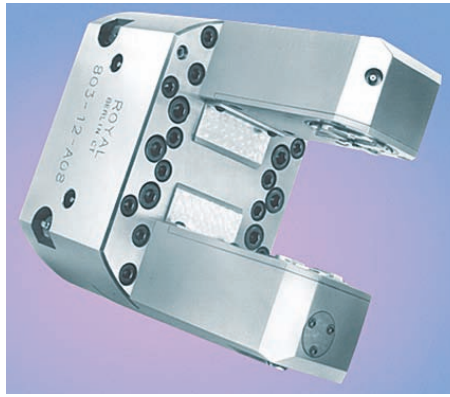
Flow control valves are used in a variety of industries including oil, gas, steam and water. Their size and shape variations are probably the most diverse of any manufactured product. Available sizes range from 1/8th of an inch up to ten (10) feet in diameter and can take on various shapes such as a Tee, Cross Tee, Elbow, Lateral or Wye or simply a straight diameter.

When selecting the correct workholding device for the machining of a flow control valve, this same diversity also holds true because there are various workholding methods used today.

Selecting the proper method can be determined based on many variables to the application such as the volume being produced, the change-over requirements, the size and configuration of the valve and the families of parts or just a single part.

Smaller Valve Bodies

Smaller valve bodies usually can fit in your hands and are basically manufactured using smaller chucks in the 6” to



Automatic index chuck.

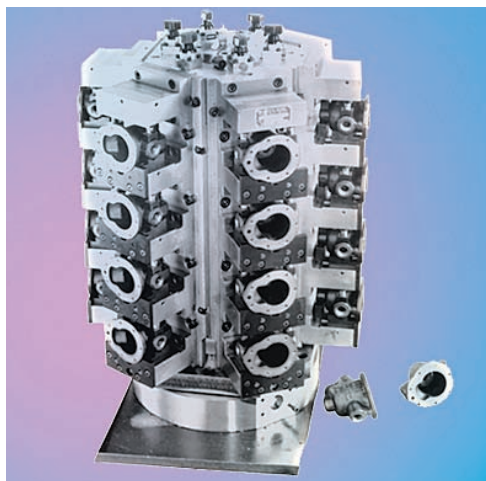
chine is running.

Lower volume valves in the small valve category are usually done, as mentioned earlier, on single jaw, anvil type, manual index chucks or 2-jaw or 2/3-jaw chucks. Change-over is not as critical, and a variety of parts can be machined on the same chuck by simply changing the top jaws. Unfortunately, the part being machined may require a number of operations since all machined areas are not accessible to be machined in these type of setups, other than an index chuck.

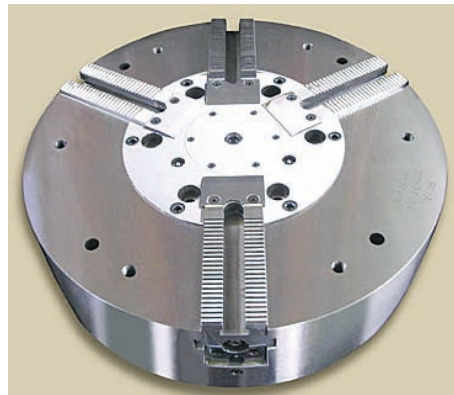
Another method is to grip the valves in a 2-jaw vertical vise situated on all four (4) sides of a tombstone which allows access to three sides of the valve for machining.

Larger Valve Bodies

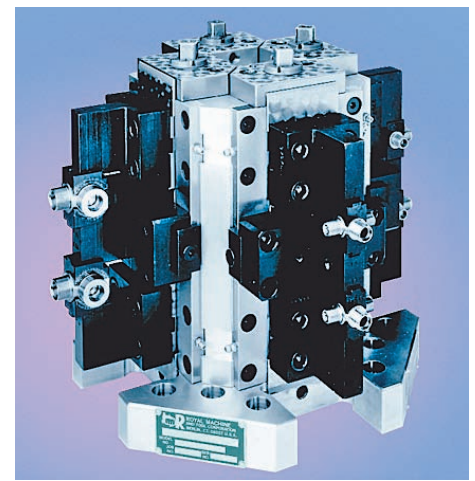
Large valve bodies usually are machined in a much smaller volume and are done mostly on machining centers. One of the biggest issues is in the handling which usually requires an overhead crane or some type of load assist device. In some cases index chucks are used on turning centers



Hexagonal hydraulic trunnion or tombstone.



Jaw chuck.



Quad vertical vise fixture.

24” size range such as 2-jaw, 2/3 jaw, single jaw, anvil type or automatic index chucks.

Higher volume small valve bodies are usually done on automatic index chucks, significantly reducing load/unload times, improving repeatability and reducing downtime. Also, the valves can be run on a machining center with a number of valves stacked on a trunnion or tombstone, thus freeing up the operator to load/unload parts while the ma-

chine is running. which reduces the handling between operations which could be timely and cumbersome. Because of the large mass the spindle RPM is sometimes limited as well.

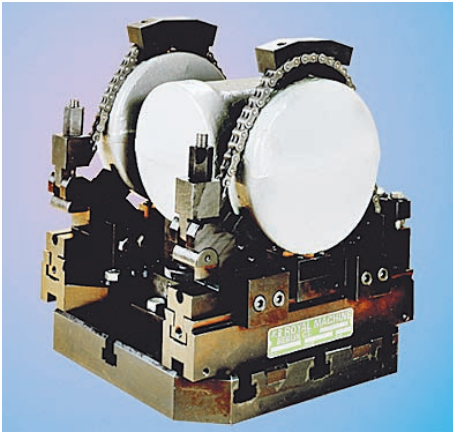
Other means of clamping on machining centers is chain fixtures which offer a great latitude in gripping diameters and easy access to all the machining areas in a single setup.

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As Seen in December 2012



MANUFACTURING NEWS



Modular chain fixture.

The chain provides a complete wrap-around gripping area. Other means include using a strap clamp arrangement in lieu of the chain. This may be sufficient in most cases, but doesn't provide the most gripping area that a chain would provide.

Another approach is to use a "C" frame fixture concept, where similar to the chain fixture, the part sits in a work nest.

Instead of a chain clamp there is a top clamp configured to the contour of the part. The "C" frame also allows complete access to all the machining areas.

Flow Control Valves can be found almost everywhere: in households, manufacturing facilities, oil rigs, treatment

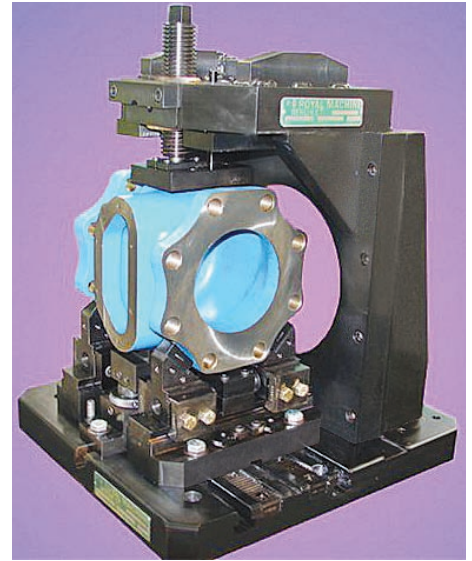
facilities, large buildings, shipping vessels and industrial equipment, to name a few. They come in a variety of shapes and sizes made of castings, forgings, investment casting and even plastics. The workholding described above only scratches the surface of the methods to hold these parts for machining.

Founded in 1952, Royal Machine & Tool Corporation serves some of the world's leading industries from its Berlin, CT, corporate offices and manufacturing facility with over 30,000 square feet

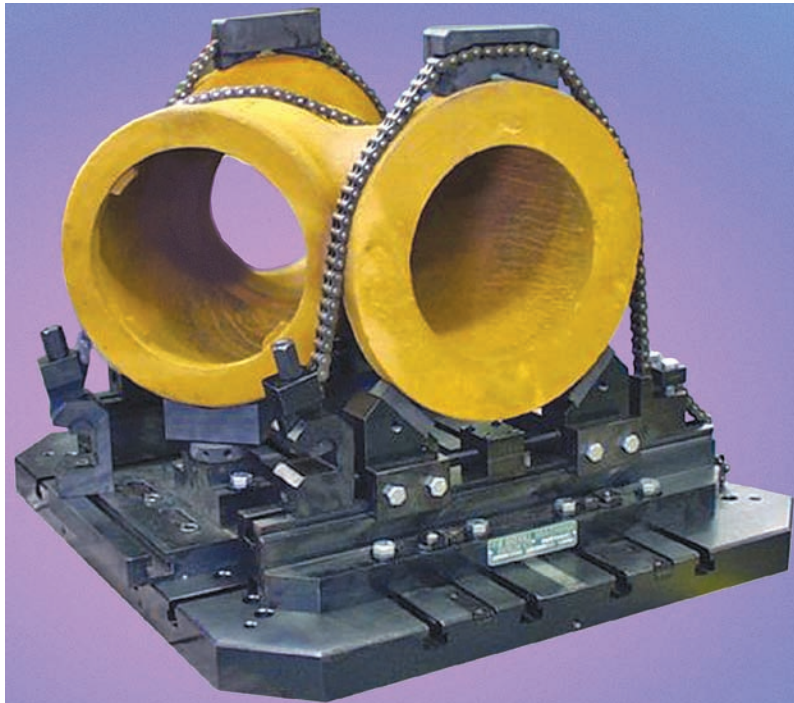
including state-of-the-art CNC machine tools. All services and products are performed / produced in the U.S. and include the designing and building of custom and standard workholding devices from simple manual fixtures to sophisticated hydraulic fixtures with multiple faces. Custom and standard chucks of all types for rotating and non-rotating applications are also designed and built by Royal Machine & Tool, as well as a complete range of contract machining options / services from single prototype machining to high volume production requirements.

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"C" frame fixture.



Large 3-flange valve body gripped on a special chain fixture over each flange area being modified.