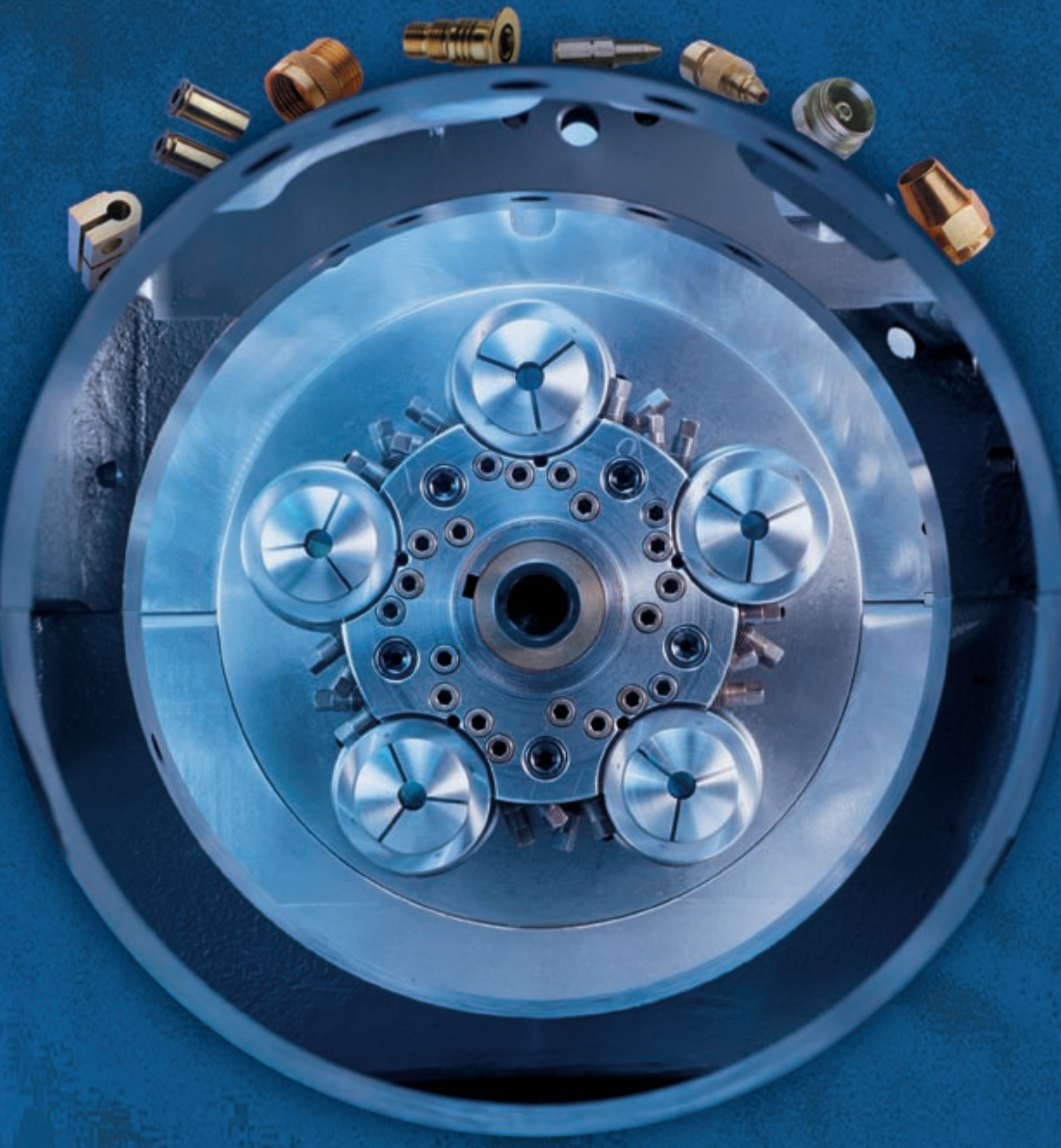
DAVENPORT
MACHINE, INC. A Brinkman International Group, Inc. Company

A Profile of Productivity



DAVENPORT
MACHINE, INC.

Servo B • Model B • Chucker

Contents

Welcome to the Davenport World of Five Spindle Automatic Bar Machines and Chuckers.

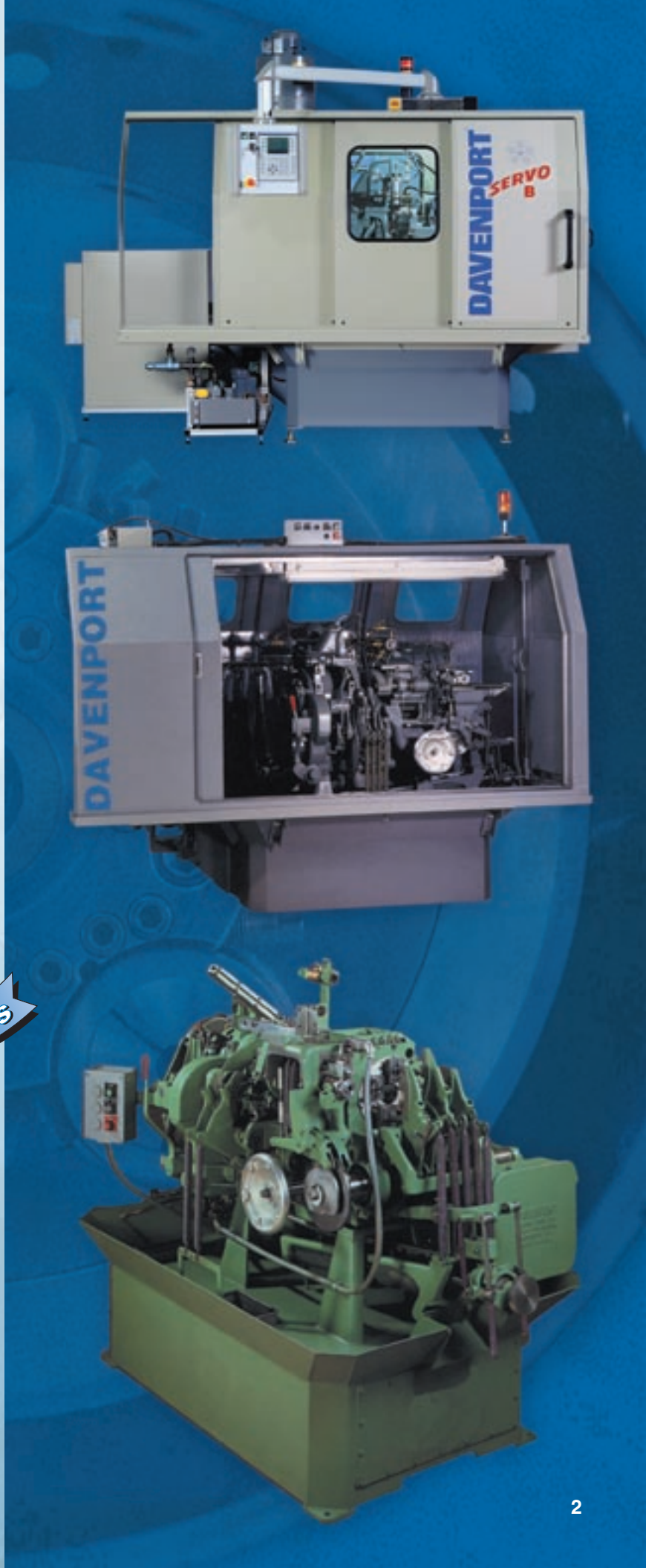
Davenport machines are the answer to cost-effective high-volume production of close tolerance parts.

For the past 100 years Davenport has created a legacy of innovation and leadership in screw machine technology. Today, we are still known world-wide for our 5-spindle Model B and Servo B screw machines. These machines are by far the fastest, most versatile multi-spindle bar machines on the market.

This brochure will provide you with an overview of the many industries that have discovered the value of owning a Model B or Servo B multi-spindle machine as well as display sample parts from each industry which illustrate the versatility and flexibility of a Davenport.

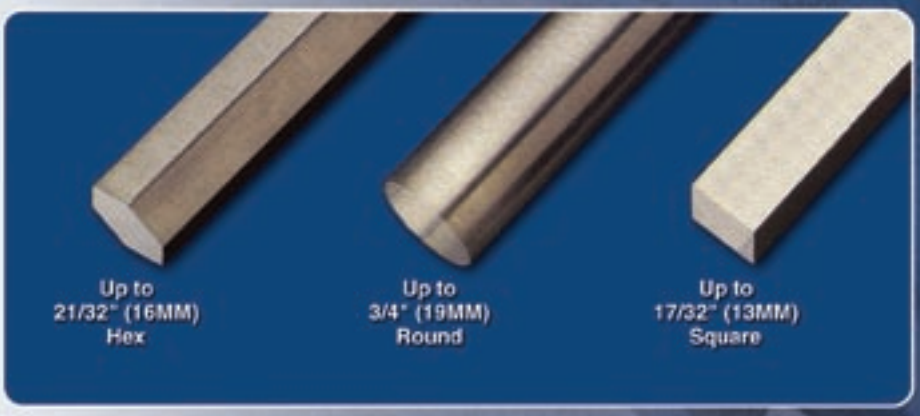
Davenport is the fastest, most versatile and economical multiple spindle automatic bar machine ever made, unmatched worldwide in the machine tool industry.

Throughout the world, Davenport Machine is represented by outstanding machine tool distributors ready to assist you in small parts production. No matter how simple or complex your machining application is, our Sales, Technical Services and Engineering staff in Rochester are ready to help.



DAVENPORT Specifications and Capacities

Standard Bar Stock Capacity



Dimensions – Standard Machine with Sound Enclosure
219.5" long x 48.125" wide x 85.5" high

Crated in 3 Parcels

Machine – 5300 lbs.
110" long x 56" wide x 92" high

Stock Carrier – 225 lbs.
124" long x 11.5" wide x 11.5" high

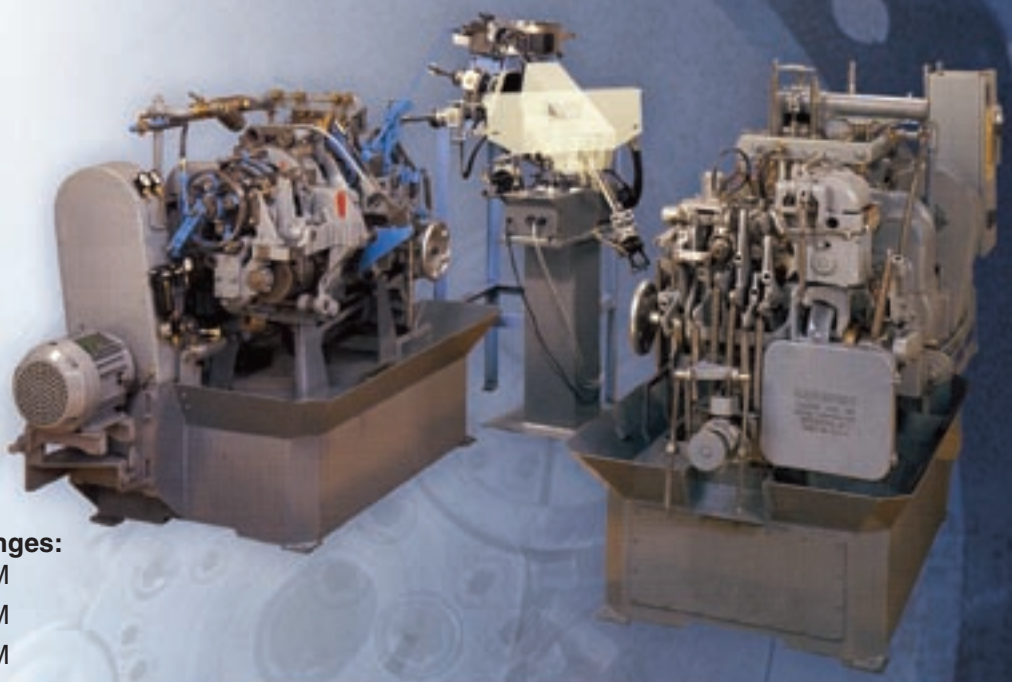
Stock Carrier Cover – 250 lbs.
102" long x 19" wide x 21" high

Optional Bar Stock Capacity*
Up to 1" (25mm) Round
27/32" (22mm) Hex
11/16" (17mm) Square

Motor Drive – 10HP, 1800 RPM

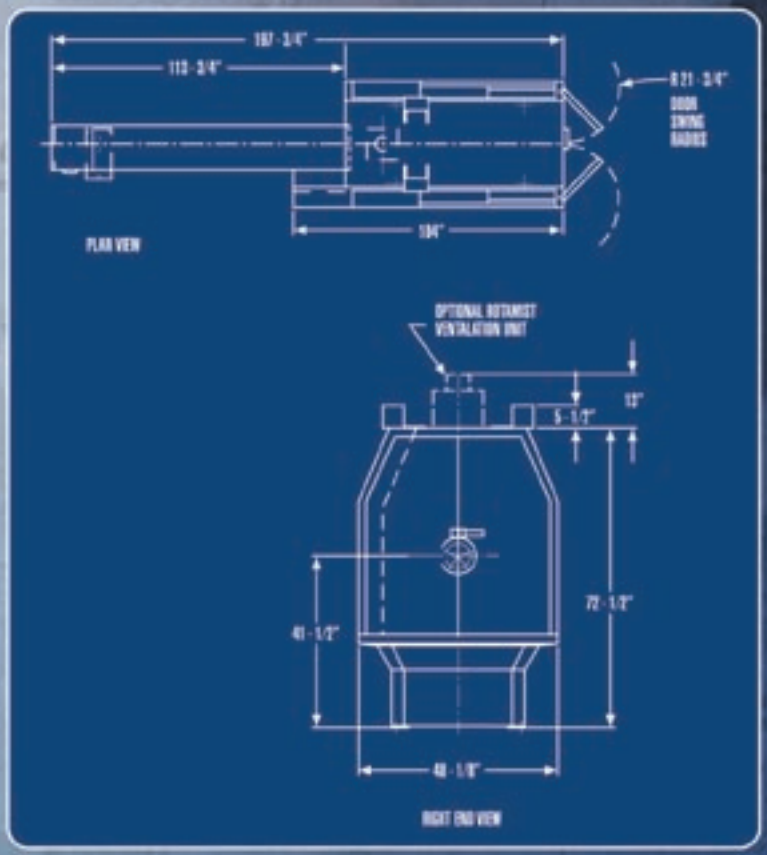
Number of Spindle Speeds – 27, Ranges:

75 cycle	500 RPM to 4500 RPM
60 cycle	400 RPM to 3600 RPM
45 cycle	311 RPM to 2799 RPM



Number of Feed Rates – 61, Ranges:

75 cycle	0.8 to 18.4 Seconds/Piece (includes 0.4 seconds index)
60 cycle	1.0 to 22.69 Seconds/Piece (includes 0.5 seconds index)
45 cycle	1.3 to 29.6 Seconds/Piece (includes 0.666 seconds index)



Number of Tooling Stations:
5 End Working
4 Cross Working
Additional Stations Optional*

Longest Length of Feed = 3"
4 1/2" Length of Feed Optional*

*Priced Upon Application

Electrical

The electronics and electrical industries universally employ the Davenport for the production of a multitude of components. These parts are used in a wide variety of products, many of which are found in common household appliances.

One application of parts produced is seen in the spacers (#7) that are installed between major sections in the assembly of household and commercial lamps. The decorative knob (#12) holds the lampshade securely to the bulb harp.

Tuning shafts and toggle switch handles are machined most cost effectively on a Davenport as well as a wide variety of electrical connectors.

A large assortment of more intricate and high-tech electrical parts can be produced using standard attachments. The wire lug (#28), an essential piece of a panel box assembly is easily made when used in conjunction with the cross drill and cross tapping attachments. The electrical cap (#39), a fuse container found in telephones to prevent electrical shock, is finished in one operation with the help of the transfer attachment, the trepan and slotting attachments.

Label # Cycle Time

Medical

The medical and dental industries are a perfect fit for small parts production on a Davenport. The tool die pin (#47), used by dentists, stabilizes false teeth in dentures.

Two critical parts of the hypodermic needle, the male and female luer lock (#48, #49, #50) and hub (#41, #43, #44), are produced by some of the the world's largest pharmaceutical equipment manufacturers.

These specialized parts are made with the high-speed drilling attachment with a cycle time of less than two seconds per piece.

Fittings

Davenport is the number one selection of manufacturers for producing oil, pneumatic, hydraulic, and grease fittings. The hose fitting (#60) was made on the Davenport using the revinloc and rotary slotting attachments.

Most fittings shown are connected to plastic tubing in such everyday items as the snowmobile and the power lawn mower.

The majority of the oil fittings on a Davenport machine are made by the machine itself. Two such parts are the straight oiler (#63) and the offset nipple (#56).

Fasteners

No other machine has produced more in the fastener industry than the Davenport. It is the prominent factor in major fastener houses around the world. Set screws, cap screws, square head screws, hex head bolts, self locking nuts, and quarter release fasteners are manufactured on Davenports at unprecedented rates.

The diverse array of the fasteners shown are the shaft connector (#74), used in the operation of outboard motors; the fishing pole nut (#77), used to connect the fishing reel to the fishing pole; and the Dzus fastener (#91), a key element in removable panels.

Versatile attachments allow threading or tapping in any position. The rotary slotting attachment is used to cut a single slot, and when teamed with the revinloc attachment, it can saw multiple slots as seen in the hex flexloc nut (#83). The revinloc attachment, when used with a broaching spindle, produces the hollow hex in cap and set screws.

Plumbing

Plumbing industry parts of all configurations are efficiently and economically machined on the Davenport.

Among the brass plumbing parts shown are the hose nozzle spray control (#109) for garden hoses, and a water temperature regulator component (#112).

A wide selection of basic faucet stems found in household faucets are also represented. The water regulator spout (#105) is an essential part of office water fountains. The ball valve (#100) is another critical part in the plumbing industry, produced on the Davenport by utilizing the thread roll attachment to burnish the ball contour.

Label # Cycle Time

Controls

Temperature controls, lock controls, and air control valves are a few of the broad spectrum of machined parts made faster and more effectively on the Davenport.

The part samples on this page include a fast setting gear (#130) for use in time clocks, a temperature control component (#118) for kitchen ovens, and the outer wheel of combination locks (#119).

The valve body (#129), a significant element in the field of refrigeration control, is produced on the Davenport with the cross drilling and spindle locating attachments.

Hardware

Parts machined on the Davenport for the hardware industry are readily seen just by strolling through your local hardware store.

Adjusting nuts for easels and lecterns (#137), interchangeable screwdriver bits (#138), and drawer pulls (#135) for household furniture are all Davenport made.

A wide assortment of tool bits and screw inserts are shown. On the right is an adjusting worm (#141) for wrenches, made on the Davenport with the peripheral mill attachment. This attachment locates and mills the worm ends.

Ordnance

Davenport is a proven machine in the ordnance industry. It is used to machine bullet cores, striker and firing pins, and arsenal caps for our nation's security.

The time relay body to the left is fabricated on the Davenport with the use of a special attachment designed specifically for this application.

Automotive

Approximately one third of all screw machine parts produced in the United States are used in the assembly of automobiles or other segments of the automotive industry.

Here we show flow valves (#182) for shock absorbers, needle valves (#165) for carburetors, and tire valve inserts (#171). Other Davenport-made automotive parts include bleeder screws, hydraulic fluid regulators used on brakes, and pump shafts for windshield wipers.

A wide range of components for diesel engines and spark plugs can also be produced on the Davenport.

The complicated choke shaft (#170) is made easily with the use of the slotter and traveling cross drill and cross tap attachments. It is parted with the sawing off attachment.

The air hose valve component (#183) is produced with the assistance of the straddle milling attachment. This part is also swaged using a Davenport thread roll attachment.

Chuckers

Significantly progressive in its adaptability to specific jobs, the Chucker version of the Davenport machine is used for secondary operations.

The minimum four-tenths of a second idle time gives the Chucker a definite edge in production, made possible without forfeiting the unparalleled five-spindle versatility.

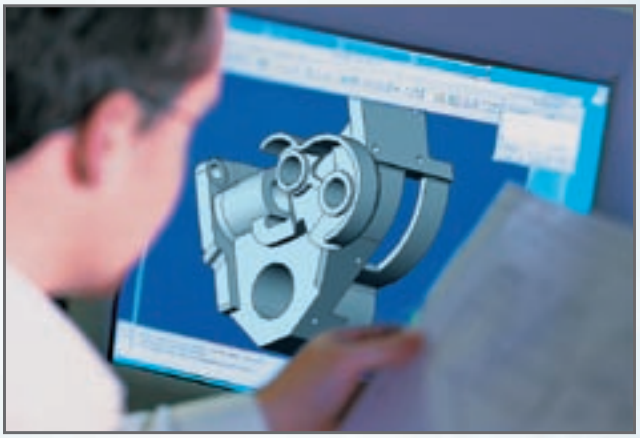
All tooling and attachments available for the Davenport Bar Machine can also be used on the Chucker. The operation of the Chucker is adaptable to an automatic loading arrangement.

The parts shown are examples of chucker work, in blank and finished configurations. Various types of stems, valves, shafts and races are just a few of the myriad of parts of all sizes which can be produced more efficiently on the Chucker.

Parts in figure #191 are an example of the Chucker performing an automated assembly operation. Both parts of this valve assembly were completed on the Davenport prior to the chucker operation.

The pairs of parts shown are examples of chucker work, in blank and finished configurations.

Engineering & Technical Services



Drawing on an extensive knowledge base and legacy archives of engineering solutions, Davenport can help customers increase productivity without the need to increase staff and expense overhead.

We maintain a blueprint and data archive of over fifty years of attachment and part designs. With such an extensive wealth of solutions on hand, we can save customers the time and expense of "re-inventing the wheel" by creating and implementing designs for which solutions already exist.

The expertise of Davenport engineers can dramatically reduce the time and cost investment needed for new designs. Davenport Engineering and Technical Services provide customers a top quality, and cost effective competitive edge in today's global economy.

The Davenport Technical Services Group will provide:

- **Time estimates, at no cost to customers**
- **Parts design**
- **Part layouts**
- **Cam design**
- **Tooling designs**
- **Turnkey retooling services**
- **Process engineering consulting**
- **Training**

The Technical Services Group is an optimum solution for our customers' business-development requirements. Using the years of experience available to us, we can cost effectively assist in the technical support required for any part capable of being produced on a Davenport.

As manufacturers experience new growth, we can ally with them in the transition periods between landing new business and bringing on additional, full-time engineering staff.

Training Programs

Factory training on Davenport equipment is available both at the factory or on-site at our customer's facility. We also offer a library of training videos.

A wide range of subjects are included in our training programs including:

- **Setup**
- **Operation**
- **Repair**
- **Attachment Installation**
- **Engineering**
- **Layout**

Rebuild and

Considering a remanufacture? Let Davenport do the job!

- Factory OEM parts that have been manufactured to the highest quality standards.
- Machines are inspected and assembled by trained and experienced factory technicians.
- Optional Davenport-designed attachments for application-specific needs.
- Noise enclosures and safety door interlocks available to conform to OSHA requirements.
- Optional Precision Revolving Head and Spindles available only from factory.
- Upgrade to Servo B Machine available.

Attachments

Davenport Machine, Inc. has hundreds of attachments, which allow parts to be made complete in most cases, and eliminate expensive secondary operations. This unique versatility has kept Davenport Machine, Inc. in the forefront of screw machine technology for many years.

MMI Control

The Servo B operates with a simple PLC based control and multiple servo drive systems that eliminate over 150 parts from the original, mechanical Model B machine. The results are reduced set-up times and higher production rates.

- Up to 4 axis control
- Stores 10 job summaries
- Easy to learn
- Optional web card

Revolving Heads

If the bed casting that aligns the revolving head on your Davenport becomes worn and you choose to re-bore, as opposed to banding and boring, Davenport can offer you an Oversize Revolving Head.

After you re-bore your machine, it should clean up in the .010" to .030" range. You can then call and order the appropriate head dimension. With oversize head blanks in stock, we can manufacture a head to your specifications up to .035" over the original dimension.

Davenport Machine has revamped the inspection department for all of their OEM parts including the revolving heads. A new Brown & Sharpe CNC Coordinate Measuring Machine has been upgraded to insure repeatability of all OEM parts.

A Certificate of Compliance with head serial number is available with all revolving heads purchased - OEM Standard or OEM Oversized.

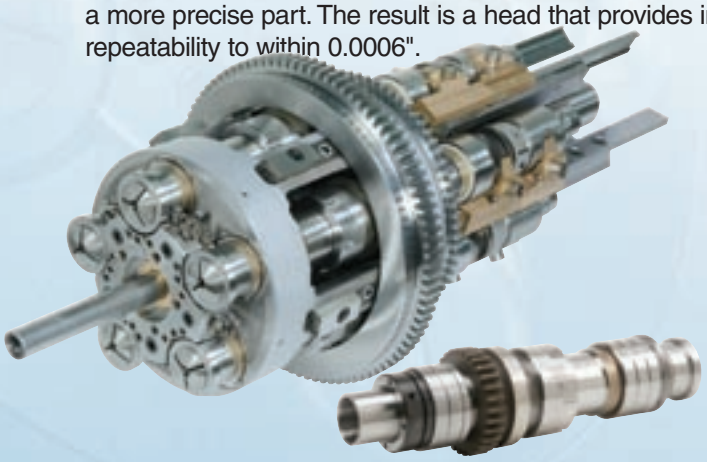
High Precision (HP) Head

By redesigning and improving the manufacturing process for the revolving head and the five integral spindles, Davenport introduces the new High Precision (HP) Head which provides:

- Increased spindle rigidity
- Improved part diameter accuracy
- Improved surface finishes
- Improved part roundness
- Less part taper and deflection
- 2 to 3 times spindle life
- Improved spindle index repeatability
- Improved spindle run-out

The new design stiffened the machine revolving spindles by replacing bronze or needle bearings with ABEC 9 angular contact radial bearings. The improvement delivers spindle run-out consistently less than 0.0005".

The revolving head has remained consistent in design, but the manufacturing process has been upgraded to produce a more precise part. The result is a head that provides index repeatability to within 0.0006".



Free turn tests* on the new HP Head produced part diameters within a total range of 0.0009" to 0.0014" depending on tooling, and speeds and feeds. This means that the new HP Head is delivering test results that are 3 to 4 times better than a good Davenport Screw Machine in the field today.

Not only does this mean better performance, less maintenance and longer component life, but it also means a shop owner can now quote on jobs where in the past specified tolerances forced them to pass up using their old Davenports.

With the new HP Head option, customers can improve their part quality while still maintaining the speed of their Davenport. The improved accuracy of the HP Head opens the door for many single-spindle shops to look to Davenport Machine for their longer production runs.

*A single point turning tool held by a stationary tool spindle cutting a diameter on the bar stock without any form of support.

Davenport Servo B

5 Spindle Automatic Screw Machine

Lower Cost, Higher Production, Fewer Parts, Faster Pay back!

The Davenport Servo B machine is the machine of choice for hundreds of customers worldwide who require increased productivity in small parts manufacturing. Davenport Servo B owner's can now meet digital-age, global production level demands with the speed, accuracy and flexibility of their Servo B machines.

The Servo B is the ideal machine for long or short runs of small parts. A simple, PLC-based man-machine interface(MMI) means reduced set-up times and adjustments and allows for operators to concentrate more on producing parts rather than fine-tuning adjustments.

Machine Features:

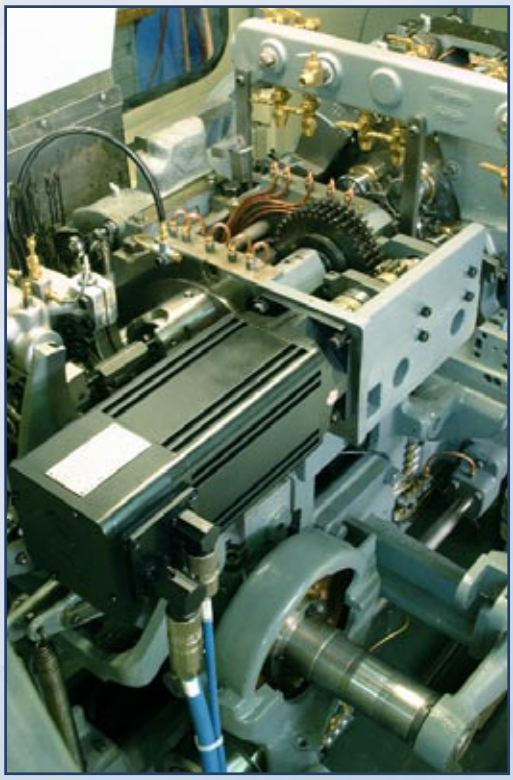
- Faster return on investment due to low machine cost
- 50% first year write-off with new tax law
- Fastest cycle times with 0.3 seconds index and programmable index points
- More up-time, less maintenance parts
- Easy set-up with full enclosure front and back sliding doors
- Spindle speeds and feeds infinitely variable from 0-3800 RPM
- Servo Threading attachment standard
- Simple PLC motion control has up to 4 axes of control and allows 10 job summaries to be stored
- Operator training reduced to a matter of days
- Optional web server card provides remote machine monitoring
- Optional Servo Burring and 2-Position Back Working attachments eliminate many secondary operations

The Servo Threading Attachment

Davenport Machine has developed a new Servo Threading Attachment that will retrofit to existing Model B multi-spindle automatic screw machines. The new attachment eliminates clutches and the gears associated with mechanical threading attachments.

It also provides users with unlimited programmable spindle speeds within the range of 0-6000 RPM.

The new attachment eliminates gear changes and clutch adjustments that create maintenance downtime thus increasing machine operating efficiency. Also, the ability to provide infinitely variable spindle speeds creates a better quality thread and lengthens tool life. The correct spindle speed is now programmable rather than being dependent on specific gear ratios that may not include the optimum speed for the application.



The new Servo Threading Attachments are standard equipment on Davenport Servo B machines.

The Servo Pickoff and 2-Station Back Working Attachments

The Servo Pickoff and 2-Station Back Working Attachments, now available as optional equipment on the Davenport Servo B, add more flexibility to the machine. The combination of these attachments will allow users to incorporate multiple machining operations after a part is cut off, including drilling, tapping, countersinks, or other operations that normally require a secondary operation on another machine.

The RPM of the servo motor controlled pickoff spindle can be electronically matched to the RPM of the work spindle to facilitate part transfer. After part pickoff, the spindle can be adjusted in both speed and direction to fit the desired machining parameters.

After the part is picked off from the work spindles, the back working slide with required cutting tools is moved into position, and the part is fed into the tools to complete the machining operation(s). The pickoff spindle is controlled by an independent servo motor that can be programmed for speeds and feeds from the Servo B PLC control.

A typical operation sequence example:

1) The pickoff advances at same revolutions and part is cut off.
2) The spindle then reverses, speeds up and drills at proper SF/M using right hand drill.
3) The spindle then slows down, taps using a right hand tap, reverses to back out tap and stops to gently eject part.
4) Spindle reverses again to pick up next part.

To see if these attachments are perfect for your application, Davenport will provide a feasibility and time study of your parts at no charge. Go to **www.davenportmachine.com** for more information.

A Profile of Productivity

- *New machines*
- *Remanufactured machines to latest OEM specs*
- *Genuine OEM repair parts, attachments, tool-holders*
- *Technical support*
  - *service/maintenance*
  - *training*
- *Custom engineering services*
  - *applications*
  - *cams/collets*
  - *accessory design*

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AMT The Association For Manufacturing Technology
100 Years of Building Global Productivity

MEMBER

When You Buy From Davenport, You Get The Whole Company, Not Just a Part.