

HARDINGE CONQUEST H51



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 **HARDINGE**

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FEATURES

- 20C collet / chuck ready main spindle
- .000010" (.1 μ m) resolution control
- Through tool coolant
- Sub headwall coolant
- Bar feed Interface*
- Three position stack light
- Chip conveyor interface
- Ethernet ready
- USB & PCMCIA memory card
- Rigid tapping
- Mist collector ready
- RS232 C ready
- Auxiliary control (MPG, cycle start & stop, collet open & close)
- Auto power down
- Ready 2 cut
- Two internal LED work lights

SUPER-PRECISION®

- SP certification
- X-Axis Scale

INCLUDED WITH SUB SPINDLE

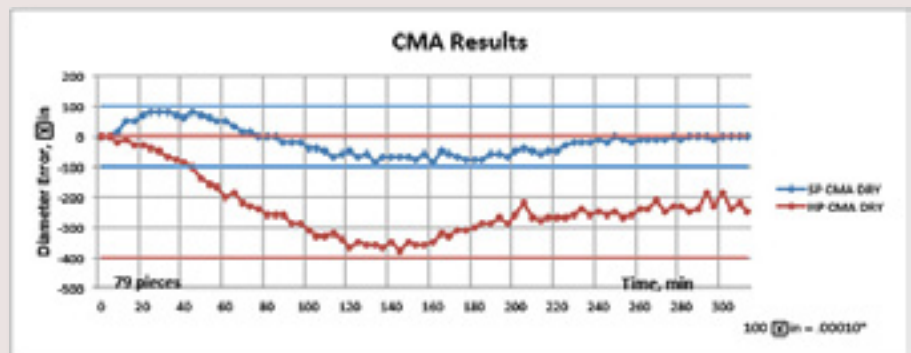
- I6C collet / chuck ready sub spindle
- Pneumatic collet closer
- Rigid tapping

* Not all barfeed interfaces are the same. Discuss your requirement with your sales representative.

The CONQUEST H51 features a 20hp, 5000rpm A2-6" main spindle with a 2" bar capacity. It offers a generous maximum turning diameter of 12.3" and a maximum turning length of 25.5". The 12 station turret offers 1/2 station index for up to 24 tools. The machine offers a wide variety of standard features such as through-tool coolant, bar feed and chip conveyor interfaces, three position stack light, PCMCIA memory card, USB Capability, rigid tapping and many others including state-of-the-art machine crash protection.

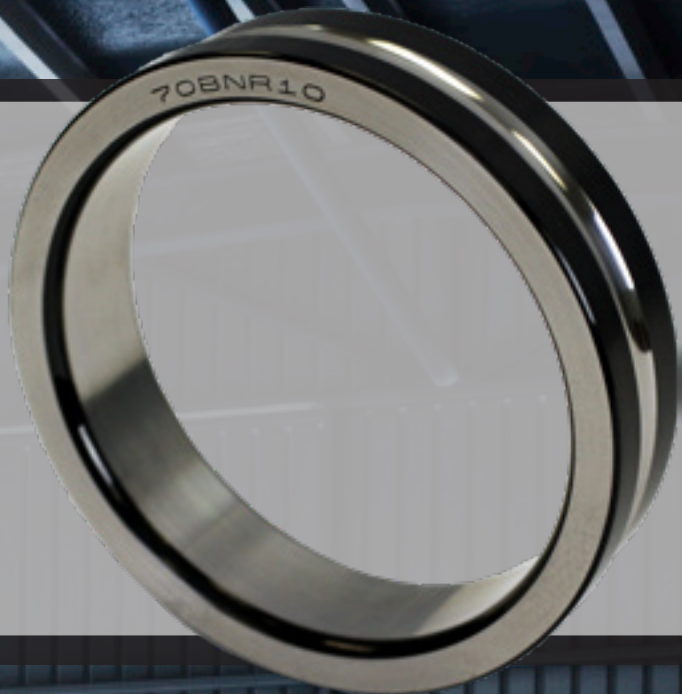


COMPARISON



CONTINUOUS MACHINING ACCURACY CUTTING CONDITIONS

- CMA Results: 0.0002"
- Spindle Speed: 1200 RPM
- Feedrate: .005 IPR
- Coolant: Dry
- Cycle Time: 4 min.
- Cutting Depth: .005"
- Material: Brass
- Temperature Controlled Environment



BEARING RACE

MATERIAL _____ 52100 STEEL 60-62RC

TOTAL DIAMETRICAL
TOLERANCES ON OD & ID _____ .0002" (5 MICRON)

TRUE PROFILE OR SPHERICITY
OF RACE RADIUS _____ .0001" (3 MICRON)

PART ROUNDNESS _____ .000060" (1.5 MICRON)

SURFACE FINISH _____ 8RA OR BETTER



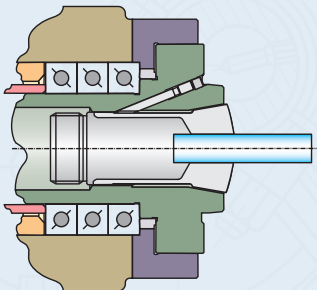
KEY FEATURES

CONQUEST H51

COLLET-READY SPINDLE ADVANTAGES

- Collet seats directly in the Hardinge spindle
- Maximum rigidity and gripping power is transferred to the part
- Maximum utilization of RPM
- Minimum weight on spindle
- Minimum overhang from the spindle bearings that assures spindle accuracy is transferred directly to the workpiece
- Optimum T.I.R.
- Gripping force directly over the workpiece
- Superior tolerances and finishes
- Capable of using maximum machine stroke capacity
- Longer tool life
- Quick changeover

COLLET READY SPINDLE

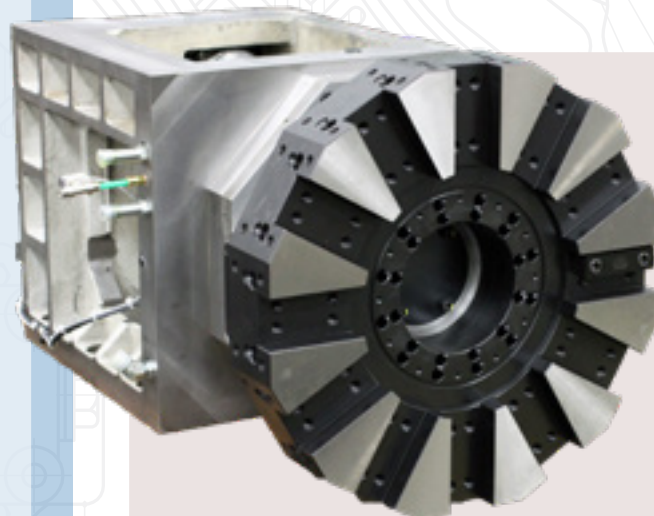


INDEPENDENT Y-AXIS

Y-axis capability is a huge productivity enhancement on a turn/mill machine tool. To get Y-axis motion, an extra set of ways is used to move the live tool across the face of the spindle. By adding a third linear axis to the turning-center turret it enables rotary cutters to machine across the spindle center line thus greatly expanding the milling capabilities of the machine.

BMT 55 TOOLING

- Hardinge BMT design
- Tooling size BMT55
- 12 station
($\frac{1}{2}$ station index for total of 24)
- Belted live tooling drive
 - Better surface finishes during milling
 - No backlash or bevel gear noise
- Index time rotation 0.40 sec
- Index time clamp-unclamp 1.45 sec
- Repeatability .000060" (1.52 micron)
- Square shank 1.0" - 25mm
- Round shank 1.5" - 38mm
- Max Speed - 8,000 RPM
- Power 7.5hp (5.5 kW) – 30min. rating
- Torque 24.3 ft-lb (34 Nm) – 30min. rating



HARDINGE T-STYLE TOP PLATE (STATIC)

- Optional T-style top plate
- Utilizes T-series tool holders
- 12-station static only
- Sq. Shank 1" (25mm)
- Round Shank 1.5" (38mm)

CONQUEST H51 MACHINE CONSTRUCTION

COLLET-READY MAIN SPINDLE

The Hardinge collet-ready spindle is the most versatile machine spindle in the industry – it is uniquely designed to accept both collets and jaw chucks without the use of an adaptor. Because the collet seats directly in the spindle, the workpiece is held close to the spindle bearings which provides the ultimate in accuracy, rigidity and gripping force. It also allows for maximum spindle RPMs which increases productivity. This exclusive design also offers numerous workholding capabilities including solid collets, master collets, dead length collets, step chucks, 3-jaw chucks and FlexC collets systems.

ROBUST 45° BASE STRUCTURE

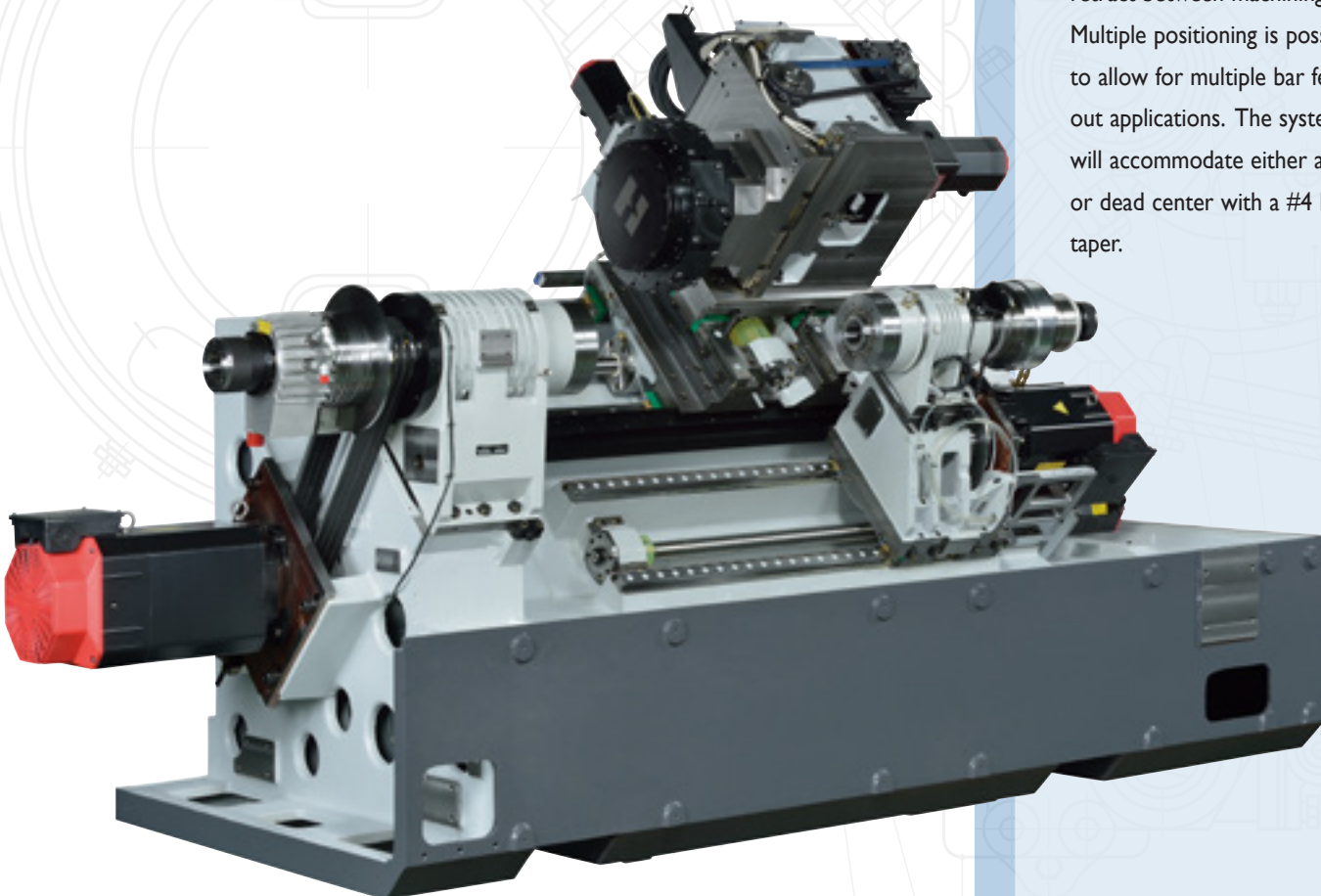
The one-piece 45 degree slant bed design greatly inhibits thermal deformation and twisting, allowing for SUPER-PRECISION® cutting performance and demanding part accuracies.

SUB SPINDLE

The belt driven sub spindle features a 10HP (7.5kW) motor with a speed range of up to 6,000RPM. The A2-5/16C Collet-ready spindle allows for the use of a complete assortment of spindle tooling including collets and jaw chucks. It also includes a pneumatic collet-closer and rigid tapping is standard.

TAILSTOCK

The servo driven tailstock features a non quill style body and is fully programmable with torque control to set the tailstock force, as well as advance or retract between machining cycles. Multiple positioning is possible to allow for multiple bar feed out applications. The system will accommodate either a live or dead center with a #4 Morse taper.



MACHINE OPTIONS

- 16 station BMT45 turret
- Parts catcher w/conveyor
- Renishaw Part probe, optical
- Tool probe (manual plug-in)
- Auto door w/light curtain
- Z-axis scale I
- Y-axis scale I
- Spindle liner kit
- Thru spindle coolant, main
- Thru spindle coolant, sub
- Air blast, main
- Air blast, sub
- Headwall coolant
- Bar feeds
- Coolant chiller2
- Part present detect, sub
- Foot switch, main
- Foot switch, sub
- Foot switch, tailstock
- 230psi coolant
- Chip conveyor rear (hinged-belt)
- Chip conveyor side (hinged-belt)
- Micro hinge chip conveyor (side)
- for fine chips
- Micro hinge chip conveyor (rear)
- for fine chips

HYDRAULICALLY-OPERATED STEADY REST

The Forkardt SRFNI Compact Steady Rest and is the ideal tool to support long workpieces without distorting or deflecting the part. It features a highly stiff structure, compact design and a fully sealed body for better protection from coolant and chips. The gripping range is 0.24" – 2.76" (6mm–70mm) and the unit provides 5 micron repeatability.

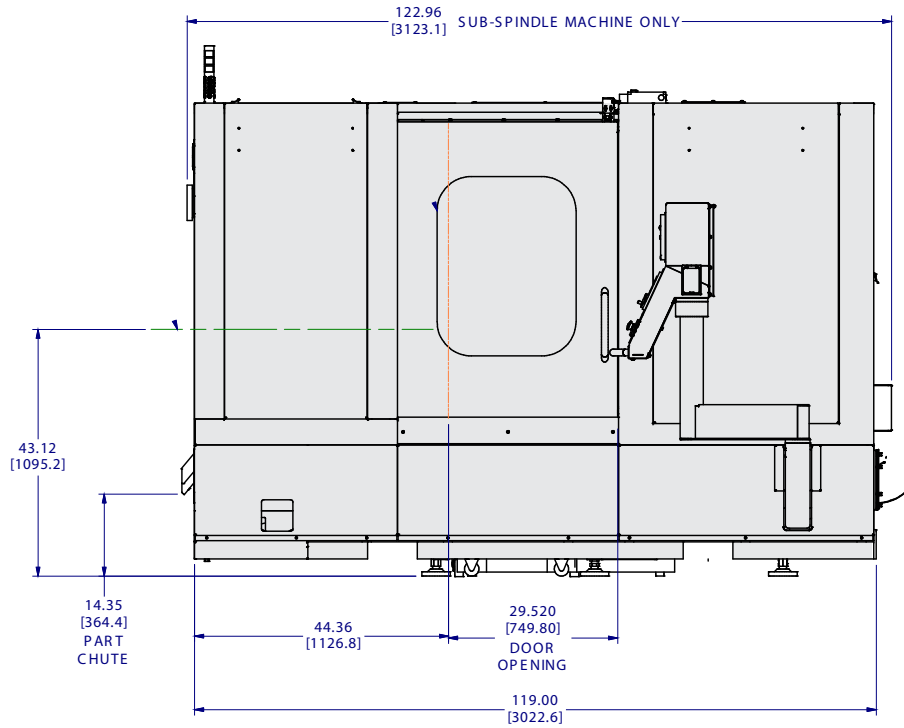


Additional features include:

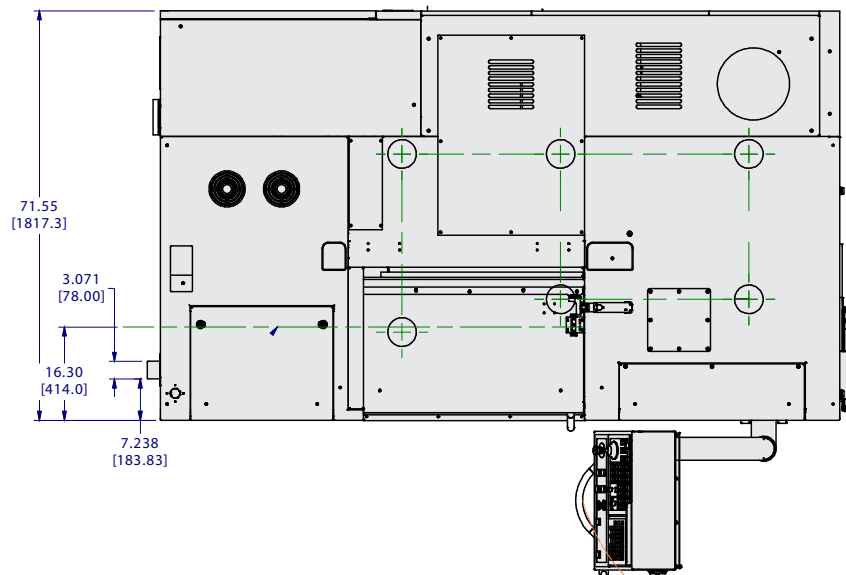
- Hydraulic ports on top and side of cylinder
- Inbuilt safety valve
- Feed-back for maximum opening
- Port for compressed air
- Provision for centralized lubrication suitable for grease or oil
- Front body profile for easy chip flow
- Steady rest unit moves on a dovetail, gripper is programmable



CONQUEST H51 FLOOR PLAN



FRONT VIEW



TOP VIEW

SPECIFICATIONS

CONQUEST H51

SWING DIAMETER	
Max. Swing Over Way Covers	27.87" (708mm)
WORK CAPACITIES	
Chuck Size	8" (200mm)
Maximum Bar Capacity	2.00" (51mm)
Maximum Machining Diameter (BMT55)	12.342" (313mm)
Maximum Machining Diameter (BMT45)	10.600" (269.2mm)
Maximum Machining Diameter (T Style)	15.040" (382mm)
Max. Machining Length w/ Tailstock (BMT55)	25.533" (648.5mm)
Max. Machining Length w/ Tailstock (BMT45)	25.759" (654.2mm)
Max. Machining Length w/ Tailstock Hardinge T style	27.318" (693.9mm)
Max. Machining Length w/Chuck (BMT55)	19.733" (501.2mm)
Max. Machining Length w/Chuck (BMT45)	19.959" (507mm)
Max. Machining Length w/Chuck Hardinge T-Style	21.518" (546.5mm)
SPINDLE	
Max. Speed	5,000-rpm (SP); 4,700-rpm (HP)
Max. Power Rating (30 mins)	20-hp (15 kW)
Max. Torque (30 min)	168 ft-lb (228 Nm)
Spindle Nose	A2-6 / 20 C
Chuck Size	8" (200mm)
Spindle Center Height	42.96" (1091mm)
Spindle Reach	16.3" (414mm)
Spindle Bore	2.378" (60.4mm)
Spindle Orient	1.0 degree
Max. Distance from Sub to Main Spindle Face	28.9" (734mm)
Min. Distance from Sub to Main Spindle Face	0.625" (15.8mm)
TRAVELS AND FEEDRATES	
Max. X-Axis Travel	7.75" (196mm)
Max. Z-Axis Travel	28.15" (715mm)
Max. Y-Axis Travel	+2.56 to -1.0" (65 to -25.4mm)
X-Axis Rapid Traverse Rates	1,100-ipm (28m/min)
Z-Axis Rapid Traverse Rates	1,500-ipm (38m/min)
Y-Axis Rapid Traverse Rates	236-ipm (6m/min)
HARDINGE BMT-55 LIVE TOOLING TOP PLATE	
BMT-55 bi-directional	12-stations (½ turret station index for total of 24)
Square Shank	1" (25mm)
Round Shank Tooling	1.50" (38mm)
Index Time (rotation/including clamp-unclamp)	0.40/1.45 Seconds
Live Tooling Power Rating (30 Min Rating)	7.5HP (5.5 kW)
Live Tooling Max Speed	8,000-rpm

HARDINGE BMT45 LIVE TOOLING TOP PLATE	
BMT-45 bi-directional	16 station + 1/2 station index
Square shank	3/4" (20mm)
Round Shank Tooling	1.25" (32mm)
Index Time (rotation/including clamp-unclamp)	0.40/1.45 Seconds
Tool Shank Dia w/ER25 Collets	.04-.625" (1mm - 16mm)
Live Tooling Power Rating (30 Min Rating)	7.5Hp (5.5kW)
Live Tooling Torque Rating (30 Min Rating)	24.3 ft-lb (33Nm)
Live Tooling Max Speed (*1)	8000rpm
HARDINGE T-STYLE STATIC TOP PLATE	
Block Type (Static) bi-directional	12-station
Square Shank (Left, Right or Inverted Tooling)	1" (25mm)
Round Shank Tooling	1.5" (38mm)
Index Time (rotation/including clamp-unclamp)	0.40/1.45 seconds
SERVO DRIVEN TAILSTOCK	
Morse Taper (no quill needed)	MT # 4 – min. applied force =350lbs. (1560N)
Max. Traverse Rate	1500-ipm (38m/min)
Max. Applied Force	1500lbs. (6672N)
Max. BMT cutting length between centers	24.25" (615.9mm)
SUB SPINDLE	
Max. Speed	6,000-rpm
Max. Power Rating (30 min)	10-hp (7.5 kW)
Max. Torque (30 min)	41.3 ft-lb (56 Nm)
Spindle Nose	A2-5/16C
Chuck Size (Chuck Not Included)	6" (150mm)
Spindle Bore	1.89" (48mm)
Spindle Orient (optional)	1.0 degree
Max. Travel	28.275" (718mm)
Max. Traverse Rate	1500-ipm (38m/min)
MACHINE DETAILS	
Floor Space	120" x 103" x 85" (3048 x 2616 x 2151mm)
Approx. Shipping Weight	16,600 lbs. (7566kg)

MACHINE CONTROLS

MITSUBISHI CONTROL

- 15" color LCD display screen aids in viewing the various programming and function pages
- The operators panel is custom-designed to be user friendly
- Mitsubishi M720V control on robust pendant mount
- The control pendant conveniently swings for better user access and can be moved out of the work zone for robot type applications where interlocking gate access is required
- Full MSY capability
- Navi-Turn programming is standard.
Limited to 2-axis turning only
- Packed with standard features

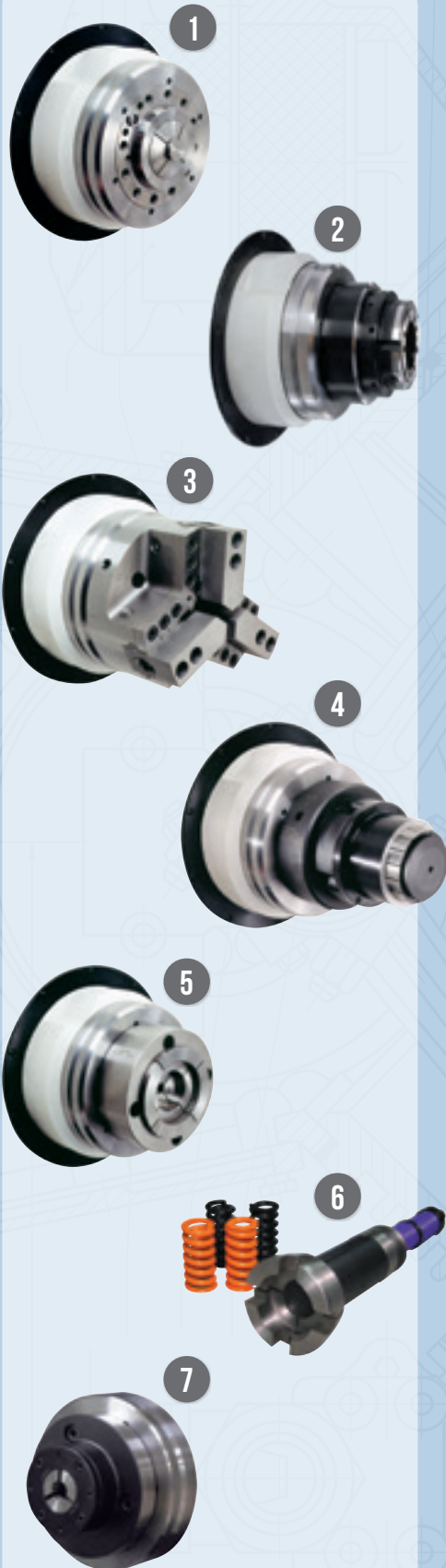


FANUC CONTROL

- 10.4" color LCD display screen aids in viewing the various programming and function pages
- The operators panel is custom-designed to be user friendly
- Fanuc 0i-TD control on robust pendant mount
- The control pendant conveniently swings for better user access and can be moved out of the work zone for robot type applications where interlocking gate access is required
- Full MSY capability
- Manual Guide-i (MG-i) programming is standard
- Packed with standard features



WORKHOLDING FLEXIBILITY



UNLIMITED FLEXIBLE WORKHOLDING OPTIONS

Hardinge is unique as a machine tool builder — we manufacture our own workholding products. Precision and accuracy is yours when you use Hardinge perfectly-mated workholding products.

1 COLLETS

Hardinge hardened and ground collets are inspected and measured in a Hardinge SUPER-PRECISION® spindle. Collets are available in fractional round, hex and square sizes and round metric, as well as round serrated fractional and metric sizes. Use adjustable, machinable collet stops for accurate part positioning.

EMERGENCY COLLETS

Emergency collets have a soft face with a pilot hole for customer drilling, boring and stepping out to the exact size required. An optional extended nose permits deeper counterbores when required and tool clearance for extended work.

2 FLEXC™ QUICK-CHANGE VULCANIZED COLLET SYSTEMS

Interchangeable quick-change vulcanized collet heads have a working range of ± 0.020 " (0.5mm) to accept bar stock variation. Collets change in seconds, while accuracy is maintained at $.0004$ " (.010mm).

STYLE "S" MASTER COLLETS AND PADS

Pads can be changed much quicker than solid collets can. Pads cost less and use less storage space when compared to a standard solid collet. Choose from hardened and ground, semi-hard and emergency pads. Styles S16, S20 and S26 require a collet closer.

3 3-JAW POWER CHUCKS

Hardinge power chucks are lever operated, counter-centrifugal and dynamically balanced. Quick-change chucks are also available.

4 SURE-GRIP® EXPANDING COLLET SYSTEMS

The Hardinge Sure-Grip expanding collet provides high-precision, internal gripping solutions with true parallel gripping. Collet-style and spindle-mount styles are available, depending on the machine model.

Master Expanding Collets are a lower-cost alternative to Sure-Grip Expanding Collet Systems and include a dead-length feature.

5 STEP CHUCKS AND CLOSERS

Step Chucks and closers are used to accurately hold larger diameter parts.

6 FORCE-LIMITING STEP CHUCK

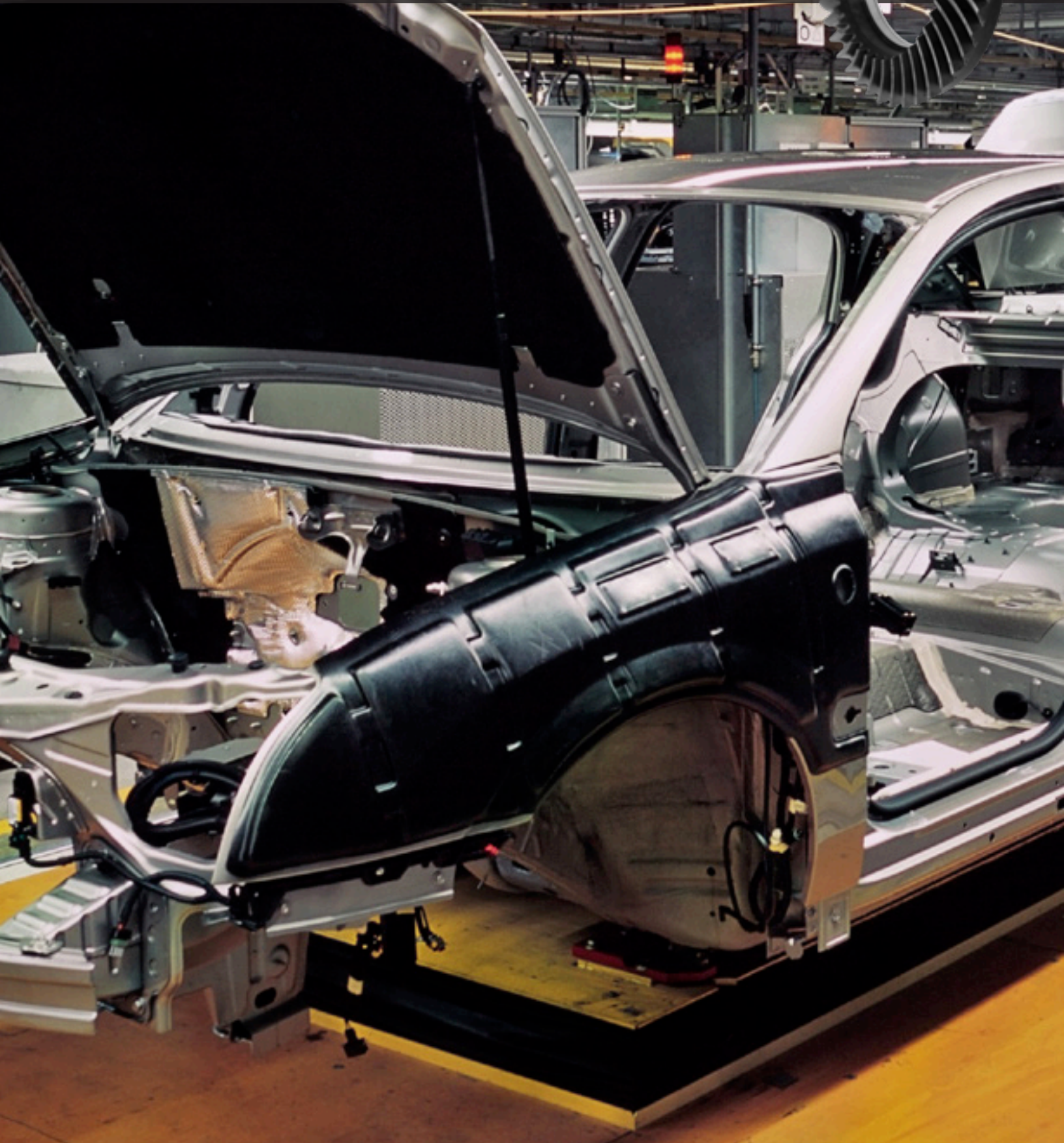
The Hardinge force-limiting step chuck has built-in force control to safely grip thin-wall parts. Maintain inside and outside concentricity in a fail-safe process while eliminating the nuisance of manually tweaking the draw bar.

7 DEAD-LENGTH® SYSTEMS

Maintain part-length control by using Hardinge dead-length systems. Choose from dead-length collet assemblies, thru-hole collets, step chucks and spider-stop step chucks. 16C to #22 B&S adapter shown on A2-5 sub-spindle.

RING GEAR

RPM _____ 140
ROUNDNESS _____ .0005" (0.0127MM)
DIAMETER _____ 6.88" (175MM)
FINISH _____ 16 μ N





HARDINGE COMPANIES WORLDWIDE

Hardinge is a leading international provider of advanced metal-cutting solutions. We provide a full spectrum of highly reliable CNC turning, milling, and grinding machines as well as technologically advanced workholding accessories.

The diverse products we offer enable us to support a variety of market applications in industries including aerospace, agricultural, automotive, construction, consumer products, defense, energy, medical, technology, transportation and more.

We've developed a strong global presence with manufacturing operations in North America, Europe, and Asia. Hardinge applies its engineering and applications expertise to provide your company with the right machine tool solution and support every time.

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