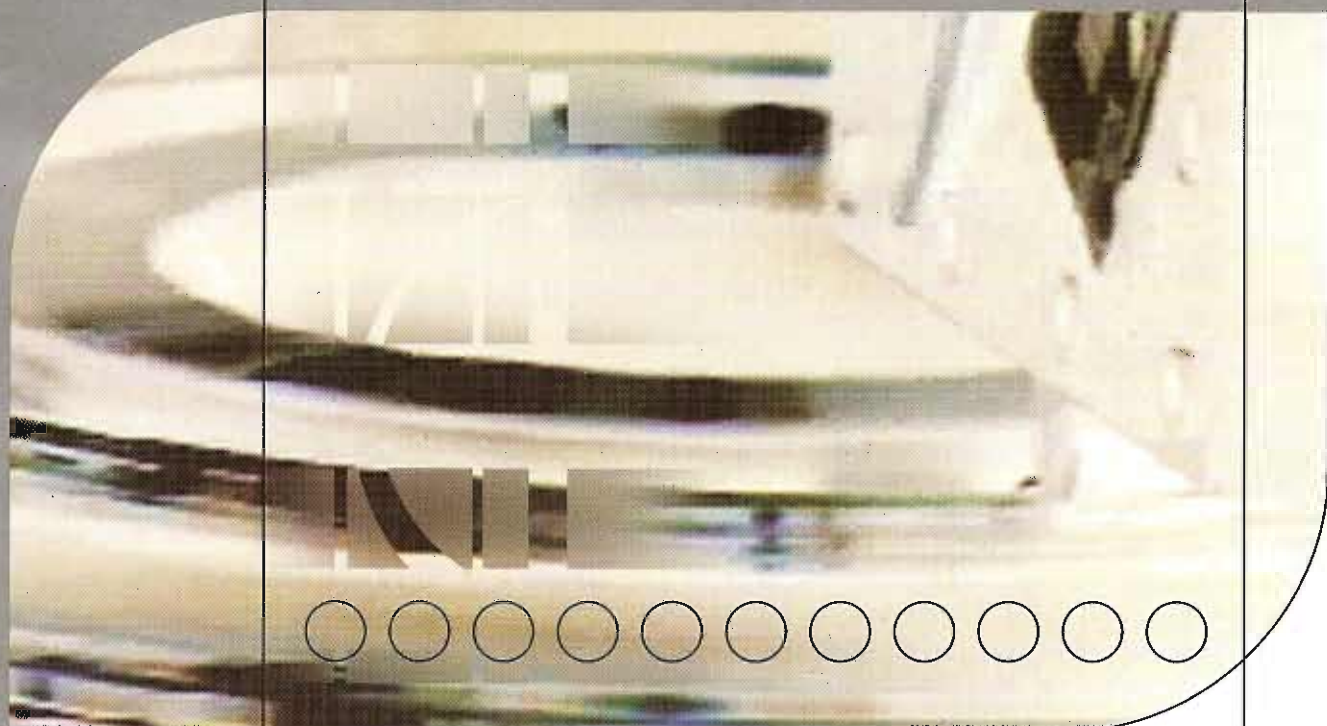




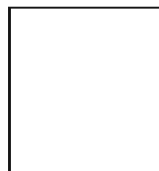
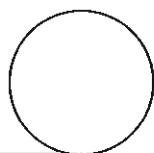
webster & bennett



THE MILLENNIUM RANGE

**vertical turning and machining centres
for the next 1000 years**

the ultimate combination of speed, power,
accuracy, flexibility and life cycle cost



some of the high quality features found in the webster & bennett millennium range

TURNING CENTRES up to 3100mm diameter turning capacity

HIGH ACCURACY & HIGH PRODUCTIVITY - the ultimate, almost without compromise. Webster & Bennett design quality - heavy duty, rigid construction with high thermal stability assures this.

HIGH SPEEDS - LOW SPEEDS - a superbly efficient transmission provides the best choice of table speeds, with appropriate power and torque, to achieve the best cutting conditions for all materials
Example - high speed - cutting Inconel 718 at 440 rpm, 0.2mm feed, 4mm depth of cut
Example - low speed - stainless steel 1100mm diameter at 2 rpm, 0.8mm feed, 5mm depth of cut

FULL TABLE DIAMETER COMPONENT PROBING - the standard cross rail allows full travel of the ram head [X axis] right and left of centre to enable in cycle probing of the full component. Extra long crossrail options accommodate auto toolchangers to be accessed both sides of the machine.

'C' AXIS - ACCURATE and POWERFUL

On a 1200mm PCD the positional accuracy is 0.01mm but the 'C' axis drive is so powerful it can be used as a rotary milling feed, for example, to ramp mill a steel forging NFA 35-567 grade 18 CN8 using a 63mm diameter 4 tip cutter at 653 rpm, 4 mm depth of cut and a feed of 550 mm/min.

TABLE ACCURACY - specially selected TIMKEN crossed roller bearings, the most accurate, heavy duty, high speed bearing - can hold axial and radial run out to less than 0.002mm. Installed within the very stable Millennium base this bearing will provide accuracy and reliability over the long life of the machine, even when required to take heavy workloads.

LIVE SPINDLE - HIGH POWER, HIGH SPEEDS. 22KW. 20-4000 rpm. Perfect for high quality milling, drilling, grinding, tapping and thread milling with single tip cutter [even off centre bores]

SILENT OPERATION - below 75 dba even at top speeds

TALL COMPONENTS - the Millennium specification options allow up to 2985mm capacity under the crossrail while retaining the very high accuracy in production.

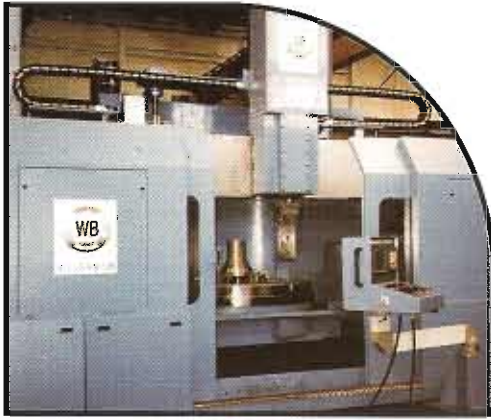
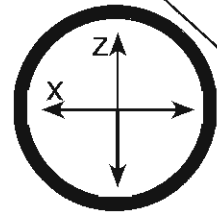
WEBSTER & BENNETT USE THE MOST STRINGENT INTERNATIONAL TEST AND CERTIFICATION PROCEDURES THROUGHOUT THE BUILD AND START UP PERIOD TO ENSURE THE MACHINE AS DELIVERED EMBODIES ALL THE MILLENNIUM DESIGN AND SPECIFICATION BENEFITS TO ASSURE QUALITY AND REPEATABILITY IN PRODUCTION.

Webster & Bennett publication TF1 provides further detail of the Millennium's technical features.

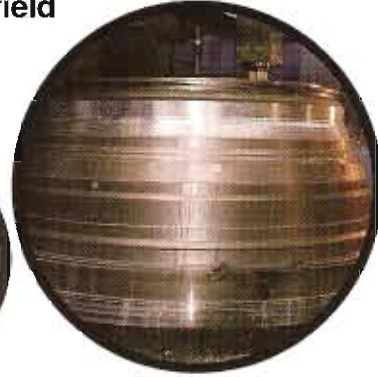
Further Webster & Bennett publications available on request are:

- AS1 - Application studies of the Millennium in use in various industries
- ATC - Automatic Toolchanging options. Toolholding systems
- GRM - the Millennium in use as a Grinding Machine
- AMR - the Millennium in use with Angular and Right Angle Milling Attachments of Probing and Gauging systems on the Millennium
- TFM - tool force monitoring systems for the Millennium
- APS - Automatic pallet systems in use on the Millennium
- FTS - the innovative Webster & Bennett Fixture Transfer System for high precision off machine set ups
- CNC - the systems and specifications available on the Millennium
- CER - the Millennium certification procedures for machine build quality and operating accuracy.
- HPC - the use of High Pressure Coolant for Chip Breaking difficult materials
- EPT - elliptical turning on the Millennium
- DCM - the heavy duty range of Double Column Millennium Vertical Turning Centres to 4500mm diameter

millennium 2 axis vertical turning machines



**A Millennium 2-175/210
at Roll Neck Rings in Sheffield**
turning small components and
Trent 800 Aero Engine Casings.



**A Millennium 2-200/250
at Belmar in Aberdeen**
turning small and large components
for the Offshore Oil Industry

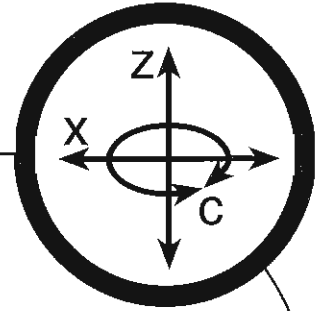


Elevating Crossrail Models	2E-100 / 120	2E-120 / 150L	2E-120 / 150H	2E-150 / 180	2E-175 / 210	2E-180 / 220	2E-200 / 250	2E-270 / 310
Table diameter	1000mm / 40"	1200mm / 48"	1200mm / 48"	1500mm / 60"	1750mm / 72"	1800mm / 72"	2000mm / 80"	2700mm / 82"
Turning Diameter	1200mm / 47"	1500mm / 59"	1500mm / 59"	1800mm / 71"	2100mm / 83"	2200mm / 87"	2500mm / 98"	3100mm / 120"
Max. work piece weight	5000kgs / 5 tons	1800kgs / 8 tons	10,000kgs / 10 tons	10,000kgs / 10 tons	15,000kgs / 15 tons	15,000kgs / 15 tons	20,000kgs / 20 tons	20,000kgs / 20 tons
Table speeds	1-700rpm	1-580rpm*	1-580rpm*	1-580rpm*	1-400rpm*	1-400rpm*	1-350rpm*	1-185rpm*
Table power Continuous	37.5kw / 50hp	37.5kw / 50hp	45kw / 60hp	45kw / 60hp	45kw / 60hp	50kw / 67hp	50kw / 67hp	75kw / 90hp
Maximum cutting height*	1200mm / 47"	1200mm / 47"	1200mm / 47"	1200mm / 47"	1200mm / 47"	1600mm / 63"	2000mm / 79"	2000mm / 79"
Ram size	200x200mm / 7.9 x 7.9"	200x200mm / 7.9 x 7.9"	200x200mm / 7.9 x 7.9"	200x200mm / 7.9 x 7.9"	200x200mm / 7.9 x 7.9"	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *
Ram stroke 'Z'	1000mm / 39.4"	1000mm / 39.4"	1000mm / 39.4"	1000mm / 39.4"	1000mm / 39.4"	1500mm / 59" *	1500mm / 59" *	1500mm / 59" *
Ram traverse 'X'	2030mm / 80"*	2130mm / 84"*	2130mm / 84"*	2280mm / 88"*	2705mm / 106"*	2600mm / 102"*	2850mm / 111"*	3500mm / 136"*
Standard ATC	12 tool*	12 tool*	18 tool*	18 tool*	18 tool*	18 tool*	18 tool*	18 tool*
Approx. Weight	17000kgs / 17 tons	19000kgs / 19 tons	26000kgs / 26tons	31000kgs / 31 tons	33000kgs / 33 tons	37000kgs / 37 tons	41000kgs / 41 tons	45000kgs / 45 tons

* indicates availability of specification enhancing options *
fixed rail models available - all sizes

the millennium 3 axis

vertical turning, milling,
drilling and grinding machine



High power, high precision turning.
Powerful and precise milling and drilling.
Grinding with attachments or dedicated grinding
heads.

3 simultaneous machining axes – X, Y and C.
Accuracy guaranteed.
Linear positional 0.0075mm/1000mm (0.0003"/40")
Repeatability 0.005mm (0.0002")
C axis positional ± 5 arc seconds
Repeatability 2.5 arc seconds

The Benefits

- a 'one stop' machine for many components
- remove re-set up time.
- no accuracy loss moving from machine to machine.
- reduce number of operations.
- more powerful milling and drilling than most machining centres.
- 50%+ production cycle time savings against existing CNC turning and machining centre production methods.
- reduce lead time – reduce stock.



(left) **Heavy duty ramp milling** a steel forging, 63mm diameter 4 tip cutter, 653 rpm, 4mm cut, 550mm/min feed (middle) **Grinding** a GE90 Front Stage Nozzle (right) **Thread milling** an off centre hole, 42mm diameter 4.5mm pitch, with the accuracy of a jig borer.

Elevating Crossrail Models	3E-100 / 120	3E-120 / 150L	3E-120 / 150H	3E-150 / 180	3E-175 / 210	3E-180 / 220	3E-200 / 250	3E-270 / 310
Table diameter	1000mm / 40"	1200mm / 48"	1200mm / 48"	1500mm / 60"	1750mm / 72"	1800mm / 72"	2000mm / 80"	2700mm / 82"
Turning Diameter	1200mm / 47"	1500mm / 59"	1500mm / 59"	1800mm / 71"	2100mm / 83"	2200mm / 87"	2500mm / 98"	3100mm / 120"
Max. work piece weight	5000kgs / 5 tons	1800kgs / 8 tons	10,000kgs / 10 tons	10,000kgs / 10 tons	15,000kgs / 15 tons	15,000kgs / 15 tons	20,000kgs / 20 tons	20,000kgs / 20 tons
Table speeds	1-700rpm	1-580rpm*	1-580rpm*	1-580rpm*	1-400rpm*	1-400rpm*	1-350rpm*	1-185rpm*
Table power Continuous	37.5kw / 50hp	37.5kw / 50hp	45kw / 60hp	45kw / 60hp	45kw / 60hp	50kw / 67hp	50kw / 67hp	75kw / 90hp
Maximum cutting height*	1200mm / 47"	1200mm / 47"	1200mm / 47"	1200mm / 47"	1200mm / 47"	1600mm / 63"	2000mm / 79"	2000mm / 79"
Ram size	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *	250x250mm / 9.85 x 9.85" *
Ram stroke 'Z'	1000mm / 39.4"	1000mm / 39.4"	1000mm / 39.4"	1000mm / 39.4"	1000mm / 39.4"	1500mm / 59"	1500mm / 59"	1500mm / 59"
Ram traverse 'X'	2030mm / 80"	2130mm / 84"	2130mm / 84"	2280mm / 88"	2705mm / 106"	2800mm / 102"	2850mm / 111"	3500mm / 136"
Table speeds, 'C' Axis	0.01-5.3rpm	0.01-5.3rpm	0.01-5.3rpm	0.01-5.3rpm	0.01-3.6rpm	0.01-5rpm	0.01-4rpm	0.01-2.5rpm
Standard ATC	12 tool*	12 tool*	18 tool*	18 tool*	18 tool*	18 tool*	18 tool*	18 tool*
Approx. Weight	17000kgs / 17 tons	19000kgs / 19 tons	26000kgs / 26tons	31000kgs / 31 tons	33000kgs / 33 tons	37000kgs / 37 tons	41000kgs / 41 tons	45000kgs / 45 tons

* indicates availability of specification enhancing options *
fixed rail models available - all sizes

angle milling, drilling and tapping



ACHIEVE PERFORMANCE IMPROVEMENTS

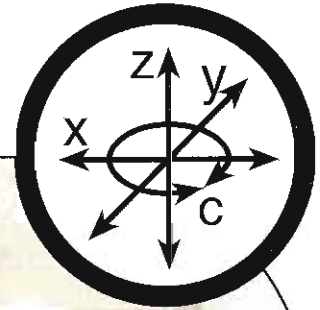
'We expected to achieve savings of 20% over our existing CNC turning and machining centre production processes. On average we are achieving 56% savings, reducing operations from 7 to 2 and currently our uptime is 98.7% so machine reliability is providing benefit too.'

T.C. Eastwood – Vickers Defence Systems



the millennium 4 axis

vertical turning and machining centres



High power, high precision turning.
Powerful and precise milling and drilling.
Large and precise cubic machining capability.

Precise grinding capability

4 simultaneous machining axes - X, Z, C and Y
Accuracy guaranteed
Linear positional 0.0075mm/1000mm 0.0003"/40"
Repeatability 0.005mm 0.0002"/40"
C axis positional ± 5 arc seconds
Repeatability 2.5 arc seconds

Combines powerful Vertical Turning capability with the machining capability of a very powerful Vertical Machining Centre.

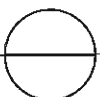
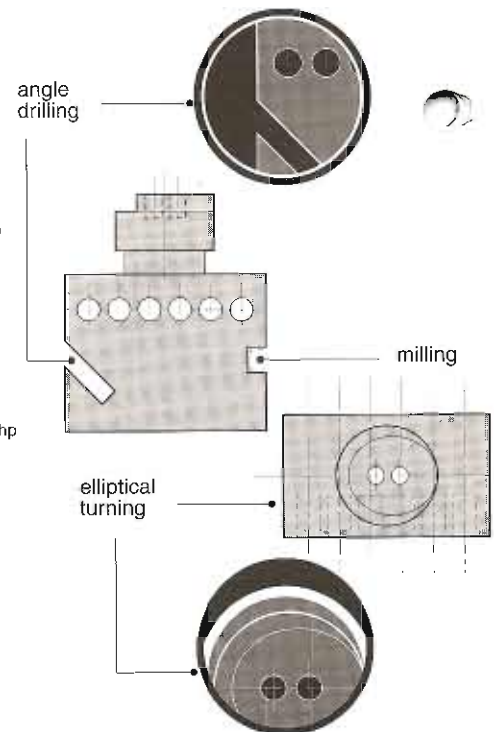
An 'all in one' machine tool, almost without compromise - precise power, whatever the machining operation.



The Millennium 4 Axis Selection

	4F-120 / 150	4F-180 / 200	4F-180 / 200XY
Table diameter	1200mm / 48"	1800mm / 72"	1800mm / 72"
Turning capacity	1500mm / 60"	2000mm / 80"	2000mm / 80"
Table turning speeds	1-580rpm	1-440rpm*	1-440rpm*
Main drive power	54/45kw / 72/60hp	50/60kw / 80/67hp	50/60kw / 80/67hp
Maximum cutting height	1200mm / 47**	1200mm / 47**	1200mm / 47**
Ram	250 x 250mm / 9.85 x 9.85"	250 x 250mm / 9.85 x 9.85"	250 x 250mm / 9.85 x 9.85"
Ram stroke - 'Z' axis	1000mm / 39.4"	1000mm / 39.4"	1000mm / 39.4"
Live tooling motor	22/18.5kw / 29/25hp	22/18.5kw / 29/25hp	22/18.5kw / 29/25hp
Live spindle speeds	20-400rpm	20-400rpm	20-400rpm
Ram traverse- 'X' axis	2130mm / 84"	2600mm / 102"	2600mm / 102"
'C' axis drive torque	6KNM	8KNM	8KNM
'C' axis milling speeds	0.01 - 5.3rpm	0.01 - 5.0rpm	0.01 - 5.0rpm
'Y' axis traverse	600mm / 24"	800mm / 32"	1250mm / 50"

* indicates availability of specification enhancing options



the capability and capacity of the millennium range

Models	2 axis	3 axis	4 axis
Profile turning and grinding.	●	●	●
P.C. drilling - horizontal & vertical.		●	●
Angle drilling and tapping.		●	●
Heavy duty horizontal, vertical, rotary & angular milling		●	●
Profile and form milling and grinding.		●	●
Internal thread milling, including off centre bores.		●	●
Internal & external cylindrical grinding.		●	●
Elliptical turning		●	●
Cubic form machining			●

3 & 4 axis machines add to their sophistication with the use of innovative attachments such as the elliptical turning head.





THE MILLENNIUM RANGE

machine tools for the world's industries



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