

# BC 1600A - BC 2600A



**CNC line boring machines  
for main and camshaft bearings**

A Company of  
ThyssenKrupp

**BERCO** S.p.A.



# Setting up, line boring and check

Fig. 1



Fig. 2



Fig. 3



A fundamental role is played in cylinder block reconditioning by the restoration of the geometrical relationship between the crankshaft axis and the cylinder axes. Although simple operations in themselves, boring camshafts and journals requires time, and precision is essential to the quality of the result.

To aid the operator in this specific application, Berco has designed the new BC 1600A and BC 2600A horizontal CNC boring machines.

The machine has the same robust construction of its predecessor, but the boring head section has been completely revolutionised, with the introduction of a new rotary advance system driven by high power and torque brushless motors, both for the spindle drive and the advance itself.

The use of recirculating ball screws, linear guides and numerical control with operator keyboard programming, make the machine among the fastest, simplest and precise to program and operate in the market in this sector.



Fig. 4



Fig. 5

Fig. 6



Fig. 1  
Final centering fine, with dial indicator attachment.

Fig. 2  
Mounting the boring bar.

Fig. 3  
Checking main bearing bore with boring bar mounted in the block with special check gauge.

Fig. 4  
Centering rough with centering cone.

Fig. 5  
Micrometer setting of the tool mounted in the bar, using the measuring device and the Vee rest.

Fig. 6  
Line boring main bearings, with tool mounted in toolholder.

# Standard outfit

Fig. 7



Fig. 7  
Setting up a V-block; one can see the central support for the boring bar. The special lock clamps are available on request, at extra cost.

Fig. 8  
Measuring unit, for setting, out of machine, tools mounted in toolholders.

Fig. 8



- 1 device for setting tools in the toolholders, complete with measuring unit consisting of micrometer and dial indicator (see fig. 8);
- 1 magnetic Vee rest for tool setting (see fig. 5). The measuring unit to use is the one stated above;
- 2 centering devices with dial indicator (see fig. 1);
- 2 parallel supports, 75 mm (3") high, for engine block set up;
- 2 parallel supports, 200 mm (7.87") high, for engine block set up;
- 2 parallel supports, 300 mm (11.81") high;
- 8 parallel support hold-down bolts;
- 4 clamps with pin and bolt, for securing the block to the parallel supports;
- 1 boring bar central support, large, complete with arm and clamps (fig. 7);
- 1 boring bar central support, large, complete with arm and clamps (only BC 2600A);
- 1 double-ended spanner, 19x24 mm;
- 1 set of six Allen keys;
- 1 ratchet spanner.

## Extra outfit

### SPECIAL REST FOR CENTRAL BAR SUPPORT

(to be used when line boring the camshaft bearings)

- **A01.39620**  
hinged-type rest with bushing, for 30 mm (1.18") dia. boring bar;
- **A01.39625**  
small support with bushing, for 25 mm (0.98") dia. boring bar;
- **A01.39612**  
small support with bushing, for 30 mm (1.18") dia. boring bar;

- **A01.39614**  
small support with bushing, for 40 mm (1.57") dia. boring bar;

### SPECIAL TOOLS AND TOOLHOLDERS

- **A01.39600**  
toolholder, 45 mm (1.77") dia., for 30 mm (1.18") dia. boring bar;
- **A00.39859**  
toolholder, 57,3 mm (2.26") dia., for 40 mm (1.57") dia. boring bar;
- **A00.39808**  
toolholder, 63 mm (2.48") dia., for 40 mm (1.57") dia. boring bar;
- **A00.39864**  
toolholder, 77.3 mm (3.04") dia., for 50 mm (1.97") dia. boring bar;
- **A00.39867**  
toolholder, 87.3 mm (3.44") dia., for 60 mm (2.36") dia. boring bar;
- **A01.39689**  
toolholder, 120 mm (4.72") dia., for 60 mm (2.36") dia. boring bar;

- **A00A24740**  
toolholder, 170 mm (6.69") dia., for 50 mm (1.97") dia. boring bar;
- **U202268081**  
boring tool 12 mm (0.47"), long, for special toolholders.

# Extra outfit

Fig. 9



## FACING ATTACHMENTS

- **A01.39691**  
facing and chamfering attachment, to be used with the 50 and 60 mm (1.97" and 2.36") dia. boring bars; 170 (6.69") dia. max capacity; complete with tool adjustment spanner (fig. 11);
- **A01.39705**  
facing and chamfering attachment, to be used with the 30 and 40 mm (1.18" and 1.57") dia. boring bars; 150 (5.91") dia. max capacity; complete with tool adjustment spanner.

## MEASURING AND CHECKING DEVICES

- **A00.39813**  
telescoping gauge for checking I/D bores, 60.3 - 76.2 mm (2.37" - 3") capacity; for use with the 40 mm (1.57") dia. boring bar;
- **A00.39819**  
telescoping gauge for checking I/D bores, 76.2 - 152.4 mm (3" - 6") capacity; for use with the 50 mm (1.97") dia. boring bar;
- **A00.39803**  
boring bar sag checking attachment, less indicators (one can use the two indicators in the standard outfit) (fig. 10);
- **A99.51450**  
**AMS 105** main bearing bore check gauge, for measurements with the boring bar in the block, 30 - 105 mm (1.18" - 4.13") capacity (fig. 3);

- **A99.51451**  
**AMS 220** check gauge as above, 100 - 220 mm (3.94" - 8.66") capacity.

## TOOL GRINDER

- **A01.39686**  
tool grinder, complete with roughing wheel, tool grinding jigs and diamond holder (fig. 12), less diamond wheel and mounted diamond;
- **A00.16957**  
diamond wheel for tool grinder;
- **C465900020**  
roughing wheel dressing diamond.

## OTHER EXTRAS

- **A00A24742**  
centering cone, 150 - 225 mm (5.9" - 8.88") dia. capacity, for the 50 mm (1.97") dia. boring bar (two pcs. are required);

- **A01.39617**  
central support for boring bar, complete with arm and clamps, it is used for small and V-blocks;
- **A00.39767**  
central support for boring bar, high type bar;
- **A01.39638**  
boring bar stand, for supporting long bars (fig. 13);
- **A00.39484**  
extension with bayonet connection, 200 mm (8") long, for boring bars;
- **A00A24763**  
lightholder for lighting complete with support.

Fig. 10



Fig. 9  
Complete boring equipment.

Fig. 10  
Boring bar sag checking attachment.

Fig. 11  
Main bearing facing and chamfering attachment.

Fig. 12  
Tool grinder.

Fig. 13  
Long bar supporting stand.

Fig. 11



Fig. 12



Fig. 13





# Extra outfit

Complete boring equipment		A00A23840	A00A24713	A00A24720	A00A24722	A00A24724	A00A24744
Complete boring equipment, with chromium-plated boring bar							
		capacity dia. 23-50 mm 0.905"-1.968"	capacity dia. 28-70 mm 1.102"-2.756"	capacity dia. 35-100 mm 1.378"-3.937"	capacity dia. 45-120 mm 1.772"-4.724"	capacity dia. 55-150 mm 2.165"-5.906"	capacity dia. 65-225 mm 2.559"-8.858"
DESCRIPTION OF THE COMPONENTS	QUANTITY	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in
Boring bar, complete with pin and screws (dia. x length)	1	20,5x1600 0.807"x63"	25x1200 0.984"x47"	30x1600 1.181"x63"	40x1800 1.575"x71"	50x1900 1.969"x75"	60x3000 2.362"x118"
Centering cone, for diameter range	2	24-50 0.945"-1.968"	28-70 1.102"-2.756"	35-95 1.378" - 2.559"	45-85 1.772" - 3.346"	55-105 2.165" - 4.134"	65-105 2.559" - 4.134"
Centering cone, for diameter range	2	-	-	65-100 2.559" - 3.937"	85-120 3.346" - 4.742"	105-150 4.134" - 5.906"	105-155 4.134" - 6.102"
Centering cone, for diameter range	2	-	-	-	-	-	155-225 6.102" - 8.858"
Side support bearings (I/D)	2	20,5 0.807	25 0.984"	30 1.181"	40 1.575"	50 1.969"	60 2.362"
Hinged-type rest with bushing, for central bar support	1	20,5 0.807	25 0.984"	30 1.181"	40 1.575"	50 1.969"	60 (2 pcs.) 2.362"
Toolholder (O/D)	1	-	45 1.772"	50 1.968"	70 2.756"	90 3.543"	100 3.937"
Toolholder (O/D)	1	-	-	60 2.362"	85 3.346"	115 4.528"	140 5.512"
Toolholder (O/D)	1	-	-	70 2.756"	-	-	180 7.087"
Spacer bushing for tool setting fixture (O/D)	1	-	25 0.984"	30 1.181"	40 1.575"	50 1.969"	60 (2 pcs.) 2.362"
Set of boring tools, 1 each size, in the lengths	1	12 (0.472")	12 (0.472")	12 (0.472")	17 (0.669")	21 (0.827")	21 (0.827")
	1	15 (0.591")	15 (0.591")	15 (0.591")	21 (0.827")	23 (0.901")	27 (1.063")
	1	17 (0.669")	17 (0.669")	17 (0.669")	23 (0.901")	27 (1.063")	31 (1.220")
	1	19 (0.748")	19 (0.748")	19 (0.748")	27 (1.063")	31 (1.220")	35 (1.378")
	1	21 (0.827")	21 (0.827")	23 (0.901")	31 (1.220")	35 (1.378")	39 (1.535")
	1	23 (0.901")	23 (0.901")	27 (1.063")	35 (1.378")	43 (1.693")	48 (1.890")
	1	27 (1.063")	27 (1.063")	31 (1.220")	39 (1.535")	48 (1.890")	55 (2.165")
	1	31 (1.220")	31 (1.220")	35 (1.378")	43 (1.693")	55 (2.165")	68 (2.677")
Set of R.H.: chamfering tools, 1 each size, in the lengths	1	-	19 (0.748")	19 (0.748")	22 (0.866")	25 (0.984")	25 (0.984")
	1	-	22 (0.866")	22 (0.866")	25 (0.984")	35 (1.378")	30 (1.181")
	1	-	30 (1.181")	25 (0.984")	30 (1.181")	40 (1.575")	40 (1.575")
	1	-	40 (1.575")	30 (1.181")	40 (1.575")	45 (1.772")	50 (1.969")
	1	-	-	35 (1.378")	45 (1.772")	50 (1.969")	68 (2.677")
	1	-	-	40 (1.575")	-	68 (2.677")	-
Set of L.H.: chamfering tools, 1 each size, in the lengths	1	-	as above	as above	as above	come sopra	as above
	1	-	as above	as above	as above	come sopra	as above
Facing tool, 78 mm (3.071") long, capacity	2	-	28-150 1.102"- 5.906"	35-170 1.378"- 6.693"	45-200 1.772" - 7.874"	55-225 2.165" - 8.858"	65-280 2.559" - 11.024"

# Extra outfit

		A00A24727	A00A24732	A00A24734	A00A24738
Complete boring equipment					
Complete boring equipment, with chromium-plated boring bar		A00A24726	A00A24733	A00A24735	A00A24739
		capacity dia. 28-70 mm 0.102"-2.756"	capacity dia. 35-100 mm 1.378"-3.937"	capacity dia. 45-120 mm 1.772"-4.724"	capacity dia. 55-150 mm 2.165"-5.906"
DESCRIPTION OF THE COMPONENTS	QUANTITY	mm/in	mm/in	mm/in	mm/in
Boring bar, complete with pin and screws (dia. x length)	1	25x1800 0.984"x71"	30x2500 1.181"x98.425"	40x2500 1.575"x98.425"	50x2500 1.969"x98.425"
Centering cone, for diameter range	2	28 - 70 1.102" - 2.756"	35 - 65 1.378" - 2.559"	45 - 85 1.772" - 3.346"	55 - 105 2.165" - 4.134"
Centering cone, for diameter range	2	-	65 - 100 2.559" - 3.937"	85 - 120 3.346" - 4.724"	105 - 150 4.134" - 5.906"
Centering cone, for diameter range	2	-	-	-	-
Side support bearings (I/D)	2	25 0.984"	30 1.181"	40 1.575"	50 1.969"
Hinged-type rest with bushing, for central bar support	1	25 0.984"	30 1.181"	40 1.575"	50 1.969"
Toolholder (O/D)	1	45 1.772"	50 1.968"	70 2.756"	90 3.543"
Toolholder (O/D)	1	-	60 2.362"	85 3.346"	115 4.528"
Toolholder (O/D)	1	-	70 2.756"	-	-
Spacer bushing for tool setting fixture (O/D)	1	25 0.984"	30 1.181"	40 1.575"	50 1.969"
Set of boring tools, 1 each size, in the lengths	1	12 (0.472")	12 (0.472")	17 (0.669")	21 (0.827")
	1	15 (0.591")	15 (0.591")	21 (0.827")	23 (0.901")
	1	17 (0.669")	17 (0.669")	23 (0.901")	27 (1.063")
	1	19 (0.748")	19 (0.748")	27 (1.063")	31 (1.220")
	1	21 (0.827")	23 (0.901")	31 (1.220")	35 (1.378")
	1	23 (0.901")	27 (1.063")	35 (1.378")	43 (1.693")
	1	27 (1.063")	31 (1.220")	39 (1.535")	48 (1.890")
	1	31 (1.220")	35 (1.378")	43 (1.693")	55 (2.165")
	1	-	-	48 (1.890")	62 (2.241")
Set of R.H.: chamfering tools, 1 each size, in the lengths	1	19 (0.748")	19 (0.748")	22 (0.866")	25 (0.984")
	1	22 (0.866")	22 (0.866")	25 (0.984")	35 (1.378")
	1	30 (1.181")	25 (0.984")	30 (1.181")	40 (1.575")
	1	40 (1.575")	30 (1.181")	40 (1.575")	45 (1.772")
	1	-	35 (1.378")	45 (1.772")	50 (1.969")
	1	-	40 (1.575")	-	68 (2.677")
Set of L.H.: chamfering tools, 1 each size, in the lengths	1	as above	as above	as above	as above
Facing tool, 78 mm (3.071") long, capacity	2	28 - 150 1.102" - 5.906"	35 - 170 1.378" - 6.693"	45 - 200 1.772" - 7.874"	55 - 225 2.165" - 8.858"

See Fig. 15

Fig. 14



Electric cabinet

Fig. 15



Control panel.

## Technical Data

	BC 1600 A		BC 2600 A	
<b>Working capacity</b>				
Boring capacity	mm 23 - 225	0.905" - 8.86"	mm 23 - 225	0,905" - 8.86"
Max spindle travel	mm 550	21.65"	mm 550	21.65"
<b>Geometrical features</b>				
Min. distance from bed to boring bar C/L	mm 525	20.67"	mm 525	20.67"
Max. distance from bed to boring bar C/L	mm 850	33.46"	mm 850	33.46"
Max. cylinder block length admitted	mm 1600	63"	mm 2600	102"
<b>Speeds and feeds</b>				
Variable spindle rotation speeds	r.p.m 20 ÷ 1000		r.p.m 20 ÷ 1000	
Variable automatic spindle work feeds	mm / min 5 ÷ 400	0.197" ÷ 15.75"	mm / min 5 ÷ 400	0.197" ÷ 15.75"
<b>Motor rating</b>				
Spindle rotation drive motor	kW 3.86	5.15 HP	kW 3.86	5.15 HP
Feed drive motor	kW 0.4	0.54 HP	kW 0.4	0.54 HP
<b>Dimensions</b>				
Length	mm 3473	137"	mm 4473	176"
Width	mm 740	29"	mm 740	29"
Max. height	mm 1600	63"	mm 1600	63"
<b>Weights</b>				
Approx. weight unpacked	kg 1500	3386 lb	kg 1800	3968 lb
Approx. weight, ocean packed	kg 2000	4408 lb	kg 2400	5291 lb

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