

# RTM 351



**Crankshaft grinder**

# The machine and its executions

The RTM351 Crankshaft Grinder, conceived and realized according to highly innovative criteria, is a structurally balanced and highly reliable machine, whose main features are the utmost precision and the top flexibility. Designed for the internal-combustion engine crankshaft reconditioning, it can, on request, be tooled up also for cylindrical grinding. The RTM351 is available in two executions:

“A” execution, suitable for regrinding crankshaft with different features and dimensions; “D” execution, same as the “A” execution but equipped with an electro-hydraulic appliance which allows also grinding of cylindrical components such as rollers, bars, etc.

In order to meet the manifold work requirements, the two

executions are available with two different center-to-center distances named RTM351/2400 and RTM351/3000.

The RTM351, as it comes complete with its standard outfit, can immediately be used for profitable operation.

Its performances are boosted by the addition of special devices such as: attachment for “in process” gauging (mechanical or hydraulic), hydraulic wheelhead plunge feed, hydraulic wheel dresser, etc.

The main technical and construction features of the RTM351 are:

- Top geometric precision and surface finish of the workpiece being ground because of the extreme sensitivity of the table movements and the

stiffness of the wheelhead assembly whose wheelspindle is supported, on 50% of its length, by special babbited bearing;

- Air-float headstock and tailstock;
- Workheads with four movements; radial and cross movements, 360° rotary motion and micrometer swing movement, for easy and fast centering of crankpins. Readings on workhead to hundredths of a mm (thou of an inch) can be both radial and crosswise;
- The clutch is mounted direct onto headstock spindle, with a view to obtaining fast and easy balancing of the masses in rotation. The clutch assembly has

furthermore been designed to obtain, at the start, an extremely smooth and gradual engagement, this being easily adjustable via the control lever;

- Transmission via highly flexible and resistant cogged belts, to ensure a constant and even workpiece rotation;
- Outboard counterweights are radially adjustable and protected by safety guards, in compliance with accident prevention regulations;
- Pushbutton panel with centralized low-voltage electric controls.

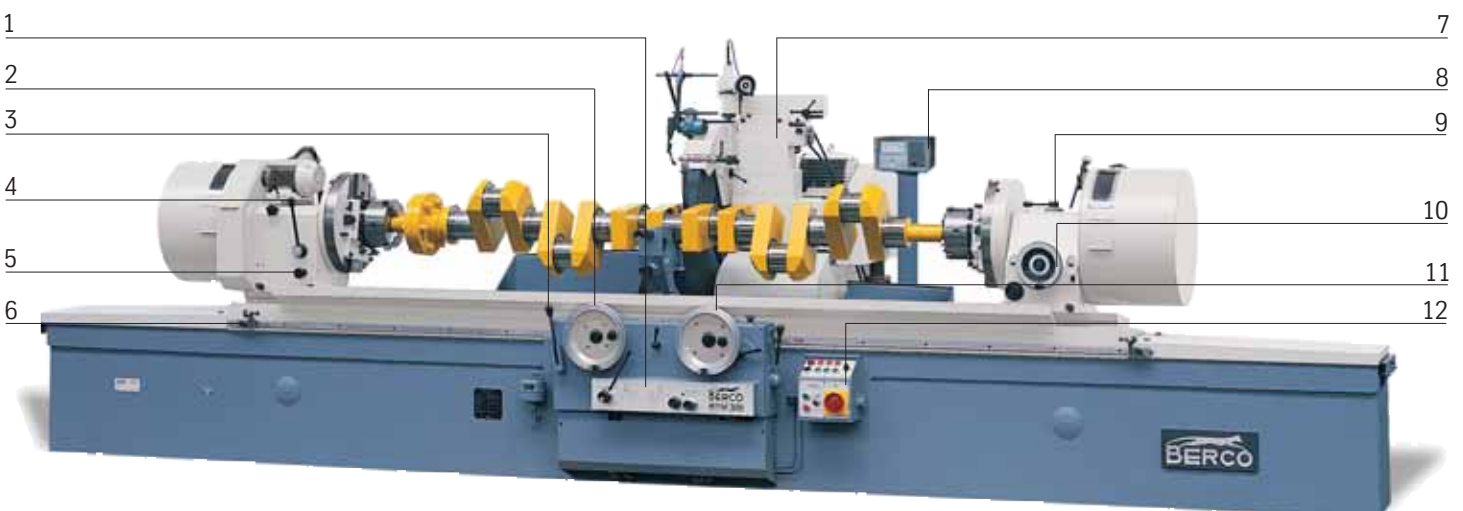
Both version can be supplied also with stepless variable speed workhead motor.

- 1 Wheelhead plunge feed control panel.
- 2 Table traverse control handwheel.
- 3 Fast table traverse control lever.

- 4 Crankshaft rotation control lever.
- 5 Faceplate lock knob.
- 6 Trip stop for automatic table traverse reverse.
- 7 Hydraulic wheel dresser.

- 8 Electronic “in process” sizing gauge.
- 9 Tailstock quill lock lever.
- 10 Tailstock quill feed control handwheel.

- 11 Wheelhead micrometer feed control handwheel.
- 12 Pushbutton panel.



**Fig. 1**  
General view of the RTM 351/3000 in the “D” execution.  
Some special devices, which make grinding easier and cut the machining times, are installed on the machine.

# Standard outfit



Fig. 2



Fig. 3



Fig. 4

Fig. 2  
Standard steady rests facing the main journals.

Fig. 3  
Workhead equipped with center driving plate.

Fig. 4  
Workhead equipped with selfcentering chuck.

- Cooling system complete with power pump, coolant tank and  $\frac{3}{4}$ " gas thread nozzle (fig. 9)
- Set of splash guards
- Grinding wheel, 915 mm (36") dia., 32 mm ( $1\frac{3}{4}$ ") wide, mounted on hub
- 1 wheel balancing arbor
- 1 grinding wheel puller
- 1 grinding wheel pulling tube
- 1 oversize motor pulley, to be used when the grinding wheel is worn
- 2 centers with nut for workhead
- 1 blunt center for workhead
- 1 center puller
- 2 self-centering chucks, 230 mm ( $9\frac{1}{64}$ ") dia., cpl. with 2 chuck wrenches (fig. 4)
- 2 driving plates (fig. 3)
- 2 driving dogs, 25-60 mm ( $1"-2\frac{3}{8}"$ ) capacity
- 2 driving dogs, 60-100 mm ( $2\frac{3}{8}" - 4"$ ) capacity
- 2 driving dogs, 100-150 mm ( $4" - 5\frac{15}{16}"$ ) capacity
- set of auxiliary counterweights for workheads (fig. 6)
- 2 standard steady rests (fig. 2)
- 1 tool kit containing: 1 center positioning checking attachment (fig. 6), 1 centering rod and 2 dial indicators for ditto
- 1 square for centering rod (fig. 8)
- DMI - attachment for taking the crank throw (fig. 7)
- DRM - attachment for dressing the grinding wheel face and corners (fig. 5); the wheel dressing diamond is available on request
- Set of levelling pads (13 pcs. for RTM 351/2400, 15 pcs. for RTM 351/3000)
- 1 lubrication gun and set of service spanners
- 2 kg (4.40 lb) wheelspindle oil





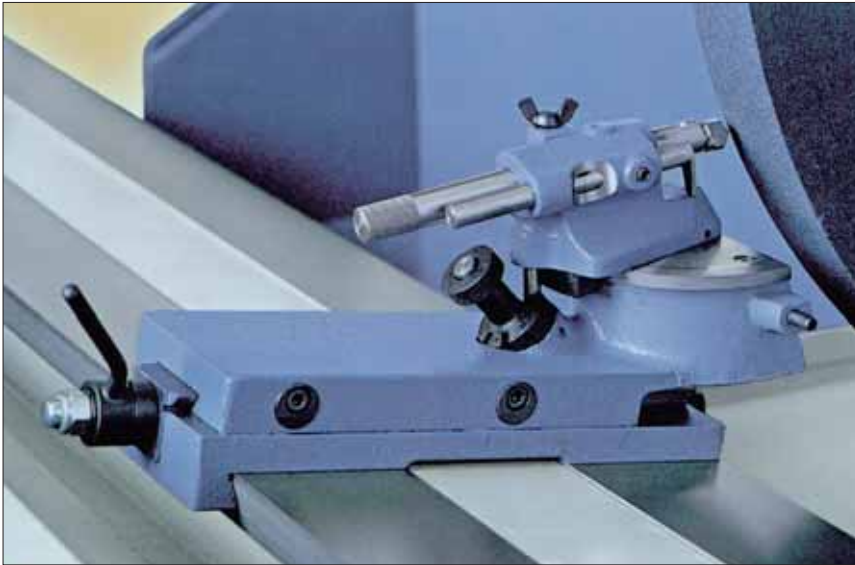


Fig. 5



Fig. 6



Fig. 7



Fig. 8

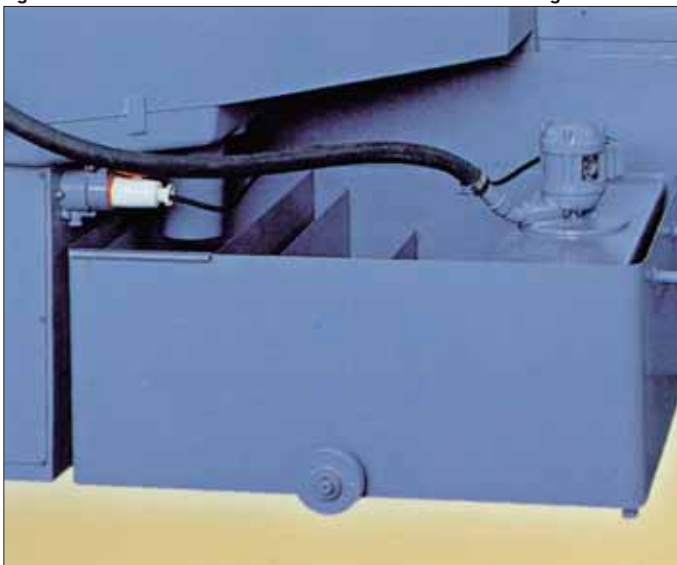


Fig. 9

Fig. 5  
DRM - Radius dresser: for dressing the grinding wheel face and corners, with the possibility to adjust the radius of the crankshaft journal fillet.

Fig. 6  
Center position checking attachment resting onto workhead gauge blocks; the auxiliary counterweights are mounted onto the faceplate.

Fig. 7  
DMI - attachment for taking the crank throw.

Fig. 8  
Centering rod mounted onto the check square.

Fig. 9  
Coolant tank with power pump.

Fig. 10  
AEM - electronic "in process" sizing gauge, complete with PSM 127 attachment; the measuring head is to be located into the dial indicator seat, as shown in the illustration.

Fig. 11  
DRMY - hydraulic wheel dresser.

Fig. 12  
PSM 127 - continuous measurement attachment.

# Extra outfit

- Grinding wheels, 915 mm (37") dia. x 350 mm (12") hole, 20 mm ( $5/16$ "), 25 mm (1"), 40 mm ( $1\ 37/64$ "), 50 mm ( $1\ 9/16$ "), and 63 mm ( $2\ 1/2$ ") wide, part Nos. U812140170, U812140180, U812140200, U806140070 and U811140030
- coolant nozzle,  $1/2$ " gas part No A01.26703
- DRFM - attachment for dressing and chamfering the grinding wheel face and dressing and tapering the grinding wheel sides (less diamond); part No. A00A22750 (fig. 16)
- DRMY - hydraulic wheel dresser (less diamond) draw. No. V10A22006 (fig. 11)
- DRP - center grinding attachment; part No. A00A22775 (fig. 15)
- DAMY - hydraulically - operated wheelhead plunge feed device (suitable for "A" and "D" execution: refer to fig. 1, item 6) draw. No. V09A22014
- LU/S - narrow steady rest; draw. No. A00A22650
- LUS/DC - narrow steady rest with builtin centering fixture, less dial indicator (use the one supplied with the machine); draw. No. A00A22675 (fig. 14)
- AEM - electronic "in process" sizing gauge; draw No. V26A17002 (fig. 10)
- PSM 127 - continuous measuring attachment; draw. No A00.64800A (fig. 12)
- DCST/CT - unit for checking tailstock cross traverse (less indicator); draw No. V11A17002
- COS M/50 - magnetic



Fig. 10

- coolant clarifier with tank in replacement of the standard coolant tank; part No. V08022016 (fig. 17)
- Gravity filtering clarifier with tank, in replacement of the standard coolant tank; part No. V08A14002
- AES 500 - static balancer, part No. A00.61200C (refer to loose leaflet)
- SFN/2B - portable belt type superfinisher, part No. A00.81580 (fig. 13)
- 2.5 K wheel dressing diamond, part No. C465908000
- Collapsible table way covers, for RTM 351/2400 execution part No. V05A22006 (pair assembled on the machine); for RTM 351/3000 part No. V05A22008
- LU - Special steady rest  $135 \div 255$  mm ( $5\ 5/16$ " -  $10\ 3/64$ ") capacity; draw. No. A00A22950
- Wheelhead and table digital reading position control device; part. No. V11A22002.



Fig. 11

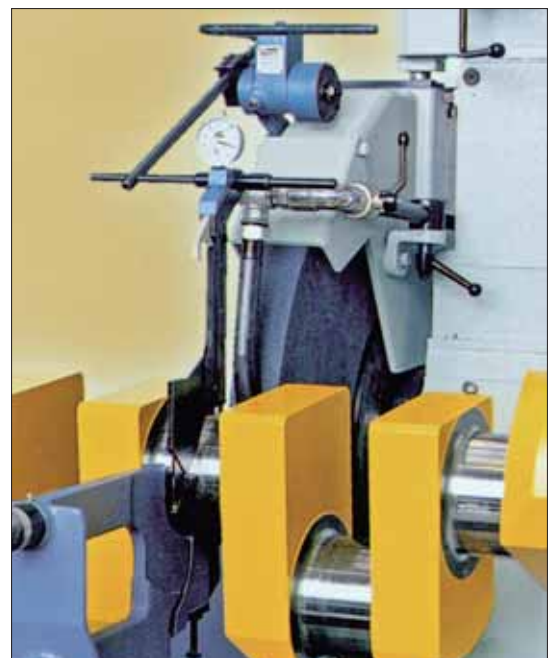


Fig. 12



# The machine and its components



Fig. 13

Fig. 13  
SFN/2B - portable belt type  
superfinisher.

Fig. 14  
LUS/DC - narrow steady rest with  
built-in centering fixture.

Fig. 15  
DRP - centering grinding  
attachment. The flexible drive shaft  
is connected direct to the  
headstock.

Fig. 16  
DRFM - attachment for dressing  
and chamfering the grinding wheel  
face and tapering the grinding  
wheel sides.

Fig. 17  
Cooling system with magnetic  
coolant clarifier and tank.



Fig. 14



Fig. 15

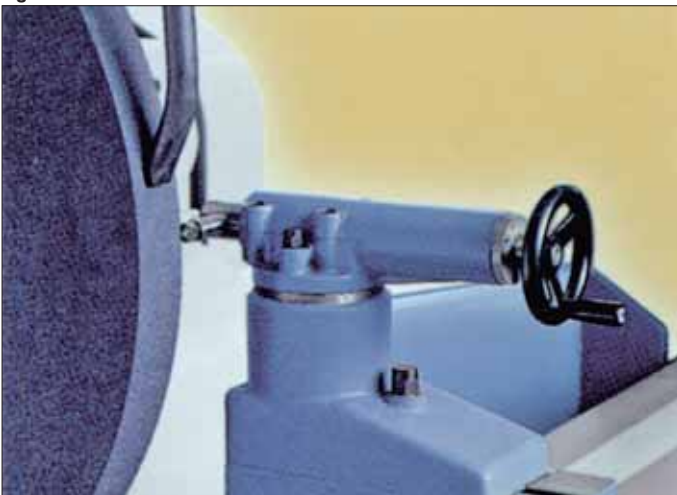


Fig. 16

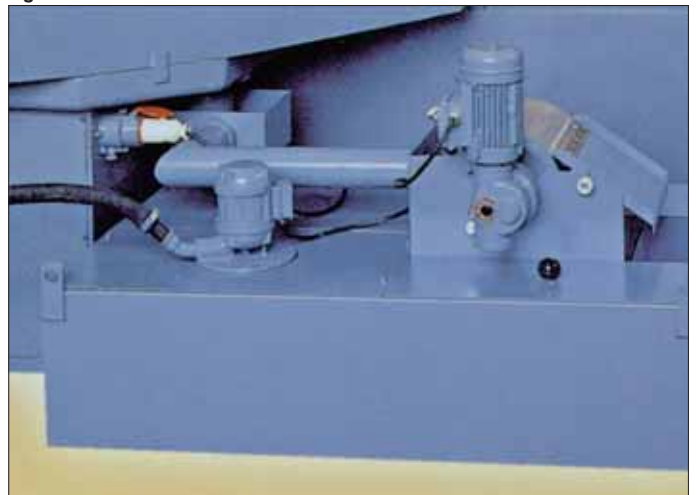
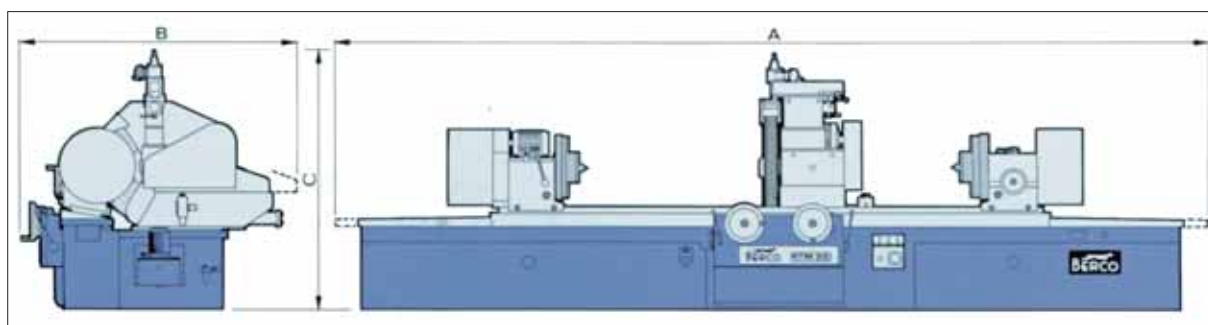


Fig. 17

# Technical data



		RTM 351/2400		RTM 351/3000	
<b>Working capacity</b>					
Max. diameter ground with full-size wheel	mm	260	10 <sup>15</sup> / <sub>64</sub> "	260	9 <sup>15</sup> / <sub>64</sub> "
Max. swing over table	mm	700	27 <sup>1</sup> / <sub>2</sub> "	700	27 <sup>1</sup> / <sub>2</sub> "
Min. diameter admitted in steady rests	mm	60	2 <sup>23</sup> / <sub>64</sub> "	60	2 <sup>23</sup> / <sub>64</sub> "
Max. diameter admitted in steady rests	mm	180	7"	180	7"
Max. eccentricity of workheads (throw)	mm	170	6 <sup>11</sup> / <sub>16</sub> "	170	6 <sup>11</sup> / <sub>16</sub> "
Max. weight admitted between centers	kg	800	1760 lb	800	1760 lb
<b>Geometric features</b>					
Height of centers over table	mm	350	13 <sup>3</sup> / <sub>4</sub> "	350	13 <sup>3</sup> / <sub>4</sub> "
Max. distance between centers	mm	2400	94 <sup>31</sup> / <sub>64</sub> "	3000	118 <sup>7</sup> / <sub>64</sub> "
Max. distance between chucks	mm	2360	93"	2960	116 <sup>1</sup> / <sub>2</sub> "
Self-centering chuck diameter	mm	230	9"	230	9"
Max. grinding wheel diameter	mm	915	36"	915	36"
Min. grinding wheel width	mm	20	2 <sup>5</sup> / <sub>32</sub> "	20	2 <sup>5</sup> / <sub>32</sub> "
Standard grinding wheel width	mm	32	1 <sup>1</sup> / <sub>4</sub> "	32	1 <sup>1</sup> / <sub>4</sub> "
Max. grinding wheel width	mm	63	2 <sup>1</sup> / <sub>2</sub> "	63	2 <sup>1</sup> / <sub>2</sub> "
<b>Wheelhead</b>					
Travel, fast	mm	170	6 <sup>11</sup> / <sub>16</sub> "	170	6 <sup>11</sup> / <sub>16</sub> "
Travel, fine	mm	230	9"	230	9"
Feed per turn of handwheel	mm	1	0,04"	1	0,04"
<b>Headstock</b>					
Workpiece rotationspeed (6)	r.p.m.		12 21 24 33 42 66		12 21 24 33 42 66
*Workpiece rotation speed (stepless)	r.p.m.		9-50		9-50
<b>Table</b>					
Micrometer feed per turn of the handwheel	mm	3,6	0,14"	3,6	0,14"
Fast traverse speed, per minute	mm	3600	141 <sup>47</sup> / <sub>64</sub> "	3600	141 <sup>47</sup> / <sub>64</sub> "
Slow traverse speed, steplessly adjustable (only for D execution), per minute	mm	45-250	1 <sup>25</sup> / <sub>32</sub> - 10"	45-250	1 <sup>25</sup> / <sub>32</sub> - 10"
(for "DR" execution)	mm			85-650	3 <sup>11</sup> / <sub>32</sub> - 25 <sup>1</sup> / <sub>2</sub> "
<b>Motor rating</b>					
Wheelhead	kW	5,5	(7,5 HP)	5,5	(7,5 HP)
Headstock	kW	0,8-0,45	(1-0,06 HP)	0,8-0,45	(1-0,06 HP)
*Headstock	kW	3,8-0,6	(4,6-0,8 HP)	3,8-0,6	(4,6-0,8 HP)
Fast table traverse	kW	0,55	(0,75 HP)	0,55	(0,75 HP)
Slow table traverse (only for D execution)	kW	0,6	(0,85 HP)	0,6	(0,85 HP)
Hydraulic system	kW	0,55	(0,75 HP)	0,55	(0,75 HP)
Cooling system	kW	0,15	(0,2 HP)	0,15	(0,2 HP)
<b>Dimensions and masses</b>					
Lenght A	mm	7428	292 <sup>7</sup> / <sub>16</sub> "	9514	374 <sup>9</sup> / <sub>16</sub> "
Width B	mm	2245	88 <sup>1</sup> / <sub>32</sub> "	2245	88 <sup>1</sup> / <sub>32</sub> "
Height C	mm	2040	80 <sup>1</sup> / <sub>32</sub> "	2040	80 <sup>1</sup> / <sub>32</sub> "
Approx. weight, unpacked	kg	5600	12345 lb	6040	13315 lb
Approx. weight, ocean packed	kg	6700	14770 lb	7500	16534 lb

Measurements, weights and executions can be changed without previous notice. Motor rating is referred to 50 Hz frequency.

\*Data valid for machines with stepless variable speed workhead motor.



ISO 9001 Cert. n. 0029/4

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00804.WM105GB00A



Published by Berco Communications Dept.

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