SPECIFICATIONS

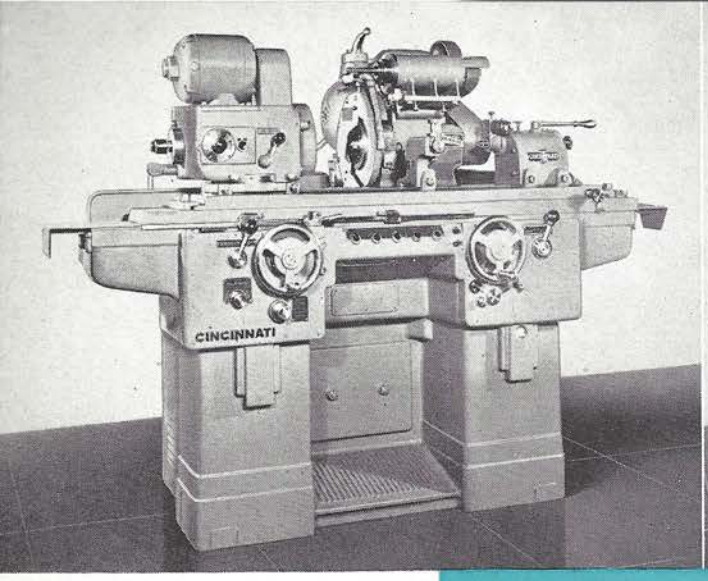
Cincinnati

FILMATIC

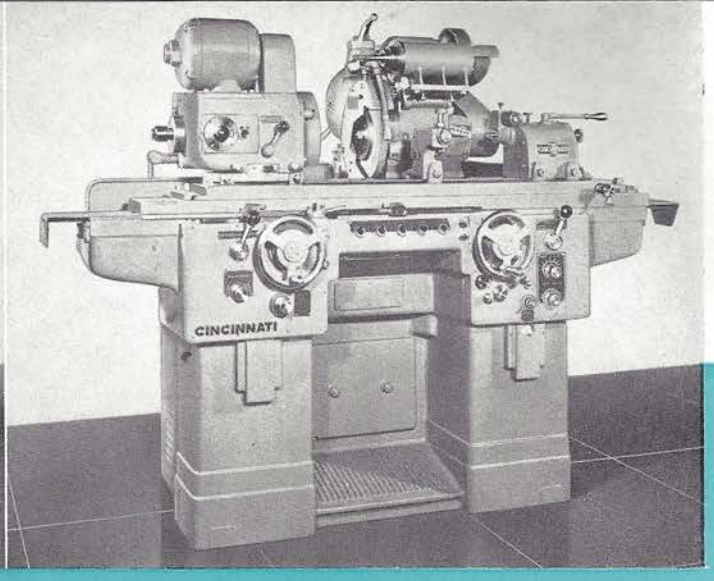
10" HYDRAULIC UNIVERSAL GRINDING MACHINE

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO, U.S.A.

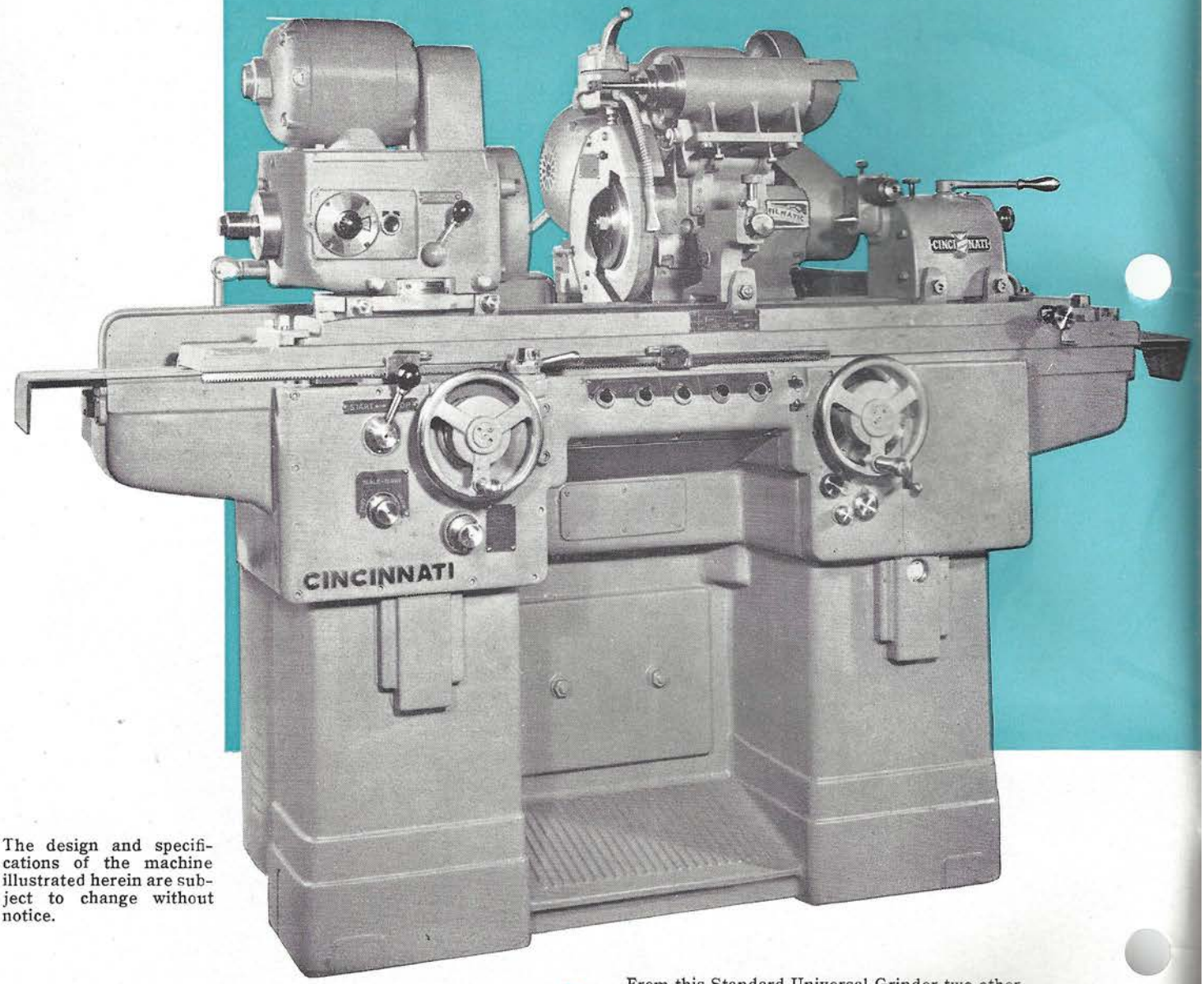
Publication No. G-577



2. Here the machine is equipped with the Hand Hydraulic Infeed Attachment for semi-production work. The rapid advance, grind, and rapid return of wheelhead is manually controlled by a single lever.



3. For production work, the Automatic Infeed Attachment is applied. This features the fully automatic grinding cycle of rapid advance, grind, tarry, and rapid return of wheelhead actuated by one movement of a single lever.



The design and specifications of the machine illustrated herein are subject to change without notice.

1. From this Standard Universal Grinder two other styles are built, both of which lend themselves to production work without sacrificing their tool-room versatility and usefulness.

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FILMATIC

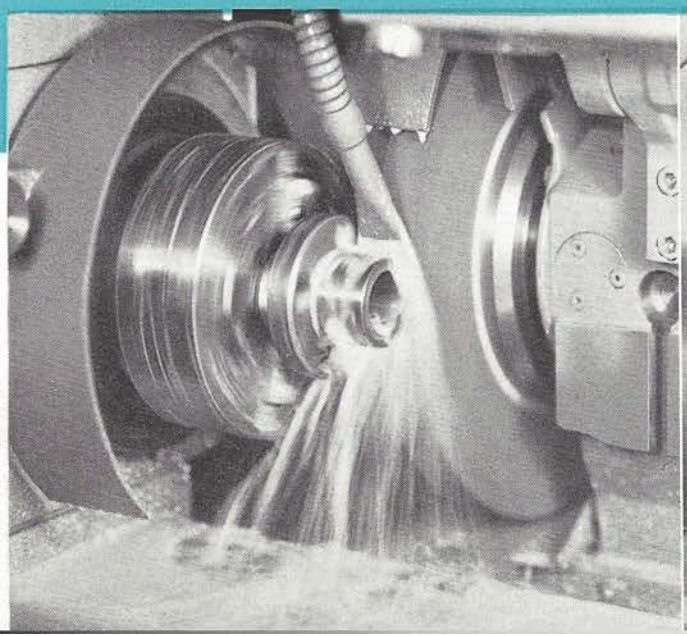
10″ HYDRAULIC UNIVERSAL GRINDING MACHINE

This New Filmatic 10″ Universal Grinding Machine has the kinds and ranges of adjustment which make it a true universal, including the hinged internal grinding attachment, but it also has many plus features distinctly of a production type: Electronic infinitely variable headstock drive with spindle jog button, sit-down operating position, adjustable spring-loaded lever-action footstock, micrometer diamond truing bracket, single-lever control of traverse, headstock rotation, and coolant; adaptability for hand or full automatic infeed.

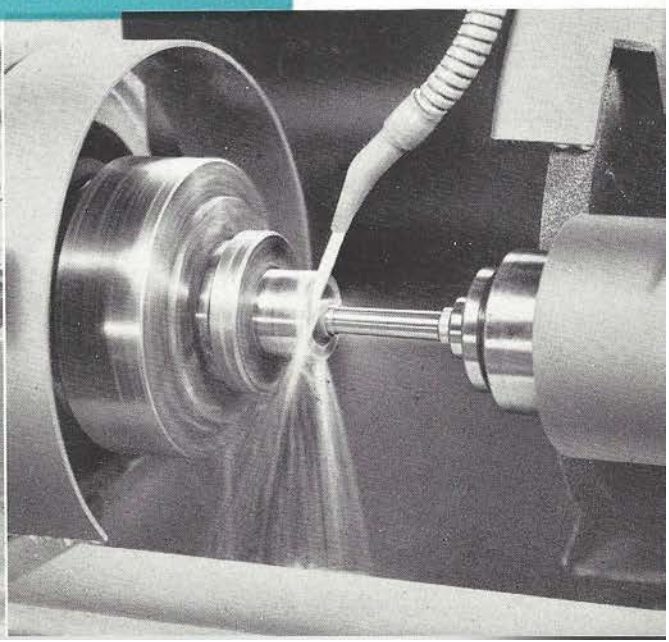
For grinding small diameters on parts swinging up to 10 inches, setups are quickly made and production rates easily maintained, whether for straight cylindrical or internal, bevel, taper, shoulder, face, or chucking work.

Sizing accuracy and finish quality are just as outstanding as the ease of operation would suggest. This machine, like all other Cincinnati Grinding Machines is equipped with efficient, long-life Filmatic spindle bearings.

There are many jobs, such as this hydraulic cylinder head, where absolute concentricity is necessary. The external grinding operation on this part is illustrated below.



Without disturbing the set-up, the Hinged Internal Grinding Attachment is swung down into position for grinding the hole. There's no doubt about concentricity when done in this manner.



HIGHLIGHTS OF DESIGN . . . and

① *Filmatic Grinding Wheel Spindle Bearings*—An important factor in producing fine finishes without regard to the skill of the operator; eliminate bearing maintenance; self adjusting.

② *Hinged Type Internal Grinding Attachment*—Eliminates most of the set-up time for internal work. External and internal grinding may be completed in one chucking of the work. Attachment can be easily swung out of grinding position or removed from machine.

③ *Electronic Headstock Drive*—Provides a smooth drive of infinitely variable speeds in a 10 to 1 ratio. A built-in jog button enables the operator to position the spindle to facilitate the loading and unloading of work.

④ *Infinitely Variable Work Speeds, 60 to 600 r. p. m.*—The correct work speed for the job is instantly available through a small control knob. There are no gears, chains or any other metal-to-metal contact in the headstock drive.

⑤ *Infinitely Variable Table Traverse Rates, 3″ to 280″ Per Minute*—A sufficient range for a wide variety of grinding jobs.

⑥ *Exceptionally Accurate Sizing Adjustment*—In increments as small as .0001″ on work diameter.

⑦ *Accuracy of Table Reversal Within .001″*—A desirable feature when grinding next to a shoulder; reduces work spoilage and occupational hazard.

⑧ *Single Lever Control*—Starts table traverse, work rotation, and coolant flow. Save operator's energy for loading and unloading work.

⑨ *Positive Stop for Cross Feed Handwheel*—For accurate sizing hand infeed jobs.

⑩ *Dog-Controlled Table Reciprocation from $\frac{1}{16}$″ to full stroke*—Exceptionally short work may be ground by traverse method, simulating plunge-cut grinding. Dogs readily adjustable.

⑪ *Rapid and Visible Pick Feed Adjustment*—Direct dial readings; instantaneous selection.

⑫ *Full Length for Table*—At extreme ends of stroke, center of gravity of headstock and footstock is within the bed; no deflection from weight of these units.

⑬ *Built-in Electrical Control Buttons*—Conveniently located on inclined surface above knee space; easy to read instruction plates.

⑭ *Micrometer Wheel Truing Adjustment*—On footstock truing device . . . minimizes cut-and-try in resetting after dressing the grinding wheel.

Accruing Benefits

⑮ *Lever Type Footstock*—Quickly retracts center, saves time and energy in the loading and unloading of work.

⑯ *Automatic Pressure Lubricating System for Table and Wheelhead Ways*—With filtered oil to maintain long life.

⑰ *Bed Recessed for Ample Knee Space*—Machine may be conveniently operated while sitting down.

ADDITIONAL HIGHLIGHTS . . . For Machines With Extra Cost Equipment

① *Automatic Infeed Attachment*—Wheelhead is hydraulically operated through its entire automatic cycle of rapid advance wheel to work, grind, tarry, and return. Movement is adjustable between $\frac{3}{8}$″ to 1″ for loading and inspecting work. Headstock rotation and coolant flow are also automatically controlled. This attachment makes it possible to do both toolroom jobs and large production runs on the same machine. Operator can dog the second piece while the machine automatically finish grinds the first piece to size.

② *Hand Hydraulic Infeed Attachment*—Hydraulically operated with quick retraction to wheelhead. Movement is adjustable between $\frac{3}{8}$″ and 1″ for loading and inspecting work. Useful for hand infeed and traverse grinding. Its operation automatically controls headstock rotation and coolant flow.

③ *Draw-in Collet Mechanism for Headstock*—For production jobs requiring rapid accurate chucking of work piece. Can also be used advantageously in many toolroom set-ups. The complete set of fifteen collets will handle diameters from $\frac{1}{8}$″ to 1″ in $\frac{1}{16}$″ increments. This mechanism can be quickly removed from headstock spindle when job is completed. Can be supplied in either screw or lever type.

④ *Positive Stop for Table*—Useful for face grinding operations. A graduated micrometer screw with $\frac{3}{8}$″ adjustment provides means for sizing and compensating for wheel wear.

⑤ *Indicator Attachment*—To assist in adjusting the taper of the swivel table when grinding taper work. The attachment includes a .001″ dial indicator.

⑥ *Quill Collet Chuck*—Used in connection with mounted grinding wheels for grinding small holes. Mounts directly in internal attachment spindle. There are seven collets available for handling any shaft diameter from .0135″ to $\frac{1}{4}$″.

⑦ *High-Speed Spindle*—25,000 r. p. m. This spindle along with the Quill Collet Chuck (item 6) and mounted wheels makes it possible to grind the smallest holes in such common parts as drill bushings and hardened liners.

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MACHINE DESCRIPTION . . .

Grinding Wheel Spindle and Bearings

CINCINNATI Filmatic 10″ Hydraulic Universal Grinding Machines have the exclusive FILMATIC bearings for the grinding wheel spindle. They are multiple shoe construction, steel backed and bronze lined, and self-adjusting for variations in load resulting from heavy or light cuts. Completely submerged in oil, the shoes create self-renewing wedge shaped oil films which rigidly and accurately support the spindle at all times. If the oil level falls below the safe limit, a float switch automatically cuts out the grinding wheel drive motor, protecting the bearings against neglect. A simple, reliable construction; no seizing under heavy, roughing cuts; smooth running for high-grade finishing cuts.

The grinding wheel and driving sheave are located exceptionally close to front and rear bearings respectively. This design provides the maximum rigidity for the spindle and aids in producing fine finishes.

Wheelhead

The grinding wheel spindle is driven direct from the motor by means of multiple V-belts. These belts, matched for uniformity of pitch length, each transmit an equal load and therefore have the longest possible life span. Outboard drive simplifies the service job of replacing worn belts. Two grinding wheel speeds are obtained, through a fool-proof arrangement, which provides maximum efficiency throughout the life of the wheel.

Liberal bearing areas and narrow guides promote smooth cross adjustment and accuracy throughout the life of the machine.

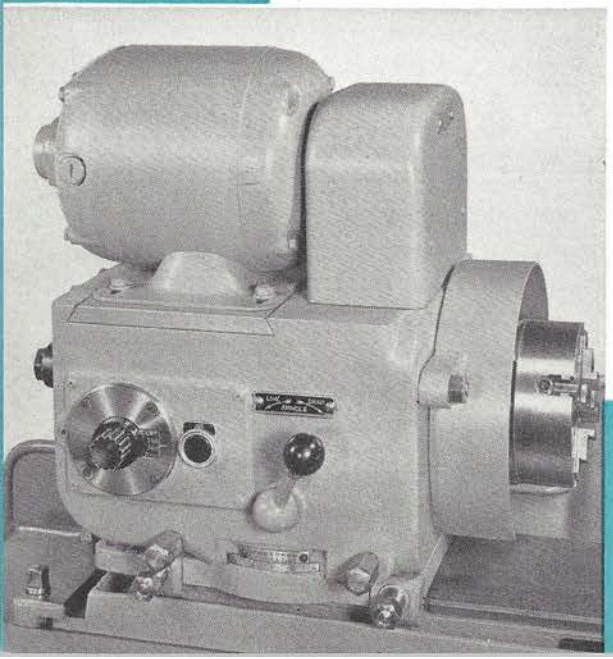
Headstock

The headstock is equipped with a Thymotrol Drive which provides infinitely variable spindle speeds from 60 to 600 r.p.m. Speeds are quickly and easily changed by rotating a small control knob on the front of the headstock.

Anti-friction bearings carry the spindle and are adjusted with a single adjusting nut at the rear. A No. 5 American Stan[illegible]l Lathe Spindle Nose permits the chuck and face plate to be quickly interchanged. A self-centering friction type brake, actuated by a small lever on front of headstock, provides a secure spindle lock regardless of spindle position. The built-in jogging switch is used to position the spindle to facilitate the loading and unloading of work.

Headstock lubrication is obtained through one oiling station. Oil is gravity fed from oiler through tubing to the various bearings.

The Electronic Unit converts A. C. to D. C. to power the ½ h.p. headstock motor. Power is transmitted directly from the motor to the spindle through a flat endless belt. There are no gears, chains, or any other metal-to-metal contact in the spindle drive. A double set of sheet metal guards keeps oil and dirt from contacting the drive belt. Belt adjustment is made by shifting the headstock motor.



Headstock unit showing speed control knob, spindle jog button, vernier scale, and spindle lock.

Footstock unit showing micrometer truing bracket and spindle operating lever.

Table Traverse

Power table traverse, hydraulically operated, provides infinitely variable feeds from 3″ to 280″ per minute.

The hand table traverse is mechanically operated. This arrangement provides two rates: rapid for setting up and for long movements; slow for shoulder grinding.

Table reciprocation may be set as short as $\frac{1}{16}$″. The mechanism trips very accurately, within .001″, allowing the operator to confidently grind close to shoulders. The traverse handwheel is stationary and inoperative when the power traverse is engaged; a safety factor for both the operator and machine.

With table reciprocation set for the minimum stroke of $\frac{1}{16}$″, two advantageous possibilities arise: A—It produces an effect comparable to a reciprocating grinding wheel spindle, eliminating the need for such a construction. B—With the automatic pick feed engaged during the minimum stroke and the table reciprocating, an automatic plunge cut effect will be obtained. Then, too, short work barely longer than the width of the wheel may be ground in the conventional manner.

Footstock

The footstock is lever operated. A knurled knob at the rear of the spindle provides a means for adjusting the spring tension thus insuring the proper center pressure with regards to the weight and size of the work piece. Footstock spindle is located in two sets of segmental bearings, consisting of three shoes each, for ease of adjustment and minimum spindle displacement. A conveniently located knurled screw securely locks the spindle. An adjustable diamond truing bracket is mounted directly on the footstock. Diamond adjustment is made by means of a graduated micrometer dial fitted to an adjusting screw. A lock screw is provided for locking diamond adjustment before truing.

Cross Traverse

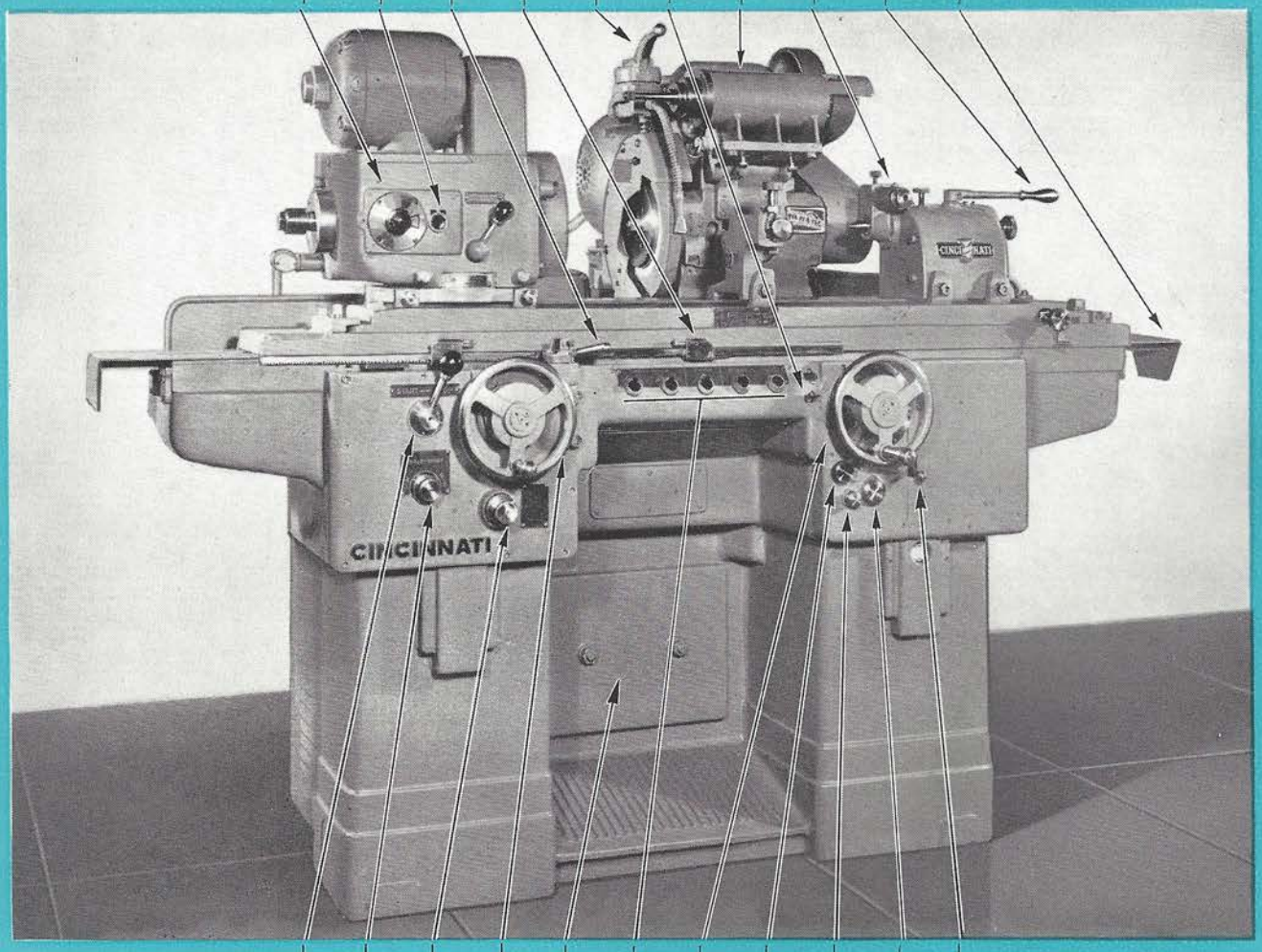
The exceptionally accurate cross feed mechanism is fitted with a large micrometer dial and can easily handle fine diameter reductions of .0001″. Automatic pick feed is engaged by simply pushing a button and is selective from .0025″ to .0001″ diameter reduction at each table reversal. An internally mounted dog stops the pick feed action approximately .001″ before the cross feed micrometer dial reaches zero, permitting the operator to finish to size by hand.

Controls

Electrical control buttons are conveniently grouped on an inclined surface directly in front of the operator. All table controls are to the left and all cross feed controls to the right. This grouping of common function controls simplifies the machine's operation. All control dials are easy to read and accurately calibrated. The various knobs and handles are easily reached from the operator's normal working position.

10" HYDRAULIC UNIVERSAL GRINDING MACHINE

FUNCTIONAL DIAGRAM

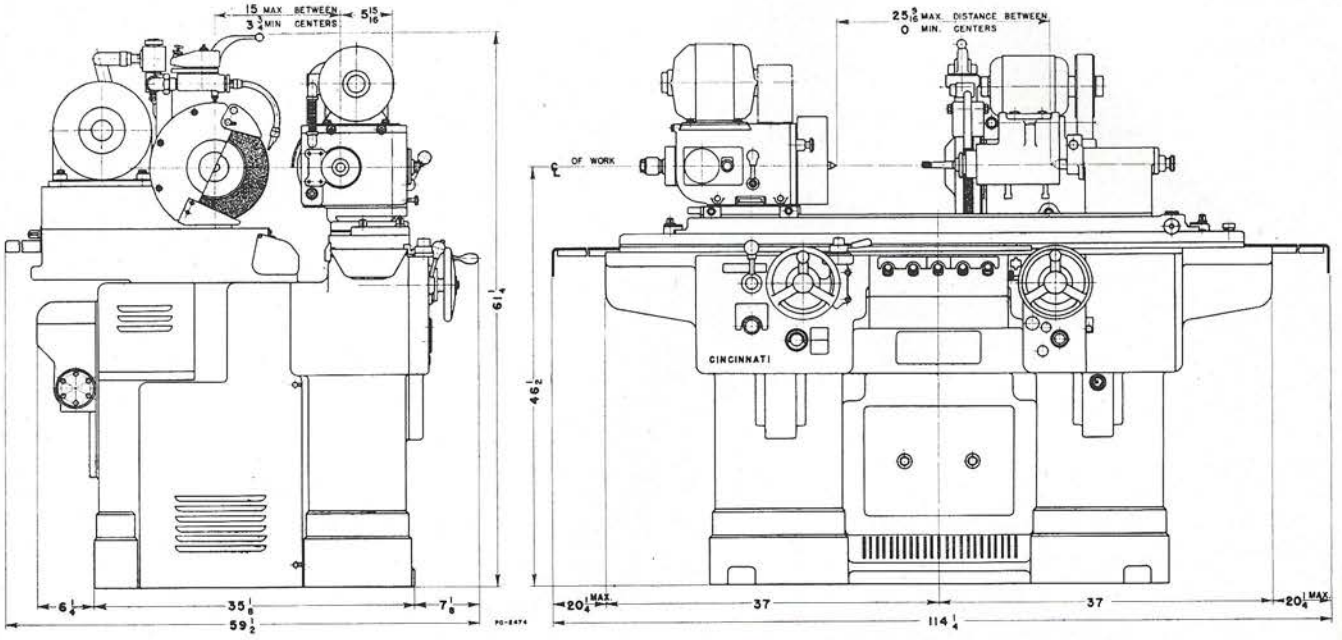


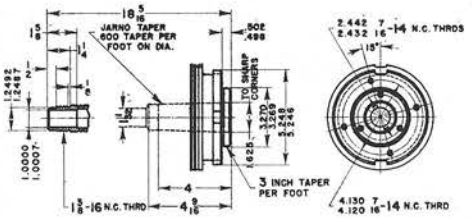
GENERAL SPECIFICATIONS (Model OL)

	10″ x 24″
CAPACITY	
Maximum swing over table	$10\frac{15}{16}$″
Maximum diameter machine will grind with full size wheel (12″ diam.)	$10\frac{15}{16}$″
Minimum diameter of grinding wheel	$7\frac{1}{2}$″
Minimum diameter of grinding wheel for grinding 0″ diameter of work	
Between centers	$9\frac{1}{2}$″
Work held in chuck	$7\frac{1}{2}$″
Nominal distance between centers	$25\frac{9}{16}$″
Swivel table graduated to an angle of — toward wheelhead	8°
Swivel table graduated to an angle of — away from wheelhead	3°
Swivel table graduated taper per foot — toward wheelhead	$4\frac{1}{2}$″
Swivel table graduated taper per foot — away from wheelhead	2″
GRINDING WHEELHEAD	
Distance between inner edge of wheel and front ege of front bearing	1″
Grinding wheel regularly supplied (diameter, face, and hole)	12″x1″x5″
Swivel range — lower swivel, right and left	110°
Swivel range — upper swivel, right and left	90°
HEADSTOCK AND FOOTSTOCK	
Headstock and Footstock center taper	Jarno No. 7
Number of work rotation speeds	Infinite
Range of work speeds	60 to 600 r.p.m.
Headstock spindle nose—American Lathe Standard	5″
MISCELLANEOUS	
Number of Table Traverse Speeds	Infinite
Range of table traverse speeds (inches per minute)	3″ to 280″
Accuracy of table reversal at all traverse rates	.001″
Table tarry adjustment—Infinite	0 to 5 sec.
Mechanical hand table traverse—rate per revolution at handwheel — rapid	1″
Mechanical hand table traverse—rate per revolution at handwheel — slow	$\frac{1}{16}$″
Distance from floor to work centers	$46\frac{1}{2}$″
Automatic infeed at table reversal (diameter reduction) — minimum	.00025″
Automatic infeed at table reversal (diameter reduction) — maximum	.005″
Minimum movement necessary to reverse the table	$\frac{1}{16}$″
Wheelhead movement per turn of handwheel — minimum	.0005″
Wheelhead movement per turn of handwheel — maximum	.050″
Minimum infeed increment in terms of diameter reduction	.0001″
POWER REQUIREMENTS	
Wheelhead motor	$1\frac{1}{2}$ h.p.
Internal grinding attachment motor	1 h.p.
Hydraulic pump motor	$\frac{3}{4}$ h.p.
Headstock motor	$\frac{1}{2}$ h.p.
Coolant pump motor	$\frac{1}{4}$ h.p.
FLOOR SPACE REQUIRED	$59\frac{1}{2}$″x$114\frac{1}{2}$″
CODE NAME	
A. C. Equipment	OLGAC
D. C. Equipment	OLGDC
SHIPPING DATA	
Net Weight	4900 lbs.
Domestic shipping	6100 lbs.
Export shipping	6900 lbs.
Approximate size of case	120″x60″x62″
Approximate volume of case, cubic feet	258
INTERNAL GRINDING ATTACHMENT	Included
Recommended range of hole diameters (with standard quill)	$\frac{7}{8}$″ to $1\frac{1}{2}$″
Maximum depth of hole (with standard quill)	$2\frac{1}{2}$″

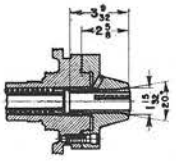
10" HYDRAULIC UNIVERSAL GRINDING MACHINE

DIMENSIONAL DRAWING

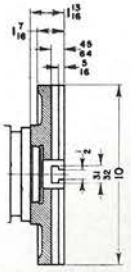




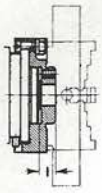
5 INCH LATHE STANDARD SPINDLE NOSE



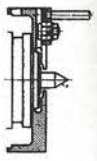
DRAW-IN COLLET



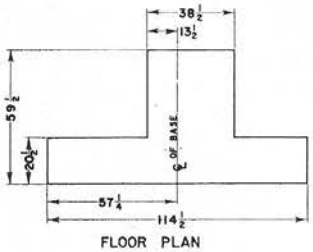
FACE PLATE



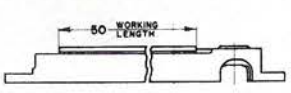
QUICK CHANGE ADAPTER FOR CHUCK & FACE PLATE



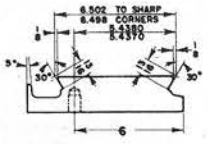
WORK DRIVER



FLOOR PLAN



SWIVEL TABLE



EQUIPMENT

STANDARD EQUIPMENT SUPPLIED WITH MACHINE

1. Headstock—Swivel base, combination live and dead spindle, having 5″ Lathe Standard Spindle Nose. Headstock spindle has a No. 14 Jarno Taper. Includes No. 7 Jarno Adapter and Center.
2. Footstock—Lever type with micrometer diamond holder bracket and diamond holder (without diamond or nib). Footstock spindle has No. 7 Jarno Taper. Center included.
3. Back Rests (Two)—Two-shoe, two-screw type maple wood shoes, $\frac{1}{8}$″ to 2″ capacity.
4. Center Rest—$\frac{1}{2}$″ to 3″ maximum work diameter.
5. Diamond Bracket—Table type for external and internal truing. (Does not include diamond or nib.)
6. Internal Grinding Attachment—Hinged type, including fitted bracket, one spindle No. 242409, quill No. 233630, two grinding wheels No. 221494, motor pulley and one driving belt.
7. Chuck—6″ four-jaw, independent (light pattern iron body with solid reversible jaws). Mounts directly on spindle nose.
8. Face Plate—10″ diameter. Mounts directly on spindle nose.
9. Wheel Mount—Balancing type, for 5″ hole wheels up to 1″ web thickness.
10. Grinding Wheel—One 12″ diameter x 1″ face x 5″ hole.
11. Work Driving Dogs—Reversible type—one $\frac{1}{4}$″ to $2\frac{1}{2}$″ capacity, and one $2\frac{1}{2}$″ to 4″ capacity.
12. Wheel Guard, Reversible—For wheels up to 12″ diameter x $1\frac{1}{2}$″ face, with coolant piping and nozzle.
13. Coolant Pump—Motor driven, including $\frac{1}{4}$ h.p. motor, controls, wiring, complete piping and diaphram valve.
14. Wrenches and Splash Guards.
15. Center Knockout Bar.
16. Reciprocating Table Movement—Table can be set to reciprocate at a minimum stroke of $\frac{1}{16}$″.
17. Complete Electrical Equipment for 50 or 60 cycle, 2 or 3 phase, 220 to 550 volts A. C. and wired in accordance with the "Machine Tool Electrical Standards". (See item 25, page 12, for electrical variations.)

EQUIPMENT SUPPLIED AT EXTRA COST

1. Hand Hydraulic Infeed Attachment—Hydraulically operated with quick retraction to wheelhead. Movement is adjustable between $\frac{3}{8}$″ and 1″ for loading and inspecting work. Useful for hand infeed and for traverse grinding. Its operation automatically controls starting and stopping of headstock rotation and coolant flow. Must be built into machine at factory.
2. Automatic Infeed Attachment—Hydraulically operated for automatic plunge cut grinding. Complete cycle (rapid advance wheel to work, grind, tarry and return) is automatic, started by one movement of the hand. Movement is adjustable between $\frac{3}{8}$″ and 1″ for loading and inspecting work. Includes mechanism for automatic starting and stopping of coolant flow and headstock rotation. Must be built into machine at factory.
3. Draw-in Collet Attachment for Headstock—Includes adapter for spindle nose and lever at rear of spindle to operate chuck.
4. Draw-in Collet Attachment for Headstock—Includes adapter for spindle nose and handwheel at rear of spindle to operate chuck.
5. Collets for the Draw-In Collet Attachment (Items 3 and 4)—$\frac{1}{8}$″, $\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{7}{16}$″, $\frac{1}{2}$″, $\frac{9}{16}$″, $\frac{5}{8}$″, $\frac{11}{16}$″, $\frac{3}{4}$″, $\frac{13}{16}$″, $\frac{7}{8}$″, $\frac{15}{16}$″, and 1″ diameter.
6. Permanent magnetic chuck with adapter—9″ diameter.
7. Double Shaft Motor—Should be supplied if wheel and guard are reversed for face grinding operations. Includes motor sheave guard, additional motor sheave, and extra coolant piping.
8. Positive Stop with $\frac{3}{8}$″ Micrometer Screw Adjustment—For positioning the table accurately when doing face grinding operations.
9. Indicator Attachment—To assist in adjusting the taper of the swivel table when grinding taper work. Includes .001″ dial indicator.
10. Extra Headstock or Footstock Center—No. 7 Jarno Taper.
11. Half Center for Footstock—For $\frac{1}{4}$″ minimum work diameter; $\frac{3}{4}$″ length of flat measured from point. For other half centers, specify work diameter and length of flat (measured from point) desired.

EQUIPMENT (Concluded)

12. Face Plate—5″ diameter.

13. Balancing Arbor for Grinding Wheel—Size No. 4 (Part No. 226874).

14. Balancing Stand for Grinding Wheel—Size No. 1 (20″ swing, sensitive way, Part No. 226679).

15. Extra Grinding Wheel Mounts—Separate wheel mount recommended for each wheel regularly used.

16. Quick Change Adapter—For face plate or chuck, complete with special L-head bolts.

17. Back Rest—Spring type, $\frac{1}{8}$″ to 1″ capacity. Two recommended.

18. Cam Grinding Attachments—Made to order. Submit prints of work.

19. Radius Truing Attachment for either 0″ to $\frac{3}{4}$″ Convex, or $\frac{3}{8}$″ to $\frac{7}{8}$″ Concave radius depending upon which diamond block is used. Attachment includes one diamond block for either convex or concave radii but does not include diamond. (See item 20 for extra diamond blocks.)

20. Extra Diamond Blocks for above attachment.

21. High-Speed Internal Grinding Attachment Spindle—25,000 r.p.m. Includes one spindle No. 243234, one quill No. 221492, two grinding wheels No. 221494, and one driving belt.

22. Removable Quill Collet Chuck—Mounts directly into internal grinding attachment spindle. Used in connection with mounted grinding wheels. A total of seven collets are required to cover the entire range of .013″ to $\frac{1}{4}$″ diameters. Each collet collapses $\frac{1}{32}$″.

23. Collets for Quill Collet Chuck (Item 22)—$\frac{3}{64}$″, $\frac{5}{64}$″, $\frac{1}{8}$″, $\frac{5}{32}$″, $\frac{3}{16}$″, $\frac{7}{32}$″, and $\frac{1}{4}$″ diameter.

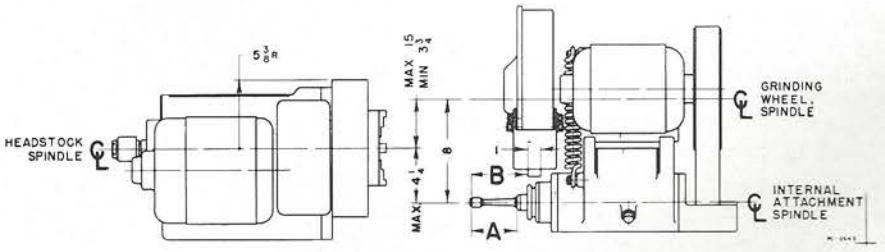
24. Mounted Grinding Wheels for Collets (Item 23)—$\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{1}{2}$″, and $\frac{3}{4}$″ wheel diameter.

25. Electrical Equipment other than that described in item 17, page 11, can be obtained at extra cost.

INTERNAL GRINDING ATTACHMENT

The Internal Attachment furnished as standard equipment includes one spindle No. 242409, one quill No. 233630, two grinding wheels No. 221494 and one driving belt.

Listed below are four other quills with corresponding grinding wheels which can be used with spindle No. 242409 and any one of which will be furnished optionally to quill No. 233630 without extra charge, or as extra equipment.



EXTRA QUILLS AND GRINDING WHEELS FOR USE WITH SPINDLE No. 242409

Spindle No. 242409	Quill			Wheel				Capacity	
	Part Number	A	B	Part Number	Size			Min. Diam.	Max. Depth
					Diam.	Face	Hole		
Standard Equipment	233630	3½″	4 3/32″	221494	11/16″	¾″	¼″	¾″	2½″
Extra Quills and Grinding Wheels for use with spindle No. 242409	233627	2¼″	2 27/32″	204759	¼″	½″	⅛″	5/16″	1½″
	233628	2¼″	2 27/32″	204760	⅜″	½″	⅛″	7/16″	1½″
	233629	2⅞″	3 15/32″	204761	5/8″	5/8″	3/16″	11/16″	2″
	233631	4¼″	4 27/32″	219677	1¼″	1″	⅜″	1⅜″	3″

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