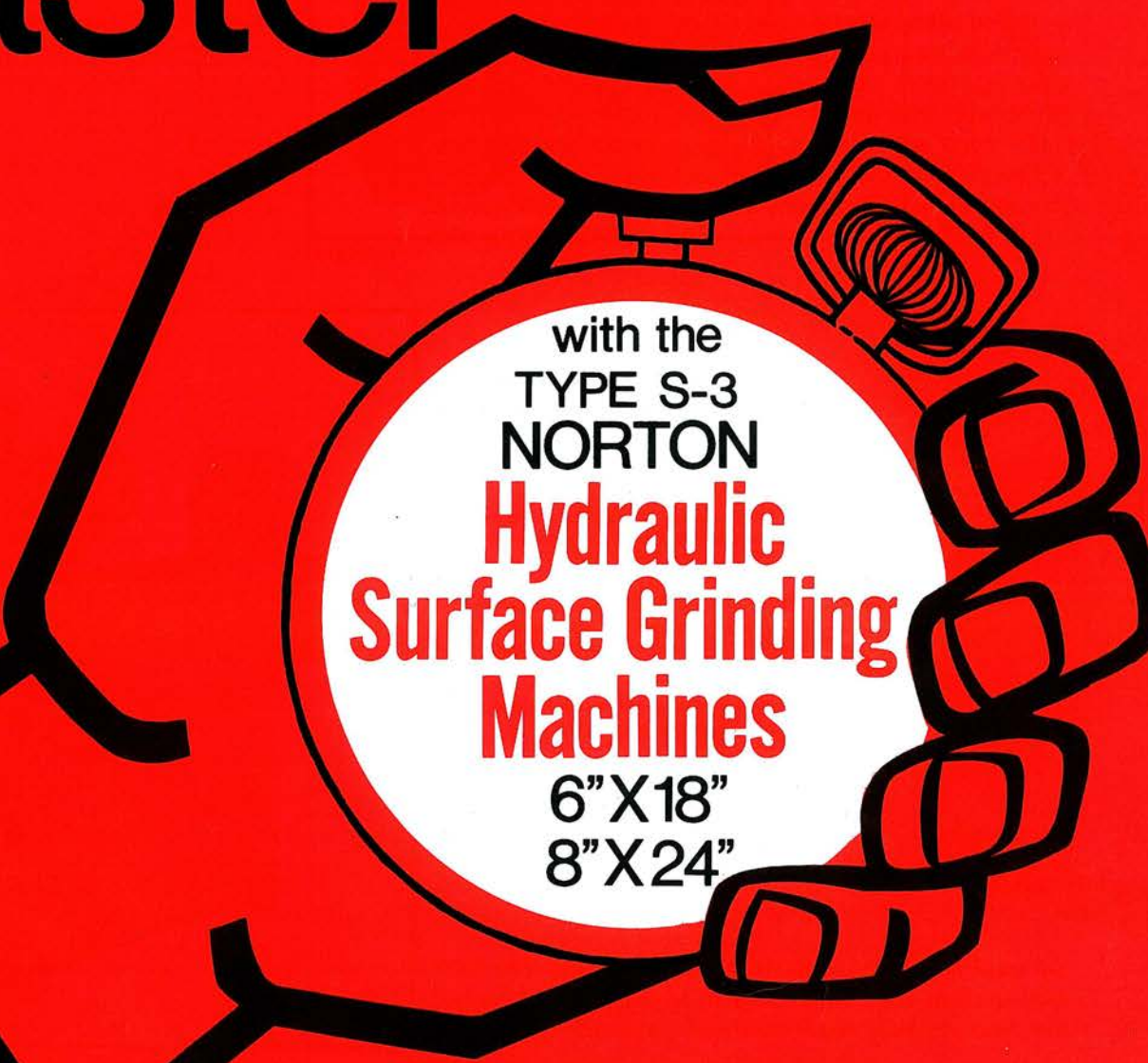


NORTON

Finish Flat Faster

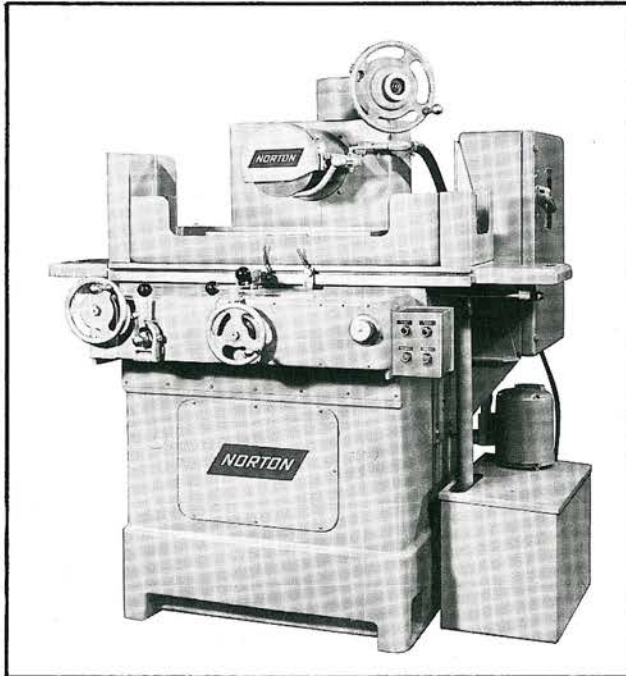


with the
TYPE S-3
NORTON
**Hydraulic
Surface Grinding
Machines**

6" X 18"
8" X 24"

Catalog No.1772-5

grind **FAST** at
150 feet per minute
with enduring precision

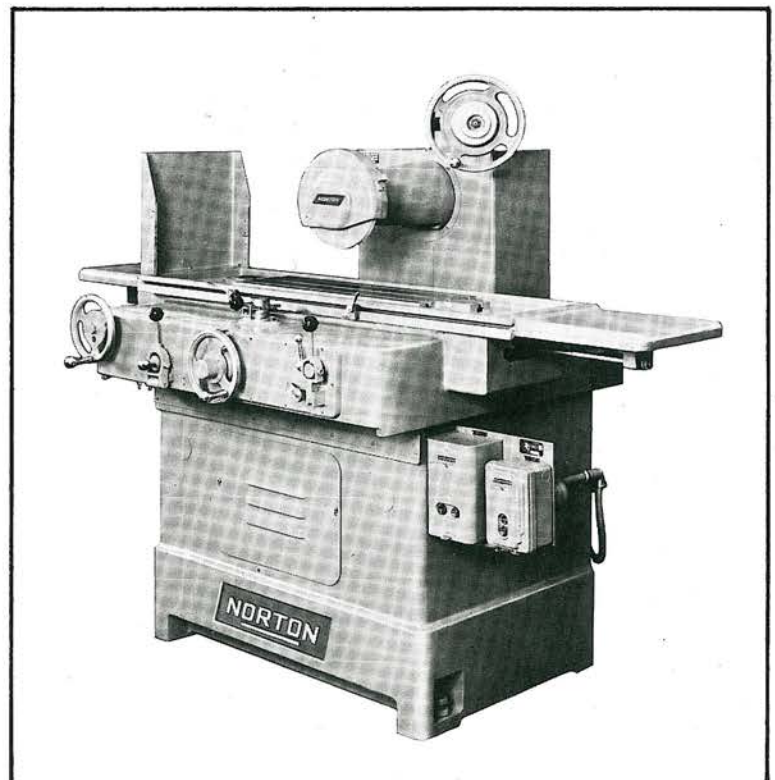


N7954-A

NORTON 6" x 18" Type S-3
Hydraulic Surface Grinder with Wet
Grinding arrangement and electrical
equipment arranged to N.M.T.B.A.
standards (at extra cost).



NORTON 8" x 24" Type S-3
Hydraulic Surface Grinder with stand-
ard equipment. Electrical equipment
is to commercial standards, but may
be arranged to N.M.T.B.A. or J.I.C.
standards at extra cost.



N8505-A



**150 FEET
PER
MINUTE**

**MORE
STROKES**

**MORE
PRODUCTION**

**MORE
PROFIT!**

Your ability to grind plane surfaces at cost levels that increase your profit-margin is largely the capacity of your equipment to deliver superior performance in:

- **Grinding Fast**
- **Grinding Accurately**
- **Grinding with Minimum Maintenance**

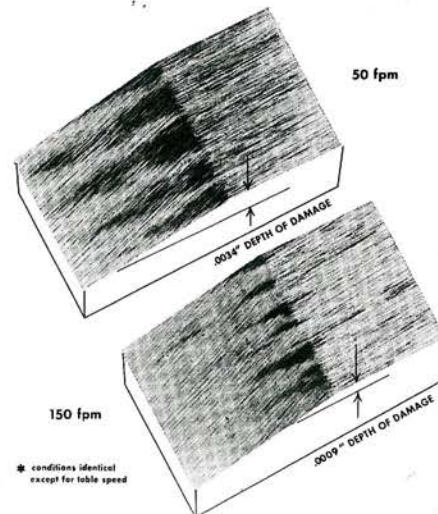
The high speed Norton Type S-3 Hydraulic Surface Grinders give you these important capabilities in a measure that produces extremely sound return on your investment.

GRINDING FAST

The high table speed of the Type S-3 — 150 feet per minute — gets work out quickly because of greater stroking rate; improves output per hour, and brings down your costs per workpiece ground.

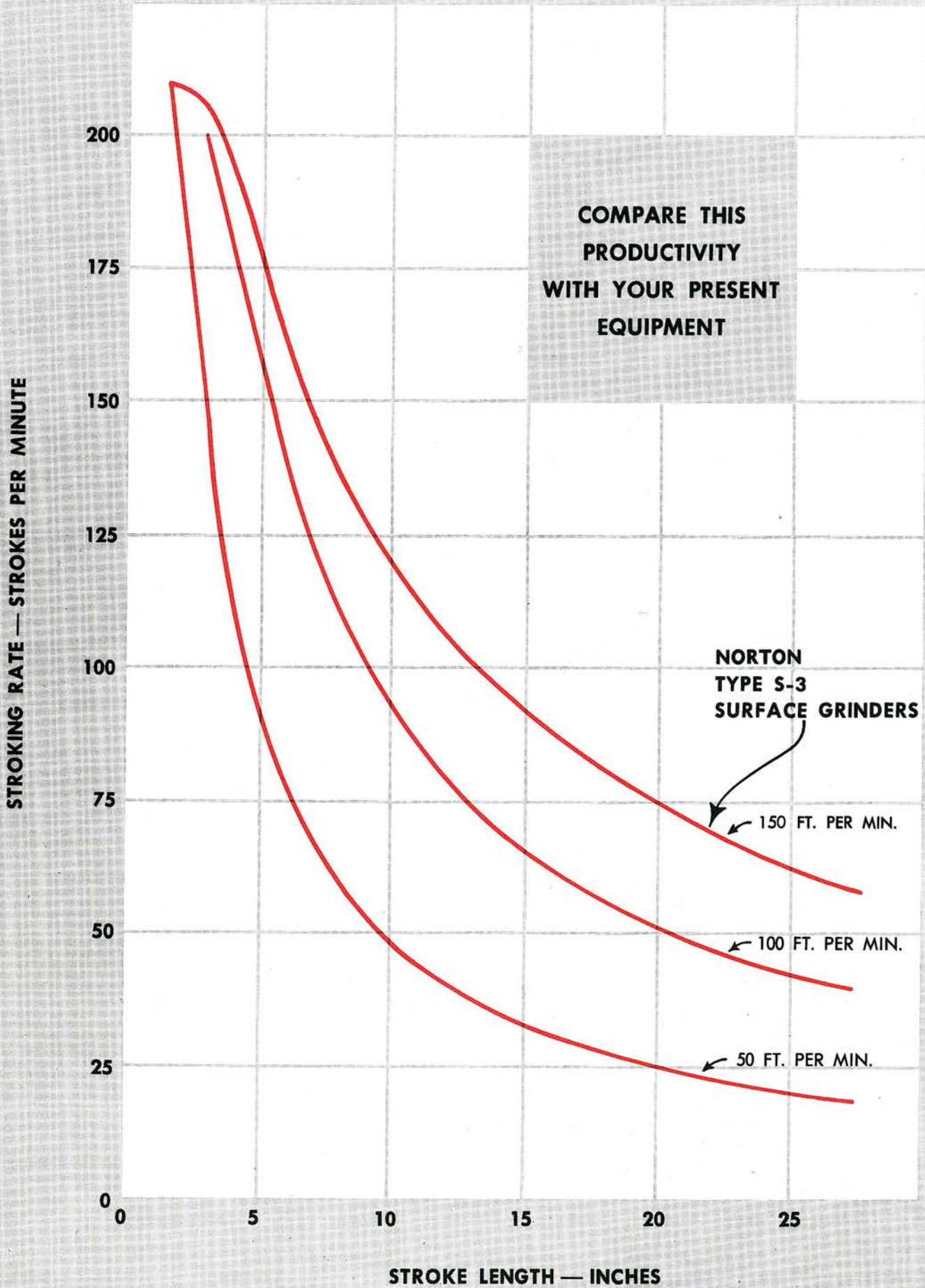
The Type S-3 high table speed gives you the added benefit — supported by scientific study — of a better surface on your parts, especially those of sensitive steel. With high table speed you are cutting fast, and producing *thick chips* which carry off grinding heat, keeping it out of the work. This gives advantages in production costs that come from less damage to your work, reduced scrap, improved quality, and minimized heat distortion.

ACTUAL TEST PHOTOS PROVE LESS BURN*



YOU GET BETTER QUALITY WORK with Norton Type S-3 Surface Grinders, thanks to their faster table speeds, which reduce heat damage. The above test samples show how faster table speeds result in cooler grinding.

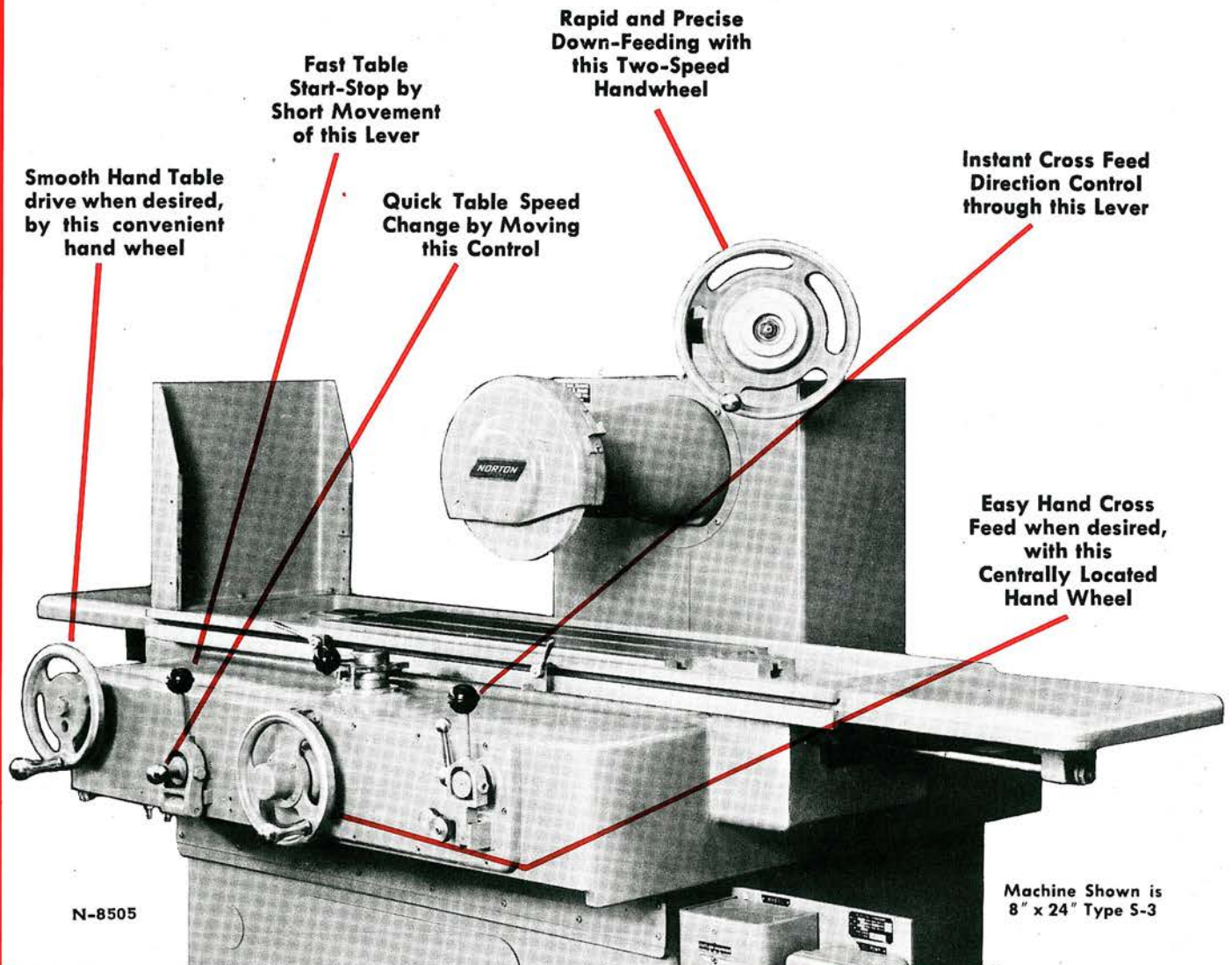
MORE STROKES — MORE PRODUCTION — MORE PROFIT



operation is also fast

- **Simplified Controls Speed Operation — Improve Output** — Controls placed in front of your operator reduce his effort; increase your production by making it easier for him to control the machine — no “acrobatics” necessary.
- **Quick Cross Feed Change** — Automatic cross feed control in front of operator’s hand permits instantaneous change of amount of cross feed.
- **Precise, Rapid Wheel Feed** — The two speed hand wheel has .0005” graduations for fast, accurate positioning and .0001” graduations for precise grinding feeds. Outer wheel is used for rapid, coarse settings while inner knurled wheel provides reduced fine increment feeding.
- **Simple Table Control** — Speeds of the power table traverse are instantly controlled as desired by simple movement of a knob conveniently located in front of the operator’s left hand.
- **Fast Work Loading** — Elbow-level work table promotes fast work loading and removal — with minimum effort.
- **Time-Saving Wheel Head Control** — Power wheel head positioning mechanism available at extra cost, speeds and eases wheel head positioning, especially with jobs requiring appreciable amounts of wheel head movement.

CLOSELY GROUPED CONTROLS SPEED GRIND



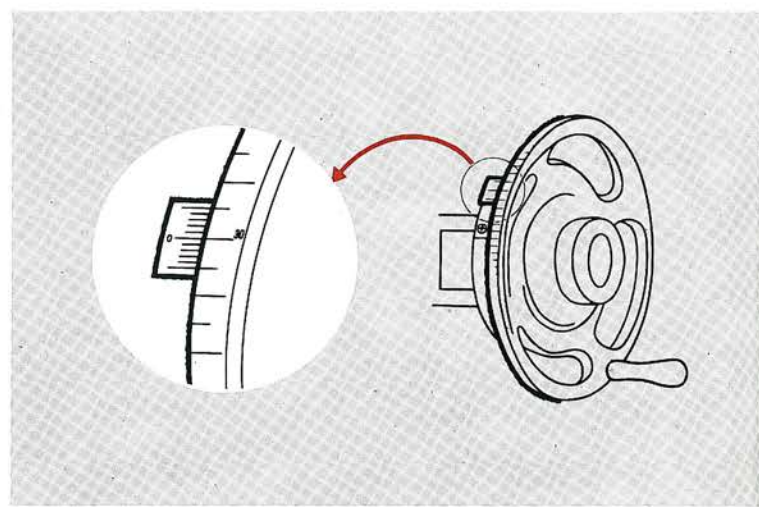
N-8505

Machine Shown is
8" x 24" Type S-3

grinding accurately

YOU FEED FAST AND ACCURATELY

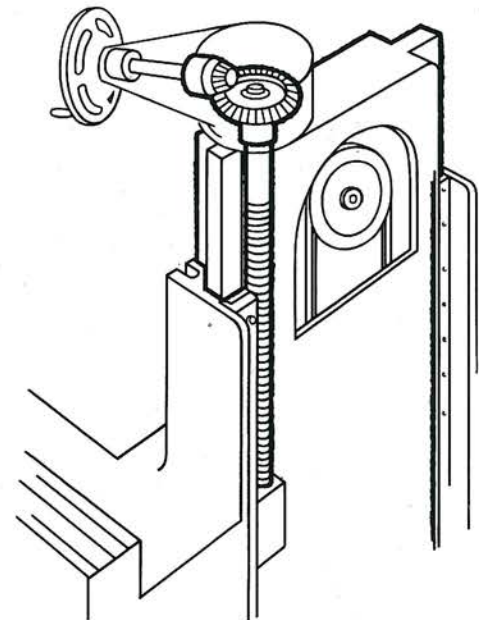
The Type S-3 allows you to feed fast and accurately in .0001" increments, reading directly from the vertical two-speed hand wheel. This has .0005" graduations for fast positioning and .0001" graduations for precise grinding feeds. The outer wheel is for rapid, coarse settings, and the inner knurled wheel is for fine increment feeding.



YOU GRIND ACCURATELY

You grind accurately with this machine because of these advantages which assure continued precision in wheel head action:

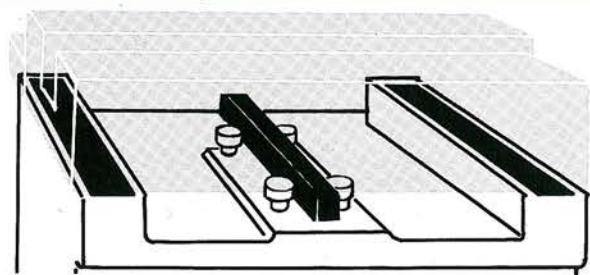
- Positive, high reduction feed from bevel gears.
- Hang-up free wheel slide with vertical ways performs positive tracking.
- Heavy wheel slide prevents deflection and vibration, eliminates need for excessive caution to obtain fine accuracy.
- Straight tracking of wheel slide with no binding is aided by hand scraped, plain bearing ways.



BETTER CROSS FEED ACCURACY FROM GUIDE-RAIL DESIGN

You get better cross feed accuracy from the Type S-3 because of a guide-rail of hardened tool steel, attached to the underside of the cross slide at the center. It runs through anti-friction bearing, hardened tool steel rollers attached to the machine base. Improved grinding of parallel shoulders results from this design, which provides direct contact between rollers and guide-rail. No oil clearance is required, since the roller bearings are pre-loaded.

The center guide and the two *flat ways* of the cross slide combine to improve grinding of parallel shoulders through straighter "tracking" of the cross slide. For this reason you do parallel shoulder and similar jobs rapidly without painstaking effort.



WIDE-SPAN AUTOMATICALLY LUBRICATED WAYS

Long, wide-span, automatically lubricated *flat* cross slide ways over the rigid base walls, aid the grind by increasing machine stability.

The wide center-to-center span of these ways (27" for the 6" x 18" S-3; 33 $\frac{3}{4}$ " for the 8" x 24" S-3), eliminates excessive table overhang and assures a positive, firm support between ways over the complete range. The use of *two* flat ways provides uniform bearing surfaces which prolong grinding accuracy.

grinding with minimum maintenance

MASSIVE WHEEL HEAD, LONG GUIDE WAYS, SUSTAIN ACCURACY

The wheel head construction of the Type S-3 features extremely rigid bracing and long guide ways. These benefit the grinding action in terms of sustained, fast accuracy, as well as minimizing the scope of future maintenance activities to restore new-machine precision.

The wheel head moves on the long guide ways which provide large area, wear-resistant bearing surfaces. This, plus the rugged wheel head design and vertical gib construction, equip you to grind square shoulders fast — without excessive fussing or caution.

The gib construction eliminates wheel head “hang up” resulting from uneven pressure on the gibs. Good finish and production of parallel and square shoulders over the entire vertical capacity of the machine, permit you to use it without restraint for all work within its capacity — you do not “baby” it to do your jobs.

ENDURING PRECISION

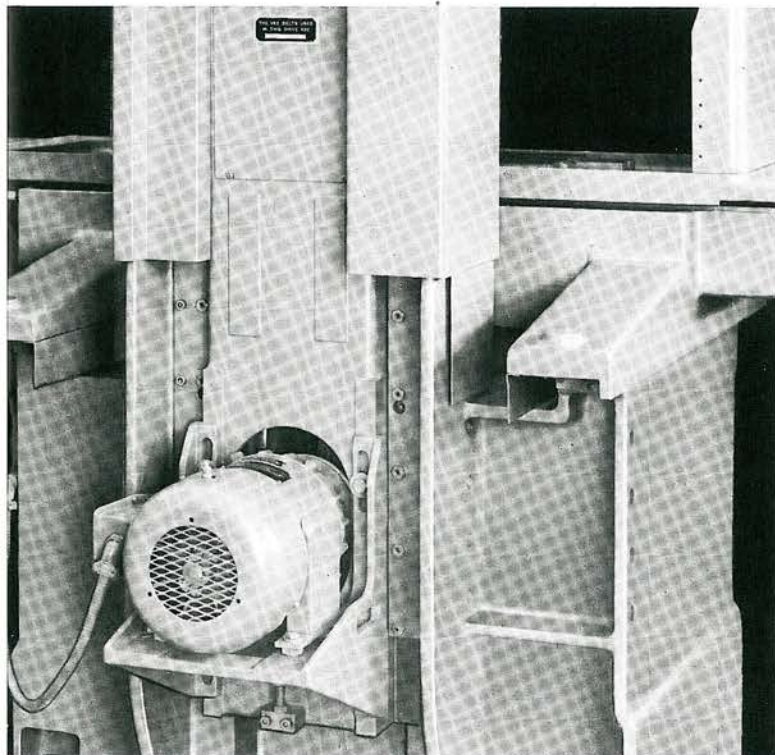
To deliver the highest return on its investment, the S-3 has been engineered with proportions and features designed to prolong its precision. This is to assure performance of the broadest range of service sought from a machine of this type.

Because of wide utility, the machine enables you to make at will, the heavy cuts usually involved in roughing operations, or to do the lighter, precise cutting normally required for fine finishing. In other words, with the S-3 you have production capability for steady, high output service, or the means to do finest tool room work—and with a minimum of upkeep or maintenance.

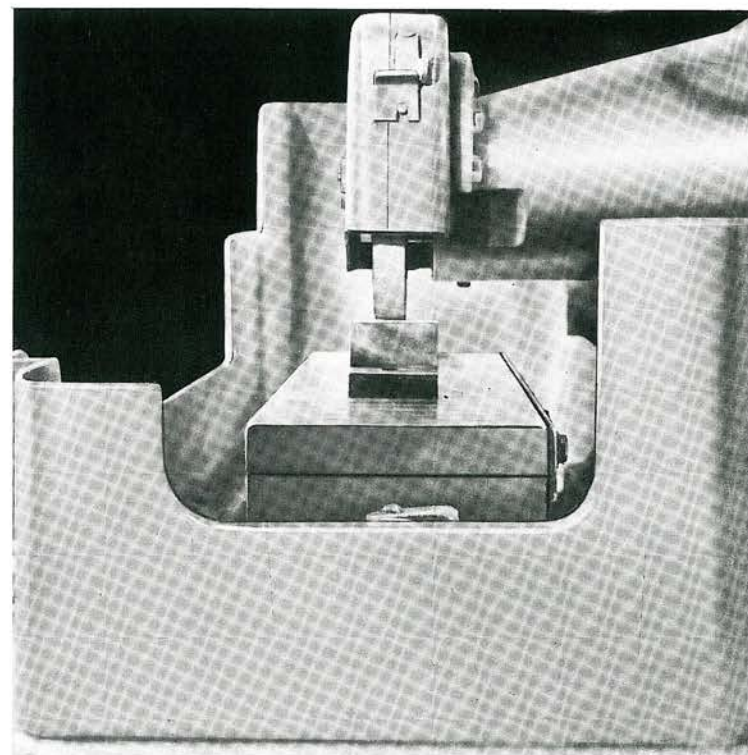
A massive housing supports the strong wheel spindle right to the ends. This increases resistance to grinding pressures with resulting benefits in service life and precise performance.

As you may do roughing or finishing in the S-3, you may find there are cost-favoring factors in being able to do these operations in a single machine.

Note also in the illustration below, that contoured splash guarding permits unobstructed view of clearances during set-up.



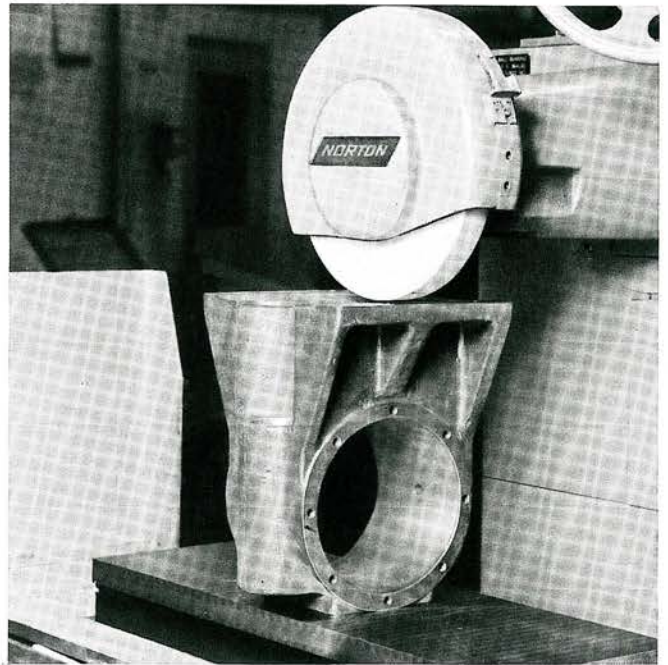
N-8506



N-7904

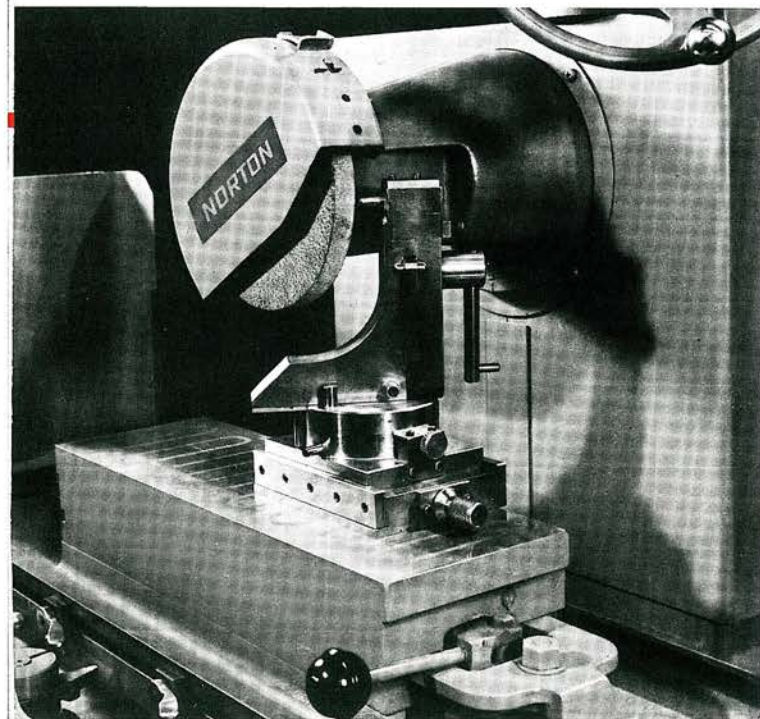
... and
grinding
profitably

across-the-board



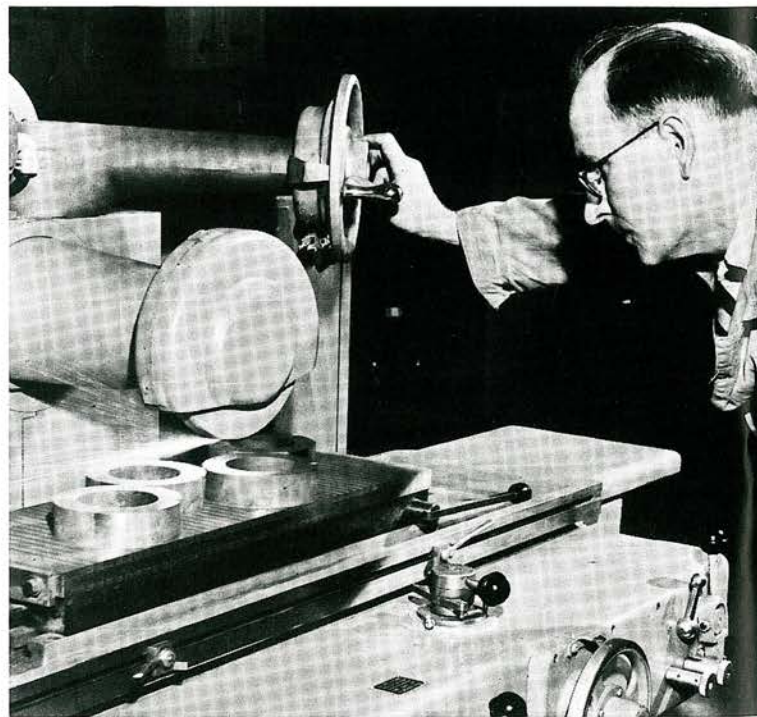
N-8535

LARGE VERTICAL CAPACITY — High-Grind Wheel Head Construction provides large vertical capacity from table top to bottom of grinding wheel, for handling tall workpieces. (See specifications on page 14).



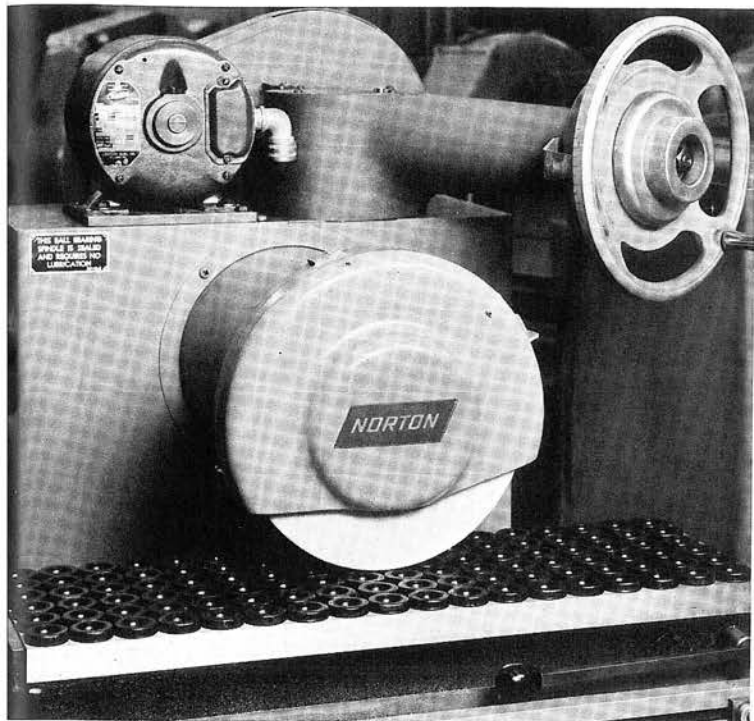
N-7962

MAXIMUM WHEEL USE — Contoured wheel spindle housing permits radial or angular truing even of worn wheels — assuring you of maximum usable wheel life when doing formed wheel grinding.



N-8565-A

CONVENIENT OPERATION — The wheel feed hand wheel is easily operated with the skilled right hand; the supplementary controls by the left hand.



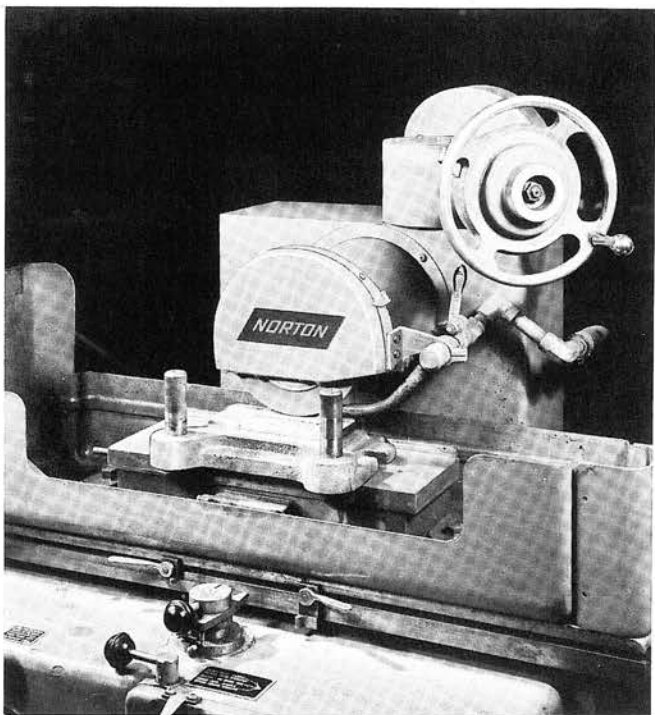
N-8534

VERSATILITY — You get the best in flatness and finish fast with the S-3, whether you grind a single piece or a chuck load.



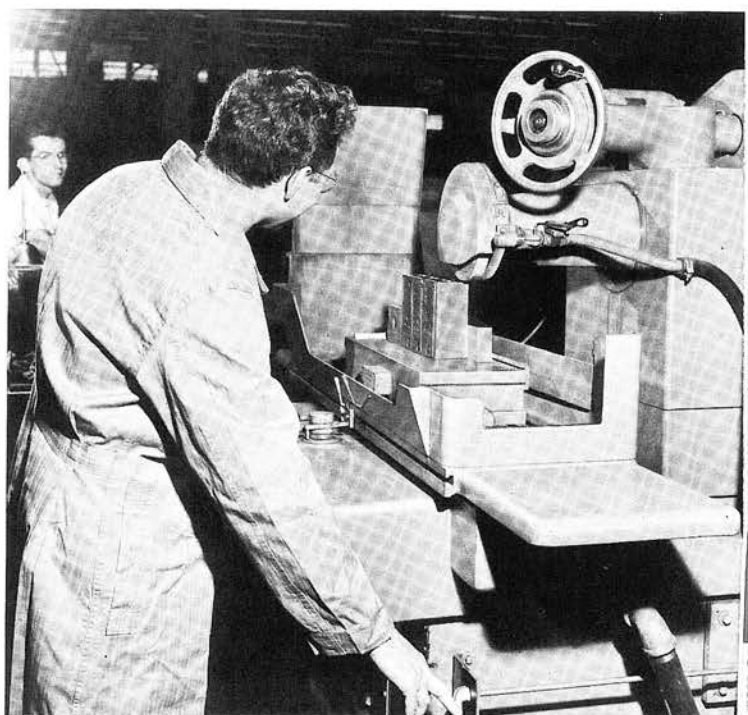
N-8709

EASY TRUING — Effortless truing of the grinding wheel by power is an additional time-and-energy saving advantage of the 8" x 24" Type S-3.



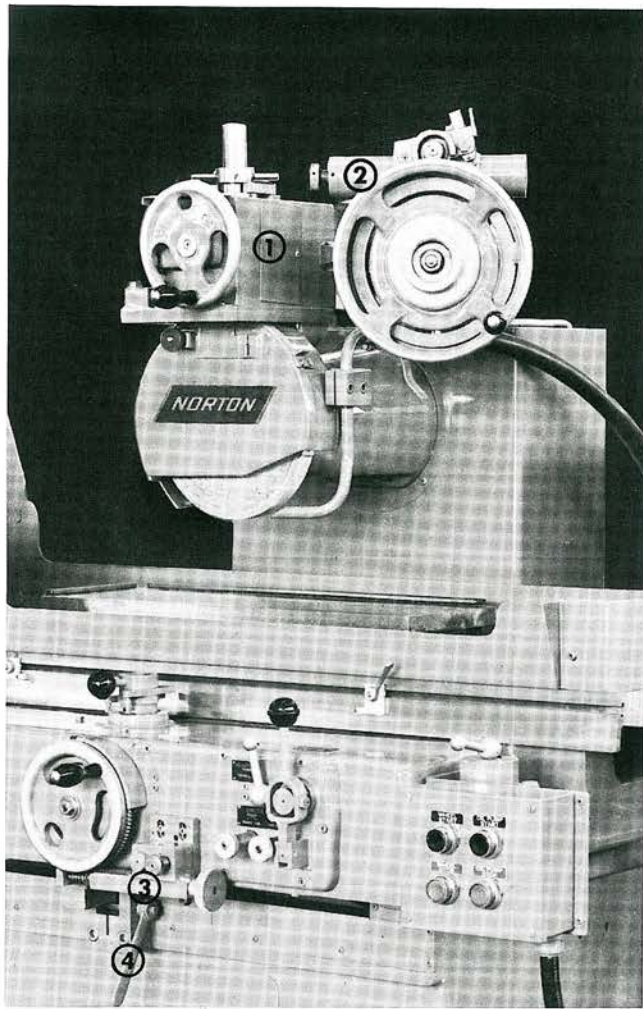
N-8070

FAST GRINDING — Rapid grinding of heat-sensitive die steels is a big "plus" quality of the S-3. It means less time, less effort, and lower costs.



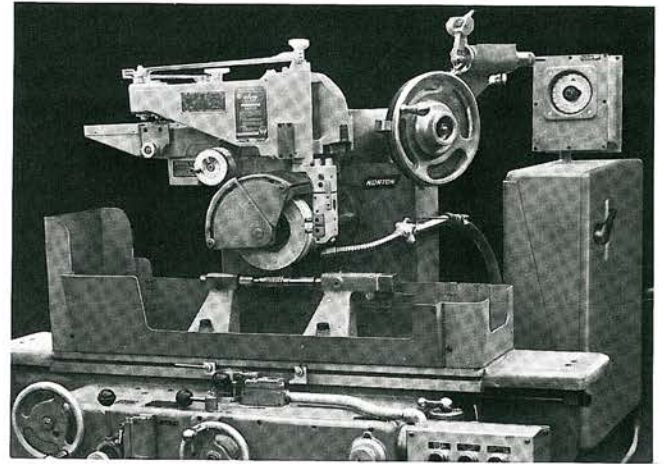
N-8708

RAPID WHEEL POSITIONING — A Power Wheel Head Positioning Mechanism, available at extra cost, eases and speeds wheel head positioning. It makes important time-savings possible; increases output possibilities of the S-3.



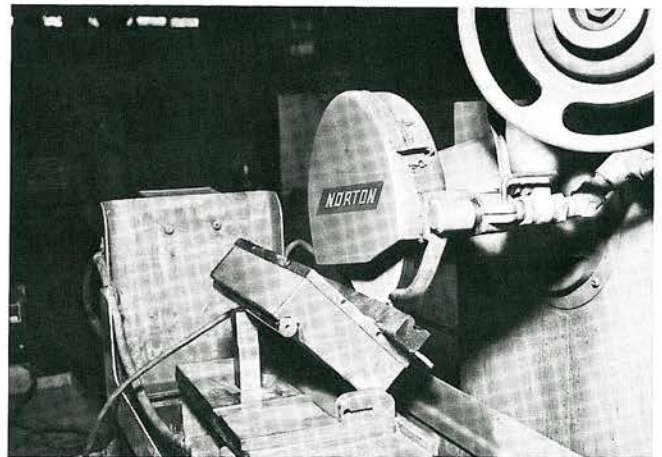
N-9467

Optional items, shown here and available at extra cost, simplify your grinding operations. The wheel guard truing device 1 allows wheel truing without removing work from table. The automatic picker downfeed 2 at each table reversal simplifies plunge or form grinding without constant operator attention. The picker downfeed may also be arranged to operate at each cross slide reversal. The fine increment cross slide feed 3 is excellent for shoulder grinding. Cross slide binder 4 provides saddle rigidity for plunge or die grinding.



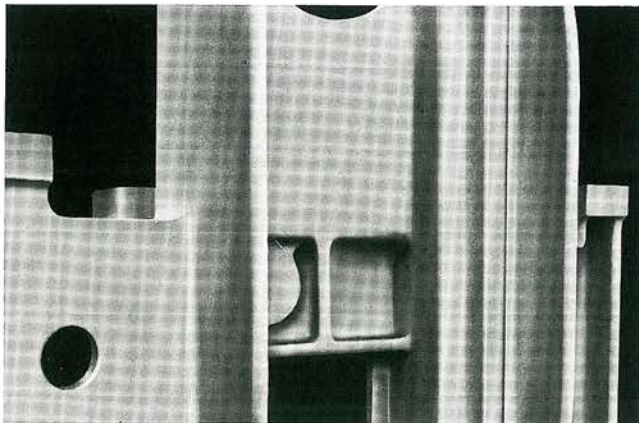
N-9309

Your S-3, equipped with a DIAFORM Truing Device, permits production grinding of shaped workpieces. It is capable of truing a wide range of contours.

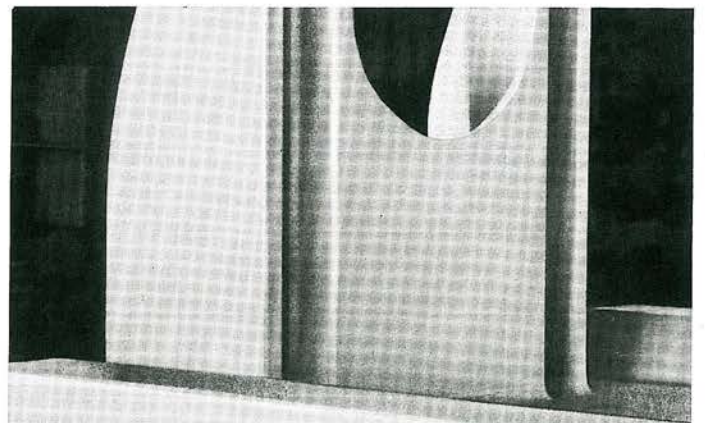


N-8030

Your S-3 may be equipped with a sine chuck. This particular job of grinding a hardened machine way brings out the best in the S-3. Finish and flatness are no problem.



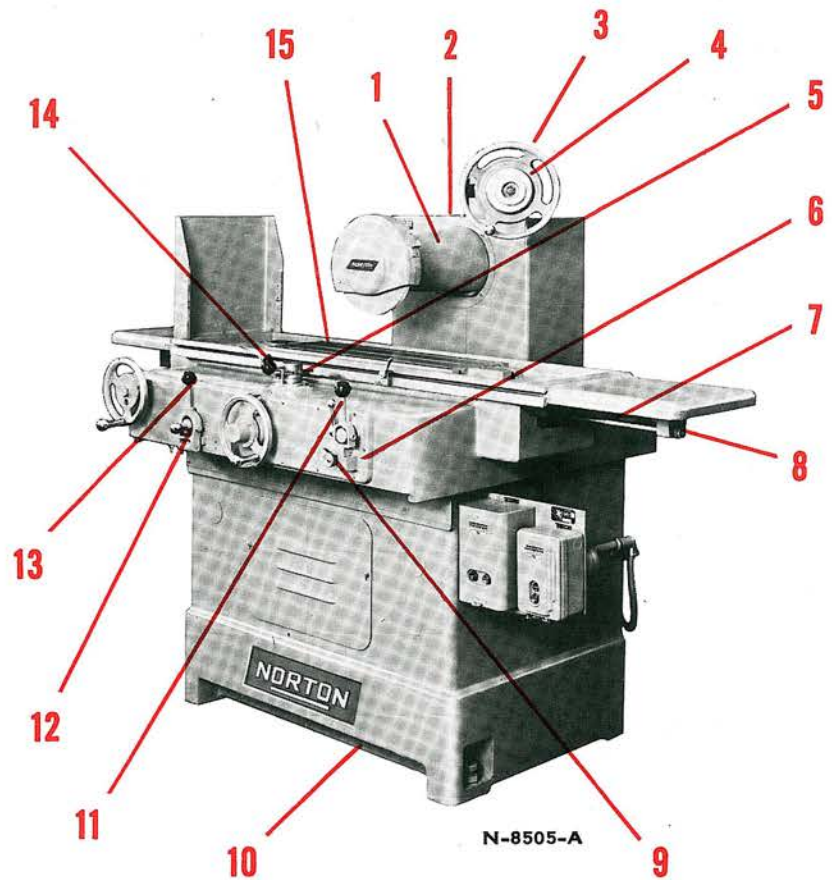
N-9295



N-9294

Much of the stability and stamina you get in a Type S-3, comes from the ruggedness of the wheel head support. In these two close-up views of an 8" x 24" Type S-3 base casting, note the desirable deep-throated proportions of the wheel head column. Better yet, consider what the "mass" in this critical support-area, can do for your grind.

here's how
you'll benefit with
your Type S-3



NORTON 8" X 24" TYPE S-3
SURFACE GRINDER

- 1 HEAVY OR LIGHT CUTS** — large wheel spindle in heavy duty housing has extreme rigidity — permits light or heavy cuts with ease.
- 2 COMPLETE WAYS PROTECTION** — Vertical Ways accuracy is extended by protecting ways from grit infiltration by efficient telescoping-type guard.
- 3 TWO-SPEED WHEEL FEED** — large handwheel for rapid positioning and center knurled wheel for reduced fine increment sizing feeds.
- 4 NEW SIZING CONTROL** — fine increment downfeed mechanism, graduated to .0001" increments, gives you smooth positive feed for fine sizing.
- 5 FEATHER-TOUCH REVERSAL** — design of reversal mechanism eliminates hammering of reverse lever on reverse dogs — gives long lasting service.
- 6 POWER WHEEL TRUING** — on the 8" x 24" S-3, the wheel is effortlessly trued by power by operating the cross feed with the work table stationary. Wheel truing on the 6" x 18" S-3 is done by operating the hand cross feed.
- 7 AUTOMATIC WAY LUBRICATION** — table and cross-slide ways are automatically lubricated — assuring long, accurate, trouble-free service.
- 8 RAPID CHANGEOVER** — piston rod latches for speedy conversion to hand table traverse. Latches disconnect table from piston rod and eliminate piston drag in cylinder when running by hand.
- 9 INSTANT CROSS FEED SETTINGS** — knob type cross feed adjustment permits fast setting by merely turning knob.
- 10 TOE ROOM** — front base design allows operator to stand close to machine comfortably — especially helpful when handling heavy work pieces.
- 11 FAST CROSS FEED CONTROL** — flip of centralized control changes or stops cross feed direction. Cross feed hand wheel does not turn when in power feed.
- 12 INFINITE NUMBER OF SPEEDS** — hydraulic table traverse quickly adjusted for speeds up to 150 surface feet per minute by simple knob control.
- 13 SIMPLIFIED OPERATION** — separate start-stop and table speed controls permit repeated stops and starts without altering table speed settings.
- 14 ALIGNMENT EASE** — centered reverse lever permits fast dog setting by visual line-up with ends of work pieces.
- 15 SMOOTH TABLE REVERSAL** — design of reversal mechanism and table traverse components eliminates bumping at end of stroke — reversal is cushioned and smooth to further increase working life of machine.

6" x 18" TYPE S-3

ARRANGEMENTS AVAILABLE

- Machine with antifriction bearing, cartridge type wheel spindle and vee-belt drive. (Flat belt drive optional at no extra charge.)

EQUIPMENT INCLUDED IN MACHINE PRICE

- Machine with anti-friction bearing, cartridge type wheel spindle and vee-belt drive.

PLUS

- Hydraulic table traverse up to 150 ft. per. minute
- Automatic cross feed, hydraulically operated
- Wheel guard, swivelling type
- Wheel sleeve for 1 1/4" hole wheel
- Fine increment down feed
- Diamond tool holder, without damond
- Hydraulic pump with 1 1/2 H.P. motor and control
- Necessary protection guards
- Wrenches
- Motor sheave and vee belt or motor pulley and flat belt for spindle drive
- Wheel drive motor, 1 1/2 H.P., 1800 R.P.M., totally enclosed, ball bearing A.C. with control
- Two grinding wheels 8" x 3/4" x 1 1/4"

AUXILIARY EQUIPMENT

(at extra cost)

- Wet grinding arrangement
- Coolant through grinding wheel arrangement
- Individual dust exhaust and separating system
- Equipment for electrolytic grinding
- Adaptor for wheel guard for central exhaust system
- Radius and tangent angle wheel dresser
- 10" diameter wheel guard and grinding wheel
- Power wheel head positioning mechanism (electric)
- Wheel guard type truing device
- Automatic picker type downfeed at each table reversal, for form or plunge grinding
- Automatic picker type downfeed at each cross slide reversal, with automatic reversal of the cross slide
- Manual cross slide binder

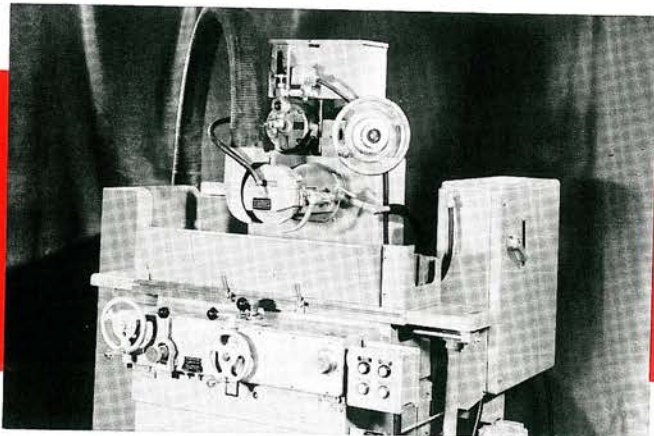
CHUCKS-PERMANENT MAGNET TYPE

	CHUCK HEIGHT	MAGNETIC SURFACE
Walker 6 x 18"	2-3/8"	6 x 18-1/4"
Taft-Peirce 6 x 18"	2-3/8"	6-3/8 x 18-1/4"
Brown & Sharpe 6 x 18"	3-5/8"	4-1/2 x 14-1/16"

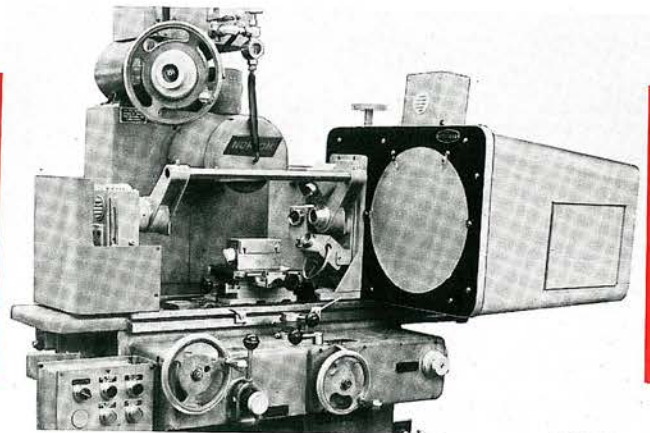
CHUCKS-ELECTRO-MAGNETIC TYPE

			* CHUCK HEIGHT	MAGNETIC SURFACE
Walker	618	Standard	60	3-3/8" 4-7/8" x 16-3/4"
Taft-Peirce	618	Standard	75	3-3/4" 5-7/8" x 16-1/4"
Walker	618	Long. Bar Pole	50	4-1/4" 5" x 18"
Walker	618	Trans. Bar Pole	141	4-1/4" 6" x 17"
Hanchett HR618		Universal	96	4" 6" x 16-1/4"
Hanchett HR618F		Fine Grid	62	3-7/8" 5" x 17"

*=WATTAGE



6" x 18" Type S-3 with Dust Exhaust Unit for dry grinds, plus Coolant through the Wheel and regular Wet Grinding Arrangement. N8367



6" x 18" Type S-3 with Optical Projector Comparator and Coolant through the Wheel Arrangement. N9018

8" x 24" TYPE S-3

ARRANGEMENT

- Machine with antifriction bearing, cartridge type wheel spindle and vee-belt drive. (Flat belt drive optional at no extra charge.)

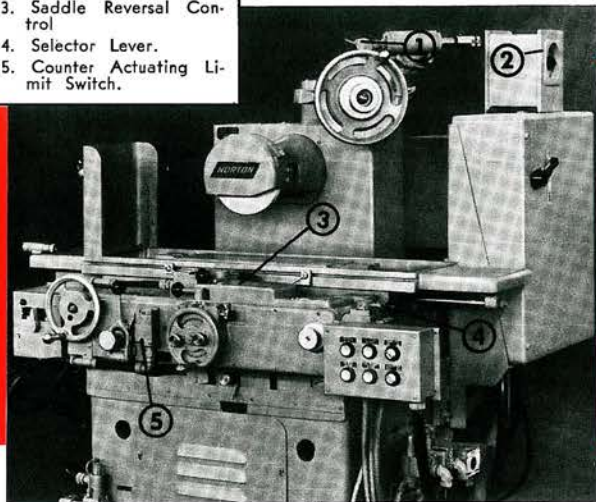
EQUIPMENT INCLUDED IN MACHINE PRICE

- Machine with anti-friction bearing, cartridge type wheel spindle and vee-belt drive.

PLUS

- Hydraulic table traverse up to 150 ft. per minute
- Automatic cross feed, hydraulically operated
- Wheel guard, swivelling type
- Wheel sleeve, for 3" hole wheel
- Fine increment down feed
- Diamond tool holder, without damond
- Hydraulic pump with 2 H.P. motor and control
- Necessary protection guards
- Wrenches
- Motor sheave and vee belt or motor pulley and flat belt for spindle drive
- Wheel drive motor, 3 H.P., 1800 R.P.M., totally enclosed, ball bearing A.C. with control
- Two grinding wheels 10" X 1" X 3"

1. Automatic Picker Type Downfeed
2. Counter to Stop Table.
3. Saddle Reversal Control
4. Selector Lever.
5. Counter Actuating Limit Switch.



N-8945

6" x 18" Type S-3 with Automatic Picker Type Downfeed at each table reversal for plunge grinding, and Automatic Downfeed at cross slide reversals for conventional grinding. Automatic cross slide reversal, and a counter for table reversals in plunge grinding also furnished.

AUXILIARY EQUIPMENT

(at extra cost)

- Wet grinding arrangement
- Coolant through grinding wheel arrangement
- Individual dust exhaust and separating system
- Equipment for electrolytic grinding
- Adaptor for wheel guard for central exhaust system
- Radius and tangent angle wheel dresser
- 12" diameter wheel guard and grinding wheel
- Power wheel head positioning mechanism (electric)
- Wheel guard type truing device
- Automatic picker type downfeed at each table reversal, for form or plunge grinding
- Automatic picker type downfeed at each cross slide reversal, with automatic reversal of the cross slide
- Manual cross slide binder

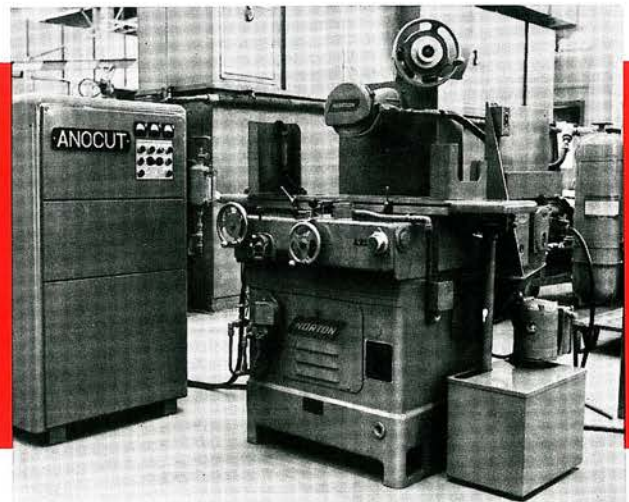
CHUCKS-PERMANENT MAGNET TYPE

	CHUCK HEIGHT	MAGNETIC SURFACE
Taft-Peirce 8 x 24"	2-7/16"	8 x 21"
Brown & Sharpe 8 x 24"	3-3/4"	6-5/16 x 19-3/4"
Walker 8 x 24"	2-7/16"	8 x 24"

CHUCKS-ELECTRO-MAGNETIC TYPE

		* CHUCK HEIGHT	MAGNETIC SURFACE
Walker 824 Standard	105	4-1/8"	6-1/2" x 22-1/2"
Taft-Peirce 824 Standard	108	4"	7-1/8" x 22-1/2"
Walker 824 Long. Bar Pole	134	4"	6-3/4" x 22"
Walker 824 Trans. Bar Pole	300	4-1/4"	8" x 22-3/4"
Hanchett HR824 Universal	208	4"	8" x 23"
*Hanchett HR824F Fine Grid	100	3-7/8"	7" x 23"

* = WATTAGE



N8321

6" x 18" Type S-3 arranged for Electrolytic grinding to obtain savings when diamond wheels are used.

SPECIFICATIONS

6" x 18" TYPE S-3

CAPACITY

Longitudinal (work).....	18"
Longitudinal (maximum table movement)....	22"
Transverse.....	7"
Vertical—distance, table top to bottom of standard 8" dia. wheel.....	15½"
Vertical movement of wheel head.....	16¾"

WORK TABLE

Width of work surface.....	6"
Length of work surface.....	18"
Tee slots—standard ½".....	3

SPINDLE

Antifriction Bearing Spindle, Cartridge Type,
Flat or Vee belt drive, speed, r.p.m..... 2750

GRINDING WHEELS

Type.....	No. 1 (straight)
Belt drive spindle.....	8" x ½" to ¾" x 1¼"
Integral motor spindle, (60 cycles). 7" x ¾" x 1¼" (50 cycles). 8" x ¾" x 1¼"	

TABLE TRAVEL

Hydraulic power — (feet per minute) variable,
up to 150 feet per minute
Hand table traversing mechanism also pro-
vided — one revolution of hand wheel
moves table..... 3⅛"

FEEDS

Vertical:
Vernier graduated..... .0001"
Hand wheel graduated..... .0005"
Cross Feed Hand Wheel Graduated..... .001"
(Each graduation represents .001" or .0264 mm.)
Cross Feed: Automatic at each reversal:
adjustable from 0" to .100" (approx.)

DRIVE

Grinding Wheel
1½ h.p., constant speed motor
(60 cycle speed is 1800 r.p.m.—50 cycle
speed is 1500 r.p.m.)
Flat or vee belt drive to spindle
Hydraulic Pump
1½ h.p. constant speed motor
(60 cycle speed is 1800 r.p.m. — 50 cycle speed
is 1500 r.p.m.)

WEIGHTS (Approximate)

Net.....	2850 lbs.
Domestic shipping.....	3100 lbs.
Export shipping.....	3250 lbs.

8" x 24" TYPE S-3

CAPACITY

Longitudinal (work).....	24"
Longitudinal (maximum table movement)....	28"
Transverse.....	9"
Vertical distance, table top to bottom of standard 10" dia. wheel.....	13¾"
Vertical movement of wheel head.....	15½"

WORK TABLE

Width of work surface.....	8"
Length of work surface.....	24"
Tee slots — standard 9/16".....	3

SPINDLE

Antifriction Bearing Spindle, Cartridge type,
Vee belt drive, speed, r.p.m..... 2270

GRINDING WHEELS

Type.....	No. 1 (straight)
Standard Size.....	10" x 1" x 3"

TABLE TRAVEL

Hydraulic power — (feet per minute) variable,
up to 150 feet per minute
Hand table traversing mechanism also pro-
vided — one revolution of hand wheel
moves table..... 3⅛"

FEEDS

Vertical:
Vernier graduated..... .0001"
Hand wheel graduated..... .0005"
Cross Feed Hand Wheel Graduated..... .001"
(Each graduation represents .001" or .0264 mm.)
Cross Feed: Continuous for truing, or
Automatic at each reversal;
adjustable from 0" to 3/16"

DRIVE

Grinding Wheel
3 h.p. constant speed motor
(60 cycle speed is 1800 r.p.m. — 50
cycle speed is 1500 r.p.m.)
Vee belt drive to spindle (Flat belt optional)
Hydraulic Pump
2 h.p. constant speed motor
(60 cycle speed is 1800 r.p.m. — 50
cycle speed is 1500 r.p.m.)

WEIGHTS (Approximate)

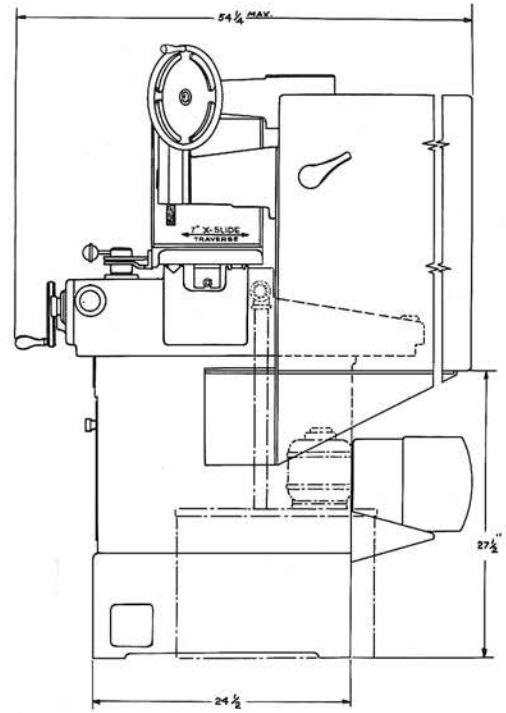
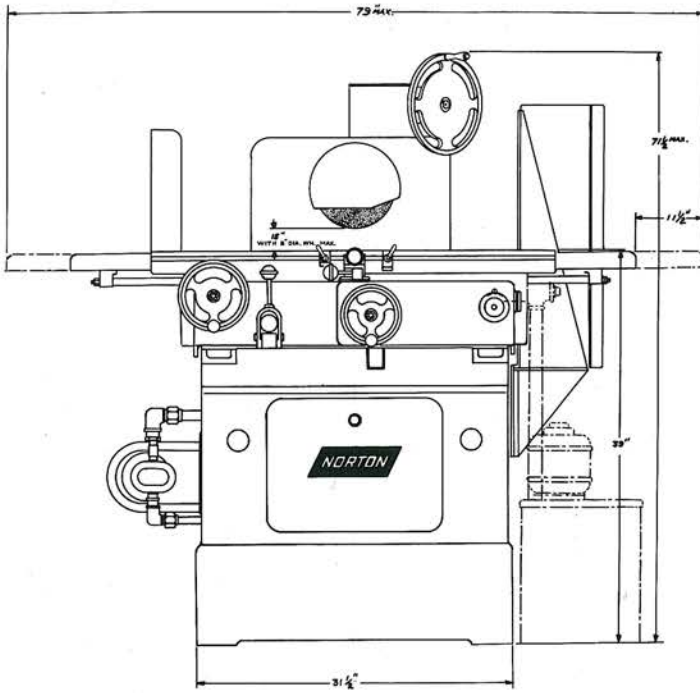
Net.....	3700 lbs.
Domestic shipping.....	4000 lbs.
Export shipping.....	4450 lbs.

(Because of variations in equipment and castings exact weights cannot be given. Motors and magnetic chuck weights are included in approximate weights.)

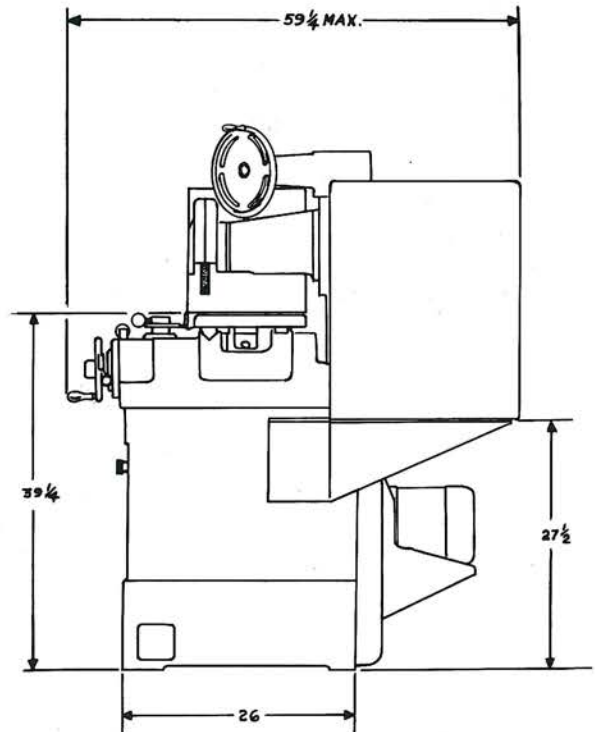
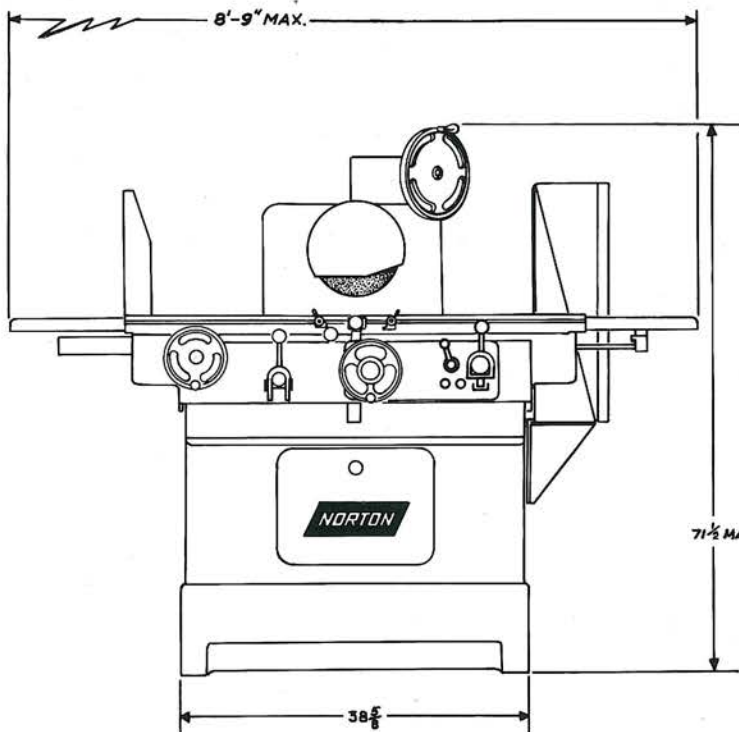
The descriptions, illustrations and specifications in this booklet are correct at the time of printing. Machines built at later dates may differ in detail due to the policy of Norton Company to improve its machines constantly.

ELEVATION DRAWINGS

6 x 18 TYPE S-3

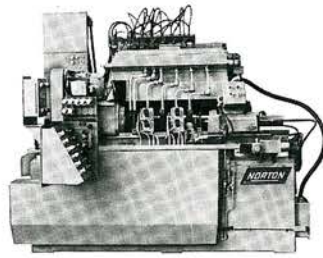


8 x 24 TYPE S-3

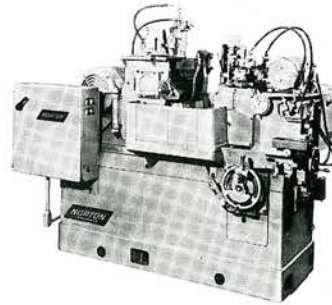


MACHINE TOOLS

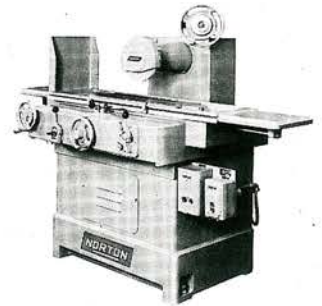
FOR GRINDING and LAPPING



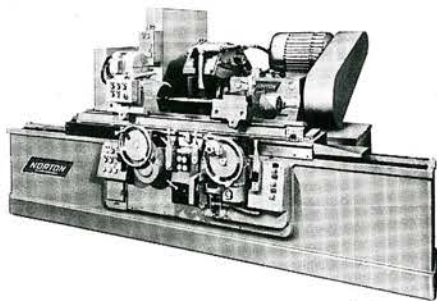
Automotive Production Grinders



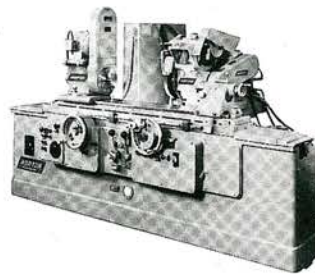
Centerless Grinders



Surface Grinders



Cylindrical and Angular Grinders



Universal Grinders



Lapping Machines

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