

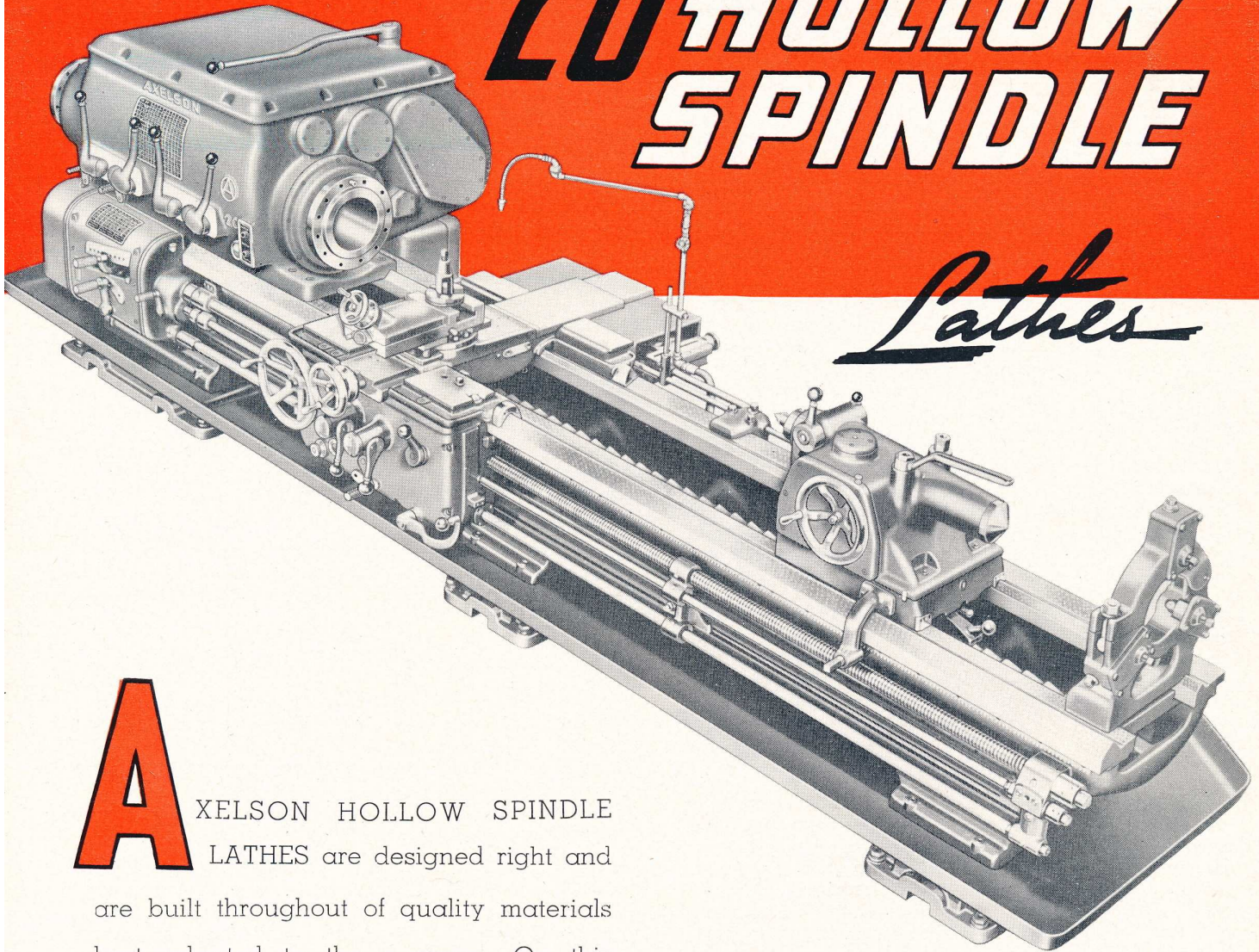
Reid May 12, 1950

AXELSON 20"

A-4151 TELEPHONES
WALTER H. MEYER MACH'Y CO.
FORT WAYNE, INDIANA

HOLLOW SPINDLE

Lathes



AXELSON HOLLOW SPINDLE LATHES are designed right and are built throughout of quality materials best adapted to the purpose. On this foundation Axelson craftsmen construct a machine tool precise in every operation and accurately finished in every detail. AXELSON HOLLOW SPINDLE LATHES conform to the high standards established

by Axelson's more than 30 years of machine tool manufacturing experience in building lathes which will deliver complete satisfaction on every adaptable type of metal turning work.

Axelson Heavy Duty Geared Head *Lathes*

General Description

As the foundation of the lathe structure, the beds of Axelson Lathes are designed and constructed to provide a rigid base for the support of the other parts of the lathe assembly. The beds are massive enough to maintain perfect alignment of parts and to withstand the strains and stresses imposed by heavy-duty cutting.

In construction, Axelson Lathe beds reflect a quarter of a century of successful metallurgical and foundry experience. Casting is done in the Axelson foundry under continuous and rigid technical control. Castings are of naturally alloyed iron containing nickel and chromium, which produce a dense, close-grained structure, free from blow-holes, hard spots and porosity.

On lathes ordered with pan and coolant system, bed is provided with one-piece heavy gage welded sheet steel chip pan. Pan is oil and water tight and runs full length of bed. Self-priming pump and all necessary piping and fittings required for coolant system are furnished with this equipment.

LEAD SCREW AND FEED ROD—The lead screw, made of steel particularly adapted for the purpose, is turned and ground before threads are machined. High grade preloaded and adjustable ball thrust bearings are provided at each end of lead screw. The feed rod, also carried on anti-friction bearings, is used for all work except threading, permitting lead screw to be used exclusively for threading.

HEADSTOCK AND SPINDLE—The headstock case is a one-piece oil tight casting. The hollow spindle of this powerful headstock is mounted on two sets of special Timken precision bearings. To insure greater rigidity, the rear half of the spindle nose bearing is located near the center of the headstock. Both sets of bearings are pre-loaded with provision for adjustment. Manufacturer's rated capacities of spindle bearings at 100 R.P.M. are:

Nose and Center Bearings, combined	
radial capacity	74,500 lb.
Nose Bearing, thrust capacity	38,100 lb.
Center Bearing, thrust capacity	28,800 lb.
Rear Bearing, combined radial	
capacity	55,500 lb.

The spindle is of forged alloy steel, ground to close tolerances. Nose at rear end is attached by means of a taper key and ring nut. Both front and rear spindle noses are type A-2, 15".

All gears in the spindle driving train are of alloy steel, carburized, hardened and profile ground. All shafts are of heat treated alloy steel, mounted on anti-friction bearings. Shafts on which gears slide have in-

tegral splines—carburized, hardened and ground. All except sliding gears are helical. The driving gear on the spindle, mounted on a tapered seat, has a pitch diameter larger than the swing over the cross slide and a face width of 3½ inches.

Lubrication is by combination pump and splash system, with all oil passing through a laminated plate filter mounted in an independently drainable chamber. Sight gage for oil level is provided on the front of the headstock.

Twenty-four spindle speeds are available, controlled by four levers. Multiple plate forward and reverse clutches transmit power from the flange-mounted motor. The automatic spindle brake is synchronized with main driving clutches, permitting rapid reversal of spindle rotation.

An index plate on the front of the headstock shows, in addition to spindle speeds, surface speeds in feet per minute for various diameters of work. Using a 60-cycle motor at 1800 R.P.M., the following spindle speeds are obtainable:

6	7	9	11	13	16	19	23
28	34	41	49	60	72	88	106
129	156	190	230	280	342	415	500

CARRIAGE—Heavy, well-ribbed carriage casting has generous hand-scraped bearing surfaces. All four wings provided with scraper type, pressure-cleaned wipers. Cross slide, carriage, and tool slide have friction locks. Steel casting used for tool slide. Both slides have adjustable tapered gibs located on the headstock side of their respective dovetails.

Feed screws have accurately cut Acme threads and are mounted on anti-friction bearings. Compensating type cross feed nut. Automatic lubrication of both feed nuts. Handwheel dials read to one-thousandth of an inch on diameter of work-piece.

Both front and rear of main carriage casting is provided with suitable gibs, adjustable to compensate for wear. Carriage, cross slide, and tool slide have troughs to return coolant fluid to center of bed. Compound rest can be swiveled 360 degrees on cross slide, utilizing a swivel unit graduated in degrees for both right and left hand settings.

Handwheel on tool slide is mounted on its shaft at angle of approximately 30 degrees with the compound rest screw. This affords ample clearance between the two handwheels. When specially requested, Axelson lathes can be equipped with tool slide having its operating handwheel parallel with cross feed handwheel.

APRON—Of double-walled box type construction, oil-tight, with self-contained oil reservoir. Longitudinal and cross feed clutches of friction cone type, independently operable from separate controls.

Direction of feed reversible from front of apron independent of spindle rotation. Apron control for selecting coarse or fine feeds. Interlock to prevent using feeding and threading controls simultaneously. All mechanism, except rack pinion and split-nut, fully enclosed.

Gears are of heat-treated alloy steel, fully anti-friction bearing mounted. Built-in pump lubricates apron mechanism, carriage ways, cross slide, tool slide, and split nut. Sight gage provided for oil level in reservoir.

A conveniently located control is provided for shifting lead screw directly into or out of engagement independent of feed rod. Automatic adjustable safety release prevents carriage from being drawn into headstock. Split-nut is made of high grade cast iron, with threads accurately machined to fit lead screw. This unit designed to be readily engaged or disengaged to full thread depth without causing damage to either nut or lead screw. Lubrication of split-nut arranged so that oil is fed only when nut is engaged.

QUICK-CHANGE GEAR BOX — Cuts all standard threads, including $1\frac{1}{2}$. Wide-faced gears, heat-treated alloy steel. Fully anti-friction bearing equipped. End train allows use of extra gears for special threads or leads. End gears all anti-friction bearing mounted. The following chart shows range of threads per inch obtainable from standard quick change gear box:

$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{11}{16}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$	$3\frac{3}{8}$
$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	$5\frac{3}{4}$
6	$6\frac{1}{2}$	$6\frac{3}{4}$	7	8	9
10	11	$11\frac{1}{2}$	12	13	$13\frac{1}{2}$
14	16	18	20	22	23
24	26	27	28	32	36
40	44	46	48	52	54
56	64	72	80	88	92

This table indicates available range of feeds, in inches, per revolution of spindle:

.003	.0035	.004	.0045	.005
.0055	.006	.0065	.007	.008
.009	.010	.011	.0115	.012
.0125	.014	.015	.017	.020
.021	.023	.024	.025	.028
.031	.035	.040	.041	.043
.046	.048	.051	.056	.062
.069	.079	.082	.086	.093
.097	.101	.111	.124	.139
.159	.165	.171	.185	

TAILSTOCK—Patented selective change-gear mechanism allows two rates of tailstock spindle travel operated by handwheel conveniently mounted on front of tailstock in vertical plane, parallel to front face of apron. Two-speed feature provides for either normal movement, or for slow speed operation which gives greater power for feeding a tailstock-mounted drill into the work held in headstock chuck.

Powerful two-bolt clamping mechanism maintains position of tailstock on bed. Ways are lubricated from self-contained oil reservoir in tailstock block. Way wipers are provided front and rear. Tailstock spindle is of alloy steel, hardened and ground, has tang-driving slot and drift holes. Removal of dead center from tailstock spindle is automatically accomplished by traversing spindle to its rearmost position. A friction binder allows the spindle to be securely locked in position without mis-alignment.

Separate locking bolts holding body to block insure against disturbing spindle alignment when clamping bolts are loosened. Crank and pinion provided for moving tailstock on bed. Quick-acting pawl used to back-up tailstock by engaging with a rack cast integrally with the bed.

TAPER ATTACHMENT—Carriage type taper attachment allows full telescoping action of cross feed screw. Rigid base and adjustable gibs insure smooth action of slides. Cover plates over entire slide mechanism exclude dust and chips. Accurate, machine-divided scale shows taper in both degrees and inches per foot.

STANDARD EQUIPMENT—One tailstock center, round tool post, and necessary wrenches. Adapter plate for using center in spindle nose is available upon special order. Additional accessories may be selected from standard 20" Lathe list.



Specifications

AXELSON 20" (8 - 9/16" Hole in Spindle) HOLLOW SPINDLE LATHES

CAPACITY

Swing over bed ways and carriage wings	22½"
Swing over cross slide	13½"
Distance between centers, base machine, tailstock flush	62"
Permissible tailstock overhang	7"
Standard tool shank dimensions	7/8" x 1¾"

DIMENSIONS

Bed length, nominal, base machine	10'-0"
Bed length, actual, base machine	11'-4"
Bed width	22"
Bed depth	15"
Height, floor to center line of spindle	42"
Headstock ways (center to center)	12¼"
Carriage ways (center to center)	19¾"

THREADING AND FEED CAPACITY

Number of threads	54
Range of threads per inch	1½ to 92
Number of feeds	49
Range of feed per revolution of spindle	0.003" to 0.185"
Diameter of lead screw	2"
Lead screw threads per inch (Acme)	2
Diameter of feed rod	1¼"
Width and pitch of rack	1¼"-8

DRIVE

Type of drive	Direct
Recommended hp of motor	20-25
Motor rpm, 60-cycle	1800

TAILSTOCK

Length of bearing on ways	17¾"
Diameter of tailstock spindle	4¼"
Travel of tailstock spindle	12¼"
Maximum set-over toward operator	1½"
Maximum set-over away from operator	1¼"
Center, Morse taper	No. 5

HEADSTOCK

Spindle bearings (Timken Type 0 Precision)	1 front; 1 center; 2 rear
Spindle nose	15" A-2
Diameter of hole through spindle	8¾" 8 7/8"
Spindle speed range, standard 60 cycle	6 to 500 r.p.m.
Number of spindle speeds	24
Length of bearing on bed	43"

CARRIAGE

Length of bearing on ways	32"
Width of cross slide	10⅞"
Travel of cross slide	14⅝"
Width of tool slide	8⅝"
Travel of tool slide	6½"

*TAPER ATTACHMENT

Length of taper turned at one setting	16"
Maximum taper per foot (included)	4"
Maximum taper in degrees (with center line)	9½°

STEADY REST

*Capacity, No. 0	0 to 6"
*Capacity, No. 1	5½" to 10½"
*Capacity, No. 2	10¼" to 15"

WEIGHT

Base weight, approximately	13,500 lb.
Additional for each 2-foot increment	800 lb.

Complete information on chucks and other accessories available upon request.

*Extra equipment.

In addition to Hollow Spindle Types, Axelson Engine Lathes are available in 14", 16", 18", 20", 25" and 32" sizes of various lengths.



For over 30 years Axelson has been manufacturing lathes which have established a reputation for quality and satisfactory performance.

AXELSON MANUFACTURING COMPANY

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