LeBLOND 12" - 14" - 16" - 18" ENGINE LATHES

BE MANUA

TOOL ROOM LATHES

GAP LATHES

- \star Installation
- ★ Maintenance
 - Operation
- ★ Repair Parts

THE R. K. LeBLOND MACHINE TOOL CO.

CINCINNATI, OHIO, U.S.A.

Service Manual

Installation • Maintenance • Operation • Repair Parts

LeBlond

12" to 18" Engine—Tool Room—Gap and 19" x 38" Sliding Bed Gap Lathes

Make the Acquaintance of . . .

LeBlond Lathes

12".... 14".... 16".... 18" sizes

"Pleased to meet you" is the usual reply when one is introduced to a new acquaintance. But a LeBlond Lathe—even though it is your first one—is more than a new face in the shop. LeBlond Lathes are old friends in many shops. We hope they are or will be in yours.

"Pleased to Meet" one can be more than a brief formality. At least it should be. Here's how we feel about it, as concerns LeBlond Lathes:

They are good lathes. Not because we say so. Rather because they can prove it, themselves. But do you know that?

They are built to precision standards by the largest manufacturer—LeBlond of a complete line of lathes. Does that mean anything?

Their fluer-de-lis $(\mathbf{\Phi})$ trade mark is internationally known and recognized. It is a mark of merit, to those who know. Do you?

They are rugged, versatile, accurate, almost foolproof. Do any of these things mean anything?

We think NOT . . . unless, of course, you want them to mean something. We are not saying you should. But may we not suggest that you treat your new LeBlond with at least the same courtesy and respect that you would a new acquaintance. Who can tell, that new acquaintance, that new LeBlond Lathe, may turn out to be one of your best friends. We hope so. That's why we say again: "Make the Acquaintance of LeBlond Lathes."

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The R. K. LeBlond Machine Tool Co. CINCINNATI, OHIO, U. S. A.

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Dimensions of 12"-14"-16"-18 Engine Lathes and Approximate Space Required



CAPACITY

12"-14"-16"-18" Engine	and T	ool Roo	em Lath	185		12"-14	" Engl	ne and	Tool Re	om La	thes New 1	Weight			16"-14	8" Eng	ine and	Tool Ru	xom Lai	thes New W	/elght Antor	
Size of Lathe	12"	14"	16"	18"			UIMEI	NOIGH	3	č – **	L033	MOLOF		-			-		i and i	Loos IVIULUI		
Swing Over Ways	141/2"	161/4"	181/4"	201/4"	Bed	A	8	C	D	E	12"	14"	Bed		Α	B	C	D	E	16"	18"	
Swing Over Compound Rest	81/4"	91/2"	1114"	131/2"	8/ 8/	7 103/"	R' A"			30"	2970	3020	7' 3"	8'	97/."	6' 10'			30"	4140	4250	
Compound Rest Travel	27/8"	21/8"	4"	4"		1 10 /4		10 10 11	or 17 18					-		N 100			E.4//	4418	4690	
Cross Silde Travel	10%4"	10%	11%	111/6"	8.6.	8 10-3/4"	8'4"	<u> </u>		54"	3205	3260	8 3"	10	3%	8 10			04	4410	4000	
Size of Tool	1/2 1/2	5/ax1	%×11/	%x11/4	10' 8"	11' 103//"	10' 4"	38%	411/4"	78"	3440	3550	11' 3"	12	9%"	10' 10'	391/2"	401/4"	78"	4690	4810	
Steady Rest Capacity	41/2"	41/2"	51/2"	51/2"	12' 8"	13' 103/4"	12'4"	50%	531/4"	102"	3675	3740	13' 3"	14'	97/8"	12' 10'	511/2"	521/4"	102"	4965	5090	
Taper Att. Max. Taper per Ft.	3"	3"	31/2"	31/2"	14' 6"	15/ 103//"	14' 4"	62.4"	651//"	126"	3910	3980	15' 3"	16	97/."	14'10'	631/6"	641/4"	126"	5240	5370	
Taper Att. Turns at One Setting-Max. Length	18"	15"	18"	18"	16' 6"	17' 103/4"	16' 4"	749.14"	771/4"	150"	4145	4220	17' 3"	18	97/2"	18' 10'	751/2"	781/4"	150"	5515	5850	

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NOMENCLATURE 12" TO 18" LeBLOND ENGINE LATHES

Service Manual

12"-14"-16"-18"Engine—Tool Room—Gap 19"-38" Sliding Bed Gap Lathes

FIRST STEPS

Unloading and Handling

Before shipment from our plant, this machine was inspected for defects and subjected to rigid accuracy tests. Every machine element was adjusted, corrected, and put in alignment. At the conclusion of this inspection, all oil was drawn from lubrication reservoirs. All bright parts were heavily coated with slushing compound.

While in transit, the machine has been subjected to conditions beyond our control. The car may have been roughly handled in switching, thus subjecting the machine to injurious jolts and strains. These may have caused breakage or affected alignment and proper operation.

Before Signing Delivery Receipt

Upon arrival of car, inspect the machine carefully. If damaged in any way, the shipment should be conditionally accepted from the transportation company, subject to thorough inspection.

Packing List

The packing list itemizes all parts included in the shipment. The Receiving Clerk should check and account for each item on the list. Keep this packing list as a part of the permanent record of the machine.

Important!

Care of the lathe begins as soon as it gets inside your shop. The machine should be kept on its skids until moved into its final location. Before the lathe is handled by cranes, the slushing compound should be removed. The lathe should be oiled before handling, to avoid scoring or scratching any of the sliding units. It is generally necessary to move the carriage, steady rest and tailstock in order to place the sling around the lathe and to balance it when it is lifted. If the lathe is rolled into position, it can be cleaned after the skids are removed.

Remove Slushing Compound

The slushing compound, which is applied to all polished and unpainted surfaces to prevent rust, picks up grit and dirt. It can be removed easily by washing with a rag saturated in kerosene or benzine. A stiff brush will get into the corners. Do not use an air hose. Pressure will drive grit and dirt into bearing surfaces. Remove cross slide guards, clean screw and slides. Don't overlook feed and control rods. Remove the shear wipers and clean thoroughly. When all surfaces are wiped clean, rub over the bright or bearing parts with a rag saturated with clean oil to cover the parts with a protecting film.

Leveling

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VERY IMPORTANT

Before your lathe left the LeBlond plant, it was subjected to rigid accuracy tests. Extremely close tolerances have been established for these tests. Every machine must conform to these limits before it passes inspection. To secure the same results, the lathes must be erected under similar conditions in your plant. THE LATHE MUST BE LEVEL TO CONSISTENTLY PRODUCE ACCURATE WORK.

The lathe should be erected on a good solid floor that is free from vibration. It should be sufficiently rigid to support the weight of the lathe without deflection. A stone or concrete foundation is preferable.

When leveling, use only solid packing or wedges under the legs. LEVEL THE BED (see illustration), BOTH LENGTHWISE AND ACROSS THE WAYS, USING AN ACCURATE LEVEL.^{*} It is highly important to have the level show the same reading when placed across the ways at both the head and tail of the bed. If the bed has a middle leg, take a reading over the center leg also, be sure it is accurately level across and between leg supports. If the level is too short to reach across the ways, place it on a good parallel strip, on blocks, as shown in the illustration. These blocks should rest on the flat surface of the front way and the rear flat surface of the rear way^{*} but not on the flat surface adjacent to the inverted vee. Accurate work cannot be produced if the bed has a twist in it. This can be prevented only by careful leveling. If lag screws or bolts are used to hold the lathe to the floor foundation, tighten only enough to prevent the lathe from "walking" or shifting.

[®]In our plant we use an 18" Queen level with graduated glass, made by Queen & Co., of Philadelphia, Pa. An ordinary machinists level is not accurate enough to get precision results.

*The rear flat way is $\frac{1}{16}$ " higher than the front flat way, on the 12" and 14" sizes, and $\frac{1}{8}$ " higher on the 16" and 18" sizes.

Leveling



Musts

LeBlond machine tools, as they are now designed and built, do not require a lot of the operator's time for servicing and care. However, the things he should do are important. When a machine has been properly set up, there are but five "Musts" for the operator to keep the machine in producing form.

He Should:

- 1. Keep the machine clean. Read instructions below.
- 2. Keep it properly lubricated. See pages 8 and 9.
- 3. Keep it level. See pages 6 and 7.
- 4. Adjust clutch. See pages 35 to 39.
- 5. Adjust gibs to take up wear. See page 34.

Cleaning

A clean machine is conducive to more and better work. Periodic cleaning of the machine after installation is advisable. Permanent stains can be avoided by wiping off the machine once a week with a rag soaked in clean kerosene. Run over bright parts with an oil soaked rag when the machine is not being used.

Lubrication



Important—Check Daily

The life of any machine, as well as the ease with which it can be operated, depends upon the care bestowed upon it. Each part should be kept clean and well lubricated.

Note-Before starting your lathe each morning, check the following:

Headstock: Keep the oil within one inch of top of intake (A).

Feed Box: Oil with can at (B).

Apron: You should be able to see oil in the intake (C). Work the plunger slowly back and forth three or four times (D).

Tailstock: Oil with a can (E).

Lead Screw and Feed Rod Bracket: Oil with a can at (J).

Motor: Follow instructions of the manufacturer.

Details of Lubrication

Headstock—Whenever the spindle is running a submerged pump that needs no priming forces oil from reservoir in the head through a Cuno oil filter (F) to all bearings on the spindle, shafts and the multiple disc clutch and brake. This is accomplished through a system of piping to all bearings. A cascade of oil is sprayed over the entire gear train. The filter is on the rear of the head. A sight feed indicator (G) gives constant check on the oil flow.

Before starting the lathe fill the reservoir until the oil is about one inch from the top of the oil filler opening (A). A good grade of engine oil SAE 30 is recommended for the headstock lubrication.

About once a month turn the cross handle on the Cuno filter (F) two or three revolutions to scrape off foreign matter that may have accumulated on the oil filter.

Apron—A plunger pump on the apron forces oil to all bearings in the apron to the cross slide and to the front and rear bed ways. Work the plunger (D) slowly in and out three or four times. This should be done daily. Fill the reservoir through the intake on the front of the apron (C). The reservoir is full when the oil can be seen in the bottom of the intake. A good grade of machine oil SAE 30 is recommended.

Quick Change Feed—A covered trough (B) on the top of the feed box supplies oil through feeders to all the needle bearings in the housing. The filtering pad in the trough should be saturated daily.

Tailstock—The oil intake (E) for the tailstock is located on the top midway between the binding screws. Unscrew the top and saturate the felt filtering pad from an oil can daily.

Lead Screw and Feed Rod—The bracket (J) on the end of the lathe supporting the lead screw and the feed rod has a screw cap on the top of the bracket for lubricating purposes. A small amount of oil from an oil can daily is sufficient.

General Practice—Motors with ball bearings should be greased once or twice a year, depending on whether under continuous or intermittent operation and on the temperature of room. Sleeve bearing motors are oil lubricated. Use a good grade of light mineral oil SAE 10 or 20. Check oil level on sleeve bearing motors once a week.

Re-Level

No lathe bed, irrespective of its manufacturer, is of sufficient strength to resist twisting, if it is not accurately leveled and its supporting members properly shimmed. The life of your lathe will be increased half again if this matter is given the proper attention. It is advisable to occasionally re-level the lathe after it has been in service. Frequency of re-levelling depends upon the condition of the floor or foundation. At LeBlond we use an 18-inch "Queen Level," to accurately level each lathe before testing and running off. An ordinary machinist's level is not sufficiently accurate to insure the best results.

**This is a highly accurate and sensitive metal level with graduated glass made by Queen & Co. of Philadelphia, Pa.



Headstock—The 12" to 18" lathes are regularly furnished with a multiple disc clutch and brake (see pages 35 to 39) incorporated in a driving pulley. The driving pulley is supported on large anti-friction bearings mounted on a bush bolted to the head, relieving the driving shaft of all strain and pull from the driving unit. The powerful multiple disc clutch when disengaged automatically engages a single plate brake.

To start the spindle you can use either the head or the apron control. With the head control pull the long handle (A) at top-front of the headstock toward you, when standing in the operating position, to disengaged push to the left; with the apron control (B) push the handle at the left end of carriage down, pull up to release. When the clutch is released it automatically applies a single disc brake.

Do not change speeds with tools under cut. Always disengage the feed before changing speeds.

To change speed on any LeBlond lathe move one or both speed control handles (C) located at the left of the clutch handle into position indicated on the graphic speed plate (position of both handles are shown for all the speed changes) for the desired speed. The speed change handles will slide the gears into position easier if the clutch is engaged momentarily, just enough to start the gear train in motion.* The two handles (D and E) at the left side are the feed compounding and reversing controls. On the 12" to 18" Tool Room Lathe (E) is a

*Do not change speed with clutch engaged.

connecting link to the feed reverse control handle (J) on the carriage (below). Instruction for their use is dealt with under feed box and thread cutting below, and on pages 11 and 20.

Apron 12" to 18"—Engine Lathe—Movement of the carriage and the cross slide is controlled by a single lever (H) on the upper center of the apron and is moved up from the stop pin for carriage movement and down from the stop pin for movement of the cross slide. On the engine lathe the movements of the carriage and the cross slide can be reversed either by reversing the feed mechanism with the reverse handle (E) on the head or by shifting the double bevel pinion handle (K) on the lower right hand side of the apron. In explaining the movements of the carriage and the cross slide we will assume the reserve handle (E) on the head is in the left hand position, where it should be set to cut a right hand thread. Now with the apron double bevel pinion handle (K) in the left hand position the carriage will feed toward the headstock and the cross slide will feed toward the rear way of the bed. With the apron reverse handle (K) thrown to the right the carriage will feed toward the tailstock and the cross slide toward the operator.



Apron 12'' to 18''—Tool Room Lathe—Movement of the carriage and the cross slide is controlled by a single lever (H) on the upper center of the apron and is moved up from the stop pin for carriage movement and down from the stop pin for movement of the cross slide. Change of direction of both the carriage and cross slide is by the feed reverse handle (J); when pulled up from the neutral position the carriage feeds towards the head, or if apron clutch (H) is set for cross slide movement the slide moves toward the operator. When the feed reverse handle (J) is down, the carriage moves toward the tailstock or the cross slide feeds toward the rear way of lathe. The reverse lever should only be used to change the direction of the feed and not to operate the carriage and cross slide.

Handle (K) is moved to center, neutral position when the lead screw is in use.

Feed Box—The feed and thread mechanism is simple and easy to operate. It consists of a cone of gears (X), an intermediate shaft (Y) and a set of sliding gears (Z). The fine change shifter (N) slides on a splined shaft and carries a tumbler gear which is dropped into engagement with a gear on the cone corresponding to the thread or feed selected on the index plate above it. For the course changes the lever (O) on the lower part of the box is moved into the (A, B, C and D) positions. To further change the range of feeds, a lever (D) on the head above the feed box is shifted into the (A and B) positions above the shifter, (A)giving the coarse range, (B) the fine range. This lever moves the sliding gear in the head into engagement as indicated by the (A and B) positions above the shifter with the resulting feeds and threads shown on the feed box plate.



Tailstock—The spindle movement of the tailstock is through rack (B) and worm (A) forming a positive lock to the spindle against backing out. The tailstock spindle (C) has a large area bearings (D) in both the front and rear of the tailstock even with the spindle



extended to the limit of its movement. The travel is greater than would ever be needed for a piece held between centers and adequate for most drilling and boring operations without reclamping the tailstock screws.

Two setover screws (P) move the tailstock top to any desired position on the accurately graduated scale on the end (T). The hand wheel sets at an angle with the spindle, is handy to operate and is arranged so that a bar can be used for hand feeding when drilling with the tailstock. A drill sleeve with a tang driver is furnished for holding drills. Heavy tailstock clamping bolts (R) securely clamp the tailstock in any position on the bed. The handle (S) securely clamps and holds the spindle in the desired positon.



Mounting Chucks and Face Plates — Mounting chucks for face plates is simple on the new key drive spindle nose. Place the chuck or face plate keyway (A) on the key (B) in the spindle with the key on top. Next, slide it into position. This brings the thread (C) on the chuck into alignment with the threaded collar (D). Then, with both hands free, start the threaded collar (D)—tightening up with a spanner wrench. The chuck or face plate is then positively placed and will run true and accurate.

Taper Attachment—The LeBlond DUAL Performance Heavy Service Carriage Type Taper Attachment combines the convenience of a telescopic screw with the rigidity of the yoke type attachment. When the carriage is brought into position for the taper operation, the bracket (A) is tightened on the flat bed way. The swivel guide bar (H) is adjusted to



the selected taper, which is marked in inches on one end of the lower bar and in degrees on the other end of the bar.

The adjustment is made by means of the set-over-knob (B) engaging the rack in the end of the taper bar, moving the swivel bar to the desired taper. It is held secure by the screws (C). Now, with the taper bar clamp screw (D) loose, and assuming that the shoe bracket gib (E) and the carriage bracket gib are properly adjusted, we are ready to chase taper threads or to finish taper turning, or finish boring. When the carriage feed is engaged the bracket (A) and its connecting rod hold the lower taper bar (G) and



the adjustable swivel bar (H) in a fixed position with relation to the bed and the work. The movement of the carriage slides the gibbed shoe (J) along the taper bar (H) and the pull is on the cross feed screw (K) and nut (L) the end of the screw telescoping in the bush (S) allowing the slide to move in or out. The telescoping end of the screw is splined (T)and in this spline a key (U) in the telescoping bush slides, allowing movement of the tool at all times.

On heavy cuts, none of the pull is on the cross feed screw but on the draw bar (M) which is connected to the bottom slide of the tool rest. On heavy cuts the clamping screw (D) is tightened and the action of the sliding shoe is the same as on light cuts, except that the pull is on the draw bar (M) clamp plate, relieving the cross feed screw of all strain and pull and wear, thus insuring longer life and sustaining the original accuracy of the screw. Adjustment of the cut is made by loosening the nut (D) and setting the tool to the proper diameter and of course tightening the nut again after the adjustment is made, however, most adjustments of the tool are made by the compound rest and there is no necessity of adjusting the nut (D) after the taper is set.

Direct Length Travel Reading Dials—The direct length travel reading dial as the name indicates makes possible the accurate measurement of length cuts directly read from a



large dual dial located on the carriage hand wheel shaft. The dials are graduated both in inches $(\frac{1}{2}'')$ marking) and fractions of an inch $(\frac{1}{64}'')$ markings) and are moved into position by gripping the knurled portion of the dial. The carriage is moved one inch with one complete revolution of the outer dial. One complete turn of the inner dial moves the carriage 24''. To use the dial first set the turning tool for the diameter to be turned, then position the tool at the start of the cut. Now turn the dial that will give the desired length until the zero mark is directly under the pointer.

The length of cut can then be read directly from the dial, or it can be used to set the length feed stops where duplicate parts are to be machined.

Dual Crossfeed Diameter Dials—The dual diameter dial saves time in tool setting as it eliminates the old cut and try method. The dial is directly behind the cross feed handle and is marked in both decimal and fractional inches. The outer dial is graduated in thousandths, one complete turn moves in .2 of an inch. The inner dial is marked in $\frac{1}{32}$ ", one complete turn moves the cross slide 3". First determine the size of the piece to be turned then bring the point of the tool into position so that it just touches the work. Then turn the dial until the zero mark is directly under the pointer. Subtract the diameter to be turned from the diameter of the stock and feed tool in one-half the amount. For example if the diameter of the stock is 2" and the diameter to be turned $1\frac{1}{2}$ " the difference is $\frac{1}{2}$ " then feed the tool in $\frac{1}{4}$ " or .250".

Sliding Bed—Gap Lathes—See engine lathe instructions on 18" size for instructions on the units common to both. The bed is composed of two sections, the top bed being moveable



on the lower bed by means of a coarse pitch screw on the rear of the bed and operated by a crank at the end of the bed. To move the upper bed loosen the clamps that are held by screws (X) through two holes in each of the heavy cross girths of the upper bed. The clamps

pull against finished surfaces under the ways of the lower bed. Move the bed into position desired and pull up clamp screws, tightening first the screw to the back of bed pulling the upper bed securely to the vee way on the back then tighten the front screws. Next place the jacks at the end of the overhanging bed. The jacks should be raised just enough to relieve the stain resulting from the unsupported load.

Regular Gap Lathes—Instruction on corresponding sizes of engine lathes also apply to gap lathes. The supplementary piece (Y) is accurately fitted in the gap and great care should be taken when it is removed to exert an even pull to avoid jamming it. The piece is held rigid in place by two locating pins and four screws.



Relieving Attachment

The fully Universal Relieving Attachment will cut any relief from zero to $\frac{1}{4}''$ with the use of only two cams. The change from external to internal or end relief is made without the addition of intermediate supporting blocks and additional knuckle joints. Spiral relief can also be taken care of by a simple adjustment of change gear combinations. The use of the taper it easily accomplished without any special brackets or connections.



To connect the relieving attachment it is only necessary to remove the compound rest, place relieving attachment in position and connect telescopic shaft.

The adjustment of the follower cam is simple and can be accomplished quickly. A wrench on the square milled end of the vertical eccentric shaft moves it and the follower cam hub that is keyed to it. When the eccentric shaft is in position for the desired relief the nuts on two bolts in the tee slot milled in the follower cam hub are tightened, holding the follower cam securely in position.

The range of adjustment accomplishes a relief from zero to $\frac{1}{16}''$ with the small follower cam and $\frac{1}{16}''$ to $\frac{1}{4}''$ with the larger follower cam. The graduations for both cams are on the follower cam hubs: zero to $\frac{1}{16}''$ being on the side next to the tailstock and $\frac{1}{16}''$ to $\frac{1}{4}''$ side next to the headstock, in increments of $\frac{1}{64}''$.

RE	LIEV	ING	ATTA	CHMI	ENT
WHEN USED WITHOUT SUB-HEAD	Nº OF FLUTES	A	B	С	WHEN USED WITH SUB-HEAD
ΠΛ	2	64	24	72	TOT. SPINDLE
SPINDLE TO H	3	48	24	64	
COLLAR	4	48	32	64	
	5	64	40	48	SPLINED IMA
	6	48	42	56	BUSH,
64T. J - U	7	64	56	48	64T.
A	8	64	48	36	
	9	64	60	40	
	10	64	60	36	
C→155	11	48	55	40	
€-	12	48	60	40	▏┫┯┓┯
	13	48	65	40] "┟┲╩┷┑
LULLAKI /	14	48	56	32	
THROW LARGE SPEED LEVER	15	48	60	32	COLLAR
WHEN RELIEVING.	16	48	64	32	NO-200 B-21-5

Pitch of Spiral Flutes

ac:ab::ab:bd

 C^2

To obtain the correct pitch of spiral at right angles to the thread the following formula may be used:

C-Circumference of hob at pitch line

L-Lead of thread

P-Pitch of Spiral Flutes

Then -= P The triangles bac and dba are similar and their corresponding sides are L proportional. They are both right angle triangles and the angles b c a and b d a are equal. Therefore their corresponding sides are proportional and we have

a c =
$$\frac{a b^2}{bd}$$
 or $\frac{C^2}{L} = P$

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CUTTING THREADS

A central position (feed control handle (H), page 11, against stop pin) holds the feed mechanism into a neutral position, releasing the dog that locks the half nuts out of engagement when the feed mechanism is used.

The lever (L) above the feed direction shifter engages the half nuts to chase threads. A downward movement of the handle engages the half nuts on the lead screw, pulled up the lead screw is released. Either the chasing dial or the lead screw reverse (J), page 11, can be used to re-engage the tool in the thread being cut. The direction of the lead screw or feed rod is reversed by the handle (E), page 10, on all LeBlond engine lathes.

Since chasing requires a number of cuts and all must be in the same line of the cut of the thread, it is necessary either to keep the half-nut engaged on the lead screw at all times and return the carriage by reversing the lead screw, or to use an indicator which meshes with the lead screw and shows when the half nut can be engaged so that the tool will cut along the same thread; the device used for this purpose is called a chasing dial.

Thread Indicator Method—The thread chasing dial on right hand side of apron, page 8, comprises a worm wheel that meshes with the lead screw and a shaft connecting the worm with the indicator dial. The dial is marked from 1 to 4 equally spaced, that is 90 degrees apart with single graduations spaced between each number.

For all even number threads close half nut at any line on dial.

For all odd number threads close half nut at any numbered line.

For half threads close half nut at any half revolution.

For quarter threads close half nut any whole revolution.

Lead Screw Reverse Method 12" to 18"—The use of the lead screw reverse on tool room lathes is particularly valuable in chasing odd threads that cannot be picked up with the thread dial; on short threading jobs; for chasing threads in blind holes or on threads stopping at a shoulder.

With the lead screw reverse you can change the direction of travel of the carriage with the use of either lead screw or feed rod without changing the direction of rotation of the spindle. The lever (J), page 11, on the right hand side of the apron shifts a single tooth clutch in the thread and feed gear train and controls the direction of rotation of the lead screw and feed rod.

More accurate threads can be cut as the single tooth clutch insures the register between the lead screw and the lead being cut. Adjustable automatic stops are provided to disengage the feed mechanism in both directions.

When the stop disengages the lead screw at the end of the thread the tool should be backed out and the feed engaged to return the carriage to the starting point without releasing the half nuts on the return. Another dog disengages the mechanism, the tool is then set to the proper depth and the control handle engaged for another cut.

Thread Cutting Data

When cutting threads it is necessary to set the tools at a right angle to the piece to be turned; that is, the axis of the thread tool should be exactly 90 degrees from the axis of the work. This is accomplished by use of a thread setting gauge.



Next set the cutting edge of the tool exactly on the dead center. The depth of the thread and the thread angle will not be cut correctly if the tool is set in any other position. When cutting threads on cast-iron or brass no cutting lubricant is necessary, but on steel it should be used. A good quality of cutting oil should be applied to the tool, especially on the finish cuts; a smoother surface is thus obtained.

On threads of fine lead, about 30 and finer, the tool may be fed straight into the work in successive cuts. However, on coarser leads it is better to set the compound rest at one-half the included angle of the thread, and feed in along the side of the thread with the compound rest handle, so that the tool cuts on one side only during the roughing. On the last two or three cuts the tool should be fed straight in, by the cross slide handle, to remove all lines caused by feeding along the side of the thread.

When the lathe is ready for the first chasing cut and a chasing stop is not being used, proceed in the following manner. Bring up the point of the tool until it touches the diameter to be chased. Set the cross feed dial at zero and feed the compound slide in $.005^{\circ}$ and take a cut. At the end of the cut withdraw the tool by means of the cross slide handle and return the carriage to the starting point. Again run the tool in until the dial is on the established zero reading and again feed the compound slide in .005. Proceed in the same manner until the last two or three cuts are to be made, then feed straight in with the cross slide to clean up both sides of the thread.

The points just outlined are also true for taper and internal threading. We would again point out that the top edge of the tool should always be set on the lathe center line and the proper side and front clearance must be allowed to clear the sides of the threads.

The table following conveys some idea of the number of cuts necessary to chase vee threads that are in common use:

No. of Threads	No. of Chasing
per inch	Cuts
8	18
10	14
11	13
12	11
13	10
16	9
20	8

This table is based on .005" per cut allowing an extra cut for finish which is the actual practice in our shop.

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Formula for Figuring Change Gears for Special Threads

A limited number of threads in between those shown on the index plate on the 16" and 18" lathes can be cut by setting the feed box to cut the same number of threads as the number of teeth in the gear H (24 teeth), on end of the feed box, and by putting a gear in place of the gear H having the same number of teeth as the thread to be cut, for example, place a 21 teeth gear to cut 21 threads, a 27 teeth gear to cut 27 threads, etc.

Another simple method not requiring compound gears follows:

On 12" and 14" Lathes-For Driving Gear F, use 36 teeth For Driven Gear H, use 27 teeth Lead Screw has 4 threads per inch For 1:1 ratio set feed box to cut 3 threads

On 16" and 18" Lathes-For Driving Gear F, use 48 teeth

For Driven Gear H, use 24 teeth

Lead Screw has 2 threads per inch

For 1:1 ratio set feed box to cut 1 thread

Example to cut 6.4" lead* on 12" lathe:

Set box to cut 3 threads x (F) 36T	 3x36	3x4	12	45T—F
Special lead to be cut x (H) 27T	= = 64x27	64x3	= 19.2	72T—H

There are a number of special leads which may be obtained by replacing the gears F, G, and H. For example, suppose a lead of .759 was desired, we first select a thread plus or minus the lead desired and set feed box levers to chase this thread. We may select 2 threads 759

which give us the lead of .500 or the following ratio ----. The ratio established on the lathe 500

between head and feed box by gears F and H, for example on the 12" lathe is - or -.

Taking the LCD^o of the above we have $\frac{3 \times 11 \times 23}{5 \times 5 \times 5 \times 2 \times 2}$ combining this we have

$$3 \times 11 \times 23 \times 4$$
 69 x 44 Pinions

_____ or ___ 5 x 5 x 5 x 2 x 2 x 3 50 x 30 Gears $\mathbf{F}' \mathbf{x} \mathbf{G}'$

These gears are shown on the diagram as _____. When it happens that the ratio cannot $G' \times H'$

be divided into suitable Lowest Common Denominators that can be arranged for gears and pinions, it becomes necessary to try another ratio. To check the problem we have

69 x	44	3036	4		759
		-	÷ —	त्रही व	1.0
50 x	30	1500	3		500

*The pitch of a screw thread is the distance from the center of one thread to the center of the next. The lead is the distance the nut will move forward on the screw when turned one full revolution. In a single thread the pitch and the lead are the same. In a double threaded screw the lead is equal to twice the pitch. In a triple thread, three times the pitch and so on.

^DLowest Common Denominator of a given number can be found in the various machinery hand books under Prime Numbers and Factors.

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Coarse Threading Attachment and Sub Head

The Coarse threading attachment provides special leads without changing the gears on the end of the lathe.

The sub head is applied to furnish exceptionally low speeds for coarse worm cutting or chasing threads with exceptionally long leads and for use with the relieving attachment.

The following diagrams show the leads that can be cut with the coarse threading attachment on the 12'', 14'', 16'' and 18'' lathes. On the 16'' and 18'' the plate indicates the results of the coarse threading attachment used with the sub head and resulting leads and diametral pitches.

When selecting gears for special leads be sure that all gears clear and that the standard quadrant is used if possible. However, there are a number of cases where special quadrants with idler gears are necessary. To cut any lead not listed use the following formula to calculate special change gears for head and box:

Explanation of
$$R = \frac{6 \times S}{T}$$



Example Illustrating Method of Computing Gears for any Lead

Let "L" = 1.782 in. nearest values fall in third row on coarse thread index plate opposite page, so lever on box will be at "C" and lever on head at "A". S = .25.

Substituting:
$$R = \frac{6 \times .25}{1.782} \times T = .8417508 \times T.$$

For first tumbler position: $R = .8417508 \times .5333333 = .4489338$.

From gear-ratio table: $\frac{22}{49}$ = .4489796. This leaves an error in ratio of .0000458. Tabulating all 9 values.

T	R	Closest Gears	Ratio of Closest Gears	Ratio Error	
.5333333 .5714285 .6153846 .6666667 .6956521 .7272727 .8000000 .8888889	.4489338 .4810004 .5180005 .5611672 .5855657 .6121824 .6734006 .7482229 .8417508	22/49 38/79 43/83 55/98 65/111 30/49 33/49 89/119 101/120	.4489796 .4810127 .5180723 .5612245 .5855856 .6122449 .6734694 .7478992 .8416667	.0000458 .0000123 .0000718 .0000573 .0000199 .0000625 .0000688 .0003237 .0000840	Best GH too big GH too big GH too big 2nd best 3rd best GH too big GH too big GH too big

Proof: L = $\frac{6 \times .025 \times .5333333}{.4489796}$ = 1.7818181. Error in lead is .0001819 or .000102 per in.

As this error is considerable, the computations should be made for compounding: Formula for use with 113T and 71T Compound Gears:

 $R = \frac{GH}{113} \times \frac{71}{GB} = \frac{L}{6 \text{ ST}}$ combining terms $R = \frac{GH}{GB} = 2652582 \frac{L}{ST}$

Substituting desired lead in this formula for compound gears,

 $R = \frac{.2652582 \times 1.782}{1 \times T}$ Where S = 1, as nearest values fall in first row of diametral pitch plate. Repeating above procedure, a pair $\frac{GH}{GB} = \frac{53}{69}$ gives a lead of 1.781987, an error of .000013, or .000007 per in. This is O. K., but cover will have to be removed if it is used.

TO OBTAIN ANY I GH = Nº OF TEETH	LEAD IN GE	NOT AR	LISTE	D, CA	ANG B	GEA R 57	TO CL	HEA.	D AND PELIEVI	GE NG AT	AR C	nn Bo: Ar. N	AS	FOL VER (LOW: 66 TO	SI CLEI	AR-S	PINDI	E)		
GB= Nº OF TEETH	IN GE	FAR	ON BOX.	(NOT	OVER	67 то	CLEA	R CO	VER .	No	UT U1	VDER	57	WHEN	Cor	APOU	NDIN	4).	0		1
L= LEAD DESIR	EQ.	51	LEVER	RATI	0 (51	GUN	DELL	65	τ'	100	18LE	RRA	TIO	(SHOW		801	TOM	OF	FLA	T#)	
RATIO OF CHANG	SE GE	ARS	B DESI	REOS		7= 6	H	L		()	THE	AD IN	OMP	OUND	NFAR	FCT	70 0	FSIRF	01	-	1 1
CHOOSE S FRO	DALLE	97	SETTIN	Pos	TION	AUWS	SEL	ECT	NEAR	EST	PRACT	TICAL	PAIR	CF GE	ARS	ROM	A GE	AA-R	ATIO	TABL	E .
To CHECK FOR	ERRO	R. 5	UBSTIT	TUTE	ACT	UAL	GEAN	RA	TIO S	ELEC	TEA	, IN	FOL	LOWI	Ng i	FORM	NUL	1:		99 5 6 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C	
ACTUAL LEAD	L = 4	GST.	. Act	TUAL	LEA	O M	UST	8E 1	VITH	N LI	MIT	OF E	RRO	R PE	RMI	551	SLE.				5.
FORMULA MOR USI	E W171	- 119	TAND	717	COM	POUND	O GEI	4 R9 :	R=	GH -	.26	525	82 2	4							
CHOOSE "S" FROM	LEVE	R SE	TTING	THAT	-	S' VAL		N DIA	METR	AL P	TCH I	NDEX 1	PLATE	NEA	REST.	TO DE	SIRED	LEA	0.		
To CHECK FOR E	RROR-	- A	CTUAL	LEA	p L	= -	3.76	9911.	5 R.S	57.	<u> </u>				<u> </u>	<u>C st</u>			<u>.</u>		
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COLLAR	NO	ON	ON					1	-EV	ER	ON	HE	AD)			2 -				
_f⊾]	HEAD	BOX	BOX	A	в	A	B	A	В	Α.	B	A	В	A	B	A	В	A'	B	A	B
48T. 9 -			A	6,400	.800	6.857	.857	1.385	.923	8.000	1.000	8.348	.045	8.727	.091	9.600	1.200	0.667	.393	12	12
1 1 4	48	24	B	3.200	.400	3.429	.429	3,692	.462	4.000	.500	4.174	.522	4,364	545	4.800	.600	5.335	.667	6	7
		_	C	1.600	200	1.714	.214	1.846	.231	2,000	.2.50	2.087	.261	2.182	273	2,400	,300	.667	333	3	8
		-120-	A	5.867	.733	6.286	.786	6.769	. 846	7.333	.917	7.652	.957	8.000	1,000	8.800	1.100	9.778	1.222	<u>u</u>	18
9111	44	24	B	2.933	. 367	3.143	.893	3.385	.423	3.667	.458	3.826	478	4.000	.500	4.400	.550	-289	.6//	22	16 11
]_[C	1.467	.183	1.571	.196	1.692	,212	1.833	.229	1.943	239	2,000	.250	1.2.00	,275	2,444	306	4	32
247	100	04	A	5,333	.667	5.714	.714	6.154	.769	6.667	.835	6.957	.870	7.273	.909	8.000	1.000	9.889	556	5	5
-8-1-	40	104	В	2.667	.353	2,857	.357	9.077	.385	3.333	.417	3.478	,435	3636	.400	4.000	.300	9,774	274		5
Left.		-	C	1.333	.167	1.429	179	1.538	.192	1.667	.208	1.739	.217	1.818	.241	2.000	250	2.222	10	62	14
GEARS FOR	1	0	A	4.800	.600	5,143	.643	5.558	.692	6.000	.750	5.261	.783	6.545	.018	1,200	.900	8.000	500	11	9
COARSE THREADS	36	24	в	2.400	.300	2.571	.321	2.769	.346	3,000	.375	3.130	.391	3.273	.409	3,600	.450	4,000	250	2+	<u>16</u> 9
COLLAR FL d			C	1.200	.150	1.286	.161	1.385	.03	1.500	.188	(.565	.196	1.630	.205	1.800			0.00	-4	32
a Pil	20	2	A	4.267	,593	4.5/1	.571	4.923	.65	5.333	.667	5.365	. 696	5.86	.127	6.400	.800	1.111	144	0 A	+
HEAD	34	14		2,133	.267	2.286	.286	2.466	.308	2.667	.533	2.783	348	1455	102	3.2.00	.400	1776	022	2	+
		+		1,067	.155	1.143	.143	1.231	.104	1.355	461	1.33(.114	5 455	682	6.000	750	1 447	BSR	7+	15
164				4.000	.500	1,000	.200	0 300	200	3.000	.00	2400	397	2 727	241	1.000	375	9335	417	32	皆
	30	24	1	2,000	,250	1.071	:000	1154	,600	1.350	,513	1.304	.320	1 344	. 341	1 500		1667		13	36
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	-	+		1467	49.9	1.000	414	4 000	500	4 33	547	4.522	545	4 727	.591	5 200	.650	5.778	.722	61	12
COLLAR 7 4	26	21		1733	117	1857	232	2,000	250	2.167	.271	2 261	.283	2364	295	2,600	325	2,889	.361	34	13
GEARS FOR	100	12-		867		929		1.000	,	1.083		1.130		1.182		1.300		1.444		15	
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9 4	F	-	<u> </u>	419		Ŧ	7P	.483		1 T	6P	.546		.571	1.1	1 Ŧ	5P.	,698		T	4ºP.
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ALP			D	160	1.0055	50	.0059	152	1.0064	48	.0069	46	.0072	44.	.0015	40	.008	36	.009	32	.010
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e HL		F	AB	HE I	30P	표	28P	H	76P	표	24 P	I	230	#	220	10 II	107.	গু	3F.	8	BF.
GEAR ON HEAD	- 1	F	BB	I	GOP	H-	56P.	H.	52 P.	H	488	<u><u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u>	468	22 I,	AAP	20	ADP.	18	101.	16 IL	16 17
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Feed Drive 12" to 18" LeBlond Heavy Duty Engine Lathe



Feed Drive

The LeBlond Heavy Duty Engine Lathes are equipped with gear drive from headstock to quick change box. The gear A on the spindle drives the feed reverse gears B-B'. From this shaft the feed comes through compound mechanism D-D'-E-E'. This is controlled by compound shifter lever on the head and is specified on the feed plate in the right hand column as A and B. At this point the feed drive comes from the head through the quadrant idler to the feed box, namely F, G, H. The feed drive enters the feed box through a splined shaft with a sliding tumbler gear and pinion I and J engaging in cone gears K. The lever on the box with the positions A, B, C and D controls the feed through gears Q, R, S and T which drive the feed rod. The gear U on the feed rod drives the sliding gear V on the lead screw.

From the quick change box the power is transmitted to the apron by either the lead screw (for chasing threads only) or the feed rod. Engaging the feed rod the bevel pinions No. 1 reverse the travel of the carriage or cross slide when engaged with the bevel gear No. 2. The pinion No. 3 drives the clutch gear No. 4 which can be engaged to drive cross feed gear No. 10 or the longitudinal gear No. 5, the latter driving gear No. 6 which is mounted on the rack stud with rack pinion No. 7.

Cross feed pinion No. 11 is pressed on the cross feed screw and is engaged with gear No. 10 for power movement of the cross slide. The gear No. 8 is mounted on the handwheel shaft and drives through No. 6 to the rack wheel pinion for manual longitudinal feed.

## Sharpening Lathe Tools

turned, below the cutting edge of the tool (132). The front clearance should be less for small diameters than for large diameters, ranging from 8 to 15 degrees. Do not grind more front clearance than is necessary as this takes away the support from the cutting edge of the tool. 132

The tool is ground with the side clearance "D" (127) to take care of the advance and to prevent the dragging of the tool on the shoulder formed by the cut (131). This angle is usually about 6 degrees from the vertical and is constant.

Tool bits can be ground best in their own holders. To prevent grinding the holder, extend the tool beyond its regular cutting position.

> After a tool has been ground on the emery wheel, it will produce better work and last longer if the cutting edge is stoned with an oil stone. This takes out the wheel marks and gives a smooth cutting edge. Care must be taken in grinding cut-off tools to see that

both sides of the tool have the necessary side clearance (133). A tool of this kind also cuts better if a lip is ground back of the cutting edge to curl the chip as it comes off the piece (134).



In grinding boring tools, see that the front clearance is sufficient to prevent the tool from rubbing in the hole and dragging at the point "A" (135).

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#### Adjustment of the Lead Screw

The lead screw is in tension and to maintain its accuracy it must be kept that way. Turn the nut (X) to the right until it is tight, then loosen until screw can be turned by hand. The nut on the end of the screw holds a collar against a shoulder on the screw. The collar is also a stop for the ball thrust bearing. The adjusting nut moves a bush against the ball race.



#### Carriage Gibs

Each of the two front gibs (C) on the carriage are held against the underside of the vee way with two cap screws (D) and against the side of the way with two adjusting set screws (E). To adjust, loosen cap screws (D) on the underside and tighten the two adjusting screws (E) on the side until you can feel a slight pressure of the gib against the side of the way. Proceed in the same manner with the second front gib, then tighten the cap screws in both gibs.

The long straight gib (F) on the rear of the carriage is adjusted in the same manner as the front gibs. Loosen the two cap screws (G) on the back side of carriage and tighten the adjusting screws (H) on the underside of carriage until you feel a slight drag on the gibs. Tighten the cap screws to hold the gibs in position.



#### Clutch and Brake

This multiple disc clutch is equipped with automatic cone brake. Moving the clutch control handle to the left compresses the clutch driving discs to set the lathe driving shaft in motion. To disengage the clutch, move the clutch control handle to the right. The clutch driving discs then automatically separate and the brake takes hold to stop the lathe driving shaft with a smooth, quick stop, holding it rigid for ease in locking work in chuck or other operations requiring a fixed spindle. When necessary to turn the spindle by hand, it may be entirely disconnected from the driving shaft by throwing the lathe's regular gearshift handles into their neutral position. The speed with which the brake will stop the lathe is affected by the weight of the work piece that is in the lathe. When the spindle is driving a heavy load it will come to a slower stop than when it is without work or driving a lighter piece. Both the clutch clamping discs and the brake run continuously in oil to provide smooth starting, running and stopping. All working surfaces are given excessive area to insure oil-smooth operation for a long period of time with a minimum of adjustment. There are but two simple adjustments: 1 ... the pull pressure of the clutch discs; 2 ... the working clearance of the clutch discs.



## Chart "W" and Photos "X-Y-Z" Illustrate the Style F Clutch, 1D Series

The driving pulley (A) is mounted on a pair of tapered roller bearings (C and C') supported on the pulley bushing (B), chart (W), page 39, which is rigidly bolted to the head of the

lathe (D). The driving pulley is extended at the cover to form the clutch housing (A'). The gear teeth cut on the inside diameter of the housing (A'), completely engage the teeth on the outside diameter of the driving discs (E). This is the driving portion of the clutch. The brake shoe (F) is keyed securely to the end of the pulley support bushing and held in position by the snap ring (G). This is the stationary portion of the brake.



The operative portion of the clutch and the brake is controlled by the clutch control handle on the upper front of the lathe which operates the push rod (H) sliding freely in the center of the lathe driving shaft (I). To engage the clutch the push rod is forced out between the clutch fingers (J) which are levers having their fulcrum against pin (K') in the clutch hub (K) by means of their adjusting screws (L). The clutch fingers (J) are pivotally connected to the driving plate (M) so that the spreading of the fingers pulls the driving plate (M) toward the clutch hub (K), compressing the intermediate clutch discs (N) between them,

these are keyed to the central portion of the clutch hub and ride alternately between the driving clutch discs (E). This compressing movement locks the operative and driving clutch parts together to drive the clutch hub and the lathe drive shaft (I) to which the hub is splined. The nut (O) on the drive shaft and the three screws (P) secure the clutch hub to the drive shaft in its properly adjusted position.



The brake (Q) is set into the flange (M') extending from the reverse side of the driving plate (M). Three springs (R) separate the driving plate (M) and the clutch hub (K) when the push rod is withdrawn from between the clutch fingers by moving the clutch control handle to disengage the clutch. These springs instantly free the clutch discs to avoid any drag between them. They automatically apply the brake (Q) to the brake shoe (F) stopping the lathe driving shaft (I).

#### Adjustments

There are two adjustments on the LeBlond 1D, Style F Clutch (identical on all three sizes: 3DC, 6DC, 9DC): The first is to set the proper pull of the clutch. The second to set the proper clearance of the clutch discs.

#### Checking

There are also two places where the clutch should be checked:

(1) If the chuck fails to stop in a reasonable time, the loaded heights of the springs should be checked as follows:

Clutch 3 DC 70 lbs. @  $1\frac{5}{16}''$  high Clutch 6 DC 110 lbs. @  $1\frac{1}{4}''$  high Clutch 9 DC 200 lbs. @  $1^{13}32''$  high

(2) Overheating of the oil due to lack of clearance. Oil is circulated through the clutch all the time the driving shaft (I) is running. This circulation stops when the clutch is disengaged leaving sufficient oil in driving pulley to run idle. When the clutch runs idle for a long period, the oil in which the clutch plates run will warm up to possibly 130 to 140 degrees **F**. If the temperature should go beyond this range, it indicates there is not enough clearance between the clutch plates, and the clutch should be adjusted.

#### First Adjustment, (for pull only)

Adjust or check clutch for pull only. Drain the oil from the clutch (V) and remove the cover (S) by removing screws (T). Put clutch control lever in engaged position. Loosen nuts (U) on the three clutch fingers (J). To increase pull, turn each screw (L) to the right (turn each screw the same amount to keep in balance). Tighten these screws to the point where the belt will begin to slip when the clutch is engaged while the spindle is blocked or held so it cannot turn, or when it requires a pull of about 30 lbs. at the clutch control handle to force the push rod into the engaged position. If even adjustment of the three screws has been made, the end of the push rod will run perfectly central when the clutch is engaged. For best results, balance the screw adjustment so the push rod will run central. When adjustment is correct, tighten the lock nuts (U).

#### Second Adjustment, (for clearance)

Adjust clutch for clearance (after the pull adjustment has been made or found correct). With the oil drained and cover removed, put the clutch control handle in the engaged position. Remove the three screws (P) and tighten nut (O), turning to the right with a spanner wrench, to force the clutch assembly back into the clutch housing, or pulley as far as it will go. Now back off the nut (O) just enough so the screw holes are properly aligned for the screws (P) into the hub. Next, make the proper clearance adjustments as follows:

Clutch 3DC back off nut (O) 5-6 turns. Clutch 6DC back off nut (O) 1 turn Clutch 9DC back off nut (O)  $1\frac{1}{2}$  turns

This should leave clearance approximately .050, .060, and .090 inches respectively between the clutch hub and the adjusting nut or determined by a feeler gauge. This shows the clearance that will be provided for the clutch plates when the clutch is disengaged. Replacing the screws(P) will draw clutch assembly tight against the nut in its proper operating position.



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#### Spindle

In time the roller bearings on the spindle will need adjustment. Straighten leg of the spider washer that is bent into wrench slot of the adjusting nut (A). Then, with a spanner wrench in position on the nut with the hook in one of the slots, tap the wrench handle until you can feel a slight drag on the spindle when you pull the small face plate around by hand. When properly adjusted, bend the leg of spider washer that lines up with a wrench slot.





## **Repair Parts Section**

When ordering repair parts it is IMPORTANT for prompt service to give the following information in your order:

- 1. Size of lathe.
- 2. Serial number.
- 3. Number of part as listed.
- 4. Quantity wanted.

The serial number is absolutely necessary. It is stamped on the flat surface on the front way at the tailstock end of the bed. The numbers indicating the parts are *not* stock numbers, therefore, the information requested is of prime importance for the prompt handling of your order.



LeBLOND 19"-38" SLIDING BED GAP LATHE



LeBLOND 19"-38" SLIDING BED GAP LATHE

CAT. 311



LeBLOND 19"-38" SLIDING BED GAP LATHE

CAT. 312

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LOBLOND 12"-14"-16"-18" HEAVY DUTY ENGINE LATHE

CAT. 360

-40-





LATHE SERIAL NUMBER. THE SERIAL NUMBER IS STAMPED ON THE FRONT WAY ABOUT 2" FROM THE TAILSTOCK END -- ALSO GIVE THE CATALOG No. OF THIS PAGE. WHEN ORDERING PARTS, SPECIFY THE



25

COMPOUND REST (STRAIGHT-12" AND 14")





WHEN ORDERING PARTS, SPECIFY THE LATHE SERIAL NUMBER. THE SERIAL NUMBER IS STAMPED ON THE FRONT WAY ABOUT 2" FROM THE TAILSTOCK END — ALSO GIVE THE CATALOG No. OF THIS PAGE.





FEED BOX AND TRANSLATING GEARS

LeBLOND 12"-14"-16"-18" HEAVY DUTY ENGINE LATHE



WHEN ORDERING PARTS, SPECIFY THE LATHE SERIAL NUMBER. THE SERIAL NUMBER IS STAMPED ON THE FRONT WAY ABOUT 2" FROM THE TAILSTOCK END -- ALSO GIVE THE CATALOG No. OF THIS PAGE.

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TAILSTOCK

WHEN ORDERING PARTS, SPECIFY THE LATHE SERIAL NUMBER. THE SERIAL NUMBER IS STAMPED ON THE FRONT WAY ABOUT 2" FROM THE TAILSTOCK END — ALSO GIVE THE CATALOG No. OF THIS PAGE.



WHEN ORDERING PARTS, SPECIFY THE LATHE SERIAL NUMBER. THE SERIAL NUMBER IS STAMPED ON THE FRONT WAY ABOUT 2" FROM THE TAILSTOCK END--ALSO GIVE THE CATALOG No. OF THIS PAGE.







TAPER ATTACHMENT





CAT. 367



LeBLOND 14"-16"-18" HEAVY DUTY ENGINE LATHE

