CAST IRON BED 11 in. LATHE
Operating and Maintenance Instructions

The cleats holding the No. 46-230 Four-Speed Lathe in its box should be carefully removed so as to avoid damaging the machine, and the lathe mounted on a bench or stand. The bench on which it is mounted should have a top of regular 2" stock, in order to support the machine properly—or our lathe stand No. 46-927 should be used.

The tool support base DDL-171, together with its clamp, are not shipped in place, for convenience in packing. Unscrew the DDL-173 acorn nut, then insert the tool support base Clamp HL-614 into place under the top of the lathe bed. The screw SP-838 along with the coil spring DDL-176 and two DDL-174 washers, is now inserted up through the opening in the base clamp, and through the slots in the lathe bed and tool support base, and fastened from the top with the acorn nut DDL-173.

Screw the cast iron bed of the lathe firmly to the bench, about one to two inches back from the front edge. Install the motor so that the No. 932 four-step motor pulley lines up perfectly with the cone pulley on the lathe headstock. This can be done by passing a length of string around both pulleys, to check the alignment. See that the motor is mounted at the proper height, so as not to make the belt too tight, which will result in undue wear on the bearings, or too loose, which would result in belt slippage.

The headstock is securely fastened to the lathe when shipped. To move the tailstock to any point along the lathe bed, simply lift up on the ball end lever DDL-277-S, at the rear, and move the tailstock to the position desired, then clamp in place by pushing down on the lever again.

The tailstock spindle has a No. 2 Morse taper hole, into which the cup center and all other attachments with No. 2 Morse taper shank, will fit. To remove the cup center or other attachments, simply turn the ball crank handle DDL-160, that operates the tailstock sleeve, so that the sleeve is moved back. Keep turning it back until the center is pushed out of the sleeve.

The headstock spindle is also reamed for No. 2 Morse taper centers, in addition to having a 5/8" hole drilled clear through the spindle. To remove a center or other attachment from the headstock spindle, use a 1/4" brass rod, inserted through the hole in the spindle and tap the end with a hammer. A steel or iron rod can also be used, but care should be taken that the rod is of at least 1/2" diameter, so that it will strike the end of the shank evenly.

The points of both the drive and cup centers are replaceable when bent or worn. To remove, loosen the Allen set screw SP-253 with the wrench provided, and push out the point with a piece of stiff wire inserted in the small end of the center. Keep a supply of points on hand. These are part No. DDL-206.

The headstock spindle is threaded for mounting faceplates or hand wheel, a right-hand thread being used on the inner end of the spindle and a left-hand thread on the outer end. The 3" faceplate No. 936 has right-hand threads only, and fits only on the inner end of the spindle. The 6" faceplate No. 937 has right and left-hand threads and will fit either end of the spindle. The hand wheel No. 938 has left-hand threads only, and will fit only the outer end of the spindle. Sanding Disk No. 46-934 fits the right-hand end only.

To mount either faceplate, hold the spindle by placing the wrench on the large hexagon nut on the right end of the spindle. Do not place the wrench on the hexagon at the outer end of the pulley; this should be used only when removing the nut at the right-hand end of the spindle for purposes of lubrication or repair.

Adapter No. 935, which has a 1/2" nose with a taper shank, can be used in either the headstock or tailstock spindles, and enables all lathe attachments with 1/2" holes to be used on this lathe.

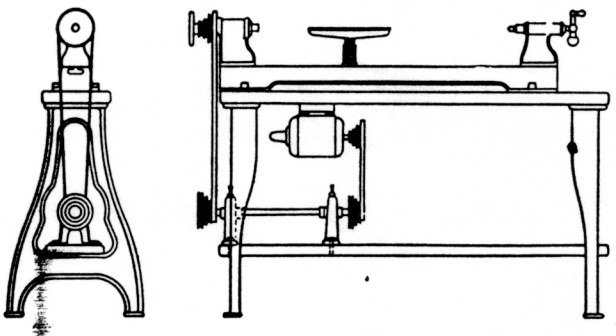
POWER AND SPEED

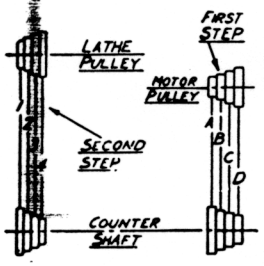
If the lathe is to be operated directly from a motor, 1/3 H.P. will be found suitable for light home workshop use, and for medium duty work. For heavy duty work a 1/2 H.P. motor is recommended. Use only a constant-speed motor, a universal motor is not satisfactory. If the lathe is to be operated in connection with a countershaft as shown in (Fig. 3), then a capacitor start squirrel cage induction motor should be used, as the starting load of this arrangement is too great for a Split Phase motor.

The motor should be connected so that the lathe revolves toward the operator, that is, in the same direction as the hands of a clock, when looking at the lathe from the headstock end. If the motor turns the wrong way, turn it around or follow the maker's directions for reversing the direction of the rotation.

With a 1725 R.P.M. motor, using a No. 932 four-step pulley on the motor shaft—the lathe will have speeds of 900, 1400, 2200 and 3400 R.P.M. The smaller the work being turned the higher the speed should be—the larger the work the slower the speed.

If a larger range of speeds is needed, then the countershaft arrangement as shown in (Fig. 3) is used. Here a No. 718 pulley is mounted on the motor shaft, with a No. 720 pulley to match on the countershaft. Belt No. 284 is used between the motor and the countershaft. The No. 932 pulley is used on the opposite end of the countershaft. With this arrange-





R.P.M.	FIRST STEP	SECOND STEP	R.P.M.	FIRST STEP	SECOND STEP
340	A	4	1125	B	2
475	B	4	1225	A	1
525	A	3	1400	D	3
675	C	4	1575	C	2
750	B	3	1700	B	1
825	A	2	2200	D	2
900	D	4	2500	C	1
1050	C	3	3400	D	1

FIG. 3

No. 930 lathe with countershaft on No. 1463 stand

ment speeds ranging from 340 to 3400 R. P. M. can be obtained. The chart (Fig. 3) shows the various speeds obtainable through the use of different pulley arrangements. The slower speeds are especially useful for large faceplate work to be done on the outer end of the spindle in connection with the floorstand for the tool supports (No. 697 shown in Fig. 6).

LUBRICATION

The oil cup SP-2475 in the lathe headstock is provided so that the Timken bearings of your lathe may receive the proper lubrication. A few drops of a good quality light machine oil should be injected from time to time, enough to keep the oil level up to, but not above, the oil level plug SP-514 which is tapped into the front of the main body of the headstock. Do not use more than a few drops every 10 to 15 working hours. When in doubt, remove the oil level plug to see that the oil level is neither too high nor too low.

THE INDEXING MECHANISM

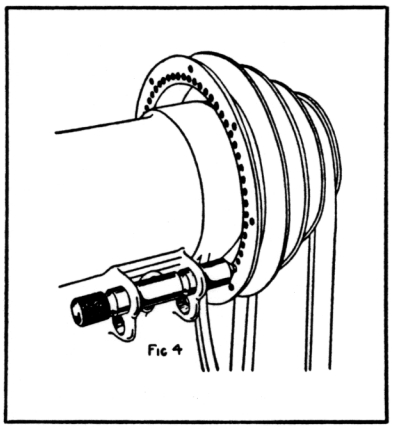
A unique feature of your 11-inch Lathe is the indexing mechanism, which will be found exceedingly useful when fluting, reeding, or any kind of dividing work is to be done on the lathe.

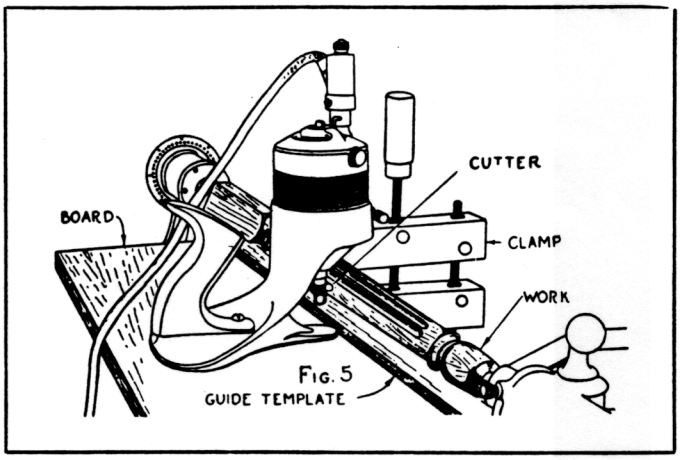
Reeds or flutes are cut in turned work, such as large table legs, by mounting between a pair of "centers" which are indexed (Fig. 4), and enable the work to be turned a definite amount between each cut. The flute itself is usually cut by means of a routing tool held in a portable router or in a flexible shaft, which is run along against a guide template, in the manner shown in (Fig. 5). After one cut has been made, the work is "indexed" or turned forward through a definite number of degrees, and the second cut is made.

The indexing device (Fig. 4) consists of two rows of holes, accurately spaced around the rim of the cone pulley, together with an index pin adapted to engage with either row of holes.

There are 60 holes in the inside row of holes, spaced 6 degrees apart, and eight holes in the outer row, spaced 45 degrees apart. These two rows enable a great amount of indexing and dividing to be done.

For example, suppose six flutes are to be made in a turned leg, the turning is placed between centers, the index pin is placed in the upper holes in its bracket, so that it will align with the inner row of 60 holes, and the end of the pin is inserted into one of the holes in the pulley rim. The flute is then cut in the work by means of the portable router or flexible shaft, (Fig. 5) then the index pin is withdrawn from the hole, the pulley turned forward, counting the holes as this is done, and the index pin re-inserted into the tenth hole.





After the second flute is cut, the pulley is turned forward another ten holes, the third flute is cut, and so on until all the flutes have been cut. Simply dividing the number of holes in the row by the number of flutes to be cut will give the number of holes that must be taken each time—and it will be noted that 8 and 60 provide a very large number of possible divisions.

The arrangement (shown in Fig. 5) for supporting the shaper while cutting the flutes consists of a 1" board, fastened by two bolts through the regular tool-support bases. To the rear of this board is

clamped a strip of wood to serve as a guide template. This strip is set to the taper of the leg, and the "toe" of the shaper holder bears against the strip and regulates the depth of the cut. Where the contour of the leg is curved the template, of course, is curved also to correspond to the leg.

While a common type of hand shaper is shown in use in these illustrations, a flexible shaft, carrying either a shaper cutter of a round-nose router bit, can be used in the same way, by making a wooden holder or clamp for the chuck of the flexible shaft, the clamp being adapted to bear against the guide template in the same manner.

Another valuable use of the indexing mechanism is the division of faceplate work. Suppose we have a disk on the faceplate which is to be accurately divided into eight segments. The index pin is set in the lower hole in its bracket so that it lines up with the outer row of eight holes, and inserted into one of the holes. Now a surface gauge is used to draw a horizontal line exactly across the center of the work. When this

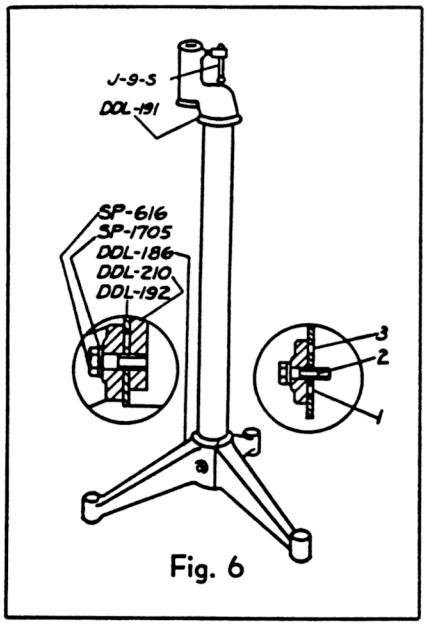


Fig. 6

line has been drawn, the work is indexed one hole and another line drawn, and similarly until all the segments have been accurately marked.

A little study will soon disclose many other uses of the index mechanism.

WARNING: Do not under any circumstances, use the index pin as a lock to hold the pulley stationary while unscrewing faceplates or other attachments. If this is done it will ruin the usefulness of the index device.

When the lathe is used for turning, see that the pin is pulled back until the ball catch snaps in place, thus holding the pin and preventing it from sliding forward to catch in the pulley when the latter is moving.

OPERATING THE LATHE

Never drive the piece to be turned into the drive center while the center is in place in the lathe. If you do this you will eventually stretch the metal of the headstock spindle so that neither the center nor the faceplates will fit, and you will thus ruin the accuracy of your lathe.

Always remove the drive center from the lathe and drive it into the end of the work by tapping the end of the center shank with a mallet to sink the spurs into the wood. If the wood to be turned is very hard, it is well to saw diagonals about ⅛" deep into the end of the wood so that the spurs will drive it easily. After the spur center has made its impression in the wood, replace it in the lathe, then place the work between the centers. Set and tighten the tailstock to the bed so that when the piece to be turned is held against the drive center there will be about ½" between the end of turning and the point of the cup center. Still holding the wood between the centers, turn the ball-crank handle on the tailstock spindle so that the point of the cup center enter the wood. Turn the lathe by hand, and see that the wood turns easily, but without shake, then tighten the tailstock sleeve clamp to hold the spindle in this position.

Always adjust the tool rest so that it is from ⅛" to ¼" away from the piece to be turned, and about ⅛" above the center. Never make toolrest adjustments while the machine is running. Before starting the lathe see that all adjustments have been properly made and that all adjusting screws and clamps are tight.

Use a slow speed when roughing off the corners of the work. If a band saw is available, always rough large faceplate work to shape before mounting it on the faceplate.

Do not wear a loose necktie, loose shirt sleeves or any other loose clothing while working on the lathe, as there is great danger that such loose clothing will be caught in the revolving work.

NOTE: It is naturally impossible, in the space of an instruction sheet, to give complete instructions in wood-turning.

Our handbook "Getting the Most Out of Your Lathe," contains very complete instructions in all kinds of work that can be done on a lathe of this kind, including metal turning and spinning.

IMPORTANT

Note that taper shanks are driven by the close fit between shank and socket, and that consequently centers and other attachments with taper shanks must be DRIVEN home into the socket, not merely placed into it. This does not mean that they are to be driven in with a hammer, but that they should be sharply thrust into place with the hand.

Never use an emery-wheel arbor with taper shank without first running the tailstock up to it to prevent it from coming out. With a properly mounted and true emery wheel this will not happen, but many emery wheels are out of balance, and the vibration caused by this lack of balance may cause the shank to loosen and the attachment to fly out. Run the tailstock up and be safe. It is preferable to use the No. 145 left hand threaded emery wheel arbor, when doing this type of work.

Do not use No. 151 sanding disc on No. 935 adapter in this lathe. The pressure on a sanding disk is usually greatest on the outer circumference, and this tends to loosen the shank. Always use No. 46-934 threaded sanding disc on this lathe.

The right is reserved to make changes in design or equipment at any time without incurring any obligation to install these on machines previously sold, and to discontinue models of machines, motors or accessories at any time without notice.

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Rockwell MANUFACTURING COMPANY

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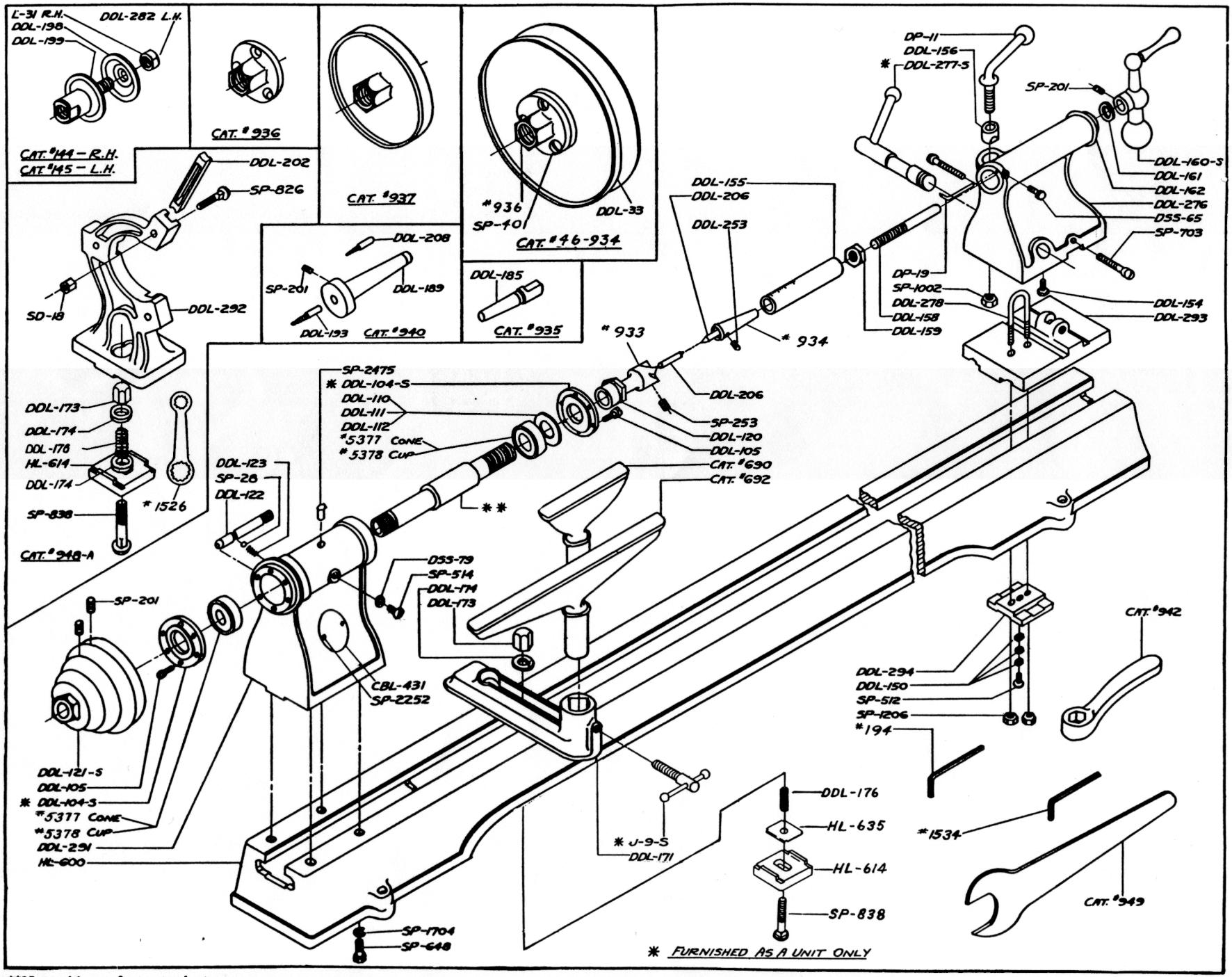

**Not sold, see footnote, last page.

Table 1. REPLACEMENT PARTS

IMPORTANT: Give both the Part Number and the Description of each item when ordering from this list; also the Serial Number of the machine on which the parts are to be used.

Part No.	Description	No. Req.
	BED	
HL-600	Cast Iron lathe bed	1
	HEADSTOCK PARTS	
DDL-104-S	Bearing Cap with felt and retaining washer	2
DDL-105	Bearing cap screw (#10-32 x 7/16" Fillister Hd.)	12
DDL-110	.003" shim washer	2
DDL-111	.008" shim washer	2
DDL-112	.010" shim washer	4
**	Headstock spindle	1
DDL-120	Spindle nut	2
DDL-121-S	Four step lathe pulley with screw	1
DDL-122	Index pin	1
DDL-123	Spring for index pin	2
DDL-206	Steel center point	1
DDL-291	Headstock body for 11" C.I. bed lathe	1
DDL-291-R	Complete Headstock	1
CBL-431	Name plate	1
DSS-79	7/16 x 1/4 x 7/16 fiber washer	1
SP-28	1/4" steel ball	2
SP-201	7/16-18 x 7/16 flat pt. Allen set screw	2
SP-253	1/4-28 x 1/4 Allen set screw	1
SP-514	1/4-20 x 3/8 rd. hd. mach. screw	1
SP-648	3/8-16 x 1 1/4 hex. hd. cap screw	4
SP-1704	3/8 lockwasher	4
SP-2252	#2x7/16 Parker Kalon Drive Screw	2
SP-2475	#302 style shoulder type oiler	1
No. 933	Spur center with No. 2 taper shank	1
SP-5377	#07098 Cone	2
SP-5378	#07204 Cup	2
	TAILSTOCK PARTS	
DDL-150	Special clamp plate washer	3
DDL-154	Tailstock eccentric shoulder screw	1
DDL-155	Tailstock quill	1
DDL-156	Quill lock sleeve	1
DDL-158	Quill spindle	1
DDL-159	Quill spindle nut, L.H.	1
DDL-160-S	Tailstock ball crank handle	1
DDL-161	Fiber washer for quill stud	1
DDL-162	Tailstock end cap	1
DDL-206	Steel center point	1
DDL-253	1/4-28 x 7/16 spec. Allen set screw	1
DDL-276	Tailstock body	1
DDL-276-R	Complete Tailstock assembly	1
DDL-277-S	Tailstock bearing eccentric with ball pin	1
DDL-278	Clamp U-bolt	1
DDL-293	Sub base for set over tail stock	1
DDL-294	Tailstock clamp plate	1
DSS-65	Knurled thumb screw	1
DP-11	Ball end lever	1
DP-19	Quill pointer	1
SP-201	7/16-18 x 7/16 flat pt. Allen set screw	1
SP-512	7/16-18 x 1/2 rd. hd. mach. screw	1
SP-703	1/4-20 x 1 1/4 Fillister head cap screw	2
SP-1002	7/16-14 hex. nut	1
SP-1206	7/16-24 hex. nut	2
No. 934	Cup center with No. 2 shank	1

Part No.	Description	No. Req.
	TOOL SUPPORT PARTS	
DDL-171	Tool support base (3 7/8 high) without clamp	1
DDL-173	Acorn nut	1
DDL-174	Steel washer 1" x 29/64 x 1/8	2
DDL-176	Coil spring	1
HL-614	Clamp Plate for Tool Support and steady rest	1
HL-635	Plate	1
SP-838	7/16 x 2 1/4 carriage bolt	1
No. 690	Four inch tool rest	1
No. 692	Twelve inch tool rest	1
	STEADYREST PARTS	
DDL-173	Acorn nut	1
DDL-174	Steel washer 1" x 29/64 x 1/8	2
DDL-176	Coil spring	1
DDL-202	Guide bar for steady rest	3
DDL-292	Main body for steady rest	1
HL-614	Clamp Plate for Tool Support and steady rest	1
HL-635	Plate	1
SBS-47	Wrench	1
SD-18	1/4-20 special nut	3
SP-826	1/4 x 1 1/2 carriage bolt	3
SP-838	7/16 x 2 1/4 carriage bolt	1
No. 948-A	Steady rest for 11" cast iron bed lathe	1
	EMERY-WHEEL ARBOR PARTS	
DDL-198	Cupped steel washer (1/2" hole)	1
DDL-280	Emery wheel arbor R.H.	1
DDL-281	Emery wheel arbor L.H.	1
DDL-282	Hex. nut L.H. for emery wheel arbor	1
L-31	1/2"-13 hex. nut	1
No. 144	R.H. threaded emery wheel	1
No. 145	L.H. threaded emery wheel	1
	FLOOR STAND PARTS	
DDL-186	Spider Leg Casting	3
DDL-191	Elbow	1
DDL-192	Column	1
DDL-210	Clamp Plate	1
J-9-S	Lock Bolt with Ball Pin	1
SP-616	1/2"-13x1 1/2" Hex. Hd. Cap Screw	1
SP-1705	Lock Washer 7/8" O.D x 1/2" I.D. x 1/8" Thick	1
	MISCELLANEOUS PARTS AND ACCESSORIES	
No. 194	7/16" plain Allen wrench	1
No. 932	Four-Step Pulley	1
No. 935	Taper shank adapter with #2 Morse taper shank	1
No. 936	Three inch face plate	1
No. 937	Six inch face plate	1
No. 940	Screw center with screws	1
No. 942	Wrench for tool support base	1
No. 949	Arbor wrench	1
No. 46-934	8 1/2" sanding disc with threaded hub	1
No. 1534	1/4" plain Allen wrench	1
No. 49-303	Steel Leg	2
No. 46-927	Complete Stand	1
DDL-193	1 1/2" #14 screw	1
DDL-208	1 5/16" #8 screw	1

**NOTE: The final machining of the No. 2 Morse taper hole in the spindle of the headstock of this lathe is done after installation of the spindle. This is the only method of assuring perfect alignment. If replacement of the spindle of your lathe should ever be necessary, send the entire headstock to us prepaid and insured. Charges will be nominal for the new spindle plus labor charge.

Be sure to mail a separate letter giving correct name and address and telling what is to be done, any time parts are returned to the factory.