12" WOODWORKING LATHE
Operating and Maintenance Instructions

The lathe is packed assembled ready for use. Care should be taken in unpacking so that finished surfaces are not burred or marred. The lathe can be mounted on regular No. 46-927 lathe stand or on a suitable bench: in either case it may be found necessary to shim under the lathe feet in order to make the bed level. Check the bed by putting a level across at the headstock and also across at the tailstock, also along the length of the bed in the center. In this way it is possible to detect a twist which might occur in the bed if clamped to an uneven bench top. This checkup should be made periodically to overcome warpage which might occur in the wood bench top, causing strain in the lathe bed.

The motor may be mounted either below the top of the bench, on the lower shelf, or behind the headstock to suit the user's convenience. If lathe stand is used, the necessary holes for mounting motors either below the top or on the lower shelf are drilled partly through the board. It is merely necessary to determine which holes are needed and they can be drilled through to suit.

HEADSTOCK

The headstock is the most important unit of any lathe, and it is necessary that it be kept in perfect condition. The design and construction of our headstock together with the use of greaseal ball bearings eliminates the most common cause of trouble, that is, lack of lubrication or improper lubrication. With this most common cause of trouble eliminated there is no reason why the lathe cannot be used steadily for years without difficulty.

Due to the fact that we use endless belts which may some time need replacement, or the fact that a customer will require a different length of belt than standard, it may be necessary to remove the spindle and pulley. The bearings on the headstock are preloaded at assembly by shimming behind the outboard bearing in order to insure a rigid yet free-running spindle. IT IS VERY IMPORTANT, THEREFORE, when removing the spindle and pulley not to disturb the outboard bearing. To remove spindle and pulley proceed as follows: Loosen the inboard bearing retaining cap CBL-409 by taking out 4 DDL-105 screws. Then by holding the pulley with a wrench on the flats adjacent to the small step, loosen the outboard bearing nut CBL-410 (this is a left-hand thread). Finally loosen pulley from spindle by unscrewing the two SP-201 Allen set screws with wrench furnished. The spindle will now slide in the direction of the tailstock, taking the inboard bearing with it. The outboard bearing with the shims remains in place. Due to the rigidity required in the spindle it is necessary to hold all bearing fits close and it may be found necessary to tap the outboard end of the spindle LIGHTLY to move the spindle. CAUTION: do not drive with a hammer against the end of the spindle, but use a piece of wood between the spindle and the hammer. (Do not use heavy blows with hammer because this will destroy the smooth surfaces of the ball races or the balls, and ruin the bearings).

To re-assemble reverse the above procedure. Be sure, however, when tightening the pulley on the spindle that the two SP-201 Allen set screws bear against the flat on the spindle to avoid burring the spindle and making future disassembly difficult. The belt on the lathe must be a good fit in order to drive the headstock at slow speed and yet it must be readily shifted. A tight belt causes excessive wear on the pulleys and belt, and unnecessary load on the motor bearings. If necessary shim up the motor to obtain right tension.

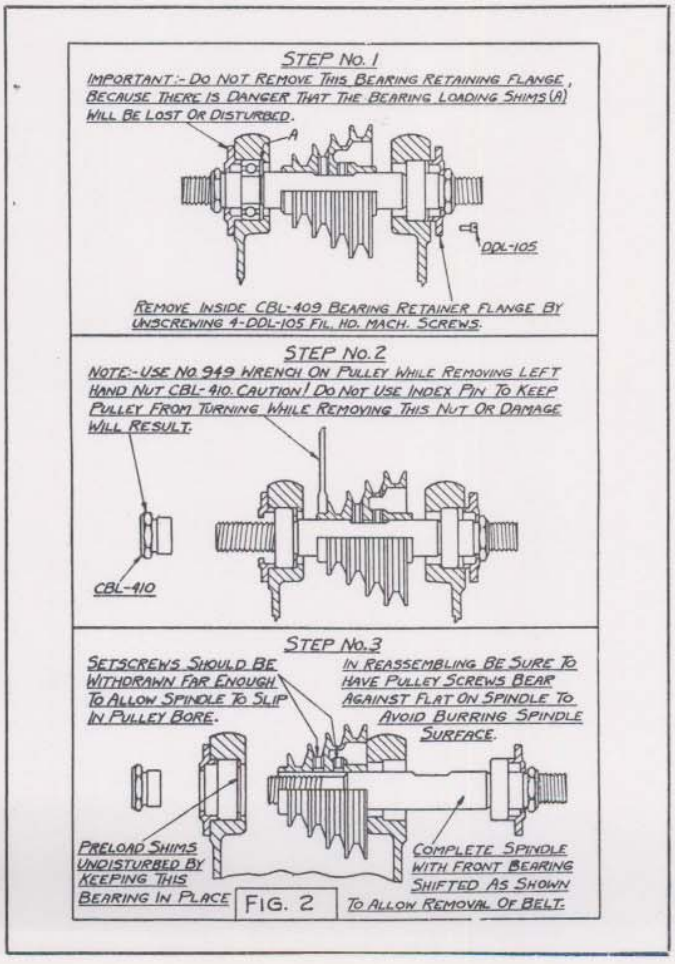


FIG. 2

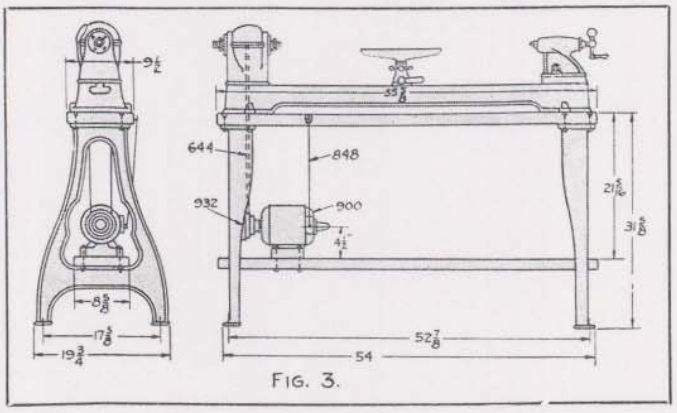


FIG. 3.

TAILSTOCK

The tailstock is made with a sub-base having the set-over feature for taper turning. Be sure to slide the tailstock close to the headstock and check for alignment using the centers in both headstock and tailstock. If the centers do not line up, loosen the headless set screw CBL-423 in the tailstock sub-base on the side opposite to which the tailstock is offset and turn the other set screw until the centers line up, then tighten both set screws.

The tailstock quill is moved in and out of the tailstock by turning the ball crank handle DDL-160. When the quill has been brought to the right position it is locked with the ball handle DP-11 at the top of the tailstock. The center on the tailstock can be ejected by pulling in the quill to the limit which brings the point of the operating screw against the back of the center; a slight additional turn then forces out the center.

A small oil hole will be found on the rear bearing cap of the tailstock. An occasional drop of oil at this point will take care of the lubrication needs of the tailstock.

At the bottom of the tailstock on the side toward the headstock will be found a small ground area which overlaps the tailstock and sub-base. This surface is intended for a zero mark to be put on at the time the centers are lined up. Due to the fact that this mark extends over the joint of the tailstock and the sub-base, we suggest that it be made with a square and a scriber. If a fine edged chisel is used, be careful that the mark is not too deep because this may peen the sharp edge at this joint.

TOOL SUPPORT

The Tool Support Base is new in design and operates somewhat differently from the standard type.

The tool support itself has a turned shank which is clamped into a V-groove in the support bracket thus permitting it to be rotated, raised or lowered. This clamping is accomplished by using the ball-pin lock screw CBL-440-S. The base is clamped to the bed by using the clamp lever CBL-433. This lever rotates an eccentric shaft which extends the full length of the bracket. The eccentric shaft engages a forged steel eyebolt which extends down through the slot in the lathe bed, and has a clamp flange and two hexagon nuts inside the bed. In clamping, the eccentric pulls up on the eyebolt and forces the clamp flange up against the machined surface underneath the lathe bed top, in turn pulling down on the eccentric and support bracket.

The eccentric should lock at a point where it approaches dead center which makes it self locking. If for any reason adjustment is required, this is done by tightening or loosening the locknuts SBS-19.

THE INDEXING MECHANISM

The indexing mechanism is useful for fluting or reeding. Two rows of holes are provided in the pulley rim for use with the index pin, the inner row having 60 holes and the outer row 8 holes. With this combination it is possible to get a large number of divisions. The index pin is mounted on a swinging link, the other end of which is fastened to the index-pin body. The in and out movement, together with the swinging movement, makes it possible to engage or disengage the index pin in either row of holes.

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.

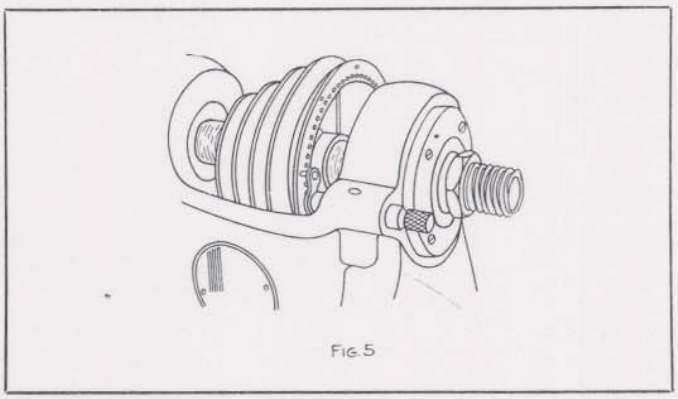


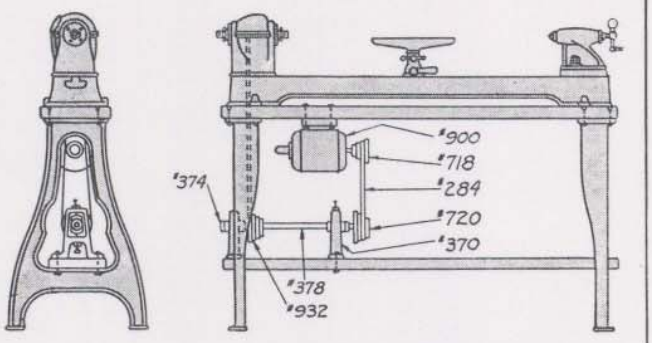
FIG. 5

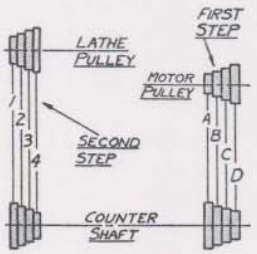
POWER AND SPEED

If the lathe is to be operated directly from a motor ⅓ H.P. will be found suitable for light homeworkshop use, and for medium duty. For heavy duty work a ½ 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 counter-shaft as shown in Fig. 4 then a repulsion-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 spindle rotates clockwise when looking at the lathe from the headstock end; that is, the top of the work should turn forward, toward the operator. If the motor rotates the wrong way, turn it around, or follow the maker's directions for reversing direction of rotation.

With a 1725 R.P.M. motor, using 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 a countershaft arrangement shown in Fig. 4 is used. This gives 16 speeds ranging from 340 R.P.M. to 3400 R.P.M. The accompanying table shows the arrangement of belts used to obtain all of the sixteen speeds.





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. 4.

FLOOR STAND

The No. 697 Floor Stand for tool support (Fig. 6) has a tube sufficient in length and with holes added at the bottom for adjustment.

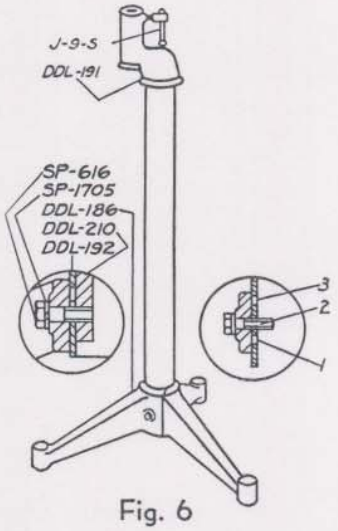


Fig. 6

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 1/8" deep into the end of the wood so that the spurs will drive in 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 1/2" between the end of the 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 enters 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 1/8" to 1/4" away from the piece to be turned, and about 1/8" 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.

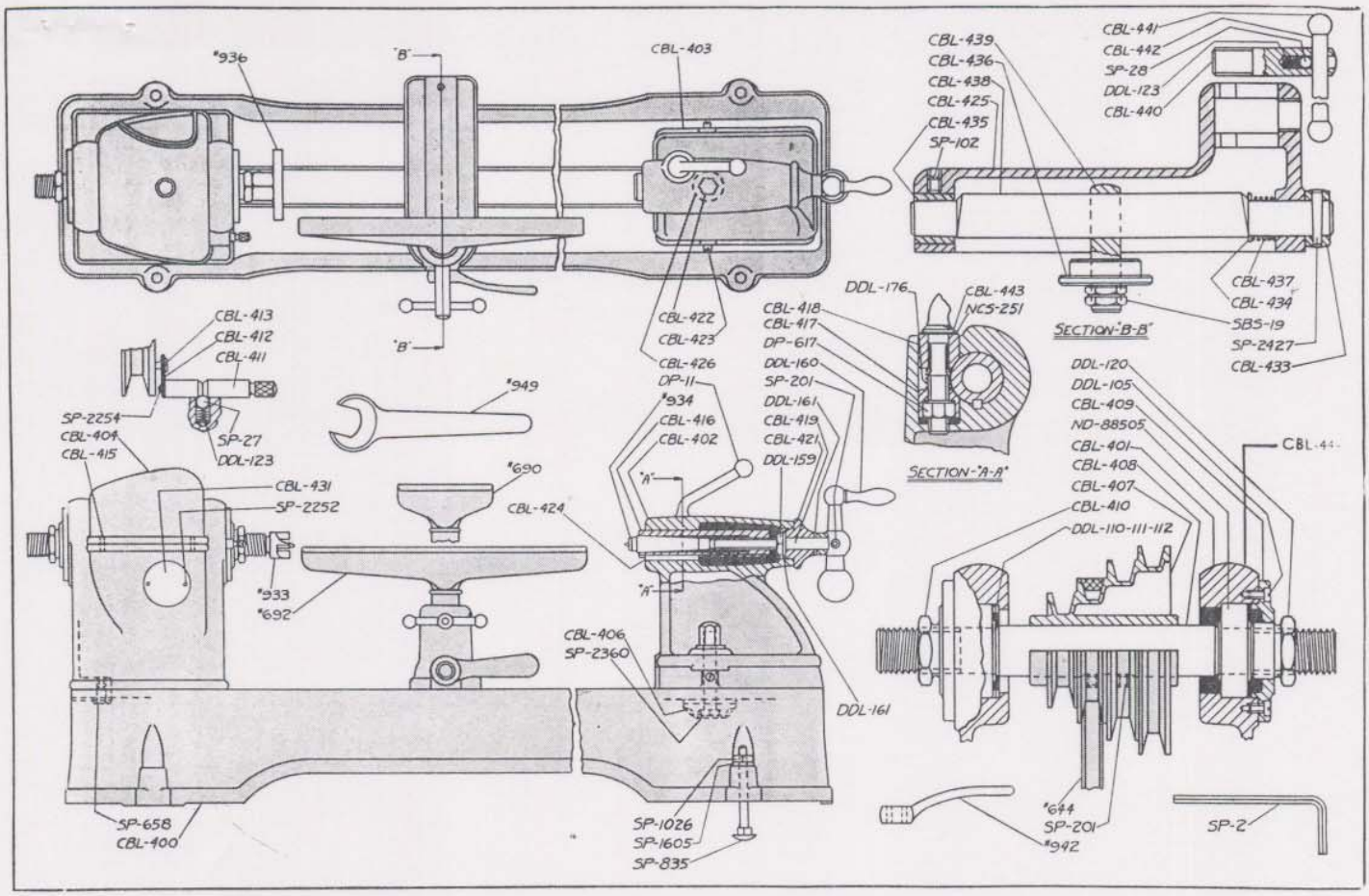
Do not wear a loose necktie, loose shirt sleeves or any other loose clothing while working on the lathe, as there is great danger that such loose clothing will be caught in the revolving work.

IMPORTANT

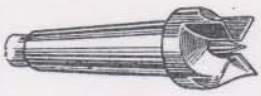
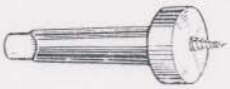
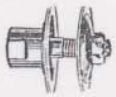
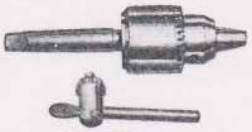
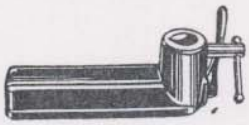
Note that taper shanks are driven by the close fit between shank and socket, and that consequently centers and other attachments with taper shanks must be DRIVEN home into the socket, not merely placed into it. This does not mean that they are to be driven in with a hammer, but that they should be sharply 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 No. 939 60-degree center in the tailstock, as when turning metal, and to lubricate the center properly. The No. 144 right hand threaded or the No. 145 left hand threaded emery wheel arbor can also be used.

Do not use No. 151 sanding disk 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. 951 threaded sanding disk on this lathe.



Accessories For Lathes With No. 2 Morse Taper Spindles

 933 DRIVE CENTER Has replaceable Pin	 934 CUP CENTER Has replaceable Pin.	 940 SCREW CENTER Has replaceable 1½" Screw	 144 R.H. SCREW ON ARBOR 145 L.H. SCREW ON ARBOR	 968 GEARED CHUCK Cap. ½"
 692 12" TOOL REST	 690 4" TOOL REST	 695 RIGHT ANGLE TOOL REST	 694 24" TOOL REST	697 FLOOR STAND For Tool Rests 
 1461 TOOL REST BASE 12" LATHE	No. 1468 STEADY REST for 12" Lathe with Cast Iron Bed 	936 3" FACE PLATE R.H. Threads 	937 6" FACE PLATE  R.H. and L.H. Threads	 No. 939—60° Plain Center. Hardened and Accurately Ground

CONSULT YOUR DELTA DEALER FOR PRICES OF REPLACEMENT PARTS, ACCESSORIES AND TOOLS

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	
CBL-400	Lathe Bed	1
	HEADSTOCK PARTS	
CBL-401	Headstock Body only	1
CBL-401-R	Complete Headstock with belt and pulley guard	1
CBL-404	Headstock Guard	1
CBL-407	Spindle Pulley	1
*CBL-408	Spindle	1
CBL-409	Bearing Retainer Flange	2
CBL-410	Spindle Nut (left hand)	1
CBL-411-S	Index Pin (complete)	1
CBL-415	Guard Pin	2
CBL-444	Thumb Sc. for Hd. Stock Pulley Gd.	1
DDL-105	No. 10-32 x 7/16" Fill. Hd. Screw	8
DDL-110	.003" Shim Washer	5
DDL-120	Spindle Nut (R.H.)	1
DDL-123	Coil Spring	1
SP-27	3/32" Dia., Steel Ball	1
SP-201	5/16-18 x 5/16" Allen Set Screw	2
SP-658	3/8-24 x 1" Hexagon Head Cap Screw	2
ND-88505	Greaseal Ball Bearing	2
#644	V-Belt	1
	TAILSTOCK PARTS	
CBL-402	Tailstock Body only	1
CBL-402-S	Tailstock complete with Sub Base and Clamp	1
CBL-403	Tailstock Sub Base	1
CBL-406	Clamp Plate	1
CBL-416	Tailstock Quill	1
CBL-417	Lower Clamp Sleeve	1
CBL-418	Upper Clamp Sleeve	1
CBL-419	Quill Adjusting Screw	1
CBL-443	13/32 x 25/64 x 1/16" Washer	1
DDL-159	Quill Adjustment Screw Nut	1
DDL-160	Ball Crank Handle	1
DDL-161	Fibre Thrust Washer	2
DDL-176	Coil Spring	1
DP-617	7/16-14 x 5/8" Hex. Nut	1
NCS-251	Shim Washer	4
SP-201	5/16-18 x 5/16" Allen Set Screw	1
SP-2360	1/2-13 x 3 1/4" Sq. Hd. Mach. Bolt	1
	TOOL SUPPORT PARTS	
CBL-425	Tool Support Base Cast. only	1
CBL-433	Operating Lever	1
CBL-434	Washer 25/64 x 1/16" Th.	1
CBL-435	Bushing	1
CBL-436	Eyebolt Flange	1
CBL-437	Coil Spring	1
CBL-438	Eccentric Shaft	1
CBL-439	Eyebolt	1
CBL-440	Ball Handle Clamp Bolt	1
CBL-440-S	Clamp Bolt with Handle	1
SBS-19	5/8-18 x 3/4" Hex. Nut	2
SP-102	1/4-20 x 3/8" Hd'less Set. Sc.	1
SP-2427	No. 3 x 1 1/4" Taper Pin	1
#1461	Tool Support Base comp. not including Tool Support	1
	FLOOR STAND PARTS	
DDL-186	Spider Leg Casting	1
DDL-191	Elbow	1
DDL-192	Column	1
DDL-210	Clamp Plate	1
J-9-S	Lock Bolt with Ball Pin	1
SP-616	1/2-13 x 1 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
#1463	Floor Stand	1
	ACCESSORIES	
DDL-206	Steel Center Point	2
DDL-253	1/4-28 x 5/16" Allen Set Screw	2
#163	3 x 3" Sanding Drum	1
#164	1 3/4 x 2" Sanding Drum	1
#165	Grinding Wheel Arbor	1
#194	5/32" Plain Allen Wrench for 5/16" Set Screw or #10 Cap Screw (Old No. SP-2)	1
#690	4" Tool Support	1
#692	12" Tool Support	1
#694	24" Tool Support	1
#695	Right Angle Tool Support	1
#697	Floor Stand for Tool Support	1
#932	4 Step Motor Pulley (specify bore)	1
#933	Spur Center	1
#934	Cup Center	1
#935	Taper Shank Adapter	1
#936	3" Dia. Face Plate	1
#937	6" Dia. Face Plate	1
#938	5" Hand Wheel	1
#939	60° Center for Metal Work	1
#940	Screw Center	1
#942	Socket Wrench	1
#949	Arbor Wrench	1
#1534	1/8" Plain Allen Wrench for 1/4" Set Screw or #8 Cap Screw (old DP-1)	1

CONSULT YOUR DELTA DEALER FOR PRICES OF REPLACEMENT PARTS, ACCESSORIES AND TOOLS

*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 for $21.00. Charges will be $2.90 for the new spindle plus $1.00 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.

Prices Subject To Change Without Notice.