QUICK CHANGE GEAR BOX Continued

Part No	Name Of Part	List Price
Q 517	20-T Drive Gear ..	2.70
Q 543	Tumbler Lever Hinge Pin	.06
Q 544	Tumbler Plate	.90
*Q 405 (Q 462)	Tumbler Lever Plunger	.15
SP 500	¼-20x¼ Socket Set Screw (2)	.06
*SP 1400 (SP 1328)	Gits St. oiler (2) .	.10
*SP 1520 (SP 1230)	1/8x⅞ Groov-pin T1 (2)	.03
*SP 416 (SP 441)	5/16-18x1" Socket Hd. Cap Screw (3)	.15
*SP 424 (SP 462)	⅜-16x1" Socket Hd. Cap Screw (mounting bolts) (2)	.15
*SP 1522 (SP 1232)	1/8x1¼ Groov-pin T1 (1)	.03
*SP 1521 (SP 1231)	1/8x1 Groov-pin T1 (1)	.03
*SP 524 (SP 521)	⅜x½ Socket Set Screw	.10
*SP 213 (SP 259)	10-24x⅜ Rd. H. Mach. Screw (15)	.03
*SP 1517 (SP 1227)	1/8x½ Groov-pin T1 (1)	.03
*SP 846 (Q 468)	⅝"-18 Special Nut (1)	.03
*SP 1530 (Q 464)	Thumb Paddle Stop Pin (1)	.03

*Indicates a combined assembly, or any change in part or design. Order part by the number in bracket ().

SPINDLE SPEEDS

Standard and Quick Change

BACK GEAR	DIRECT DRIVE
50	250
73	437
134	700

SPINDLE SPEEDS

Dual and Dual Quick Change

BACK GEAR	LOW DIRECT	HIGH DIRECT
50	250	870
73	437	1460
134	701	2400

METRIC

Metric Transposing Gears, quadrant, metal gear chart and additional change gears for cutting from .2 to 6. MM pitch threads on Clausing Standard lathes.
CATALOG NO. 1037 ..... $12.00

Metric Transposing gears, quadrant, metal gear chart and change gears for cutting from .75 to 6. MM pitch threads on Clausing Quick Change lathes.
CATALOG NO. 1038 ..... $12.00

Standard gear cover to replace Quick Change gear cover (needed on converted Quick Change lathes).
CATALOG NO. DL115-S DL-117 ..... $8.90

Inconverting an English Quick Change Lathe, much of the quick change feature is lost. This is not characteristic of the Clausing lathe, only, but all regular quick change lathes.

METRIC PARTS FOR EITHER STANDARD OR QUICK CHANGE LATHES

M-110 Metric Cross Slide Lead Screw, 2 MM pitch $2.25
M-111 Metric Cross Slide Lead Screw Nut $1.00
M-114 Metric Compound Lead Screw 2 MM Pitch $1.25
M-115 Metric Compound Lead Screw Nut ..... $ .75
M-112 Metric Micrometer Collars ..... $ .50

Cut "Near" Metric Threads Without Conversion Gears

By using a 17-tooth or a 23-tooth stud gear, a number of "near" metric threads can be cut on a Clausing quick change lathe without the use of conversion gears. These threads are not exact but are useable for commercial purposes. If you desire to cut these threads, use the following schedule:

Use Stud Gear With:	Set Gear Box to Cut:	Actual Result Will be:	Thread: Use for MM
17-teeth	4 threads	5.997 MM	6.
23-teeth	6½ threads	4.993 MM	5.
17-teeth	6 threads	3.998 MM	4.
17-teeth	8 threads	2.998 MM	3.
23-teeth	13 threads	2.496 MM	2.5
17-teeth	12 threads	1.999 MM	2.
17-teeth	16 threads	1.499 MM	1.5
23-teeth	26 threads	1.248 MM	1.25
17-teeth	24 threads	.999 MM	1.
17-teeth	32 threads	.749 MM	.75
17-teeth	48 threads	.499 MM	.5

M-118 17-tooth Gear $1.80
M-119 23-tooth Gear 2.00

Full Information, Please . . .

YOU can be assured of the best possible service on replacement parts if you give full information regarding the part or parts wanted. Give the part number, name of part, and price. Always give serial number of your lathe—you will find number stamped on top of bed at tailstock end. All SP numbers in this book indicate standard parts, such as bolts and nuts, and we ask that such parts be obtained locally if possible. The minimum order on SP items is twenty-five cents, unless purchased with other parts, in which case the price of 3 or 6 cents prevails. If SP items alone are ordered, they should total the 25-cent minimum. All prices apply only to replacement parts—prices cannot be used in calculating the price of any assembly "less" certain parts.

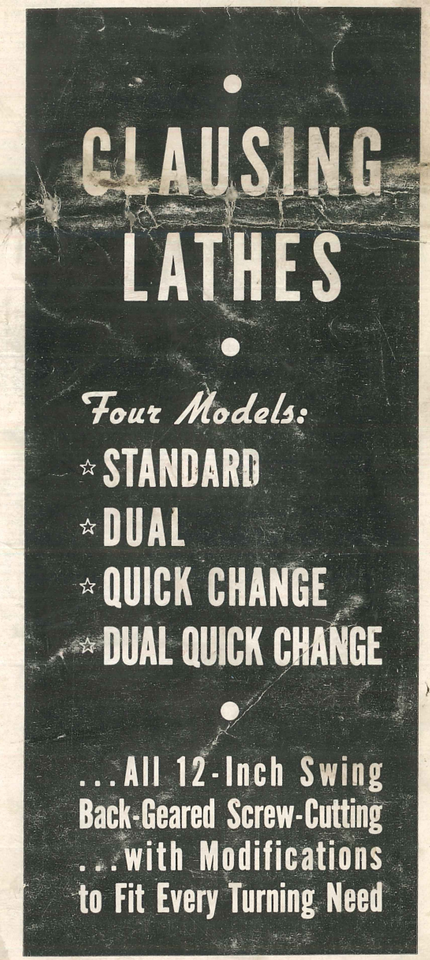
CLAUSING MFG. CO.
235 RICHMOND AVENUE
OTTUMWA, IOWA, U. S. A.

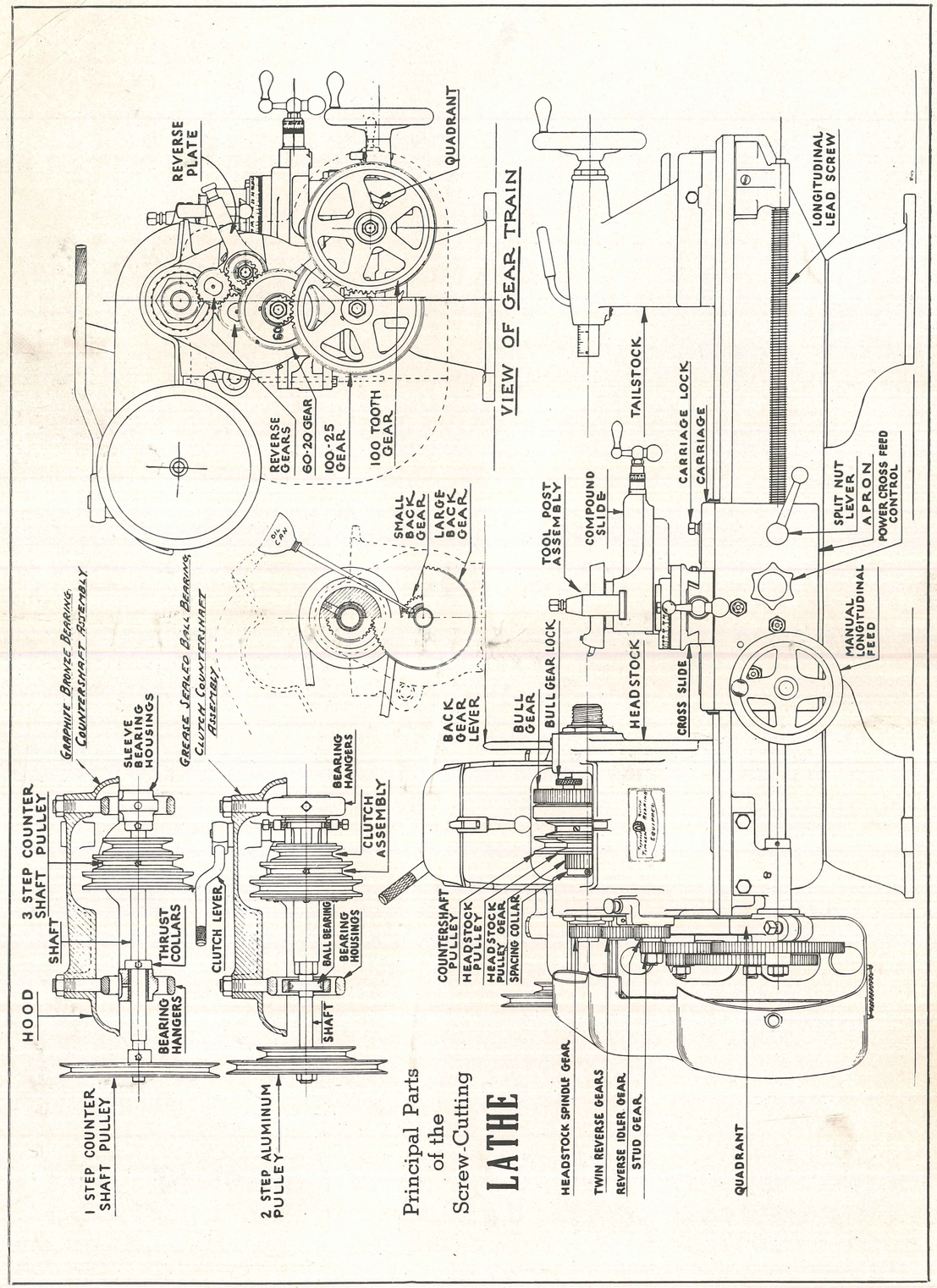
CLAUSING

INSTRUCTIONS AND PARTS LIST

THIS book is valuable. Read it carefully before installing or operating your lathe.

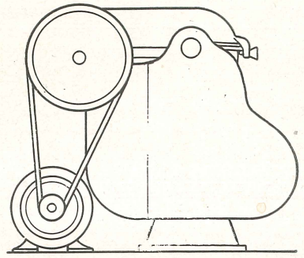
CLAUSING MFG. CO.
235 Richmond Ave., Ottumwa, Iowa—U. S. A.



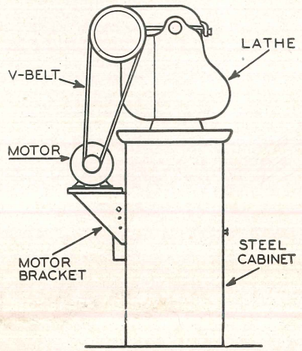


Principal Parts of the Screw-Cutting **LATHE**

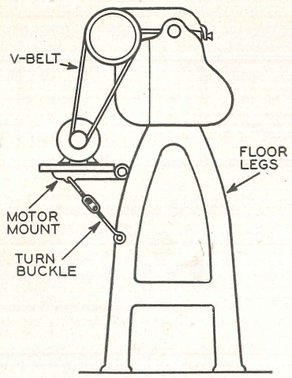
INSTALLATION • *HOW TO MOUNT YOUR CLAUSING LATHE AND CHECK FOR ACCURACY*



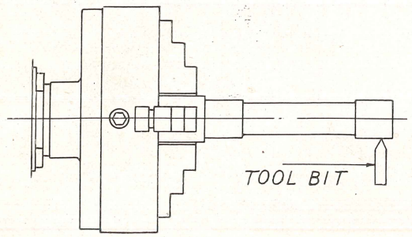
INSTALLATION ON WOOD BENCH



INSTALLATION ON STEEL CABINET



INSTALLATION ON FLOOR LEGS

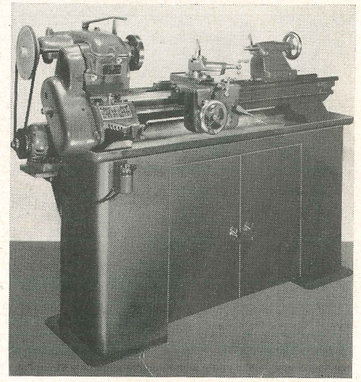


YOU have purchased a precision screw-cutting lathe. It is well designed, carefully made and convenient to operate. Properly installed and given reasonable attention, it will hold its inbuilt accuracy over a considerable period of years.

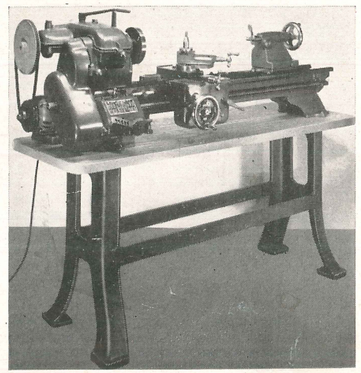
SETTING UP ALL Clausing lathes have four-point mounting and can be installed on any level wood or metal bench top of suitable size. If a wood top is used, it should be no less than 1⅛ inches thick, select stock. A bench top height of 28 to 30 inches is correct. Fastenings should be ⅜ inch through bolts or lag screws. The bed bolts must not be pulled down tight on a rough or warped bench since "drawing down" to make contact with such a surface will distort the lathe bed. The lathe bed itself must be absolutely level, for otherwise its weight will cause distortion causing the lathe to turn and bore taper. Check carefully with a precision level, crosswise at both ends of the bed and lengthwise at the center. Adjust by placing thin metal shims under either the lathe itself or the bench or legs on which it is mounted. Take time and pains on the installation if you want your lathe to be accurate.

MOTOR AND SWITCH CLAUSING Standard and Quick Change Lathes operate satisfactorily with a ¼ or ⅓ h.p., 1725 r.p.m. motor. The Dual and Dual Quick Change require ⅓ or ½ h.p., this being necessary for power on the higher speeds. A capacitor type motor is ideal since it permits easy installation of a reversing switch, but any type of motor except split phase can be used. The motor is mounted at the rear of the lathe, on or below the bench top. It is advisable to use two or three ⅛ inch shims under the motor to permit belt adjustment, since any belt will stretch a little through wear. The logical place for the motor switch is on the left side where it is out of the way and less likely to be turned on accidentally. A reversing switch (Cat. No. 2050) is preferable since there are many jobs in tapping, grinding, etc., where it is necessary or convenient to reverse the spindle. However, a plain on-off switch of any type is practical for most work.

OILING FOLLOW the oiling chart that is enclosed with this booklet. Even before you use the lathe for the first time, oil all the places indicated on the chart. No. 10 motor oil or equivalent should be used. Oil regularly and completely—it is the only way to keep your lathe in good condition. Wipe the bed and all polished parts of the lathe with an oily rag at frequent intervals. Hand in hand with oil goes the matter of cleanliness. Keep your lathe clean — oil and dirt form an abrasive compound which can easily damage carefully fitted bearing surfaces. If your lathe is out of use for long intervals, the use of a canvas cover is advisable to prevent the formation of surface dirt or rusting.

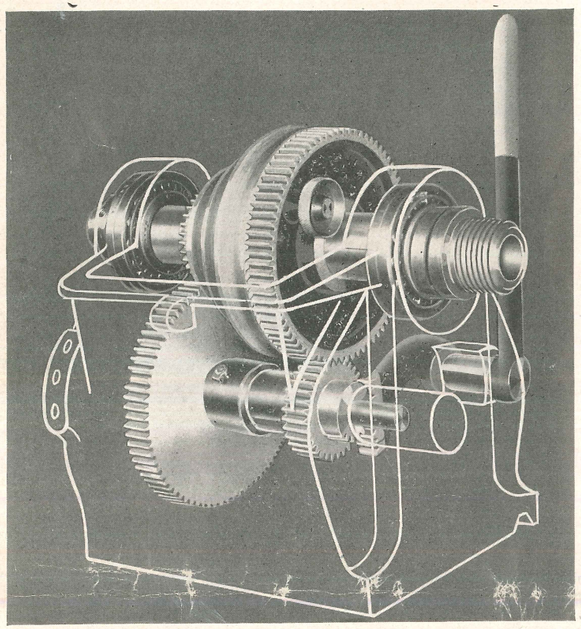


CHECKING ACCURACY THE factory test card attached to your lathe is a record of accuracy tests made immediately before shipment. Your lathe is identified by a serial number stamped on end of bed. A record of accuracy tests on each lathe is kept on file at the factory, and any reference to the accuracy of your lathe should mention the serial number. Most shops do not have the precision equipment necessary to recheck fully on accuracy tests, but under normal conditions of shipment the test figures can be accepted at face value. A worthwhile recheck which tests the alignment of headstock with bed can be made as shown in lower left diagram. Unless the headstock is perfectly parallel with the bed, the lathe will turn tapered work. Chuck a piece of steel 1 inch or more in diameter, letting it project about 4 inches from chuck. Turn the piece so that shoulders are formed at either end. Measuring with micrometer should show both shoulders the same diameter. Providing the chuck jaws are parallel, any error over .001 inch is probably caused by distortion of the lathe bed



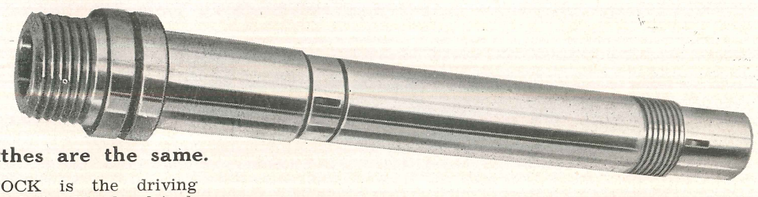
OPERATION

HOW TO OPERATE AND ADJUST CLAUSING DUAL AND STANDARD LATHES



in mounting, and a careful recheck should be made. Rechecking the crosslide accuracy is easily done by taking a light cut across the faceplate and then testing the plate with a straight edge.

STANDARD and Dual Lathes are back-geared, screw-cutting lathes with independent gears which are substituted as needed in gear train to obtain proper carriage speed for a certain number of threads per inch or a corresponding rate of travel for turning. The Standard model has plain, sleeve bearing countershaft while the Dual has ball bearing countershaft fitted with friction clutch. In other respects the two lathes are the same.



THE HEADSTOCK

THE HEADSTOCK is the driving mechanism of the lathe. The headstock spindle is fitted with a three-step pulley so that three direct-drive speeds—250, 437 and 700 r.p.m.—can be obtained by shifting the drive belt. Automatic slacking of the belt when the hood is lifted makes belt shifting easy. The back gears are mounted below the spindle, and when these are engaged it is possible to obtain three back gear speeds—50, 73 and 134 r.p.m.

HOW BACK GEARS WORK

REFER to the photo at top of page for an understanding of the various spindle speeds. The large gear on the spindle is the bull gear, and it is keyed solidly to the spindle. The small gear on the spindle is fastened securely to the pulley and the combined gear-pulley floats on the spindle, that is, the spindle does not drive it. Now, when you want direct drive it is necessary to clamp the bull gear to the pulley by turning the bull gear thumb wheel in a clockwise direction. The bull gear then turns with the pulley and the bull gear drives the spindle. To go into back gear raise the hood. Revolve the headstock pulley by hand until the thumb wheel comes up. Turn the thumb wheel counter clockwise until the bull gear is free of the headstock pulley. Next, pull the back gear lever forward. It is usually necessary to rock the headstock pulley in order to get the gears into mesh. The drive is now from countershaft to headstock pulley, but the pulley does not drive the spindle. Instead, the motion is transferred to the large back gear via the small spindle gear. The small back gear drives the bull gear and the bull gear drives the spindle.

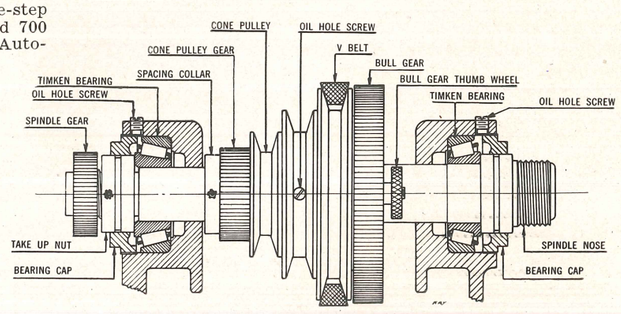
Refer to your own lathe. Note the oil cup on back gear shaft quill. Get a long spout oil can so that you can lubricate this weekly as required. Note, at back of headstock, the square head set screw which stops shift arm when back gears are in full mesh. Maintain this adjustment.

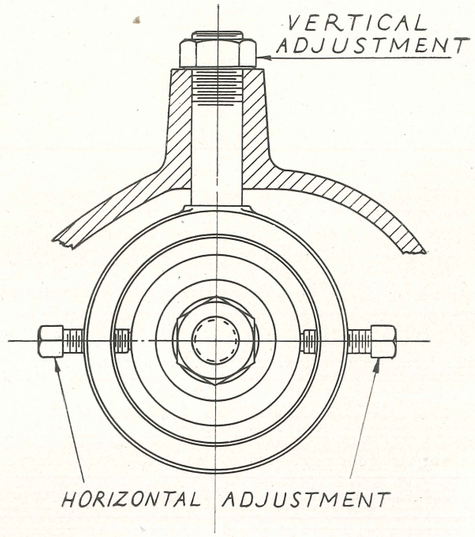
HEADSTOCK SPINDLE

THE spindle has a ¾ inch through hole ground to No. 3 Morse taper at inboard end. All accessories with No. 3 Morse taper shank can be used. Standard equipment includes a Morse No. 3 to 2 reducing sleeve. You should make a knock-out rod to remove centers from spindle. The rod should be brass, bronze or hardwood, ¾ inch diameter by 12 inches long. The spindle nose is threaded to receive faceplates and chucks. Do not slam chucks on, as they are then sometimes difficult to remove. Ordinarily, the chuck can be removed with a light sharp tug on the chuck wrench. If this fails, lock the bull gear to headstock pulley and draw the back gears into mesh. This locks the spindle. Then, using a wood block and hammer, tap gently on the jaws of the chuck.

BEARING ADJUSTMENT

WHEN the lathe chatters easily and the spindle seems to be loose, tighten the bearings. Do this by removing spindle gear on outboard end of spindle. Then remove bearing cap. Loosen the set screw that holds the take-up collar nut. With a metal rod, turn the take-up collar until the spindle has a slight drag. Reassemble.





CHANGING HEADSTOCK BELT

IF AN endless belt is to be fitted it is necessary to remove the spindle. First, remove gear on outboard end of spindle. Remove both bearing caps. Unscrew take-up nut completely. Loosen the set screw in spacing collar. With a block of wood for pad, drive the spindle forward. The rear bearing will slide off the spindle. Do not let it drop or become dirty. Put a block of wood between the bull gear hub and the headstock casting so that all the pressure will be on the hub, and continue driving spindle forward. As the spindle is driven forward, the spacing collar, pulley and bull gear are stripped off. Fit the belt over the pulley and reassemble. Previous to knocking down the spindle in this manner, it is necessary to fit the belt over the countershaft. This is easily done by loosening the two hanger bolts to permit complete removal of the countershaft. A much simpler alternate method of replacing belt is to use Cat. No. 1154 Veelos V-Belt. This is a link type belt of proven merit and has the advantage that it can be fitted without removal of spindle.

TAILSTOCK

THE tailstock is used to hold the dead end of the work and can be set at any point along the bed. It is securely clamped in place by means of the toggle wrench provided. The tailstock can be set over for turning tapers by loosening the set over bolt on one side and tightening the set over bolt on the opposite side. The bed clamp should be released before doing this. Use the index marks when returning the tailstock to normal center position, or, for precision work, run a test turning and check both ends of work with micrometer, adjusting tailstock accordingly. The tailstock spindle is locked by friction plates worked by a handle at rear of tailstock. The handle is pushed forward to lock and pulled back to release. The travel necessary for release is stopped by a pin, which prevents the handle from making unnecessary revolutions. The handle fits over a cone and can be adjusted by loosening nut and then rotating handle so that locking point comes slightly forward of center.

SLEEVE BEARING COUNTERSHAFT

INSPECT your own lathe. Note that the countershaft can be adjusted in all directions. In making vertical adjustment, be sure to loosen the set screw in hood which locks one bearing hanger in place. The horizontal adjustment is used most, since this controls belt tension. Keep the countershaft parallel with the headstock spindle for proper belt tracking.

CLUTCH COUNTERSHAFT

THE clutch countershaft runs on ball bearings which should be kept well lubricated (see page 7 for complete oiling instructions.) When clutch fails to pull it can be adjusted by tightening the nut on expanding clutch hub, as shown in drawing on page 9, locking the adjustment with second nut. Do not tighten clutch excessively as this puts an unnecessary load on the mechanism.
Proper belt tension can be obtained by adjusting the countershaft backward or forward inside the bearing hangers. Bearing hangers can also be raised or lowered after releasing set screw in hood and screw holding shift lever.

STANDARD APRON

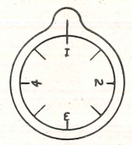
The longitudinal feed is engaged by pulling up on the lever at right end of apron which closes split nut on lead screw. Make certain that the split nut is fully closed—partial closing will ride the edges of the thread and can do damage. The power cross feed is engaged by turning star wheel in center of apron. Here, again, make certain that you engage the gears fully. No harm is done if the long and cross feed are engaged at the same time. Your tool bit will then travel at about a 45 degree angle. The hand longitudinal feed is through a gear train which engages rack on underside of bed.

THREAD DIAL

THE thread dial shows when to close the split nut when cutting threads so that the tool bit will not split the thread but always track in the same groove. Each numbered division of the thread dial represents 1 inch of carriage travel. Engagement of the feed takes place when certain marks on the dial come opposite the witness mark. If the dial should get out of alignment causing marks to register a little to one side of index mark, adjust by rotating gear slightly after loosening set screw (see drawing on page 12).

CARRIAGE

GIBS are used at back and front of carriage to prevent climbing. The back gib is adjusted by backing off the two hex nuts a half turn, after which the actual adjustment is made with the slot head adjusting screws. The front gib is adjusted by turning the socket head crew at left end of carriage. At the right side of carriage is the clamp bolt which locks the carriage in one spot so that it cannot creep when facing or cutting off. The carriage is locked for shipment and the clamp bolt must be loosened before using longitudinal hand or power feed.



How To Use THREAD DIAL

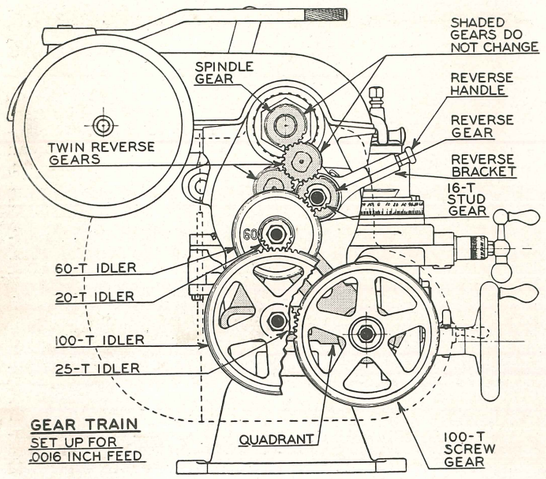
EVEN THREADS . . if same as lead screw or any multiple, that is, 8 16, 24, etc., engage at will without reference to thread dial.
EVEN THREADS . . . . other than above, engage on any line of the dial.
ODD THREADS . . . are cut by engaging on any of the numbered lines.
HALF THREADS . . . . such as 4½, engage on 1 and 3 or 2 and 4, but not both.
QUARTER THREADS ... such as 5¾, use any mark and return to the same mark for each cut.

SLIDE REST

THIS is the top part of carriage consisting of a cross slide and compound slide. The cross slide gib should be adjusted for a free-running fit, while the compound should be very stiff. The compound slide is fastened to the cross slide by two bolts held in T slots in the circular base. By loosening the nuts on these bolts, the compound can be rotated. A scale on circular base reading 90 degrees on each side of center shows the degrees of rotation. When using such units as the milling attachment, the compound is removed entirely. This is done by loosening the two nuts, at the same time lifting up on the compound until it comes free.

GEAR TRAIN

SPEED of carriage travel can be set to obtain any number of threads per inch or a similar inch-per-rev travel for power feed. A thread chart attached to gear cover shows how gear train is set up for various threads. The chart shows the carriage feed in threads per inch. The corresponding feed-per-rev is given in box in center of page. This applies to both cross and long feed. As shipped from factory, you will find gear train in "D" position, as shown in drawing. The 60 and 20-tooth idler gears are supplied as a combination gear, which simplifies setting up. The 25 and 100-tooth idler is likewise a



Gear train of standard lathe in D position. Box at right shows feed of carriage per revolution of work at various thread positions.

combination. All other gears are single, including the twelve change gears. You will note from thread chart that the gear train can be set up in any of four positions. In each position, the idler gear arrangement is the same but the stud and screw gears change. The idler gears are fitted over bushings, each bushing holding two gears. Two gears must always be mounted on each bushing regardless of whether or not they mesh in the train. Proper clearance for the various gear trains is obtained by sliding the gear bolts in the slotted arms of quadrant, also by loosening the quadrant bolt so that the whole arrangement can be swung up or down as needed. A slight amount of clearance between meshing gears should be allowed to prevent binding.

REVERSE MECHANISM RIGHT hand threads are cut with carriage moving toward the headstock; left hand threads are cut when carriage moves toward tailstock. The direction of travel is controlled by the reverse handle, which has three positions—up, down and center. In center position the gear train is disengaged. In upper position, the carriage moves toward tailstock, or, the crossfeed is from front to back. The "down" position moves carriage toward headstock, or, crossfeed from back to front. These movements apply only to A, C and D gear train positions. When in position "B," the direction of travel is reversed.

Standard Power Feeds

Threads	Gear Position	Feed per Rev.
600	D	.0016 inch
300	D	.0033 inch
240	D	.0041 inch
200	D	.0050 inch
160	D	.0062 inch
120	C	.0083 inch
112	C	.0089 inch
104	C	.0096 inch
96	C	.0104 inch
92	C	.0109 inch
88	C	.0114 inch
80	C	.0125 inch
72	C	.0139 inch

OPERATION • *CLAUSING QUICK CHANGE LATHES*

SIMILAR to the Standard lathe in many respects, the main differences in the Quick Change lathe are found at gear box and apron. Instead of having a stack of loose gears like the Standard lathe, all of the change gearing for the Quick Change lathe is enclosed in a gear box, and selection is made by means of two handles. The apron is considerably more complicated in design, the principal addition being a friction clutch.

LONGITUDINAL POWER FEED LONG power feed is first set by pulling the shift handle located at center of apron to "out" position. This in itself does not move the carriage, but only sets up the required gearing for long feed. If the gears do not mesh readily, rock the handwheel handle. Actual carriage movement is then obtained by turning the clutch star wheel in a clockwise direction. Carriage movement can be stopped instantly by releasing the clutch. The carriage can be made to move in either direction along the bed by using the reversing mechanism at headstock. When the reverse handle is up, the carriage will move toward tailstock.

POWER CROSS FEED POWER cross feed is set by pushing shift handle to "in" position. If the gears do not mesh readily, rock the hand cross feed handle. Actual carriage movement is then obtained by engaging the clutch. The carriage can be made to move either forward or back by means of the reverse lever. When the reverse handle is up, the cross feed is toward the back of the lathe.

THREAD FEED WHEN cutting threads, the carriage movement is controlled by the split nut lever. The friction clutch shift handle is first moved to center position, which puts the power feed in neutral position. The split nut lever at right end of apron can then be pulled up to lock the split nut around the lead screw for carriage movement. The carriage can be made to travel either right or left by using the reverse lever on headstock. When reverse lever is up, the carriage moves toward headstock, cutting a right hand thread. It will be noted that the carriage movement is opposite to that obtained when using friction clutch.

REMOVING APRON IT IS good practice to remove the apron at regular intervals for cleaning and inspection. To do this, remove the four socket head screws holding apron to saddle. Then, by lightly shaking the apron, it can be tilted forward, and this alone is often sufficient dismantling. If, however, it is necessary to remove apron entirely, first remove bracket holding end of lead screw. After tilting apron forward, it can be pushed to right until free of lathe. In reassembling, rock the handwheel and cross feed handles to get gears into mesh; also be sure that locating pins are seated before drawing up socket head screws.

GEAR BOX THE gear box houses all of the change gearing of the quick change lathe, and permits forty-eight different rates of carriage feed. All of the changes are tabulated on the thread chart attached to front of gear box. For example of setting, say that you want to cut 32 threads per inch. First, find 32 on the thread chart. Note that the sliding gear must be out, so pull gear out. Locate the hole in front of gear box directly below the column in which 32 appears. Release the tumbler lever by depressing the thumb lever, then drop the tumbler lever down and slide it over below the required hole. Pull up on the tumbler lever and release the thumb lever to let plunger snap into hole. Finally, note that clutch shift handle must be in "center" position. You are now ready to cut 32 threads per inch. The design of the Clausing gear box permits changing gears while the lathe is running, and this procedure is recommended. If gear box set-up is made with lathe not running, rotate the lead screw with your fingers to get the gears into mesh.

GEAR TRAIN AFTER setting up the lathe, removed fixed guard at outboard end of headstock and inspect gear train. All gears in the train are permanent and are not removed except for repair or adjustment. The twin reversing gear is the same as standard lathe. The knurled sleeve at center of train is the sliding gear handle. This fits over a stud and can be pushed to "in" or "out" positions. The gear train with sliding gear in is eight times as fast as with sliding gear out. While the guard is off, touch the gears lightly with graphite grease. Note the various oiling points.

TAILSTOCK THE tailstock is the same as Standard Lathe. The spindle is locked by friction plates worked by a handle at rear of tailstock, the handle being pushed forward to lock and pulled back to release. The handle fits over a cone and can be adjusted by loosening nut and then rotating handle so that locking point comes slightly forward of center.

FEED RATE NEW operators are advised to experiment a little with the gear box to become acquainted with feed rates. Start by setting the gear box for 32 threads, which gives a corresponding power feed of .0046 inch per revolution of work. This is a medium feed. It will take off quite a heavy chip with any style of roughing or turning bit; also, with square nose bit it is a good feed rate for finishing. With the lathe running, swing the clutch handle to left position, and the carriage feed rate will be immediately cut in half. Swing the clutch handle to right position, and the feed rate will be halved again. Now, stop the lathe. Push sliding gear in. Let the clutch handle remain in "right" position. Start the lathe. You will now find the tool bit taking a rough bite of .009 inch per revolution of work. This is about as fast a carriage feed as is ever needed in regular turning. However, just to observe the action, you can swing the clutch handle to left and then center. Don't take a deep cut in these positions, since the carriage really "walks." The very finest feed obtainable with the gear box is at the 224-thread position, where the carriage barely creeps at .0006 inch per revolution of work—sixty times slower and finer than the fastest carriage feed rate. The cross feeds are slower than corresponding long feeds, the exact ratio being 3/10 to 1. Expressed in round figures, the cross feed is three times as slow as the corresponding long feed, or one-third the long feed as shown on chart. For example, with gear box set for long feed of .0046 inch, the cross feed will be about .0015 inch per revolution of work. Here, again, a little experimenting will quickly acquaint the operator with the various feed rates which can be used.

OILING Your Quick Change LATHE

USE the lubrication chart of Standard Lathe (enclosed) as a general guide. Regular motor oil, No. 10 or 20, is recommended for all oiling. Additions to or changes in the oiling system are as follows:

GEAR TRAIN: All oiling points behind guard can be reached through holes drilled in guard. Sliding gear is oiled through hole in end of handle. Quadrant gear has Zerk fitting and should be shot with grease gun monthly, using automotive chassis grease. Screw gear has oil cup fitted on quadrant. Oil cup on reverse handle and oiling holes at ends of reverse gear studs are same as Standard Lathe.

GEAR BOX: Two oil cups on top of box permit oil to drip on gear cone which distributes it generally to all moving parts. Gears can be greased if desired, working from under open side of gear box. Five ball bearings at shaft ends are packed with grease; inspect at intervals of six months by removing covers and repack as needed.

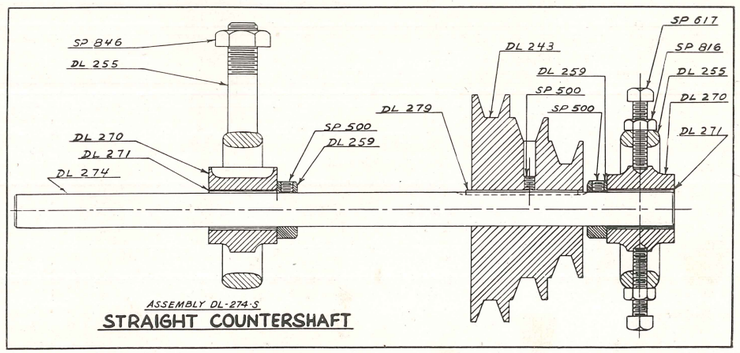
APRON: Oil cup on face of apron leads to reservoir which supplies lubrication for entire apron. Initial filling is most easily done by loosening screws in saddle and tilting apron forward, or, running oil into crankcase through opening at back of apron behind handwheel. Fill to overflow level of oil cup, 12 oz. (¾ pint) of oil required. Maintain level by periodic oiling through oil cup. Crankcase can be drained by removing plugs at bottom of apron.

CLUTCH COUNTERSHAFT: Oil holes in each bearing housing should have shot of oil every twenty hours. Pulley is oiled by removing set screw—give several shots of oil every ten hours. Keep slip ring of clutch closer oiled.

REPLACEMENT PARTS • *STANDARD AND QUICK CHANGE LATHES*

STRAIGHT COUNTERSHAFT

Part No.	Name Of Part	List Price
DL 243	3-Step Pulley	$ 4.80
*DL 255 (DL 255-S)	Bearing Hanger Assembly (2)	1.50
DL 259	Spac. Collar (2)	.30
*DL 270 (DL 270-S)	Bearing Housing Assem., DL 270, DL 271 (2)	1.30
DL 271	Bronze Bushing (2)	.75
DL 274	Countershaft	1.20
DL 274-S	Complete Countershaft	12.75
DL 279	Cone Pulley Key	.10
DL 304	3/16" Drive Pulley Key	.06
SP 500	¼"-20x¼" Socket set screw (2)	.08
*SP 617 (SP 618)	5/16"-18x1-¾" Sq. Hd. Set Screw (2)	.03
*SP 816 (SP 846)	5/16"-18 Hex. Jam Nuts (4)	.03
*SP 846 (SP 876)	⅝"-18 Hex. Jam Nuts (2)	.03
SP 616	5/16"-18x1¼" Sq. Hd. Set Screw (2)	.03

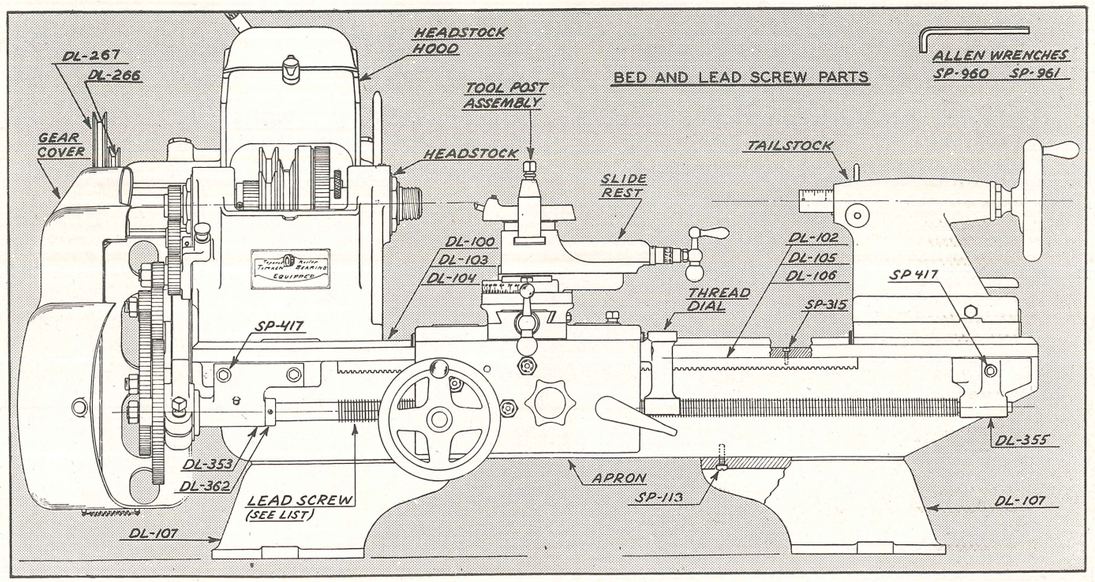


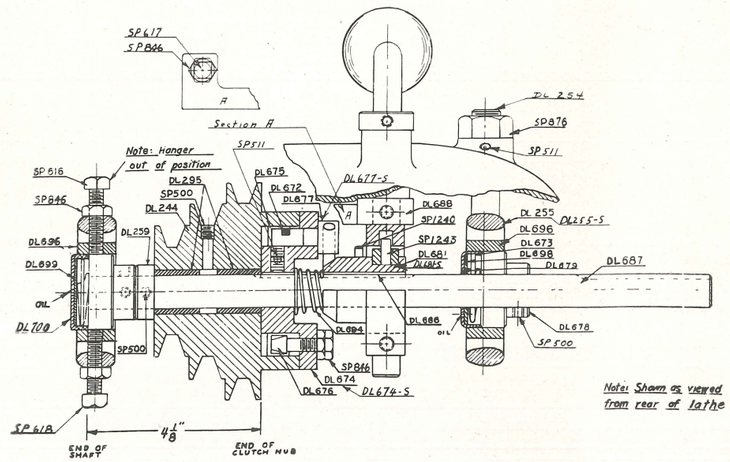
REPLACEMENT PARTS CONTINUED ON FOLLOWING PAGES

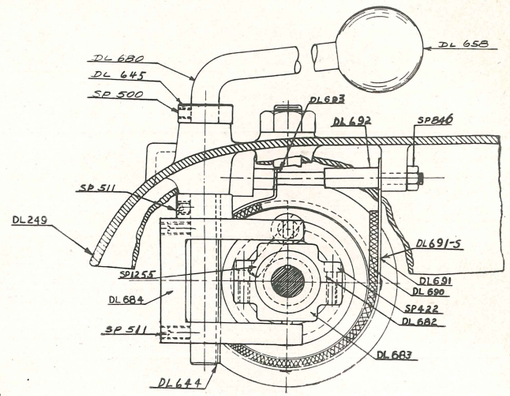
REPLACEMENT PARTS Continued

Part No.	Name Of Part	List Price
	BED AND LEAD SCREW	
DL 100	36" Bed	$ 60.00
DL 102	36" Rack	3.60
DL 103	18" Bed	45.00
DL 104	24" Bed	51.00
DL 105	18" Rack	2.70
DL 106	24" Rack	3.00
DL 107	Bed Feet 2)	3.00
DL 110	18" Lead Screw	6.00
DL 111	24" Lead Screw	6.60
*DL 266 (DL 211) 2	Step Aluminum Pulley ¾" Bore (Clutch Countershaft)	9.00
*DL 267 (DL 211)		
*DL 267 (DL 303) 8"	Steel Pulley ¾" Bore (Std. countershaft)	3.50
DL 268	1-¾" Pulley, ½" Bore	.40
DL 269	1-¾" Pulley, ¾" Bore	.40
TD 107	1-¾" Pulley, ⅝" Bore	.40
DL 280-S	1-¾"-5" Pulley, ½" Bore	3.00
DL 281-S	1-¾"-5" Pulley, ⅝" Bore	3.00
DL 282-S	1-¾"-5" Pulley, ¾" Bore	3.00
DL 353	Leadscrew Bracket (Head)	2.10
DL 355	Leadscrew Bracket (Tail)	.60
DL 356	36" Leadscrew (Std.)	7.50
DL 362	Leadscrew Collar	.45
DL 555	6" Face Plate	1.75
Q 442	18" Leadscrew	6.00
Q 443	24" Leadscrew	6.60
Q 444	36" Leadscrew	7.50
*SP 113 (SP190)	5/16" - 18x⅞ Phillips Fill Hd. Screws (8)	.03
*SP 315 (SP376)	10 - 24x½" Fill. Hd. Mach. Screw (6)	.03
*SP 417 (SP441)	5/16" - 18x1" Soc. Hd Cap Screw (3) Std. (1) Q. C.	.15
*SP 960 (SP990)	¼" Allen Wrench	.10
*SP 961 (SP991)	5/16" Allen Wrench	.10
	CLUTCH COUNTERSHAFT	
DL 212	3/16" Sq. Key For Alum. Pulley (Not Shown)	.06
DL 244-S	Pulley & Bushing Assembly, (DL 244, DL 295)	7.00
DL 255-S	Bearing Hanger, DL 254, DL 255	1.50
DL 259	Spacing Collar	.40
DL 295	Pulley Bushing	.25
DL 672	Clutch Ring Spring	.15
DL 673	Felt Retaining Ring	.10
DL 674	Clutch Expander Hub	2.50
DL 674-S	Clutch Hub Assembly, DL 672, DL 674, DL 675, DL 676, DL 677-S	6.50
DL 675	Expanding Clutch Ring	1.40
DL 676	Expanding Clutch Adjusting Bolt	.50
DL 677-S	Clutch Expander Assembly	1.25
DL 678	Ball Bearing	2.25
DL 679	Open Bearing Cover	.35
DL 679-S	Ball Bearing Housing Assembly, DL 679, DL 696, DL 699, DL 678, DL 673	1.80
DL 681	Expanding Clutch Pusher	2.50
DL 681-S	Clutch Pusher Assembly, DL 681, DL 682	3.65
DL 682-S	Slip Ring Assembly, DL 681, DL 682	1.20
DL 684	Clutch Pusher U Arm	1.00
DL 686	Countershaft Key	.05
DL 687	Clutch Shaft	.50
DL 687-S	Complete Clutch Assembly, (Less Hood)	45.70
DL 688	Brake Push Arm	.34
DL 691-S	Brake Band Lining	1.00
DL 692	Brake Bolt	.03
DL 693	Brake Push Rod	.25
DL 694	Anti-engage Spring	.10
DL 696	Bearing Housing	1.00
DL 698	Felt Washer (Open End)	.03
DL 699	Felt Washer (Closed End)	.03
DL 700	Closed Bearing Cover	.20
DL 700-S	Ball Bearing Housing Assembly (Closed, DL 700, DL 698, DL 696, DL 678, DL 673	2.00
DL 680-S	Clutch Lever & Ball Assembly, DL 680, DL 658	1.50
DL 658	Clutch Shift Ball	.60
DL 644	Shift Shaft Key	.06
SP 616	5/16-18x1¼" Sq. Hd. Set Screw (2)	.06
SP 618	5/16-18x1-¾" Sq. Hd. Set Screw (2)	.03
*SP 617 (SP 618)	5/16-18x1-¾" Sq. Hd. Set Screw (1)	.03
SP 846	5/16-18 Hex. Jam Nut (7)	.03
SP 876	⅝"-18 Hex. Jam Nut (2)	.03
SP 500	¼"-20x¼" Socket Set Screw (11)	.08

*Indicates a combined assembly, or any change in part or design. Order part by the number in bracket ().







Part No.	Name Of Part	List Price
*SP 511 (SP 510)	5/16"-18x5/16" Socket Set Screw In Hood Assembly (2)	.10
SP 511	5/16"-18x⅜" Socket Set Screw (4)	.10
	TAILSTOCK	
DL 405	Handwheel Handle	$ .75
DL 431	Angular Steel Washer	.06
DL 432	Angular Felt Washer	.06
DL 433	Semi-circular Steel Washer	.06
DL 434	Semi-circular Felt Washer	.06
DL 510	Tailstock Wrench	.45
DL 513-S	Handwheel & Handle Assembly	2.50
DL 513-SS	Handwheel & Leadscrew Assembly, DL513-S, 518, 525-S	5.30
DL 517-SS	Body & Bottom Assembly, DL 517, 510-S, 529	19.20
DL 517-SS	Complete Tailstock	42.70
DL 518	Tailstock Button	1.00
DL 520	Spindle Key	.15
DL 521	Spindle Lock Bolt	.80
DL 522	Spindle Lock Lever	.45
DL 523	Spindle	8.40
DL 524	Spindle Leadscrew Collar	.20
DL 525	Spindle Leadscrew	1.10
DL 525-S	Leadscrew & Collar Assembly	1.62
DL 526	Floating Lock Bushing	.80
DL 527	Spindle Lock Bushing	.80
DL 528	Bed Clamp Bolt ⅜"-24x2-¾" Hex. Hd. Bolt (2)	.06
DL 529		.06
*SP209A (SP257)	8-32x½" Rd. Hd. Mach. Screw (2)	.03
*SP 804 (SP894)	½-13" Hex. Nut (1)	.20
*SP 816 (SP846)	5/16"-18 Hex. Jam Nut (1)	.03
*SP1280 (SP1277)	⅛"x½" Woodruff Key (1)	.03
*SP1519 (SP1251)	⅛x¾" Groov Pin T5 (1)	.03
*SP1779 (SP1245)	¼"x1½" Groov Pin T2 (1)	.03
SP 831	5/16-18 Hex. Nut (1)	.03

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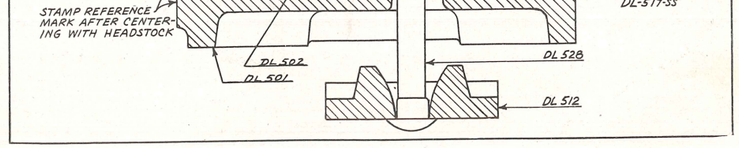

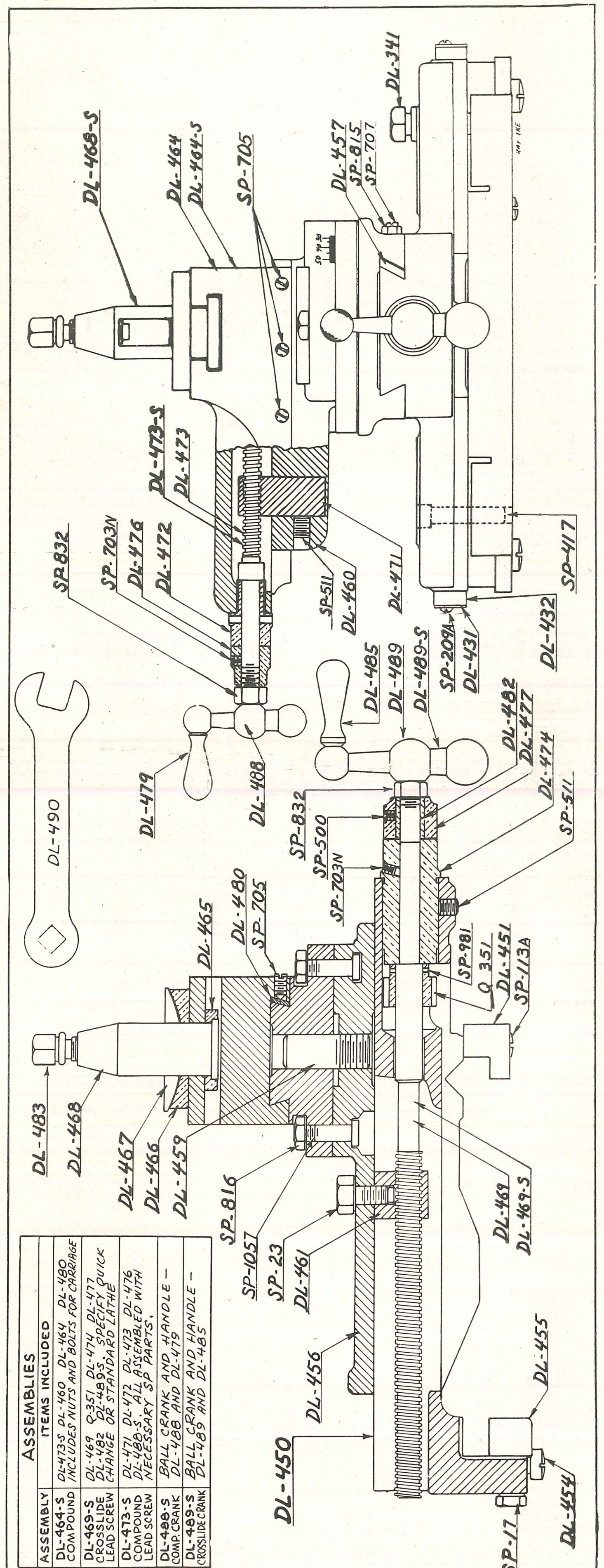

ASSEMBLIES	
ASSEMBLY	ITEMS INCLUDED
DL-464-S COMPOUND	DL-473-S DL-460 DL-464 DL-480 INCLUDES NUTS AND BOLTS FOR CARRIAGE
DL-469-S CROSSLIDE LEAD SCREW	DL-469 Q-351 DL-474 DL-477 DL-482 DL-489-S. SPECIFY QUICK CHANGE OR STANDARD LATHE
DL-473-S COMPOUND LEAD SCREW	DL-471 DL-472 DL-473 DL-476 DL-488-S. ALL ASSEMBLED WITH NECESSARY SP PARTS.
DL-488-S COMP. CRANK	BALL CRANK AND HANDLE – DL-488 AND DL-479
DL-489-S CROSSLIDE CRANK	BALL CRANK AND HANDLE – DL-489 AND DL-485

STANDARD AND QUICK CHANGE CARRIAGE

STANDARD Part No.	QUICK CHANGE Name Of Part	List Price
Q 351	Crosslide Gear	$ 1.00
DL 341	Carriage Lock Bolt	.45
DL 431	Angular Steel Washer (2)	.06
DL 432	Angular Felt Washer (2)	.06
DL 433	Semi-Circular Steel Washer (2)	.06
DL 434	Semi-Circular Felt Washer (2)	.06
*DL 450 (Q 350)	Carriage Saddle	30 00
DL 451	Front Gib	1.80
DL 454	5/16'' Special Cap Screw	.15
DL 455	Back Gib	.75
*DL 456 (DL 458)	Crosslide	12.00
DL 457	Crosslide Gib	.45
DL 459	Crosslide Swivel Post	.25
DL 460	Lower Compound	6 00
*DL 461 (DL 453)	Crosslide Leadscrew Nut	1.00
DL 464	Upper Compound	5.00
DL 464-S	Compound Assembly	17.50
DL 465	Tool Post Sq. Washer	.40
DL 466	Tool Post Ring	.60
DL 467	Tool Post Rocker	.60
DL 468	Tool Post	2 40
DL 468-S	Tool Post Complete	4.60
*DL 469 (Q 352)	Crosslide Leadscrew	3 50
*DL 469-S (Q 351-S)	Crosslide Leadscrew Assembly	6.00
DL 471	Compound Nut	.40
DL 472	Compound Leadscrew Bushing	.60
DL 473	Compound Leadscrew	1 00
DL 473-S	Compound Leadscrew Assembly	5.00
*DL 474 (Q 353)	Crosslide Leadscrew Bushing	1.75
*DL 476 (DL 477)	Crosslide Micro Collar	.50
DL 477	Crosslide Micro Collar	1.50
DL 488-S	Ball Crank & Handle Assembly, DL 488, DL 479	1.90
DL 489-S	Crosslide Ball Crank Assembly DL 489, DL 485	2.35
*DL 490 (DL 500)	Tool Post Wrench	.50
*SP 17 (SP 25)	5/16''-18x2'' Hex. Cap Screw (2)	.06
*SP 23 (SP 512)	5/16''-18x1/2'' Socket Set Screw (1)	.10
*SP 113-A (SP 149)	5/16-18x7/8 Fill Hd. Cap Screw (1)	.06
*SP 209-A (SP 257)	8-32x1/2'' Rd. Hd. Machine Screw (4)	.03
*SP 417 (SP 442)	5/16-18x1 1/4 Socket Cap Screw (1)	.15
*SP 511 (SP 510)	5/16-18x5/16'' Socket Set Screw (1)	.10
SP 500	1/4''-20x1/4'' Socket Set Screw (1)	.08
SP 1244 (Not Shown)	1/4''x3/4'' Groov-pin T2 (2)	.03
*SP 703N (SP 500)	1/4''-20x1/4'' Socket Set Screw (1)	.10
*SP 705 (SP 797)	1/4''-20x1/2'' Headless Set Screw (Cone Pt.) (4)	.03
*SP 707 (SP 799)	1/4''-20x3/4'' Headless Set Screw (Cone Pt.) (5)	.06
*SP 815 (SP 845)	1/4''-20 Jam Nut (5)	.03
*SP 816 (SP 846)	5/16''-18 Jam Nut (2)	.03
*SP 832 (SP 862)	3/8-24 Hex. Nut (2)	.03
*SP 981 (SP 1251)	1/8''x3/4'' Groov-pin T5 (1)	.03
*SP 1057 (DL 475)	Compound Clamp Bolt (2)	.25

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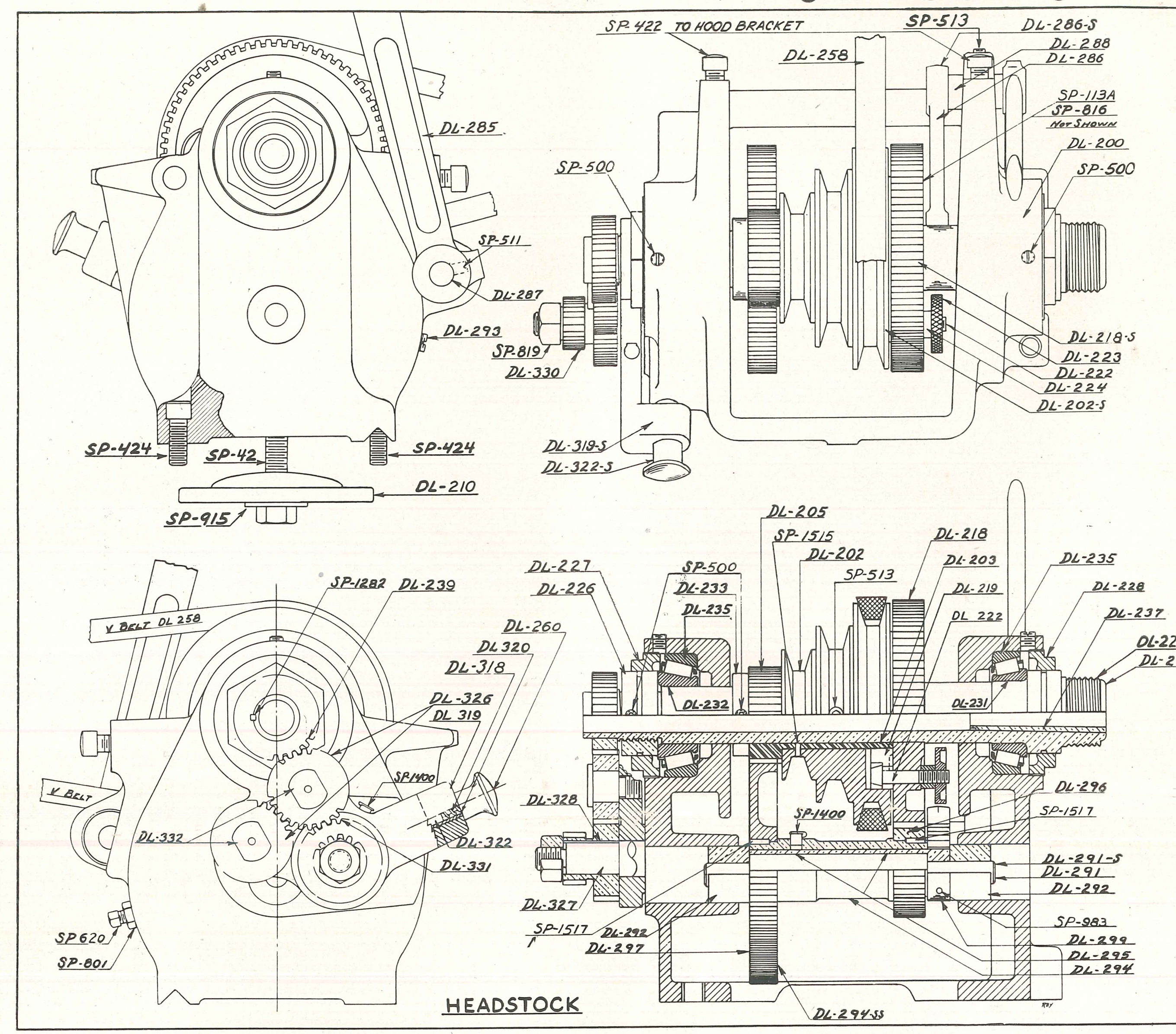

HEADSTOCK

Part No.	Name Of Part	List Price
DL 200	Headstock Body	$ 24.00
DL 200-S	Headstock Hood Assembly, DL200, DL207, DL235, DL249, DL251, DL252, DL262	35.85
DL 200-SS	Headstock Complete Inc. Hood, less Reverse Assembly	108.20
DL 202-S	Headstock Cone Pulley Assembly, DL202, Cone Pulley, DL 203 Bushing, DL 205 Gear	10.78
DL 202-SS	Pulley & Bull Gear Assembly, DL 202-S, DL 218-S	16 58
DL 210	Headstock Bed Clamp	.25
DL 218-S	Bull Gear Assemsembly, DL 218, DL 219, DL 222, DL223, DL 224, Q 406	5.80
DL 226	Take Up nut	1.80
DL 227	Rear Bearing Cap	.75
DL 228	Front Bearing Cap	.75
DL 229-S	Headstock Spindle Assembly, DL 229, DL 232 Cone (Timken 14137A)	13.85
DL 232	Rear Bearing Cone (Timken 14125A)	1.80
DL 233	Spindle Spacing Collar	.90
DL 235	Timken Bearing Cup (14274)	1.00
DL 237	Reducing Sleeve	3 90
DL 239	28-T Headstock Gear	2.10
DL 240	Eccentric Shaft Cover (Exp. Plug)	.20
DL 258	Vee Belt	1.35
DL 285	Back Gear Lever	.60
DL 286-S	Back Gear Arm, DL 288, DL 286, DL 287	1.70
DL 291-S	Eccentric Shaft Assembly, DL 299, DL 291	2.73
DL 292	Eccentric Shaft Bushing (2)	.60
DL 293	Eccentric Shaft Bushing Screw (2)	.30
DL 294-SS	Back Gear Assembly, DL 294-S, DL 296, DL 297	9.65
DL 319	Reverse Bracket	1.80
DL 319-S	Reverse Gear Assembly, DL 319, DL 326 (2) DL 327, DL 328, DL 331, DL 332 (2)	10 87
*DL 322-S (DL 336-S)	Reverse Handle Complete	1.86
*DL 326 (DL 326-S)	27-T Gear & Idler Gear Stud.	2.20
*DL 332 (DL 326-S)	27-T Gear & Idler Gear Stud.	2 20
DL 327	Stud Gear Shaft	2.00
DL 328	Stud Gear Shaft Key	.03
DL 331	28-T Gear With Shoulder	2.40

HOOD PARTS (Not Shown)

Part No.	Name Of Part	List Price
DL 207	Hood Bracket	$ 2.20
DL 249	Hood Casting	7.00
DL 252	Bolt Sleeve (2)	.20
DL 246-S	Hood Latch Assembly	1.40
SP 461	3/8-16x3/4 socket cap screw (2)	.15
SP 37	3/8-16x1 1/4 hex. hd. cap screw (2)	.06

S. P. PARTS FOR HEADSTOCK

Part No.	Name Of Part	List Price
*SP 22 (SP 32)	3/8-16x1/2 hex. hd. cap screw (1)	$ .03
*SP 42 (SP 61)	1/2-13x2 ditto (1)	.10
*SP 424 (SP 462)	3/8 - 16x1 socket set screw (4)	.15
SP 500	1/4-20x1/4 socket set screw (2)	.10
*SP 513 (SP 512)	5/16-18x1/2 socket set screw (2)	.10
SP 620	5/16-18x2 1/4 sq. hd. set screw (1)	.08
*SP 816 (SP 846)	5/16-18 Jam Nut	.03
*SP 819 (SP 834)	1/2-13 full nut (1)	.04
*SP 915 (SP 945)	1/2 Washer (1)	.03
*SP 1282 (SP 1277)	1/8x1/2 Woodruff Key (3)	.03
*SP 1517 (SP 1227)	1/8x1/2 Groov-Pin T1 (5)	.03
*SP 983 (SP 1013)	00x1 1/4 Taper Pin (1)	.03
*SP 1400 (SP 1328)	Gits Straight Oiler (2)	.10

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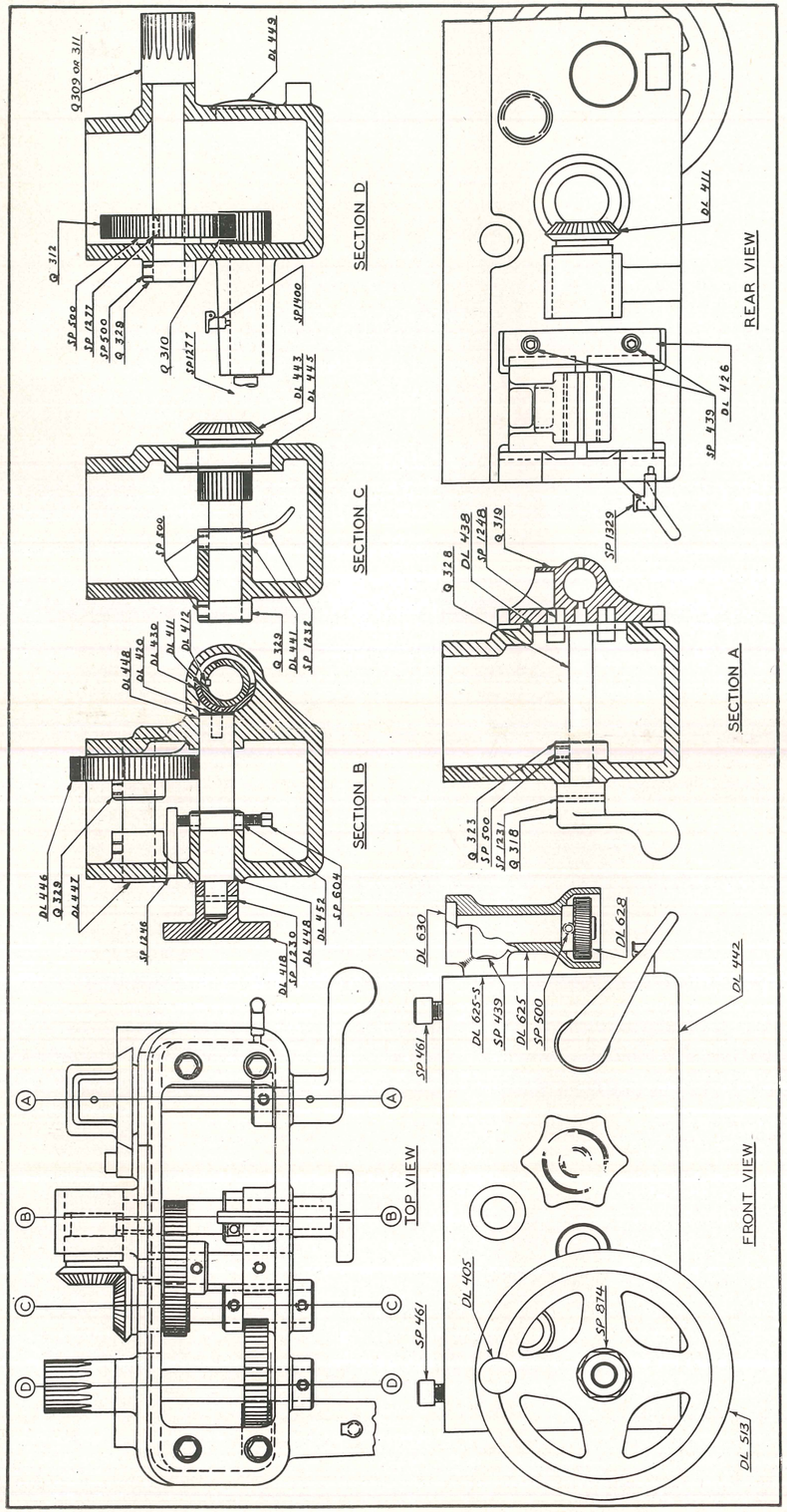
STANDARD APRON



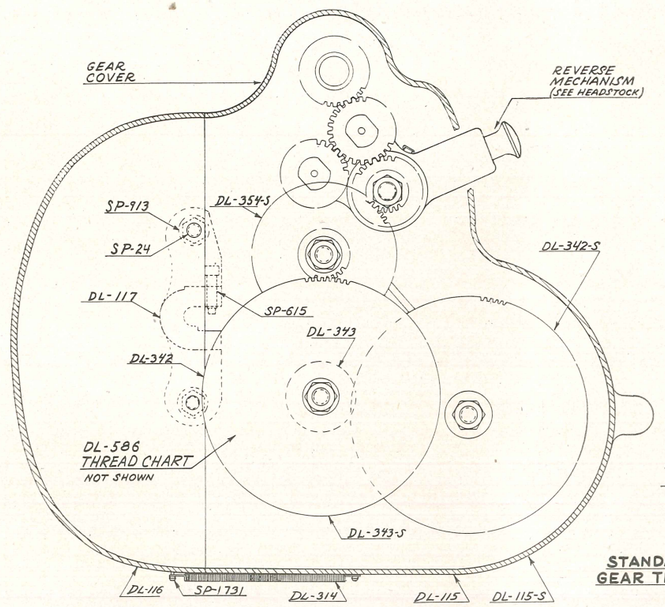
Part No.	Name of Part	List Price
DL 628	Thread Dial Gear ..	3.00
DL 630	Dial & Shaft Assembly	1.50
DL 694	Tension Spring (Clutch Countershaft) ..... (Not Shown)	.10
Q 309	16-T Rack Pinion ...	3.00
Q 310	Handwheel Shaft & pinion	3.00
Q 311	15-T Rack Pinion ..	3.00
Q 312	44-T Gear	1.50
Q 318	Split Nut Lever	.45
Q 319	Split Nut	3.60
Q 323	Idler Gear Stud Collar	.30

Part No.	Name of Part	List Price
DL 405	Handwheel Handle ..$	1.25
DL 411	Sliding Bevel Gear ..	4.50
DL 412	⅛" Square Key	.10
DL 418	Star Wheel	.45
DL 420	Bevel Gear Shift Shaft Pin	.10
DL 426	Split Nut Gib	.60
DL 430	Bevel Gear Shoe	.45
DL 438	Scroll (Includes Q 328)	3.50
DL 441	Oil Splasher Collar ..	.60
DL 442	Apron Body	18.00
DL 442-S	Complete Apron Less Thread Dial	60.00

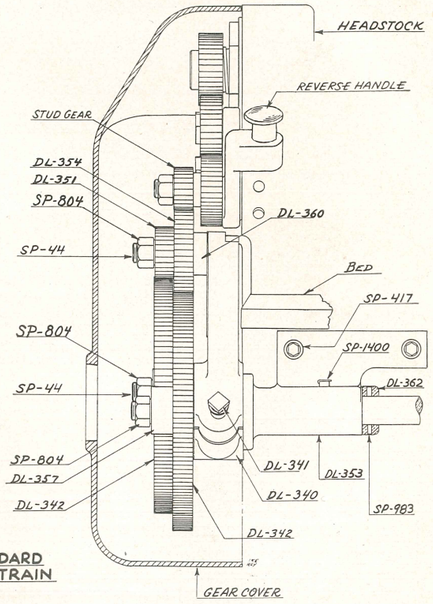
Part No.	Name of Part	List Price
DL 443	Bevel Gear & Shaft ..	6.00
DL 445	Ball Bearing (Schatz Cs 58)	.75
DL 446	47-T Idler Gear	1.40
DL 447	47-T Gear Shaft	.25
DL 448	Sliding Bevel Gear Shift Shaft	.45
DL 449	Bevel Gear Stop Collar	.40
DL 452	Handwheel	2.70
DL 513	Thread Dial (Complete)	6.00
DL 625-S	Thread Dial Body ..	2.00
DL 625	11/16" Shaft Collar (4)	.30
SP 439	5/16-18x¾ socket cap screw (3)	.06
SP 461	⅜-16x¾ socket cap screw (4)	.15
SP 500	¼-20x¼ socket set screw (8)	.10
SP 604	¼-20x⅝ sq. hd. set screw (2)	.03
SP 874	½-20 Hex Jam Nut ..	.05
SP 961	⅝" Lock Washer (2-not shown)	.03
SP 977	½" Spring Washer .. (DL 421)	.03
SP 1230	¼x⅞ Groov-pin T1	.03

Part No.	Name of Part	List Price
Q 329	11/16" Shaft Collar (4)	.30
SP 439	5/16-18x¾ socket cap screw (3)	.06
SP 461	⅜-16x¾ socket cap screw (4)	.15
SP 500	¼-20x¼ socket set screw (8)	.10
SP 604	¼-20x⅝ sq. hd. set screw (2)	.03
SP 874	½-20 Hex Jam Nut ..	.05
SP 961	⅝" Lock Washer (2-not shown)	.03
SP 977	½" Spring Washer .. (DL 421)	.03
SP 1230	¼x⅞ Groov-pin T1	.03

GEAR TRAINS

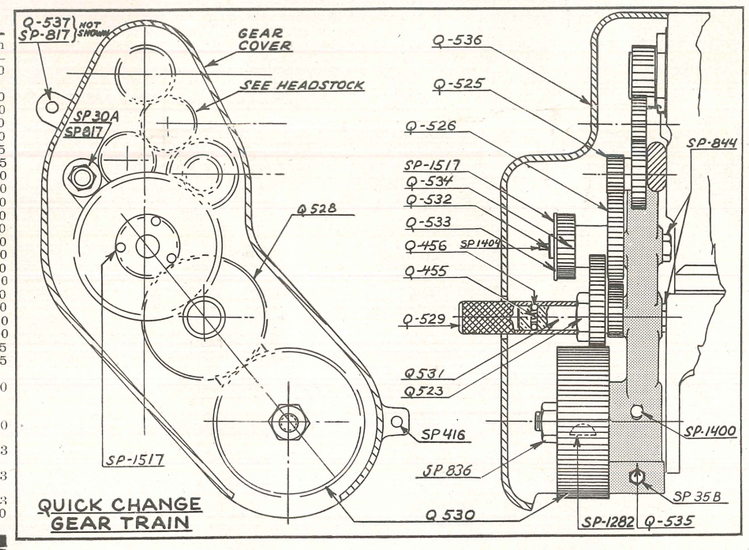


STANDARD GEAR TRAIN



STANDARD GEAR TRAIN

Part No.	Name of Part	Each
DL 115	Front Gear Guard	$ 3.00
DL 115-S	Guard Assembly, DL Nos. 115, 116, 314, 315	7.40
DL 116	Rear Gear Guard	3.00
DL 117	Gear Guard Bracket	1.50
DL 208	100-T Gear Bushing	1.00
DL 314	Gear Guard Spring	.75
DL 315	Gear Guard Hinge (not shown)	.65
DL 340	Quadrant	3.90
DL 341	Quadrant Clamp Bolt	.60
DL 342	100-T Gear (2)	2.10
DL 342-S	100-T Gear and Collar Assem.	3.30
DL 343	25-T Gear	1.20
DL 343-S	100 and 25-T Gear Assem.	3.30
DL 351	20-T Gear	1.20
DL 353	Lead Screw Bracket	2.10
DL 354	60-T Gear	1.50
DL 354-S	60 and 20-T Gear Assem.	3.20
DL 357	100-T Gear Collar	.60
DL 359	36" LS Collar (not shown)	.60
DL 360	Gear Bushing	1.00
DL 362	Lead Screw Thrust Collar	.45
DL 586	Change Gear Chart	.45
*SP 44 (SP64)	½"-13x2½ hex hd. cap screw (1)	.10
*SP 615 (SP683)	5/16"-18x1" sq. hd. set screw (dog point) (2)	.20
*SP24 (SP36)	⅜"-16x1" hex. cap screw (2)	.03
*SP 1731 (SP1241)	3/16"x⅝" Groov-pin T7 (2)	.03
*SP 983 (SP1232)	⅛x1¼ Groov-pin T1 (1)	.03
*SP 1400 (SP1328)	¼" Straight Oil Cap	.10



QUICK CHANGE GEAR TRAIN

Change Gears

NOT SHOWN

DL 577	64 Teeth	$ 1.50
DL 578	60 Teeth	1.50
DL 579	56 Teeth	1.50
DL 580	52 Teeth	1.50
DL 581	48 Teeth	1.50
DL 582	46 Teeth	1.50
DL 583	44 Teeth	1.50
DL 584	40 Teeth	1.50
DL 585	32 Teeth (2 needed)	1.50
DL 590	36 Teeth	1.50
DL 591	54 Teeth	1.50

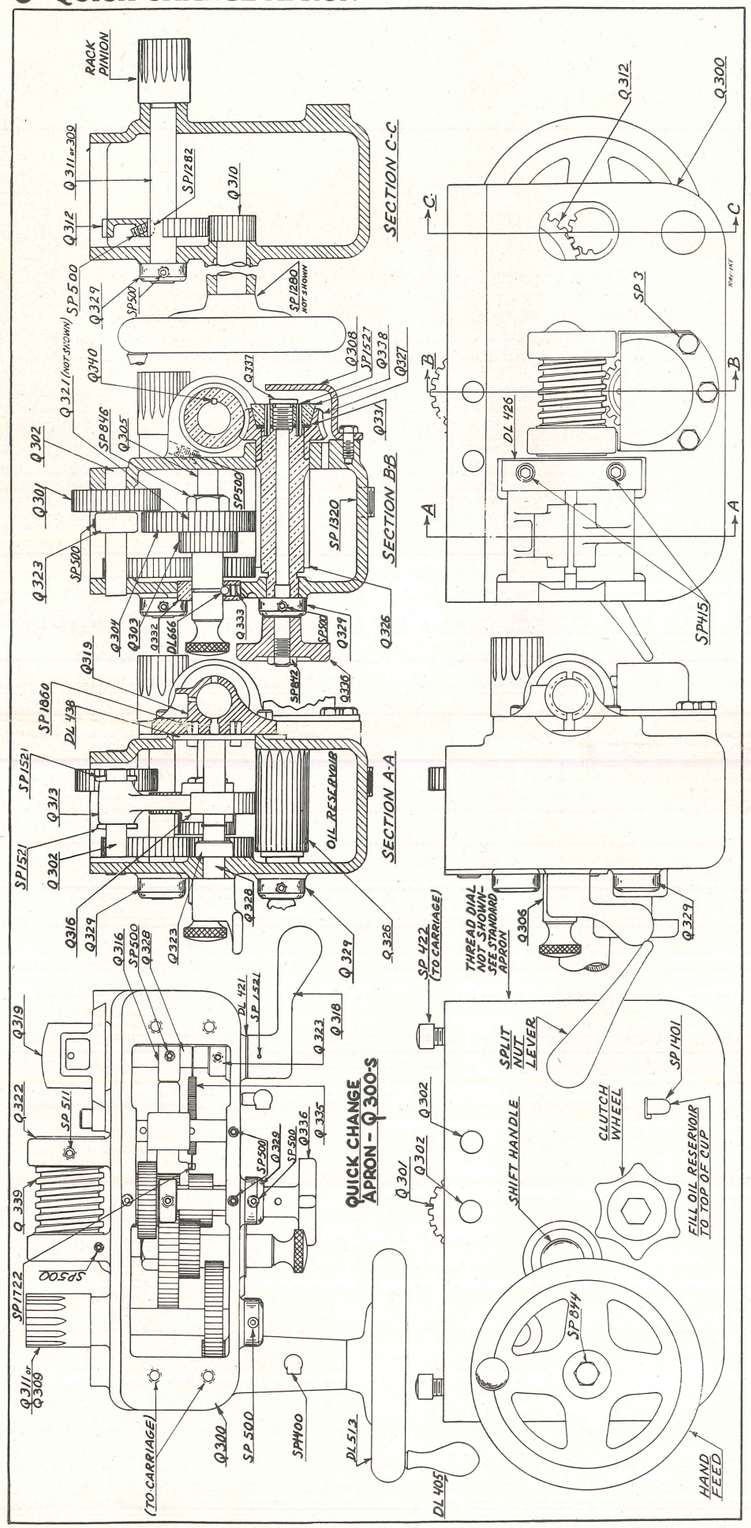
QUICK CHANGE GEAR TRAIN

Part No.	Name of Part	Each
Q 455	Sliding Gear Index Spring	$ .03
Q 456	5/16" Steel Ball	.03
Q 523	1⅛" Special Hex Nut	.60
Q 525	18-T Stud Gear	1.80
Q 526	72-T Gear	2.60
Q 528	60-T Gear	1.80
Q 529	18-T Gear and Handle	4.50
Q 530	75-T Gear	2.70
Q 531	Stud for Sliding Gear	.60
Q 532	Quadrant Stud Bolt	1.20
Q 533	Sliding Gear Stop Disk	.20
Q 534	30-T Gear and Hub	3.00
Q 535	Quadrant	3.60

Part No.	Name of Part	Each
Q 536	Gear Cover	$7.80
Q 537	Gear Cover Stud	.06
*SP 30-A (SP 40)	⅜—16x2¼ hx. cp. scr.	.05
*SP 30-B (SP 51)	7/16—14x2 hx. cp. scr.	.05
*SP 416 (SP 441)	5/16—18x1 sck. cp. scr.	.15
*SP 817 (SP 847)	⅜—16 hx. jm. nt. (3)	.03
*SP 836 (SP 866)	⅝—18 hx. nt.	.06
*SP 844 (SP 874)	½—20 hx. jm. nt. (2)	.03
*SP 1282 (SP 1277)	⅛x⅛ Key	.03
*SP 1400 (SP 1328)	¼ oil cup	.10
*SP 1404 (SP 1330)	5/16 Zerk	.15
SP 1517 (SP 1223)	Dr. Scr.	.07
SP 943	⅜ wash. (not shown) (3)	.06

*Indicates a combined assembly, or any change in part or design. Order part by the number in bracket ().

● QUICK CHANGE APRON

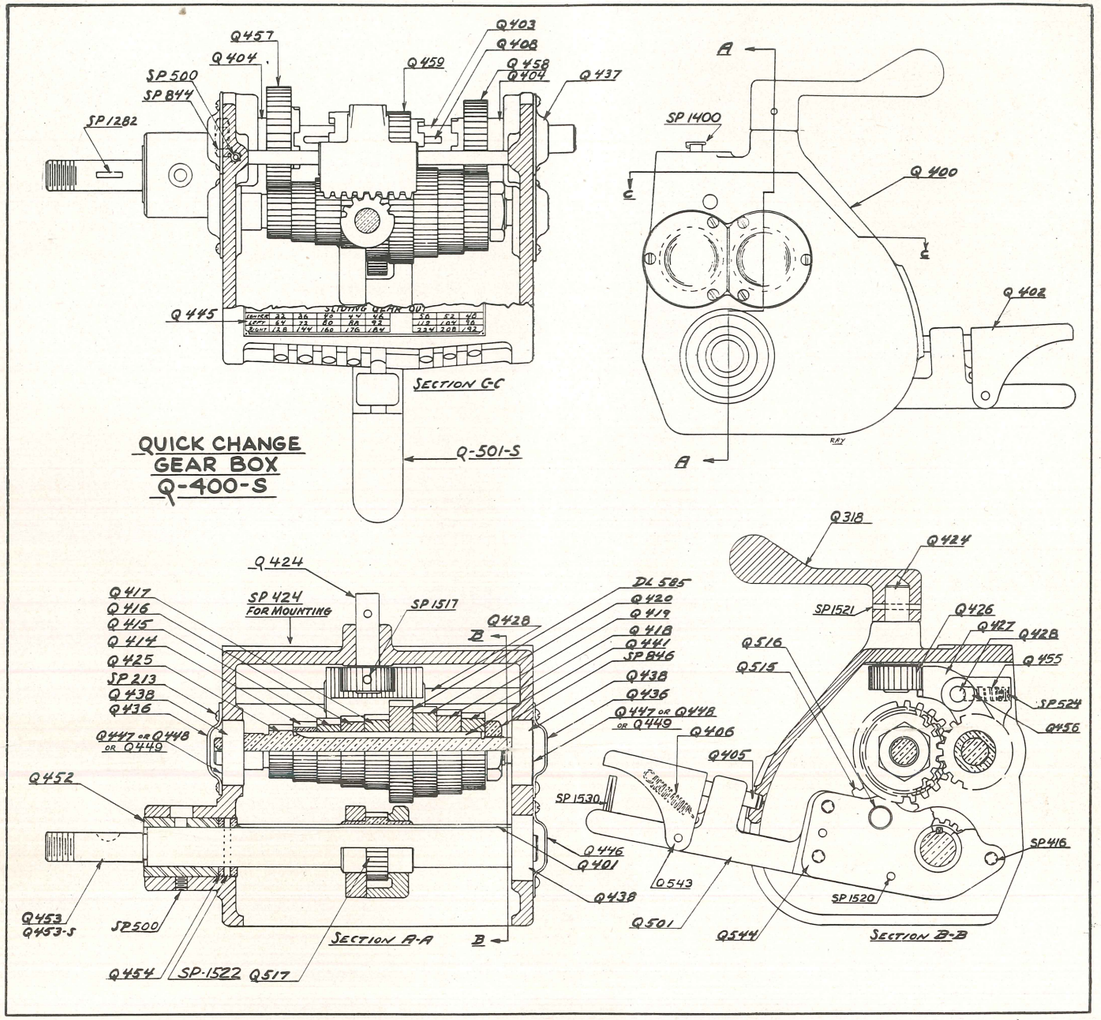


Part No.	Name of Part	Each
Q 300	Apron Casting	$18.00
Q 300-S	Complete Apron	62.90
Q 301	29-T Idler Gear	1.50
Q 302	Idler Gear Stud (2)	.20
Q 303	20-T Sliding Gear	1.20
Q 304	50-T Sliding Gear	1.50
Q 305	Sliding Gear Stud	.30
Q 306	Sliding Gear Sleeve	2.60
Q 308	Worm Gear Reservoir	.60
Q 309	16-T Rack Pinion	3.00
Q 310	Hand Wheel Shaft & Pinion	3.00
Q 311	15-T Rack Pinion	3.00
Q 312	44-T Gear	1.50
Q 313	Sliding Lock Arm	.60
Q 316	Scroll Shaft Cam	.75

Part No.	Name of Part	Each
Q 318	Split Nut Lever	.45
Q 319	Split Nut	3.60
Q 321	Sliding Gear Key	.03
Q 322	Worm Retaining Bushing	1.00
Q 323	Idler Shaft Collar (2)	.30
Q 324	Oil Reservoir Gasket	.10
Q 326	Feed Drive Pinion	3.60
Q 326-S	Pinion Assem., Q 326, 327, 331, 336, 337, 338	10.00
Q 327	28-T Worm Gear	3.00
Q 328	Scroll Shaft	.30
Q 328-S	Scroll Assem., Q 328, DL 438	.90
Q 329	11/16" Shaft Collar (2)	.30
Q 331	Worm Gear Retaining Washer	.06
Q 332	Sliding Gear Shaft Bushing	.75

Part No.	Name of Part	Each
SP 440	5/16-18x⅞ socket hd.cap screw(2)	.18
SP 461	⅜-16x¾ socket hd. cap screws(4)	.15
SP 500	¼-20x¼ socket set screw (9)	.10
SP 511	5/16-18x⅜ socket set screw	.10
SP 872	⅜-24 Hex. Jam nut	.03
SP 874	½-20 Hex. Jam nut	.05
SP 876	⅝-18 Hex. Jam nut	.03
SP 1280	⅛x½ Woodruff Key (2)	.03
SP 1277	⅛x½ Woodruff Key (2)	.03
SP 1347	½ socket pipe plug (2)	.30
SP 1328	¼" straight oil cup	.10
SP 1329	¼" angle oil cup	.30
SP 1231	⅛x1 Groov-Pin T1 (3)	.03
SP 1236	3/16x¾ Groov-Pin T1 (2)	.03
SP 1235	⅛x½ Groov-Pin T7	.15
SP 1248	⅛x¾ Groov-Pin T4 (2)	.06

● QUICK CHANGE GEAR BOX



QUICK CHANGE GEAR BOX

Part No.	Name of Part	List Price
DL 585	32-T Cone Gear	1.50
Q 318	Shift Lever	.45
Q 400	Gear Box Body	21.00
Q 400S	Complete Gear Box	70.00
*Q 401 (Q 451)	Tumbler Lever Shaft Key	.25
*Q 402 (Q 461)	Tumbler Lever Thumb Paddle	.20
Q 403	Dog Clutch Gear Shaft	.75
Q 403-S	Dog Gear Assembly, Q 403, 408, 457, 458, 459	8.00
Q 404	Adjusting Spacer Sleeve	
Q 469	Adjusting Spacer Sleeve (not shown)	
Q 470	Adjuster Spacer Sleeve	
Q 471	Adjusting Spacer Sleeve (not shown) (Custom Fit)	.15
*Q 406 (Q 460)	Tumbler Lever Spring	.06
Q 408	Dog Clutch Shaft Key	.03
Q 414	18-T Cone Gear	1.00
Q 415	20-T Cone Gear	1.00
Q 416	22-T Cone Gear	1.00
Q 417	23-T Cone Gear	1.00

Part No.	Name of Part	List Price
Q 418	24-T Cone Gear	1.00
Q 419	26-T Cone Gear	1.00
Q 420	28-T Cone Gear	1.00
Q 424	Clutch Shift Shaft	.20
Q 425	16-T Cone Gear & Shaft	4.50
Q 425-S	Gear Assembly, Q414, 415, 416, 417, 418, 419, 420, 425, 441, DL 585	13.70
Q 426	16-T Clutch Shift Gear	.75
Q 426-S	Shift Gear Assembly, Q 318, 424, 426	1.50
Q 427	Dog Clutch Slide	1.65
Q 428	Dog Clutch Shifter Bar	.35
Q 436	Closed Bearing Cover (3)	.10
Q 437	Open Bearing Cover	.10
Q 438	Ball Bearing (Nice 409-29) (5)	1.00
Q 441	Cone Gear Shaft Key	.06
Q 445	Thread & Feed Chart	.20
Q 446	Closed Bearing Cover	.10
Q 447	Adjusting Washer 1/64"	.03

Part No.	Name of Part	List Price
Q 448	Adjusting Washer 1/32"	.03
Q 449	Adjusting Washer 1/16"	.03
Q 452	Tumbler Shaft Bush.	1.00
Q 453	Tumbler Shaft	2.70
Q 453-S	Tumbler Shaft Assembly, Q 452, 453, 454	5.10
Q 454	Tumbler Thrust Collar	15
Q 455	Sliding Gear Index Spring	.06
Q 456	5/16" Steel Ball	.03
*Q 457 (Q 466-S)	32-T Gear & Bushing Assembly, Q 466, Q 465	2.30
Q 458	24-T Dog Clutch Gear	1.75
*Q 459 (Q 467)	18-T Dog Clutch Gear	3.00
Q 501	Tumbler Lever	2.00
*Q 501-S (Q 501-SS)	Tumbler Lever Assembly, Q 402, 405, 406, 501, 515, 516 517, 544	8.00
Q 515	24-T Tumbler Gear	1.00
Q 516	Tumbler Gear Shaft	.45

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