

PARTS LIST AND OPERATING INSTRUCTIONS FOR DUNLAP MODELMAKER LATHES

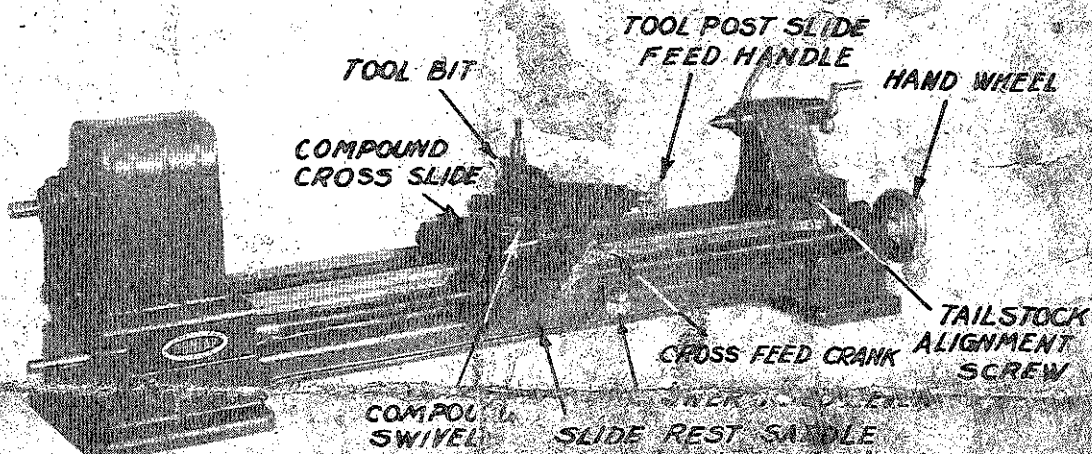
MODEL NUMBERS

MODEL NUMBER 109.0702 - STANDARD MODEL

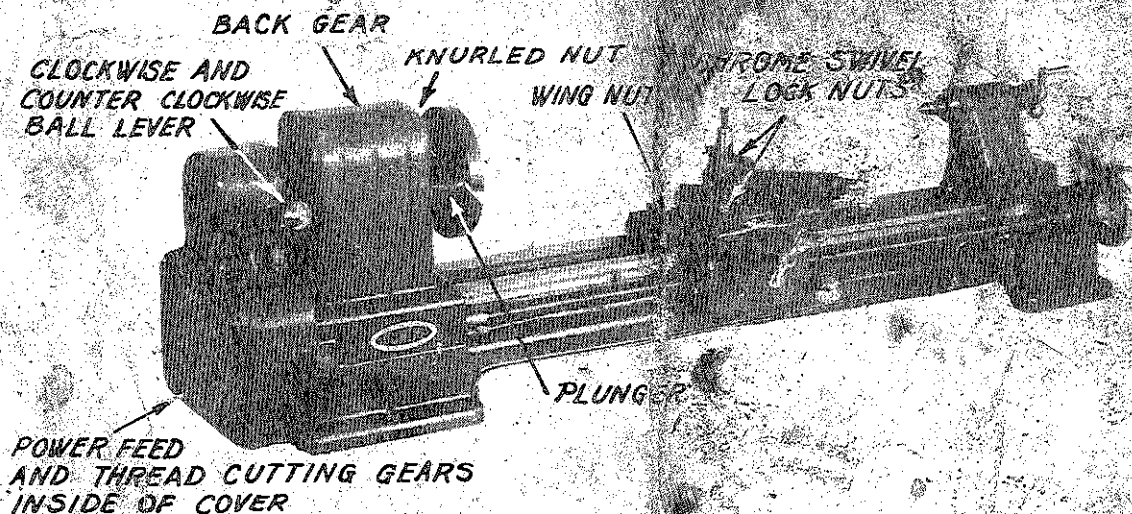
MODEL NUMBER 109.0703 - THREAD-CUTTING MODEL

COMPLETE WITH BACK GEARS

One of these is the Model Number of your lathe. It will be found on a plate which is located on the side of the right leg of the lathe. Always mention the Model Number when communicating with us regarding your lathe or when ordering parts.



STANDARD MODEL NUMBER 109.0702



THREAD-CUTTING MODEL NUMBER 109.0703

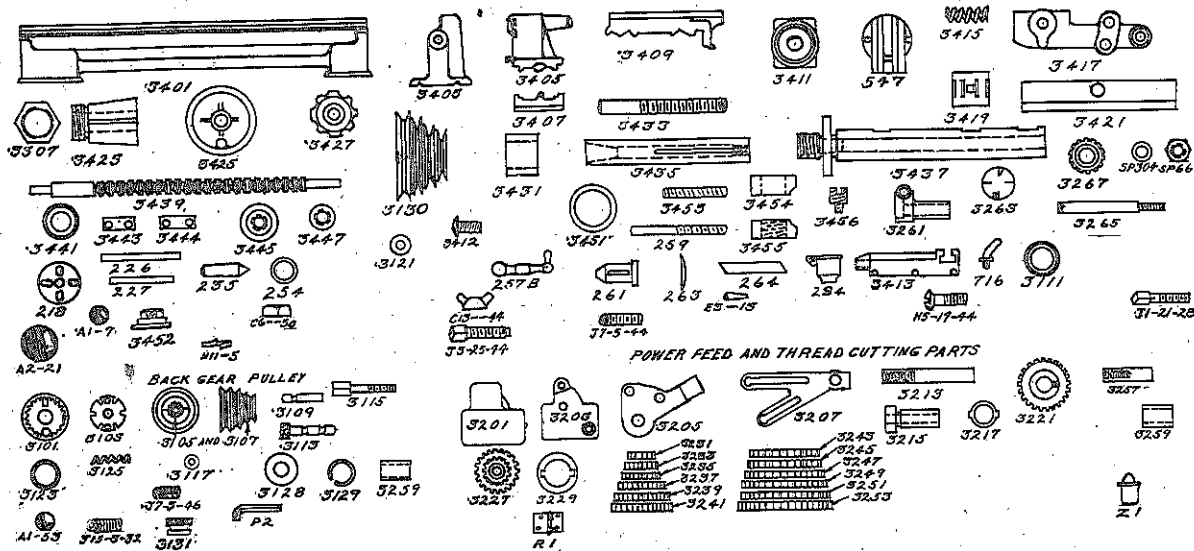
This list is not a packing slip. The parts illustrated may include parts or accessories not supplied as part of the lathe.

SEARS, ROEBUCK AND CO.

HOW TO ORDER PARTS FOR DUNLAP MODELMAKER LATHES - MODEL NOS. 109.0702, 109.0703

All parts listed here may be ordered through any Sears retail store or the mail order store which serves the territory in which you live. When ordering, always give the following information:

1. Part number;
2. Part name and price;
3. Model number, which will be found on a plate located on the side of the right leg of the lathe.



PARTS LIST

PART NUMBER	NAME OF PART	SELLING PRICE (each)	PART NUMBER	NAME OF PART	SELLING PRICE (each)	PART NUMBER	NAME OF PART	SELLING PRICE (each)
226	Swivel Base G1b	\$.15	3239	40-T Gear	\$.30	3453	Carriage Lock Stud	\$.10
227	Tool Post Slide G1b	.15	3241	44-T Gear	.35	3454	Tailstock Spindle Locking Collar	.15
225	No. 0 Morse Taper Center	.50	3243	46-T Gear	.40	3455	Tailstock Spindle Lock Nut	.15
252	Swivel Base Feed Screw	.15	3245	48-T Gear	.50	3456	Tailstock Spindle Key Screw	.15
254	Feed Screw Washer	.10	3247	52-T Gear	.50			
257 B	Crank	.30	3249	54-T Gear	.60	A1-7	5/16" Finished Ball	.10
259	Tool Post Slide Feed Screw	.15	3251	56-T Gear	.70	A1-53	5/32" Finished Ball	.10
261	Tool Post	.30	3253	58-T Gear	.70	A2-21	1" Soft Ball	.10
263	Tool Post Shoe	.15	3255	Threading Chisel	.50	B1-33-58	3/8-16 x 2 1/2" Carriage Bolt	.10
264	Tool Bit	.20	3257	Forward and Reverse Gear Stud	.15	B2-87-44	1-20 x 1 1/2" Machine Bolt Square Head	.10
284	Oil Cup	.05	3259	Gear Bushings	.15	C1-11-58	3/8-16 Hex Nut Plain	.10
547	Tool Post Slide Swivel	.15	3261	Thread Dial Body	.15	C3-44	1-20 Hex Nut Plain	.10
716	Tail Stock Locking Handle	.15	3263	Dial	.15	C6-50	5/16-18 Hex Nut Plated	.15
3101	Internal Gear Drum	.90	3265	Shaft	.15	C8-44	1-20 Square Nut	.10
3103	Back Gear Spider	.70	3267	Dial Gear	.15	C13-44	1-20 Wing Nut Plated	.10
3105	Sun Gear and Bearing	.15	3307	Taper Bearing Adj. Nut	.50	E3-13	#0000-1/4" Taper Pin	.10
3107	Back Gear Lathe Drive Pulley	4.00	3401	Lathe Bed	4.50	GR-27-50	5/16-18 1 1/2" Hex Head Cap Screw	.10
3109	Idler Shaft	.15	3403	Head Stock	1.10	H1-5-20	8-32 x 1" Round Head Machine Screw	.10
3111	Collar	.15	3405	Tail Stock	.50	H1-19-44	1-20 x 7/8" Oval Head Machine Screw	.10
3113	Plunger	.15	3407	Tail Stock Riser Block	.75	H1-27-44	1-20 x 7/8" Oval Head Machine Screw	.10
3115	Locking Pin	.15	3409	Carriage Saddle	.60	H3-17-44	1-20 x 3/4" Flat Head Machine Screw	.10
3117	Thrust Washer	.10	3411	Compound Swivel Base	.70	H3-9-44	1-20 x 3/8" Round Head Machine Screw	.10
3123	Gear Drum Bushing	.15	3412	Swivel "T" Bolt	.10	H7-19-20	8-32 x 7/8" Fill. Head Machine Screw	.10
3125	Plunger Regaining Spring	.10	3413	Tool Post Slide	.55	H7-23-20	10-32 x 1 1/8" Fill. Head Machine Screw	.10
3121	Thrust Washer	.10	3415	Feed Lever Catch Spring	.10	H7-25-44	1-20 x 1 1/8" Fillister Head Machine Screw	.10
3128	Thrust Washer	.10	3417	Feed Lever	.35	J1-21-28	10-24 x 1" Square Head Set Screw	.10
3129	Retaining Ring	.10	3419	Tail Stock Lock Block	.15	J3-25-44	1-20 x 1 1/2" Square Head Set Screw	.10
3130	Sears 4-step Motor Pulley	.75	3421	Carriage G1b Block	.15	J7-3-46	1-20 x 3/16" Allen Set Screw	.10
3131	Thumb Nut	.85	3423	Front Spindle Taper Bearing	.40	J7-5-44	1-20 x 3/4" Allen Set Screw	.10
3201	Cover	.75	3425	Hand Wheel	.25	J12-17-44	1-20 x 3/4" Headless Set Screw	.10
3203	Mounting Plate	.40	3427	Knob	.15	J12-20-44	1-20 x 1 3/4" Headless Set Screw	.10
3205	Power Feed Yoke	.40	3431	Front Spindle Sleeve Bearing	.15	J14-5-20	8-32 x 1" Headless Set Screw	.10
3207	Change Gear Spider	.40	3433	Ejection-Retracton Screw	.40	J14-9-20	8-32 x 3/8" Headless Set Screw	.10
3213	Spindle Stud	.15	3435	Tailstock Spindle	.70	J15-3-32	10-32 x 3/16" Headless Set Screw	.10
3215	Collared Shaft	.15	3437	Headstock Spindle	.75	L1-3	#1-3/16" U-Type P.K. Drive Screw	.10
3217	Keyed Bushing	.60	3439	Lead Screw	.10	N2-5	1" SAE Washer	.10
3221	Spindle Gear	.30	3441	Lead Screw-Washer	.15	N2-7	5/16" SAE Washer	.10
3227	Spindle Stud Gears (Combination)	.50	3443	Left Side Carriage Front G1b	.15	N2-9	3/8" SAE Washer	.10
3229	Spacer	.20	3445	Right Side Carriage Front G1b	.15	N4-5	1" USS Washer	.10
3231	20-T Gear	.20	3447	Feed Lever Bushing	.15	N11-5	1" Spring Locking Washer	.10
3233	24-T Gear	.20	3449	Ejection-Retracton Screw Collar	.15	P2	Allen Wrench for 1" Screw	.15
3235	32-T Gear	.30	3451	Tool Post Collar	.15	R1	2 1/2" x 3 1/2" Steel Hinge	.15
3237	36-T Gear	.25	3452	Compound Swivel Collar	.15	Z1	3/8" o.d. Spring Ball Catch	.10

A minimum charge of 25¢ made on any order. All standard nuts, bolts, washers, etc., usually are purchased locally.

ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

All parts are shipped Prepaid to you.

OPERATING INSTRUCTIONS FOR DUNLAP MODELMAKER LATHES, MODEL NOS. 109.0702, 109.0703

This lathe has been carefully checked and tested at the factory. All set screws, nuts, etc., have been tightened to prevent loss in shipment. Be sure to make the adjustments as mentioned below before operating this lathe.

ADJUSTMENTS

Get acquainted with your lathe before you use it. Every mechanic knows that each design of lathe has slightly different characteristics and adjustments. We suggest you check the following points:

1. Leveling. This tool is designed and built to do accurate work. However, it is absolutely essential that it be level if it is to be accurate. The feet of this lathe are ground parallel to the ways. Care must be taken to see that the bench upon which it is placed is flat. A sensitive spirit level should be placed across and down the length of the ways to check leveling. Place thin shims of metal under the proper feet to make the bed perfectly level.

2. Lubrication. It is absolutely necessary that all moving parts be thoroughly oiled before and after adjustments are made, and every time your lathe is used. Use good grade, light motor oil.

3. Check the two set screws on the compound cross-slide and oil the ways, so that the cross-slide travels smoothly on slide-rest saddle. Do not set it too loosely as this will cause chatter.

4. Check the three set screws on the upper unit of the compound and oil ways so that the travel is free. Here again, there should be no play or looseness in any gib after the adjustment is made.

5. Adjust wing nut at back of saddle for free movement of compound. This may be tightened to lock the compound for facing operations.

6. Be sure that the two chrome nuts on the compound swivel are tightened firmly after setting the angle for work. For most straight turning, this should be about 30 degrees away from a line at right angles to the bed.

7. The square-headed screws on each side of the tail stock are for a horizontal adjustment of the center. This makes tapered cuts possible and also assures perfect alignment between centers. Be sure tail stock is tightened down securely when operating. Turning hand crank to the left automatically ejects tail stock center from the ram.

8. The head stock is equipped with two bronze bearings. Over a long period of time, the front bearing may show wear. Tightening the large nut ahead of pulley will take up any such wear.

9. Excessive end play in the spindle may be removed by loosening the set screw in the pulley and adjusting the position of the pulley.

10. If the face plate is slightly out of true, a light facing cut should be taken. This is customary lathe procedure on any lathe and serves to fit the face plate to your particular lathe.

11. Be sure the four fillister head screws, counterbored into top side of the bottom plate of the compound (slide rest saddle), are tight.

MOTOR REQUIREMENTS: A 1/4 or 1/3 horse power, 1725 or 1750 R.P.M. motor is recommended to drive the lathe. A 4-step, 1/2"-bore pulley (Part Number 9.2084) should be used on the motor shaft. A 3/8 inch V belt should be used of a length to fit your set-up.

SPEEDS: Use of the proper speed is very important.

Metalworking speeds are much slower than woodworking speeds. Remember that the larger the diameter of the work being turned, the slower the speed should be. Slower speeds will give more power.

BACK GEARS: The thread-cutting model No. 109.0703 is regularly equipped with back gears which provide slower speeds and a greater range of speeds. This assembly may be added to the standard model. Jack shafts can also be used to broaden the speed range of the standard model though the back gear is about the same price and gives a greater reduction.

There are two controls on the back gear:

(1) A knurled nut is provided on the drum next to the pulley to lock this drum to the pulley. To connect the pulley and drum, loosen the knurled nut. Then slide this nut down the slot toward the spindle turning pulley slightly until the nut drops into a slot and then tighten knurled nut.

(2) The other control is a plunger at the front of the head stock which serves to lock the drum to the head stock. To engage the plunger turn the drum until 1/4" hole in drum lines up with plunger. Then push in the plunger.

These two controls are used as follows:

(1) To secure direct drive the knurled nut is placed in the proper position to lock the pulley and drum together and the plunger must be out (disengaged).

(2) To secure Back Gear drive the knurled nut must be disengaged (at the outer end of the slot) and the plunger must be in.

(3) You must never attempt to operate with both the knurled nut and plunger engaged.

Cold rolled steel should be turned at approximately 850 R.P.M. on work up to 1/2" in diameter. At one inch, the proper speed drops to 265 R.P.M. and at 1-1/2", to 174 R.P.M. These speeds are only approximate. In general, the speed in R.P.M. is dependent on the proper surface-cutting speed of the metal. For various grades of steel, this surface speed varies from 70 to 120 feet per minute; cast iron at 120 R.P.M. Such metals as brass, aluminum, etc., should be turned at higher speeds.

$$\text{R.P.M.} = \frac{\text{S.P.M.} \times 3.28}{D}$$

R.P.M. = Spindle speed in R.P.M.

S.P.M. = Correct surface speed in feet per minute of metal being cut.

D = Diameter of work in inches.

Metalworking speeds, available on this lathe commence at 120 R.P.M. and may run up to 385 R.P.M. using back gear; without back gear they commence at 600 R.P.M. and may run up to 1925 R.P.M.; depending on the diameter and the kind of metal being turned, as stated before.

SETTING UP WORK BETWEEN CENTERS. In setting up a piece of steel between centers, drill a 60-degree

hole in each end of the steel with a center drill. Fasten a bent-tail lathe dog on one end of the piece and mount the piece between centers. The arm of the lathe dog projects into the hole or open slot in face plate and drives the work. The dead center (tail stock center) is lubricated with white lead or a heavy machine oil.

The tool bit is mounted in the tool post and adjusted so that the point of the bit is very nearly on a level with the center of the piece, or a shade below the center. This position varies with the hardness of the piece being cut. A little experimenting will enable you to get the proper angle for a perfectly smooth cut.

Keep the compound over the ways as much as possible, avoiding a long overhang. Keep the tool bit down to a short overhang. Remember that in cutting metal you are exerting tremendous pressure on the point of the tool bit. To keep chatter out, the whole assembly must be as rigid and solid as possible.

The tool bit must be kept carefully ground to get the best results. The forms to which it may be ground will vary with the types of work being undertaken.

USE OF CHUCKS: On some work generally short in length, it may be more convenient to grip the work in a four-jaw chuck. With this arrangement, the work is not supported by the tail stock. This permits the operator to perform boring, facing, drilling operations, etc.

LUBRICATION: Always keep bearings and ways well lubricated with a high-grade, light oil.

For more information on the general subject of lathe work, we suggest that you purchase one of our metal lathe manuals. You will find this book helpful.

THREAD GEARS: The thread cutting model #109.0703 is regularly equipped with all necessary gears for both power feed and cutting of threads from eight to ninety-six threads to the inch.

The ball lever found to the left of the head stock controls the direction clockwise or counter-clockwise of the lead screw. With power off, loosen ball and push lever to upper position for clockwise rotation of lead screw. Turn head stock pulley slightly by hand to allow gears to drop in mesh. Lower position is counter-clockwise and center position is neutral. Be sure lever is tightened by turning ball after changing from one position to another.

SETTING UP THREADING GEARS: The whole idea of the threading gears is to drive the lead screw at a definite speed with relation to the head stock spindle. The lead screw will then move the compound along the bed at the proper speed with relation to the work in order to cut a thread.

Threads are specified as "so many threads per inch." To get a variety of threads, it is necessary to use different gear trains between the spindle and lead screw in order to get a different number of threads per inch.

The purpose of the gear chart is to enable you to set up the proper gear train for the thread you wish to cut.

Refer to the gear chart inside the gear cover. Consider Figure 1. The gears may be placed in different positions on the bracket which carries them. These positions are identified by letters.

As a typical example suppose you wish to cut eight threads per inch. On the chart the first column reads, "Threads per inch," and beneath this

locate "8". Also note that the general scheme of setting for an eight thread is illustrated in Figure 1. This comes from the last column of the chart.

(1) Assuming the gears from the previous set-up have been removed.

Under "Gears on Screw" opposite 8 is 32F. Select the gear marked 32 and mount this on the end of the lead screw. Place spacer collar No. 3229 over keyed bushing, back of No. 32 gear to bring gear into forward position.

(2) Under "Position B" there are two lines, (—). This indicates that no gears are used in this position for this thread.

(3) Next note that a 32- and 64-tooth gear are to be mounted on the bracket in "Position C." The 32-tooth gear is in back, (close to head stock), and the 64-tooth gear in front. This is determined by the initials "B" and "F", directly beneath the heading "Position C."

(4) "Position B" indicates that no gears are used in this position on this thread.

(5) "Position A" shows that a 64-tooth gear is placed on top of a 20-tooth at the position on the bracket arm shown as "A". Note that the 20-tooth gear is not in mesh but is a spacer gear (S).

(6) "Spindle Stud Gear" calls for a 32-tooth gear to be mounted on the end of the spindle. This completes the selection of the gear train. The gears are brought in mesh by adjusting the bracket and the position of the gears. Do not run gears too tight, there should be at least clearance for a piece of paper between the gears.

CUTTING A THREAD:

(1) Set the compound at an angle of approximately 29 degrees.

(2) Grind a tool bit to a V form with an angle of 60 degrees at the point of the V. Mount in the tool post at right angles to the work.

(3) Use cross slide feed screw to bring point of bit close to end of work and in position to take a very light cut.

(4) Use slowest speed on drive pulley - apply lubricant.

(5) Assuming that we are cutting eight threads, watch the thread dial and as it rotates, engage the Power Feed lever on saddle when the stationary mark is in line with any one of the four dial marks. This applies when cutting all even number threads per inch. When cutting odd number threads per inch use Dial Figures 1 and 2 only. The bit will now trace the form of the thread on the work.

(6) At the end of the thread, disengage the lever and use the cross-slide feed screw to pull the bit back, and return to original position.

(7) Use the compound to set the feed in deeper and repeat the process using the thread dial as before.

TABLE OF SPINDLE SPEEDS
(using motor pulley directly on
1725 R.P.M. Motor)

MOTOR PULLEY	LATHE PULLEY	WITHOUT BACK GEARS	WITH BACK GEARS
Large step 4	Small step 1	600	120
3	2	870	174
2	3	1325	265
1	4	1925	385

Further reduction in spindle speeds may be obtained by use of a countershaft.