

E L N A



SERVICE MANUAL

FOREWORD



This temporary set of service instructions for the ELNA "Transforma" and "Supermatic" machines is meant to help you until our well illustrated ELNA Service Manual is completed.

Written in simple language, these instructions should be of good use to those who are entrusted with the task of preparing and servicing ELNA Sewing Machines to the full satisfaction of their users.

HOW TO USE THIS SERVICE GUIDE

To know how to make certain adjustments, look over the list of contents to see where the required information can be found.

This list of contents also indicates whether the adjustment in question is the same for both types of machines ("Transforma" and "Supermatic") or only for the "Transforma", or respectively, the "Supermatic".

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NOTE: Make all adjustments on Elna Transforma and Elna Supermatic only in the following sequence.

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1. TIMING OF FEED DOG

When feed dog is correctly timed, it must not move the material while the needle is in the material. If this requirement is not met, proceed as follows:

1. Remove needle, presser foot, needle plate and the two Phillips screws that hold the free arm cover.
2. Remove free arm cover.
3. Remove oil hole screw on top of feed gear and remove also feed gear ring. Lift feed cam rod so that it comes off simultaneously from feed gear and tappet lever.
4. Turn flywheel towards you until needle is at lowest position.
5. Lift feed gear off axle. Next, make sure that bearing washer is placed on axle with lip over inside edge. When installing feed gear, make certain that the round hole on top of gear is in the position closest to the Nylon gear, and either in the exact center of the Nylon gear or slightly to the left of the center.
6. Replace feed cam rod by placing both of its ends simultaneously on their corresponding counterparts. (Do not use force!)
7. Replace feed gear ring, oil hole screw and free arm cover, then replace also needle plate, presser foot and needle.

2. CENTERING OF NEEDLE BAR (for "Transforma")

When needle bar is correctly centered, the needle clearance and centering gauge No. 607801 (when looked at from front) must be exactly in the center of the stitch hole in the needle plate. If this requirement is not met, proceed as follows:

1. Remove needle and presser foot.
2. Insert and fasten needle clearance and centering gauge No. 607801 (or straight needle of size 90 or 100)
3. Lower presser foot lever and swing open front cover (thread take-up lever must be in a raised position).
4. Loosen stop screw (No. 714034) at the right of the head portion of upper casing (about 2 inches below the lamp grid).
5. Turn flywheel slowly towards you until needle bar is in its lowest position.
6. By turning the black cradle spring screw No. 711081 (inside of head; close at lower needle bar bearing) clockwise or counter-clockwise, adjust the needle bar so that the gauge (or needle) when looked at from front, is exactly in the center of the hole in the needle plate.
7. Tighten the stop screw (No. 714034) after this adjustment.
8. Remove gauge, close front cover and replace presser foot and needle.

3. CENTERING OF NEEDLE BAR FOR STITCH WIDTH "4" (for "Supermatic")

When needle bar is correctly centered for stitch width "4", the distance between gauge No. 607801 and left end of oblong stitch hole in needle plate (when needle bar is at its extreme left position) must be equal to the distance between gauge and right end of stitch hole (when needle bar is at its extreme right position). If this requirement is not met, proceed as follows:

1. Remove needle and presser foot.
2. Install disc "03" in ELNAGRAPH.
3. Insert and fasten Needle Clearance and Centering Gauge No. 607801. If gauge is not available, use straight needle of medium size (Nos. 90 or 100).
4. Set stitch width knob at "4" and centering wheel at center position.
5. Lower presser foot lever, swing open front cover (thread take-up lever must be in a raised position), then loosen black cradle spring screw No. 711081 (inside of head; close at lower needle bar bearing) to such an extent that the cradle (No. 711056) at its extreme left position does not hit the head of the screw.
6. Turn flywheel towards you until gauge (or needle) reaches its lowest positions at the left and the right, and check whether the distances between gauge and the ends of the hole in needle plate are equal at both extreme positions of the gauge. If these distances are not equal on both sides, loosen black screw on top of cradle lever (No. 716290) and adjust by means of small bright cradle lever stud.
7. Tighten black set screw after this adjustment.
8. Make machine run, then screw in black cradle spring screw No. 711081 until slight clicking noise can be heard. At this moment, turn back this screw about $\frac{3}{4}$ of a turn until clicking noise disappears.
9. Tighten the stop screw (No. 714034) at the right of the head portion of upper casing (about 2 inches below lamp grid).
10. Close front cover, remove gauge, then replace presser foot and needle.

4. ADJUSTMENT OF CENTERING WHEEL (for "Supermatic")

If adjustment of centering wheel is correct, the needle clearance and centering gauge No. 607801 must be in the middle of the oblong stitch hole in needle plate (when looked at from front) when centering wheel is set at center position and stitch width knob is set at "0". If this requirement is not met, proceed as follows:

1. Remove needle and presser foot.
2. Install disc "03" in ELNAGRAPH.
3. Insert and fasten needle clearance and centering gauge No. 607801 (or needle size 90 or 100).

4. Set stitch width knob at "0".
5. Turn centering wheel to extreme left position.
6. Turn flywheel towards you until needle reaches its lowest position at the left.
7. Check distance between gauge (needle) and the left end of hole in needle plate.
8. Turn centering wheel to extreme right.
9. Check distance between gauge (needle) and the right end of hole in needle plate.
10. Compare whether both of above distances are equal.

If this is not the case, proceed as follows:

11. Unscrew black hexagonal screw in centering lever (right above centering wheel) by means of an end wrench (6 millimeters).
12. Adjust by means of bright centering lever stud (in centering lever) until both aforementioned distances have become equal.
13. Tighten black set screw after this adjustment.
14. Remove gauge and replace needle and presser foot.

5. ADJUSTMENT OF CLEARANCE BETWEEN NEEDLE AND SHUTTLE HOOK

When clearance between gauge No. 607801 (or needle) and point of shuttle hook is correct, the gauge (or needle) must just clear or barely touch the point of the shuttle hook (for this test, centering wheel must be in center position and stitch width knob at "0"). If this is not the case, proceed as follows:

1. Remove needle, presser foot and needle plate.
2. Lower presser foot lever and swing open front cover (thread take-up lever must be in a raised position).
3. Set stitch width knob at "0" and centering wheel at center position.

THIS INSTRUCTION (NO. 3) IS NOT APPLICABLE FOR THE ELNA "Transforma"

4. Insert and fasten needle clearance and centering gauge No. 607801 (or a straight needle of size 90 or 100)
5. Turn flywheel slowly toward you until point of shuttle hook is exactly behind the center of the gauge (needle)
6. Loosen large black screw (right below bright tension release pin No. 711082)
7. Insert screw driver into bright positioning bolt (located at right of needle bar and at same height as aforementioned black set screw) and turn positioning bolt until gauge (or needle) just clears, or barely touches, the point of the shuttle hook.

8. Tighten black set screw after this adjustment.

9. Close front cover, remove gauge and replace needle, needle plate and presser foot.

6 TIMING OF SHUTTLE HOOK IN RELATION TO NEEDLE BAR

If timing of shuttle hook in relation to needle bar is correct, the point of the shuttle hook must be behind the center of the gauge No. 607801 (or needle) after the needle bar has risen .089 inches (2.25 millimeters) from its lowest position (for this test, centering wheel must be in center position and stitch width knob at "0" on SUPERMATIC). If this requirement is not met, adjust as follows:

1. Remove needle, presser foot, needle plate and feed dog. Snap back shuttle cover.
2. Lift out upper guard ring after removing both cylindrical fastening screws which hold upper guard ring to lower guard ring (do not loosen the two screws with conical heads which are located inside of both cylindrical fastening screws).
3. Lift out lower guard ring. This is possible only in one particular position of the lower guard ring in relation to the shuttle hook. Turn flywheel slowly toward you until the opening between shuttle point and rear end of shuttle hook faces the left. With a finger, turn lower guard ring inside of shuttle hook until the straight edge of the lower guard ring is farthest away from you and the left end of this straight edge is just in line with the rear end of the opening in the shuttle hook. Pull out lower guard ring toward the left.
4. Loosen slightly the three black conical screws at the bottom of the shuttle hook until shuttle hook can be turned with slight friction (do not remove oil hole screw in center of shuttle hook!)
5. Insert and fasten needle clearance and centering gauge No. 607801..
6. Set stitch width knob at "0" and centering wheel in center position.

THIS INSTRUCTION (No. 6) is NOT APPLICABLE FOR THE ELNA "TRANSFORMA"

7. Lower presser foot lever and swing open front cover (thread take-up lever must be in a raised position).
8. Turn flywheel slowly towards you until needle bar reaches its lowest position.
9. With a slide caliper measure distance between upper end of needle clamp and lower face of lower needle bar bearing.

Read this measurement, then subtract 2.25 millimeters (.089 inches) from the above reading and adjust slide caliper to new reading.

10. Place one jaw of slide caliper on upper end of needle clamp, then turn flywheel slowly towards you until other jaw of caliper touches lower face of lower needle bar bearing. Stop turning flywheel.

11. With fingers turn shuttle hook slowly counter-clockwise until point of shuttle hook is just at the center of the needle clearance and centering gauge No. 607801.
12. Before tightening the three black conical screws at the bottom of shuttle hook, recheck as follows:
 - a) Turn flywheel slowly towards you, while holding jaws of slide caliper (showing the new reading) against needle bar, until both jaws are again lodged firmly (without play) between upper end of needle clamp and lower face of lower needle bar bearing.
 - b) If point of shuttle hook is timed correctly, it must, at this moment, be at the center of the gauge No. 607801. If this is not the case, bring point of shuttle hook to center of gauge and recheck again.
13. After the correct timing has been obtained, do not tighten the three black conical screws at the bottom of the shuttle hook completely at one time, but tighten each screw only gradually until all three screws are finally tightened completely.
14. Remove gauge, close front cover, replace lower guard ring, upper guard ring, feed dog and needle plate, then replace also presser foot and needle.

7. ADJUSTMENT OF NEEDLE BAR HEIGHT

The needle bar height is correctly adjusted, when the point of the shuttle hook just touches the lower end of the gauge No. 607800 while passing below this gauge (for this test, centering wheel must be in center position and stitch width knob at "0"). If this is not the case, adjust as follows:

1. Remove needle, presser foot and needle plate, then insert needle bar height gauge No. 607800.
2. Set stitch width knob at "0" and the centering wheel to center position.

THIS INSTRUCTION (No. 2) IS NOT APPLICABLE FOR THE ELNA "TRANSFORMA"

3. Turn flywheel towards you and check whether point of shuttle hook just touches gently the flat at the bottom of the gauge.
4. If needle bar is set too high, proceed as follows:
 - a) Lower presser foot lever and swing open front cover (thread take-up lever must be in a raised position).
 - b) Turn flywheel slowly towards you until point of shuttle hook is just below the needle bar height gauge.

- c) Loosen cylindrical screw in needle bar link pin and lower the needle bar until gauge rests upon point of shuttle hook.
- d) Tighten cylindrical screw after adjustment.
- e) Remove gauge and close front cover. Replace needle plate, presser foot and needle.

- 5. If needle bar is set too low, a conforming procedure for adjusting the height by means of the same gauge has to be followed.
- 6. Replace needle plate, presser foot and needle.
- 7. It is essential after the above adjustment to check also the clearance between needles and point of shuttle hook when using the double needle clamp (to prevent skip stitching and needle breaking).

8. ADJUSTMENT OF NEEDLE CLEARANCE WHEN USING DOUBLE NEEDLE CLAMP

If the clearance between the two gauges No. 607801 (or needles) and point of shuttle hook is correct, the point of the shuttle hook should just clear or barely touch each of the two gauges (or needles). For this test, the centering wheel must be in center position and the stitch width knob at "0" (on the SUPERMATIC). If the above requirement is not met, adjust as follows:

- 1. Remove presser foot and needle plate.
- 2. Remove single needle clamp and attach double needle clamp in its place.
- 3. Insert and fasten two needle clearance and centering gauges No. 607801 (or two needles Nos. 90 or 100) in double needle clamp.
- 4. Lower the presser foot lever and swing open front cover (thread take-up lever must be in a raised position).
- 5. Set stitch width lever at "0" and centering wheel at center position.

THIS INSTRUCTION (No. 5) IS NOT APPLICABLE FOR THE ELNA "TRANSFORMA"

- 6. Turn flywheel slowly towards you until point of shuttle hook is opposite the first (right) needle gauge. Check clearance between point of shuttle hook and gauge.
- 7. Turn flywheel slowly towards you until point of shuttle hook is just opposite the second (left) gauge. Check clearance between point of shuttle hook and gauge.
- 8. If clearances are not equal for both gauges, proceed as follows:

Loosen black screw of needle bar link pin in such a manner that the needle bar is still held in position by friction (to prevent dropping of the needle bar), then turn needle bar clockwise or counter-clockwise (as required) until clearances at both gauges are equal.

9. Tighten screw in needle bar link pin after this adjustment.
10. Remove gauges and double needle clamp. Close front cover. Replace single needle clamp, needle, needle plate and presser foot.

9. ADJUSTMENT OF CLOTH PRESSER BAR

If the cloth presser bar is correctly adjusted, the gauge No. 541361 (or the presser foot) must be in line with (parallel with) the slots in the needle plate. If this requirement is not met, proceed as follows:

1. Remove needle and presser foot, then fasten presser bar adjusting gauge No. 541361 to cloth presser bar.
2. Lower presser foot lever until gauge rests upon needle plate.
3. Open front cover (thread take-up lever must be in a raised position).
4. Check if gauge lines up with slots in needle plate.
5. If gauge does not line up with slots, loosen slightly black set screw (with Allen wrench 2 millimeters) in presser bar guide (on top of cloth presser bar), then turn gauge with cloth presser bar to the left or right (as required) until gauge lines up with slots in needle plate.
6. Tighten black set screw after this adjustment.
7. Remove gauge and close front cover. Replace needle and presser foot

10. CENTERING OF FEED DOG

If feed dog is correctly centered, its teeth bars must be in line with (parallel to) the slots in the needle plate and must clear both sides of each needle plate slot. If this is not the case, adjust as follows:

1. Remove needle, presser foot and needle plate.
2. Set stitch length regulating lever at "0".
3. Turn flywheel slowly towards you until feed dog is in its highest position.
4. Loosen the two black fastening screws which hold the feed dog.
5. Place feed dog centering gauge No. 70226 in place of needle plate. Feed dog will thereby be lined up automatically.
6. Tighten the two black feed dog screws after this adjustment, remove gauge, and replace needle plate.
7. Set stitch length regulating lever at "4 forward" (longest stitch) and check, while machine runs, whether or not feed dog hits needle plate. Follow same procedure for reverse sewing by setting stitch length regulating lever at "4 backward".

8. If feed dog hits needle plate (clicking noise when machine runs), remove needle plate, then loosen black feed dog screws and move feed dog slightly forward or backward (as required) until feed dog clears needle plate. Recheck with feed dog centering gauge No. 70226 to see whether feed dog is still lined up. Readjust, if necessary.
9. Remove gauge, then replace needle plate, presser foot and needle.

11. ADJUSTING HEIGHT OF FEED DOG

The height of the feed dog is correctly adjusted when the tips of the teeth, at the highest position of the feed dog, are about 1/32" above the needle plate. If this is not the case, adjust as follows:

1. Remove needle, presser foot, needle plate and free arm cover.
2. Replace needle plate.
3. Set stitch length regulating lever at "3" or "4".
4. Loosen black nut on lifter skid screw by using an end wrench (7 millimeters).
5. a) Turn flywheel towards you until feed dog reaches its highest position. Next, turn the (eccentric) lifter skid screw with end wrench until tips of feed dog teeth are about 1/32" above needle plate.

b) If feed dog height gauge (No. 605355, old style, or No. 607829/62 new style) is available, place this gauge on needle plate, then turn flywheel slowly towards you until feed dog is in its highest position and check the height of the feed dog teeth in relation to the recessed portions on both sides of the gauge.

If adjusted correctly, the tips of the feed dog teeth must either touch or interfere with the recess "0.8" and must not touch or interfere with recess "0.9".

If above requirement is not met, adjust feed dog with (eccentric) lifter skid screw (as explained in Paragraph a).

6. Tighten black nut by using two end wrenches simultaneously on black nut and lifter skid screw.
7. Remove needle plate and replace free arm cover. Replace needle plate, presser foot and needle.

12. ADJUSTMENT OF STITCH LENGTH (for "TRANSFORMA")

When stitch length is correctly adjusted, the length of stitches for forward sewing should be equal to the corresponding length of stitches for backward sewing.

To adjust (equalize) stitch length for both directions of sewing, proceed as follows:

1. Attach presser foot to cloth presser bar and insert needle.
2. Place piece of paper underneath presser foot and lower the presser foot lever.
3. Set stitch length regulating lever exactly at "2" and turn bright stop screw (No. 501313), below the stitch length scale, into the upper casing until it comes to a stop against the stitch length regulating lever (inside of upper casing).
4. Turn flywheel towards you and stitch 11 holes with the needle.
5. To sew backwards, swing stitch length regulating lever entirely to the right until it comes to a stop. Then, turn flywheel towards you, stitching again 11 holes with the needle.
6. Compare total length of the stitches made at the forward position of the stitch length regulating lever with that made at the backward position of this lever.

If correctly adjusted, the total length of 11 holes at forward sewing should be equal to the total length of 10 to 11 holes at backward sewing.

7. If above requirement is not met, adjust stitch length as follows:
 - a) Loosen and remove the two black fastening screws (Phillips screws) of the Transforma cover and remove also Transforma cover.
 - b) Loosen set screw (No. 504312) in the left lower portion of the stitch length regulating lever, about 2 turns.
 - c) Replace Transforma cover and tighten it by means of the two black fastening screws.
 - d) Remove bright stop screw No. 501313 (below stitch length scale).
 - e) Insert a small screw driver into hole for stop screw No. 501313 and loosen set screw No. 504310 (which is in front of lower portion of the stitch length regulating lever) just sufficiently so that the stitch length regulating lever is still held in position by friction with the feed control shaft (No. 726003). If the above set screw No. 504310 cannot be reached through the hole, move the stitch length regulating lever to the left or right (as required) until this screw can be reached without difficulty with the screw driver.
 - f) If stitch length forwards is too large, move stitch length regulating lever slightly to the left. If stitch length forwards is too small, move stitch length regulating lever slightly to the right. The feed control shaft must not turn during this adjustment. Care must also be taken during this adjustment that the stitch length regulating lever does not touch either of both sides of the slot in the Transforma cover in which it moves.
8. Tighten firmly aforementioned stop screw No. 504310 and replace also bright stop screw No. 501313 (below the stitch length scale).
9. Check whether the total length of 11 stitched holes forwards is equal to the total length of 10 to 11 stitched holes backwards.

If this is not the case, repeat the aforementioned procedure until the above requirement is met.

10. Remove the two black fastening screws (Phillips screws) of the Transforma cover and remove also Transforma cover.

11. Tighten firmly the pointed set screw No. 504312 in the left lower portion of the stitch length regulating lever.

12. Replace Transforma cover and tighten it with the two Phillips screws.

13. ADJUSTMENT OF STITCH LENGTH (for SUPERMATIC)

When stitch length is correctly adjusted, the length of stitches for forward sewing should be equal to the corresponding length of stitches for backward sewing.

To adjust (equalise) stitch length for both directions of sewing, proceed as follows:

1. Attach presser foot to cloth presser bar and insert needle.
2. Place piece of paper underneath presser foot and lower presser foot lever.
3. Set stitch length regulating lever exactly at "2 forwards".
4. Set stitch width knob at "0" and centering wheel at center position.
5. Turn flywheel slowly towards you and stitch 11 holes.
6. Set stitch length regulating lever exactly at "2 backwards" and stitch 11 holes.
7. Compare total length of the stitches made at the forward position of the stitch length regulating lever with that made at the backward position of this lever.

If correctly adjusted, the total length of 11 stitched holes at forward sewing should be equal to the total length of 10 to 11 stitched holes at backward sewing.

8. If above requirement is not met, adjust stitch length as follows:

- a) Loosen black set screw in feed control lever (No. 716202) which can be reached with a screw driver through a hole in front of the upper casing (about 1 1/2" below the lower end of the stitch length scale).

If black set screw cannot be seen through the hole, move the stitch length regulating lever until this screw can be reached without difficulty through the hole.

- b) If stitch length forwards is too large, turn bright feed control key (screw) in feed control lever counter-clockwise. To do this, move stitch length regulating lever until this feed control key can be reached with a screw driver through the hole in the upper casing.

If stitch length forwards is too small, turn bright feed control key clockwise.

- c) Check whether the total length of 11 stitched holes forwards is equal to the total length of 10 to 11 stitched holes backwards.

If this is not the case, repeat the aforementioned procedure until the above requirement is met.

- d) Tighten black set screw in feed control lever after adjustment.

14. TIMING OF NEEDLE BAR SWING (for "SUPERMATIC")

If swing of needle bar is correctly timed, the needle, during zig-zag sewing, must not move sideways while it is in the material. Moreover, the feed dog (during automatic sewing, when the stitch length regulating lever is at position "A") must not move the material while the needle is in the material.

If the above requirements are not met, adjust as follows:

1. Remove needle and presser foot.
2. Install disc No. 101 (turkish hemstitch) in ELNAGRAPH.
3. Set stitch length regulating lever at "A" (automatic sewing).
4. Turn flywheel slowly towards you until the pin in the reversing lever (No. 726274) ascends one of the slopes at the upper portion of the double cam.

Watch movement of feed fork (No. 716204) on top of feed control shaft. When movement of this feed fork has stopped, do not turn flywheel any further. At this moment the pin in the reversing lever has just reached the highest point of the cam slope.

5. Check the height of the feed dog above the needle plate.
6. Turn flywheel slowly towards you until feed fork just begins to move again. Stop turning the flywheel. At this moment the pin in the reversing lever begins to descend the next slope of the cam.
7. Check the height of the feed dog above the needle plate.
8. Compare both heights of feed dog above needle plate to see if they are equal.
9. If these heights are not equal, adjust as follows:

Remove disc No. 101 and with a thin screw driver loosen the black set screw at the circumference of the assembled cam axle.

If the first reading of the feed dog height exceeds the second reading, turn the driving pin (No. 716227) in the assembled cam (disc) axle counter-clockwise until both readings are equal.

Conversely, if the second reading of the feed dog height is larger than the first reading, turn the driving pin clockwise until both readings are equal.

Tighten the black set screw at the circumference of the assembled cam (disc) axle after this adjustment.

10. To check whether above adjustment is correct, proceed in the following manner:

- a) Attach cording foot, insert needle and install disc No. 101.
- b) Set stitch width knob at "4", centering wheel in center position and stitch length regulating lever at "A".
- c) Place a piece of paper underneath cording foot and lower presser bar lever.
- d) Turn flywheel slowly towards you until needle enters paper.
- e) Continue turning flywheel and check whether needle goes downwards without tearing paper.
- f) Proceed turning flywheel and check whether needle rises without tearing paper.
- g) Check also whether or not feed dog moves paper while needle is in the paper.

If tearing of paper by needle occurs, repeat aforementioned adjustment until needle penetrates and leaves the paper without tearing it.

15. ADJUSTMENT OF FULLY AUTOMATIC FEED CONTROL (FOR DOUBLE CAMS)

When the fully automatic feed control is correctly adjusted, the design, made by the machine, must correspond exactly with the design indicated on the top of each double disc. If this is not the case, adjust as follows:

1. Attach cording foot to cloth presser bar.
2. Install disc No. 101 (Turkish Hemstitch) in ELNAGRAPH
3. Insert needle of size 120.
4. Thread machine with size 120 thread (upper and lower thread).
5. Adjust so that upper thread tension is on "1 1/2" or "2 1/2". Increase tension of lower thread by turning graduated screw on upper guard ring to 1 1/2" or "2."
6. Set stitch length regulating lever at "A" (automatic sewing) and stitch width knob at "3". Centering wheel must be at center position.
7. Place material (linen or cotton) underneath cording foot, lower the presser foot lever, and start sewing.
8. When feeding mechanism is correctly adjusted, the needle must altogether go 18 times exactly through each hole, although not in consecutive order.

If the penetrations of the needle are scattered around each one of the holes, the material is fed either too fast or too slowly.

If feeding is too fast, loosen black set screw on top of reversing lever support (No. 726294) and turn bright adjusting screw in reversing lever support slightly counter-clockwise.

Conversely, if feeding is too slow (material does not move fast enough; remains stationary, or is even fed backwards), turn bright adjusting screw slightly clockwise.

Tighten black set screw in reversing lever support after this adjustment.

16. ADJUSTMENT OF FREE THREAD EVACUATION DEVICE (Free Thread Escapement Device)

As already indicated by its name, it is the purpose of the above device to permit the upper thread to pass freely in and out of the shuttle beak and the guard ring stops.

To make possible the free escapement of the upper thread, the following adjustments must be made, if necessary:

1. Position of Release Cam (No. 710133) on Lower Shaft (No. 760001)

If release cam No. 710133 is in its correct position on the lower shaft, the thread release (No. 720129) should have reached its lowest position at the time the needle bar is also in its lowest position.

If this requirement is not met, adjust as follows:

- a) Remove needle, presser foot, needle plate and free arm cover.
- b) Loosen the two fastening screws in the release cam (No. 710133) then turn flywheel slowly toward you until needle bar is in its lowest position.
- c) With your fingers, turn release cam away from or toward you until thread release is also in its lowest position.
- d) While pressing gently the (nylon) feed dog pinion (No. 710005) on the lower shaft toward the right, force gently the release cam toward the left until it touches the lower shaft bearing bushing, then tighten both fastening screws in the release cam. Care must be taken that the release cam does not turn around the lower shaft during this procedure. Finally check to see that the lower shaft turns freely (without binding) and that the axial play of the lower shaft does not exceed .0012".
- e) After the above adjustment, replace and fasten the free arm cover, then replace needle plate, presser foot and needle.

2. Adjusting Height of Guard Ring Stop (No. 760085)

If height of guard ring stop is correctly adjusted, the underside of the pointed portion of this guard ring stop, when in its lowest position, must be .009"

to .013" above the upper face of the shuttle hook.

If this requirement is not met, adjust as follows:

- a) Remove needle, presser foot, needle plate and free arm cover.
- b) Turn flywheel towards you until guard ring stop reaches its lowest position, then loosen with Allen wrench (7 millimeters) the black nut (No. 500336) which is located at the right inside of the thread release (No. 720129).
- c) Adjust height by turning the bright hexagonal lifter skid screw (No. 710048) (at the right, outside of the thread release No. 720129) clockwise or counter-clockwise (as required) until the underside of the pointed portion of the guard ring stop is .009" to .013" above the shuttle hook, as explained before.
- d) Tighten black nut (No. 500336) by using two end wrenches (7 millimeters) simultaneously on nut and lifter skid screw No. 710048.
- e) Replace free arm cover, needle plate, presser foot and needle.

3. Adjusting the Lateral Position of the Guard Ring Stop (No. 760085)

The guard ring stop is in its correct lateral position when during the up and down movement of the guard ring stop (No. 760085) the upper guard ring (No. 760075) does not move sideways. In this case, the noise, created by the free thread escapement device, will be at its lowest level. Should the noise be too loud, then it can be observed that either the upper guard ring is continuously lifted and dropped by the thread release (No. 720129) or that the pointed portion of the guard ring stop hits against the guard ring.

If the latter condition exists, adjust the lateral position of the guard ring stop as follows:

- a) Remove needle, presser foot, needle plate and free arm cover.
- b) Check lateral play of thread release by moving it sideways in both directions with your fingers.

If excessive lateral play should be observed, loosen carefully the thin set screw No. 714012 (at the left of the release spring No. 710132), then push the release axle No. 710126 to the left. Carefully tighten thin set screw No. 714012.

- c) With wrench (4 millimeters) loosen carefully the bright hexagonal nut No. 714052 (in front of guard ring stop No. 760085) in such a manner that the guard ring stop is still held in position by friction against the thread release.
- d) Push guard ring stop slightly to the left or right (as required) until, while turning flywheel slowly towards you, the guard ring stop moves only up and down, without interfering laterally with the upper guard ring.
- e) While running machine, check noise created by free thread escapement device

to make certain that this noise is at its lowest level.

If this is not the case, move guard ring stop very slightly to the left or right (as required) until the least audible noise is obtained.

- f) With wrench (4 millimeters) tighten carefully bright nut No. 714052 in front of guard ring stop.
- g) Replace free arm cover, needle plate, presser foot and needle.

17. ADJUSTMENT OF UPPER TENSION DEVICE

When upper thread tension is adjusted correctly, no tension of the upper thread must be felt when a No. 120 thread is being used and the Tension Regulator Dial (No. 711113) is set at "0" (with presser foot lever in lower position). The first slight tension should only then be felt when the indicator mark on the front cover is located between ".07" and "1" of the tension regulator dial.

If, under these circumstances, tension should be felt when the dial has not yet reached ".07", adjust as follows:

Swing open front cover (Presser foot lever must be lowered and thread take-up lever in a raised position), then turn bright (upper) screw (Parker screw No. 714047) slightly counter-clockwise until the aforementioned requirement is met.

To increase the initial thread tension, turn the bright upper screw slightly in clockwise direction.

18. ADJUSTMENT OF LOWER TENSION DEVICE

If lower tension device is correctly adjusted, a slight tension must be felt when a fine thread (No. 120) is drawn by hand between upper guard ring No. 760075 and lower tension skid No. 710077 (the graduated screw No. 710080 must be set at "1"). For this test the bobbin thread must be loose so that it does not pull and turn the bobbin.

If no tension at all, or if too much tension of the lower thread is observed, adjust as follows:

- a) Remove presser foot, needle, needle plate and bobbin. Snap back shuttle cover.
- b) With a small screw driver remove the two guard ring fastening screws No. 710122, then remove upper guard ring No. 760075.
- c) With a small screw driver loosen both shuttle beak fastening screws No. 714015 about two turns, then lift up the portion of the shuttle beak which locks the lower tension axle No. 710081. Next, turn lower tension axle clockwise or counter-clockwise (as required).

To increase initial lower tension, turn lower tension axle clockwise, to decrease tension turn axle counter-clockwise.

- d) Tighten both shuttle beak fastening screws No. 714015 and see to it that the lower tension axle is properly locked by the shuttle beak.
- e) Replace upper guard ring and fasten it by means of the two screws No. 710122. Make sure that the two small springs No. 710123 (underneath the heads of the above screws) are also inserted. The old style screws No. 714009 do not require these springs.
- f) Check again tension of lower thread as explained above. If necessary, repeat above adjustment.
- g) Replace needle plate, presser foot and needle. Snap back shuttle cover in its working position.

19. ADJUSTMENT OF COUPLING DEVICE AT FLYWHEEL

Coupling device will function properly when point of coupling knob screw is at a distance of about 1/8" from the nearest outside lug of the coupling stop, when the coupling knob is firmly tightened.

If point of coupling knob screw touches the outside lug of the coupling stop before coupling knob is fully tightened, remove coupling knob and displace coupling stop in a clockwise direction until the aforementioned requirement is met.

20. ADJUSTING THE THREAD GUIDE (THREAD CARRIER) FOR THE BOBBIN WINDER

If bobbin thread guide on top of front cover is not correctly adjusted, bobbin will not be filled uniformly and evenly.

To set bobbin thread guide to correct position, open front cover (thread take-up lever must be in a raised position and presser bar lever must be lowered) and loosen black set screw inside cover. Adjust thread guide by moving it in or out (as required), then tighten black set screw again. Close front cover.

21. VARIOUS REPAIRS

Machine runs noisily (with stitch width lever knob at "3" or "4")

1. Check upper shaft for end play (play in axial direction).
2. If end play is excessive (over .0012"), remove coupling device and flywheel. Loosen Allen screw in coupling ring with 3 millimeters Allen wrench. Swing open front cover (thread take-up lever must be in a raised position and presser foot lever be lowered) and press upper shaft from left to right (Press against counter-weight) while also pressing against coupling ring from right to left; tighten Allen screw in coupling ring. Turn upper shaft towards you to verify that shaft turns freely, without binding. End play must not exceed .0012"

Replace flywheel and coupling device.

3. Check also if cradle spring screw No. 711081 is adjusted as explained in point 8 of instruction 3. Centering of Needle Bar for Stitch Width "4".

Slipping of Motor Friction Wheel

This occurs when oil gets between friction surface of flywheel and motor friction wheel or motor draw spring (No. 713009) is too weak.

To remedy, remove coupling device and flywheel. Wipe off thoroughly all oil from flywheel and motor friction wheel with clean rag. Reassemble flywheel and coupling device.

If Motor draw spring (No. 713009) is too weak, replace defective spring with new one.

Replacement of Shuttle Hook

If shuttle hook must be removed for some reason, proceed as follows:

1. Remove needle, presser foot, needle plate and feed dog. Snap back shuttle cover.
2. Loosen oil hole screw on bottom of shuttle assembly. Do not loosen the three black screws (No. 714020) at the bottom of the shuttle hook.
3. Lift out shuttle assembly.

To replace shuttle assembly, proceed in the following manner:

1. Turn flywheel towards you until needle is in its lowest position.
2. Insert shuttle assembly so that the point of the shuttle hook is about $3/32$ " behind the shuttle stop (No. 710084-old style) and the shuttle beak (No. 710082) is lodged between the shuttle stop and the stop spring (No. 710085).

If necessary, adjustment can be made by lifting out shuttle assembly again, and by advancing or retarding the shuttle hook by one tooth at a time.

It is thereby assumed that, before removing of the shuttle assembly, the initial timing of the shuttle hook in relation to the needle bar has been correct.

3. Replace oil hole screw, feed dog, needle plate, presser foot and needle. Snap back shuttle cover in its working position.