

# Service Manual Sewing Machine

## 5400 Series



THE SINGER COMPANY  
© 2000 SINGER DO BRASIL  
ALL RIGHTS RESERVED

® Registered Trademark "THE SINGER COMPANY LTD."

Printed In Brazil

357773-002 MAY/00

### 5400 Series - REVISION RECORD

Rev.	Description	Approval and date

Rev. no. \_\_\_\_\_

MAY/00

This manual is designed for use by trained and qualified service persons.

THE SINGER COMPANY will not be responsible for any parts requiring replacement owing to natural wear or to abuse or negligence of the use or in the event the machine is serviced by other than a trained and qualified service person, or if parts are substituted which do not meet applicable specifications.

## General Information

### Scope

This service manual describes all of the servicing procedures, including all adjustments and parts removal and replacement for the series 5400 machines. Supplementary information covering any production changes, improvements or changes to parts will be made by issuing Singer service/parts bulletins.

### Machine Description

- Tubular bed
- Lightweight "Duratec" casting.
- Apollo sewing system.
- Electronic triac foot speed controller.
- New "FT" fabric feed system.
- Vertical needle profile.
- Motor concealed in arm.
- Horizontal spool pin.
- Touch and wind declutching hand wheel.
- Bobbin capacity of 41 meters (45 yds) minimum.
- Universal presser bar pressure control.
- Maximum stitch length 5 mm (5 s.p.i.).
- Self-threading take-up lever.
- Push button instant reverse.
- One-way needle insertion.
- Direct pattern selection.
- Bed length 378 mm. (14.88 inches) without cloth plate.
- Bed width 185 mm. (7.28 inches).
- Bed height 83 mm. (3.2 inches).
- Clearance under free arm 25,4 mm. (1.0 inch).
- Free arm circumference 264 mm. (10.39 inches).
- Overall height 300 mm. (11.81 inches).
- Weight 9 kg. (19 lbs).

### Tool requirements

For servicing the series 5400, the following tools are required:

- 1/8" screwdriver
- 3/16" screwdriver
- 1/4" screwdriver
- Sharp nose screwdriver
- Philips screwdriver
- 8 mm. open end wrench
- 10 mm. open end wrench
- Pliers
- Wire-cutter pliers
- Feeler gauge GM8092
- Feeler gauge set.

### "Duratec" Casting

With the introduction of "Duratec", selfthreading screws have been used to mount many of the parts and assemblies to the structure. It is important that when replacing these screws, they be threaded into the original screw threads. The proper procedure for doing this is to insert the screw into the hole and turn the screw counterclockwise until the screw can be felt to "drop" in place. An audible "click" may also be heard. Once the screw is properly in place, it may then be tightened.

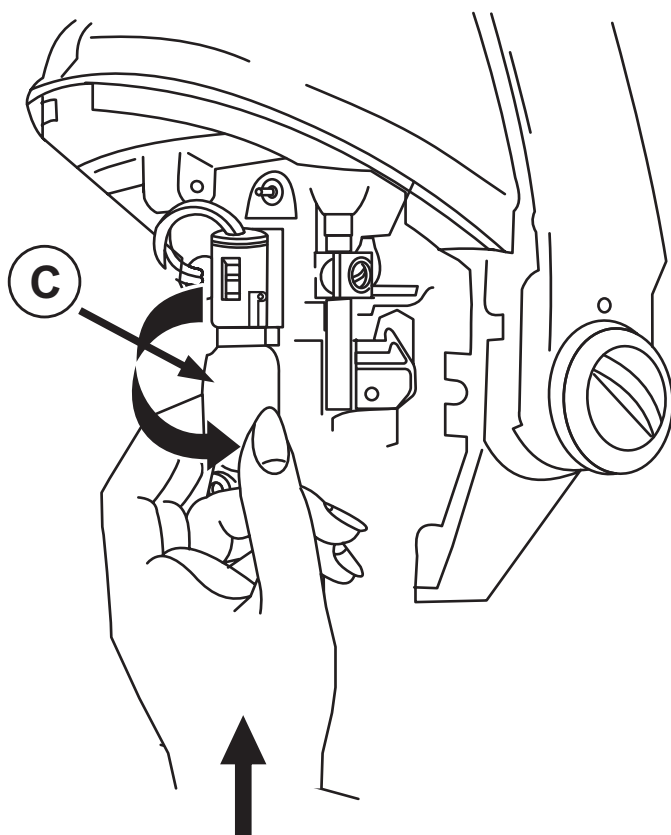
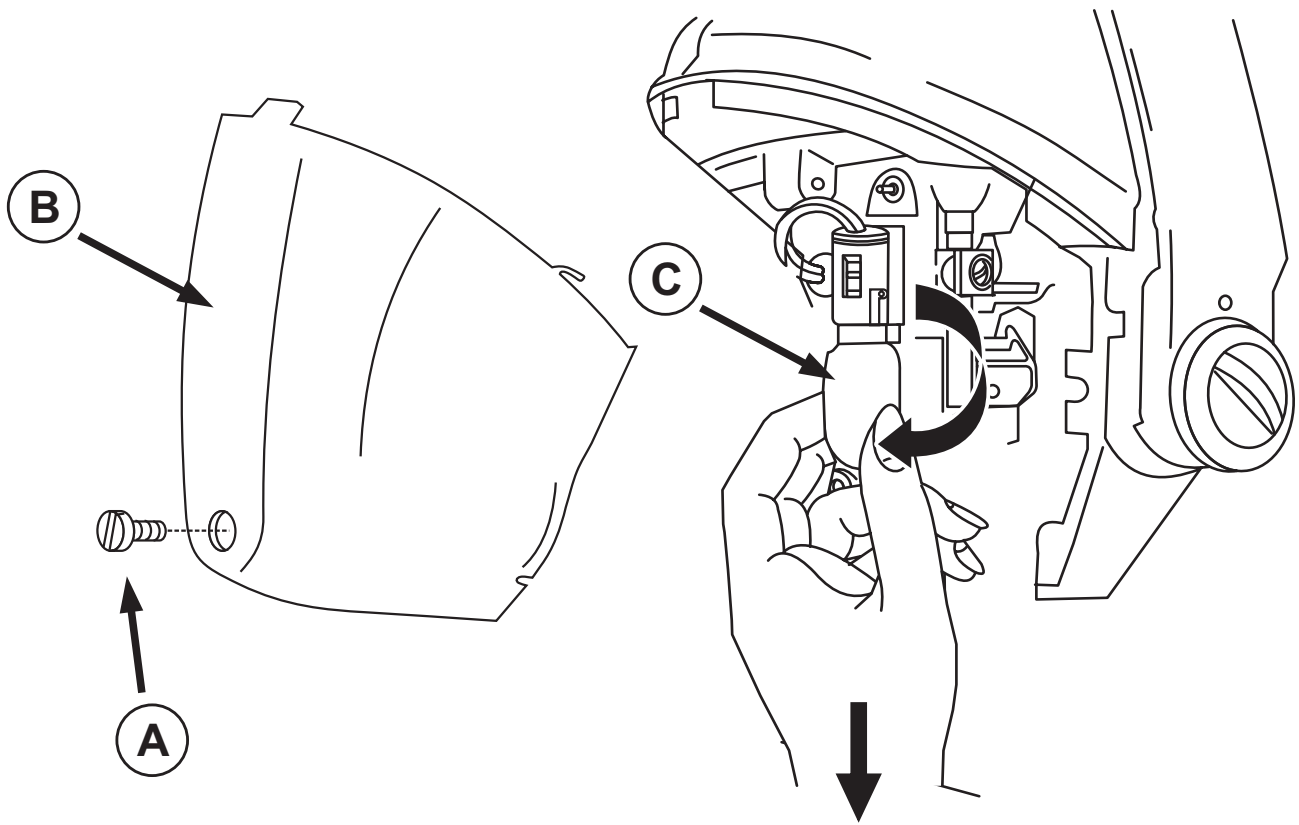
## Table of contents Section I

● Parts removals and replacements.....	06
● Face plate.....	07-08
● Light bulb replacement.....	07-08
● Bottom bed cover.....	09-10
● Rear cover.....	11-12
● Front cover.....	13-14
● Needle bar.....	15-16
● Head end assembly.....	17-18
● Take-up lever assembly and needle bar connecting link.....	19-20
● Hand wheel.....	21-22
● Hand wheel disassembly.....	21-22
● Camstack.....	23-24
● Arm shaft and horizontal bevel gear.....	25-26
● Tension assembly.....	27-28
● Needle bar driving arm - needle bar driving arm tension spring.....	29-30
● Cam controlled feed mechanism.....	31-32
● Motor and motor belt.....	33-34
● Hook.....	35-36
● Feed lifting lever assembly.....	37-38
● Feed rock shaft assembly.....	39-40
● Feed forked connection.....	41-42
● Vertical shaft bevel gear.....	43-44
● Vertical shaft.....	45-46
● Pattern selector mechanism.....	47-48
● Needle position lever.....	49-50
● Stitch length and buttonhole control assembly .....	51-52

## Section II

● Sequential order of adjustment procedures.....	53
● Vertical shaft end play.....	54-55
● Bevel gear mesh and arm shaft end play.....	56-57
● Disc and disc follower end play.....	58-59
● Camstack radial play.....	58-59
● Take-up lever and needle bar connecting link lost motion.....	60-61
● Needle bar bearings.....	62-63
● Needle bar height.....	64-65
● Needle bar pendulum timing (timing the camstack).....	66-67
● Zig-zag centralizing procedure.....	68-69
● Centralizing left-center-right needle position.....	70-71
● Needle location in the needle place slot.....	72-73
● Needle to hook relationship.....	74-75
● Zig-zag bight stop in the straight stitch position.....	76-77
● Maximum width zig-zag bight stop.....	78-79
● Needle bar safety bight stop.....	80-81
● Alignment of knobs with panel graphics.....	82-83
● Presser bar height and alignment.....	84-85
● Hook drive belt tension and hook drive belt retainer bracket.....	86-87
● Hook timing (hook and needle synchronism).....	88-89
● Bobbin case position finger.....	90-91
● Bobbin case position bracket and plate.....	90-91
● Bobbin case clearance.....	92-93
● Needle Thread tension.....	94-95
● Bobbin winder.....	96-97
● Feed rock shaft end play.....	98-99
● Feed dog centralization.....	100-101
● Feed dog height.....	100-101
● Feed dog throw.....	102-103
● Stitch length regulator spring tension.....	104-105
● Motor belt tension.....	106-107
● Lubrication.....	108 to 111
● Flexi feed zeroing.....	112-113
● Zero feed.....	114-115
● Buttonhole cutting space.....	116-117
● Notes.....	118 to 120

**Section I**  
**Parts removal and  
replacement**





## Face Plate

### Removal:

- 1- Raise presser foot.
- 2- Remove face plate screw (A).
- 3- Remove face plate (B) by grasping it around the bottom edge and pulling toward the left, then down and away from the machine.

### Replacement:

- 1- Replacement is the same as removal in reverse order. Be sure the presser foot is in the raised position.

## Light Bulb Replacement

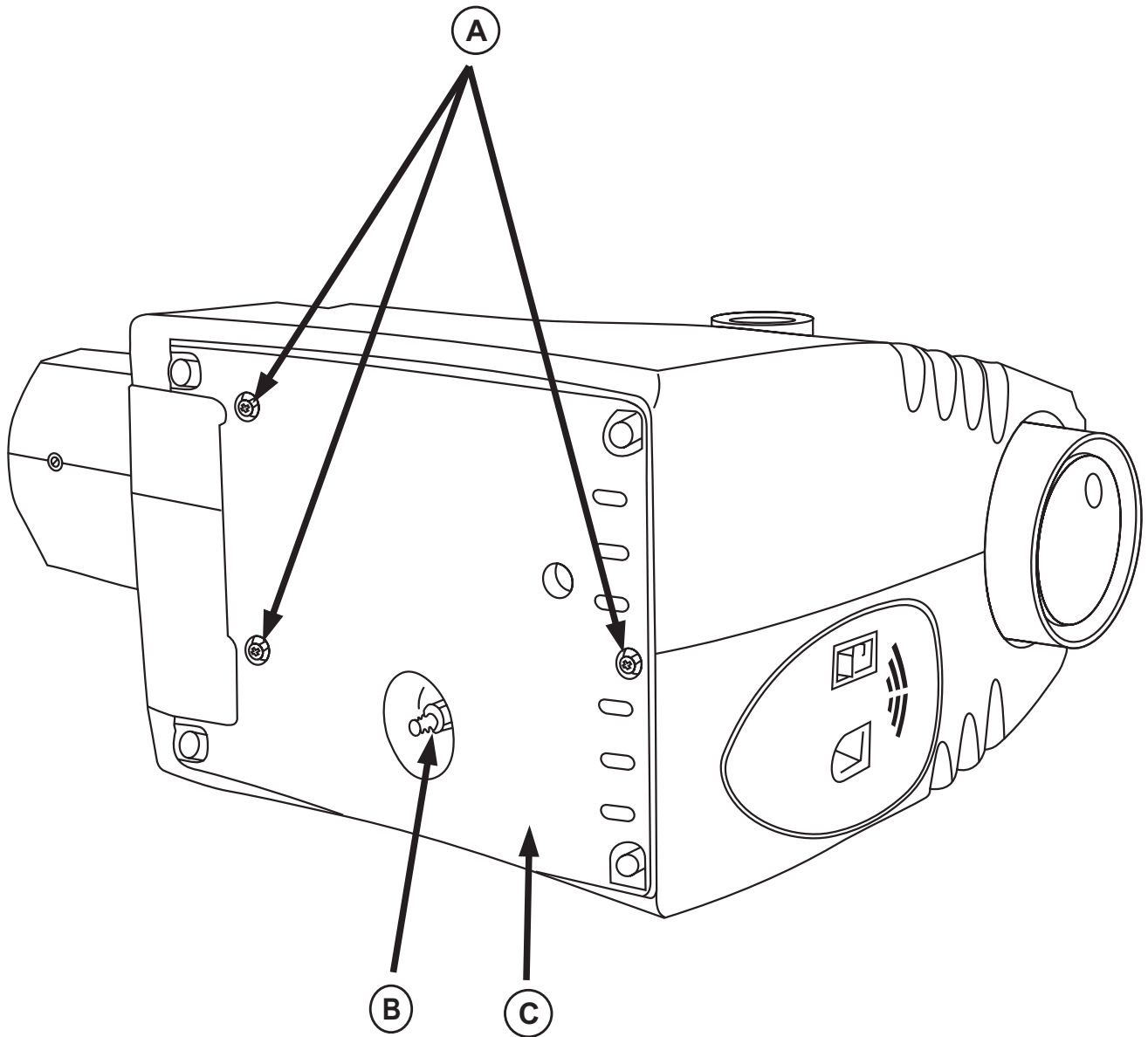
### Removal:

Turn the machine off and remove plug from outlet

- 1- Remove face plate.
- 2- Push bulb (C) up into the socket and turn it in a clockwise direction to unlock bulb pins.
- 3- Pull bulb (C) down out of socket.

### Replacement:

- 1- Push bulb (C) up into socket and turn in a counterclockwise direction until bulb pins lock into position.



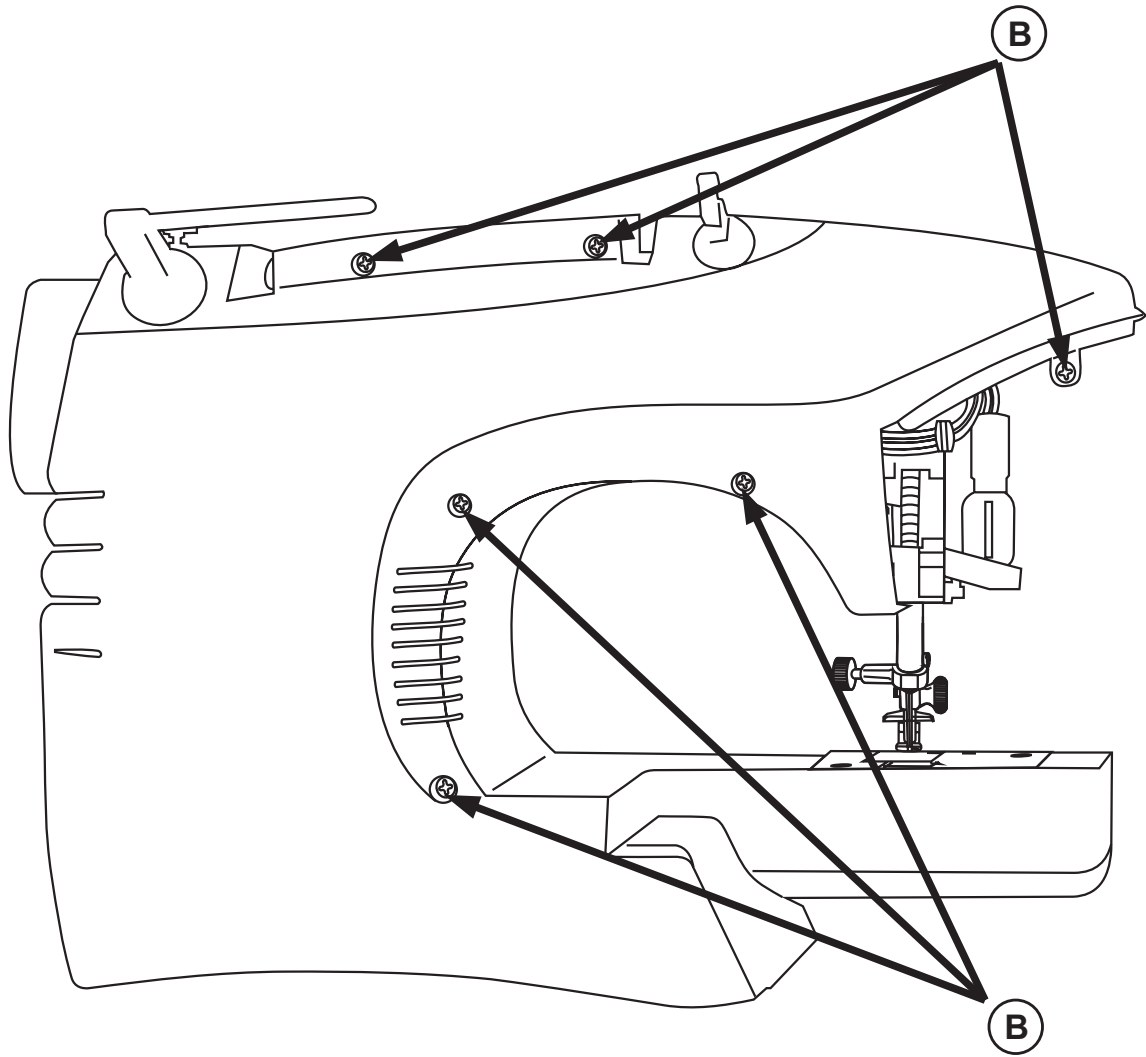
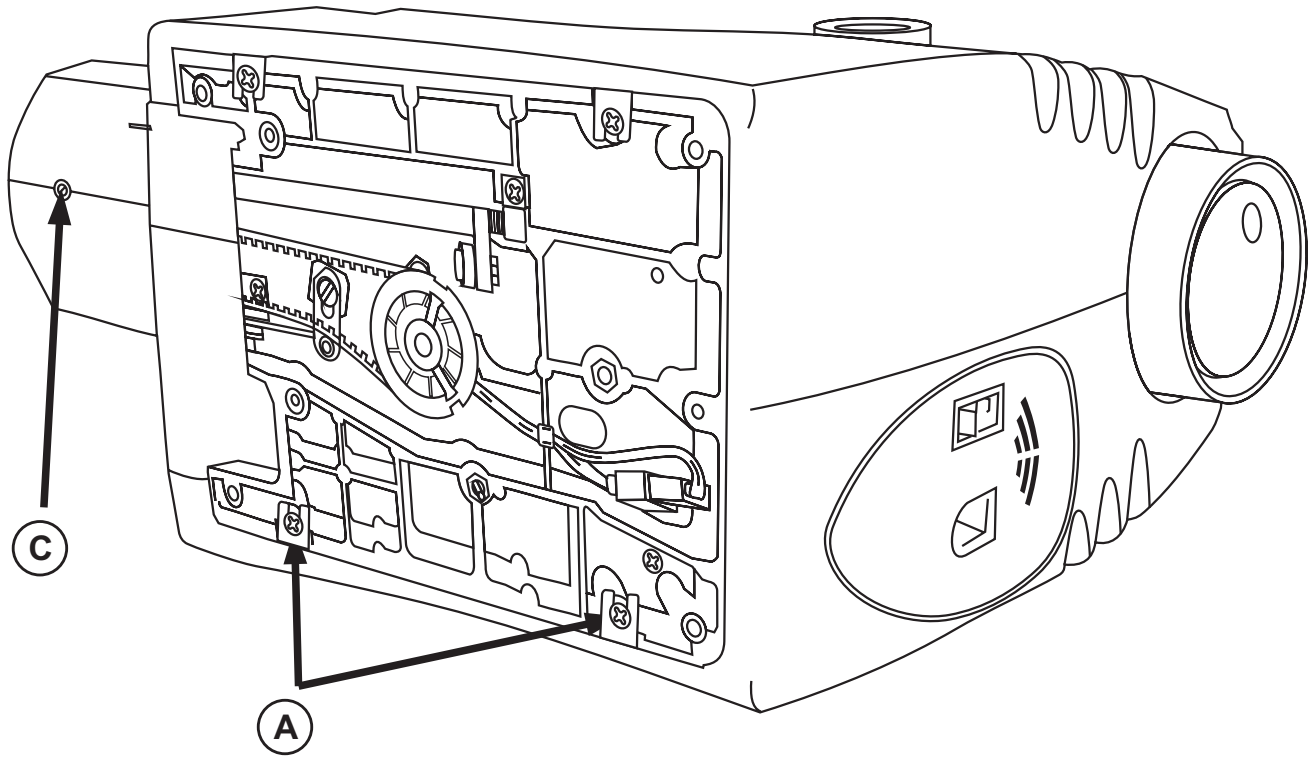
## Bottom Bed Cover

### Removal:

- 1- Remove three bottom bed cover screws (A).
- 2- Remove 8 mm hex nut (B).
- 3- Remove bottom bed cover (C).

### Replacement:

- 1- Replacement is the same as removal in reverse order.



## Rear Cover

### Removal:

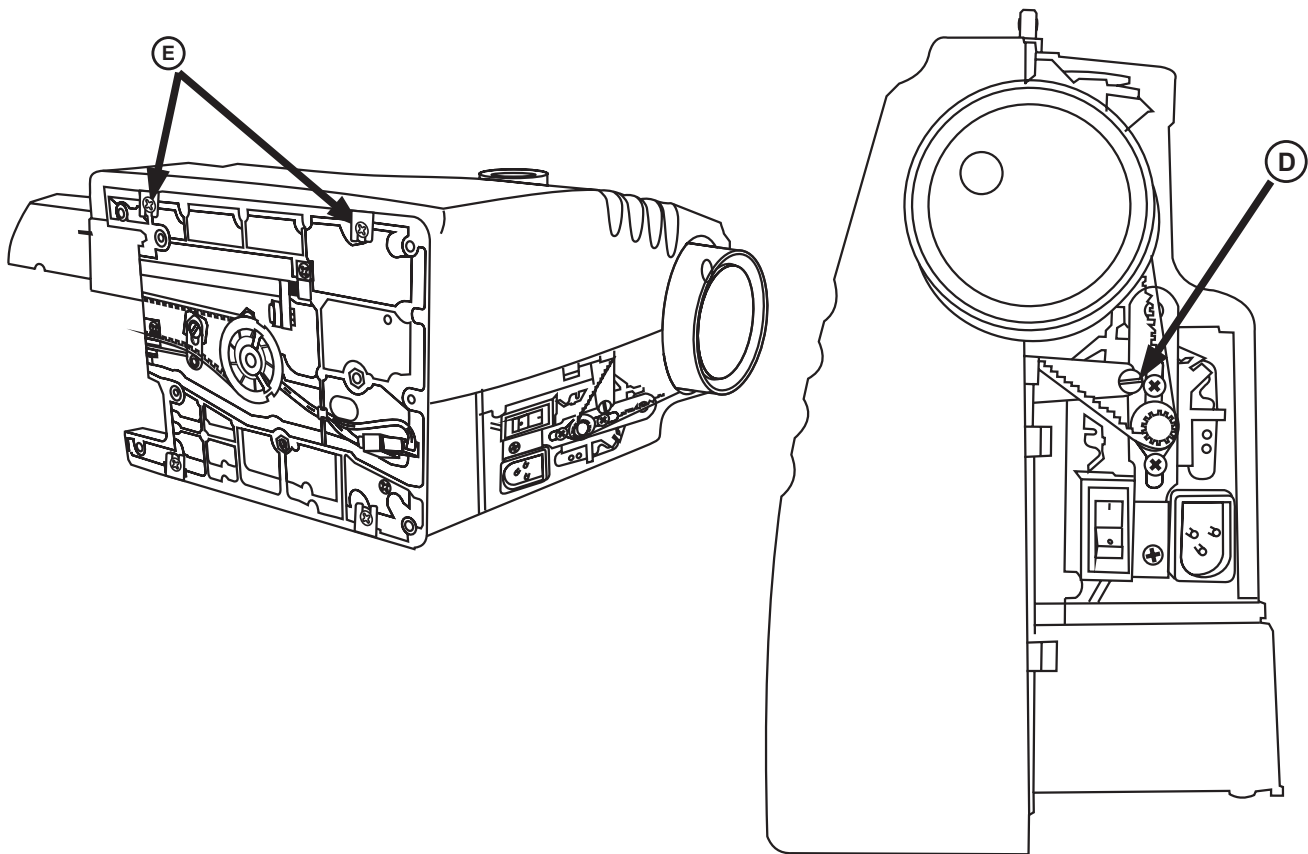
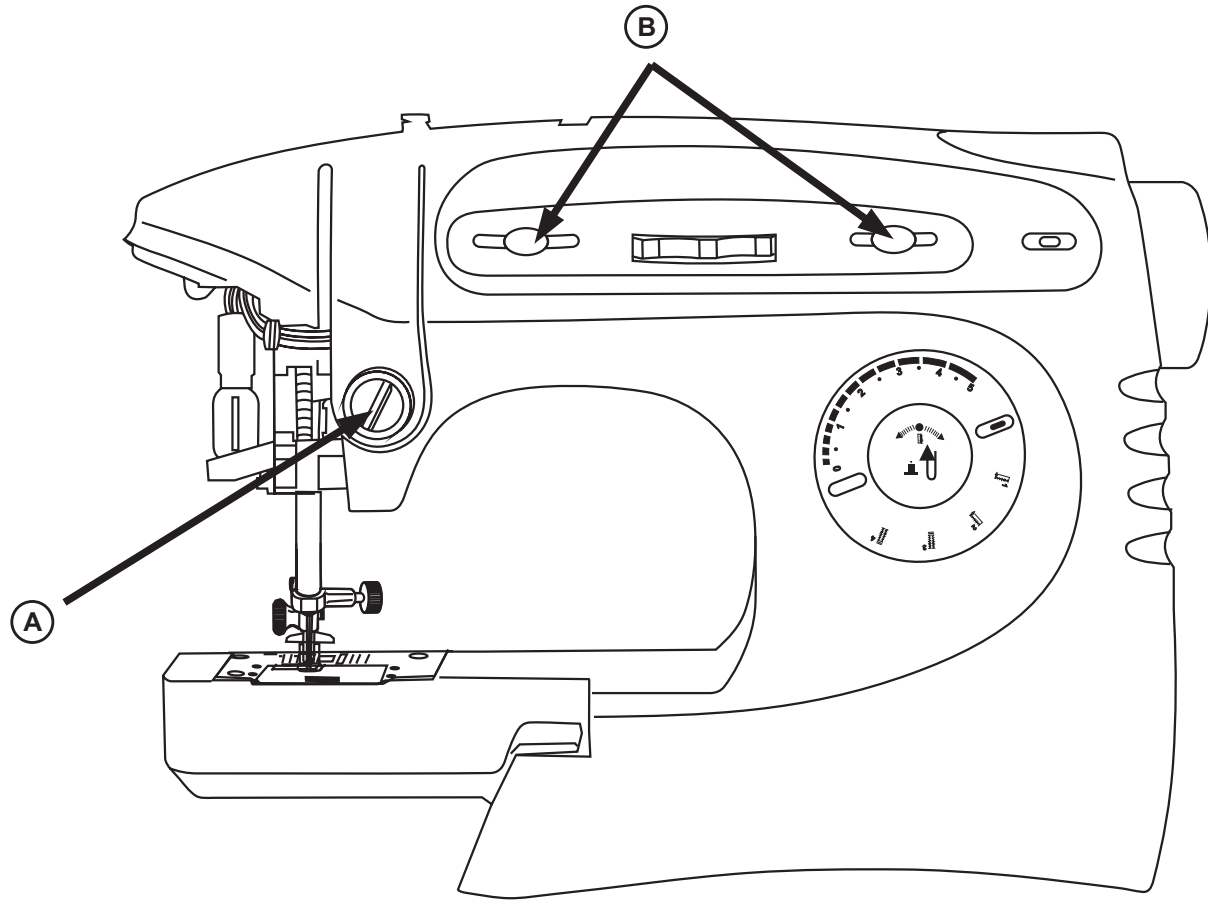
- 1- Raise carrying handle and remove the free-arm extension table.
- 2- Remove the bottom bed cover located under the machine.
- 3- Loose screws (A) and screw ( C ) by turning them twice.
- 4- Remove the 6 screws (B)
- 5- Turn on the machine
- 6- Remove the cover from needle plate area first, for there are tips in this area connecting the front cover.
- 7- Remove the cover by pulling it straigh upwards.

### Replacement:

- 1- Replacement is the same as removal in reverse Order.

### Note:

Make sure the covers (rear and front) are correctly connected, specially in the needle plate area tips.



## Front Cover

### Removal:

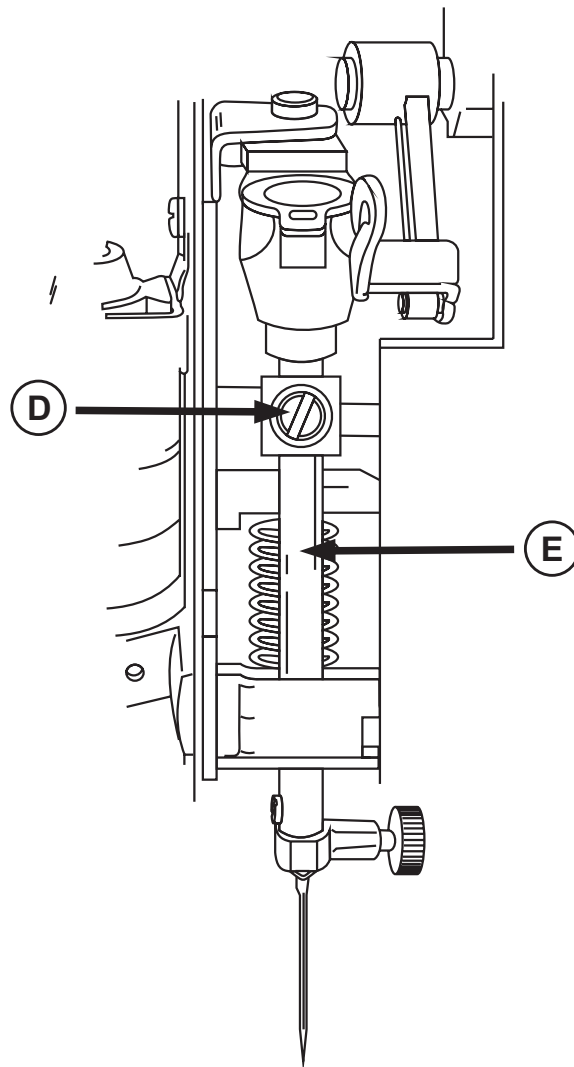
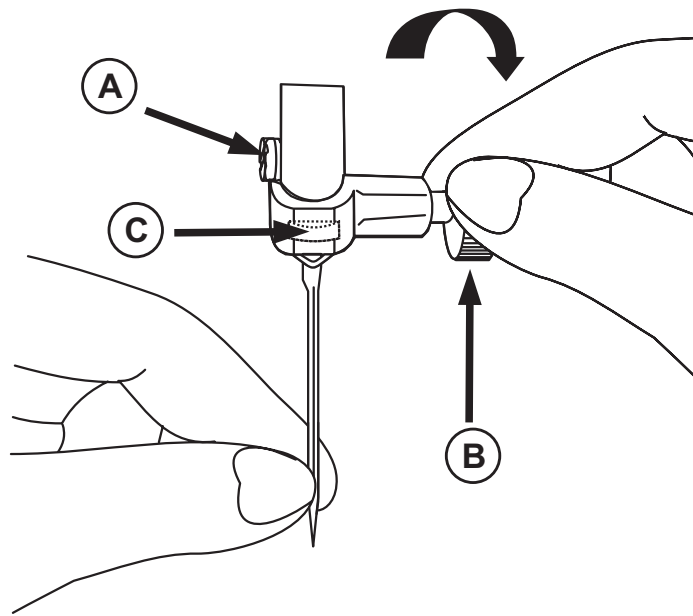
- 1- Remove the free-arm extension table, face plate, bottom bed cover and rear cover.
- 2- Position the tension assembly dial (A) to "0" and remove it by pulling straight frontwards. Use same procedure to remove the two selector knobs (B).
- 3- Loosen the two screws (C) and screw (D). (Turn them 3 times)
- 4- Turn the machine down placing the front cover upwards.
- 5- Loosen the two screws (E). Turn them twice.
- 6- Remove the front cover by pulling it up. In the tension assembly area there is a pressure tip. Pull the cover first in this area. This will make disconnection easier.

### Replacement

- 1- Replacement is the same as removal in reverse order.

### Note:

Replace the cover by compelling it enough to make the screw groove end (E), (D) and (C) lean against the screw diameter. Make sure the cover is completely joined and leaned, specially in the tension assembly area.





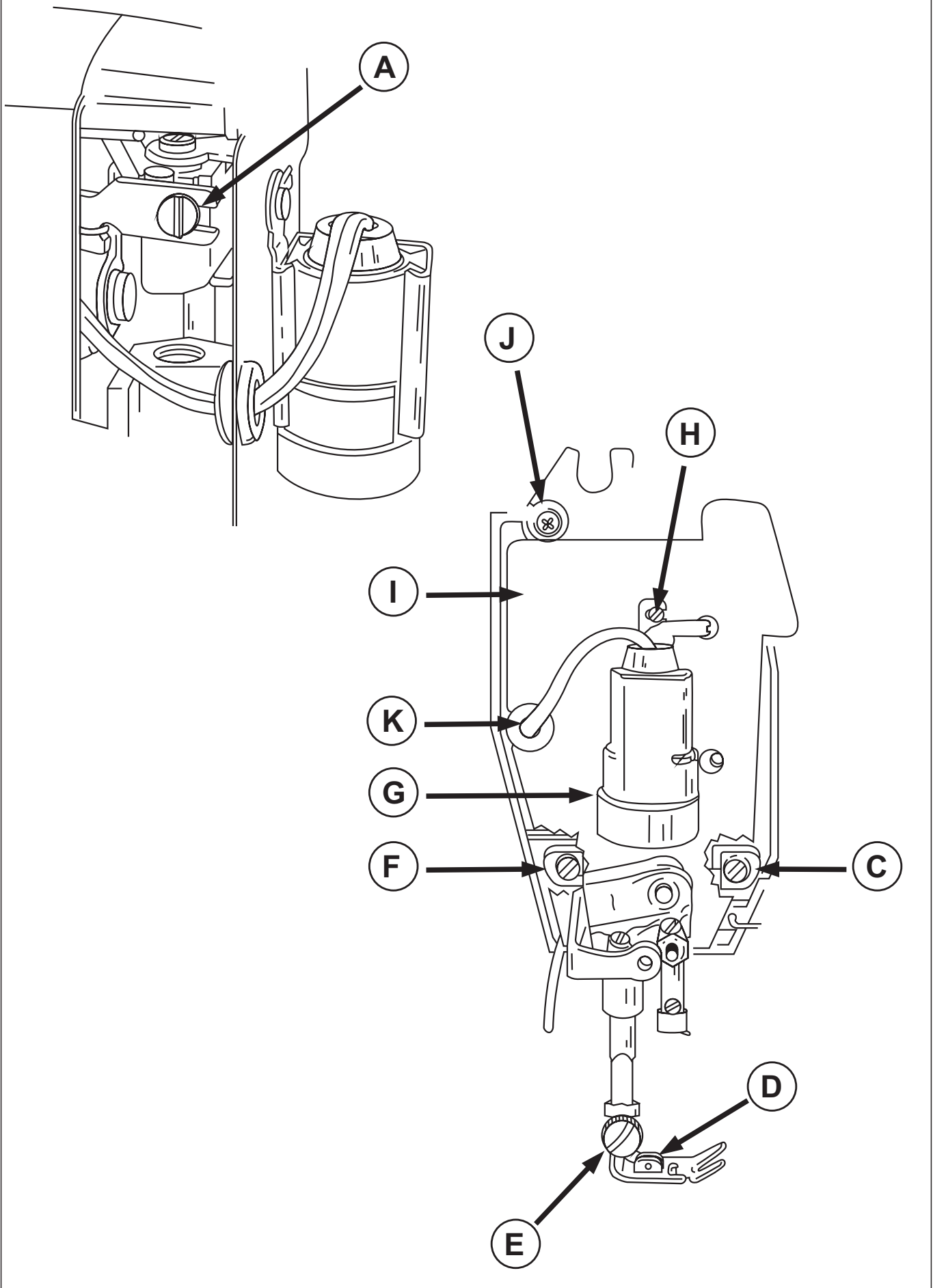
## Needle Bar

### Removal:

- 1- Remove tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Remove needle by loosening the screw (B) with thread guide, and needle bar gib (C).
- 3- Loosen needle bar clamping screw (D).
- 4- Draw needle bar (E) up and out of the machine.

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- Then, adjust needle bar height.



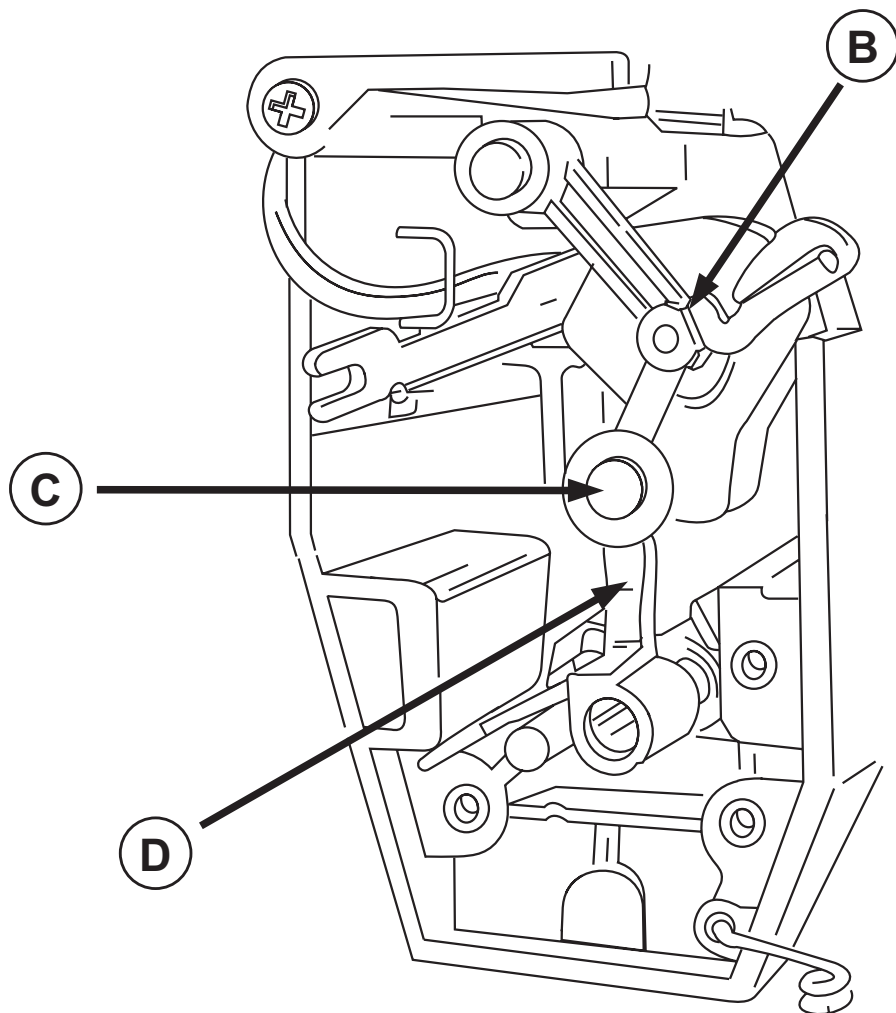
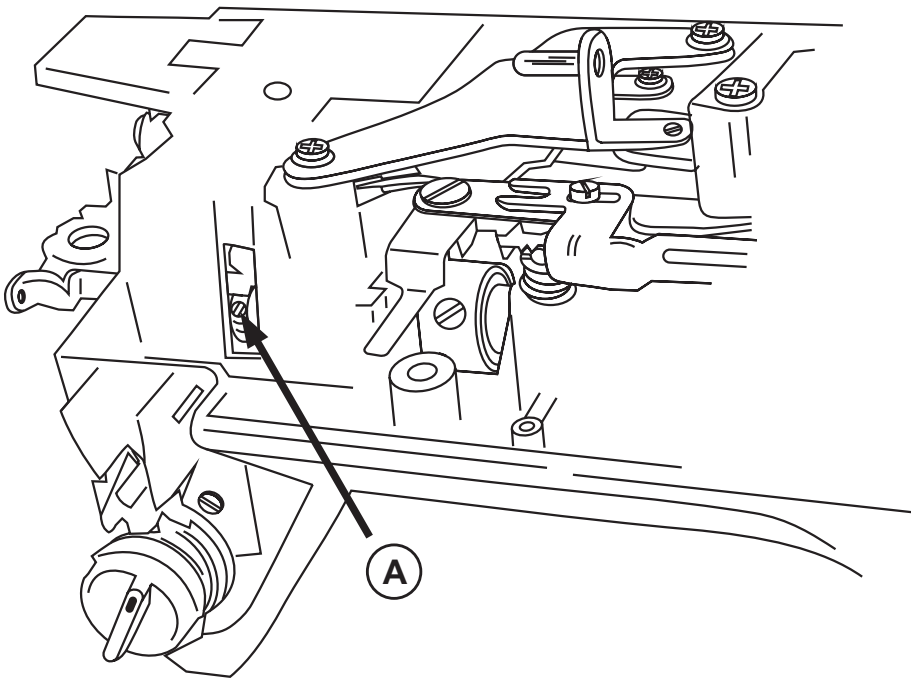
## Head End Assembly

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front) and needle.
- 2- Loosen screw (A).
- 3- Remove presser foot (D) and presser foot screw (E).
- 4- Remove screw (H), light socket (G) and light shield (I).
- 5- Raise presser bar.
- 6- Remove three screws and washers (C), (F) and (J).
- 7- Remove head end assembly.

### Replacement:

- 1- Replacement is the same as removal in reverse order. Make sure that light harness is located in wire guard as illustrated in (K) or interference may occur between the harness and the needle bar drive lever.
- 2- Adjust needle location in the needle plate slot and needle to hook relationship. (See pages 72 to 75)
- 3- Check hook timing needle bar height and presser bar height and adjust if necessary. (See pages 64-65 and 88-89)
- 4- Adjust presser bar alignment and height. (See pages 84-85)



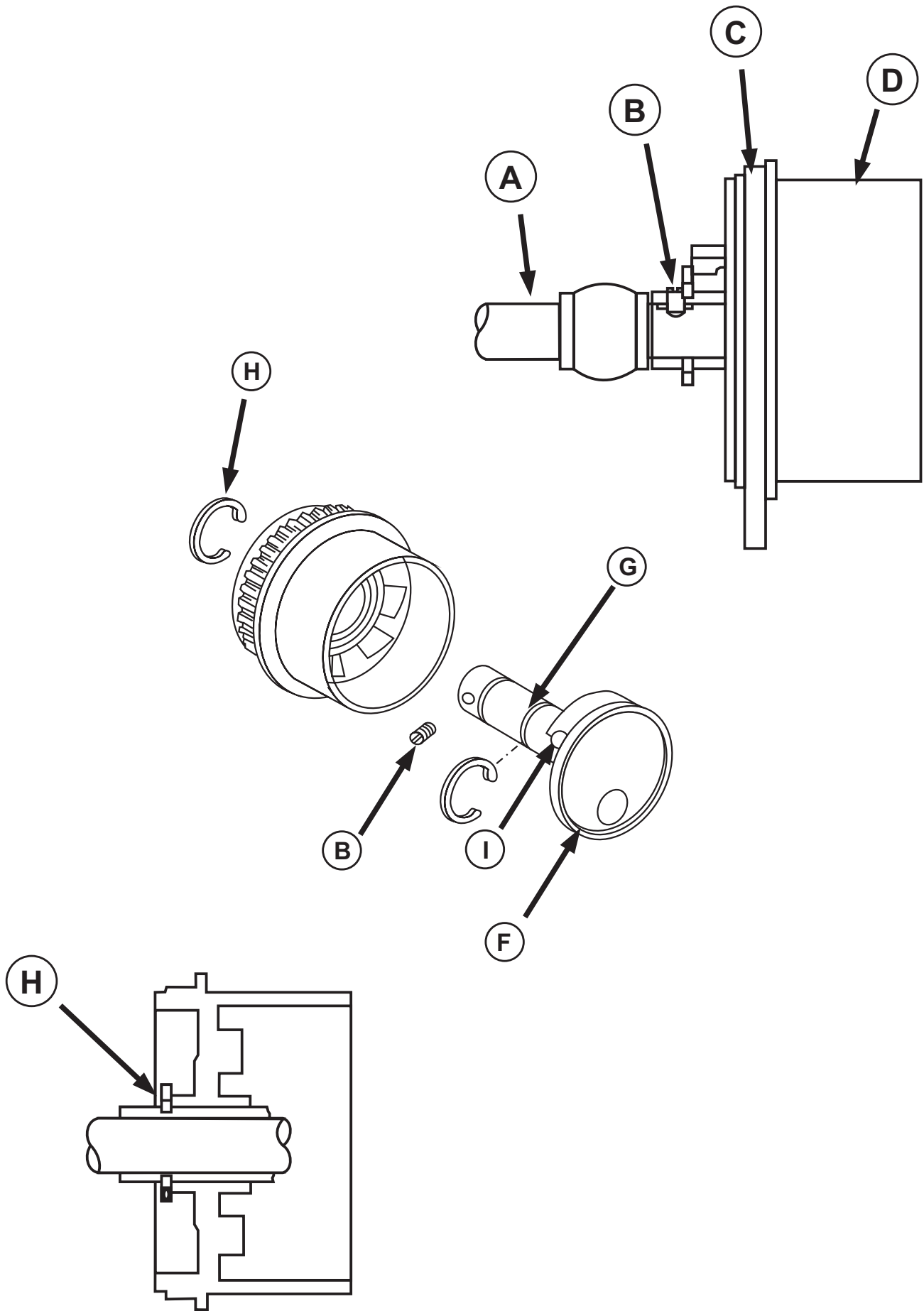
## Take-up Lever Assembly and Needle Bar Connecting Link

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front) and head end assembly.
- 2- Loosen screw (A) sufficiently to clear the recess on the thread take-up stud (C).
- 3- Slide take-up lever assembly (B), take-up stud (C) and needle bar connecting link (D).

### Replacement:

- 1- Replacement is the same as removal in reverse order. Make sure that stud (C) is firmly located against link (D).
- 2- Adjust needle location in the needle plate slot and needle to hook relationship. (See pages 70 to 75)
- 3- Check hook timing and needle bar height and presser bar height and adjust if necessary. (See pages 64-65 and 88-89)
- 4- Adjust presser bar alignment and height. (See pages 84-85)



## Hand Wheel

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Rotate hand wheel (D) to locate the hand wheel bushing set screw (B).
- 3- Loosen screw (B) sufficiently to clear the recess in the arm shaft (A).
- 4- Remove hand wheel (D) from arm shaft (A) while sliding motor belt (C) to the left.

### Replacement:

- 1- Replacement is the same as removal in reverse order. Make sure set screw (B) is properly located in the hole in the flat of arm shaft (A).

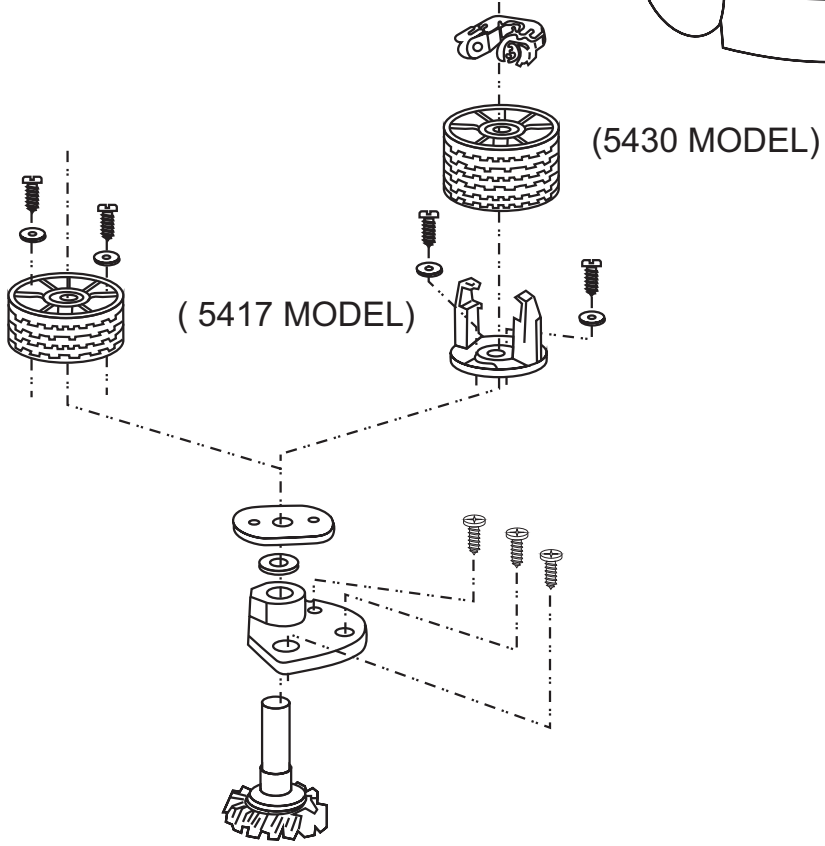
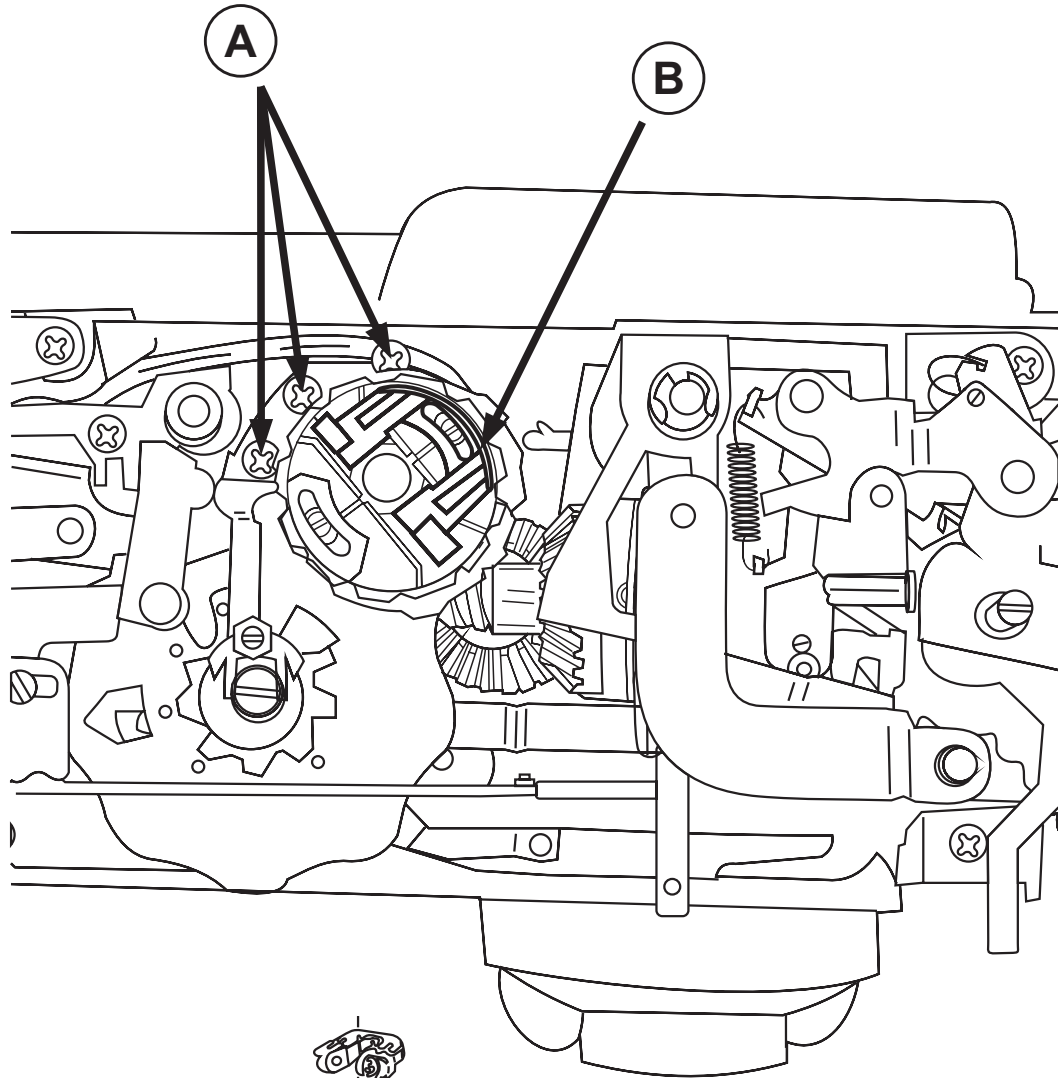
## Hand Wheel Disassembly

### Disassembly sequence:

- 1- Remove hand wheel bushing set screw (B).
- 2- Remove retaining ring (H).
- 3- Remove clutch assembly (G).
- 4- Remove plate cover (F) by pulling the pin (I) out.

### Reassembly sequence:

- 1- Replace plate (F) aligning pin in plate with hole (G) in assembly.
- 2- Insert clutch assembly in hand wheel.
- 3- Disengage clutch.
- 4- Replace retaining ring (H).
- 5- Replace hand wheel bushing screw (B).





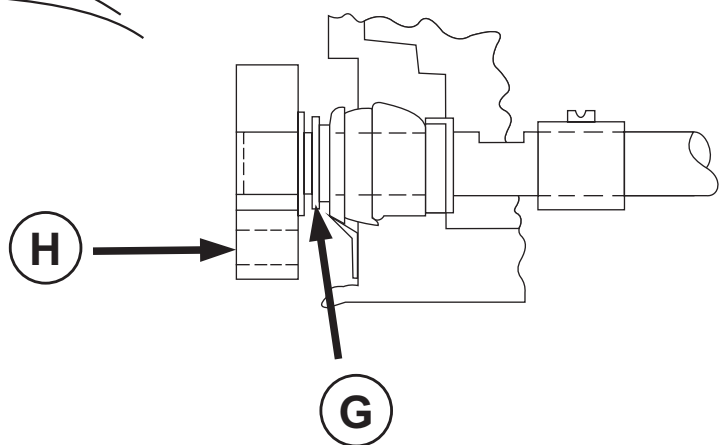
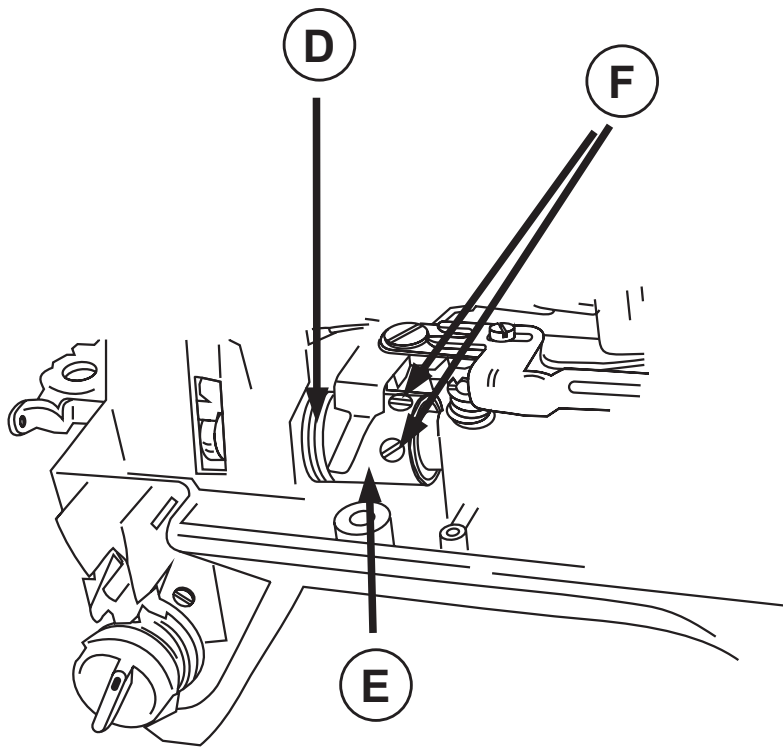
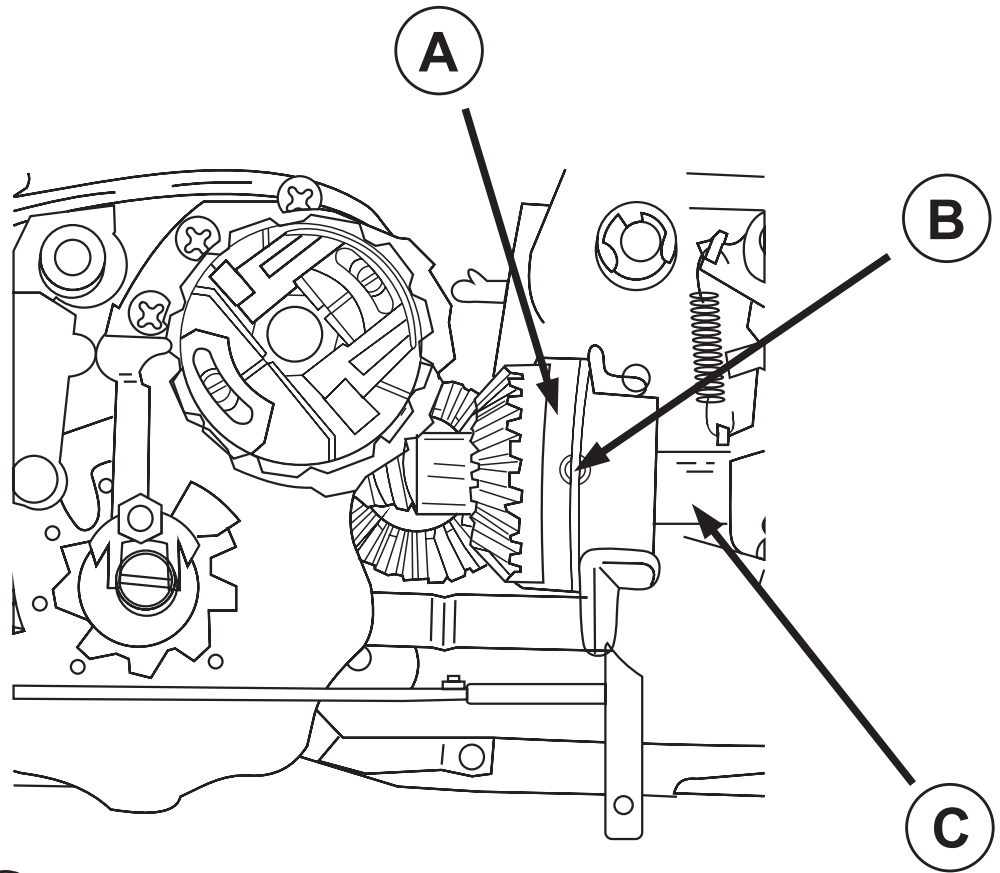
## Camstack

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Remove three screws (A).
- 3- Set stitch length control dial to "5" and move the zig-zag lever to left (Straight stitch position)
- 4- Remove camstack assembly (B).

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- Adjust camstack radial play and needle bar pendulum timing. (See pages 58 to 59 and 66-67)
- 3- Check left-to-right needle location and zig-zag bight stops and adjust if necessary. (See pages 70-71 and 76 to 79)
- 4- Check needle follower clearance. (See pages 58 to 59)



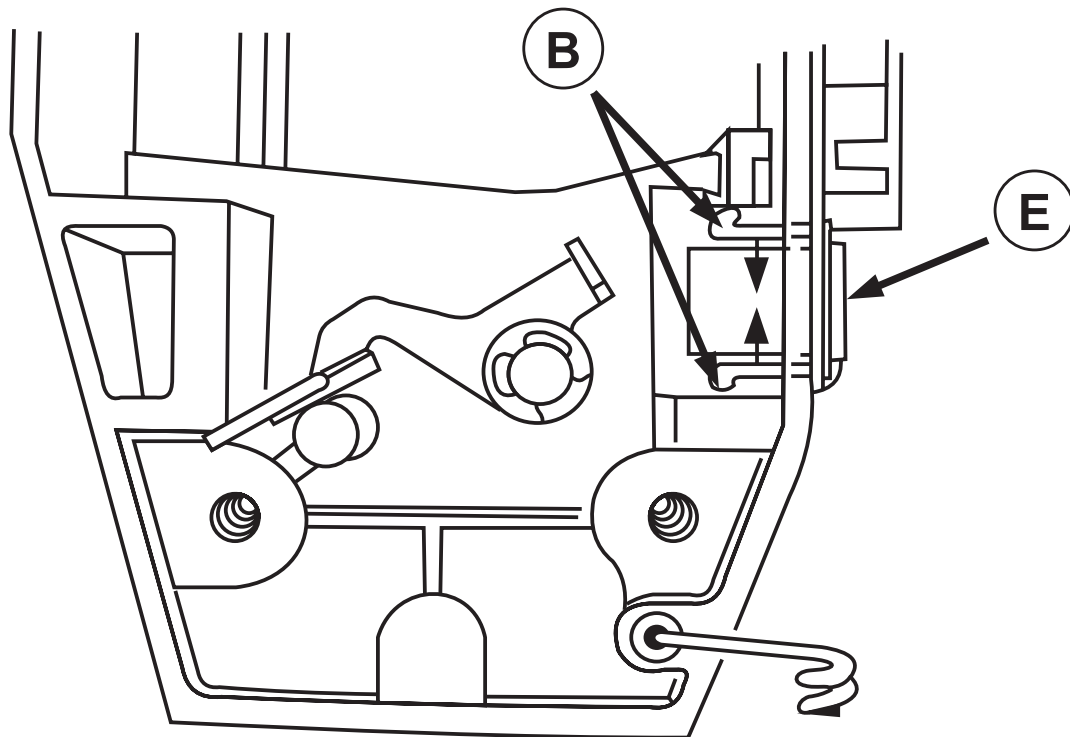
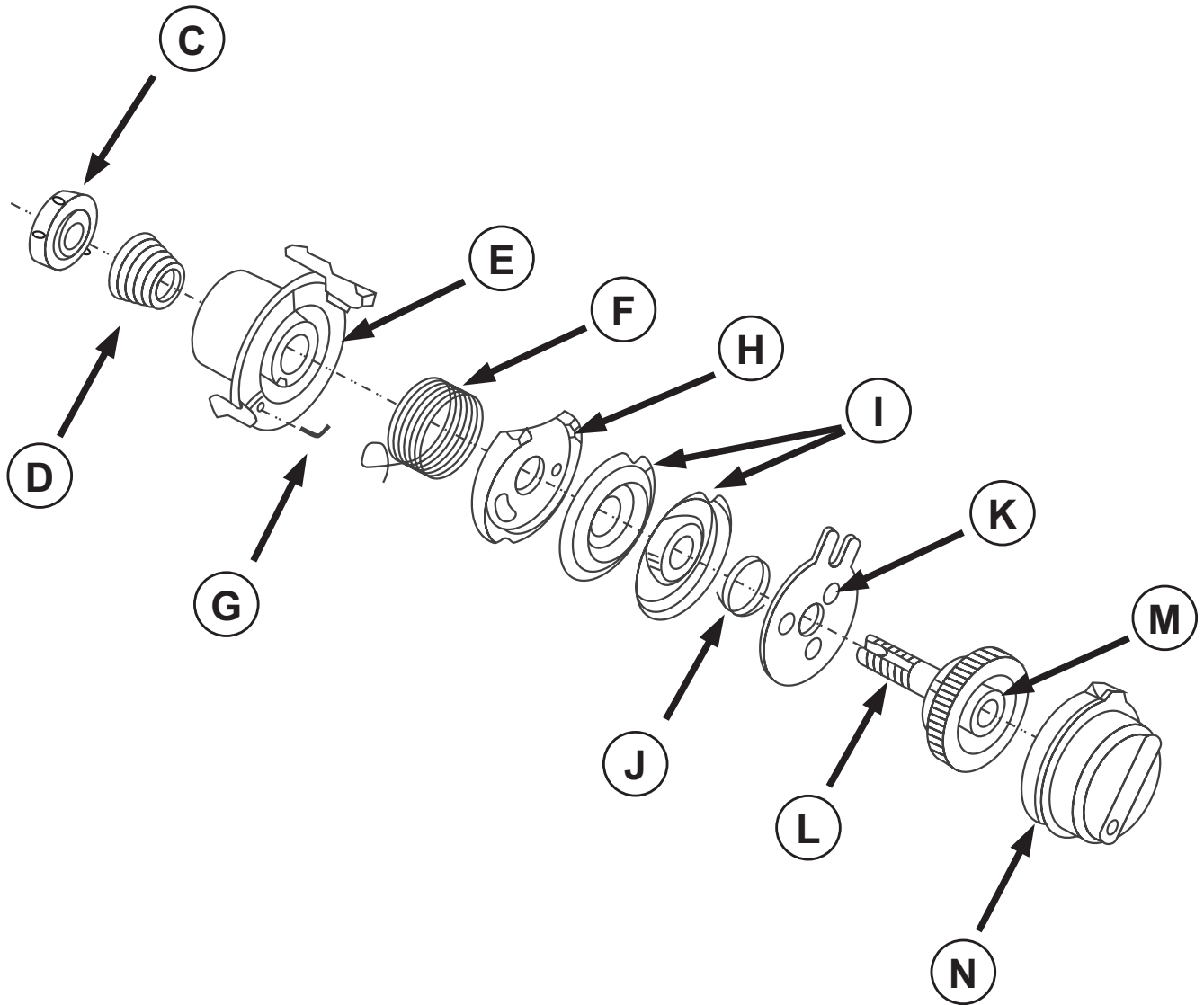
## Arm shaft and horizontal bevel gear

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front), head end assembly, take-up lever assembly, camstack and hand wheel.
- 2- Loosen the arm shaft collar set screws (F) so that the collar can move along the arm shaft.
- 3- Loosen set screw (B) in bevel gear (A) making sure it is loosened sufficiently to clear the groove in the horizontal arm shaft.
- 4- Draw the crank (H) with arm shaft (C) to the left until it clears bevel gear (A).
- 5- Remove bevel gear (A).
- 6- Continue to draw arm shaft (C) out of the machine until it clears collar (E) and washer (D).
- 7- Remove collar (E) and washer (D).
- 8- Remove arm shaft (C). Washer (G) will remain on the arm shaft.

### Replacement:

- 1- Replacement is the same as removal in reverse order. (Refer to "bevel gear mesh and arm shaft end play" on page 56-57)
- 2- In order to maintain feed timing align the timing mark on the vertical shaft bevel gear between the two timing marks on the horizontal bevel gear. (Refer to "bevel gear mesh and arm shaft end play" on page 56-57)
- 3- Adjust bevel gear mesh and arm shaft end play, camstack radial play, and make corrections you believe it's necessary to firmly place the take-up lever assembly and needle bar connecting link. (See pages 56 to 59 and 17-18)
- 4- Check and adjust if necessary:
  - needle bar height (pages 64-65)
  - left-center-right needle position (pages 70-71)
  - Zig-zag bight stops positioning (pages 76 to 79)
  - needle bar height (pages 84-85)
  - hook timing (pages 88-89)



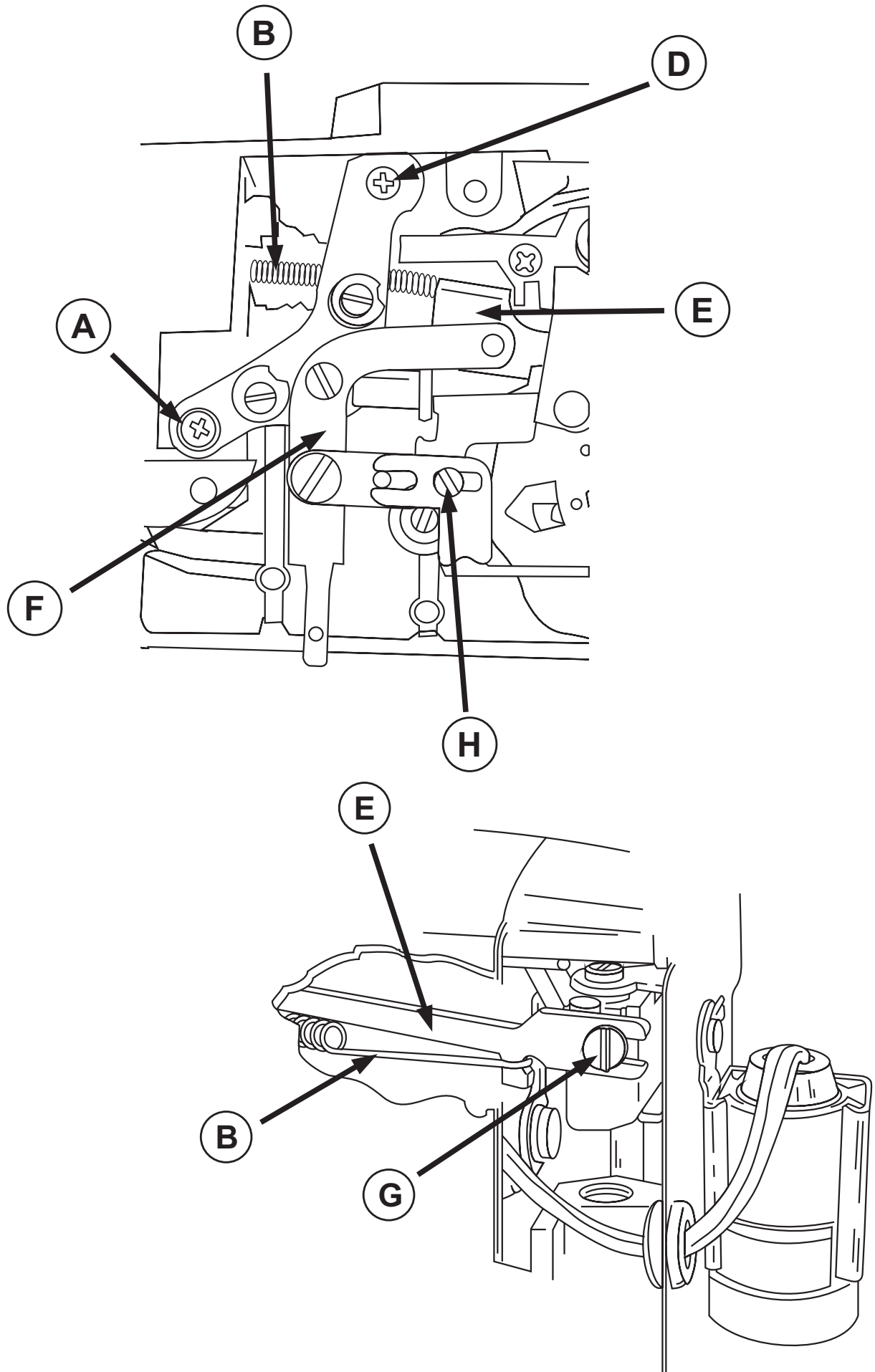
## Tension assembly

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Force in the direction shown by arrows in the illustration, the two retainers (B), and pull out the tension assembly.
- 3- Remove the tension adjusting dial (N).
- 4- Turn adjusting knob insert (M) counterclockwise all the way to release tension spindle (L) from spindle nut (C).
- 5- Remove nut (C) , spring (D) , spindle (L) , thread guide (H), tension discs ( I ), spring ( J ) and plate (K).
- 6- To disassembly take-up spring (F) remove clip (G) by pulling out of tension assembly body (E), and remove take-up spring (F).

### Replacement:

- 1- Replacement is the same as removal in reverse order, however take some time to check the following:
- 2- The two tension discs ( I ) must be assembled with their convex surfaces facing each other.
- 3- Plate (K) must be assembled with the three set outs resting against concave side of the first tension disc ( I ).
- 4- To adjust tension assembly follow instructions given in the chapter "Needle thread tension" on page 94-95.



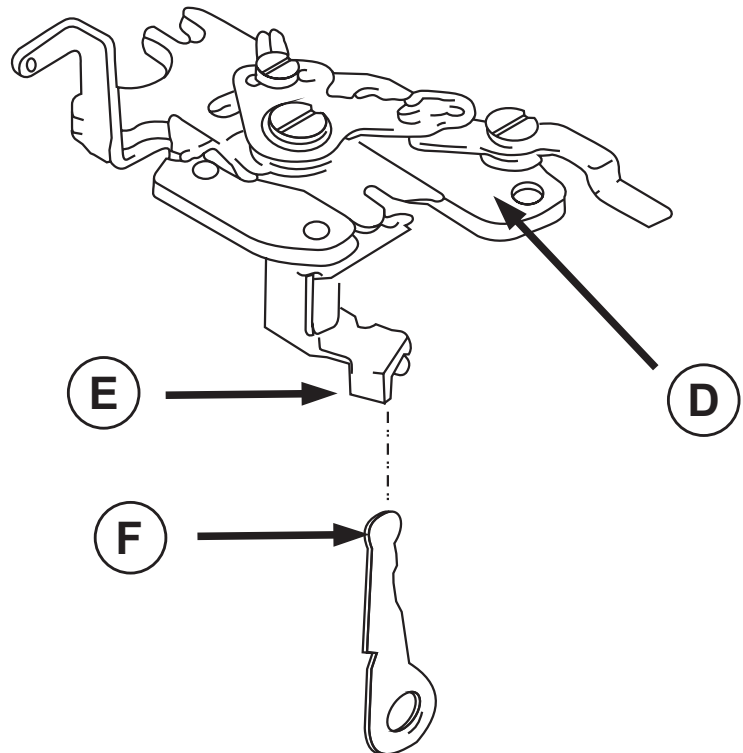
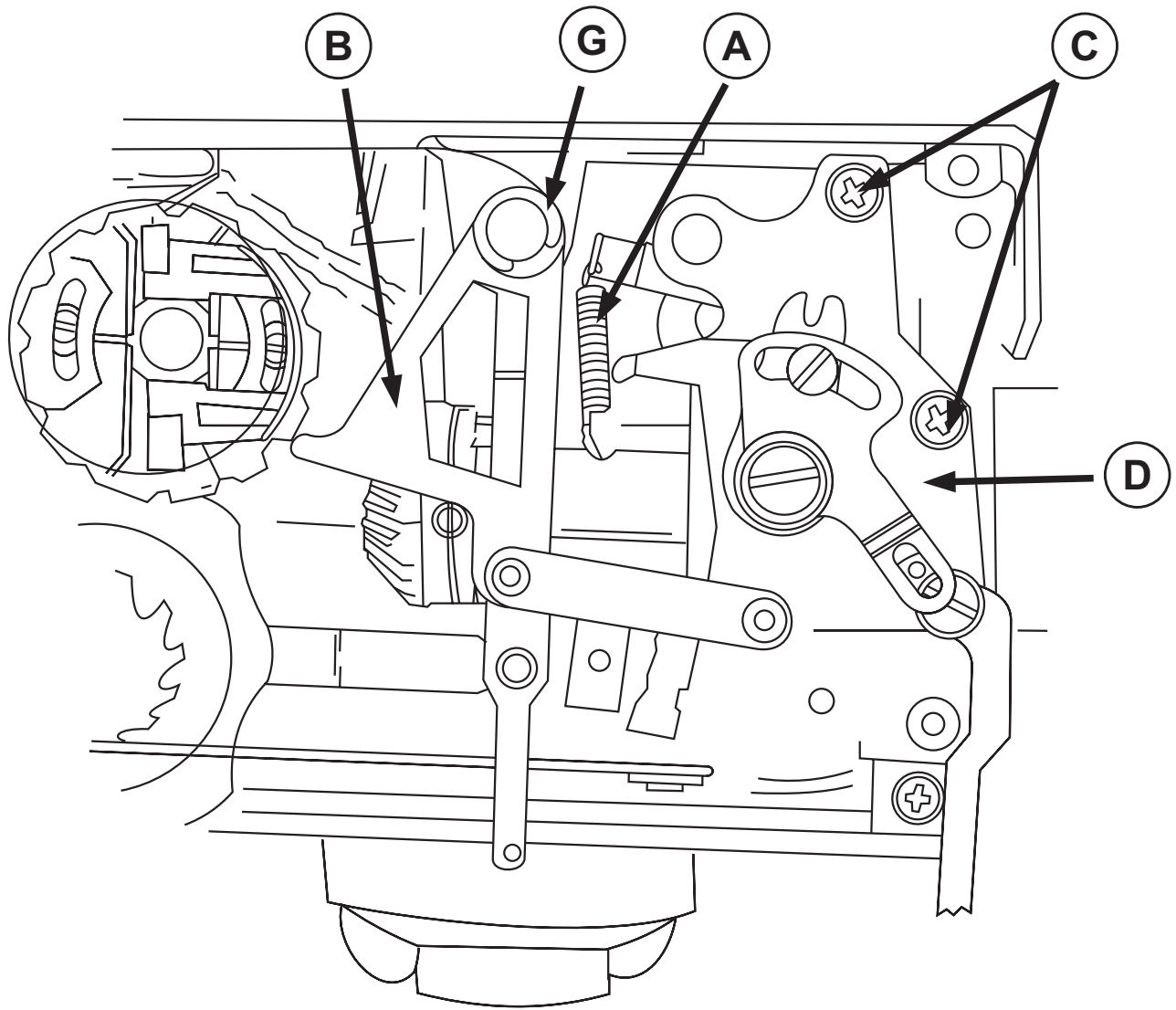
## Needle bar driving arm - needle bar driving arm tension spring

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front) and the left carrying handle support.
- 2- Unhook spring (B) from the needle bar driving arm (E).
- 3- Remove screws (A), (D) and (H) and lift stitch width bracket assembly (F) from the needle bar driving arm (E).
- 4- Remove needle bar driving arm clamping screw (G).
- 5- Remove needle bar driving arm (E) from the top of the machine.

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- Adjust left-to-right needle position. (See pages 72-73)
- 3- Adjust the space between the sides of buttonhole (See pages 116-117)





## Cam controlled feed mechanism (only for model 5430)

### Removal:

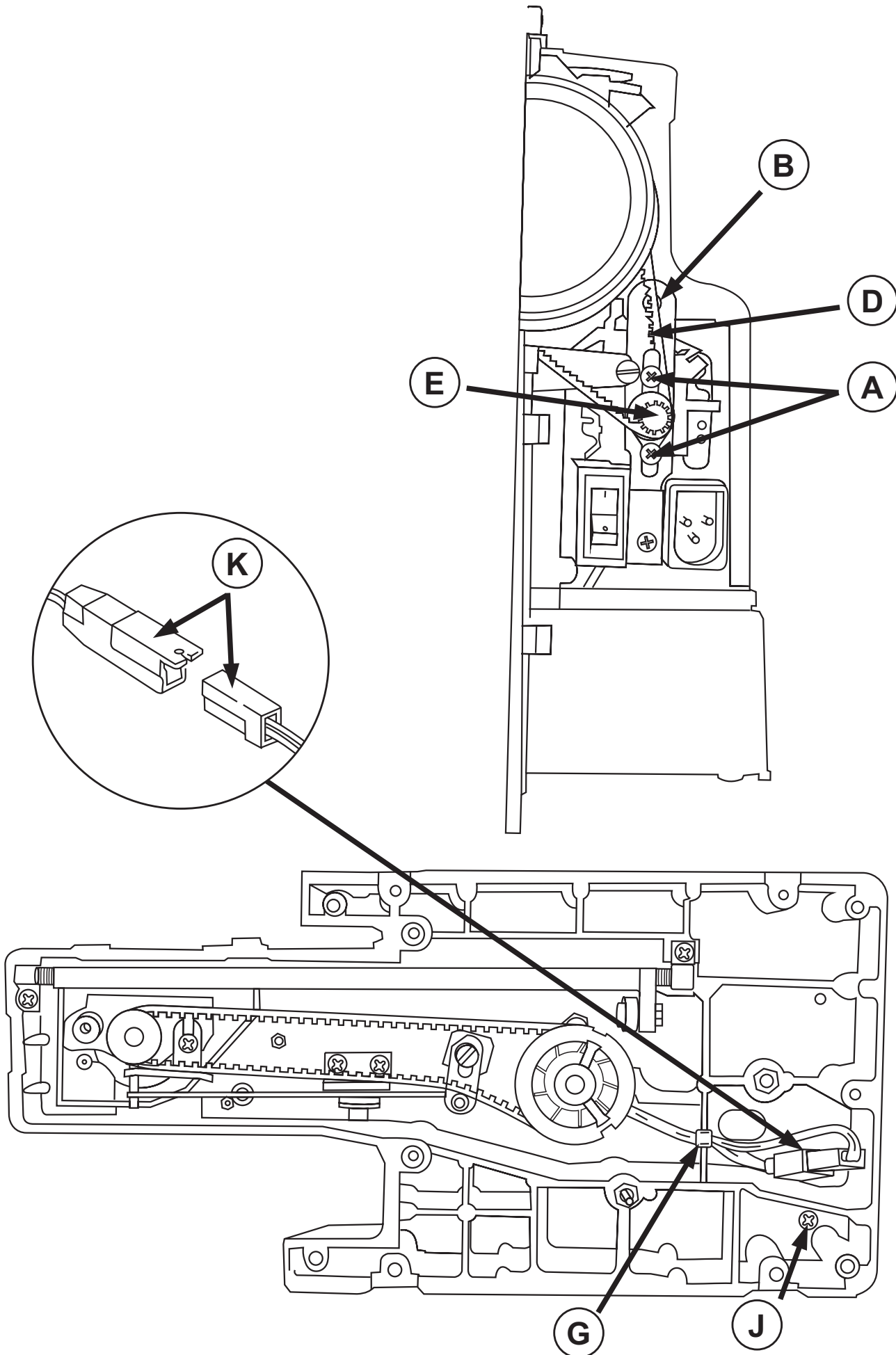
- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front) and the right carrying handle support.
- 2- Set stitch length control dial to flexi stitch (the mark on the dial aligned with the dot in the front cover)
- 3- Remove spring (A).
- 4- Set stitch length control dial to "5".
- 5- Remove the ring (G) and then the cam follower assembly (B).
- 6- Remove screws (C).
- 7- Remove cam control feed mechanism (D).

### Replacement:

- 1- Replacement is the same as removal in reverse order.

### Caution:

When replacing the cam control feed mechanism, make sure bracket (E) straddles lever (F).  
Readjust the flexi-stitch balance if necessary.



## Motor and motor belt

**Attention:**

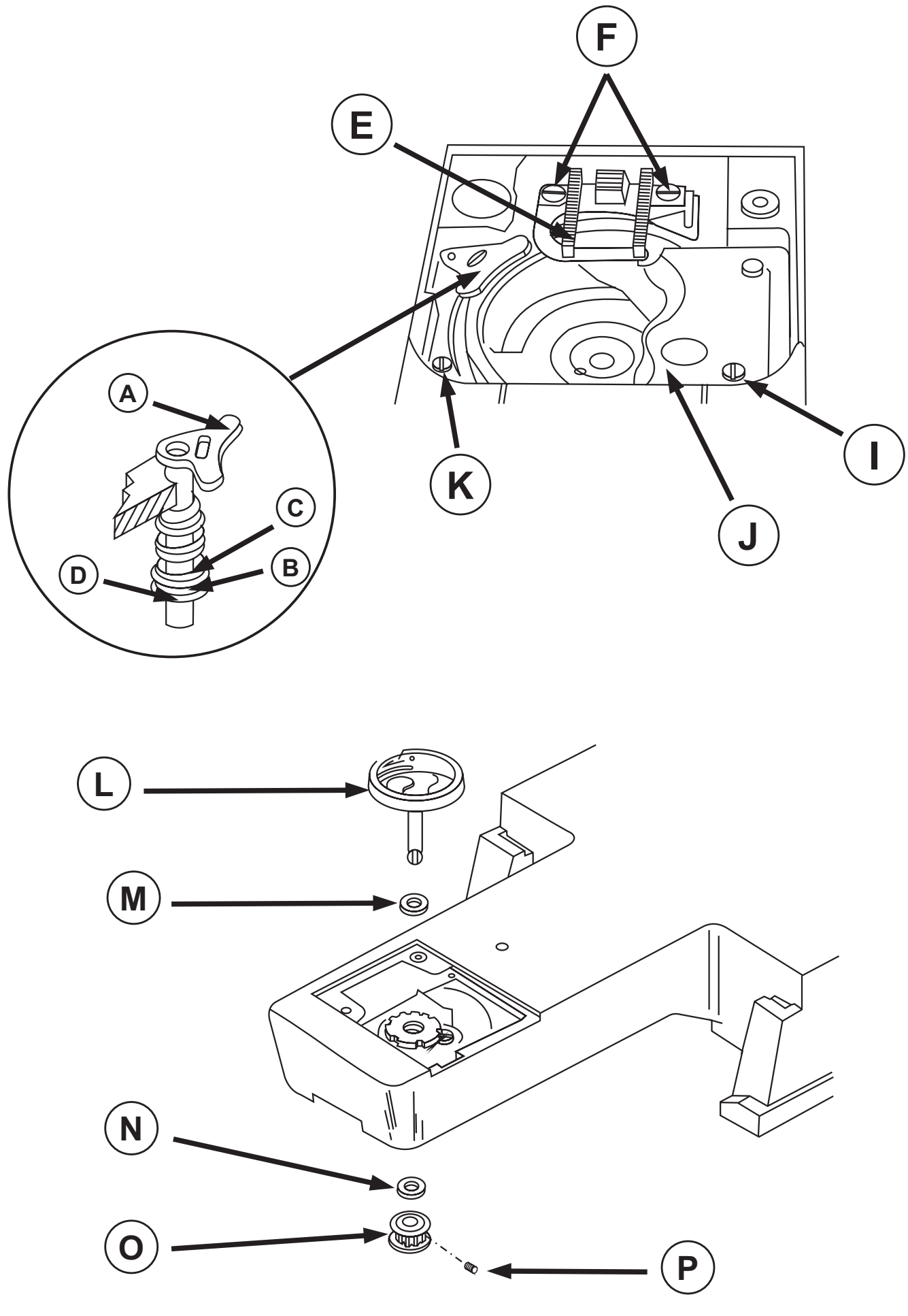
Make sure the machine is turned off and remove plug from outlet socket before disassembling

**Removal:**

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Loose the two motor adjustment screws (A)
- 3- Carefully lift the motor and slip the motor belt (D) off the motor pulley (E) and hand wheel.
- 4- Cut off the plastic loop (G)
- 5- Disconnect wire by pulling the bonding jumper (K) apart.
- 6- Loosen mounting plate screw (B) 4 or 5 turns only.
- 7- Remove the screw (J).
- 8- Lift motor and tilt its bottom edge out from the machine until mounting plate (I) is clear of the casting edge.

**Replacement:**

- 1- Replacement is the same as removal in reverse order. First pass bonding jumper (K) through the casting groove. The nut on screw (B) must be properly located in the channel on the inside of the casting to allow mounting motor



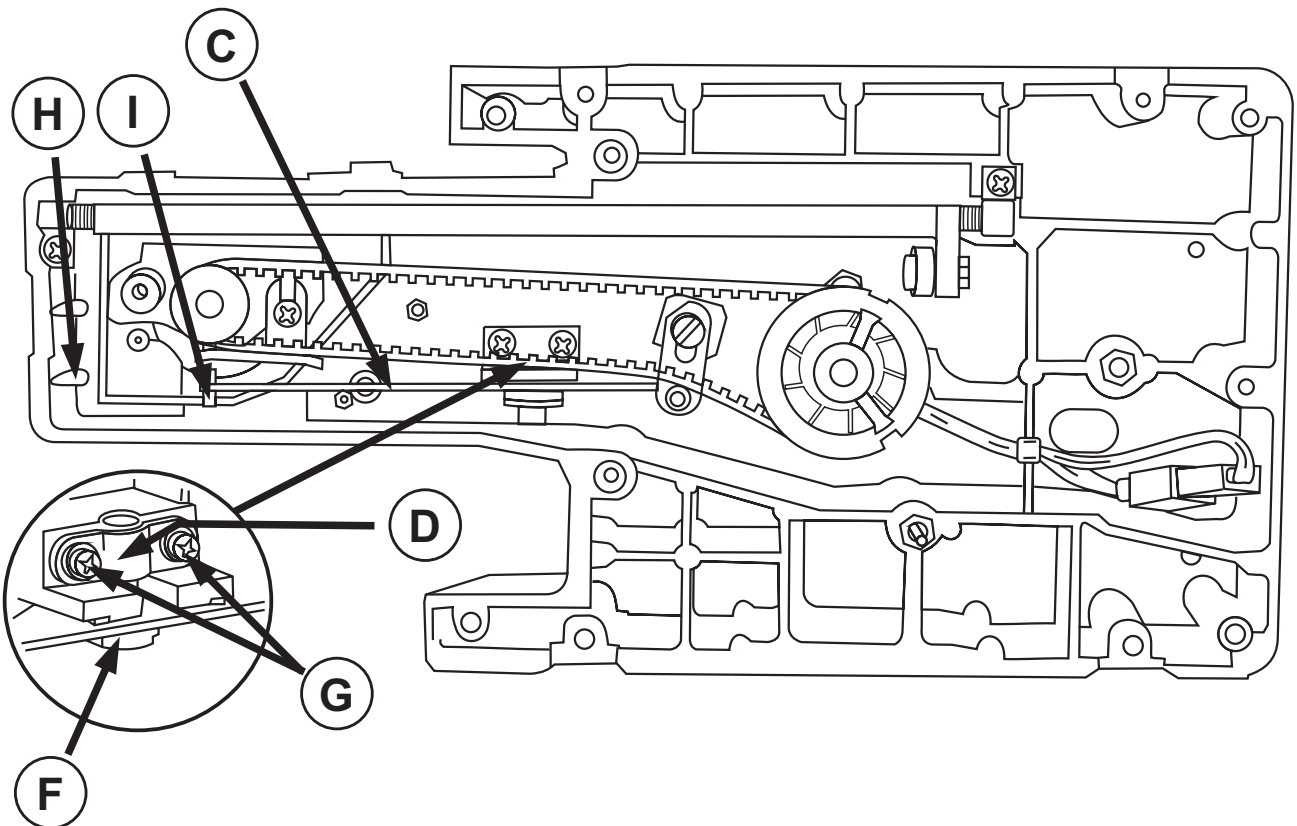
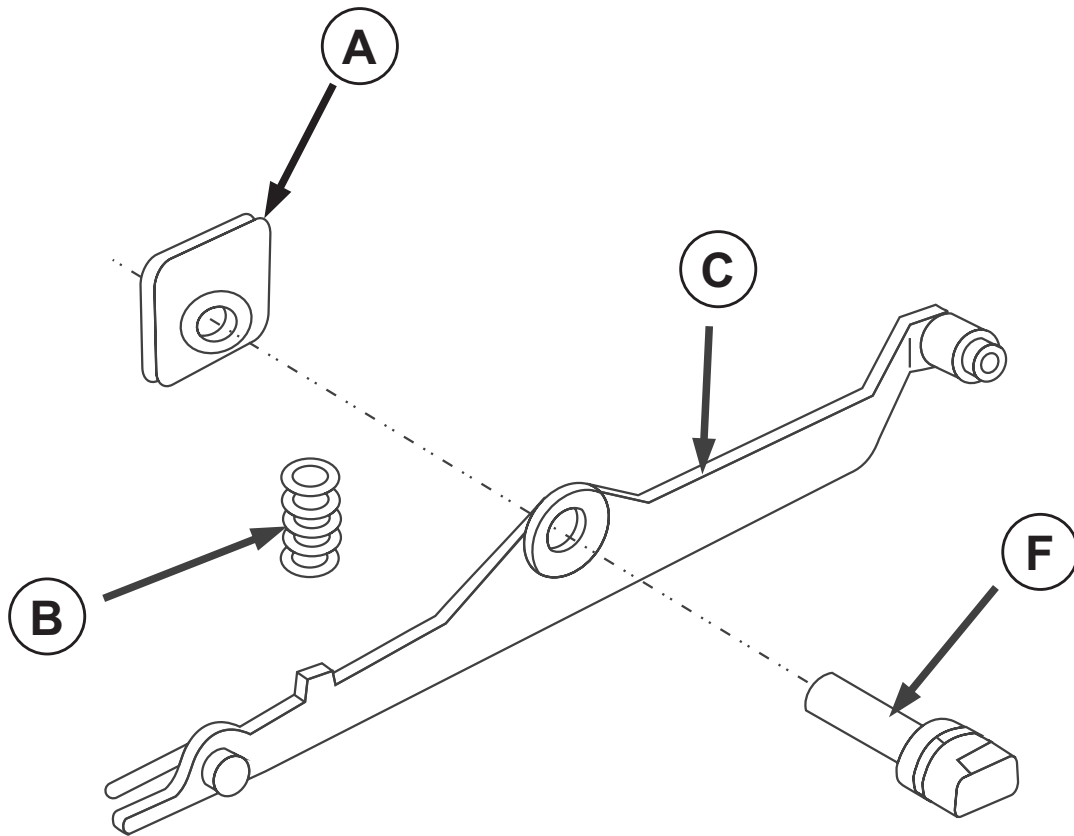
## Hook

### Removal:

- 1- Remove the free arm extension table, face plate, rear and bottom bed covers, needle plate and bobbin case.
- 2- Remove feed dog screws (F) and feed dog (E).
- 3- Remove position plate screws ( I ) and (K).
- 4- Remove position plate ( J ).
- 5- Remove retaining ring (D), washer (B) and spring (C).
- 6- Draw retaining plate (A) up and out of the machine.
- 7- Loosen screw (P) in drive pulley (O).
- 8- Remove hook (L) by driving it up.
- 9- Remove hook washer (M), pulley (O) and pulley washer (N).

### Replacement:

- 1- Replace washer (M) and hook shaft (L) and place hook in the machine base bushing.
- 2- Thread pulley washer (N) and pulley (O) with the hook drive belt attached on to the hook shaft.
- 3- Locate pulley set screw (P) on the flat on the hook shaft.
- 4- While holding hook (L) down with finger pressure, press up lightly on pulley (O) and tighten screw (P). Check hook (L) for end play. There Should be 0,00 mm - 0,05 mm (.000" - .002") end play. Check for free rotating.
- 5- Replace retaining plate (A) , spring (C), Washer (B) and retaining ring (D).
- 6- Replace position plate ( J ), screws (K) and ( I ) and the bobbin case. Adjust bobbin case thread clearances. (See pages 90-93)
- 7- Replace feed dog (F) and feed screws (E). Adjust feed dog centralization and parallelism (See pages 100-103). Check feed dog throw and adjust if necessary.(See pages 64-65)
- 8- Adjust hook timing.
- 9- Check needle to hook relationship and adjust if necessary. (See pages 88-89)
- 10- Check needle bar height and adjust if necessary. (See pages 64-65)



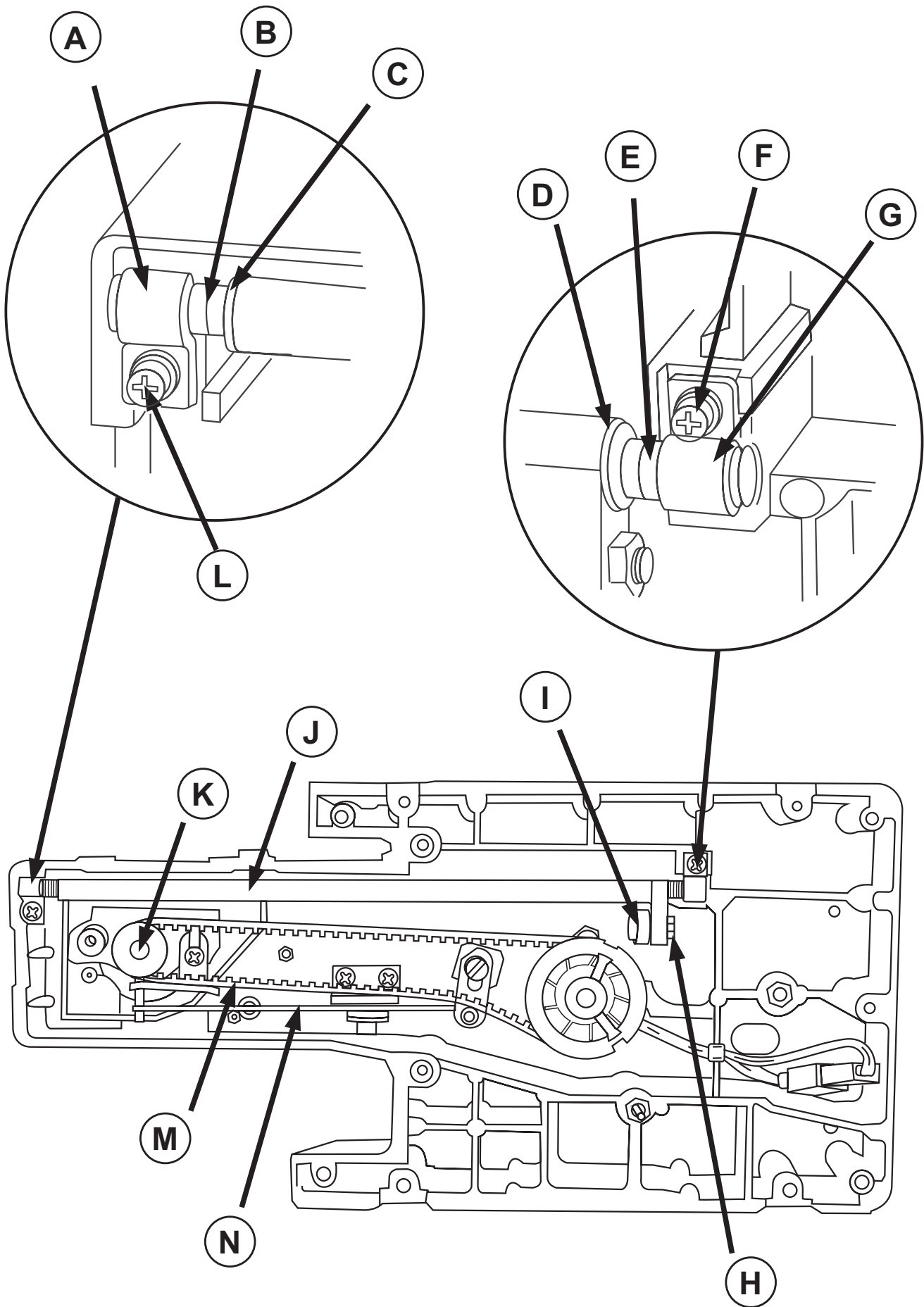
## Feed lifting lever assembly

### Removal:

- 1- Set machine to number "5" stitch length (maximum).
- 2- Turn hand wheel toward the front of the machine to locate the feed dog at its furthest rear position.
- 3- Remove the free arm extension table, face plate, rear and bottom bed covers.
- 4- Remove screws (G) to swing bracket (F) clear of eccentric stud (D).
- 5- Slightly depress feed bar assembly (H) until the fork on the feed lifting lever clears the pin (I) on the feed bar.
- 6- Draw the feed lifting lever assembly (C) down and to the left out of the machine.

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- Position the eccentric stud (D) making sure spacer (A) is positioned with the hole offset against the feed lifting lever bushing.
- 3- Adjust feed dog height.(See pages 100-101)
- 4- Be sure spring (B) is properly located in the hole in the casting and over the setour in the feed lifting lever (C).





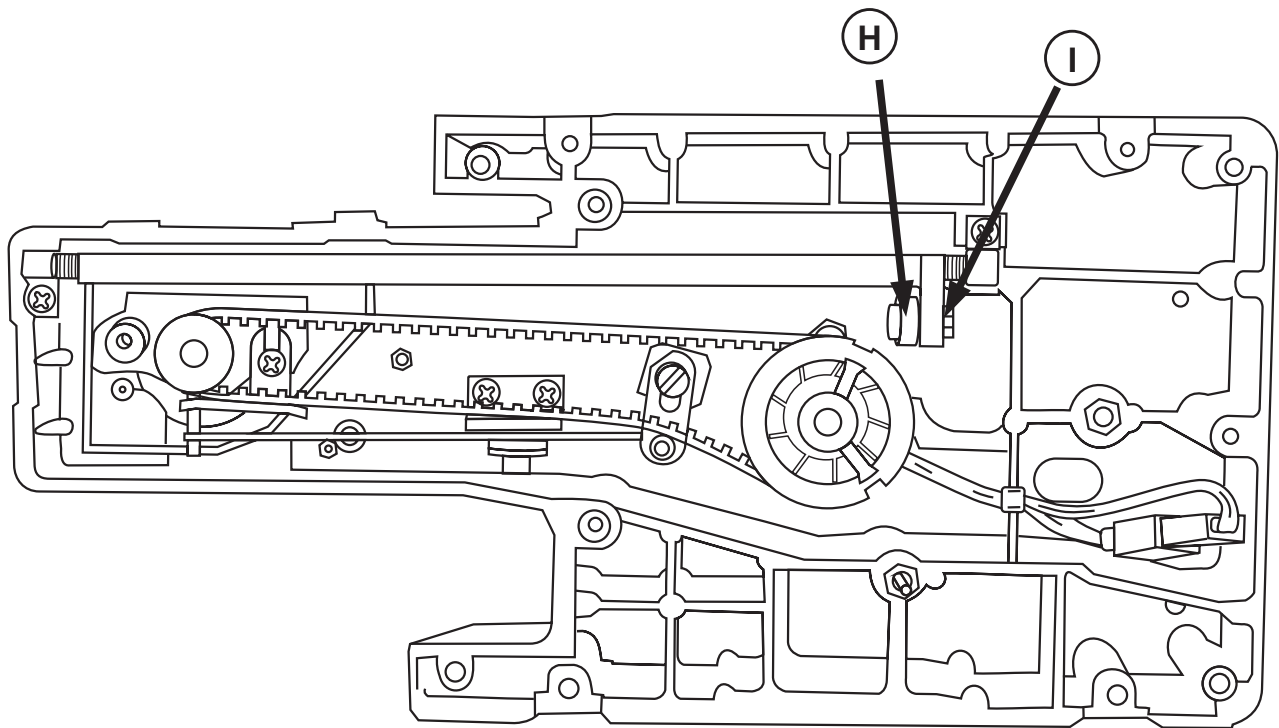
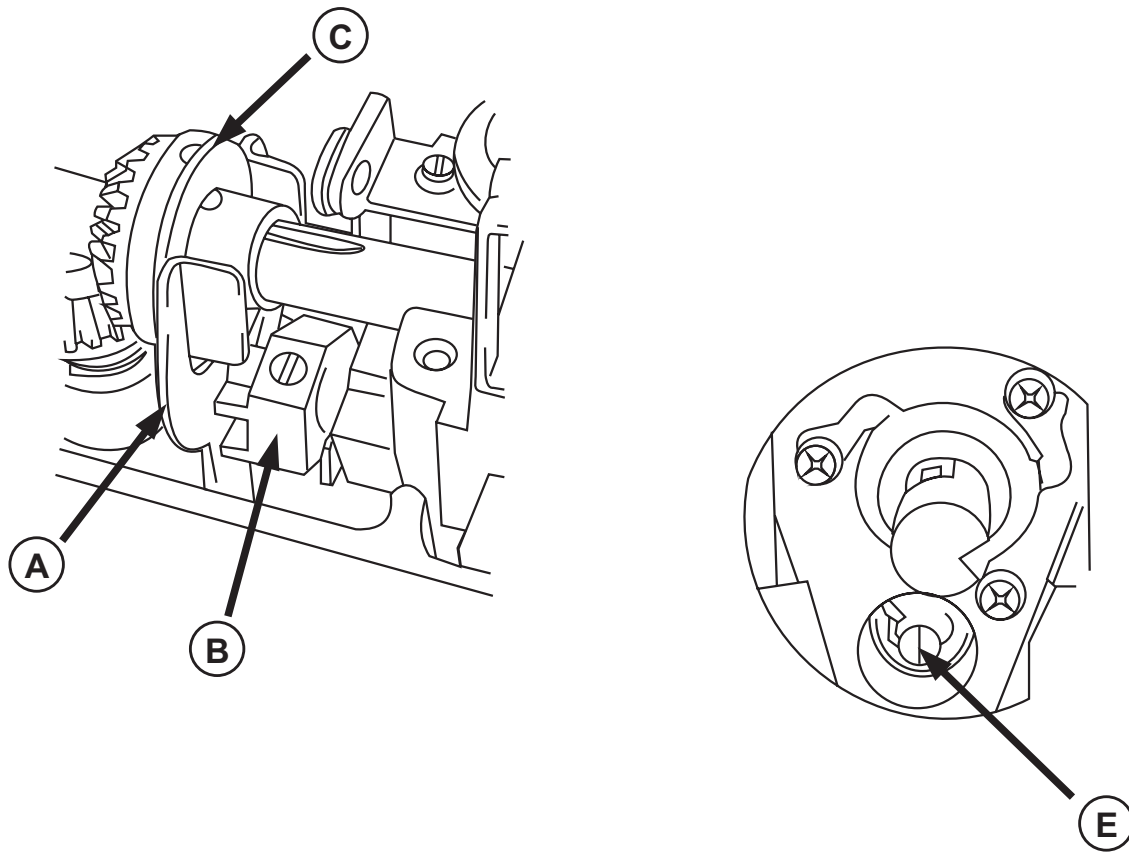
## Feed rock shaft assembly

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front), needle plate, feed dog, feed lifting lever assembly (N), pulley (K), and belt (M)
- 2- Remove 10 mm eccentric hinge screw nut (H) and eccentric hinge screw (I).
- 3- Remove rock shaft center clamp screws (F) and (L) and clamps (G) and (A).
- 4- Remove left rock shaft center (B) with washer (C) and right rock shaft center (E) with washer (D).
- 5- Remove feed rock shaft assembly ( J ).

### Replacement:

- 1- Replace feed rock shaft assembly ( J ), left and right centers (B) and (E) with washers (C) and (D) and clamps (A) and (G).
- 2- Tighten clamp screws (F) and (L).
- 3- Replace the feed lifting assembly and feed dog. (See pages 35 to 38)
- 4- Replace eccentric hinge screw (I) and hinge screw nut (H). Tighten nut (H) to finger tightness.
- 5- Adjust feed dog centralization and feed rock shaft end play. (See pages 98 to 101)
- 6- Adjust feed dog height. (See pages 100-101)
- 7- Adjust feed dog throw. (See pages 102-103)
- 8- Adjust hook timing. (See pages 88-89)



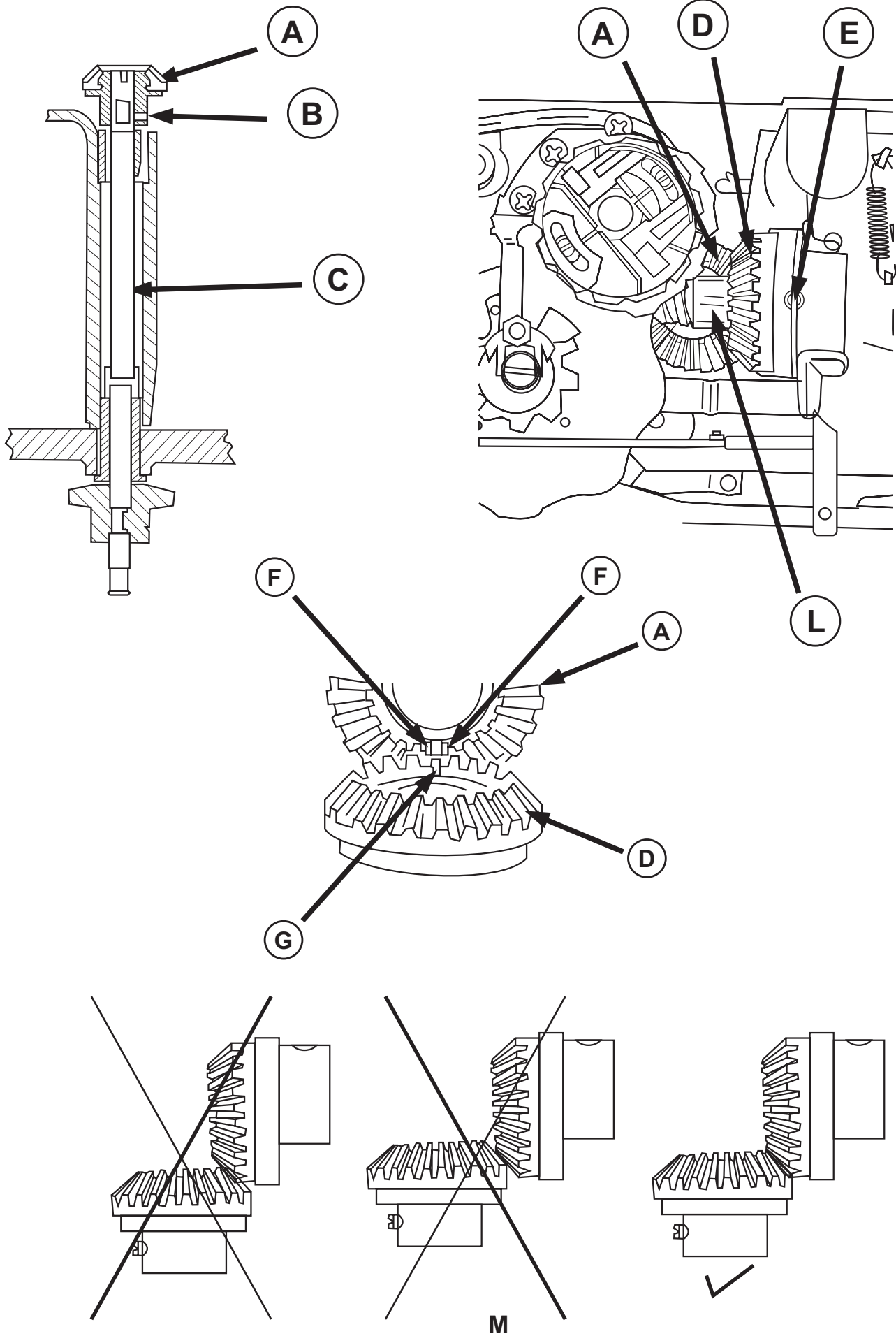
## Feed forked connection

### Removal:

- 1 Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front), the buttonhole assembly (see pages 51-52) and the hand wheel.
- 2- Remove screw nut (I) and the eccentric screw (H).
- 3- Position the top of the eccentric gear at the back of the machine
- 4- Turn shaft (E) counterclockwise until stitch regulator stroke is in the vertical position and keep it in that position
- 5- Remove the fork by pushing it down

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- Adjust feed dog throw.(See pages 102-103)



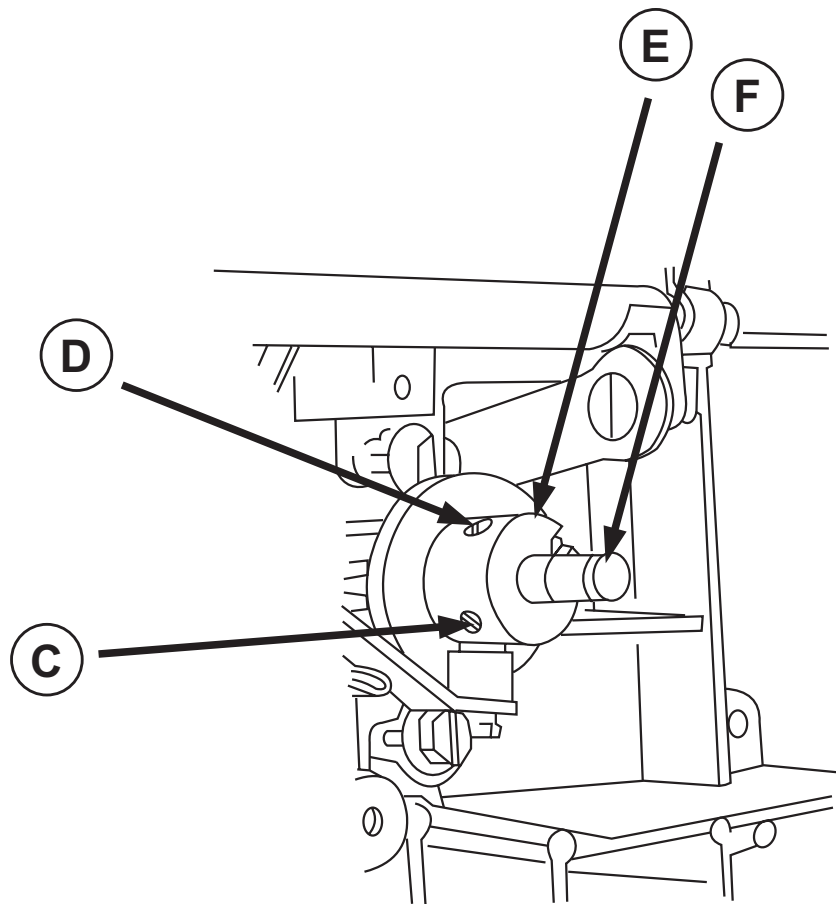
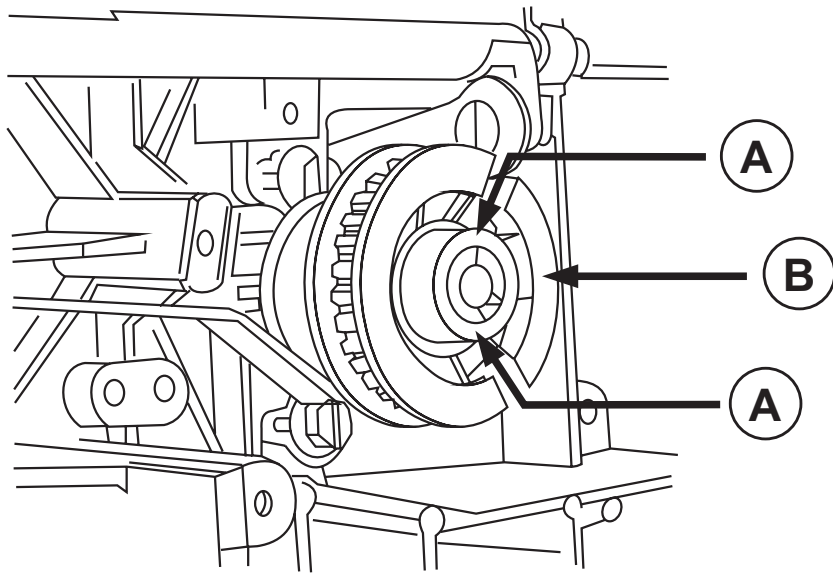
## Vertical shaft bevel gear

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front), the front head end assembly, the buttonhole assembly, the take-up lever assembly, camstack and hand wheel.
- 2- Remove arm shaft sufficiently to clear vertical shaft bevel gear (A).
- 3- Rotate vertical shaft (C) until vertical gear set screw (B) is accessible.
- 4- Loosen set screw (B) to remove gear (A).

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- Check for vertical shaft end play and adjust if necessary. (See pages 54-55)
- 3- Locate gear (A) so the top of the gear hub is even with the top of the vertical shaft (C).
- 4- Locate arm shaft bevel gear (D) on the arm shaft. (See also "Bevel gear mesh and arm shaft end play" on pages 56-57)
- 5- Position arm shaft bevel gear (A) and (D) so that the mark (G) on the gear (D) straddles the marks (F) on the gear (A).
- 6- Lightly move bevel gear (D) to the left until it just touches vertical shaft gear (A).
- 7- Tighten bevel gear set screw (E) making sure it is correctly located in the "V" shaped groove in the horizontal shaft.
- 8- Rotate the arm shaft (L) slowly several times. Observe the position of the two gears with relation to each other. The top edges of the gears should be even with each other (illustration M). If this condition does not exist, it will be necessary to repeat the above procedure and move the vertical bevel gear (A) up or down in order to achieve the correct position.
- 9- Adjust camstack radial play, take-up lever and needle bar connecting link lost motion, pendulum timing, needle location left-to-right and needle to hook relationship. (See pages 58 to 62, 66-67 and 72 to 75)
- 10- Check and adjust, if necessary:
  - needle bar height. (pages 64-65)
  - left-center-right needle position. (pages 70-71)
  - zig-zag lever bight stops (pages 76-79)
  - presser bar height (pages 84-85)
  - hook timing (pages 88-89)



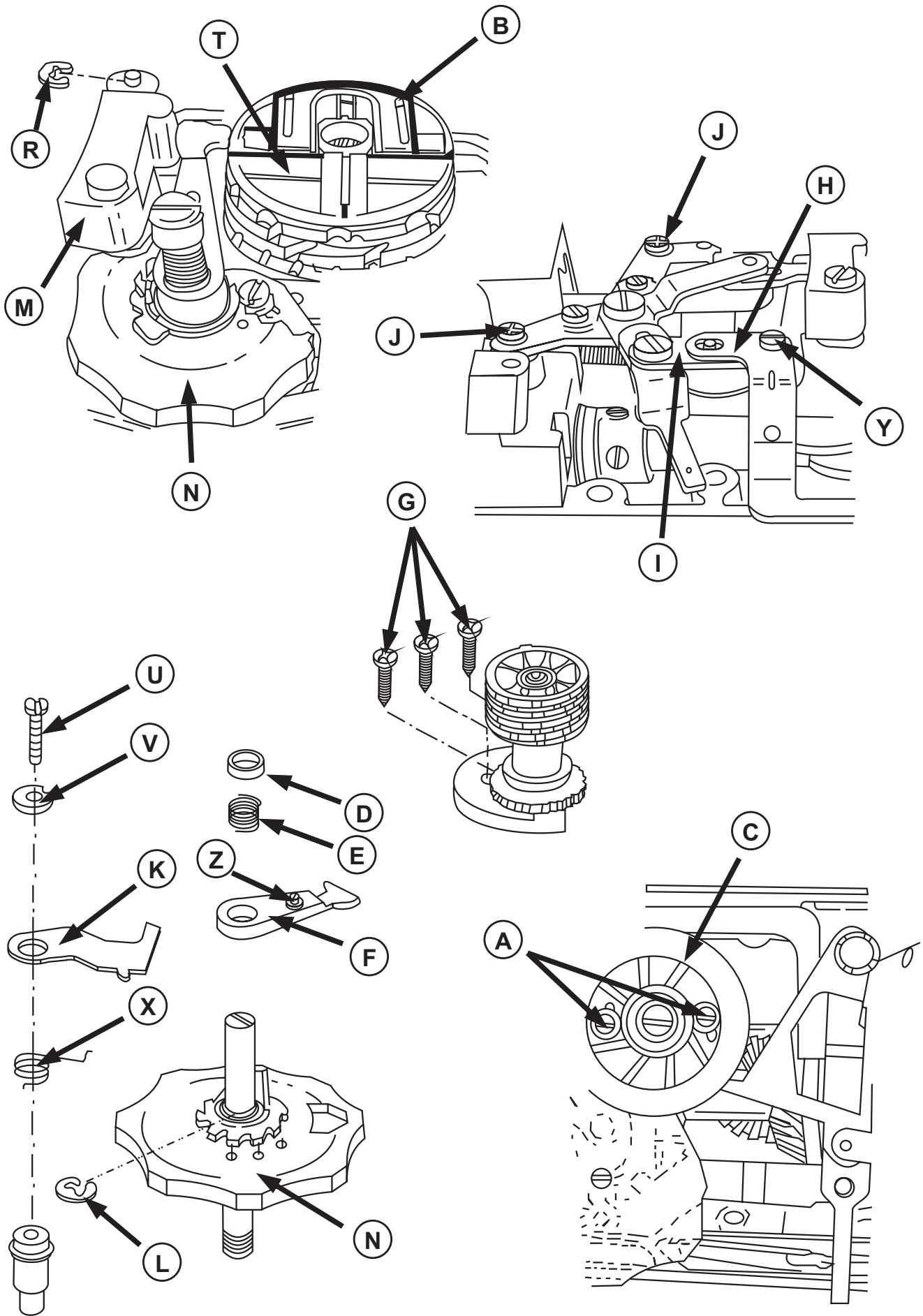
## Vertical shaft

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front), the head end assembly, the buttonhole assembly, the take-up lever assembly, camstack, hand wheel, horizontal shaft and vertical shaft bevel gear.
- 2- Loosen the two belt drive pulley screws (A) sufficiently to remove it.
- 3- Loosen the two feed lifting cam screws (C) and (D) sufficiently to remove the vertical shaft
- 4- Draw vertical shaft (F) up out of machine with plastic washer and the felt, removing also feed cam (E) with the washer.

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- When replacing feed lifting cam (E) find the screw (D) nearer to the groove in the cam hub on the flat of vertical shaft (F).
- 3- Refer to "Vertical shaft bevel gear" on pages 43- 44 and "Vertical shaft end play" on pages 54-55 for gear setting procedure.
- 4- Check feed dog height and adjust if necessary.(See pages 100-101)





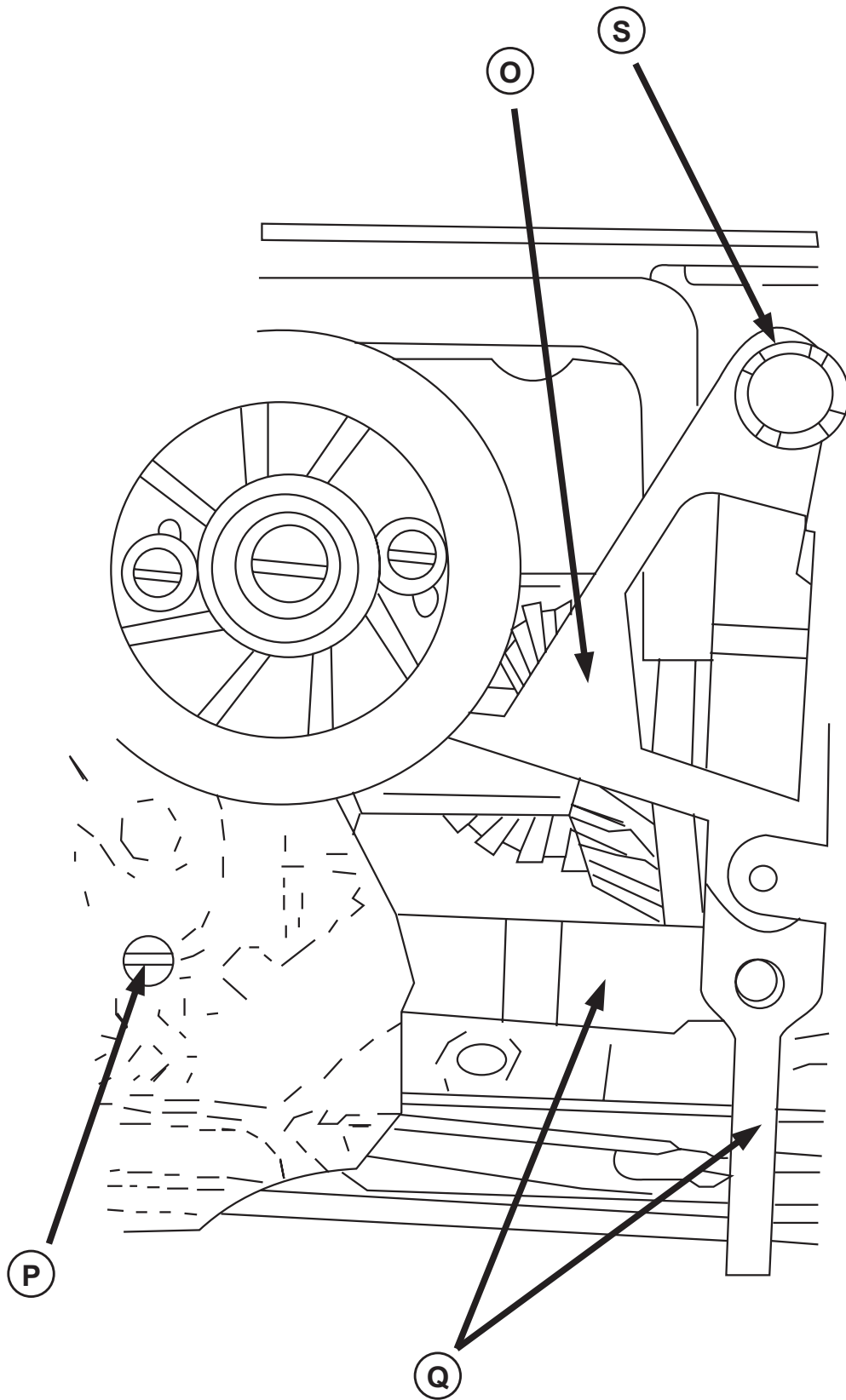
## Pattern selector mechanism

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, and all covers (face plate, rear, bottom bed and front).
- 2- Remove screws (A) (Only for model 5417)
- 3- Remove camstack (C).
- 4- For model 5430, place the handle (B) in the vertical position and pull it up out of the camstack (T).
- 5- Remove the screws (G) and the camstack gear assembly..
- 6- Remove pattern selector dial retaining ring (plastic)(D).
- 7- Remove spring (E) together with the disc follower (F)
- 8- Remove screws that hold the covers together (Y)
- 9- Remove the screws ( J ) and then the stitch length lever assembly
- 10- Remove the screw (U), the washer (V), the lever (K) and the spring (X)
- 11- Remove the retaining ring (R) out of the needle bar driving arm slide block (M)
- 12- Remove the retaining ring (L) out of pattern selector dial (N).
- 13- Remove needle bar driving arm slide block (M) together with the pattern selector dial (N).

### Replacement:

- 1- Replacement is the same as removal in reverse order.
- 2- Check and adjust if necessary:
  - Left-center-right needle position. (Pages 70-71)
  - Disc and disc follower clearance. (Pages 58-59)
  - Cam stack radial play (Pages 58-59)
  - Needle bar pendulum timing. (Pages 66-67)
  - Buttonhole cutting space. (Pages 116-117)
  - Needle location left-to-right (Pages 70-71)
  - Zig-zag bight stop positioning (Pages 76 to 79)



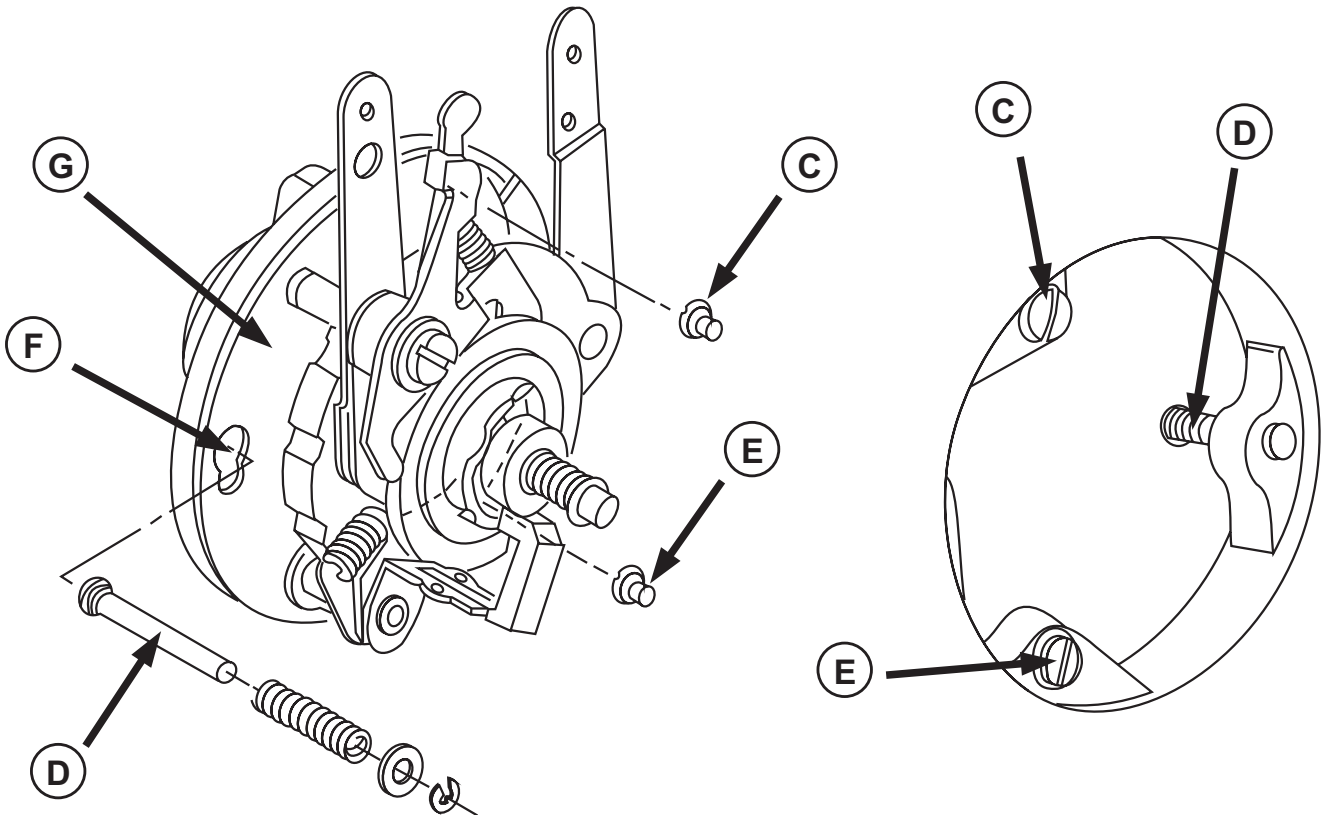
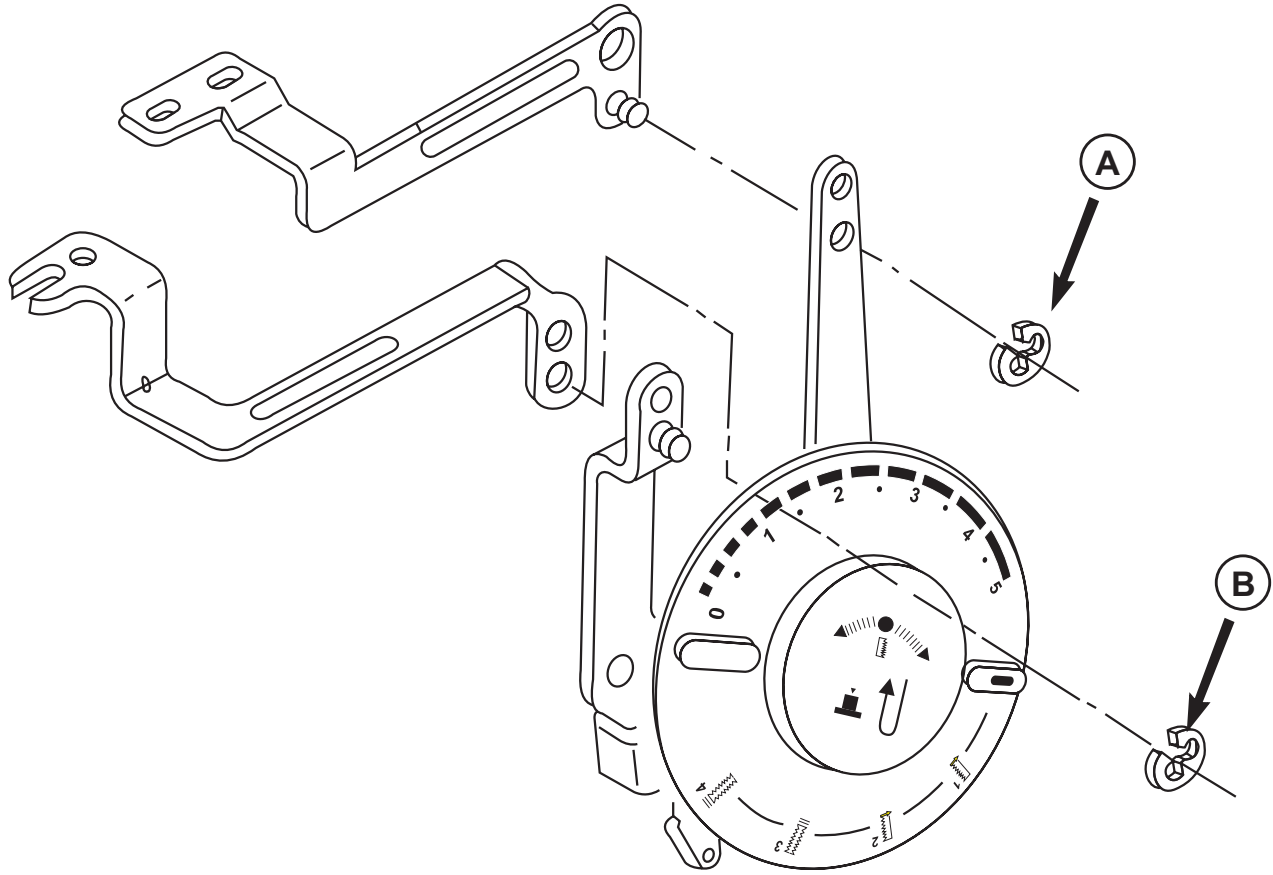
## Needle position selector lever

### Removal:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front).
- 2- Remove retaining ring (S), the cam controlled feed follower (O) and the retaining ring located under it.
- 3- Remove link screw (P) through the pattern selector dial hole.
- 4- Remove needle position selection lever assembly (Q).

### Replacement:

- 1- Replacement is the same as removal but in reverse order.
- 2- Check and adjust if necessary:
  - Left-center-right needle position. (Pages 70-71)
  - Disc and disc follower clearance. (Pages 58-59)
  - Cam stack radial play (Pages 58-59)
  - Needle bar pendulum timing. (Pages 66-67)
  - Buttonhole cutting space. (Pages 116-117)
  - Needle location left-to-right (Pages 70-71)
  - Zig-zag bight stop positioning (Pages 76 to 79)



## Stitch length and buttonhole control assembly

### Removal:

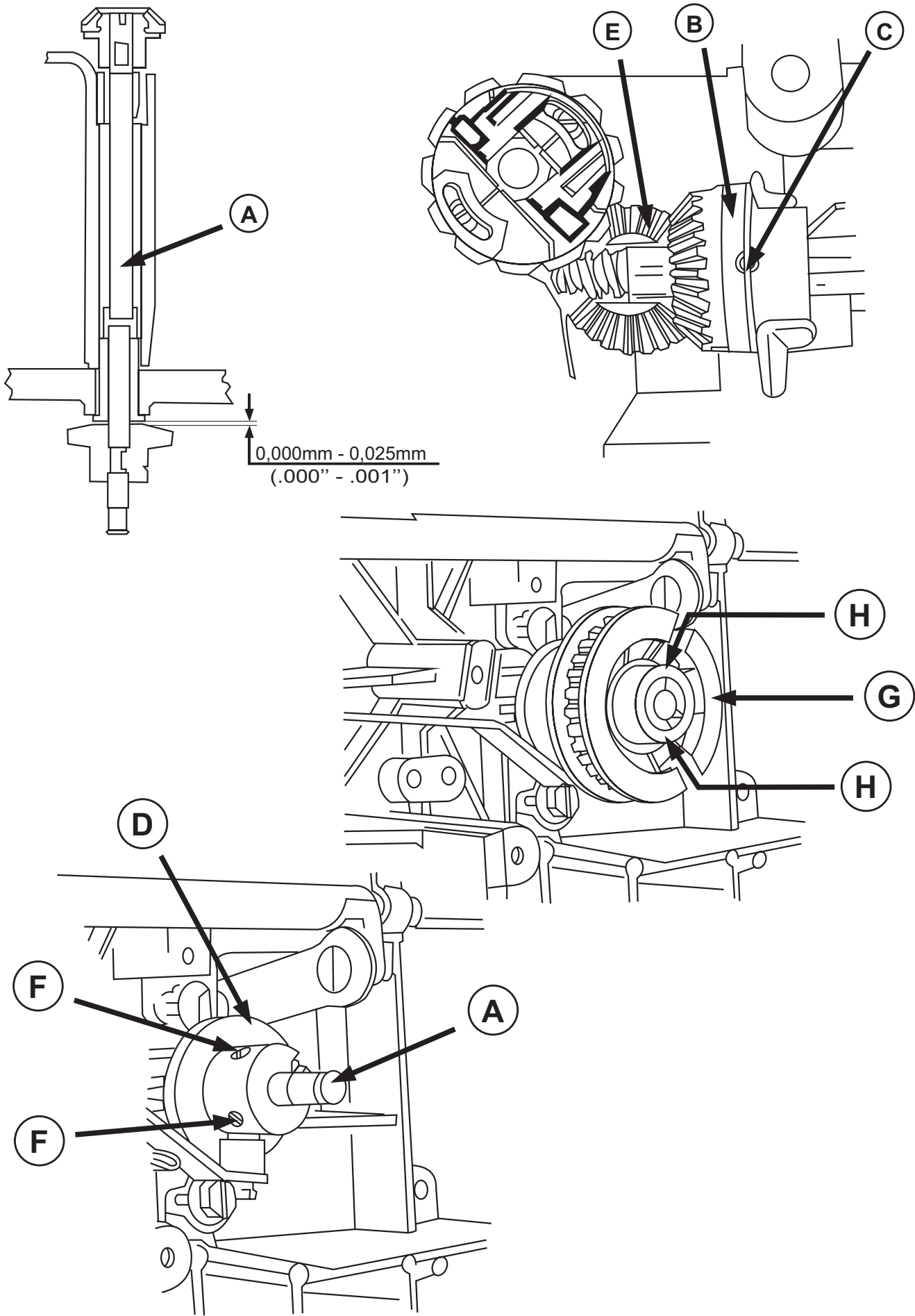
- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 3- Set stitch length and buttonhole control dial to "buttonhole step 1".
- 4- Remove retaining rings (A) and (B)
- 5- By means of a broad bladed screw driver press the pin (D) forward from inside of the machine.
- 6- While pressing stud (D), rotate the entire assembly clockwise until the heads of the studs (C), (D) and (E) are clear of the holes in plate (G).
- 7- Tilt the bottom of the assembly away from the machine and draw the assembly downward to remove.

### Replacement:

- 1- Set the stitch length and buttonhole dial at maximum stitch length.
- 2- Insert the assembly in the machine aligning the head to stud (D) with the large hole (F) in plate (G).  
If properly aligned, the assembly should be seating flush against the machine casting.
- 3- Slightly depress stud (D) toward the front of the machine and press firmly while rotating the assembly slightly counterclockwise until the heads of studs (C), (D) and (E) snap into the openings of the plate (G).
- 4- Replace retaining rings (A) and (B) and the cam controlled feed mechanism.
- 5- Check and adjust if necessary:
  - Left-center-right needle position (Pages 70-71)
  - Zero feed (Pages 114-115)
  - Alignment of lever knobs with panel graphics (Pages 82-83)
  - Buttonhole cutting space (Pages 116-117)

**Section II**

**Sequential order of  
adjustment procedures**



## Vertical shaft end play

The vertical shaft must be set to have 0.000 mm - 0.025 mm (.000" - .001") end play before setting the arm shaft bevel gear and vertical shaft gear mesh. If incorrectly set, noise may be generated.

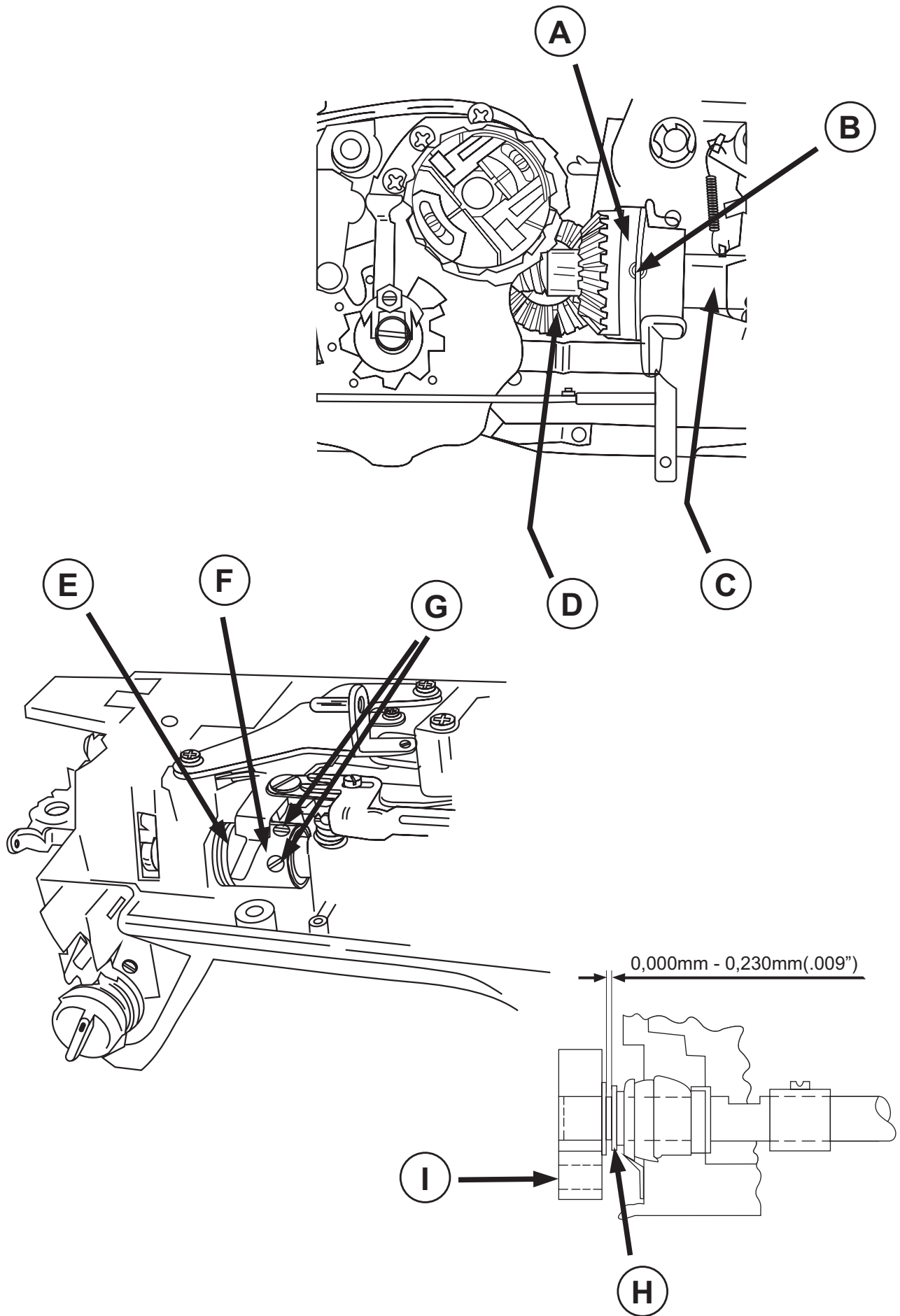
### Check:

- 1- Remove the tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front).
- 2- Push belt drive pulley (G) up and down to check any existing excessive play.

### Adjustment:

- 1- Loosen the two screws (H) in the belt drive pulley (G) sufficiently to clear the recess in the vertical shaft (A) and remove pulley (G) .
- 2- Loosen the two set screws (F) in feed cam (D) approximately one turn.
- 4- While pulling down on vertical shaft (A) push up on the feed cam (D).
- 5- Tighten feed cam screws (F).
- 6- Recheck for vertical shaft end play and make sure the shaft rotates freely without binds.
- 7- Replace belt drive pulley (G) being sure it is properly seated up against feed cam (D).
- 8- Adjust arm shaft end play and make the gear (B) of the arm shaft match the gear (E) of the vertical shaft by tightening screw (C). (See pages 43 to 46).
- 9- Adjust hook timing. (See pages 88-89).





## Bevel gear mesh and arm shaft end play

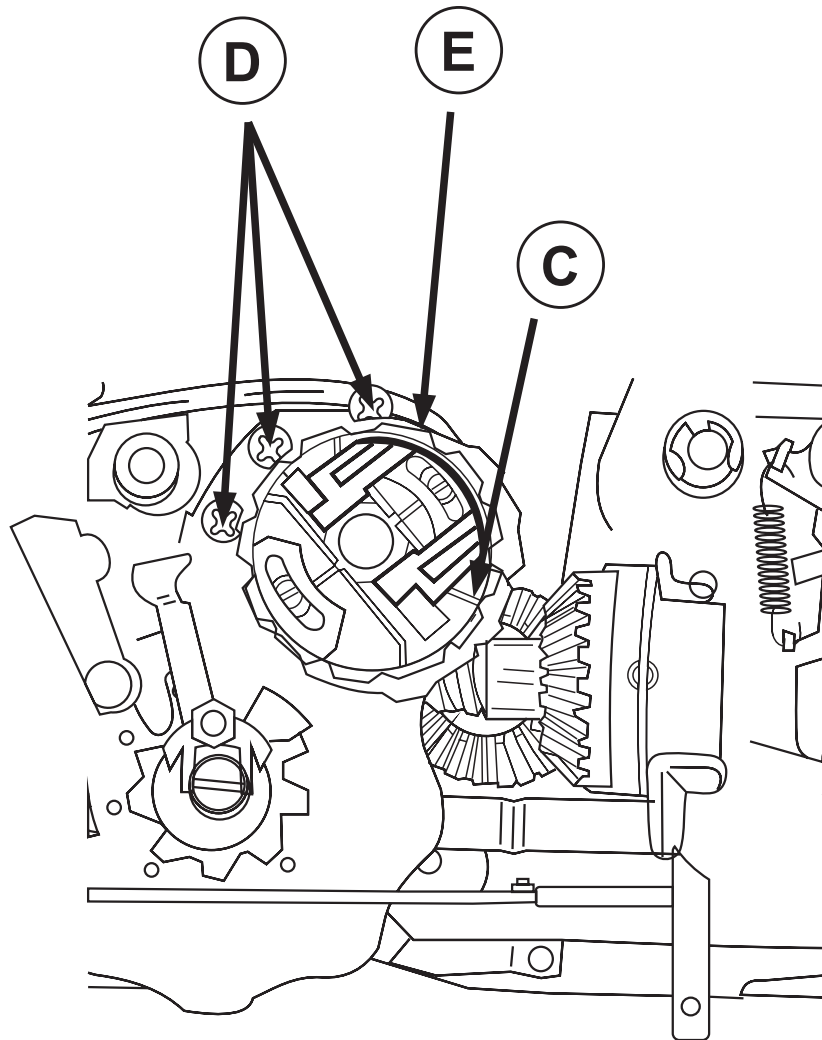
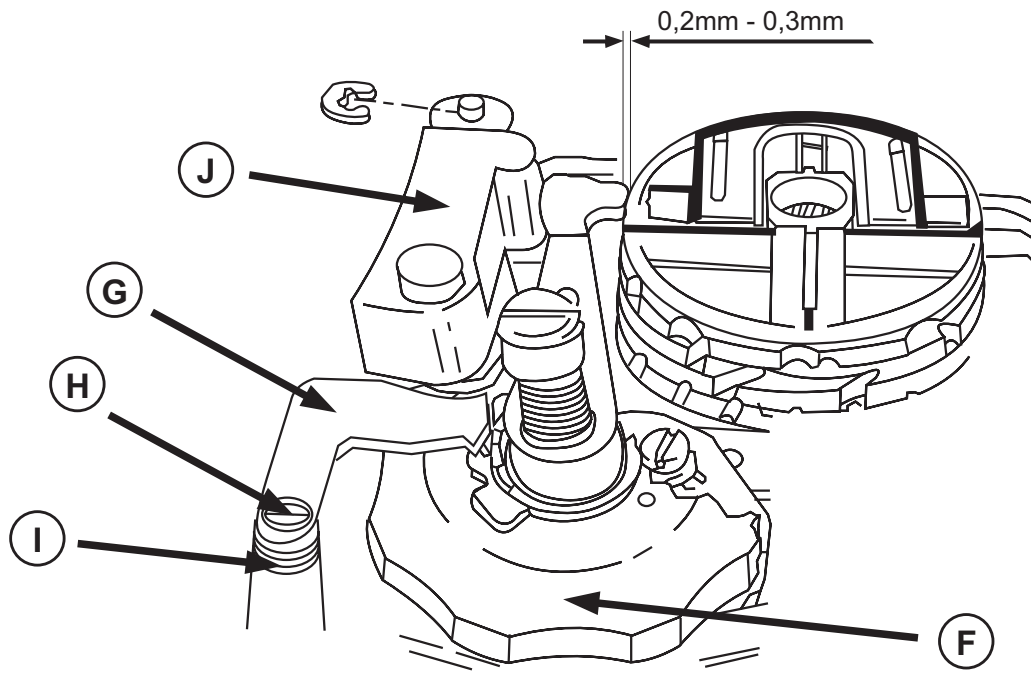
The arm shaft should not have any perceptible shake or end play when assembled in the machine and should rotate freely without binds.

### Check:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Check for arm shaft end play by pushing it left to right and adjust if necessary.

### Adjustment:

- 1- Loosen the two set screws (G) in arm shaft collar (F).
- 2- Push arm shaft (C) to the left by means of the hand wheel.
- 3- Through the access hole in the front of the casting insert a 0,23 mm (.009") shim gauge between the plastic washer (H) and the needle bar crank (I).
- 4- While maintaining the position of the shim gauge, pull the arm shaft (C) to the right by means of the hand wheel.
- 5- Loosen the screw (B) on the bevel gear (A) and lightly move bevel gear (A) to the left until it just touches vertical shaft gear (D).
- 6- Tighten screw (B).
- 7- Remove the shim gauge and lightly move the arm shaft (C) to the right.
- 8- While maintaining the position of the arm shaft to the right, bring collar (F) and washer (E) to the left until they just touch the bushing in the casting.
- 9- Tighten then the collar set screws (G) making sure one of them is located on the flat of arm shaft (C).



## Disc and disc follower play

The disc follower should be adjusted so that a 0,2 - 0,3 mm. (.007" - .011") play is obtained between its contact point and the top of the disc tooth.

### Check:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front).
- 2- Set the zig-zag lever to its maximum width.
- 3- Set the pattern selector dial (F) between "A" and "B". In this position the "leg" of the isolating lever (G) will be placed on the top of the selector dial tooth.
- 4- There should be then a 0,2 - 0,3 mm. (.007" - .011") play between the disc follower contact point and the top of the disc tooth.

### Adjustment:

- 1- Set the zig-zag lever to its maximum width.
- 2- Rotate the hand wheel until you meet the disc follower contact point on top of the disc tooth.
- 3- Set the pattern selector dial (F) between "A" and "B". In this position the "leg" of disc follower disengaging lever (G) will be placed on top of the pattern selector dial tooth.
- 4- Loosen the screw (H).
- 5- Turn eccentric washer (I) so that the frontal point of disc follower disengaging lever (G) touches the arm slide block (J).
- 6- Tighten screw (H).
- 7- Recheck the play and adjust once again if necessary.

## Camstack radial play

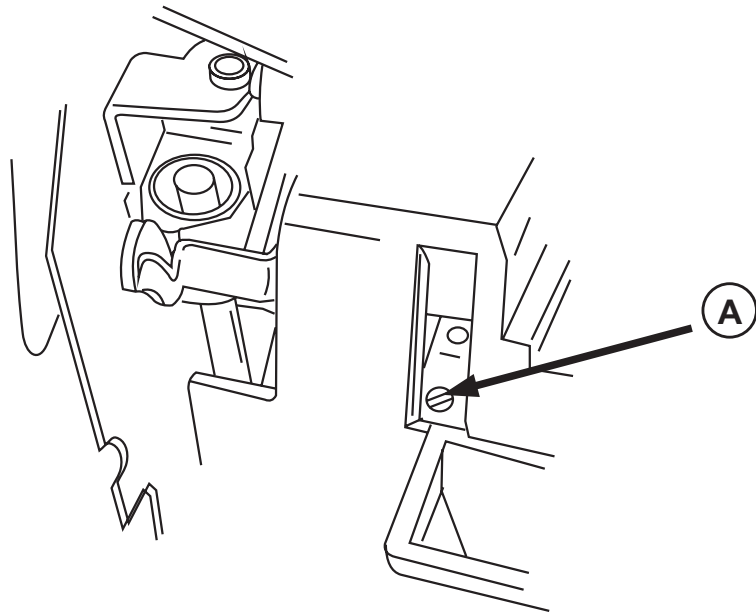
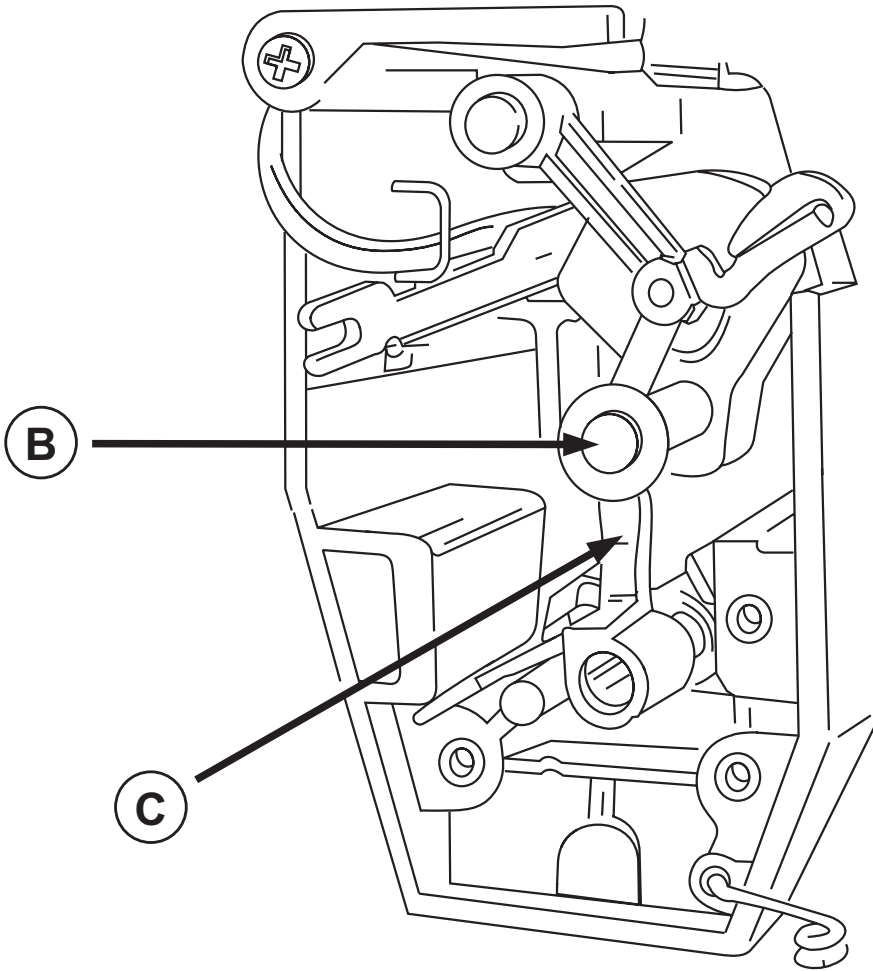
For the camstack to perform reliably, there should be a minimum of radial play consistent with uniform operating tone.

### Check:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front).
- 2- Set machine for straight stitch.
- 3- Rotate the camstack (C) back and forth. Rotate hand wheel for one complete turn of the camstack. Check for rotational play at four equidistant points (each 90° approximately) on a full revolution of the camstack. If there is one point without rotational play in a complete revolution of the camstack, no adjustment is needed even though radial play may exist in other positions.

### Adjustment:

- 1- Loosen the three camstack mounting plate screws (D).
- 2- Move camstack gear assembly (E) toward the worm gear of the arm shaft to eliminate rotational play and away from the worm gear of arm shaft to eliminate binding.
- 3- Tighten the three mounting screws (D). (See pages 23-24)
- 4- Recheck for rotational play and readjust if necessary.



## Take-up lever and needle bar connecting link lost motion

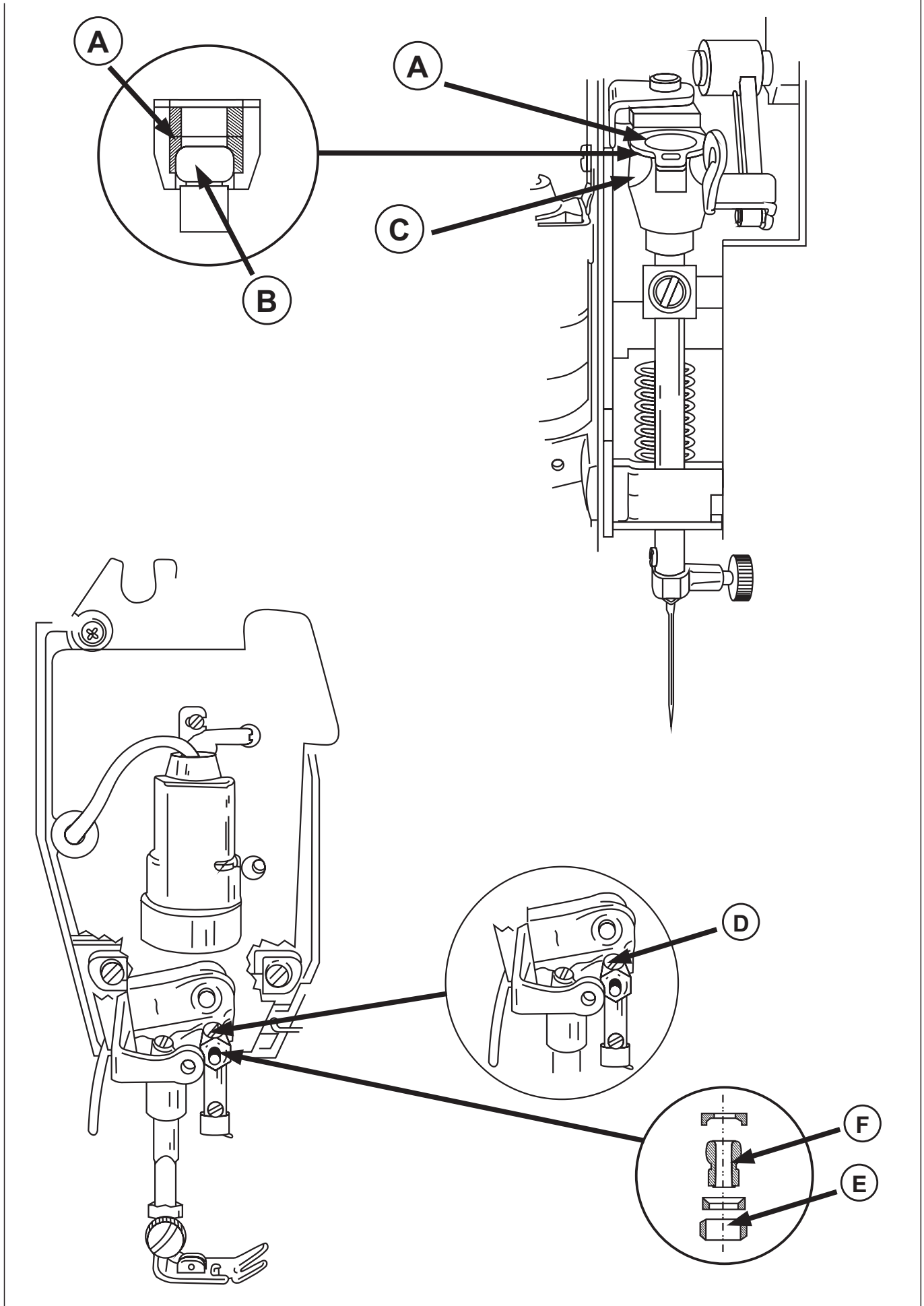
Looseness in either or the take-up lever and needle bar connecting link will cause the machine to run noisy and may cause irregular stitching.

### Check:

- 1- Remove needle and presser foot.
- 2- Run machine at high speed and check for rapping noise in head end.
- 3- Turn hand wheel toward the front of the machine to bring the needle bar to its lowest position.
- 4- Grasp the needle clamp and check for excessive vertical and radial play by moving needle bar up and down rotatively.

### Adjustment:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front).
- 2- Loosen thread take-up screw (A).
- 3- Firmly press thread take-up stud (B) against needle bar connecting link (C) and tighten screw (A).
- 4- Turn the hand wheel through several revolutions and check for binds at several different positions. Readjust if necessary.
- 5- Recheck for noise and vertical or radial play of the needle bar. If excessive play still exists, the thread take-up lever and/or the needle bar connecting link is worn and must be replaced. (See pages 19-20)



## Needle bar bearings

Looseness of the needle bar bearings will cause irregular stitching and may cause needle breakage.

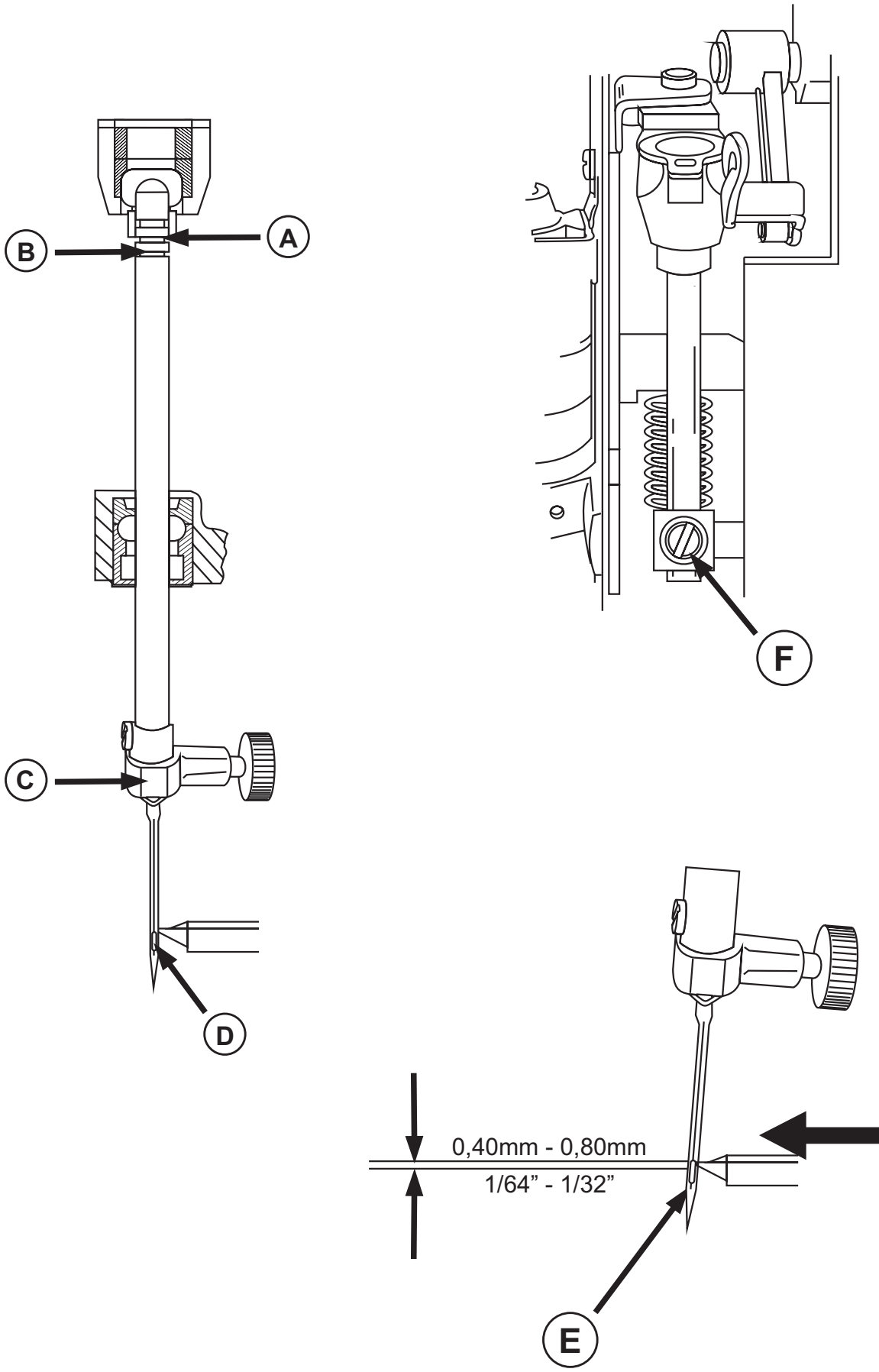
### Check:

- 1- Turn hand wheel toward front of the machine to bring needle bar to its lowest position.
- 2- Grasp needle clamp and check for excessive front-to-back play.-
- 3- Place needle bar in right needle position.
- 4- Push needle clamp fully to the left and check for binding by slowly releasing the needle bar. It should move smoothly to the right.
- 5- There must be no excessive play or binding in the needle bar bearings.

### Adjustment:

- 1- Loosen screw (D).
- 2- Press up on collar (E) by means of a small screwdriver with just sufficient pressure to eliminate play in ball bushing (F), yet not bind bushing (F) in its housings.
- 3- Tighten screw (D).
- 4- Recheck front to back play of needle bar as described in "Checking items 1 and 2" above. If excessive play persists replace spring in upper bushing assembly.





## Needle bar height

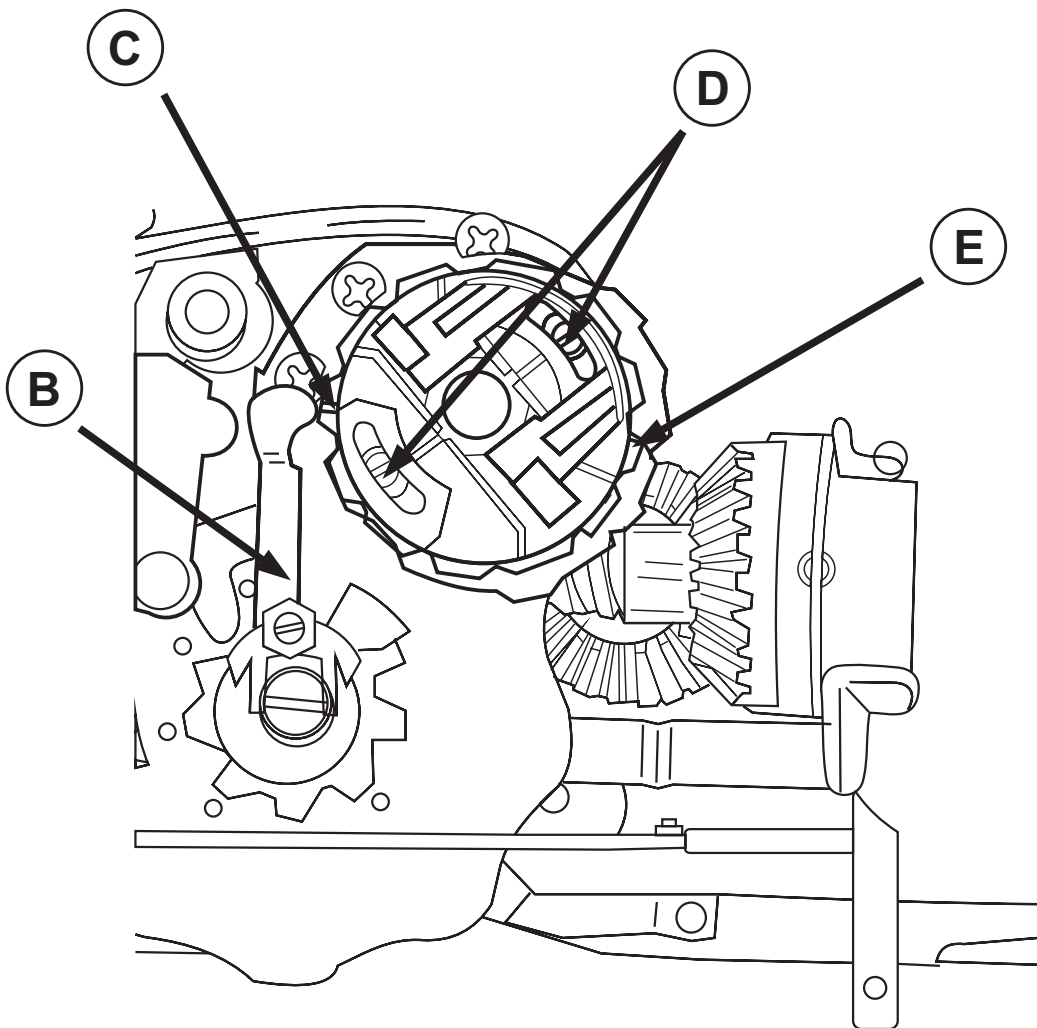
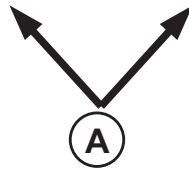
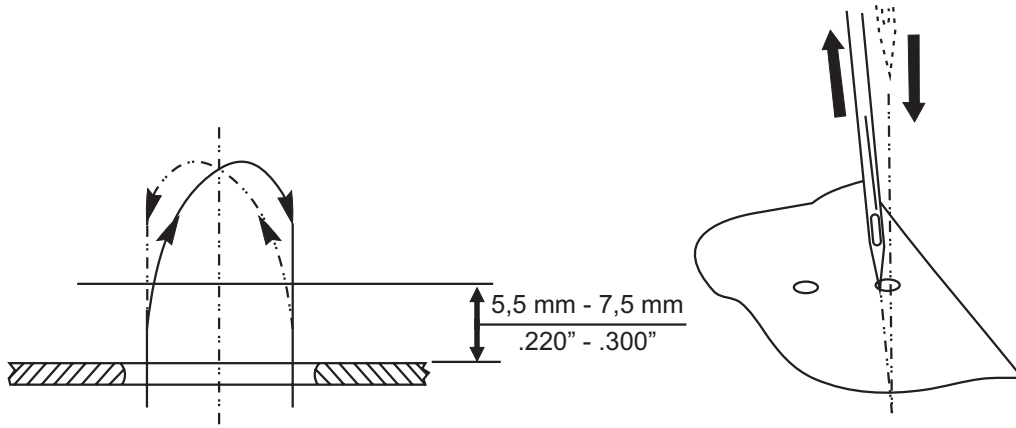
Three rings are cut into the upper end of the needle bar. The distance between the center and lower ring represents the rise required to form a thread loop at the eye of the needle required for hook point seizure.

### Check:

- 1- Remove face plate, presser foot, needle, needle plate and bobbin case.
- 2- Insert a size 18 needle in the needle bar.
- 3- Set machine for straight stitch, center needle position.
- 4- Turn the hand wheel toward the front of the machine to bring the needle bar to its lowest position.
- 5- Observe the position of the center timing mark (A) with relation to the bottom face of the upper needle bushing.
- 6- Turn the hand wheel toward the front of the machine to bring the lower timing mark (B) to the same relative position as previously occupied by the center needle bar timing mark. In this position the point of the hook (D) should be within the width of the blade of the needle. Adjust hook timing, if necessary, to satisfy this requirement. (See pages 88-89)
- 7- Select zigzag, maximum width. Turn the hand wheel toward the front of the machine to move the hook point to the rear of the needle when the needle is in the left zigzag position. The top of the needle eye (E) should be 0,40 mm - 0,80 mm (1/64" - 1/32") below the underside of the hook point.

### Adjustment:

- 1- Loosen needle bar clamping screw (F) and raise or lower the needle bar to suit the left needle position requirements.
- 2- Tighten screw (F) to pinch tightness.
- 3- Needle clamp hub (C) should be parallel with the front edge of the needle plate.
- 4- Securely tighten screw (F).



## Needle bar pendulum timing

### Check:

- 1- Set the machine for zig-zag, maximum width.
- 2- Remove the presser foot.
- 3- With the presser bar in a raised position, hold a piece of paper in place over the needle plate, so needle penetration may be observed.
- 4- Turn hand wheel toward the front of the machine.
- 5- As the needle is rising from the right perforation, the point of the needle should be moving to the left lightly touching the edge of the paper without enlarging the hole and should reach its peak of ascent slightly past center of the two extreme positions of the needle. (illustration A).
- 6- On the downward stroke, all lateral movement should cease when the needle point is 5,5 mm - 7,5 mm (.220" - .300") above the needle plate. The needle must return into the opposite hole precisely.

### Adjustment:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Rotate hand wheel toward the front of the machine to bring reference mark (C) on the camstack opposite the follower (B) bring the needle to its lowest position in the left hand swing of zig-zag.
- 3- Loosen two camstack clamping screws (D).
- 4- Advance pendulum timing if needle begins its right to left movement too late by rotating camstack (E) slightly to the right (clockwise). Retard pendulum timing if needle begins its right-to-left movement too soon by rotating camstack (E) slightly to the left (counterclockwise).
- 5- Tighten one clamping screw (D) and recheck pendulum timing. Readjust if necessary.
- 6- If pendulum timing is correct, tighten both clamping screws (D) securely.

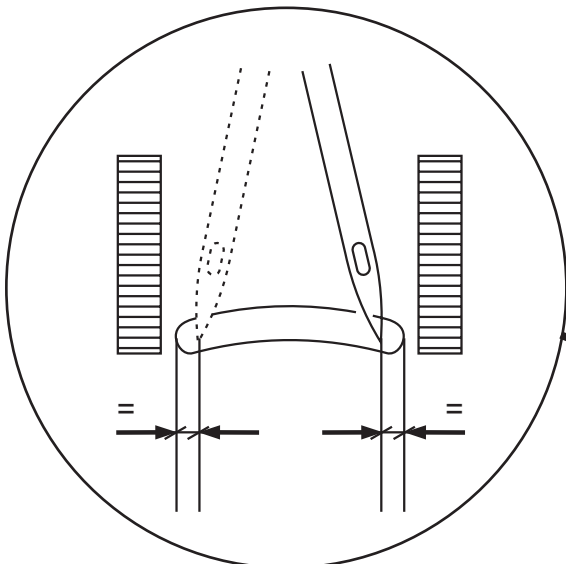
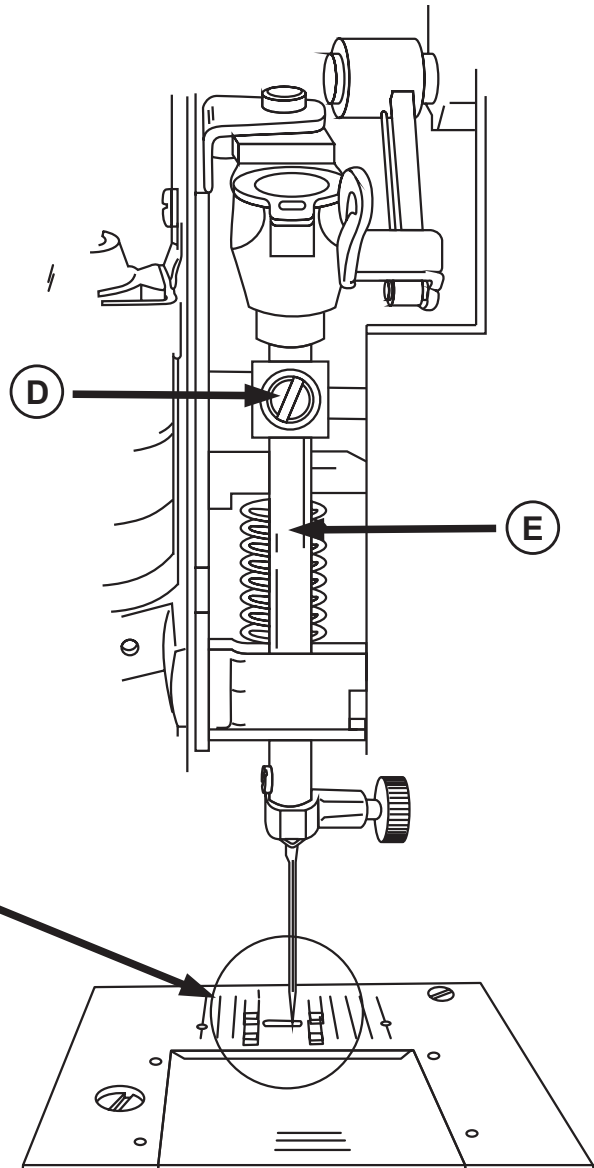
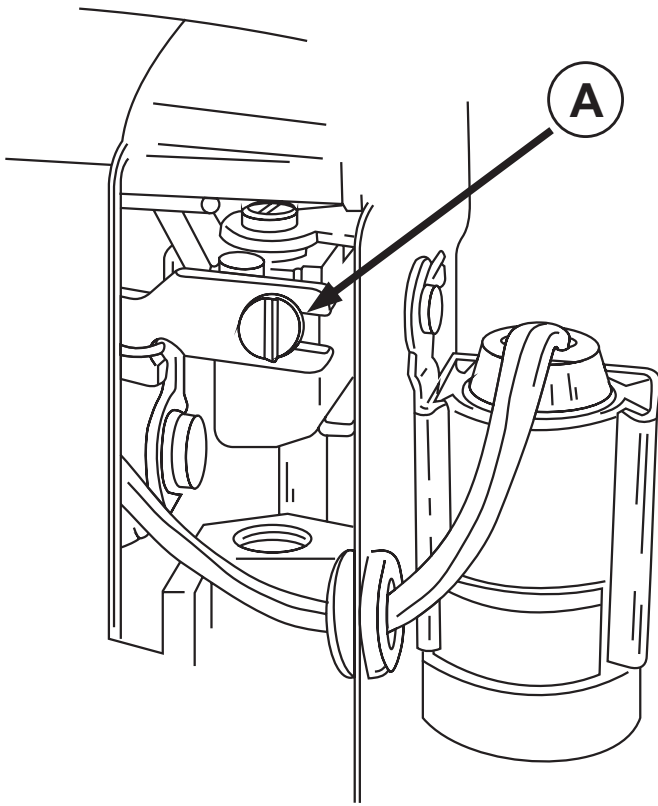


ILLUSTRATION F

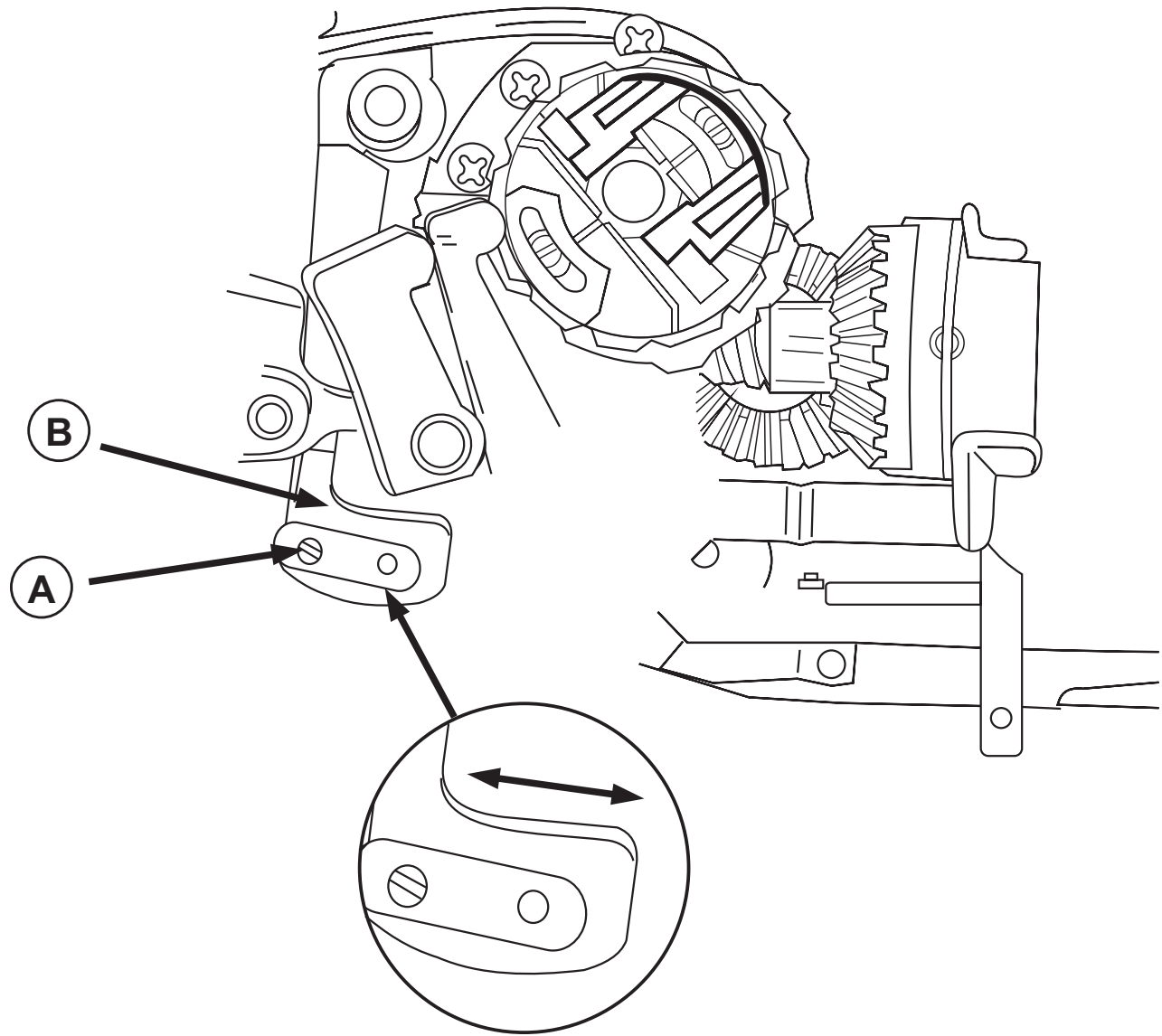
## Zig-zag centralizing procedure

### Check:

- 1- Set the machine for zig-zag, maximum width.
- 2- Remove the presser foot.
- 3- Rotate hand wheel to make the needle penetrate the needle plate slot left-to-right.
- 4- As the needle penetrates the slot left-to-right an equal lateral play should be maintained, according to illustration "F".

### Adjustment:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Set stitch width lever to maximum zig-zag.
- 3- Rotate the hand wheel toward the front of the machine, until the needle in its descending way, reaches the needle plate level.
- 4- Loosen screw (A).
- 5- Move needle bar (E) to right or left reducing or increasing the lateral play as you desire.
- 6- Without disturbing the position of the needle bar (E), tighten screw (A).
- 7- Recheck and readjust if necessary.



## Centralizing left-center-right needle position

The left and right zig-zag needle penetrations, at maximum width, must coincide with the left and right needle position when the machine is set for straight stitching.

### Check:

- 1- Set the machine for zig-zag, maximum width.
- 2- With the presser foot in a raised position, hold a piece of paper in place over the needle plate so needle penetrations may be observed.
- 3- Make left and right zig-zag needle penetrations in the paper.
- 4- Without disturbing the position of the paper move the stitch width lever to straight stitch, move the needle position lever to left needle position and rotate the hand wheel toward the front of the machine to bring the tip of the needle over the left zig-zag needle penetration in the paper.
- 5- Repeat for the right needle position.
- 6- The needle should enter the zig-zag needle penetrations precisely.

### Adjustment:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front) and presser foot.
- 2- Set stitch width lever at maximum zig-zag.
- 3- While holding a piece of paper over the needle plate, rotate the hand wheel until left and right needle penetrations are made in the paper.
- 4- Without disturbing the location of the paper move stitch width lever to straight stitch and needle position lever to left needle position.
- 5- Rotate hand wheel to bring the point of the needle above the left penetrations in the paper.
- 6- Loosen screw (A).
- 7- Move slide block bracket (B) to right or left until the needle coincides with the needle penetration.
- 8- Without disturbing the position of bracket (B) tighten screw (A).
- 9- Recheck and adjust if necessary.



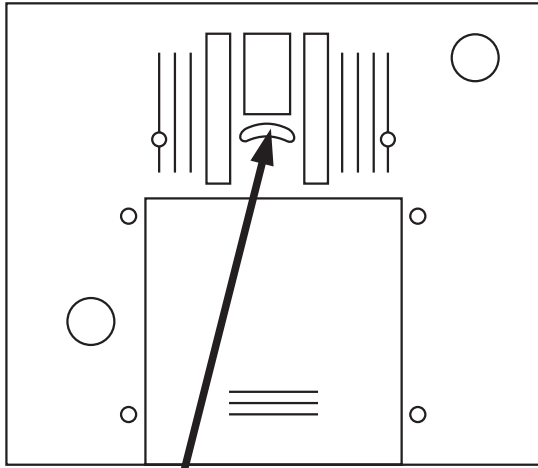
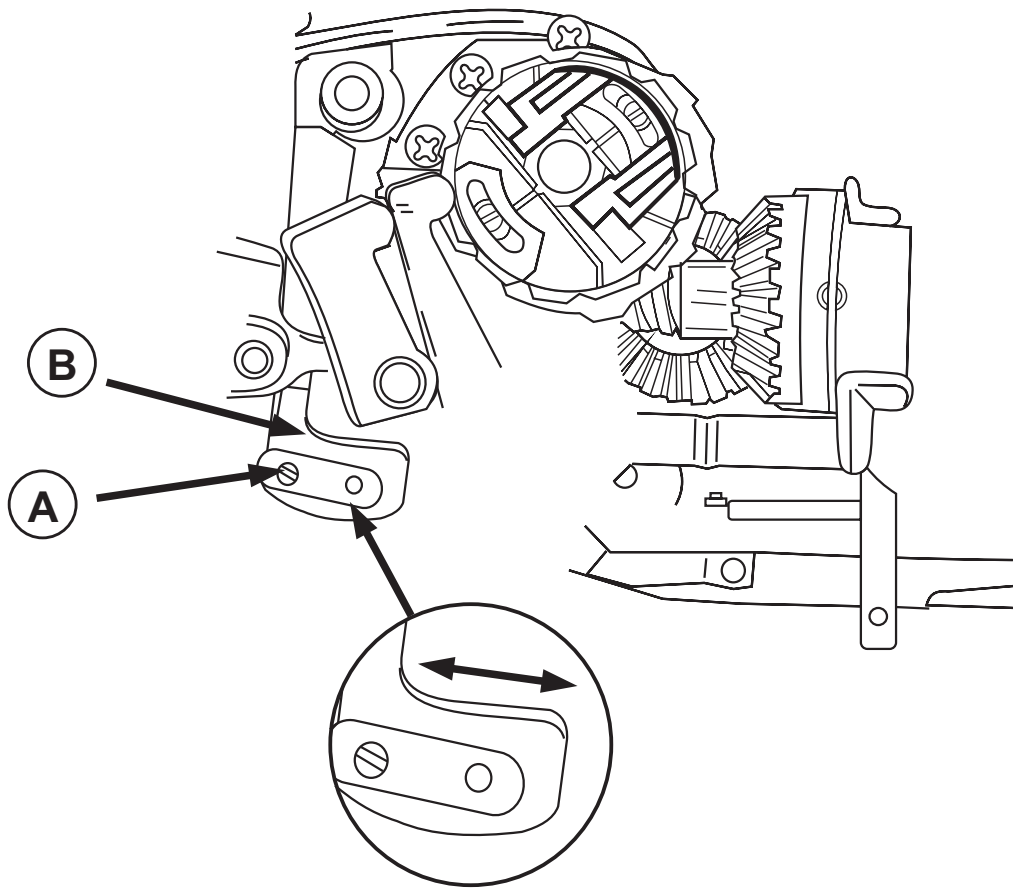
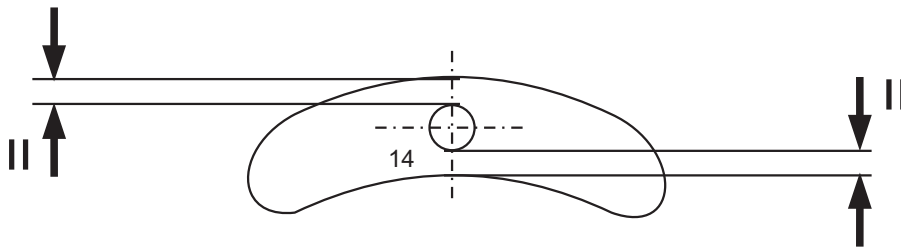


ILLUSTRATION "A"

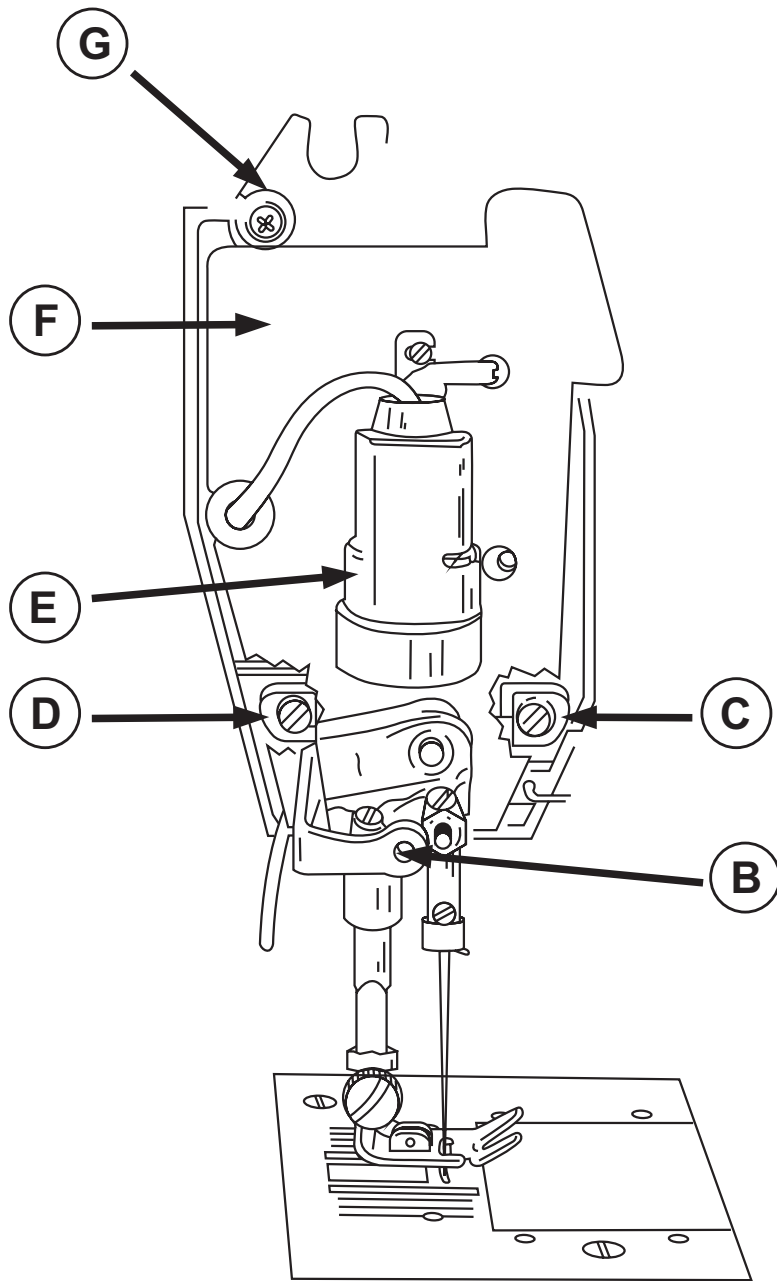
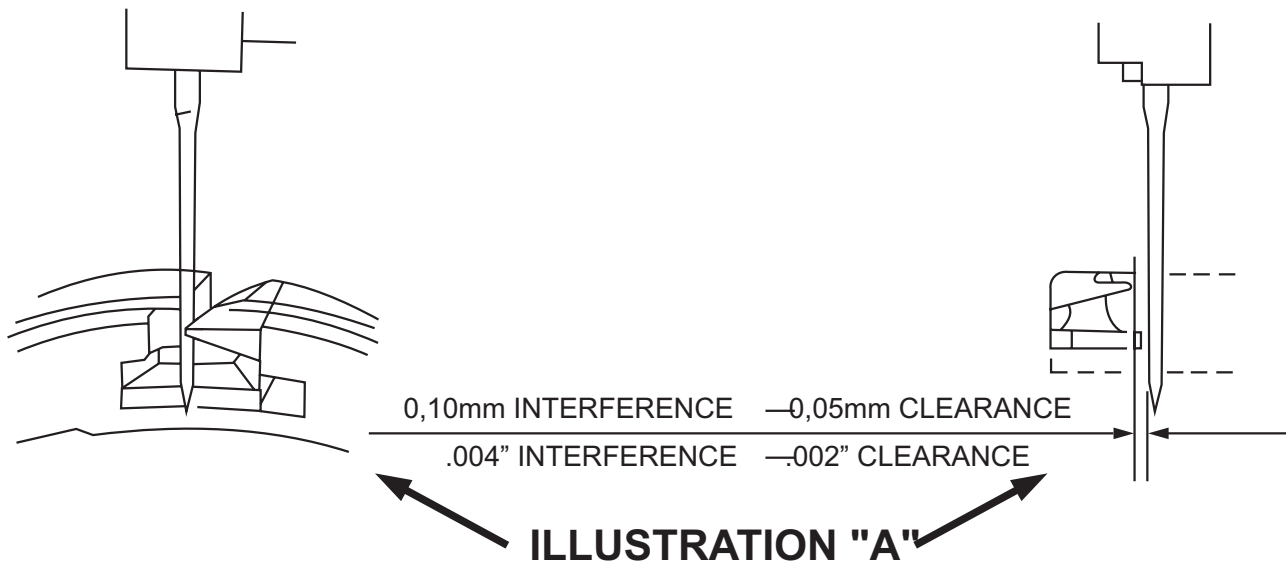


## Needle location in the needle plate slot

When a size 14 needle penetrates the needle plate slot, it must remain in the center of that opening.

### Adjustment:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front) and presser foot
- 2- Rotate hand wheel toward the front of the machine until a needle size 14 penetrates the needle plate slot (See illustration "A").
- 3- Loosen screw (A).
- 4- Move slide block bracket (B) to right or left until the needle is located in the center of needle plate slot in a position corresponding to 5/6 o'clock on a watch, and with a 0,18 mm (.007") clearance between the needle and the needle plate slot edge, as shown in the illustration "A".
- 5- Tighten screw (A).



## Needle to hook relationship

Proper needle to hook relationship is required to prevent skipping of stitches on various fabrics and to prevent hook and needle damage. If the needle is too far from the hook, the hook point will be unable to pick up the needle thread loop and skipping of stitches will occur. If the needle is too close to the hook, the hook point will strike the needle as it passes and may cause damage to the hook point or needle breakage.

Before attempting any adjustment, needle location and hook timing must be verified. Also, visually inspect the hook point for any damage. If the point is bent or burred, it must be replaced.

### Check:

- 1- Set the machine for straight stitch, center needle position.
- 2- Remove presser foot, needle plate and bobbin case.
- 3- Install a size 18 needle.
- 4- Turn the hand wheel toward the front of the machine until the point of the hook is directly behind the needle. There should be a 0,10 mm (.004") interference to a 0,05 mm (.002") clearance between the point of the hook and the needle (illustration A).

### Adjustment:

- 1- Remove needle plate, light, light socket (E) and light shield (F).
- 2- Loosen screws (C), (D) and (G) maintaining a pinch on the for control.
- 3- Pivot the head end assembly (B) on screw (G) front to back to obtain the proper distance between the needle and the hook point. (illustration A).
- 4- Securely tighten screws (C), (D) and (G).

## Feed rock shaft end play

There must be no end play or binds in feed rock shaft (C).

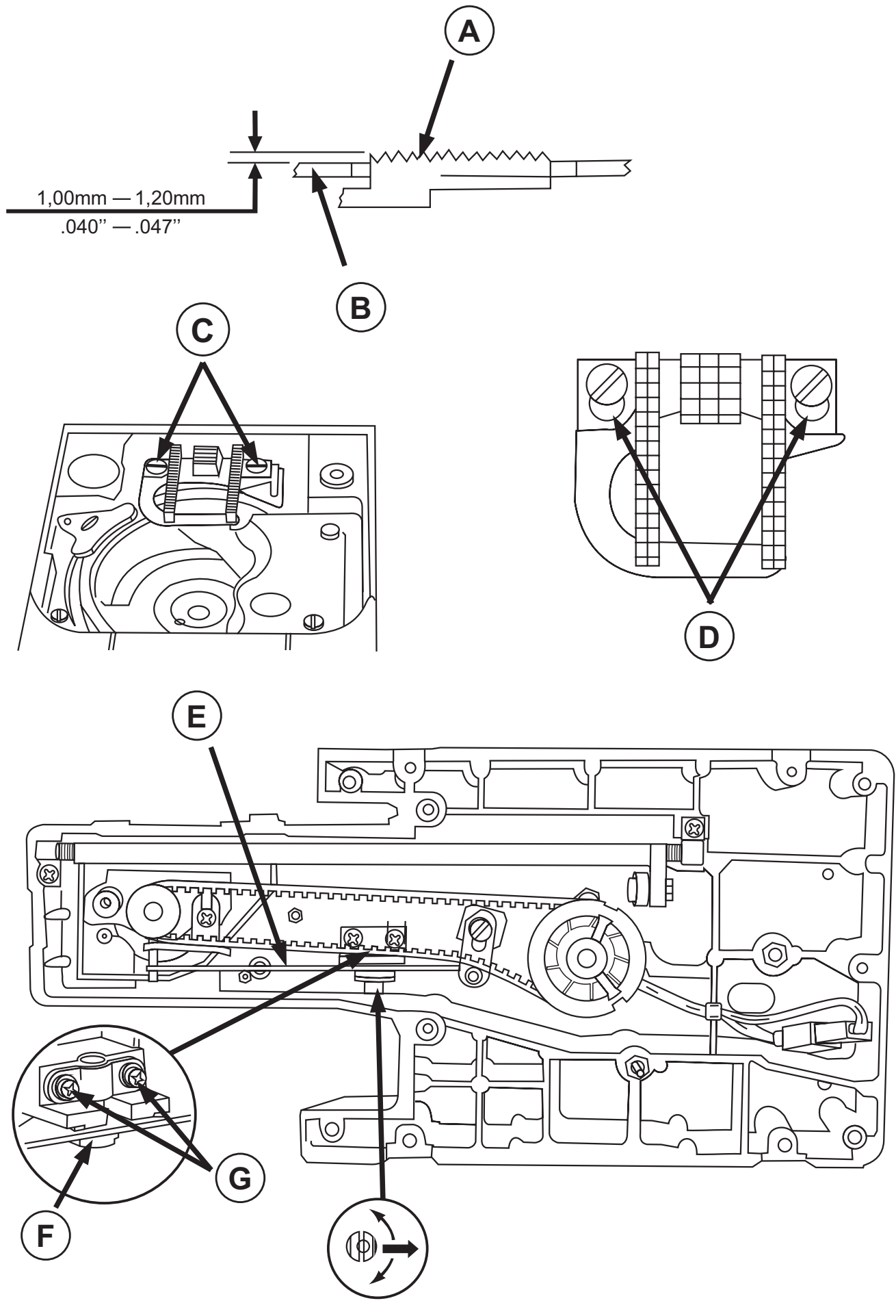
### Check:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front)
- 2- Move feed rock shaft (C) left to right to check for end play.

### Adjustment:

- 1- Hold feed rock shaft (C) to the left against rock shaft center (B) and check that the feed dog is centralized in the needle plate slots.
- 2- Loosen left center clamp screw (A) and move center (B) with rock shaft (C) left or right to centralize feed dog in needle plate slots.
- 3- Tighten left center clamp screw (A).
- 4- Loosen the right center clamp screw (F).
- 5- Move the right rock s

ies to the structure. It is important that when replacing these s



## Feed dog centralization

### Check:

- 1- Set the machine to straight stitch, maximum stitch length.
- 2- Turn the hand wheel toward the front of the machine to bring feed dog (A) to its highest point.
- 3- Feed dog (A) must be parallel to and centrally located in the needle plate slots.

### Adjustment:

- 1- Remove presser foot and needle plate.
- 2- Loosen the two feed dog screws (C) and move feed dog (A) as required to satisfy proper alignment. Feed dog screws (A) must be located at the very rear of the slots (D) in the base of the feed dog.
- 3- Tighten feed dog screws (C).

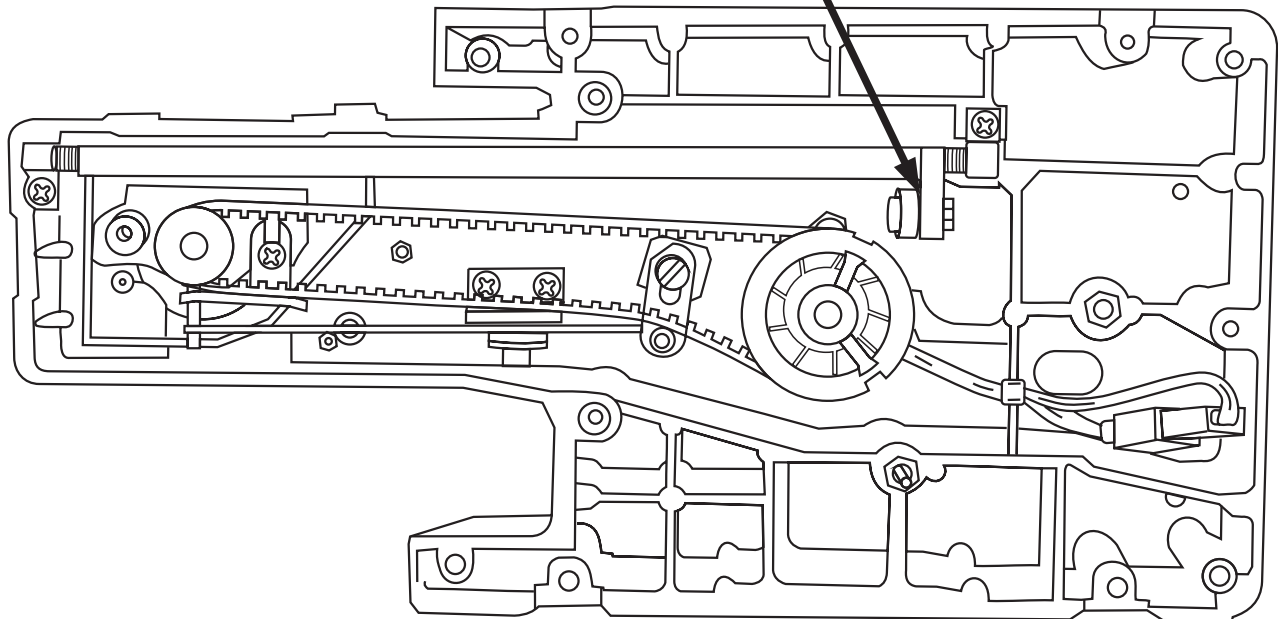
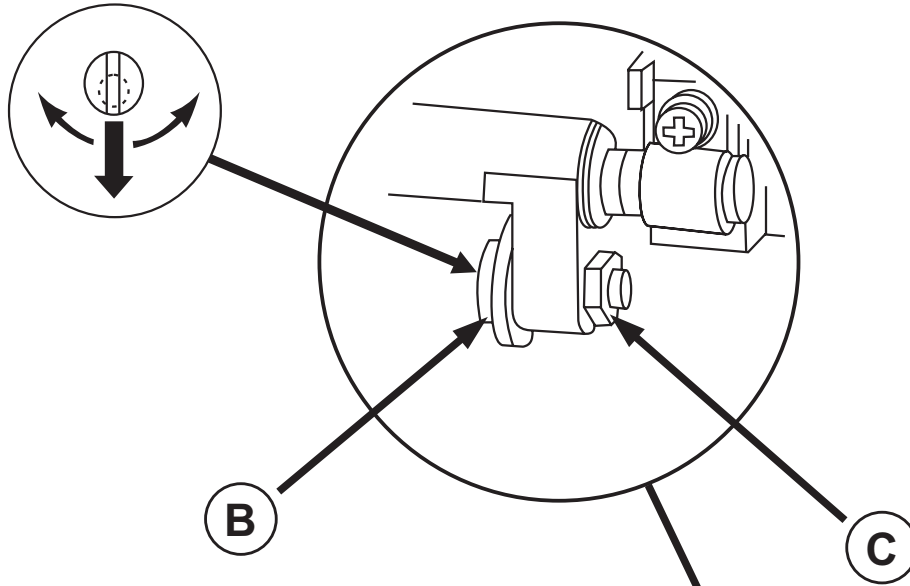
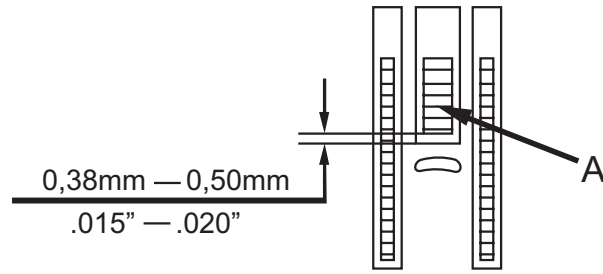
## Feed dog height

### Check:

- 1- Set the machine to straight stitch, maximum stitch length.
- 2- Turn the hand wheel toward the front of the machine to bring feed dog (A) to its highest point at the rear of its stroke.
- 3- The top of feed dog (A) must be 1,00 mm - 1,20 mm (.040" - .047") above the top of the needle plate (B).

### Adjustment:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, r
- 2- Loosen eccentric hinge stud clamp screws (G) to pinch tightness.
- 3- The highest point of hinge stud eccentric (F) must be to the right before making the adjustment. By means of a 7,0 mm open end wrench, rotate eccentric hinge stud (F) left or right to raise or lower the feed dog.
- 4- While pushing up snugly on eccentric (F), tighten screws (G).  
Tightening the two hinge stud clamp screws (G) will cause the feed lifting lever (E) to raise slightly thereby causing the feed dog to be slightly higher than actually set. There must be no looseness or binding of feed lifting lever (E). Push in on feed lever (E) and slowly allow it to return to its normal position. There should be no hang-ups or binds. Move lever up and down to check for looseness.





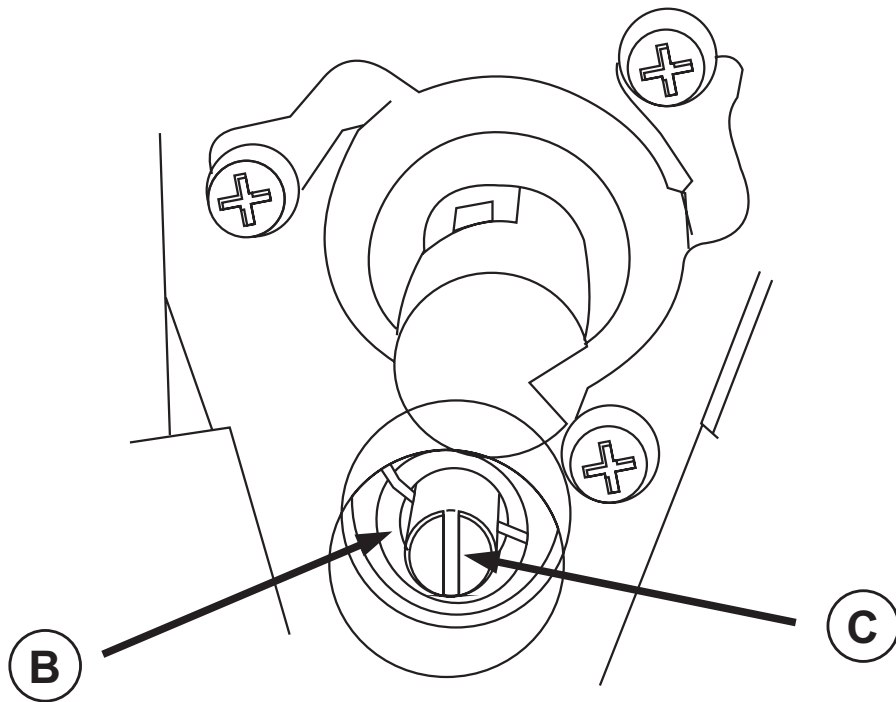
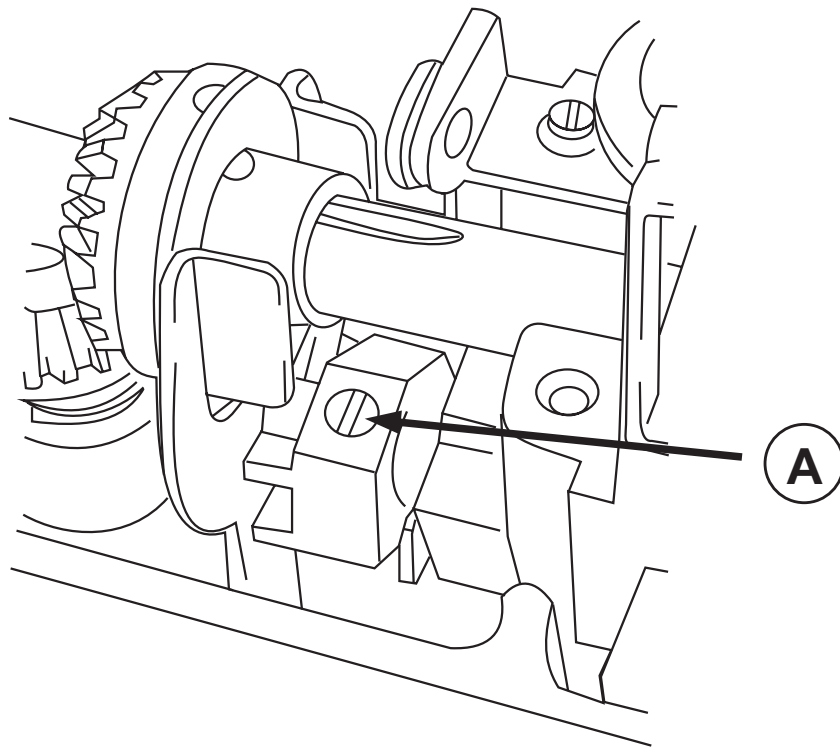
## Feed dog throw

### Check:

- 1- Set the machine to maximum stitch length.
- 2- Turn hand wheel toward the front of the machine until feed dog (A) is in its most forward position.
- 3- There should be a clearance of 0,38 mm - 0,50 mm (.015" -.020") between the center bar of feed dog (A) and the edge of the center slot of the needle plate.

### Adjusting:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front).
- 2- Loosen locknut (C).
- 3- Turn eccentric screw (B) clockwise or counterclockwise as required to obtain correct feed dog throw.
- 4- Tighten locknut (C).

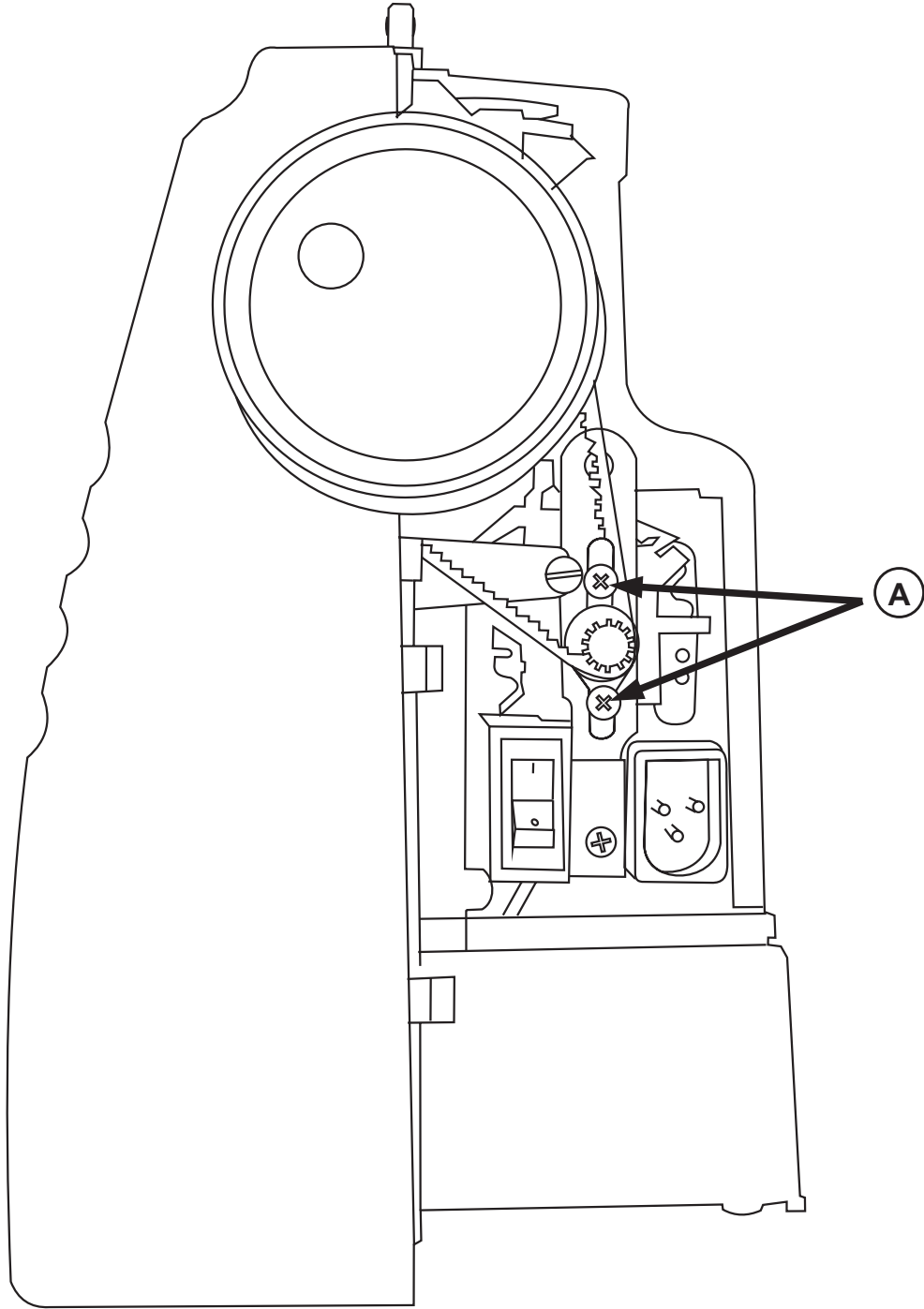


## Stitch length regulator spring tension

The reverse button must operate smoothly with the stitch length set at maximum stitch.

### Adjustment;

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front), motor belt and hand wheel.
- 2- Loosen screw (A) in feed regulator assembly.
- 3- Upon loosening this screw, the stud (C) will rotate, allowing the spring (B) to loosen tension.
- 4- Rotate stud (C) one complete counterclockwise revolution only to place proper tension on spring (B).
- 5- Tighten screw (A).

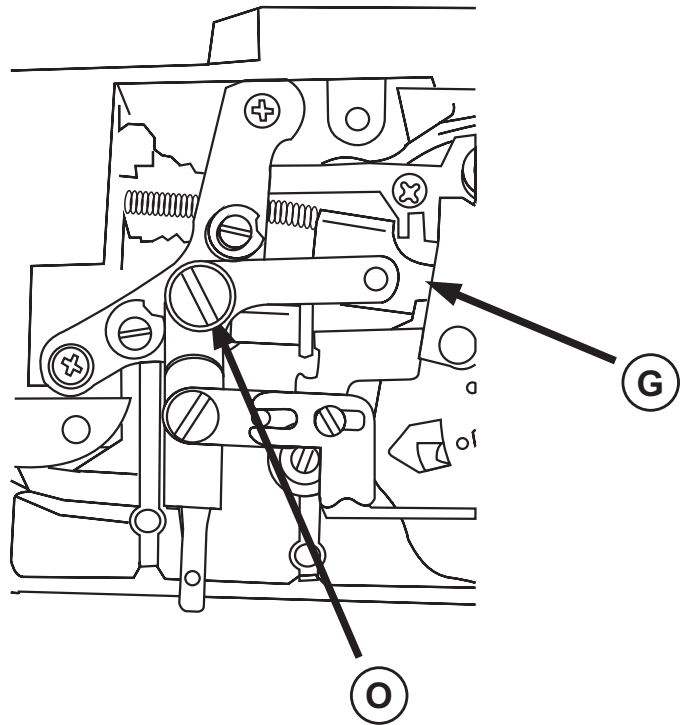
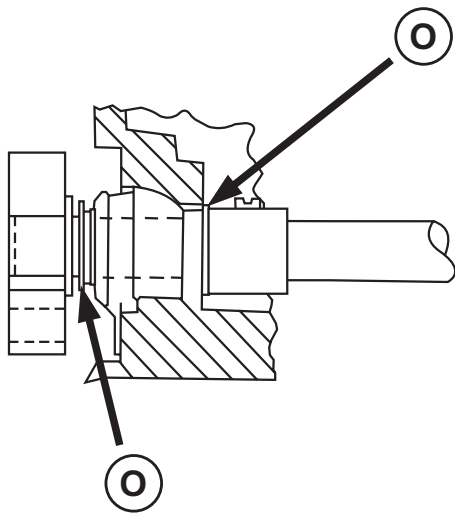
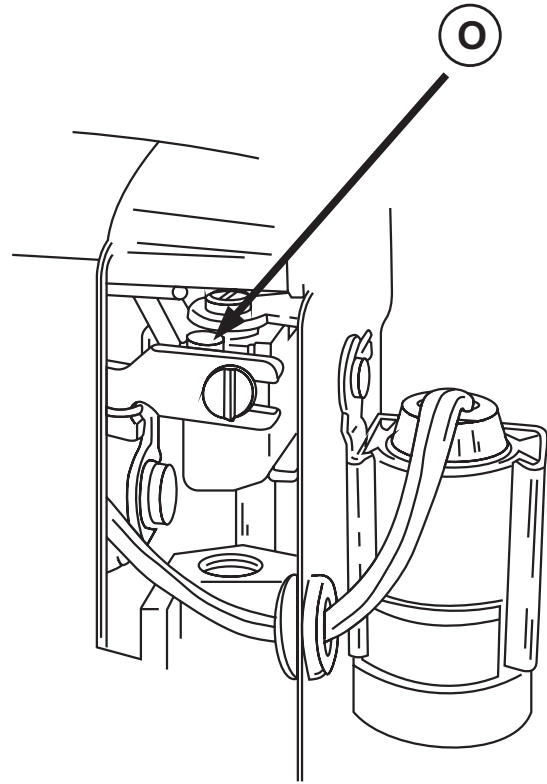
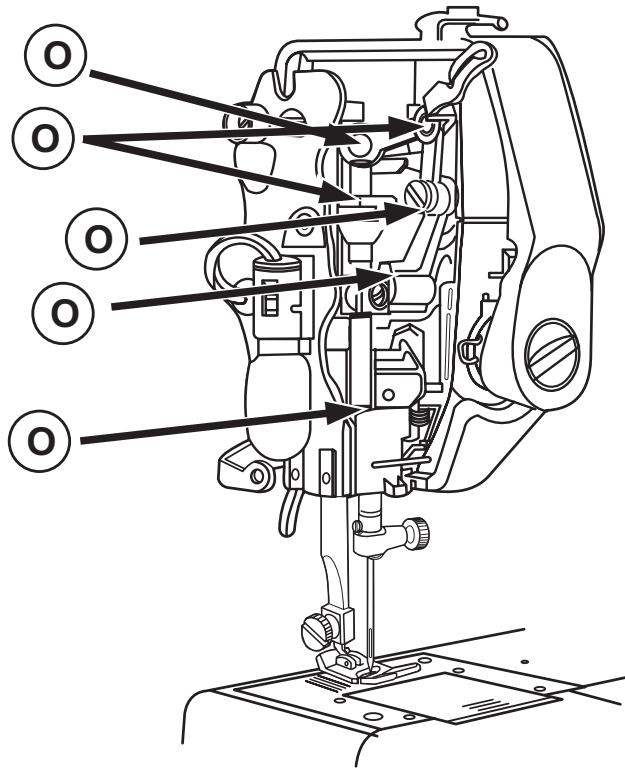


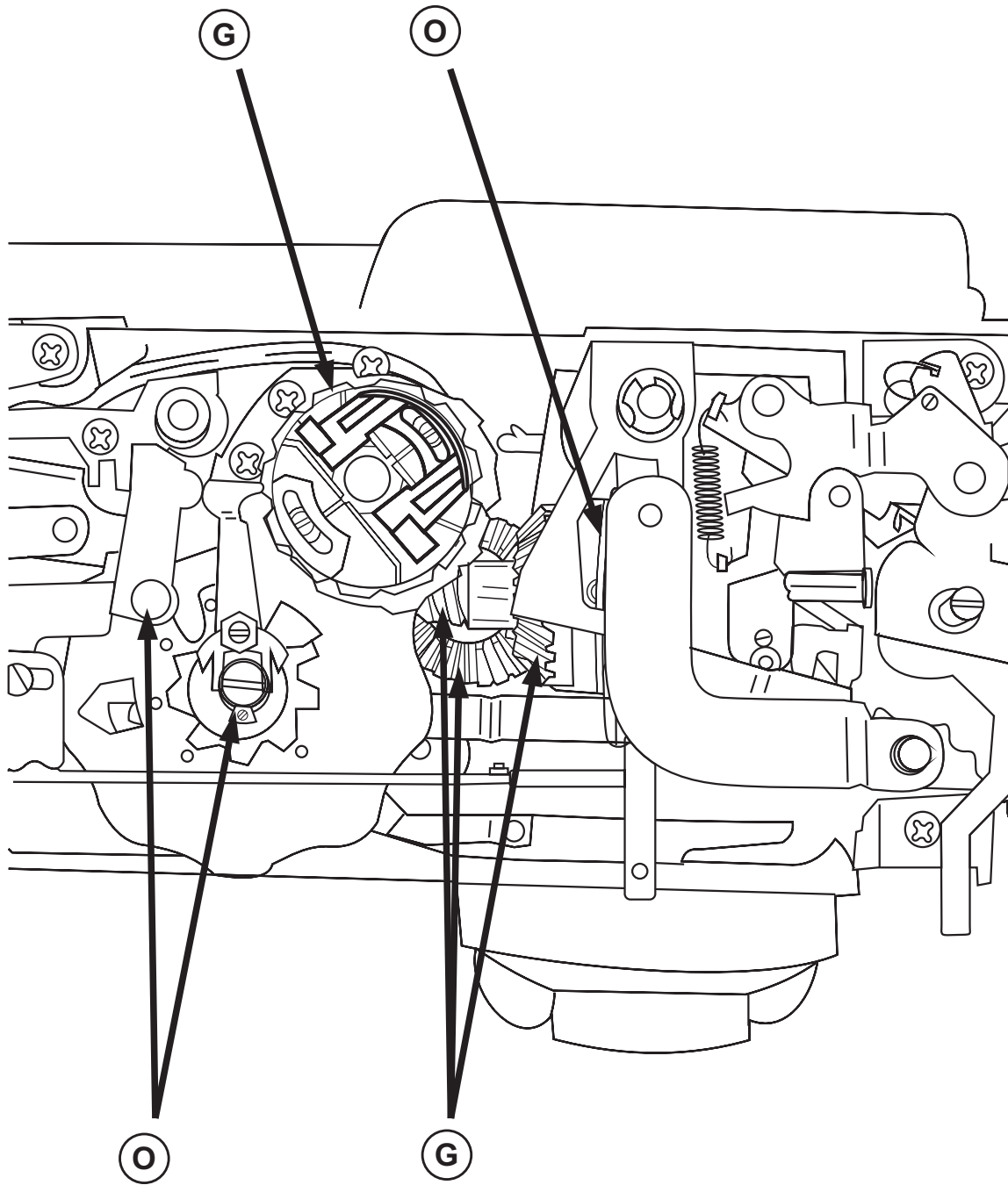
## Motor belt tension

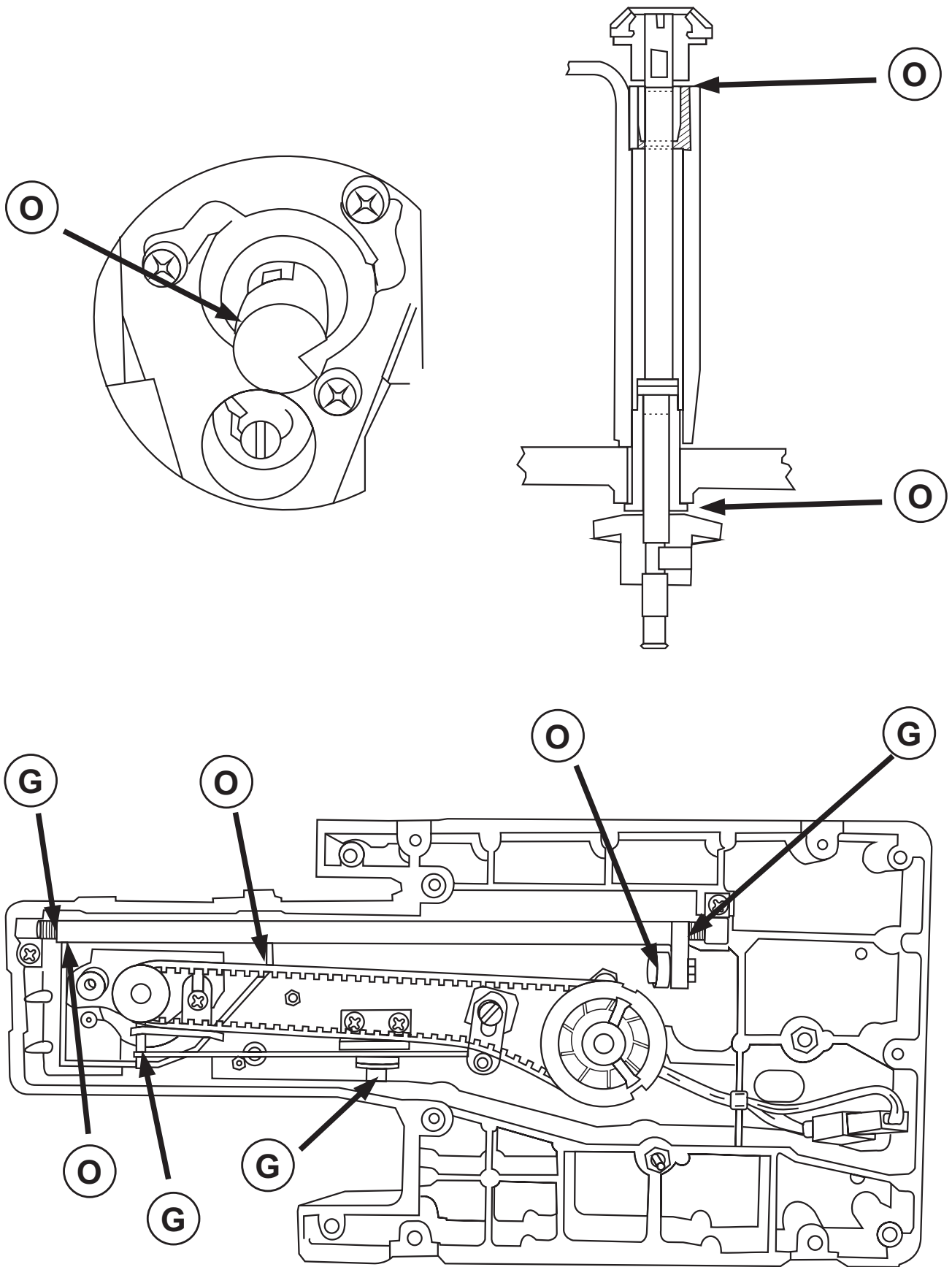
Too tight a motor belt tension can cause the machine to run slow and will overload the motor. Too loose a motor belt tension will create belt noise and may cause jumping of the belt teeth on cogged motor pulley.

### Adjustment:

- 1- Remove the free arm extension table, face plate, rear and bottom bed covers.
- 2- Loosen adjusting screws (A).
- 3- Bring the motor up or down until the machine is running at its adequate highest speed.
- 4- Tighten screws (A).









## Lubrication

In order to meet the customer minimum lubrication requirement, the machine must be lubricated as indicated on pages 108/109/110.

Only Singer oil and Singer grease must be used.

Use of parafin based oil, or non-silicon type grease, will create a build up of residue on the bearing surfaces. The self-lubricating qualities of the bearings will be defeated by clogging of the pores in the bearing if such oil or grease are used.

All thread, lint, or any foreign matter must be removed before lubrication.

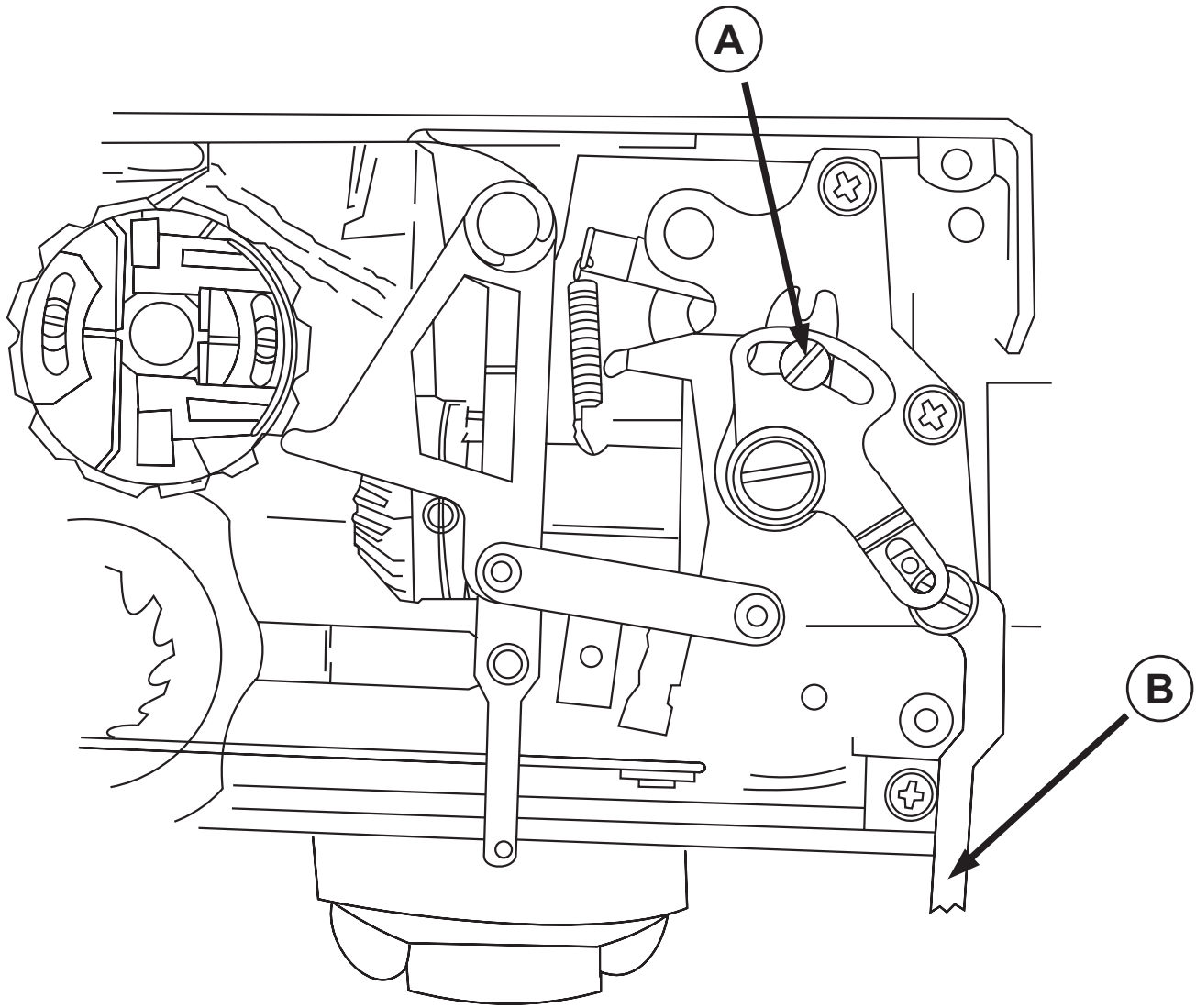
O = Singer oil

G = Singer grease

### Applying lubrication:



- Applied to cam surfaces, cover entire surface.
- To gears, cover each tooth.
- To slides, cover entire surface.

Do not apply grease to oil-impregnated metal parts.



## Flexi stitch zeroing

### Machine settings:

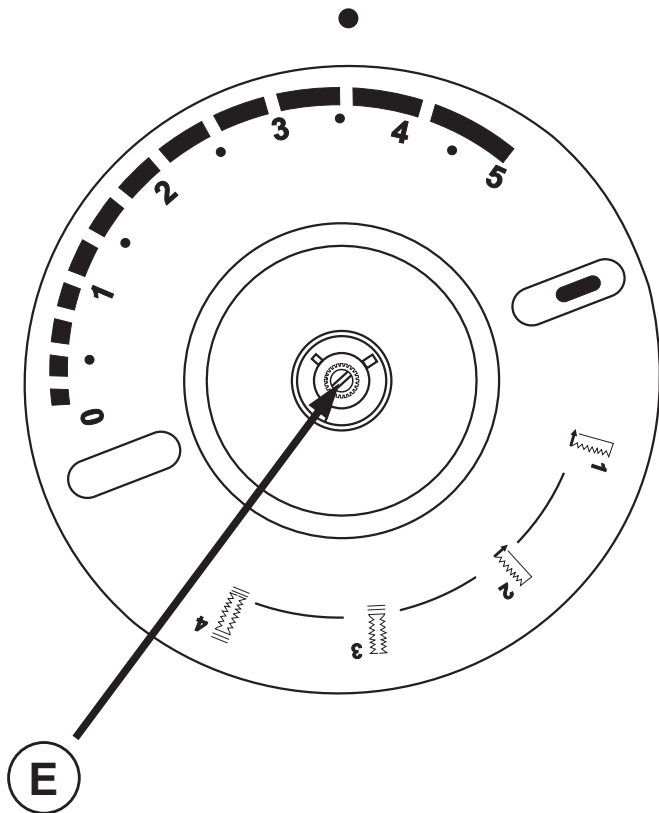
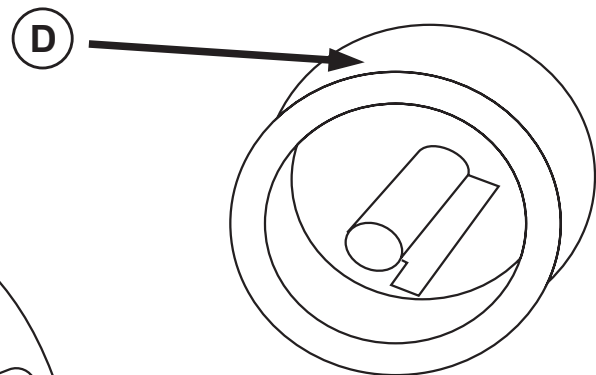
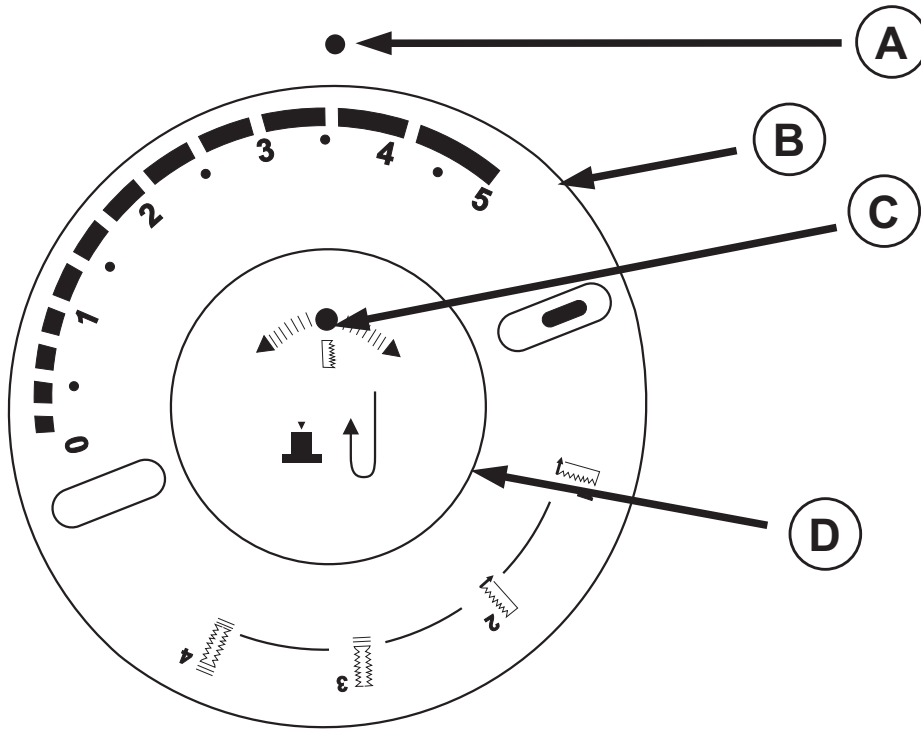
- 1- Stitch selection: straight stretch stitch.
- 2- Stitch width: straight stitch.
- 3- Stitch length: Turn dial to left until the indicator mark printed on it (  ) is aligned with the dot in the front cover (  ).
- 4- Balance control: neutral (center).

### Check:

- 1- Place a piece of paper on the needle plate and lower the presser foot.
- 2- Turn the machine by hand and observe the needle penetrations.
- 3- The machine should produce two penetrations forward and one reverse. The reverse penetration should enter the previous hole cleanly.

### Adjustment:

- 1- Check "zero feed" and adjust if necessary.
- 2- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers, all covers (face plate, rear, bottom bed and front) and the handle and its supports.
- 3- Loosen screw (A).
- 4- While holding screw (A), move lever (B) slightly to the right to increase reverse and decrease forward feed. Move lever (B) slightly to the left to decrease reverse and increase forward feed.
- 5- Tighten screw (A).
- 6- Recheck flexi stitch feed balance with lever in the neutral position. Readjust if necessary.



## Zero feed

### Check:

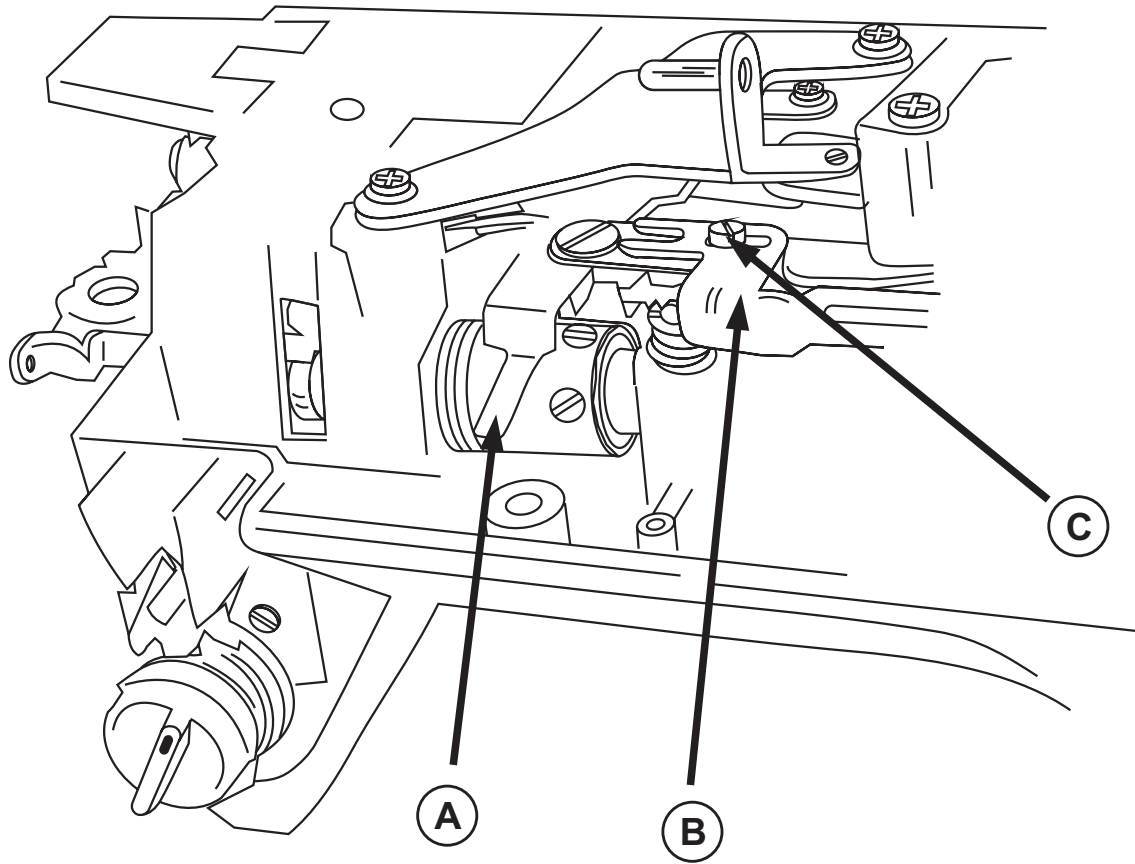
- 1- Remove needle.
- 2- Place a 2-ply of light-weight fabric over the needle plate.
- 3- Set stitch length control dial (B) to "O" (zero).
- 4- Set reverse button with indicator mark (C) in line with reference mark (A) on the front cover.
- 5- Lower presser foot on fabric and run machine at full speed.
- 6- There should be no feeding of the fabric.

**Note:** On occasion, there may be a machine where absolute zero feed is difficult to achieve. In such cases, forward feed movement must not exceed 6,35 mm (.250") in fifteen seconds. Reverse feed is unacceptable.

- 7- Turn stitch length dial to number "4" buttonhole position and recheck. There should be no feeding of the fabric.

### Adjustment:

- 1- Turn stitch length dial to number "5" (maximum stitch length).
- 2- Remove reverse button (D) by pulling straight out from machine.
- 3- Return stitch length dial to "O" (zero).
- 4- Lower presser foot on single ply of fabric and run machine at full speed.
- 5- Turn adjusting screw (E) clockwise to decrease forward feed and counterclockwise to decrease reverse feed until there is no feeding of the fabric.
- 6- Recheck at number "4" buttonhole position for zero feeding of fabric and readjust if necessary.
- 7- Replace reverse button (D) with indicator mark (C) in line with reference mark (A) on the front cover of the machine.



0,50mm — 1,00mm  
.020" — .040"

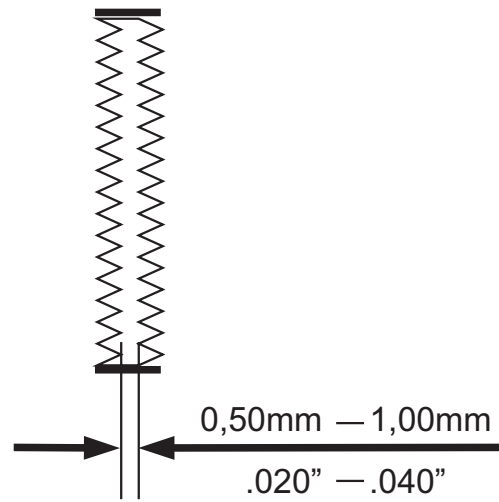
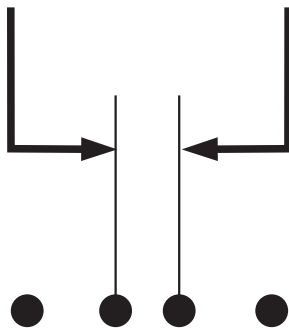


ILLUSTRATION D

## Buttonhole cutting space

To allow sufficient space for cutting without damaging the thread, the buttonhole cutting space must be approximately 0,50 mm - 1,00 mm (.020" - .040").

### Check:

- 1- Remove presser foot.
- 2- Insert a number 9 needle to provide better visibility and accuracy when checking buttonhole cutting space.
- 3- Turn buttonhole control dial to number "1" position.
- 4- While holding a piece of paper over the needle plate, make two needle penetrations.
- 5- Without disturbing the position of the paper, turn buttonhole control dial to number "3" position and make two more needle penetrations.
- 6- The distance between the two inner perforations should be 0,50 mm - 1,00 mm (.020" - .040").

### Adjustment:

- 1- Remove the free arm extension table, tension assembly dial, the knobs of the zig-zag and needle position levers and all covers (face plate, rear, bottom bed and front).
- 2- Loosen screw (C) while maintaining the position of bracket (B).
- 3- Move stitch width control lever (A) left to increase space and right to decrease cutting space.
- 4- Tighten screw (C).
- 5- Recheck and readjust if necessary.







