UG SEWING HEAD

This manual contains repair and adjustment procedures for the Barudan UG style sewing head. The UG sewing head has:

- **7 Needles**
- **Turret (round) style head**
- **Single Take-up lever**
- **Optional Trimmers**

NEEDLE DEPTH ADJUSTMENT

PURPOSE:
The needle must rise 2-3 mm from bottom dead center thus forming a loop behind the needle. As the hook point passes behind the needle it captures the formed loop. If the Needle Bar is too high or too low the sewing quality is effected. The needle can not capture the loop therefore a stitch will not be formed or not form properly.

CAUSES:
- < Red caps worn or broken.
- < Broken needle.
- < "Slam" into hoop.
- < Changed needle brand.

SYMPTOMS:
- < Skip Stitches
- < Looping
- < Fraying
- < Breaking Thread
- < Breaking Needles

TOOLS NEEDED
4 mm Allen Wrench
3 mm Allen Wrench
Needle Screwdriver
Flathead Screwdriver
Offset Screwdriver
Flashlight
New Needle
Cleaning Brush

PROCEDURE:

1. **Power** down Embroidery Machine.
2. Using a 4 mm Allen Wrench, **remove** 2- M5 x 10 hex socket bolt from Sewing Head Cover.
3. **Remove** Sewing Head Cover.
4. **Rotate** gangshaft until Needle Bar Driver is in highest position, this is called **Color Change Position.**
5. Using a Flathead Screwdriver, **remove** throat plate screws.
6. **Remove** throat plate.

7. **Remove** bobbin case from Hook Assembly.

8. Using **cleaning brush**, clean any thread debris or lint from hook area.

9. **Manually** rotate Turret to **Needle #1**.

10. **Remove** thread from Needle #1.

11. Using Needle Screwdriver, **loosen** needle set screw.

12. **Remove** and **discard** old needle.

13. **Insert new needle** correctly. (Groove facing front and scarf is in back.) *See Figure 1*.

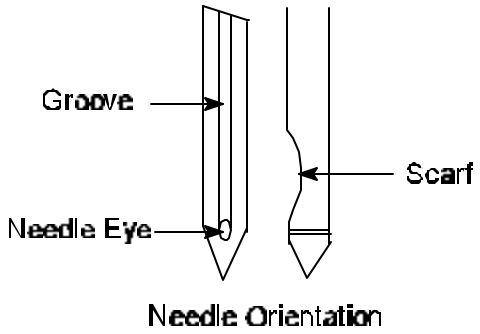


Figure 1

14. Using Needle Screwdriver, **tighten** needle set screw.

15. While Standing in front of training sewing head, **rotate** gangshaft towards you so needle is at its lowest point **(Bottom Dead Center**).

16. Before making any adjustments see if needle **eyelet** is positioned halfway through hook basket. *See Figure 2*.

    If needle eyelet looks out of position proceed to ***Step 17****.*

    If ***no*** *adjustments are necessary proceed to* ***Hook Timing.***

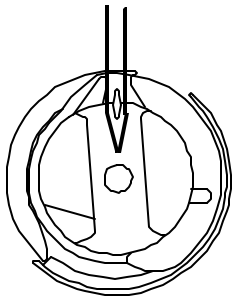


Figure 2

17. Using 3 mm Allen Wrench, **loosen** hex socket bolt on Needle Bar Driver.

    < ***Check*** *for damage.*

    Replace *damaged parts*.

18. **Adjust** by moving Needle Bar driver up or down so ½ of needle **eyelet** is viewed in hook basket.

Note:	Needle Bar Driver must remain centered on red cap.

19. Using 3 mm Allen Wrench, **tighten** hex socket bolt to set Needle Bar driver.

20. **Rotate** gangshaft to **color change position**.

21. **Reinstall** throat plate.

22. Using Flathead Screwdriver, **tighten** throat plate screws.

23. **Reinstall** bobbin case.

24. Using 4 mm Allen Wrench, **replace** Sewing Head Cover.

25. Using enclosed disk, **sew** the **"HOX" test** to check for proper adjustment.

Note:	If symptoms are still occurring proceed to **Hook Timing**.

HOOK TIMING

Hook timing is probably the most misunderstood aspect of embroidery machine mechanics. It has nothing to do with the type of fabric, tension or synchronization of the heads on a multi-head machine.

PURPOSE:
Hook timing is the proper position of the Hook Assembly in relation to the needle in order to form a stitch. The hook is directly attached to the drive shaft, eliminating the need to routinely re-time it.

CAUSES:

- < Something gets caught in Hook Assembly.
- < Size of needle has drastically changed.
- < A build-up of thread behind hook pushes hook out of line.

SYMPTOMS:

- < Machine fails to form or complete a stitch.
- < Excessive Needle Breaks.
- < Thread Frays
- < "Birdnesting"

TOOLS NEEDED
2 mm Allen Wrench
Flathead Screwdriver
Needle Screwdriver
Offset Screwdriver
Flashlight
New Needles
Cleaning Brush
Emery/Crocus Cloth

PROCEDURE:
Needle depth must be checked before timing the hook.

A. PREPARATION

1. **Power down** Embroidery Machine.
2. Using a Flathead Screwdriver, **remove** throat plate screws.
3. **Remove** throat plate.
4. **Remove** bobbin case from Hook Assembly.
5. Using **cleaning brush**, clean any thread debris or lint from hook area.

6. **Rotate** gangshaft until Needle Bar Driver is in highest position, this is called **Color Change Position.**

7. With finger, **check** entire Hook Assembly for burrs or nicks.

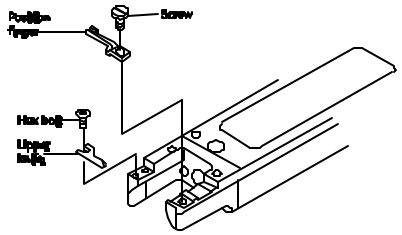
   *If burrs or nicks are present on Hook Assembly continue to **Section B.***

   *If Hook Assembly is **not** damaged continue to **Section C**.*

B. HOOK ASSEMBLY REPLACEMENT

8. **Disengage** Needle Bar Driver.

9. Using 2 mm Allen Wrench, **remove** Upper Knife hex bolt. *(If applicable) See Figure 3.*



UG-E Style Head

Figure 3

10. **Remove** Upper Knife. *(If applicable).*

11. Using a Flathead Screwdriver, **remove** Position Finger **screw**.

12. **Remove** Position Finger.

13. **Remove** Hook Driving Rod from Hook (Fork). *(If applicable)*

14. **Release** Hook (Fork). (This allows Hook Assembly to be removed easily).

15. Using a Flathead Screwdriver, **loosen** three set screws on Hook Assembly.

16. **Remove** Hook Assembly.

17. Gently rub burred or nicked area of Hook Assembly with emery or crocus cloth until smooth.

> **Note:** If burrs or nicks can not be smoothed, **replace** with new Hook Assembly.

18. **Rotate** gangshaft until Take-up Lever is up position.

19. **Insert** repaired or new Hook Assembly on bottom shaft.

20. **Replace** Position Finger.

21. **Insert** Position Finger **screw**. (Do not tighten completely).

22. **Rotate** Hook Assembly until Basket Notch is aligned with Position Finger Nose. *See Figure 4.*

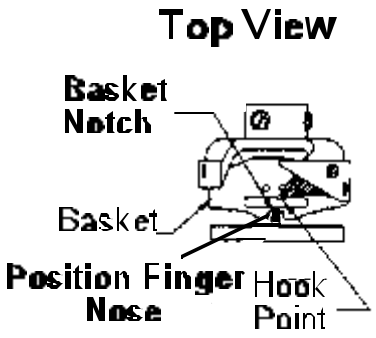


Figure 4

23. Using Flathead Screwdriver, **tighten** Position Finger screw.

24. **Replace** Upper Knife. *(If applicable)*

25. Using 2 mm Allen Wrench, **insert** hex bolt. (Do not tighten completely).

26. **Upper Knife** tip rests on Position Finger and back rests flush against Needle Plate Bracket. *See Figure 5. (If applicable)*

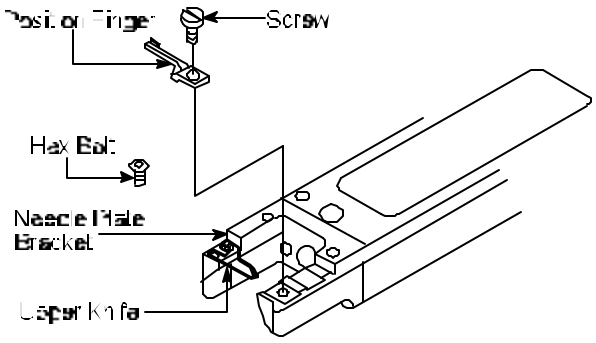


Figure 5

27. **Replace** Hook Driving Rod in Hook (Fork). *(If applicable)*

28. **Rotate** Hook Point to 9:00 position.

29. **Only tighten** set screw closest to Hook Point.

C. HOOK POINT TIMING

30. **Rotate** gangshaft to **Color Change Position**.

31. **Manually** rotate Turret to **Needle #1.**

32. **Remove** thread from Needle #1.

33. **Loosen** needle set screw.

34. **Remove** and **discard** old Needle.

35. **Insert new needle** correctly. (Groove facing front and scarf is in back). *See Figure 6*.

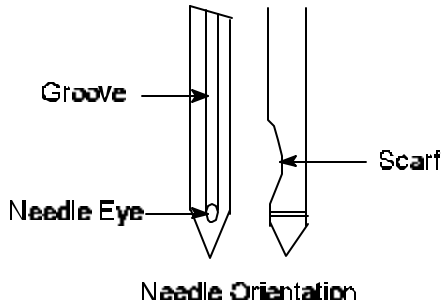


Figure 6

36. Using Needle Screwdriver, **tighten** needle set screw.

37. **Using** a needle screwdriver, **loosen** two set screws **furthest** from hook point leaving the set screw closest to hook point tight. (If Hook Assembly was removed as instructed in Section B, two set screws are loose already) *See Figure 7.*

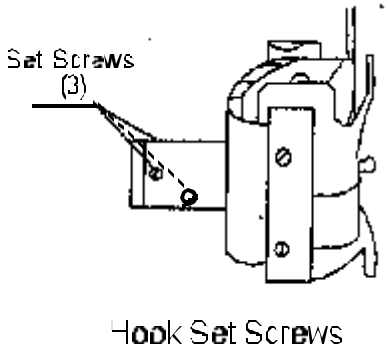


Figure 7

38. **Engage** Needle Bar Driver.

39. While Standing in front of training sewing head, rotate gangshaft towards you so needle is at its lowest point **(Bottom Dead Center).**

40. Continue turning gangshaft until **needle rises 2 to 3 mm**.

    Point of hook should be directly behind scarf of needle and above needle eyelet. *See Figure 8*.

*If hook point **needs** adjustment proceed to **Step 36**.*

*If hook point **does not** need adjustment proceed to **Section D Hook to Needle Gap.***

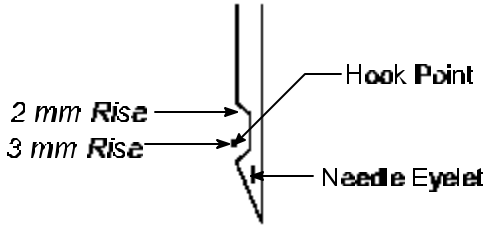


Figure 8

41. Using Flathead Screwdriver, **loosen** remaining set screw (closest to hook point).

42. Adjust so tip of hook point is behind and in **middle of needle**. *See Figure 9.*

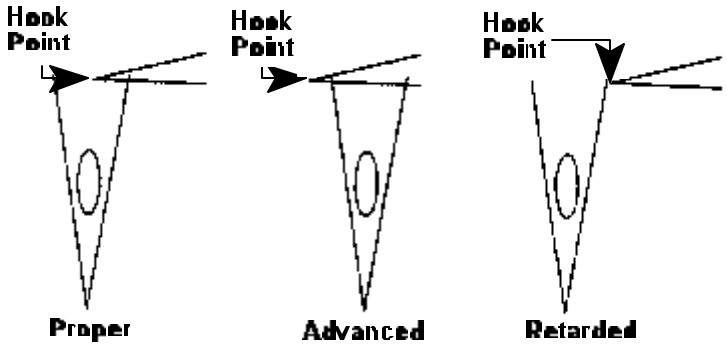


Figure 9

43. Using Flathead Screwdriver, **tighten** set screw closest to hook point

D. HOOK TO NEEDLE GAP

*The circumference on each machine may vary, by checking the **first** and **last** needle will determine whether the embroidery machine should be re-timed*
*(ie: **Needle #1** may be have the correct gap from hook point, **Needle #7** may be touching the hook point so move the hook .5 mm away.)*

44. **Rotate** gangshaft to **Color Change Position**.

45. Using Flathead Screwdriver, **loosen** needle set screw.

46. **Rotate** needle so groove is facing back and scarf is in front.

47. Using Needle Screwdriver, **tighten** needle set screw.

48. Rotate gangshaft until **Hook Point** is behind needle.

49. Using Flathead Screwdriver, **loosen** set screw closest to Hook Point.

50. **Adjust** Hook Assembly so Hook Point is directly behind needle and as close to needle as possible. (Should not cause needle to bend).

51. Using Flathead Screwdriver, **tighten** set screw closest to Hook Point.

52. **Rotate** gangshaft to **Color Change Position**.

53. Using Needle Screwdriver, **loosen** needle set screw.

54. **Rotate** needle to correct position. (Groove facing front and scarf is in back).

55. **Manually** rotate Turret to **Needle #7**.

56. **Remove** thread from Needle #7.

57. Using Needle Screwdriver, **loosen** needle set screw.

58. **Insert** new needle, **groove** is facing **back** and **scarf** is in **fron**t

59. Using Needle Screwdriver, **tighten** needle set screw.

60. Rotate gangshaft until **Hook Point** is behind needle.

61. Hook Point should be directly behind needle and as close to needle as possible. (Should not cause needle to bend).

    *If Hook Point causes needle to bend on **Needle #7** then adjust Hook Point 0.5 mm away from needle.*

62. Using Flathead Screwdriver, **tighten** two remaining set screws (furthest from hook point)

63. **Rotate** gangshaft to **Color Change Position**.

64. Using Needle Screwdriver, **loosen** needle set screw.

65. **Rotate** needle to correct position. (Groove facing front and scarf is in back).

66. Using Needle Screwdriver, **tighten** needle set screw.

67. Proceed to **Position Finger Adjustment**.

POSITION FINGER ADJUSTMENT

DEFINITION:
The Position Finger secures the hook basket in place and guides the bobbin thread to fabric.

CAUSES:
- < Replaced Hook Assembly.
- < Position Finger set screw not secure.

TOOLS NEEDED
Small Flathead Screwdriver

SYMPTOMS:
- < Bobbin thread underside of garment not centered.
- < No bobbin thread-"looping".

PROCEDURE:

1. **Engage** Needle Bar Driver.

2. **Rotate** gangshaft until needle reaches it's lowest point this is called, **Bottom Dead center**.

3. Using Flathead Screwdriver, **loosen** Position Finger screw.

4. **Move** Position Finger **left or right**, centering Position Finger Nose with needle. *See Figure 1.*

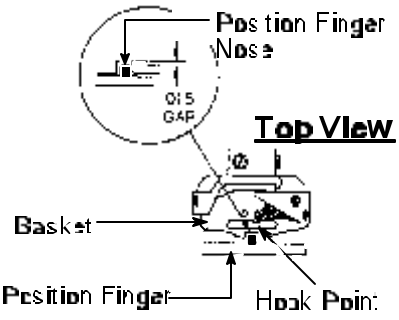


Figure 1

NOTE: Bobbin thread may not be centered if adjustment is incorrect.

5. Move Position Finger Nose **forward or back** from hook basket allowing enough clearance for thread to pass between easily. *See Figure 2*

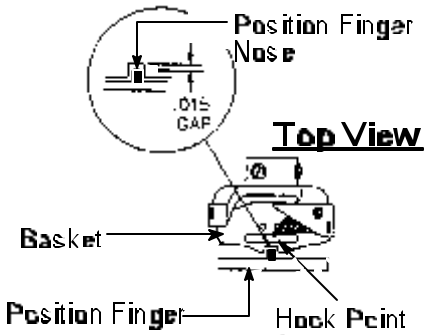


Figure 2

NOTE:	If Position Finger Nose is too close to hook basket, birdnesting or thread breaks may occur

6. While holding Position Finger in place, **tighten** Position Finger **screw**.
7. **Rotate** gangshaft to **Color Change Position**.
8. **Reinstall** throat plate.
9. Using Flathead Screwdriver, **tighten** throat plate screws.
10. **Reinstall** bobbin case in Hook Assembly.
11. Using enclosed disk, **sew** the **"HOX" test** to check for proper adjustment.

NEEDLE BAR REPLACEMENT

DEFINITION:
The Needle Bar holds the needle and moves up and down.

CAUSES:

- < Bent
- < Burrs
- < Lack of Lubrication

SYMPTOMS:

- < Little or no movement up or down.
- < Skip Stitches.
- < Breaking needles

TOOLS NEEDED

4 mm Allen Wrench
3 mm Allen Wrench
2.5 mm Allen Wrench
2 mm Allen Wrench
Small Flathead Screwdriver
Needle Screwdriver
Flashlight
New Needles
New Needle Bar
New Small Spring

PROCEDURE:

A. NEEDLE BAR REPLACEMENT

1. **Power down** Embroidery Machine.

2. **Pull** thread **Keep Lever** forward to disengage thread apron clamps. (If applicable) *See Figure 1*.

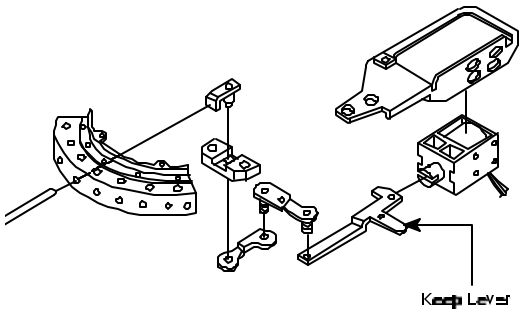


Figure 1

3. Using a 4 mm Allen Wrench, **remove** 2-M5 x 10 hex socket bolts from Sewing Head Cover.

4. **Remove** Sewing Head Cover.

5. **Rotate** gangshaft until Needle Bar Driver is in up position or **Color Change Position**.

6. **Position** damaged Needle Bar left or right of Needle Bar Driver.

7. Using a Needle Screwdriver, **loosen** needle set screw and **remove** needle.

8. **Squeeze** and **hold** Needle Bar and Presser Foot together and **remove** needle clamp, white spacer and 6 mm O-ring. *See Figure 2.*

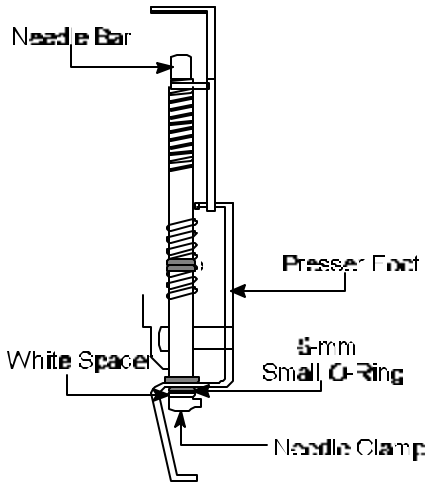


Figure 2

9. Slowly **release** Needle Bar and Presser Foot.

10. **Move** Presser Foot down to its lowest position and **remove** 7 mm O-ring. *See Figure 3.*

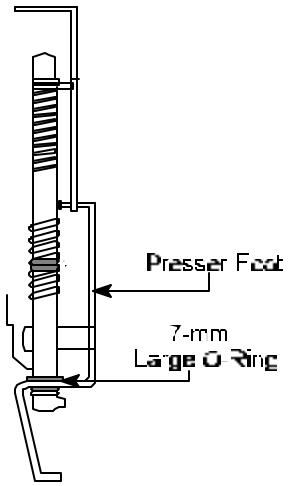


Figure 3

11. Carefully (springs may ricochet) **pull** Needle Bar up and out of Turret Assembly.

    It is not necessary to remove Presser Foot spring and 2-6 mm O-rings.

12. **Discard** old Needle Bar and Needle Bar spring. *See Figure 4.*

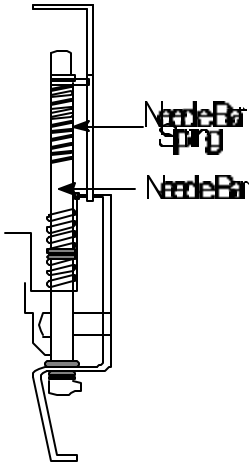


Figure 4

14. **Insert** new Needle Bar spring onto new Needle Bar.

15. **Insert** new Needle Bar and Needle Bar Spring into top Presser Foot hole.

16. **Slide** Needle Bar through Presser Foot Spring and two 6 mm O-rings.
See Figure 5.

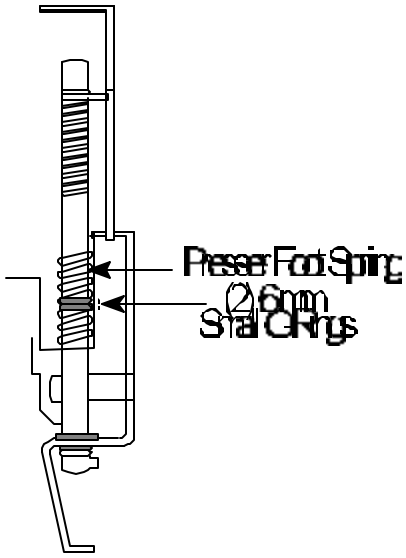


Figure 5

17. Continue **inserting** Needle Bar through Turret Plate.

18. Press Needle Bar down ½ inch below bottom of Turret Plate then **slide** 7 mm O-ring onto Needle Bar..

19. **Press** Needle Bar and Presser Foot together making sure Needle Bar guide pin lines up with Presser Foot guide pin hole. *See Figure 6.*

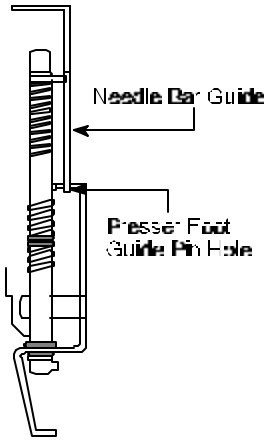


Figure 6

20. While holding Needle Bar and Presser Foot together **slide** 6 mm O-ring and white spacer onto Needle Bar.

21. **Insert** Needle Clamp onto Needle Bar and align set screw with bottom hole then snug set screw. *See Figure 7.*

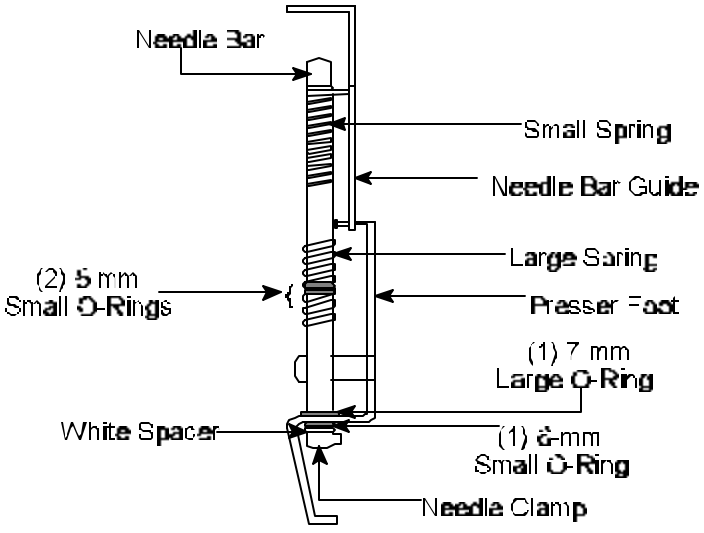


Figure 7

22. **Replace** Sewing Head Cover.

23. Using 4 mm Allen Wrench, **replace** 2-M5 x 10 hex bolts for Sewing Head Cover.

PRESSER FOOT REPLACEMENT

DEFINITION:
Presses down on material to prevent flagging.

CAUSES:
- < Bent
- < Damaged beyond repair

MOST PRESSER FEET CAN BE BENT BACK INTO SHAPE.

TOOLS NEEDED
4 mm Allen Wrench
3 mm Allen Wrench
2.5 mm Allen Wrench
Offset Screwdriver
Flashlight
Needle Screwdriver
Small Flathead Screwdriver
Needle Nose Pliers
New Presser Foot

SYMPTOMS:
- < Breaking needles
- < Needle Bar doesn't move freely
- < Presser foot damages material
- < Skipping Stitches

PROCEDURE:

A. REPLACING PRESSER FOOT

1. **Power down** Embroidery Machine.

2. **Pull** thread keep lever forward to disengage thread apron clamps. (If applicable) *See Figure 1.*

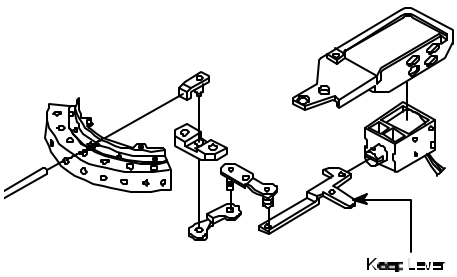


Figure 1

3 Using a 4 mm Allen wrench, **remove** 2-M5 x 10 hex bolts and Sewing Head Cover.

4. **Rotate** gangshaft to until Needle Bar Driver is in highest position, this is called **Color Change Position**.

5. Using a Needle Screwdriver, **loosen** needle set screw and **remove** needle.

If your machine has trimmers continue to ***Section B Trimmers Step 6.***

If your machine does ***not*** *have trimmers continue to* ***Section C Non-Trimmers Step 14.***

B. TRIMMERS

6. Using a 2.5 mm Allen Wrench, **loosen** seven Thread Support Clamp **hex socket screws**. *See Figure 2.*

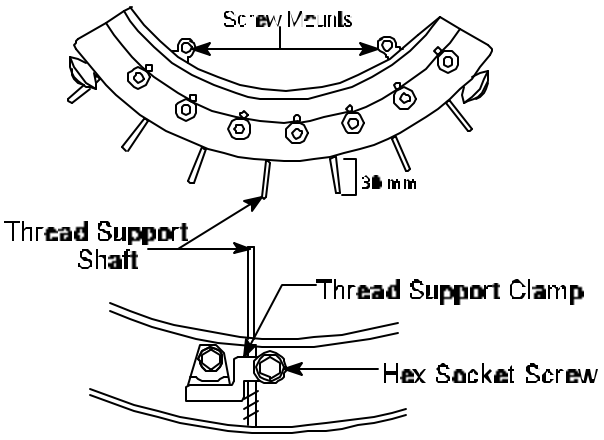


Figure 2

7. **Pull** out Thread Support Clmap enough to grasph Thread Support Pin with Needle Nose Pliers.

8. Carefully **pull** Thread Support Pin out approximately 30 mm enough to clear Turret Assembly. (If pin is pulled out to far, clamp and spring will fall out). *See Figure 3.*

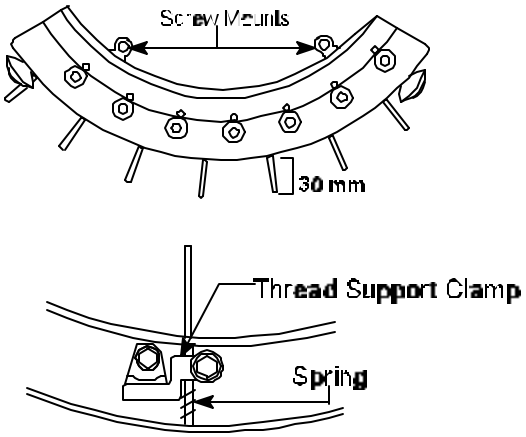


Figure 3

12. Using a Flathead Screwdriver, **loosen** and **remove** two set screws that secures the Thread Apron to Turret Plate. *See Figure 4.*

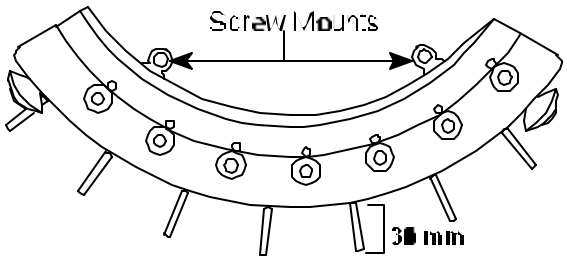


Figure 4

13. While standing directly in front of sewing head, grasp Thread Apron with both hands and gently hold right side in. With left hand pull Thread Apron up and out. (A small flat area is on outer edge of set screw hole which enables Thread Apron to be removed and replaced easily without breaking). *See Figure 5.*

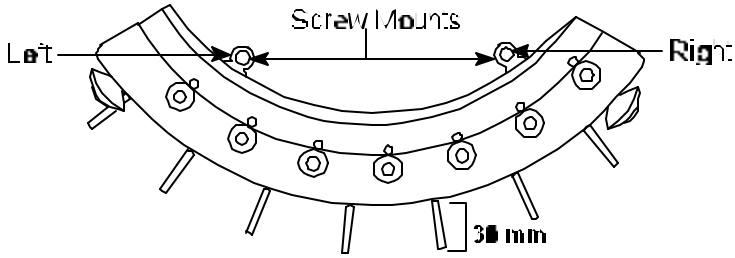


Figure 6

Continue to Step 16.

C. NON-TRIMMERS

14. **Remove** two screws securing the Thread End Trap Assembly.

15. **Remove** Thread End Trap Assembly.

Continue to Step 16.

16. Hold Needle Bar and Presser Foot together and **remove** needle clamp, white spacer and 6 mm O-ring. *See Figure 6.*

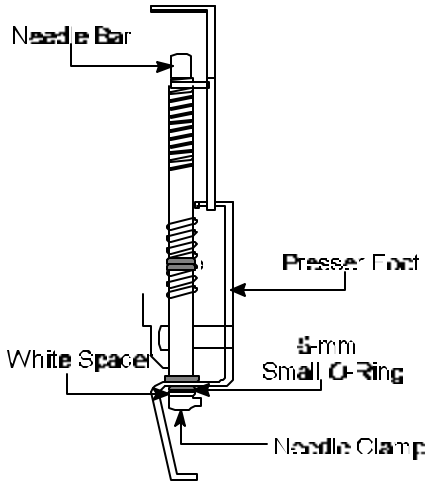


Figure 6

17. Slowly **release** Needle Bar and Presser Foot.

18. **Move** Presser Foot down to its lowest position and **remove** 7 mm O-ring. See Figure 7.

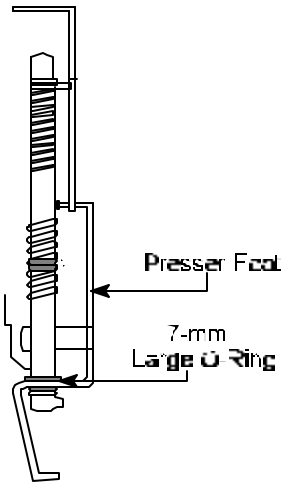


Figure 7

19. Carefully (springs may ricochet) **pull** Needle Bar up and out of Turret Plate.

20. **Replace** Needle Bar Spring onto shaft of Needle Bar. *See Figure 8.*

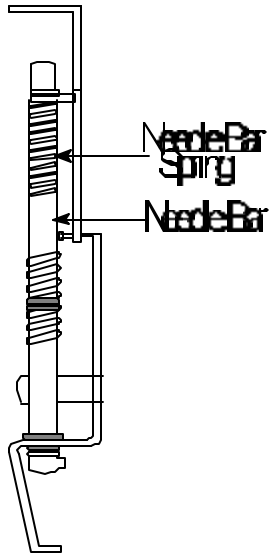


Figure 8

21. **Remove** Pressor Foot, Presser Foot Spring and two 6 mm O-rings.

22. **Discard** old Presser Foot.

23. While holding new Presser Foot in one hand slide Needle Bar through top opening approximately 1 inch. *See Figure 9.*

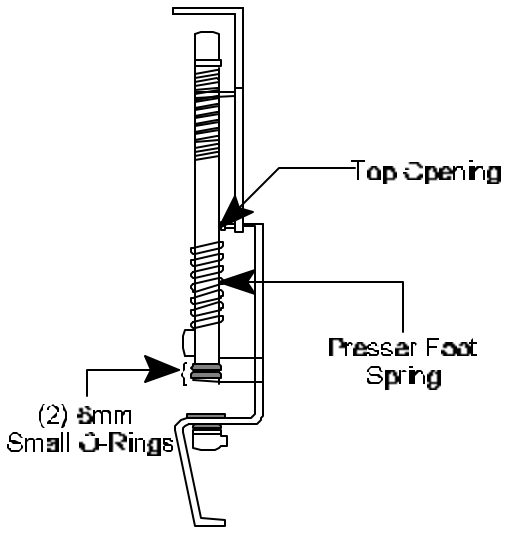


Figure 9

24. **Slide** two 6 mm O-rings onto shaft of Needle Bar. *See Figure 9.*

25. **Replace** Presser Foot Spring. *See Figure 9.*

26. Press Needle Bar down ½ inch below bottom of Presser foot **slide 7 mm** O-ring onto Needle Bar.

27. **Press** Needle Bar and Presser Foot together making sure Needle Bar guide pin lines up with Presser Foot guide pin hole. *See Figure 13.*

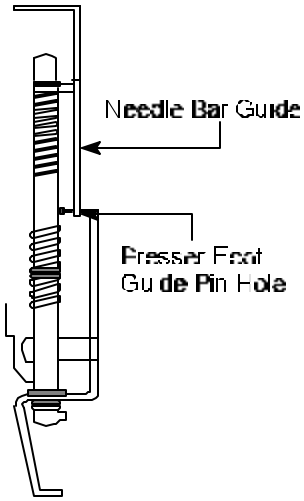


Figure 14

28. While holding Needle Bar and Presser Foot together **slide** 6 mm O-ring, and white spacer onto Needle Bar. *See Figure 16.*

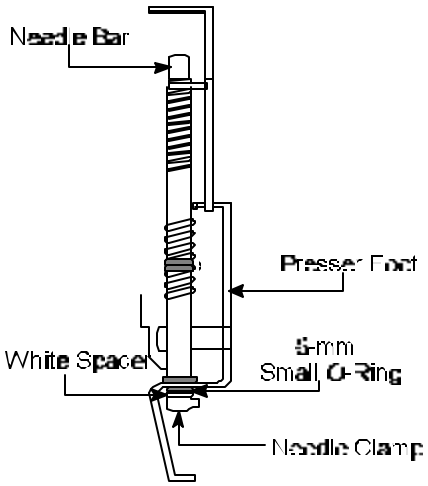


Figure 16

29. **Insert** Needle Clamp onto Needle Bar and align set screw with bottom hole then snug set screw. *See Figure 16.*

30. **Insert** Needle and secure with Needle Screwdriver.

If your machine has trimmers continue to ***Section D Trimmers Step 31.***

If your machine does ***not*** *have trimmers continue to* ***Section E Non-Timmers Step 37.***

D. TRIMMERS

31. **Replace** Thread Apron. With both hands holding Thread Apron, insert right side first then follow through with left side. *See Figure 17*.

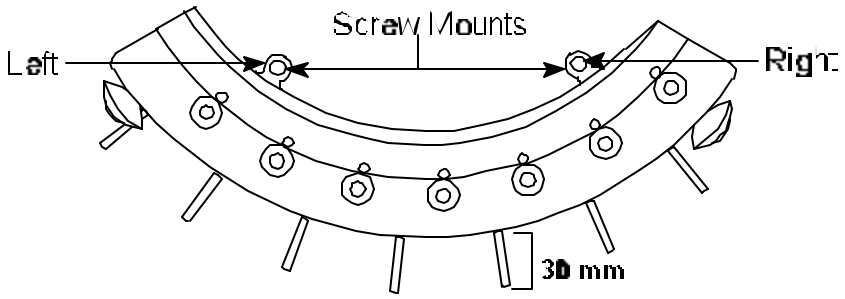


Figure 17

32. Using a Flathead Screwdriver, **replace** and **tighten** two set screws that secures the Thread Apron to Turret Assembly.

33. While using end of a Flathead Screwdriver, **push** Thread Support Pins back until flush with Thread Apron.

34. Using a 2.5 mm Allen Wrench, **tighten** seven Thread Support Clamp **hex socket screws**.

35. **Replace** Sewing Head Cover.

36. Using enclosed disk, **sew** the **"HOX" test** to check for proper adjustment.

E. NON TRIMMERS

37. **Replace** Thread Apron.

38. Using a Flathead Screwdriver, **replace** and **tighten** two set screws that secures the Thread Apron.

39. **Replace** Sewing Head Cover.

40. Using enclosed disk, **sew** the **"HOX" test** to check for proper adjustment.

REAR BOTTOM SHAFT BUSHING REPLACEMENT

DEFINITION:
The rear bushing allows the bottom shaft to rotate freely without front to back movement, securing the Hook Assembly. The bushing has an oil pad which allows oil to saturate and lubricate the bottom shaft.

CAUSES:

- < Lack of oil
- < Improper replacement
- < Wear and tear

SYMPTOMS:

- < Little or no Hook movement
- < Excessive noise

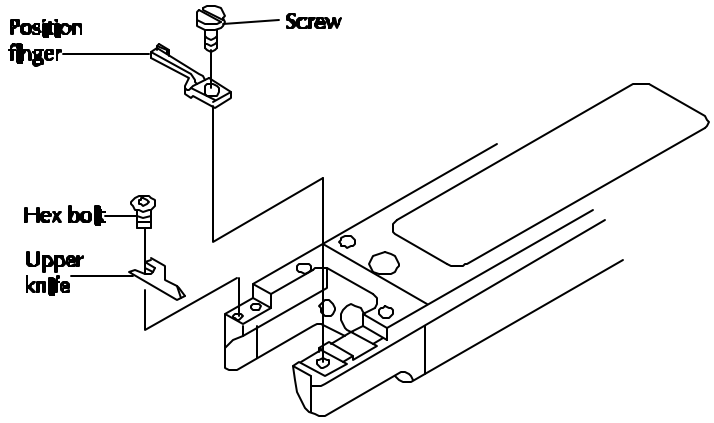
TOOLS NEEDED
3 mm Allen Wrench
Flathead Screwdriver
Needle Screwdriver
Offset Screwdriver
Hammer
Brass Rod
New Needles
New Rear Bushing
New Bottom Shaft
New Felt Pad
New Bevel Gear
Flashlight
Cleaning Brush
Permanent Marker

PROCEDURE:

A. REMOVING REAR BUSHING

1. **Power down** Embroidery Machine.
2. **Disengage** Needle Bar Driver.
3. Using Flathead Screwdriver, **remove** throat plate screws.
4. **Remove** throat plate.

5. Using 2 mm Allen Wrench, **remove** Upper Knife hex bolt. *See Figure 1.*



UG-E Style Head

Figure 1

6. **Remove** Upper Knife.
7. Using Flathead Screwdriver, **remove** Position Finger screw.
8. **Remove** Position Finger.
9. **Remove** Hook Driving Rod from Hook (Fork).
10. **Release** Hook (Fork). (This allows Hook Assembly to be removed easily).
11. **Remove** Hook Assembly by **loosening** three set screws.
12. **Remove** Hook Assembly.

13. **Loosen** and **Remove** M5 x 25 screw from Gear Cover Set (Grease Elbow). *See Figure 2.*

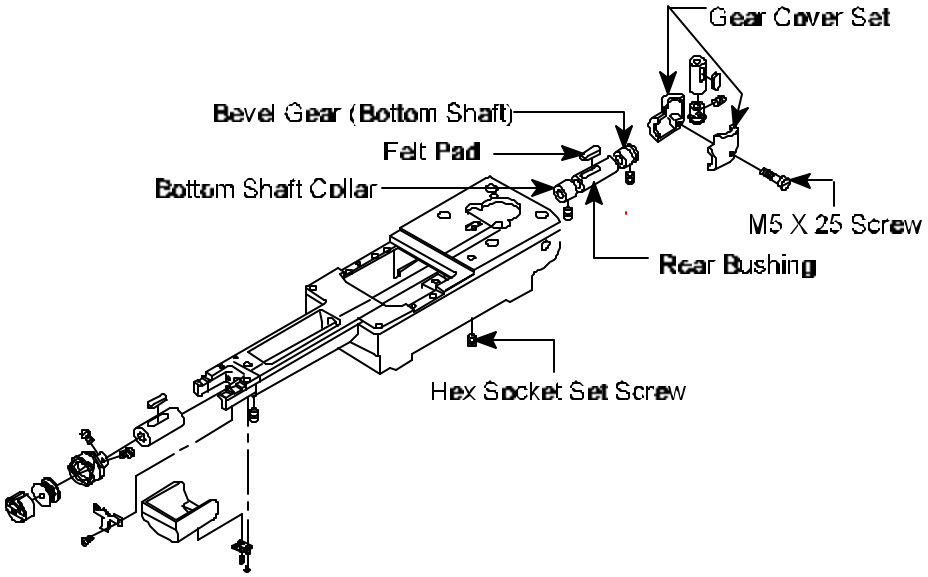


Figure 2

> **Note:** **Gear Cover Set** is located back of bottom shaft, it surrounds rear bottom shaft and lower vertical gears. M5 x 25 screw is located bottom right side of sewing head.

14. Using 3 mm Allen Wrench, **loosen** two screws on bottom shaft collar. *See Figure 2.*

15. Using Flathead Screwdriver, **loosen** two screws on bottom shaft bevel gear. *See Figure 2.*

> **Note:** If screws are not easily accessible, gears may have to be forced to rotate. Hammer against brass rod (preferably) or Flathead Screwdriver.
> **CAUTION:** If using a Flathead Screwdriver, damage may occur-- **Replace** gear.

16. **Remove** bottom shaft bevel gear.

17. **Remove** bottom shaft and bottom shaft collar.

> **Note:** If bottom shaft is seized, hammer against brass rod (preferably) or Flathead Screwdriver to break bottom shaft free from rear bushing.

18. Using 3 mm Allen Wrench, **loosen** 3 mm Allen screw from bottom rear bushing. (This screw holds bushing in place.)

19. **Remove** rear bushing by hammering a brass rod against rear side of bushing. (Bushing can only be removed in one direction--forward towards front of sewing head).

20. **Remove** felt pad from bushing.

21. **Clean** felt pad and set aside.

22. **Discard** bushing.

23. **Insert** felt pad into new bushing.

24. Using **permanent marker**, mark both ends of new rear shaft bushing to indicate oil port location.

25. **Oil** outer bushing for smoother installation.

26. **Insert** new bushing from front (oil port facing up with oil recess facing front) until bushing is 5 mm through opposite side of casting.

> **Note:** **CAUTION:** Oil Port on bushing **must** be positioned up with oil recess facing front. This allows oil to pass through bushing onto bottom shaft.

27. Using **permanent marker**, mark new bottom shaft end to indicate flat spot.

28. **Insert** new bottom shaft (marked flat end) through front bushing **only**.

29. **Insert** bottom shaft collar (shiny side against rear bushing) onto bottom shaft.

30. **Position** bevel gear to rear bushing and **align** holes.

31. Continue inserting bottom shaft through rear bushing and bevel gear until bottom shaft protrudes 2 mm.

32. With gears apart rotate gangshaft. Gangshaft should rotate smoothly.

> **Note:** Once both gears are meshed and set into place the gangshaft should rotate in the same manner when gears were apart.

33. **Align** one set screw on bevel gear to mark (indicating flat spot) on bottom shaft then using Flathead Screwdriver, **tighten** set screw.

34. Using Flathead Screwdriver, **tighten** remaining set screw on bevel gear.

35. **Position** two gears together until teeth mesh .

36. Place brass rod against rear bushing and gently hammer brass rod until a .033 mm gap is between bushing and bevel gear.

> **Note: This adjustment is very critical:**
> - < **Proper Gear Alignment**-Gangshaft must rotate smoothly. Unnoticeable Bottom Shaft front to back movement. .033 mm gap between bushing and bevel gear.
> - < **Tight Gears**-Gangshaft binds. Hammer gear in opposite direction until gangshaft achieves the **Proper Gear Alignment**.
> - < **Loose Gears**-Bottom shaft has front to back movement and play between gears. Hammer bushing until achieving **Proper Gear Alignment .**

37. Using 3 mm Allen Wrench, **tighten** 3 mm Allen screw to secure rear bushing.

38. **Position** bottom shaft collar against rear bushing.

39. **Tighten** and **secure** two screws on bottom shaft collar.

40. **Rotate** gangshaft: checking bottom shaft collar adjustment did not effect movement.

    * If binding occurs loosen two screws on bottom shaft collar, reposition until binding is eliminated.

41. **Rotate** gangshaft to **color change position**.

B. HOOK ASSEMBLY REPLACEMENT

42. Insert **Hook Assembly** on bottom shaft.

43. **Replace** Position Finger.

44. **Insert** Position Finger **screw**. (Do not tighten completely).

45. **Rotate** Hook Assembly until Basket Notch is aligned with Position Finger Nose. *See Figure 3*.

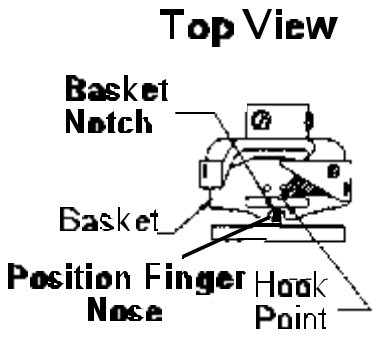


Figure 3

44. Using Flathead Screwdriver, **tighten** Position Finger screw.

45. **Replace** Upper Knife.

46. Using 2 mm Allen Wrench, **insert** hex bolt. (Do not tighten completely).

47. **Upper Knife** rests on Postion Finger and back rests flush against Needle Plate Bracket. See Figure 4.

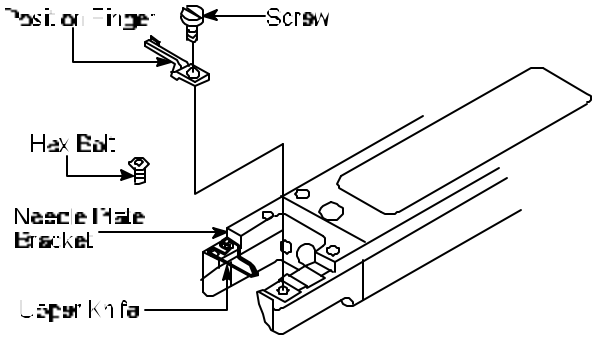


Figure 4

48. **Replace** Hook Driving Rod in Hook (Fork).

49. **Rotate** Hook Point to 9:00 position.

50. **Only tighten** set screw closest to Hook Point.

D. HOOK TO NEEDLE GAP

*The circumference on each machine may vary, by checking the **first** and **last** needle will determine whether the embroidery machine should be re-timed*
*(ie: **Needle #1** may be have the correct gap from hook point, **Needle #7** may be touching the hook point so move the hook .5 mm away.)*

51. **Rotate** gangshaft to **color change position**.

52. **Manually rotate** Turret to **Needle #1**.

53. Using Needle Screwdriver, **loosen** needle set screw.

54. **Rotate** needle so groove is facing back and scarf is in front.

55. Using Needle Screwdriver, **tighten** needle set screw.

56. **Engage** Needle Bar Driver.

57. Rotate gangshaft until **Hook Point** is behind needle.

58. Using Flathead Screwdriver, **loosen** set screw closest to Hook Point.

59. **Adjust** Hook Assembly so Hook Point is directly behind needle and as close to needle as possible. (Should not cause needle to bend).

60. Using Flathead Screwdriver, **tighten** set screw closest to Hook Point.

61. **Rotate** gangshaft to **Color Change Position**.

62. Using Needle Screwdriver, **loosen** needle set screw.

63. **Rotate** needle to correct position. (Groove facing front and scarf is in back). *See Figure 5*.

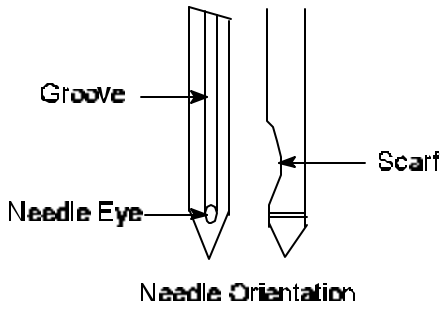


Figure 5

64. Using Needle Screwdriver, **tighten** needle set screw.

65. **Manually** rotate Turret to **Needle #7**.

66. **Remove** thread from Needle #7.

67. Using Needle Screwdriver, **loosen** needle set screw.

68. **Insert** new needle, **groove** is facing **back** and **scarf** is in **fron**t

69. Using Needle Screwdriver, **tighten** needle set screw.

70. **Rotate** gangshaft until **Hook Point** is behind needle.

71. Hook Point should be directly **behind** needle and as close to needle as possible. (Should not cause needle to bend).

    *If Hook Point causes needle to bend on **Needle #7** then adjust Hook Point 0.5 mm away from needle.*

72. Using Flathead Screwdriver, **tighten** two remaining set screws (furthest from hook point)

73. **Rotate** gangshaft to **Color Change Position**.

74. Using Needle Screwdriver, **loosen** needle set screw.

75. **Rotate** needle to correct position. (Groove facing front and scarf is in back).

E. POSITION FINGER ADJUSTMENT

76. **Engage** Needle Bar Driver.

77. **Rotate** gangshaft until needle reaches it's lowest point, **Bottom Dead center**.

78. Using Flathead Screwdriver, **loosen** Position Finger screw.

79. **Move** Position Finger **left or right**, centering Position Finger Nose with needle. *See Figure 6.*

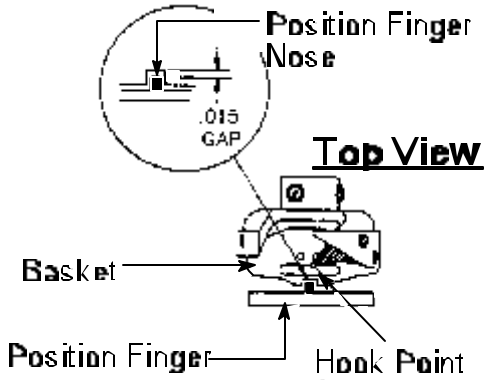


Figure 6

NOTE:	Bobbin thread may not be centered if adjustment is incorrect.

80 Move Position Finger Nose **forward or back** from hook basket allowing enough clearance for thread to pass between easily. *See Figure 7.*

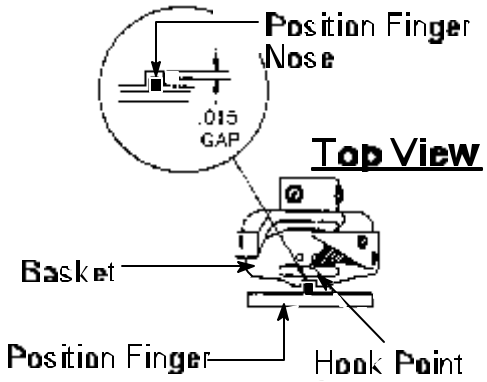


Figure 7

> **NOTE**: If Position Finger Nose is too close to hook basket, birdnesting or thread breaks may occur.

81. While holding Position Finger in place, **tighten** Position Finger **screw**.

82. **Rotate** gangshaft to **Color Change Position**.

83. **Reinstall** throat plate.

84. Using Flathead Screwdriver, **tighten** throat plate screws.

85. **Reinstall** bobbin case in Hook Assembly.

86. Using enclosed disk, **sew** the **"HOX" test** to check for proper adjustment.