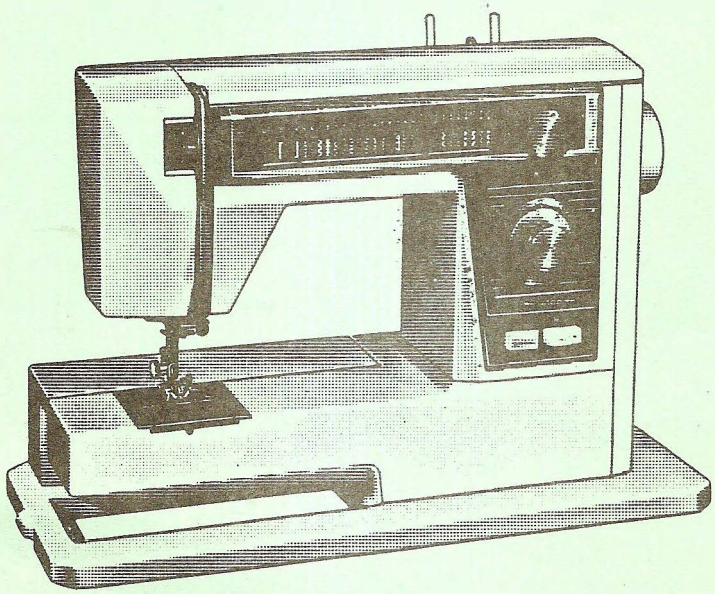
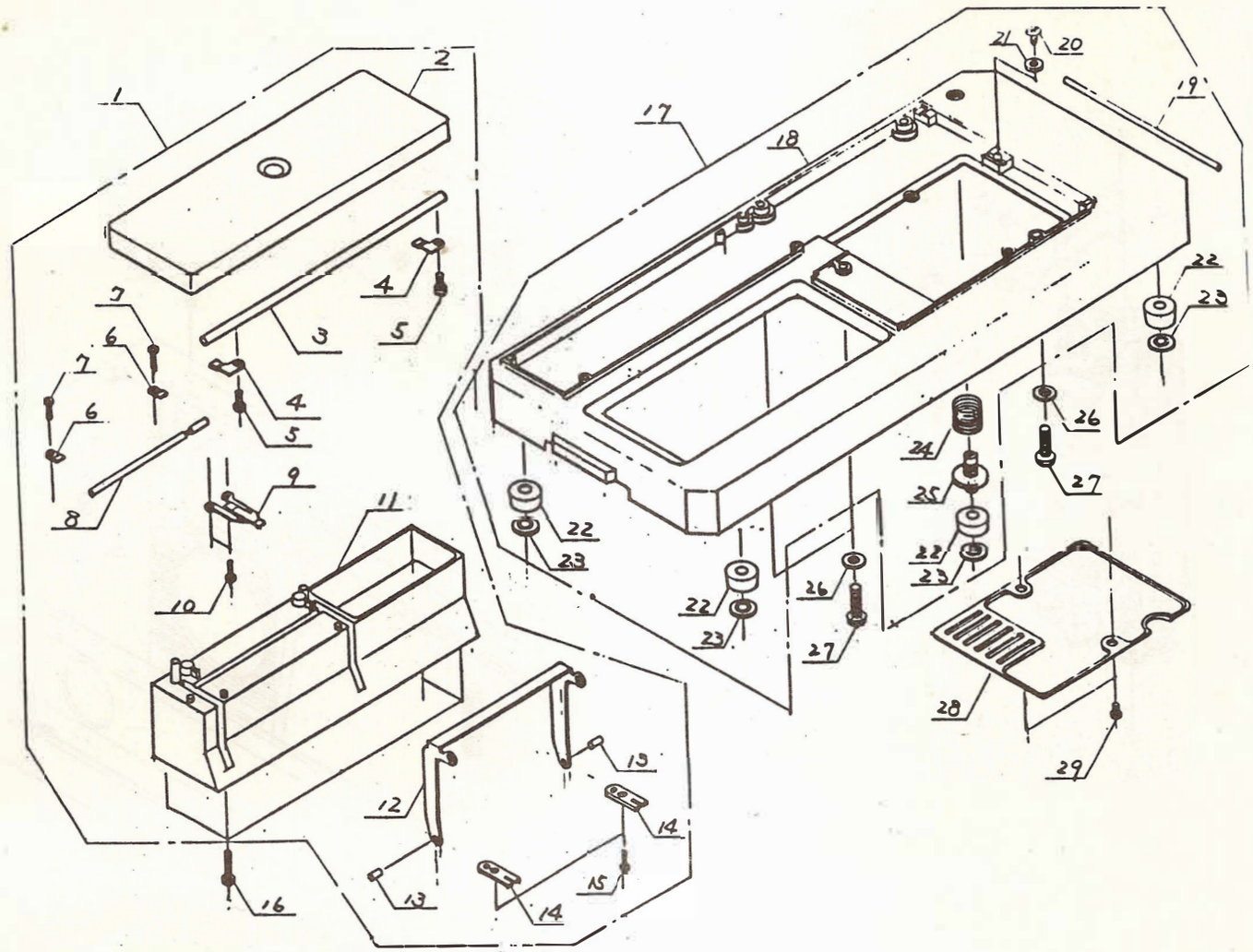
SERVICING MANUAL

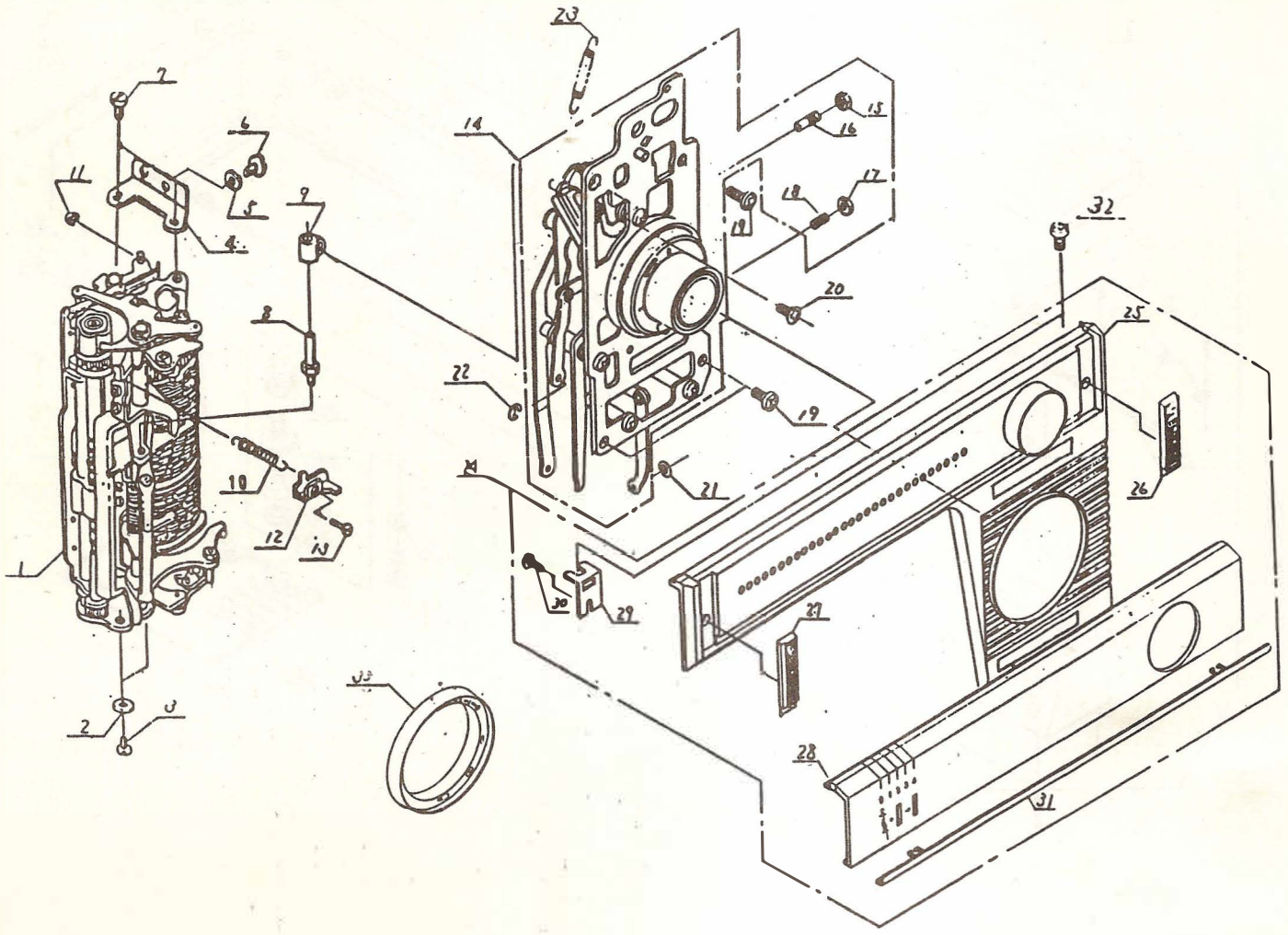
RE 3000



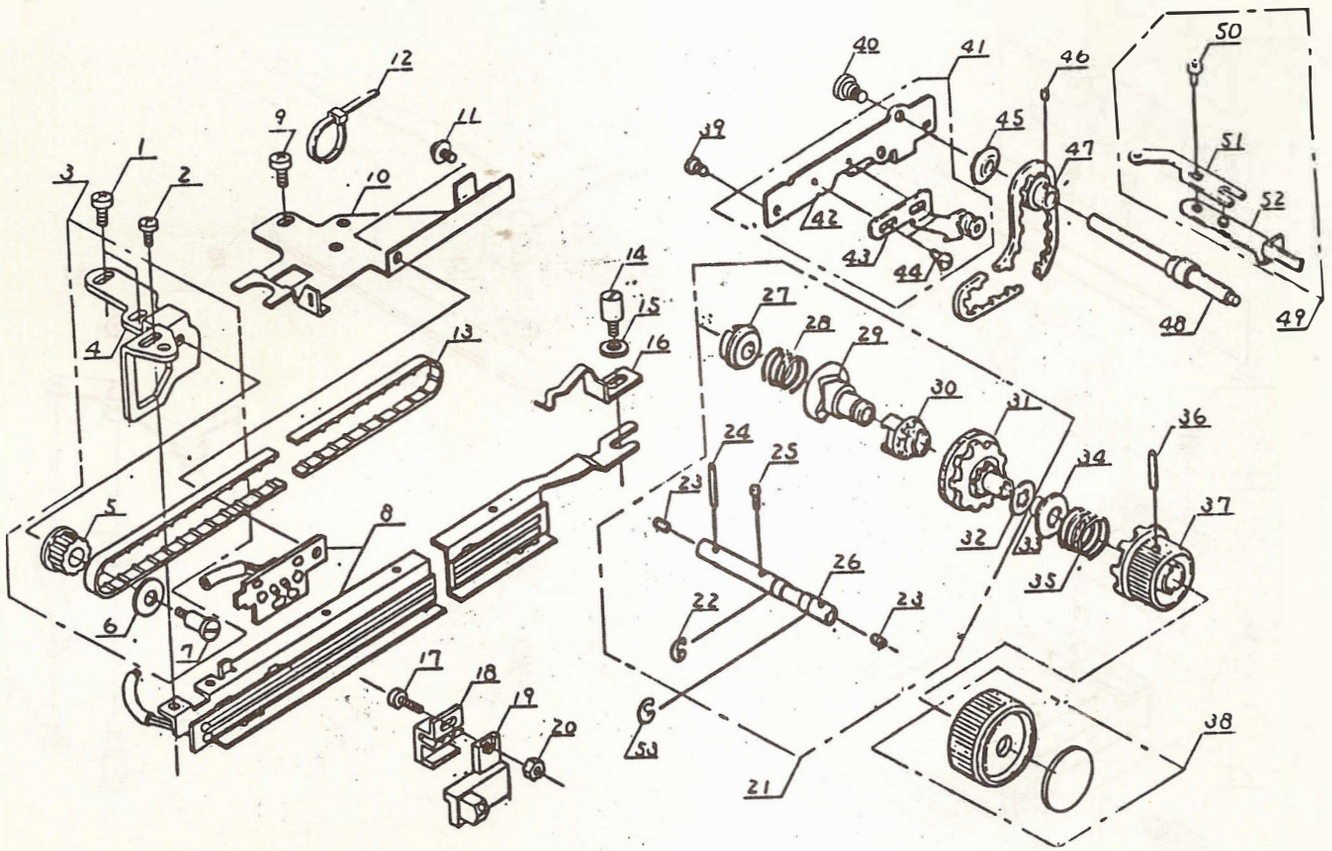
CONTENTS



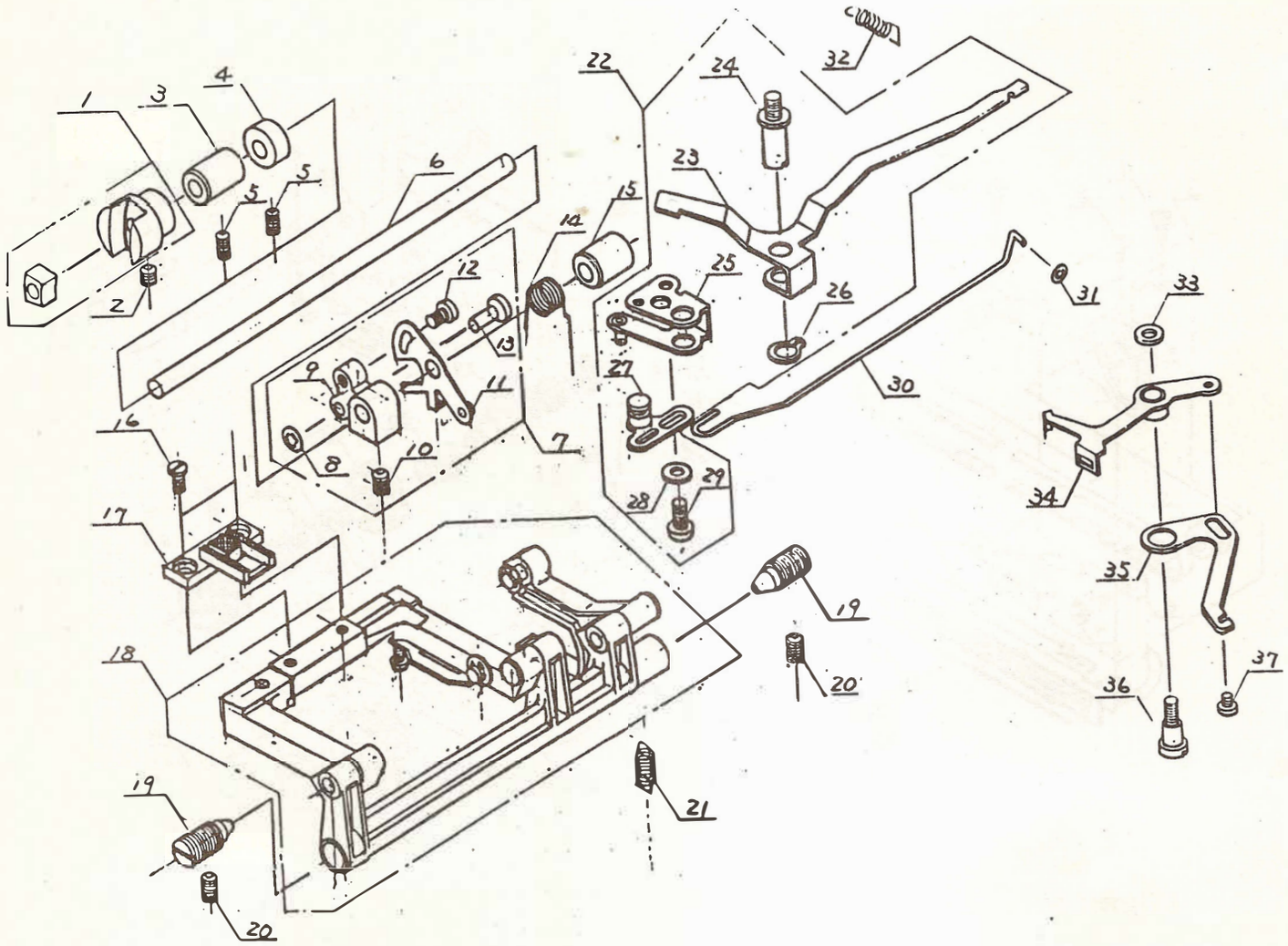
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	817641005	"Flip Top" sewing box unit			
2	817191005	"Flip Top" panel			
3	817192006	Pin			
4	817193007	Set plate			
5	000107307	+ pan head TAP TITE screw 3x8(B)			
6	817198002	Set plate			
7	000107307	+ pan head TAP TITE screw 3x8(B)			
8	817197001	Pin			
9	817199003	Spring			
10	000107307	+ pan head TAP TITE screw 3x8(B)			
11	817190004	Compartment			
12	817194008	Guide arm			
13	817195009	Pin			
14	817196000	Set plate			
15	000121204	+ pan head TAP TITE screw 4x8(B)			
16	000107709	+ pan head TAP TITE screw 4x8(B)			
17	817528016	Base unit			
18	817187112	Base			
19	817188009	Spring			
20	000081005	+- binding head small screw 4x8			
21	000070506	Washer			
22	605074008	Rubber cushion			
23	813123004	CS ring			
24	820351005	Spring			
25	820350004	Balance adjusting screw			
26	000127200	Set screw 6x16			
27	000081005	+- binding head small screw 4x8			
28	817189000	Base lid			



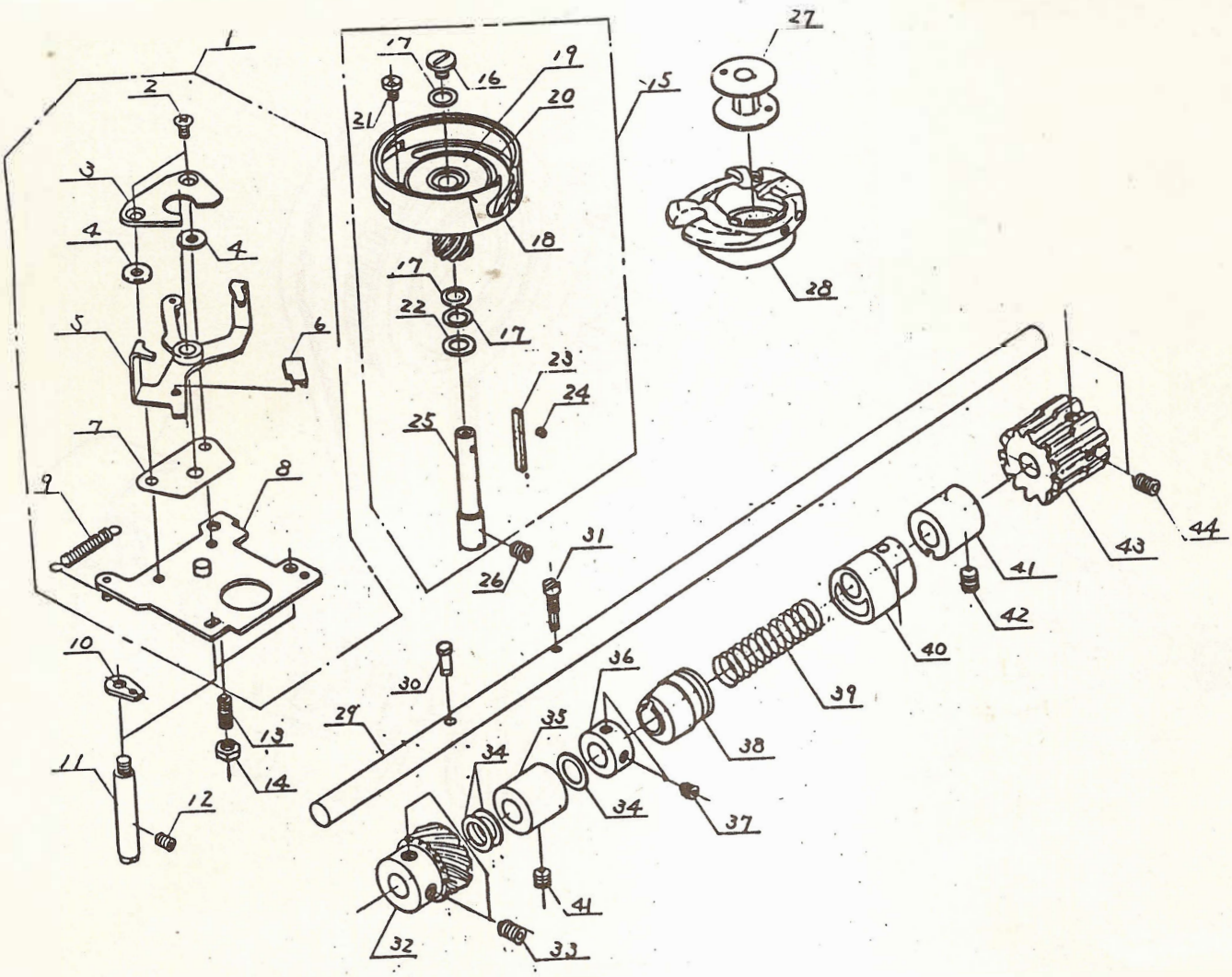
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	817625003	Cam block unit	31	817102004	Ornamental strip
2	000070908	Washer	32	000081005	+- binding head small screw 4x8
3	000104706	+- pan head small screw 4x16	33	817624105	Zigzag width dial unit
4	817123006	Cam block set plate	34	810140008	Cap
5	000070506	Washer			
6	000081005	+- binding head small screw 4x8			
7	761042004	Set screw			
8	810349009	Pin			
9	810350003	Zigzag arm connecting block			
10	815073004	Spring			
11	000002105	Snap ring			
12	817093006	Spring supporting plate			
13	000069214	+ flat head screw 3.5x8			
14	817642006	Stitch control device			
15	000061205	Hexagon nut 4-3-7			
16	817078005	Set screw			
17	000061205	Hexagon nut 4-3-7			
18	000113306	Set screw 4x10			
19	000081005	+- binding head small screw 4x8			
20	000069214	+ flat head screw 3.5x8			
21	000001300	Snap ring			
22	000001207	Snap ring			
23	810222005	Spring			
24	817623207	Front panel unit			
25	817103000	Front panel			
26	817104001	Ornamental plate (1)			
27	817105002	Ornamental plate (2)			
28	817212003	Pattern indicating plate			
29	817108005	Front panel set plate			
30	000107307	+ pan head TAP TITE screw 3x8(B)			



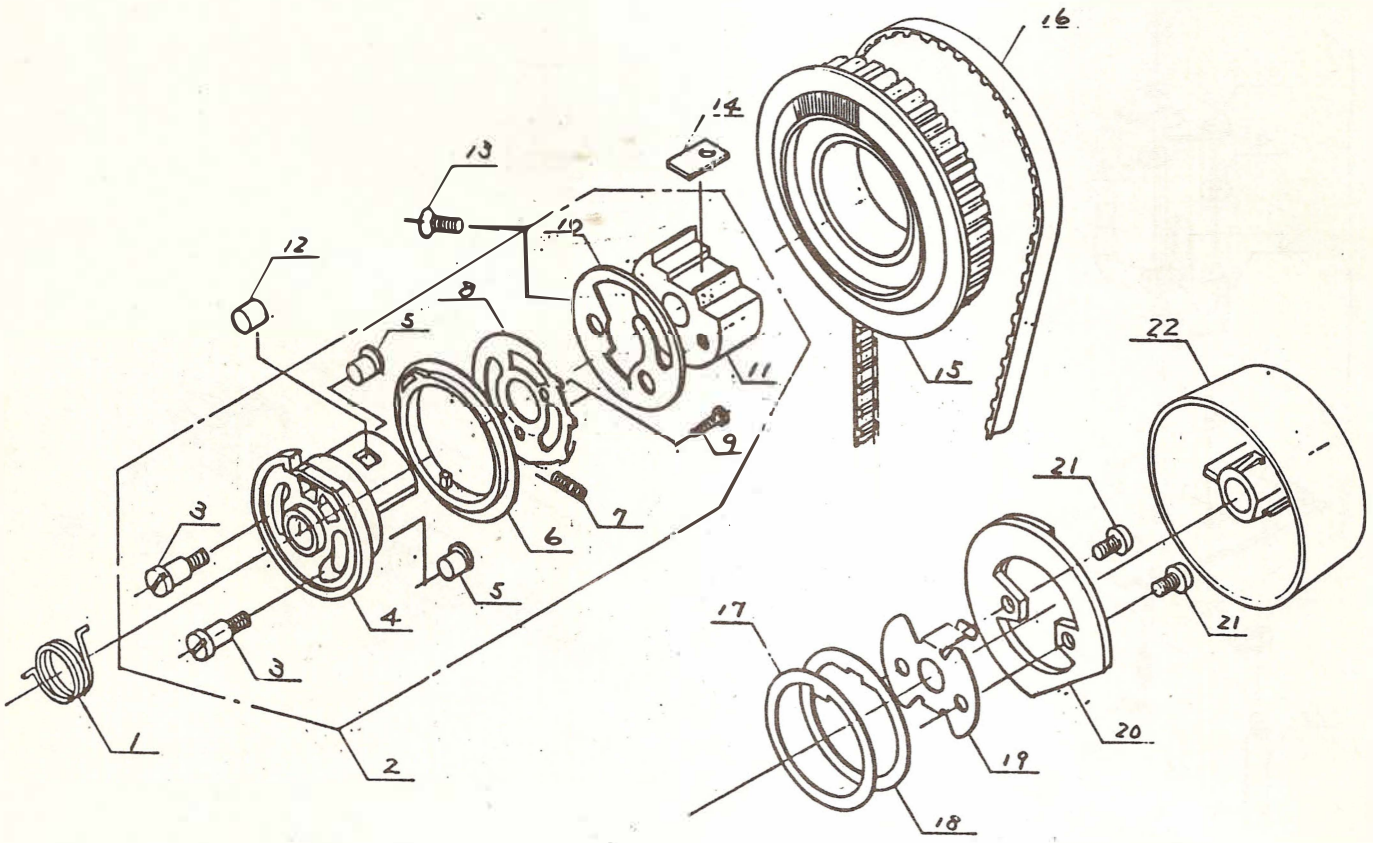
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	000081005	+- binding head small screw 4x8	31	810360006	Dial index cam
2	000101105	+- binding head small screw 3x4	32	000014203	CS ring
3	817630001	Sprocket unit	33	817128001	Ring
4	817132008	Bracket	34	810357000	Washer
5	810042009	Sprocket	35	810356009	Spring
6	810043000	Washer	36	810358001	Pin
7	817133009	Hinge screw	37	810355019	Dial base
8	817537007	LED guide plate unit	38	817527004	Dial unit
9	000081005	+- binding head small screw 4x8	39	810220003	Set screw
10	817137003	Cord guide plate	40	813120001	Hinge screw
11	000115009	Set screw 3x8	41	817629007	Spool pin set plate unit
12	000053008	Binder SKB-1M	42	817130006	Spool pin set plate
13	810369005	Belt	43	810651---	Idler supporting plate unit
14	810368004	Set screw	44	810228001	Set screw
15	000070506	Washer	45	810377006	Flange
16	817131007	Selector gear spring	46	000111201	Hexagon socket screw 4x4
17	000078319	+- binding head small screw 3x6	47	810376005	Timing gear
18	817140009	LED holder (2)	48	817508009	Timing gear unit
19	817510004	LED holder unit	49	817526003	Selector clutch rod unit
20	000061803	Hexagon nut 3-3-5.5	50	000107101	+ pan head TAP TITE screw 3x5
21	817628006	Pattern selecting dial unit	51	817124007	Selector clutch rod (1)
22	000001702	Snap ring	52	810353006	Selector clutch rod (2)
23	000111201	Hexagon socket screw	53	000001702	Snap ring
24	810364000	Pin			
25	810362008	Pin			
26	817127000	Dial shaft			
27	810366002	Spring supporter			
28	810365001	Spring			
29	810363009	Claw release cam			
30	810361007	Ring			



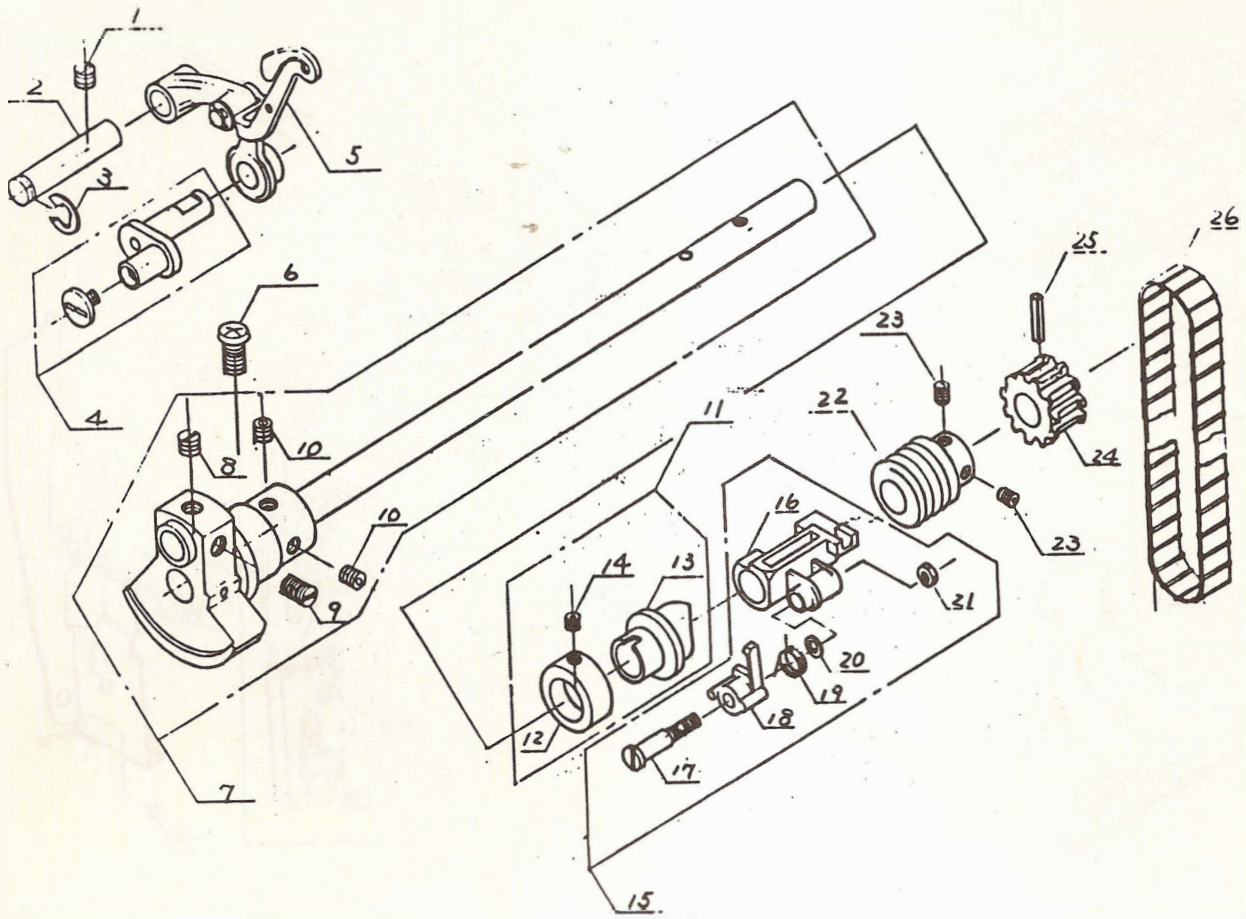
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	625508008	Feed regulator unit	31	000014100	CS ring
2	000111304	Hexagon socket screw 5x5	32	817059000	Spring
3	625144002	Bushing	33	000070506	Washer
4	820387000	Ring	34	817056007	Needle plate driving lever
5	000111108	Hexagon socket screw 4x6	35	817057008	Needle hole adjusting lever
6	817047005	Feed regulating shaft	36	817058009	Hinge screw
7	817612007	Feed arm unit	37	000101105	+- binding head small screw 3x4
8	000014007	CS ring			
9	817048006	Feed arm			
10	000111304	Hexagon socket screw 5x5			
11	817049007	Feed adjusting plate			
12	000081005	+- binding head small screw 4x8			
13	812020007	Feed adjusting pin			
14	817050001	Spring			
15	625145003	Bushing			
16	614025002	Set screw			
17	820136013	Feed dog			
18	625517000	Feed rock shaft unit			
19	532030003	Center screw			
20	000113605	Flat head set screw 5x8			
21	625131006	Spring			
22	817523000	Needle plate driving lever unit			
23	817051002	Needle plate driving lever			
24	817054005	Drop lever holding screw			
25	817052003	Drop lever			
26	000015008	C ring			
27	817053004	Drop feed adjusting plate			
28	000071013	Washer			
29	000081005	+- binding head small screw 4x8			
30	817055006	Drop feed rod			



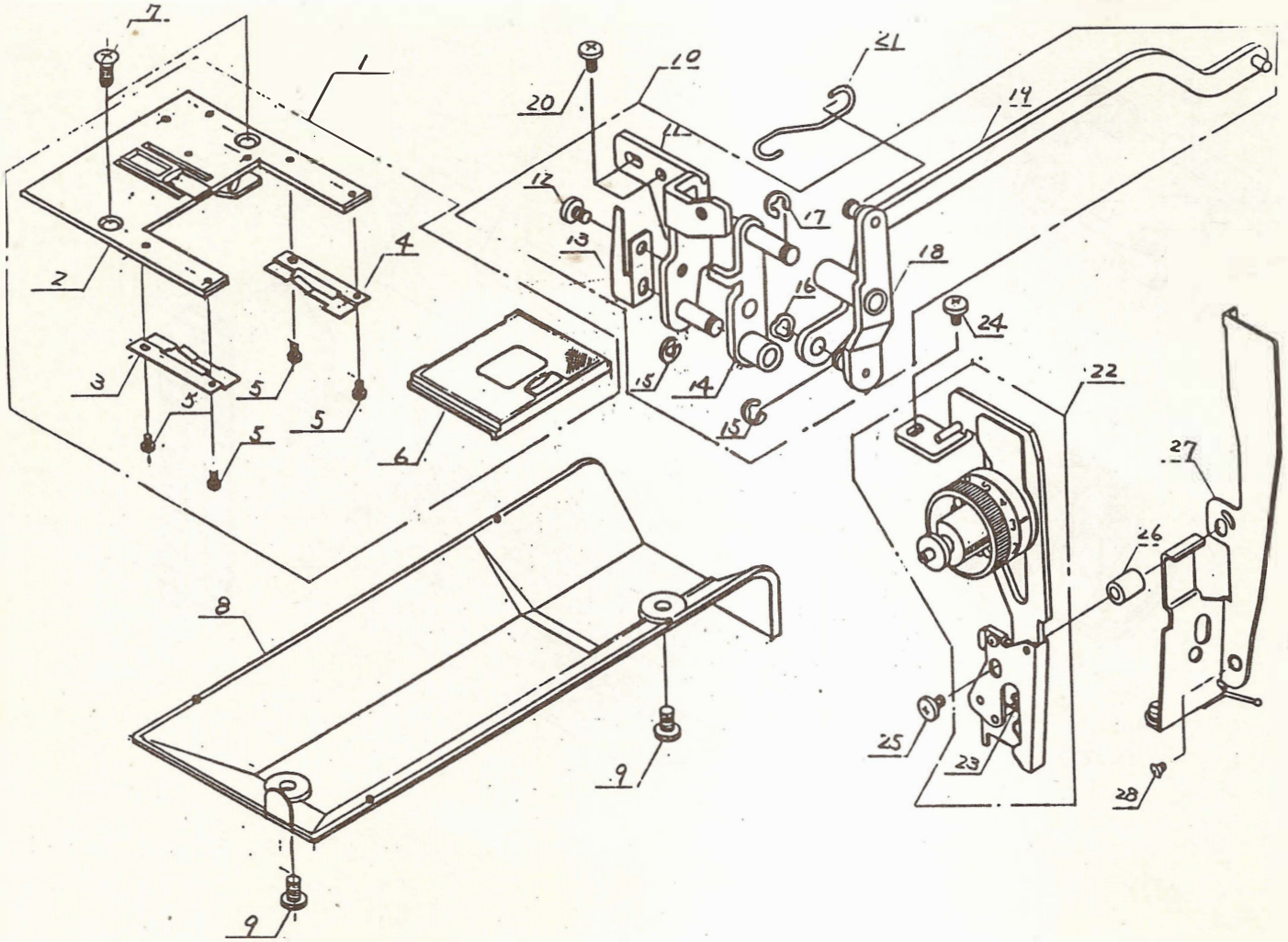
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	625614008	Bobbin case stopper unit	31	817045003	Feed cam set screw
2	000102508	+ flat head small screw 3x6	32	625114003	Lower shaft gear
3	625106002	Bobbin case stopper set plate	33	000111304	Hexagon socket screw
4	625109005	Washer	34	000036201	Thrust washer
5	625104000	Bobbin case stopper	35	625111000	Bushing
6	625105001	Slide plate	36	820166001	Ring
7	625107003	Washer	37	000111201	Hexagon socket screw
8	625108004	Bobbin case stopper base plate	38	817042000	Feed lifting cam
9	625246005	Spring	39	817043001	Spring
10	625070006	Nut	40	817044002	Feed cam
11	625110009	Set screw	41	625112001	Bushing
12	000111108	Hexagon socket screw 4x6	42	000111304	Hexagon socket screw
13	625148006	Feed lift stopper	43	817046004	Lower shaft gear
14	000061205	Hexagon nut 4-3-7	44	000111304	Hexagon socket screw
15	625612006	Shuttle hook unit			
16	625103009	Lid screw			
17	000036005	Thrust washer FT60x0.25			
18	625951000	Shuttle hook body			
19	820118008	Magnet			
20	820119009	Cover plate			
21	820374004	+- binding head small screw 2x2.3			
22	625102008	Washer			
23	625101007	Oil wick			
24	820125008	Oil wick			
25	625100006	Eccentric pin			
26	000111304	Hexagon socket screw			
27	102261000	Bobbin			
28	820515009	Bobbin case			
29	817041009	Lower shaft			
30	820161006	Pin			



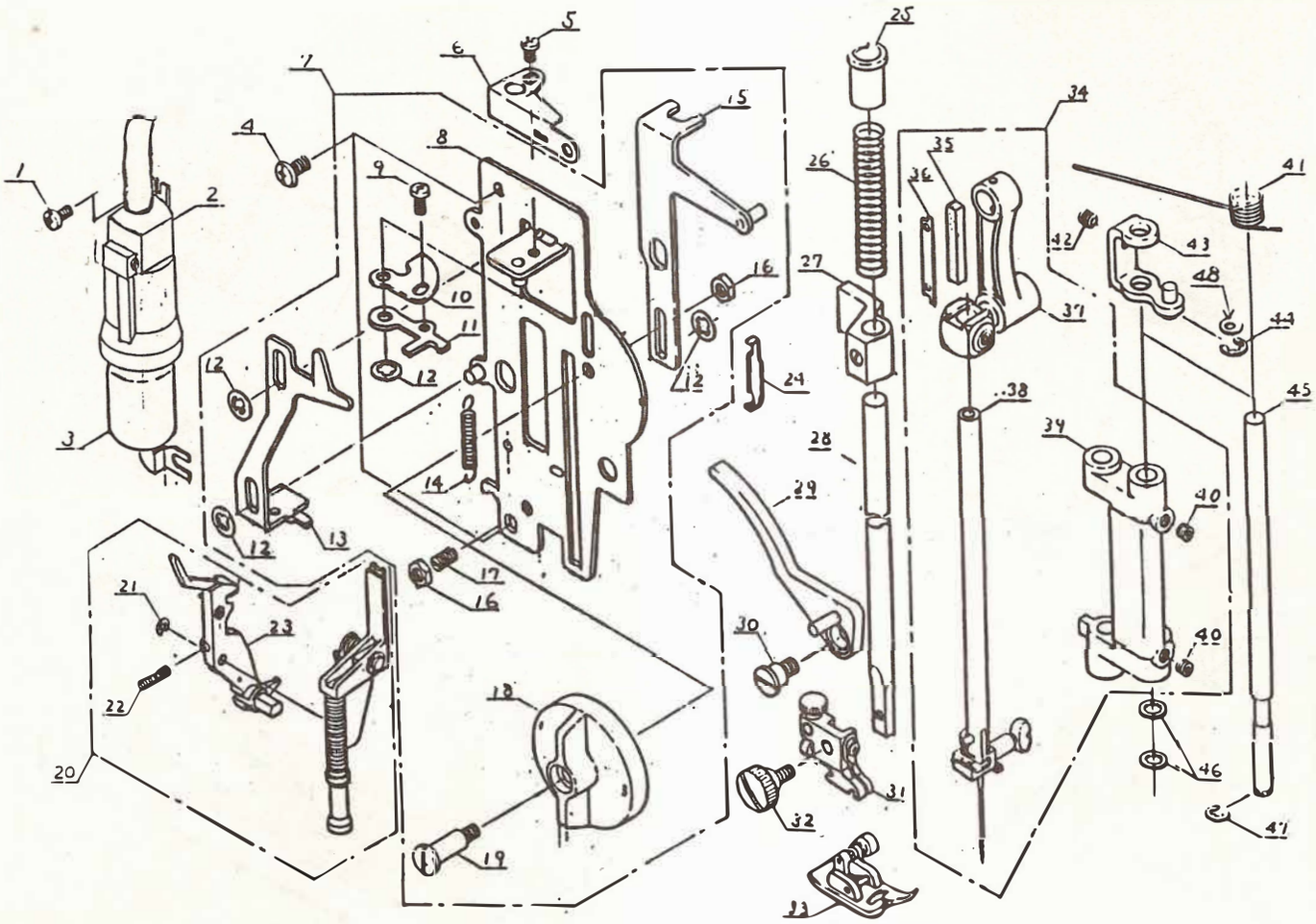
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	815067005	Spring			
2	815609108	Balance wheel bushing unit			
3	810104000	Hinge screw			
4	815066004	Stopper cam			
5	810103009	Cushion			
6	811016007	Stopper release ring			
7	811004002	Spring			
8	810102008	Claw release plate			
9	000075800	+ pan head small screw			
10	810098011	Washer			
11	810097010	Balance wheel bushing			
12	810107003	Declutch roller			
13	000102106	+ flat head small screw			
14	810106002	Declutch roller holding plate			
15	817553009	Belt wheel			
16	817234001	Timing belt			
17	810422007	Washer			
18	810426001	Washer			
19	810111000	Washer			
20	817039004	Balance weight			
21	000081005	+- binding head small screw 4x8			
22	813019006	Balance wheel			
23	810114106	Ornamental plate			



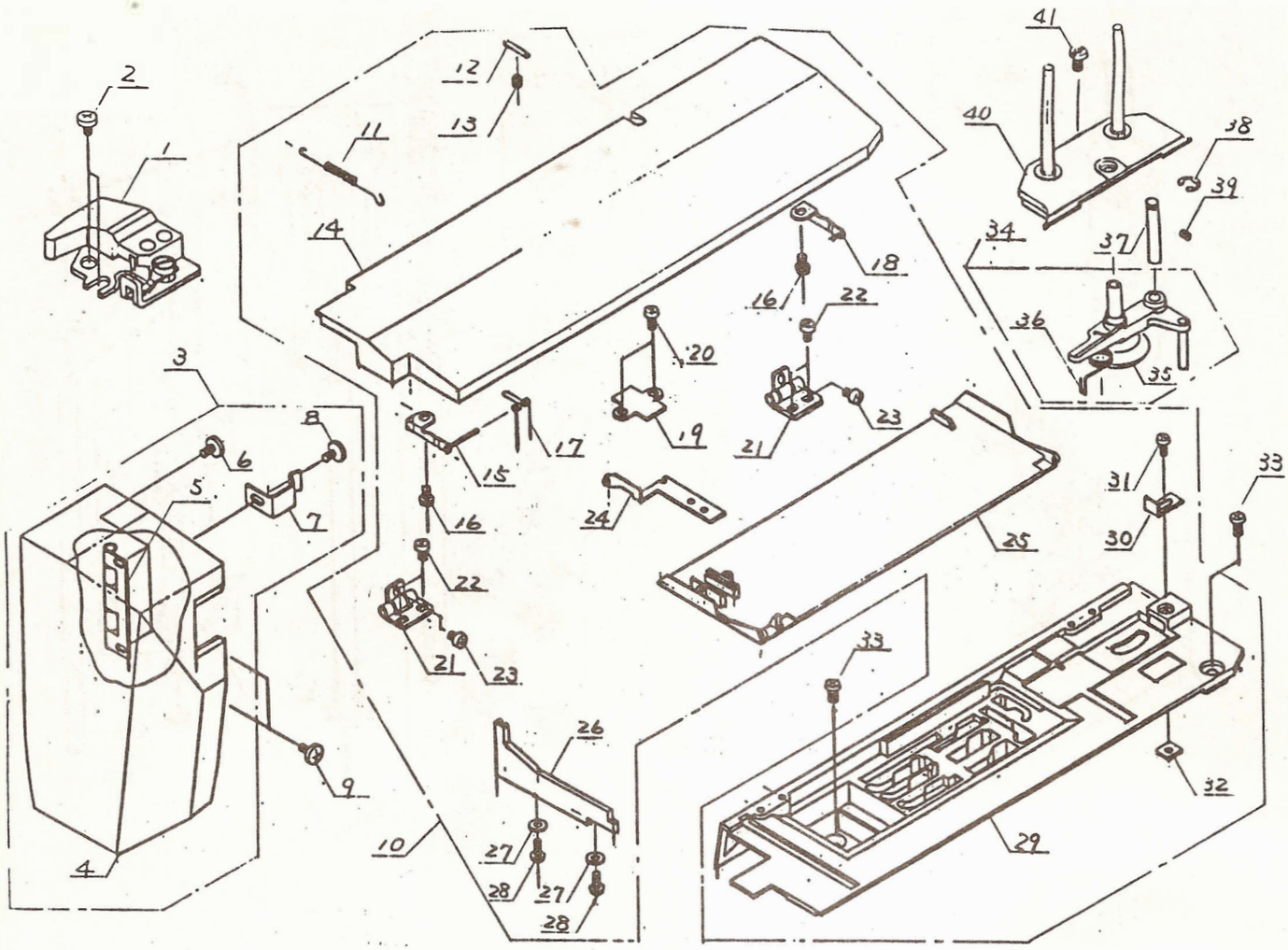
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	000082903	Set screw 5x6			
2	802028004	Pin			
3	000001702	Snap ring			
4	673520005	Needle bar crank pin unit			
5	625506006	Thread take-up lever unit			
6	000100506	+- pan head set screw			
7	817506007	Upper shaft unit			
8	102063000	Set screw			
9	102073000	Set screw			
10	000111304	Hexagon socket screw			
11	810607008	Declutch cam unit			
12	810092004	Ring			
13	810091003	Declutch cam			
14	000111108	Hexagon socket screw			
15	810608009	Declutch bracket unit			
16	810093005	Declutcher			
17	810096008	Hinge screw			
18	810096006	Claw			
19	810095007	Spring			
20	000070218	Washer			
21	000061803	Hexagon nut 3-3-5.5			
22	810089008	Upper shaft worm gear			
23	000111304	Hexagon socket screw			
24	817038003	Upper shaft gear			
25	000004200	Spring pin			
26	817611006	Clip belt unit			



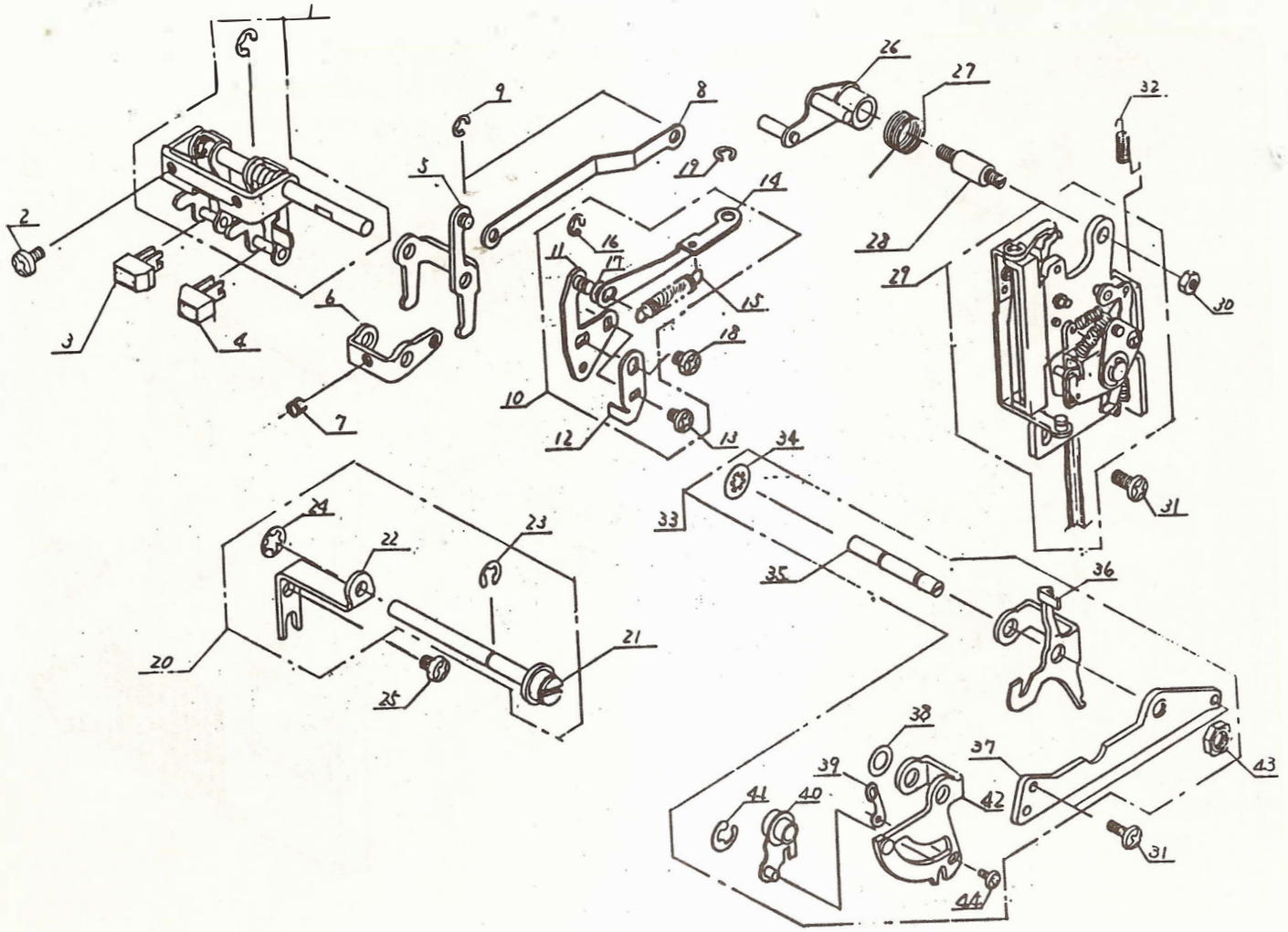
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	817601106	Needle plate unit			
2	817501105	Needle plate			
3	625008003	Slide plate guide (L)			
4	625009004	Slide plate guide (R)			
5	820374004	+- binding head small screw 2x2.3			
6	625007002	Slide plate			
7	681009008	Flat head screw			
8	817004000	Free arm cover plate			
9	810220003	Set screw			
10	817607009	Zigzag rod unit			
11	817019008	Zigzag rod base plate			
12	000103705	+- binding head small screw 4x5			
13	817021003	Spring			
14	817020002	Link base			
15	000002507	Snap ring			
16	813105000	Spring washer			
17	000001609	Snap ring			
18	817022004	Link			
19	817023005	Zigzag rod			
20	000081005	+- binding head small screw 4x8			
21	817025007	Rod			
22	817551007	Tension unit			
23	625241000	Check spring			
24	810220003	Set screw			
25	000103118	+ binding head small screw 4x14			
26	625059009	Collar			
27	817552008	Thread guide unit			
28	693093006	Flat head screw			



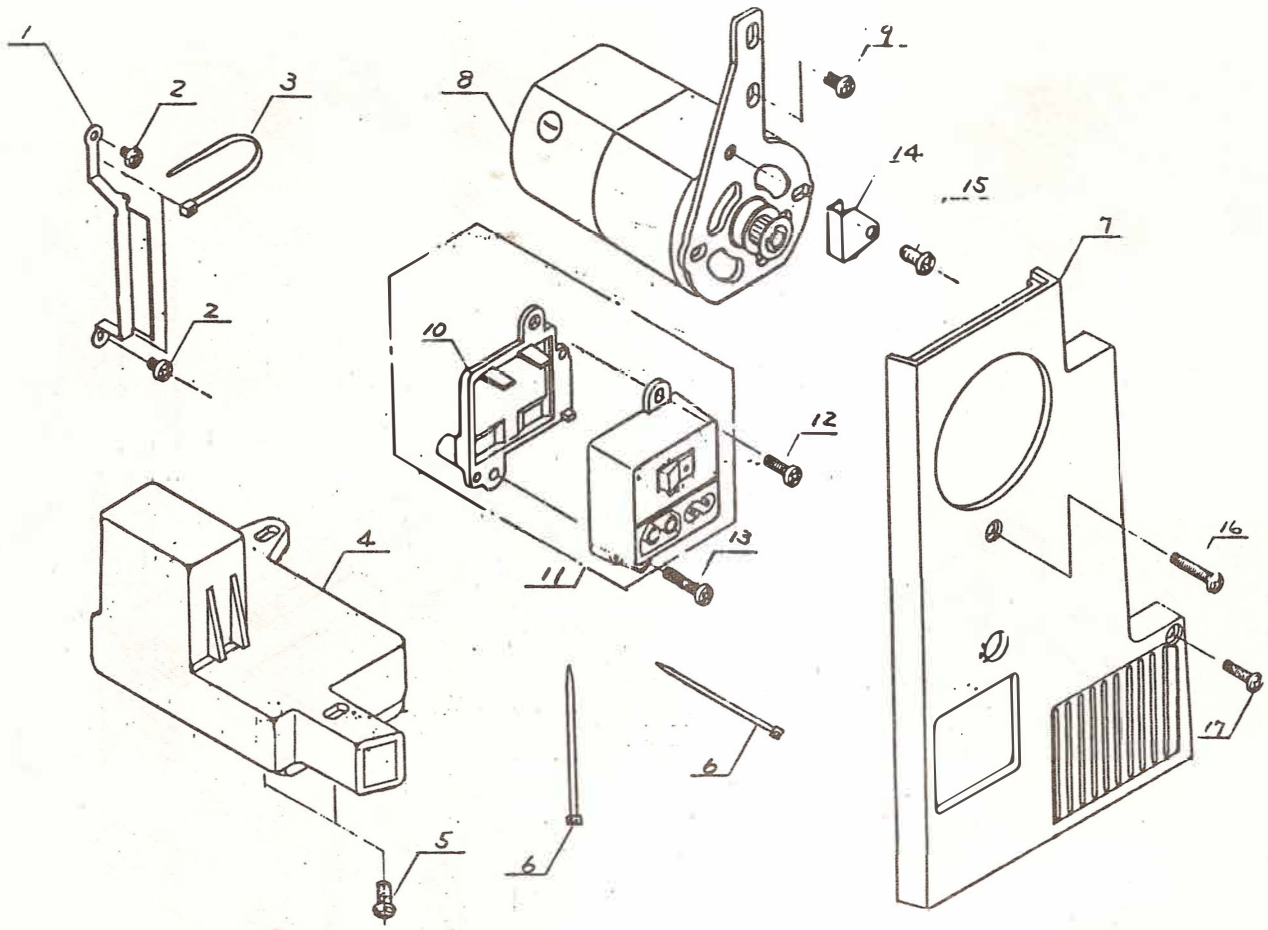
Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	000103808	+- binding head small screw 3x5	31	804509000	Foot holder unit
2	817538008	Lamp socket unit	32	102012004	Thumb screw
3	000009009	Light bulb	33	820506007	Zigzag foot
4	000081005	+- binding head small screw 4x8	34	625623000	Needle bar supporter unit
5	000101105	+- binding head small screw 3x4	35	810437005	Felt
6	625085004	Tension unit supporter	36	810438006	Spring
7	817610005	Threader supporting plate unit	37	625501001	Needle bar connecting stud unit
8	817037002	Threader supporting plate	38	625040007	Needle bar
9	000103808	+- binding head small screw 3x5	39	625039003	Needle bar supporter
10	625066009	Tension release plate (2)	40	000111201	Hexagon socket screw
11	625065008	Tension release plate (1)	41	625044001	Spring
12	000014007	CS ring	42	000111108	Hexagon socket screw
13	625063006	Tension release rod	43	625043000	Needle bar supporter plate
14	815097004	Spring	44	000002507	Snap ring
15	625067000	Pressure adjusting plate	45	625042009	Pin
16	000062402	Hexagon nut	46	000036603	Thrust washer FT50-0.5
17	625148006	Set screw	47	000002116	Snap ring
18	625068001	Pressure regulating dial	48	000036407	Thrust washer FT50-0.25
19	820090003	Hinge screw	49	102047008	Needle clamp screw
20	625505005	Threader unit	50	102408089	Needle, HA-1, size 14
21	000002301	Snap ring	51	625225008	Washer
22	625079005	Spring	52	820044002	Hinge screw
23	625529005	Threader supporter unit	53	625041008	Thread guide
24	625084003	Spring	54	820528016	Needle clamp unit
25	820047005	Bushing	55	000020202	Spring pin 2x10
26	815023009	Spring	56	625503003	Needle bar unit
27	671515001	Presser bar guide bracket unit			
28	102801008	Presser bar			
29	815027003	Presser bar lifter			
30	810431009	Hinge screw			



Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	817502003	Thread guide unit	31	000066727	+- binding head small screw 3x8
2	000077525	+ pan head small screw 4x6	32	630005006	Leaf nut
3	817606008	Face plate unit	33	000103417	+- binding head small screw 4x8
4	817016108	Face plate	34	817511005	Bobbin winder unit
5	366501009	Face plate hinge unit	35	102171002	Bobbin winder ring
6	000077503	+ pan head small screw 4x6	36	810388000	Spring
7	817017006	Spring	37	810389001	Pin
8	810220003	Set screw	38	000001506	Snap ring
9	000077503	+ pan head small screw	39	000082501	Set screw 4x6
10	817602107	Top cover unit	40	817141000	Spool pin
11	817010009	Spring	41	000104005	+- binding head small screw
12	820018007	Thread guide			
13	820448000	Set screw			
14	817005104	Top cover			
15	817013002	Chart supporting plate (L)			
16	000100300	+ pan head small screw 3.5x5			
17	817011000	Spring			
18	817012001	Chart supporting plate (R)			
19	817009005	Guide pin supporting plate			
20	000107905	+ pan head TAP TITE screw 3x6(B)			
21	820502003	Top cover hinge unit			
22	000107318	+ pan head TAP TITE screw 3x8(B)			
23	000100300	+ pan head small screw 3.5x5			
24	817008004	Guide pin			
25	817521101	Quick reference chart unit			
26	817015004	Guide plate			
27	000070104	Washer			
28	000107802	+ pan head TAP TITE screw 3x10(B)			
29	817014003	Foot compartment			
30	625026007	Bobbin winder stopper			



Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	817620008	Button set plate unit	31	000081005	+- binding head small screw 4x8
2	000103004	+- binding head small screw 5x6	32	817164009	Spring
3	817549002	Cycle-stitch button	33	817631002	Stopper unit
4	817550006	Needle-up button	34	000013800	CS ring
5	817165000	Connecting arm (1)	35	817146005	Pin
6	817166001	Connecting arm (2)	36	817235002	Declutch arm
7	000082707	Set screw 4x8	37	817145015	Stopper bracket
8	817167002	Connecting rod (1)	38	000036500	Thrust washer
9	000001300	Snap ring	39	817149008	Stopper adjusting plate
10	817638009	Shift lever adjuster unit	40	817150002	Connecting arm
11	817168003	Shift lever adjuster	41	000001609	Snap ring
12	817169004	Adjusting plate	42	817148018	Stopper
13	000101105	+- binding head small screw 3x4	43	000061618	Hexagon nut
14	817170008	Connecting rod (2)	44	000103808	+- binding head small screw 3x5
15	817171009	Spring			
16	000001300	Snap ring			
17	000071013	Washer			
18	000101507	+- binding head small screw 3.5x5			
19	000001300	Snap ring			
20	817639000	Buttonhole feed balancing knob unit			
21	817172000	Buttonhole feed balancing knob			
22	817173001	Knob set plate			
23	000002507	Snap ring			
24	000013903	CS ring			
25	000101404	+- binding head small screw 4x6			
26	817152004	Connecting arm			
27	817153005	Spring			
28	817151003	Connecting arm holding screw			
29	817632106	Needle-up device			
30	000062402	Hexagon nut 4-2-7			



Ref. No.	Parts No.	Name of Parts	Ref. No.	Parts No.	Name of Parts
1	817174002	Cord guide			
2	000081005	+- binding head small screw 4x8			
3	000053008	Binder SKB-1M			
4	817529006	Speed control device			
5	000103509	+- binding head small screw 4x10			
6	000053008	Binder SKB-1M			
7	817144003	Belt cover			
8	021995213	Motor			
9	000101301	+- binding head small screw 5x10			
10	817180207	Plug cover			
11	817543006	Motor attachment plug unit			
12	000101703	+- binding head small screw 4x12			
13	000106801	+- binding head small screw 4x35			
14	817205003	Cord guide			
15	540049000	FT small screw 3.5x8			
16	000080901	+- binding head small screw 4x25			
17	000104119	+- binding head small screw 4x20			

PATTERN SELECTOR DIAL

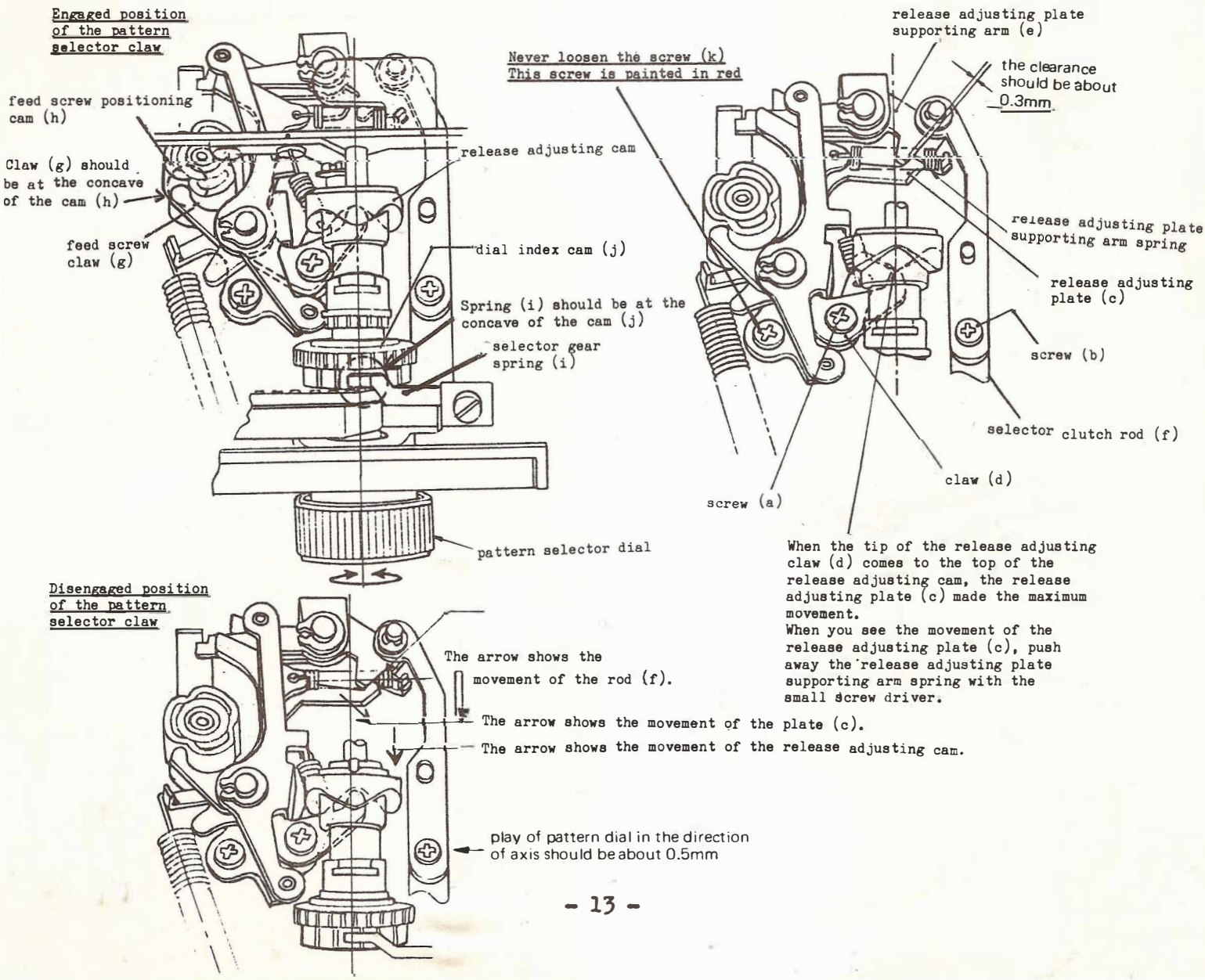
In case the electronic eye does not move even you turn the pattern selector dial, make adjustment as follows:

1. Loosen the screws (a) and (b).
2. Turn the pattern selector dial until the movement of the release adjusting plate (c) becomes the maximum. At this point, adjust the position of the claw (d) so that the distance between the release adjusting plate (c) and the release adjusting plate supporting arm (e) is 0.3mm. Then, tighten the screw (a).
3. Release the pattern selector claw as shown in the diagram. Adjust the position of the selector clutch rod (f) so that the pattern selector dial has the play of 0.5mm in thrust direction. Then, tighten the screw (b).

Note: i) When the pattern selector claw is set to work, make sure that the feed screw claw (g) is at the concave of the feed screw positioning cam (h) and that the selector gear spring (i) is at the concave of the dial index cam (j).

ii) In order to prevent the selector clutch rod (f) from bending, support the selector clutch rod (f) by the screw driver when you tighten (loosen) the screw (b).

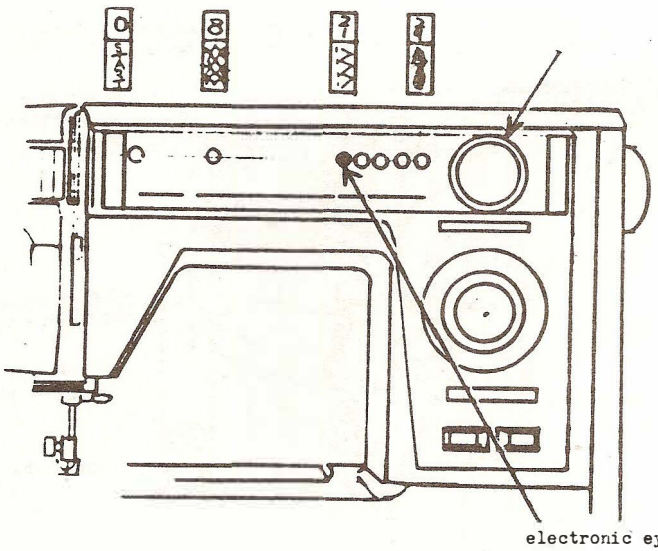
iii) Never loosen the screw (k) on the release adjusting plate. This screw is painted in red.

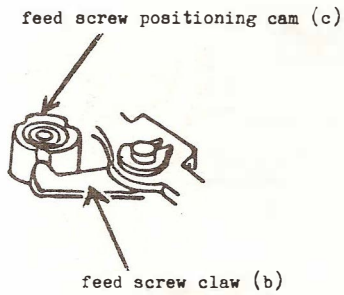


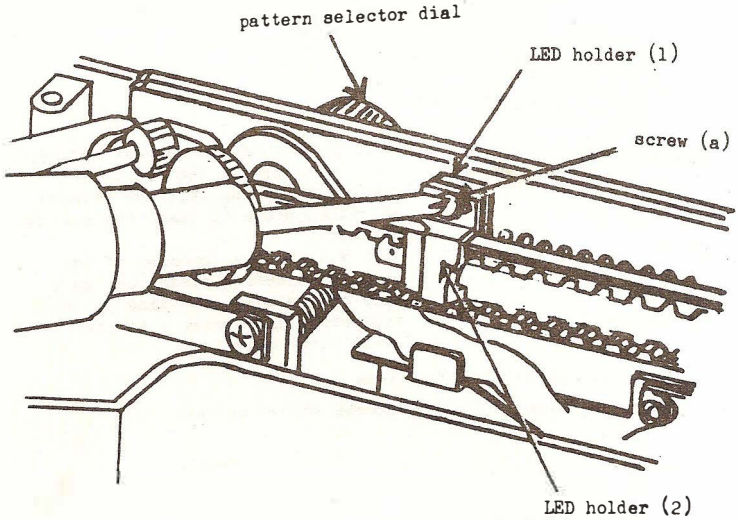
POSITION OF LED HOLDER

In case the electronic eye does not point at the correct pattern, make adjustment as follows:

1. Set the electronic eye **at the pattern 21**. Check if the feed screw claw is positioned at the concave of the feed screw positioning cam. (See PATTERN SELECTOR DIAL)
2. Loosen the screw (a). Adjust the position of the LED holder (1) so that the centre of the electronic eye points at the centre of the pattern 21. Then, tighten the screw (a).
3. Turn the pattern selector dial to set the electronic eye at the pattern 8 and then at the pattern 29 to check if the electronic eye points at the correct patterns.
4. Turn the pattern selector dial counter-clockwise as far as it goes and then release your hold of the dial. At this point, the feed screw claw (b) should return to the concave of the feed screw positioning cam (c).
5. If not, make adjustment as follows:
   Loosen the screw on the LED guide plate and the screw on the selector gear spring. Holding the selector gear spring with your right hand, move the LED guide plate to the right with your left hand until it hits the LED holder (2). Then, tighten the screw on the LED guide plate.







TIMING OF NEEDLE SWING

In zigzag sewing, the needle should make the parabolic movement above the needle plate. In other words, the needle should start and cease its parabolic movement at the same height from the needle plate as shown in the diagram. (Fig. 1)
If not, make adjustment as follows:

1. Set the pattern selector dial at 21 and stitch width dial at 7.
2. Loosen the two screws (a).
3. While holding the one of the screws (a) with the hexagon driver so that the upper shaft worm gear does not rotate, turn the balance wheel little by little until the upper shaft worm gear is positioned for correct needle swing.
   i) In case the needle starts to swing too early, turn the balance wheel (upper shaft) in the direction of A. (Fig. 2)
   ii) In case the needle delays to swing, turn the balance wheel in the direction of B.
4. Tighten the two screws (a).

Note: The distance between the upper shaft worm gear and the upper shaft rear bushing should be 0.5mm.

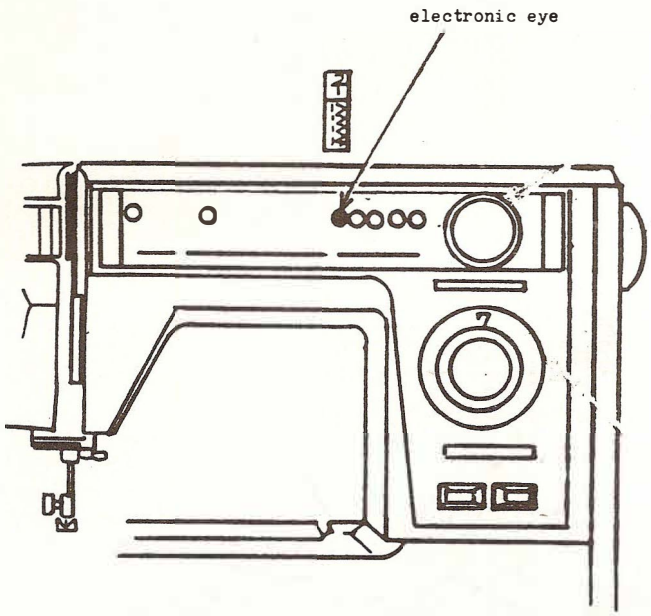
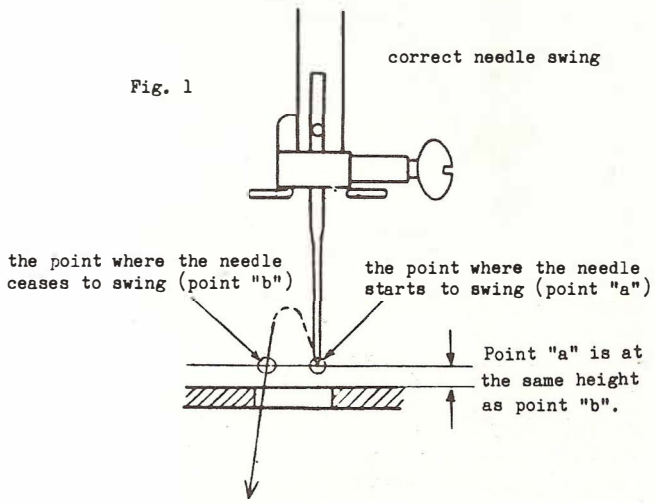


Fig. 1



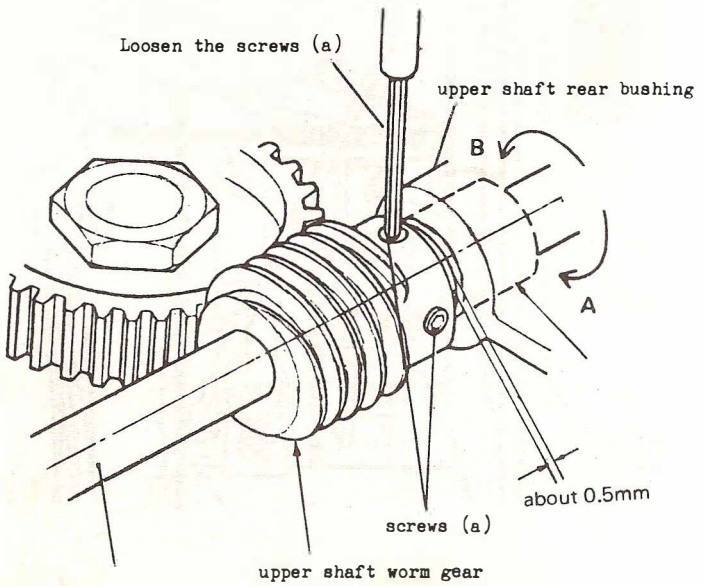


Fig. 2

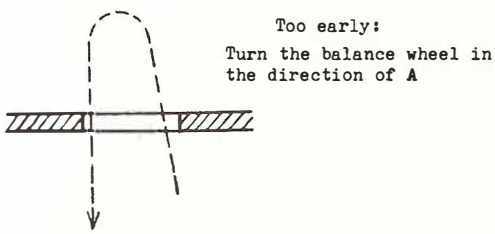
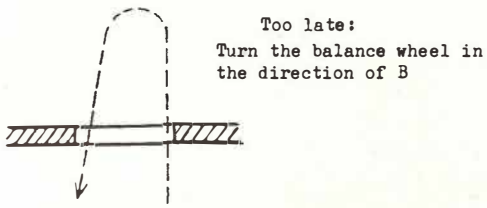


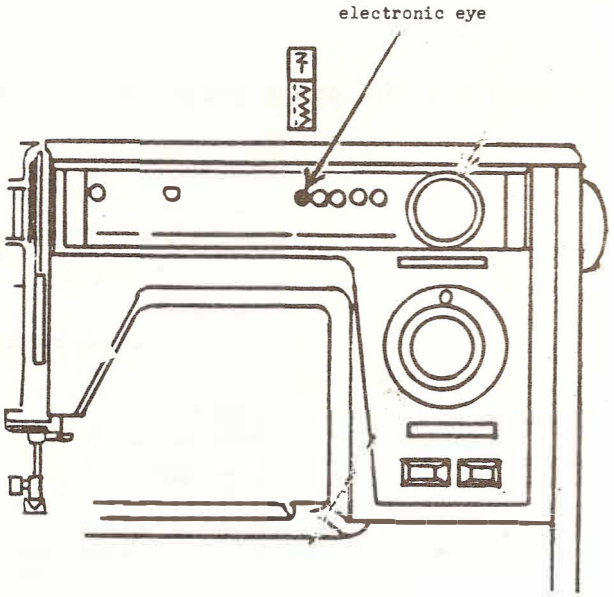
Fig. 3

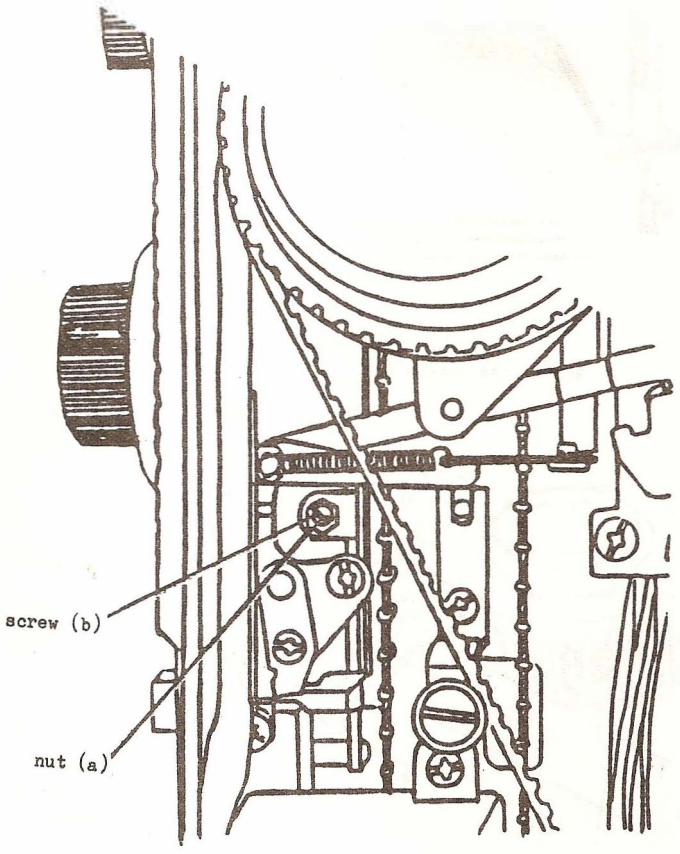


"M" NEEDLE POSITION

The needle should not make zigzag movement when the stitch width dial is set at 0.
If it is not correct, make adjustment as follows:

1. Set the pattern selector dial at **21** and the stitch width dial at 0.
2. Loosen the nut (a).
3. While turning the balance wheel counter-clockwise, turn the screw (b) little clockwise or counter-clockwise.
4. At the point where the needle does not make zigzag movement, stop turning the screw (b).
5. Tighten the screw (a). Then, check if the adjustment is made correctly.



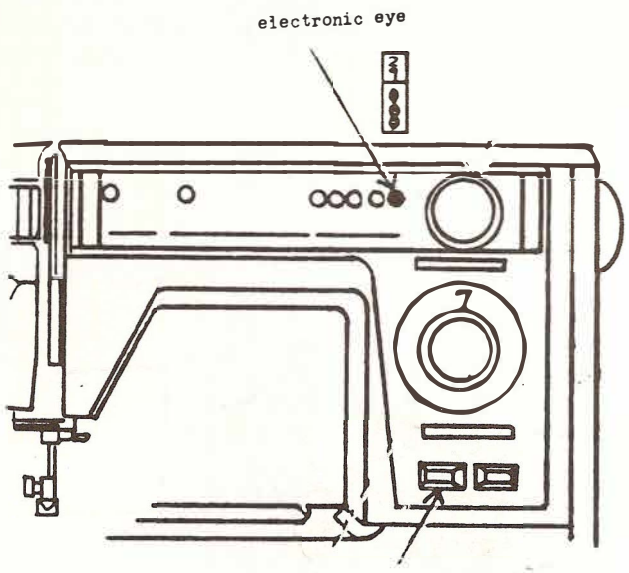


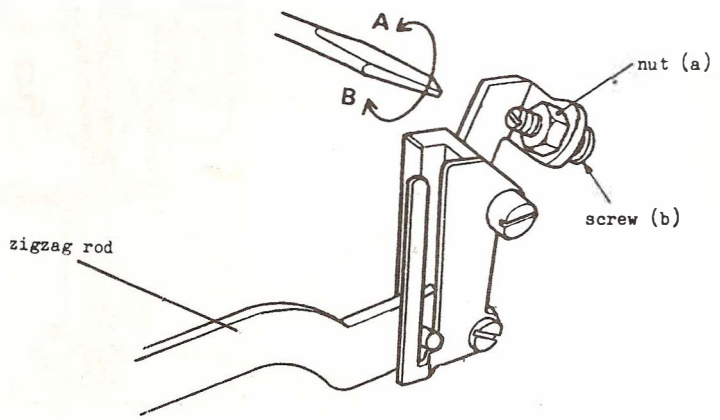
"0" NEEDLE POSITION OF PATTERN SEWING

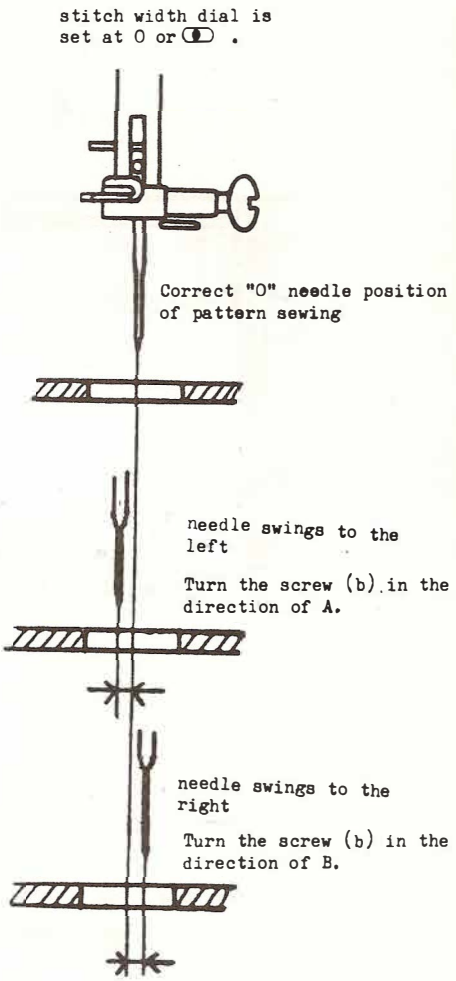
0 needle position of the pattern sewing and 0 needle position of the straight sewing should be the same.

1. Set the pattern selector dial at 29 and the stitch width dial at 7.
2. Push the cycle stitch button and run the machine. Turn the balance wheel counter-clockwise to lower the needle to the surface of the needle plate.
3. Change the stitch width dial from 7 to 0. Loosen the nut (a).
4. Change the stitch width dial from 0 to 7 (7 to 0) to check if the needle makes vibration.
   i) In case the needle swing to the left, turn the screw (b) in the direction of **A.**
   ii) In case the needle swing to the right, turn the screw (b) in the direction of **B.**
5. After adjustment, change the stitch width from 7 to 0 (0 to 7) to check if adjustment is made correctly.

Note: After this adjustment, check if NEEDLE DROP is correct.



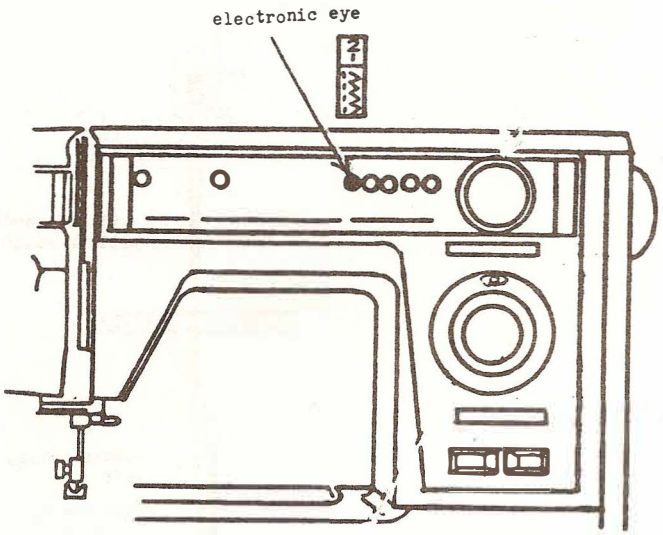


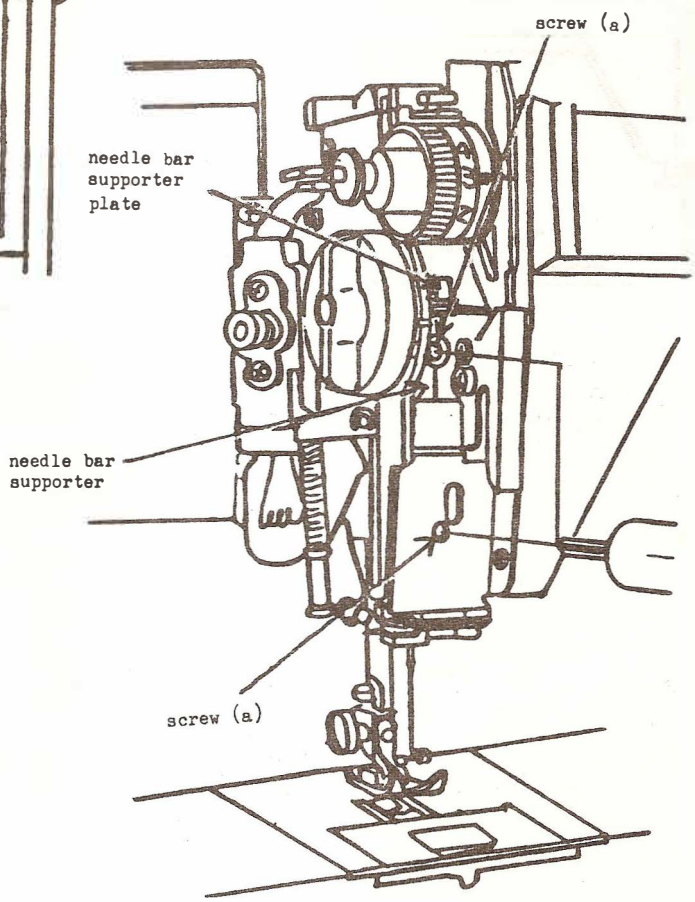


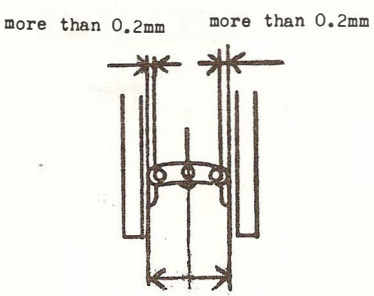
NEEDLE DROP

When the stitch width dial is set at , the needle should drop at the centre of the hole of the needle plate. When it is set at 7, the needle should drop at more than 0.2mm inside from the both right and left sides of the hole of the needle plate.
If NEEDLE DROP is incorrect, make adjustment as follows:

1. Set the pattern selector dial at 21 and the stitch width dial at
2. Loosen the two screws (a) to correct the position of the needle so that the needle drops at the centre of the hole of the needle plate.
3. Tighten one of the screws (a) while you draw up the needle bar supporter plate and draw down the needle bar supporter.
4. Set the pattern selector dial at 7. Turn the balance wheel counter-clockwise to check if the needle drops at more than 0.2mm inside from the hole of the needle plate.
5. After checking, tighten another screw (a).







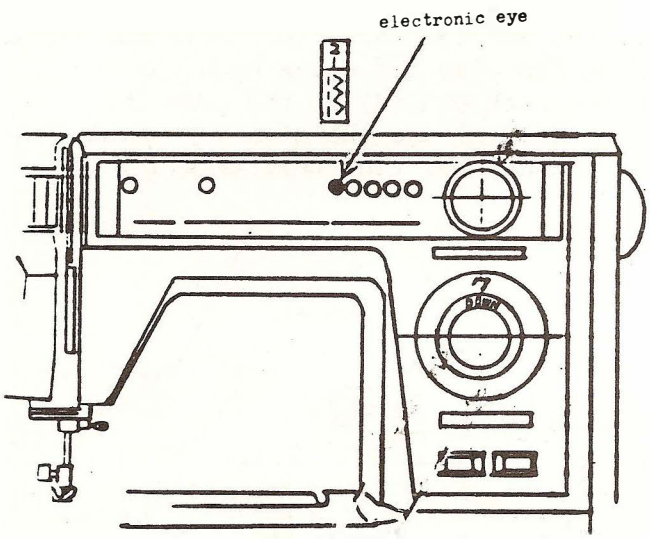
Needle should drop at more than 0.2mm inside from the hole of the needle plate when stitch width is 7.

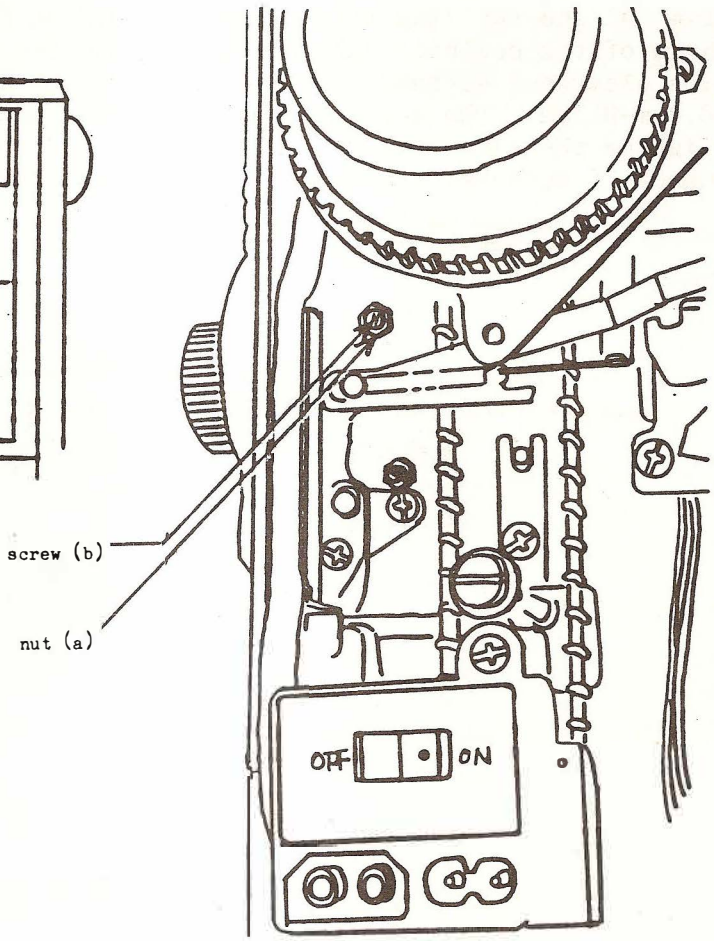
MAXIMUM ZIGZAG WIDTH

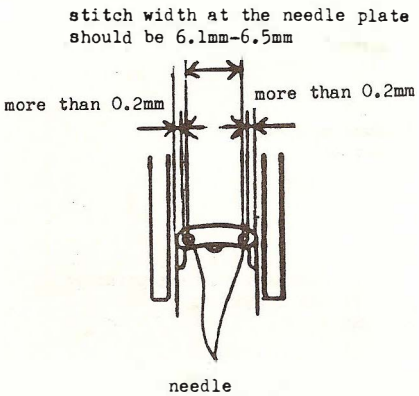
When the stitch width dial is set at 7, the needle should drop at more than 0.2mm inside from the both right and left sides of the hole of the needle plate. At the same time, the stitch width at the needle plate should be 6.1mm-6.5mm.
If it is not correct, make adjustment as follows:

1. Set the pattern selector dial at 21 , the stitch width dial at 7 and the stitch length dial at "DOWN".
2. Loosen the nut (a). While turning the balance wheel counter-clockwise, turn the screw (b) to make stitch width at the needle plate 6.1mm-6.5mm.
3. Tighten the nut (a).
4. Change the stitch width from 0 to 7 (7 to 0) to check that the stitch width dial functions smoothly.

Note: In case the stitch width dial does not function smoothly, make the maximum stitch width little narrower.







stitch width
is 7.

AUTO-PATTERN SETTING MECHANISM

In the instruction book, the customer is instructed to press the pattern selector dial after pattern selection to ensure the pattern selector claw (this claw is included in the machine mechanism unit so it is not visible from outside) is set at the selected pattern. However, this machine has AUTO-SETTING MECHANISM which makes the machine set for the selected pattern even if the customer fails to press the pattern selector dial.
In case this mechanism does not funtion, make adjustment as follows:

Note: This auto-setting mechanism funtions during the needle's travel from its highest point to the surface of the presser foot when the presser foot is raised (Fig. 2). You will hear the click sound when the claw is set at the selected pattern.

1. Turn the pattern selector dial to set at some pattern and leave it without pressing.
2. Loosen the screw (a).
3. Turn the balance wheel counter-clockwise until the needle comes to its highest point.
4. While maintaining the contact of the claw (b) and the screw (c), move the declutch cam (d) and the ring (e) so that the pin of the claw (b) comes upon the brim of the declutch cam (d) and hit the declutch cam (d) at the claw (b). The clearance distance between the declutch cam (d) and the claw (b) should be 0.2mm-0.5mm. The declutch cam (d) should contact the ring (e). (Fig.1)
5. Tighten the screw (a).
6. Check if auto-setting mechanism functions well.

Fig. 1

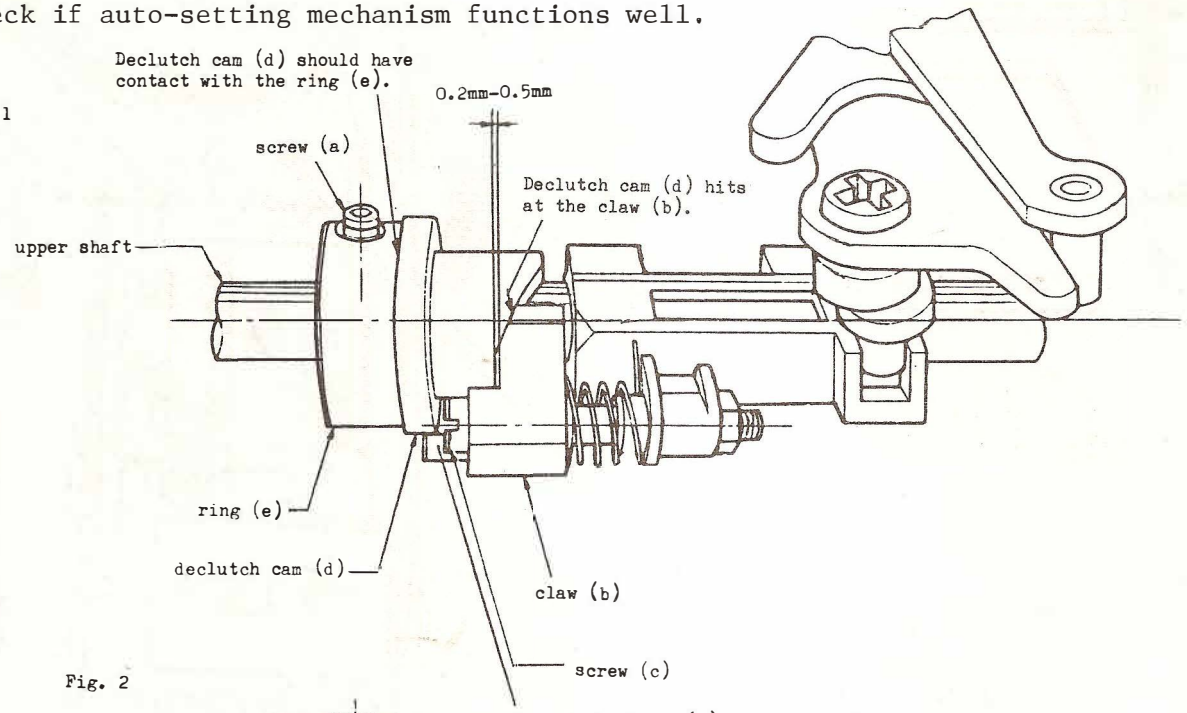
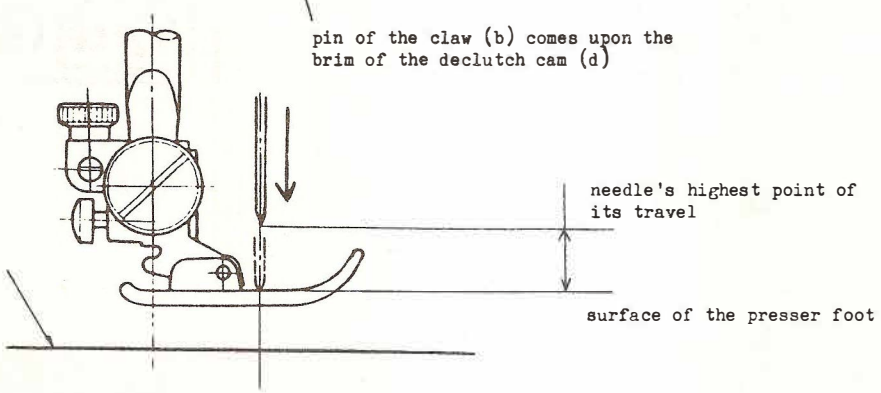


Fig. 2

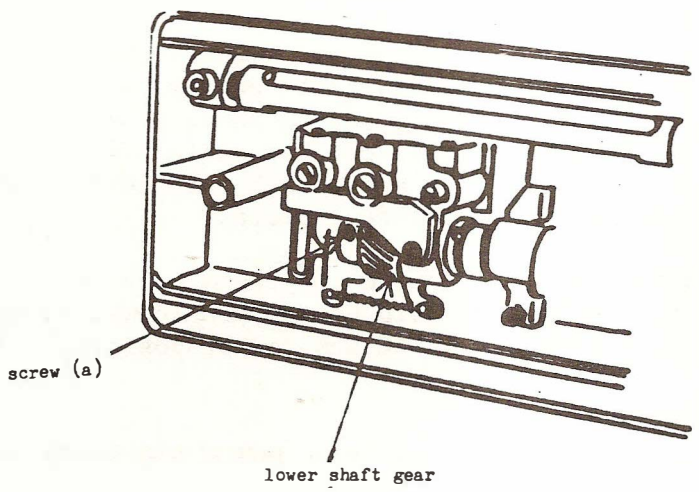


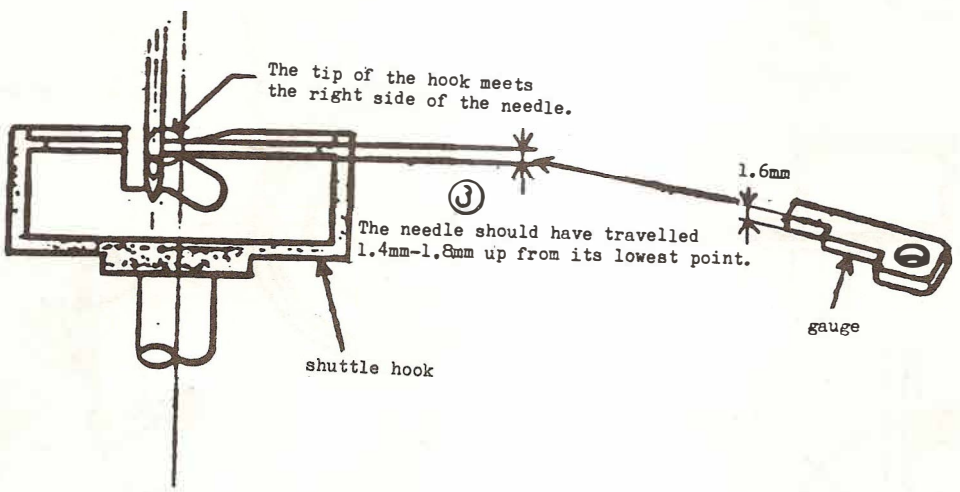
HOOK TIMING

With the stitch width at 7 and the needle at its right swing of zigzag, turn the balance wheel counter-clockwise to bring down the needle to its lowest point. Turn the balance wheel further until the tip of the hook meets the right side of the needle. At this point, the needle should have traveled 1.4mm-1.8mm up from its lowest point.
In case it is not correct, make adjustment as follows:

1. Remove the needle plate and the bobbin holder.
2. Set the stitch width dial at ⊙ . Loosen the screw (a). Turn the balance wheel counter-clockwise until the tip of the hook meets the right side of the needle.
3. While holding the bobbin holder not to rotate, turn the balance wheel counter-clockwise until the distance between the tip of the hook and the upper edge of the needle eye becomes 1.4mm-1.8mm as the needle comes up from its lowest point. (At this point, the feed dog should be below the needle plate.). Tighten the screw (a) while taking care that the lower shaft does not cause large vibration.
4. Refit the bobbin holder and the needle plate.

Note: i) Use the needle #14.
ii) Prior to this adjustment, check if HEIGHT OF NEEDLE is correct.



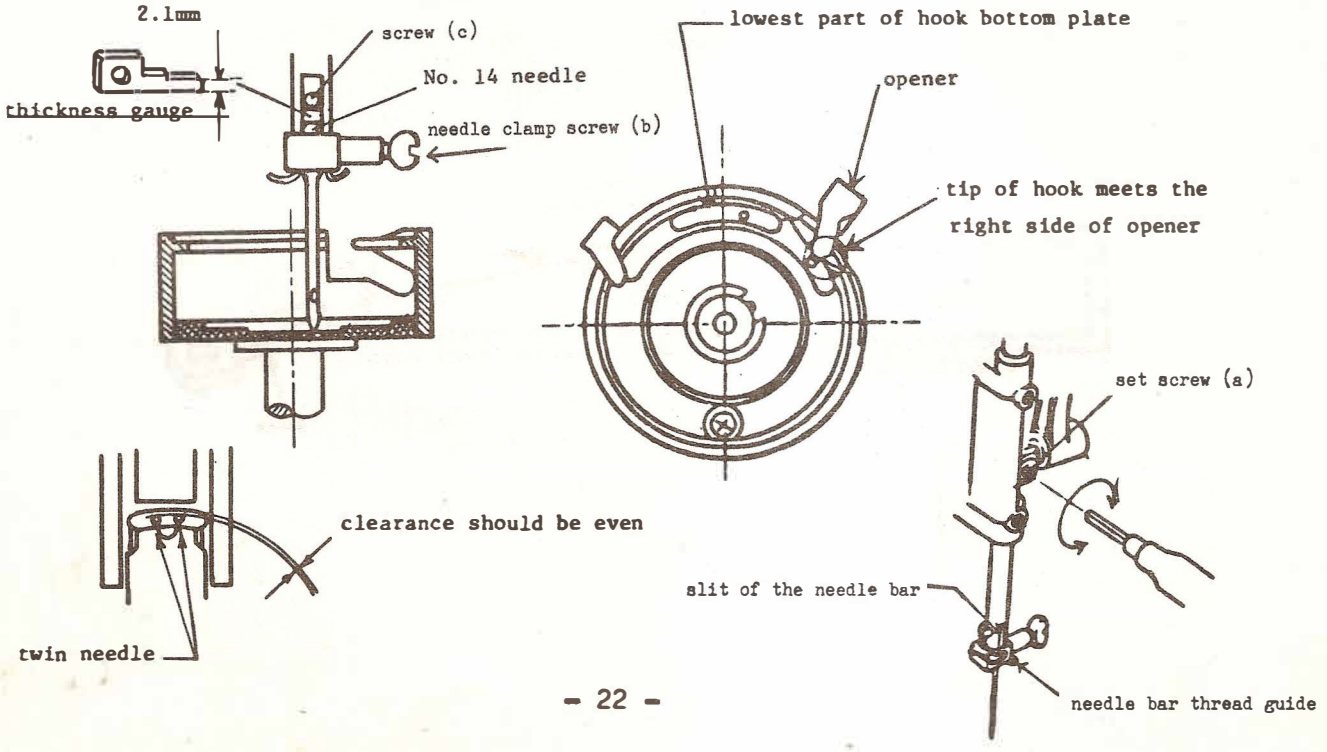


HEIGHT OF NEEDLE (NEEDLE BAR)

Set the zigzag width dial at 7 (maximum) and turn the balance wheel counter-clockwise until the needle comes down to its lowest point of the right zigzag. Then turn the balance wheel further until the tip of the hook meets the right side of the needle.
HEIGHT OF NEEDLE is measured by the distance between the upper edge of the needle and the tip of the hook. Correct height of the needle is 3.2-3.6mm on the above conditions.
If not, adjust as follows: (Use the needle #14.)

1. Detach the foot holder unit and the needle plate unit. Remove the bobbin holder unit. Then, open the face plate.
2. Set the zigzag width dial at 7 (maximum)
3. Turn the balance wheel counter-clockwise to swing the needle to the right.
4. Turn the balance wheel further until the needle comes to its lowest point. Loosen the set screw (a) and push the needle bar up about 5mm from its normal position. Then, tighten the screw (a) temporarily.
5. Loosen the needle clamp screw (b). Insert the gauge of 2.1mm between the needle bar thread guide set screw (c) and the needle. Tighten the screw (c) while maintaining the distance between the screw (c) and the needle 2.1mm by the gauge.
6. Turn the balance wheel until the needle bar comes down to its lowest point. Loosen the screw (a) to drop the needle into the ditch of the hook. (If the needle does not fall on the ditch of the hook, make adjustment according to the NOTE as explained below.)
7. Turn the slit of the needle bar to the front and tighten the screw (a). Loosen the screw (b) and pull out the gauge. Attach the needle to the needle bar. Then, attach the twin needle to the needle bar to check if the clearance distance between the twin needle and the hole of the needle plate is even.
8. Put the bobbin holder unit into the hook and attach the needle plate unit. Attach the foot holder unit and close the face plate.

(Note) Remove the gauge and the needle. Remove the two screws (d) on the lower shaft. Make adjustment so that the tip of the hook comes to the right side of the opener when the needle bar is at its lowest position. Tighten the screws (d).
Then, start the adjustment 2.



CLEARANCE DISTANCE BETWEEN NEEDLE AND HOOK (1/2)

The optimum clearance distance between the needle and the tip of the shuttle hook is -0.1mm to +0.05mm.

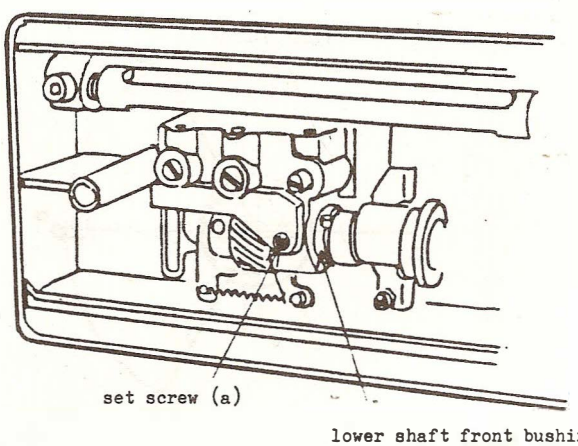
1. Set the stitch width dial at ⊂●⊃
2. Loosen the set screw (a) on the lower shaft front bushing.
3. Insert the screw driver into the notch of the lower shaft front bushing and turn it in the direction of (A) in order to cause the backlash between gears.
4. Loosen the screw (b) on the shuttle shaft. Turn the shuttle shaft (eccentric pin) little by little to adjust the clearance between the needle and the tip of the shuttle hook to its optimum distance(-0.1mm to +0.05mm).
5. Set the stitch width dial at ⊂●⊃ and check if the clearance between the needle and the tip of the shuttle hook is -0.1mm to +0.05mm. Then, make the same checking with the stitch width dial at ⊂●⊃
   After checking, tighten the screw (b).

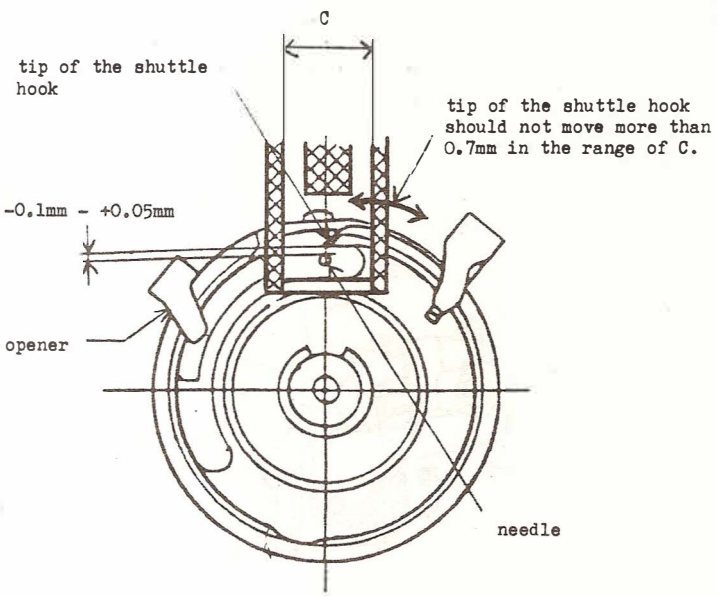
(Caution) Be careful not to cause any vibration on the shuttle shaft.

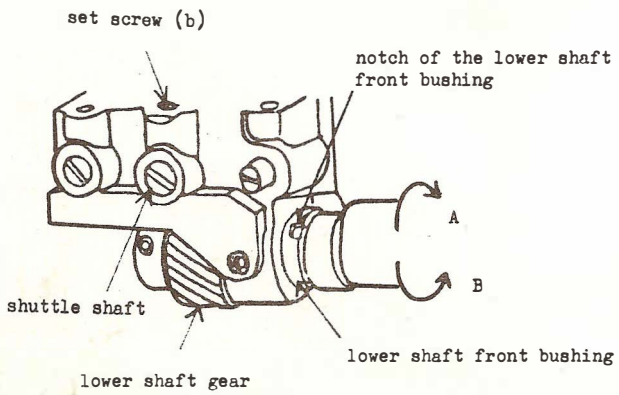
6. Turn the lower shaft front bushing in the direction of B to adjust the action (contact) of lower shaft gear and the gear of the shuttle hook to the following condition;
   i) The shuttle hook has play at every position.
   ii) The tip of the shuttle hook has play less than 0.7mm when it is positioned in the range of C as shown in the diagram.

(Note) If the rotation of the lower shaft becomes heavy after the adjustment, turn the lower shaft rear bushing in order that the notch of the lower shaft rear bushing comes to the same position as that of lower shaft front bushing.

7. Tighten the screw (a).
8. After adjustment, check if HOOK TIMING and HEIGHT OF FEED DOG are correct.



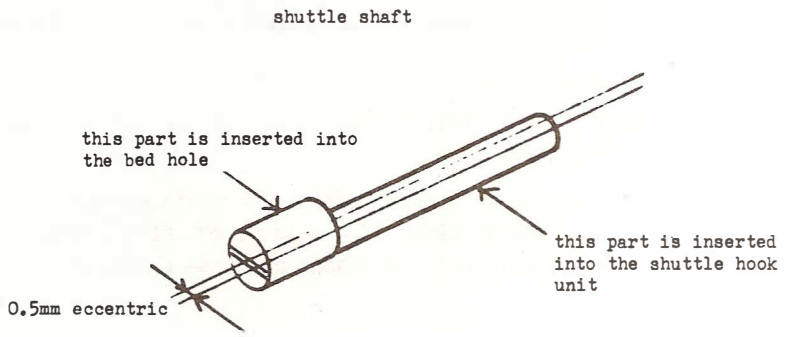


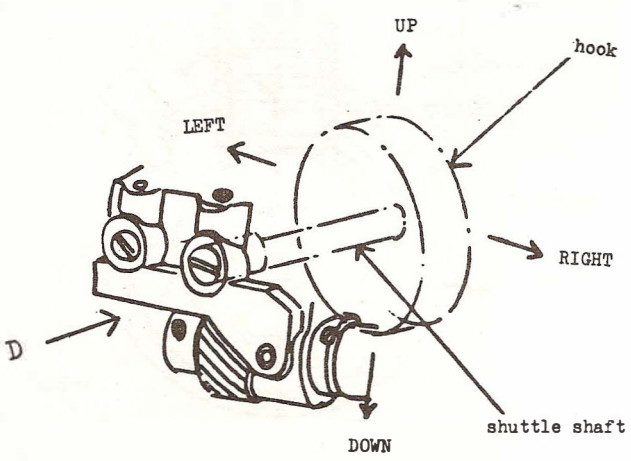


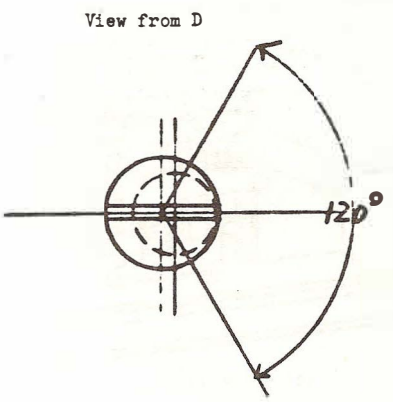
Note:

1. Since the shuttle shaft is eccentric (the location of the centre differs 0.5mm from the each side), it moves the shuttle hook not only vertically but also horizontally if you turn the shuttle shaft.
   When the shuttle comes to the rightmost position, the slit of the shuttle haft is vertical, which is the standard position of the shuttle hook.
   You can adjust the position of the shuttle hook in its vertical motion by turning the shuttle shaft within the angle of 120 degrees. If you turn the shuttle shaft over 120 degrees, the shuttle hook makes horizontal movement which breaks the correct balance between the shuttle hook and the opener. So never turn the shuttle shaft more than 120 degrees from its standard position.

2. In case the rotation of the lower shaft becomes heavy after adjustment 6 (page 5), make adjustment so that the notch of the lower shaft front bushing comes to the same position of the notch of the lower shaft rear bushing.



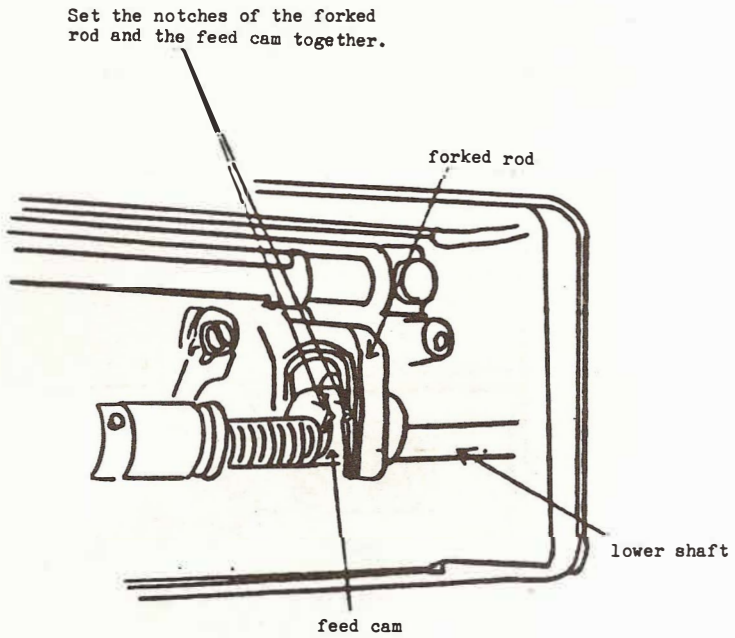


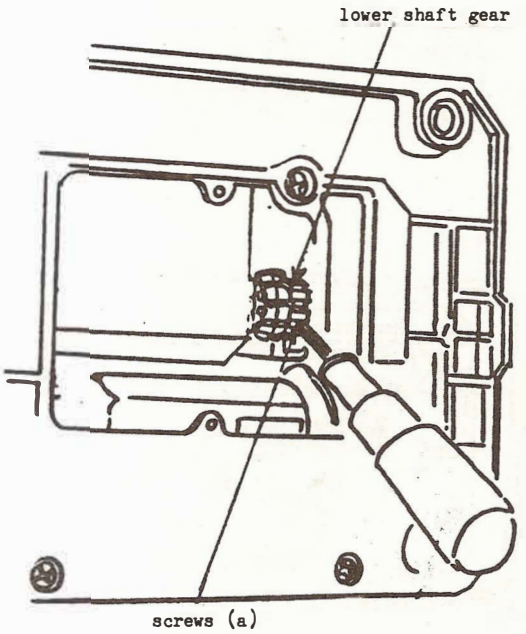


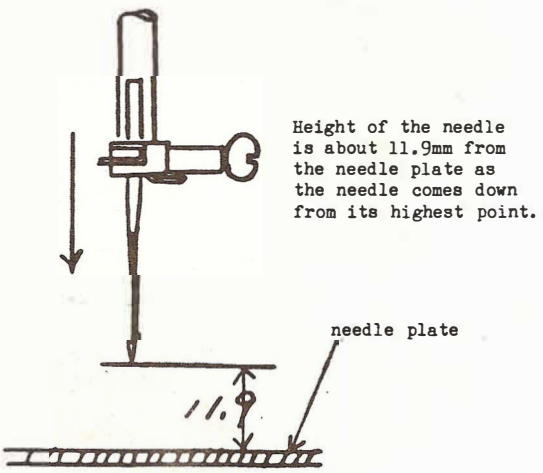
FEED TIMING

1. Set the pattern selector dial at 21 and the stitch width dial at ⊙ .
2. Set the notches of the forked rod and the feed cam together.
3. Change the stitch width from 0 to 4 (4 to 0) several times to check the movement of the forked rod.
4. In case the forked rod moves, turn the lower shaft little by little until the forked rod ceases to move.
5. Loosen the two screws (a).
6. Holding the lower shaft not to rotate, turn the balance wheel counter-clockwise until the height of the needle becomes 11.9mm from the needle plate as the needle comes down from its highest point.
7. Tighten the screws (a).

Note: After this adjustment, check if HOOK TIMING and HEIGHT OF NEEDLE is correct.





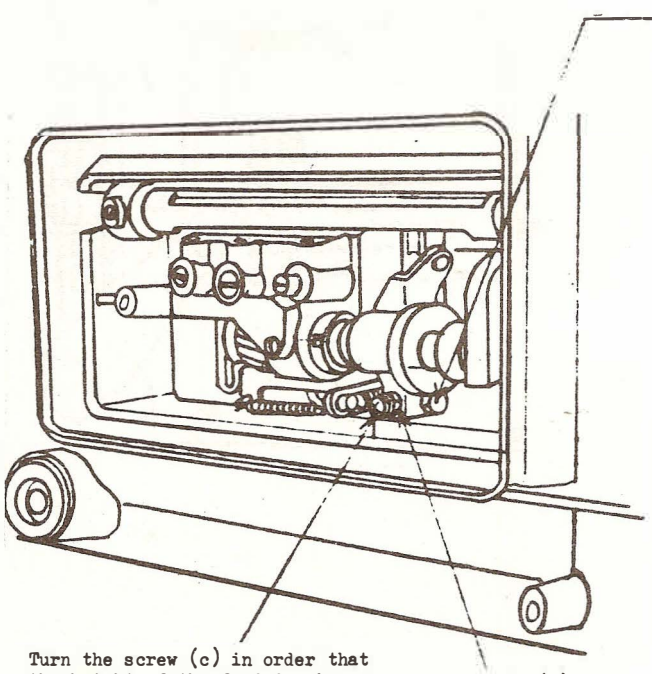


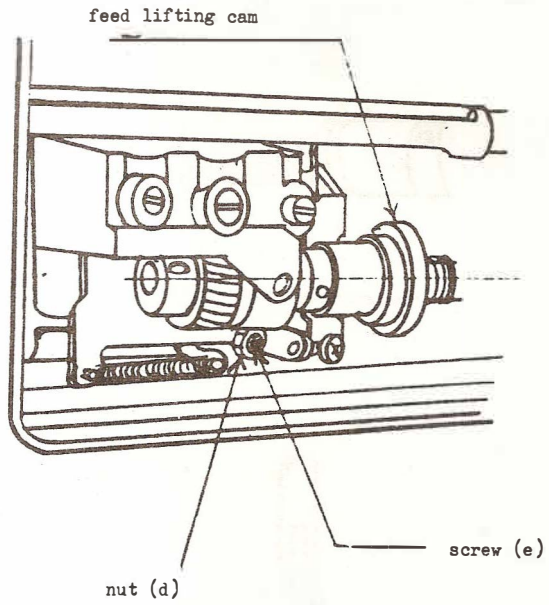
You can measure the hight of 11.9mm by using a bobbin as per illustrated.

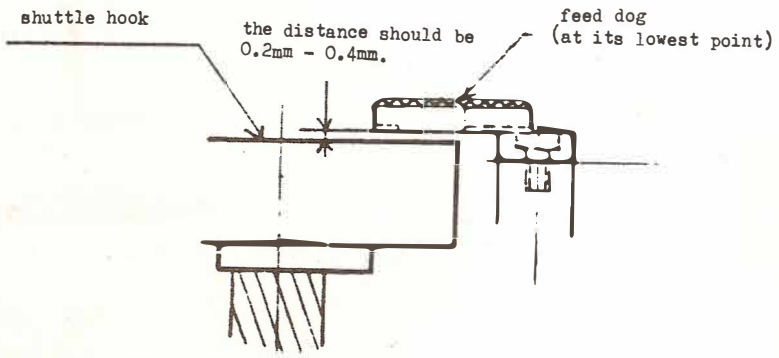
HEIGHT OF FEED DOG

Set the pressure dial at 3. Lower the presser foot.
Turn the balance wheel counter-clockwise to raise the feed dog to its highest point. At this point, the height of the feed dog must be 0.75 - 0.85mm above the needle plate.
Turn the balance wheel further to lower the feed dog to its lowest point. At this point, the feed dog must be under the needle plate and the distance between the feed dog and the shuttle hook must be 0.2 - 0.4mm.

1. Set the pressure dial at 3 and the stitch length regulator dial at 4. Lower the presser foot.
   Turn the balance wheel counter-clockwise until the feed dog comes to its highest point.
2. Loosen the screw (a) and the nut (b).
   Adjust the height of the feed dog (0.75 - 0.85mm from the needle plate) by turning the screw (c).
3. Tighten the nut (b). Check the height of the feed dog.
   Tighten the screw (a).
4. Turn the feed lifting cam until the feed dog comes to its lowest point.
5. Loosen the nut (d).
   Adjust the distance between the feed dog and the shuttle hook (0.2 - 0.4mm) by turning the screw (e).
6. Tighten the nut (d).





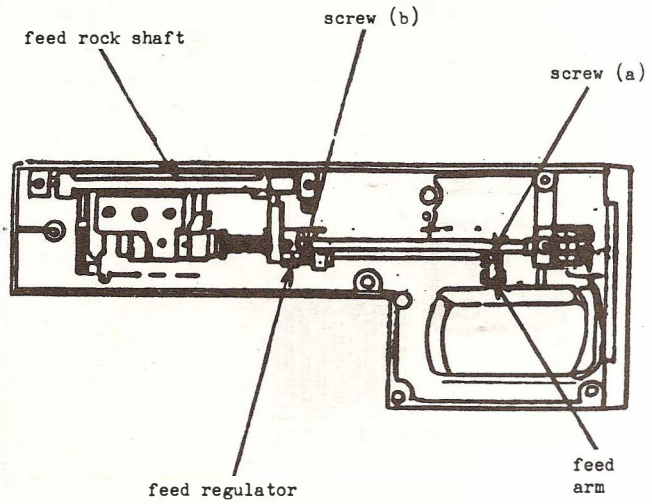


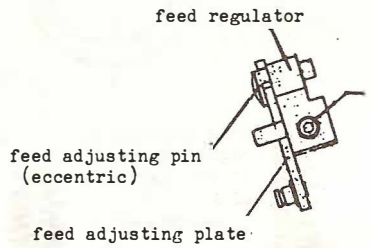
"0" FEED POSITION

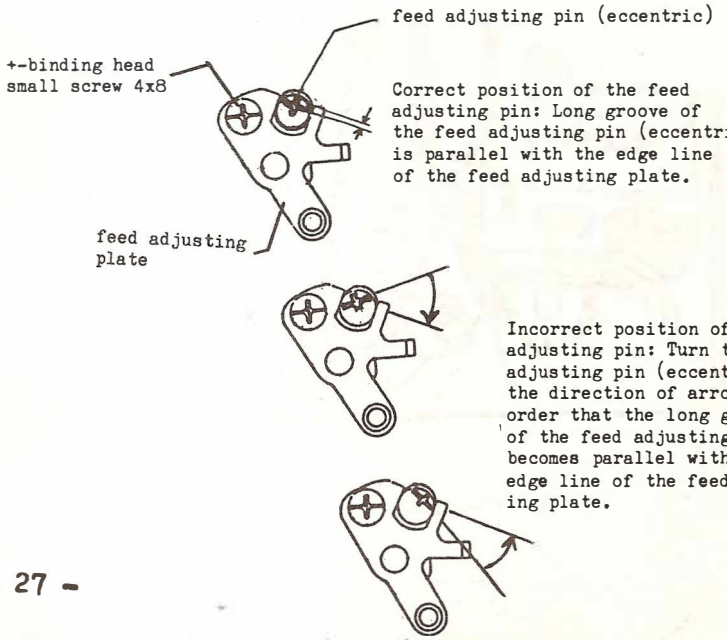
When the stitch length regulator dial is set at "0", the machine should not feed a fabric. In case "0" FEED POSITION is incorrect, make adjustment as follows:

1. Remove the base unit and the speed control device unit.
2. Set the pattern selector dial at 21 , stitch width dial at ⊙ and the stitch length dial at 0.
3. Loosen the hexagonal screw (a) on the feed cam. Run the machine slowly while you keep pressing the hexagonal screw (b) on the feed regulator unit with the hexagonal driver.
4. Adjust the position of the feed regulator by the hexagonal driver in order that the feed rock shaft does not move. Then, tighten the hexagonal screw (b).
5. Tighten the hexagonal screw (a).
6. Refit the speed control device unit and the base unit.

Note: i) Before this adjustment, set the position of the feed regulating pin at the position as shown in the Fig. 1.
ii) After this adjustment, check if PITCH DIFFERENCE is correct. Correct pitch difference is 10 pithces in forward against 9-11 pitches in backward.
iii) After this adjustment, check if PITCH DIFFERENCE OF BUTTONHOLE and SUPER STITCH MECHANISM are correct.







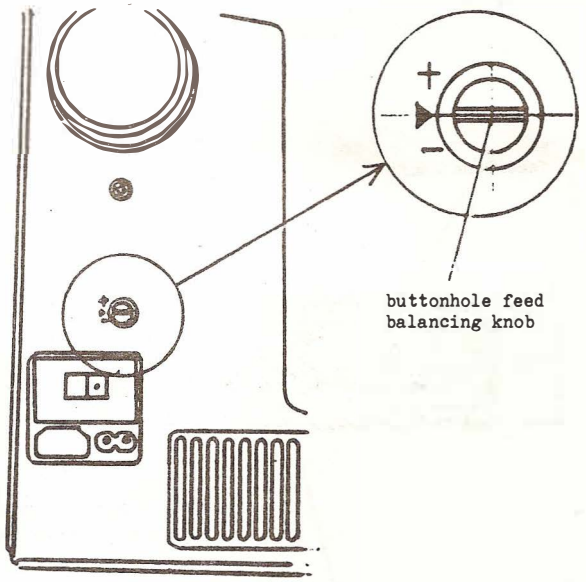
PITCH DIFFERENCE OF BUTTONHOLE

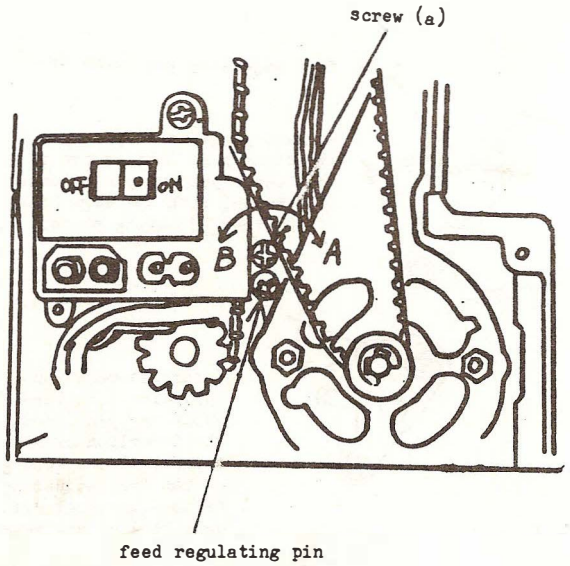
In case the correct pitch difference can not be obtained by the buttonhole feed balancing knob, make adjustment as follows:

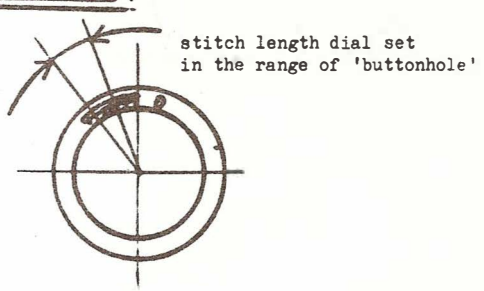
Note: The optimum variance is 9-11 stitches in the left row against 10 stitches in the right row of buttonhole. (The machine should sew 30 stitches in 10mm.)

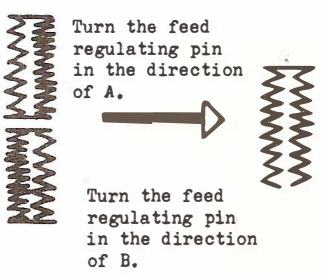
1. Set the buttonhole feed balancing knob at ▶ .
2. Set the pattern selector dial at 0, the stitch width dial at 7 and the stitch length dial at "buttonhole range".
3. After sewing off the buttonhole, compare the stitch length in both seams.
4. Loosen the screw (a).
5. Turn the feed regulating pin with the + driver.
   i) If the stitch is more open on the left side, turn the feed regulating pin in the direction of A.
   ii) If the stitch is more open on the right side, turn the feed regulating pin in the direction of B.
   Then tighten the screw (a) temporarily.
6. After checking the pitch difference, tighten the screw (a).

Note: After the adjustment, check if SUPER STITCH MECHANISM is correct.





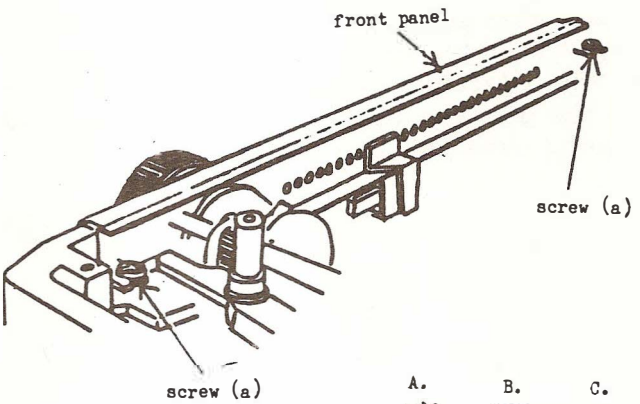


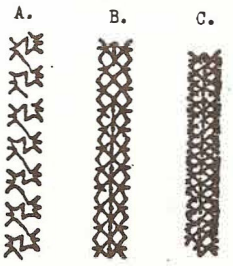


SUPER STITCH MECHANISM

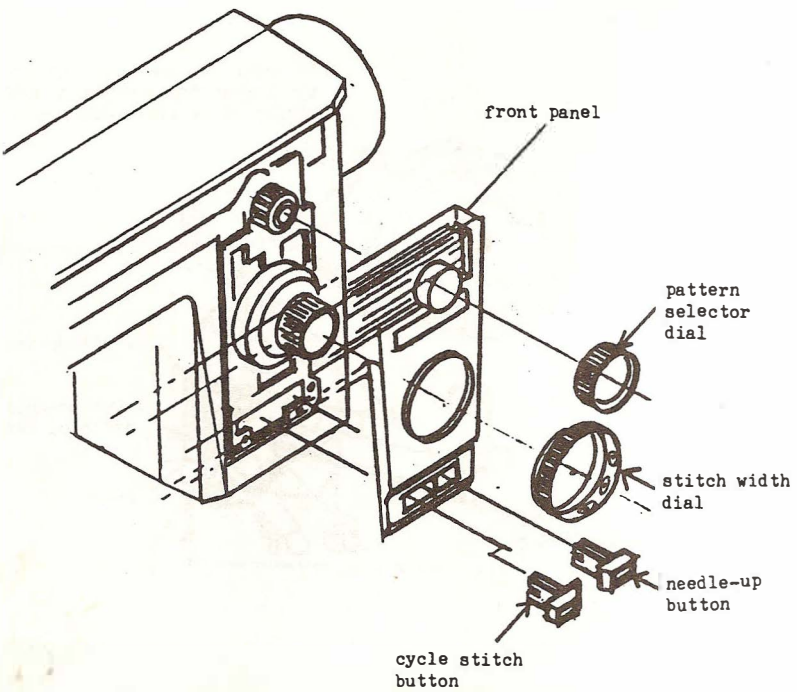
The super stitch pattern can be elongated/shortened by turning the stitch length dial. The machine is designed to make standard length of super stitch pattern when the stitch length dial is set at 4.
If it is not correct, make adjustment as follows:

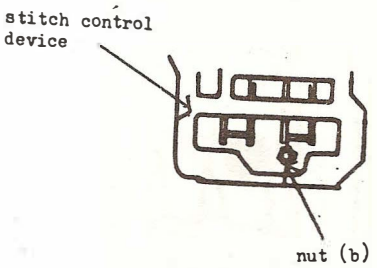
1. Set the pattern selector dial at 8, stitch width dial at 7 and the stitch length dial at 4.
2. Remove the pattern selector dial, the stitch width dial, the cycle stitch button and the needle-up button. (When you remove these parts, be careful not to make scratch on them.)
3. Loosen the two screws (a) to pull out the front panel unit.
4. Sew off the super stitch patterns. (Press the foot controller for 600-700 rpm)
5. Turn the nut (b) for adjustment.
   i) Turn the nut (b) clockwise to elongate the pattern.
   ii) Turn the nut (b) counter-clockwise to shorten the pattern.
6. Refit the front panel unit, the cycle stitch button, the needle-up button, the stitch width button and the pattern selector dial.





A: Drawn out
B: Standard
C: Compressed





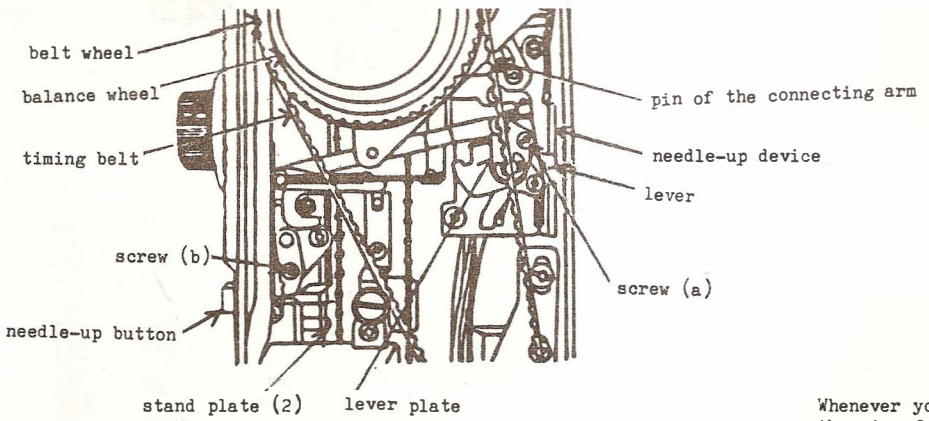
NEEDLE-UP AND CYCLE STITCH MECHANISM 1/4

When you push the needle-up button, the upper shaft make less than one rotation and the motor stops when the needle comes to its highest point. When you push the cycle stitch button, the machine completes the unit of the pattern and then the motor stops when the needle comes to its highest point.
In case NEEDLE-UP and CYCLE STITCH mechanism does not function, make adjustment as follows:

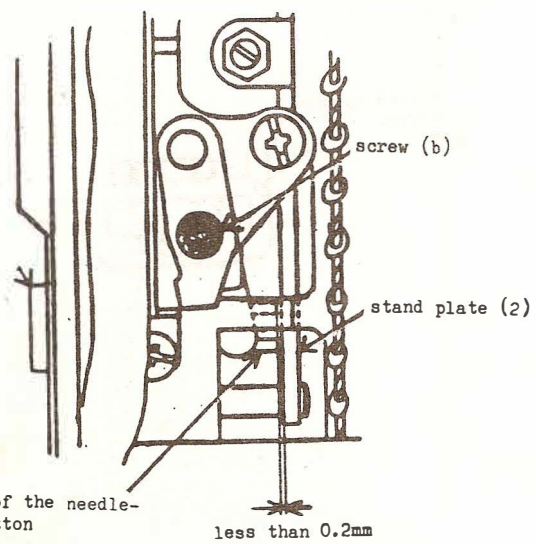
1. Remove the balance wheel, the timing belt, the belt wheel and the bobbin winder unit. Turn the balance wheel counter-clockwise to bring down the pin of the connecting arm to the lowest point. Turn the balance wheel further until the pin of the connecting arm comes to its highest point. While maintaining the position of the pin of the connecting arm, bring down the needle bar to its lowest point. Make the following adjustment while maintaining the machine in this condition. (The pin of the connecting arm comes down in every 18 stitches of the upper shaft.)

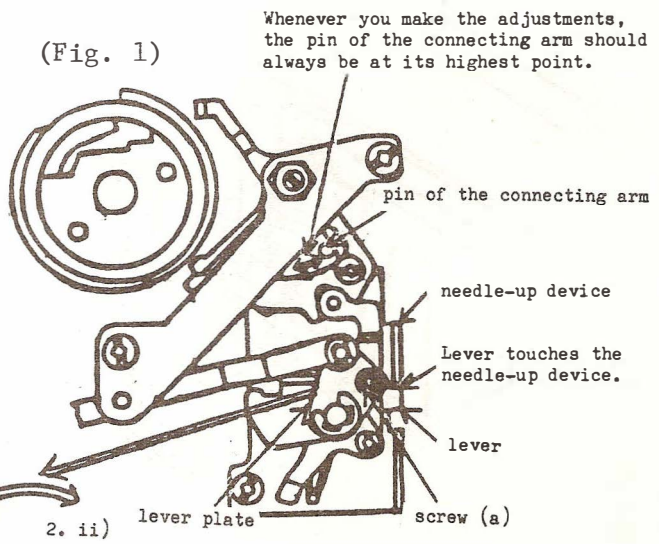
(Check 1) Push the needle-up button to make the lever touch the needle-up device. In this condition, the distance between the foot of the needle-up button and the stand plate (2) should be less than 0.2mm.

2. Loosen the screws (a) and (b). Adjust the position of the lever plate to obtain the optimum distance between the foot of the needle-up button and the stand plate (2). Tighten the screw (a).(Fig. 1)
 i) In case the distance is more than 0.2mm, turn the lever plate counter-clockwise.
ii) In case the lever does not touch the needle-up button and the stand plate (2) is correct, turn the lever plate clockwise.



(Fig. 1)





NEEDLE-UP AND CYCLE STITCH MECHANISM 2/4

(Check 2) Distance between the connecting arm and the E-ring (a) should be 0.3mm-0.7mm when the cycle stitch button is released.

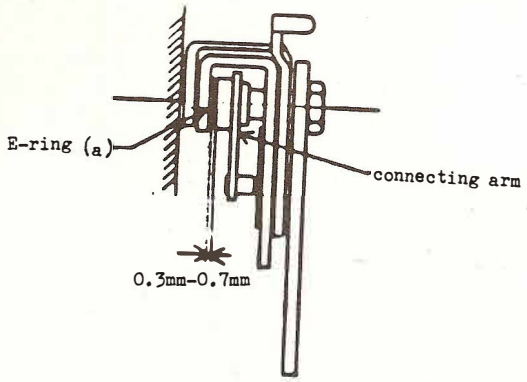
3. Loosen the screws (b) and (c). Move the shift lever adjuster to make the distance between the connecting arm and the E-ring 0.3mm-0.7mm. Then, tighten the screw (b).

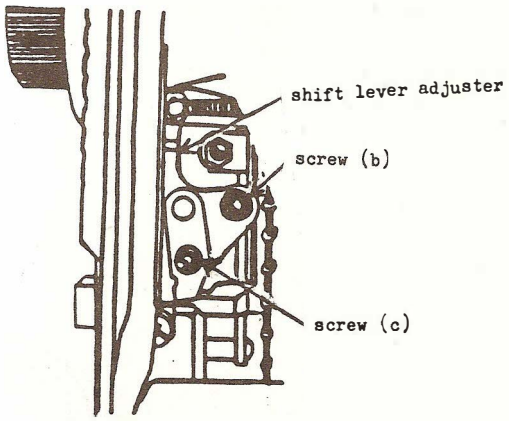
(Check 3) Push the cycle stitch button to make the lever touch the needle-up device. In this condition, the distance between the foot of the cycle stitch button and the stand plate (2) should be less than 0.2mm.

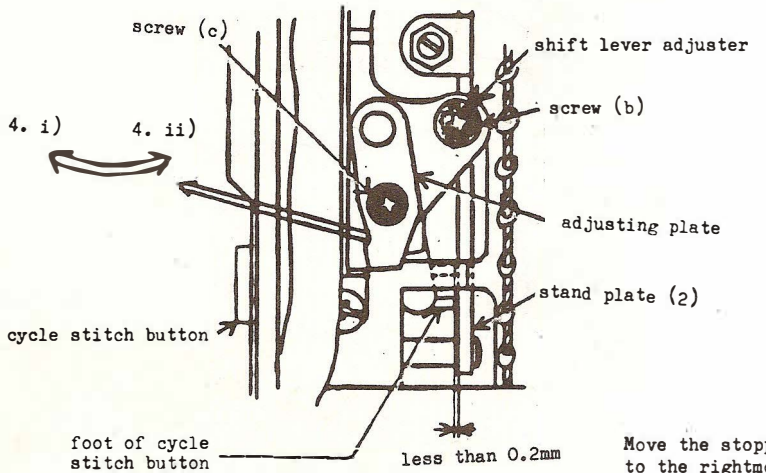
4. Loosen the screws (c) and (d). Move the stopper adjusting plate to the right as far as it goes and tighten the screw (d) temporarily.
(If you leave the screw (d) too loosely, the stopper adjusting plate might be detached.)
Move the adjusting plate to make the distance between the foot of the cycle stitch button and the stand plate (2) less than 0.2mm.

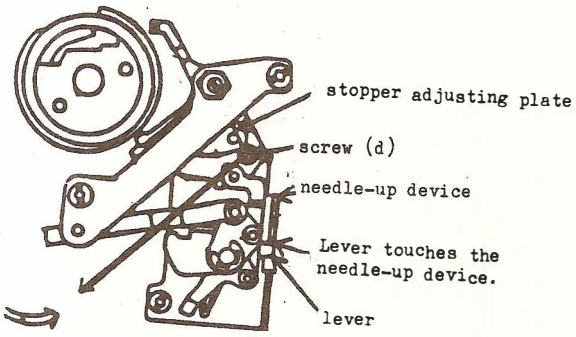
i) In case the distance between the foot of the cycle stitch button and the stand plate (2) is more than 0.2mm, turn the adjusting plate to the left.

ii) In case the lever does not touch the needle-up device while the distance between the foot of the cycle stitch button and the stand plate (2) is correct, turn the adjusting plate to the right.









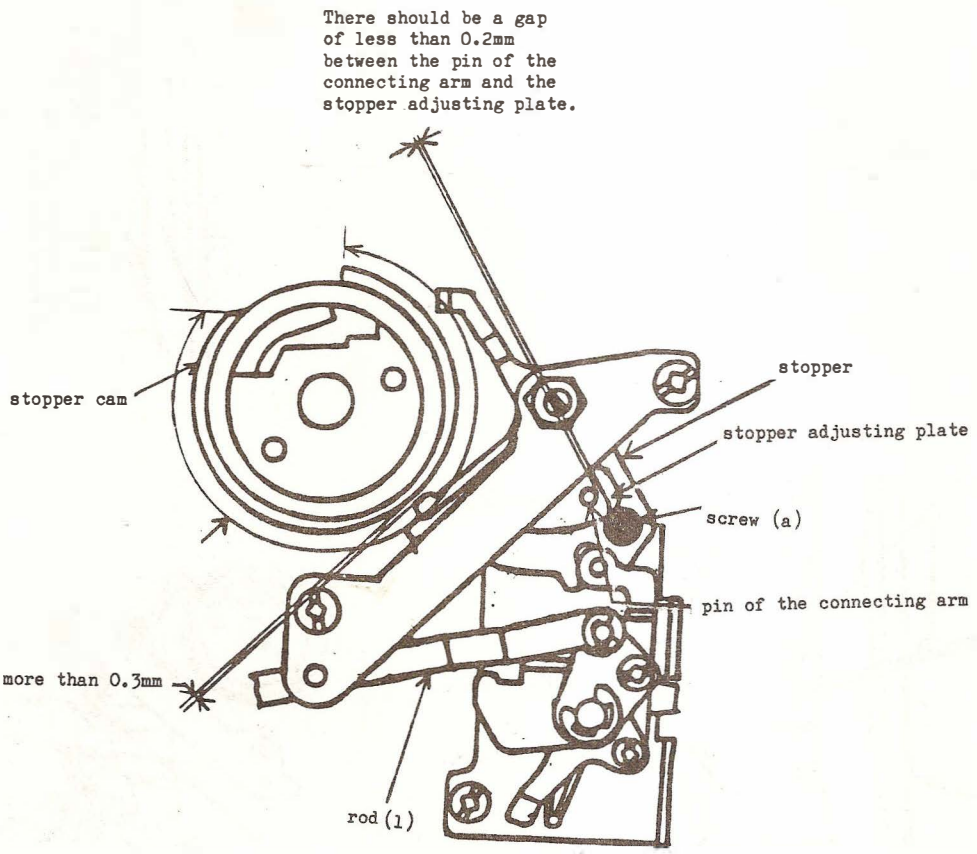
Move the stopper adjusting plate to the rightmost and tighten the screw (d) temporarily.

(Check 4) When you push the cycle stitch button lightly, the pin of the connecting arm will come out. If you push the cycle stitch button strongly, the connecting rod (1) will move. Make the following adjustment while you keep pushing the cycle stitch button lightly so that the connecting rod (1) does not move. Distance between the pin of the connecting arm and the stopper adjusting plate should be less than 0.2mm and both parts should not touch each other.

5. Loosen the screw (a). (If you make the screw (a) too loose, the stopper adjusting plate might be detached.) Move the stopper adjusting plate to make the distance between the pin of the connecting arm and the stopper adjusting plate less than 0.2mm.

Note: i) When you push the cycle stitch button lightly, the pin of the connecting arm comes out without touching the stopper adjusting plate. When you release the cycle stitch button, distance between the connecting arm and the E-ring should be 0.2mm-0.7mm. (See Check 2)

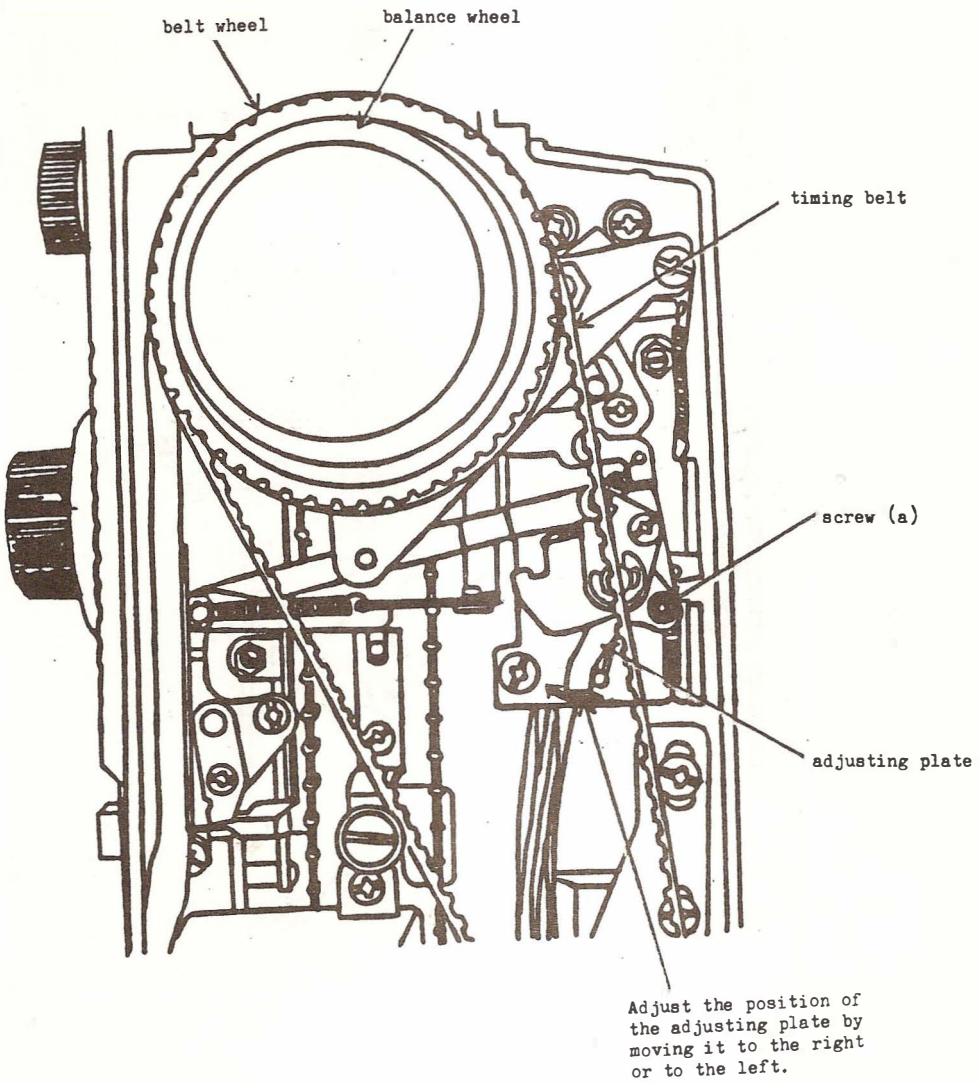
ii) When you push the cycle stitch button, the distance between the stopper cam and the stopper should be more than 0.3mm. Check this distance at every direction of the stopper cam by turning the upper shaft.



NEEDLE-UP AND CYCLE STITCH MECHANISM 4/4

6. Refit the bobbin winder unit, the belt wheel, the timing belt and the balance wheel.
7. Loosen the screw (a). Move the adjusting plate in order that the NEEDLE-UP and CYCLE STITCH mechanism functions well.

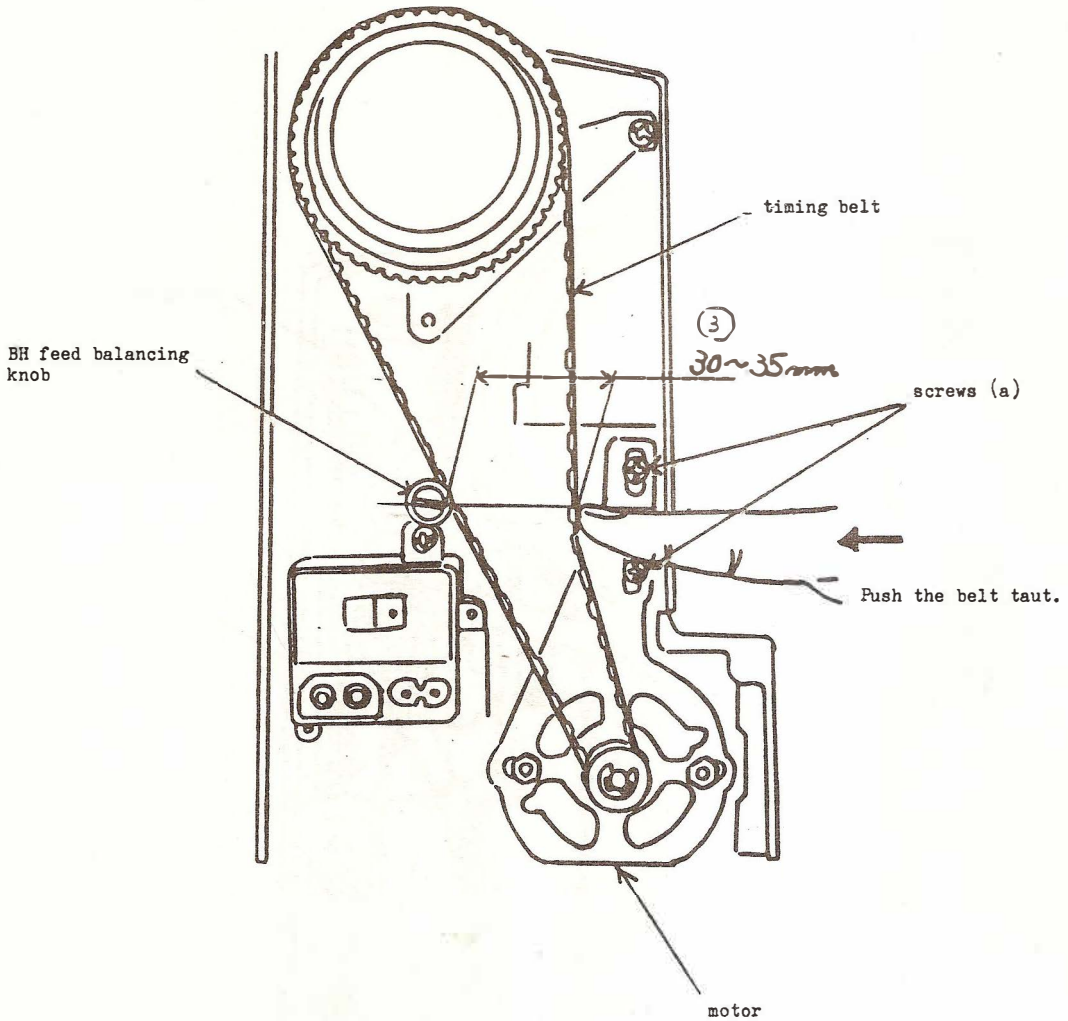
Note: If the adjusting plate goes to left excessively, the motor will not stop at the proper point. If it goes to right excessively, the needle will not stop at the correct position or sometimes the motor does not rotate.



TENSION OF TIMING BELT

The correct tension of the timing belt i obtained under the condition that the clearance between the belt and the BH feed balancing knob is 30mm-35mm when the belt is pushed taut.

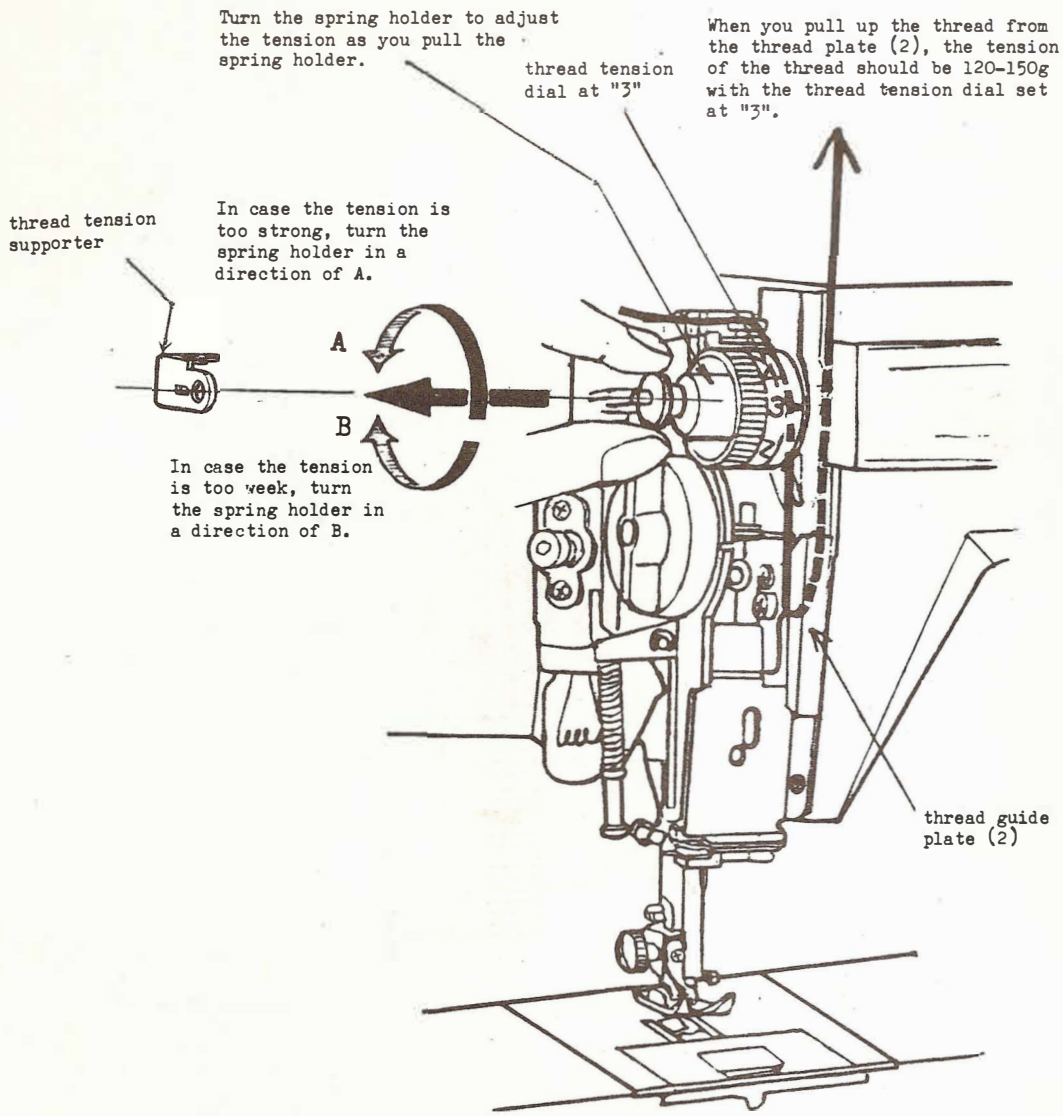
1. Remove the belt cover.
2. Loosen the two screws (a).
3. Adjust the position of the motor to make the clearance between the belt and the BH balancing knob 30mm-35mm.
4. Tighten the two screws (a).



UPPER THREAD TENSION

The optimum tension of the upper thread is 120-150g as per the illustration.
(Use a cotton thread #60)

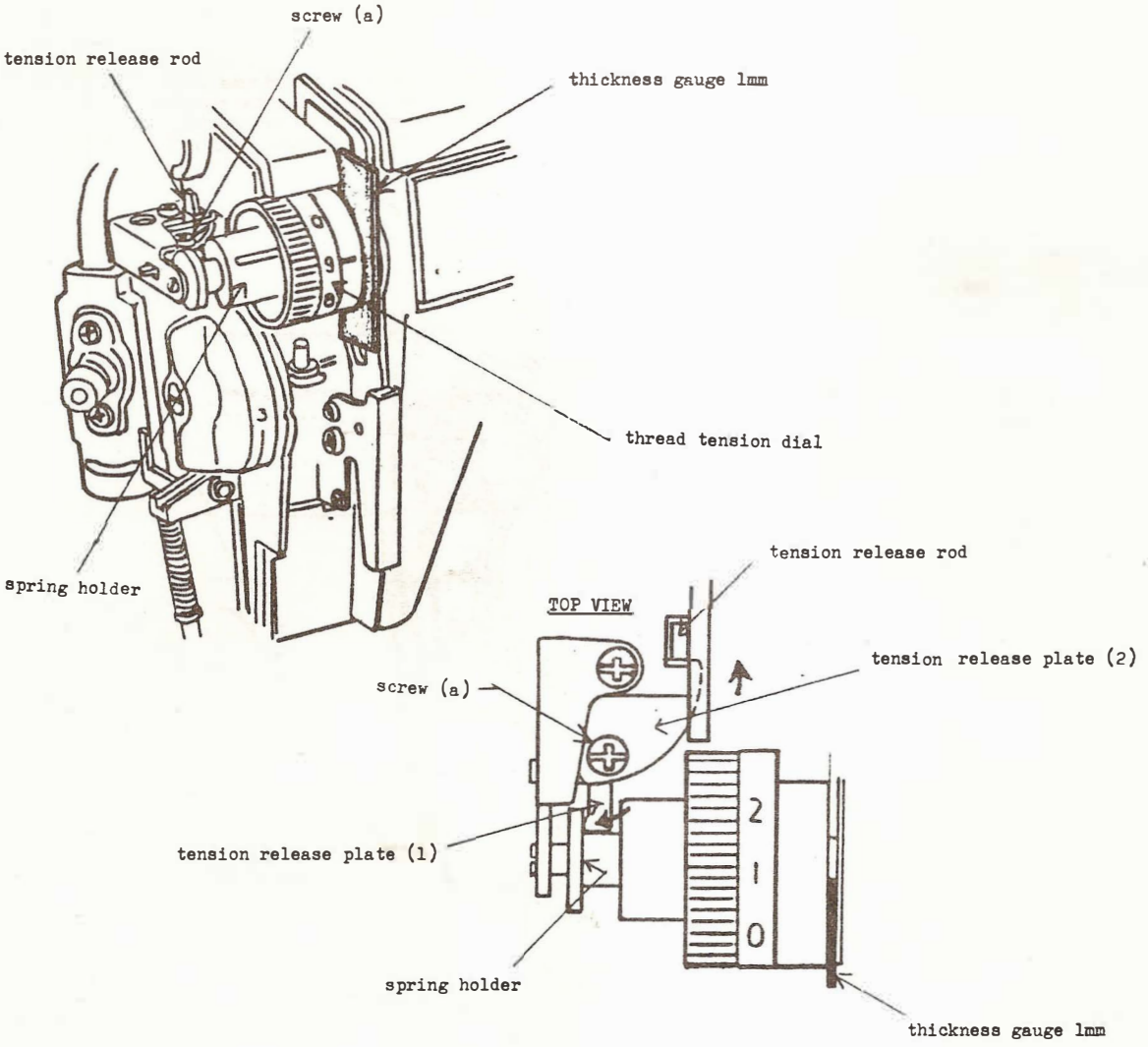
1. Set the thread tension dial at 3.
   Check if the tension of the upper thread is optimum.
2. Remove the thread tension supporter.
3. Lower the presser foot.
   Turn the spring holder to adjust the tension as you pull the spring holder.
   (When you pull the spring holder, set the thread tension dial at 0 and you can pull it easily.)
   i) In case the tension is too strong, turn the spring holder in a direction of A.
   ii) In case the tension is too week, turn the spring holder in a direction of B.
4. Check if the adjustment is made satisfactorily.
5. Attach the thread tension supporter.



THREAD TENSION RELEASE MECHANISM

When you lift up the presser foot, the thread tension release mechanism automatically functions as you see the spring holder moves 0.4-0.8mm to the left.

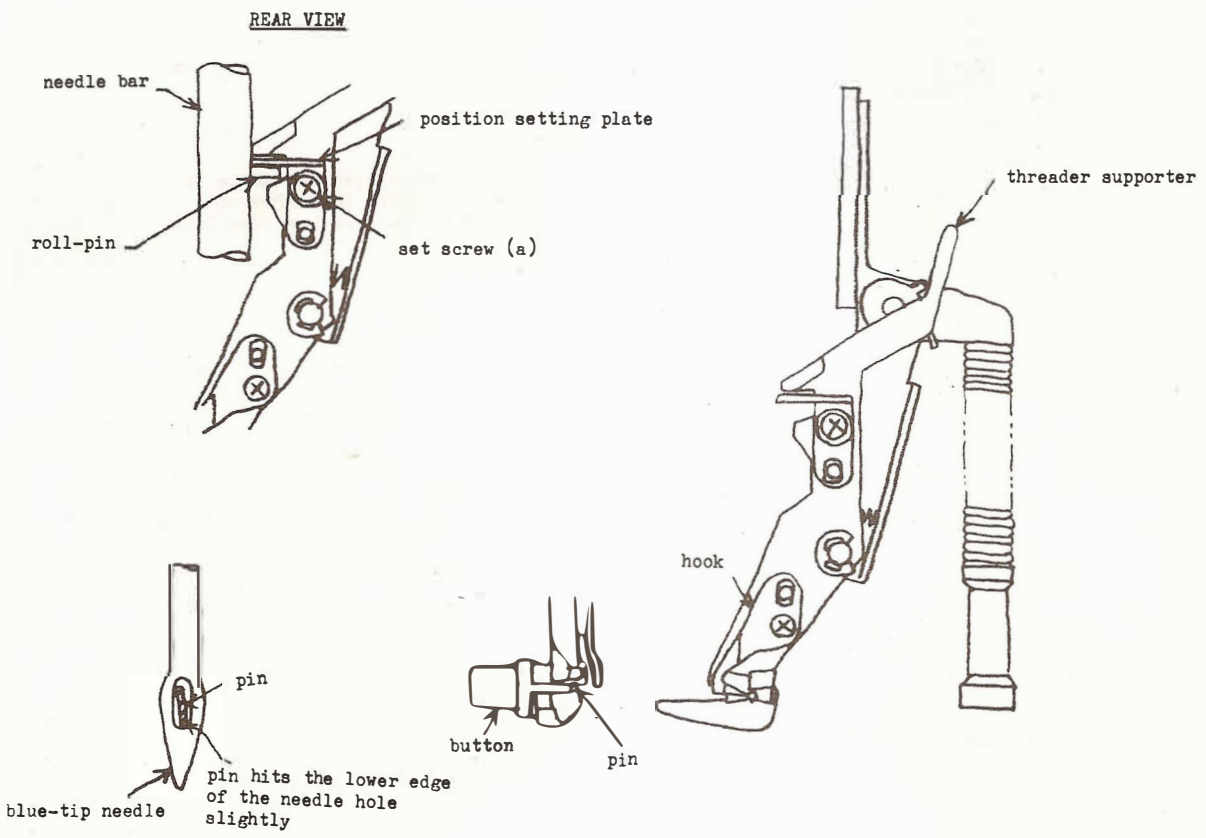
1. Lift up the presser foot.
2. Loosen the screw (a).
3. Set the thread tension dial at 0. Insert the gauge of 1mm between the thread tension disk and the centre plate.
4. Turn the thread tension dial from 0 to 9 with the gauge between them.
5. Tighten the screw (a) as you move the tension release plate (1) and (2) in the direction of arrow.
6. Remove the gauge and check the thread tension release mechanism.



NEEDLE THREADER 1/2

In case the pin of the threader hits the needle, adjust as follows:

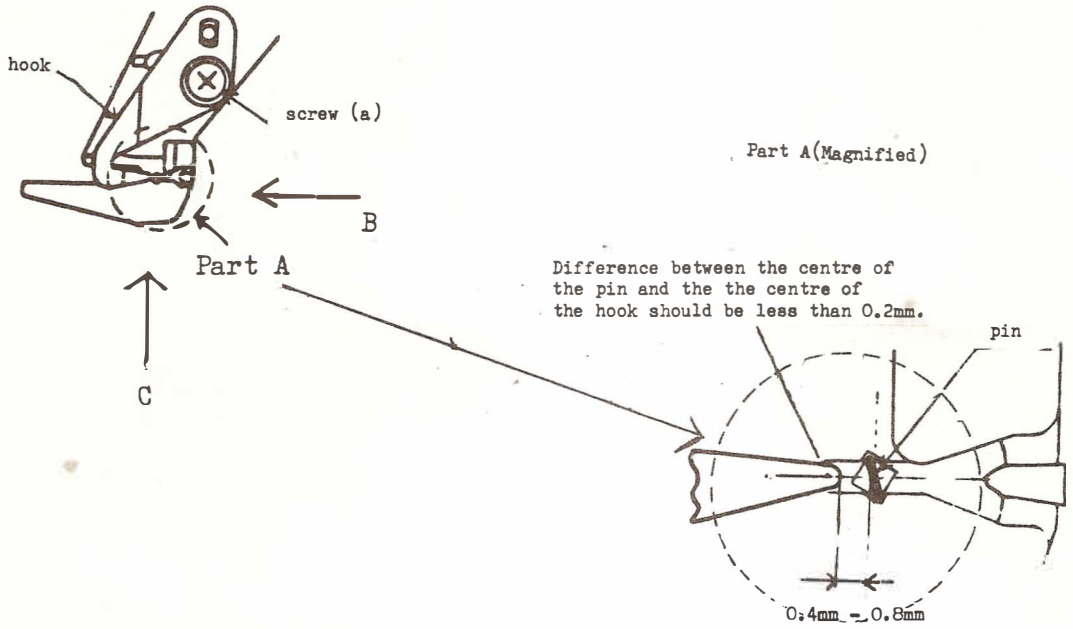
1. Attach the blue-tip needle.
2. Turn the balance wheel counter-clockwise until the needle comes to its highest point.
3. Pull down the threader in order that the position setting plate touches the roll-pin.
4. Loosen the screw (a).
5. Adjust the position of the threader supporter in order that the pin hits the lower edge of the needle hole slightly.
6. Pull down the threader so that the position setting plate hits the roll-pin. Tighten the screw (a).
7. Check if the adjustment is done correctly.

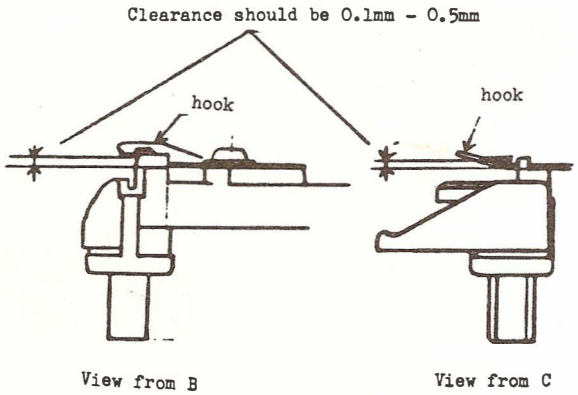


NEEDLE THREADER 2/2

In case the hook of the threader does not catch the thread, make adjustment as follows:

1. Use the blue-tip needle and the embroidery thread #50.
2. Adjustment A.
   Loosen the screw (a). Make adjustment as shown in the diagram (A).
3. Adjustment B.
   Bend the tip of the hook to make adjustment as shown in the diagram (B).
4. After adjustment, check if adjustment is made correctly.





POSITION OF NEEDLE BAR SUPPORTER

If the needle bar supporter is not positioned correctly, the needle might hit the needle plate and the machine can not obtain optimum NEEDLE DROP.

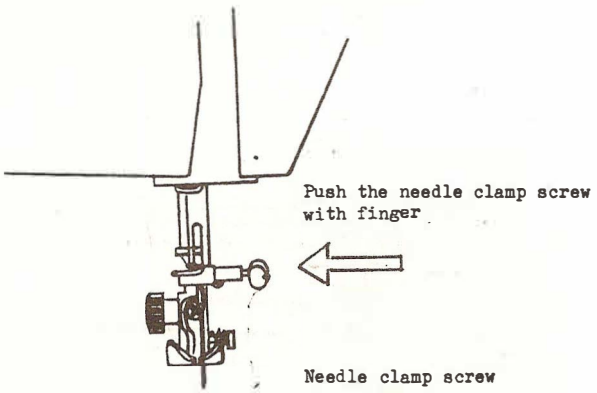
Make adjustment as follows:

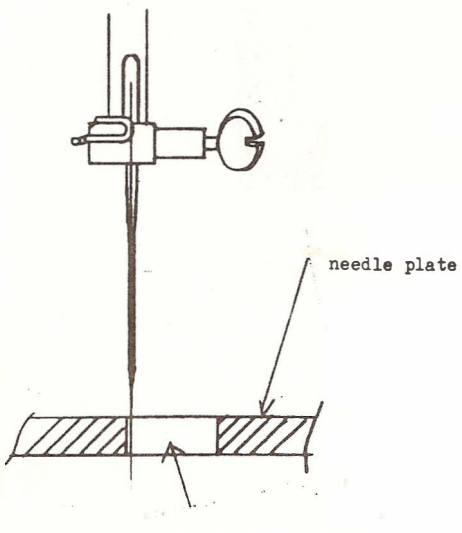
1. Turn the balance wheel counter-clockwise until the needle comes up above the needle plate. Then push the needle clamp screw to the left as far as it goes.

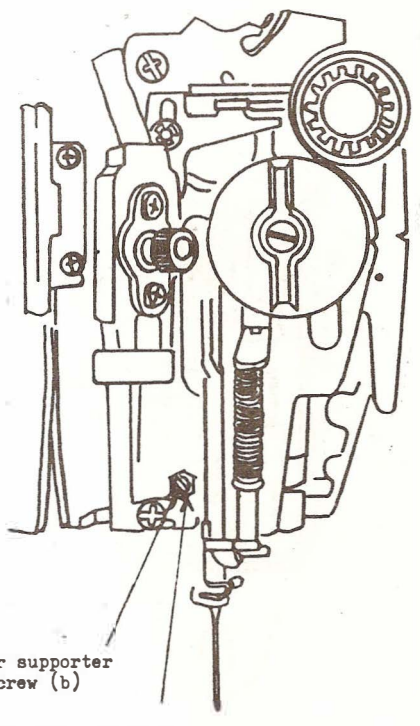
2. While pushing the needle clamp screw, turn the balance wheel counter-clockwise to bring down the needle into the hole of the needle plate. Check if the clearance distance between the needle and the needle plate is correct.

3. Loosen the needle bar supporter stopper nut (a).
   Adjust the position of the needle bar supporter by turning the needle bar supporter stopper screw (b) in order that the needle passes through the hole of the needle plate as close as possible to the needle plate but not hitting it.
   i) In case the needle hits the needle plate: Turn the screw (b) clockwise.
   ii) In case the clearance between the needle and the needle plate is too large: Turn the screw (b) counter-clockwise.

4. After adjustment, tighten the nut (a).



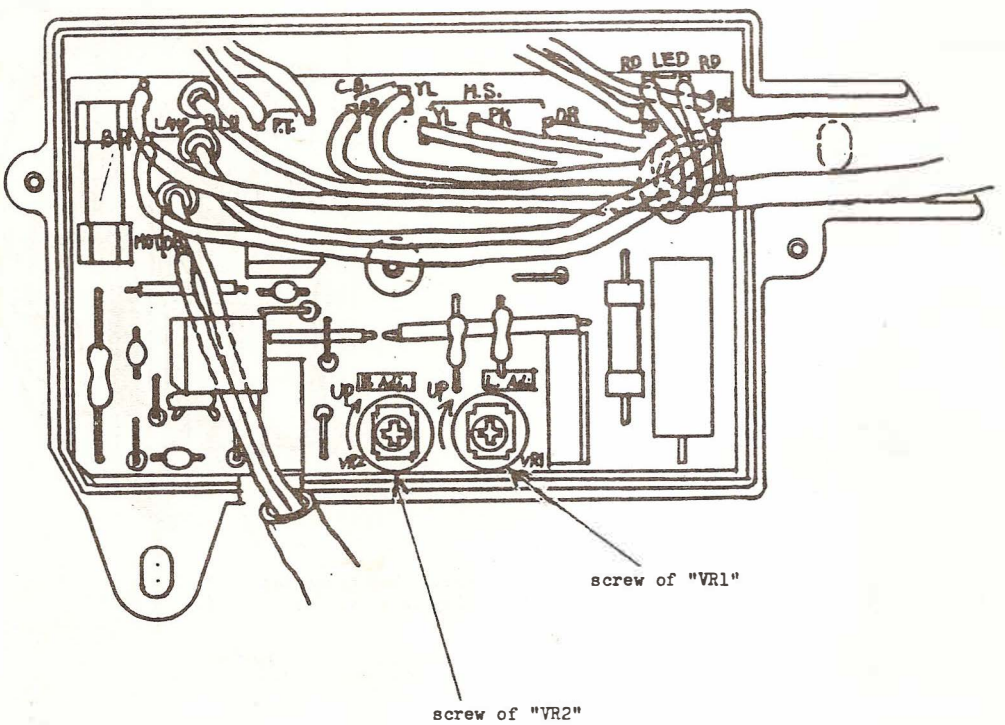




MACHINE SPEED (200-240V)

The optimum speed of machine is 160rpm-190rpm when the machine starts to run and 850rpm-950rpm when the machine runs at its highest speed.

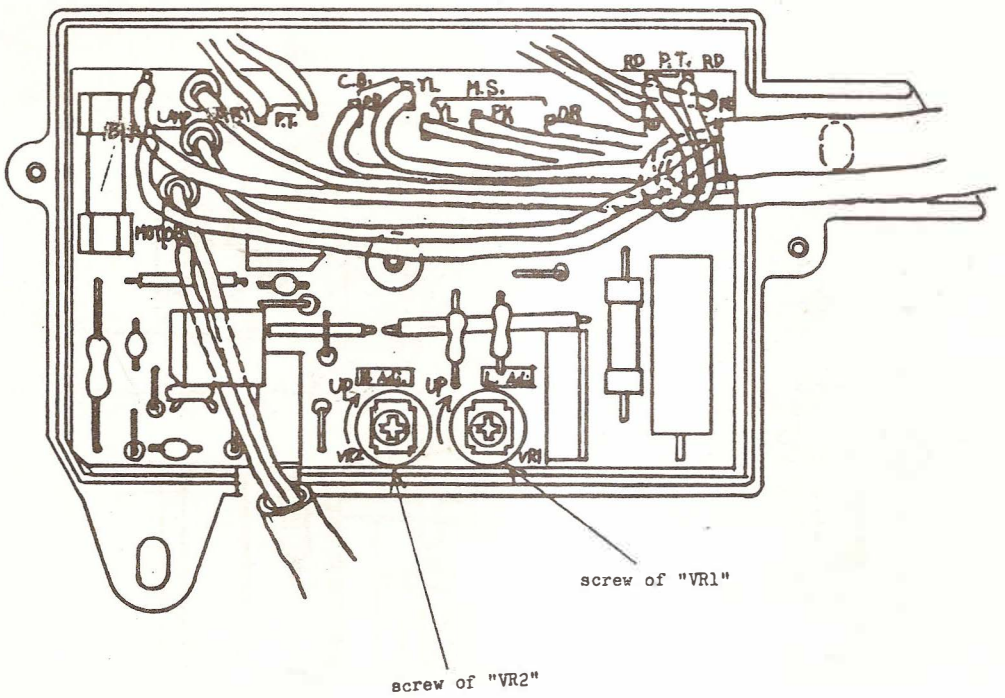
1. Remove the base lid. Turn on the switch.
2. Set the pattern selector dial at 21 , the stitch width dial at 7 and stitch length dial at 4.
3. Press on the foot controller lightly. When the upper shaft starts to rotate, maintain the pressure on the foot controller.
4. Turn the screw of "VR1" with the + screw driver to obtain the optimum speed (160-190rpm).
   i) In case the machine runs too slow, turn the screw clockwise.
   ii) In case the machine runs too fast, turn the screw counter-clockwise.
5. Press on the foot controller hard.
6. Turn the screw of "VR2" to obtain the optimum speed(850-950rpm).
   i) In case the machine runs too slow, turn the screw clockwise.
   ii) In case the machine runs too fast, turn the screw counter-clockwise.
7. Check if the machine speed is correct.
8. Refit the base lid.



MACHINE SPEED (CANADIAN SPECIFICATIONS)

The optimum speed of machine is 160rpm-190rpm when the machine starts to run and 850rpm-950rpm when the machine runs at its highest speed.

1. Remove the base lid. Turn on the switch.
2. Set the pattern selector dial at 21 , the stitch width dial at 7 and stitch length dial at 4.
3. Press on the foot controller lightly. When the upper shaft starts to rotate, maintain the pressure on the foot controller.
4. Turn the screw of VR1" with the + screw driver to obtain the optimum speed (160-190rpm).
   i) In case the machine runs too slow, turn the screw clockwise.
   ii) In case the machine runs too fast, turn the screw counter-clockwise.
5. Press on the foot controller hard.
6. Turn the screw of VR2" to obtain the optimum speed(850-950rpm).
   i) In case the machine runs too slow, turn the screw clockwise.
   ii) In case the machine runs too fast, turn the screw counter-clockwise.
7. Check if the machine speed is correct.
8. Refit the base lid.



MACHINE SPEED (100-125V, EXCEPT CANADA)

The optimum speed of machine is 120rpm-140rpm when the machine starts to run and 850rpm-950rpm when the machine runs at its highest speed.

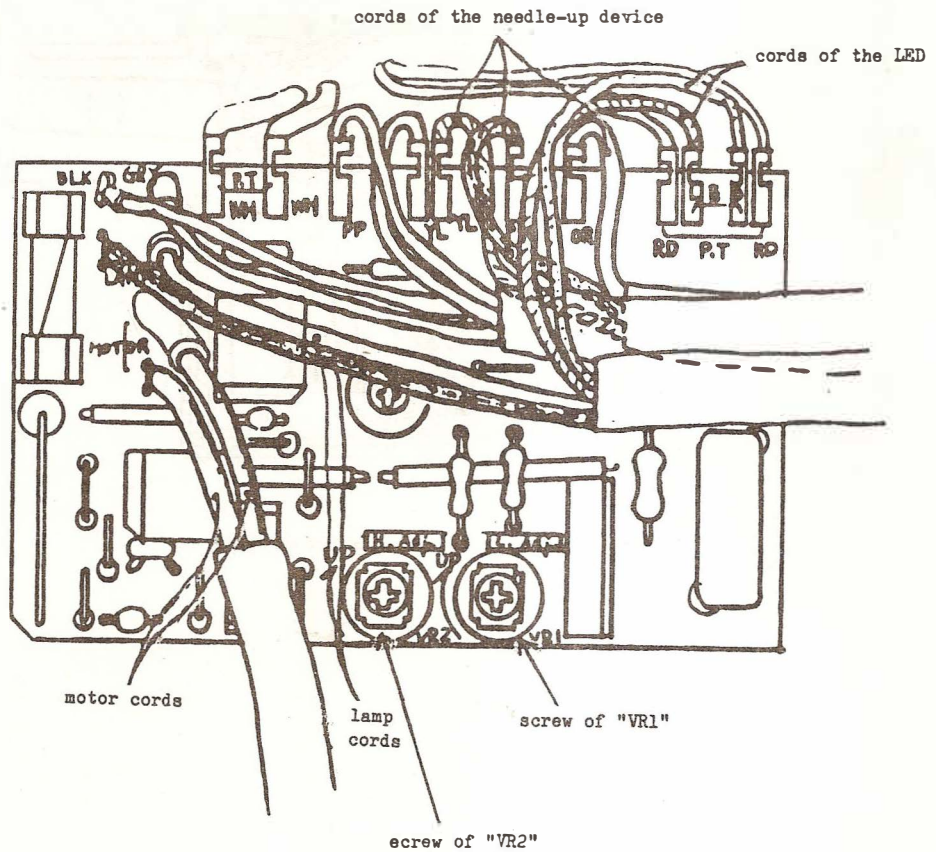
1. Remove the base lid. Turn on the switch.
2. Set the pattern selector dial at 21 , the stitch width dial at 7 and stitch length dial at 4.
3. Press on the foot controller lightly. When the upper shaft starts to rotate, maintain the pressure on the foot controller.
4. Turn the screw of "VR1" with the + screw driver to obtain the optimum speed (120-140rpm).

 i) In case the machine runs too slow, turn the screw clockwise.
ii) In case the machine runs too fast, turn the screw counter-clockwise.

5. Press on the foot controller hard.
6. Turn the screw of "VR2" to obtain the optimum speed(850-950rpm).

 i) In case the machine runs too slow, turn the screw clockwise.
ii) In case the machine runs too fast, turn the screw counter-clockwise.

7. Check if the machine speed is correct.
8. Refit the base lid.

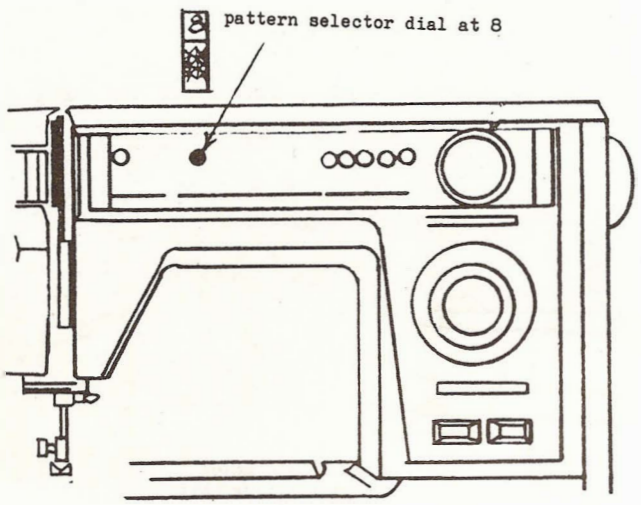


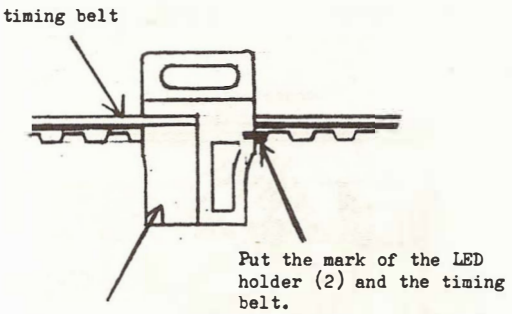
TO CHANGE ELECTRONIC EYE

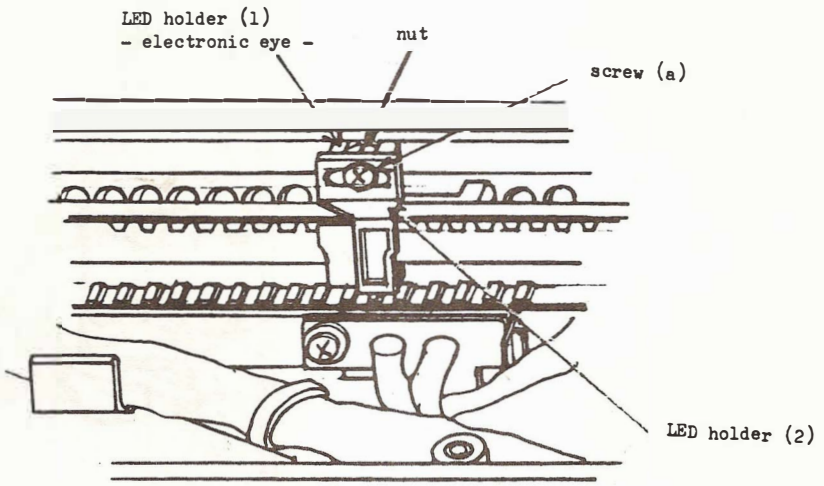
1. Set the pattern selector dial at 8.
2. Mark on the LED holder (2) and on the timing belt to record the position of them.
3. Remove the screw (a), LED holder (1) and the LED holder (2). (When you remove the screw (a), be careful not to drop the nut.)
4. Change the LED holder (1). Tighten the screw (a) temporarily.

Note: If you have removed the LED holder (2) from the timing belt, refit the LED holder (2) at the same place as before on the timing belt. Then, refit the LED holder (1).

5. Adjust the position of the electronic eye according to the instructions of POSITION OF LED HOLDER.







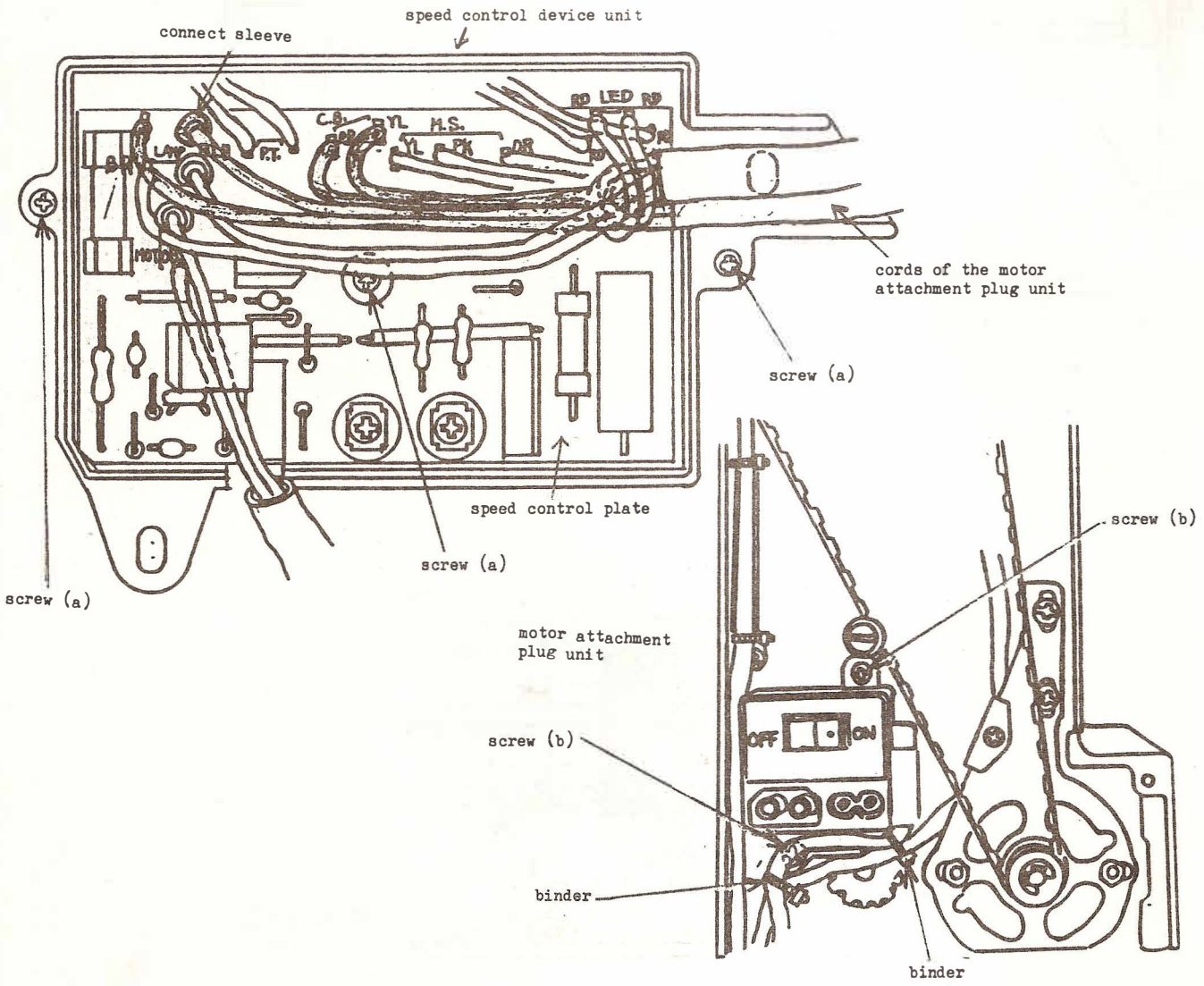
TO CHANGE MOTOR ATTACHMENT PLUG UNIT 1/2
(200-240V)

To remove:

1. Turn off the switch. Disconnect the power plug and the foot controller plug from the motor attachment plug unit.
2. Detach the base by removing four screws. Detach the lid of the speed control device unit by removing three screws (a).
3. Disconnect four cords (black, gray, yellow, purple) of the motor attachment plug unit from the terminals of the speed control device unit.

Note: i) Pull out the terminals of cords from the terminals of the speed control device unit by the flat pliers in order not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.
iii) It might facilitate this job if you disconnect two red cords of the lamp socket unit.

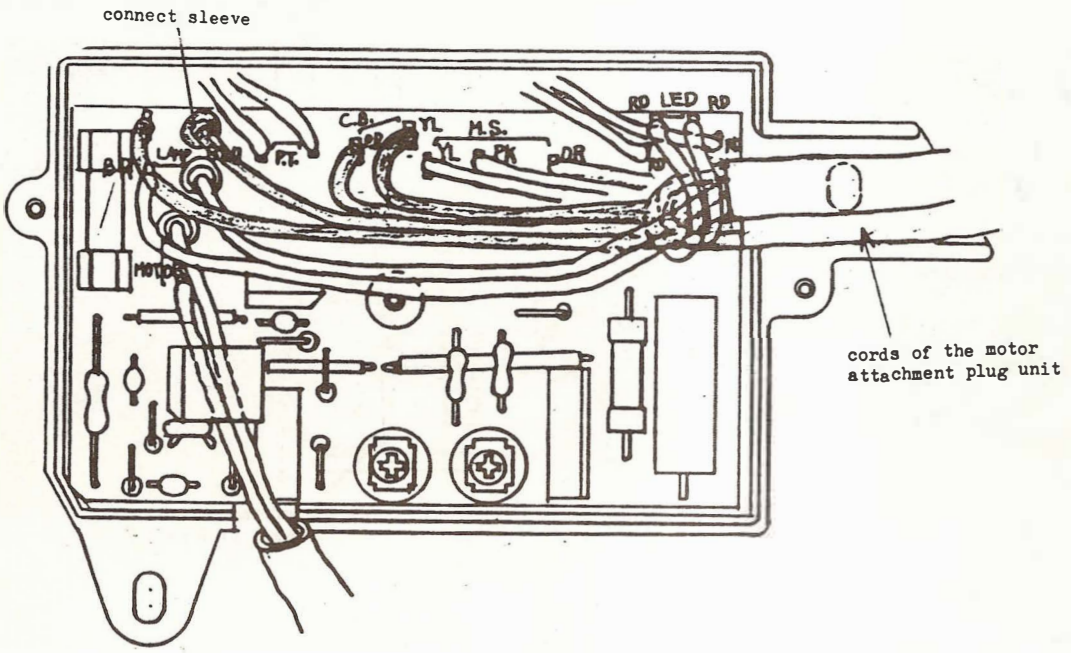
4. Cut two parts of the binder. (Be careful not to damage the cords when cutting.)
5. Remove the motor attachment plug unit by removing two screws (b).

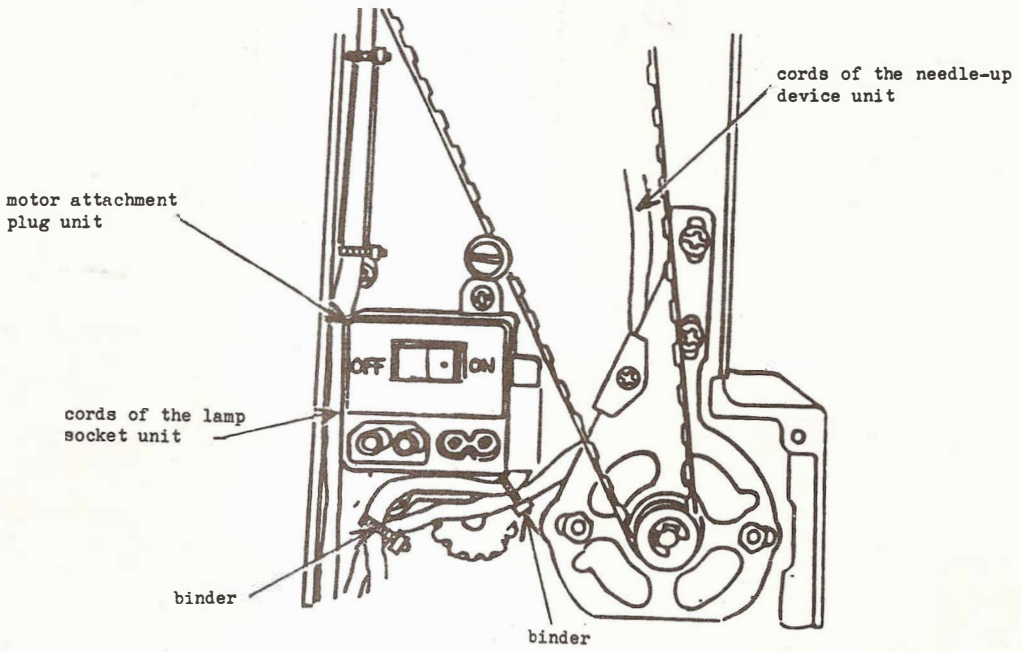


TO CHANGE MOTOR ATTACHMENT PLUG UNIT 2/2
(200-240V)

To refit:

6. Attach the motor attachment plug unit to the machine with two screws.
7. Put the cords of the motor attachment plug unit and the cords of the needle-up device unit into the ditch of the motor attachment plug unit and then combine them with the binder.
8. Connect the cords with the terminals with the flat pliers taking care not to damage them.
9. Combine the cords of the needle-up device unit and the motor attachment plug unit with the binder. Cut off the excess part of the binder.
10. Attach the lid of the speed control device unit and the base.





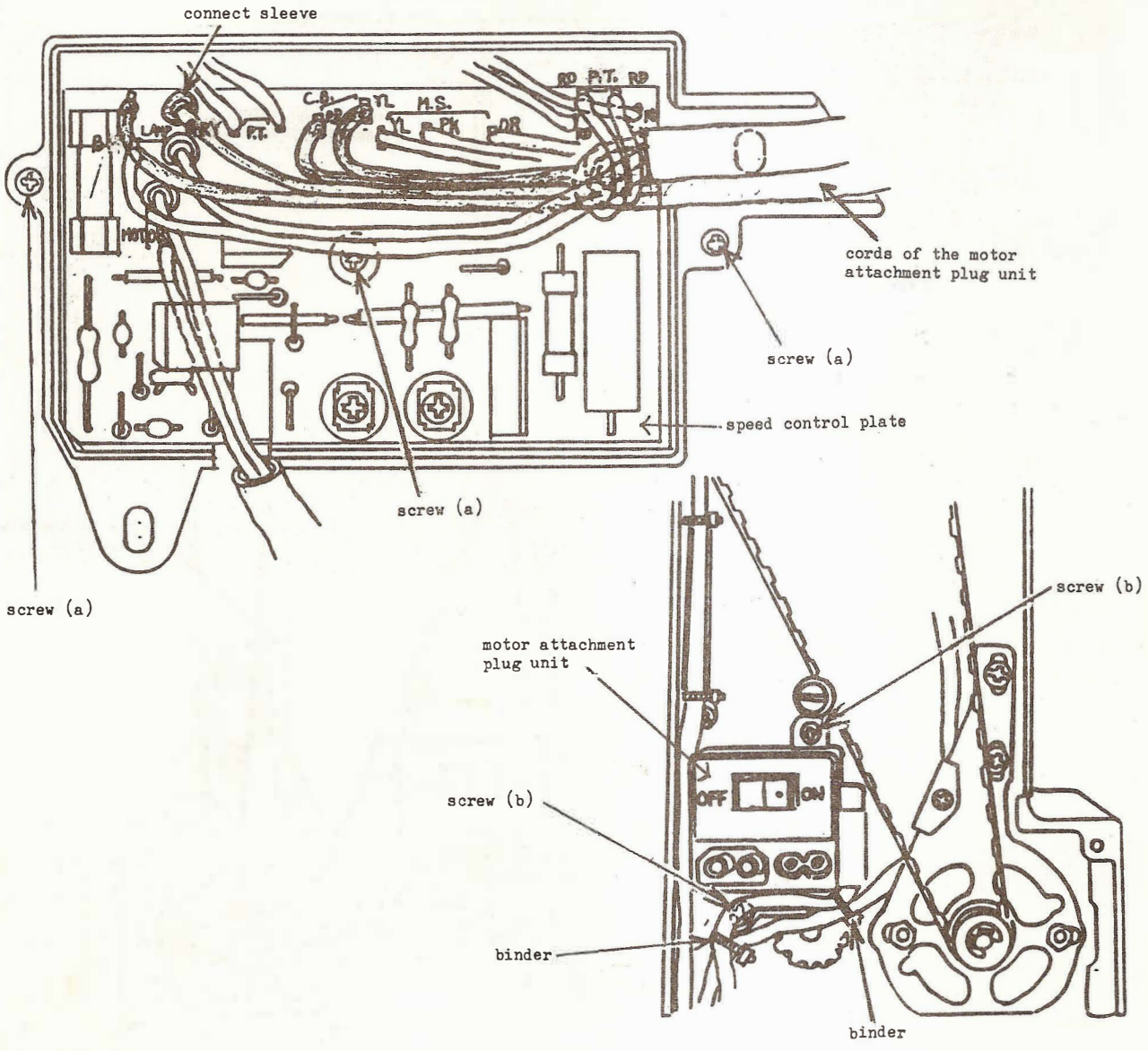
TO CHANGE MOTOR ATTACHMENT PLUG UNIT 1/2
(CANADIAN SPECIFICATIONS)

To remove:

1. Turn off the switch. Disconnect the power plug and the foot controller plug from the motor attachment plug unit.
2. Detach the base by removing four screws. Detach the lid of the speed control device unit by removing three screws (a).
3. Disconnect four cords (black, gray, yellow, purple) of the motor attachment plug unit from the terminals of the speed control device unit.

Note: i) Pull out the terminals of cords from the terminals of the speed control device unit by the flat pliers in order not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.
iii) It might facilitate this job if you disconnect two red cords of the lamp socket unit.

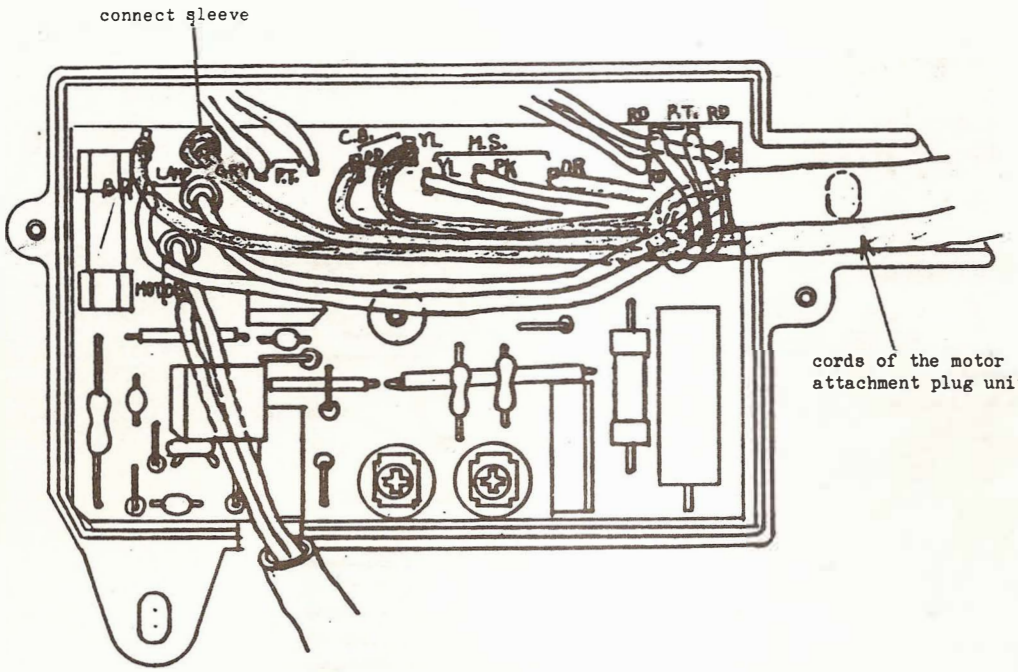
4. Cut two parts of the binder. (Be careful not to damage the cords when cutting.)
5. Remove the motor attachment plug unit by removing two screws (b).

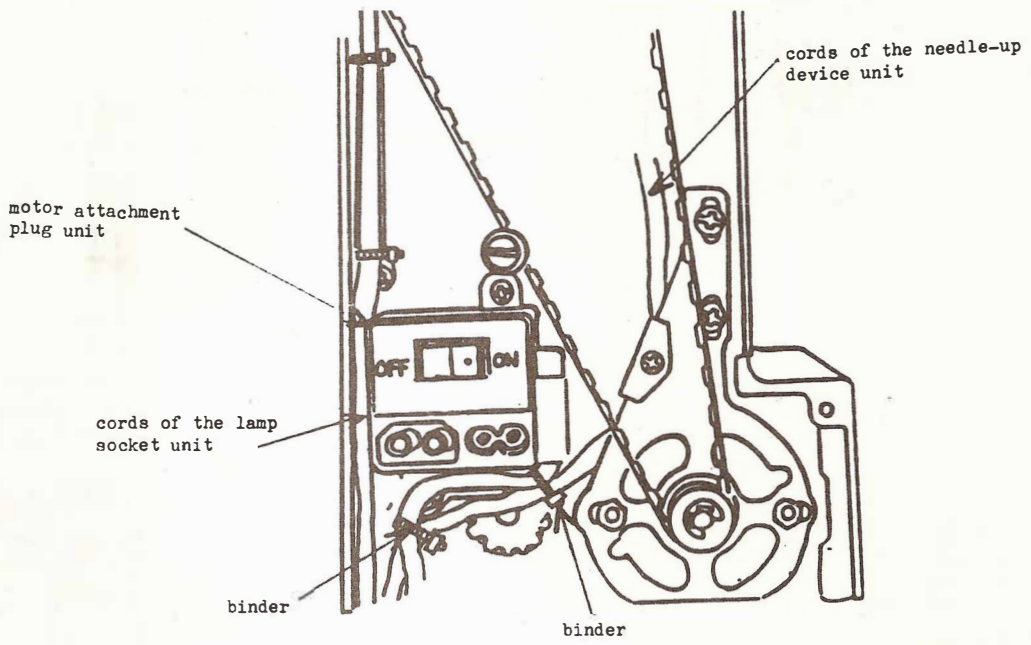


TO CHANGE MOTOR ATTACHMENT PLUG UNIT 2/2
(CANADIAN SPECIFICATIONS)

To refit:

6. Attach the motor attachment plug unit to the machine with two screws.
7. Put the cords of the motor attachment plug unit and the cords of the needle-up device unit into the ditch of the motor attachment plug unit and then combine them with the binder.
8. Connect the cords with the terminals with the flat pliers taking care not to damage them.
9. Combine the cords of the needle-up device unit and the motor attachment plug unit with the binder. Cut off the excess part of the binder.
10. Attach the lid of the speed control device unit and the base.





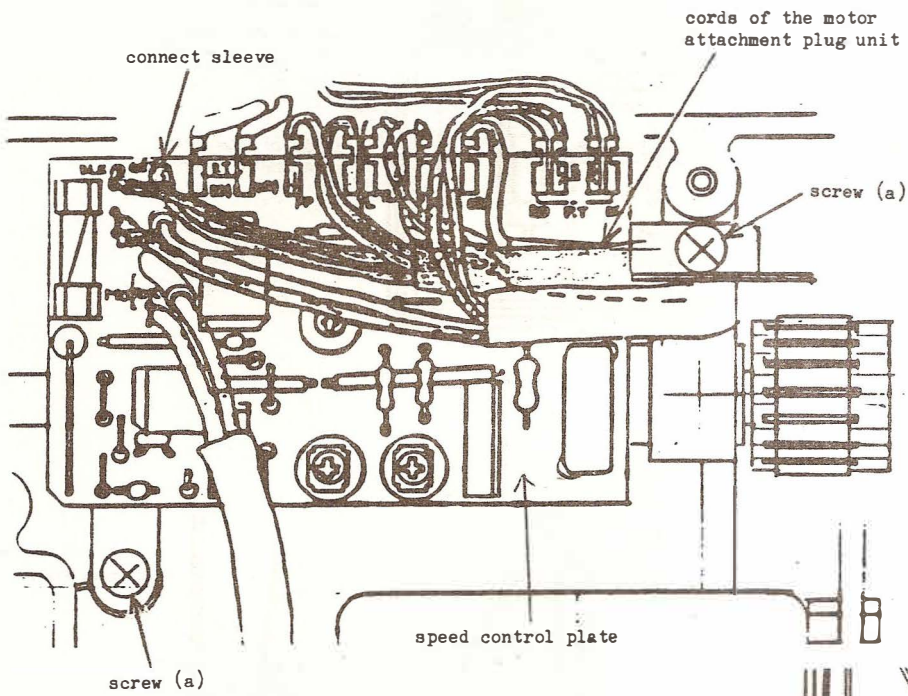
TO CHANGE MOTOR ATTACHMENT PLUG UNIT 1/2
(100-125V, EXCEPT CANADA)

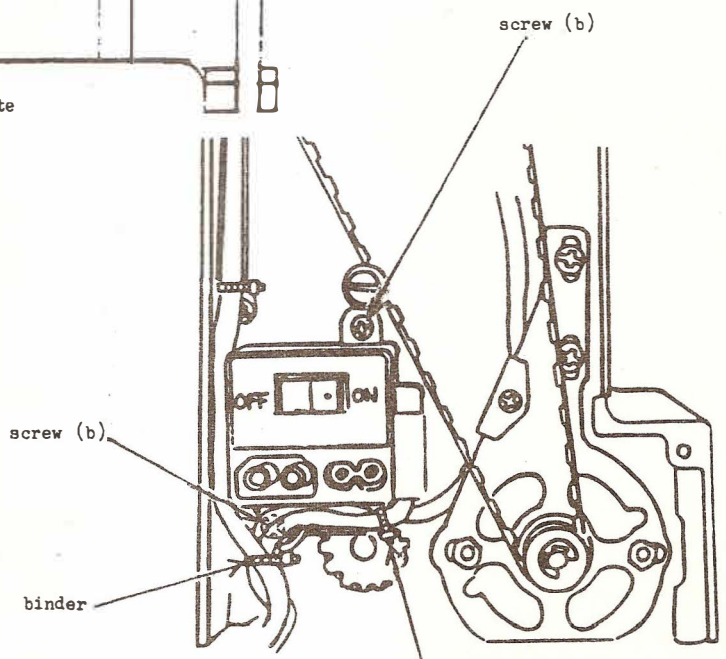
To remove:

1. Turn off the switch. Disconnect the power plug and the foot controller plug from the motor attachment plug unit.
2. Detach the base by removing four screws. Detach the speed control plate by removing two screws (a).
3. Disconnect four cords (black, gray, yellow, purple) of the motor attachment plug unit from the terminals of the speed control plate.

Note: i) Pull out the terminals of cords from the terminals of the speed control plate by the flat pliers in order not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off. Never touch the elements on the speed control plate.
iii) It might facilitate this job if you disconnect two red cords of the lamp socket unit.

4. Cut two parts of the binder. (Be careful not to damage the cords when cutting.)
5. Remove the motor attachment plug unit by removing two screws (b).

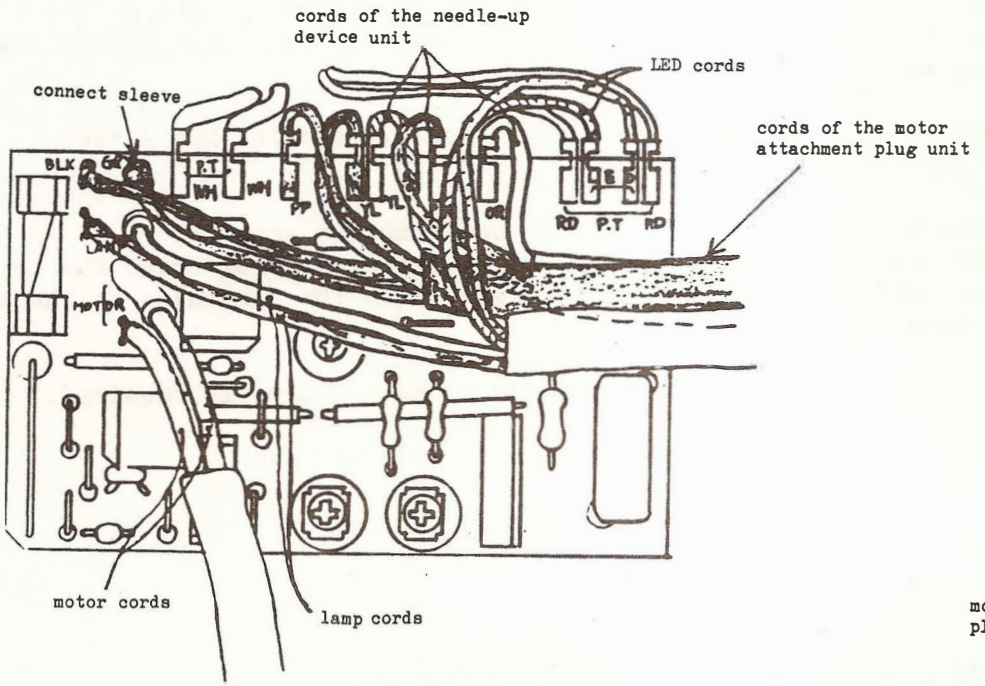


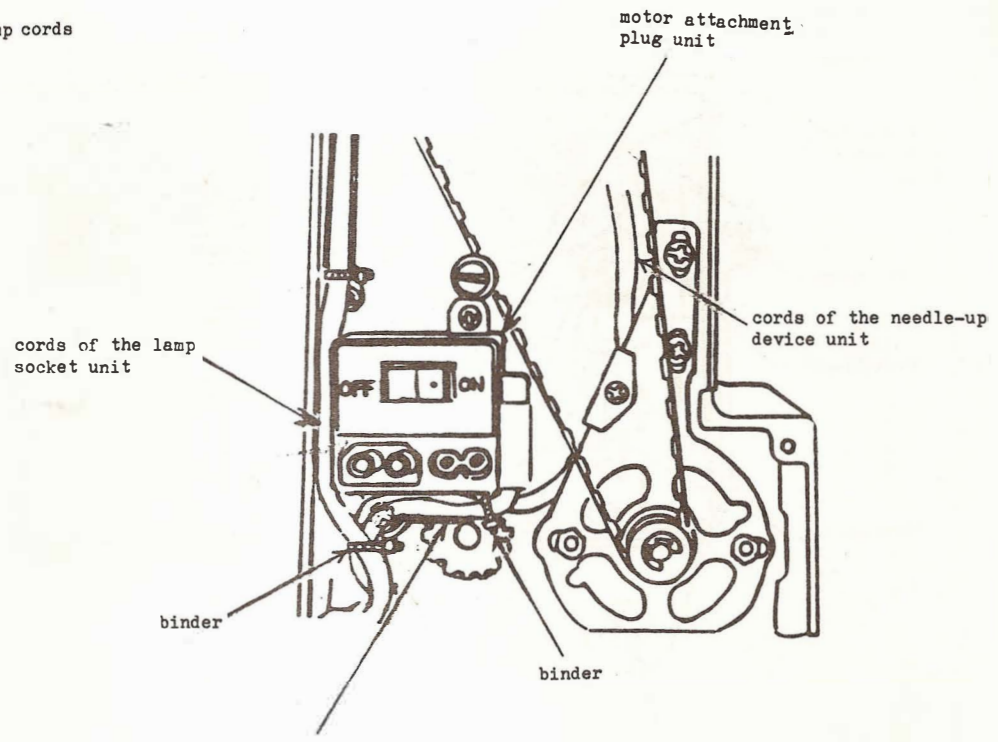


TO CHANGE MOTOR ATTACHMENT PLUG UNIT 2/2
(100-125V, EXCEPT CANADA)

To refit:

6. Attach the motor attachment plug unit to the machine with two screws.
7. Put the cords of the motor attachment plug unit and the cords of the needle-up device unit into the ditch of the motor attachment plug unit and then combine them with the binder.
8. Connect the cords with the terminals with the flat pliers taking care not to damage them.
9. Combine the cords of the needle-up device, lamp socket unit and the motor attachment plug unit with the binder. Cut off the excess part of the binder.
10. Attach the lid of the speed control plate and the base.





TO CHANGE SPEED CONTROL DEVICE UNIT
(200-240V)

To remove:

1. Turn off the switch. Disconnect the power plug, foot controller plug from the motor attachment plug unit.
2. Detach the base and the lid of the speed control device unit.
3. Disconnect the motor cords (two black cords), the lamp cords (two red cords, one each of brown and blue cord), the cords of the motor attachment plug unit (brown, blue, yellow, purple) and the cords of the needle-up device unit (yellow, orange, pink) from the speed control device unit.

Note: i) Pull out the terminals of cords from the terminals of the speed control device unit with the flat pliers not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

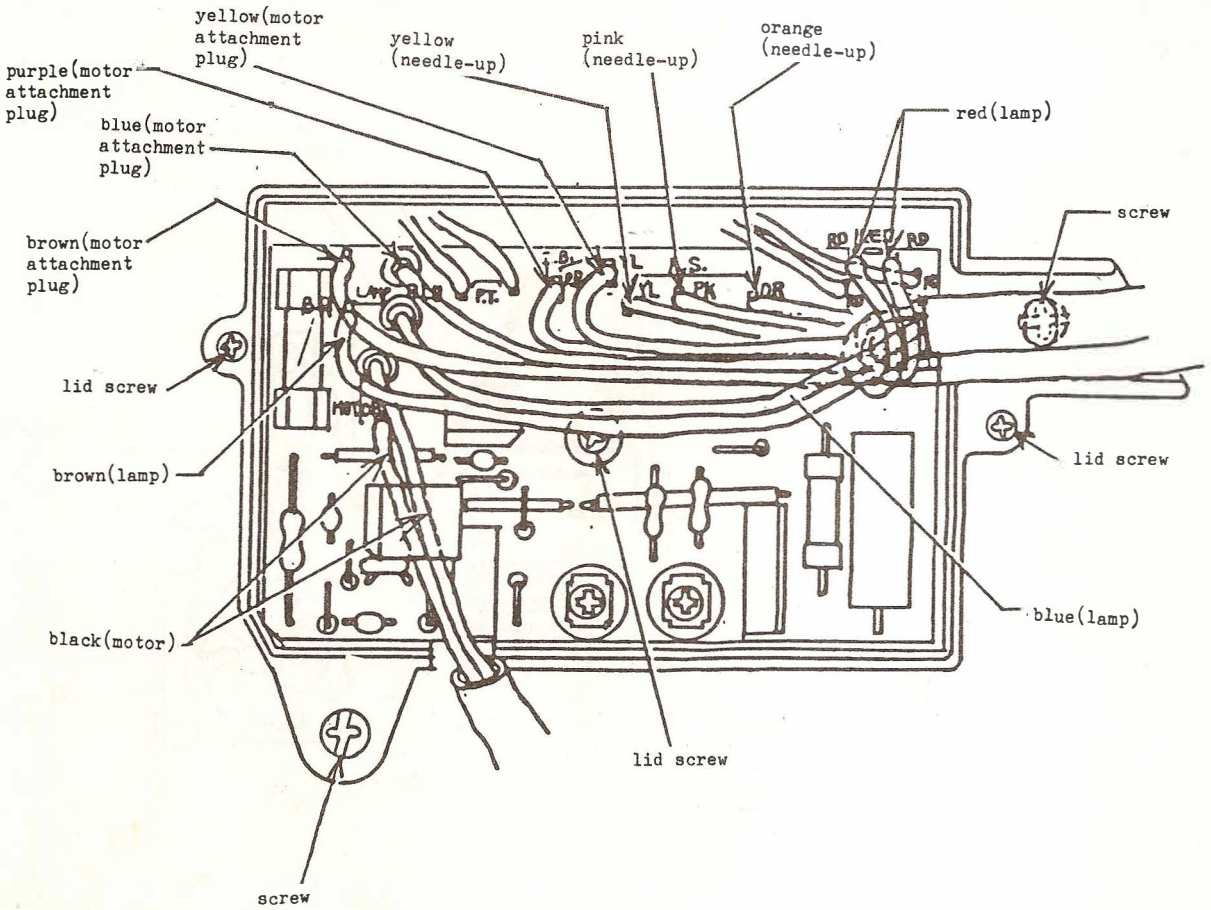
4. Detach the speed control device unit from the bed by removing two screws.

To refit:

5. Attach the speed control device unit to the bed with two screws.
6. Connect the lamp cords, the cords of the motor attachment plug unit, the cords of the needle-up device unit and the motor cords with the terminals of the speed control device unit.

Note: Never fail to cover the terminals with the connect sleeve if required.

7. Attach the lid of the speed control device unit and the base.



TO CHANGE SPEED CONTROL DEVICE UNIT
(CANADIAN SPECIFICATIONS)

To remove:

1. Turn off the switch. Disconnect the power plug, foot controller plug from the motor attachment plug unit.
2. Detach the base and the lid of the speed control device unit.
3. Disconnect the motor cords (two black cords), the lamp cords (two red cords and two black cords), the cords of the motor attachment plug unit (black, gray, yellow, purple) and the cords of the needle-up device unit (yellow, orange, pink) from the speed control device unit.

Note: i) Pull out the terminals of cords from the terminals of the speed control device unit with the flat pliers not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

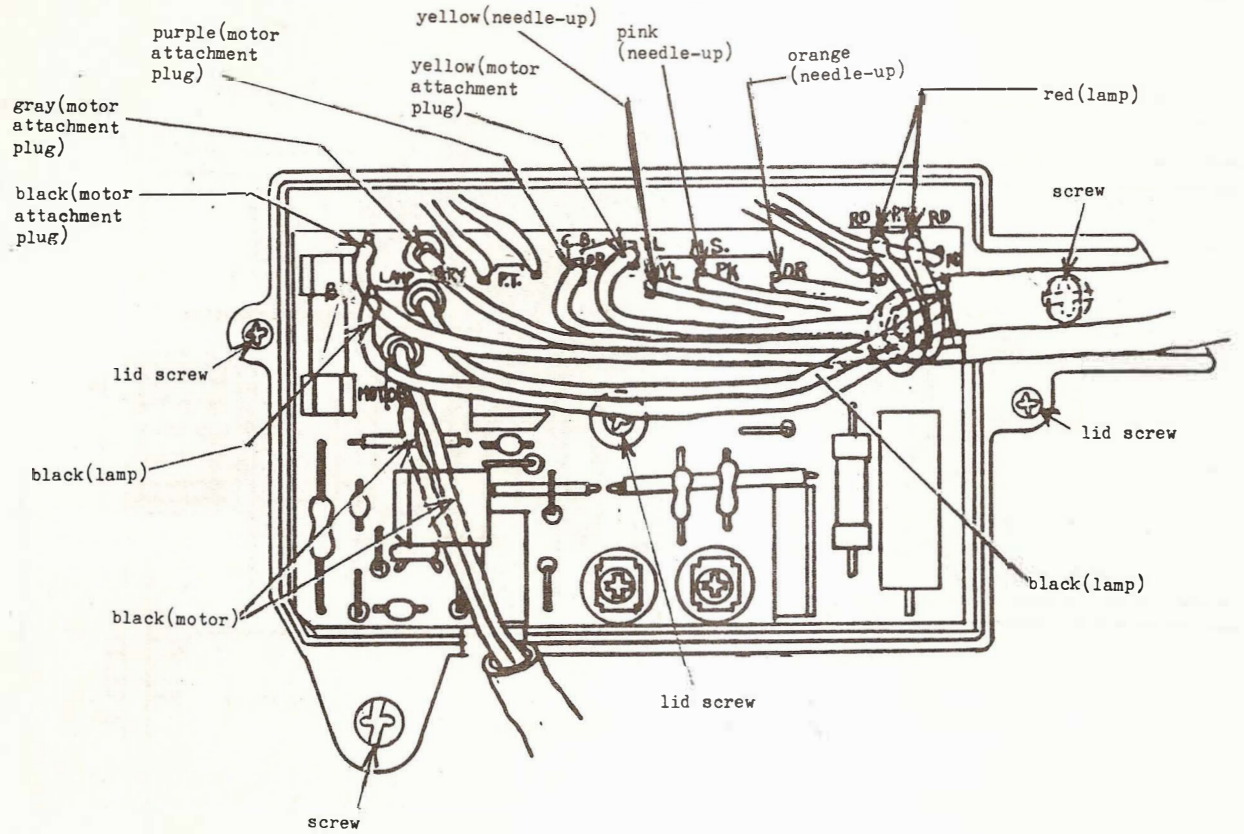
4. Detach the speed control device unit from the bed by removing two screws.

To refit:

5. Attach the speed control device unit to the bed with two screws.
6. Connect the lamp cords, the cords of the motor attachment plug unit, the cords of the needle-up device unit and the motor cords with the terminals of the speed control device unit.

Note: Never fail to cover the terminals with the connect sleeve if required.

7. Attach the lid of the speed control device unit and the base.



TO CHANGE SPEED CONTROL PLATE
(100-125V, EXCEPT CANADA)

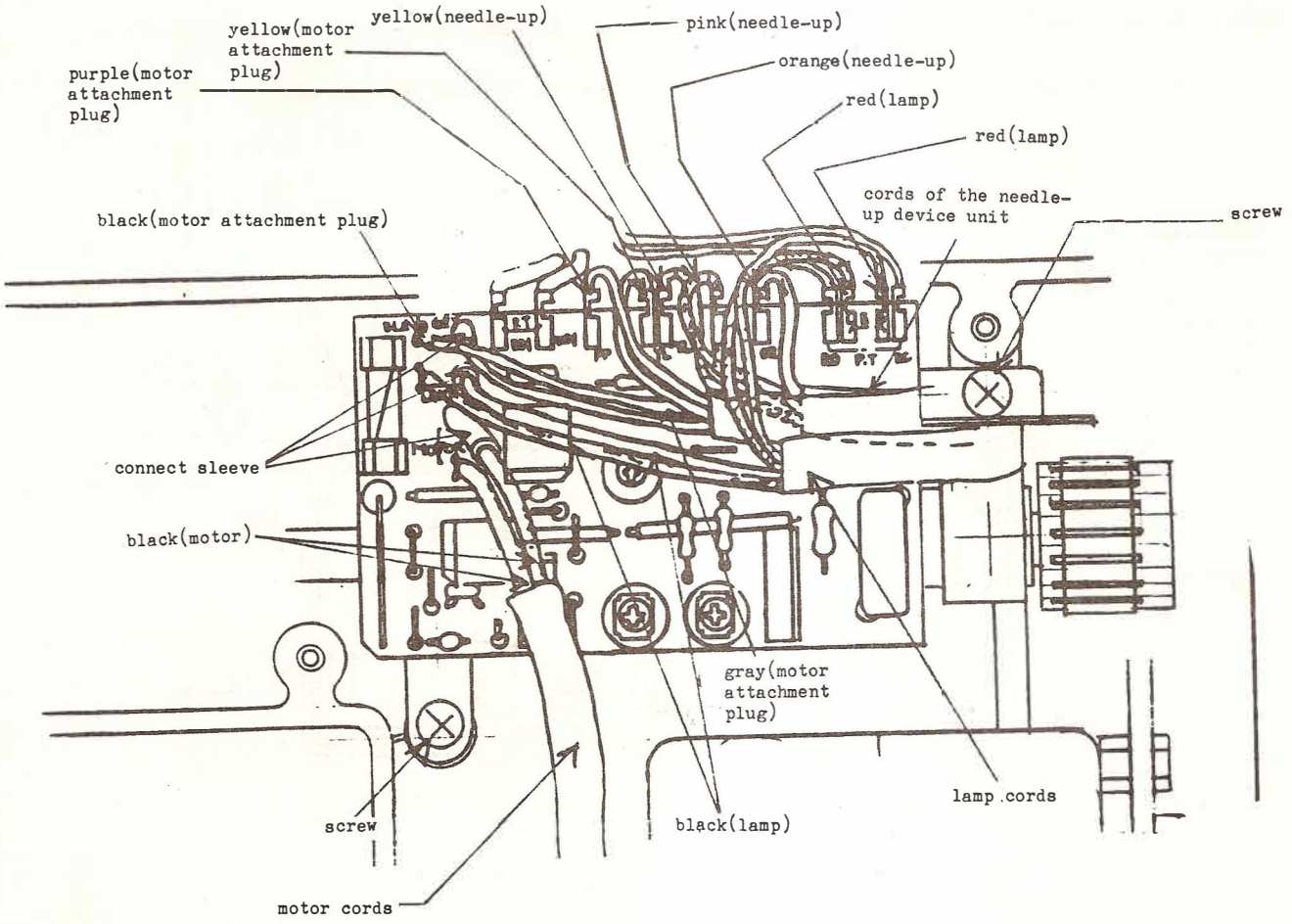
To remove:

1. Turn off the switch. Disconnect the power plug and the foot controller plug from the motor attachment plug unit.
2. Detach the base.
3. Disconnect the motor cords (two black cords) from the speed control plate.
4. Detach the speed control plate from the bed.
5. Disconnect the lamp cords (two each of black and red cords), the cords of the motor attachment plug unit (black, gray, yellow, purple), the cords of the needle-up device unit (yellow, orange, pink) from the terminals of the speed control plate.

Note: i) Pull out the terminals of cords from the terminals of the speed control plate with the flat pliers not to bend the terminals.
ii) When you pull out the terminals, hold by speed control plate lest it should come off. Never touch the elements on the speed control plate.

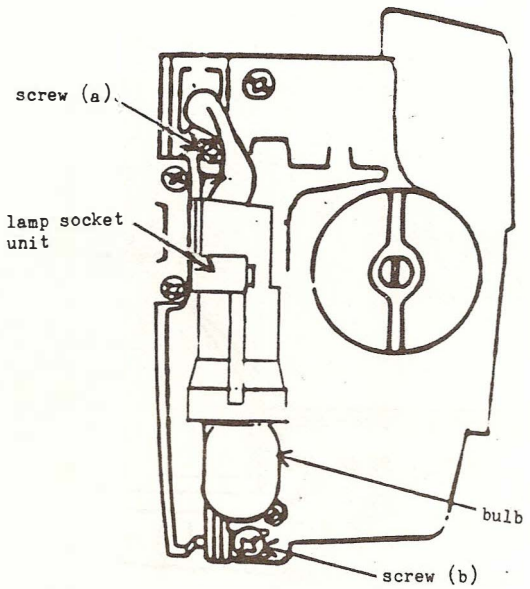
To refit:

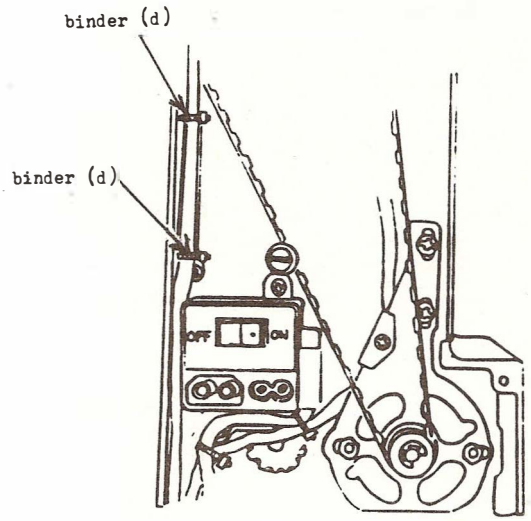
6. Connect the lamp cords, the cords of the motor attachment plug unit and the cords of the needle-up device unit with the terminals of the speed control plate.
7. Attach the speed control plate to the bed with two screws.
8. Connect the motor cords with the terminals of the speed control plate.
9. Refit the base.

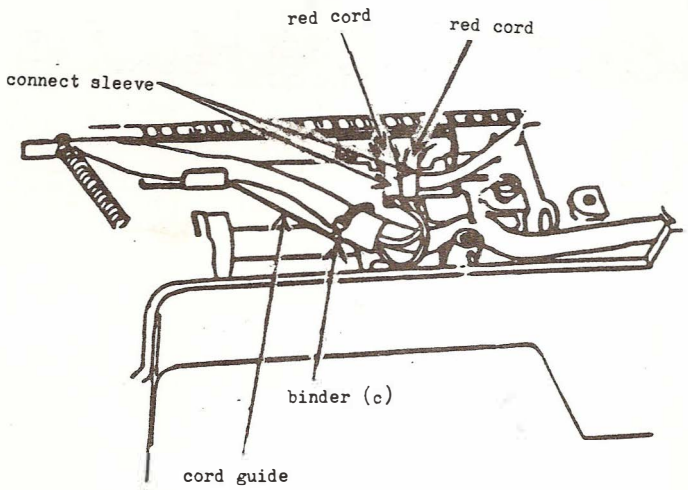


TO CHANGE LAMP SOCKET UNIT 1/5
(200-240V)

To remove:
1. Turn off the switch. Disconnect the power plug and the controller plug from the motor attachment plug unit.
2. Remove the top cover unit, the belt cover and the bulb.
3. Remove the screw (a) and loosen the screw (b).
4. Cut off the binder (c).
5. Disconnect the two red cords from the printed board.
6. Cut off the two binders (d).





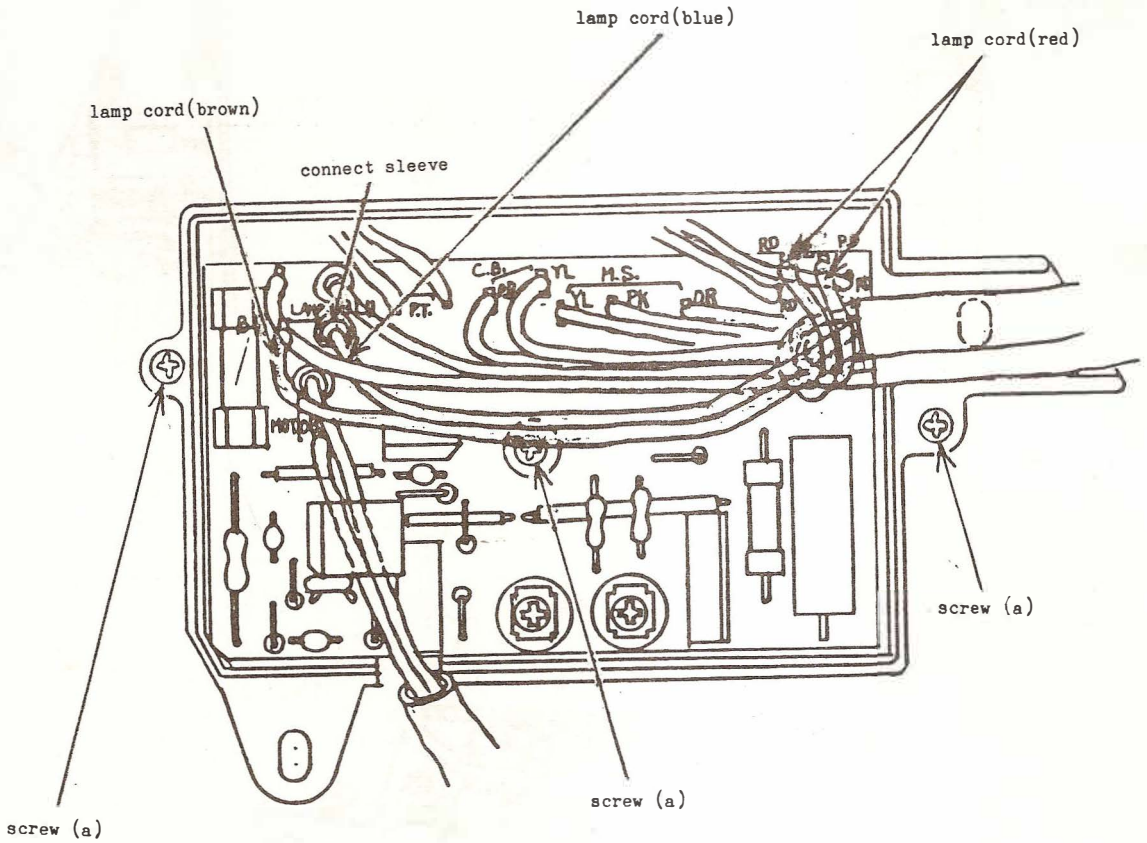


TO CHANGE LAMP SOCKET UNIT 2/5
(200-240V)

7. Detach the base.
8. Remove three screws (a) to detach the speed control device unit.
9. Disconnect the lamp cords (one each of brown, blue and two red cords) from the speed control device unit.

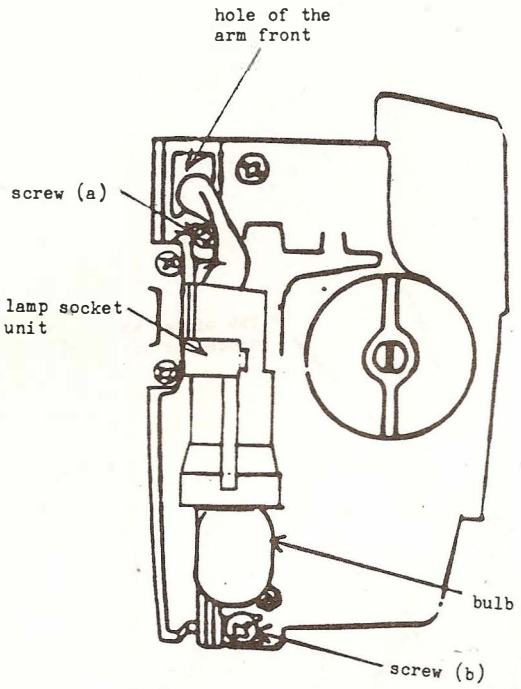
Note: i) Pull out the terminals of the cords with the flat pliers not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

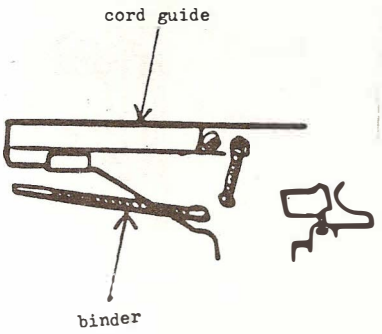
10. Remove the lamp socket unit.

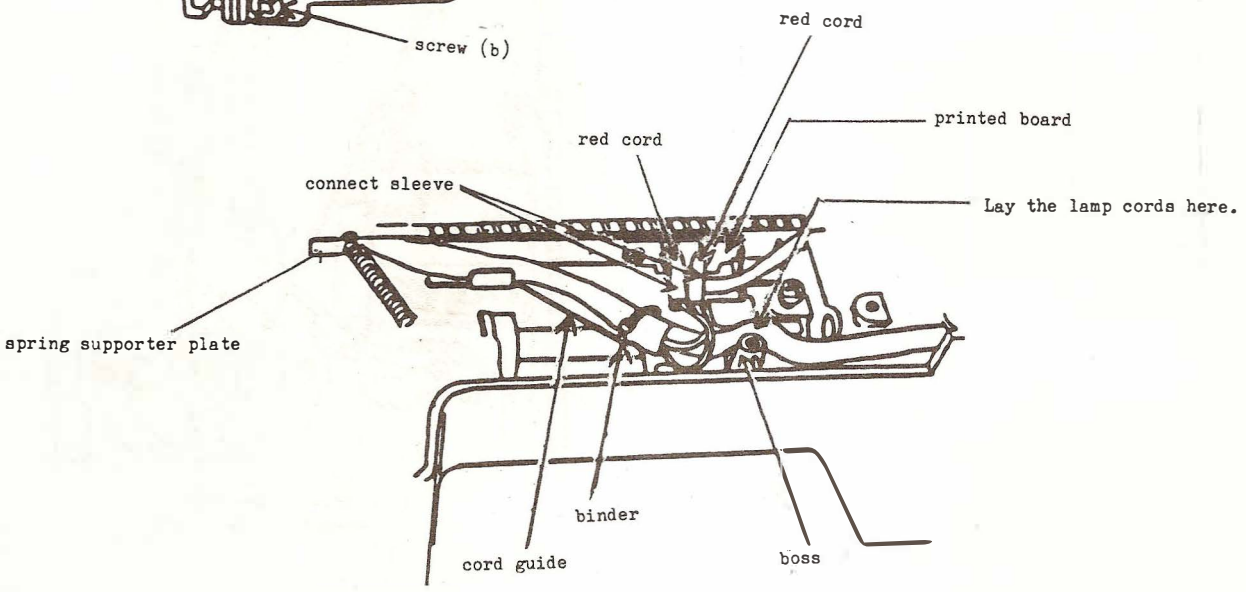


TO CHANGE LAMP SOCKET UNIT 3/5
(200-240V)

11. Attach the bulb to the lamp socket unit.
12. Attach the lamp socket unit to the machine with the screws (a) and (b).
13. Pass the lamp cords through the hole of the arm front.
14. Pass the binder through the two holes of the cord guide on the upper part of the arm.
15. Place the lamp cords on the machine and fix them with the binder as shown in the diagram. Cut off the excess part of the binder.
16. Connect two red cords with the terminals of the printed board.
17. Cover the terminals with the connect sleeve.
18. Bundle the terminals of the lamp cords with a rubber band and pass them through the concave part of the spring supporting plate.



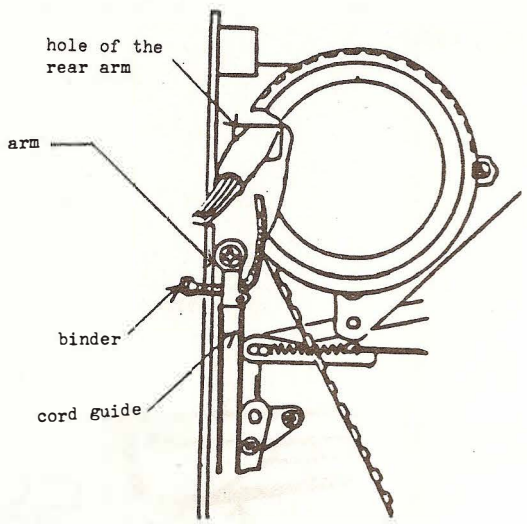


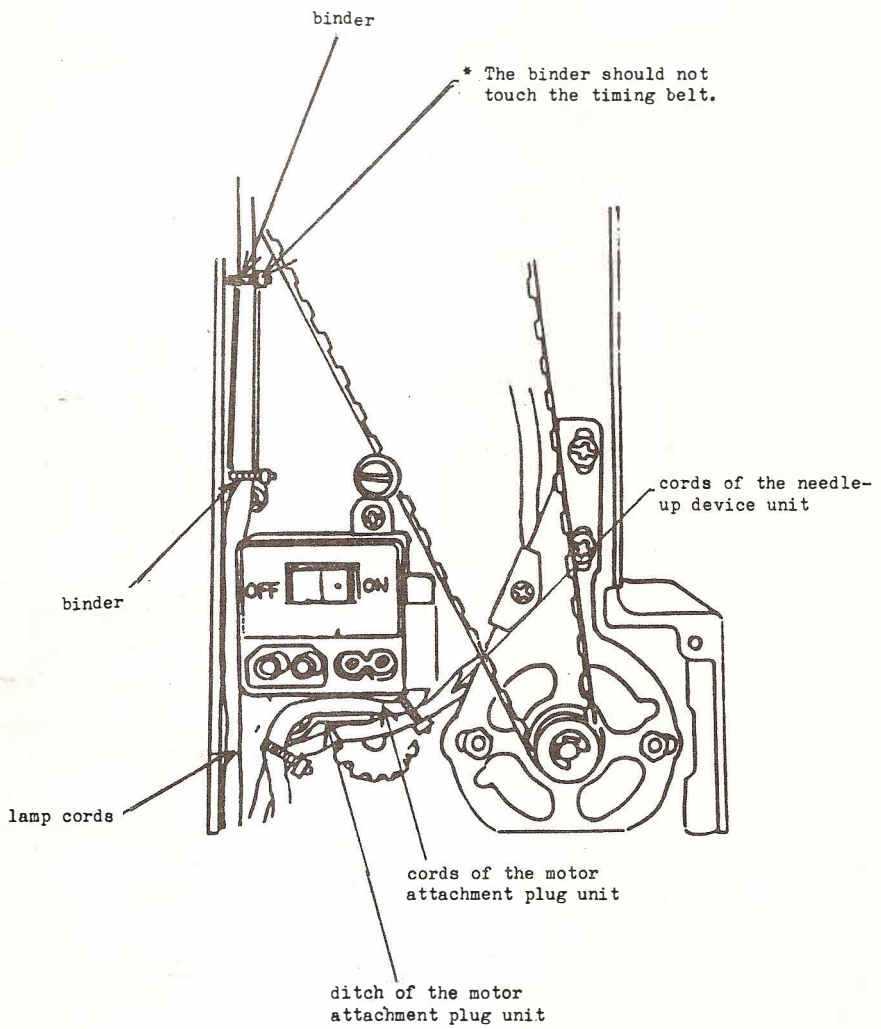


TO CHANGE LAMP SOCKET UNIT 4/5
(200-240V)

19. Pass the lamp cords through the hole of the rear arm.
20. Pass the lamp cords between the cord guide and the arm. Fix them with the binders as shown in the diagram. Cut off the excess part of the binder.

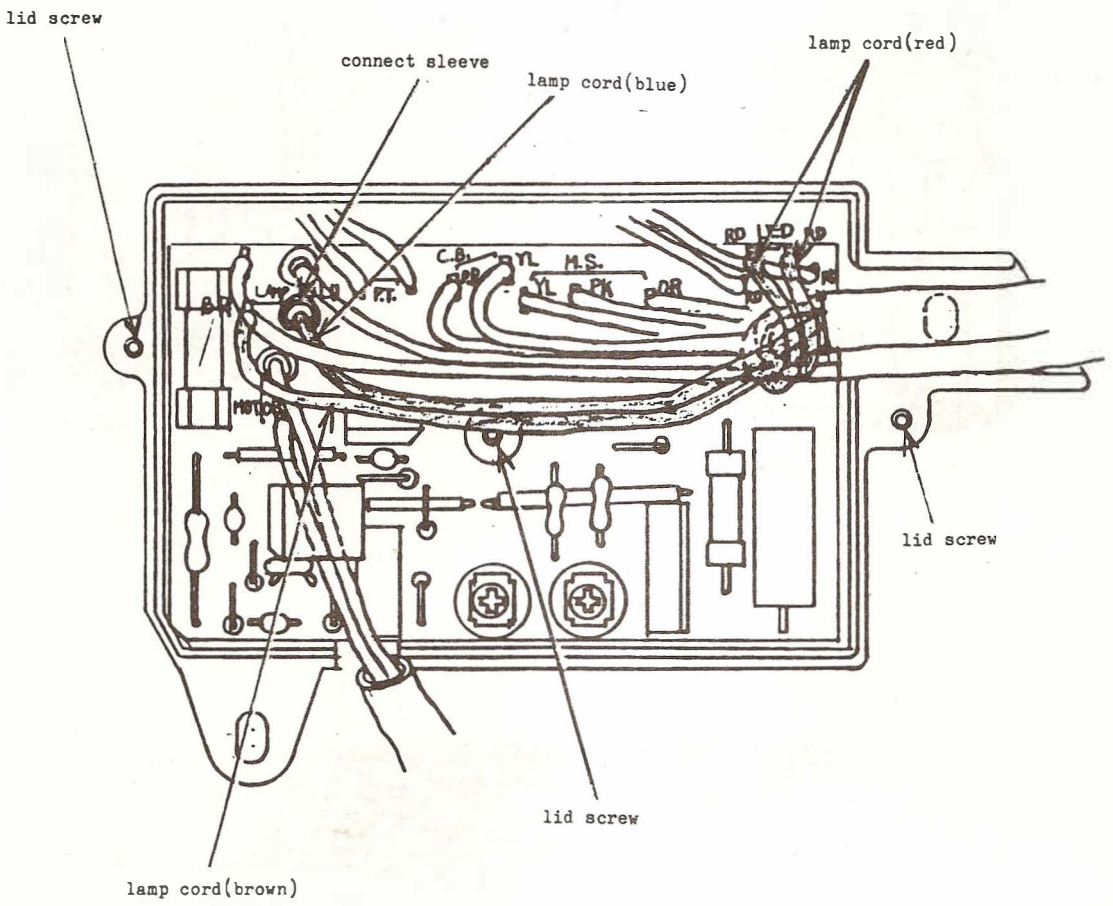
Note: The binder should not touch the timing belt.





TO CHANGE LAMP SOCKET UNIT 5/5
(200-240V)

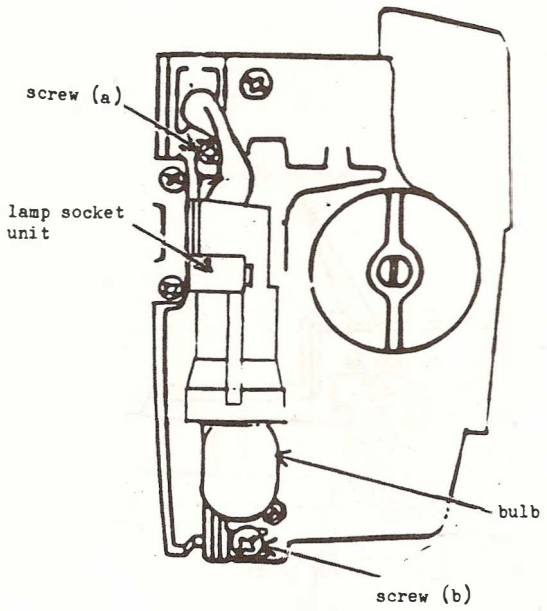
21. Connect four lamp cords with the terminals of the speed control device unit with the flat pliers.
22. Attach the lid of the speed control device unit with three screws.
23. Attach the base, the belt cover, top cover unit.

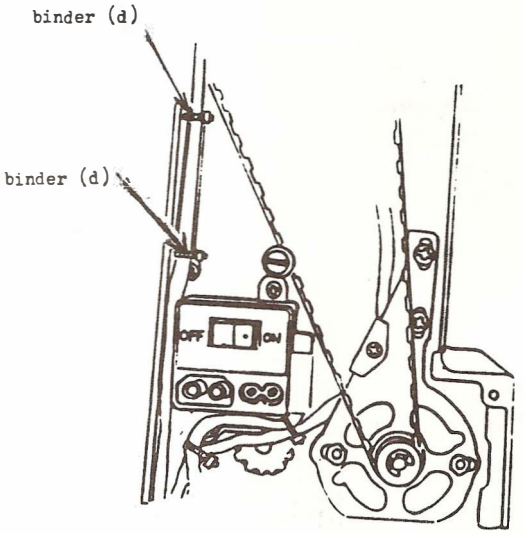


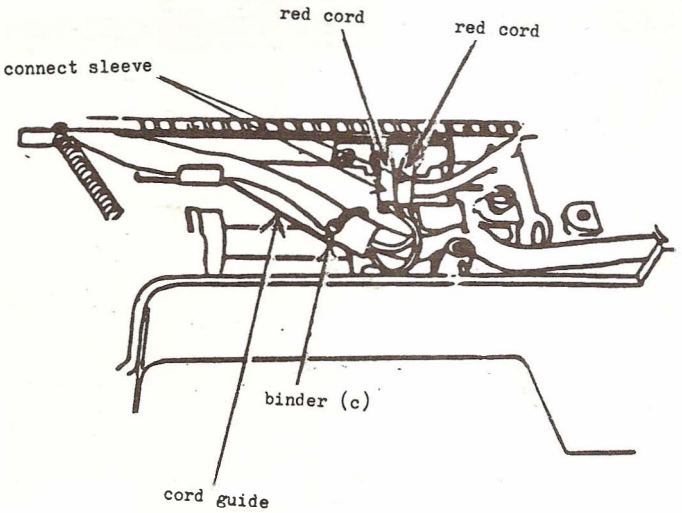
TO CHANGE LAMP SOCKET UNIT 1/5
(CANADIAN SPECIFICATIONS)

To remove:

1. Turn off the switch. Disconnect the power plug and the controller plug from the motor attachment plug unit.
2. Remove the top cover unit, the belt cover and the bulb.
3. Remove the screw (a) and loosen the screw (b).
4. Cut off the binder (c).
5. Disconnect the two red cords from the printed board.
6. Cut off the two binders (d).





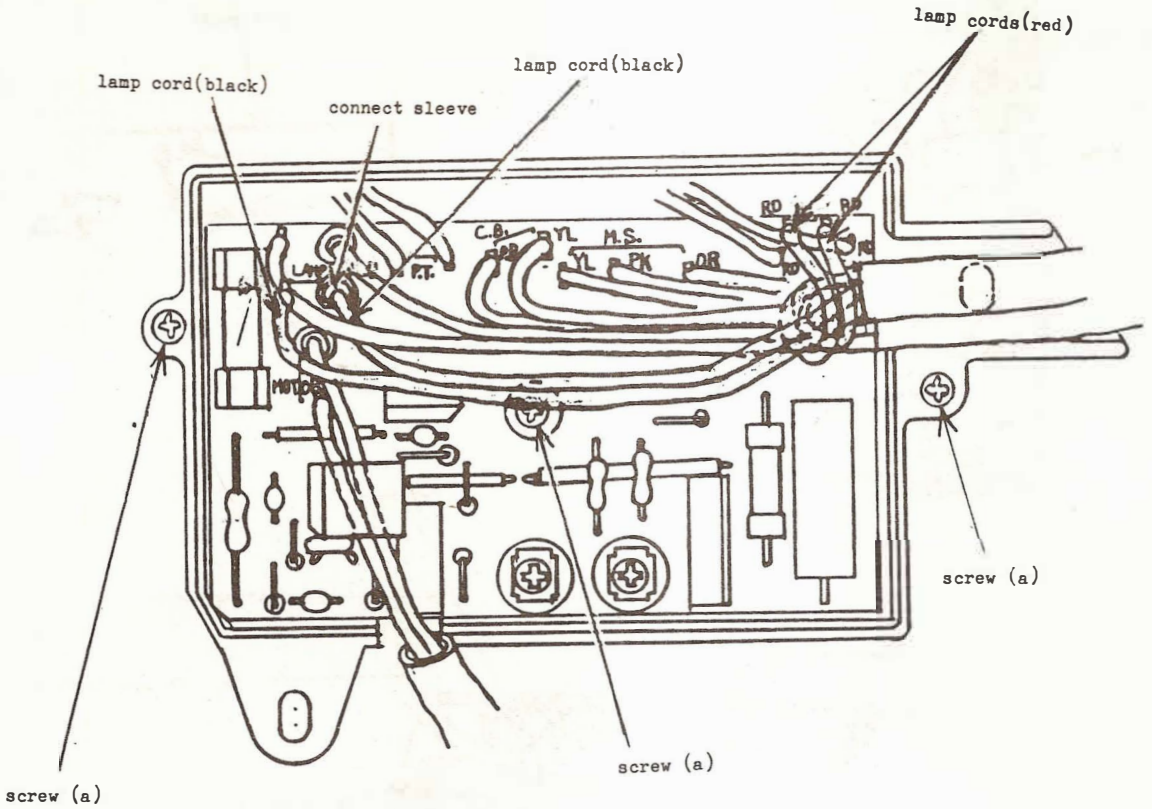


TO CHANGE LAMP SOCKET UNIT 2/5
(CANADIAN SPECIFICATIONS)

7. Detach the base.
8. Remove three screws (a) to detach the speed control device unit.
9. Disconnect the lamp cords (two each of black and red cords) from the speed control device unit.

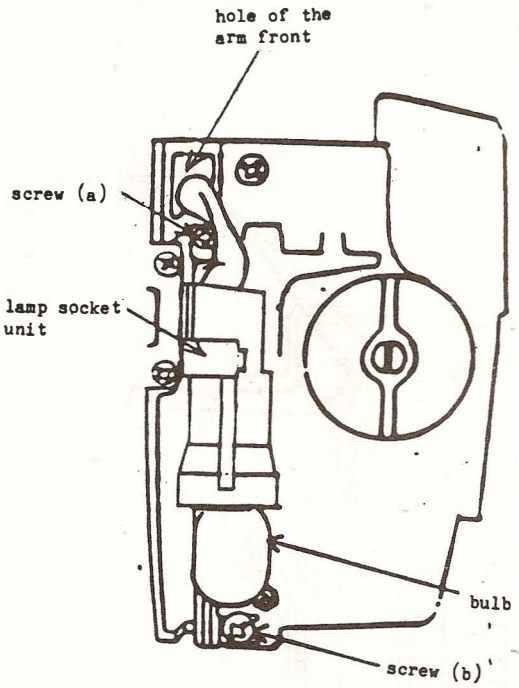
Note: i) Pull out the terminals of the cords with the flat pliers not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

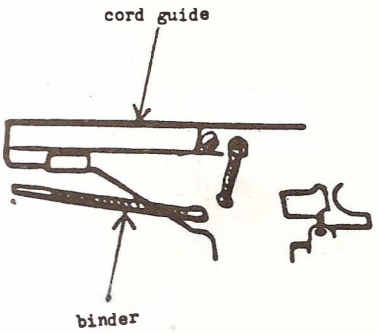
10. Remove the lamp socket unit.

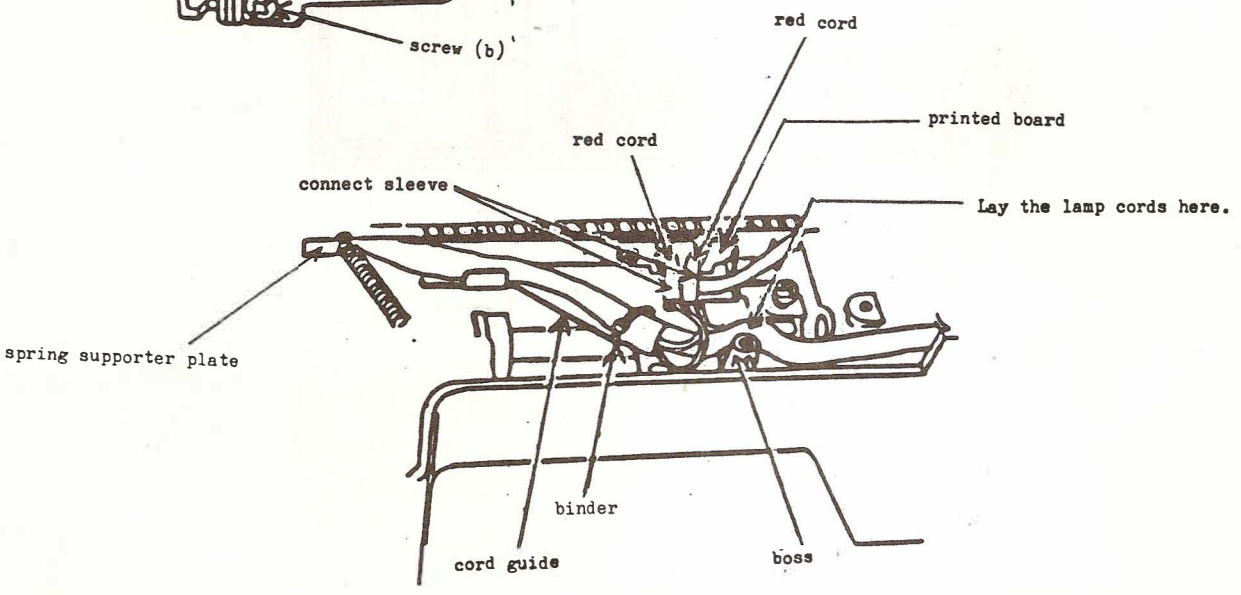


TO CHANGE LAMP SOCKET UNIT 3/5
(CANADIAN SPECIFICATIONS)

11. Attach the bulb to the lamp socket unit.
12. Attach the lamp socket unit to the machine with the screws (a) and (b).
13. Pass the lamp cords through the hole of the arm front.
14. Pass the binder through the two holes of the cord guide on the upper part of the arm.
15. Place the lamp cords on the machine and fix them with the binder as shown in the diagram. Cut off the excess part of the binder.
16. Connect two red cords with the terminals of the printed board.
17. Cover the terminals with the connect sleeve.
18. Bundle the terminals of the lamp cords with a rubber band and pass them through the concave part of the spring supporting plate.



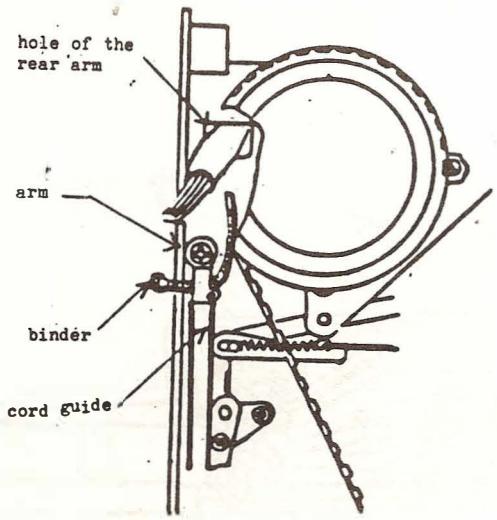


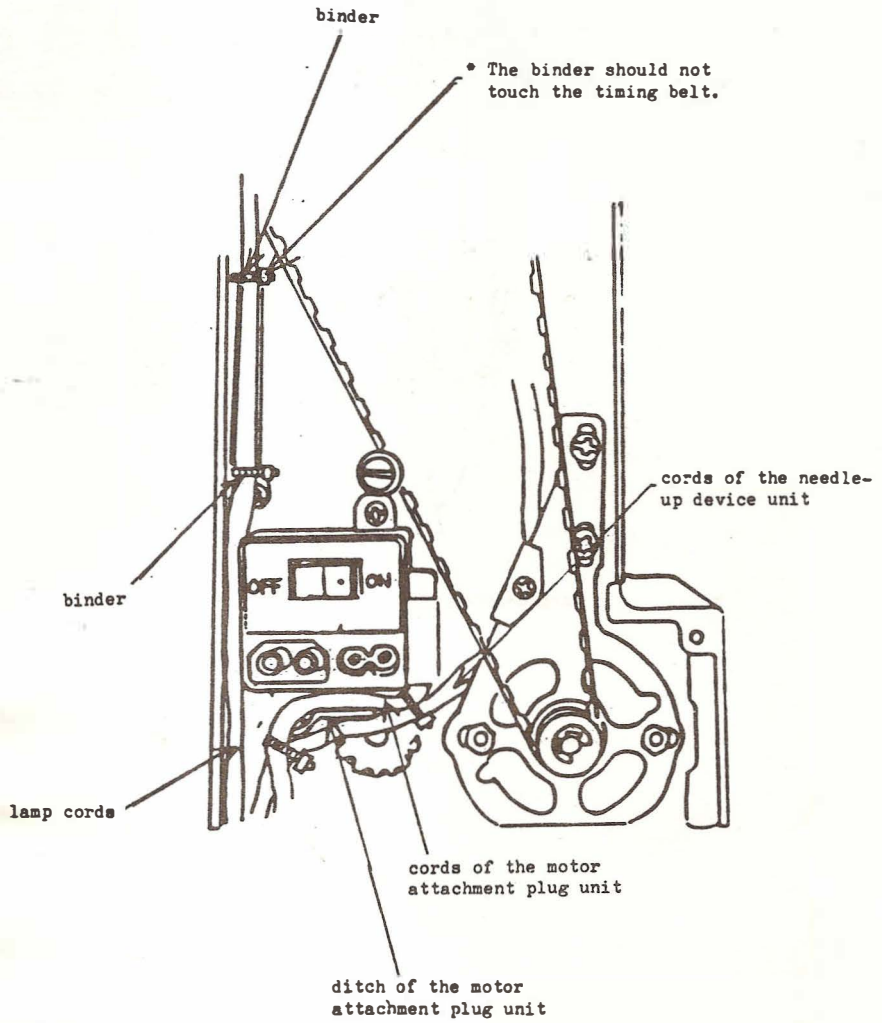


TO CHANGE LAMP SOCKET UNIT 4/5
(CANADIAN SPECIFICATIONS)

19. Pass the lamp cords through the hole of the rear arm.
20. Pass the lamp cords between the cord guide and the arm. Fix them with the binders as shown in the diagram. Cut off the excess part of the binder.

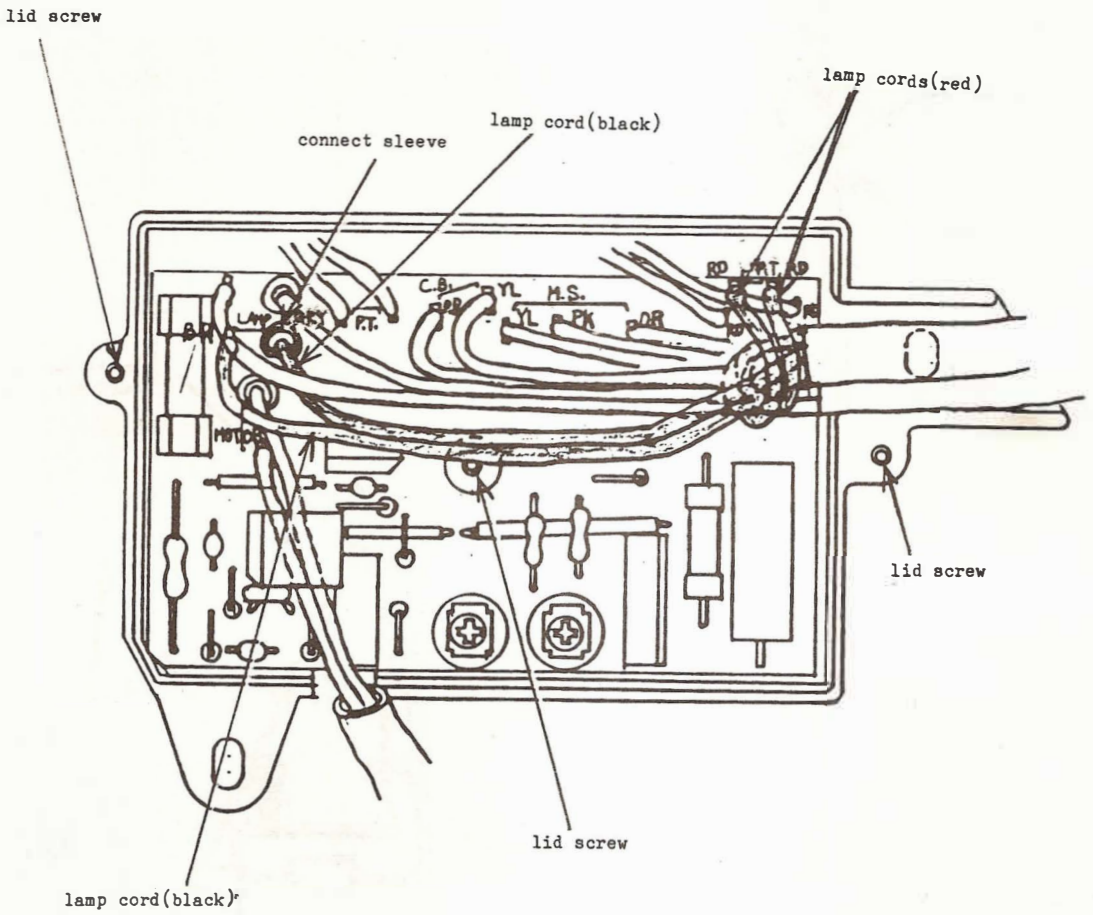
Note: The binder should not touch the timing belt.





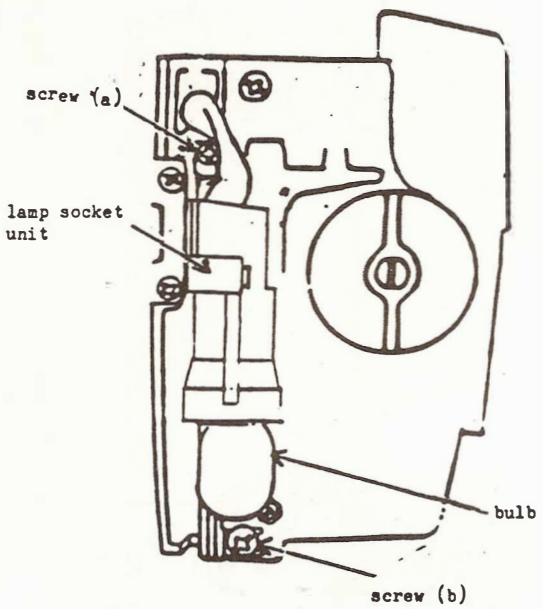
TO CHANGE LAMP SOCKET UNIT 5/5
(CANADIAN SPECIFICATIONS)

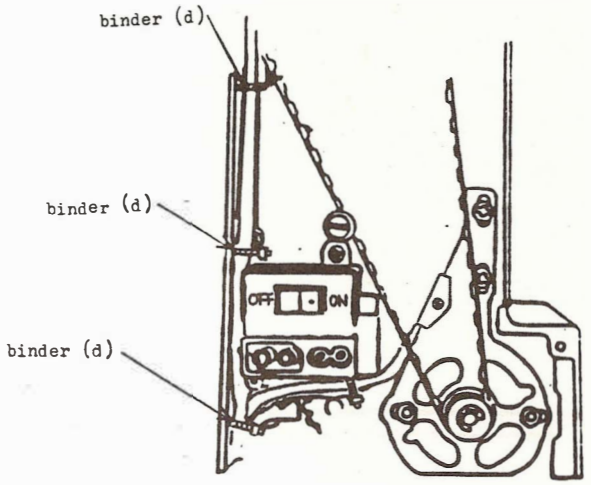
21. Connect four lamp cords with the terminals of the speed control device unit with the flat pliers.
22. Attach the lid of the speed control device unit with three screws.
23. Attach the base, the belt cover, top cover unit.

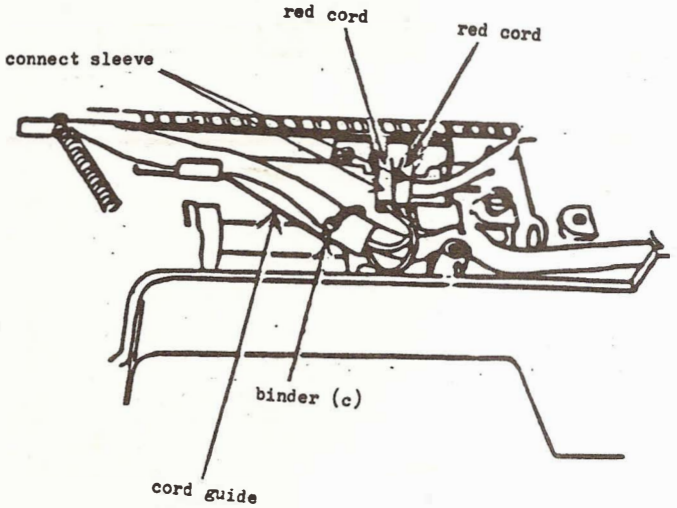


TO CHANGE LAMP SOCKET UNIT 1/5
(100-125V, EXCEPT CANADA)

To remove:
1. Turn off the switch. Disconnect the power plug and the controller plug from the motor attachment plug unit.
2. Remove the top cover unit, the belt cover and the bulb.
3. Remove the screw (a) and loosen the screw (b).
4. Cut off the binder (c).
5. Disconnect the two red cords from the printed board.
6. Cut off the three binders (d).





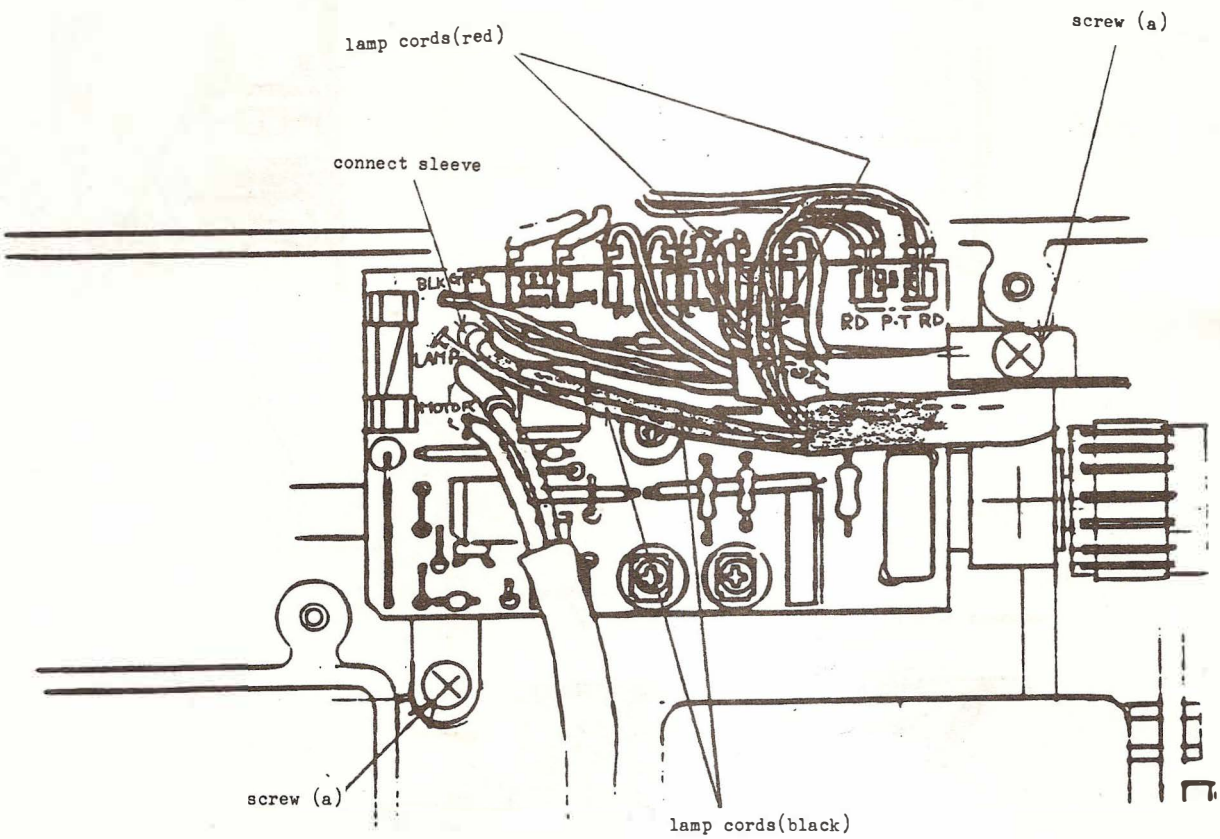


TO CHANGE LAMP SOCKET UNIT 2/5
(100-125V, EXCEPT CANADA)

7. Detach the base.
8. Remove two screws (a) to detach the speed control plate from the machine.
9. Disconnect the lamp cords (two each of black and red cords) from the speed control device unit.

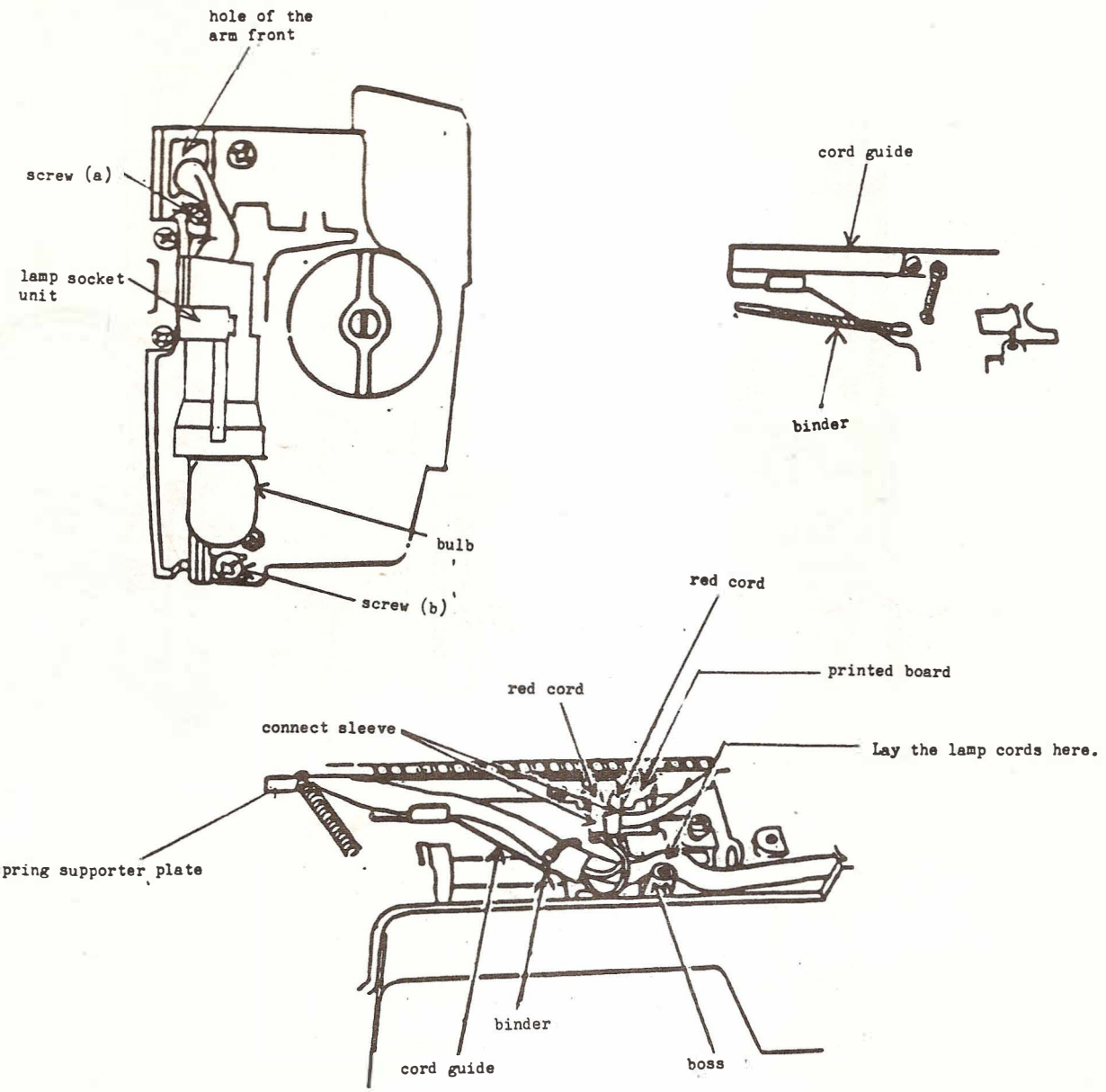
Note: i) Pull out the terminals of the cords with the flat pliers not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

10. Remove the lamp socket unit.



TO CHANGE LAMP SOCKET UNIT 3/5
(100-125V, EXCEPT CANADA)

11. Attach the bulb to the lamp socket unit.
12. Attach the lamp socket unit to the machine with the screws (a) and (b).
13. Pass the lamp cords through the hole of the arm front.
14. Pass the binders through the two holes of the cord guide on the upper part of the arm.
15. Place the lamp cords on the machine and fix them with the binder as shown in the diagram. Cut off the excess part of the binder.
16. Connect two red cords with the terminals of the printed board.
17. Cover the terminals with the connect sleeve.
18. Bundle the terminals of the lamp cords with a rubber band and pass them through the concave part of the spring supporting plate.

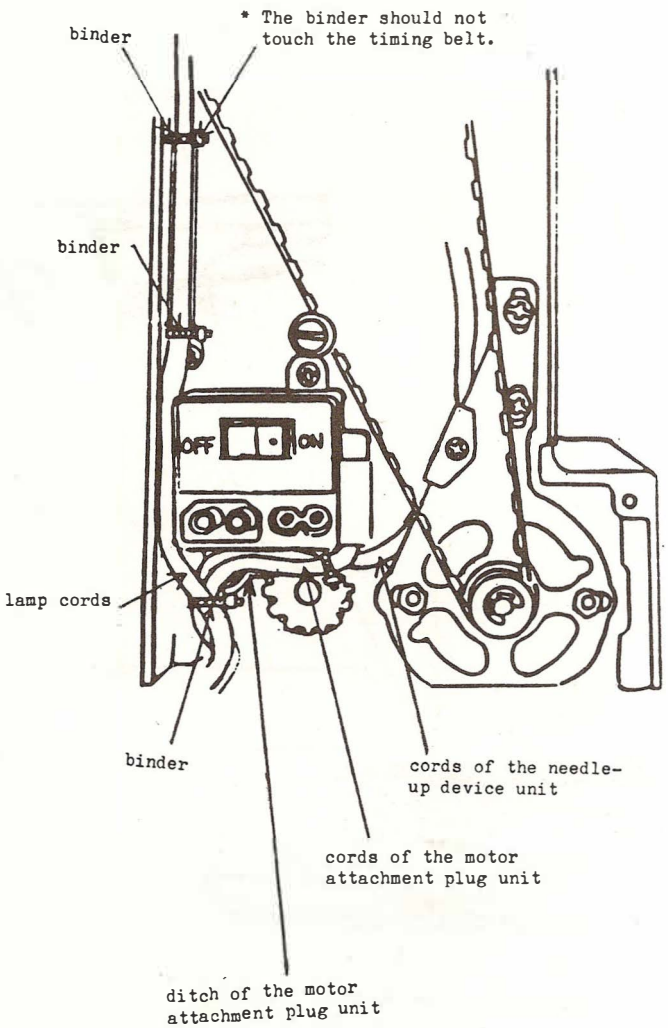


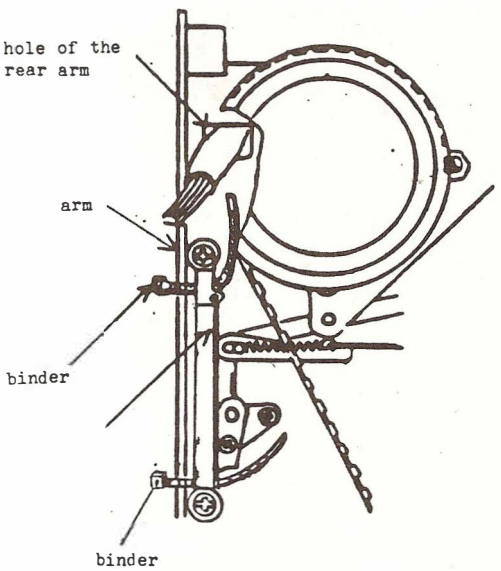
TO CHANGE LAMP SOCKET UNIT 4/5
(100-125V, EXCEPT CANADA)

19. Pass the lamp cords through the hole of the rear arm.
20. Pass the lamp cords between the cord buide and the arm. Fix them with the binders as shown in the diagram. Cut off the excess part of the binder.

Note: The binder should not touch the timing belt.

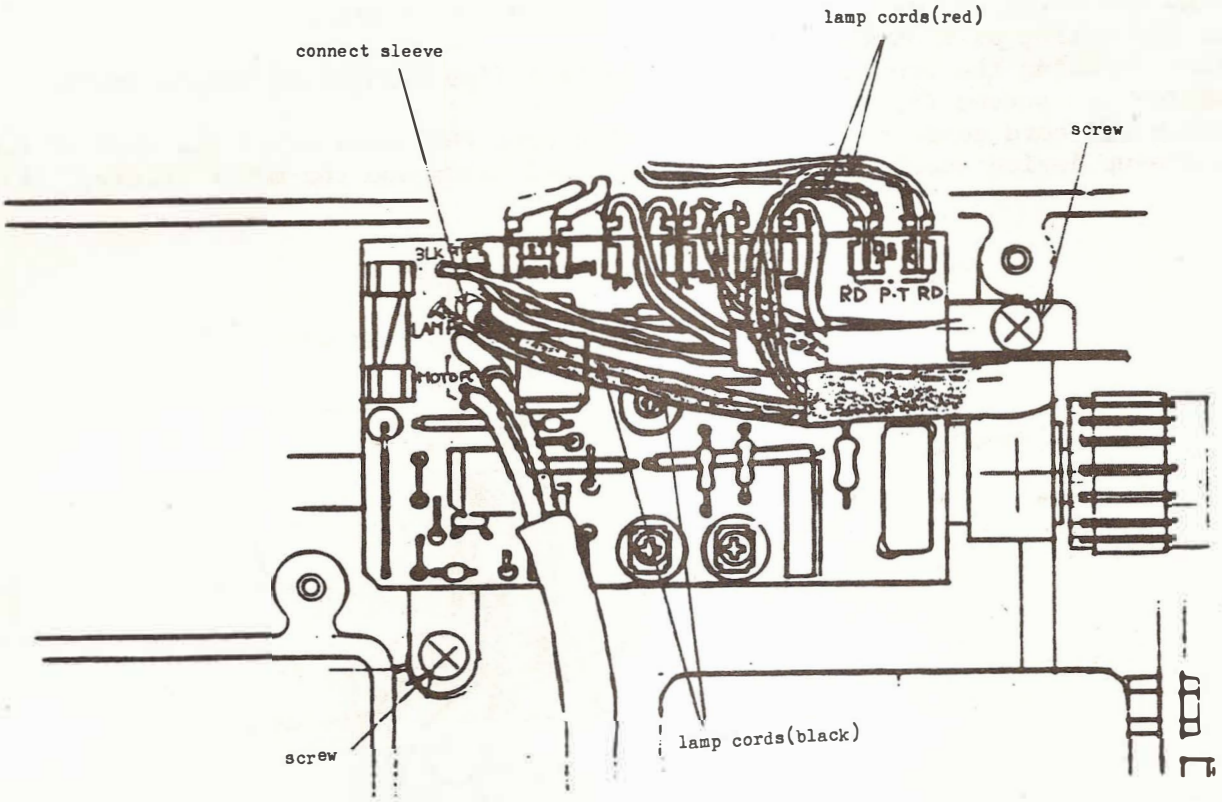
21. Bundle up the lamp cords, the cords of the motor attachment plug unit and the cords of the needle-up device unit with the binder. Cut off the excess part of the binder.





TO CHANGE LAMP SOCKET UNIT 5/5
(100-125V, EXCEPT CANADA)

21. Connect four lamp cords with the terminals of the speed control device unit with the flat pliers.
22. Attach the speed control plate with two screws.
23. Attach the base, the belt cover, top cover unit.



TO CHANGE MOTOR 1/2
(200-240V)

To remove:

1. Turn off the switch. Disconnect the power plug and the foot controller plug from the motor attachment plug unit. Detach the belt cover and the base.
2. Detach the lid from the speed control device unit. Disconnect the motor cords (two black cords) from the speed control plate. (Fig. 2, See next page)

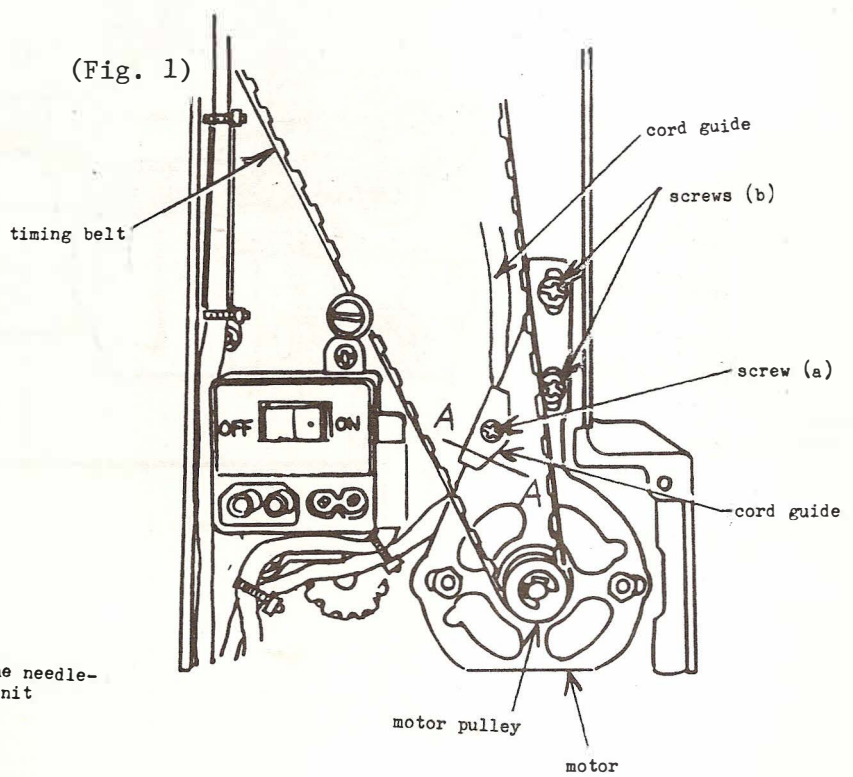
Note: i) Pull out the terminals of cords with the flat pliers not to bend the terminals.
ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

3. Remove the screw (a) and detach the cord guide.
4. Remove the two screws (b) and take off the timing belt. Remove the motor. (Fig. 1)

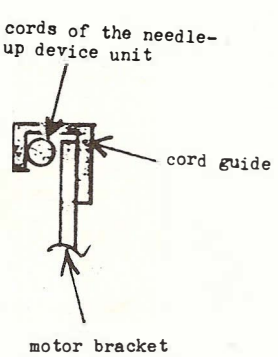
To refit:

5. Mount the motor on the machine with two screws (b) loosely.
6. Set the timing belt on the machine.
7. After checking the tension of the timing belt (See TENSION OF TIMING BELT), tighten two screws (b).
8. Attach the cord guide to the motor bracket with the screw (a). The cord of the needle-up device should pass between the cord guide and the motor bracket. (Fig. 3)

(Fig. 1)



(Fig. 3)



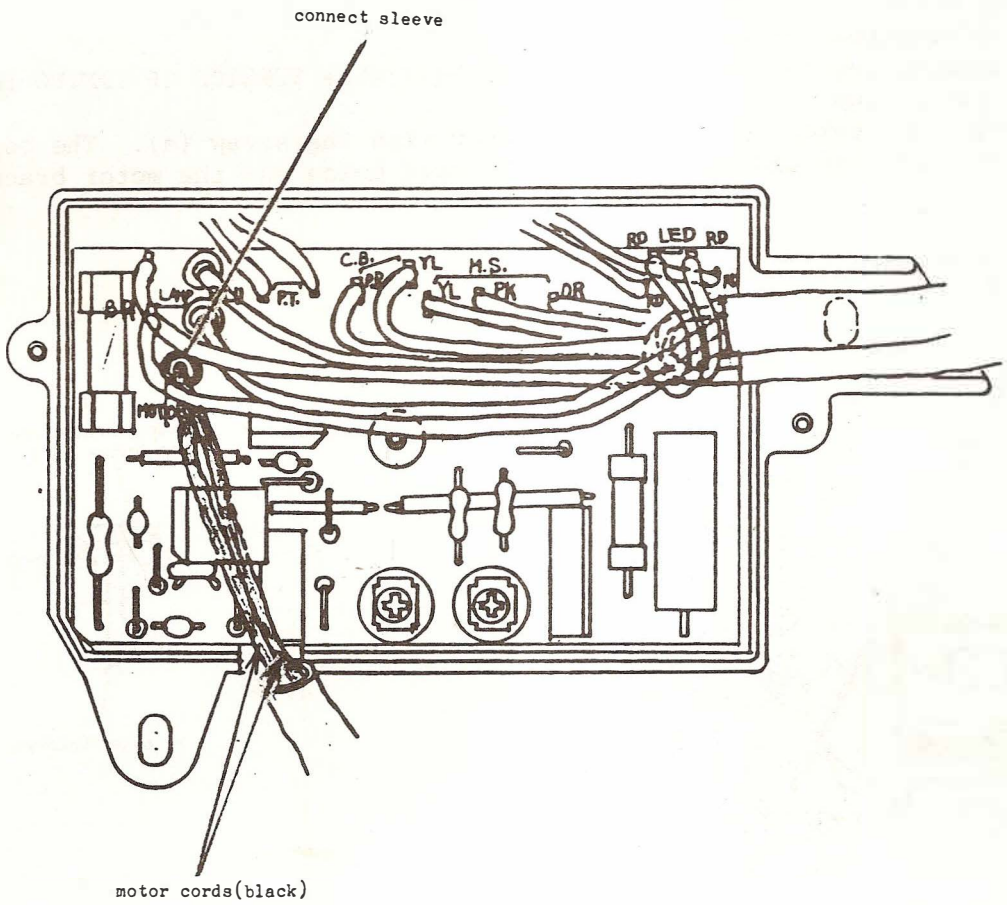
TO CHANGE MOTOR 2/2
(200-240V)

9. Connect the two motor cords with the terminals of the speed control plate. (Fig. 2)

Note: i) When you connect the terminals of cords with the terminals of the speed control plate, use the flat pliers not to bend the terminals.
ii) Be sure to cover the terminals with the cord sleeve for the relative terminals.

10. Attach the base and the belt cover.

(Fig. 2)



TO CHANGE MOTOR 1/2
(CANADIAN SPECIFICATIONS)

To remove:

1. Turn off the switch. Disconnect the power plug and the foot controller plug from the motor attachment plug unit. Detach the belt cover and the base.
2. Detach the lid from the speed control device unit. Disconnect the motor cords (two black cords) from the speed control plate. (Fig. 2, See next page)

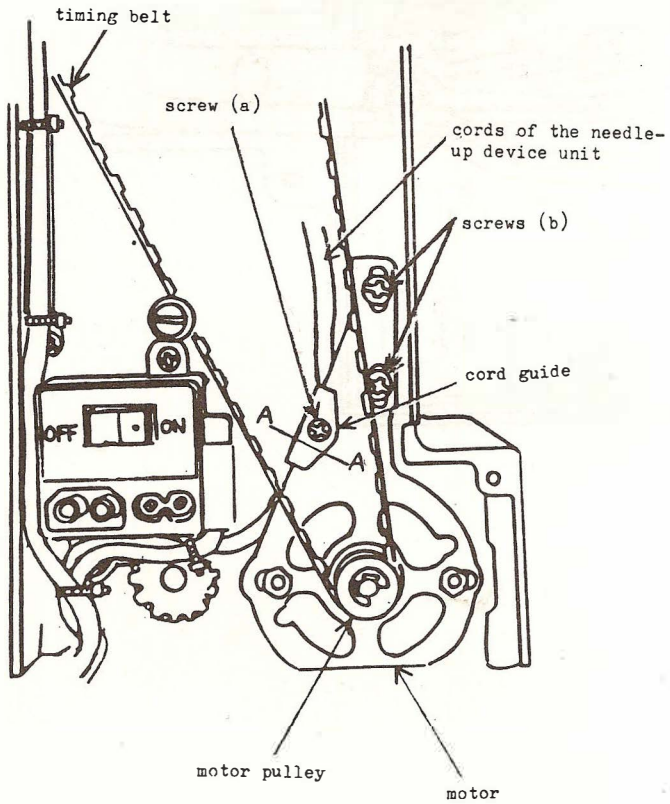
Note: i) Pull out the terminals of cords with the flat pliers not to bend the terminals.

ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

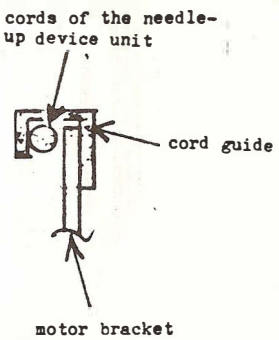
3. Remove the screw (a) and detach the cord guide.
4. Remove the two screws (b) and take off the timing belt. Remove the motor. (Fig. 1)

To refit:

5. Mount the motor on the machine with two screws (b) loosely.
6. Set the timing belt on the machine.
7. After checking the tension of the timing belt (See TENSION OF TIMING BELT), tighten two screws (b).
8. Attach the cord guide to the motor bracket with the screw (a). The cord of the needle-up device should pass between the cord guide and the motor bracket. (Fig. 3)



(Fig. 1)



(Fig. 3)

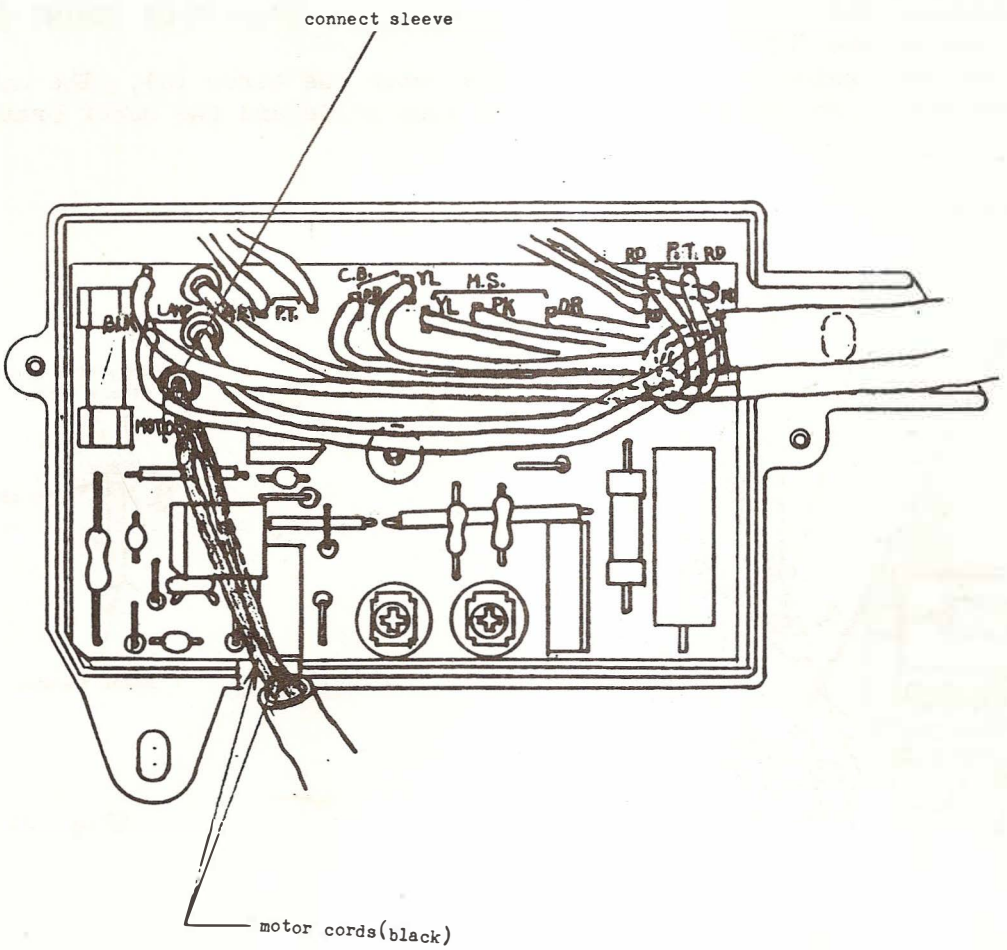
TO CHANGE MOTOR 2/2
(CANADIAN SPECIFICATIONS)

9. Connect the two motor cords with the terminals of the speed control plate. (Fig. 2)

Note: i) When you connect the terminals of cords with the terminals of the speed control plate, use the flat pliers not to bend the terminals.
ii) Be sure to cover the terminals with the cord sleeve for the relative terminals.

10. Attach the base and the belt cover.

(Fig. 2)



TO CHANGE MOTOR 1/2
(100-125V, EXCEPT CANADA)

To remove:

1. Turn off the switch. Disconnect the power plug and the foot controller plug from the motor attachment plug unit. Detach the belt cover and the base.
2. Disconnect the motor cords (two black cords) from the speed control plate. (Fig. 2, See next page)

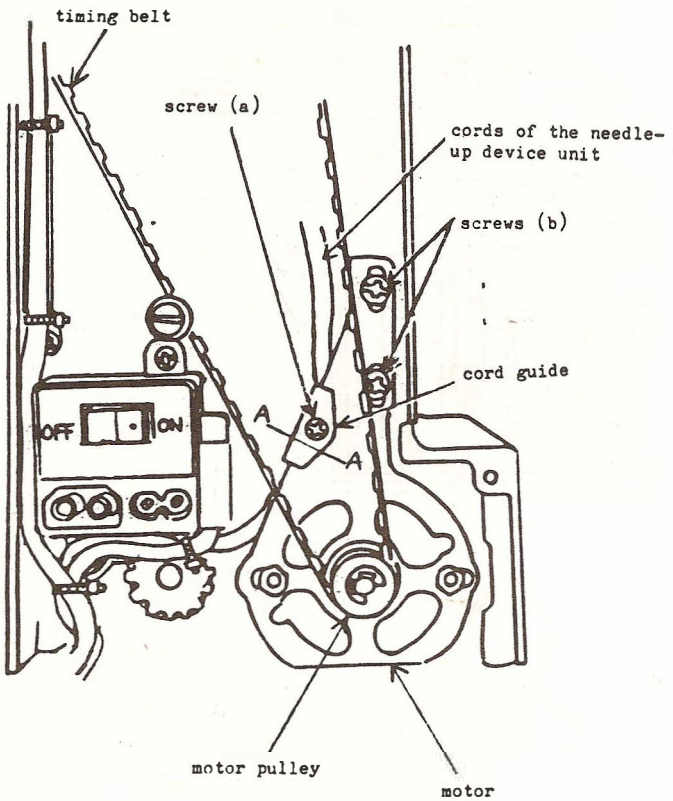
Note: i) Pull out the terminals of cords with the flat pliers not to bend the terminals.

ii) When you pull out the terminals, hold the speed control plate lest it should come off the speed control device unit. Never touch the elements on the speed control plate.

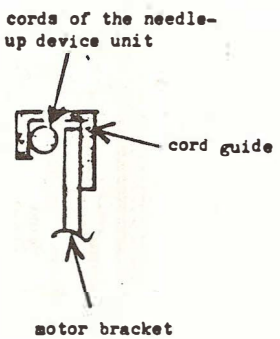
3. Remove the screw (a) and detach the cord guide.
4. Remove the two screws (b) and take off the timing belt. Remove the motor. (Fig. 1)

To refit:

5. Mount the motor on the machine with two screws (b) loosely.
6. Set the timing belt on the machine.
7. After checking the tension of the timing belt (See TENSION OF TIMING BELT), tighten two screws (b).
8. Attach the cord guide to the motor bracket with the screw (a). The cord of the needle-up device should pass between the cord guide and the motor bracket. (Fig. 3)



(Fig. 1)



(Fig. 3)

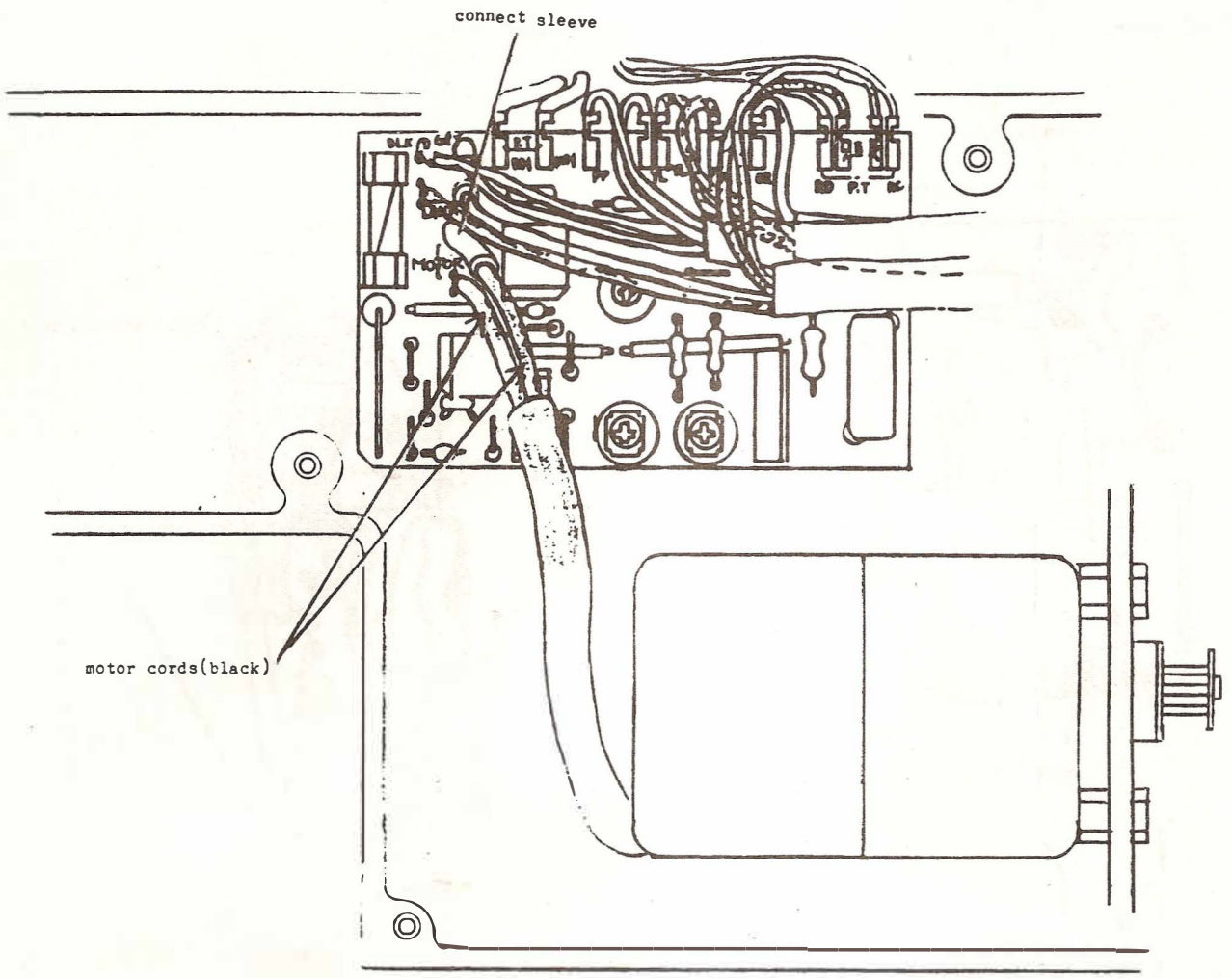
TO CHANGE MOTOR 2/2
(100-125V, EXCEPT CANADA)

9. Connect the two motor cords with the terminals of the speed control plate. (Fig. 2)

Note: i) When you connect the terminals of cords with the terminals of the speed control plate, use the flat pliers not to bend the terminals.
ii) Be sure to cover the terminals with the cord sleeve for the relative terminals.

10. Attach the base and the belt cover.

(Fig. 2)



TO CHANGE CHECK SPRING 1/2

1. Detach the bulb.
2. Remove the screw (a).
3. Remove two screws (b) to detach the threader supporting plate.
4. Remove two screws (c) to detach the thread tension unit.

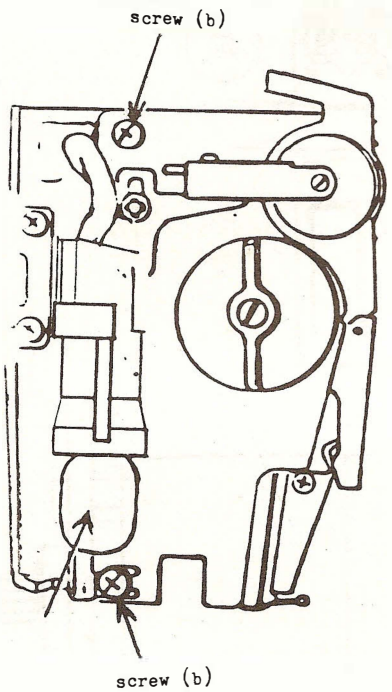
Note: When you remove the lower screw (c), be careful not to miss the collar.

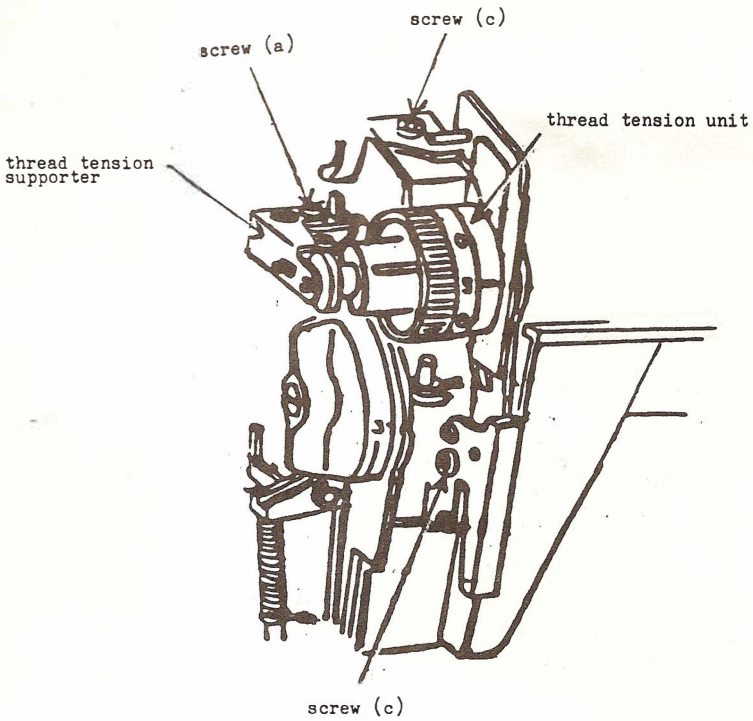
5. Remove the screw (d) and detach the thread guide (3) from the thread tension unit.
6. Change the check spring.

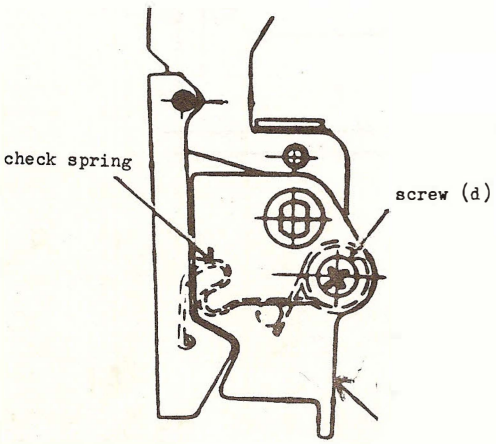
Note: Set the check spring at the same position as before.

7. Attach the thread guide (3) to the thread tension unit.
8. Attach the thread tension unit to the machine.

Note: Attach the collar with the lower screw (c).







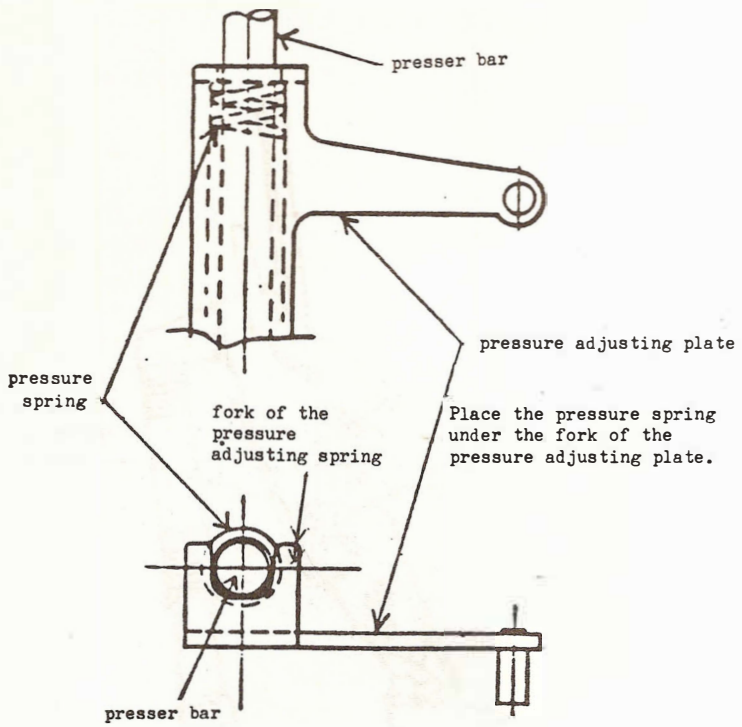
TO CHANGE CHECK SPRING 2/2

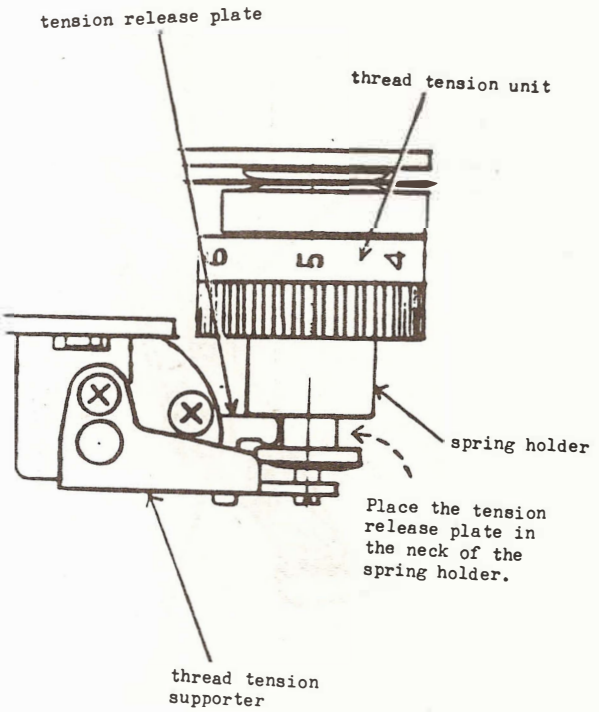
9. Refit the threader supporting plate.

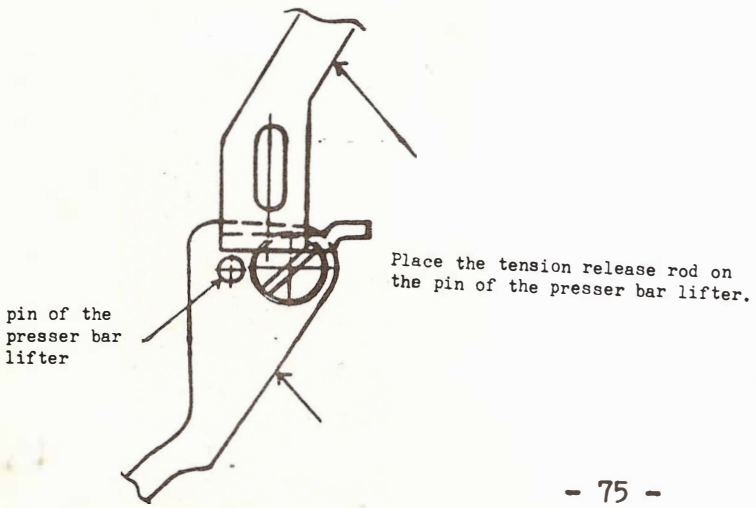
Note: A) Position the needle bar supporter spring with its longer wire placed behind the threader supporter plate.
B) Set the pressure adjusting plate to the presser bar.
Place the pressure spring under the fork of the pressure adjusting plate.
C) Place the tension release rod on the pin of the presser bar lifter.
D) Place the tension release plate in the neck of the spring holder.
E) Attach the threader supporter plate together with the lamp attachment plate.

10. Attach the thread tension supporter.
11. Attach the bulb.

Note: After changing the check spring, check if the THREAD TENSION RELEASE MECHANISM functions well.







TO CHANGE NEEDLE THREADER

L. Detach the face plate. Remove the bulb.
2. Lift up the needle threader.
3. Remove the E-ring.
4. Detach the threader supporter. (Be careful the threader supporter spring might jump out.)
5. Attach the new threader supporter and fix it with the E-ring.
6. Place the threader supporter spring between the hole of the threader supporter and the convex of the thread supporter arm.
7. Check if the threader supporter moves smoothly.
8. Adjust the function of the needle threader according to the instruction of NEEDLE THREADER.
9. Attach the bulb and the face plate.