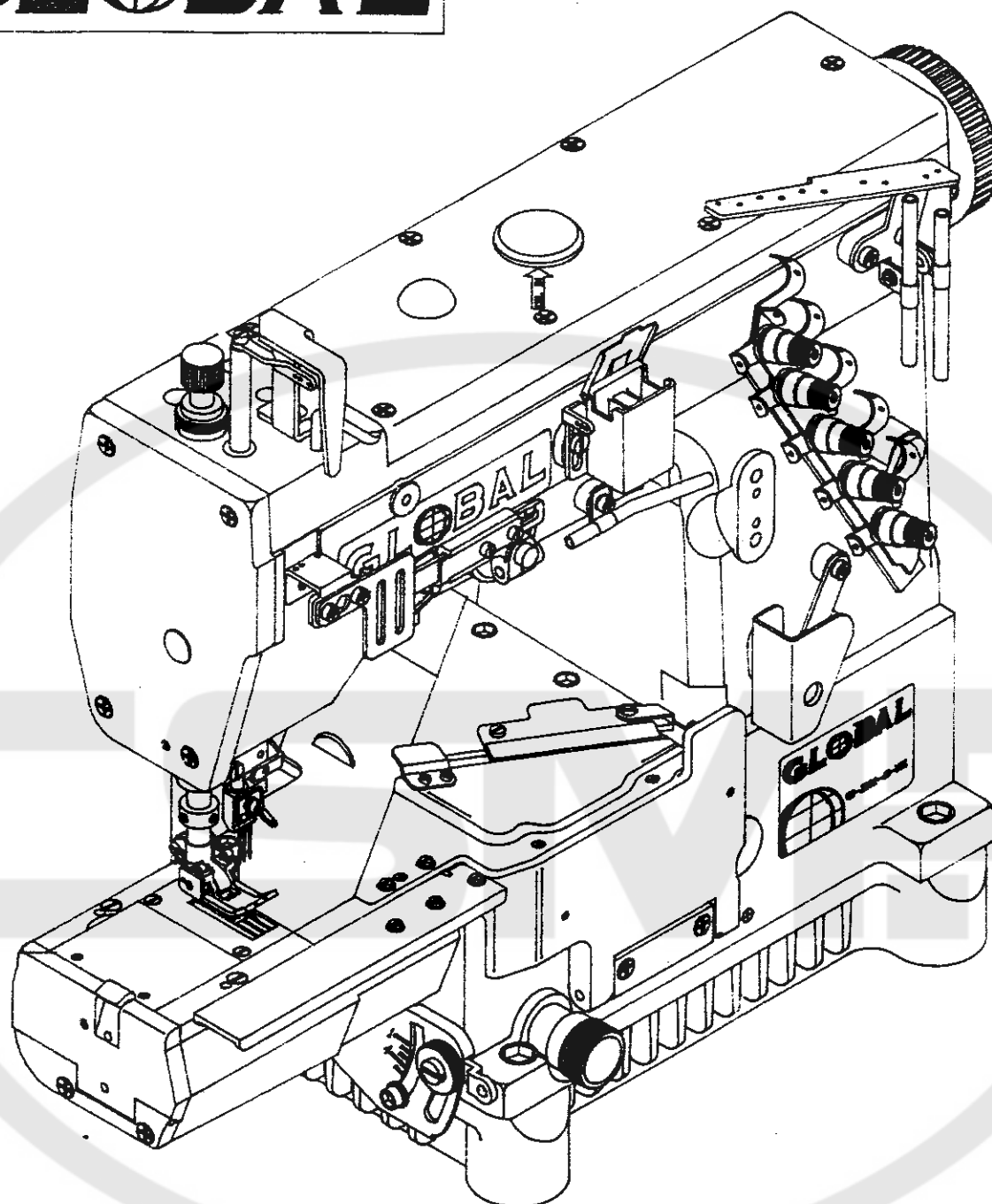




Ver.1.1 1998.9
NO.



MODELS CB2802 CB2803

INSTRUCTION MANUEL

PREFACE:

CB SERIES IS HIGH SPEED CYLINDER BED INTELOCK MACHINE AND CAN ACHIVE EXCELLENT EFFICIENCY, STABLE QUALITY AND DURABLE MACHINE LIFE.

SAFETY NOTICE:

1. BELT COVER MUST BE INSTALLED.
2. MAKE SURE THE MOTOR WIRING IS INSTALLED PROPERLY.
3. MAKE SURE TO CUT OFF THE ELECTRICITY AND WAIT TILL MOTOR STOPS COMPLETELY BEFORE CONDUCT PRE-OPERATION INSPECTION, CLEANING, THREADING AND CHANGING THE NEEDLES..
4. FOR NEW MACHINES, PLEASE DO NOT RUT EXCEED 4,500 SPR DURING THE FIRST MONTH USAGE.
5. DO NOT OVER ADDING THE LUBRICATION OIL.
6. PLEASE DRIP ONE DROP OF OIL ON THE NEEDLE BAR BEFOE OPERATION.
7. PLEASE MAKE SURE THE NEEDLES ARE INSTALLED PROPERLY.
8. PLEASE MAKE SURE THE THREADING IS CORRECY.
9. PLEASE MAKE SURE TO CLEAN THE MACHINE DAILY.

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1. BASIC SPECIFICATION:

1-1 SPECIFICATION:

MODELCB-2802. CB-2803

STITCH TYPE.....ISO 406, 407, 602, 605

APPLICATIONGENERAL SEAMING OF KNITTED MATERIAL

SEWING SPEEDMAX. 5500 STITCH/MIN.

4500 STITCH/MIN FOR THE MACHINE WITH PULLER

NEEDLE TO BE USED: SCHMETZ OR ORGAN UY128GAS #65~90.

NEEDLE DISTANCE CB-2802: 4.0, 4.8, 5.6 m.m.

CB-2803: 5.6, 6.4 m.m.

CIRCUMFERENCE OF CYLINDER BED - 280 m.m.

STITCH LENGTH1.4 ~ 3.6 m.m.

STITCH NUMBER: 7-8 STITCH/INCH

8-21 STITCH/30 m.m.

FEED REGULATION.....BY PUSH-BUTTON

DIFFERENTIAL RATIOMAX. NORMAL DIFFERENTIAL RATIO: 1:2.9

MAX. REVERSE DIFFERENTIAL RATIO: 1:0.3

DIFFERENTIAL FEED REGULATION.-BY ADJUSTING SCREW OR BY CONTROL

LEVER (ADJUSTING DURING OPERATION

FROM OUTSIDE IS POSSIBLE BY MOVING

CONTROL LEVER UP AND DOWN).

PRESSER FOOT LIFT MAX. 6.5 mm

(5.0mm FOR MACHINE WITH TOP COVER THREAD)

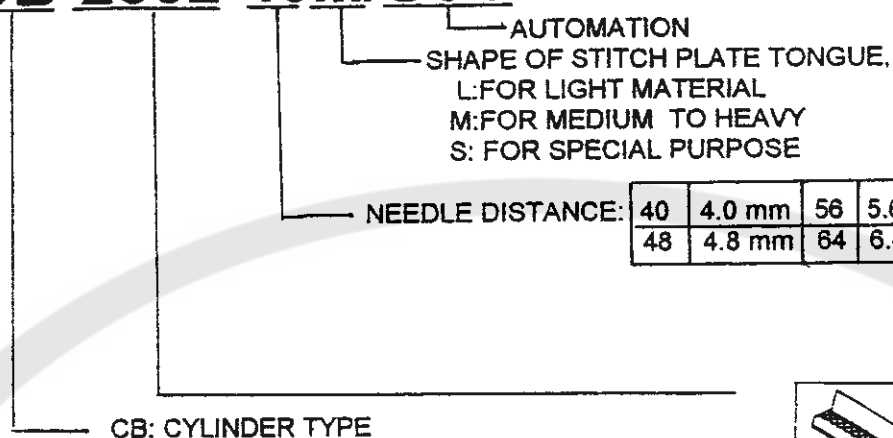
LUBRICATION OILMOBIL #10 OR EQUIVALENT

LUBRICATION .. AUTOMATIC LUBRICATION BY OIL PUMP

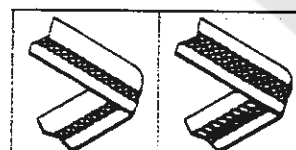
(COMBINED USE WITH SPLASHING LUBRICATION)

1-2 SUB-CLASS:

CB-2802-40M/UTC



40	4.0 mm	56	5.6 mm
48	4.8 mm	64	6.4 mm



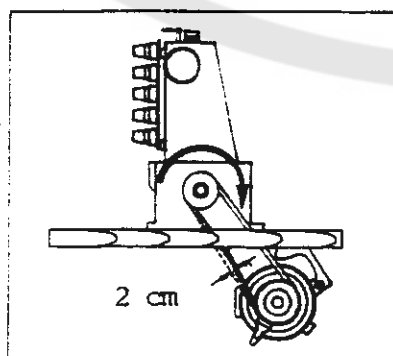
STITCH TYPE	602	605
CODE	2802	2803

2. INSTALLATION:

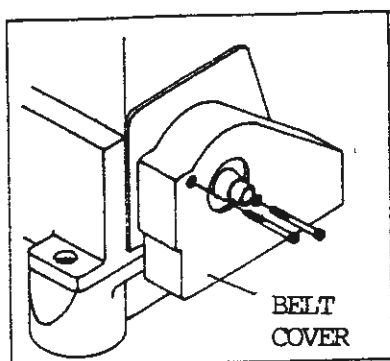
2-1. MOTOR, BELT AND BELT COVER

THE MAXIMUM SEWING SPEED OF THIS MACHINE IS 5500 s.p.m.. AND ORDINARY SPEED IS 5000 s.p.m. DURING THE FIRST 200 HOURS (OR FIRST MONTH) OF USING THE MACHINE, PLEASE DO NOT EXCEED 80% OF THE ORDINARY SPEED.

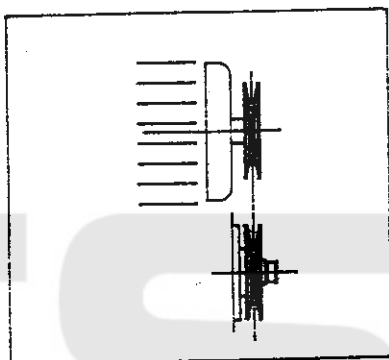
A. BELT: M TYPE V BELT AND BE SURE THAT THE MOTOR TURNING DIRECTION IS CLOCKWISE AND THE MOTOR BELT TENSION CAN BE PRESSED INWARD ABOUT 2 cm.



B. BELT COVER: INSTALL BELT AS SHOWN IN THE ILLUSTRATION.



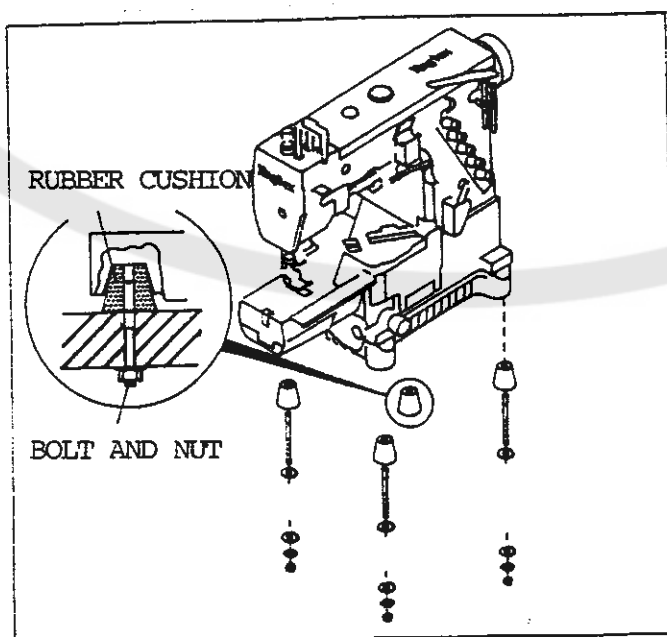
C. MOTOR: USE CLUTCH MOTOR OF 3-PHASE, 2-POLE, 400 W(1/2HP). FIX THE POSITION OF MOTOR SO THAT THE CENTERS OF MOTOR PULLEY AND MACHINE PULLEY ALIGN WHEN MOTOR PULLEY SHIFT TO THE LEFT BY PUSHING PEDAL.



	(MM)				
	85	90	100	110	120
50HZ			4600	5000	5500
60HZ	4600	4900	5500	6000	

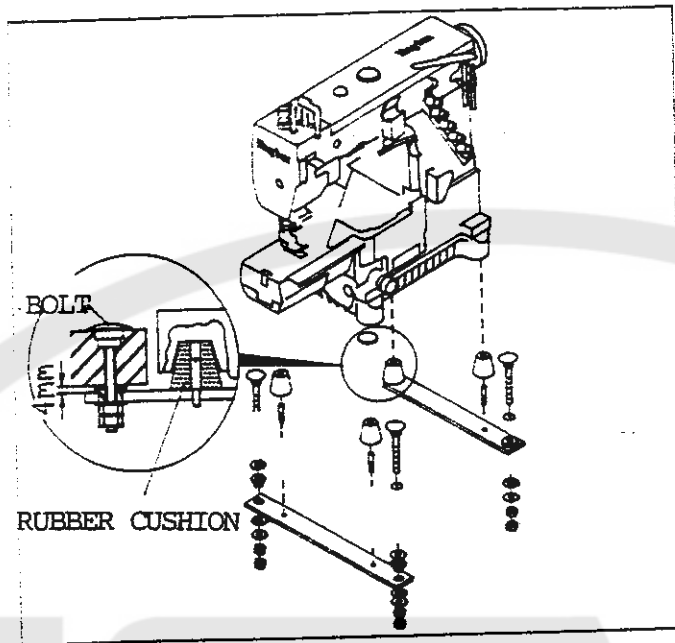
2-2 TABLE TOP INSTALLATION

INSTALL THE MACHINE CORRECTLY REFERRING TO THE ILLUSTRATION. SET BOLTS AND NUTS TO MACHINE TABLE AND PUT RUBBER CUSHIONS ON BOLTS AND REST THE MACHINE ON THEM SECURELY.



2-3 SEMI-SUBMERGED INSTALLATION

INSTALL THE MACHINE CORRECTLY REFERRING TO THE ILLUSTRATION.
SET SCREWS ON SUPPORTING BOARD AND SET SUPPORTING BOARD
ON MACHINE TABLE. THEN PUT RUBBER CUSHIONS ON SCREWS ON
WHICH REST THE MACHINE SECURELY.



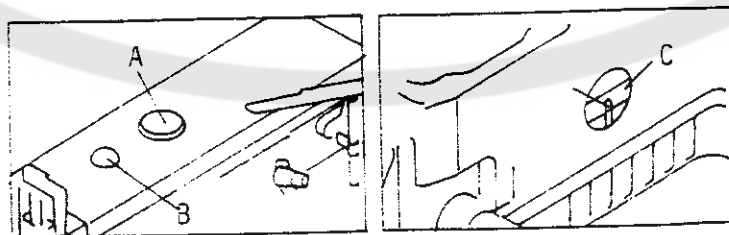
3. LUBRICATION OIL AND COOLING OIL

3-1. LUBRICATION OIL AND COOLING OIL

PLEASE USE MOBIL #10 OR EQUIVALENT OIL FOR LUBRICATION OIL AND USE
SILICONE OIL FOR COOLING OIL.

3-2 FEEDING OIL

THE LUBRICATION OIL HAS BEEN DRAINED OFF COMPLETELY BEFORE
DELIVERY, ADDING OIL TO THE UPPER LINE OF OIL GAUGE (C) BY REMOVING
SEAL PLUG (A). ALSO, PLEASE MAKE SURE THE OIL FLOWS OUT OF NOZZLE
(B) AT THE START OF OPERATION.

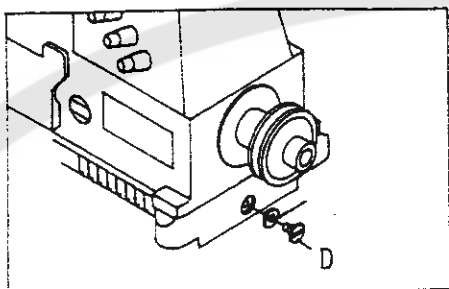


*BEFORE STARTING A BRAND NEW MACHINE OR A MACHINE WHICH HAS NOT
BEEN USED FOR MORE THAN A COUPLE OF WEEKS, LUBRICATE THE NEEDLE
BAR FIRST.

3-3 CHANGING OIL

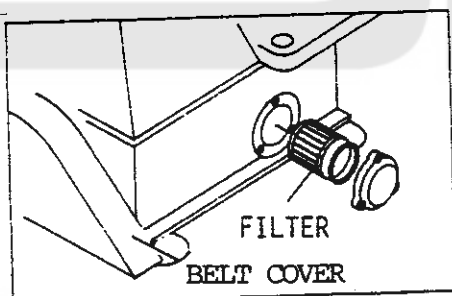
FOR THE LONGER LIFE OF MACHINE, CHANGE LUBRICATION OIL COMPLETELY AFTER 250 HOURS (OR 4 WEEKS) OF INITIAL OPERATION.

- A. AFTER TAKING OFF BELT COVER, REMOVE V-BELT FROM MOTOR PULLEY, AND REMOVE MACHINE HEAD FROM MACHINE TABLE.
- B. LOOSEN SCREW (D) AND DRAIN OFF ALL THE OIL FROM THE MACHINE.
- C. AFTAER DRAINING, TIGHTEN SCREW (D) BACK.
- D. WHEN REPLENISHING OIL PLEASE REFER TO PARAGRAPH 3-2 "FEEDING OIL" ABOVE.



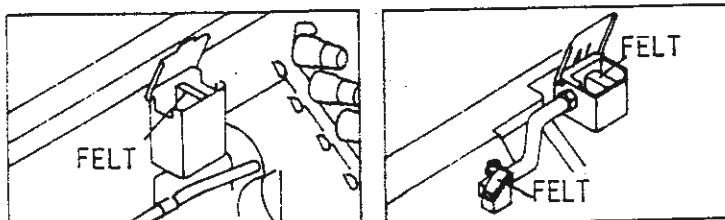
3-4 OIL FILTER

ALTHOUGH THE MACHINE IS USING OIL PUMP LUBRICATION AND SPLASHING LUBRICATION SYSTEMS, PLEASE CHECK AND CLEAN OIL FILTER EVERY MONTH. AND WHEN NO OIL OR VERY LITTLE OIL COMES OUT OF NOZZLE EVEN INDICATOR SHOWS NORMAL, PLEASE CHECK OIL FILTER AND REPLACE IT IF NECESSARY.



3-5 ADDING COOLING OIL

AVOID NEEDLE BREAKING, STITCH JUMPING OR THREAD MELTING PROBLEMS ETC. PLEASE FILL COOLING OIL TANK AND FELT WITH SILICONE OIL UNDER SOME SPECIAL CIRCUMSTANCES, CAN NOT USE SILICONE OIL OR NO NEED TO USE SILICONE OIL THEN, YOU CAN TAKE FELT OFF FROM RESERVOIR.



4. NEEDLE

4-1 NEEDLE SELECTION

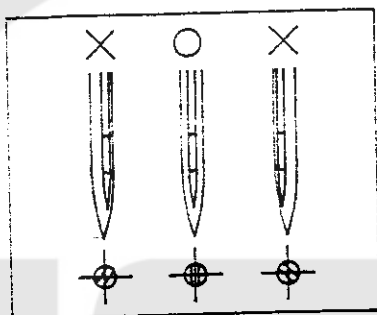
NEEDLE UY128GAS OF SCHMETZ OR ORGAN IS TO BE USED.

THERE ARE MANY SIZES OF NEEDLE, AND THE MOST SUITED NEEDLE TO THE THICKNESS AND THE KIND OF MATERIAL SHOULD BE SELECTED.

JAPANESE SIZE	9	10	11	12	13	14
METRIC SIZE	65	70	75	80	85	90

4-2 HOW TO REPLACE THE NEEDLES

REPLACING NEEDLE SHOULD BE MADE CORRECTLY WITH THE SCARF FACING RIGHTLY BACKWARD AS SHOWN IN THE ILLUSTRATION.

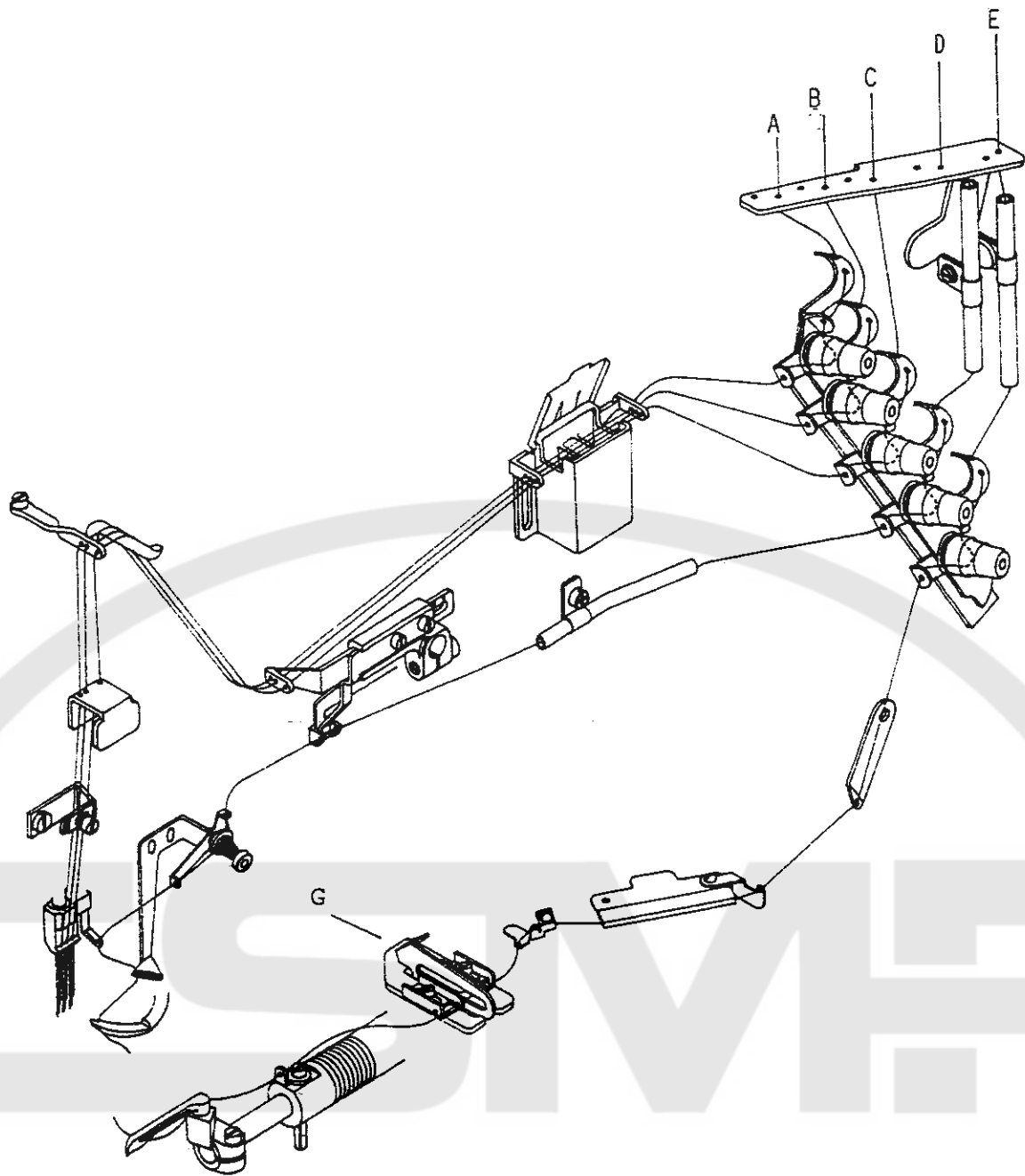


4-3 THREADING

THREADING SHOULD BE MADE CORRECTLY REFERRING TO THE ILLUSTRATION. IMPROPER THREADING MIGHT CAUSE SKIP STITCH, THREAD BREAKAGE AND UNEVEN TENSION.

A,B,C ... NEEDLE THREAD D... TOP COVER THREAD E...LOOPER THREAD

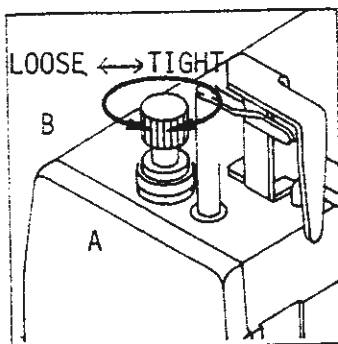
THE THREADING FOR THREE NEEDLE MACHINE IS SHOWN IN THE ILLUSTRATION BELOW. FOR TWO NEEDLE MACHINE, THREADING IS THE SAME EXCEPT TWO NEEDLE THREAD. EASY THREADING IS POSSIBLE WITH THE LIFTING UP OF SUPPORTING PLATE BY PRESSING LEVER (F). AFTER THREADING, RETURN IT BACK TO THE ORIGINAL POSITION BY PRESSING PART (G) WITHOUT FAIL.



5. PROPER OPERATION ADJUSTMENT

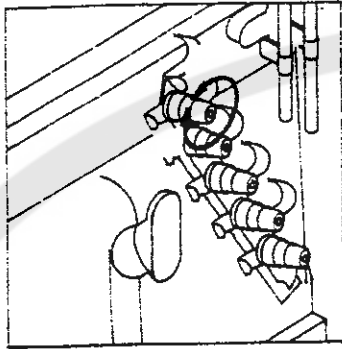
5-1 PRESSURE OF PRESSER FOOT

TO INCREASE THE PRESSURE OF PRESSER FOOT, TURN ADJUSTING SCREW(B) CLOCKWISE AFTER LOOSENING LOCK NUT (A) AND TO DECREASE TURN IT COUNTERCLOCKWISE. PRESSURE OF PRESSER FOOT SHOULD BE AS WEAK AS POSSIBLE SO LONG AS PRESSER FOOT CAN OPERATE PROPERLY.



5-2 THREAD TENSION

DIFFERENT THREADS HAVE DIFFERENT TENSIONS AND EVEN SAME THREADS WILL HAVE DIFFERENT TENSIONS WHEN GO THROUGH DIFFERENT THREADING HOLES. EACH THREAD TENSION CAN BE ADJUSTED BY INDIVIDUAL TENSION NUT TO INCREASE THREAD TENSION, TURN TENSION NUT CLOCKWISE, TO DECREASE THREAD TENSION TURN TENSION NUT COUNTERCLOCKWISE. PLEASE USE LEAST THREAD TENSION AS LONG AS IT WILL NOT AFFECT THE SEWING EFFECTS.



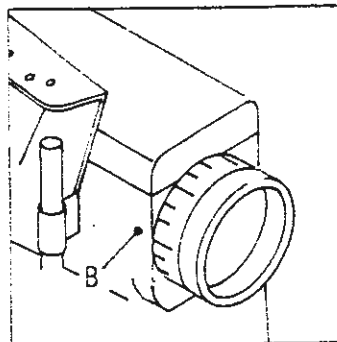
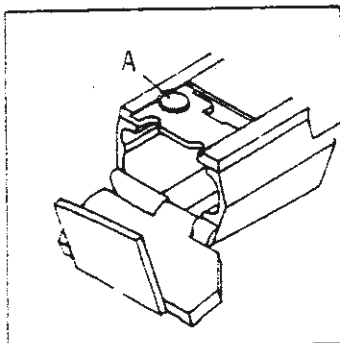
5-3 ADJUSTING STITCH LENGTH

ADJUSTMENT OF STITCH LENGTH CAN BE MADE STEPLESSLY FROM 1.4MM/PER STITCH TO 3.6 MM/PER STITCH.

THE TABLE BELOW SHOWS THE STITCH LENGTH

STITCH LENGTH	STITCH NUMBER	STITCH NUMBER
3.6 m.m.	7/PER INCH	8/PER 30 m.m.
2.4 m.m.	10.5/PER INCH	12.5/PER 30 m.m.
1.4 m.m.	18/PER INCH	21/PER 30 m.m.

PRESS PUSH BUTTON (A) WITH LEFT HAND LIGHTLY TILL THE TIP OF WHICH CONTACT TO A PART INSIDE. KEEP PRESSING, TURN HANDWHEEL WITH RIGHT HAND TILL PUSH BUTTON GETS IN. AT THIS POINT. PRESS IN PUSH BUTTON STRONGLY AND TURN HANDWHEEL. A GRADUATION ON THE CIRCUMFERENCE OF HANDWHEEL INDICATES A STITCH LENGTH (mm). WHICH SHOULD BE ALIGNED WITH THE MARK (B). THEN RELEASE HAND.



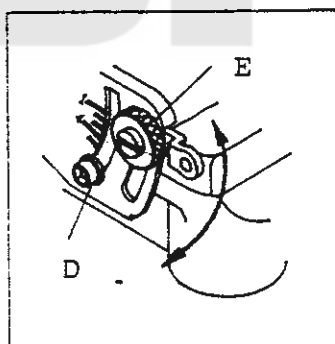
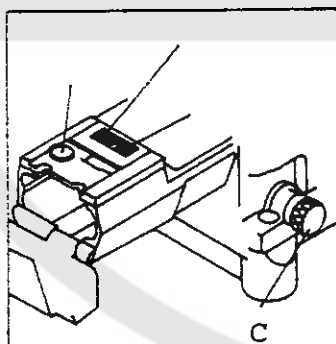
NOTE : IN CASE OF MACHINE WITH UT DEVICE (LOWER THREAD TRIMMER)
WHICH IS EQUIPPED WITH A MOTOR WITH AUTOMATIC NEEDLE
POSITIONING SYSTEM, MOTOR SWITCH MUST BE TURNED OFF WITHOUT
FAIL WHEN CHANGING STITCH LENGTH.

5-4 ADJUSTING DIFFERENTIAL FEED

NORMAL DIFFERENTIAL FEED OR REVERSE DIFFERENTIAL FEED CAN BE SET
FREELY BY TURNING KNOB (C). AS DIFFERENTIAL FEED AND MAIN FEED IS DRIVEN
INDIVIDUALLY. WHEN MAIN FEED AMOUNT (STITCH LENGTH) IS CHANGED, THE DIFFERENTIAL
RATIO CHANGES ACCORDINGLY. IN THIS CASE READJUSTMENT IS NECESSARY. THE
GRADUATION SHOWS THE AMOUNT OF DIFFERENTIAL FEED. FOR INSTANCE, IN CASE THE
DESIRED FEED AMOUNT (STITCH LENGTH) IS "2" AND IF THE GRADUATION IS SET AT "2" BY
TURNING KNOB (C), THE DIFFERENTIAL RATIO BECOMES 1:1.
WHEN SETTING THE GRADUATION OVER "2", IT BECOMES NORMAL DIFFERENTIAL AND SETTING
IT UNDER "2", IT BECOMES REVERSE DIFFERENTIAL.
FOR THE MAIN FEED AMOUNT THE UPPER LIMIT IS "4".

*WHEN USING DIFFERENTIAL FEED CONTROL LEVER FIX DIFFERENTIAL FEED
CONTROL LEVER AT THE DESIRED POSITION WITH NUT (E) WITHIN THE RANGE
FROM THE POSITION OF GRADUATION ON LEVER WHEN TURNING KNOB (C) TO
STOPPER (D).

AT THE TIME OF USING MAX. DIFFERENTIAL FEED, TURN KNOB (C)
AND SET LEVER AT GRADUATION "1". FOR ADJUSTING FEED AMOUNT DURING
OPERATION. ATTACH A CHAIN TO THE LEVER.



* THE RANGE OF DIFFERENTIAL RATIO VARIES ACCORDING TO THE STITCH
LENGTH. REFER TO THE TABLE BELOW:

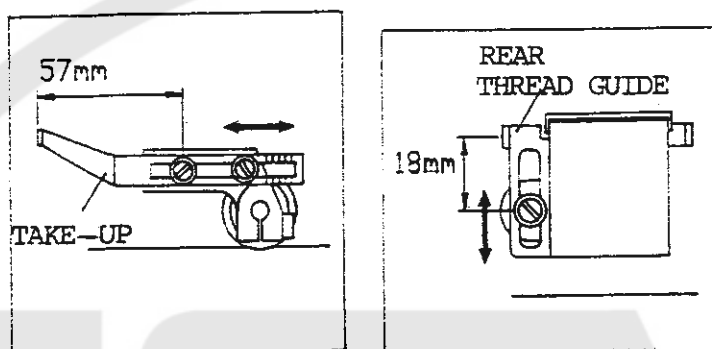
STITCH LENGTH	MAX. NORMAL DIFF.	MAX. REVERSE DIFF.
3.6 m.m.	1 : 1.1	1 : 0.3
2.5 m.m.	1 : 1.6	1 : 0.4
2.0 m.m.	1 : 2	1 : 0.5
1.4 m.m.	1 : 2.9	1 : 0.7

* CAN USE DIFFERENTIAL FEED CONTROL LEVER TO ACHIEVE SHIRING
EFFECTS WHEN NEEDED DURING SEWING OPERATION.

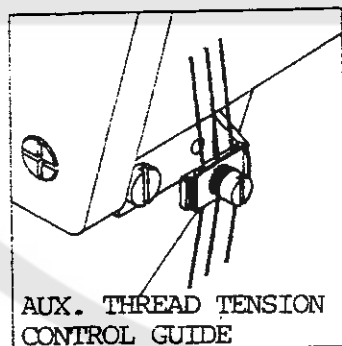
5-5 ADJUSTING THE NEEDLE THREAD TAKE-UP

DIFFERENT THREADS HAVE DIFFERENT STRETCH TENSION AND CAUSE SKIP STITCHING THREAD BREAKING AND UNSTABLE STITCHING EASILY. THIS MACHINE EQUIPPED WITH THREAD TAKE-UP, FRONT NEEDLE THREAD GUIDE, REAR THREAD GUIDE AND AUXILIARY THREAD TENSION CONTROL GUIDE IN ORDER TO GIVE BETTER CONTROL OF THE LOOPER THREAD TAKE-UP AND STABILIZE THE STRETCHING OF LOOPER THREAD.

A, B THE THREAD TAKE-UP AND REAR THREAD GUIDE WERE SET AT STANDARD POSITION BEFORE SHIPMENT. AS SHOWN ON FIGURE A/B. AND ALSO CAN BE ADJUSTED AS ARROW DIRECTIONS IF NECESSARY.

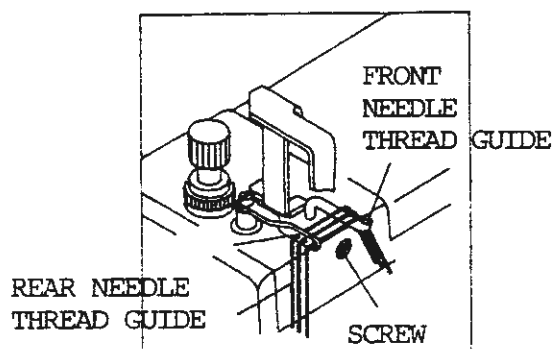


C. SOME TIMES, IT IS NOT SO EASY TO MAKE LOOP FOR SOME KINDS OF THREAD AND ALSO MAKE IT DIFFICULT FOR LOOPER TO CATCH THE NEEDLE THREAD, CAUSING SKIP STITCH. IN SUCH CASE, CAN USE AUXILIARY THREAD TENSION CONTROL GUIDE TO STABILIZE THE THREADS.



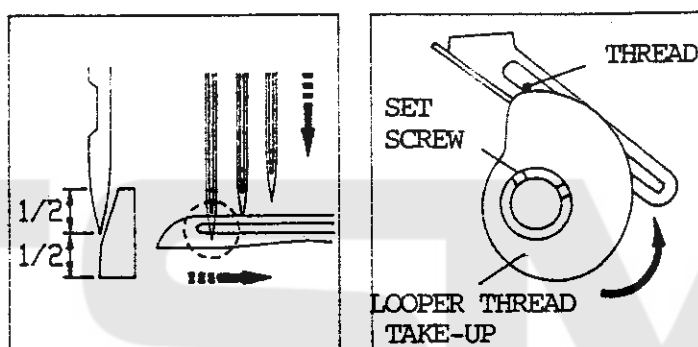
D. IN CASE THE FORMATION OF NEEDLE THREAD LOOP IS UNSTABLE WHEN USING STRETCHABLE THREAD, YOU CAN SOLVE THIS BY ADJUSTING THE HEIGHT OF FRONT NEEDLE THREAD GUIDE, ESPECIALLY WHEN LOOPER MOVE FROM RIGHT TO THE LEFT.

IF THE LEFT NEEDLE SKIP THE STITCH WHEN USING SYNTHETIC THREAD OR RIGHT NEEDLE INTERFERE WITH THE FORMATION OF THREAD LOOP WHEN USING BLENDED THREAD, YOU CAN USE FRONT NEEDLE THREAD GUIDE, WITH NEEDLE BAR AT THE LOWEST POSITION, THE CENTER OF THREAD HOLE OF REAR THREAD GUIDE EYELET SHOULD BE EVEN WITH THE SURFACE OF FRONT NEEDLE THREAD GUIDE AND FRONT NEEDLE THREAD GUIDE AND REAR THREAD GUIDE SHOULD BE PARALLEL WITH EACH OTHER.

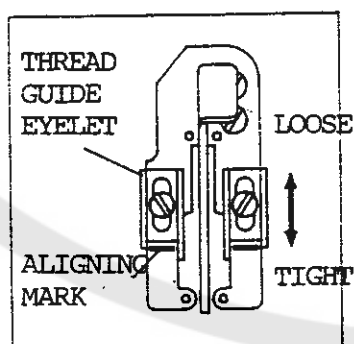


5-6 ADJUSTING THE LOOPER THREAD TAKE-UP

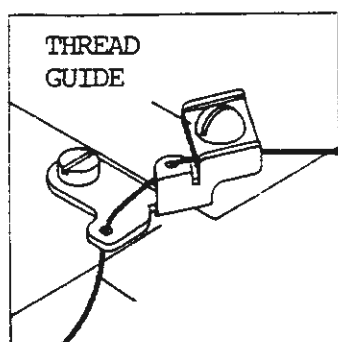
E/F. WHEN LEFT NEEDLE COMES DOWN TO THE HALF POINT, THE THREAD MUST GET OFF FROM THE HIGHEST POSITION OF LOOPER THREAD TAKE-UP. THE ADJUSTMENT IS MADE BY LOOSENING SCREW, TURN THE LOOPER THREAD TAKE-UP TO THE PROPER POSITION AND TIGHTEN THE SCREW.



G. TO DECREASE THE AMOUNT OF LOOPER THREAD IN THE SEAM MOVE THREAD GUIDE EYELET TO ALIGNING MARK TO INCREASE, MOVE IT BACKWARD.



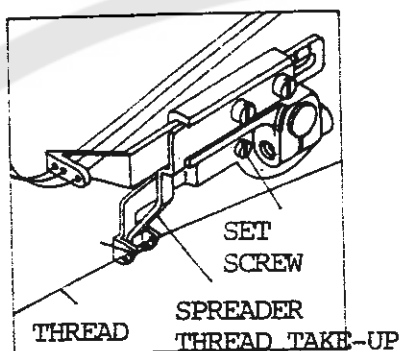
H. FOR STRETCHABLE THREADS, MOVE RIGHT AND LEFT THREAD GUIDES TO ALIGNING MARK AND ALSO DO NOT PASS THE THREAD BETWEEN THREAD GUIDE.



5-7 ADJUSTING SPREADER THREAD TAKE-UP

1. THE THREAD AMOUNT OF TOP COVER THREAD IS ADJUSTED BY SPREADER THREAD TAKE-UP.

FOR STANDARD POSITION, MOVE THE SPREADER THREAD TAKE UP ALL THE WAY UP TO THE HIGHEST POINT AND SEWING THREAD SHOULD LIGHTLY TOUCH WITH SPREADER THREAD TAKE-UP. LOOSEN THE SET SCREW AND MOVE THE SPREADER THREAD GUIDE EYELET UPWARD IN ORDER TO TIGHTEN THE TOP COVER THREAD AND VICE VERSA FOR LOOSEN THE TOP COVER THREAD.



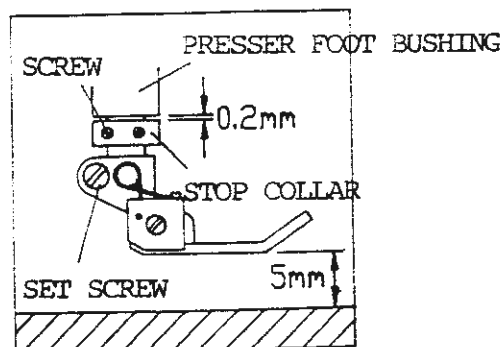
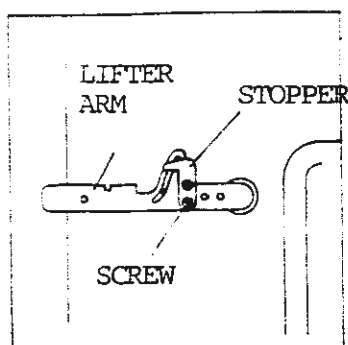
6. ADJUSTMENT OF MACHINE

THIS MACHINE WAS SENT TO THE STANDARD POSITION BEFORE DELIVERY AND IT'S UNNECESSARY TO RE-ADJUST UNLESS UNDER SOME SITUATION AS CHANGING THE NEEDLE, LOOPER, DIFFERENT KIND OF FABRIC OR DIFFERENT SEWING THREADS. PLEASE ADJUST ACCORDING TO FOLLOWING ITEMS :

6-1. ADJUSTING PRESSER FOOT AND SETTING THE HEIGHT OF PRESSER FOOT

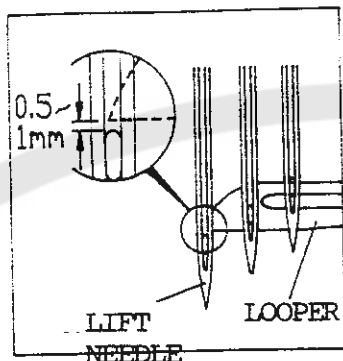
IT WILL BE EASIER TO CONDUCT SOME ADJUSTMENTS BY TAKING OFF THE PRESSER FOOT AS FOLLOWS :

A / B. LOOSED THE LIFTER ARM AND LOOSEN THE SCREW FROM PRESSER FOOT AND STOPPER, LIFTING UP THE PRESSER BAR, YOU CAN TAKE PRESSER FOOT VERY EASILY. AFTER CHANGING, REMEMBER PUT IT BACK IN REVERSE SEQUENCE.

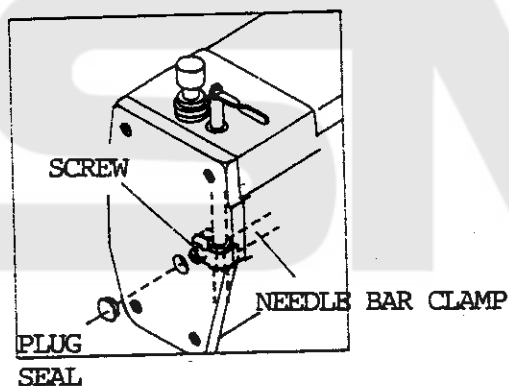


6-2 ADJUSTING THE HEIGHT OF NEEDLE BAR AND NEEDLE DROP POINT

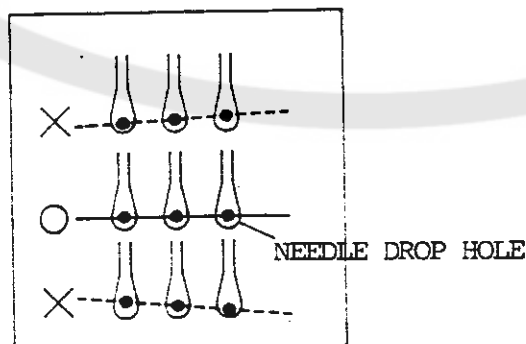
- C. WHEN THE TIP OF LOOPER COMES TO THE CENTER OF LEFT NEEDLE, THE LOOPER SHOULD POSITION ABOVE THE UPPER END OF NEEDLE EYE BY 0.5 - 1.0 mm AS THIS IS THE STANDARD POSITION FOR NEEDLE BAR.



- D. LOOSEN THE SCREW OF NEEDLE BAR CLAMP AND ADJUST THE NEEDLE BAR TO GET PROPER HEIGHT.

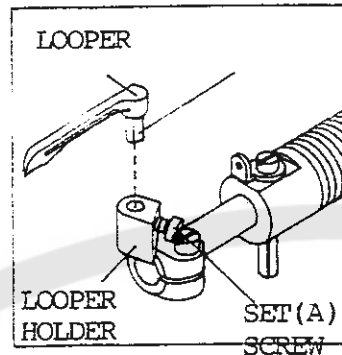


- E. AFTER ADJUSTMENTS, TIGHTEN THE SCREW OF NEEDLE BAR CLAMP AND MAKE SURE THE NEEDLES ARE IN THE CENTER OF NEEDLE DROP HOLE OF NEEDLE PLATE.



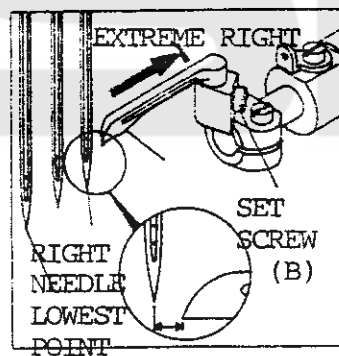
6-3. INSTALLING LOOPER

- F. INSERTING LOOPER ALL THE WAY INTO LOOPER HOLDER AND PLEASE MAKE SURE LOOPER IS FULLY FITTED INTO PROPER POSITION, THEN TIGHTEN SCREW (A).



6-4. SETTING LOOPER

- G. THE LOOPER IS LOCATED AT THE EXTREME RIGHT WHEN NEEDLE BAR DECEMD TO IT'S LOWEST POINT. AND THE DISTANCE BETWEEN THE TIP OF LOOPER AND THE CENTER OF RIGHT NEEDLE IS VARIOUS ACCORDING TO THE NEEDLE DISTANCE. PLEASE REFER TO THE TABLE BELOW FOR ADJUSTMENT AND THE ADJUSTMENT IS MADE BY LOOSENING THE SCREW (B) OF LOOPER HOLDER



NEEDLE DISTANCE (m.m.)	LOOPER MOVEMENT TO THE RIGHT (m.m.)
4.0	4.0
4.8	3.6
5.6	3.2
6.4	2.8

6-5. THE CLEARANCE BETWEEN LOOPER AND NEEDLE

H. CB-2803 (3-NEEDLE)

WHEN THE TIP OF LOOPER MEETS THE CENTER OF LEFT NEEDLE, THE CLEARANCE BETWEEN THEM SHOULD BE 0.2 - 0.3 mm.

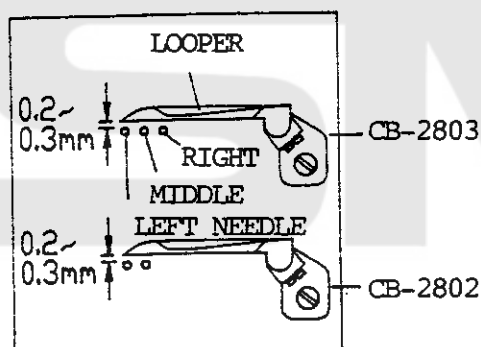
WHEN THE TIP OF LOOPER MEETS THE CENTER OF MIDDLE NEEDLE, THE CLEARANCE BETWEEN THEM SHOULD BE MINIMAL.

WHEN THE TIP OF LOOPER MEETS THE CENTER OF RIGHT NEEDLE, GIVING THE CLEARANCE OF 0 - 0.05 mm BETWEEN THE TIP OF LOOPER AND NEEDLE BY PUSHING REAR NEEDLE GUARD 0.2 - 0.3 mm AGAINST THE NEEDLE. THE ADJUSTMENT IS MADE BY LOOSENING SCREW OF LOOPER HOLDER.

CB-2802 (2-NEEDLE)

WHEN THE TIP OF LOOPER MEETS THE CENTER OF LEFT NEEDLE, THE CLEARANCE BETWEEN THEM SHOULD BE 0.2 - 0.3 mm.

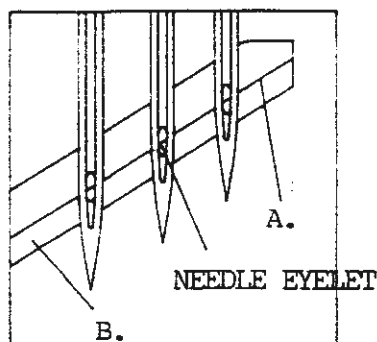
WHEN THE TIP OF LOOPER MEETS THE CENTER OF RIGHT NEEDLE, THE REAR NEEDLE GUARD SHOULD PUSH NEEDLE 0.2 - 0.3 mm IN ORDER TO GET THE CLEARANCE OF 0-0.05 mm BETWEEN THE TIP OF LOOPER AND NEEDLE.



6-6. THE RELATION BETWEEN NEEDLE AND REAR NEEDLE GUARD

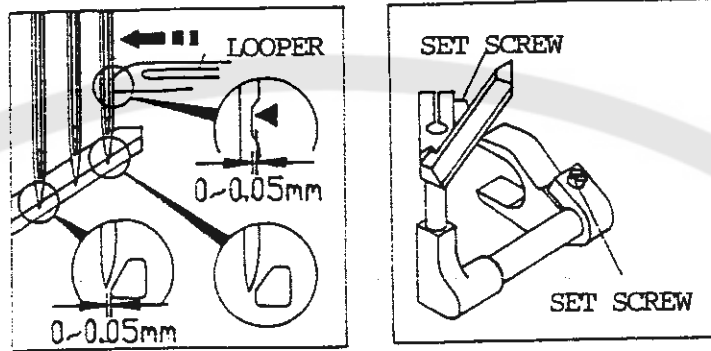
I. SETTING THE HEIGHT OF REAR NEEDLE GUARD

WHEN NEEDLES DESCEND TO THE LOWEST POSITION LINE (A) OF REAR NEEDLE GUARD (B) ALIGN WITH THE CENTER OF THE EYE OF EACH NEEDLE. THE ADJUSTMENT OF THE HEIGHT OF REAR NEEDLE GUARD IS MADE BY LOOSENING THE SCREW.



J/K. SETTING THE ANGLE AND TIMING OF REAR NEEDLE GUARD

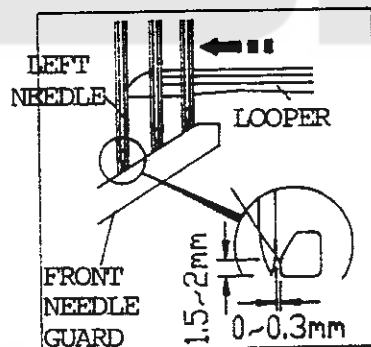
WHEN THE TIP OF LOOPER PASSES THE CENTER OF RIGHT NEEDLE, THE REAR NEEDLE GUARD WILL SLIGHTLY PUSH THE RIGHT NEEDLE FORWARD ABOUT 0.2 - 0.3 mm. AND AT THIS TIME, THE CLEARANCE BETWEEN LOOPER AND RIGHT NEEDLE IS 0 - 0.05 mm AND LOOPER WILL TOUCH MIDDLE NEEDLE SLIGHTLY. AND THE CLEARANCE BETWEEN LOOPER AND LEFT NEEDLE IS 0 - 0.05 mm. THESE ADJUSTMENTS ARE MADE BY LOOSENING THE SCREWS (C) AND (D).



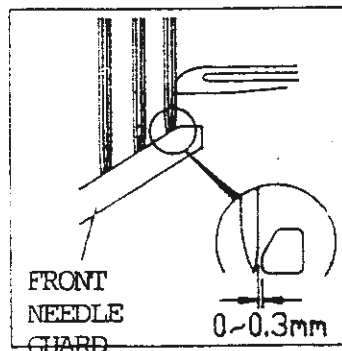
6-7. THE RELATION BETWEEN NEEDLE AND FRONT NEEDLE GUARD

SETTING THE ANGLE AND TIMING OF FRONT NEEDLE GUARD :

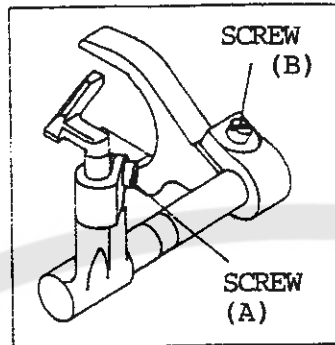
- A. WHEN THE TIP OF LOOPER COMES TO THE CENTER OF LEFT NEEDLE. MAKE IT 1.5 - 2 mm HIGHER THAN THE NEEDLE. AT THIS MOMENT, THIS MOVE WILL GIVE A CLEARANCE OF 0 - 0.3 mm BETWEEN THE NEEDLE AND THE FRONT NEEDLE GUARD.



- B. WHEN THE TIP OF LOOPER IS RETURNED TO THE RIGHT NEEDLE, PROVIDE A CLEARANCE OF 0 - 0.3 mm BETWEEN THE RIGHT NEEDLE AND FRONT NEEDLE GUARD.

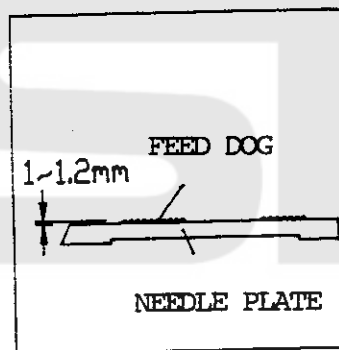


C. THESE ADJUSTMENTS CAN BE MADE BY LOOSENING SCREW (A) IN ORDER TO ADJUST THE ANGLE AND HIGH OF FRONT NEEDLE GUARD AND LOOSENING SCREW (B), THEN TURNING HAND WHEEL IN ORDER TO ADJUST THE PROPER POSITION FOR NEEDLE, LOOPER AND FRONT NEEDLE GUARD.



6-8. SETTING THE HEIGHT OF FEED DOG

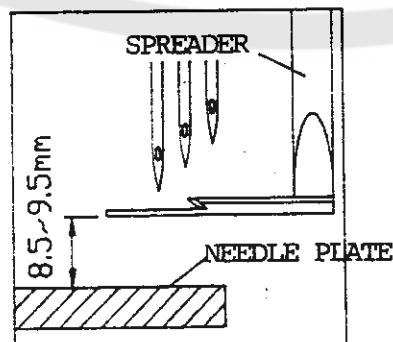
D. WHEN FEED DOGS RISE TO THE UPPER MOST, THEIR HEIGHT OF FEED DOGS IS 1 - 1.2 mm ABOVE THE SURFACE OF NEEDLE PLATE AND DIFFERENTIAL AND MAIN FEED DOG ARE PARALLEL TO THE SURFACE OF NEEDLE PLATE.



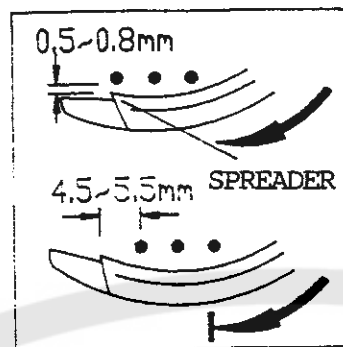
7. TOP COVERSTITCH

7-1. INSTALLING AND SETTING THE SPREADER

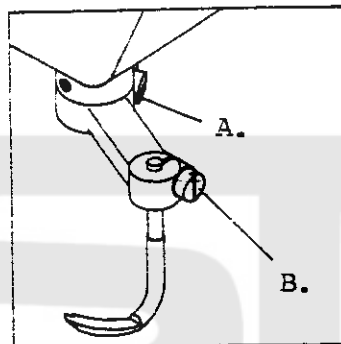
E. THE HEIGHT OF SPREADER IS 8.5 - 9.5 mm ABOVE THE SURFACE OF NEEDLE PLATE.



F. WHEN SPREADER MOVE TO THE LEFT AND PASSES BEHIND THE LEFT NEEDLE, THE CLEARANCE IS 0.5 - 0.8 mm. AND WHEN SPREADER REACHES THE EXTREME LEFT, THE DISTANCE BETWEEN TIP OF HOOKING PART AND THE CENTER OF LEFT NEEDLE IS 4.5 - 5.5 mm.

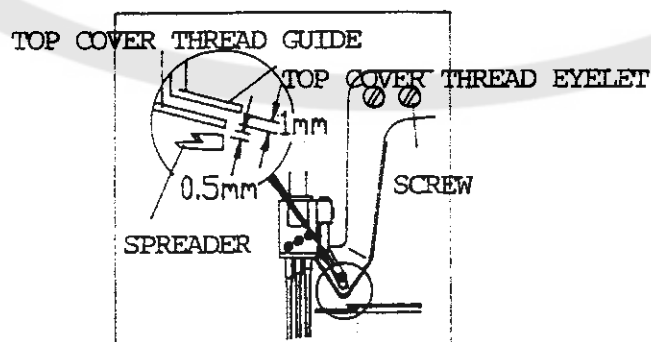


G. THE ADJUSTMENTS ARE MADE BY LOOSENING SCREW (A) FOR THE HEIGHT OF LOOPER AND LOOSENING SCREW (B) FOR MOVING POSITION OF LOOPER.



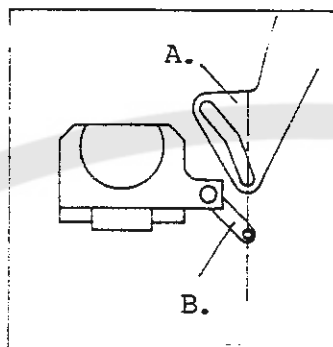
7-2. SETTING THE TOP COVER THREAD GUIDE

H. THERE MUST BE A CLEARANCE OF 0.5 mm BETWEEN THE BOTTOM OF THE TOP COVER THREAD GUIDE AND SPREADER AND WHEN SPREADER COMES TO THE EXTREME RIGHT, THE THREAD IS CAUGHT BY THREAD HOOKING PART PROPERLY. AND HANGING LOOSELY ON THE TOP COVER THREAD GUIDE.

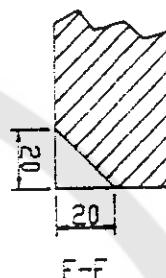
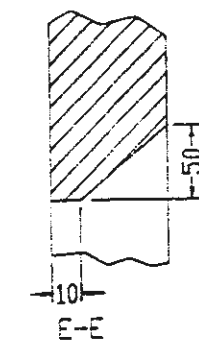
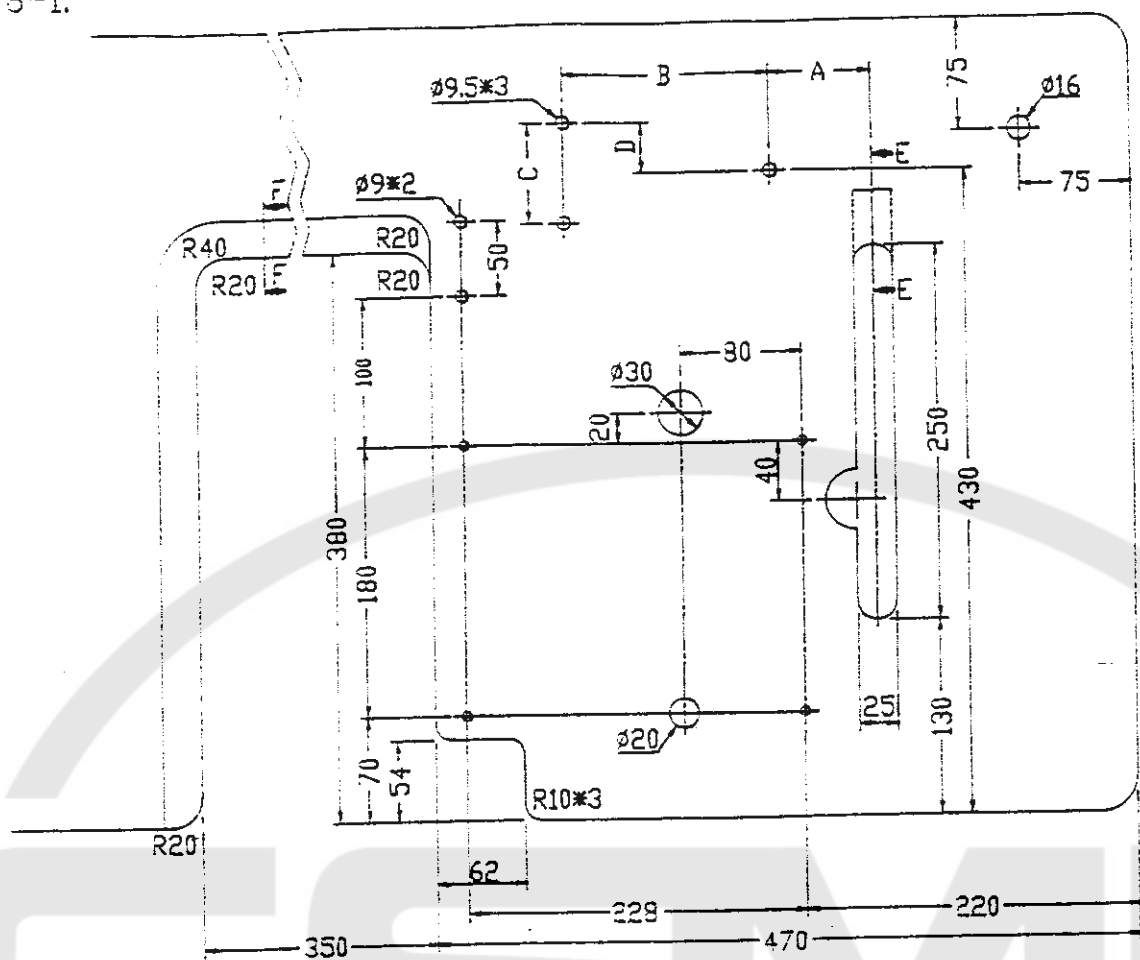


I. WHEN NEEDLE BAR AT THE LOWEST POSITION, THE CLEARANCE BETWEEN THE SURFACE OF TOP COVER THREAD GUIDE (A) AND THE UNDERSURFACE OF TOP COVER THREAD EYELET (B) IS 1.0 mm.

SET THE THREAD HOLE OF TOP COVER THREAD EYELET ON THE CENTER LINE OF THE SLOT OF TOP COVER THREAD GUIDE, THEN TIGHTEN SCREW.



3.
3-1.



3-2.

