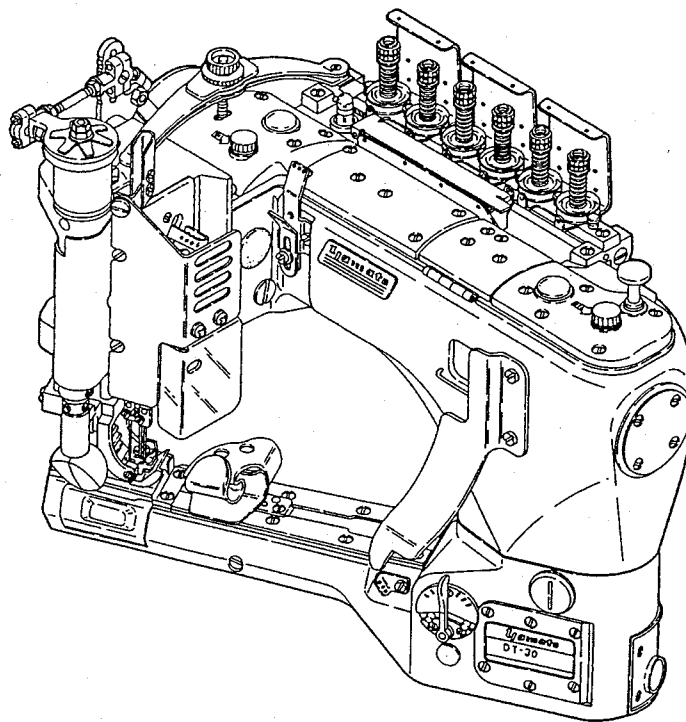


Yamato

INSTRUCTIONS
FOR
CLASS DT-30



INTRODUCTION

This instruction book has been prepared for all users of Class DT-30.

Your garment business will bring a brilliant success when you are versed in the operation and maintenance with the superior quality of our DT-30 model machine by this instruction book.

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1. Classification of Machine

DT-30 . . . 3-Needle, 6-Thread, 3-Line Double Chainstitch Sewing Machine for
Double-lapped Seaming on Heavy or Extra Heavy Fabrics

2. Numbering on Model Plate

Example: DT-30-01F/AC1

① ② ③ ④ ⑤

① Symbol of Series

② Number of Models

③ Number of Submodels according to uses

④ Needle distance (E: 6.35 mm, F: 7.14 mm)

⑤ Device

AC1 Pneumatic Thread Chain Cutter

FDL-1 Pneumatic Presser Foot Lifter

3. Specifications

Description	High Speed, 3 Needle, Feed-Off-The-Arm Double Chainstitch Sewing Machine
Dimensions	430 (L) × 280 (W) × 330 (H) mm
Circumference of Feed Arm	165 mm at the needle drop point
Space of Operation	210 mm in the cylindrical shape from the needle drop point
Weight	24 kg (Machine Head only)
Stitch Type	(401.401.401) (ISO)
Sewing Speed	Max. 4500 s.p.m.
Stitch Length	2.1 - 4.2 mm 6 - 12 stitches/inch (25.4 mm), 7 - 14 stitches/30 mm
Applications	3 lines double chainstitch for double-lapped seaming on heavy or extra heavy fabrics
Needle Distance	E: 6.35 mm (3.175 + 3.175), F: 7.14 mm (3.57 + 3.57)
Needle System	UY×128GAS made by ORGAN [standard: #22] UY128GAS made by SCHMETZ [standard: 140]
Needle Stroke	33 mm
Presser Foot Lifting	7.4 mm (maximum)
Feed Adjustment	by Lever
Differential Feeding	Dial System
Differential Ratio	Normal differential feeding: 1.0 : 1.3 (maximum) Reverse differential feeding: 1.0 : 0.7 (maximum)
Feed Roller Operation	Intermittent feeding by Clutch Mechanism
Lubrication	Automatic feeding by Gear Pump
Lubricant	YAMATO SF OIL #68
Capacity of Reservoir	Frame: approx. 100 cc Cylinder: approx. 100 cc

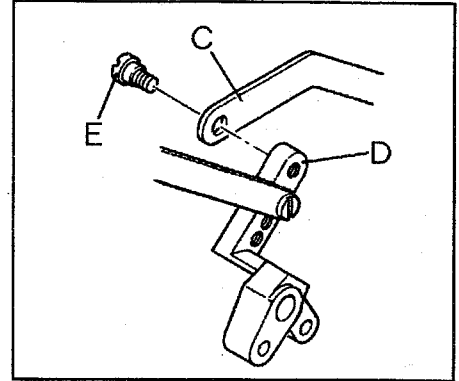
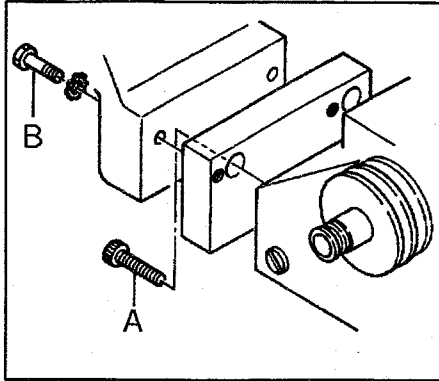
4. Installation

4-1 Set style PD-C

The Machine must be installed correctly according to the illustrations.

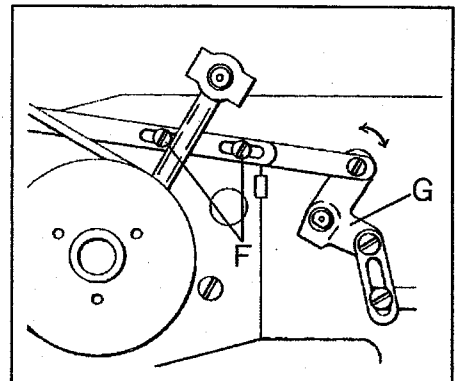
- (1) Fit Machine Frame Supplementary Plate to the Machine with Screw(A).
- (2) Fix the Machine on Pedestal with Bolt(B).
- (3) By Screw(E), connect Presser Foot Lifting Link(C) on Pedestal with Presser Bar Lifter Lever(Large)(D).

Note: For using with FDL-1 Device, this work is not necessary.



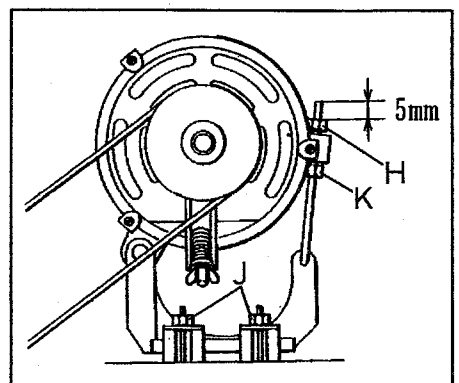
- (4) Adjust the lifting amount of Presser Foot as follows:

- ① Touch Presser Foot to Stitch Plate closely.
- ② Loosen Screws(F) of Lifter Lever Link(Long).
- ③ Press Presser Bar Lifter Lever(Left)(G) to left, and then return it to right by 0.5 mm.
- ④ Tighten Screws(F).

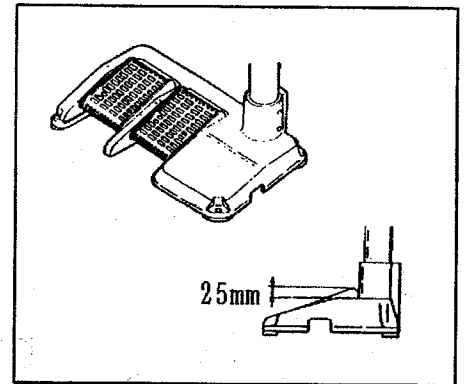
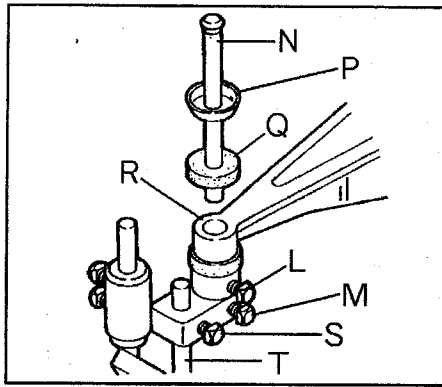


- (5) Install Motor as follows:

- ① Make the distance of about 5 mm between the top of Nut(H) and that of Adjusting Screw.
- ② Engage Belt with Machine Pulley and Motor Pulley.
- ③ Position Motor so that Belt is tight, and then tighten three Nuts(J) to fix the Motor.
- ④ Loosen Nuts(H) and (K) to tighten Belt properly.



- (6) Install Motor Lever Connecting Rod(Upper)(N), Washer(P), and Motor Lever Cushion(Q) to Motor Lever.
- ① Loosen Screws(L) and (M).
 - ② Remove Motor Lever Connecting Rod(Upper)(N), Washer(P), and Motor Lever Cushion(Q).
 - ③ Put the Motor Lever Cushion(Q) and Washer(P) removed on Motor Lever(R), and then pass Motor Lever Connecting Rod(Upper)(N) through (P), (Q), and (R) as shown in figure.
 - ④ Tighten Screws(L) and (M).
 - ⑤ Loosen Screw(S) and lift Motor Lever Connecting Rod(Lower)(T) to set so that the front of Motor Pedal can be 25 mm above the top of Basement.
 - ⑥ Tighten Screw(S).

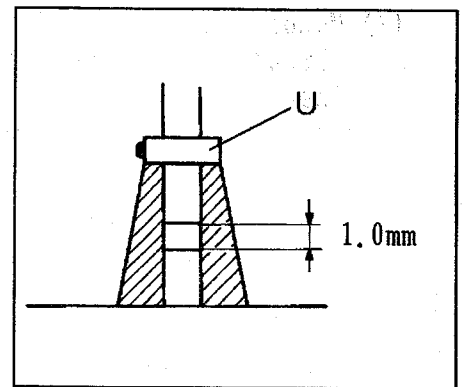
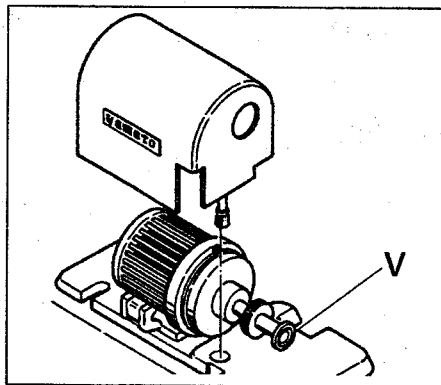


- (7) Fit Motor Cover as follows:

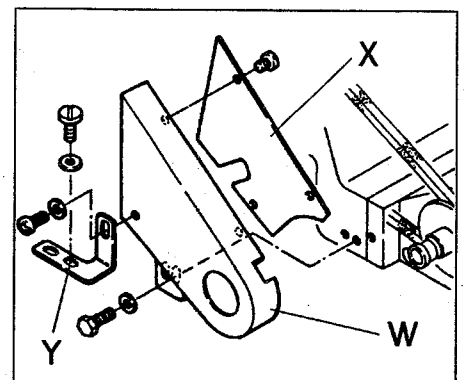
As shown in the figure, position Collar(U) so that there is a clearance of 1 mm between the foot of Motor Cover and the Pin of Pedestal.

Note: When there is not the clearance mentioned above, the vibration produced from Motor and Machine may cause vibration and/or noise at Motor Cover.

- (8) Install Handwheel(V).

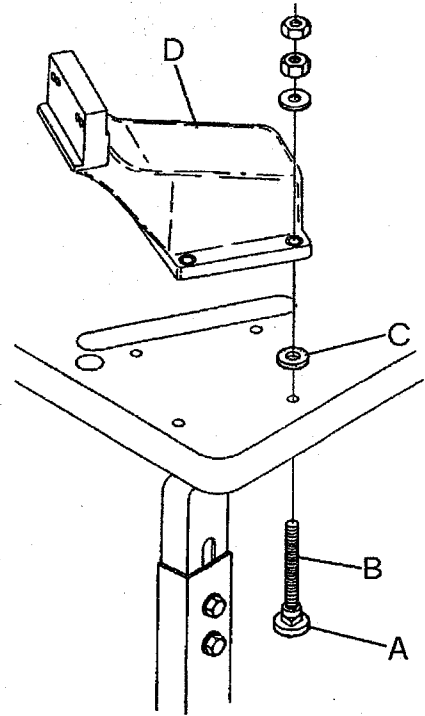
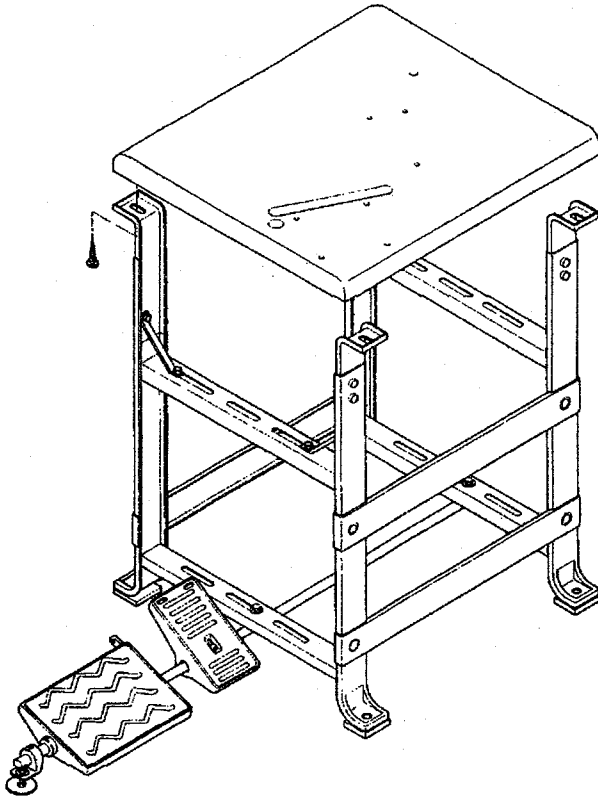


- (9) Install Belt Cover(W), Belt Cover(Right)(X), and then Belt Cover Stay(Y).

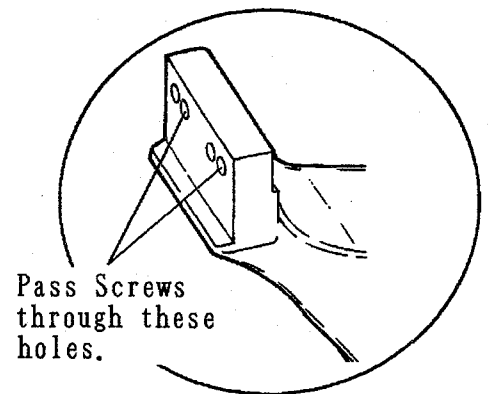
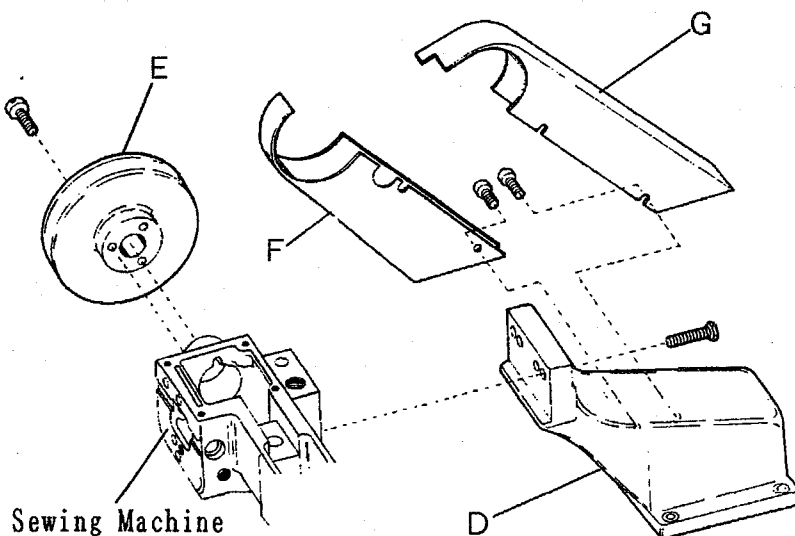


4-2 Set style SL-C

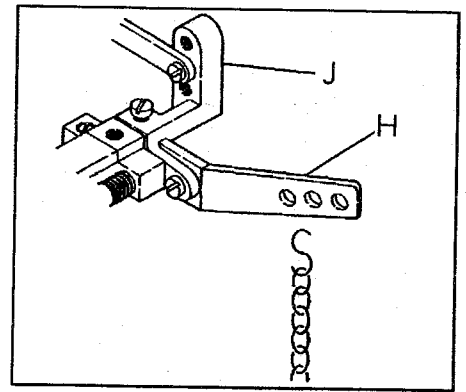
- (1) Assemble Table Legs.
- (2) Mount Table on Legs.
- (3) Install Pedal and Presser Foot Lifter Pedal.
- (4) Tighten Bolt (B) to Hanging Nut (A).
- (5) Put Cushions (C) on the four places.
- (6) Install Sewing Machine Supporting Block (D).



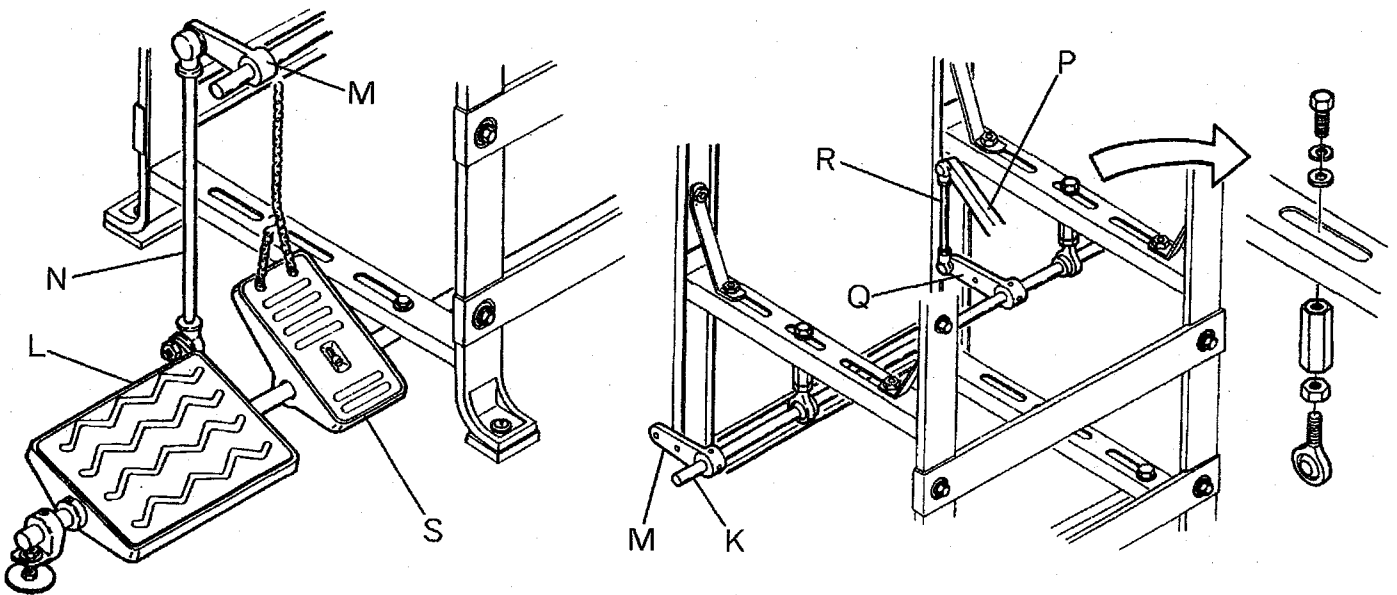
- (7) Mount Sewing Machine on Sewing Machine Supporting Block (D) with Screws passed through Sewing Machine Supporting Block (D).
- (8) Install Handwheel (E).
- (9) Install Belt Cover (Lower) (F) and (Upper) (G).



- (10) Install Presser Foot Connecting Lever(H) to Presser Bar Lifter Lever(J). Hang Chain on Presser Foot Connecting Lever(H) and pass the Chain through the hole in Table.

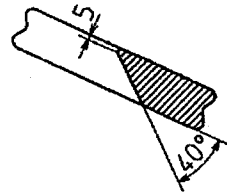


- (11) Install Driving Lever Shaft(K) and the related parts.
(12) Connect Pedal(L) and Driving Lever(M) with Pitman(N).
(13) Connect Motor Lever(P) and Driving Lever(Q) with Pitman(R).
(14) Connect the Chain to Presser Foot Lifter Pedal(S).
(15) Install Thread Stand.

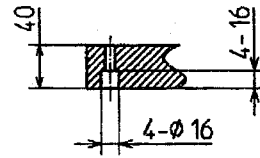


* Schematic diagram for cutting Table

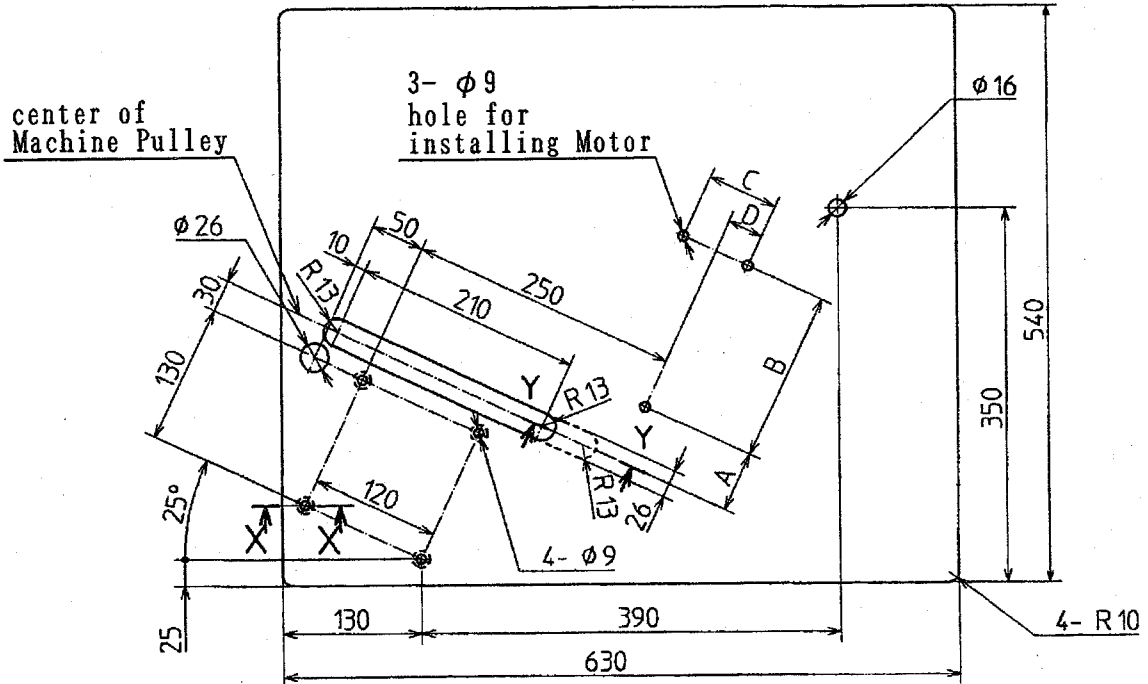
A	B	C	D
59	159	66	33



Section Y-Y



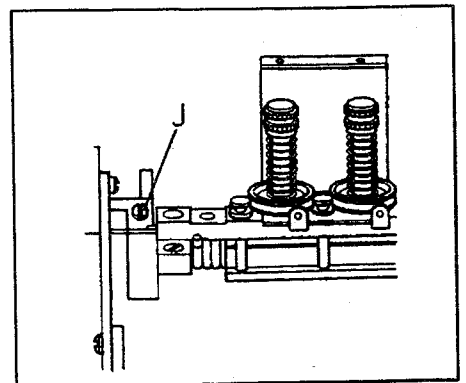
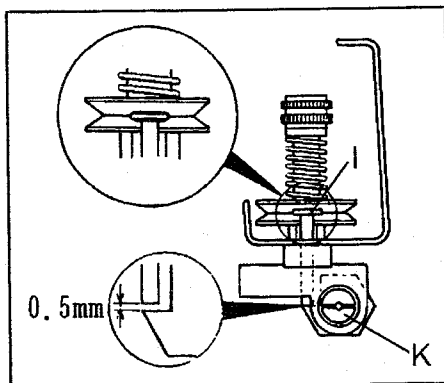
Section X-X



△
Operator

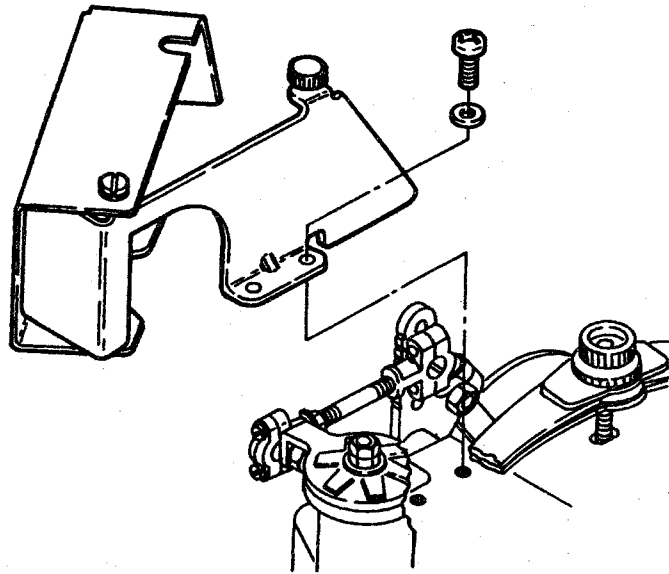
4-3 Adjustment of Tension Release Pin

Without pedalling, adjust the upper part of Tension Release Pin(I) to be in the middle of Thread Tension Disc(Upper) and (Lower). Make the clearance of 0.5 mm between Tension Release Pin(I) and Tension Release Shaft(K). This adjustment is made by loosening Screw(J) of Presser Bar Lifter Lever(Large) and turning Tension Release Shaft(K) by the screwdriver.



4-4 Installation of Clutch Rod Cover

Install Clutch Rod Cover as shown in the figure.



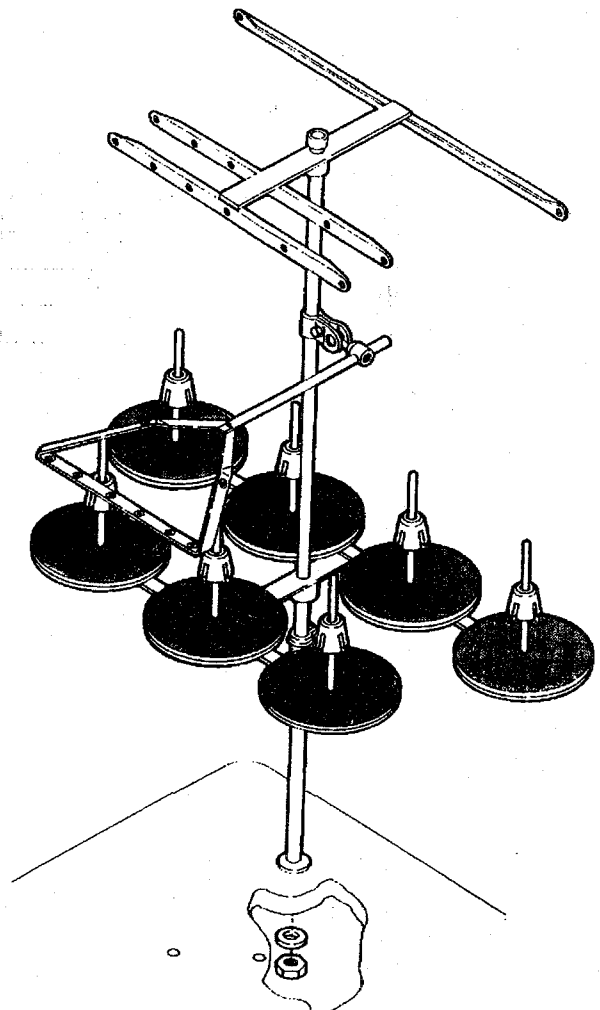
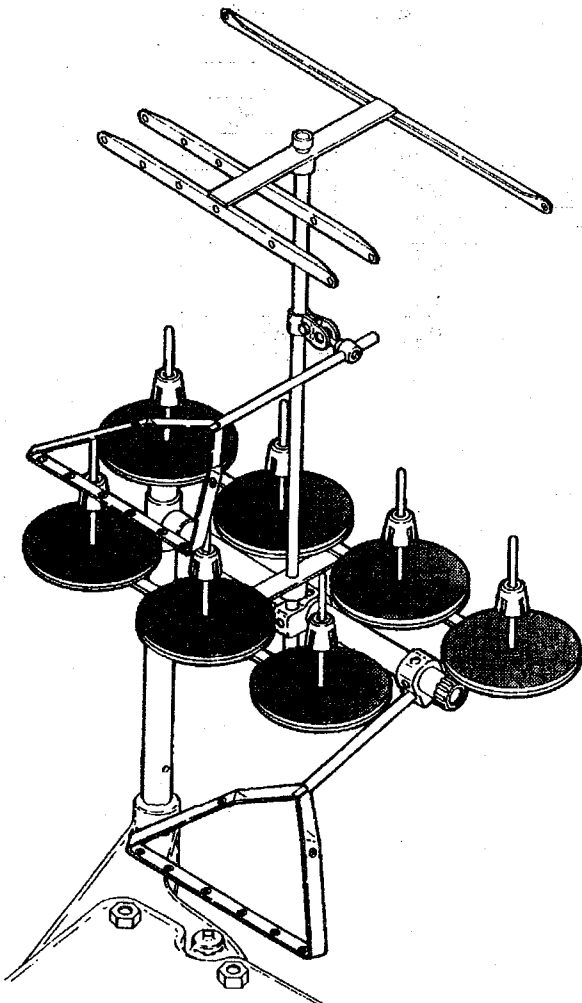
4-5 Installation of Thread Stand

(1) Set style PD-C

Install Thread Stand Pipe (Short) and (Long) to the position below, and then install Thread Stand, Complete Set.

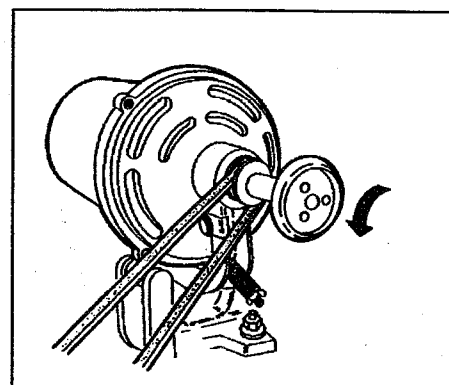
(2) Set style SL-C

Install Column Pipe (Lower) Machine Table, and then install Thread Stand, Complete Set as shown in the following figure.



5. Sewing speed and turning direction of Pulley

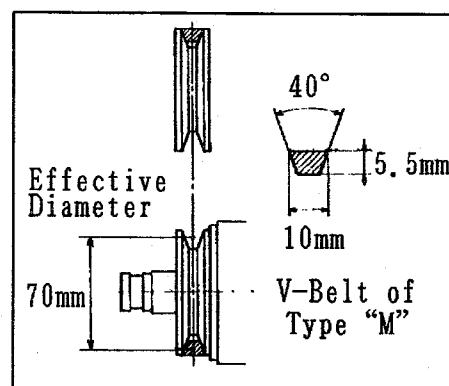
The maximum sewing speed of this Machine is 4500 s.p.m. and the economical speed is 4000 s.p.m. For keeping the good durability, however, it is desirable to operate at 3500 s.p.m. for the initial use of about 200 hours (for one month), in case of brand-new Machine. The turning direction of Handwheel is counterclockwise as shown in the illustration.



6. Motor and Belt

Use the Clutch Motor of 3-phase, 2-pole, 400 watt (1/2 HP) and V-Belt of Type "M".

As shown in the illustration, the Motor must be positioned to make both center lines of Motor and Machine Pulleys in a line when the Motor comes to left by pedalling.



* Diameter specified on the table is the nearest size (mm) to the calculated value, because Pulleys are obtainable in steps of 5 mm at the market.

external diameter of Motor Pulley (mm)	s.p.m.		Belt size	
	50 Hz	60 Hz	PD-C	SL-C
75	—	3500	M38	M57
85	—	4000	M39	M58
90	3500	—	M39	M58
95	—	4500	M40	M58
100	4000	—	M40	M58
110	4500	—	M41	M59

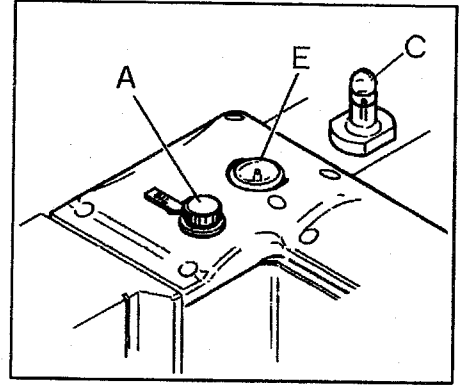
7. Lubrication

7-1 Lubricant

YAMATO SF OIL #68 is recommendable as a lubricant.

7-2 Oil feeding

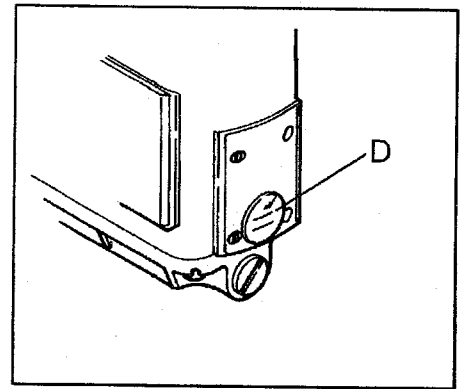
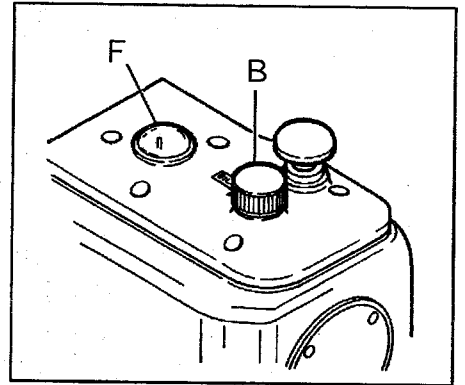
Before operation, remove Oil Caps(A) and (B) marked "OIL". Then, new oil must be fed there without fail. When feeding at (A), fill oil till the point of Oil Height Indicator comes to the upper line on Oil Gauge(C), and when feeding at (B) fill oil to the upper line of Oil Gauge(D).



7-3 Oil Gauge and confirmation of oil flow

Prior to the operation, always check Oil Gauge(C) and (D), then operate the Machine with oil kept between two lines.

Replenish oil if its amount is below the lower line. When starting Machine, look into Oil Windows(E) and (F) and confirm that oil is smoothly flowing out of Oil Pipe.

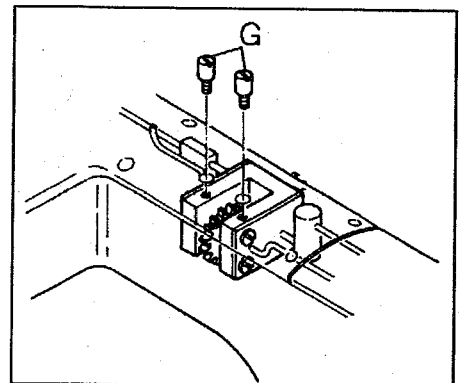


7-4 Oil priming

In installing a brand-new Machine or starting the Machine has not been in use for some time, priming of oil may be necessary.

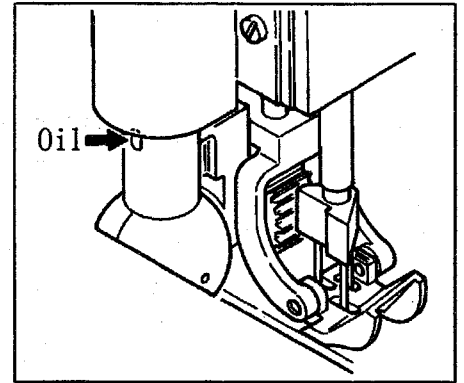
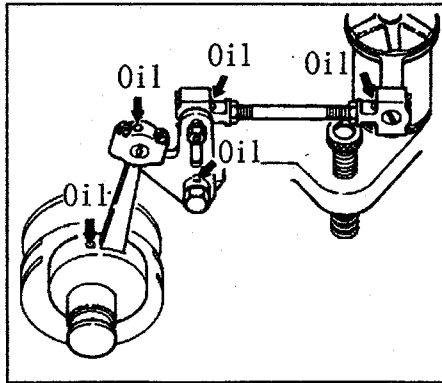
In this case, remove Plug Screw(G) of Gear Pump and feed oil from here.

Operate the Machine after the Screw is retightened as before.



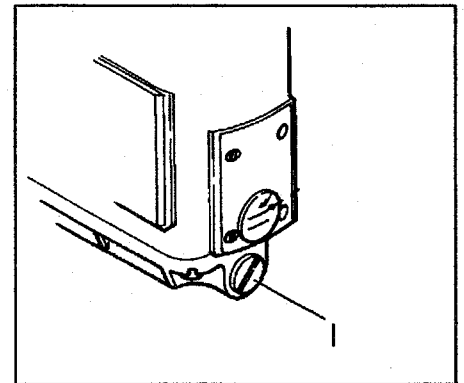
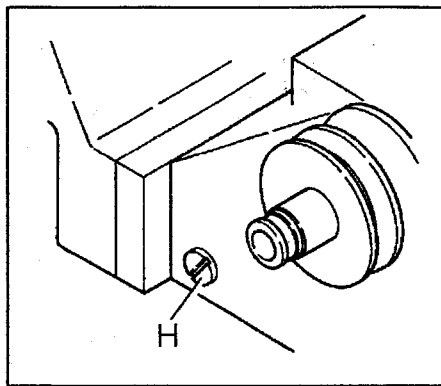
7-5 Oil replenishment

Every day before operation, oil the points shown by the arrows as far as they become damp.



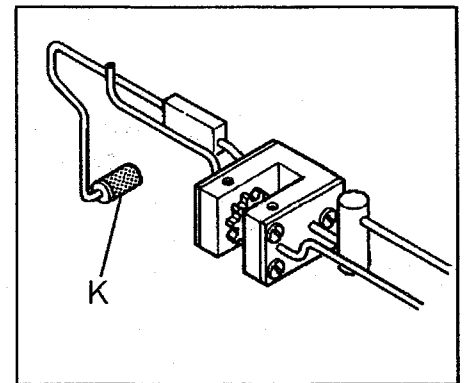
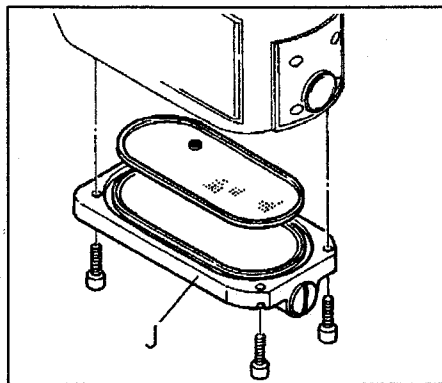
7-6 Oil exchange

In order to keep long use of the Machine, change oil entirely after about 200 hours on the initial use. Then, oil should be exchanged 2 or 3 times a year. For draining oil, remove Screws (H) and (I).



7-7 Cleaning of Filter Screens

When oil is changed 2 or 3 times a year, remove Oil Reservoir (J) and clean the interior of Cylinder and the Reservoir together with the Filter Screens. Simultaneously, remove Pump and clean its In-take Filter (K).



8. Proper operation

8-1 Needle system

UY×128GAS made by ORGAN or UY128GAS made by SCHMETZ should be used.

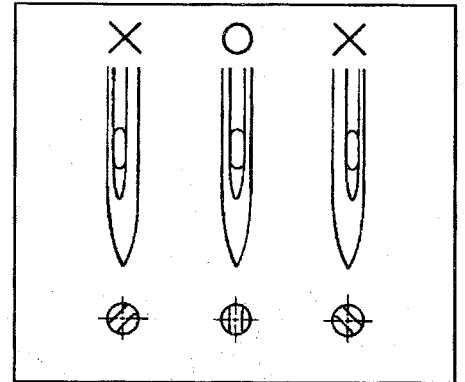
Needle sizes applicable to this Machine are listed on the table hereunder, and suitable size must be selected in accordance with the nature of sewing.

* At the shipment, this Machine has Needle of #22.

Japanese System	14	15	16	17	18	19	20	21	*22	23
Metric System	90	95	100	105	110	120	125	130	140	160

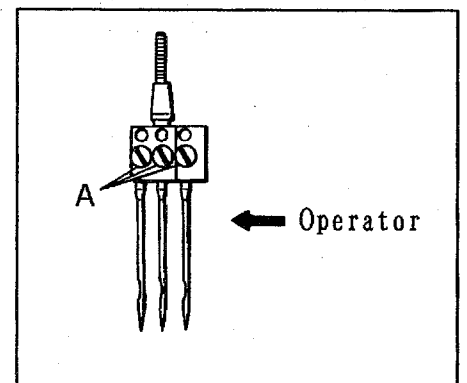
8-2 Setting of Needles

Needles must be correctly set facing their scarves against the rear side of Machine as shown in the illustration.



Exchange as follows:

- (1) Turn Handwheel and raise Needles to their highest position.
- (2) Loosen Screws(A) and pull Needles downwards.
- (3) Making sure of the facing of their scarves, insert new needles fully to holes of Needle Clamp and retighten Screws(A) respectively.



8-3 Threading

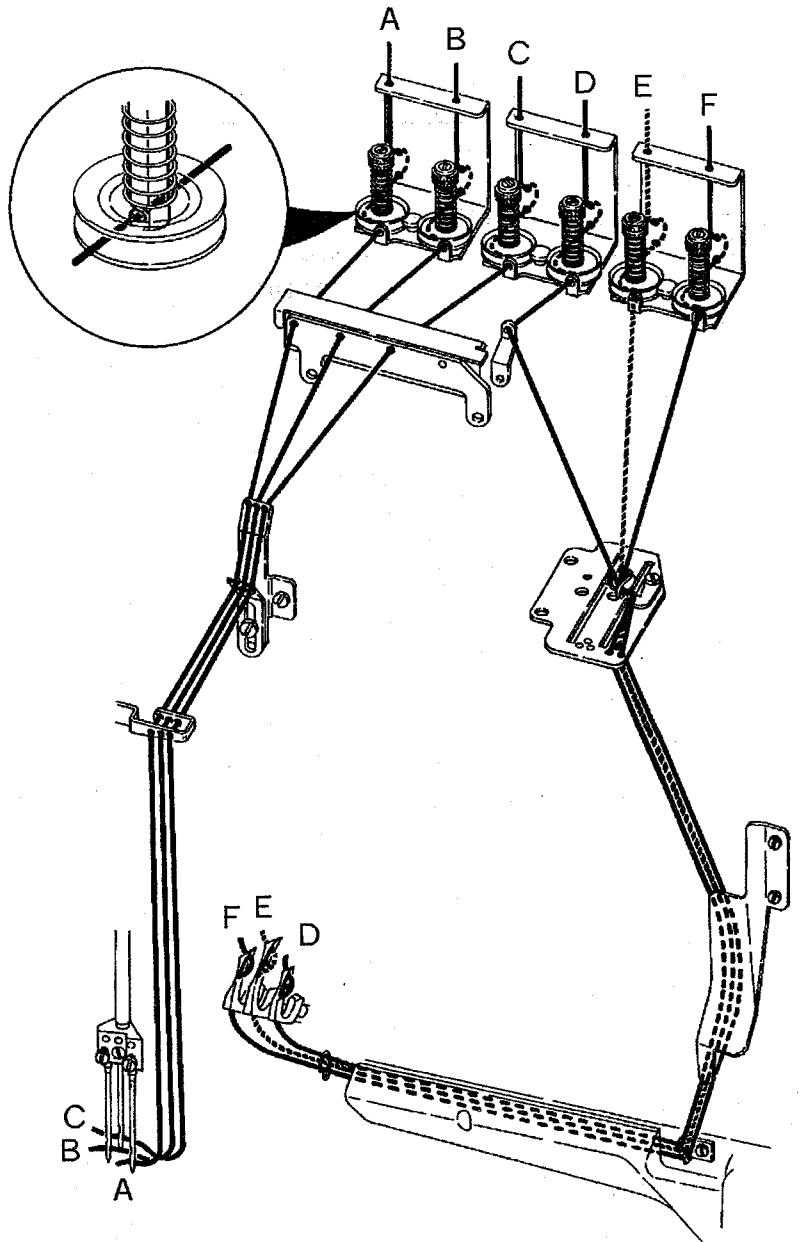
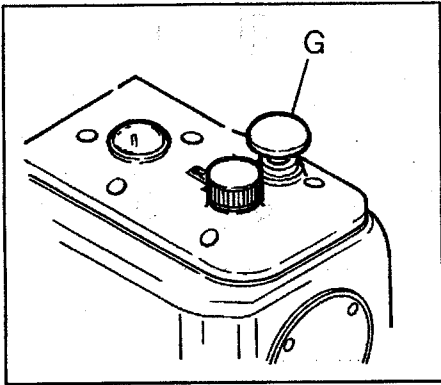
The threading should be correctly made according to the illustration shown hereunder.

Skipping stitch, thread breakage, lack of uniformity and/or other troubles may be caused by the incorrect threading. Take care, please.

A, B, C . . . Needle threads
D, E, F . . . Looper threads

* Threading of Looper threads

Bring Loopers to left end and press Pushbutton(G), then the threading can be made easily as Loopers come out.



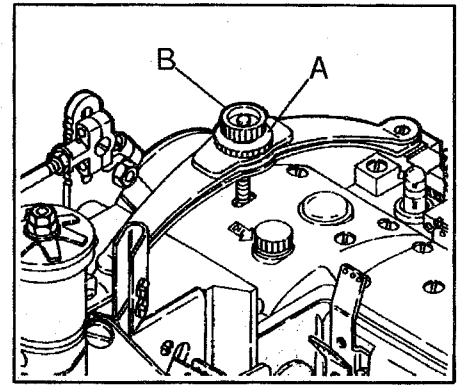
8-4 Thread tension

Tension of thread must be adjusted as weak as possible unless the good balance is lost in the seaming, because it depends on the kind of fabric or thread, stitch length and/or other sewing factors.

Note: Refer to the item regarding to the thread tension in "Proper adjustment" on page 17.

8-5 Pressure of Presser Foot

The pressure should be as weak as possible so long as stable stitches can be formed. However, when the pressure is too weak, it may cause uneven feeding, lack of uniformity of the seaming or skipping stitch. To strengthen the pressure, loosen Lock Nut (A) and turn Adjusting Nut (B) to clockwise. To weaken it, loosen the Nut (A) and turn the Nut (B) to counterclockwise.



8-6 Adjustment of stitch length

Stitch length can be adjusted from 2.1 to 4.2 mm. The right table shows stitch length and number of stitches per inch or 30 mm.

At the shipment, stitch length is set to 3.5 mm.

Note: Stitch length depends on the movement of Feed Roller. Refer to "Adjustment of Feed Roller movement" on page 15.

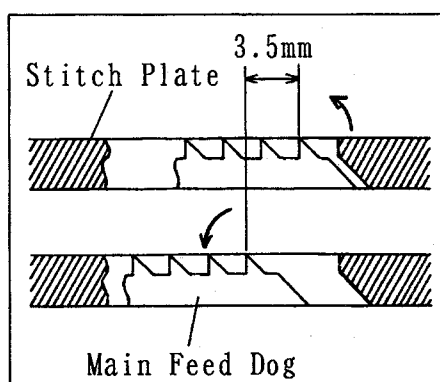
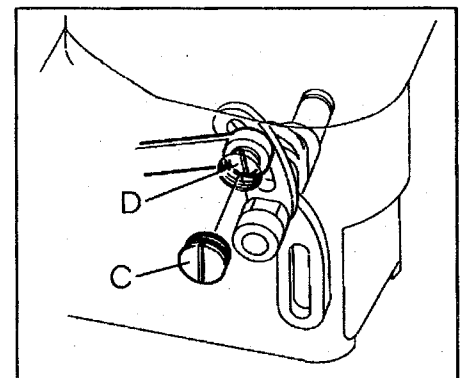
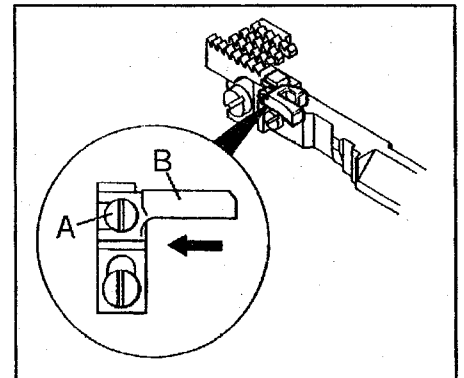
stitch length (mm)	stitches per	
	inch	30 mm
4.2	6	7
3.6	7	8
3.2	8	9.5
2.8	9	10.5
2.5	10	12
2.3	11	13
2.1	12	14

* Changing stitch length

Note: If stitch length is set to 4.2 mm or more, Main Feed Dog touches Stitch Plate. Do not set to 4.2 mm or more.

- (1) Loosen Screw (A) of Needle Guard (B) and move the Guard fully to the rear, then tighten (A) temporarily.
- (2) Remove Screw (C).
- (3) Loosen Screw (D) and move this Screw upward for lengthening the stitch length, and downward for shortening.
- (4) After deciding stitch length, tighten Screw (D) firmly and reattach Screw (C).
- (5) Referring to "Adjustment of Needle Guard" on page 21, adjust the Needle Guard (B) and tighten the Screw (A).

Note: When sewing fabric of 14 ounce or more, set the movement of Main Feed Dog to 3.5 mm or more.



8-7 Adjustment of differential feeding

This adjustment shall be made by moving Differential Feed Operating Lever(A) to right or left.

When the Lever(A) is set in between "4" and "5" of graduations, the differential feeding becomes ineffective because both Main and Differential Feed Dogs make the equal movement.

* Normal differential feeding

Turning the Lever(A) toward "9" of the graduations, the normal differential feeding is obtainable and its ratio becomes 1 : 1.3, maximum at "9".

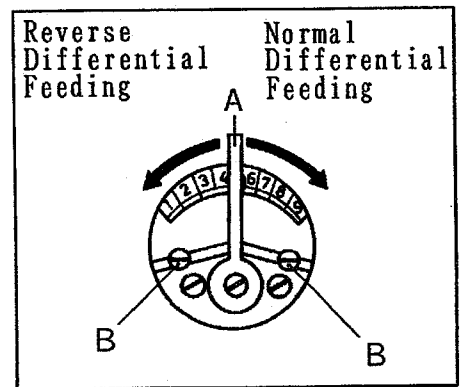
* Reverse differential feeding

Turning the Lever(A) toward "1" of the graduations, the reverse differential feeding is obtainable and its ratio becomes 1 : 0.7, maximum at "1".

At the sewing finish, if fabrics slippage in the stitching occurs, turn the Lever(A) toward "9" so as to make the upper fabric fed more.

To the contrary, turn the Lever(A) toward "1".

Note: Screws(B) are set to stop the Lever(A) and restrict the feeding amount within a certain extent.



8-8 Adjustment of Feed Roller movement

At the shipment, stitch length is set to 3.5 mm, and Feed Roller movement is set to the fourth line from the top on Clutch Driving Lever.

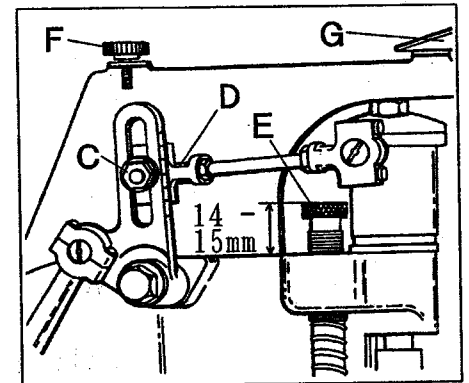
When changing Feed Dogs movement, adjust Feed Roller movement so that it has the same stitch length as Feed Dogs movement as mentioned below.

Loosen Screw(F) and open Clutch Rod Cover(Left)(G).

To increase the movement, loosen Nut(C) and move Clutch Connecting Rod(D) upward.

To decrease the movement, loosen (C) and move (D) downward.

Note: Too much movement of Feed Roller to that of Feed Dogs may cause clog on sewing at overlapped portion of material, needle thread breakage, blunt needle point, and stretch of material. Too little movement may cause seam distortion and shrinkage of bottom layer material.



8-9 Pressure of Feed Roller

Pressure of Feed Roller must be made enough to feed fabrics uniformly.

To strengthen the pressure, turn Adjusting Screw(E) to clockwise.

To weaken the pressure, turn it to counterclockwise.

The standard distance between the top of Adjusting Screw(E) and that of Sewing Head is 14 - 15 mm.

8-10 "SP Unit" for needle thread oiling

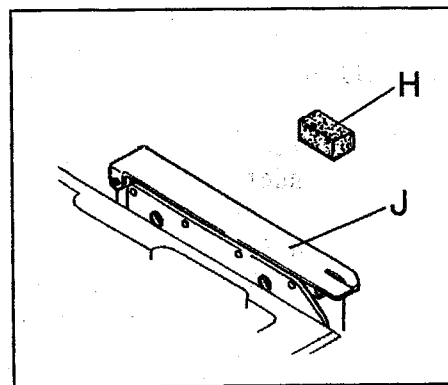
In the high speed sewing, Needles might be overheated by the friction with sewing materials causing thread breakage, skipping stitch or enlargement of stitch holes.

To prevent these troubles, "SP Unit" for needle thread oiling is assembled as the "Standard Equipment".

* Oil of Silicone Line is most effective for this Unit.

* When using "SP Unit", take SP Felt(H) out of the bag hung on Connection Rod, and put (H) into SP Oil Cup, and then pour Oil of Silicone Line into SP Oil Cup. Though we recommend Oil of Silicone Line is used, if you do not use it judging from the sewing material, remove Felt not to touch thread to a dried Felt.

Note: Check the quantity of oil occasionally by opening Oil Cup Lid(J). And replenish some oil if insufficient.



9. Proper adjustment

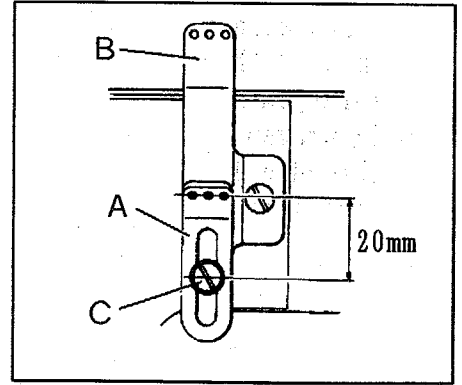
9-1 Tension of needle thread

(1) Needle Thread Eyelet (Left)

Needle Thread Eyelet (Left) (A) shall be tightened with Screw (C) at the fitting hole just under the Eyelet (Right) (B).

The standard position of the Eyelet (A) is 20 mm to its thread eye from the center of Screw (C).

To tighten the needle thread, move the Eyelet (A) downward. To loosen, move it upward.

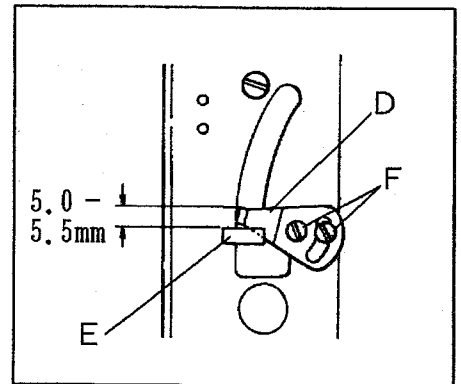


(2) Needle Thread Take-up

The Needle Thread Take-up (D) will help to keep the tightness of needle threads which come out of Loopers and also to form loops satisfactorily when Loopers hook them.

When Needle Bar is at its lowest position, the Needle Thread Take-up (D) will be at 5.0 - 5.5 mm above the upper edge of Needle Bar Lever Thread Eyelet (E). This is the standard position of the Needle Thread Take-up (D).

After loosening Screws (F), when the Needle Thread Take-up (D) is moved upward, loops are large. And when moved downward, loops are small.



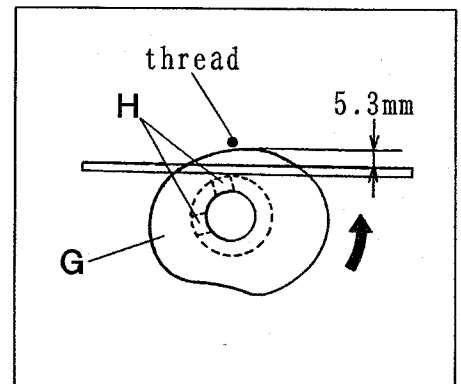
9-2 Tension of looper thread

The illustration shows Looper Thread Take-up seen from operator's side.

Loosen Screw (H). When Needle Bar is at its top position, adjust so that Take-up (G) is 5.3 mm above the top of Eyelet Supporting Plate (J).

To increase the amount of looper thread, turn Take-up (G) in the direction indicated by arrow mark. And then, tighten Screw (H).

Note: In adjusting the Take-up (G), it must not be moved longitudinally.



9-3 Synchronization of Needle and Loper movement

The movements of Needle and Loper have been synchronized most suitable before shipment, however, it is necessary to readjust when Needle or Loper Mechanism is disassembled or parts are exchanged. To confirm the correct synchronizing, use Loper Timing Test Bar (#69201) and Loper Timing Gauge (#93690) which are supplied on the extra order.

Measurement and adjustment of synchronizing:

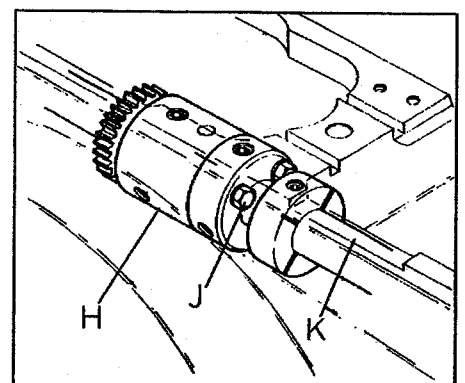
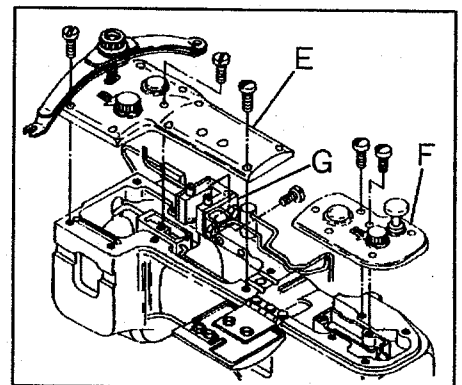
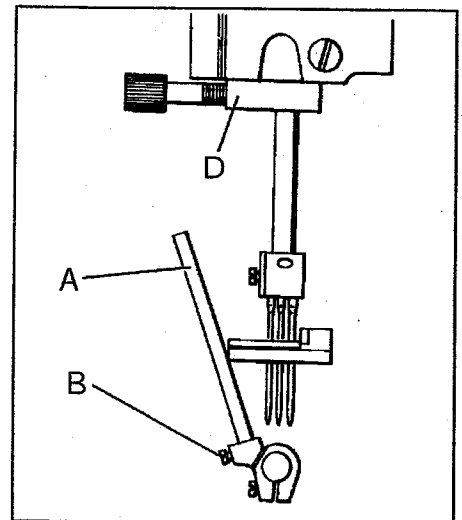
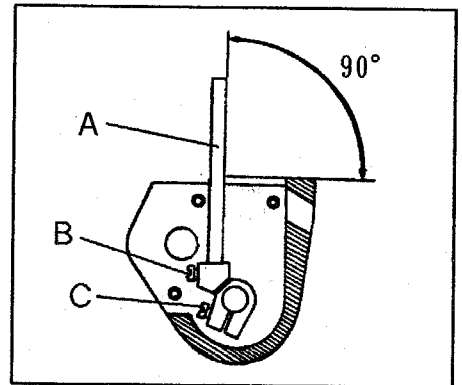
- (1) Remove Needles, Stitch Plate, Presser Foot, Main Feed Dog, Differential Feed Dog, and Feed Roller.
- (2) Fit Loper Timing Test Bar(A) with diameter of 3.97 mm to the place where the Loper on the operator side has been removed, and tighten Screw(B).
- (3) When Loper Holder comes to the right end, loosen Screw(C) and correct the position of the Holder so as to make the Test Bar(A) vertical (90°).
- (4) Bring the Test Bar(A) to the extreme left and fit Stitch Plate.
- (5) Turn Machine Pulley slowly to counterclockwise and apply the Test Bar(A) to Stitch Plate softly.
- (6) Apply Loper Timing Gauge(D) to the under surface of Sewing Head and fix it to Needle Bar.
- (7) Turn Machine Pulley to clockwise slowly until Timing Gauge(D) touches Sewing Head or the Test Bar(A) touches Stitch Plate.

At this time, either clearance between Timing Gauge(D) and Sewing Head or the Test Bar(A) and Stitch Plate must be 0.1 mm or less. If the clearance is 0.1 mm or more, the following adjustment must be made.

- (8) Remove Crank Chamber Cover(E) and Top Cover (Front)(F) and then, remove Pump, Complete Set(G). Then, turn Machine Pulley to clockwise slowly.
- (9) Loosen three Screws(J)of Main Shaft Coupling(H).

At this time, if Timing Gauge(D) touches Sewing Head before the Test Bar(A) touches Stitch Plate, turn Main Shaft(K) to clockwise as the timing of Loper is early. To the contrary, if the Test Bar(A) touches Stitch Plate and there is an clearance between Timing Gauge(D) and Sewing Head, turn Main Shaft(K) to counterclockwise as the timing of Loper is late in this case.

At each adjustment of Main Shaft Coupling(H), process of (6), (7), and (8) must be repeated. To facilitate these process, only Screw(J) should be tightened of temporarily. After adjustment, tighten firmly 3 pcs. Bolts, and follow the process mentioned above and examine the synchronization again.

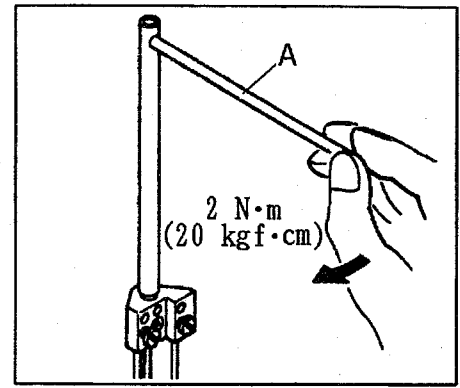


9-4 Setting of Needle Clamp

The Clamp is screwed in Needle Bar and tightened with the torque of 2 N·m (20 kgf·cm).

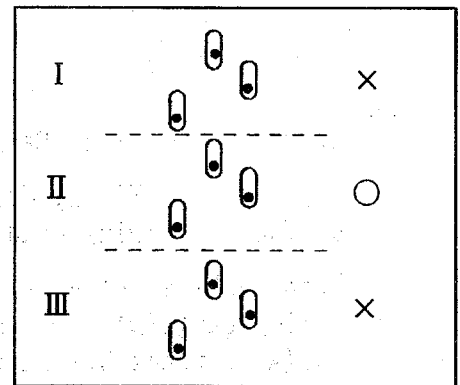
* Moderate tightening is obtainable by means of Needle Bar Setting Torque Bar (#68375 - the extra parts). Insert the Torque Bar (A) to the hole at upper part of Needle Bar and continue tightening until it begins to bend.

Note: Do not tighten Needle Bar with the torque of 2 N·m (20 kgf·cm) or more, otherwise the external diameter of lower edge of Needle Bar becomes swell and unusable. The lower edge of Needle Bar and upper edge of Needle Clamp must not meet each other. Please take care.



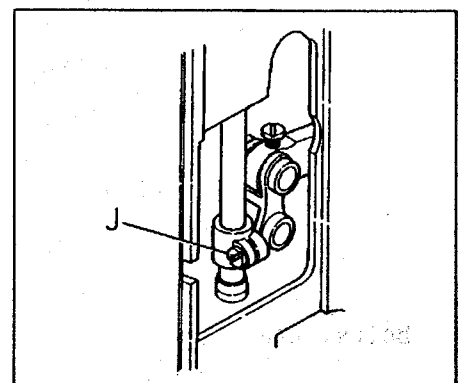
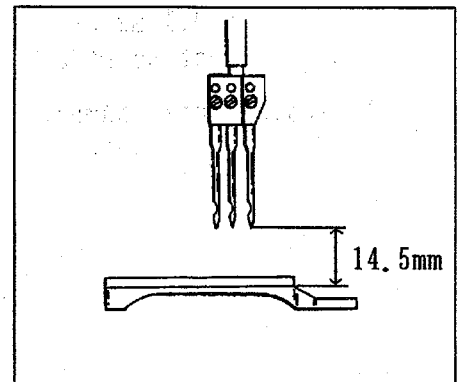
9-5 Relation between Needles and Stitch Plate

When adjusting the height of Needle Bar or others, Needles must be made to be at the center of dropping point on Stitch Plate as shown in Fig. II, and must not be as shown in Fig. I and III.



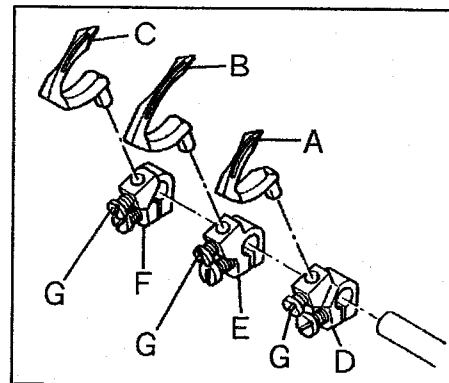
9-6 Height of Needle Bar

When Needle is at the top of its travel, make the distance of 14.5 mm from the point of Needle to the top of Stitch Plate. The adjustment is made by moving Needle Bar vertically after loosening Screw (J) of Needle Bar Connecting Bracket.



9-7 Height and setting angle of Looper

Loopers(A), (B), and (C) shall be fully inserted to Looper Holders(D), (E), and (F) respectively and tightened with Screws(G). Then, height and setting angle of Looper are decided accordingly.

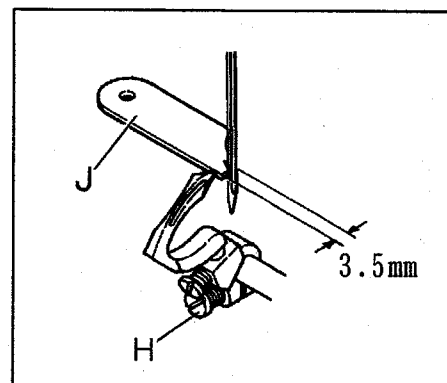
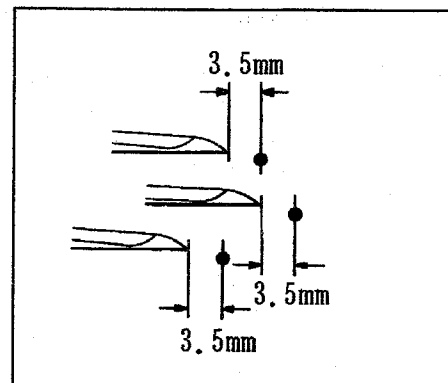


9-8 Swing distance of Looper

When Loopers come to the extreme left of the swing, distance to the point from center of the needle must be 3.5 mm.

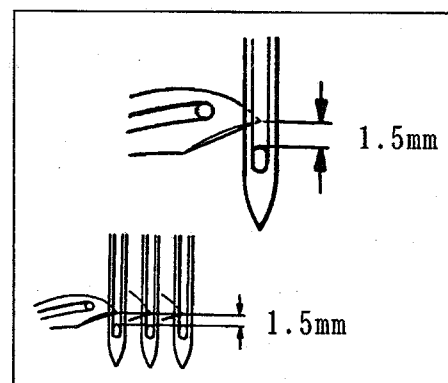
This adjustment is made after loosening Screw(H). With Looper Gauge(J) #3021700 which is supplied on the extra order, the adjustment is accomplished much easier.

Note: Looper Gauge for 3.5 mm in size is attached.



* Checking of relation between Needle and Looper
After adjusting swing distance of Looper, check if the following is satisfied.

When the Looper point coming from left meets the centerline of Needle, check that the point is 1.5 mm above the top end of needle eye. If it is not satisfied, readjust the swing distance of Looper.



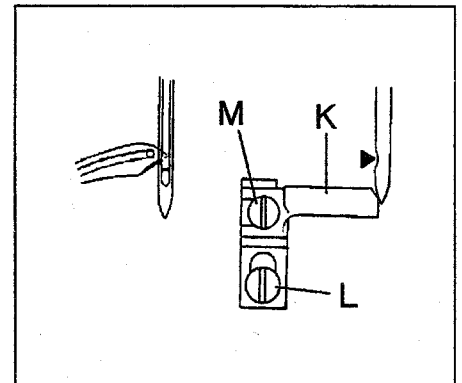
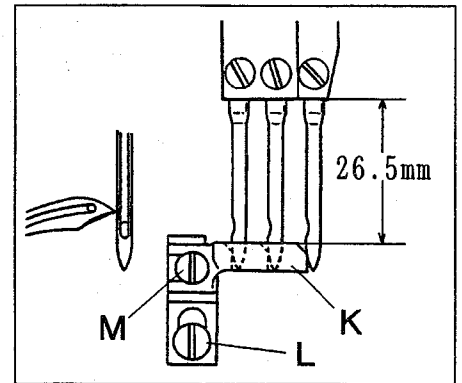
9-9 Adjustment of Needle Guard

When Needle Bar is at its bottom position, loosen Screw(L) and adjust Needle Guard up and down so that the distance between the bottom of Needle Clamp and the top of Needle Guard(K) is 26.5 mm.

When Loopers pass behind Needles, loosen Screw(M) and adjust Needle Guard(K) so that Needle Guard(K) presses Needles by 0 - 0.05 mm.

* Examine one of the three Needles, which is least touched Needle Guard, and make a distance of 0 mm between the Needle and Needle Guard. Other Needles are allowed to press Needle Guard slightly.

Note: Readjustment must be made when stitch length is changed, because Needle Guard is fitted to Main Feed Bar and the clearance for Needles will be changed in proportion to the change of stitch length.



9-10 Longitudinal position of Needle and Loper

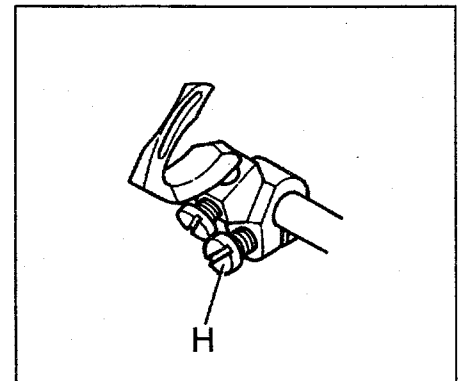
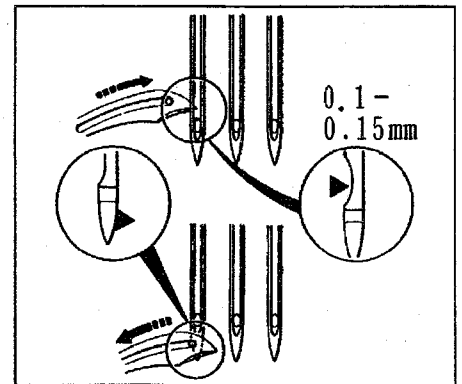
In the movement to right from its extreme left end, when Loper passes behind Needle and its point comes to the center of Needle, make the clearance of 0.1 - 0.15 mm between Needle and Loper.

This adjustment is made by loosening Screw(H) of Loper Holder.

Subsequently, it must be confirmed that Needle brushes the back face of Loper very lightly when it comes down behind Loper which is moving to left from the extreme right end.

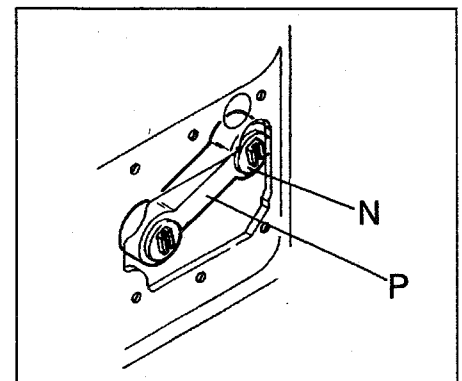
When Needle touches Loper so strong that the Needle bends when there is a clearance between them, refer to "Adjustment of longitudinal movement of Loper" and adjust it.

Note: At the shipment, the Needle #22 is installed. The longitudinal movement of Loper is set to 3.0 mm.



9-11 Adjustment of longitudinal movement of Loper

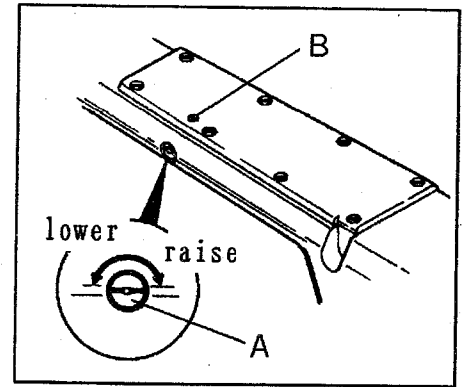
After loosening Screw(N) on the front of Loper Avoid Connecting Rod, remove Sewing Cylinder Cover(Left) and move the Loper Avoid Connecting Rod(P) up and down. Scope of the movement shall be decreased by moving the Rod upward and increased by moving the Rod downward.



9-12 Setting and adjustment of Feed Dogs

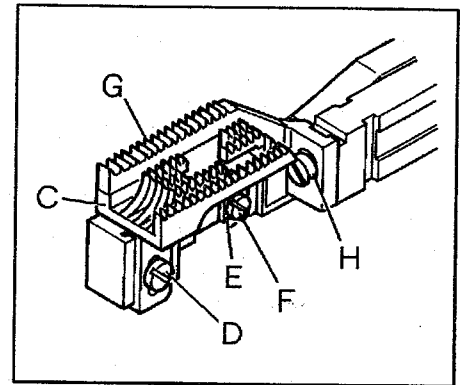
(1) Position of Feed Bar Eccentric Pin

The Feed Bar Eccentric Pin(A) is situated at the center of the Cylinder and used for making the fine adjustment of height of Main and Differential Feed Dogs simultaneously. Before assembling both Dogs, make the groove on the Pin(A) horizontal and fix it with Screw(B) to get the same scope of vertical adjustment for both Dogs. The vertical movement scope shall be 2.5 mm at the rear end of the Feed Dogs. By turning Pin(A) to clockwise the Dogs are raised, and to counterclockwise the Dogs are lowered.



(2) Setting Feed Dogs

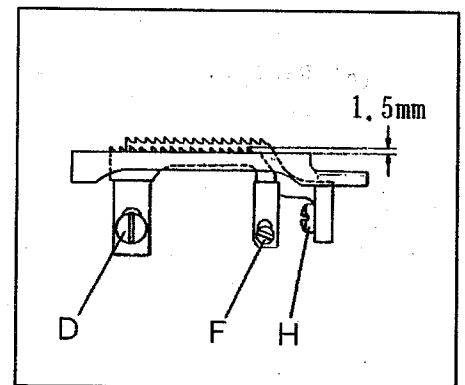
- ① Fit Main Feed Dog(C) with Screw(D).
- ② Apply Main Feed Dog Stay(E) to Main Feed Dog(C) and tighten it with Screw(F).
- ③ Apply Differential Feed Dog(G) to Main Feed Dog(C) softly and tighten it with Screw(H).
- ④ Turn Machine Pulley with differential effect and confirm the Feed Dogs move smoothly.



(3) Height of Feed Dogs

When Feed Dogs raise to the highest position, set the front first tooth by 1.5 mm above the top face of Stitch Plate.

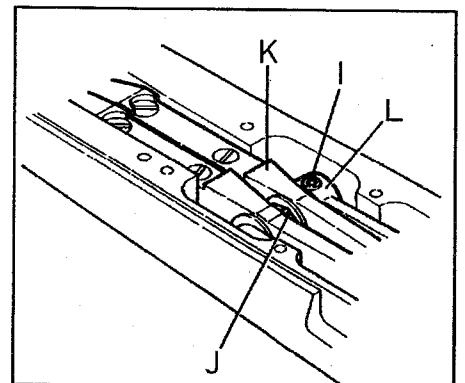
This adjustment is made after loosening Screws (D), (F), and (H).



(4) Position of Main Feed Bar

In such cases as Feed Dogs contact the front part or rear part of the groove on Stitch Plate, Main Feed Bar(K) can be moved to front or rear by turning Main Feed Bar Driving Link Pin(J) after loosening Screw(I).

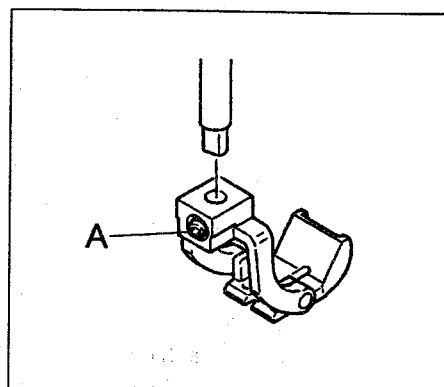
To turn the Pin(J), knock the notched place on its brim with the tapering tool or similars. After adjustment, tighten Screw(I) without any play on Main Feed Bar(K) and Main Feed Bar Driving Ling(L).



9-13 Removal, setting, and adjustment of Presser Foot

(1) Removal

Raise Presser Bar fully by pressing Presser Foot Pedal and remove Presser Foot after loosening Screw(A).



(2) Setting

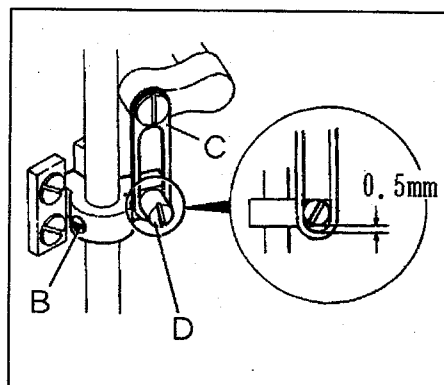
Raise Presser Bar fully by pressing Presser Foot Pedal and set Presser Foot, then tighten Screw (A).

Presser Foot can be set at the original position as there is a flat spot on Presser Bar, however, confirm the position for caution's sake.

When Needles do not come to the center of needle drop position on Presser Foot, adjust the Foot by turning Presser Bar after loosening Screw(B) of Connecting Bracket.

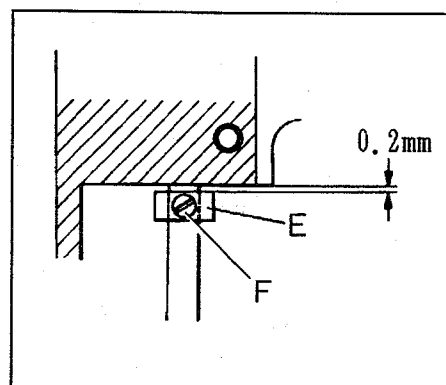
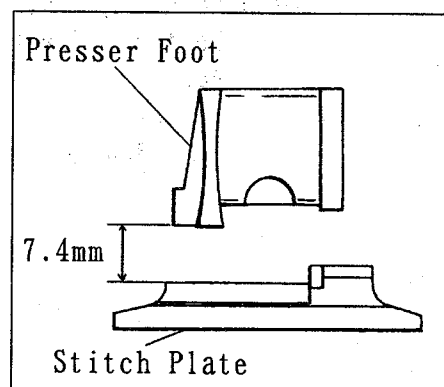
(3) Adjustment of Presser Bar Connecting Bracket

Apply Presser Foot closely on the top face of Stitch Plate and loosen Screw(B) of the Connecting Bracket, then make the clearance of 0.5 mm approximately between Presser Bar Connecting Link(C) and Screw(D).



(4) Position of Presser Bar Collar

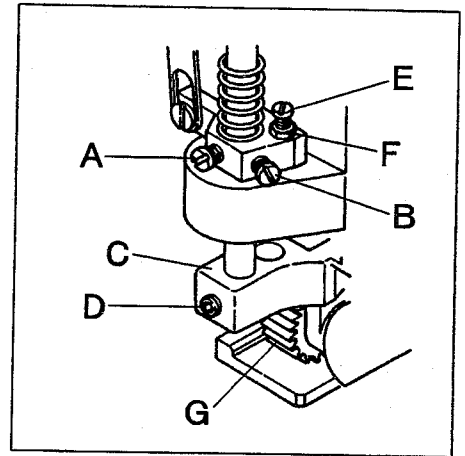
Make the clearance between Sewing Head and the Collar(E) 0.2 mm, when Presser Foot reaches its highest position (7.4 mm above the top face of Stitch Plate), then tighten Screw(F) of the Collar.



9-14 Removal, setting, and adjustment of Feed Roller

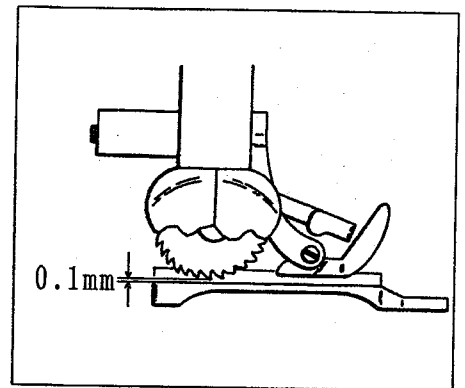
(1) Removal

- ① Remove Screw(A) of Feed Roller Pressing Bar Connection, and loosen Screw(B).
- ② Loosen Screw(D) of Feed Roller Bracket(C).
- ③ Remove the Bracket(C) after raising Feed Roller Pressing Bar as required.



(2) Setting and adjustment

- ① Through Feed Roller Pressing Spring and Pressing Bar Connection, Feed Roller Pressing Bar shall be inserted to the Bracket(C).
- ② Put the Screw(A), and tighten it at the hollow on the Pressing Bar, then tighten Screw(B).
- ③ Apply Adjusting Screw(E) of the Pressing Bar Connection to the boss on Sewing Head, then tighten Screw(D) with an clearance of about 0.1 mm between Feed Roller(G) and Stitch Plate. This clearance will prevent Feed Roller(G) from wearing caused by contacting with Stitch Plate, when the Machine is run idle.



- (3) Link Motion of Feed Roller(G) and Presser Foot
When Presser Foot is raised by treading Presser Foot Pedal, Feed Roller(G) is also raised by the linking mechanism.

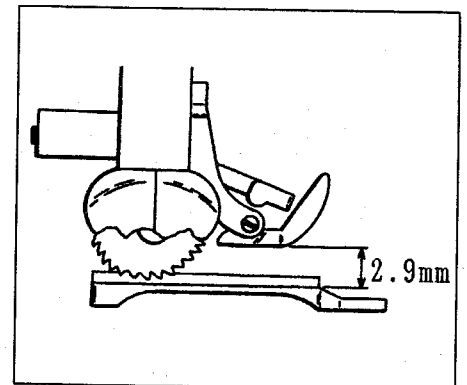
At the time of shipment, the adjustment has been made so that Feed Roller(G) starts rising when Presser Foot is higher than the top of Stitch Plate by 2.9 mm.

When it needs to adjust the timing for raising Presser Foot and Feed Roller(G) according to the sewing condition, the adjustment shall be made as mentioned hereunder.

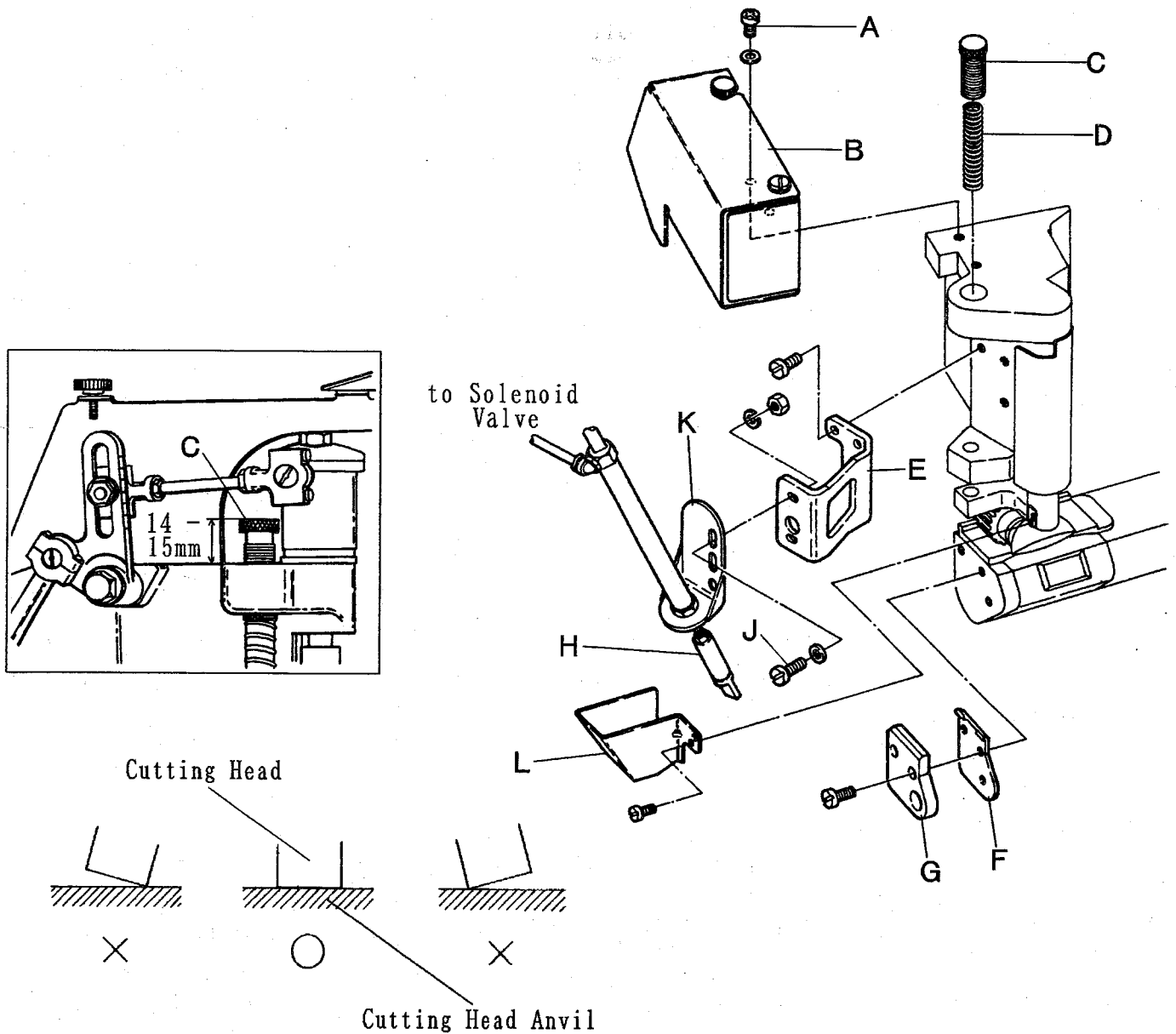
- ① Make Feed Roller(G) free by loosening Screw(D).
- ② Adjusting Screw(E) can be adjusted by loosening Nut(F).

To raise Feed Roller(G) early, turn Adjusting Screw(E) to counterclockwise, and to raise it late, turn (E) to clockwise.

- ③ After adjustment, lock Adjusting Screw(E) with Nut(F).
- ④ Provide an clearance of 0.1 mm between Feed Roller(G) and Stitch Plate, then tighten Screw(D).



1 O. "AC1" and "FDL-1" Devices
 10-1 Installation of "AC1" Device



Note: When Sewing Machine with "AC1" Device is purchased, the following (1), (2), (3), (4), (9), and (10) are not necessary.

* Procedure for installing "AC1" Device to Sewing Machine

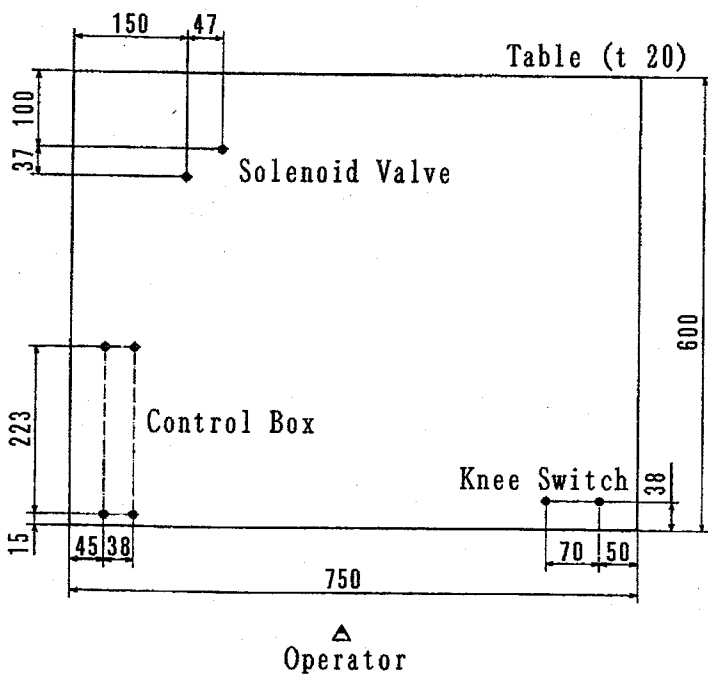
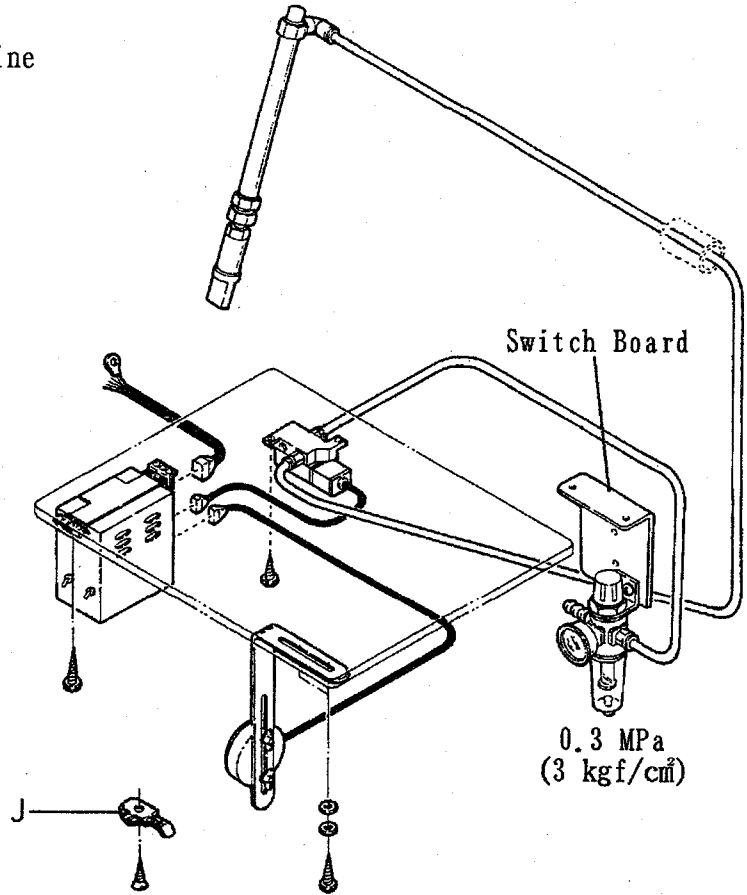
- (1) Loosen Screw(A) and remove Clutch Rod Cover, Complete Set(B).
- (2) Loosen Adjusting Screw(C) and remove Feed Roller Pressing Spring(D).
- (3) Install Cylinder Holder Support(E).
- (4) Install Chain Guide(F) and Cutting Head Anvil(G).
- (5) Install the preset Cutting Head(H) and Air Cylinder with Screw(J).
- (6) Loosen Screw(J) and adjust Cylinder Holder(K) up and down so that the center of Cutting Head(H) touches the angle of Cutting Head Anvil(G).
- (7) Loosen Screw(J) and adjust so that Cutting Head(H) touches on a parallel with angle of Cutting Head Anvil(G). If it does not touches parallel, thread chain may not be cut.
- (8) Install Cutting Head Cover(L).
- (9) Install Feed Roller Pressing Spring(D) and Adjusting Screw(C), and then make the height of Adjusting Screw(C) 14 - 15 mm.
- (10) Install Clutch Rod Cover, Complete Set(B).

10-2 Wiring and piping diagram for "AC1" Device

- (1) Install Regulator to Switch Board for Pedestal type.
- (2) The air pressure shall be set to 0.3 MPa (3 kgf/cm²), and shall be as weak as possible so long as thread chain can be cut.

Note: Refer to the figure, install each part to the under surface of Table.

* Install Cord and Vinyl Tube to the under surface of Machine Table with UL Clamp(J).



10-3 Operation of "AC1" Device

- (1) Turn **ON** Power Supply Switch for Motor.
- (2) Turn **ON** Power Supply Switch(A) for Control Box.
- (3) Turn Toggle Switch(D) to 'PUSH' and press Knee Switch.

Cutting Head lowers to hit against Cutting Head Anvil.

While pressing Knee Switch, Cutting Head lowers. When releasing Knee Switch, Cutting Head rises to its original position.

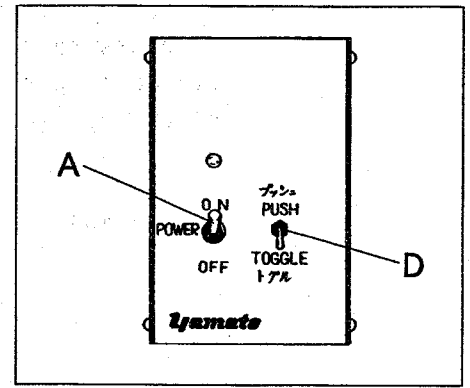
- (5) Turn Toggle Switch(D) to 'TOGGLE', and press Knee Switch.

Cutting Head lowers to hit against Cutting Head Anvil and stops.

Press Knee Switch again, and Cutting Head rises.

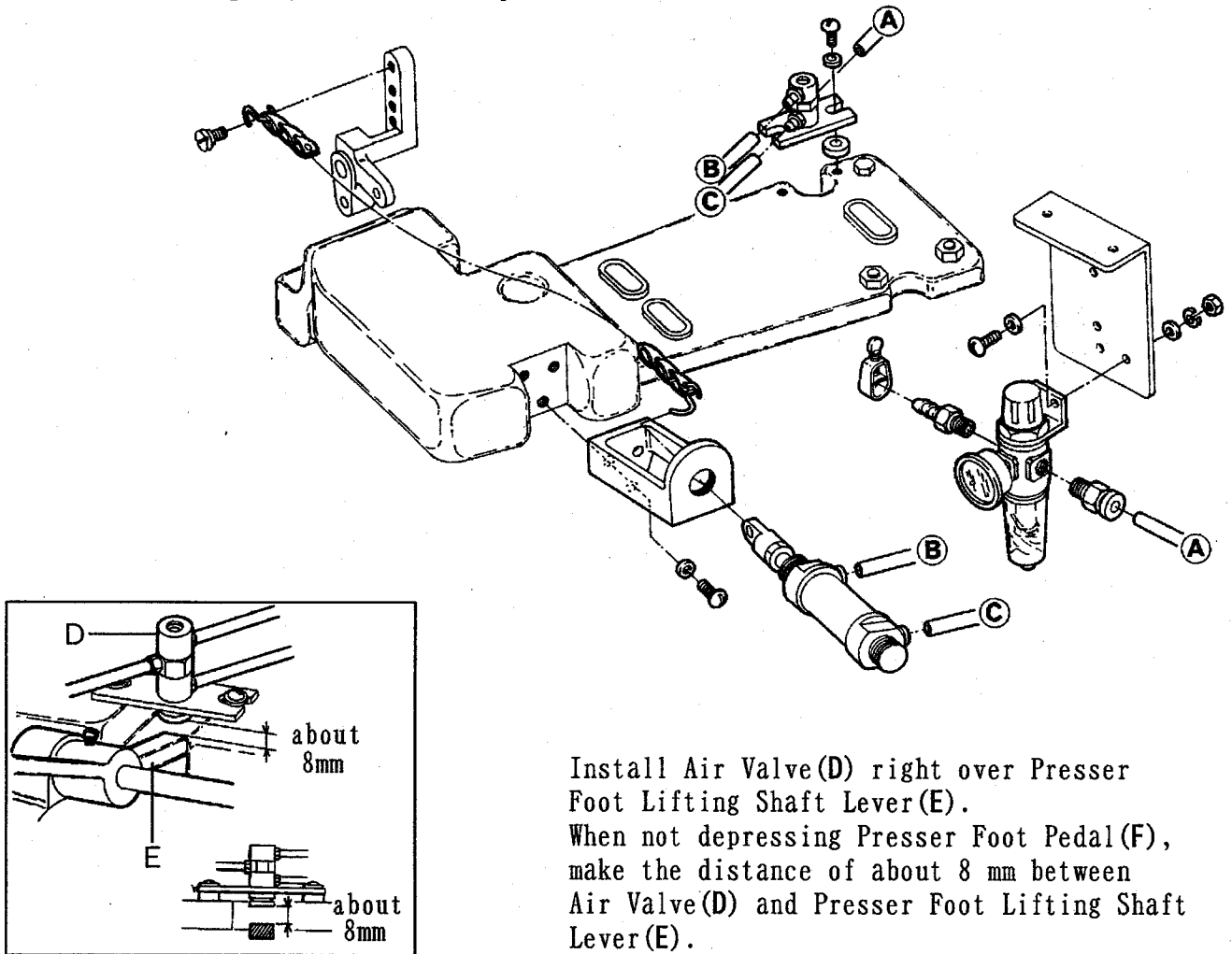
Note: When sewing, turn Toggle Switch(D) to 'PUSH'.

When adjusting, turn Toggle Switch(D) to 'TOGGLE'.



10-4 Installation of "FDL-1" Device

Refer to the figure, install each part.



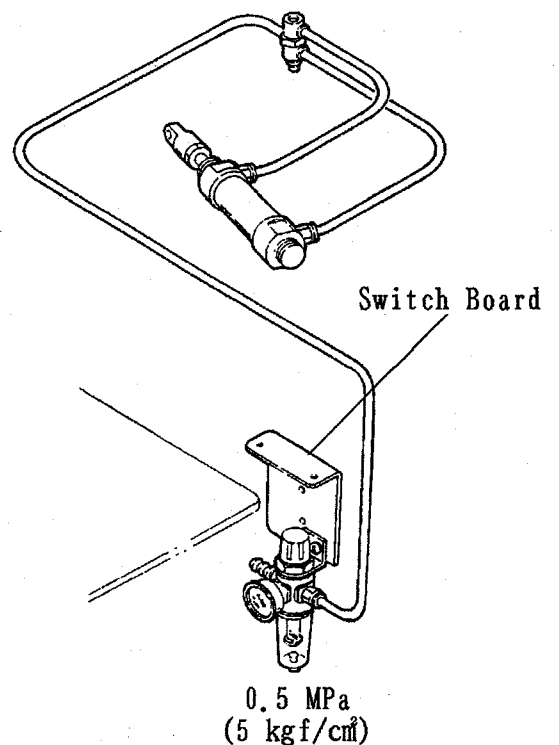
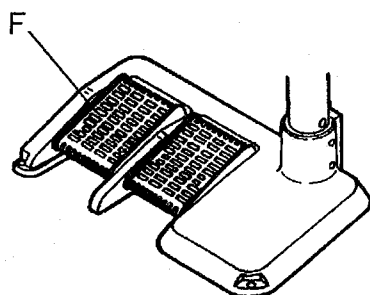
Install Air Valve (D) right over Presser Foot Lifting Shaft Lever (E).
When not depressing Presser Foot Pedal (F), make the distance of about 8 mm between Air Valve (D) and Presser Foot Lifting Shaft Lever (E).

10-5 Piping diagram for "FDL-1" Device

- (1) Install Regulator to Switch Board for Pedestal type.
- (2) The air pressure shall be set to 0.5 MPa (5 kgf/cm²).

10-6 Operation of "FDL-1" Device

When depressing Presser Foot Pedal (F) by toe, Air Cylinder operates to raise Presser Foot.

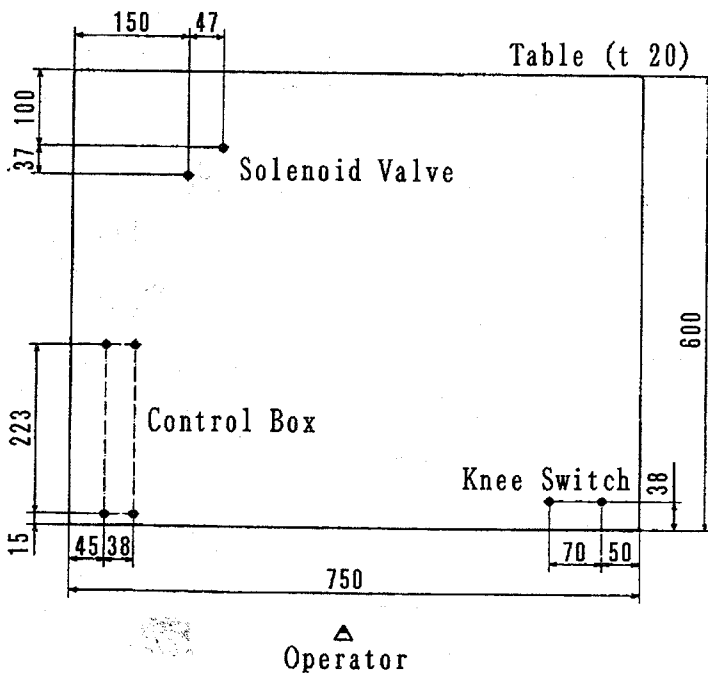
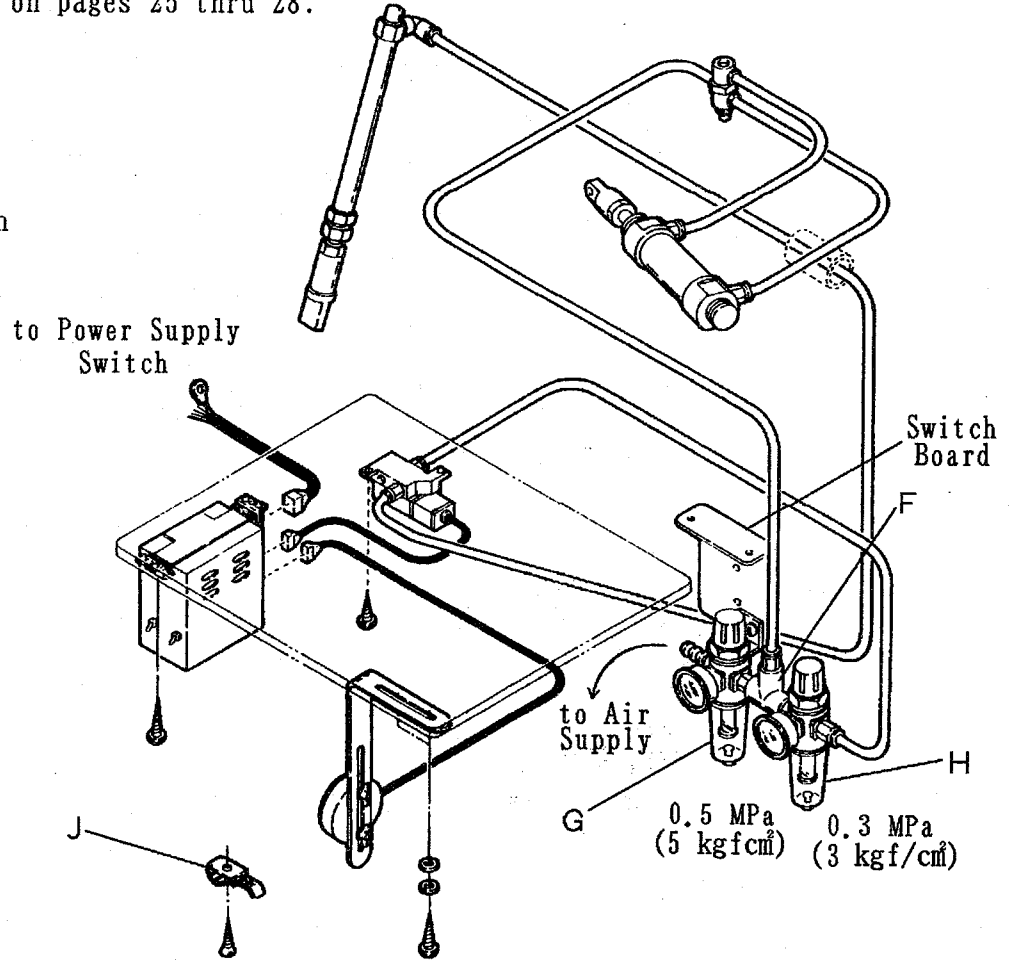


10-7 Wiring and piping diagram for both "AC1" and "FDL-1" Devices

- (1) Install Regulator(G) to Switch Board for Pedestal type.
- (2) Install the assembled T-Joint(F) to the Regulator(G) and then install the other Regulator(H) to the T-Joint(F).
- (3) The air pressure shall be set to 0.3 MPa (3 kgf/cm²) for "AC1" Device and 0.5 MPa (5 kgf/cm²) for "FDL-1" Device.

Note: For the installation and operation of the both Devices, refer to the items 10-1 thru 10-6 on pages 25 thru 28.

* Install Cord and Vinyl Tube to the under surface of Machine Table with UL Clamp(J).



1 1. Against troubles! (Causes and countermeasures)

Causes	Countermeasures	Page
A Skip-stitching		
Incorrect threading	Refer to "Threading"	13
Improper setting of Needle (Height and Facing)	Refer to "Setting of Needles"	12
Breakage or bend of needle point	Change defective needle for new one	
Improper relation between Needle and Looper	Refer to "Synchronization of Needle and Looper movement" and "Longitudinal position of Needle and Looper"	18 21
Wearing at point of Looper	Readjust by oilstone or emery paper, or change for new one	
Improper relation between Needle and Needle Guard	Refer to "Adjustment of Needle Guard"	21
Excessive strength or weakness of thread tension	Adjust the tension appropriately	
B Thread breakage		
Incorrect threading	Refer to "Threading"	13
Improper setting of Needle (Height and Facing)	Refer to "Setting of Needles"	12
Poor finish of groove and eye of Needle	Change defective Needle for new one	
Excessive strength of thread tension	Adjust the tension appropriately	
Poor quality of thread	Change thread for better one	
Improper relation between Needle and Looper	Refer to "Synchronization of Needle and Looper movement" and "Longitudinal position of Needle and Looper"	18 21
Thicker thread comparing with size of needle eye	Change thread or Needle for suitable ones	
Scratch on Needle, Looper, Stitch Plate, Presser Foot Tongue, Eyelet and etc.	Readjust by oilstone or emery paper, or change for new ones	
C Needle breakage		
Improper setting of Needle (Height and Facing)	Refer to "Setting of Needles"	12
Bend of Needle	Change defective needle for new one	
Improper relation between Needle and Looper	Refer to "Synchronization of Needle and Looper movement" and "Longitudinal position of Needle and Looper"	18 21
Improper relation between Needle and Needle Guard	Refer to "Adjustment of Needle Guard"	21

Causes	Countermeasures	Page
D Looseness on sewing finish		
Incorrect threading	Refer to "Threading"	13
Improper operation of Tension Discs	Clean dust inside Discs to be operated smoothly	
Improper relation between Needle and Loper	Refer to "Synchronization of Needle and Loper movement" and "Longitudinal position of Needle and Loper"	18 21
Improper positioning of Eyelets	Refer to "Tension of needle thread" and "Tension of looper thread"	17
E Lack of uniformity on sewing finish		
Incorrect threading	Refer to "Threading"	13
Uneven thickness of thread	Change thread for better one	
Poor finish of thread eye in Eyelets	Polish defective eyes by emery paper or the like	
Improper positioning of Eyelets	Refer to "Tension of needle thread" and "Tension of looper thread"	17
F Excessive wrinkles in sewing		
Excessive thickness of needle	Select suitable needle for thread and fabric	
Improper adjustment of differential ratio	Refer to "Adjustment of differential feeding"	15
Unsuitable pressure of Presser Foot	Refer to "Pressure of Presser Foot"	14
Excessive strength of thread tension	Adjust to obtain appropriate strength	
Incorrect fitting of Feed Dogs	Refer to "Setting and adjustment of Feed Dogs"	22
G Excessive opening on Needle penetration		
Bluntness of needle point	Change needle for new one	
Thicker needle comparing with fabrics	Change needle for thinner one	
Angular edge of needle drop hole in Stitch Plate	Round off the edge by emery paper or the like	
H Insufficient forming of thread chain		
Incorrect threading	Refer to "Threading"	13
Excessive strength or weakness of thread tension	Adjust tension suitably	
Improper positioning of Eyelets	Refer to "Tension of needle thread" and "Tension of looper thread"	17
Improper relation between Needle and Loper	Refer to "Synchronization of Needle and Loper movement" and "Longitudinal position of Needle and Loper"	18 21
Scratch on Stitch Plate Tongue and/or Presser Foot Tongue	Round off by emery paper or the like	
I Damages on fabrics by Feed Dogs		
Excessive sharpness of Feed Dogs	Round off by oilstone or the like	
Excessive pressure of Presser Foot	Adjust the pressure as weak as possible and refer to "Pressure of Presser Foot"	14

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