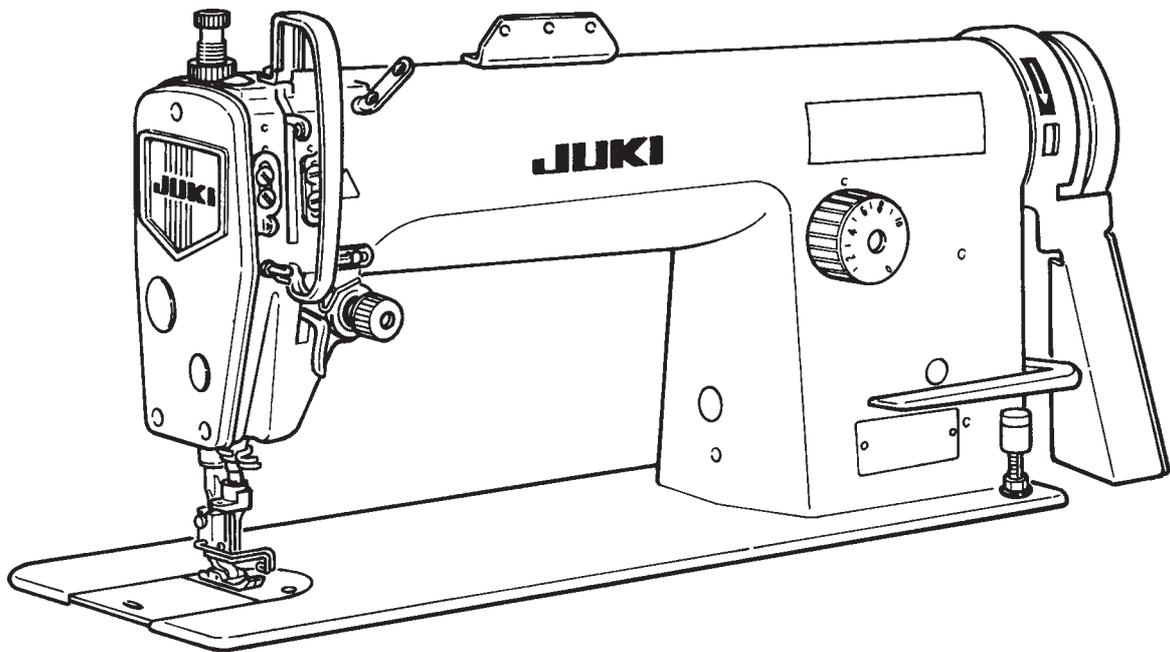


JUKI®

**Special 2-needle Pin-point
Saddle Stitch Machine**

MP-200N Series

ENGINEER'S MANUAL



29337300
No.E332-01

PREFACE

This Engineer's Manual is written for the technical personnel who are responsible for the service and maintenance of the machine.

The Instruction Manual for these machines intended for the maintenance personnel and operators at an apparel factory contains operating instructions in detail. And this manual describes "Standard Adjustment", "Adjustment Procedures", "Results of Improper Adjustment", and other important information which are not covered by the Instruction Manual.

It is advisable to use the relevant Instruction Manual and Parts List together with this Engineer's Manual when carrying out the maintenance of these machines.

In addition, for the motor for the sewing machine with thread trimmer, refer to the separate Instruction Manual or Engineer's Manual for the motor. And for the control panel, refer to the Instruction Manual for the control panel.

This manual gives the "Standard Adjustment" on the former page under which the most basic adjustment value is described, and on the latter page "Results of Improper Adjustment" under which stitching errors and troubles arising from mechanical failures are described together with the "Adjustment Procedures".

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1. SPECIFICATIONS

(1) MP-200N SERIES

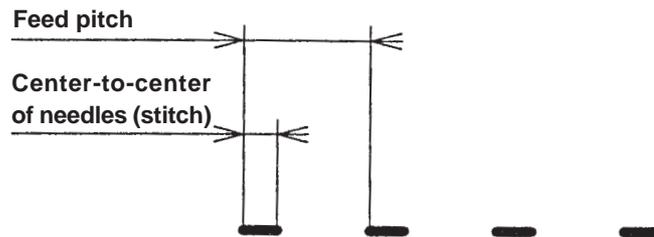
No.	Model name		Specifications	
			MP-200NS	MP-200NL
1	Machine type		Pin-point saddle stitch	
2	Application		For pin-point stitching of gents' suits, etc. (Light-weight to medium-weight materials)	For pin-point stitching for ladies' suits, etc. (Light-weight to medium-weight materials)
3	Sewing speed (normal sewing speed)		Max. 2,000 rpm (Normal 1,500 rpm)	Max. 1,500 rpm up to feed pitch 8 mm Max. 1,200 rpm when exceeding feed pitch 8 mm
4	Stitch length		3.5 to 10 mm Reverse feed stitching impossible	10 mm (When needle gauge is 5 mm) Reverse feed stitching impossible
5	Needle gauge		1.6 mm (standard), 2.0 mm (accessory) (Optional : 1.2 mm, 2.5 mm)	5.0 mm (standard) (Optional : 3.0 mm, 4.0 mm)
6	Needle	Sewing needle	SHEMETZ 29-C-150 Nm80 to Nm140 (Standard Nm90)	ORGAN CP X 1J #18U to #22U (Standard #22U)
		Hook needle	SCHMETZ 29-C-151 Nm80 to Nm140 (Standard (Nm100))	ORGAN CP X 12J #19 to #23 (Standard #23)
7	Applicable thread count		Tetron and spun threads/#60 to #30	Tetron and spun threads/#30 to #8
8	Lift of presser foot		Hand lifter : 5.5 mm Knee lifter : 12 mm	
9	Stitch adjusting method		Dial method	
10	Thread take-up lever		Link type	
11	Needle bar stroke		23.8 mm	
12	Feed mechanism		Rectangular feeding	
13	Main shaft/hook driving shaft drive		Bevel gear	
14	Lubrication		Manual	
15	Lubricating oil		New Defrix Oil No.2 (Equivalent to ISO VG32)	
16	Bed size		467 mm X 178 mm	
17	Space of sewing area		265 mm from needle entry point	
18	Handwheel size		V belt effective diameter : ϕ 67.4 mm	
19	Transmission belt		M type V belt	
20	Motor used		4P 400W motor (Motor with needle positioner can be used.)	
21	Table		Table for lockstitch machine can be used.	

Model		MP-200NS		MP-200NL	
Needle gauge (mm)		1.6		5	
Difference in level between needles (mm)		1.3		1.3	
Distance from top surface of throat plate (mm) *	Sewing needle	7	29C150	7	CPx1J
	Hook needle	5.7	29C151	5.7	CPx12J

* The distance from the top surface of the throat plate is when the needle bar is in its upper dead point.

2. STITCHES OF PIN-POINT SADDLE STITCHING

Pin-point saddle stitching is a stitching method that performs handsewn feeling with a single piece of thread. Imitation hand-stitch decorative stitching at low cost and with high productivity can be performed in the process where stitches of the wrong side such as decorative stitches of lapel on gents' coat or the like do not appear. For the pin-point saddle stitching, the stitches are formed by means of the concerted action of sewing needle, hook needle, spreader and looper. Distance between two needles becomes the stitch width. Distance of stitch plus the portion where stitch does not appear becomes feed pitch. Relation between stitch (center-to-center of needles) of product and pitch is as described below.



Stitch like a loop is formed since this machine is a single thread chainstitch machine, and the loop is formed on the sewn product. Accordingly, sewing is performed from the wrong side of product when sewing.

3. CAUTIONS ON SEWING

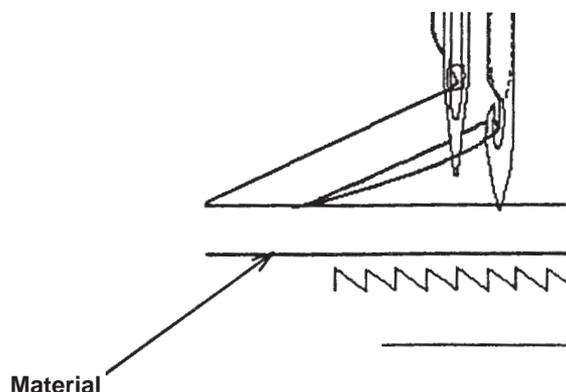
Conditions when performing curve stitching are deteriorated since sewing needle and hook needle pierce materials simultaneously. When sewing needle does not pierce the loop that the hook needle has hooked, stitch skipping may occur, or needle may be bent by materials and come in contact with spreader or looper. As a result, needle breakage, or damage of spreader or looper may occur.

The more the clearance between needle and needle widens, the more this tendency becomes apparent. In addition, be sure not to turn the material with the needle pierced. The needle is bent by the material and comes in contact with spreader or looper. As a result, needle breakage, damage of spreader or looper may occur. In addition, stitches are not formed, and stitching failures such as stitch skipping, thread breakage, fabric yarn breakage, etc. will occur.

4. CORNER STITCHING

Corner stitching making hook needle the center can be performed if the top end of hook needle slightly pierces the material while the hook needle hooks loop and sewing needle is in the loop when needle bar comes down.

Timing is very delicate and high technique is required. Perform carefully when you want to execute this stitching. In addition, the motor with needle positioner is recommended.

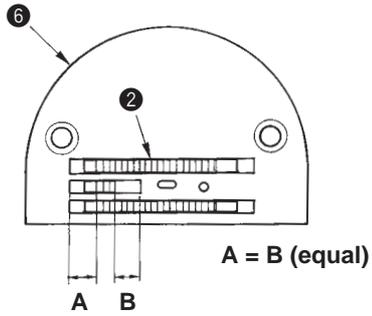


5. STANDARD ADJUSTMENT

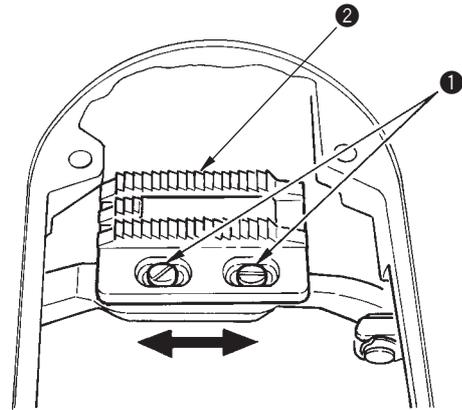
(1) Adjusting the position of the feed dog

Standard Adjustment

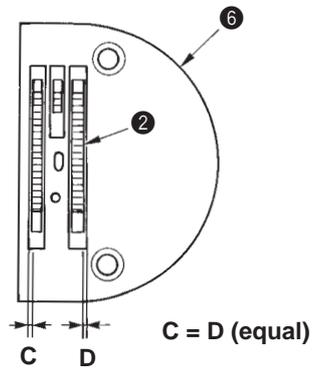
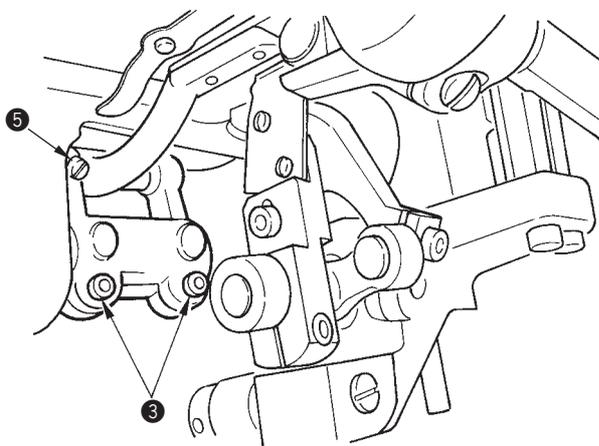
1) Adjusting the longitudinal position



Adjust feed dog ② so that it is longitudinally equal in terms of the groove for the feed dog of throat plate ⑥.

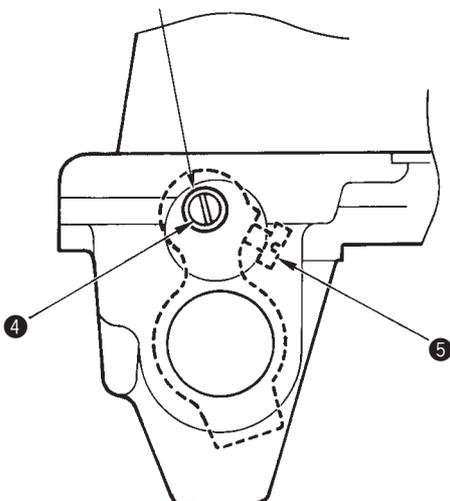


2) Adjusting the lateral position



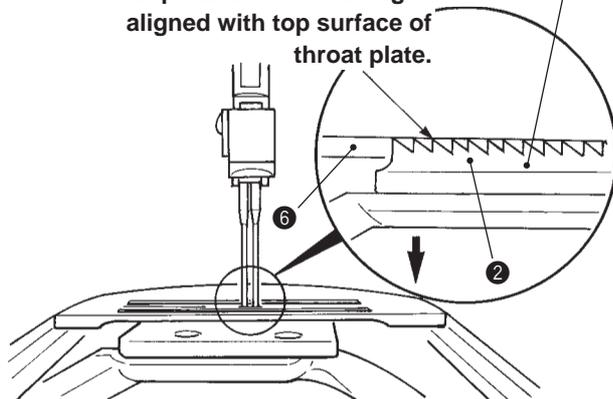
3) Adjusting the inclination

Hole in machine bed



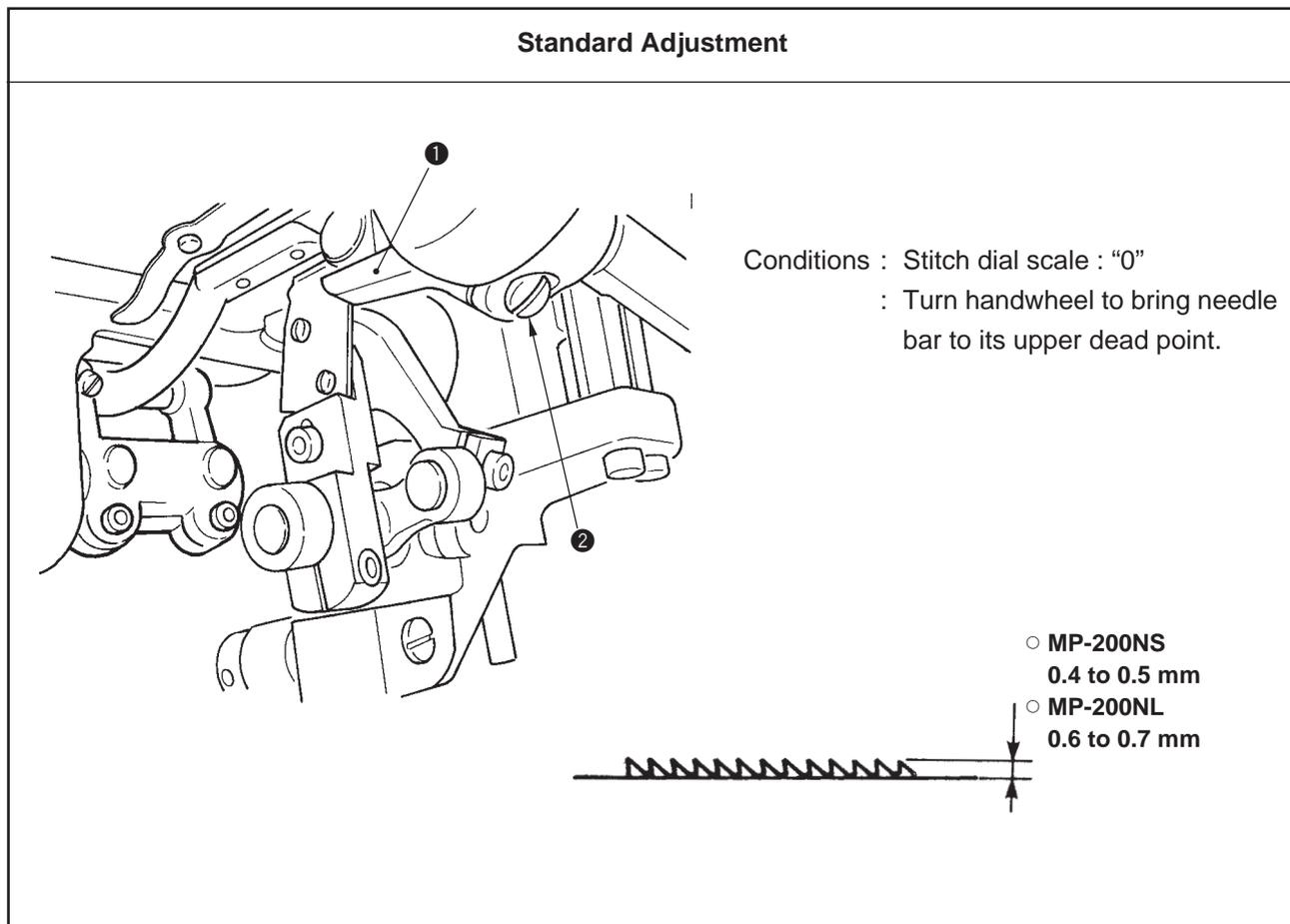
Top surface of feed dog is aligned with top surface of throat plate.

Feed dog is parallel to throat plate.

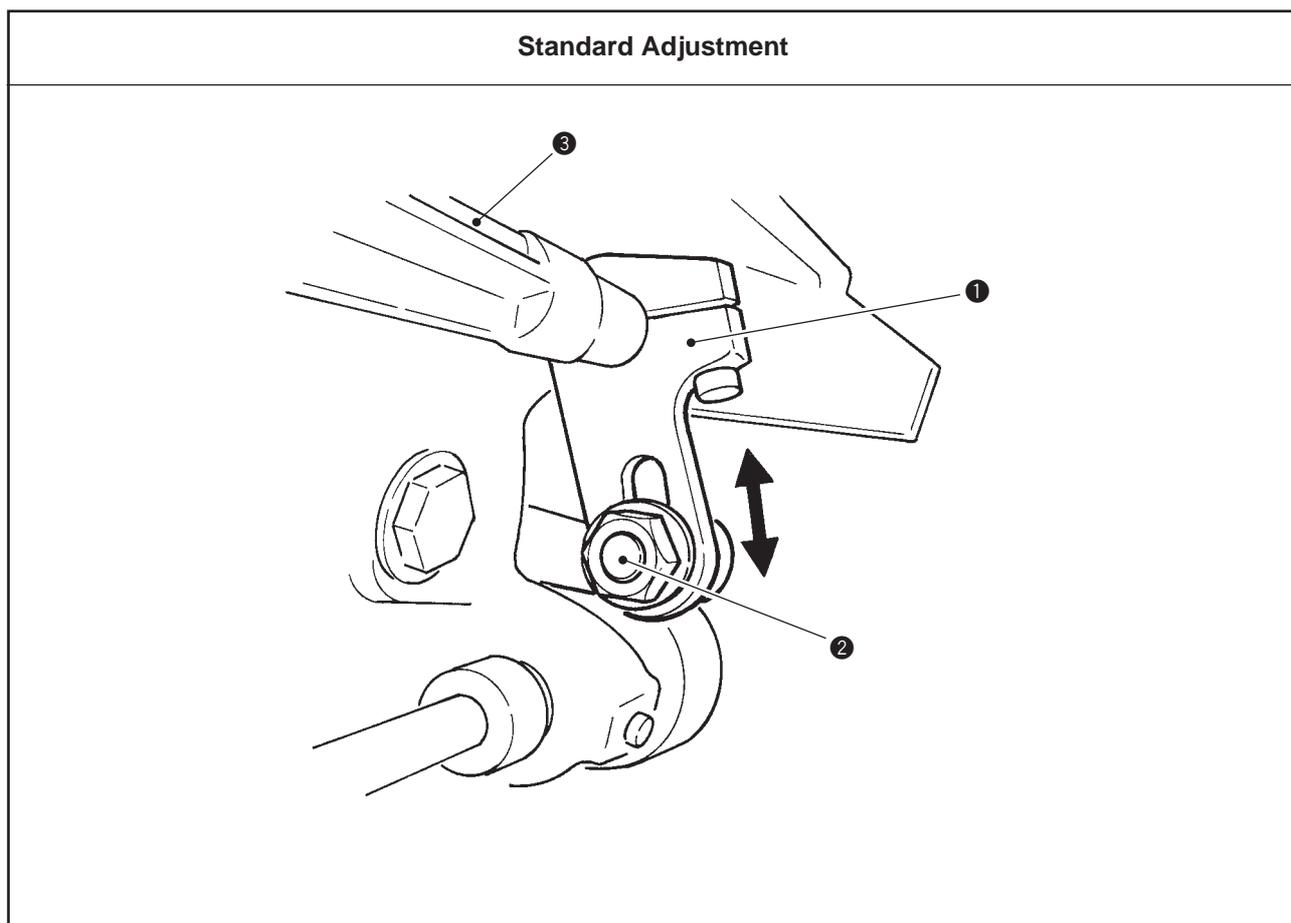


Adjustment Procedures	Results of Improper Adjustment
<p>1) Adjusting the longitudinal position</p> <ol style="list-style-type: none"> 1. Loosen two setscrews ② in the feed dog, move feed dog ② longitudinally (direction of the arrow mark), and adjust so that A is equal to B. 2. Set the stitch dial to the maximum 10 mm and check that throat plate ⑥ and feed dog ② do not interfere with each other. <p>(Caution) At the same time, check that there is no interference between the throat plate and the feed dog when the feed amount is maximum.</p> <p>2) Adjusting the lateral position</p> <ol style="list-style-type: none"> 1. Loosen two feed bar setscrews ③, move the feed dog to the left or right and adjust so that clearance between feed dog ② and throat plate ⑥ should be equal (C = D). <p>3) Adjusting the inclination</p> <ol style="list-style-type: none"> 1. Turn the handwheel and set it to the position where feed rock crank arm shaft ④ can be observed from the hole in the machine bed. 2. Loosen setscrew ⑤ in the feed rock crank arm shaft. 3. Turn feed rock crank arm shaft ④ using a screwdriver from the hole in the machine bed and adjust the inclination of feed dog ②. 4. Tighten setscrew ⑤ in the feed rock crank arm shaft at the position where the feed dog is parallel to throat plate ⑥ when top surface of throat plate ⑥ is aligned with that of feed dog ② when feed dog ② descends below the throat plate (direction of ↓). 5. Turn the handwheel by hand and check the inclination of feed dog ② after the adjustment. <p>(Caution) When the adjustment value at the time of delivery from the factory is changed, be sure to turn the handwheel by hand and check the inclination of feed dog ② before operation.</p>	<p>○ To incline the feed dog with its front up is effective to prevent puckering. To incline the feed dog with its front down reduces fabric yarn breakage of knit materials.</p>

(2) Adjusting the height of the feed dog



(3) Adjusting the vertical movement of the feed

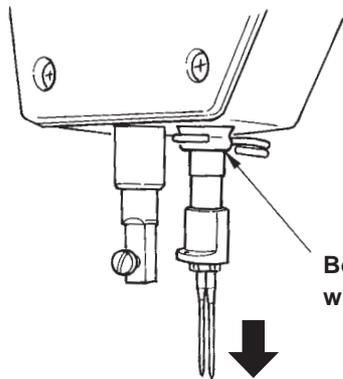


Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen setscrew ② in feed driving fork end ①, move feed driving fork end ① in the direction of rotation, and adjust the height of the feed dog.</p> <ul style="list-style-type: none"> ○ MP-200NS : 0.4 to 0.5 mm ○ MP-200NL : 0.6 to 0.7 mm <p>(Caution) When adjustment has been performed, operate the machine after carefully checking whether the feed dog does not come in contact with other parts.</p>	

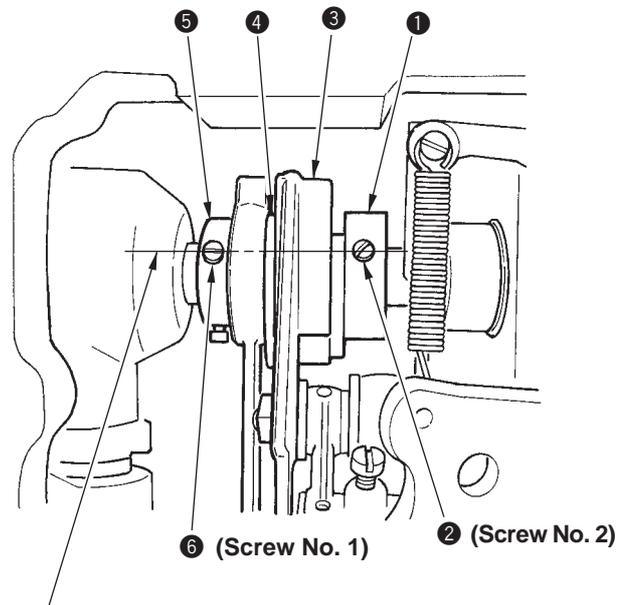
Adjustment Procedures	Results of Improper Adjustment
<p>1. Adjust the vertical movement of the feed at the position of lock nut ② in the long hole of feed driving shaft rear arm ①.</p> <p>2. When the lock nut is tightened on the side of feed driving shaft ③ in the long hole, the movement is increased, and when it is tightened on the outside (extreme top end of the long hole), the movement is decreased.</p> <ul style="list-style-type: none"> ○ MP-200NS : To fix at the extreme top end of the long hole (Minimum feed movement) ○ MP-200NL : To fix at the position of approximately 1/3 from the side of top end of the long hole. <p>(Caution) Check that there is no contact between feed dog, loop guide and spreader.</p>	<ul style="list-style-type: none"> ○ When the vertical movement is increased, it is improved for thick thread or cloth to be caught on the feed dog. ○ To raise the feed dog and to increase the vertical movement as well are effective when stitch gathering occurs with heavy-weight material, overlapped section, etc. ○ To decrease the vertical movement of the feed dog can control the flopping of material by the feed dog. As a result, it is effective for the process where light-weight material or straight sewing is required.

(4) Feed cam timing

Standard Adjustment

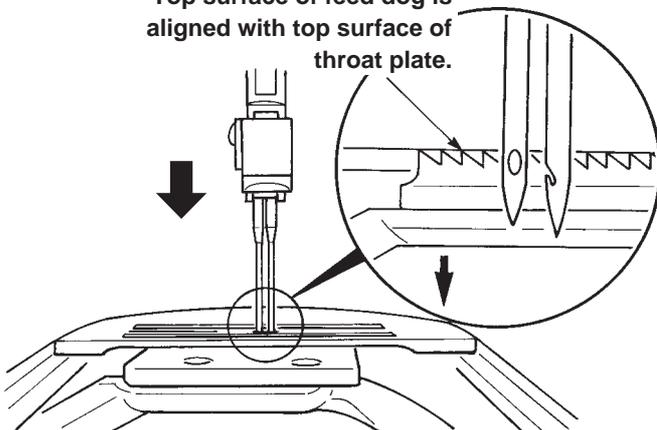


Bottom end of metal is aligned with 4th engraved marker line.



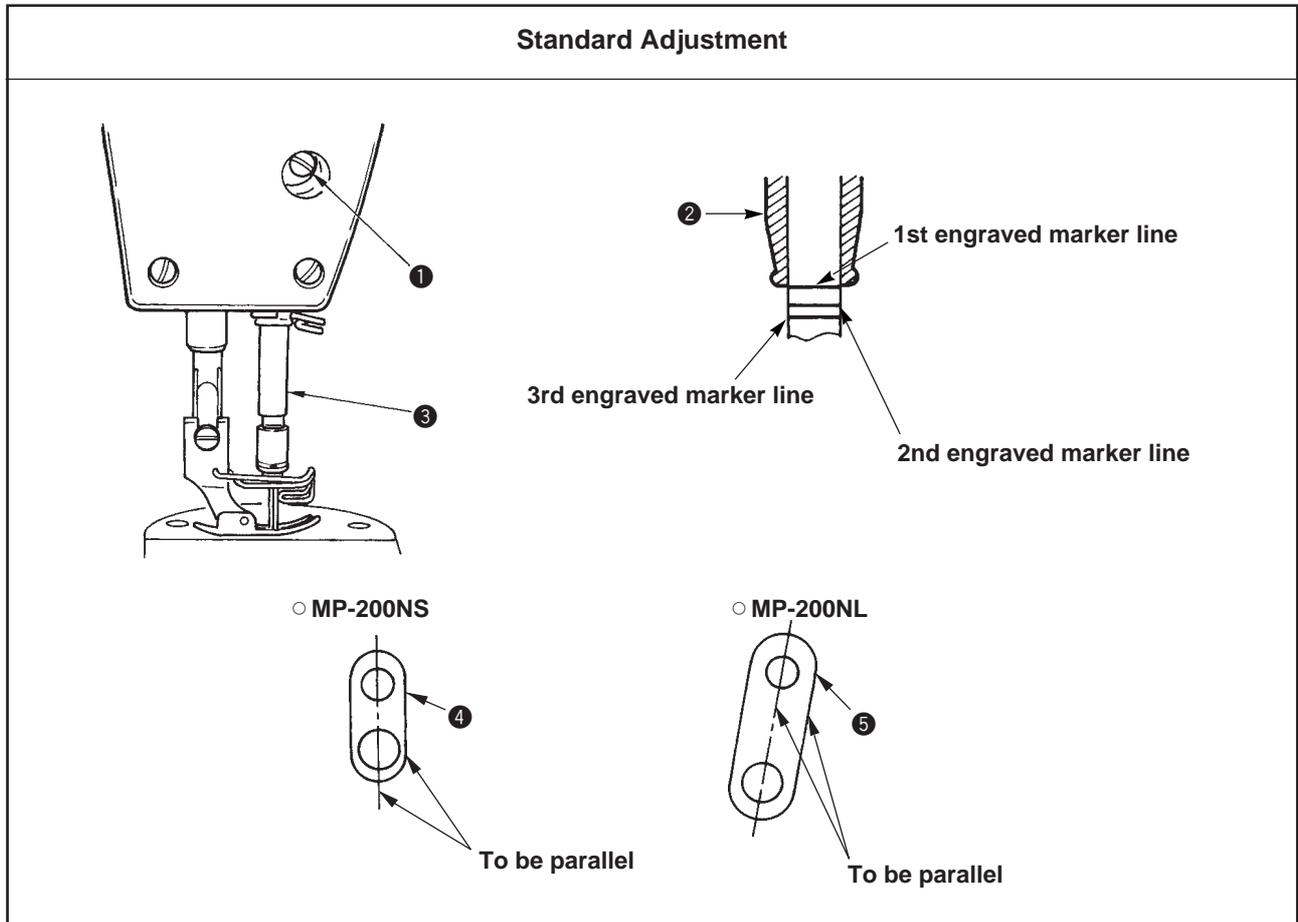
Standard : ② and ⑥ are almost aligned with each other.

Top surface of feed dog is aligned with top surface of throat plate.

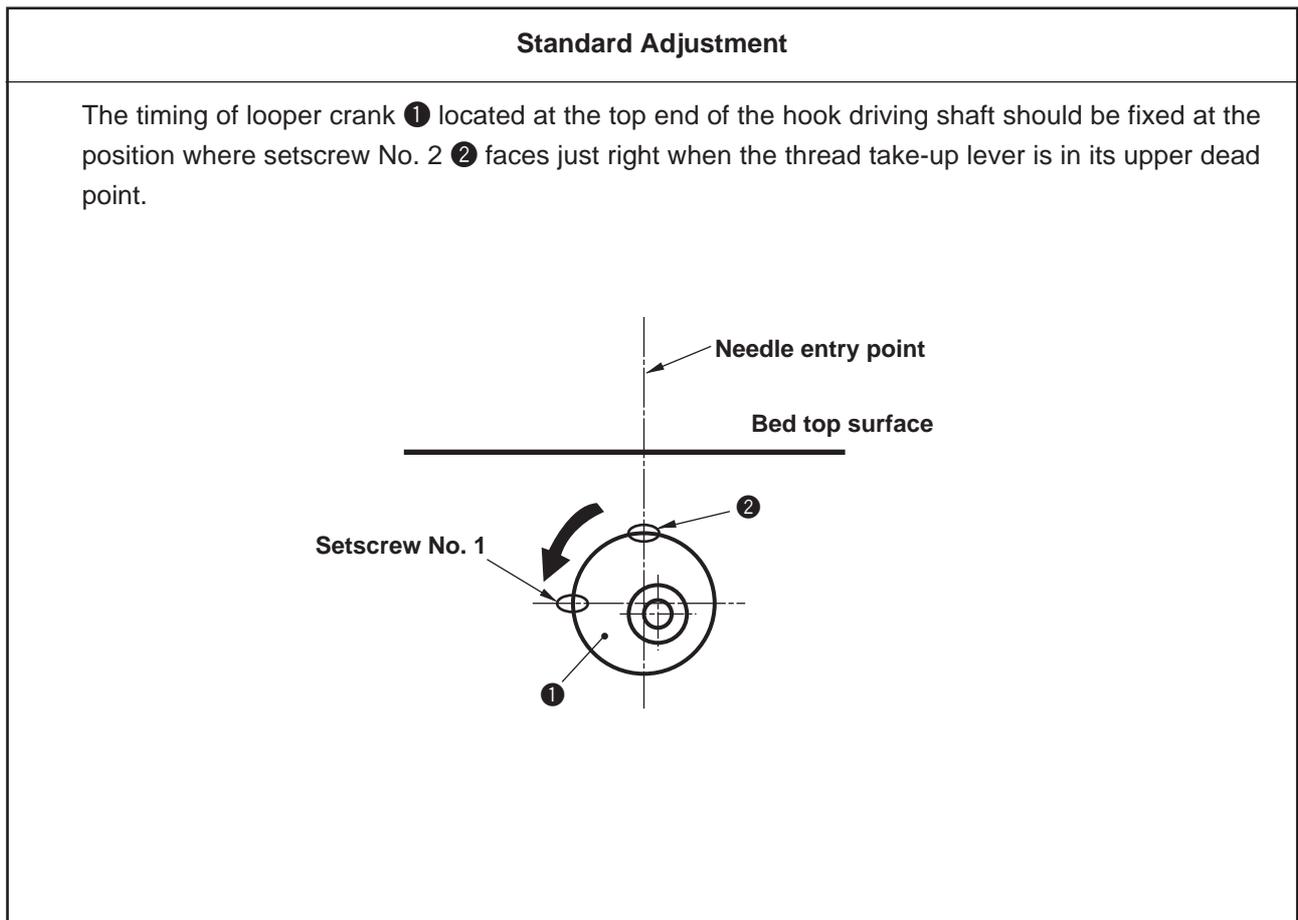


Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Adjust the timing of feed rock triangle cam ❶ to the position where the feed dog does not move even moving the reverse feed lever up or down when the 4th engraved marker line (lowest marker line) is aligned with the bottom end of the metal when the needle bar comes down. 2. Loosen two setscrews ❷ in feed rock triangle cam ❶. 3. Turn the handwheel with feed rock triangle cam ❸ fixed in the normal rotational direction to retard the feed timing, or in the reverse direction to advance the feed timing. 4. Install feed rock triangle cam ❸ so that the edge of feed rock rod ❸ comes in contact with feed eccentric cam side plate ❹ of feed rock triangle cam ❶. <p>(Caution) Turn the main shaft and check that there is no skew between feed rock rod ❸ and feed eccentric cam side plate ❹.</p> <ol style="list-style-type: none"> 5. To adjust the timing of feed driving cam ❺, stop the cam at the position where the top surface of the feed dog is aligned with the top surface of the throat plate when the top end of needle eyelet of the sewing needle is aligned with the top surface of the throat plate while the needle bar descends. (Alignment of three points) 6. Loosen two setscrews ❻ in feed driving cam ❺. 7. Turn the handwheel with feed driving cam ❺ fixed in the normal rotational direction to retard the timing of the vertical movement, or in the reverse direction to advance the timing. 	<ul style="list-style-type: none"> ○ When loop is not tightened in overlapped section sewing, retard the feed timing. Then feed tightening is applied and loop is tightened. ○ If the timing is excessively advanced or retarded, the sewing product is fed when the needle is pierced. As a result, needle breakage, bend of spreader, etc. will occur. ○ When the timing between feed rock triangle cam ❶ and feed driving cam ❺ is not proper, return is applied to the feed dog at the end of feed or at the start of feed. As a result, stitch skipping will be caused.

(5) Height of the needle bar



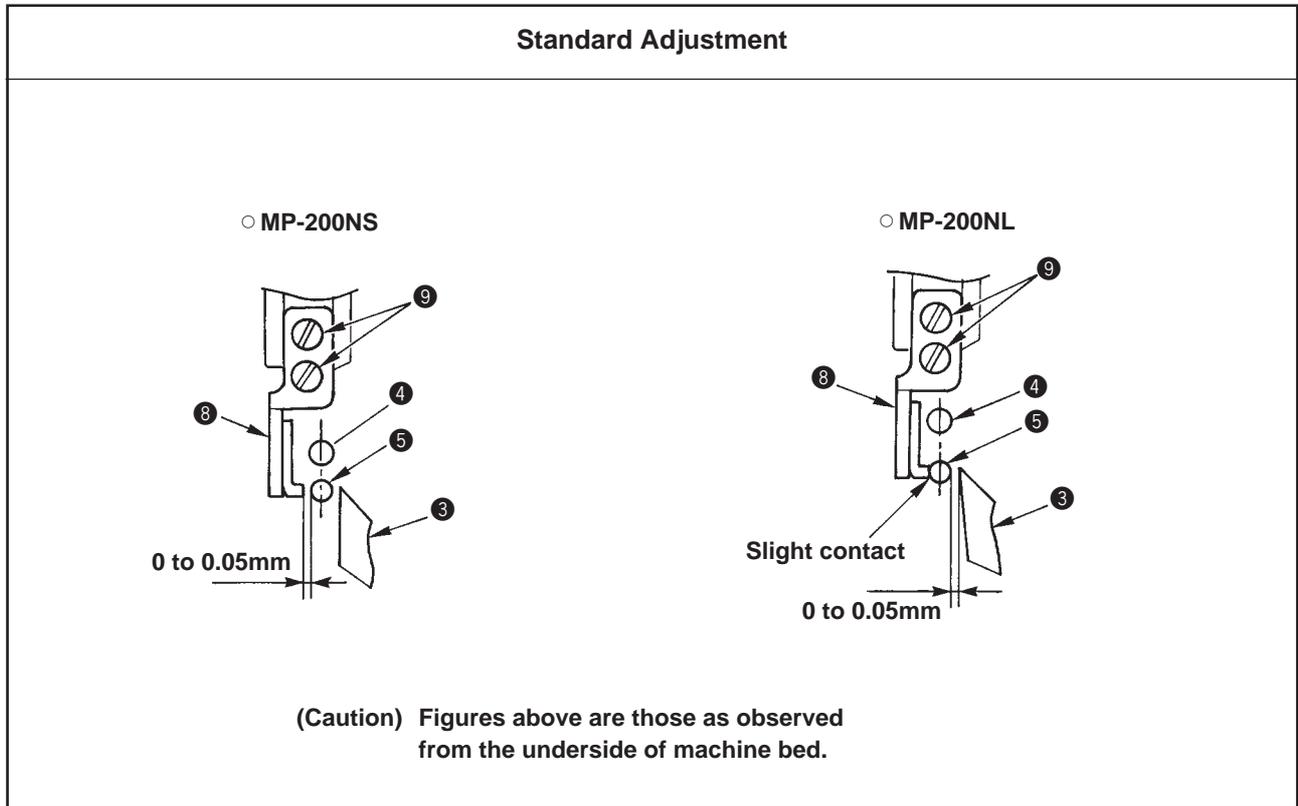
(6) Looper crank timing



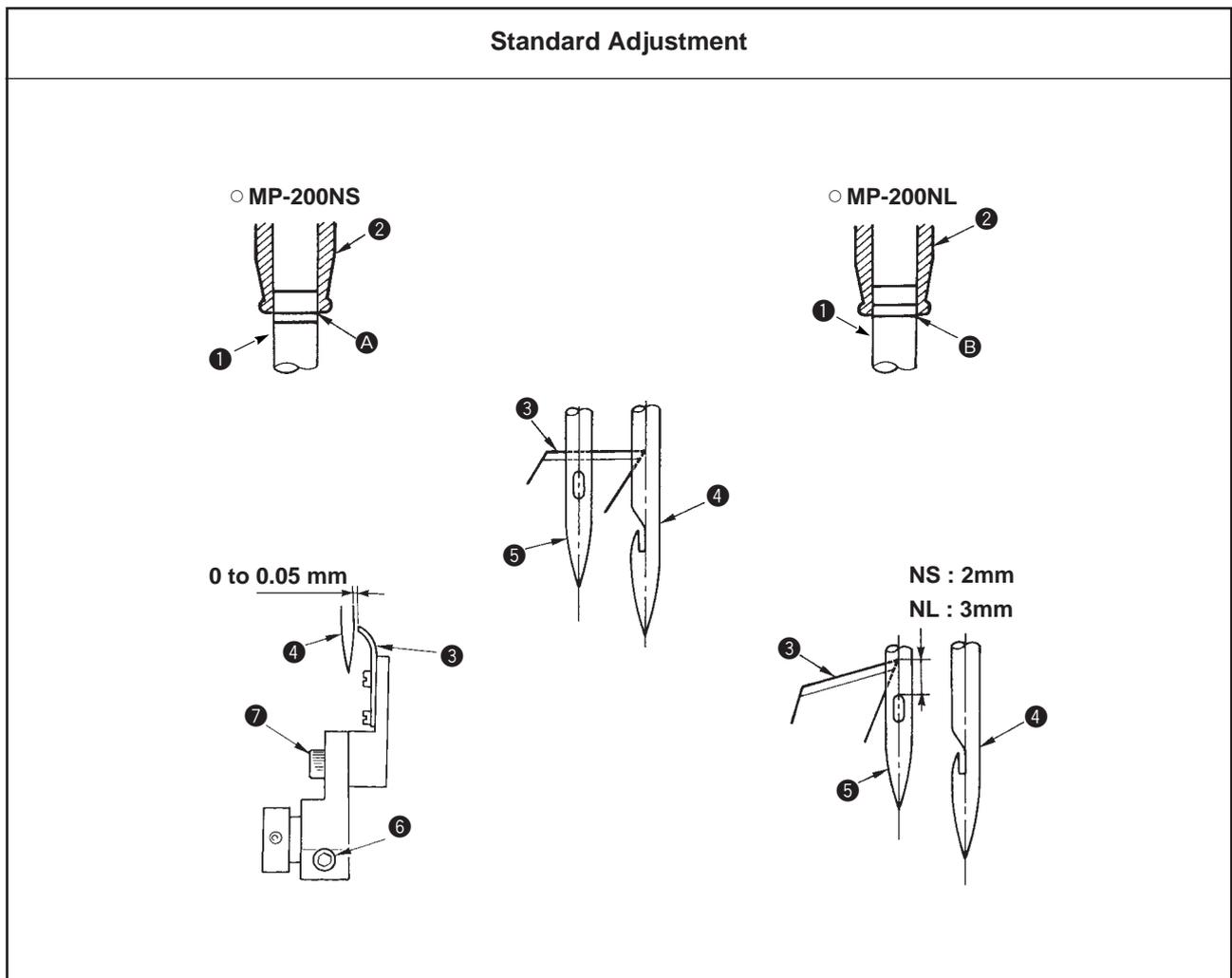
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Height of needle bar ③ is adjusted to the position where the 1st engraved marker line located at the top on needle bar ③ has come to the bottom end of needle bar lower metal ② when the needle bar is in its lower dead point. 2. Remove the rubber plug located on the right side in the face plate and loosen setscrew ① in the needle bar bracket to adjust the height. <ul style="list-style-type: none"> ○ MP-200NS After adjusting the 1st engraved marker line, turn needle bar ③ so that two needles enter in parallel to needle hole ④ in the throat plate to adjust the height. ○ MP-200NL After adjusting the 1st engraved marker line, turn needle bar ③ so that two needles enter in parallel to slanted needle hole ⑤ in the throat plate to adjust the height. 3. After the adjustment, securely tighten setscrew ①. 	

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Remove the throat plate and loosen two setscrews in looper crank ①. Turn the handwheel and stop it at the position where the thread hole of thread take-up lever is highest. 2. Stop the position where setscrew No.2 ② in looper crank ① faces just right. 	<ul style="list-style-type: none"> ○ Fine adjustment of the looper timing can be performed by means of the looper crank.

(7) Position of the loop guide



(8) Adjusting the needle and the looper



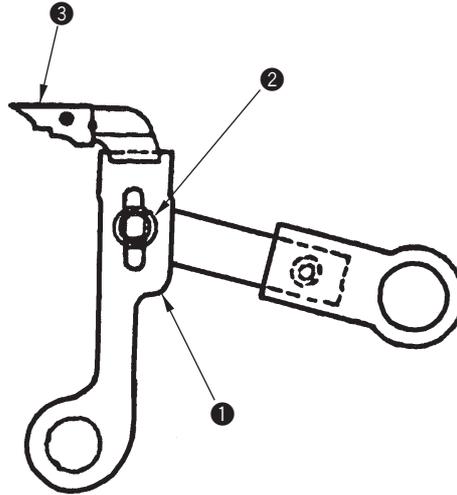
Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen setscrews ⑨ in the loop guide and adjust loop guide ⑧ to the position on the just side of sewing needle ⑤.</p> <ul style="list-style-type: none"> ○ MP-200NS <p>Adjust the position so that the clearance between loop guide ⑧ and sewing needle ⑤ is 0 to 0.05 mm, and tighten setscrews ⑨ in the loop guide.</p> <ul style="list-style-type: none"> ○ MP-200NL <p>Make looper guide ⑧ slightly come in contact with sewing needle ⑤ so that the clearance between sewing needle ⑤ and the top end of looper ③ is 0 to 0.05 mm, and tighten setscrews ⑨ in the loop guide.</p> <p>(Caution) After the adjustment, check whether the spreader does not come in contact with loop guide ⑧ when the spreader advanced the most.</p>	<ul style="list-style-type: none"> ○ If the clearance is excessively large, stitch skipping will occur, or chain-off thread will be unstable. ○ If the loop guide strongly comes in contact with the needle, needle breakage will occur.

Adjustment Procedures	Results of Improper Adjustment
<p>1. ○ MP-200NS</p> <p>Turn the handwheel in the normal rotational direction from the lowest point of the needle bar and align the 2nd engraved marker line A of the second from the top of needle bar ① with the bottom end of needle bar lower metal ②.</p> <ul style="list-style-type: none"> ○ MP-200NL <p>Turn the handwheel in the normal rotational direction from the lowest point of the needle bar and align the 3rd engraved marker line B of the third from the top of needle bar ① with the bottom of needle bar lower metal ②.</p> <p>2. In the state of step 1., loosen looper holder clamping screw ⑥ and adjust so that the top end of looper ③ is aligned with the center of hook needle ④.</p> <p>3. Adjust the clearance between the top end of looper ③ and hook needle ④ to 0 to 0.05 mm and tighten looper holder clamping screw ⑥.</p> <p>4. Turn the handwheel in the normal rotational direction from the lowest point of the needle bar and align the top end of looper ③ with the center of sewing needle ⑤.</p> <p>5. Loosen looper installing base setscrew ⑦ and adjust the top end of looper ③ to NS : 2 mm and NL : 3 mm from the top end of needle eyelet of sewing needle ⑤. Then tighten looper installing base setscrew ⑦.</p> <p>(Caution) After performing the adjustment related to looper ③, be sure to turn the handwheel by hand and operate the machine after checking that the respective parts do not come in contact with each other.</p>	<ul style="list-style-type: none"> ○ When the adjustment value is improper, stitch skipping or defective chain-off thread will be caused.

(9) Adjusting the stroke of the spreader

Standard Adjustment

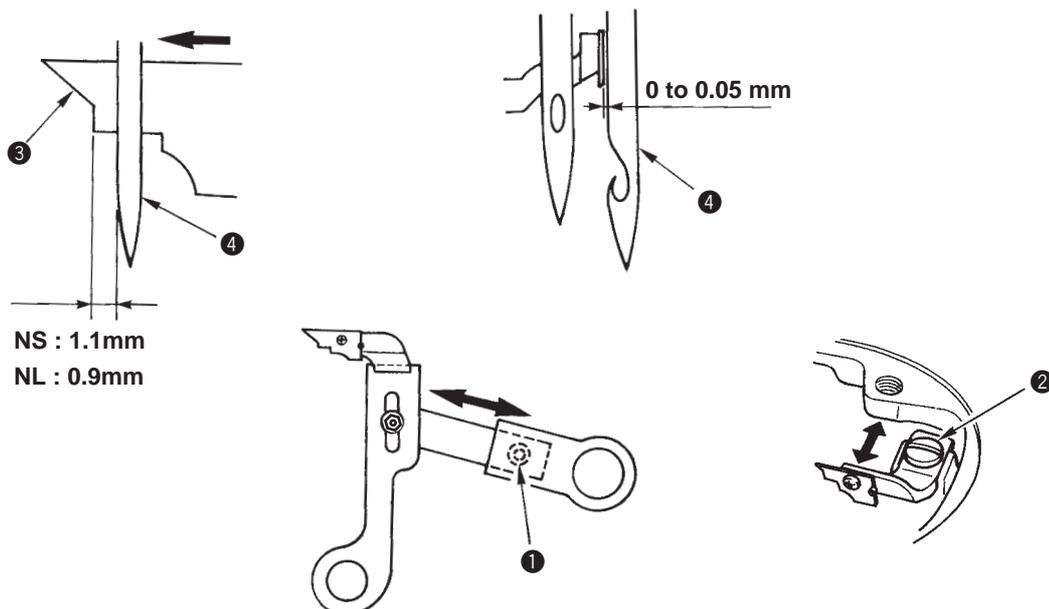
Fulcrum position of spreader arm ① can change the stroke of spreader ③ by changing the position of hexagon nut ②. The standard position is the center of slot.



(10) Adjusting the needle and the spreader

Standard Adjustment

Most advanced position of spreader



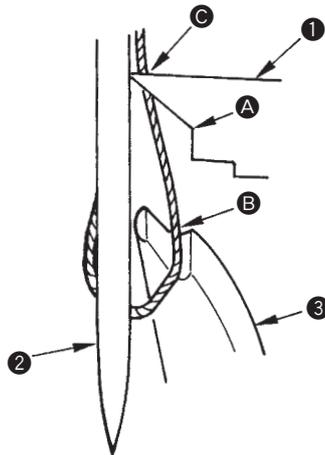
Adjustment Procedures	Results of Improper Adjustment
<p>1. Fulcrum shaft can be moved by loosening hexagon nut ❷.</p> <ul style="list-style-type: none"> ○ Lower the position downward to increase the stroke of the spreader, or lift it to upward to decrease the stroke. <p>(Caution) When adjustment is performed, it is necessary to check the timing of the spreader and the looper (11) and (12).</p>	<ul style="list-style-type: none"> ○ If the stroke is excessively large, the spreader arm will come in contact with the machine bed. ○ If the stroke is excessively small, return of thread hooking will be retarded.

Adjustment Procedures	Results of Improper Adjustment
<p>1. Adjust the most advanced position of spreader ❸ to the state that the flat portion of spreader ❸ is projected NS : 1.1 mm and NL : 0.9 mm from hook needle ❹.</p> <p>Loosen screw ❶ in the spreader driving link and adjust the position by the length of the link.</p> <p>2. Loosen setscrew ❷ in the spreader installing base and adjust the clearance provided between spreader ❸ and hook needle ❹ to 0 to 0.05 mm.</p>	

(11) Timing of relationship among the needle, looper and spreader

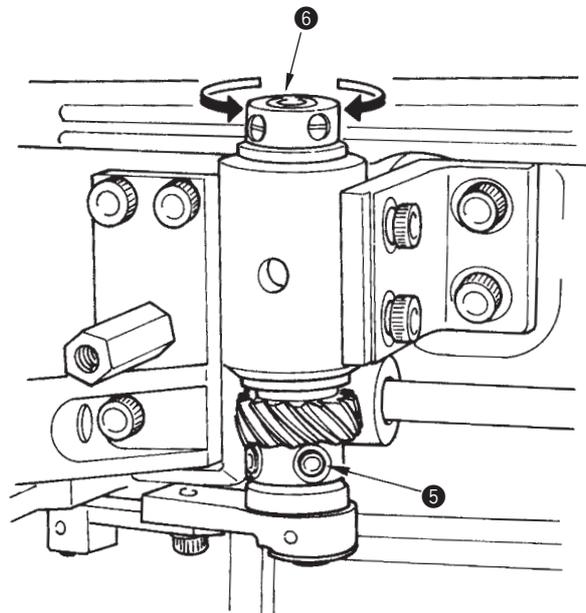
Standard Adjustment

1. Perform the adjustment while carefully confirming whether components come in contact with one another.
2. Sew by turning by hand the actual sewing product with the thread actually used, and confirm the result to adjust.



(12) Adjusting the spreader timing

Standard Adjustment



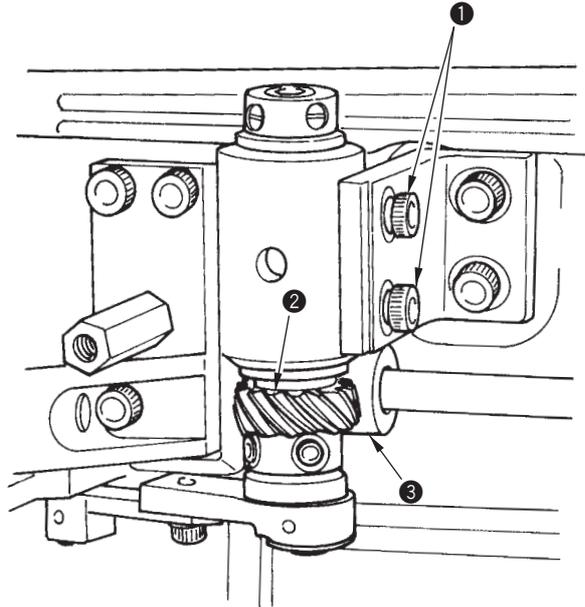
Adjustment Procedures	Results of Improper Adjustment
<p>Stretch thread between section A of spreader 1 and section B of the looper, and hook thread on hook needle 2. Turn by hand the sewing machine to perform two to three stitches, and confirm the loop which is made on the needle top.</p> <ol style="list-style-type: none"> 1. Adjust so that when the loop of needle thread is hooked on thread groove B by looper 3, simultaneously top end C of spreader 1 catches the thread. 2. When the loop is large and the thread cannot be caught on thread groove B of looper 3, advance the timing of spreader 1. 3. On the contrary, when the loop is small and the thread cannot be caught on thread groove B of spreader 3, delay the timing of spreader 1. Adjust so that spreader 1 securely catches the loop and carries it to hook needle 2. <p>(Caution) After performing adjustment related to looper 3 and spreader 1, be sure to turn the handwheel by hand and operate the machine after checking that the respective parts do not come in contact with each other.</p>	<ul style="list-style-type: none"> ○ Stitch skipping will occur when the loop at the needle top is large or small.

Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen setscrew 5 in the spreader driving gear, and turn thrust collar 6 clockwise to delay spreader timing. Turn it counterclockwise to advance the timing. Tighten setscrew 5 at the timing when the loop is sent well to the hook needle. <p>(Caution) When tightening setscrew 5 in the gear, the torque is increased when the play in the spreader crank shaft is excessively small, and the play occurs at the top end of the spreader when the play is excessively large.</p>	

(13) Adjusting the backlash of the spreader gear

Standard Adjustment

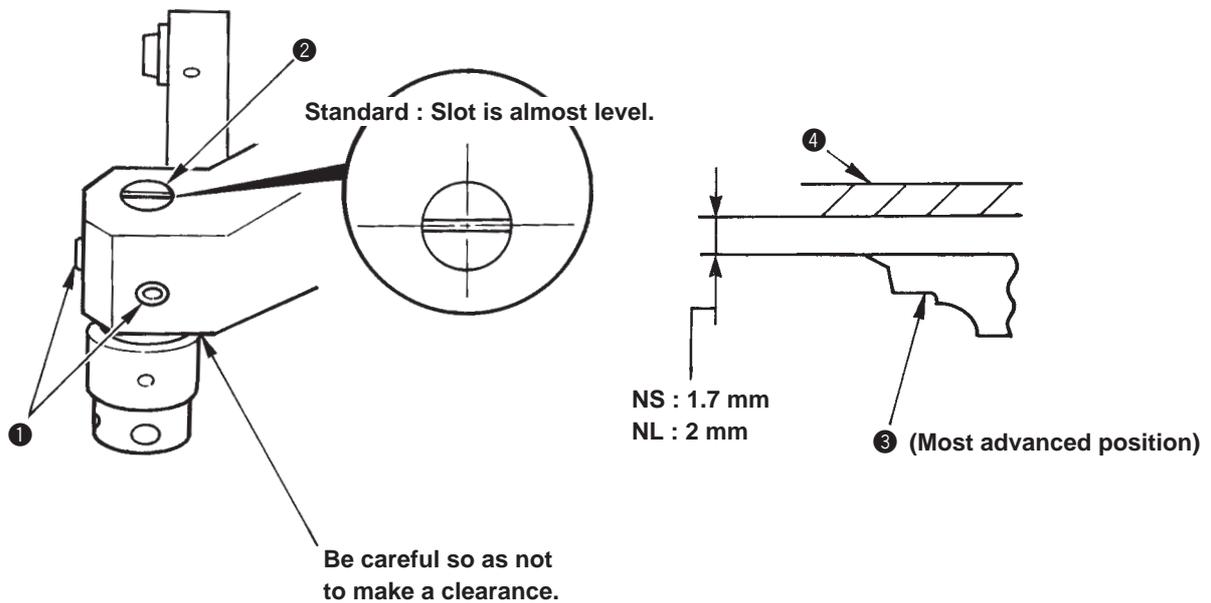
A backlash of approximately 1° between hook driving shaft gear ③ and spreader gear ② should be kept.



(14) Adjusting the height of the spreader

Standard Adjustment

Height of spreader ③ can be adjusted by turning spreader eccentric shaft ②.



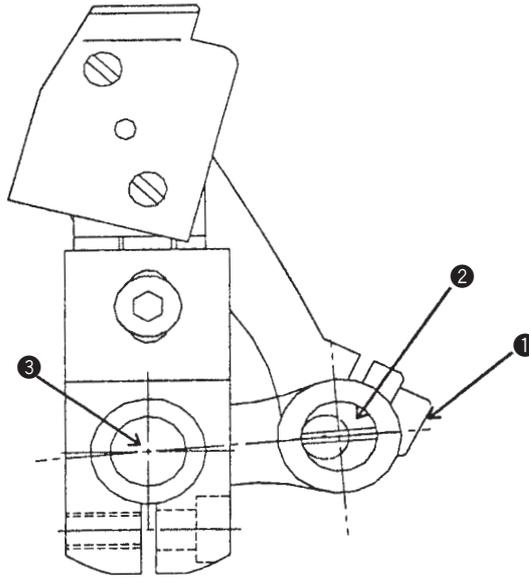
Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen setscrews ❶ in the spreader crank shaft case and move the case to adjust the backlash. Move the case near the hook driving shaft to decrease the backlash and move it away from the shaft to increase the backlash.</p>	<ul style="list-style-type: none"> ○ If the backlash is small, main shaft torque will increase. ○ If the backlash is large, play of the spreader will increase. ○ When the backlash is either small or large, groaning noise of the gear will occur.

Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen two setscrews ❶ and turn spreader eccentric shaft ❷ to adjust the height of spreader ❸.</p> <ul style="list-style-type: none"> ○ Turn it clockwise to increase the height, or counterclockwise to decrease the height. <p>2. Adjust the clearance from the bottom surface of throat plate ❹ to the top surface of spreader ❸ is NS : 1.7 mm and NL : 2 mm at the most advanced position of spreader ❸.</p> <p>3. Holding spreader eccentric shaft ❷ so that it does not slip out from the base, adjust the height.</p>	<ul style="list-style-type: none"> ○ If the height is excessively high, the spreader will come in contact with the feed dog. ○ If the height is excessively low, the spreader will come in contact with the looper or the loop guide. ○ Even if the height is either excessively high or excessively low, the hook needle may not hook thread.

(15) Position of the looper link eccentric pin

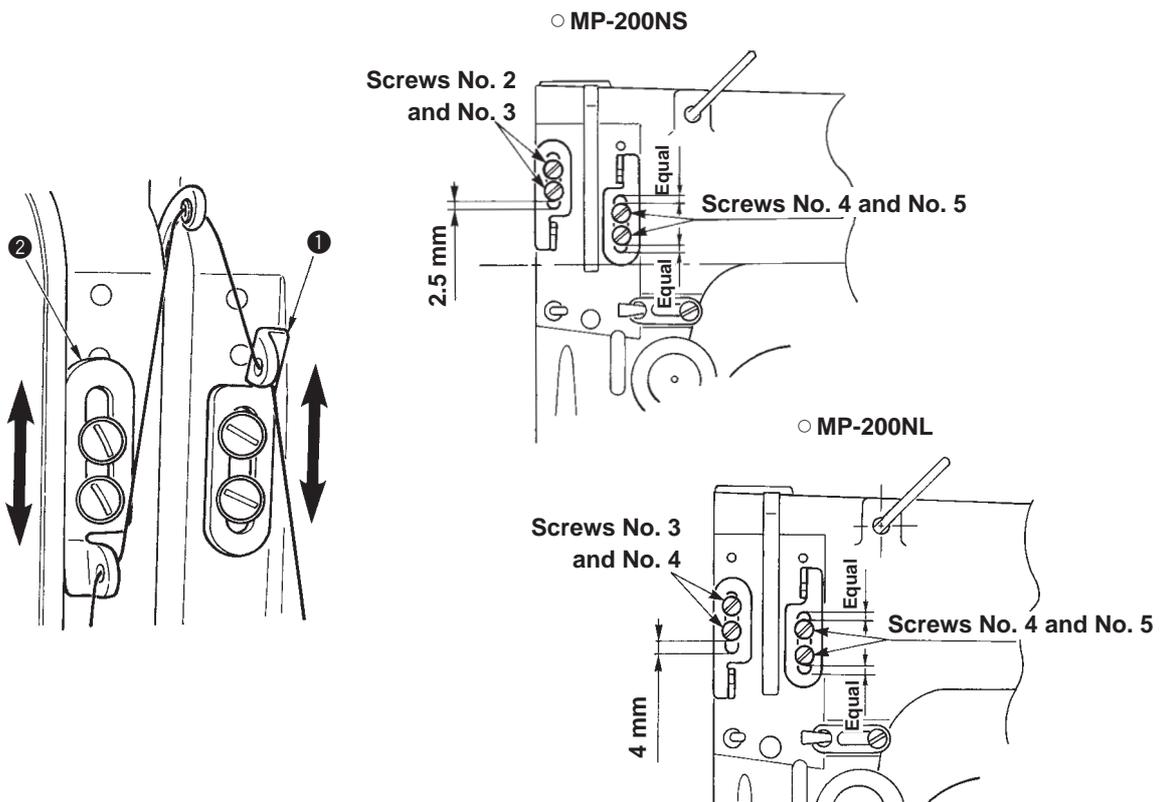
Standard Adjustment

Position of looper link eccentric pin ② is adjusted to the maximum stroke of the looper (stroke is large) at the time of delivery from the factory.



(16) Adjusting the thread take-up thread guide

Standard Adjustment

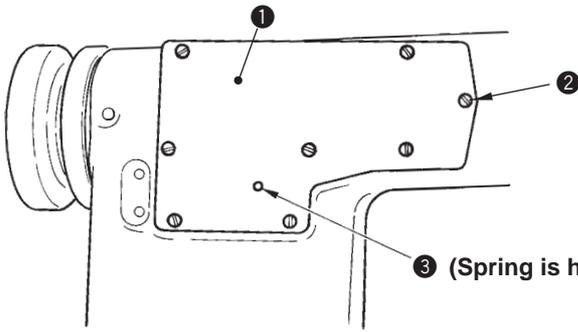


Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Loosen screw ❶ and turn looper link eccentric pin ❷ to change the stroke of the looper. 2. The stroke is increased when the pin is near the shaft center of looper link ❸, and the stroke is decreased when the pin is away from the shaft center of the link. 3. This procedure can be used for fine adjustment of the looper. As a matter of course, however, the stroke of the looper changes. 	<ul style="list-style-type: none"> ○ If the looper stroke is excessively small, return of the looper is retarded and defective stitching will occur.

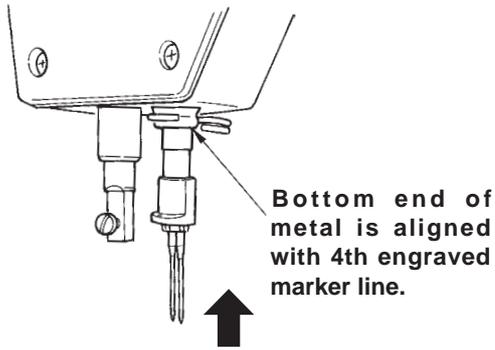
Adjustment Procedures	Results of Improper Adjustment
<ol style="list-style-type: none"> 1. Adjusting the loop <ol style="list-style-type: none"> (1) The size of loop can be adjusted with thread take-up thread guide (right) ❶. (2) For both MP-200NS and NL, the clearances between thread take-up guide (right) ❶, screw No. 4, and screw No. 5 are equal. <ul style="list-style-type: none"> ○ To increase the loop, adjust by lowering thread take-up thread guide (right) ❶. ○ To decrease the loop, adjust by raising thread take-up thread guide (right) ❶. 2. Adjusting the stitch tightness <ol style="list-style-type: none"> (1) Stitch tightness condition of the right side (wrong side at the time of sewing) of sewing product can be adjusted with thread take-up thread guide (left) ❷. (2) MP-200NS : The clearances between thread take-up guide (left) ❷, Screw No. 2 and screw No. 3 are vertically equal. (Standard : 2.5 mm) (3) MP-200NL : Adjust the clearance between the thread take-up guide (left) and screw No. 4 to 4 mm. <ul style="list-style-type: none"> ○ When stitch tightness is weak, adjust by raising thread take-up thread guide (left) ❷. ○ When stitch tightness is strong, adjust by lowering thread take-up thread guide (left) ❷. 	<ul style="list-style-type: none"> ○ Good sewing condition may not be obtained.

(17) Adjustment to adapt to the overlapped section of the heavy-weight materials

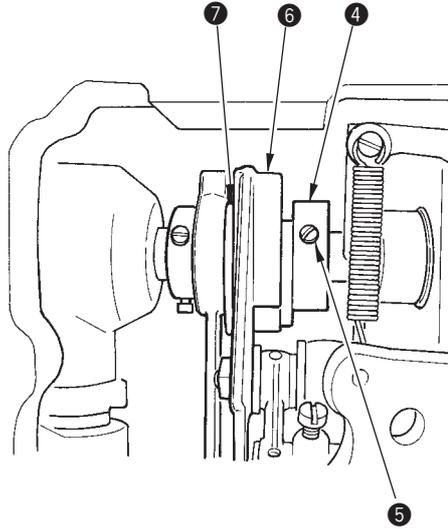
Standard Adjustment



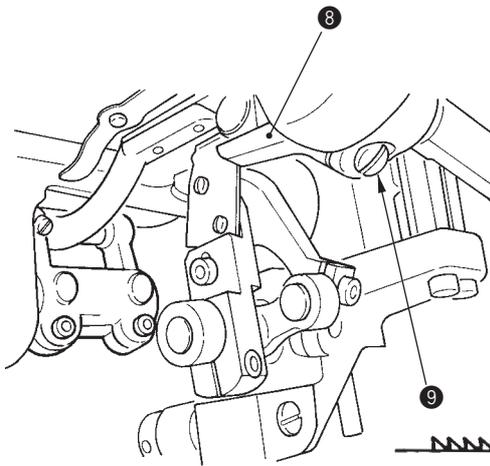
3 (Spring is hooked to this pin.)



Bottom end of metal is aligned with 4th engraved marker line.



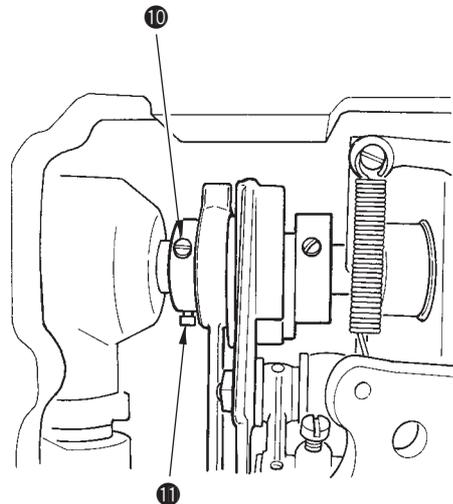
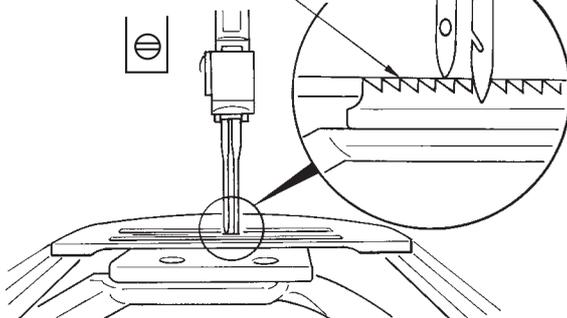
Adjust the timing of feed rock triangle cam 4 to the position where the feed dog does not move even moving the lever up or down when the 4th engraved marker line of the needle bar (lowest engraved marker line) is aligned with the bottom end of the metal when the needle bar goes up.
(Adjust by reversing the standard adjustment of (4) Feed cam timing (when needle bar comes down).)



0.9 to 1.0 mm

Conditions : Stitch dial scale : "0"
Turn handwheel to bring needle bar to its upper dead point.

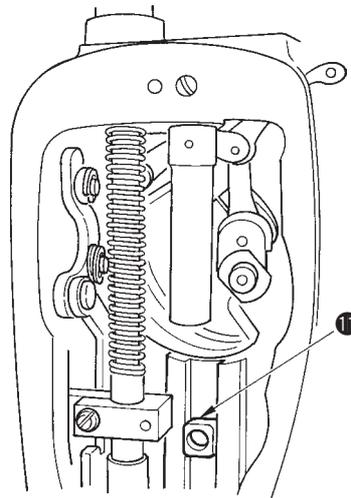
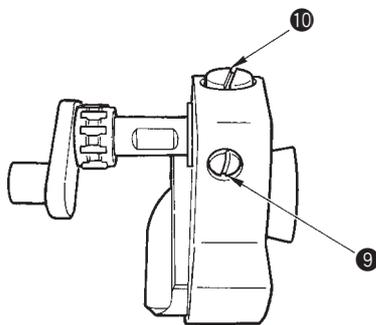
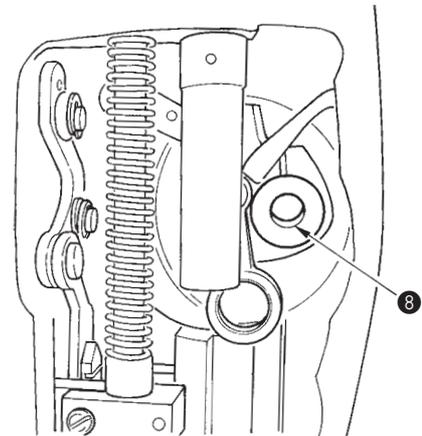
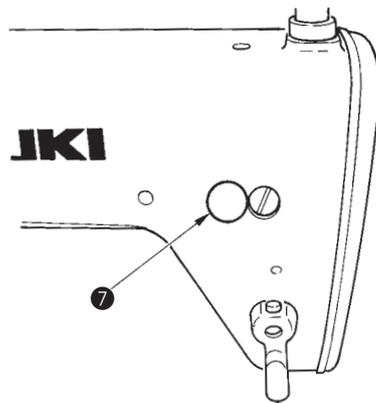
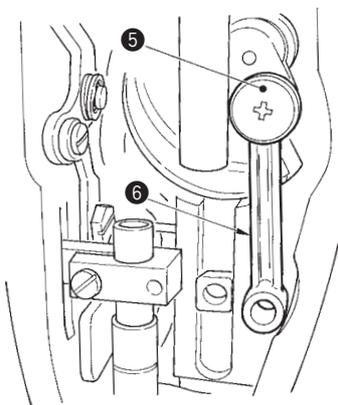
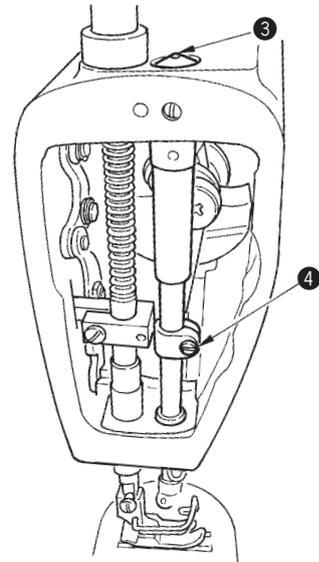
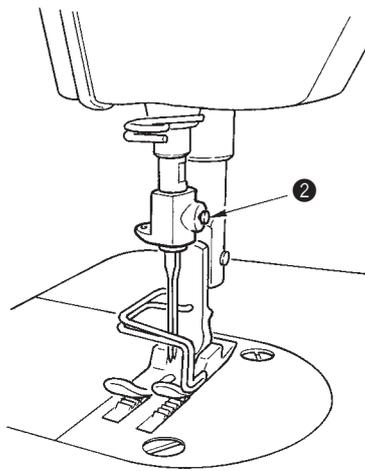
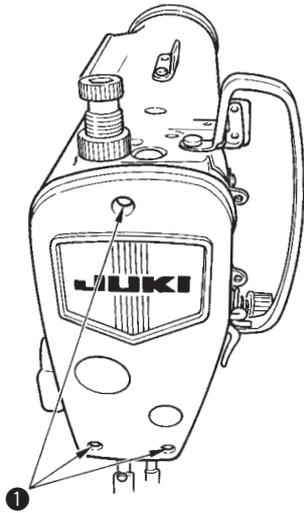
Top surface of feed dog is aligned with top surface of throat plate.



Adjustment Procedures	Results of Improper Adjustment
<p>1. Loosen eight setscrews ② in window plate ① located on the rear side and remove window plate ①.</p> <p>(Caution) After the adjustment, hook the knee lifter link arm spring on knee lifter link arm spring hook shaft ③ (installed inside) of window plate ① and install window plate ①.</p> <p>2. Loosen two setscrews ⑤ in feed rock triangle cam ④.</p> <p>3. In the state that feed rock triangle cam ④ is fixed, turn the handwheel in the normal rotational direction to retard the feed timing, or turn in the reverse direction to advance the timing.</p> <p>4. Install feed rock triangle cam ④ so that the edge of feed rock rod ⑥ comes in contact with feed eccentric cam side plate ⑦ of triangle cam ④.</p> <p>(Caution) Turn the main shaft and confirm that there is no unnecessary skew between feed rock rod ⑥ and feed eccentric cam side plate ⑦.</p> <p>5. Adjust the height of the feed dog to 0.9 to 1.0 mm.</p> <p>6. Loosen setscrew ⑨ in feed driving fork end ⑧ and turn feed driving fork end ⑧ in the rotational direction to adjust the height of the feed dog.</p> <p>7. Loosen two setscrews ⑪ in feed driving cam ⑩.</p> <p>8. Adjust the timing of feed driving cam ⑩ to the position where the top surface of the feed dog is aligned with the top surface of the throat plate when the top end of the sewing needle is aligned with the top surface of the throat plate. (Alignment of three points)</p>	

(18) Replacing the needle bar crank (optional component)

Disassembling/assembling procedure



Disassembling/assembling procedure

1. Loosen and remove three setscrews ❶ in the face plate.
2. Bring the needle bar to its upper dead point, loosen and remove needle clamp screw ❷. Then loosen and remove the needle clamp bracket (with the needle clamp bracket hook in case of needle gauge of 3 mm or more).
3. Remove rubber cap ❸ of the needle bar upper metal located on the top surface of the machine arm. Loosen needle bar bracket clamping screw ❹ and draw out upward the needle bar. Remove the needle bar bracket.
4. Loosen setscrew (left hand screw) ❺ in the needle bar crank rod, remove first thread take-up needle bearing and remove needle bar crank rod ❻.
5. Remove rubber plug ❷ located on the rear side of the machine arm, enter the hexagon wrench from the hole for screwdriver, loosen first the needle bar crank bracket clamping screw, then loosen the setscrew to remove the needle bar crank.
6. Pass the needle bar crank to change through thread take-up lever, needle bearing, protection plate ❸, and counterweight. Press the needle bar crank until it will go no further.
7. Tighten setscrew ❾ at the flat section of the needle bar crank.
When using the free-setting needle bar crank, stop it at the optional position, after assembling all components, loosen the needle bar crank setscrew and determine the position while performing adjustment.
8. Tighten needle bar crank bracket clamping screw ❿. At this time, check whether there is any lateral play at the thread take-up lever. When there is a play, loosen the needle bar crank setscrew and press the needle bar crank to the back. However, when there is a skew between the needle bar crank and the thread take-up lever, the seizure of thread take-up lever will be caused. So, be careful.
9. Enter first needle bar crank rod ❻ to the needle bar crank and enter the needle bearing between the needle bar crank and the needle bar crank rod.
10. Tighten setscrew (left hand screw) ❺ in the needle bar crank rod.
11. Enter the needle bar bracket to the needle bar crank rod and enter them to needle bar bracket guide roller ⓫.
12. Insert the needle bar into the needle bar bracket from the upside and screw the needle clamp to the needle bar.
13. For the height and positioning of the needle bar, refer to (5) Height of the needle bar.
14. Re-adjust (11) Timing of relationship among the needle, looper and spreader.

6. MOTOR PULLEY AND V BELT

Model	No. of revolutions of sewing machine	Effective diameter of handwheel	No. of poles of motor	Frequency	No. of revolutions of motor	Effective diameter of motor pulley	V belt size
MP-200NS	2,000 rpm	67.4 mm	4	50Hz	1,430 rpm	90 mm	
				60Hz	1,715 rpm	75 mm	
MP-200NL	1,200 rpm			50Hz	1,430 rpm	55 mm	M39
				60Hz	1,715 rpm	45 mm	

7. CONSUMABLE PARTS AND SELECTIVE PARTS

(1) Consumable parts

Name of consumable parts	Part No.	Q'ty for machine head
Looper (JC1008P)	23136005	1
Spreader (JC1023)	23138209	1
Spreader (3 mm)	23125800	1
Spreader (4 mm)	23125909	1
Spreader (5 mm)	23126006	1
Sewing needle SCHMETZ 29-C-150 Nm90	MC231000900	1
Sewing needle ORGAN CP X 1J #22U	MCP1JJB2200	1
Hook needle SCHMETZ 29-C-151 Nm100	MC276001000	1
Hook needle ORGAN CP X 12J #23	MCP12JB2300	1

(2) Selective parts

1) Table of replacing parts related to the thread take-up lever (optional)

Part No.	Name of part	Description	Effect
23121106	Needle bar crank (10 mm)	Standard timing (Provided as standard)	
23121205	Needle bar crank (8 mm)	This type is adjusted so that the timing of thread take-up lever is faster by 10° than the standard one. (Standard - 10°)	Thread is more tightened as compared with the standard one.
23121304	Needle bar crank (12 mm)	This type is adjusted so that the timing of thread take-up lever is slower by 10° than the standard one. (Standard + 10°)	Thread is more loosened as compared with the standard one.
23124403	Needle bar crank (Free)	This type has no flat portion on the shaft and is adjusted so that the timing of thread take-up lever can be set freely. However, the needle bar stroke changes together with the timing of thread take-up lever.	

* To adjust to a broad range of materials, various types including timing of thread take-up lever are prepared.

2) Parts for installing the motor sensor

Name of part	Part No.	Remarks
Sensor boss	22622401	To be attached to rear end of main shaft
Sensor rod	23141906	For installing belt cover
Sensor rod lock nut	NM6040001SC	2 pcs. required

3) Gauge replacement parts list

Basic type before changing needle gauge			MP-200N														Remarks
			S type (1.6 mm standard)							L type (5.0 mm standard)							
Needle gauge to be changed (mm)			1.2 mm	1.6 mm	2.0 mm	2.5 mm	3.0 mm	4.0 mm	5.0 mm	1.2 mm	1.6 mm	2.0 mm	2.5 mm	3.0 mm	4.0 mm	1.6 mm	◎ Standard parts for S and L types (without set setting) ○ Parts which are necessary to purchase when size is changed (included in set). ▼ Parts which are included in S or L type and not necessary to purchase (not included in set).
Part No.	Name of part	Qty															
23124100	Needle clamp S	1	▼	◎	▼	▼			○	○	○	○					Common to S type
23124308	Needle clamp spacer (1.2 mm)	1	○						○								S type Exclusive for 1.2 mm
23124407	Needle clamp spacer (1.6 mm)	1		◎						○							S type Exclusive for 1.6 mm
23124506	Needle clamp spacer (2.0 mm)	1			◎						○						S type Exclusive for 2.0 mm (Supplied as accessory for S type)
23124605	Needle clamp spacer (2.5 mm)	1				○						○					S type Exclusive for 2.5 mm
23124803	Needle clamp (3 mm)	1					○							○			L type Exclusive for 3.0 mm
23124902	Needle clamp (4 mm)	1						○							○		L type Exclusive for 4.0 mm
23125008	Needle clamp (5 mm)	1							○							◎	L type Exclusive for 5.0 mm
23124209	Needle clamp bracket S	1	▼	◎	▼	▼			○	○	○	○					Common to S type
SS8090540SP	Needle clamp bracket S setscrew	1	▼	◎	▼	▼			○	○	○	○					Common to S type
23125107	Needle clamp bracket (3 mm)	1					○							○			L type Exclusive for 3.0 mm
23125206	Needle clamp bracket (4 mm)	1						○							○		L type Exclusive for 4.0 mm
23125305	Needle clamp bracket (5 mm)	1							○							◎	L type Exclusive for 5.0 mm
SS7090530SP	Needle clamp screw	1						○	○	○				○	○	◎	Common to L type
23125404	Needle clamp hook	1						○	○	○				○	○	◎	Common to L type
SS5060310SP	Needle clamp hook setscrew	1						○	○	○				○	○	◎	Common to L type
23122658	Presser foot S (asm.)	1	▼	◎	▼	▼			○	○	○	○					Common to S type
23122757	Presser foot L (asm.)	1					○	○	○					▼	▼	◎	Common to L type
23123003	Throat plate (1.4X3.0)	1	○						○								S type Exclusive for 1.2 mm
23123102	Throat plate (1.6X4.2)	1		◎	▼					○	○						S type Exclusive Common to 1.6 to 2.0 mm
23123201	Throat plate (1.6X4.7)	1				○						○					S type Exclusive for 2.5 mm
23123300	Throat plate (2.2X5.6)	1					○							○			L type Exclusive for 3.0 mm
23123409	Throat plate (2.2X6.6)	1						○							○		L type Exclusive for 4.0 mm
23123508	Throat plate (2.2X7.7)	1							○							◎	L type Exclusive for 5.0 mm
23125750	Spreader installing base (asm.)	1	▼	◎	▼	▼	▼		○	○	○	○	○				Common to S type For L type 3.0 mm
23138209	Spreader (JC1023)	1	▼	◎	▼	▼			○	○	○	○					Common to S type
SM4020301SC	Spreader setscrew	1	▼	◎	▼	▼			○	○	○	○					Common to S type For L type 3.0 mm
23125800	Spreader (3 mm)	1					○							○			L type Exclusive for 3.0 mm
23125909	Spreader (4 mm)	1						○							○		L type Exclusive for 4.0 mm
23126006	Spreader (5 mm)	1							○							◎	L type Exclusive for 5.0 mm
23136104	Looper crank	1	▼	◎	▼	▼			○	○	○	○					Common to S type
23121502	Looper crank B	1					○	○	○					▼	▼	◎	Common to L type
SM8060612TP	Looper crank setscrew	2	▼	◎	▼	▼			○	○	○	○	○	▼	▼	◎	Common to each type and each size

Name of part	Set Part No.	Part No.
Standard type and no setting		No setting
Needle clamp spacer only No setting since others are supplied as standard accessories for machine head.		No setting
Needle gauge 2.5 mm Set for S type		23124654
Needle gauge 3.0 mm Set for S type		23124852
Needle gauge 4.0 mm Set for S type		23124951
Needle gauge 5.0 mm Set for S type		23125057
Needle gauge 1.2 mm Set for L type		23124366
Needle gauge 1.6 mm Set for L type		23124456
Needle gauge 2.0 mm Set for L type		23124556
Needle gauge 2.5 mm Set for L type		23124653
Needle gauge 3.0 mm Set for L type		23124861
Needle gauge 4.0 mm Set for L type		23124960
Standard type and no setting		No setting

8. TROUBLES AND CORRECTIVE MEASURES

No.	Troubles	Causes	Corrective measures	Corresponding page
1.	Thread breakage Thread hangnail	Thread path, looper point or spreader point has a scratch.	Polish the scratch using a fine emery paper or the like. Replace the parts with new ones.	
		Looper, spreader, bottom surface of feed dog and loop guide come in contact with one another.	Readjust the timing or the clearance.	P. 11,13
		Thread tension is too high.	Reduce the thread tension.	
		An excessive clearance is provided between looper and needle.	Bring up the looper near the needle.	P. 11
		Timing between needle and looper is not proper.	Readjust the timing.	P. 15
		Looper comes in contact with needle.	Readjust the clearance between needle and looper.	P. 11
2.	Stitch skipping (on the right side of cloth)	Loop on the right side of cloth is fallen.	Tighten the thread tension.	
			Adjust the thread take-up thread guide, right.	P. 19
			Adjust the stroke of the thread take-up spring.	
		Sewing needle fails to pierce the loop on the right side of cloth.	Turn the needle bar and adjust so that the sewing needle pierces the center of loop on the right side of cloth.	P. 9
		Loop on the right side of cloth is too small due to high tension and sewing needle fails to pierce the loop.	Turn the needle bar and adjust so that the sewing needle pierces the center of loop on the right side of cloth.	P. 9
		Thread comes off hook needle before sewing needle pierces loop.	Delay the feed timing.	P. 7
	Increase the feed pitch.			
	Stitch skipping (on the wrong side of cloth)	Looper fails to catch thread.	Reduce the clearance between needle and looper.	P. 11
		Spreader fails to catch thread.	Readjust the spreader.	P. 15
		Loop is not formed due to excessive high thread tension and looper fails to catch thread.	Reduce the thread tension.	
Loop guide fails to work and loop cannot be formed.		Bring up the loop guide near the needle.	P. 11	
3.	Incomplete thread catching	Looper top or spreader top has a scratch.	Polish the scratch using a fine emery paper or the like.	
		An excessive clearance is provided between looper and needle.	Reduce the clearance between looper and needle.	P. 11
		Spreader fails to catch thread.	Readjust the spreader.	P. 15
		Thread tension is too high.	Reduce the thread tension.	
		Thread is thick for hook needle.	Use a thick needle.	
		Loop guide fails to work.	Readjust the loop guide.	P. 11

No.	Troubles	Causes	Corrective measures	Corresponding page
4.	Thread tension defect	Loop on the right side of cloth is too large.	Increase the thread tension. Move to upside the thread take-up thread guide, right.	P. 19
		Loop is excessively tightened.	Reduce the thread tension. Move to downside the thread take-up thread guide, right.	P. 19
		Stitches on the right side of sewing product (wrong side when sewing) are strongly tightened.	Move to downside the thread take-up thread guide, left.	P. 19
		When the presser is raised in the corner stitching, thread is loosened.	Increase the rising timing of thread tension disk.	
5.	Fabric yarn breakage (run)	Thread tension is too high.	Adjust the thread tension.	
		Hook needle has burrs.	Replace the needle with a new one.	
6.	Chain-off thread does not come out.	Loop guide fails to work.	Bring up the loop guide near the needle.	P. 11
		Needle does not enter until it goes to the end.	Enter the needle until it goes to the end.	
		Timing between spreader and looper is not proper.	Readjust the timing.	P. 15
		Thread fails to enter loop due to rough motion of thread at the time of chain-off thread.	Reduce the stroke of the thread take-up spring.	
			Decrease the height of the feed dog. Reduce the vertical movement of the feed dog.	P. 5 P. 5
		Chain-off thread is difficult to come out due to cloth pulling condition.	Lightly pull the cloth backward in the left direction.	
		Thread is thick and chain-off thread is caught on feed dog.	Increase the vertical movement of the feed dog.	P. 5
7.	General sewing defect (In case of spun thread or the like)	When using the thread of large resistance such as spun thread or the like, if there are many threading sections such as thread guide and the like, change of thread tension increases.	Reduce to the utmost the threading sections between thread stand, intermedite thread guide and arm thread guide, and reduce the change of thread tension.	
8.	Fabric yarn breakage occurs with synthetic knit goods.	Needle is too thick.	Use a thin needle within the sewing possible range.	
9.	Thread pulling occurs with light-weight materials.	Needle is too thick.	Use a thin needle within the sewing possible range.	
10.	Breakage or wear of spreader	Machine turns a sharp curve by force.	Turn the curve slowly. Do not change the direction when needle is pierced.	
		Machine is sewing an extra heavy-weight material.	Advance the feed timing and make the needle pierce the sewing product after the sewing product has been completely fed.	P. 7
		Contact of parts	Check whether the parts come in contact with each other.	

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