

SINGER
INDUSTRIAL PRODUCTS

Service Manual

1191D

200A

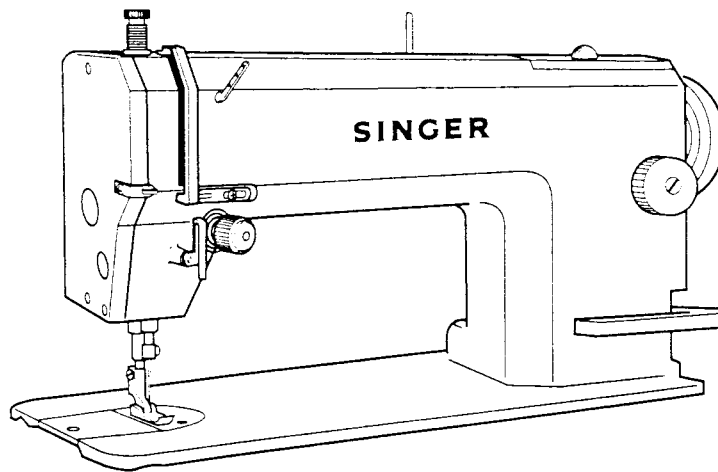
300A

258A

558A

CONTENTS

1. DESCRIPTION OF MACHINE	1
2. GENERAL FEATURES	1
3. SPECIFICATIONS	2
4. ADJUSTMENTS	3
SETTING NEEDLE BAR AT CORRECT HEIGHT	3
SETTING THREAD TAKE-UP SPRING HEIGHT	4
SETTING THREAD TAKE-UP SPRING TENSION	4
SETTING PRESSER BAR AT CORRECT HEIGHT	5
TIMING SEWING HOOK AND SETTING SEWING HOOK IN RELATION TO NEEDLE	6
ADJUSTING FEED REVERSE LEVER	7
TIMING THE FEED	7
SETTING FEED DOG AT CORRECT HEIGHT	8
5. REMOVAL AND REPLACEMENT OF PRINCIPAL ASSEMBLIES	9
SEWING HOOK AND OIL FILTER	9
HOOK SHAFT	11
OIL PUMP	12
UPRIGHT ARM SHAFT	13
NEEDLE BAR	14
PRESSER BAR	15
NEEDLE THREAD TAKE-UP	15
NEEDLE BAR WICK	18
OIL WICK HOLDER	18
ARM SHAFT	20



1. DESCRIPTION OF MACHINE

Class 1191D Machines are high speed, rotary hook, fully automatic lubricated long arm flat bed lockstitch machine with drop feed and hand operated reverse feeding mechanism. Recommended for general stitching operations on a range of light to heavyweight fabrics.

2. GENERAL FEATURES

Regular Machines

- Federal stitch type 301.
- Balanced horizontal axis rotating hook.
- Fork type feed bar.
- Dial type stitch regulator on front of arm.
- Pinch-point free thread take-up lever guard.
- Fully automatic lubricating system.
- Knee lifter mechanism integral to machine base and oil reservoir.
- Arm top cover with oil flow window.
- The arm is provided with a seat for mounting a light fixture.

3. Specifications

Variety	200A	300A	258A	558A
Stitch type	301 (Lockstitch)			
Type of feed	Drop feed			
For sewing	Light to medium	Medium to medium heavy	Medium to heavy Light leather	
Needle bar stroke	30.5 mm	36.5 mm	35.2 mm	
Maximum speed *	4,500 s.p.m.	4,000 s.p.m.	3,000 s.p.m.	
Max. stitch length	4.2 mm	5.0 mm	7.0 mm	
Fabric clearance (When raised with lifting lever)	6.0 mm			
Presser bar lift (by knee)	12.7 mm			
Needle	1955-01 #14	1955-01 #16	1955-01 #21	
Sewing hook	#414126		#414424	#543381
Bobbin case	#544745			#376406
Bobbin	#55623			#366963
Machine pulley	74 mm effective diameter for V-belt			
Lubrication system	Fully automatic lubrication system			
Oil return system	Plunger type oil return system			
Oil	SINGER type "C" oil			
Workspace width	279 mm			
Workspace height	130 mm			
Bed size	476 × 178 mm			
Noise level	Lpa ≤ 83 dB A Noise measurement according to DIN 45 635-48-A-1			
Net weight (head only)	about 26.5 Kg			
Gross weight (with accessories)	about 33 Kg			

Note: * The machine should be operated at a speed slower than the maximum recommended speed depending on the material being sewn and the type of work being done.

Subject to alterations in design, dimensions and weight.

4. ADJUSTMENT

SETTING NEEDLE BAR AT CORRECT HEIGHT

Preparation:

Remove face plate, slide plate and throat plate. See that needle is correctly set in needle bar.

The needle bar bushing (lower) should be set so that its lower end is located as shown in Fig. 1. To reset bushing, loosen set screw.

Check:

Turn machine pulley over toward you until needle bar is at its lowest point. Timing mark A on needle bar should be level with lower end of bushing.

Check timing of hook as instructed on page 6.

Setting:

Turn machine pulley over toward you until needle bar is at its lowest point. Loosen needle bar connecting stud clamping screw and raise or lower needle bar so that timing mark A is level with lower end of bushing. Then securely tighten clamping screw.

Replace throat plate and slide plate.

When replacing the face plate, make certain that the screw holes in the face plate gasket are aligned with the respective screw holes in the face plate, avoiding injury to the gasket and consequent oil leakage.

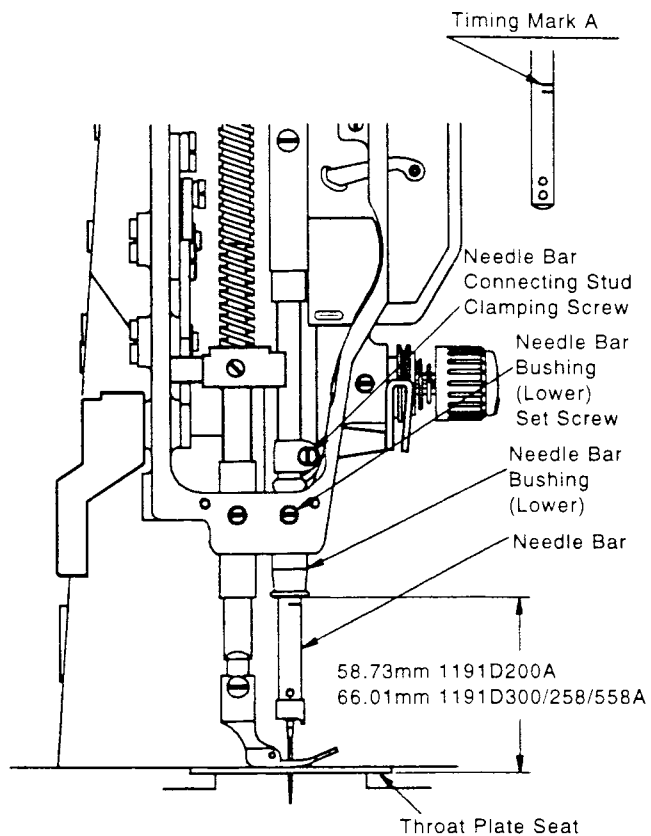


Fig.1

SETTING THREAD TAKE-UP SPRING HEIGHT

Preparation:

Thread the machine and place a lightweight material under presser foot.

Check:

Turn machine pulley over toward you slowly. When take-up lever begins to rise, thread take-up spring (Fig. 2) makes a slight dip and a return to its higher position. Later, as the take-up lever approaches top of stroke, take-up spring should be drawn all the way down; setting the stitch. As lever descends, the take-up spring returns to rest.

Setting:

Loosen thread take-up spring regulator set screw (Fig. 2). Turn tension stud (at the same time turning entire tension assembly) either over toward left to lower take-up spring and decrease its movement, or over toward right to raise take-up spring and increase its movement. Securely tighten the set screw.

NOTE: Under certain condition of tacking, it may be necessary to set the take-up spring higher than it is otherwise normally set.

CAUTION: Take-up spring height setting must be checked each time a different foot is applied to the machine.

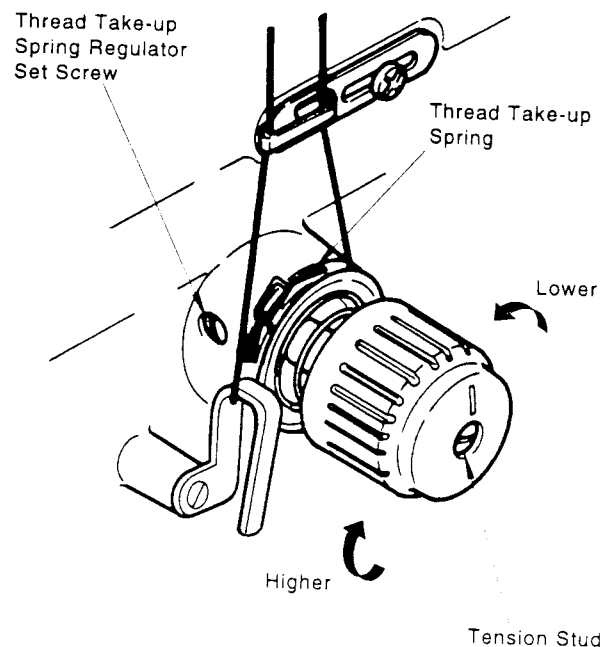


Fig.2

SETTING THREAD TAKE-UP SPRING TENSION

Preparation:

Thread the machine. Securely tighten thread take-up spring regulator set screw (Fig. 3). Make sure thumb nut is on stud.

Check:

Tension on take-up spring should be sufficient to ensure action at top speed, but still light enough to permit itself to be drawn all the way down (as take-up lever approaches height of stroke) before any thread is drawn through the tension discs.

Setting:

Using a large screwdriver in slot of stud, turn stud either over toward left to decrease tension or over to right to increase it, as shown in Fig. 3.

NOTE: The tension on the take-up spring may require different settings depending upon the size of thread or thickness of material used. Heavier thread and materials require more tension to ensure correct thread control.

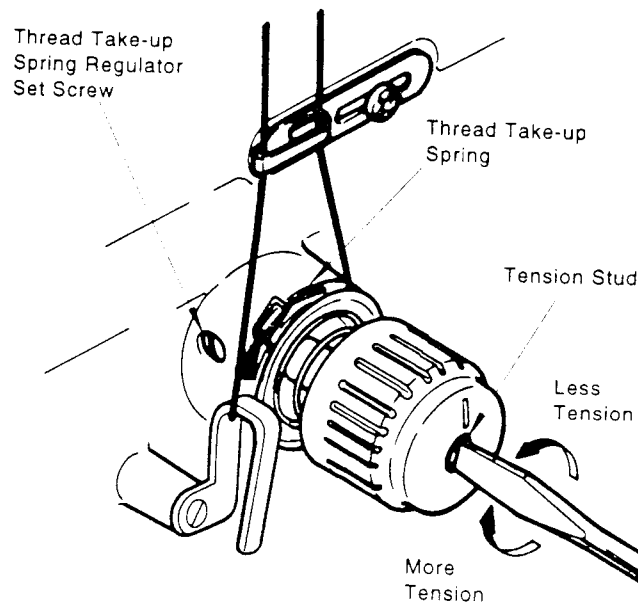


Fig.3

SETTING PRESSER BAR AT CORRECT HEIGHT

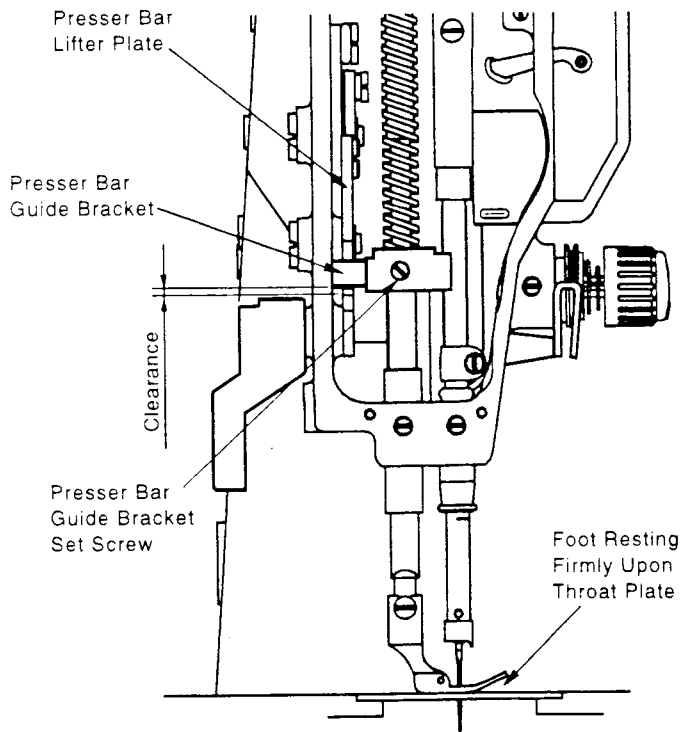


Fig.4

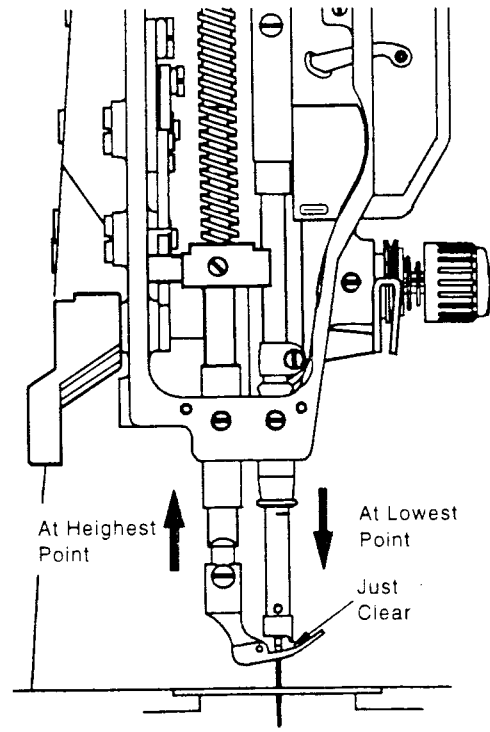


Fig.5

Preparation:

Remove face plate and slide plate.

Check:

1. When presser foot rests firmly upon throat plate (with feed dog below throat plate) there should be some clearance between presser bar guide bracket and presser bar lifter plate, as shown in Fig. 4.
2. When presser foot is at its highest point and needle bar is at its lowest, top of presser foot should clear lower end of needle bar thread guide, as shown in Fig. 5.

Setting:

1. Loosen presser regulating thumb screw. (Fig. 22, page 14)
2. Loosen presser bar guide bracket set screw.
3. Raise or lower presser bar guide bracket so that there is some clearance between guide bracket and presser bar lifter plate.
4. Securely tighten set screw.
5. Tighten presser regulating thumb screw as required.

TIMING SEWING HOOK AND SETTING SEWING HOOK IN RELATION TO NEEDLE

Preparation:

Remove presser foot, slide plate, throat plate and feed dog.

Check:

When lower timing mark on needle bar (needle bar on its upward stroke) is level with the lower end of lower needle bar bushing, the point of sewing hook should be at the center of the needle, as shown in Fig. 6.

Also, when point of sewing hook passes the needle, the clearance between hook point and needle should be approximately equal to thickness of a piece of ordinary notepaper (about 0.13mm), as shown in Figs. 7 and 8.

NOTE: Not only the point of sewing hook but entire "FLAT" of hook point should clear scarf on needle blade. Normally, 0.5mm clearance is provided between hub of hook and rotating hook shaft bushing (front).

Setting:

Loosen the two set screws in hub of hook. Then retighten one of the set screws very lightly so that the sewing hook can still be turned on the shaft.

Hold shaft immovable and turn hook as required to bring point of hook to center of needle and at the same time adjust clearance between needle and hook point.

Tighten two set screws lightly, turn machine pulley to make certain the sewing hook is correctly set in relation to the needle. Then securely tighten the two set screws.

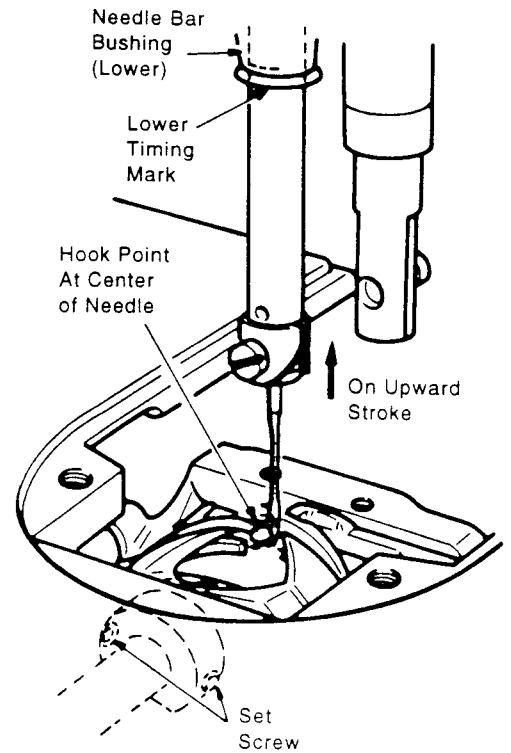


Fig. 6

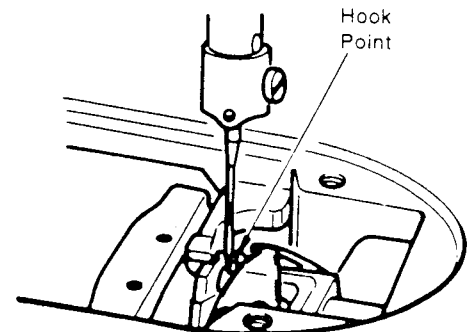


Fig. 7

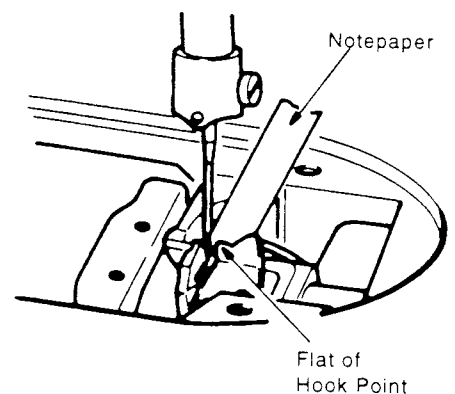


Fig. 8

ADJUSTING FEED REVERSE LEVER

Before the machine leaves the factory, the spring tension of feed reverse lever is set at an appropriate tension for easy and comfortable sewing operation.

If it is necessary to adjust the feed reverse lever spring tension, tip machine back and loosen feed reverse lever spring retainer screw holding the spring retainer on the machine leg. Move spring retainer up or down, as required, and securely tighten the spring retainer screw.

The lighter the tension, the easier it is to operate the feed reverse lever, however the tension should be set a little heavier for maximum stitch and high speed sewing.

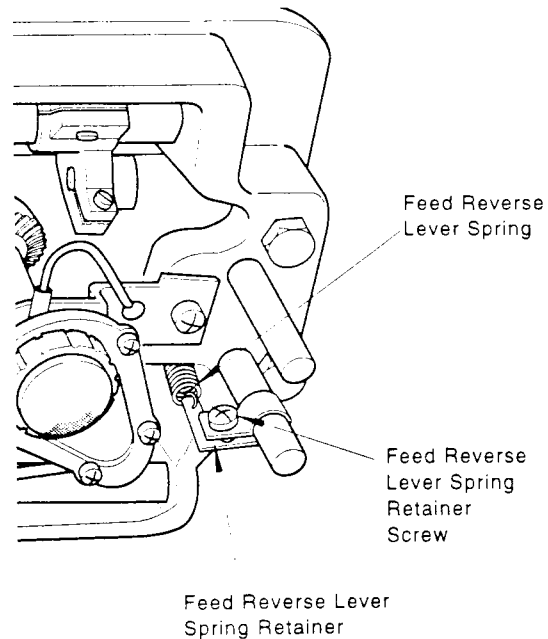


Fig.9

TIMING THE FEED

Before the machine leaves the factory, the feed and feed lifting eccentric is set for average sewing conditions; having the timing mark aligned on the longer timing mark provided for it on the arm shaft.

(The longer timing mark on the arm shaft will be at the upper side when needle bar is at its lowest point.)

If for any reason it is necessary to alter the timing of feed and feed lifting eccentric, loosen set screws in the eccentric and adjust the eccentric in desired setting taking every care so that the arm shaft will rotate freely. Then securely tighten the set screws.

NOTE: When making above adjustment, push the eccentric lightly to the right so that feed rock shaft crank connecting rod, feed connecting link, feed regulator, and feed regulator hinge stud are lightly in contact with each respective part with no binding or excessive play between the parts. (Fig.11)

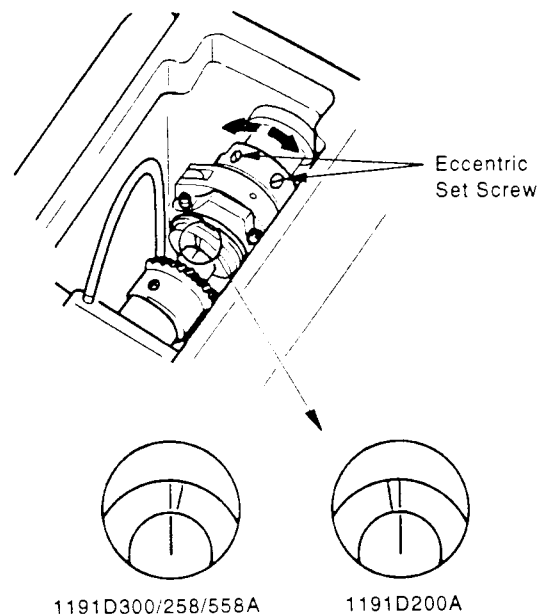


Fig.10

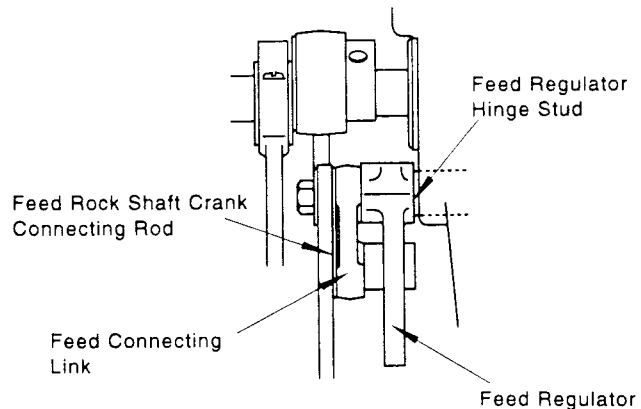


Fig.11

SETTING THE FEED DOG AT CORRECT HEIGHT

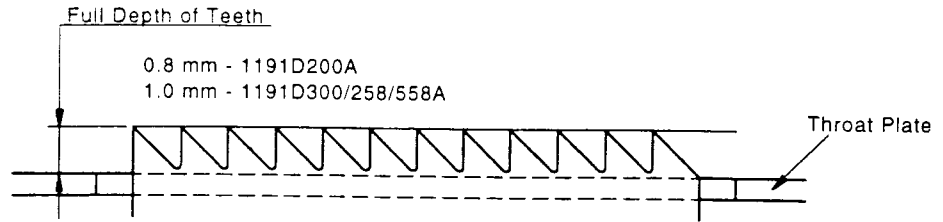


Fig.12

When the feed dog is at its highest position, approximately the full depth of all the teeth should project above the top surface of the throat plate as shown in Fig. 12.

Before checking the height of feed dog, set the machine for the longest stitch. To adjust, loosen feed lifting rock shaft crank (front) clamping screw and raise or lower feed dog, as required, by moving feed lifting rock shaft crank (front). Then securely tighten the clamping screw. (Fig. 13)

If it is found necessary to adjust the feed dog height due to the material being sewn or exchanging the feed dog and throat plate, it should be adjusted in the manner explained above.

NOTE: Feed dog should not contact edges of the throat plate slots during its movement and should be located centrally in relation to the front, rear and sides of the throat plate slots.

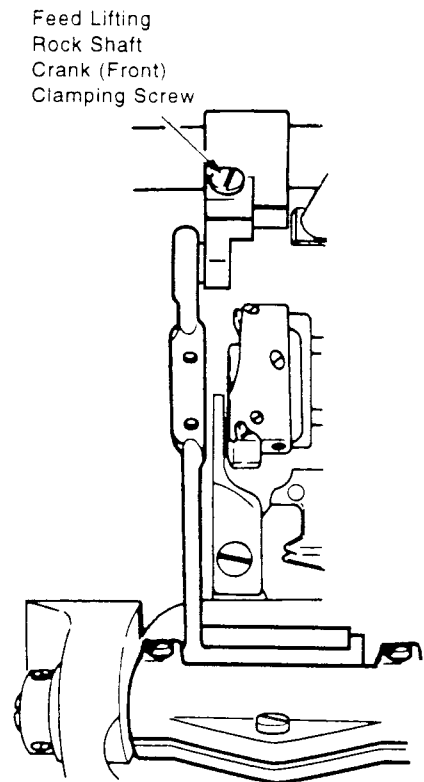


Fig.13

5. REMOVAL AND REPLACEMENT OF PRINCIPAL ASSEMBLIES

Machines of Class 1191D are made with extreme precision in machining and assembly, and the "Superfinish" process provides microscopically smooth bearing surfaces. Therefore, special care should be taken not to permit any misalignment of parts or cause any scratches or nicks on the bearing surfaces by careless assembly or handling of parts. Any such damage might render the machine incapable of the long, trouble-free service for which it is designed.

REMOVING SEWING HOOK

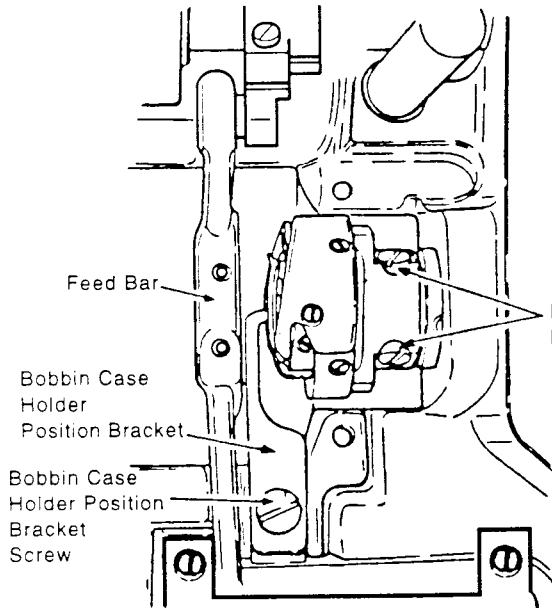


Fig. 14

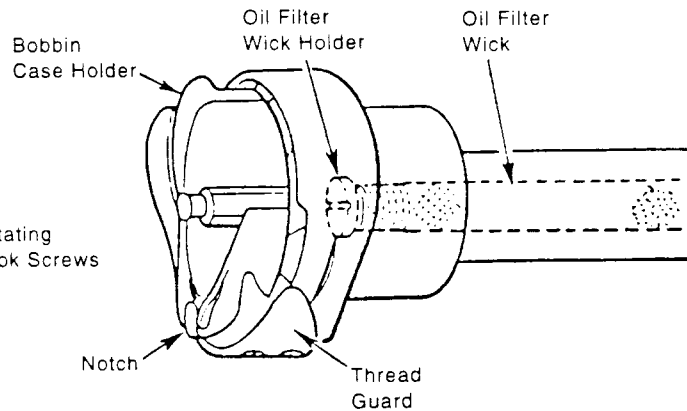


Fig. 15

Remove the needle, slide plate, throat plate and bobbin case. Remove bobbin case holder position bracket screw and the bobbin case holder position bracket. Loosen the two set screws in the hub of hook and turn the machine pulley over toward you until the feed bar is raised to its highest point. (Fig. 14)

Turn the rotating hook until the thread guard on the hook is at the bottom as shown in Fig. 15. Turn the bobbin case holder until the notch is also near the bottom, as shown in Fig. 15. The rotating hook can then be removed from the hook shaft.

REPLACING OIL FILTER WICK (#143042)

While the rotating hook is off the shaft, it is advisable to replace the oil filter wick #143042 in the end of the hook shaft. Unscrew the oil filter wick holder from the hook shaft and replace with a complete new filter #143042. (Fig.15)

REPLACING SEWING HOOK

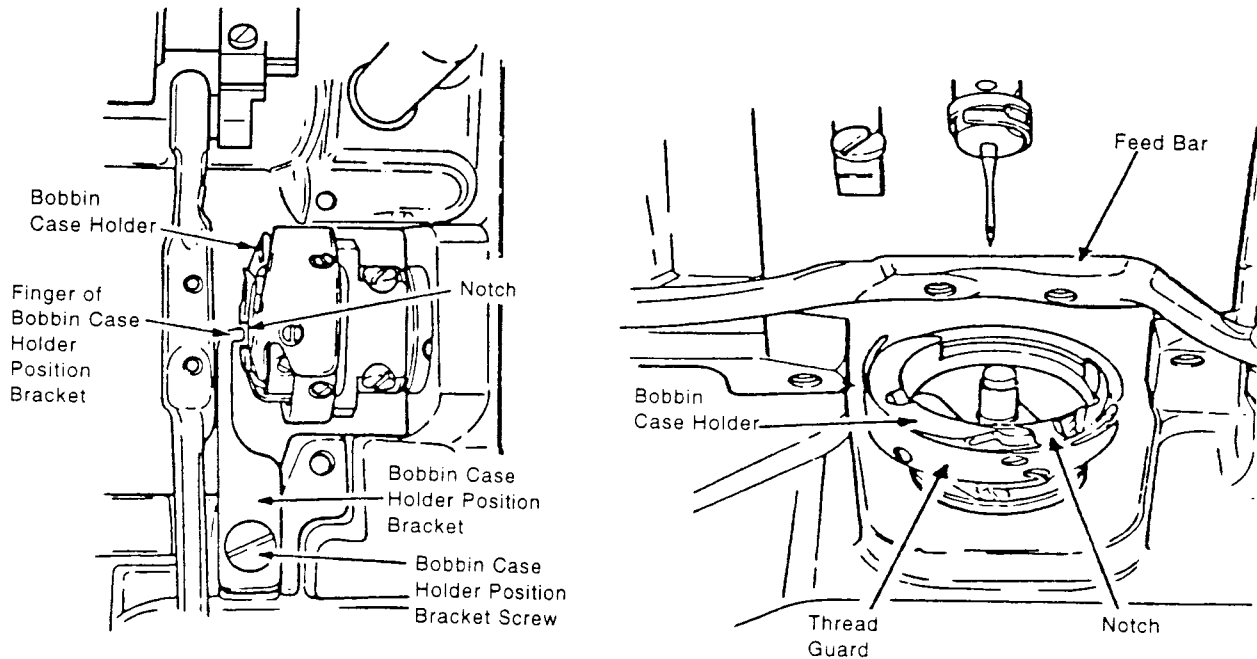


Fig.16

When placing a new rotating hook on the shaft, have the rotating hook thread guard at the bottom and the bobbin case holder turned to the position shown in Fig.16 so that the hook will clear the feed bar.

Place the hook in position on the shaft and turn the bobbin case holder until the notch is at the top, as shown in sketch at left above.

Replace the bobbin case holder position bracket making sure that the finger enters the notch at the top of the bobbin case holder. Then securely fasten the bobbin case holder position bracket with bobbin case holder position bracket screw. (Fig. 16)

Replace the needle. Time the sewing hook as instructed on page 6. Replace the bobbin case, throat plate and slide plate.

REMOVAL AND REPLACEMENT OF ROTATING HOOK SHAFT

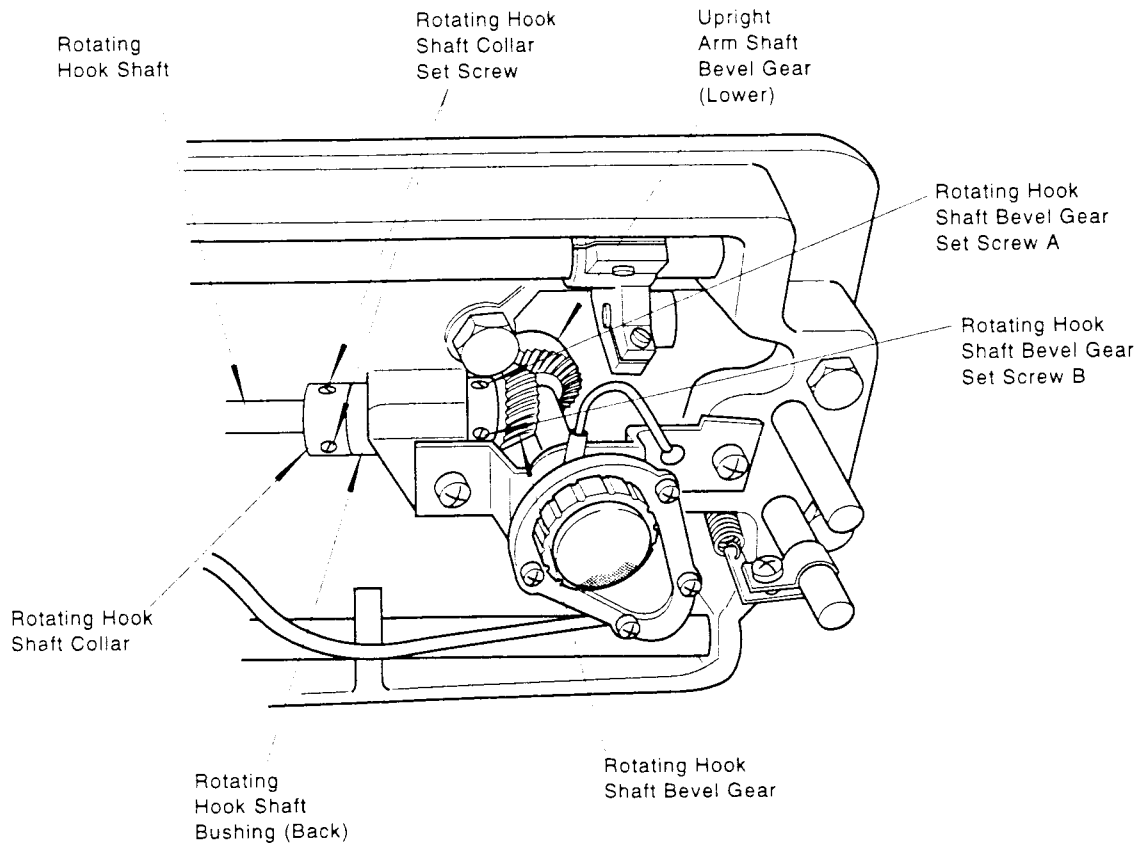


Fig.17

Remove and replace rotating hook shaft as instructed below.

1. Remove the rotating hook as instructed on page 9.
2. Mark one tooth of lower arm shaft (upright) bevel gear and the corresponding space of rotating hook shaft bevel gear with chalk or crayon. This is important as these gears may become separated during removal of shaft. These marks will then make it possible to obtain the original mating position of the gears.
3. Loosen two rotating hook shaft collar screws and rotating hook shaft bevel gear set screws A and B. While holding the two bevel gears in mesh (by inserting a large screwdriver in between upright arm shaft and rotating hook shaft bevel gear), withdraw the old hook shaft and insert the new shaft.
4. Make certain that set screw A seats over flat on the hook shaft. Set hook shaft in position so that the distance from rotating hook oil filter wick holder to end face of bed is 11.7mm. Push rotating hook shaft bevel gear against rotating hook shaft bushing (back) and securely tighten the first set screw A. Then securely tighten the second set screw B.
5. Push the ground face of hook shaft collar against hook shaft bushing (back) and securely tighten the set screws taking every care so that the shaft will rotate freely without end play.
6. Time the sewing hook as instructed on page 6.

OIL PUMP

Removal:

1. Using a screwdriver, pry open the oil tube clamps A and B and remove oil tube for rotating hook shaft and oil removing tube.
2. Remove oil tube for arm shaft.
3. Remove two oil pump screws.
4. Carefully pull the entire oil pump off the lower end of upright arm shaft.

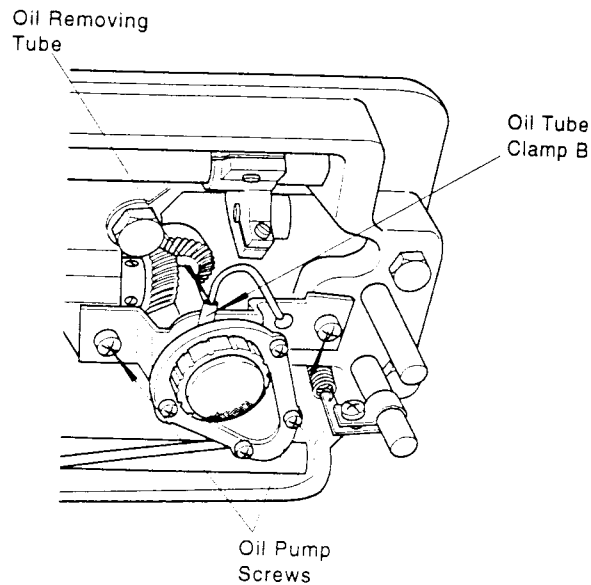


Fig. 18

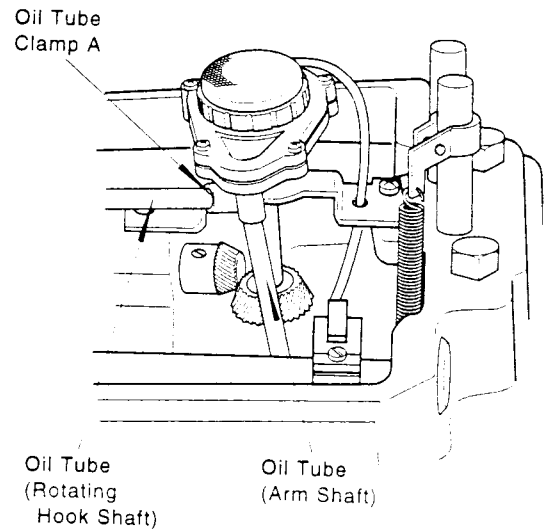


Fig. 19

Replacement:

1. Replace the entire oil pump while turning the machine pulley so that the lug on the impeller will fit in the slot provided for it on the lower end of upright arm shaft.
2. Replace and securely tighten the two oil pump screws. Make certain that machine turns freely as the screws are tightened.
3. Pry open the oil tube clamps A and B and replace oil tube for rotating hook shaft and oil removing tube pushing them as far as they will go on the oil pipe in the oil pump.
4. Replace oil tube for arm shaft pushing it on the oil pipe as far as it will go.
5. Make certain that all three oil tubes are clear of other moving parts.

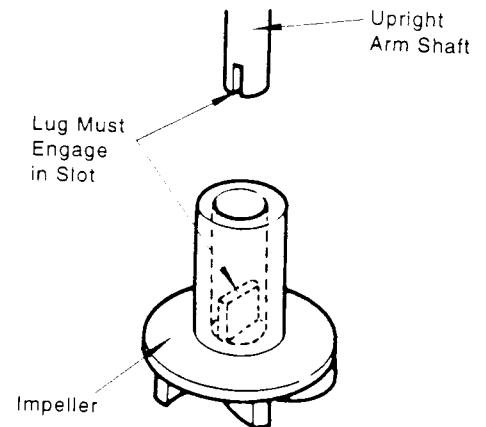


Fig. 20

REMOVAL AND REPLACEMENT OF UPRIGHT ARM SHAFT

Removal:

If it is found necessary to remove the upright arm shaft, it should be removed in the following manner.

1. Remove oil pump as instructed on page 12.
2. Follow the instructions for removal of hook shaft on page 11 except that, instead of removing the hook shaft, merely remove hook shaft bevel gear.
3. Remove arm top cover.
4. Mark the two bevel gears, arm shaft (horizontal) bevel gear and arm shaft (upright) bevel gear (upper) with chalk or crayon on one tooth of one gear and the corresponding space between the teeth of other gear so that these gears may be reassembled in their original relative positions without difficulty.
5. Remove the arm hole plug at rear of machine. Insert screwdriver through this access hole and loosen the two upright arm shaft bevel gear (upper) set screws.
6. While holding the two upper bevel gears in mesh, draw upright arm shaft down and out of machine.

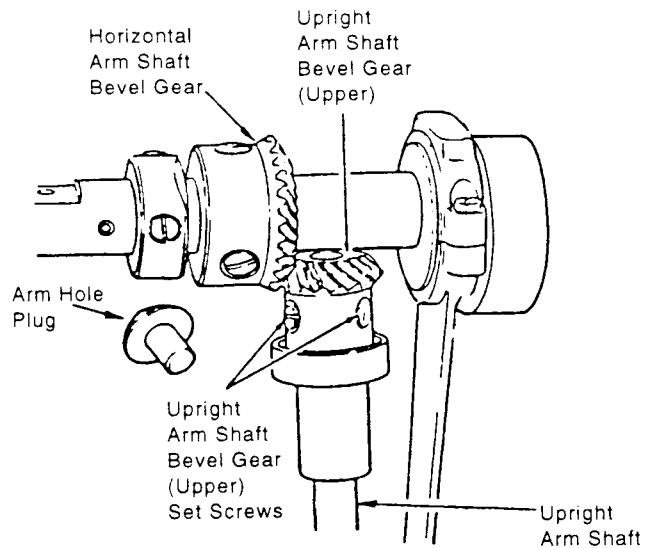


Fig.21

Replacement:

1. Before installing upright arm shaft, make certain it has the lower bevel gear correctly fastened at the lower end of shaft.
2. Insert upright arm shaft so through upright arm shaft bevel gear (upper).
3. Turn upright arm shaft so that one of the two set screws in the bevel gear will gear upon the upper flat on the shaft and tighten the two set screws.
4. Replace and set hook shaft bevel gear as instructed on page 11.
5. Replace oil pump as instructed on page 12.
6. Replace arm hole plug and arm top cover.

REMOVAL AND REPLACEMENT OF NEEDLE BAR

Removal:

1. Remove needle, needle set screw and needle bar thread guard.
2. Remove face plate.
3. Loosen needle bar connecting stud clamping screw.
4. Loosen thread take-up lever oil guard screw just enough to allow needle bar to pass, then slip needle bar up through both needle bar bushings and out of machine.

NOTE: If it becomes necessary to remove upper needle bar bushing, first remove thread take-up lever oil guard screw and take-up lever oil guard. Then loosen set screw and drive upper needle bar bushing down and out of head of machine. Use a 10mm copper or brass driving pin.

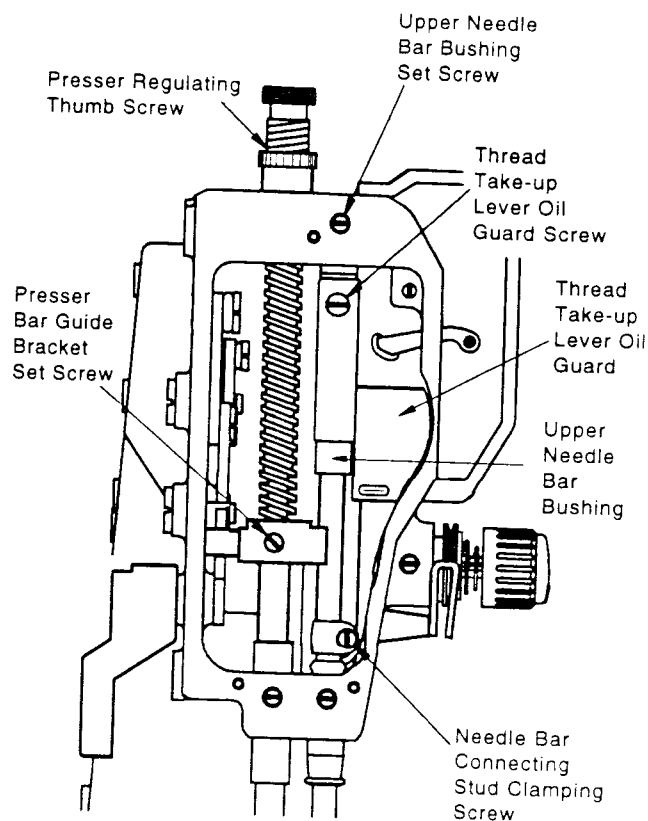


Fig.22

Before replacing the needle bar, replace upper needle bar bushing by driving it down into hole provided for it in the head of the machine. Make certain top of bushing is level with top of arm. Tighten set screw.

Replacement:

1. Slip needle bar down through both bushings in the head of the machine. Tighten clamping screw temporarily.
2. Replace needle bar thread guard, needle set screw and needle.
3. Set needle bar at correct height as instructed on page 3 and securely tighten clamping screw.
4. Replace oil guard and fasten it securely to upper needle bar bushing with thread take-up lever oil guard screw.
5. Replace face plate.

REMOVAL AND REPLACEMENT OF PRESSER BAR

Removal:

1. Remove presser foot and face plate.
2. Remove presser regulating thumb screw.
3. Loosen presser bar guide bracket set screw just enough to move the presser bar. Slide presser bar up through presser bar bushing and out of machine. (Fig. 22)

Replacement:

1. Slip presser bar down through presser bar bushing.
2. Replace presser foot and presser regulating thumb screw.
3. Set presser bar at correct height, as instructed on page 5.
4. Securely tighten presser bar guide bracket set screw.
5. Replace face plate.

REMOVAL AND REPLACEMENT OF THREAD TAKE-UP

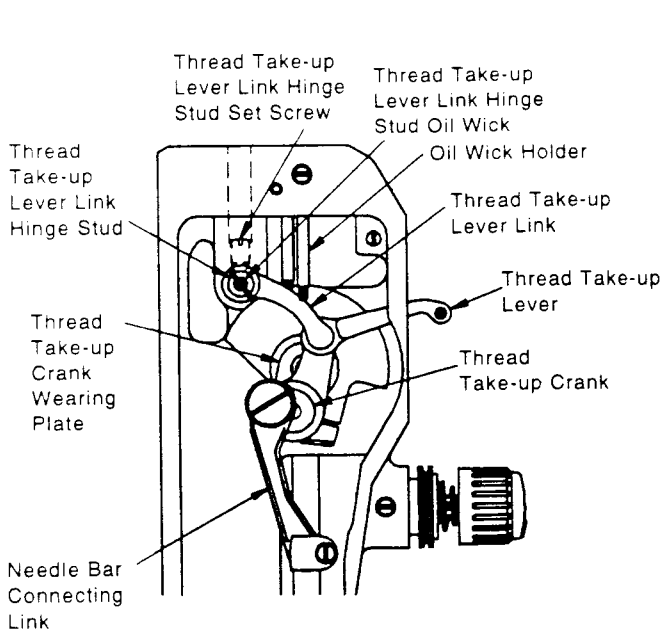


Fig.23

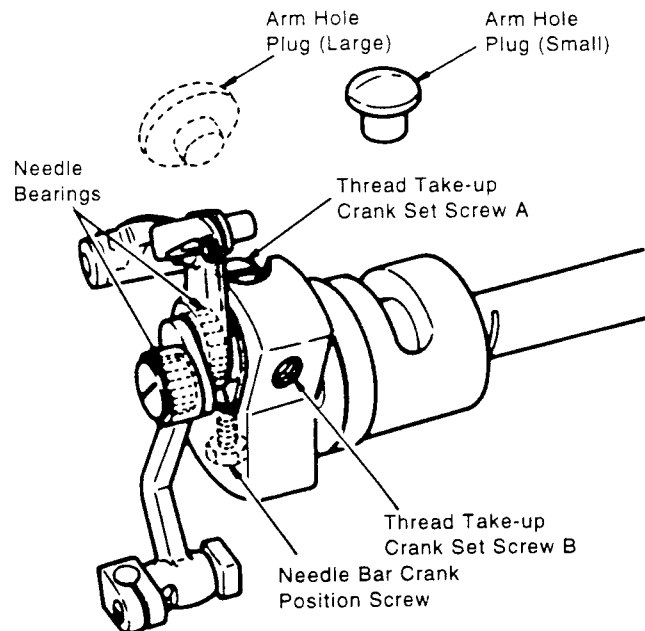


Fig.24

Removal:

1. Remove face plate, arm hole plug (large) and arm hole plug (small) from machine.
 2. Remove needle bar, upper needle bar bushing, presser regulating thumb screw, presser bar and presser bar guide bracket.
 3. Turn machine pulley as required to reach thread take-up crank set screw through hole left by removal of arm hole plug (large). Loosen take-up crank set screw A.
 4. Turn machine pulley as required, loosen thread take-up crank set screw B on needle bar crank.
- CAUTION: DO NOT DISTURB the smaller hexagon head needle bar crank position screw, Fig. 24, which holds the needle bar crank at its correct position on the horizontal arm shaft.
5. Loosen thread take-up lever link hinge stud set screw in top of arm.
 6. Remove oil wick holder assembly as instructed on page 18.
 7. Move thread take-up lever link down to its lower dead point and pull take-up lever link and take-up lever link hinge stud out of machine taking care not to pull loose the oil wick in the hinge stud.
 8. Back the end of take-up lever toward the inside of the machine, turning the machine pulley as required until the take-up lever is free of the slot provided for it.
 9. The needle thread take-up link assembly can now be pulled free from the needle bar crank.

Replacement:

1. Make sure thread take-up crank wearing plate is in place and undamaged on the face of the needle bar crank, as shown in Fig. 23.
2. Turn machine pulley as required to make thread take-up crank set screw B in needle bar crank accessible through hole at rear of machine head.
3. Assemble thread take-up lever assembly to needle bar crank so that the set screw B will bear on the flat on thread take-up crank, as shown in Fig. 24.
4. Insert screwdriver through access hole in rear of machine head and securely tighten thread take-up crank set screw B.
5. Test for side play by pushing take-up lever right and left. There should be 0.025-0.05mm side shake between take-up lever and wearing plate.
6. If there is no side shake as mentioned in item 5 above, move thread take-up crank inward or outward in needle bar crank, as required, to obtain clearance.
7. Slip the upper end of take-up lever through the slot provided for it in head of machine.
8. Turn machine pulley as required to make thread take-up crank set screw A in needle bar crank accessible through hole at rear of machine head.
9. Insert screwdriver through same hole, securely tighten thread take-up crank set screw A.
10. Insert a flexible guide wire (piano wire) through small hole at top of machine head, and from back to front through hole in boss for thread take-up lever link hinge stud.

- Assemble thread take-up lever link hinge stud to thread take-up lever link. Hook the end of two oil wicks in the hinge stud to guide wire mentioned above, and while lightly pulling the oil wicks out through the small hole at top of machine taking care not to pull loose the oil wicks, assemble take-up lever link hinge stud and take-up lever link to the machine head.

NOTE: Make certain that set screw is bearing squarely on flat of take-up lever link hinge stud and that there is no play in take-up lever link.

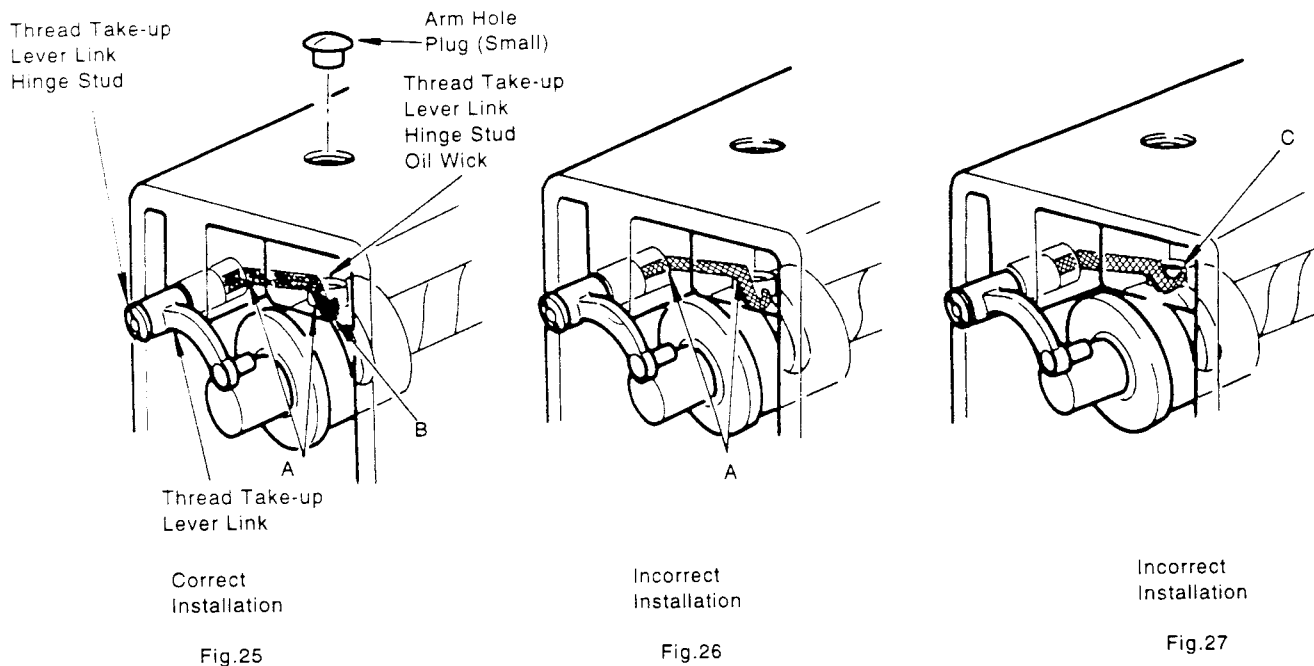
- Securely tighten take-up lever link hinge stud set screw.

- Push the end of oil wick leading from the take-up lever link hinge stud back into machine head taking care so that wick is slack over sharp edges of the arm at point A. This will insure free passage of oil. Use tweezers through the access hole at top of machine head to loop the wick and bring it into positive contact with the arm shaft at point B, as shown in Fig. 25.

NOTE: DO NOT FORCE the wick leaders down too tightly against the edges A of the arm, as shown in Fig. 26, as this will decrease the flow of oil from the arm shaft to the thread take-up lever link.

CAUTION: If the bottom of either oil wick leader is caught on the ledge at point C, as shown in Fig. 27, no oil can be taken up by the wick to be carried to the thread take-up lever link where it is needed. Make sure that the oil wick leaders are pushed all the way down into the smaller hole, without jamming, until they touch the arm shaft as shown in Fig. 25.

- Turn machine pulley slowly, by hand, testing take-up for binding, end shake and noise. If binding occurs re-check clearance between take-up and wearing plate, and between hinge stud and machine casting. If end shake or abnormal noise occurs, re-check clearance between take-up and wearing plate, and between hinge stud and take-up lever link.



- Replace presser bar guide bracket. (Fig. 4, page 5)

- Replace presser regulating thumb screw. (Fig. 22, page 14)

- Replace and adjust upper needle bar bushing, needle bar and its related parts as instructed on pages 3 & 15.

- Replace both large and small arm hole plugs.

- Replace face plate, as instructed on page 3.

REMOVAL AND REPLACEMENT OF THREAD TAKE-UP LEVER OIL GUARD

To remove thread take-up lever oil guard, turn machine pulley to move take-up lever so that it does not interfere with removal of the oil guard. Then remove thread take-up lever oil guard screw and lift oil guard upward and out of machine.

When replacing the oil guard which carries the needle bar wick, make sure that the loop of needle bar wick is placed behind and in contact with the needle bar as shown in Fig. 28.

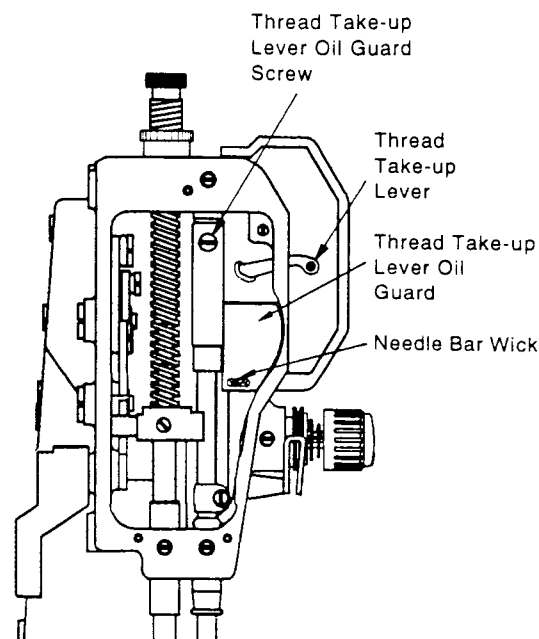


Fig.28

REMOVAL AND REPLACEMENT OF OIL WICK HOLDER

Removal:

Oil wick holder includes two oil wick leaders and an oil wick for the needle bar connecting link and for two sets of needle bearings in the thread take-up, as shown in Fig. 29, it is removed in the following manner.

1. Remove face plate, needle bar and upper needle bar bushing from the machine as instructed on page 14.
2. Remove oil wick holder screw.
3. Pulling gently, draw entire oil wick holder assembly out of the head of the machine.

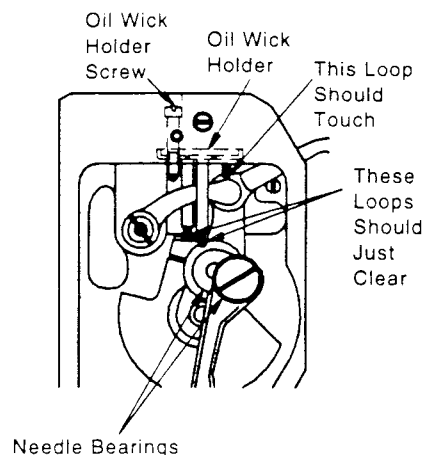


Fig.29

Replacement:

1. Remove arm hole plug (small), as shown in Fig. 30.
2. Insert the two oil wicks into the hole provided for them in the head of the machine, as shown in Fig. 30, so that wicks are slack over edge of oil wick holder at point D. This will insure free passage of oil. Using a screwdriver through hole at top of machine head, push the wicks down and bring them into positive contact with the thread take-up lever link hinge stud oil wick already installed.

3. When wick leaders are correctly installed, fasten oil wick holder lightly with holder screw.
4. Adjust the two oil wick loops in holder so that they come as close as possible to, without touching, the two sets of needle bearings.
5. Securely tighten holder screw.
6. Replace arm hole plug (small).
7. Replace upper needle bar bushing and needle bar as instructed on page 14.
8. Replace face plate as instructed on page 3.

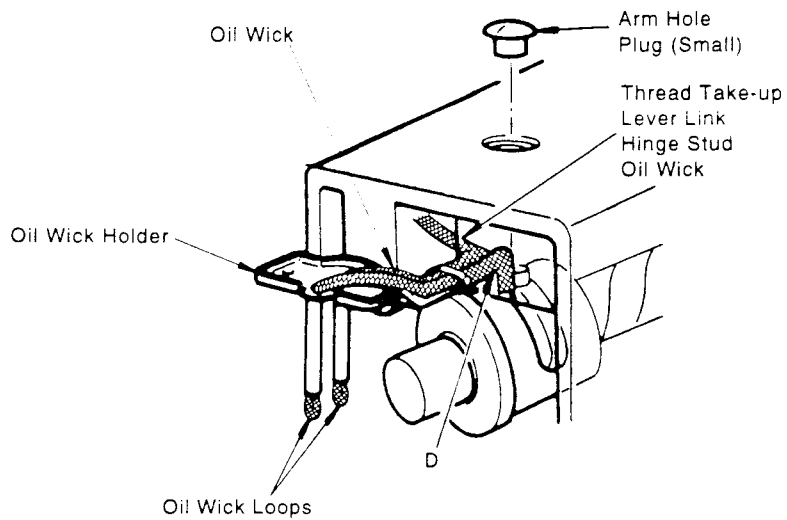


Fig.30

REMOVAL AND REPLACEMENT OF ARM SHAFT

Removal:

1. Remove the face plate.
2. Remove the thread take-up lever oil guard, as instructed on page 18.
3. Remove upper needle bar bushing, needle bar, presser foot and presser bar as instructed on pages 14 & 15.
4. Remove entire thread take-up lever assembly, as instructed on page 16.
5. Remove arm top cover screws and lift arm top cover off the machine.
6. Loosen the two feed and feed lifting eccentric set screws.
7. Loosen the two set screws in arm shaft (horizontal) bevel gear and the two set screws in arm shaft thrust collar.
8. Loosen the two set screws in machine pulley and remove machine pulley.
9. Turn the needle bar crank until it is in the position shown in Fig. 32 to prevent crank from disturbing the two oil wick loops in oil wick holder during removal of arm shaft.
10. While maintaining needle bar crank in position shown in Fig. 32, hold arm shaft and upright arm shaft bevel gears in mesh by holding the blade of a large screwdriver between thrust collar and bevel gear, then push the end of the arm shaft through arm shaft bushing (back) toward face plate end of machine.
11. Using another shaft (or a drift pin of the same diameter as the arm shaft on these machines), push the arm shaft further through the machine (still keeping the bevel gears in mesh). This temporary shaft must be pushed sufficiently far into the machine to hold the entire gear and feed eccentric mechanism etc. in position upon it until the new shaft is installed. When inserting the temporary shaft, or a drift pin, make certain that every care is taken to avoid injury to the oil seal in the arm shaft bushing (back) and consequent oil leakage.
12. Finally grasp needle-bar-crank-end of the arm shaft firmly at the face plate end and pull the arm shaft straight out of the machine.

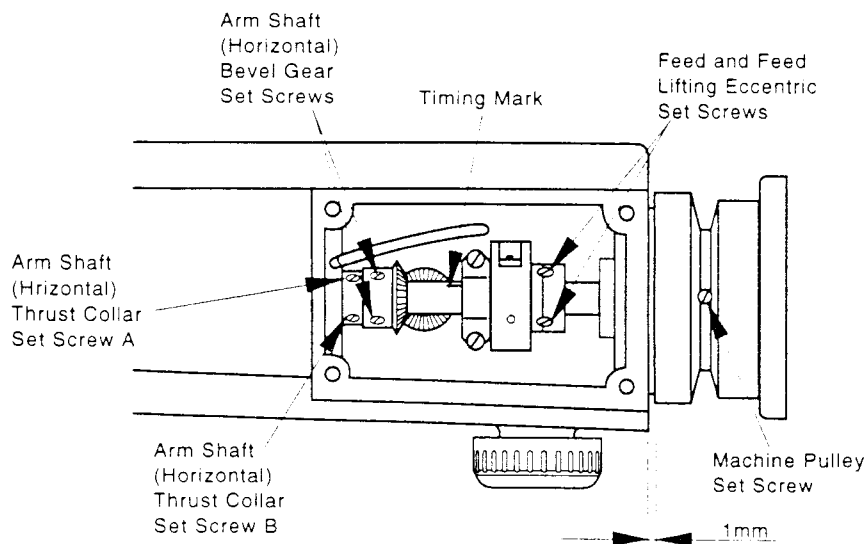


Fig. 31

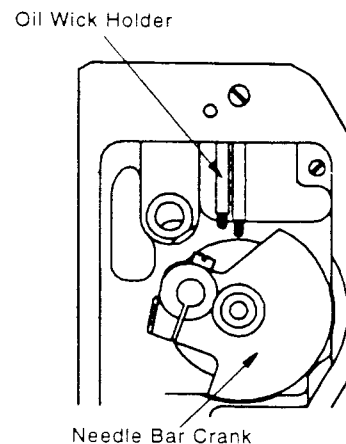


Fig. 32

Replacement:

1. Insert the machine-pulley-end of the arm shaft into the arm shaft bushing at the head of the machine arm.
2. Make certain that the needle bar crank is turned to the position shown in Fig. 32, clearing the two wick loops in oil wick holder.
3. While still holding the bevel gears in mesh with a screwdriver, push the arm shaft straight through the machine arm, thrust collar, arm shaft bevel gear and feed and feed lifting eccentric. When installing the new arm shaft, make certain that every care is taken to avoid injury to the oil seal in the arm shaft bushing (back).
4. Replace machine pulley on arm shaft with the two set screws located over the two grooves on the shaft and tighten the set screws temporarily.
5. Turn machine pulley over toward you until the two set screws in the thrust collar are at top as shown in Fig. 31. Align and securely tighten the upper set screw A (set screw which appears immediately after the first set screw when machine pulley is rotated over toward operator) on the longer timing mark provided for it on the arm shaft to give minimum end play in arm shaft. Turn machine pulley and test the arm shaft for freeness in rotation.
6. Set machine pulley in position so that there is 1mm clearance between machine pulley and end face of arm, as shown in Fig. 31.
7. Position set screw in arm shaft bevel gear over flat on the arm shaft and tighten securely. Hold machine pulley with right hand to check arm shaft from rotating, and move arm shaft (upright) bevel gear with left hand and feel for slight backlash. If there is no backlash, loosen the two set screws in the bevel gear and lightly tap the bevel gear away from the mating gear until there is just a slight amount of backlash. Then securely tighten both set screws in the bevel gear. Re-check backlash.
8. Adjust setting of feed and feed lifting eccentric, as instructed on page 7.
9. Replace thread take-up lever assembly, as instructed on pages 16 & 17.
10. Replace upper needle bar bushing and needle bar, as instructed on page 14.
11. Replace presser bar and presser foot, as instructed on page 15.
12. Replace thread take-up lever oil guard, as instructed on page 18.
13. Check adjustment and timing of parts disturbed and correct where necessary.
14. Replace arm top cover and securely tighten the screws.
15. Replace face plate, as instructed on page 3.