

SINGER

Service Manual

CLASS 510K



THE SINGER COMPANY

From the library of: Superior Sewing Machine & Supply LLC

USE **SINGER*** OILS and LUBRICANTS

*They insure freedom from lubricating trouble and give
longer life to sewing equipment*

The following are the correct lubricants for these machines:
TYPE A — MANUFACTURING MACHINE OIL, LIGHT GRADE

*When an oil is desired which will produce a minimum of
stain on fabrics, even after a long period of storage, use:*

TYPE C — MANUFACTURING MACHINE OIL, LIGHT GRADE

OTHER **SINGER*** LUBRICANTS

TYPE E — THREAD LUBRICANT

For lubricating the needle thread of sewing machines for stitching fabrics or leather where a thread lubricant is required.

TYPE F — MOTOR OIL

For oil-lubricated motors and plain bearings in power tables and transmitters.

NOTE: All oils are available in 1 quart and 1 gallon tins and 5 gallon drums.

GEAR LUBRICANT

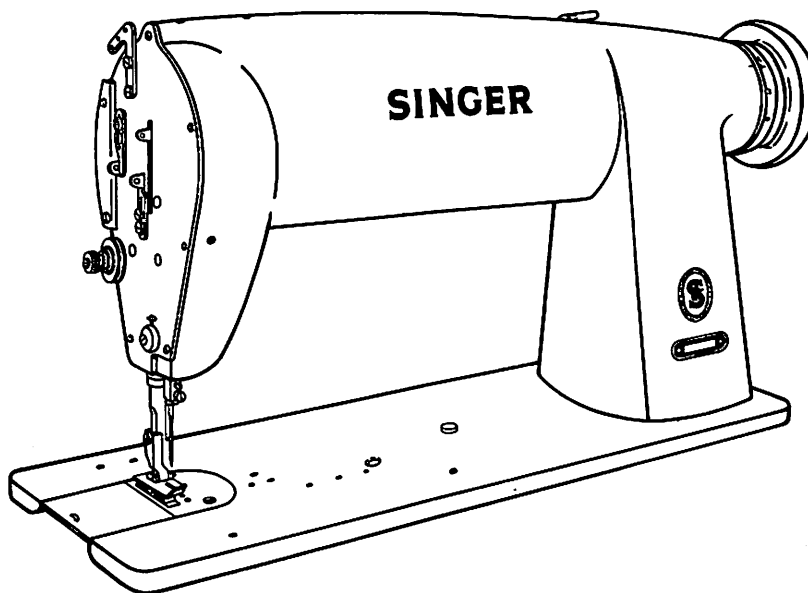
This specially prepared grease is recommended for gear lubrication on manufacturing sewing machines.

Form K6783
(768)

SINGER*

Service Manual

Class 510K Machines



Machine 510K111

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DESCRIPTION

Class 510K Machines are high speed, one needle, rotating looper, drop feed single thread chainstitch machines for basting light to heavy weight men's and women's clothing.

GENERAL FEATURES

Long arm, flat bed.

Bed dimensions: Length, 18-3/4 inches (457.2 mm). Width, 7 inches (177.8 mm). Working space at right of needle, 11 inches (279.4 mm).

Drop Feed. Pendant link feed mechanism with adjustable feed levelling eccentric pin.

Rotating looper.

Socket-type needle bar.

One needle.

Single thread chain stitch, F.S.T. 101.

Semi-automatic lubrication.

Double shielded ball bearings at both ends of arm shaft and at pulley end of looper driving shaft.

Needle bearings for feed driving and feed lifting connections, needle bar connecting link and looper shaft.

Knee lifter.

Tapped hole and seat in rear of arm provided for mounting a light fixture.

Machine pulley for 3/8 inch (9.5 mm) V-belt. Outside diameter of belt groove, 2.9 inches (73.66 mm). Effective diameter for 5/16 inch (7.9 mm) round leather belt, 2-3/8 inches (60.3 mm).

Totally enclosed Belt Guard available at an extra charge.

Single spool thread unwinder available at no extra charge if specified on order.

SPECIAL CHARACTERISTICS OF MACHINE VARIETIES

MACHINE 510K110

Light to medium weight fabrics.

Needle : Cat.1901 (chromium), sizes 12 to 25.

Needle bar stroke: 1 inch (25.4 mm).

Presser bar lift : 5/16 inch (7.9 mm).

Stitch length : Max. 4 per inch (25.4 mm)
Min.12 per inch (25.4 mm).

Speed : Max. 5,000 s.p.m.

MACHINE 510K111

Medium to heavy weight fabrics.

Needle : Cat.3355 (chromium), sizes 12 to 25.

Needle bar stroke: 1.7/16 inches (36.5 mm)

Presser bar lift : 3/8 inch (9.5 mm)

Stitch length : Max.2½ per inch (25.4 mm)
Min.12 per inch (25.4 mm)

Speed : Max. 5,000 s.p.m. for stitch lengths 4 to 12.
Max. 4,000 s.p.m. for stitch lengths 2½ to 4.

NOTE: For long, continuous runs reduce maximum machine speeds by approximately 500 s.p.m.

SETTING UP

DRIP PAN

Position drip pan on underside of table, as shown in Fig. 2, with its right end even with right inside edge of machine cut-out in table.

Using four 3/4 inch (19 mm) wire nails, fasten drip pan low enough in table cut-out to avoid interference with rock lever rod (shown in Fig. 2).

KNEE LIFTER

Using three 7/8 inch (22 mm) wood screws (shown at 1, Fig. 2) fasten rock lever bracket 2 to underside of table. Locate bracket 2 so that rock lever rod can rise and fall through hole provided for it in drip pan without striking edge of hole.

Locate rock lever extension 3 to hold rock lever rod equidistant from front and rear edges of hole in drip pan. Make certain that platform at top end of rod will be directly under knee lifting rod in machine; then securely tighten clamp screw 4.

Raise rock lever rod 5 to bring its platform just below knee lifting rod in machine, when at rest. Make certain platform is turned as shown in Fig. 2 and securely tighten clamping screw 6.

Knee plate 7 may be raised, lowered or turned to suit the requirements of the operator, after loosening clamping screw 8. Knee plate arm 9 may also be moved toward the left or right and toward front or rear after loosening clamping screw 10. Tighten both screws 8 and 10 securely when correct position is obtained.

Set stop stud 11 to stop the action of the knee lifter as soon as knee lifter raises presser foot high enough to trip hand lifter on machine. Securely tighten clamping screw 12.

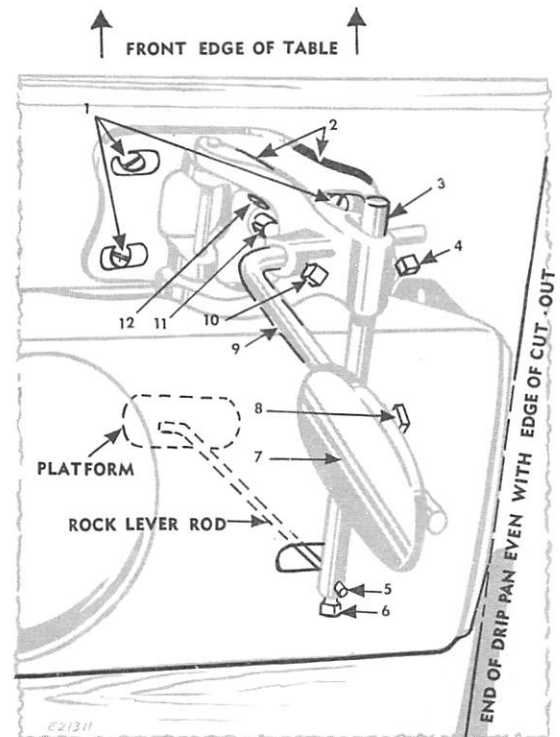


Fig. 2. Drip Pan and Knee Lifter beneath the Table.

MACHINE HEAD

Machine head should rest upon cushioning pads in four corners of cut-out in table. Machine hinges must not be used to support head except when machine is tilted back upon machine rest pin on table.

MACHINE PULLEY

When machine is in operation, machine pulley must always turn over TOWARD the operator.

CAUTION: DO NOT START THE MACHINE, NOT EVEN TO TEST THE SPEED, UNTIL IT HAS BEEN THOROUGHLY OILED.

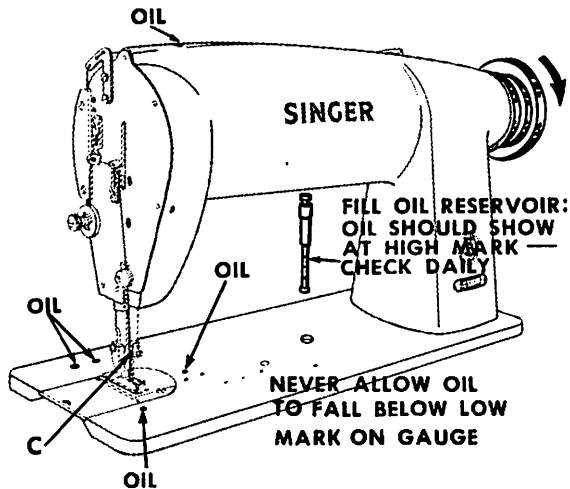


Fig. 3. Oil Reservoir and other Oiling Points on Machine.

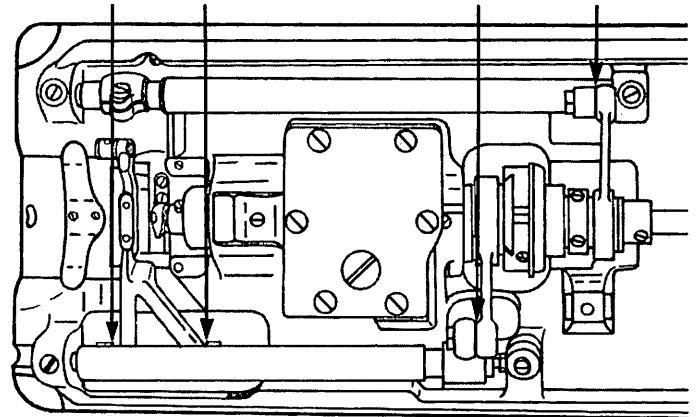


Fig. 4. Priming Points beneath Machine Bed.

LUBRICATION AND CLEANING

OIL

Using SINGER* OIL "TYPE A" or "TYPE C".

OIL RESERVOIR

Fill by lifting out oil gauge and applying oil to hole in machine bed, as instructed in Fig. 3. Reservoir supplies oil to eccentrics and to front bushing on looper driving shaft.

DAILY CARE

Apply a few drops of oil to the holes shown in Fig. 3.

Check oil level in reservoir before starting machine. Add oil, when necessary to maintain level at HIGH mark. NEVER ALLOW OIL LEVEL TO DROP BELOW LOWER MARK ON GAUGE.

AFTER INSTALLATION

New machines and machines installed after several weeks of idleness should be primed before using.

Apply oil to priming points shown in Fig.4, beneath machine bed.

CLEANING

Remove all lint and abrasive matter from around looper and from between feed rows on underside of throat plate.

Remove dirt from needle stop hole C, Fig. 3 in needle bar, by pushing the shank of a needle through hole. Wipe off all excess oil from areas of machine that may come in contact with material to be sewn.

NEEDLES

Use SINGER* needles -

Catalogue 3355 (Chromium) for 510K111 Machine.

Catalogue 1901 (Chromium) for 510K110 Machine.

ORDERS FOR NEEDLES should specify Quantity required, size number and Catalogue number.

EXAMPLE.....

"100 size 16, Catalogue 3355 (Chromium) Needles".

Size of the needle to be used should be determined by type of material being sewn and by size of thread which must pass freely through the eye of needle.

TO SET THE NEEDLE

Turn machine pulley over TOWARD you until needle bar is at its highest point.

Loosen needle clamping screw. Insert needle up into needle bar as far as it will go, with long groove of needle to the left and eye of needle directly in line with arm of machine.

Securely tighten clamping screw.

THREAD

Either right or left twist thread can be used in the needle.

Rough or uneven thread, or thread which passes with difficulty through the eye of the needle, will interfere with successful operation of machine.

UPPER THREADING

Turn machine pulley TOWARD you until needle is at its highest position.

Pass thread from unwinder, through threading points No. 1 to No. 10 in order shown in Fig. 6.

Thread needle from left to right.

Leave about three inches of thread behind the presser foot, as shown in Fig. 6, with which to start sewing.

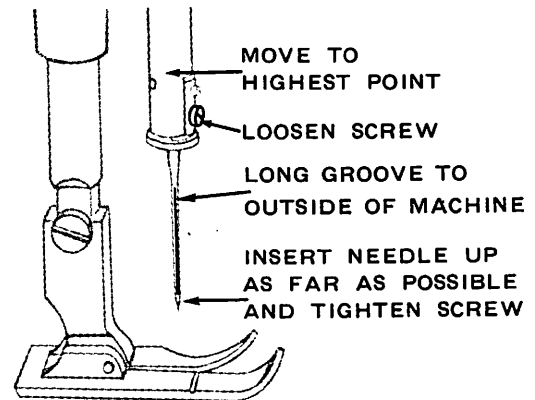


Fig. 5. Setting Needle.

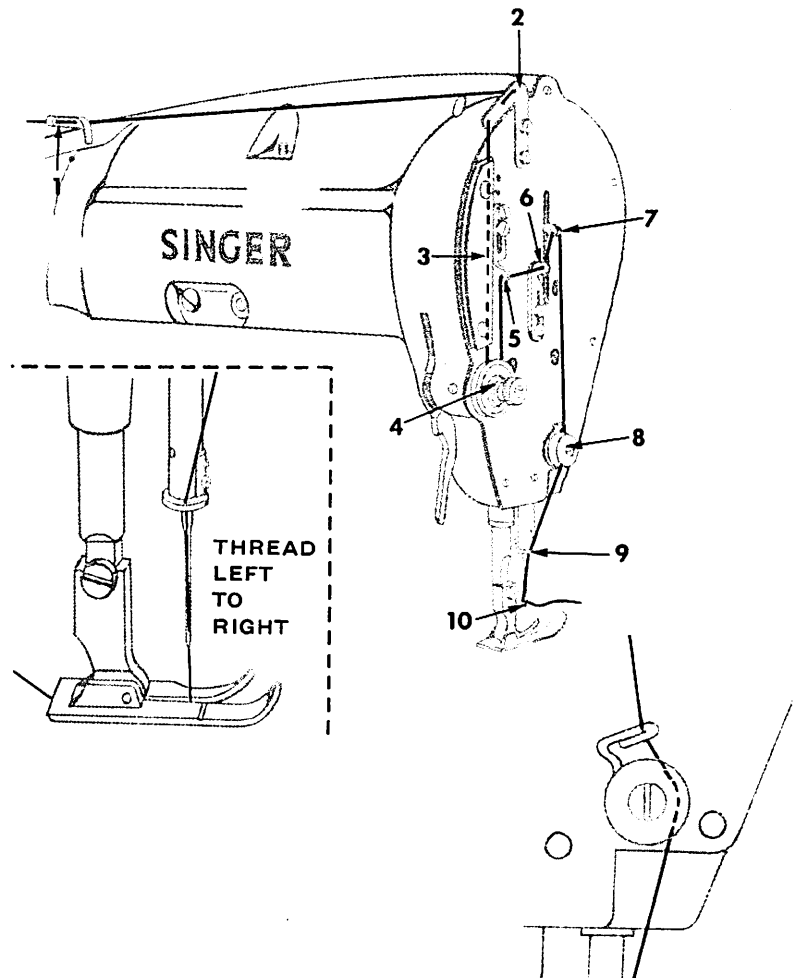


Fig. 6. Threading.

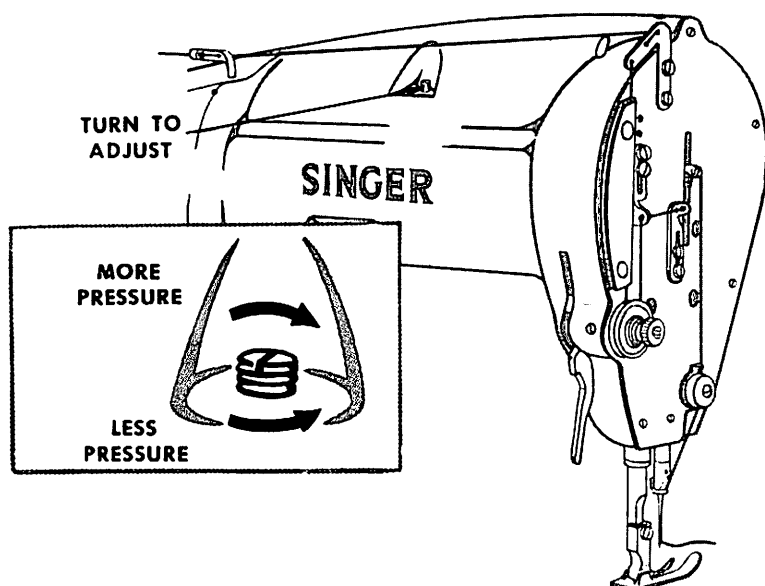


Fig. 7. Regulating Presser Foot Pressure.

Pressure on material should be as light as possible, while sufficient to insure correct feeding.

To increase pressure turn this screw downward (clockwise). To reduce pressure turn screw upward (anti-clockwise).

Do not completely release pressure on presser foot otherwise the ball bearing on the top of the presser bar may be displaced.

Pressure is correct when work moves steadily and smoothly without stalling.

TO REGULATE THE LENGTH OF STITCH

To change the length of stitch....

STOP machine

Depress plunger in machine bed as instructed in Fig. 8 and

Turn machine pulley over TOWARD you slowly until plunger drops (clicks).

Then turn machine pulley, until number indicating desired stitch length is opposite mark P, Fig. 8, on arm, and release plunger.

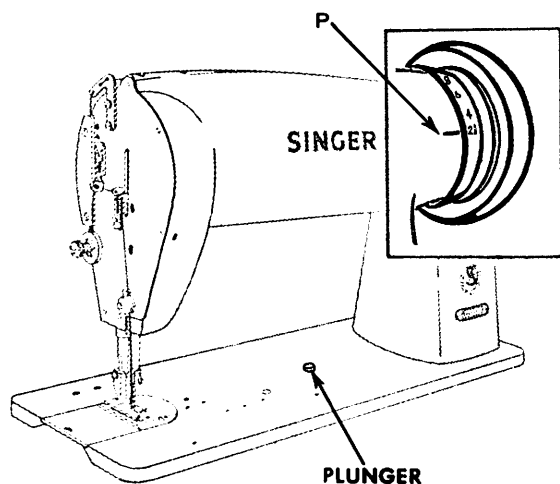


Fig. 8. Regulating Stitch Length.

TO REGULATE PRESSURE OF PRESSER FOOT ON MATERIAL

Correct presser foot pressure helps feed work efficiently. You can regulate pressure by means of screw on top of arm, as shown in Fig. 7.

Never depress plunger while machine is running.

Make certain that plunger is disengaged before starting machine.

TO START SEWING

Place the material and thread beneath the presser foot, lower presser foot and start to sew, turning the machine pulley over TOWARD you. If the thread loop thrown out by the needle for the looper to catch does not stand out at right angles to the line of motion of the looper, the needle should be turned slightly to bring it into this position.

TO TURN A CORNER

Stop machine when needle is entering the material.

Raise presser foot.

Turn material for next line of stitching, using needle as a pivot.

Lower presser foot.

Resume sewing.

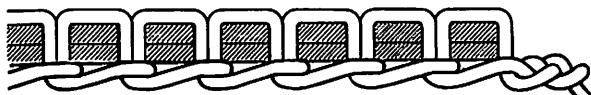


Fig. 9. Stitching Fastened at the End of a Seam.

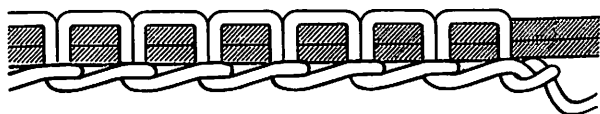


Fig. 10. Stitching Fastened Off in the Work.

TO REMOVE THE WORK

Sew two stitches past the end of the seam and stop the needle bar at highest point. Draw about three inches of thread through the tension discs. Draw the slack thread through the eye of the needle, then pull the thread upward from the work, presser foot down, and cut the thread close to the goods. Raise the presser foot, pull the work from you and the end of the thread will be drawn through the loop; then pull the end of the thread to fasten, as shown in Fig. 9.

TO FASTEN OFF THE STITCHING IN THE WORK

When it is necessary to fasten the last stitch in the work, stop the machine with

the needle in the work, hold the material close to the presser foot to prevent the work from moving, raise the presser foot and take one more stitch in the last hole made, see Fig. 10. Stop the needle bar at its highest point and draw about three inches of thread through the tension disc. Draw the slack thread through the eye of the needle, pull the thread upward from the work and cut the thread close to the goods. Pull the work from you and the end of the thread will be drawn through the loop; then pull the end of the thread to fasten, as shown in Fig. 10.

TO TAKE OUT A SEAM

The seam can be readily taken apart without injury to the material by unfastening the last stitch and drawing out the thread in the opposite direction to which the seam was sewn.

In cases where both ends of a seam are likely to be trimmed, as in fitting a garment, etc., always begin the seam at the end which is sure to be trimmed; at the other end, reverse the work and stitch back sufficient distance to allow for trimming.

TO AVOID THREAD BREAKAGE

1. Remove sharp edges from thread contact surfaces of all thread handling parts.
2. Check needle and thread as instructed on page 6.
3. Thread machine correctly, as instructed on page 6.
4. Make certain machine is set for lightest tension possible, without loss of thread control.
5. Keep machine clean and well oiled, at all times.

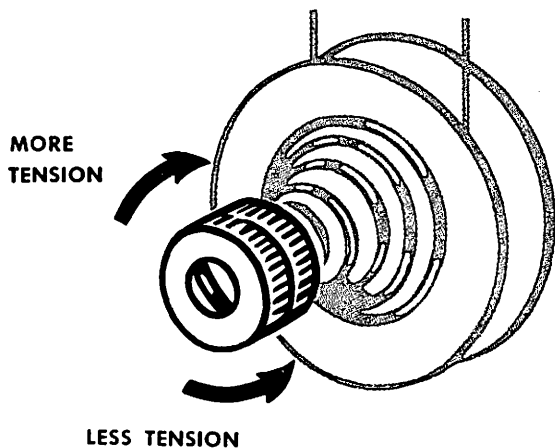


Fig. 11. Thread Tension.

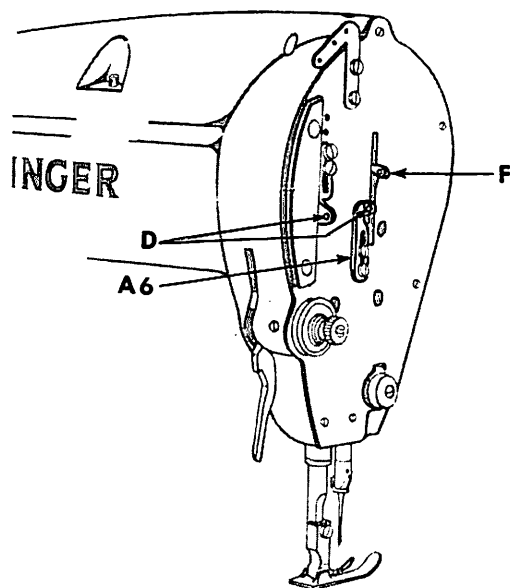


Fig. 12. Adjustable Thread Guide.

TO REGULATE TENSION

The machine is fitted with a light tension spring and should be regulated to give just enough tension to set the stitch and also control the thread which is being pulled into the system.

Regulate tension as shown in Fig. 11.

TO ADJUST ADJUSTABLE THREAD GUIDE

(See Fig. 12).

The eyelet D of adjustable thread guide A6 should be positioned so that on the downstroke of take-up F no thread is pulled into the system, and at completion of downstroke of take-up F there is no slack thread between needle and tension.

This adjustment to thread guide A6 should be made after a few stitches have been taken on the material to be handled, and at the thickest part of the seam, for example, crossing seams.

TO ADJUST THROAT PLATE THREAD RETAINER AND NEEDLE GUARD

The thread retainer on the underside of the throat plate must be correctly positioned to ensure that the loop of thread from the previous stitch is retained to enable the formation of the next stitch.

To adjust, loosen the two set screws and move the thread retainer towards or away from the needle as required.

Machines of Class 510K are made with extreme precision in machining and assembly. Therefore, utmost care should be taken not to permit any misalignment of parts. Any scratches or nicks on bearing surfaces caused by careless assembly or handling of parts might render a machine incapable of the long, trouble-free service for which it was designed.

NOTE: The instructions on the following pages are for Service Representatives.

INSTRUCTIONS

FOR

SETTING and TIMING

NOTE: Before any unnecessary time and effort is spent making major adjustments or installations, check the following conditions of machine performance.

1. Sample of work currently produced on machine.
2. Needle and thread in use.
3. Threading.
4. Speed of machine.
5. Lubrication condition.

Before checking and adjusting a machine which has been idle for some time, check for hardened oil or grease between moving parts. Clean machine with Varsol or a similar cleaning compound and remove all hardened lubricant, then hand-oil all moving parts at points of contact.

After a machine has had considerable use, check for worn-out parts, loose-fitting shafts, eccentrics, studs and links, bent needle bar, presser bar and needle, damaged looper, throat plate, presser foot and feed dog. Replace all parts showing wear with SINGER* spare parts for top performance.

SPECIFICATIONS

The following gauge distances apply for average sewing conditions:-

Height of lower end of needle bar
(lower) bushing above throat plate
seat:

51OK110 - 2.528 inches (64.21 mm)

51OK111 - 2.715 inches (68.96 mm)

Height of feed dog above throat
plate:

.0415 to .0445 inch - (10.54 to 11.30
mm)

Height of needle stop in needle bar
above throat plate seat:

51OK110 - 1.067 inches (27.10 mm)

51OK111 - 1.168 inches (29.66 mm)

Height of lower end of presser bar
bushing above throat plate seat:

2.450 inches (62.23 mm)

Certain sewing conditions may necessitate
slight variations from these settings.

BALL BEARING AND NEEDLE BEARING NOTES

There are three ball bearings and five
needle bearings in each of these machines.

Ball bearings on forward end of arm shaft
and rear end of looper driving shaft are
force fitted into their correct position
at factory.

When replacing ball bearings make certain
that they form a tight fit on their
respective shafts.

Ball bearing on machine pulley is also a
forced fit.

The five needle bearings should receive the
same care as ball bearings and should not
be removed from their respective housings
except for replacement. Needle bearings
should be replaced by pressing on numbered
end of outside shell.

Any pressure on unnumbered end may
distort shell and cramp bearings.

After installation care should be taken
to see that needle bearings roll freely
in their respective housings.

TO TIME THE MACHINE

The parts are in their proper timing on
the various shafts when the locating
screws are in the shaft splines provided
for them. The locating screws are the
second screws appearing when the shafts
are revolved in their normal direction of
rotation. In addition, the timing marks
on the feed lifting eccentric and looper
driving shaft should be in line.

TO TIME ARM SHAFT WITH LOOPER DRIVING SHAFT

Arm shaft and looper driving shaft (with
their components) are in time with each
other, when timing mark R on needle bar
S is just visible below needle bar bushing
O, Fig. 16, mark P on arm is in line with
arrow T, Fig. 17, on machine pulley and
arrow H is in line with mark G, Fig. 15
on feed lifting eccentric connection.
These settings are for average sewing
conditions.

To adjust loosen two screws L, Fig. 15,
align timing mark P with arrow T, Fig.
17, and turn shaft K as required to align
arrow H with mark G, Fig. 15.

Securely tighten two screws L, Fig. 15.

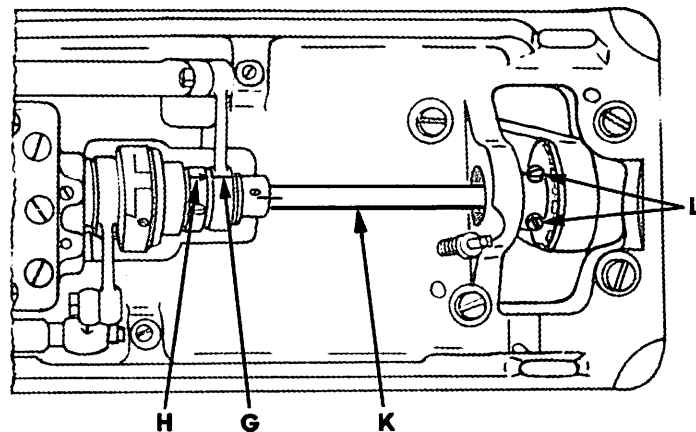


Fig. 15. Timing Mark on Feed Lifting
Connection.

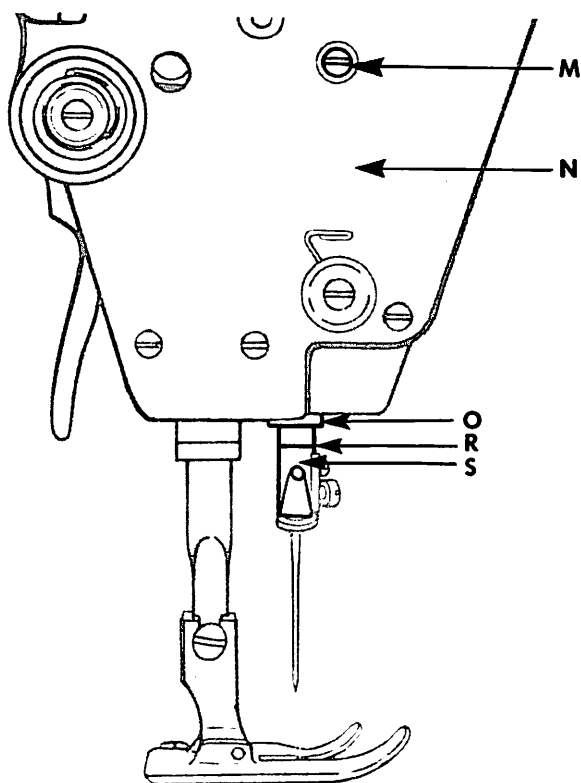


Fig. 16. To Set Needle Bar.

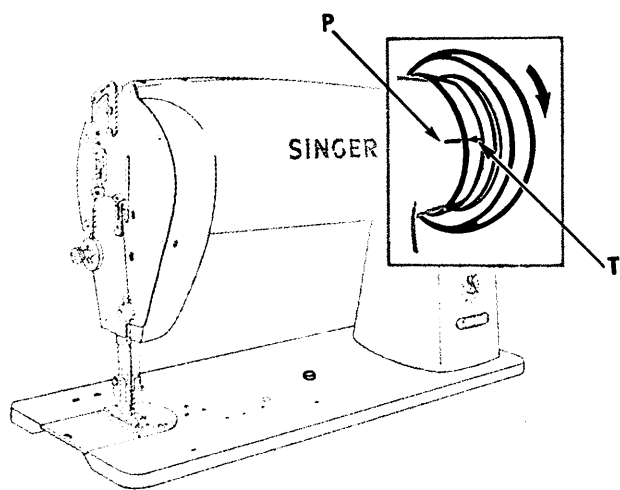


Fig. 17. Timing Mark on Arm.

TO SET NEEDLE BAR AT CORRECT HEIGHT

(See Fig. 16).

Check height of needle bar bushing. Turn machine pulley TOWARD you until needle bar is at highest point. Lower mark R on needle bar S should just be visible below lower end of needle bar bushing O.

To set needle bar at correct height, loosen screw M through access hole in face plate N. Move needle bar to correct height and securely tighten screw M.

CAUTION: Be sure that needle bar does not rotate while making this adjustment.

TO RESET NEEDLE BAR BUSHING

Remove face plate as instructed on page 22.

Remove needle bar as instructed on page 22.

Remove throat plate. Set lower end of needle bar bushing to a height of 2.528 inches (64.21 mm) (51OK110) or 2.715 inches (68.96 mm) (51OK111) from throat plate seat.

Replace throat plate

Replace needle bar as instructed on page 22.

Replace face plate as instructed on page 22.

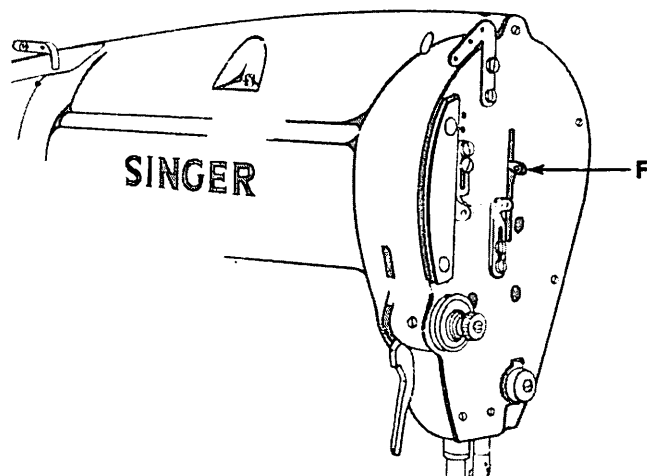


Fig. 18. Thread Take-up.

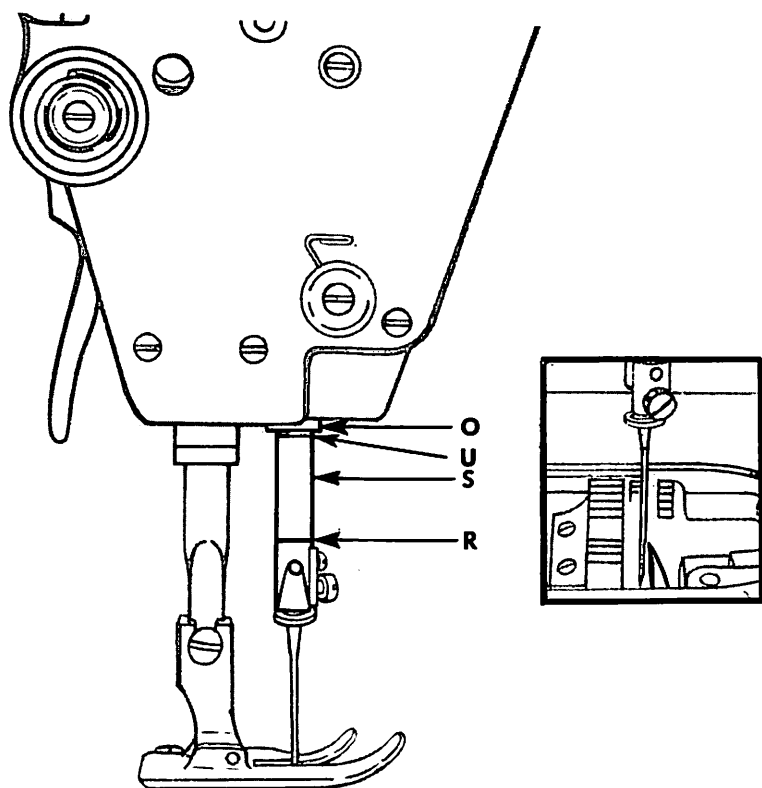


Fig. 19. Timing Marks on Needle Bar.

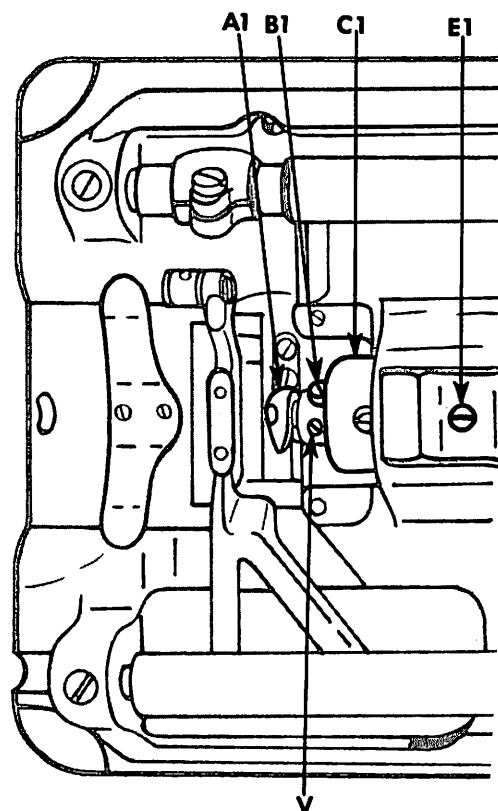


Fig. 20. To Time the Looper.

TO TIME THE LOOPER

First ensure that the needle bar is set correctly as instructed on page 13.

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

To determine whether the looper is correctly timed, place a new needle in the machine, then turn machine pulley over toward you until the needle bar has started to rise from its lowest position and the upper timing mark U, Fig. 19 is just visible at the lower end of the needle bar bushing O, Fig. 19. When the needle bar is in this position, the point of the looper should be at the centre of the needle.

If the looper is not correctly timed, loosen the large screw B1, Fig. 20 in the looper hub V. (Do not loosen the small screw in the looper hub).

Turn the looper A1, Fig. 20 to bring the point of the looper to the centre of the needle while the upper timing mark U on the needle bar is just visible at the bottom of the bushing O, Fig. 19 then tighten screw B1, Fig. 20.

The point of the looper should pass the needle as closely as possible without touching it. The looper should be placed in the shaft as far as it will go. If it is necessary to move the looper sidwise, loosen the set screw E1, Fig. 20 and move the bushing C1, Fig. 20 with looper as required, tapping to the right, or prying it to the left with a screwdriver placed in the hole at bottom of bushing, against the bed casting. Tighten set screw E1, Fig. 20.

TO SET PRESSER BAR AT THE CORRECT HEIGHT

PREPARATION

Remove face plate as instructed on page 22.

Test presser bar for smooth, uniform motion. If presser bar tends to stick at any point, feeding will be adversely affected. Presser bar may need cleaning, repairing or replacement.

Accumulation of lint, oil and dirt on presser foot seat on presser bar, may prevent proper seating of foot. Clean this area before checking and setting the presser bar.

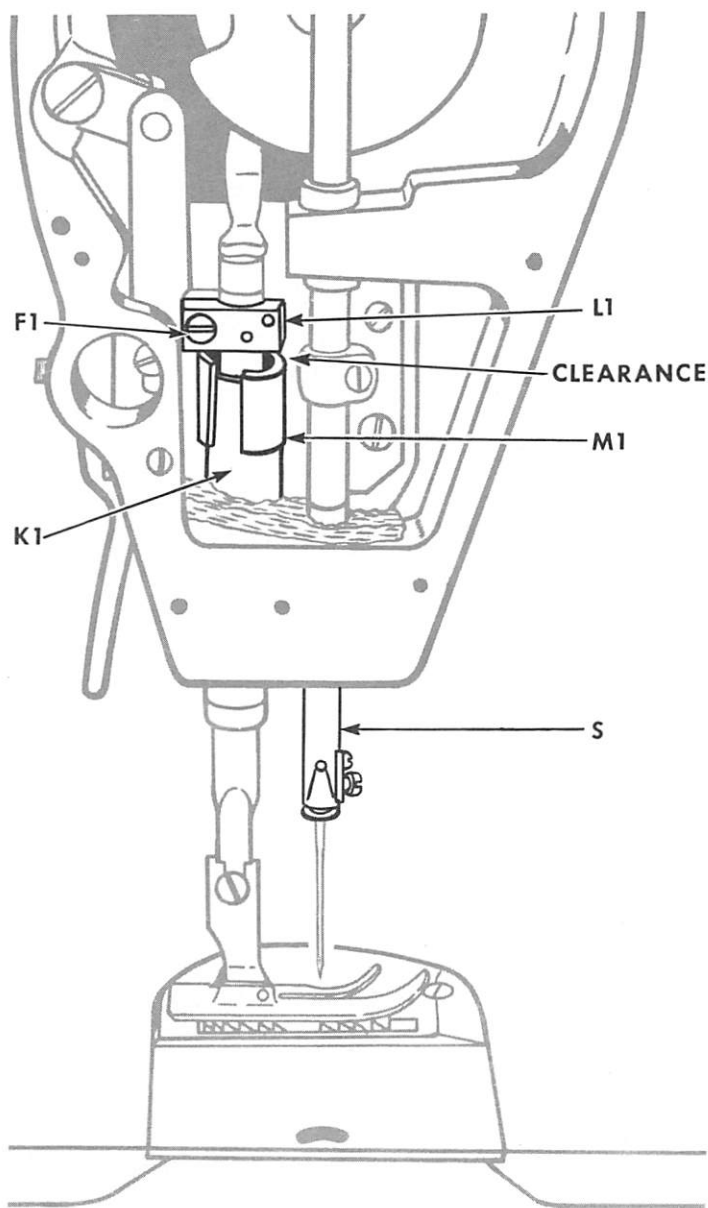


Fig. 21. Checking Height of Presser Bar.

CHECK

1. When presser foot is raised with presser bar lifting lever, there should be a clearance of 5/16 inch (7.92 mm) (51OK110) or 3/8 inch (9.52 mm) (51OK111) between presser foot and throat plate.
2. When presser foot rests firmly upon throat plate (with feed dog below throat plate) there should still be some clearance between presser bar guide bracket L1 and lifting bracket M1 as shown in Fig. 21.
3. When presser foot is at its highest point and needle bar is at its lowest, top of presser foot should clear the thread guide on lower end of needle bar S.

SETTING

Release presser bar lifting lever to lower presser foot.

Loosen clamping screw F1, Fig. 21.

Raise or lower guide bracket L1 as required.

Make certain presser bar is turned correctly so that needle will locate centrally between the two toes of the presser foot.

Securely tighten screw F1.

TO RESET PRESSER BAR BUSHING

Remove presser bar as instructed on page 23. Set lower end of presser bar bushing K1 to a height of 2.450 inches (62.23 mm) above throat plate seat.

Replace presser bar as instructed on page 23.

OTHER ADJUSTMENTS

Presser foot should offer as little resistance as possible to material. Check bottom surface of foot for wear or abrasion; particularly at radius where toe meets with sole of presser foot.

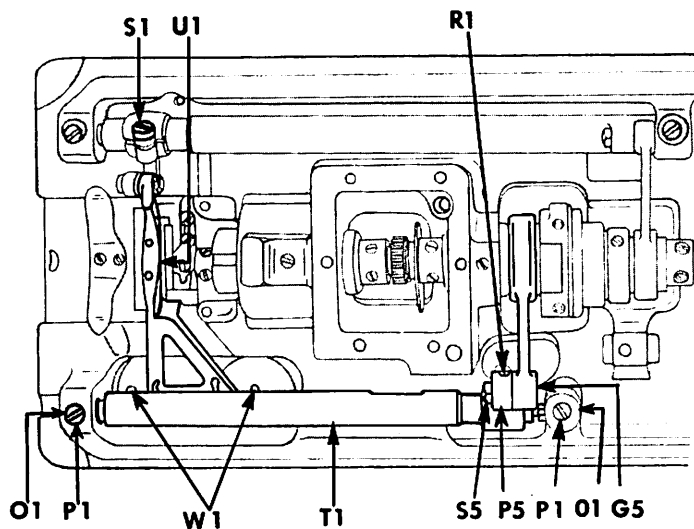


Fig. 22. Adjusting the Feed Dog.

TO CENTRALISE FEED DOG IN THROAT PLATE SLOTS

CHECK

Feed dog should not contact edges of throat plate slots

SIDEWISE SETTING

Feed dog should travel on a line midway between sides of throat plate slots.

Feed dog can be moved towards left or right as required, after loosening screws P1 and screws S1 and R1, Fig. 22. Remove nut S5 and screw G5.

Loosen screw R1, realign crank P5 with link R5 then tighten screw R1. Replace screw G5 and lock nut S5 as instructed on page 26.

By moving bearing centres at O1 to left or right, as required, rock shaft T1, feed bar U1 and feed dog can be moved to desired position. Ensure that bearing centres O1 will hold rock shaft T1 snugly in place without binding, then securely tighten screws P1 and screw S1.

LENGTHWISE SETTING

Set machine for longest stitch as instructed on page 7. Feed dog should be set so that its movement is equidistant from front and rear edges of throat plate slots. Loosen pinch screw R1 and move feed bar U1 and rock shaft T1 as required.

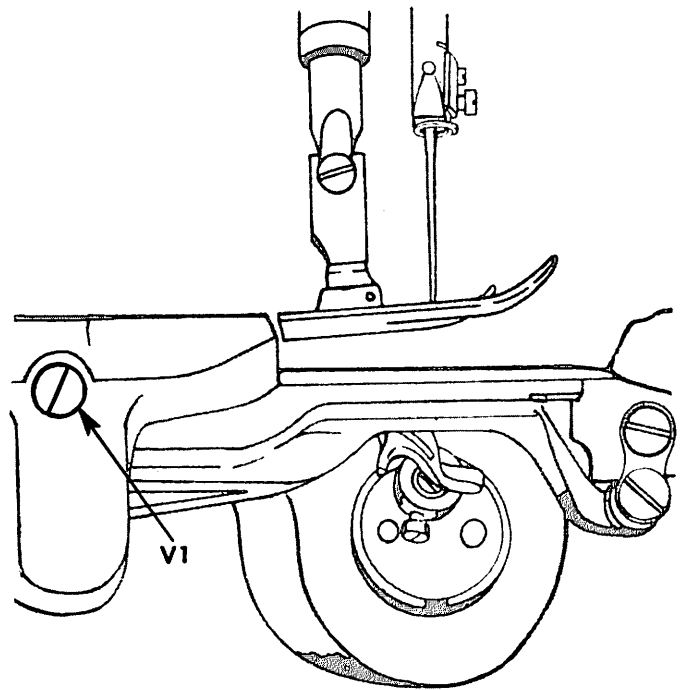


Fig. 23. To Tilt Feed Dog.

Securely tighten screw R1.

Set feed dog at correct height.

TO SET FEED DOG HEIGHT

Turn machine pulley over TOWARD you until feed dog is at highest position. Top of feed dog should be .043 inch (1. mm) above throat plate. To adjust, turn machine back on hinges, loosen screw S1, Fig. 22 and raise or lower feed bar U1 to desired height. Re-tighten screw S1 securely.

TO LEVEL FEED DOG

Loosen set screws W1, Fig. 22 and turn eccentric hinge pin V1, Fig. 23, until feed dog is level at top of feed path.

CAUTION: After adjusting always ensure feed dog does not strike throat plate.

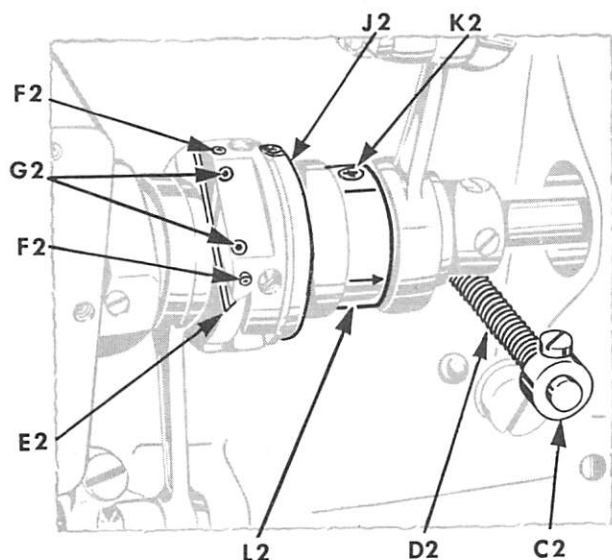


Fig. 24. Adjusting the Feed Eccentrics.

TO PREVENT UNAUTHORIZED CHANGE OF STITCH LENGTH

Loosen screws F2, Fig. 24. Tighten adjusting socket screws G2, Fig. 24 firmly and securely tighten locking screws F2. Feed driving eccentric J2, Fig. 24 will then be locked and stitch length cannot be changed.

TO ADJUST FEED DRIVING ECCENTRIC GIB

Feed eccentric is provided with a gib E2, Fig. 24 which can be adjusted to take-up any loose motion between feed driving eccentric and eccentric body. To adjust gib, loosen two locking screws F2, Fig. 24 nearest gib E2; then turn in two adjusting screws G2, Fig. 24 against gib until all play is eliminated and eccentric fits snugly in slot in eccentric body. Securely tighten the two locking screws F2.

CHECK

Depress plunger in machine bed Fig. 10, page 7. Turn machine pulley over towards you slowly until plunger engages. While engaged turn machine pulley through the full indicated stitch length range. Resistance should be felt without being excessive.

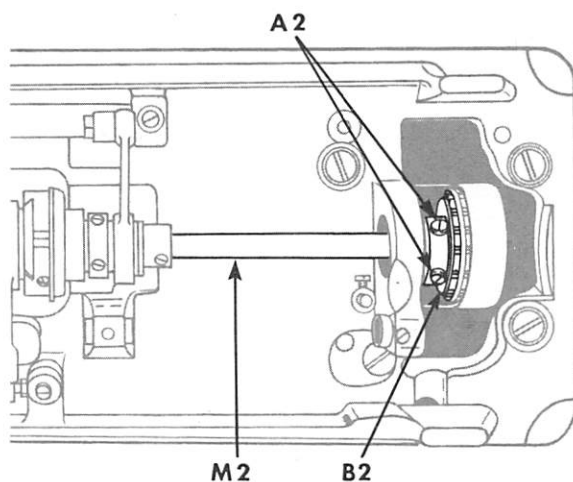


Fig. 25. Timing Feed Motion.

TO ADJUST FEED ECCENTRIC CAM

A spring held by collar L2, Fig. 24 presses against feed eccentric cam to prevent it from moving out of position during operation. Ordinarily, collar L2 should be set flush with end of hub of eccentric body, as shown.

To adjust, loosen set screw K2. This set screw must enter timing groove in eccentric body when it is re-tightened.

TO CHECK THE KNEE LIFTER ROD SPRING

Spring D2, Fig. 24, between bed casting and collar C2, Fig. 24, on knee lifter lifting rod, cushions action of lifting bracket.

Occasionally inspect this spring to make certain it is in good working condition.

FEED TIMING

If a faster or slower feed timing than standard setting is desired (see page 12) loosen screws A2, Fig. 25 on lower connection belt pulley, B2, and turn the looper driving shaft M2 as desired, then tighten screw A2.

Retime looper as instructed on page 14.

The feed lifting eccentric can be adjusted independent of the feed driving eccentric, if required, by loosening screws and rotating feed lifting eccentric on looper driving shaft until desired timing is obtained.

Instructions for
REMOVAL AND REPLACEMENT
OF PRINCIPAL ASSEMBLIES

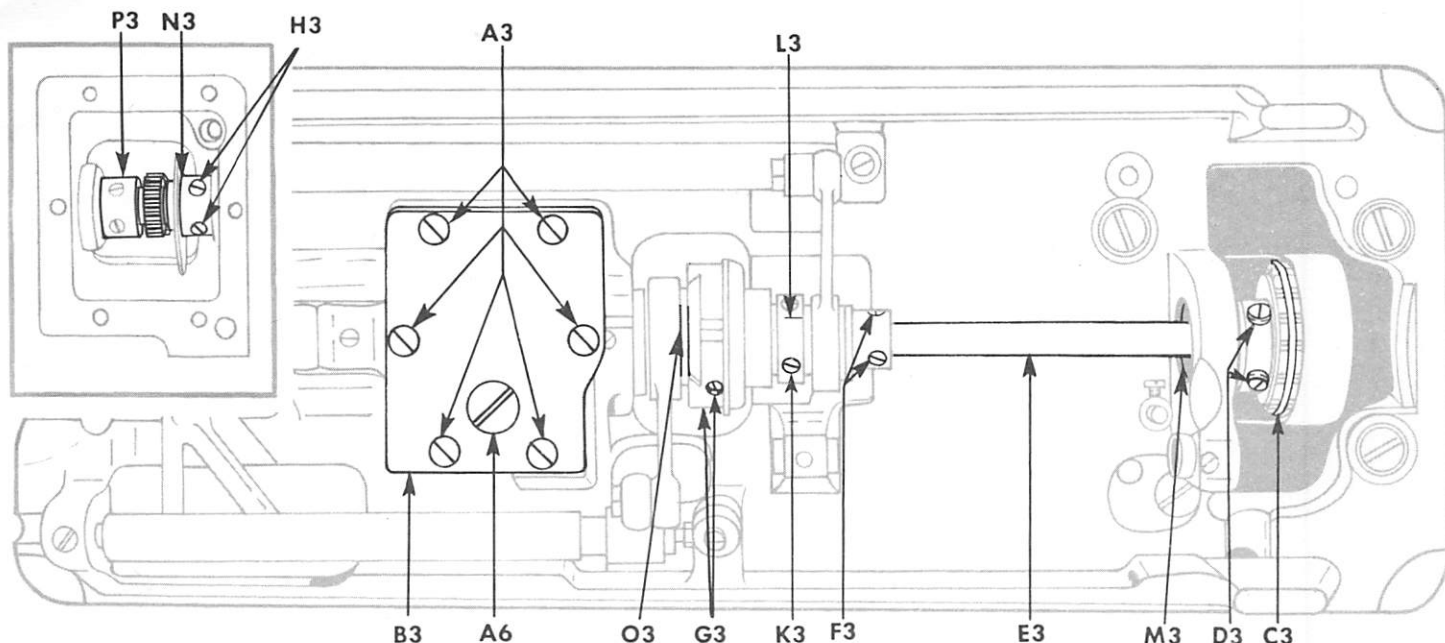


Fig. 26. Looper Driving Shaft.

THE LOOPER DRIVING SHAFT

REMOVAL

(See Fig. 26)

Remove drain plug screw A6 and drain off oil. Remove screws A3, reservoir bottom cover B3 and gasket.

Slip belt off lower pulley C3.

Loosen screws D3.

Remove pulley C3 from shaft E3.

Loosen set screws F3 and G3 in feed lifting and feed eccentrics.

DO NOT LOOSEN SCREW K3 IN COLLAR L3.

Loosen gear set screws H3 (inset).

Mark gears N3 and P3 for correct meshing to ensure perfect operation when re-assembled.

Draw shaft with its ball bearing M3 from left to right, out of machine.

REPLACEMENT

When replacing shaft E3, ensure that oil lead wire is in place in shaft. Hold gear N3 in position and push shaft in (ensuring feed eccentrics slip on shaft in their proper order) until snap ring on ball bearing M3 seats on casting. Tighten gear screws before tightening set screws G3.

Gear N3 is correctly positioned when end play has been eliminated from shaft E3 by setting gear N3 against looper driving shaft bushing.

Locate feed eccentric until there is approximately .004 inch (.1 m.m.) clearance between feed eccentric and bushing at O3. Tighten set screws G3, ensuring the second screw (as shaft turns over TOWARD you) enters groove in shaft. Move feed lifting eccentric to left as far as it will go. Line up timing marks on feed lifting eccentric and looper driving shaft. Securely tighten screws F3. Replace pulley C3. Ensure that ball bearing is correctly positioned so that left side of pulley C3 seats firmly against ball bearing M3 and pulley hub is flush with end of shaft on other side.

FOR AVERAGE SEWING CONDITIONS

Retime machine as instructed on page 12. Check looper timing as instructed on page 14.

Replace oil reservoir bottom cover, B3, and gasket and securely fasten with screws A3.

Replace and securely tighten drain plug screw A6.

Fill oil reservoir as instructed on page 5.

TO REMOVE THE LOOPER

Remove needle, throat plate and bed slide.

Turn machine pulley to raise feed dog to highest point. Loosen screw U3, Fig. 27, turn looper as required and remove.

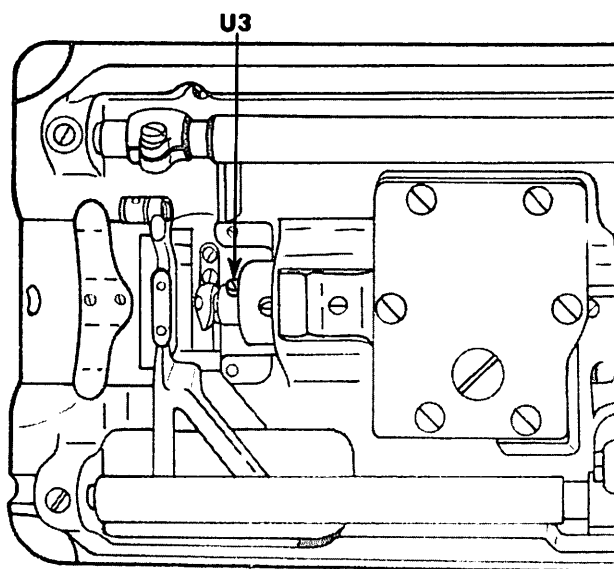


Fig. 27. Removing Looper.

REPLACEMENT

Replace looper and time as instructed on page 14.

TO REMOVE LOOPER SHAFT BUSHING AND LOOPER SHAFT

Drain off oil and remove oil reservoir cover, see Fig. 26, page 20. Remove looper as instructed above. Remove screws R3, Fig. 28, and feed bar lifting link S3. Turn machine pulley over toward you to drop feed bar T3 clear. Mark gears N3 and P3 for correct meshing to ensure perfect operation when re-assembled. Loosen screws V3 and W3 and withdraw looper shaft bushing X3 with looper shaft and friction plate. Loosen looper shaft set screw Y3 and back out looper set screw U3. Remove collar Z3 and withdraw looper shaft.

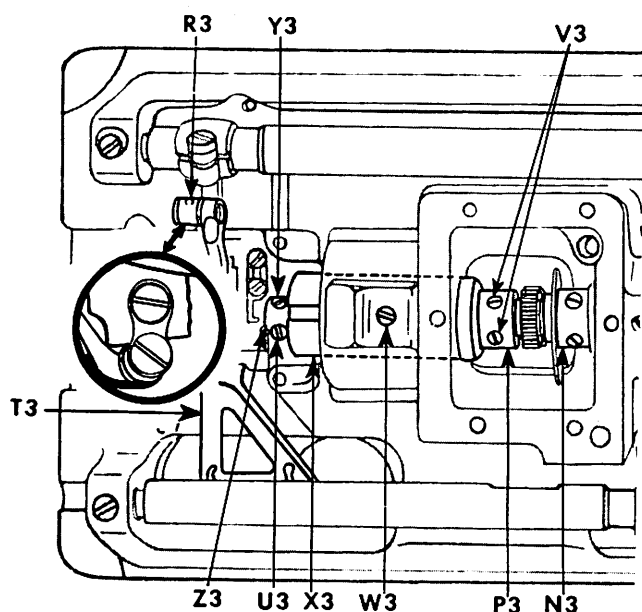


Fig. 28. Removing Looper Shaft and Bushing.

REPLACEMENT

Ensure that friction plate is positioned on end of bushing, then push shaft through bushing until shoulder on shaft is flush with friction plate. Replace collar, Z3, pass looper set screw U3 into hole in shaft then tighten looper shaft collar set screw Y3.

Holding looper shaft gear P3 in mesh, push bushing X3 into casting inserting end of looper shaft into gear P3 bringing gear P3 up against friction plate. Tighten the gear screws, V3, the first screw appearing as gear turns in its normal rotation should locate on flat on shaft. Gear is correctly positioned when end play has been eliminated from shaft.

Replace looper and time as instructed on page 14.

TO REMOVE AND REPLACE FACE PLATE

REMOVAL

(See Fig. 29)

1. Remove two screws A4, and face plate thread guard B4.
2. Loosen screw C4 and remove tension assembly D4.
3. Remove six screws E4 and face plate F4.

REPLACEMENT

1. Instal face plate F4 and tighten six screws E4.
2. Replace thread guard B4 and tighten two screws A4.
3. Replace needle thread tension D4 and tighten screw C4.

TO REMOVE AND REPLACE NEEDLE BAR

REMOVAL

(See Fig. 30)

1. Remove face plate, as instructed above.
2. Remove needle and set screw, needle bar thread guide and screw.
3. Loosen needle bar connecting stud pinch screw G4.
4. Loosen pinch screw H4 and remove take-up K4.
5. Remove needle bar L4 through hole in top of arm.

REPLACEMENT

1. Insert needle bar L4 down through hole in top of arm, through upper needle bar bushing, through stud M4, and finally through lower needle bar bushing.
2. Replace take-up K4 approximately 1/32 inch (.79 m.m.) from top of needle bar. Lightly tighten pinch screw H4.
3. Replace needle bar thread guide and screw, needle set screw and needle.

4. Reset needle bar height as instructed on page 13.
5. Replace face plate, as instructed above.
6. Ensure that take-up K4 is centred in slot in face plate and securely tighten pinch screw H4.

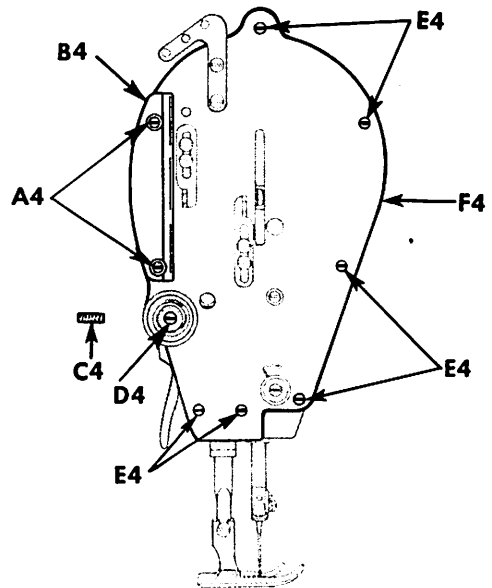


Fig. 29. Removing Face Plate.

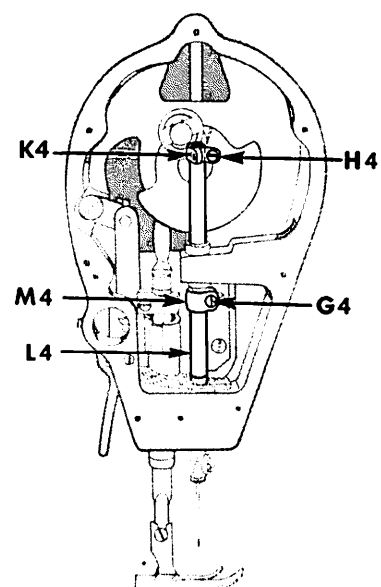


Fig. 30. Removing Needle Bar.

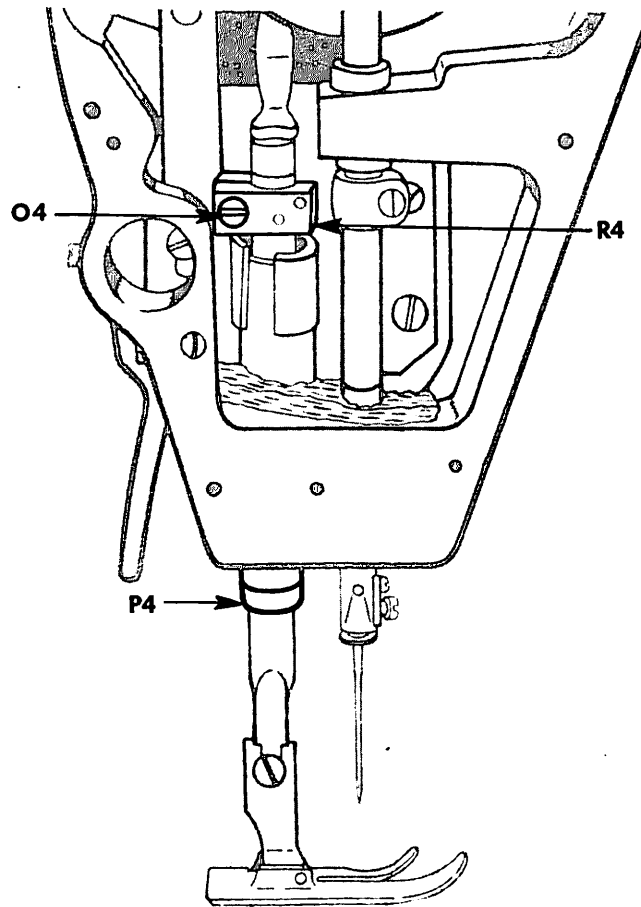


Fig. 31. Removing Presser Bar.

TO REMOVE AND REPLACE PRESSER BAR

REMOVAL

1. Remove face plate as instructed on page 22.
2. Remove presser foot screw and presser foot.
3. Release pressure on presser bar spring, see Fig. 9, page 7.
4. Loosen screw O4 and slip presser bar down and out of machine.

CAUTION: Take care not to lose the ball bearing at the top of the presser bar.

REPLACEMENT

1. Insert presser bar up through presser bar bushing P4 and presser bar guide bracket R4.
2. Replace ball bearing in top of presser bar.
3. Replace presser foot screw and presser foot.
4. Reset height of presser bar, as instructed on page 15.
5. Re-adjust presser bar spring pressure.
6. Replace face plate as instructed on page 22.

THE ARM SHAFT CONNECTION BELT

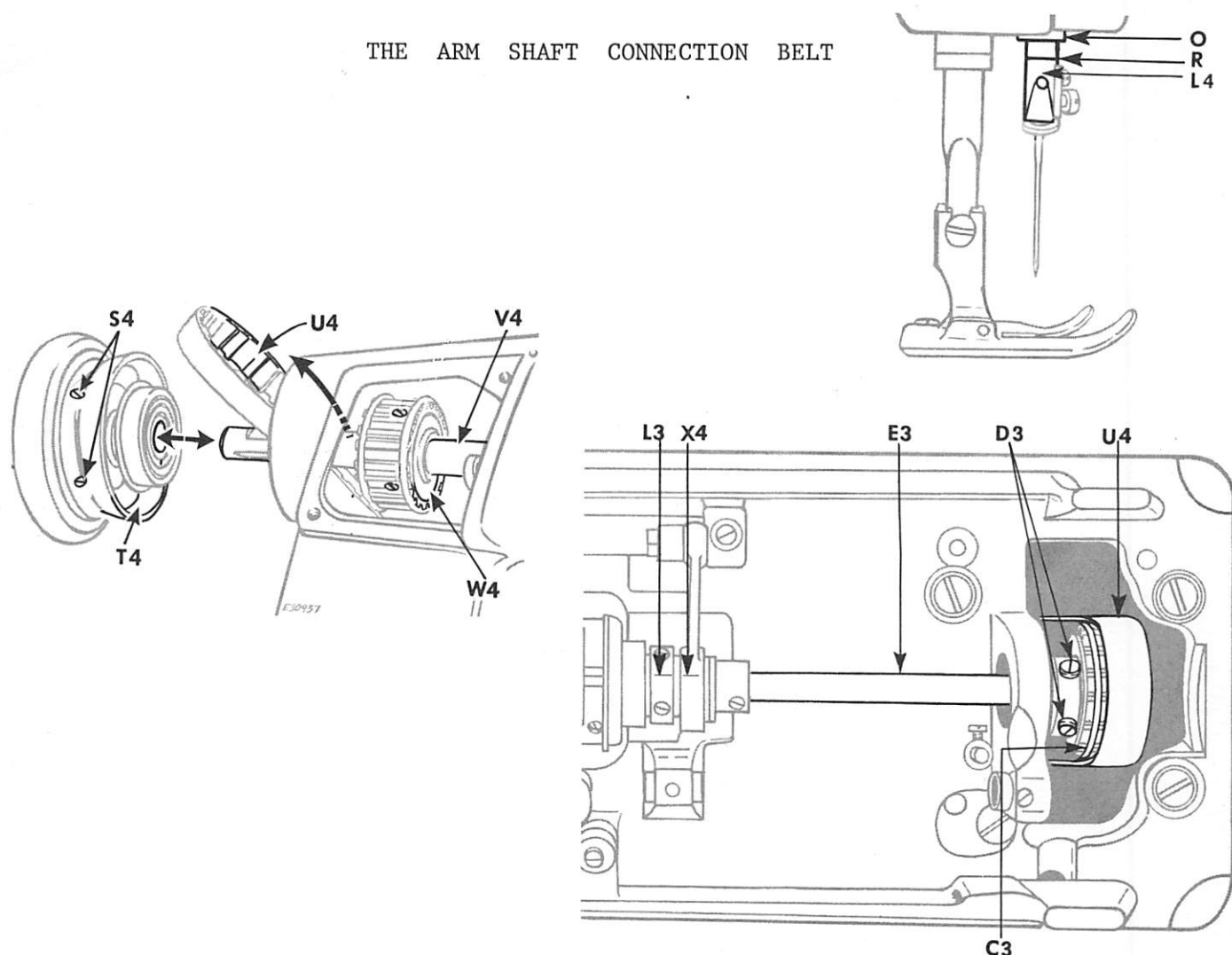


Fig. 32. Removing Arm Shaft Connection Belt.

REMOVAL

(See Fig. 32)

Remove needle to avoid damaging it while arm and looper shafts are out of time.

Slip belt off lower pulley C3. Loosen screws S4. Remove machine pulley T4 with its ball bearing. Remove side cover. Lift belt U4 up and draw it out around arm shaft as shown.

REPLACEMENT

Replace belt U4 through ball bearing hole, as shown. After placing belt over upper pulley W4, replace machine pulley T4 with its ball bearing.

To eliminate end play from shaft, lightly tighten set screws S4 in machine pulley.

Press upper pulley W4 to left tapping machine pulley into position with palm of hand. Locate second screw, i.e. the second screw which appear when machine pulley turns over toward operator, in the groove of arm shaft.

Turn arm shaft until lower timing mark R on needle bar L4 is just visible below needle bar bushing O. Keep this mark in position and turn lower shaft pulley until timing mark (arrow L3) on collar is opposite timing mark X4. Ensure set screws D3 are accessible. With shafts E3 and V4 in this position, lead belt on to lower pulley C3 at point nearest you. Turn machine pulley over TOWARD you and slide belt over remaining width of lower pulley.

Check timing of machine before starting to sew.

THE ARM SHAFT

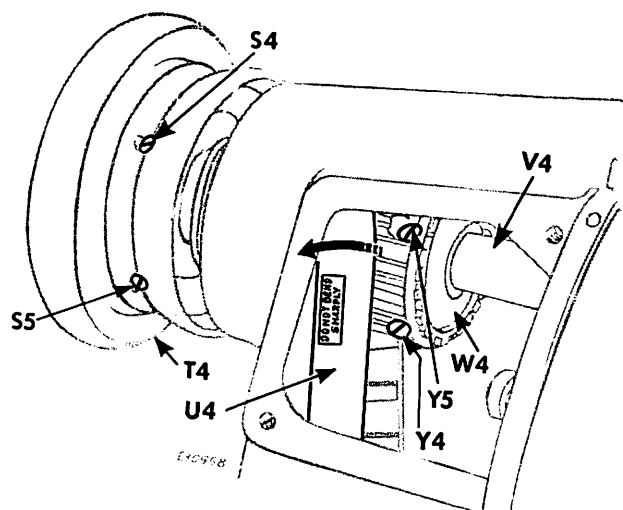


Fig. 33. Removing Pulley from Arm Shaft.

REMOVAL

Arm Shaft must be removed from face plate end of machine. Under no circumstances should an attempt be made to separate needle bar crank Z4, Fig. 34 from shaft V4, Fig. 33, as they are manufactured as a unit for accuracy.

Remove face plate and associated parts as instructed on page 22.

Remove needle bar as instructed on page 22.

Insert screw driver through hole in top of arm, loosen set screws A5 and B5, Fig. 34 and withdraw hinge stud D5. Thrust washer C5 will now fall from crank.

Remove needle bar connecting link E5.

Remove belt as instructed on page 24.

Loosen screws Y4 and Y5, Fig. 33, and hold pulley W4. Withdraw arm shaft V4 with crank Z4 from needle bar end.

REPLACEMENT

If it is found necessary to replace ball bearings at needle bar end of shaft V4, they should be forced on to shaft until they rest against oiling felt flange. Care should be taken to avoid damaging flange.

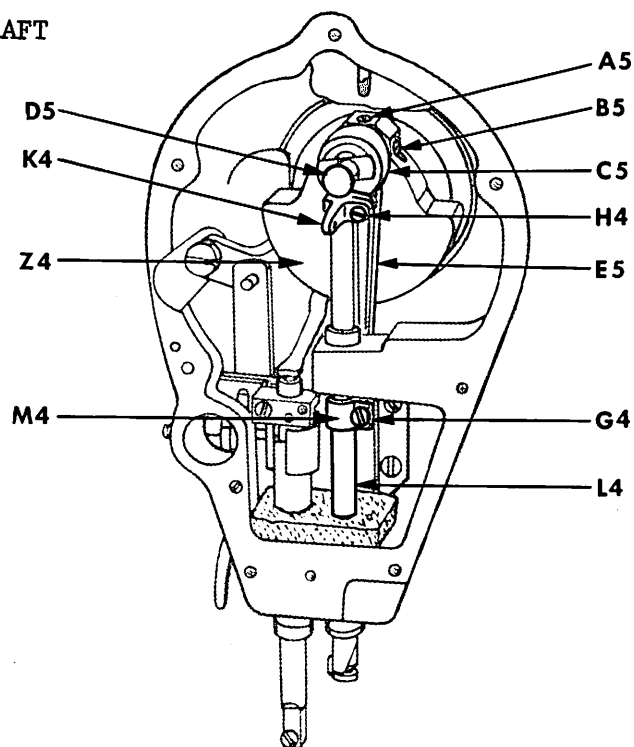


Fig. 34. To Remove Arm Shaft.

Slip arm shaft V4 with needle bar crank Z4, Fig. 34, into machine (at needle bar end).

Slip pulley W4, Fig. 33, on arm shaft so that position screw Y4 enters hole in arm shaft and set screw Y5 locates on flat on arm shaft. Securely tighten screws Y4 and Y5.

Replace arm shaft connection belt U4 on pulley W4. Replace machine pulley ensuring that position screw S5 locates on spline and set screw S4 on flat.

Place thrust washer C5, Fig. 34, in recess in crank Z4. Slip hinge stud D5 through upper end of link E5 and into hole provided for it in crank Z4, Fig. 34. Ensure there is no binding and a minimum of end play in linkage before securely tightening screws A5 and B5, Fig. 34 and that A5 is located on the flat of stud D5.

Replace belt U4 on lower pulley as instructed on page 24.

Replace needle bar as instructed on page 22.

Replace face plate as instructed on page 22.

Retime machine.

THE FEED DRIVING AND FEED LIFTING ROCK SHAFT

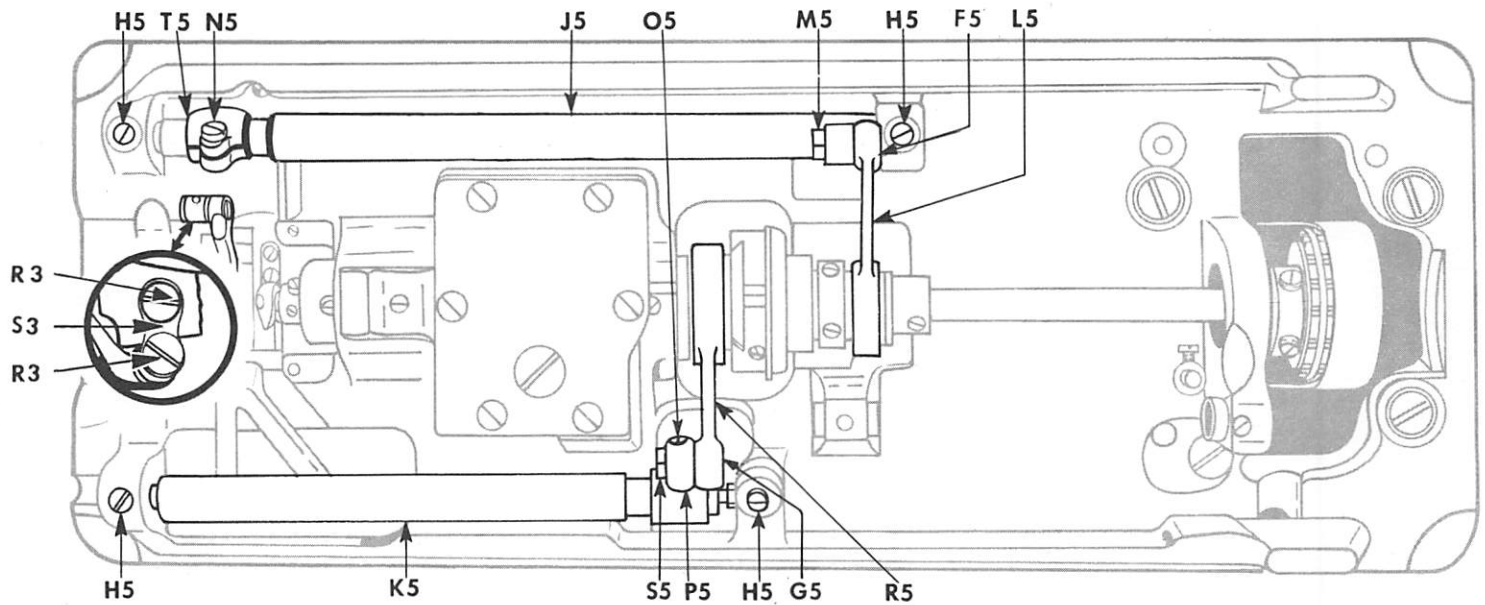


Fig. 35. Removing Feed Driving and Feed Lifting Rock Shafts.

REMOVAL

Remove screws R3, inset Fig. 35, and feed bar lifting link S3, Fig. 35.

Loosen lock nuts M5 and S5, remove screws F5 and G5. Loosen four screws H5 and after easing back the bearing centres, lift out feed lifting rock shaft J5 and feed driving rock shaft K5 with feed bar assembly.

REPLACEMENT

Replace feed lifting rock shaft J5, and moving the bearing centres to right or left ensure that the crank portion of shaft J5 is in perfect alignment with the free end of feed lifting connection L5 when the latter is midway between its two extreme side play positions. Tighten two screws H5.

Replace screw F5 turning the screw fully down then backing off about 1/8 of a turn. Lock in position with lock nut M5 and check machine for free movement.

Replace feed driving rock shaft K5 with feed bar assembly. Line up feed dog with the slots in the throat plate by moving shaft K5 bearing centres to right or left. Tighten two screws H5.

Replace feed bar lifting link S3. If necessary loosen screw N5 and moving feed bar lifting crank T5 to right or left ensure correct alignment of linkage. Lightly tighten screws N5. Replace screws R3 and tighten securely.

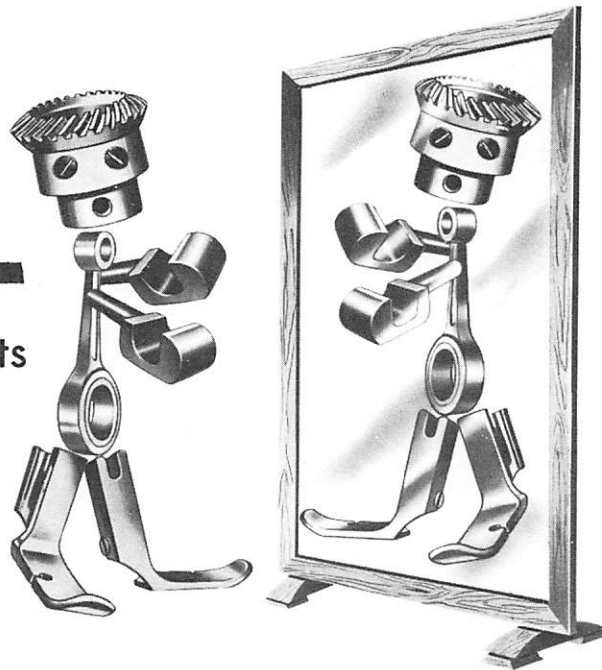
If necessary, loosen feed driving connection crank pinch screw O5 and move feed driving connection crank P5 to right or left to obtain a perfect alignment with the free end of feed driving connection R5 when the latter is midway between its two extreme side play positions. Lightly tighten screw O5.

Replace screw G5 turning the screw fully down then backing off about 1/8 of a turn. Lock in position with lock nut S5 and check machine for free movement.

Set feed dog lengthwise in throat plate and height above throat plate as instructed on page 16.

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