

WILLCOX & GIBBS

CLASS 500-E

**DISASSEMBLY & ASSEMBLY
INSTRUCTIONS**

34.40
2 | 68.80
6

WILLCOX & GIBBS

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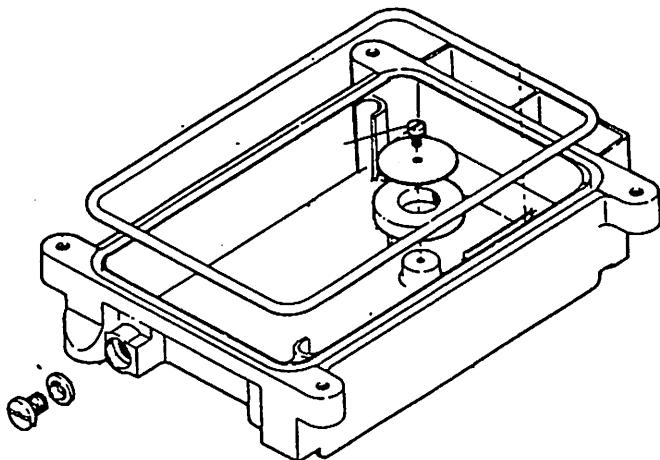
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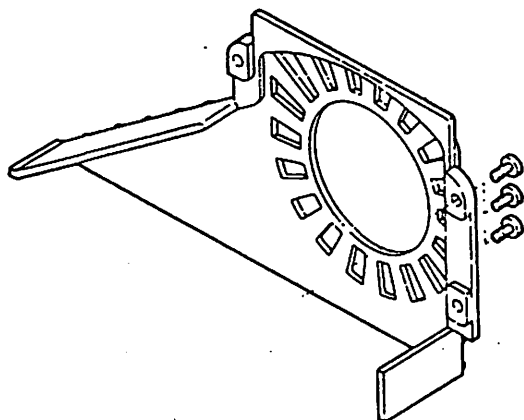
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193	"				

OIL



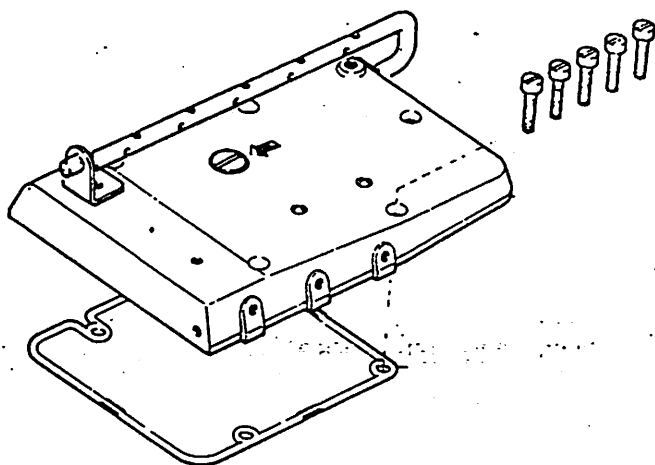
- (1)
Remove screw and gasket.
Drain oil.
Replace screw and gasket.

BELT COVER



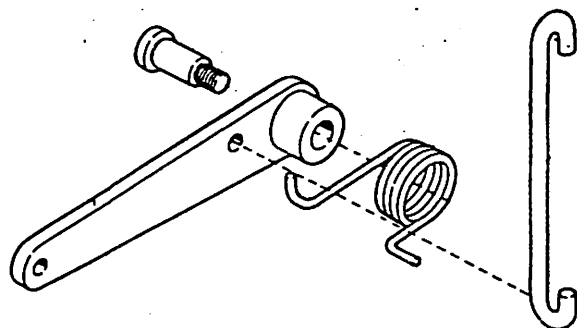
- (2)
Remove the 3 screws.

TOP COVER (COMPLETE)



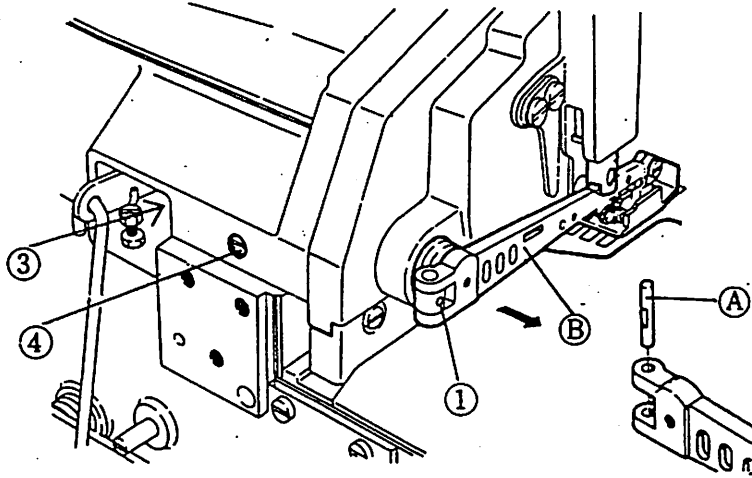
- (3)
Remove the 5 screws.
Remove top cover together with gasket.

FOOT LIFT LEVER



- (4)
Remove the screw.
Remove foot lift lever together
with link and spring.

PRESSER ARM (COMPLETE)

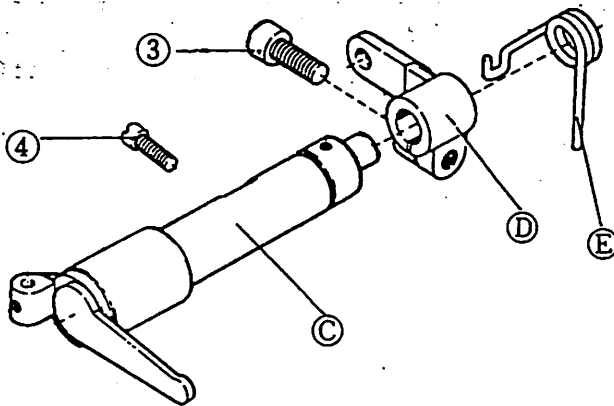


(5)

Raise the hand lift lever and swing out the presser arm B in the direction of the arrow. Loosen screw 1 and remove pin A.

Use 1/16" allen key.
Remove presser arm(complete).

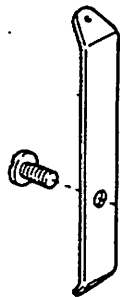
FOOT LIFT SHAFT



(6)

Loosen screws 3 and 4. Remove foot lift shaft C(complete) from the left. Remove intermediate lever D and spring E from the right. Use a 3/16" allen key for screw 3.

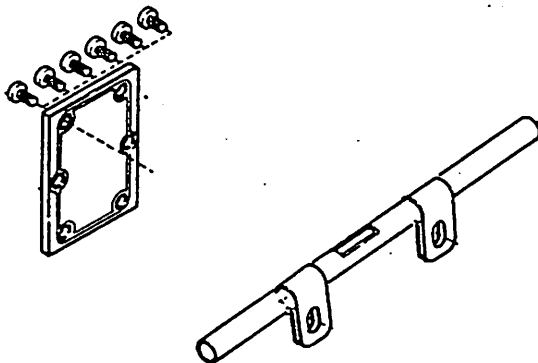
LOOPER THREAD GUIDE (REAR)



(7) -E32-

Remove screw and looper thread guide(rear).

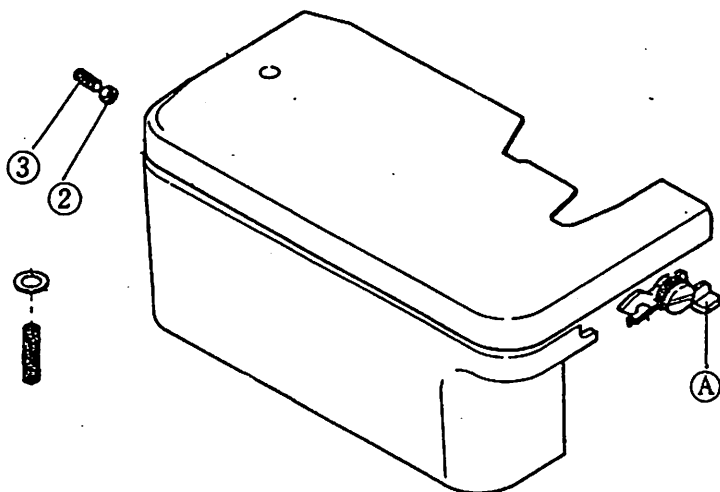
COVER PLATE



(8)

Remove 6 screws and cover plate. E32: remove looper thread tube at the same time.

CLOTH PLATE/SIDE COVER (COMPLETE)



(9)
Push down latch A and open cloth plate. Loosen nut 2 and screw 3. Lift off cloth plate and side cover(complete).
Use a 7mm spanner.
Remove spring and washer too.

FABRIC GUARD

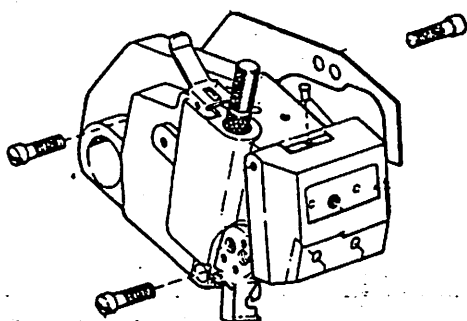
E 32 · 52

E 56



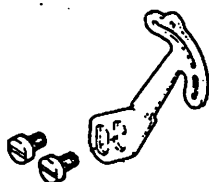
(10)
Remove 2 screws and take off the fabric guard.

ARM (LEFT)



(11) -E32.E52-
Remove 3 screws and take off arm(left) assembly together with gasket.

NEEDLE THREAD TAKEUP



(12) -E32.E52-
Remove 2 screws and take off needle thread takeup.

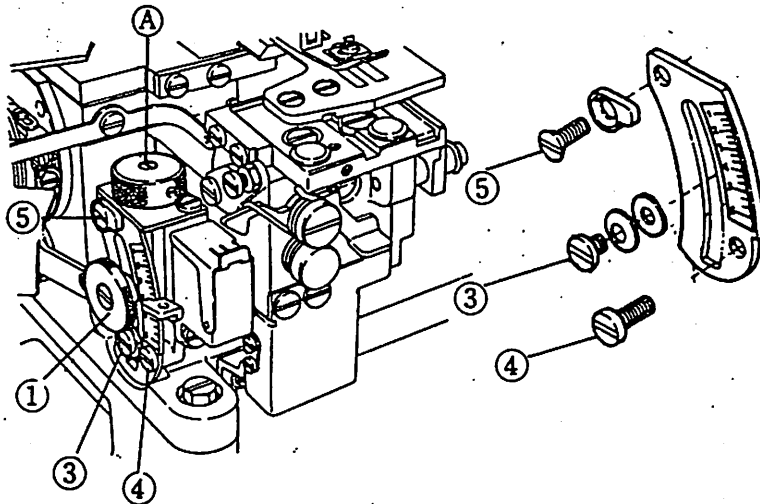
DIFF. FEED THUMB NUT



(13)

Loosen the nut and remove it together with screw 1 and washer.

DIFF. FEED REG. GUIDE



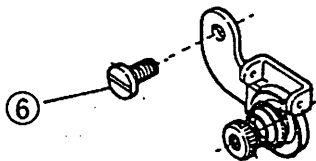
(14)

Turn the thumbscrew A clockwise until it is in its highest position.

Loosen screw 3.

Remove screws 4 and 5 and take off differential feed regulating guide.

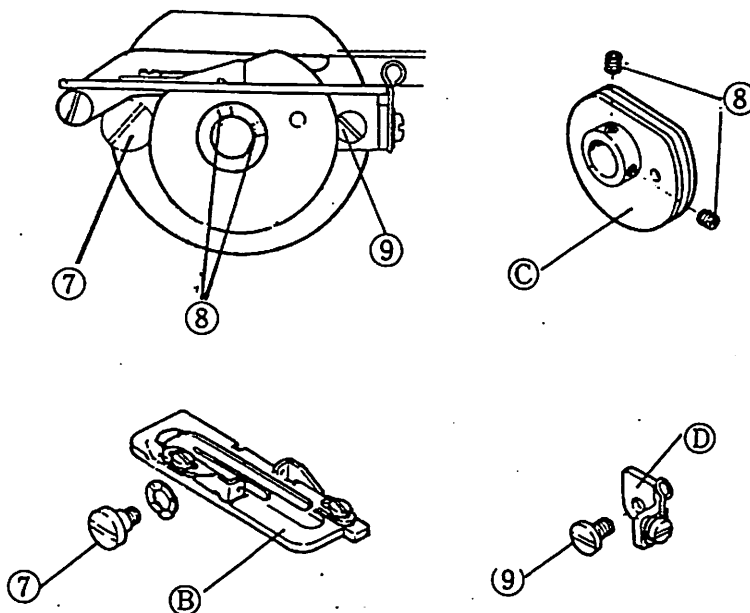
CHAINSTITCH LOOPER THREAD TENSION BRACKET



(15) -E32-

Remove screw 6 and take off the chainstitch looper thread tension bracket (complete).

CHAINSTITCH LOOPER THREAD TAKEUP



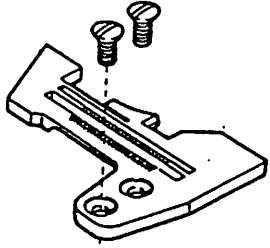
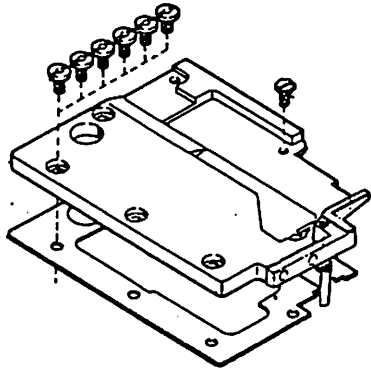


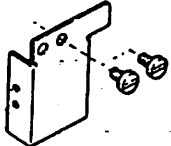
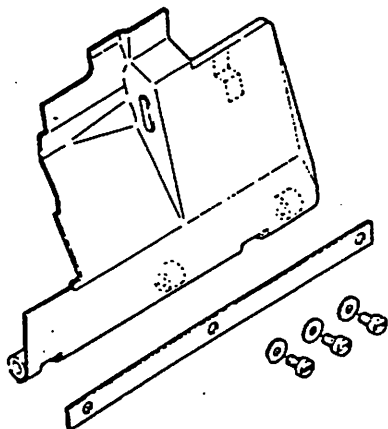
(16) -E32-




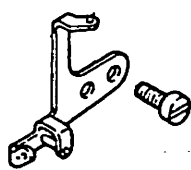
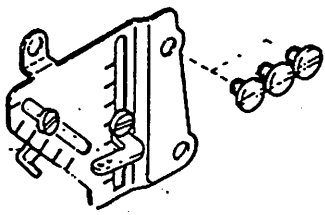
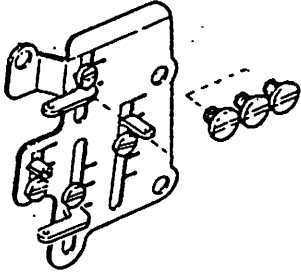
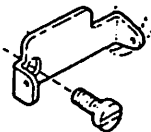
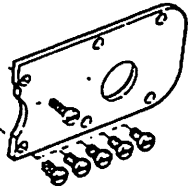
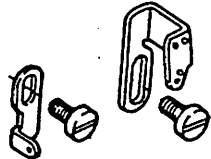
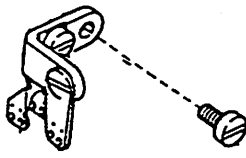
Remove screw 7 and take off the looper thread guide bracket B. Remove the spring washer too.

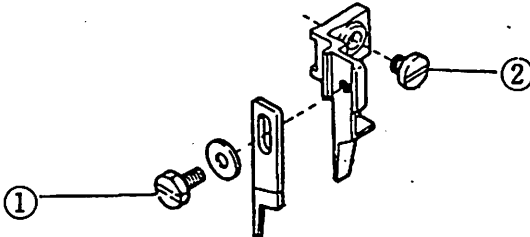

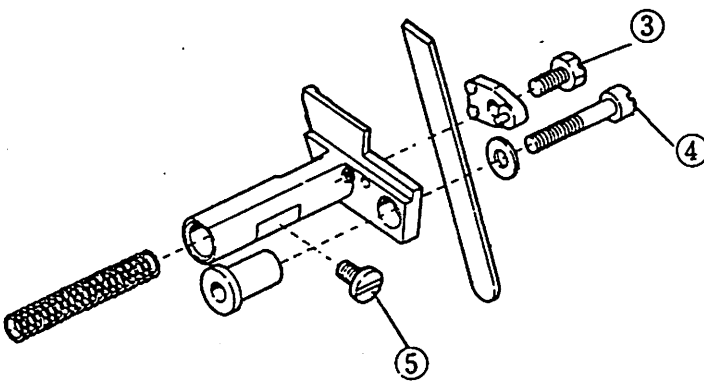
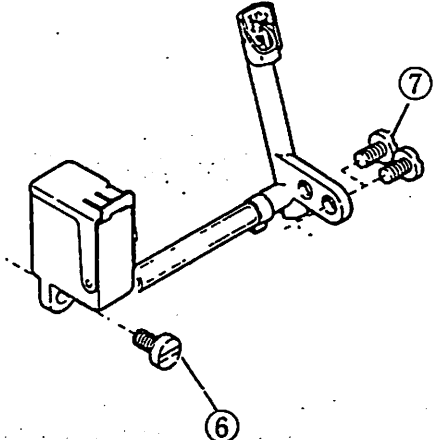
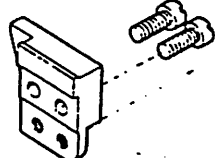
Loosen the 2 screws 8 and remove the looper thread takeup C.

Use a 1/16" allen key.

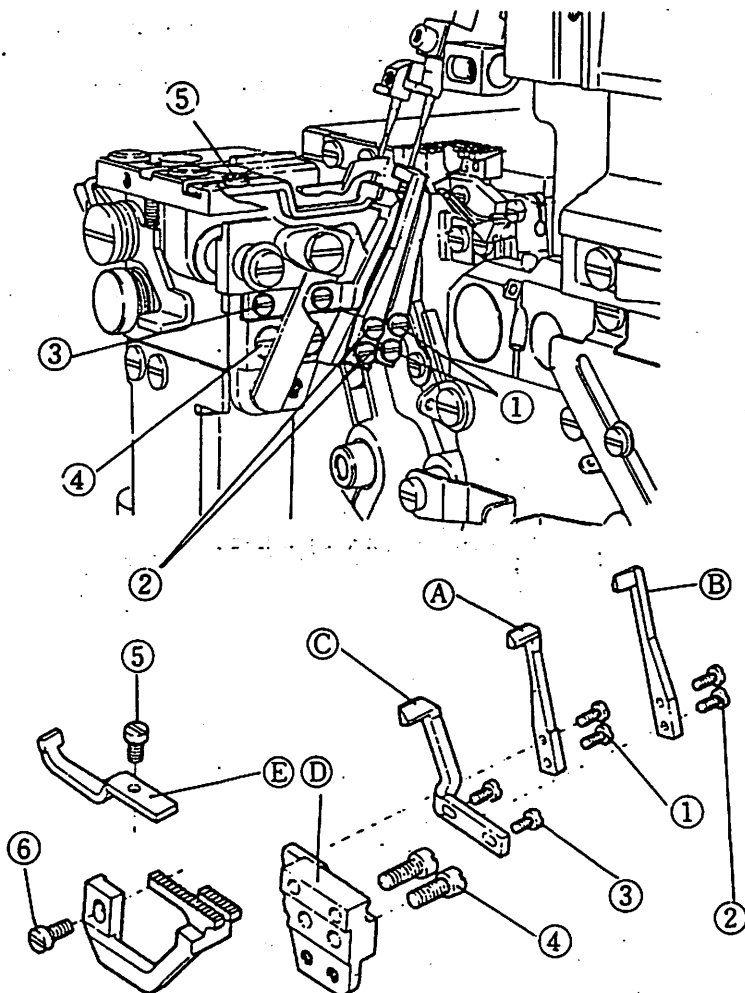
Remove screw 9 and take off the looper thread takeup stopper D.

<p>NEEDLE PLATE</p> 	<p>(17) Remove 2 screws and needle plate.</p>
<p>TOP COVER PLATE</p> 	<p>(18) Remove 7 screws and take off the upper cover plate. Note the gasket. Use a 7mm spanner for the odd screw.</p>
<p>FEED ECCENTRIC COVER</p> 	<p>(19) Remove 2 screws and take off feed eccentric cover.</p>
<p>NEEDLE</p> 	<p>(20) Loosen screws and remove needles. Use 1/16" allen key. E56: use 7mm spanner.</p>
<p>FRONT COVER GUIDE</p> 	<p>(21) Remove 2 screws and take off front cover guide.</p>
<p>FRONT COVER</p> 	<p>(22) Remove 3 screws, front cover and gasket. Note that the front cover may be removed even if the screws are only loosened. In this case leave the gasket in place.</p>

<p>LOWER LOOPER THREAD TAKEUP</p> <p>E 32 · 52</p>  <p>E 56</p> 	<p>(23)</p> <p>Remove screw and lower looper thread takeup.</p>
<p>UPPER LOOPER THREAD TAKEUP</p> <p>E 32 · 52</p>  <p>E 56</p> 	<p>(24)</p> <p>Remove screw and upper looper thread takeup.</p>
<p>LOOPER THREAD GUIDE PLATE</p> <p>E 32 · 52</p>  <p>E 56</p> 	<p>(25)</p> <p>Loosen the thread guide screws. Remove the 3 screws and take off the looper thread guide plate.</p>
<p>LOWER LOOPER THREAD GUIDE</p> 	<p>(26) -E32.E52-</p> <p>Remove the screw and take off the lower looper thread guide (center).</p>
<p>UPPER LOOPER HOLDER COVER</p> 	<p>(27)</p> <p>Remove the screws and take off the upper looper holder cover.</p>
<p>NEEDLE THREAD GUIDES</p> <p>E 32 · 52</p>  <p>E 56</p> 	<p>(28)</p> <p>Remove the screws and take off the needle thread guides. E32.E52: left and center E56: complete</p>

<p>UPPER KNIFE/CLAMP</p> 	<p>(29) Loosen screw 1. Remove upper knife and washer. Use a 7mm spanner. Remove screw 2 and take off upper knife clamp.</p>
<p>UPPER KNIFE CLAMP PIN</p> 	<p>(30) Remove upper knife clamp guide pin.</p>
<p>LOWER KNIFE/HOLDER</p>  <p>front left of bed</p>	<p>(31) Loosen screw 3. Use a 7mm spanner. Remove screw 4. Push the lower knife holder to the left and loosen screw 5 (front of bed). Take off lower knife and holder.</p>
<p>NEEDLE COOLER RESERVOIR</p> 	<p>(32) Remove screw 6 and the 2 screws 7. Take off the needle cooler and lower silicone oil reser- voir as a set.</p>
<p>NEEDLE COOLER BRACKET</p> 	<p>(33) -E52.E56- Remove the 2 screws. Take off needle cooler bracket.</p>

NEEDLE GUARDS/BACKET (E32)



(34) -E32-

Remove the 2 screws 1 and take off the rear overlock needle guard A.

Remove the 2 screws 2 and take off the front overlock needle guard B.

Remove the 2 screws 3 and take off the rear chainstitch needle guard C.

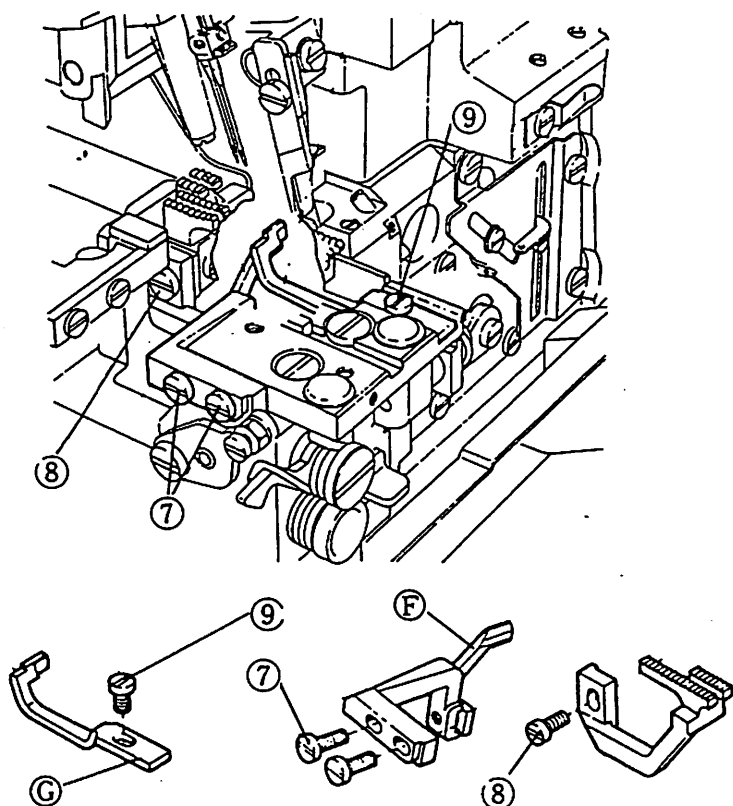
Remove the 2 screws 4 and take off the needle guard bracket D.

(35) -E32-

Remove screw 6 and take off differential feed dogs.

Remove screw 5 and take off the front chainstitch needle guard E.

NEEDLE GUARDS (E52 E56)



(36) -E52.E56-

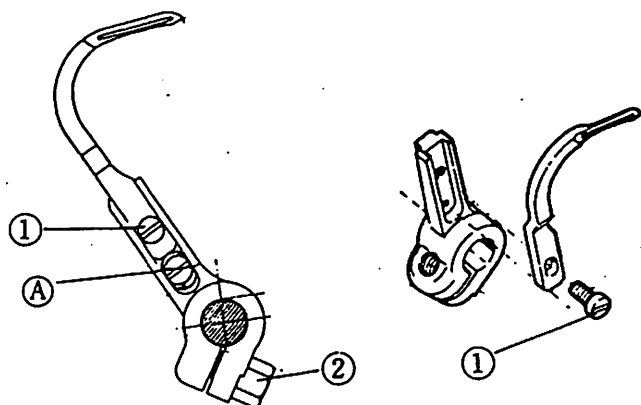
Remove the 2 screws 7 and take off the rear needle guard F together with bracket.

(37) -E52.E56-

Remove the differential feed dog screw 8 and take off the differential feed dogs.

Remove screw 9 and take off the front needle guard G.

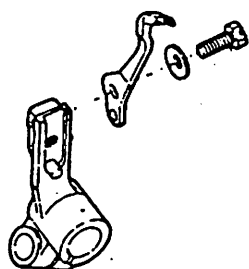
CHAINSTITCH LOOPER/HOLDER



(38) -E32-

Remove screw 1 (upper screw) and take off looper.
Loosen screw 2 and remove chainstitch looper holder.
Use an 8mm spanner.
Note: don't loosen screw A.

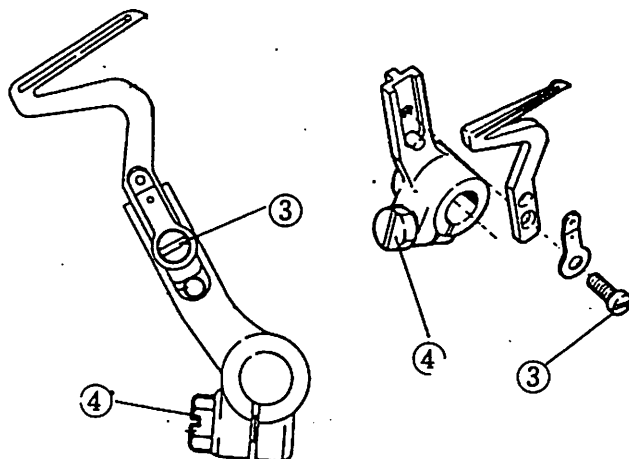
MOVABLE NEEDLE GUARD



(39) -E32.E52-

Loosen screw.
Use a 5mm spanner.

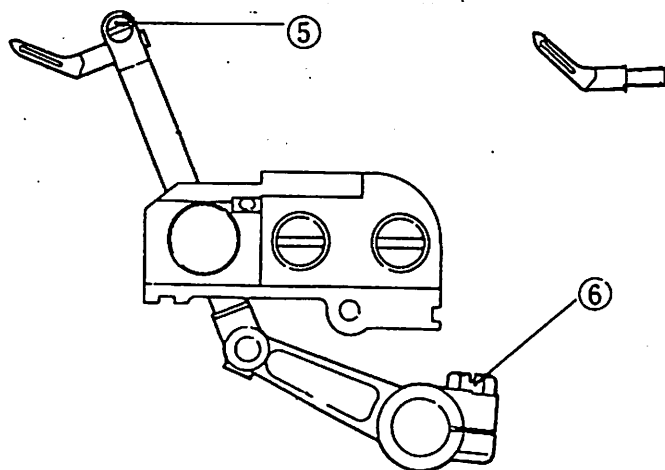
LOWER LOOPER/LEVER



(40)

Remove screw 3 and take off lower looper together with thread guide (left).
Loosen screw 4 and take off lower looper lever.
Use an 8mm spanner.

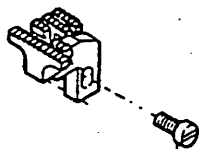
UPPER LOOPER



(41)

Loosen screw 5 and remove upper looper.
Loosen screw 6.
Use an 8mm spanner.

MAIN FEED DOGS



(42)

Remove screw and take off main feed dogs.

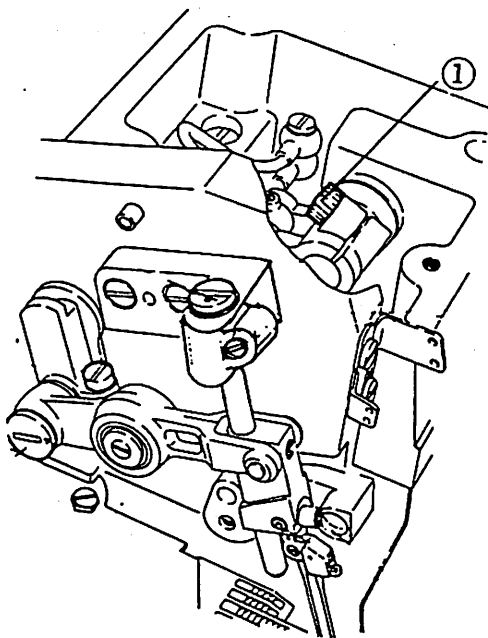
MAIN FEED DOG BRACKET



(43)

Remove screw and take off main feed dog bracket.
Note: only when being dismantled completely.

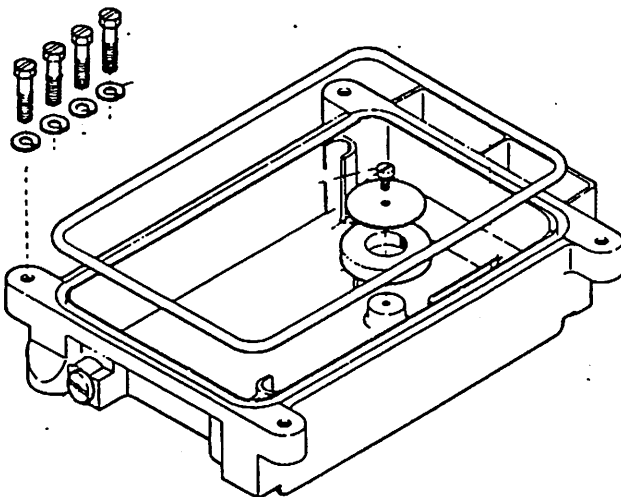
NEEDLE CRANK CLAMP SCREW



(44)

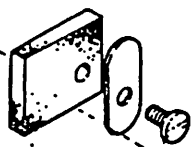
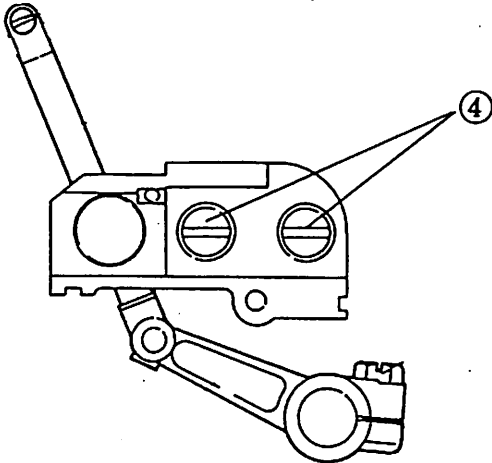
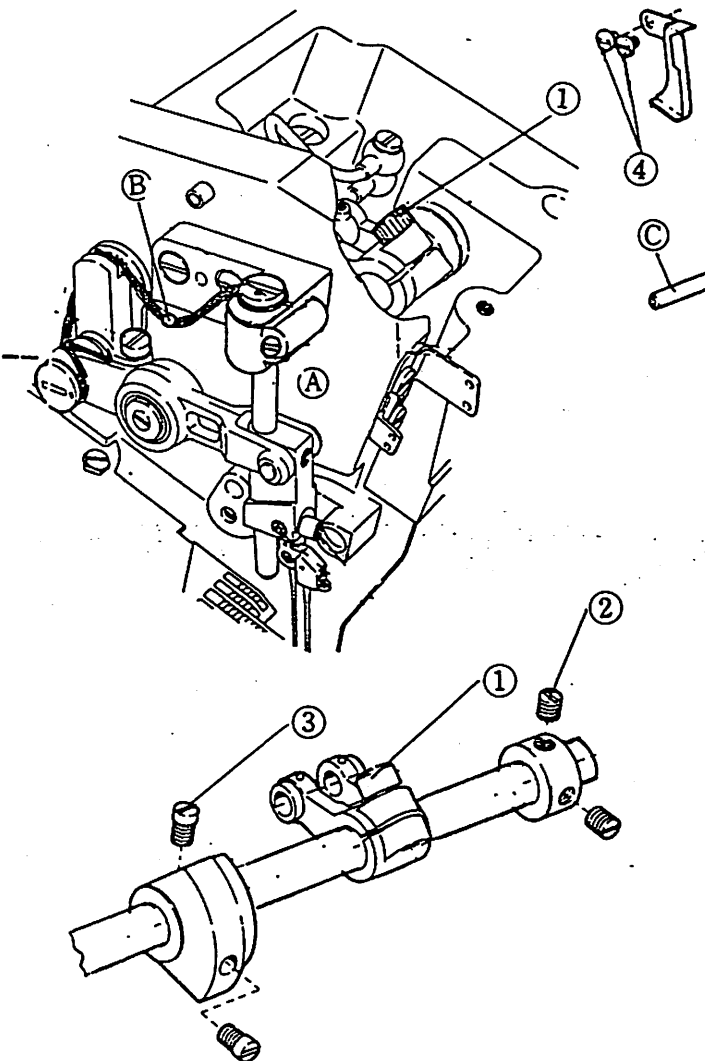
Loosen clamp screw 1.
Use a 3/16" allen key.
Note that this is completely dismantled in section 51.

OIL PAN

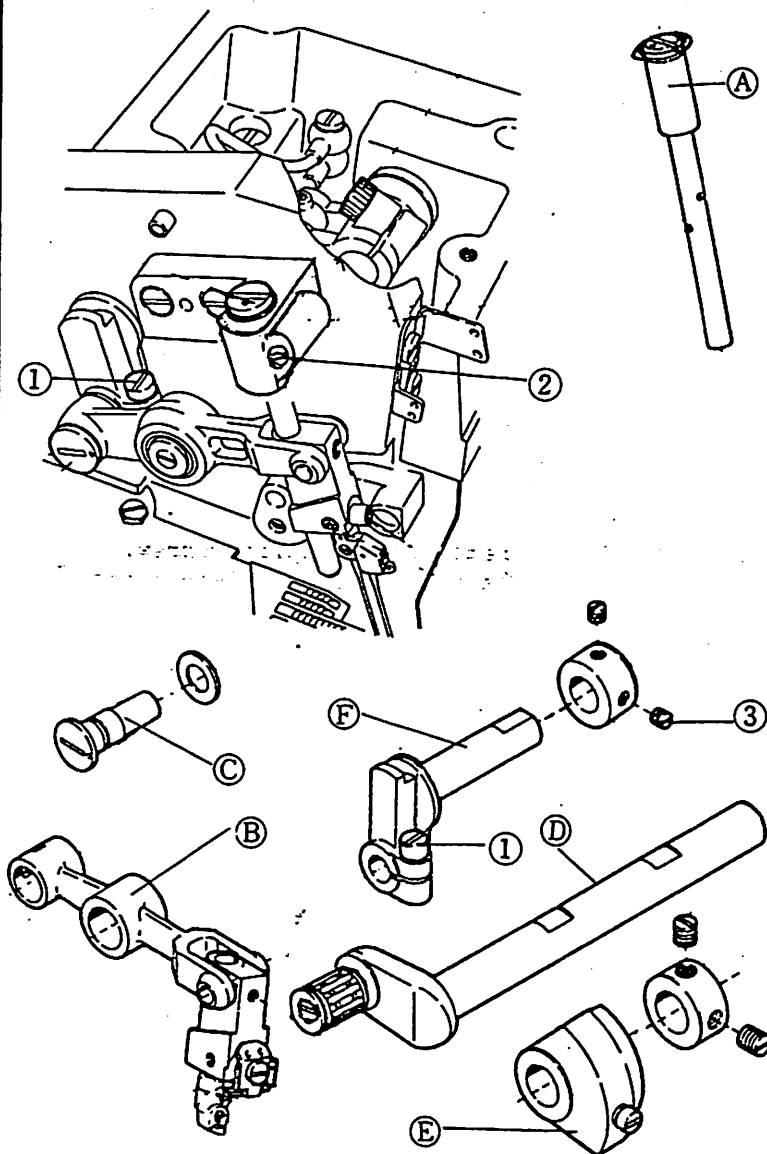


(45)

Remove the 4 screws and lift machine from oil pan. Handle the O-ring carefully.

<p>OIL DISTRIBUTION FELT</p> 	<p>(46) Loosen screw. Note that this is behind the upper looper holder.</p>
<p>UPPER LOOPER HOLDER GUIDE BASE</p> 	<p>(47) Loosen the 2 screws 4 and remove the upper looper holder guide base from the front. Take care not to damage the oil supply felt which is held behind the set plate in section 46.</p>
<p>NEEDLE DRIVE (E32 E52)</p> 	<p>(48) -E32.E52- Remove the 2 screws 4 and take off machine arm left cover (area A)</p>
	<p>(49) -E32.E52- Push out the oil restriction pin C located in hole B in the pulley direction.</p>
	<p>(50) -E32.E52- Pull out the oil distribution braid from hole B.</p>
	<p>(51) -E32.E52- Loosen needle drive crank clamp screw 1. Use a 3/16" allen key. Loosen the 2 thrust collar screws 2 and loosen the 2 balance weight screws 3.</p>

NEEDLE DRIVE (E32 E52)



(52) -E32.E52-
Loosen the holder clamp screw 1.

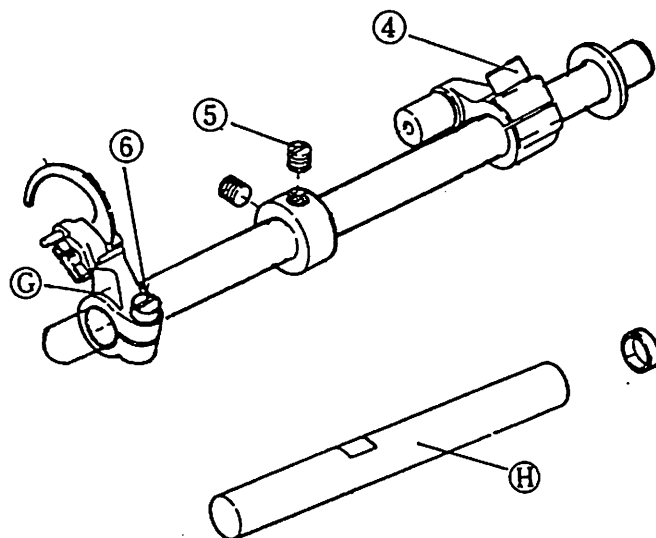
(53) -E32.E52-
Loosen screw 2..
Remove the needle holder guide stud A from the top of machine.

(54)-E32.E52-
Remove pin C and take out washer. Take off the needle drive lever B and needle holder guide as a set.

(55) -E32.E52-
Remove needle drive shaft D. Take out balance weight E and thrust collar.

(56) -E32.E52-
Loosen the 2 thrust collar screws 3 and remove the holder F.

NEEDLE DRIVE (E56)



(57) -E56-
Loosen the needle drive crank clamp screw 4.
Use a 3/16" allen key.

(58) -E56-
Loosen the 2 thrust collar screws 5.

(59) -E56-
Loosen the needle arm clamp screw 6 and remove the needle arm G.

(60) -E56-
Remove the plug and needle drive shaft H from the pulley side of machine. Take out washer and thrust collar.

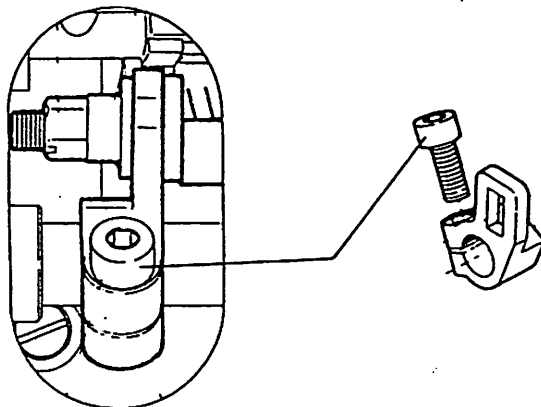
OIL DISTRIBUTOR/LUBRICATION BLOCK



(61)

Remove the coupling screw.
Take out the oil distributor tubes, block and the oil flow adjust pin.

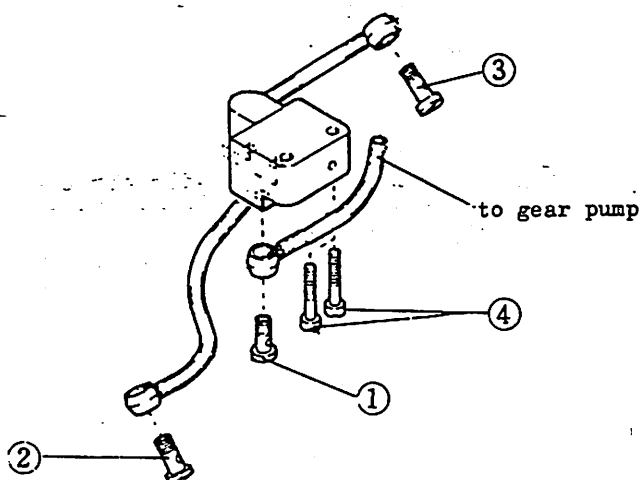
MAIN FEED CRANK SCREW



(62)

Loosen the main feed crank clamp screw through the dead hole in the rear center of the bed.
Use a 3/16" allen key.

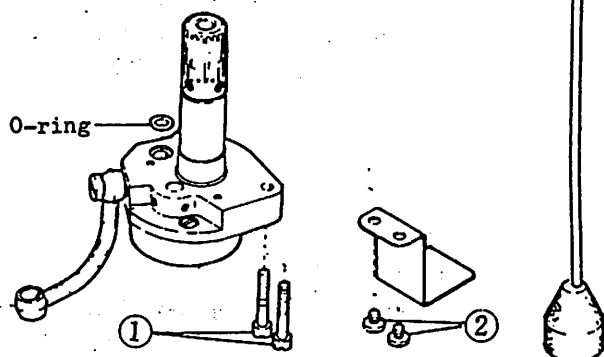
BY-PASS/OIL SPLASH SCREWS



(63)

Remove the by-pass coupling screw 1 from the by-pass (bottom center of bed).
Remove the coupling screws 2 and 3.
Remove the 2 screws 4 and take out the by-pass (complete).

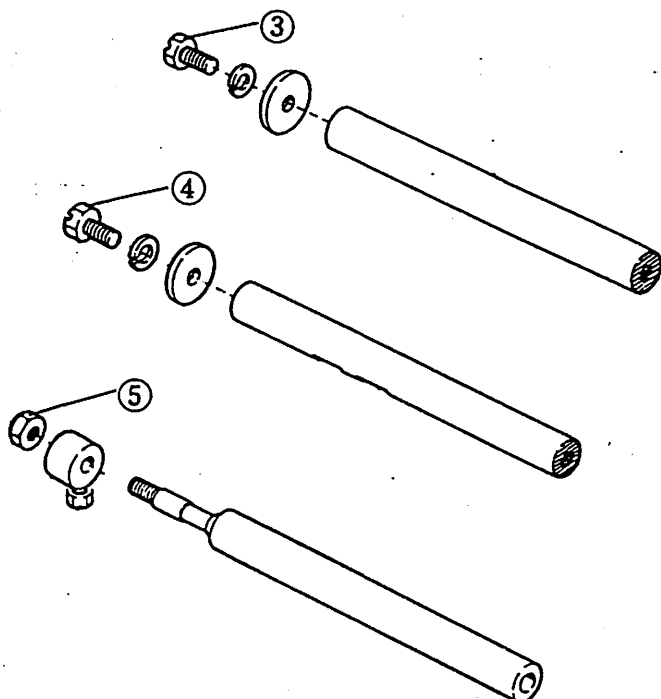
GEAR PUMP/OIL INDICATOR



(64)

Remove the 2 screws 1 and take out the gear pump.
Note the O-ring.
Remove the 2 screws 2, the oil indicator support and the oil indicator.

LOOPER SHAFT SCREWS



(65)

Remove the upper looper shaft screw 3 together with the 2 washers. (The shaft is at right angles to the crankshaft on the pulley side.)
Use a 7mm spanner.

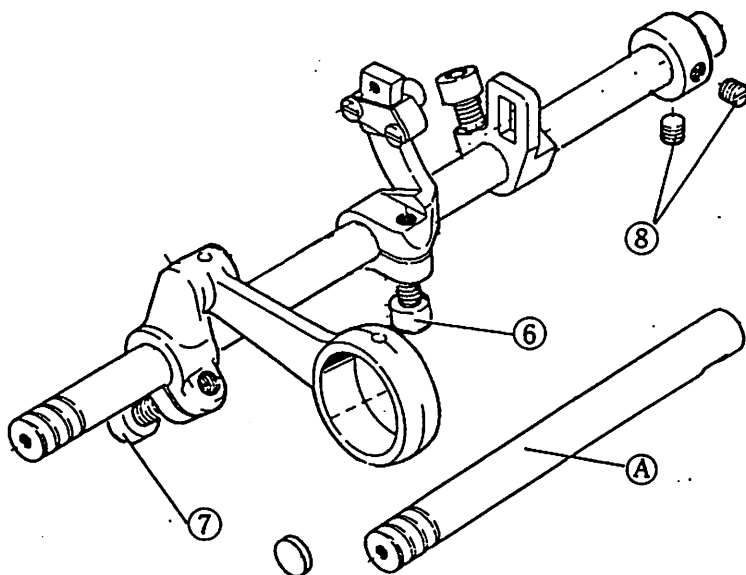
(66)

Remove the lower looper shaft screw 4 together with the 2 washers. (The shaft is in the center of the bed.)

(67) -E32-

Loosen the nut 5 on the end of the chainstitch looper shaft. (The shaft is on the left of the bed).

FEED SHAFT



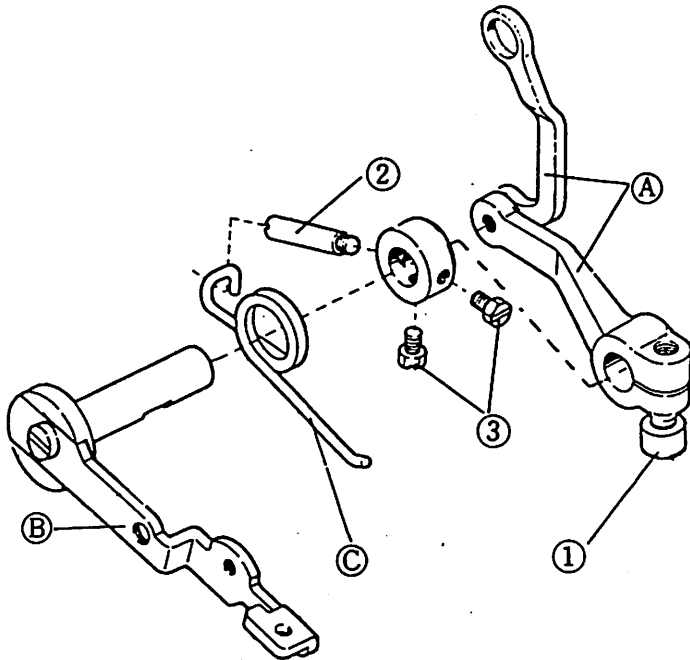
(68)

Loosen the diff. feed crank clamp screw 6 and the feed drive crank clamp screw 7. (The shaft at the rear of the machine and parallel to the crankshaft).
Use a 3/16" allen key.

(69)

Loosen the 2 thrust collar screws 8 and remove the feed shaft A together with cap from the left of the machine.

DIFF. FEED REG. LEVER (LEFT)



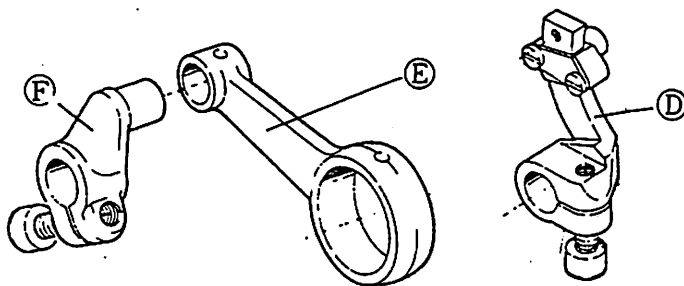
(70)

Loosen the diff. feed regulating lever(right) clamp screw 1.
Use a 3/16" allen key.

(71)

Remove latch screw 2 and loosen the 2 thrust collar screws 3.
Remove the diff. feed regulating lever(left) B together with spring C from the left of the thrust washer.

FEED CRANKS

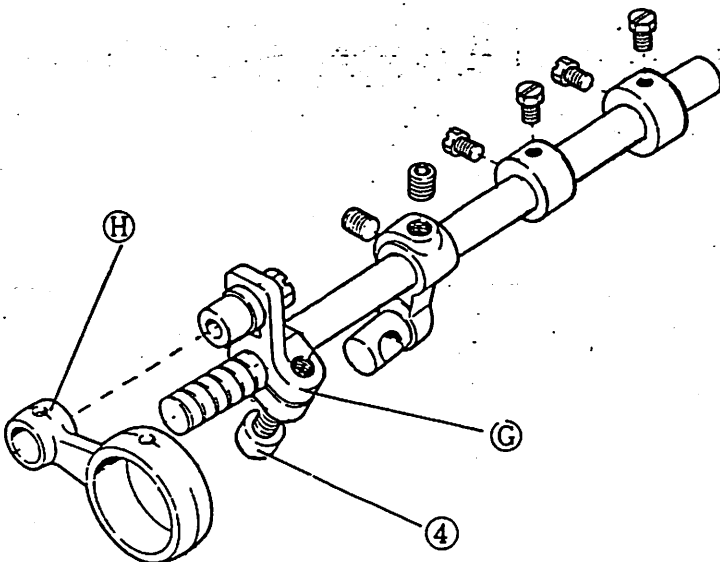


(72)

Remove the diff. feed crank D and the diff. feed reg. lever (right) A from the left of the machine.

Push the main feed drive connection E upwards and remove the feed drive crank F from the left.

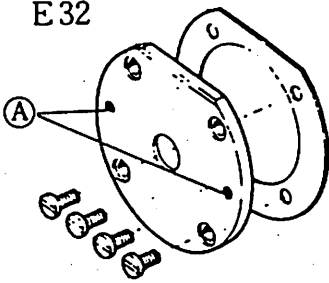
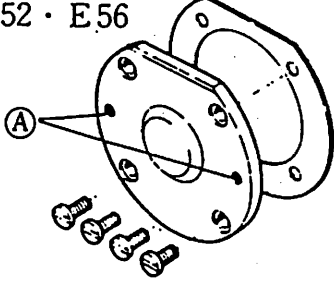
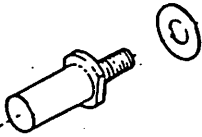

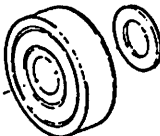
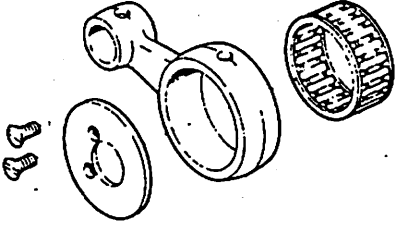
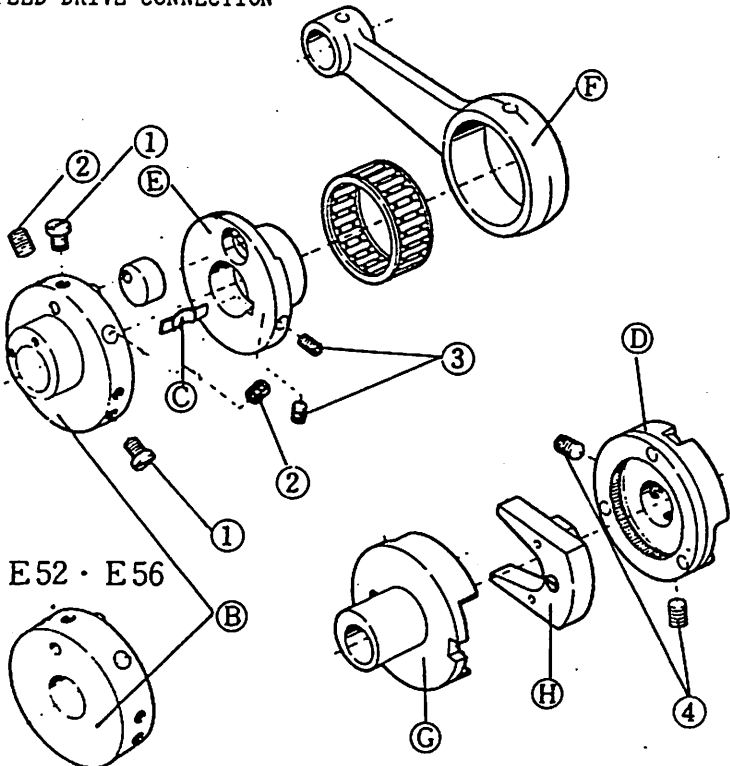
LOOPER AVOIDING CRANK



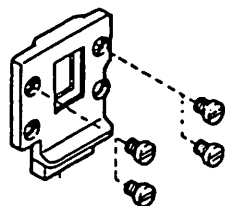
(73) -E32-

Loosen the looper avoiding crank clamp screw 4.

Push the crank G to the right and free it from the looper avoiding connection H.

<p>HOUSING E 32</p>  <p>E 52 · E 56</p> 	<p>(74) Remove the 4 screws. The housing can be removed easily by inserting 2 of the upper cover or oil gear pump screws into holes A and turning each screw alternately.</p>
<p>BEARING SCREW E 32</p>  <p>E 52 · E 56</p> 	<p>(75) Remove bearing screw (or crankshaft extension) and washer. E32: use a 12mm spanner.</p>
<p>BEARING</p> 	<p>(76) Remove the bearing and washer by lifting the pulley side of the machine and turning the crankshaft anti-clockwise.</p>
<p>LOOPER AVOIDING CONNECTION</p> 	<p>(77) -E32- Remove the bearing collar screws and the collar. Remove the needle bearing and the looper avoiding connection.</p>
<p>FEED DRIVE CONNECTION</p>  <p>E 52 · E 56</p>	<p>(78) Remove the 2 stopper screws 1. Loosen the 2 looper avoiding eccentric screws 2. Use a 3/32" allen key. Loosen the 2 feed eccentric flat spring screws 3. Use a 1/16" allen key. (The old type used only 1 screw). Loosen the 2 ratchet wheel screws 4. Use a 3/32" allen key. Remove the parts B, E, F, G, H and D from the left.</p>

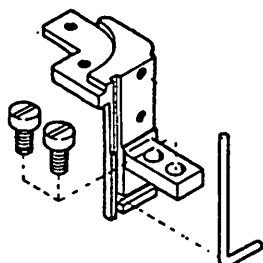
FEED BAR OIL SEAL GUIDE



(79)

Remove the 4 screws.
Move feed bars to their highest position and take off the oil seal guide.

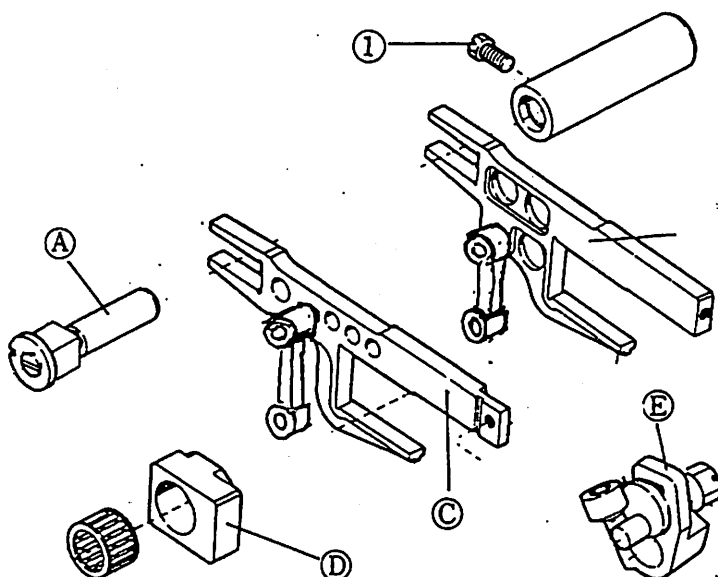
FEED BAR GUIDE LEFT



(80)

Remove the 2 screws and take off feed base guide(left).

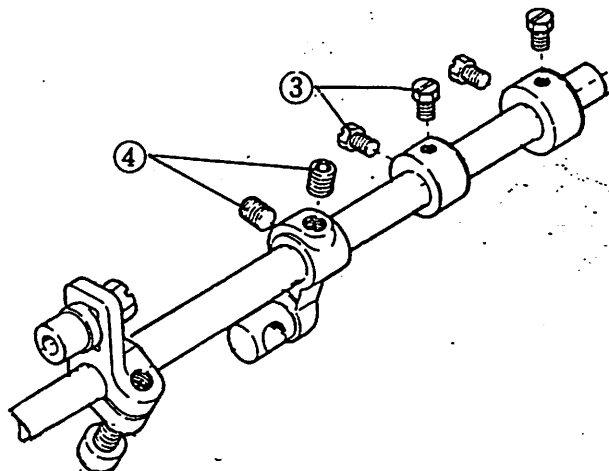
FEED DRIVE



(81)

Loosen the feed bar pin screw 1 and remove feed bar pin A (complete).
Remove main feed bar B, diff. feed bar C, feed bar lift block D and main feed crank E from the left of the machine.

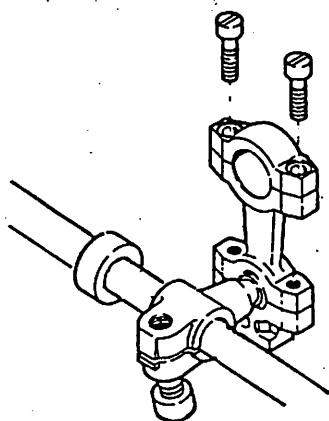
LOOPER AVOIDING LEVER



(82) -E32-

Loosen the 2 looper avoiding shaft thrust collar screws 3.
Loosen the 2 looper avoiding lever screws 4.
Use a 1/8" allen key.

LOWER LOOPER DRIVE CONNECTION CAP

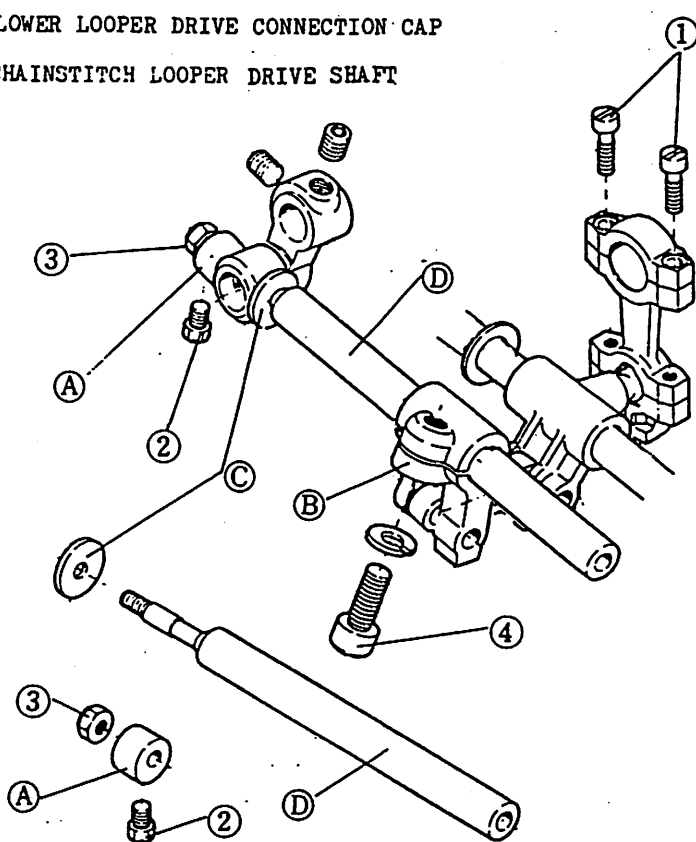


(83) -E52.E56-

Remove the 2 cap screws and cap from the top center of bed.
Note: keep the cap and connection together as a set.

LOWER LOOPER DRIVE CONNECTION CAP

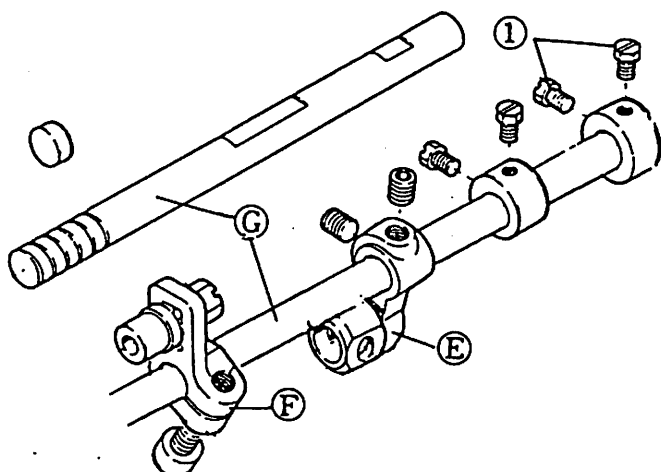
CHAINSTITCH LOOPER DRIVE SHAFT



(84) -E32-

Remove the 2 cap screws 1 from the top center of the machine bed.
From the bottom rear of the machine bed loosen the looper avoiding block collar screw 2. Remove the nut 3 together with collar A.
Loosen looper drive crank clamp screw 4 and remove looper drive shaft D.
Take out washer B.
Use a 3/16" allen key.

LOOPER AVOIDING SHAFT



(85) -E32-

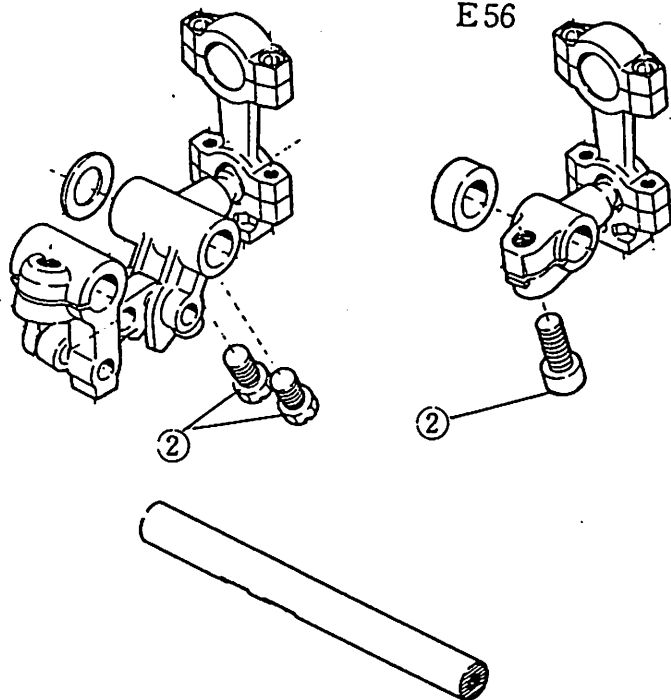
Loosen the 2 thrust collar screws 1.
Remove the shaft from the left together the plug, looper avoiding lever E, looper avoiding crank F, shaft G and the 2 thrust collars.

LOWER LOOPER LEVER SHAFT/CONNECTION

E32

E52

E56

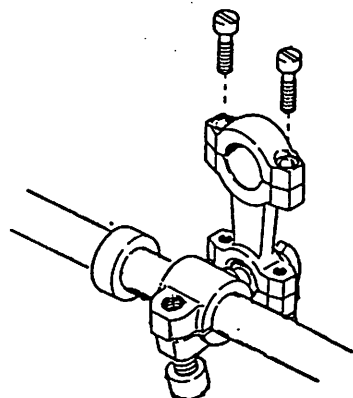


(86)

Loosen the lower looper drive crank screw 2(E32: 2 screws).
Use a 7mm box wrench(E32)
Use a 3/16" allen key(E52.E56)

Remove shaft and washer.
Take out lower looper drive connection and crank as a set.

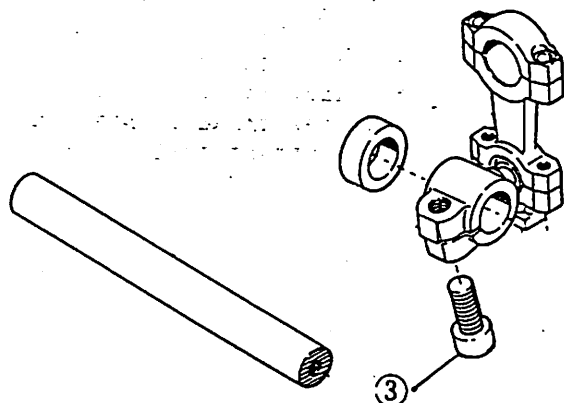
UPPER LOOPER DRIVE CONNECTION CAP



(87)

Remove the 2 cap screws and cap from the top right of the bed.
Note: keep the cap and the connection together as a set.

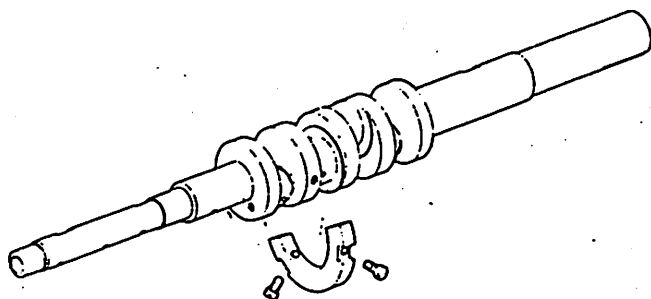
UPPER LOOPER DRIVE SHAFT/CONNECTION



(88)

Loosen the upper looper crank clamp screw 3.
Use a 3/16" allen key.
Remove drive shaft and washer.
Take out upper looper drive crank and drive connection as a set.

BALANCE WEIGHT



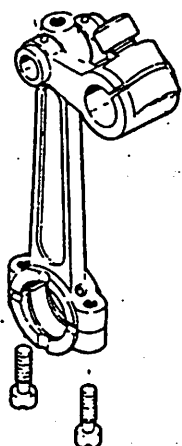
(89)

Remove the 2 screws and the balance weight.
Note: the E56 balance weight is in two parts.

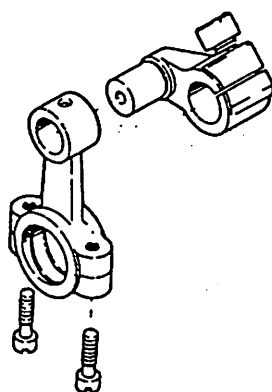
NEEDLE DRIVE CONNECTION/CRANK

E 32

E 52



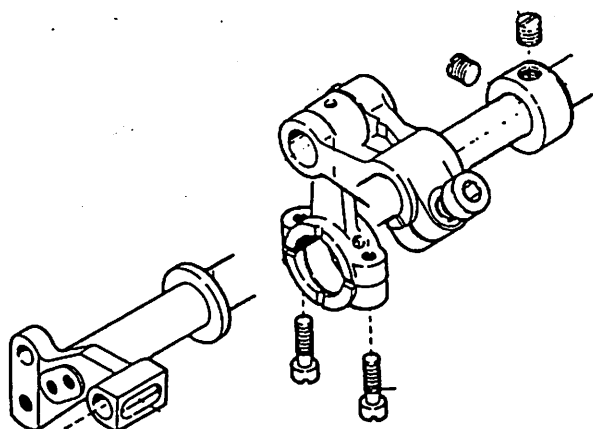
E 56



(90)

Remove the 2 needle drive connection cap screws.
Remove drive crank and connection.
Note: keep cap and connection together as a set.

UPPER KNIFE CONNECTION CAP



(91)

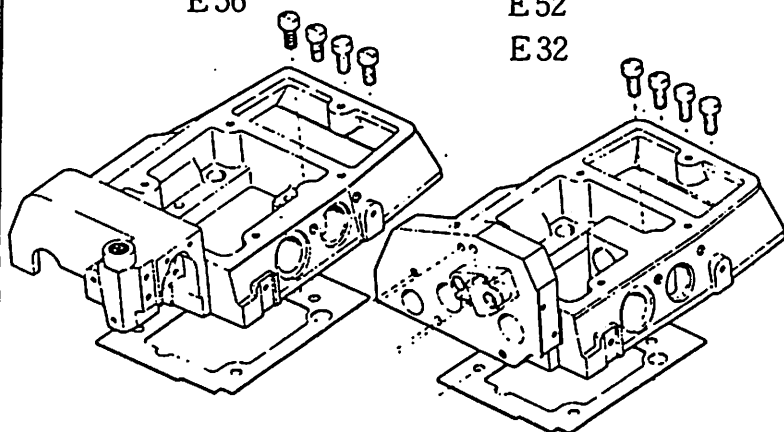
Remove the 2 upper knife drive connection cap screws.
Remove the cap.

MACHINE ARM (RIGHT)

E 56

E 52

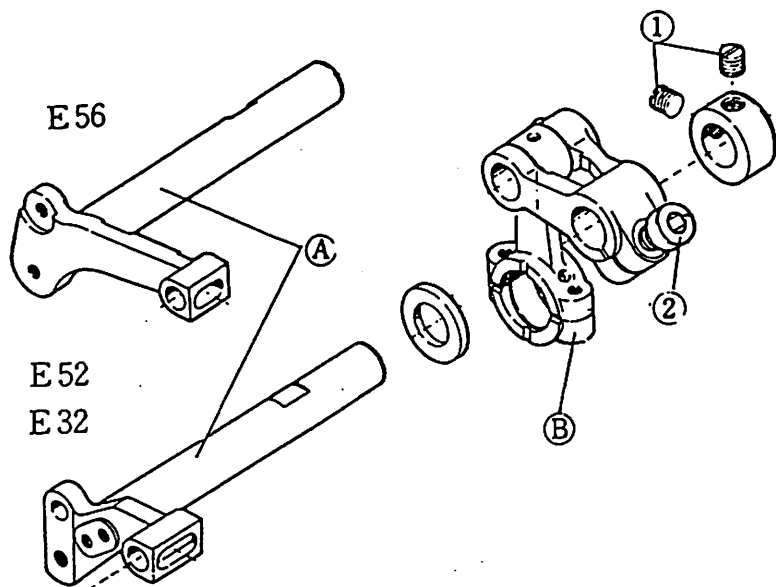
E 32



(92)

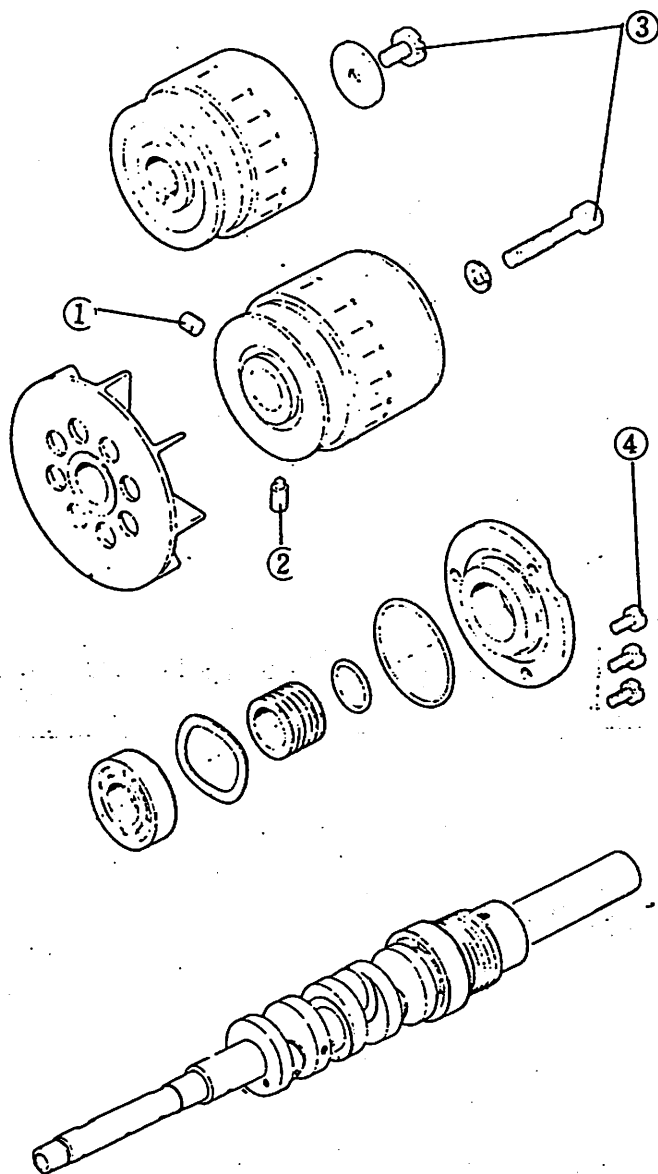
Remove the 4 screws and lift off the arm(right).
Note the gasket.

UPPER KNIFE MECHANISM



- (93)
- Loosen the 2 thrust collar screws 1.
 - Loosen the upper knife drive crank clamp screw 2.
 - Remove the upper knife lever A from the left.
 - Take out the thrust collar, drive crank (complete) B and washer.

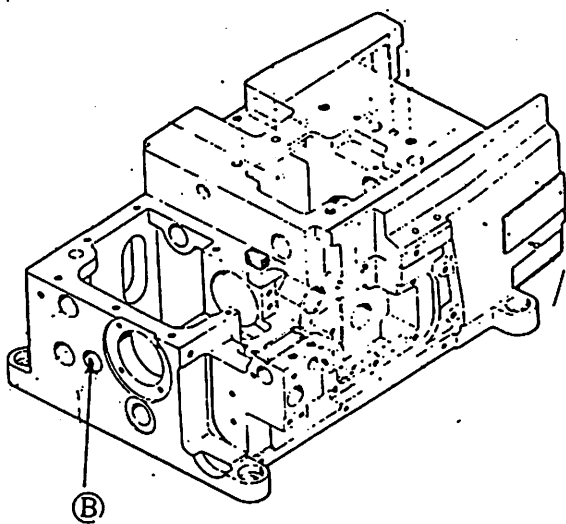
CRANKSHAFT



- (94)
- Remove the pulley screw 1.
 - Loosen the pulley screw 2.
 - Insert a bar into the screw-hole 1 to hold the shaft steady and remove screw 3.
 - Use a 12mm box wrench or a 3/16" allen key.
 - Remove fan.
 - Remove the 3 screws 4 and take off the ball bearing retainer.
 - Remove the shaft from the right of the machine.

ASSEMBLY

CHAINSTITCH LOOPER AVOIDING SHAFT



(1) - E32 -

Insert the looper avoiding shaft A into the bed through hole B. Replace looper avoiding crank C, looper avoiding lever D, thrust collar E (polished surface to the right) and thrust collar F (polished surface to the left) on the shaft.

(2) - E32 -

Replace cap G in the bushing.

(3) - E32 -

Maintaining a small gap with the cap G, push the shaft to the left. Lightly push the thrust collar F to the left and tighten the 2 screws 1. Tighten the spot screw first.

(4) - E32 -

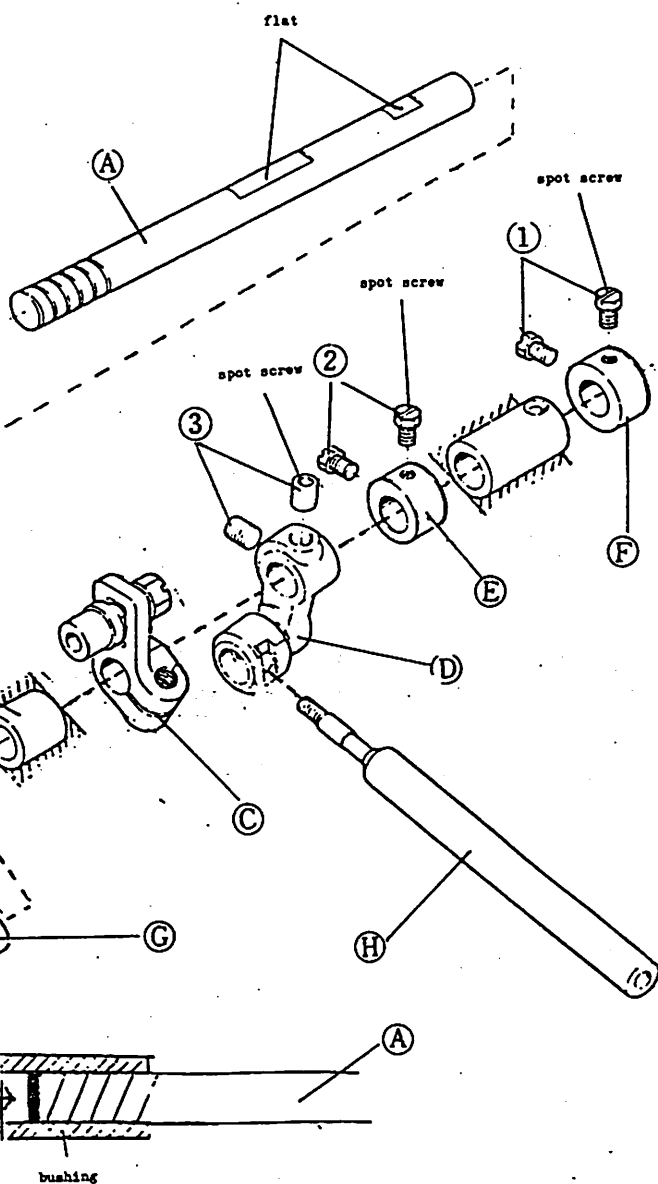
Push the thrust collar E lightly to the right, hold thrust collar F so that there is no free play in the shaft and tighten the 2 screws 2. Tighten the spot screw first.

(5) -E32-

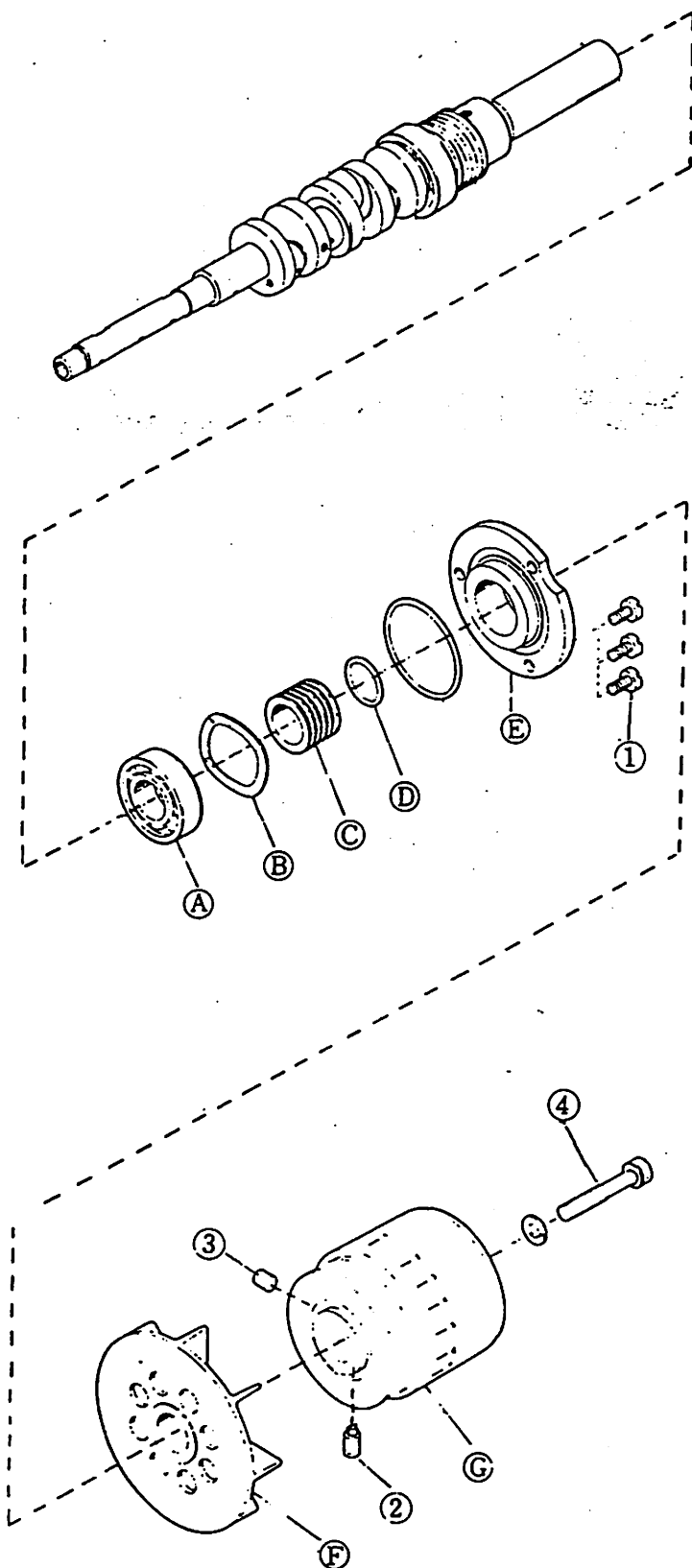
Insert the looper drive shaft H into the center of the looper avoiding block on D as shown. Tighten the 2 screws 3. Tighten the spot screw first.

(6) - E32 -

Remove the looper drive shaft H.



CRANKSHAFT



(7)

Insert the crankshaft into the bed from the right.

(8)

Replace the ball bearing A, spring washer B, oil seal C, O-ring D and ball bearing retainer E (together with O-ring) on the shaft.

(9)

Carefully tighten the 3 screws 1. Check that the crankshaft can move smoothly.

(10)

Replace the fan F and pulley G on crankshaft. Align screw 2 with the crankshaft groove. Lightly tighten screw 2 so the pulley can move.

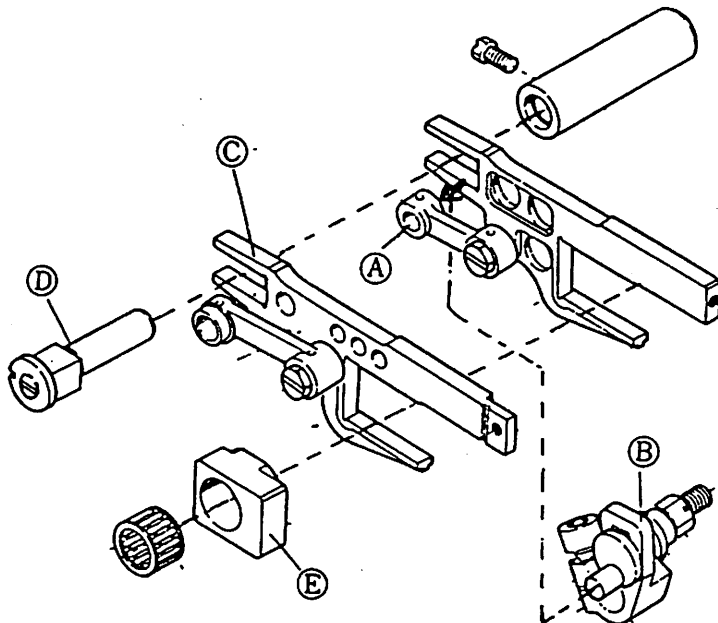
(11)

Insert a short bar into the screwhole 3 to prevent the shaft from moving and tighten screw 4.

(12)

Tighten screw 2.
Tighten screw 3.

FEED BARS



(13)

Locate the main feed crank B in the main feed bar link A and replace them on the left of the crankshaft together with the differential feed bar C.

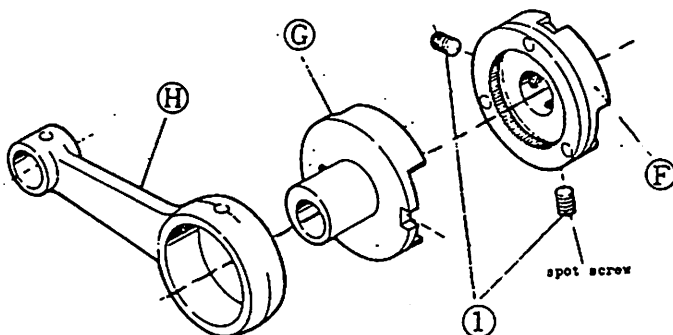
(14)

Replace the feed bar pin D. Note that the polished surface should be at the top.

(15)

Replace the feed bar lift block E and the needle bearing.

FEED REGULATING ECCENTRIC



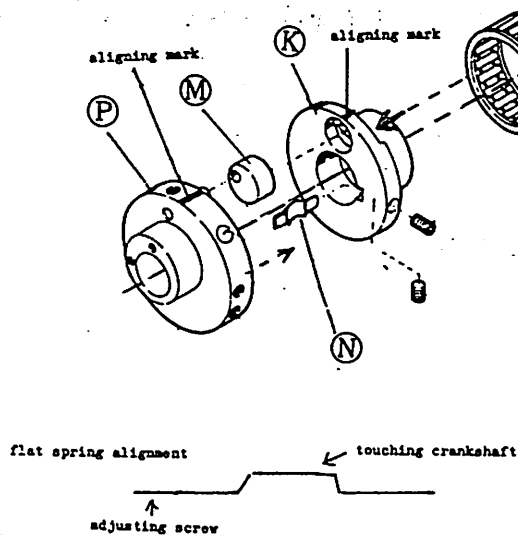
(16)

Replace the ratchet wheel F on the crankshaft from the left. Push it lightly to the right and tighten the 2 screws 1. Tighten the spot screw first.

(17)

Replace feed drive connection H on the feed regulating eccentric G. Note that the oil hole should be at the top.

ASSEMBLING FEED ECCENTRIC



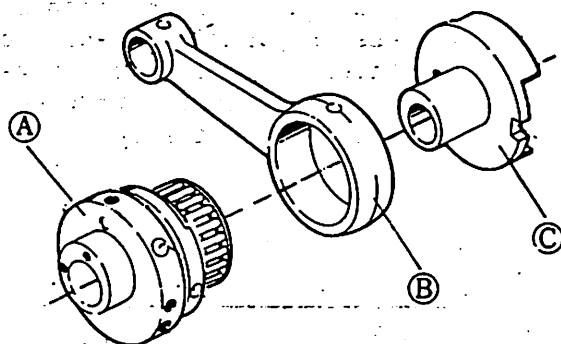
(18)

Replace the needle bearing L on the feed eccentric K from the right.

(19)

Replace the feed eccentric guide M in the feed eccentric K. Replace the looper avoiding eccentric P (E52; E56 feed eccentric retainer). Align the aligning marks. Replace the spring N in the feed eccentric K groove from the right.

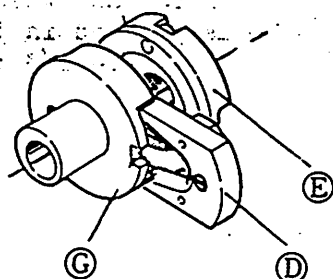
FEED ECCENTRIC



(20)

Replace the complete feed eccentric assembly A on the crankshaft with the spring groove at the bottom. Turn the pulley and locate the needle bearing part between the feed drive connection B and the feed regulating eccentric C.

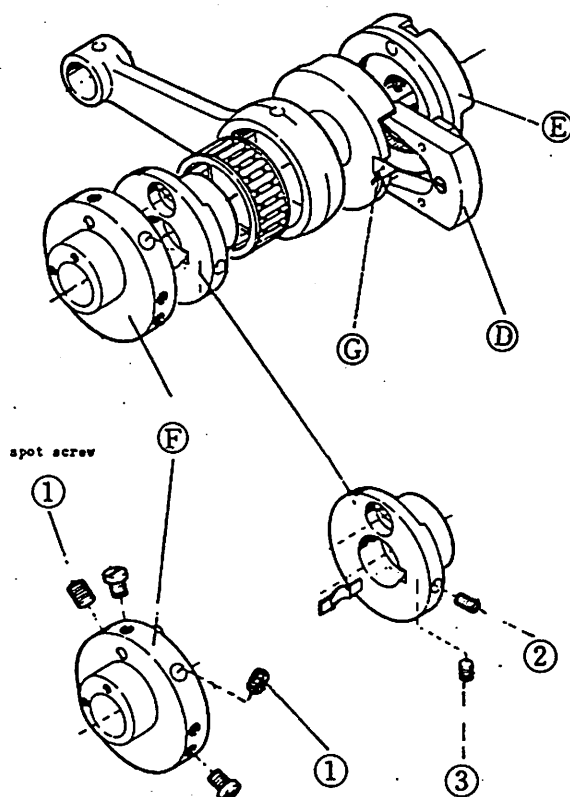
FEED REGULATING RATCHET



(21)

With the feed regulating eccentric groove G at the top, replace the ratchet D. While pushing the ratchet D onto the crankshaft, push it to the right and locate it in the ratchet wheel E.

LOCATING FEED ECCENTRIC



(22)

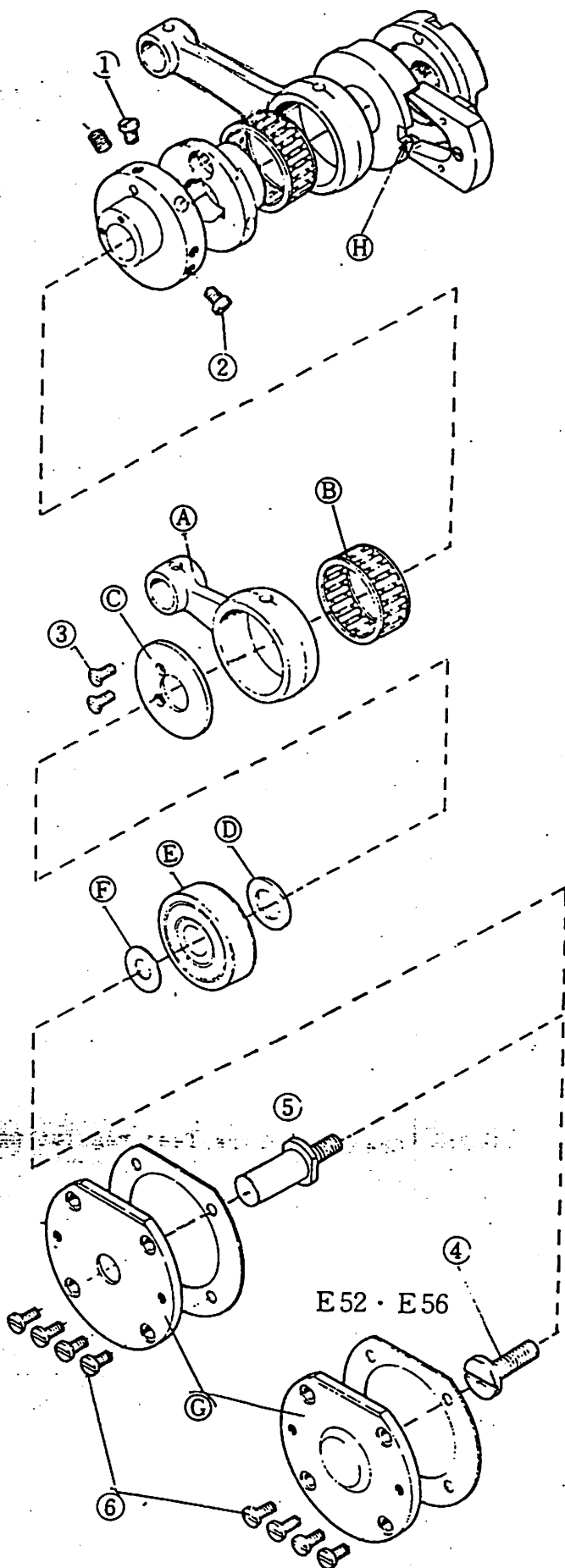
Push the looper avoiding eccentric F lightly to the right and tighten the 2 screws 1. Tighten the spot screw first. Note that the flat is in the same position as the flat for the ratchet wheel E.

(23)

Check that the feed regulating ratchet D can move smoothly.

(24)

Press the pushbutton and locate it in groove G. Tighten screw 2 so there is a slight pressure when the handwheel is turned. Tighten screw 3.



(25)

Replace and tighten stop screw 1. Press in pushbutton and locate stopper in eccentric groove H. Turn pulley anti-clockwise until it touches stop screw 1.

(26)

Release pushbutton. Turn pulley about 1/3 turn clockwise and replace screw 2. Note the position of the screw: check that when the pushbutton is pressed in the handwheel can only move 1/3 turn and not 2/3 turn.

(27) - E32 -

Replace looper avoiding connection A, needle bearing B and collar C on crankshaft. Tighten the 2 screws 3. Note that oil holes should be at top.

(28)

Replace washer D, ball bearing E and washer F on the crankshaft.

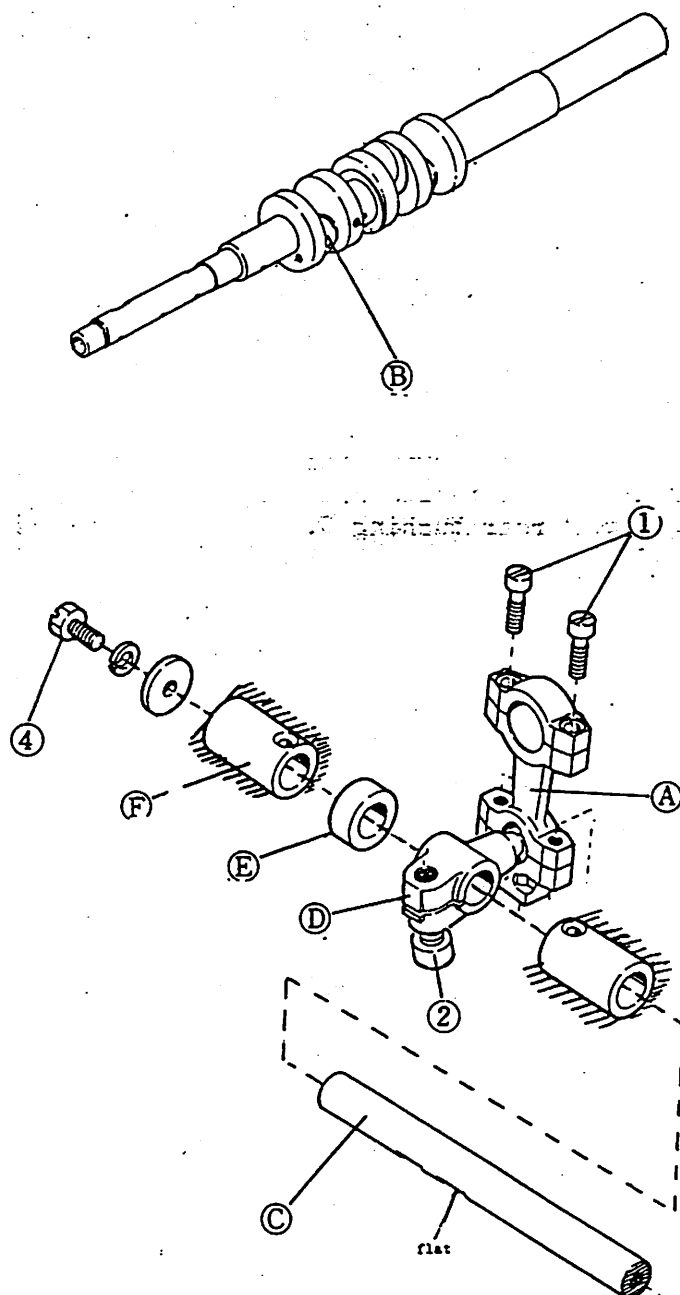
(29)

Replace and tighten bearing screw 4 (E52; E56) or crankshaft extension 5.

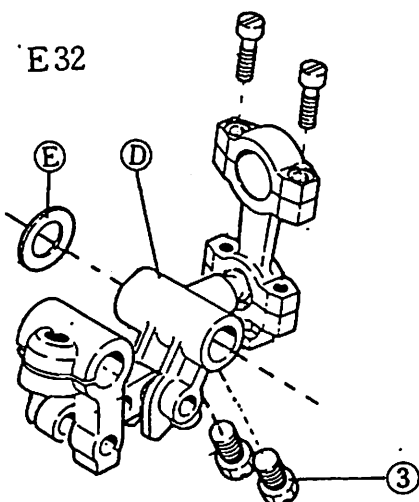
(30)

Replace housing G. Do not omit gasket. Tighten the 4 screws 6.

LOWER LOOPER DRIVE CONNECTION



E32



(31)

Replace the lower looper drive connection (complete) A on the crankshaft B from the bottom of the bed.

Align the aligning marks and replace the cap from the top of the machine.

Tighten screws 1 carefully.

Check that the connection can move smoothly.

(32) - E52, E56 -

Replace lower looper lever shaft C from the front of the bed.

Insert it through the drive crank D and washer E.

Tighten the clamp screw 2 with the shaft protruding slightly from the rear bushing F.

- E32 -

Insert the shaft C so that the flat lines up with the screws 3. Lightly tighten screws 3.

(33)

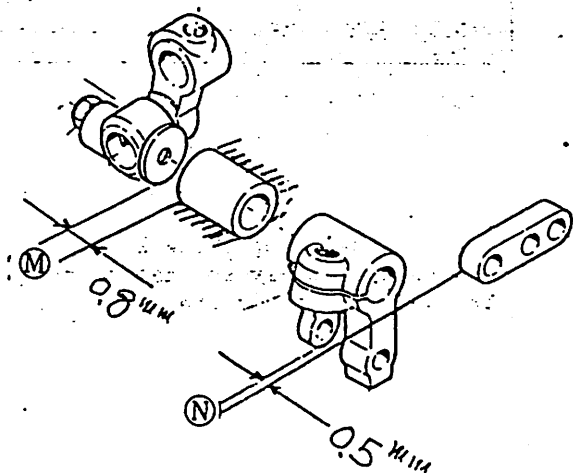
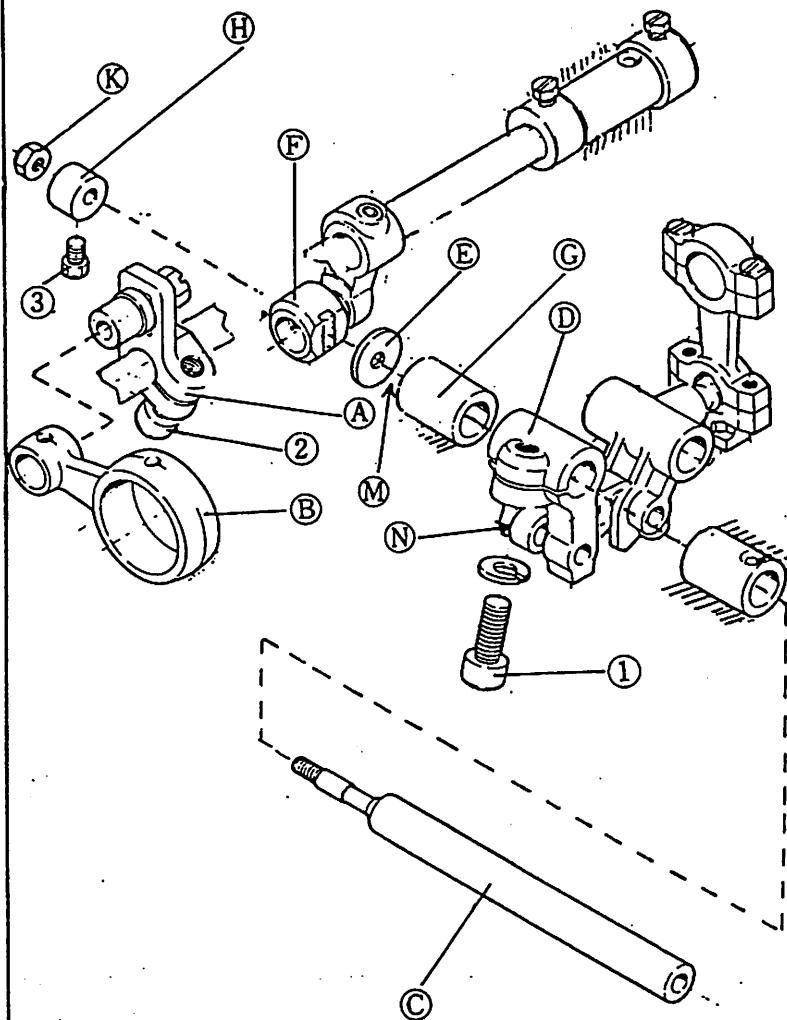
Tighten the washer and spring washer onto the end of the shaft C with screw 4.

(34)

Loosen screw 2 or screw 3 (E32). Lightly push screw 4 to the right and the drive crank D to the left.

Tighten the clamp screw 2 or screws 3 securely so that there is no free play in the shaft.

DOUBLE CHAINSTITCH DRIVE SHAFT



(35) - E32 -

Push the loop avoiding crank A to the left and locate it in the loop avoiding connection B.

(36) - E32 -

Insert the loop avoiding drive shaft C through the drivecrank D, washer E and block F from the front of the bed. Lightly tighten screw 1 with the narrow part of the shaft protruding slightly from the rear bushing G.

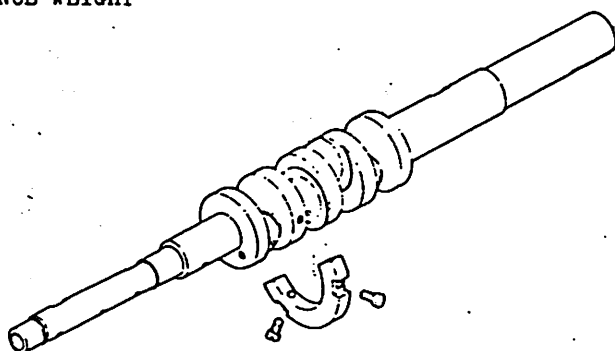
(37) -E32-

Replace collar H on the end of the drive shaft C. Tighten screw 3 so that there is no free play between collar H and block F. Loosen screw 1 and check that the shaft C can move smoothly. Tighten nut K.

(38) - E32 -

Loosen screw 1. With the loop avoiding connection B in its rearmost position (loop avoiding drive shaft fully forwards) set clearance M to 0.8mm and then tighten the loop avoiding crank A screw 2 securely. Set clearance N to 0.5mm and then tighten the drive crank D screw 1 securely.

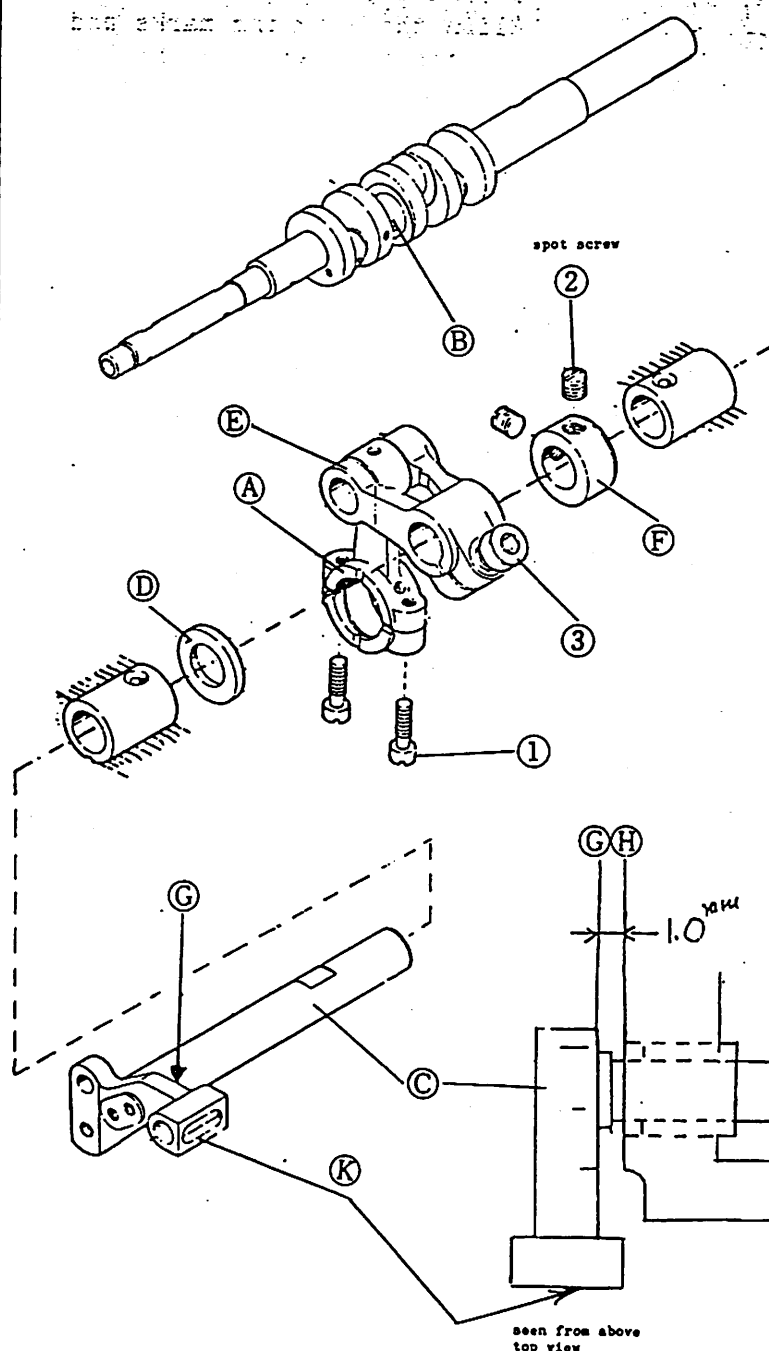
BALANCE WEIGHT



(39)

Replace the balance weight on the crankshaft.
Note that the E56 balance weight is in two parts.

UPPER KNIFE LEVER (E32 E52)



(40) - E32, E52 -

Replace the upper knife drive connection assembly A on the crankshaft B from the top of the bed.
Align the aligning marks and replace the cap from the bottom of the bed.
Tighten the 2 screws 1 carefully.
Check that the connection moves smoothly.

(41) - E32, E52 -

Insert the upper knife lever C into the bed from the left.
Insert it through the washer D, drive crank E and collar F.

(42) - E32, E52 -

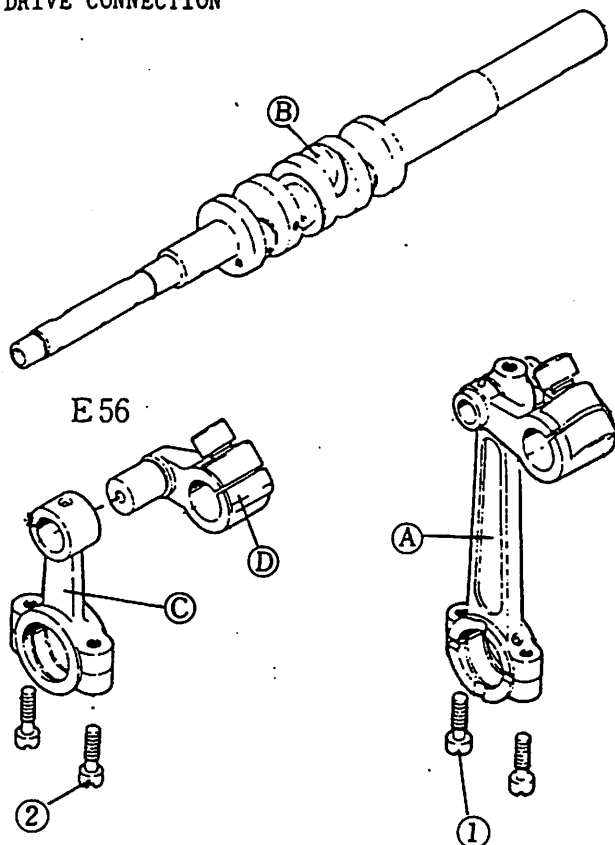
Set the clearance between the surface of the upper knife lever G and the bed H to 1.0mm as shown.

Push the collar F lightly to the right and tighten the 2 screws 2.
Tighten the spot screw first.

(43) - E32, E52 -

Lightly tighten screw 3 and move upper knife lever C to its lowest position.
Set the surface K so that it is vertical. Push the drive crank E lightly to the left and tighten screw 3 so that there is no free play in the shaft.
Check that the shaft can move smoothly.

NEEDLE DRIVE CONNECTION



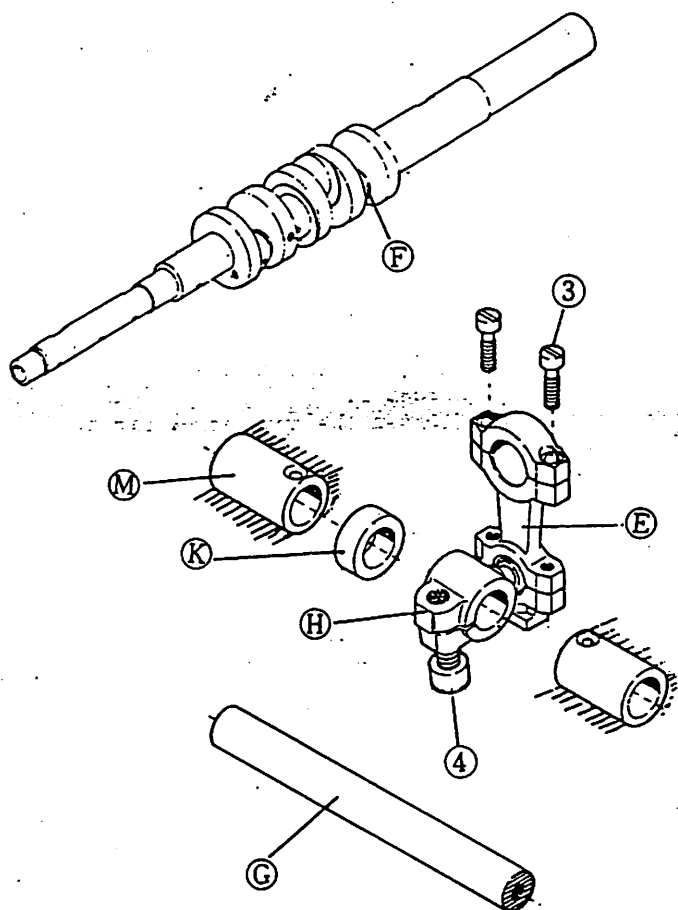
(44) - E32, E52 -

Replace the needle drive connection A on the crankshaft B from the top of the bed. Align the aligning marks and replace the cap from the bottom. Tighten the 2 screws 1 carefully. Check that connection A can move smoothly.

(45) - E56 -

Locate the needle drive crank D in the needle drive connection C and replace it on the crankshaft B from the top of the bed. Align the aligning marks and replace the cap from the bottom. Tighten the 2 screws 2 carefully. Check that the connection C can move smoothly.

UPPER LOOPER DRIVE CONNECTION



(46)

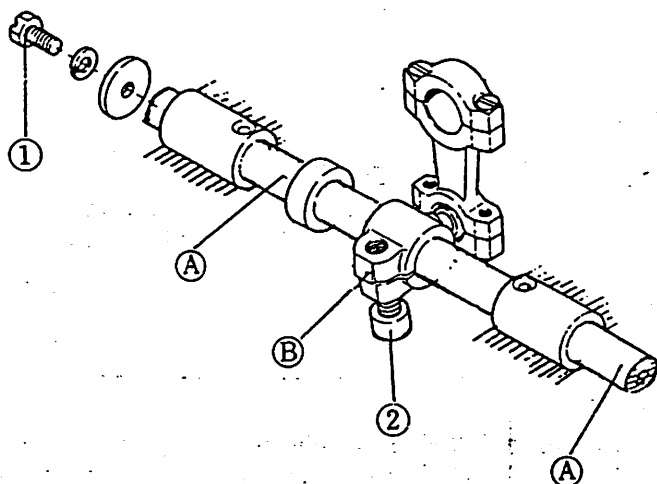
Replace the upper looper drive connection E on the crankshaft F from the bottom of the bed as a set.

Align the aligning marks and replace the cap from the top. Tighten the 2 screws 3 carefully. Check that the connection E can move smoothly.

(47)

Insert the upper looper drive shaft G through the upper looper crank H and washer K from the front of the bed. With the end of the shaft protruding slightly from the rear bushing M, lightly tighten screw 4.

UPPER LOOPER DRIVE SHAFT



(48)

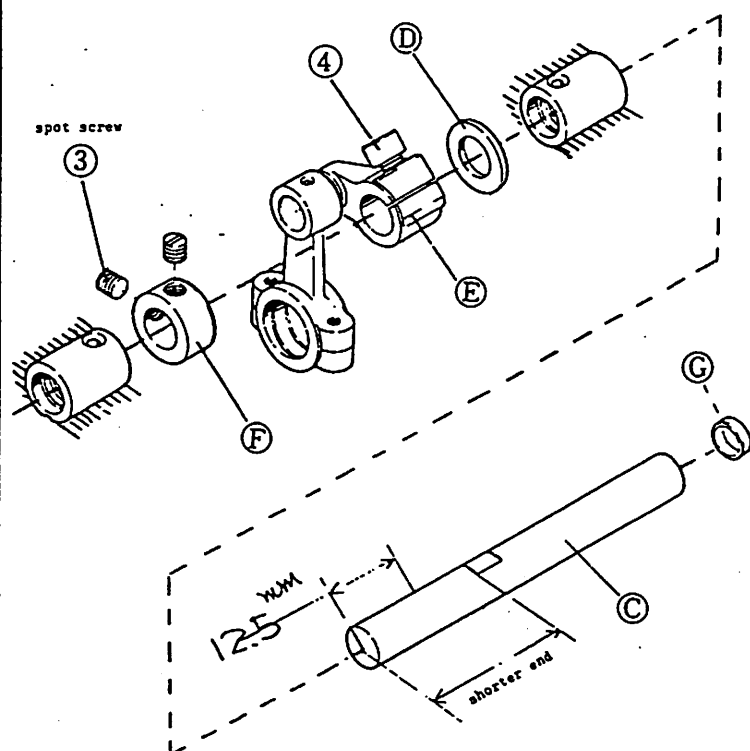
Replace washer and spring washer on the end of the looper drive shaft A and tighten screw 1.

(49)

Loosen screw 2. Push screw 1 lightly to the right and push upper looper crank B lightly to the left. Tighten screw 2 so that there is no free play in the shaft A.

Check that the shaft A can move smoothly.

NEEDLE DRIVE SHAFT (E56)



(50) - E56 -

Insert the needle drive shaft C through the washer D, the needle drive crank E and the collar F from the right of the bed.

(51) - E56 -

With the needle drive shaft C protruding 12.5mm from the left of the bed, push collar F lightly to the left and tighten the 2 screws 3.

Tighten the spot screw first.

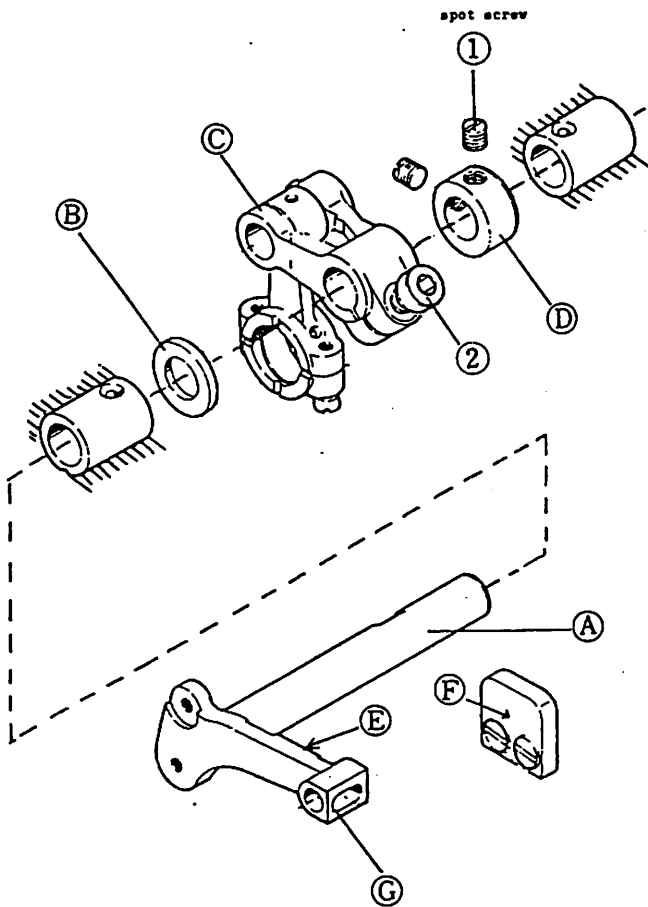
(52) - E56 -

Push the collar F lightly to the left, push the needle drive crank E and washer D lightly to the right and tighten screw 4 so that there is no free play in the shaft C.

Check that the shaft C can move smoothly.

Replace cap G.

UPPER KNIFE LEVER (E56)



(53) - E56 -

Insert the upper knife lever A through the washer B, the upper knife drive crank C and the collar D from the left of the bed.

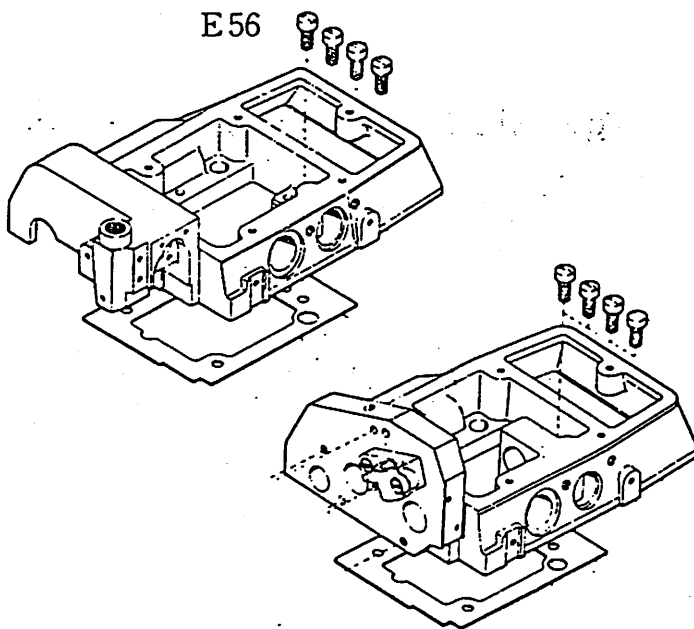
(54) - E56 -

Push the surface E lightly against the upper knife lever guide F, push collar D lightly to the right and tighten the 2 screws 1. Tighten the spot screw first.

(55) - E56 -

Lightly tighten screw 2 and move the upper knife lever A to its lowest position. Set surface G so that it is vertical. Push the upper knife drive crank C lightly to the left and tighten the screw so that there is no free play in the shaft A. Check that the shaft can move smoothly.

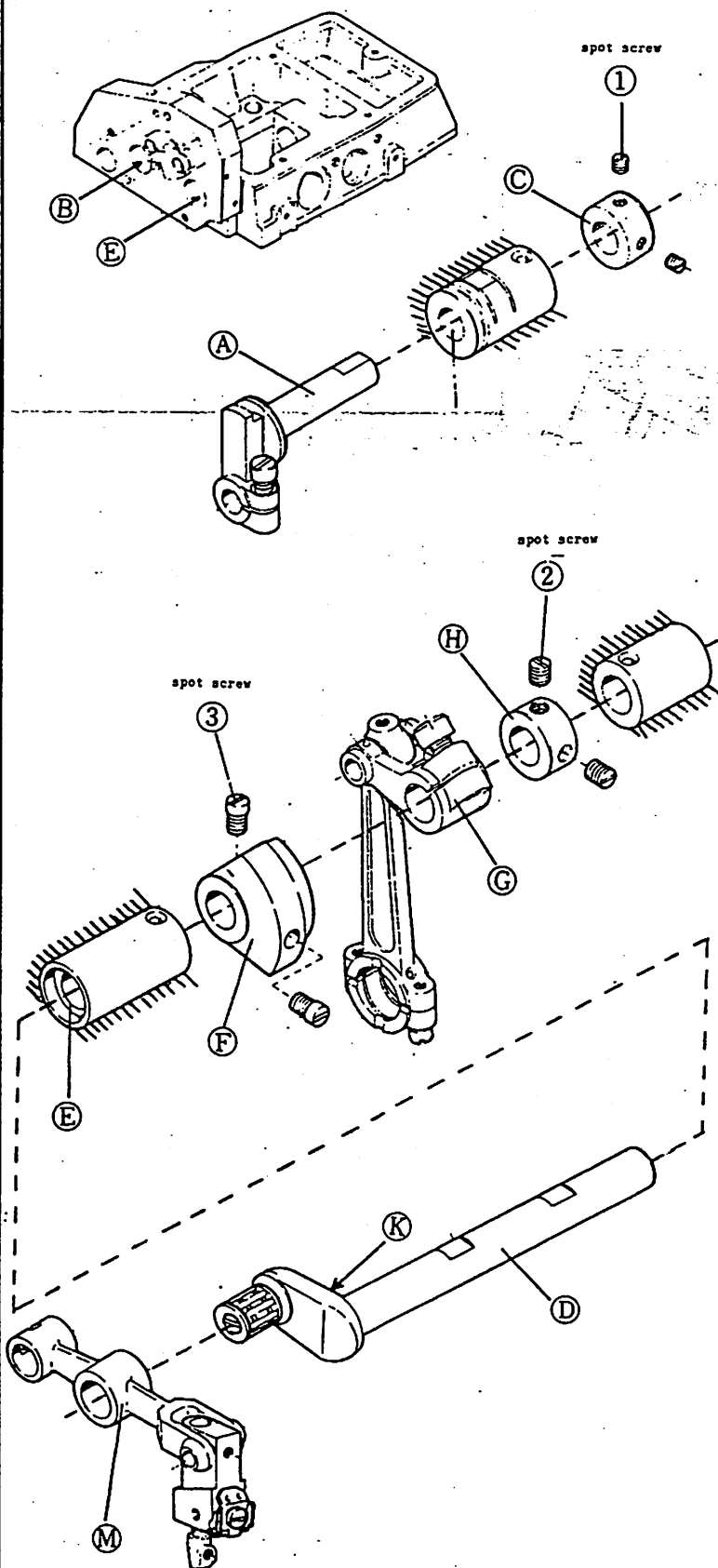
MACHINE ARM (RIGHT)



(56)

Replace the 4 screws and tighten securely.

NEEDLE DRIVE (E32 E52)



(57) - E32, E52 -

Insert the holder A through the hole B in the left of the arm and into the thrust collar C. Tighten the 2 screws 1 so that there is no free play in the holder A. Tighten the spot screw first.

Check that the holder A can move smoothly.

(58) - E32, E52 -

Insert the needle drive shaft D into the arm through the hole E, balance weight F, needle drive crank G and collar H.

(59) - E32, E52 -

Push the collar H lightly to the right and tighten the 2 screws 2 so that there is a clearance of 0.5mm between surface K and the left of the arm.

Tighten the spot screw first.

(60) - E32, E52 -

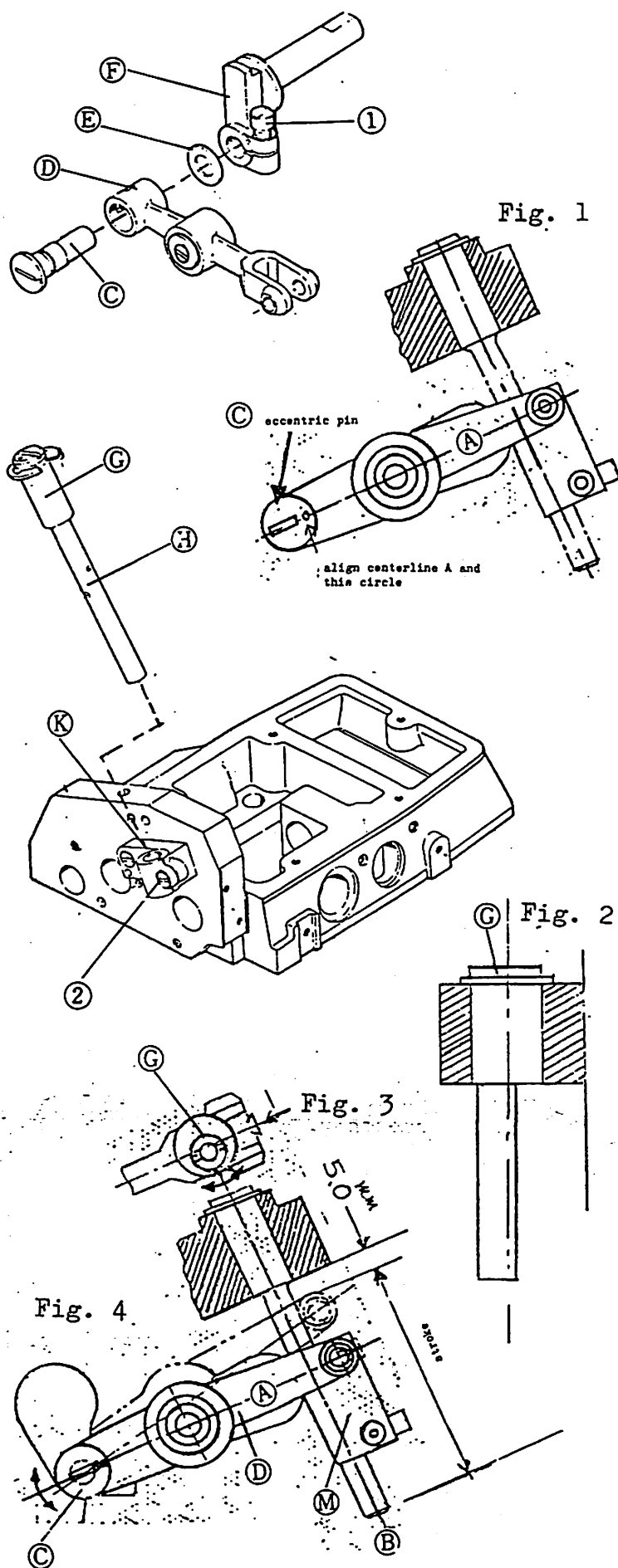
Push the needle drive shaft D lightly to the right and push the balance weight F lightly to the left. Tighten the 2 screws 3 so that there is no free play in the shaft D.

Check that the shaft can move smoothly.

(61) - E32, E52 -

Replace the needle drive lever M (complete) on the needle bearing of shaft D.

NEEDLE HOLDER GUIDE STUD (E32 E52)



(62) - E32, E52 -

Insert pin C through needle drive lever D, washer E and into holder F. Align the aligning mark (circle) on pin C along the centerline A of the needle drive lever D.

Hold pin C in position with a screwdriver and lightly tighten screw 1. (See Fig. 1).

(63) - E32, E52 -

Insert stud G into the hole with the upper oil holes H facing the front. (See Figs. 2, 3)

Turn the stud slightly from side to side as shown in Fig. 3 and push it into place.

(64) - E32, E52 -

Turn stud G so that the needle drive lever D can move smoothly up and down about 1cm either side of the point where lines A and B cross at right angles. Tighten screw 2.

(65) - E32, E52 -

Turn the eccentric pin C in the direction shown by the arrow and set it so that the needle holder guide M can move smoothly in the range shown.

Push holder F lightly and tighten screw 1.

Note: if the needle holder guide is tight at the top of its stroke then turn eccentric clockwise. If it is tight at the bottom of its stroke then turn eccentric anti-clockwise.

NEEDLE DRIVE OIL SUPPLY WICK
(E32 E52)

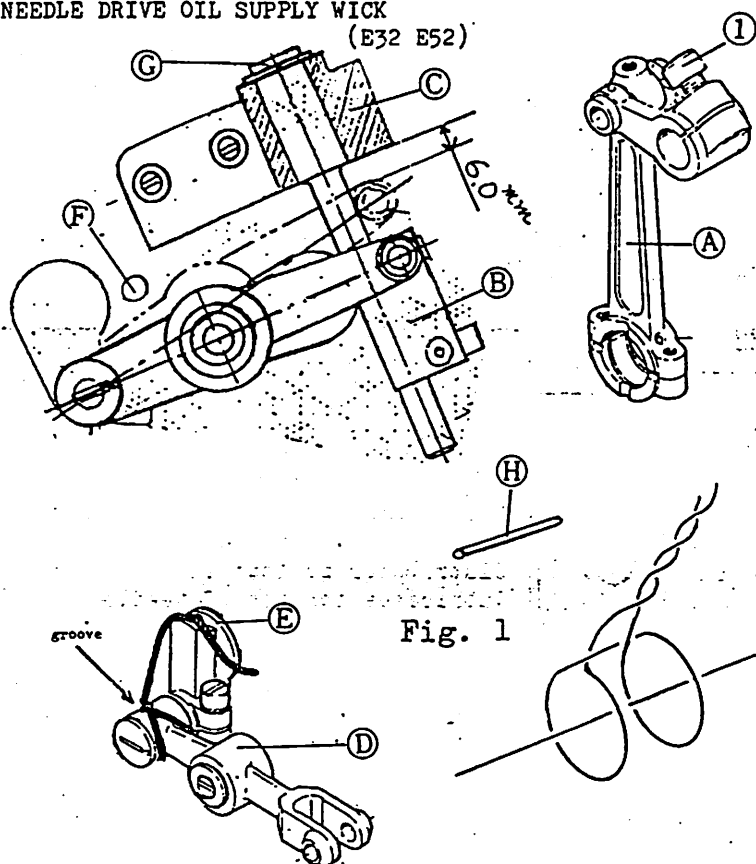
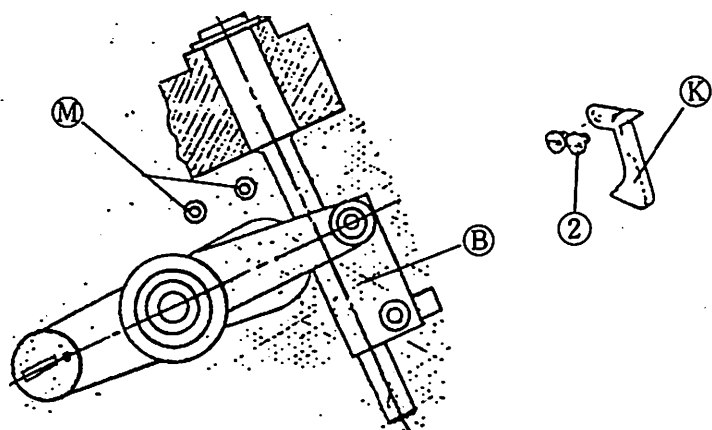
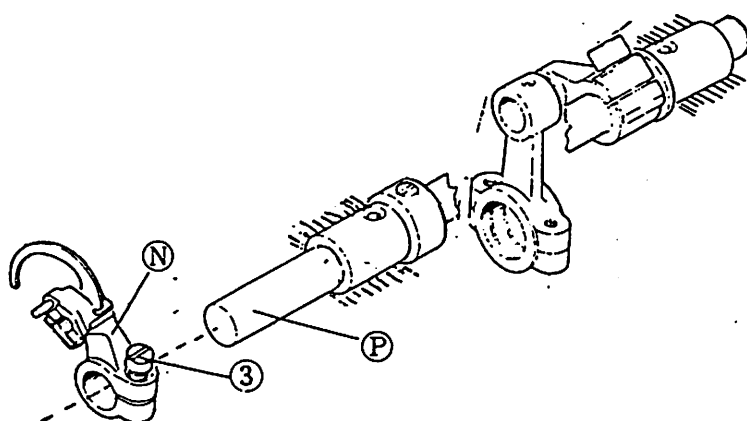


Fig. 1



NEEDLE ARM (E56)



(66) - E32, E52 -
Move the needle drive connection A to its highest position. Set upper surface of the needle holder guide B about 6.0mm from the bottom surface of bracket C and lightly tighten screw 1.

(67) - E32, E52 -
Locate the oil wick in the groove of the back of the needle drive lever D and twist the wick together as shown (Fig. 1). Drape the wick over the pin E and insert it through the hole F in the arm.

(68) - E32, E52 -
Insert the oil wick which is at the top of the stud G through the hole F in the arm and twist it together with the oil wick from the back of the needle drive lever D (step 67).

(69) - E32, E52 -
Insert the oil restricting pin H into the hole F from the left of the arm.

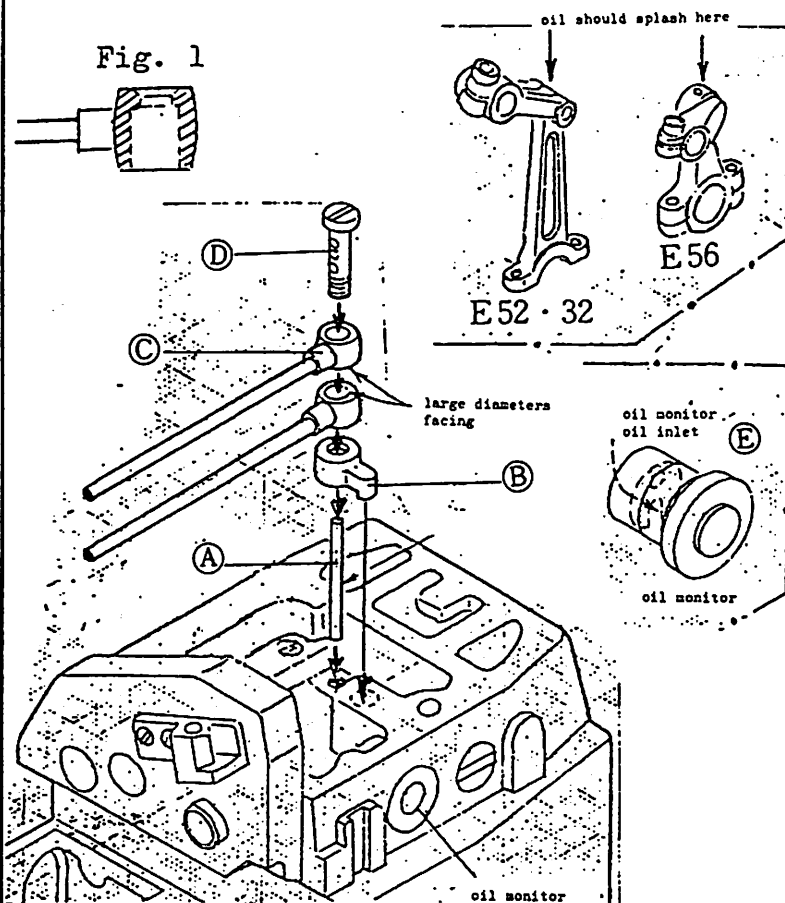
(70) - E32, E52 -
Replace the machine arm left cover K on the arm M and tighten the 2 screws 2. Check that it does not touch the needle holder guide B.

(71) - E56 -
Replace the needle arm N on the needle drive shaft P from the left. Lightly tighten screw 3.

OIL DISTRIBUTORS

Fig. 2

Fig. 1



(72)

Insert the oil flow adjust pin A into the hole in the bed shown by the arrow. Locate the lubrication block in the hole B on the bed as shown by the arrow.

(73)

Replace the two oil distributors with the large internal bores facing each other (see Fig. 1). Tighten junction screw D.

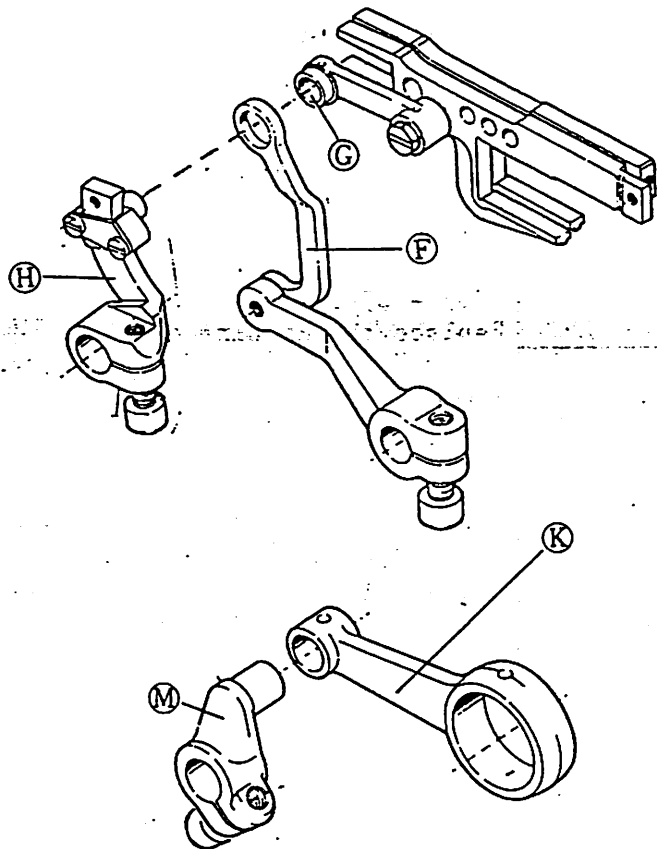
- E32, E52 -

Position the upper oil distributor so that it lubricates the top of needle drive connection (see Fig. 2). Insert the lower oil distributor into the oil monitor hole E.

- E56 -

The positions of the two oil distributors are reversed.

DIFFERENTIAL FEED CRANK



(74)

Replace the differential feed regulating link F on the differential feed link G.

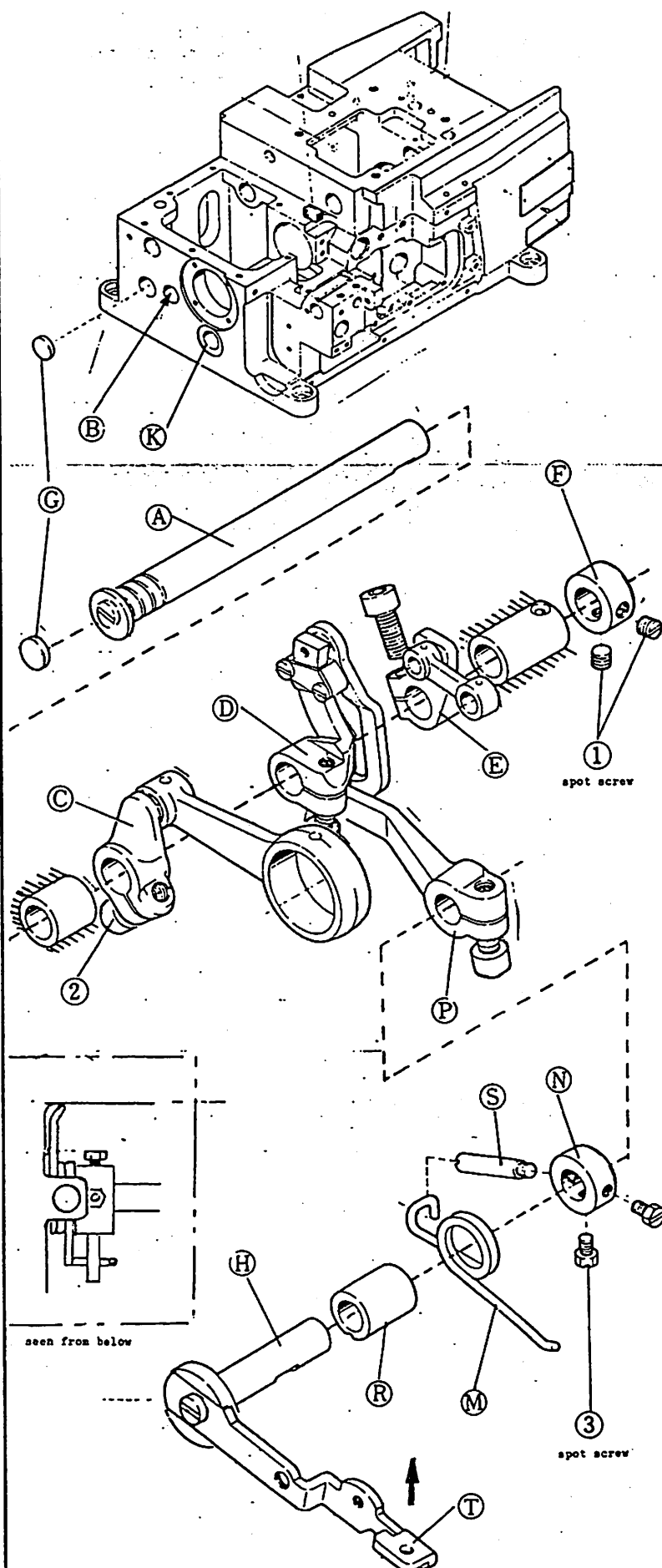
(75)

Replace the differential feed crank (complete) H in the differential feed link G.

(76)

Lift the feed drive connection K and locate it on the feed drive crank M from the right.

FEED SHAFT



(77)

Insert the feed shaft A into the hole B in the left of the bed. Insert it through the feed drive crank C, the differential feed crank D, main feed crank E and collar F.

(78)

Push the feed shaft A lightly to the right and push the collar F lightly to the left. Tighten the 2 screws 1. Tighten the spot screw first.

(79)

Tighten the feed drive crank screw 2.

(80)

Replace the cap G in the hole on the left of the bed.

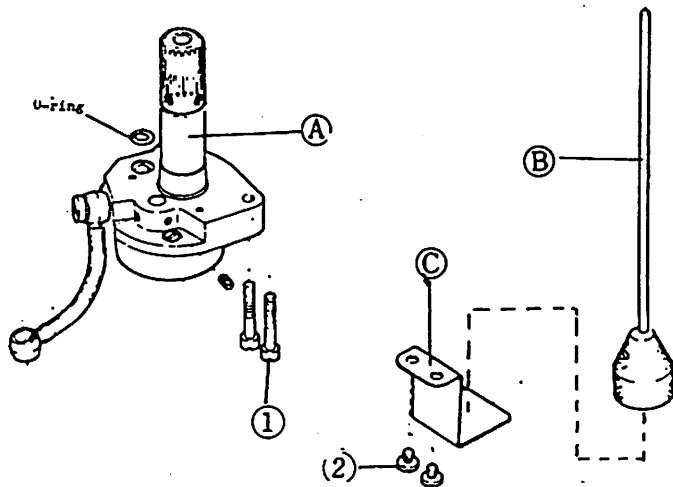
(81)

Insert the differential feed regulating shaft H into the hole K in the left of the bed. Insert it through the spring M, the thrust collar N and the differential feed regulating lever P.

(82)

Replace spring M on the end of the bushing R. Replace the latch screw S. Lift the diff. feed reg. lever T (see arrow). Push collar N to the left. Push latch screw S down and tighten the 2 screws 3. Tighten the spot screw first.

GEAR PUMP/OIL INDICATOR



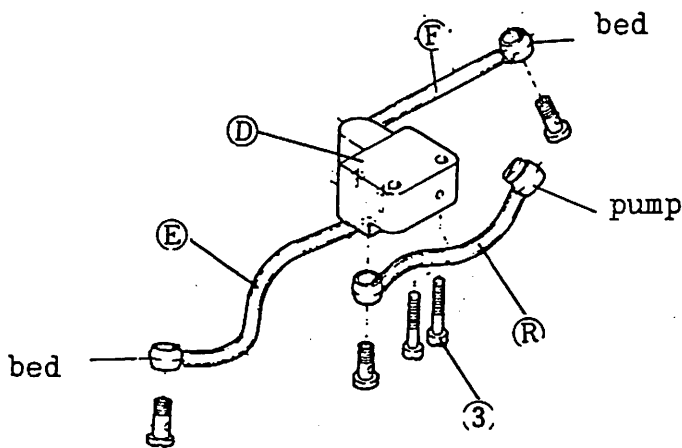
(83)

Replace the oil pump A on the bottom, pulley side of the bed. Tighten the 2 screws 1. Do not omit the O-ring.

(84)

Replace the oil indicator B in the bottom, front pulley side of the bed. Fasten the indicator support C with the 2 screws 2.

BY-PASS



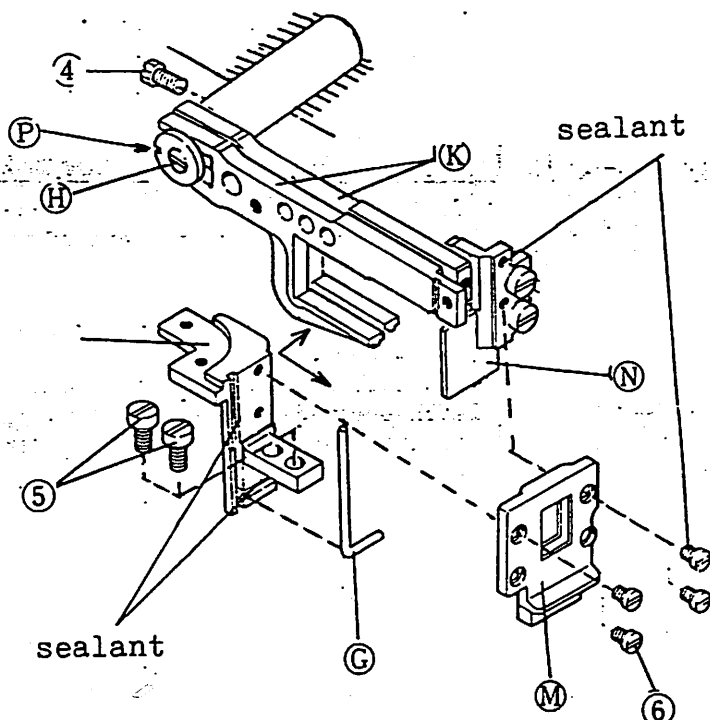
(85)

Replace the by-pass D in the bottom, center of the bed. Tighten the 2 screws.

(86)

Fasten the 2 oil tubes E to the bed. Fasten the by-pass pipe R (from the gear pump) to the by-pass.

FEED BAR GUIDE LEFT/OIL SEAL GUIDE



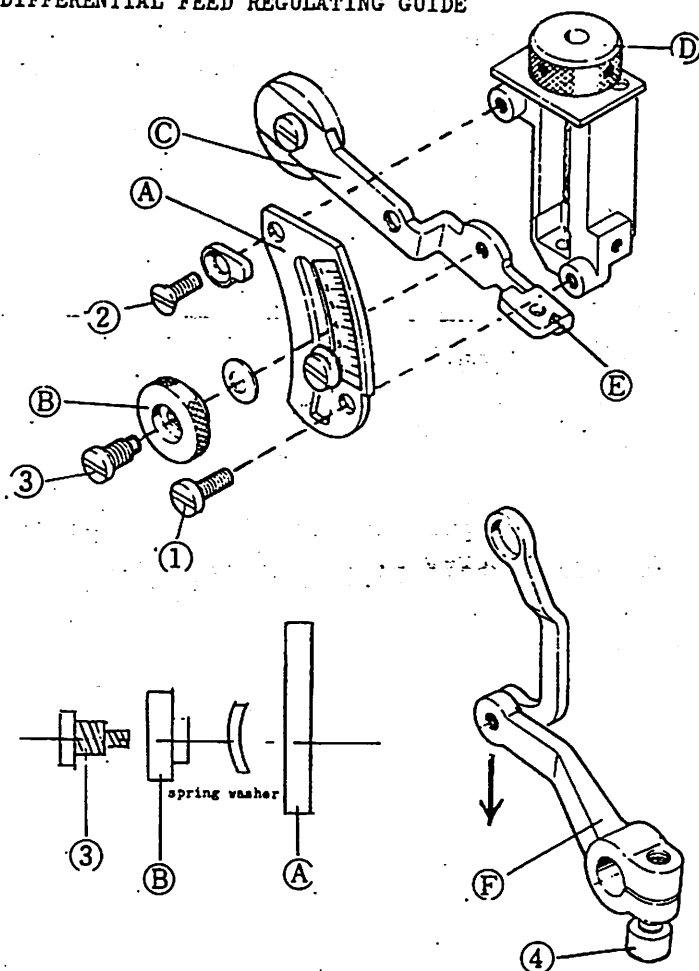
(87)

Loosen the feed eccentric screw 4. Replace the O-ring G in the feed bar guide F and push it lightly to the front and right. Tighten the 2 screws 5 so that the feed bars K can move smoothly with no free play. Push the feed bar pin H to the right and tighten screw 4 with the groove F facing backwards.

(88)

Move the feed bars K to their highest position and replace the feed bar oil seal guide M. Tighten the 4 screws 6.

DIFFERENTIAL FEED REGULATING GUIDE



(89)

Fasten the differential feed regulating guide A with screw 1.

Lightly tighten screw 2.

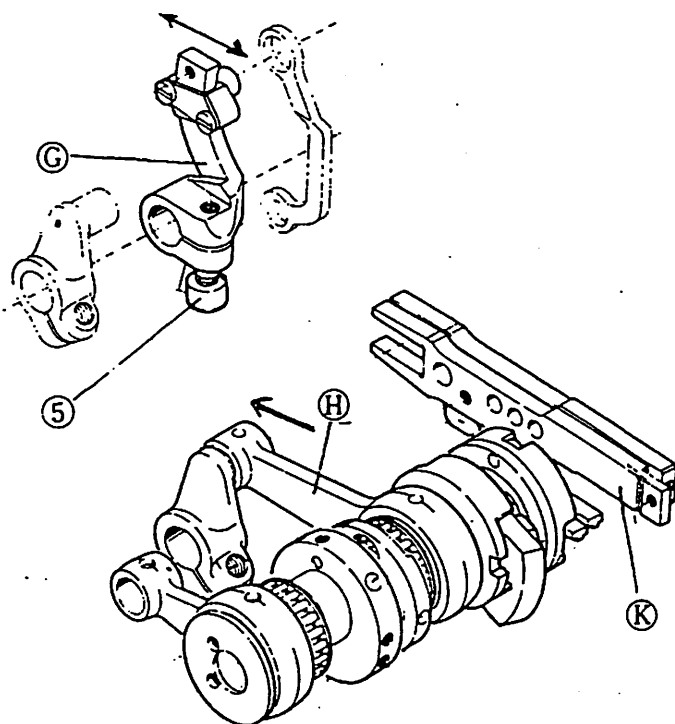
(90)

Fasten thumb nut B and spring washer to differential feed regulating lever C with screw 3 so that nut B can turn smoothly. Note position of spring washer.

(91)

Turn thumb nut D fully clockwise. Check that the differential feed regulating lever surface E can be lifted to mark '1'. Pull differential feed regulating lever right F down and tighten screw 4.

POSITIONING DIFF. FEED CRANK



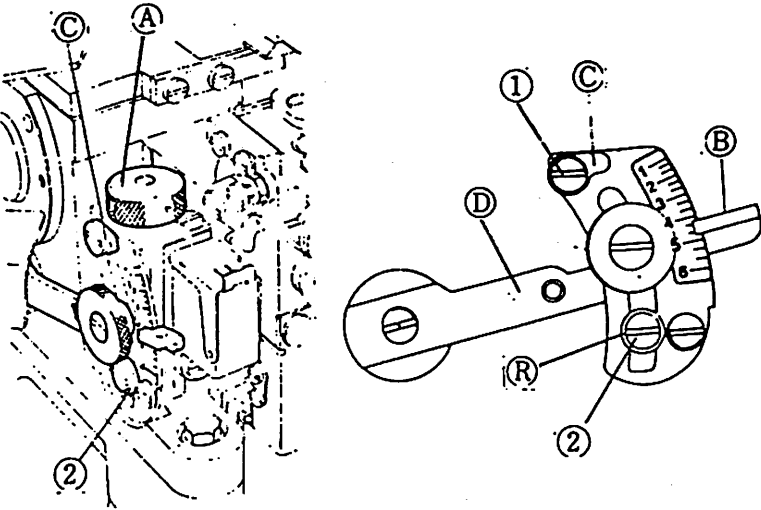
(92)

Push in the pushbutton and turn the pulley fully clockwise.

(93)

Lightly tighten screw 5 so that the differential feed crank G can be moved by hand. Move the feed drive connection H to its rearmost position (see arrow). Move the crank back and forth until the differential feed bar K does not move when the lever C is moved up and down. Maintain this position and tighten screw 5.

POSITIONING DIFF. FEED REGULATING
LEVER



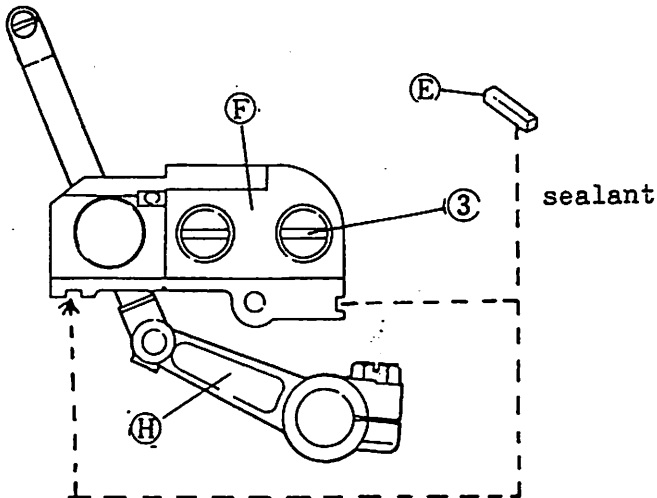
(94)

Turn thumb nut A anti-clockwise and set the surface B of lever to '1'.
Turn the stopper C so that it just touches differential feed regulating lever D and tighten screw 1.

(95)

Turn nut A anti-clockwise and set the surface B of lever to '5'. Move stopper R so that it just touches differential feed regulating lever D and tighten screw 2.

UPPER LOOPER GUIDE BASE

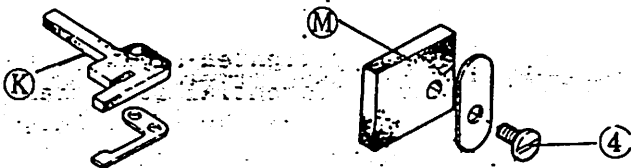


(96)

Use sealant and replace the 2 gaskets E on the upper looper guide base F.
Lightly fasten the complete upper looper guide base F to the bed with the 2 screws 3.

(97)

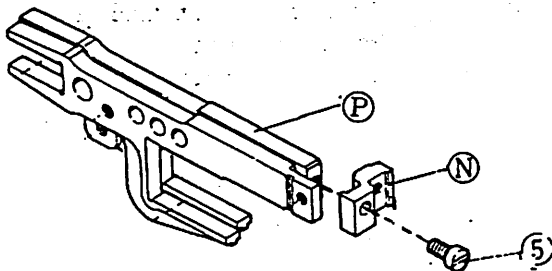
Tighten the 2 screws 3 carefully so that the upper looper holder H can move smoothly.



(98)

Insert the oil felt K (attached to the bottom of the looper guide base) behind the oil felt M (attached to the bed).
Tighten screw 4.

MAIN FEED DOG BRACKET



(99)

Replace main feed dog bracket N on the main feed bar P.
Tighten screw 5.

CHECKING NEEDLE



if needle is not straight, replace it

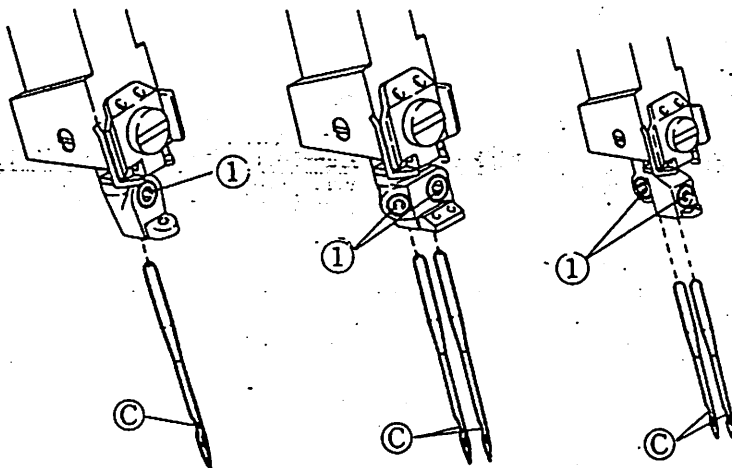
(100) - E32, E52 -
Place the needle on the cloth plate or a milled part of the bed. Press the shank at A and roll the needle. Watch the tip of the needle B and check that it is straight.

NEEDLE ALIGNMENT

E 52 (1-needle)

E 52 (2-needle)

E 32



(101) - E32, E52 -
Insert the needle into holder as far as it will go with scarf C facing backwards. Tighten screw 1.
Note: remove the double chainstitch needle (E32 - left needle) after checking drop point.

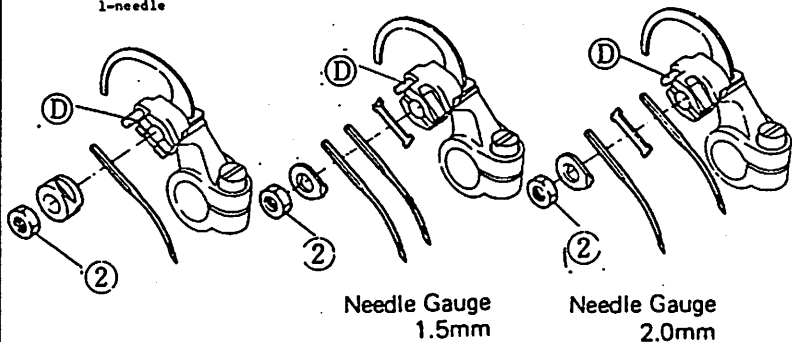
Needle Type Organ DCx27

NEEDLE (E56)

1-needle

2-needle

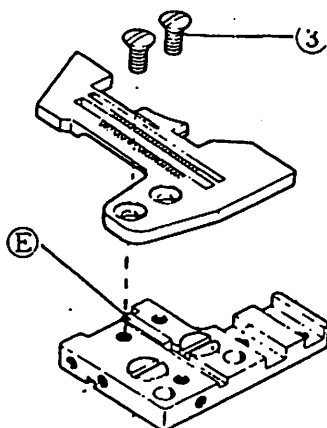
2-needle



(102) - E56 -
Insert the needle into needle arm until it touches pin D. Tighten nut 2.

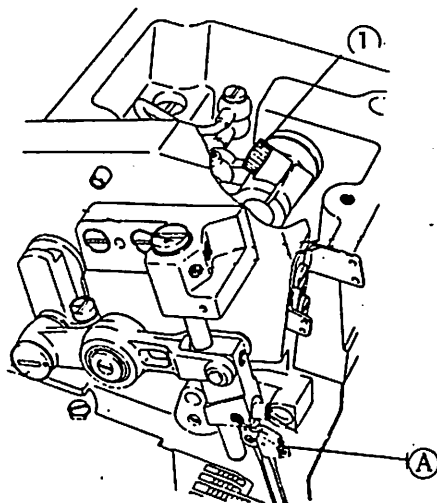
Needles	Organ	Schmets
1 Needle	UOx154	UY154GAS
2 Needle	UNx154	UY154GCS

NEEDLE PLATE



(103)
Locate needle plate in groove E and tighten the 2 screws 3.
STANDARD ADJUSTMENTS
- IMPORTANT!! -
For machine #7605897 and after (manufactured after Jan 1 1980) make adjustments as described here. However, for machine #7605896 and before (manufactured before Jan 1 1980) please see sections 216 - 230.

NEEDLE HEIGHT

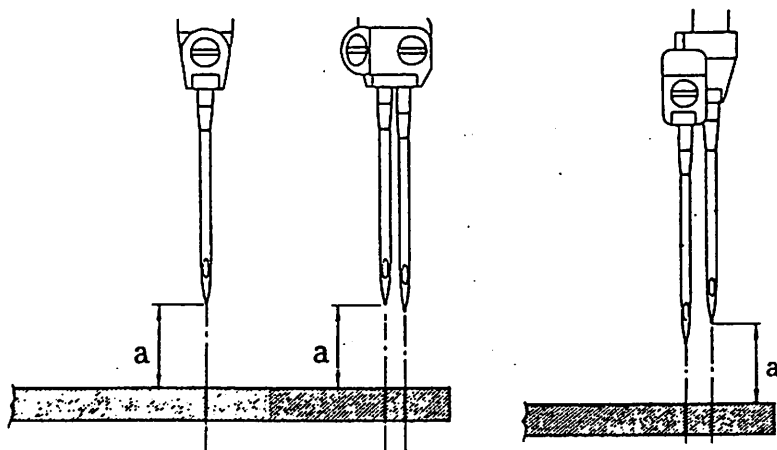


E 52

1-needle

2-needle

E 32



(104) - E32, E52 -

Move needle holder A to its highest position. Loosen needle drive crank screw 1 so that the needle holder can be moved by hand.

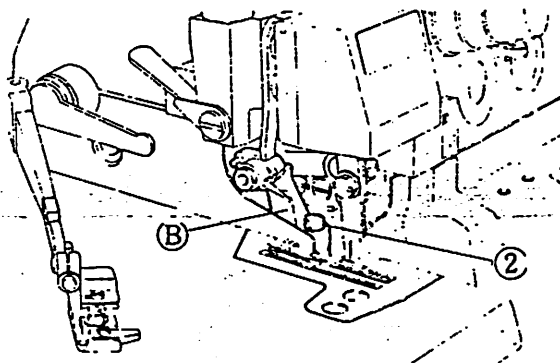
Set the correct distance between the surface of the needle plate and the tip of the needle.

Tighten screw 1.

Note: if the needle holder A has been dismantled then reset both needle height and needle drop point.

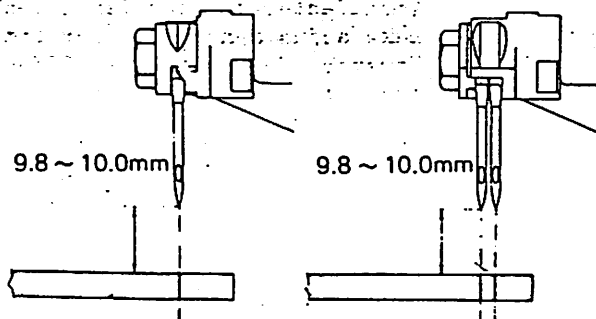
Model	Needle Height	Model	Needle Height
E 52-130	9.9-10.1	E 32-410	9.9-10.1
131	10.8-11.0	411	"
132	9.9-10.1	420	"
133	"	430	"
134	"	430	"
135	10.8-11.0	431	"
136	9.9-10.1	440	10.8-11.0
137	"	450	"
240	10.8-11.0	451	9.9-10.1
210	9.9-10.1	540	10.8-11.0
210	"	541	9.9-10.1
211	"	542	10.8-11.0
220	"	550	9.9-10.1
221	10.8-11.0		
231	9.9-10.1		
242	"		
243	10.8-11.0		

NEEDLE HEIGHT



9.8 ~ 10.0mm

9.8 ~ 10.0mm



(105) - E56 -

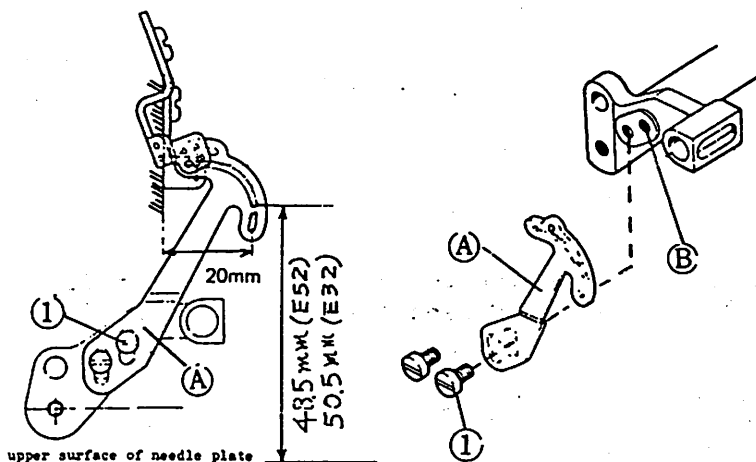
Move the needle arm B to its highest position. Loosen screw 2 so that the needle arm can be moved by hand.

Set the distance between the surface of needle plate and the tip of the needle to the specified distance.

Tighten screw 2.

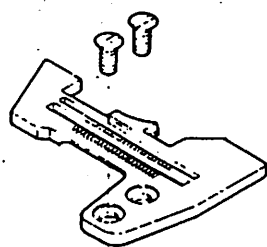
8.8~9mm	8.3~8.5mm
E 56-110	E 56-231
E 56-111	E 56-232
E 56-230/503-133-W	E 56-233

NEEDLE THREAD TAKEUP



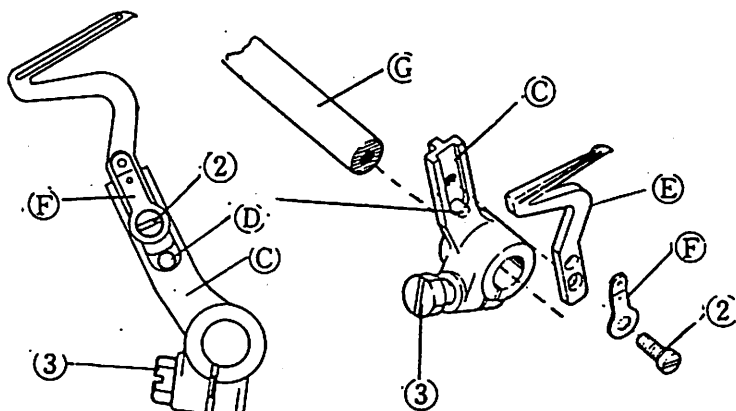
(106) - E32, E52 -
Replace the needle thread takeup A on the left of the upper knife lever B when the needle is in its lowest position. Set the takeup A so that it is 20mm from the front of the arm and the specified distance above the needle plate as shown. Tighten the 2 screws 1.

NEEDLE PLATE



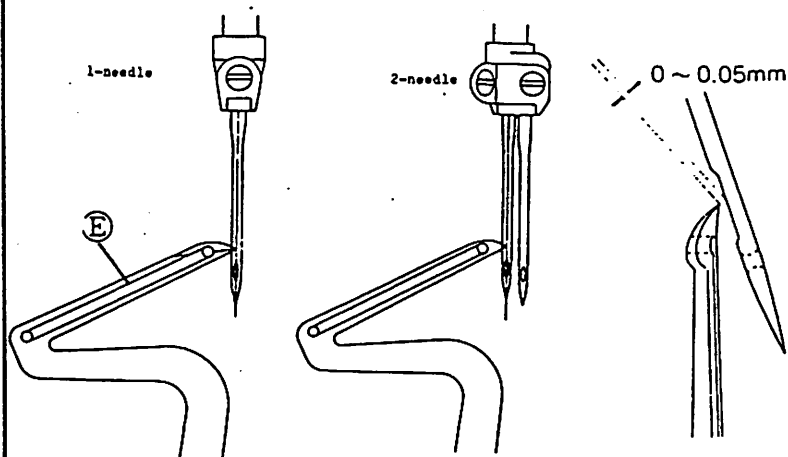
(107)
Remove needle plate.

LOWER LOOPER LEVER



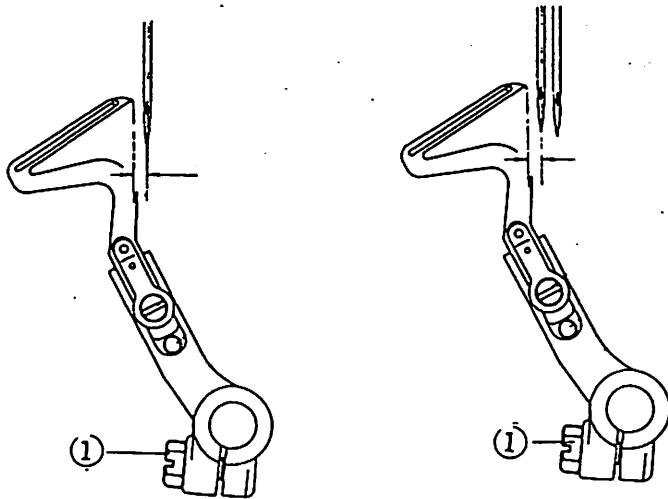
(108)
Replace the lower looper E in the lower looper lever C so that it touches pin D. Replace the thread guide F and tighten screw 2. Replace the lever C on the shaft G and lightly tighten screw 3 so that it can be moved by hand.

POSITIONING LOWER LOOPER



(109) - E52 -
Turn handwheel and raise needle 3mm above its lowest position. Move looper E by hand so that the tip of looper is behind the centerline of needle and the clearance between them is 0 - 0.05mm as shown.

LOWER LOOPER SETTING

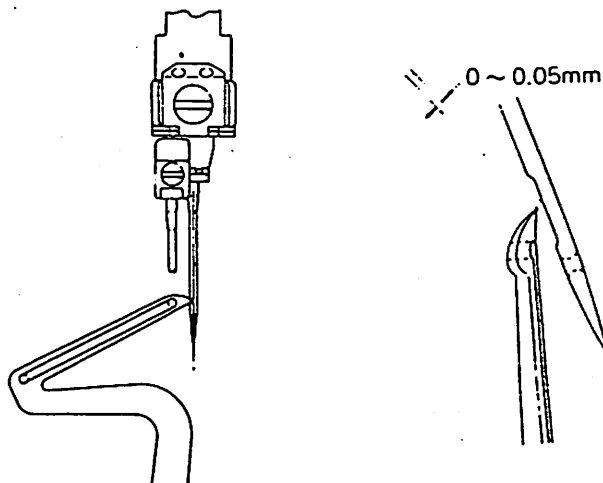


Needle bar in lowest position

(110) - E52 -
Turn handwheel and move lower looper to its extreme left position.
Set lower looper so that the distance between the centerline of needle and tip of looper is correct (see table).
Tighten screw 1.

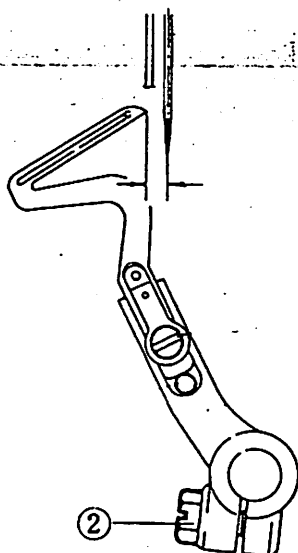
Model	Lower Looper Setting
E 52-130	3.8-4.0
131	3.6-3.8
132	3.8-4.0
133	"
134	"
135	3.6-3.8
136	3.8-4.0
137	"
140	3.6-3.8
210	3.8-4.0
219C	"
211	"
220	"
221	3.6-3.6
231	3.8-4.0
242	"
243	3.6-3.8

POSITIONING LOWER LOOPER



(111) - E32 -
Turn handwheel and raise needle 3mm above its lowest position.
Move looper by hand so that the tip of looper is behind the centerline of right needle and the clearance is 0 - 0.05mm as shown.

LOWER LOOPER SETTING

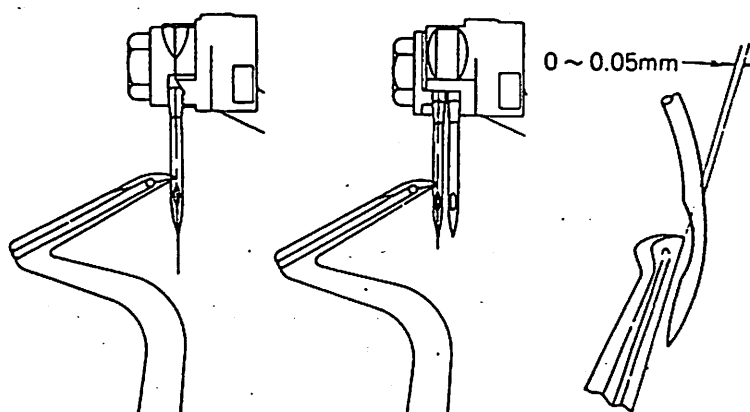


Needle bar in lowest position.

(112) - E32 -
Turn handwheel and move lower looper to its extreme left position.
Set lower looper so that the distance between the centerline of right needle and tip of the looper is correct (see table).
Tighten screw 2.

Model	Lower Looper Setting
E 32-410	3.8-4.0
411	"
420	"
430	"
431	"
440	"
450	3.4-3.6
451	"
540	3.8-4.0
541	3.6-3.8
542	3.8-4.0
543	3.6-3.8
550	3.8-4.0

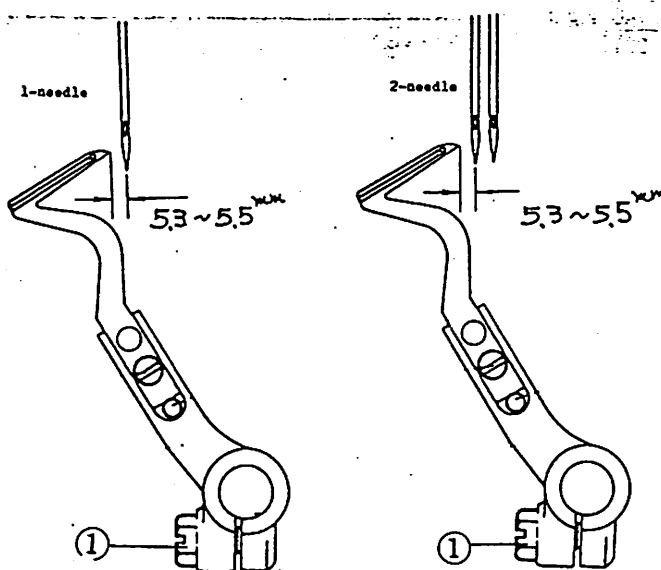
POSITIONING LOWER LOOPER



(113) - E56 -

Turn handwheel and move needle to its lowest position. Align the tip of looper and the centerline of needle. Move the looper so that the clearance is 0 - 0.05mm as shown.

LOWER LOOPER SETTING



(114) - E56 -

Turn handwheel and move looper to its extreme left position. Set the lower looper so that the distance between the centerline of needle and tip of looper is correct (see table).

Tighten screw 1.

Non-standard models
4.8 ~ 5.0mm

E56-110

E56-111

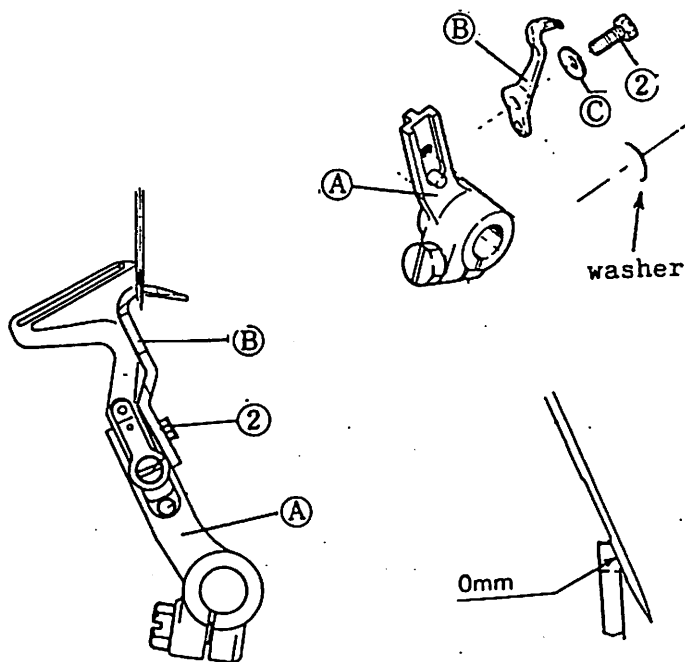
E56-230/503-133-W

E56-231

E56-232

E56-233

MOVABLE NEEDLE GUARD (REAR)



(115)

- E32, E52 movable needle guard machines -

Replace movable needle guard B and washer C on lower looper lever A.

Note direction of washer.
Tighten screw 2 lightly.

(116)

- E32, E52 movable needle guard machines -

Move looper so that its tip is behind the centerline of needle. Set clearance between needle guard B and needle to 0mm.
Tighten screw 2.

UPPER LOOPER

standard lift

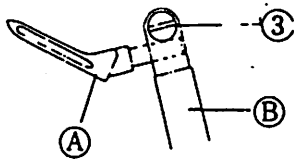


Fig 1

Model	Model	
E 32-410	E 52-130	E 56-110
411	134	111
420	136	230
430	210	231
431	210C	232
440	211	233
540	220	
550	231	
	242	

high lift (E32, 52)
low lift (E56)

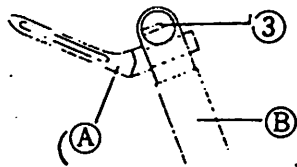


Fig 2

Model	Model	Model
E 32-450	E 52-131	All E56
451	132	machines except those shown on right.
541	133	
542	135	
543	137	
	140	
	221	
	243	

(117)

Replace upper looper A in upper looper holder B.

The correct position of the looper depends on the machine model (see Tables 1 or 2).

Table 1: align the end of the looper shaft and the looper holder. Lightly tighten screw 3. Table 2: push the upper looper fully into the looper holder B. Lightly tighten screw 3.

(118)

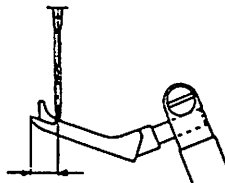
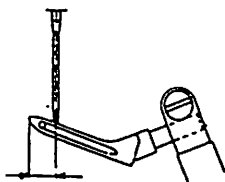
Tighten screw 4 lightly so that upper looper holder C can be moved by hand.

UPPER LOOPER GAUGE

E 52

E 56

1-needle

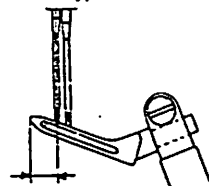


E 52

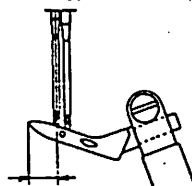
E 56

2-needle

stitch type 514

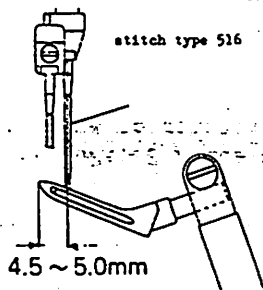


stitch type 512

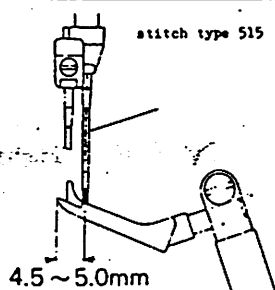


E 32

stitch type 516



stitch type 515



(119)

Turn handwheel and move upper looper to its extreme left position. Move upper looper holder C up and down and set the distance between tip of upper looper and centerline of needle as shown. Set the distance to 4.5 - 5.0mm for all E32, E56 machines.

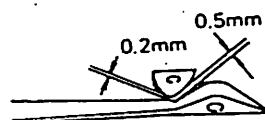
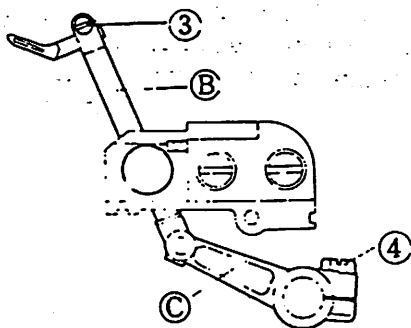
Model	Upper Looper Setting
E 52-130	4.5 - 5.0
131	5.5 - 5.8
132	5.3 - 5.8
133	"
134	4.5 - 5.0
135	5.5 - 5.8
136	4.5 - 5.0
137	5.3 - 5.8
140	5.5 - 5.8
210	4.5 - 5.0
210C	"
211	"
220	"
221	"
231	"
242	"
243	5.5 - 5.8

(120)

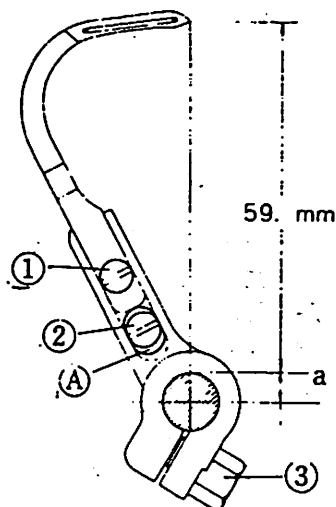
Check that there is a sideways clearance of about 0.5mm when the loopers cross.

Move the upper looper back and forth and set the clearance between the two loopers to 0.2mm as shown.

Tighten screws 3 and 4.



DOUBLE CHAINSTITCH LOOPER HOLDER



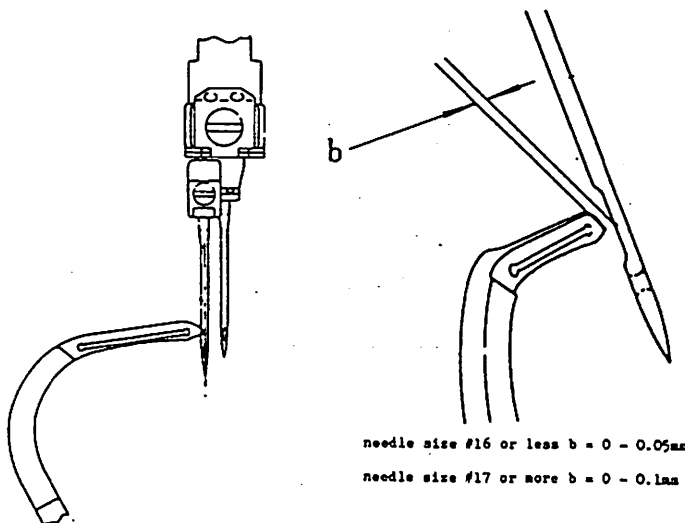
(121)

Replace double chainstitch looper in holder so that it touches looper regulator A. Tighten screw 1.

Note: if the looper holder has been changed then loosen screw 2, set the distance as shown and tighten screw 1.

Move looper regulator A so that it touches the bottom of looper and tighten screw 2.

POSITIONING DOUBLE CHAINSTITCH LOOPER

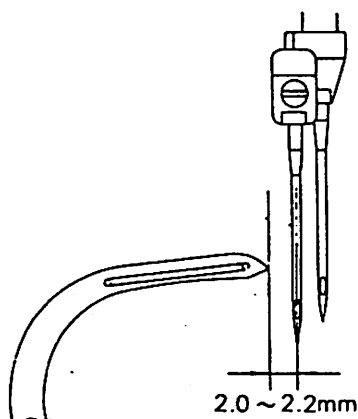


(122)

Replace looper holder on the double chainstitch looper drive shaft and lightly tighten screw 3.

Turn handwheel and raise needle 3mm above its lowest position. Move the looper by hand so that it is behind the centerline of left needle and set the clearance 'b' as shown.

POSITIONING DOUBLE CHAINSTITCH LOOPER



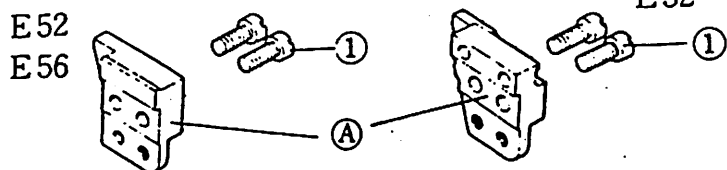
(123)

Turn handwheel and move lower looper to its extreme left position.

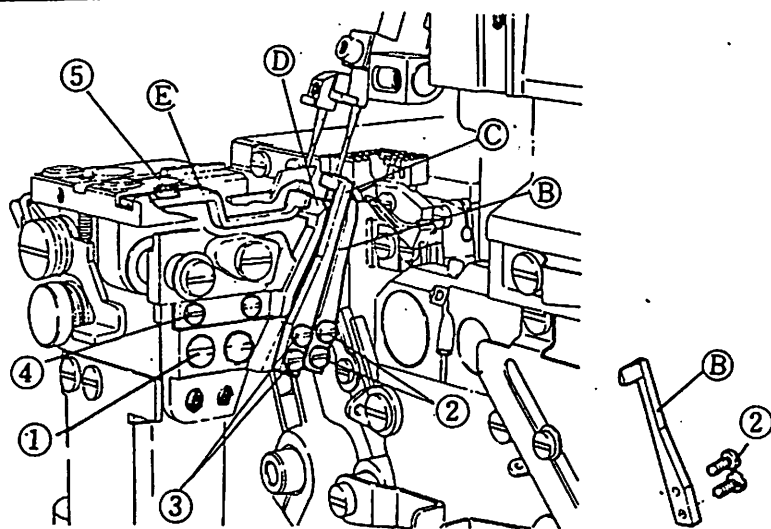
Set the clearance between tip of looper and centerline of left needle as shown.

Tighten screw 3.

NEEDLE GUARD BRACKET

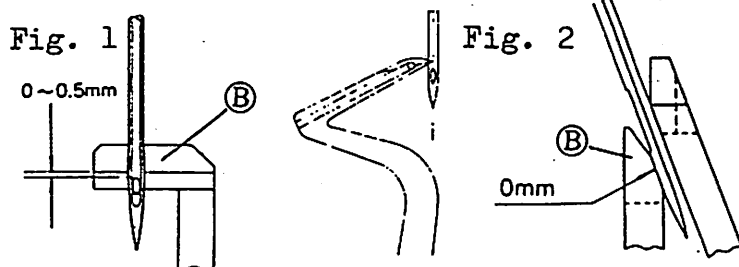


(124)
Replace needle guard bracket A (E52, E56 needle cooler bracket) and tighten 2 screws 1.



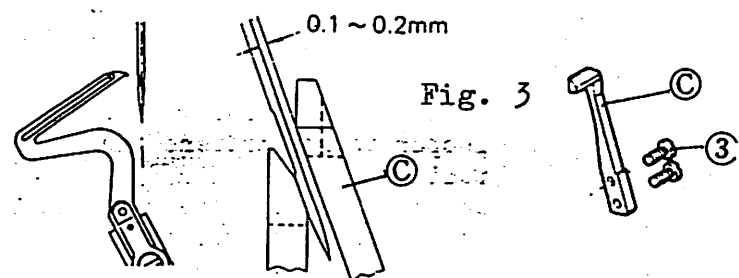
(125)
- E32 overlock needle guard rear - Move needle to its lowest position.
Replace the needle guard B and set the correct distance between the needle guard and eye of needle as shown (Fig. 1).
Lightly tighten 2 screws 2.

ADJUSTING NEEDLE GUARD (REAR)



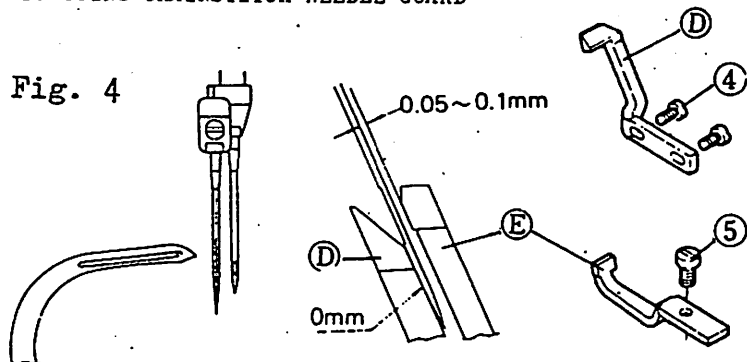
(126)
- E32 overlock needle guard rear - Move the lower looper so that it is behind the centerline of needle. Set the clearance between the needle and needle guard B to 0mm.
Tighten 2 screws 2.
(See Fig. 2).

ADJUSTING NEEDLE GUARD (FRONT)



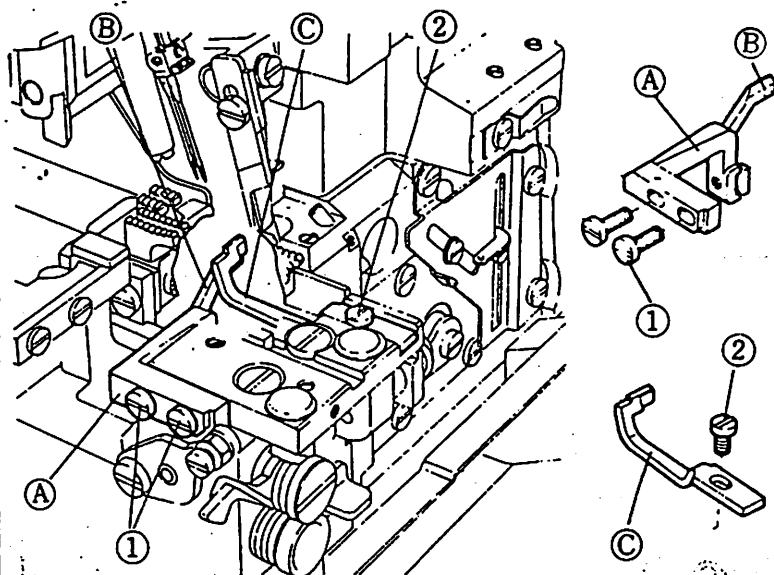
(127)
- E32 overlock needle guard front - Move needle to its lowest position.
Set the clearance between the front needle guard and needle to 0.1 - 0.2mm.
Tighten 2 screws 3.
(See Fig. 3).

ADJUSTING CHAINSTITCH NEEDLE GUARD



(128)
- E32 chainstitch needle guard - Move needle to its lowest position. Replace the rear chainstitch needle guard D so that the clearance between guard and needle is 0mm.
Tighten the 2 screws 4.
Replace the front chainstitch needle guard E so that the clearance between guard and needle is 0.05 - 0.1mm.
Tighten screw 5.
(See Fig. 4).

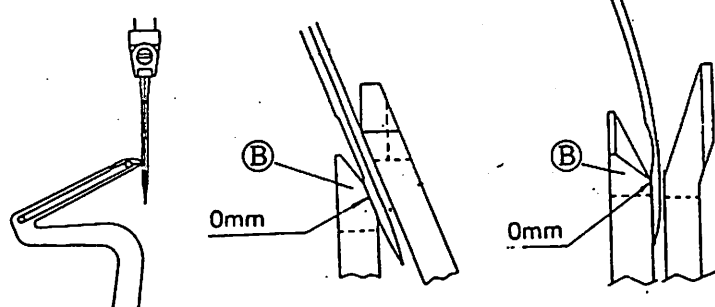
NEEDLE GUARD



(129)

- E52, E56 needle guard rear -
Replace needle guard bracket A
and lightly tighten the 2
screws 1.

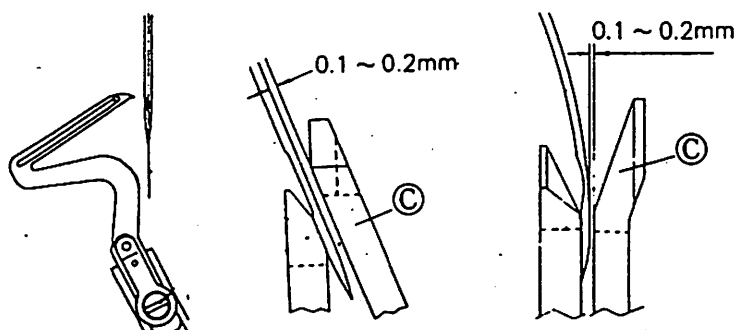
ADJUSTING NEEDLE GUARD (REAR)



(130)

- E52, E56 needle guard rear -
Move lower loop so that it is
behind the centerline of needle.
Set the clearance between
needle guard B and needle to
0mm.
Tighten the 2 screws 1.

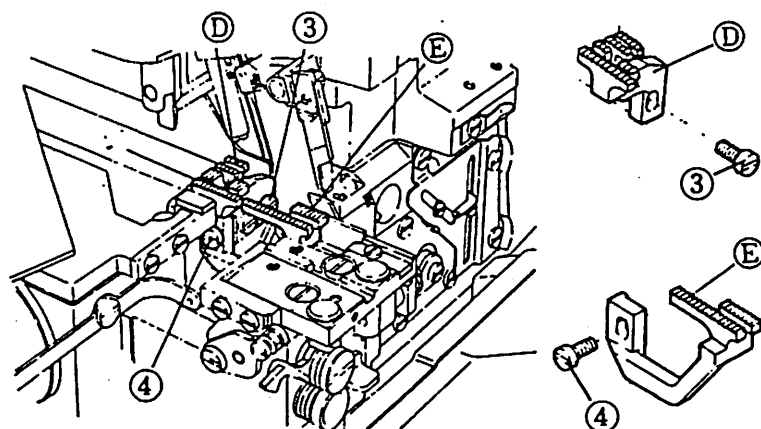
ADJUSTING NEEDLE GUARD (FRONT)



(131)

- E52, E56 needle guard front -
Move the needle to its lowest
position.
Set clearance between needle
and front needle guard C to
0.1 - 0.2mm.
Tighten screw 2.

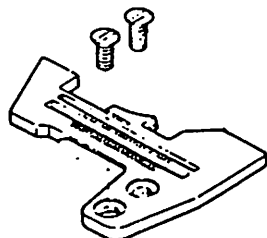
FEED DOGS



(132)

Replace main feed dogs D and
lightly tighten screw 3.
Replace differential feed dogs
E and lightly tighten screw 4.

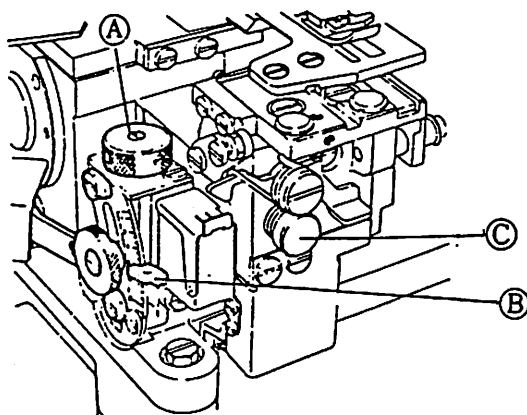
NEEDLE PLATE



(133)

Replace needle plate and lightly tighten the 2 screws.

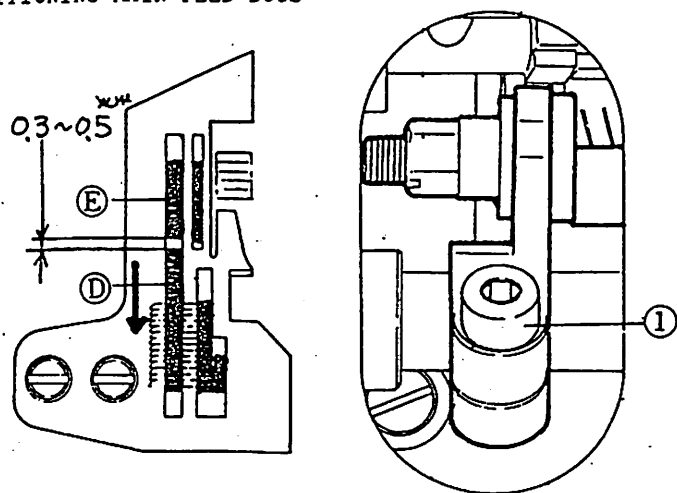
MAXIMUM STITCH LENGTH



(134)

Set differential feed regulating lever B to '1'. Press in push-button C and turn handwheel until it engages. Turn the handwheel fully clockwise and set maximum stitch length.

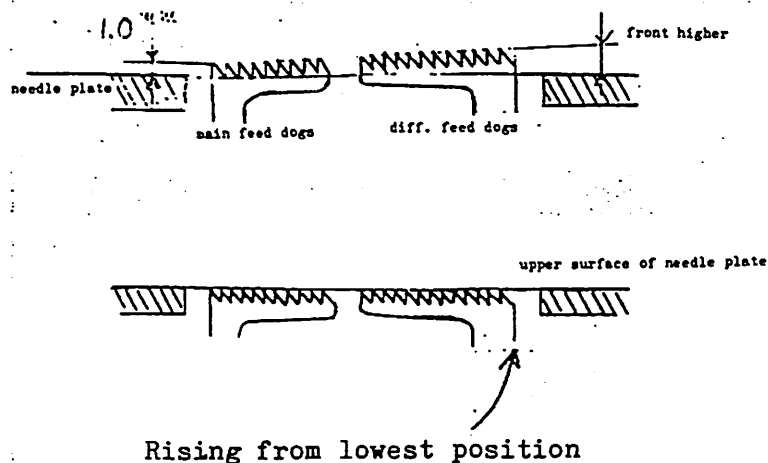
POSITIONING MAIN FEED DOGS



(135)

Move the differential feed dogs to their frontmost position (see arrow). Set the clearance between differential and main feed dogs E to 0.3 - 0.5mm. Tighten screw 1 from the dead hole at the rear of the bed.

FEED DOG HEIGHT

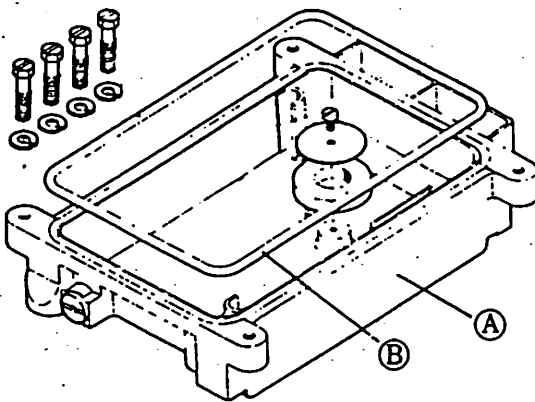


(136)

Move the main feed dogs to their highest position. Set them so that the rear 2 - 3 teeth are 1.0mm above the surface of the needle plate and lightly tighten screw.

Move feed dogs until the main feed dogs are level with the surface of needle plate. Set the differential feed dogs so that they are also level and tighten screws.

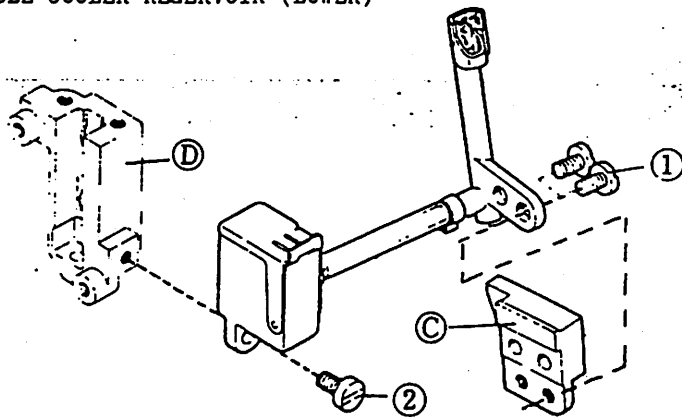
OIL PAN



(137)

Replace O-ring in oil pan A.
Replace machine bed on oil pan
and tighten the 4 screws.
Do not omit washers.

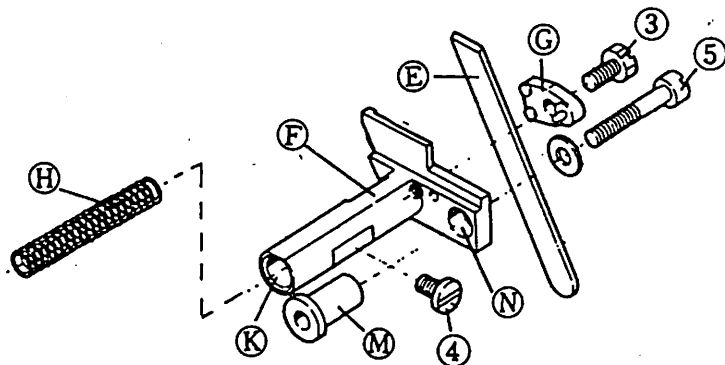
NEEDLE COOLER RESERVOIR (LOWER)



(138)

Move lower looper holder to its
extreme left position.
Replace needle cooling device
(complete) and attach it to
needle cooler bracket C (E32
needle guard bracket) and to
differential feed regulating
base D.
Tighten screws 1 and 2.
Check that it does not interfere
with needle.

LOWER KNIFE HOLDER

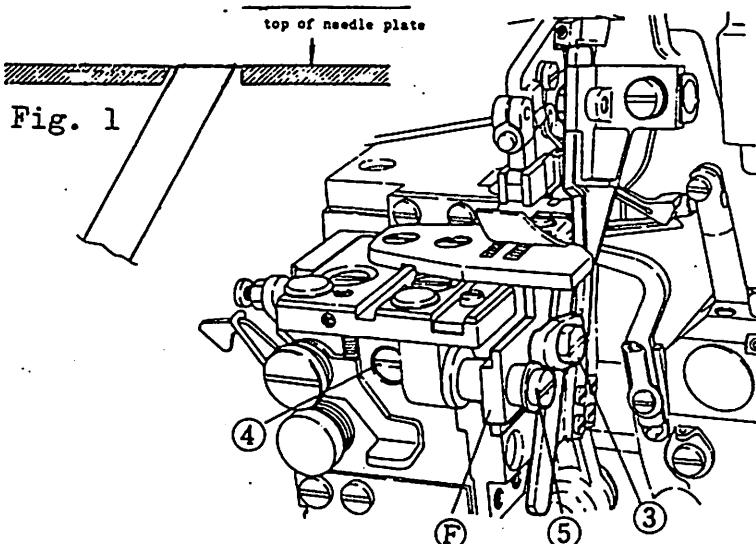


(139)

Replace lower knife E and lower
knife clamp G on lower knife
holder F and lightly tighten
screw 3.

(140)

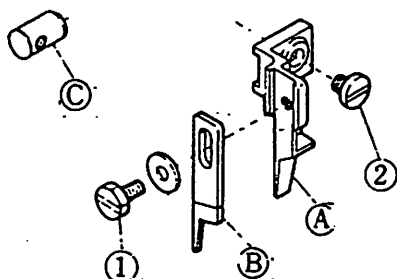
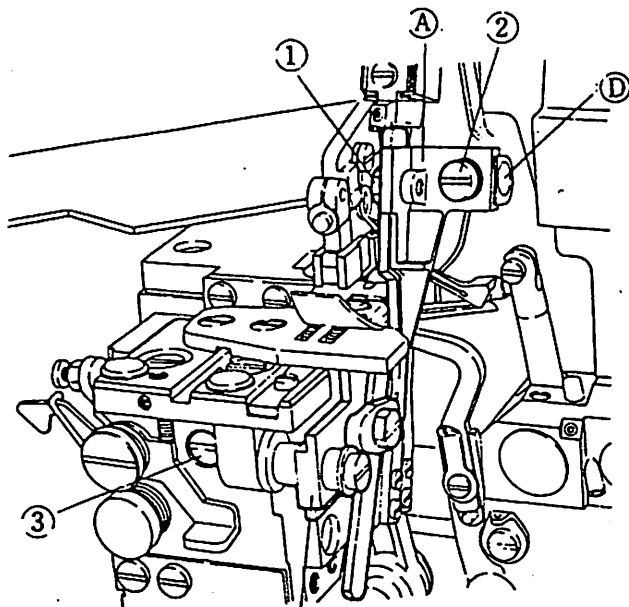
Replace spring H in hole K and
insert holder K into hole N.
Replace lower knife holder F in
bed and lightly tighten screw 4.
Replace screw 5 and washer.
Tighten 5 securely.



(141)

Set the lower knife so that
it is level with the
surface of needle plate and
tighten screw 3. (See Fig. 1).

UPPER KNIFE



(142)
Replace upper knife B and washer on upper knife clamp A and lightly tighten screw 1.

(143)
Insert pin C into the upper knife lever D from the left. Replace knife clamp A on lever D and lightly tighten screw 2.

(144)
Move upper knife lever D to its highest position. Move the knife clamp A left or right until the desired trim margin is obtained. Tighten screw 2. (See Fig. 1). Note: in the case of 2 needle machines and E32 machines, measure from the right needle.

Fig. 1

Fig. 2

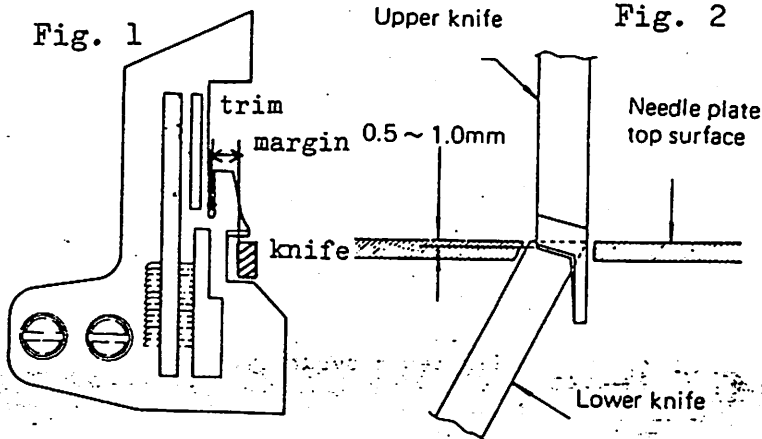
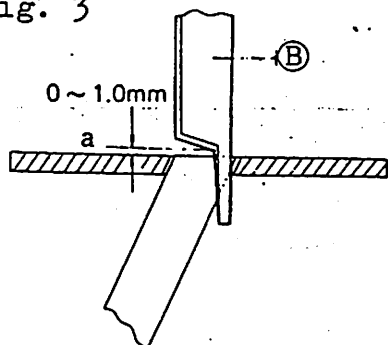


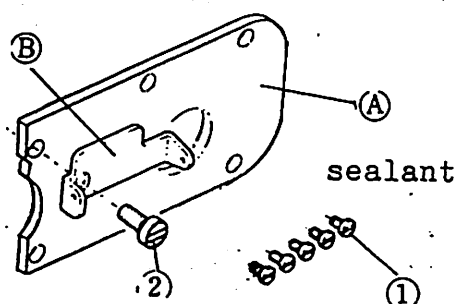
Fig. 3



(145)
Move upper knife lever D to its lowest position. Set the upper knife so that the front overlaps the lower knife by 0.5 - 1.0mm. Tighten screw 1. (See Fig. 2).

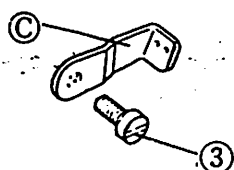
(146)
Move the upper knife lever D so that the distance 'a' is 0 - 0.1mm (See Fig. 3). Loosen screw 3 and with only the pressure of the spring pushing upper knife B against lower knife, tighten screw 3 again.

UPPER LOOPER HOLDER COVER

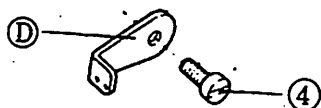


(147) - E32, E52 -
Replace the upper looper holder cover A together with center thread guide B on the front of the bed. Tighten the 5 screws 1. Set the thread guide as shown in Fig. 1 below and tighten screw 2.

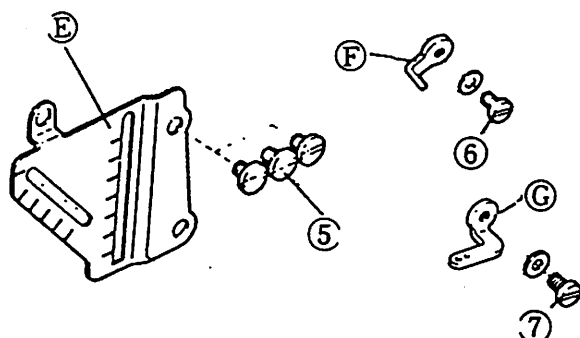
UPPER & LOWER LOOPER THREAD GUIDES



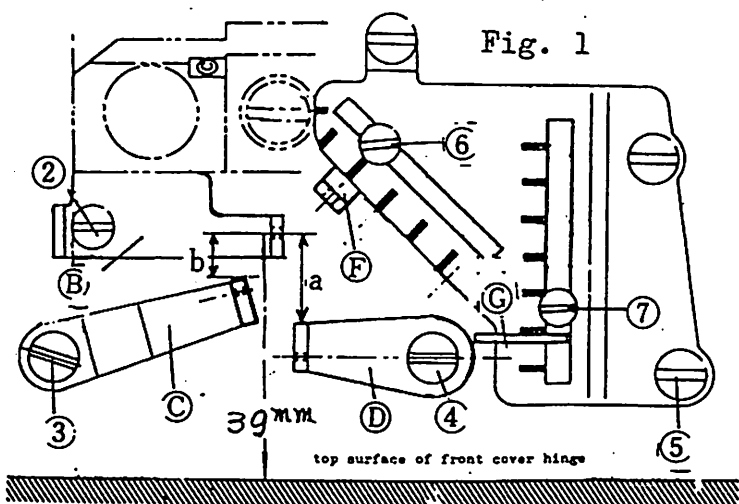
(148) - E32, E52 -
Turn handwheel and move lower looper to its extreme right position.
Replace lower looper thread takeup C on looper shaft. Set the distance 'b' to 6.0 - 7.0mm and tighten screw 3 (See Fig. 1).
For stitch type 512, 'b' = 10.0 - 11.0mm.



(149) - E32, E52 -
Turn handwheel and move lower looper to its extreme right position.
Replace upper looper thread takeup D on the looper shaft. Set the distance 'a' to 15.0 - 16.0mm and tighten screw 4 (See Fig. 1).

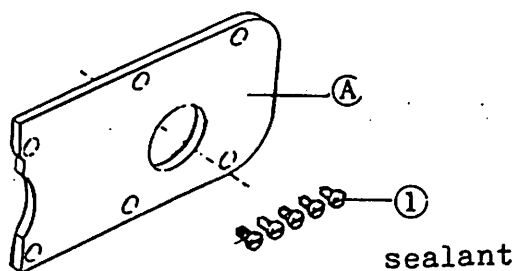


(150) - E32, E52 -
Replace the looper thread guide plate E on the front of bed and tighten the 3 screws 5.



(151) - E32, E52 -
Replace upper looper thread guide F and thread guide(right) G. Set them as shown in Fig. 1. Tighten screws 6 and 7.

UPPER LOOPER HOLDER COVER



(152) - E56 -

Replace the upper looper cover holder A on the front of bed and tighten the 6 screws 1.

UPPER & LOWER LOOPER THREAD GUIDES

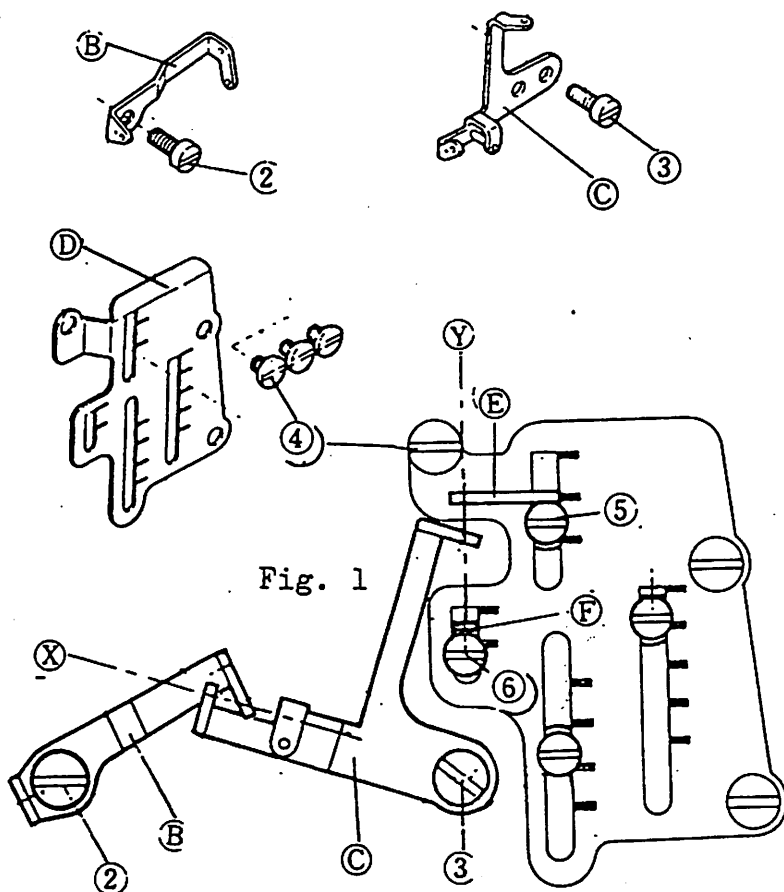


Fig. 1

(153) - E56 -

Replace lower looper thread takeup B on lower looper shaft and replace upper looper thread takeup C on upper looper shaft. Lightly tighten screws 2 and 3.

(154) - E56 -

Replace the looper thread guide plate D on the front of bed and tighten the 3 screws 4.

(155) - E56 -

Replace upper looper thread guide E and thread guide F. Set them as shown in Fig. 1. Tighten screws 5 and 6.

(156) - E56 -

Turn handwheel and move looper to its extreme left position. Set the upper looper thread takeup C and the lower looper thread takeup B so that the eyelets align (lines X and Y, Fig. 1). Tighten screws 2 and 3.

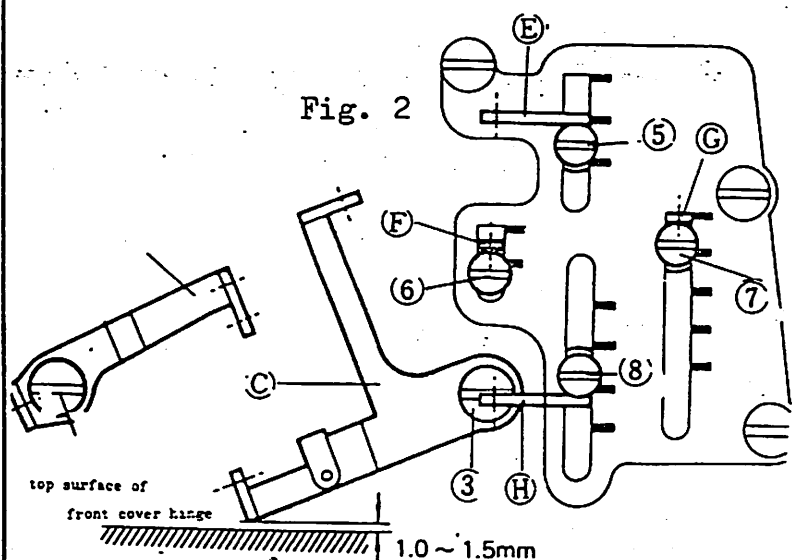
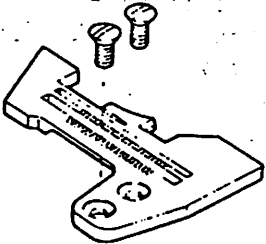
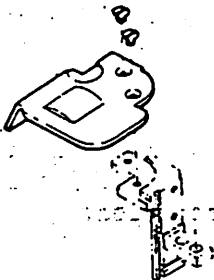
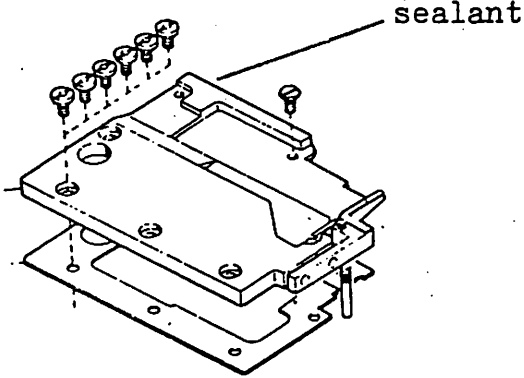
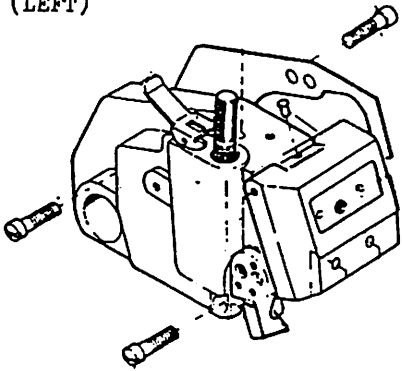
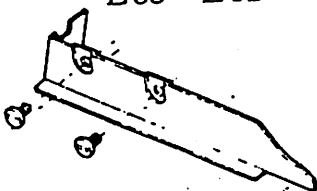
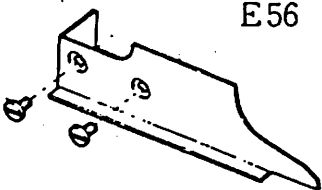


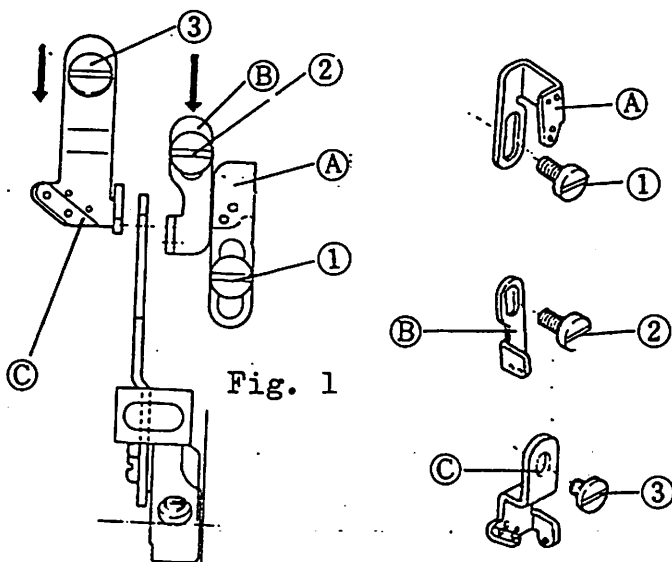
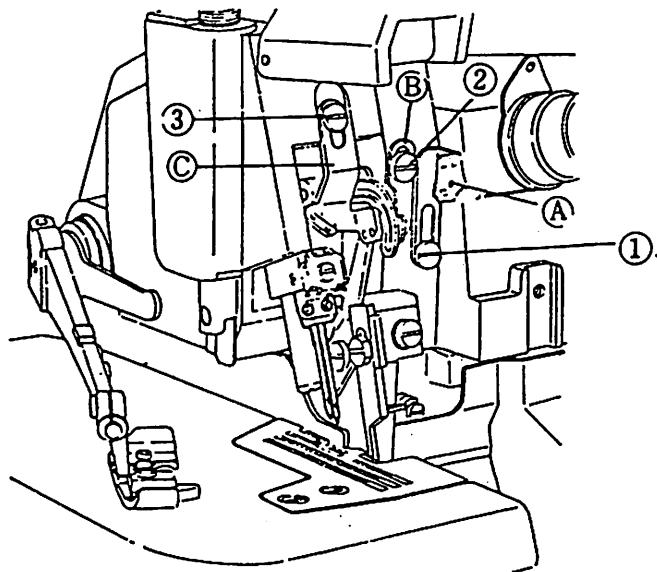
Fig. 2

(157) - E56 -

Check that there is a clearance of 1.0 - 1.5mm between upper looper thread takeup C and bed. Set the right thread guide G and the center thread guide H as shown (See Fig. 2). Tighten screws 7 and 8.

<p>NEEDLE PLATE</p> 	<p>(158) Remove needle plate.</p>
<p>FEED ECCENTRIC COVER</p> 	<p>(159) Replace feed eccentric cover on the left feed bar guide and tighten the 2 screws.</p>
<p>COVER PLATE</p> 	<p>(160) Replace cover plate and gasket. Tighten the 7 screws securely.</p>
<p>MACHINE ARM (LEFT)</p> 	<p>(161) - E32, E52 - Replace the complete machine arm (left) together with gasket and tighten the 3 screws securely.</p>
<p>FABRIC GUARD</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>E53 - E32</p>  </div> <div style="text-align: center;"> <p>E56</p>  </div> </div>	<p>(162) Replace the fabric guard and tighten the 2 screws securely.</p>

NEEDLE THREAD GUIDES

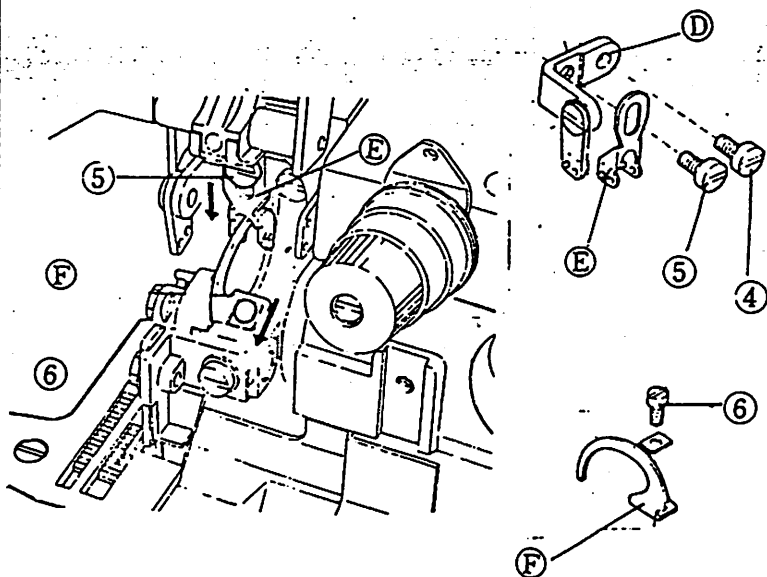


(163) - E32, E52 -
Replace needle thread guide right A on the front of the arm. Set it in the center of the long slot as shown in Fig. 1 and tighten screw 1.

(164) - E32, E52 -
Replace needle thread guide center B on the front of the arm. Set it in its lowest position and tighten screw 2 (See Fig. 1).
Note: for stitch types 503, 505 and 515, set it in its highest position.

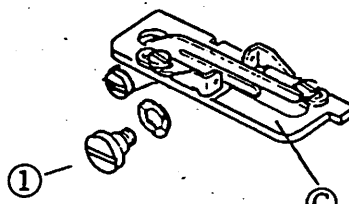
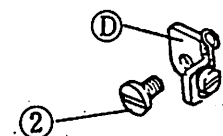
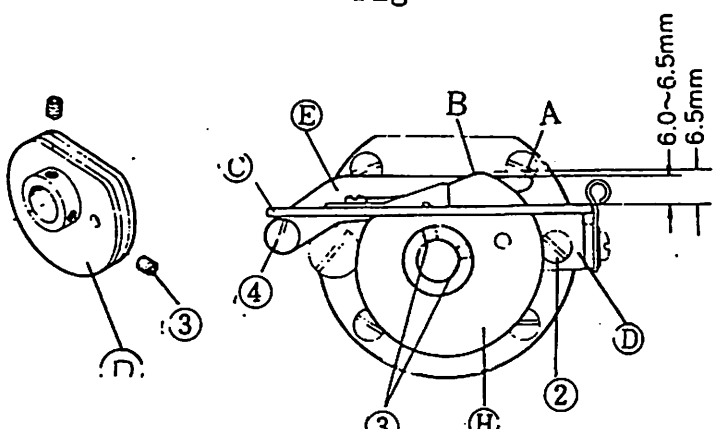
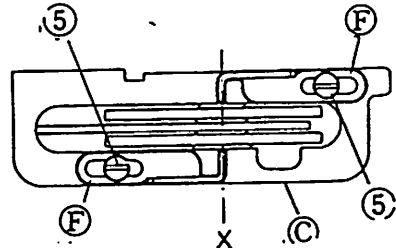
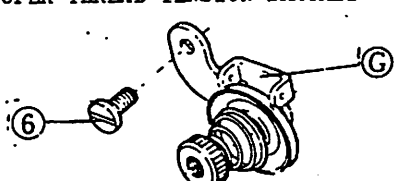
(165) - E32, E52 -
Replace the needle thread guide left C on the arm. Set it in its lowest position and tighten screw 3.
Note: for stitch types 503, 505 and 515, set it in its highest position.

NEEDLE THREAD GUIDES

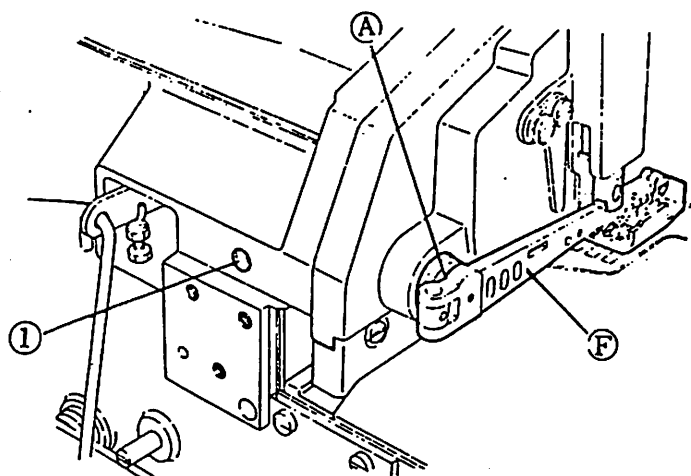


(166) - E56 -
Replace needle thread guide (complete) D on arm and tighten screw 4.
Set needle thread guide center to its lowest position and tighten screw 5.

(167) - E56 -
Replace needle thread takeup F on arm. Pull it fully forwards and tighten screw 6.
Note: for stitch length of 6 spi or less on stitch types 503 and 505 push it fully backwards.

<p>CHAINSTITCH LOOPER THREAD GUIDE BRACKET</p> 	<p>(168) - E32 - Replace the complete thread guide bracket C on the left of the bed. Set it so that it is horizontal. Tighten screw 1. Do not omit washer. See Fig. 1.</p>
<p>STOPPER</p> 	<p>(169) - E32 - Replace looper thread takeup stopper D and align it with thread guide bracket C. Tighten screw 2. See Fig. 1.</p>
<p>CHAINSTITCH LOOPER THREAD TAKEUP</p> <p>Fig. 1</p> 	<p>(170) - E32 - Push up the looper thread guide bracket C and replace the looper thread takeup H on the crankshaft extension. Locate it centrally under the takeup guide E. Tighten the 2 screws 3 so that when the needle is in its highest, part B is 6.5mm above the bracket C. See Fig. 1.</p>
<p>CHAINSTITCH LOOPER THREAD EYELETS</p> 	<p>(171) - E32 - Set the takeup guide E so that the surface A is 6.0 - 6.5mm above the bracket and tighten screw 4. See Fig. 1.</p> <p>(172) - E32 - Align the looper thread eyelets F as shown (line X). Tighten the 2 screws 5.</p>
<p>CHAINSTITCH LOOPER THREAD TENSION BRACKET</p> 	<p>(173) - E32 - Replace the complete bracket G on the left rear of the bed. Tighten screw 6.</p>

PRESSER ARM

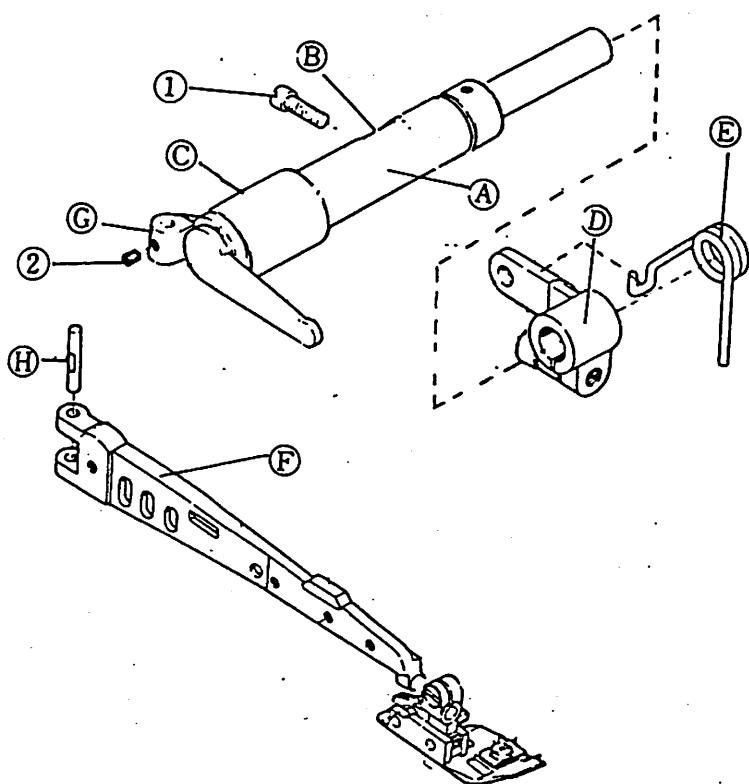


(174)

Insert the presser arm shaft (complete) A into the arm from the left so that the flat B aligns with the screw 1. (There is an aligning mark on the bushing at C). Replace the intermediate lever D and spring E on shaft.

(175)

Locate spring E under the intermediate lever D. Lightly tighten screw 1 onto flat B so that the presser arm shaft A protrudes about 8mm from the arm. (E56: 22mm)

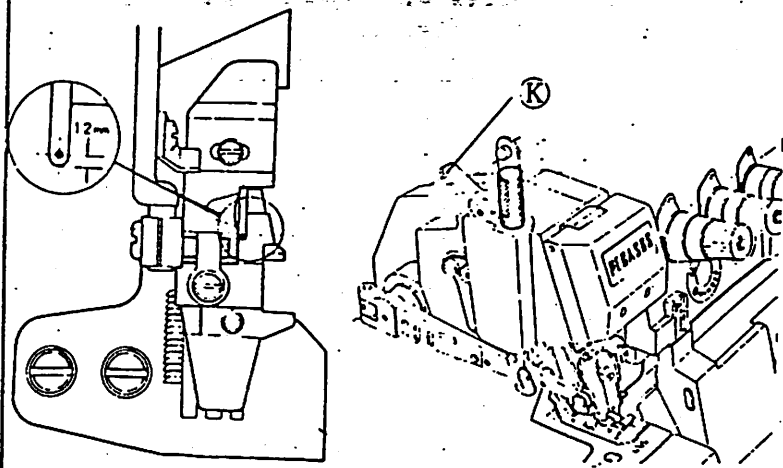


(176)

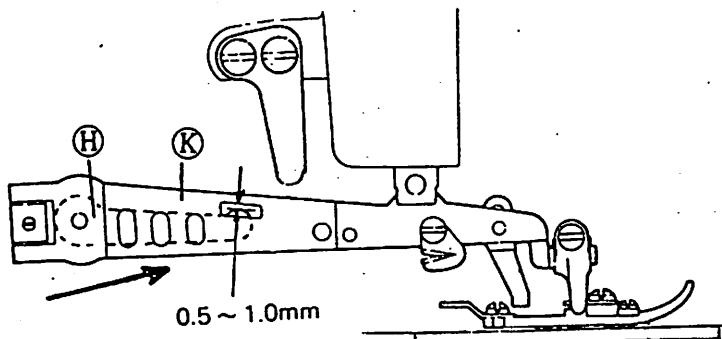
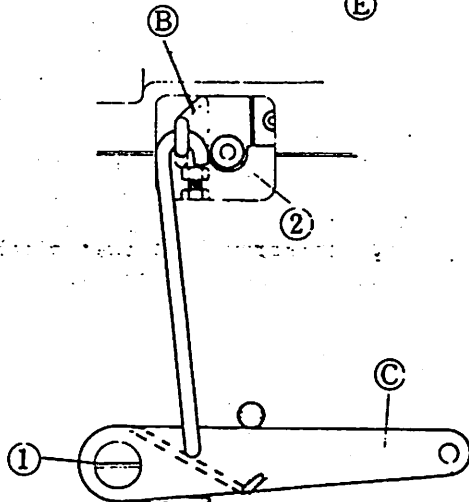
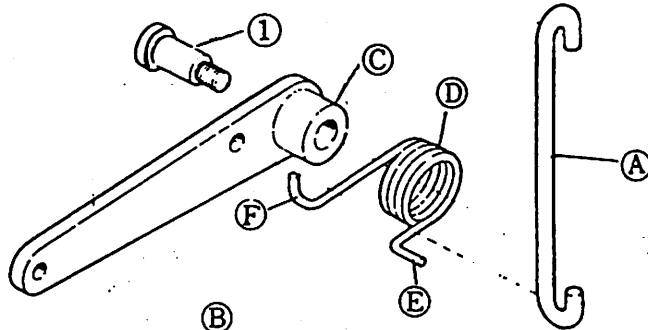
Replace presser arm (complete) F on hinge G. Insert pin H and tighten screw 2 onto the flat.

(177)

Lift lever K and swing presser arm F into place. Slightly loosen screw 1. Move shaft A left and right and set it so that the needle is centered in the presser foot. Tighten screw 1. Check that the lever K can move up and down smoothly and that the presser foot is parallel to the needle plate. Note: see sect 210 for presser foot adjustment.



FOOT LIFT LEVER



(178)

Connect the foot lift lever C and the intermediate lever B with the link A. Place spring D on foot lift lever C. Insert part E into bed and replace foot lift lever on bed. Tighten screw 1.

(179)

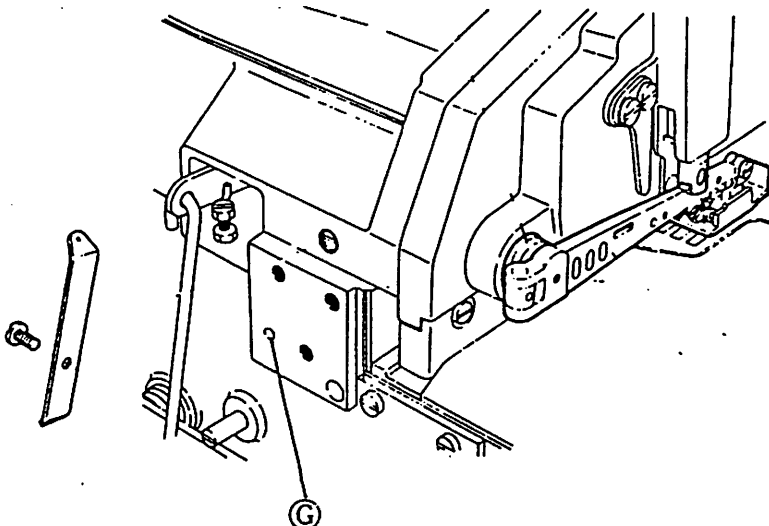
Turn handwheel and move feed dogs to their lowest position. Set the distance between foot lift shaft H and presser arm K to 0.5 - 1.0mm as shown.

Tighten screw 2.

Note: this adjustment can be made easily by inserting a screwdriver behind the presser arm K (See arrow).

Note: see section 210 for presser foot lift adjustment.

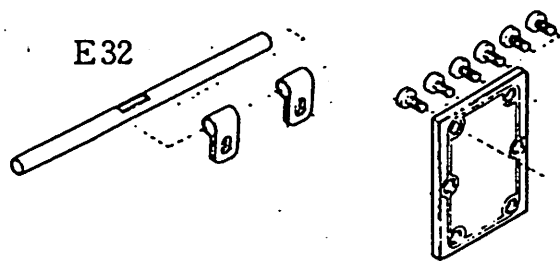
CHAINSTITCH LOOPER THREAD GUIDE



(180) - E32 -

Replace the rear chainstitch looper thread guide on the back of the bed at G. Tighten screw.

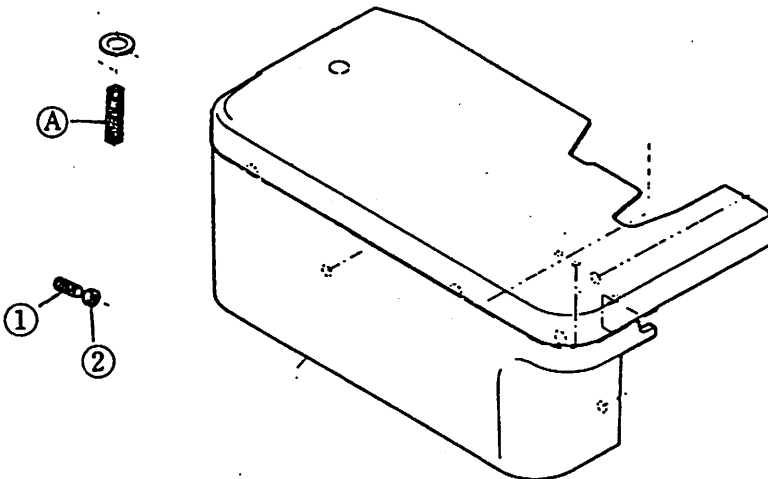
COVER PLATE



(181)

Replace the feed adjustment cover plate on the back of bed and tighten the 6 screws.
Note: E32, replace the chainstitch thread tube on the center of cover.

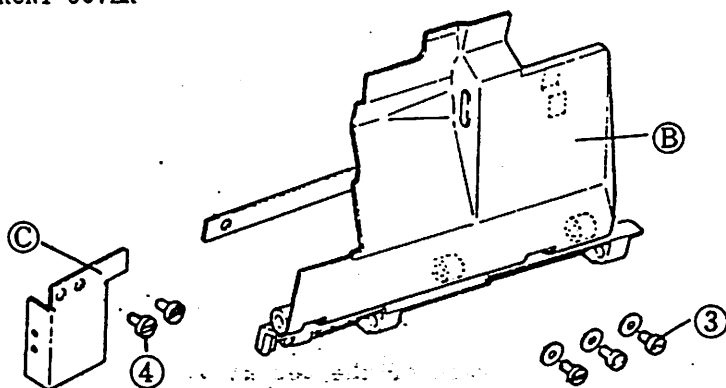
CLOTH PLATE



(182)

Replace the spring A and washer in the hole at the left rear of bed. Replace the cloth plate and side cover (complete). Tighten screw 1 so that cloth plate can move smoothly. Tighten nut 2.

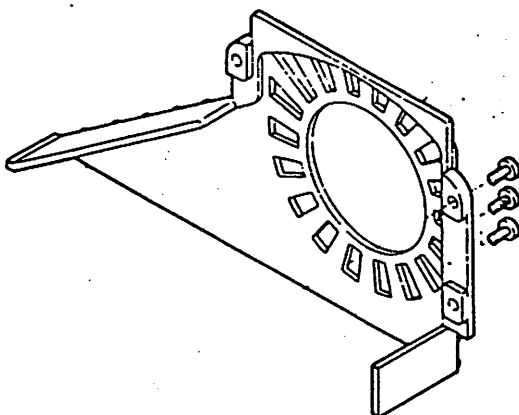
FRONT COVER



(183)

Replace the front cover B and gasket on the front of bed and tighten the 3 screws 3. Replace the front cover guide C and tighten the 2 screws 4. Check that front cover B can slide behind the spring on guide C.

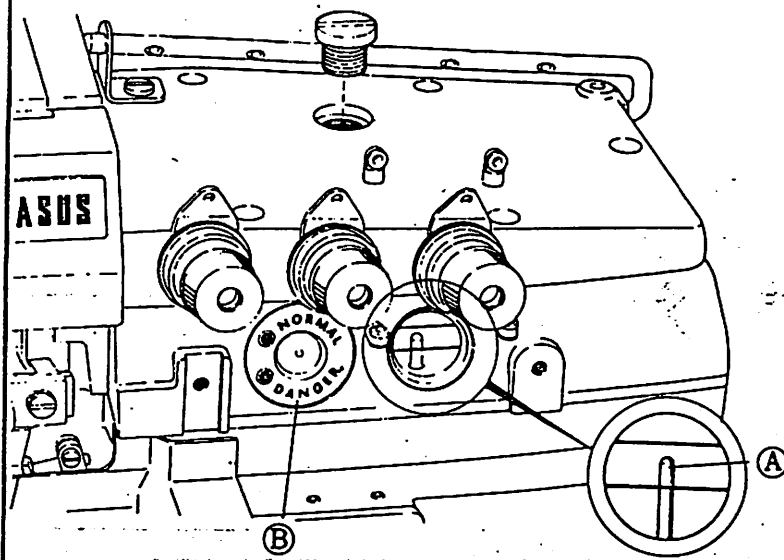
BELT COVER



(184)

Replace belt cover on the right of bed and tighten the 3 screws.

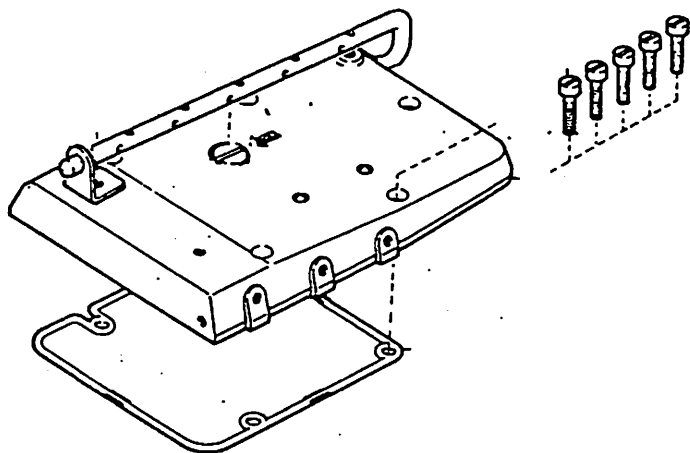
REPLACING OIL



(185)

Fill with oil. (Check the level in the oil level gauge A).
Note: when the machine is running and functioning correctly, then the oil monitor B is green.
If it remains red, then please check the oil level or oil filter.

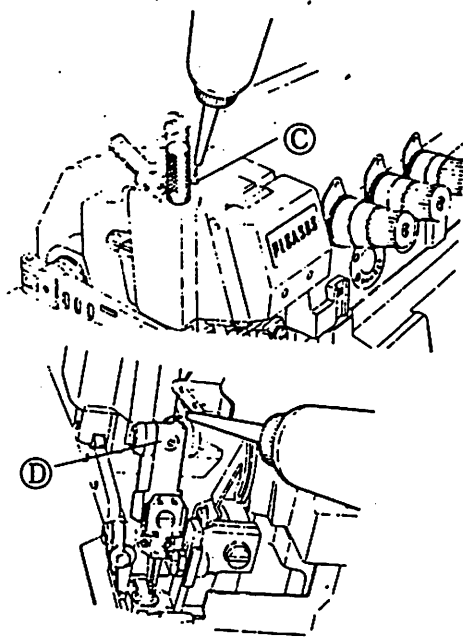
TOP COVER



(186)

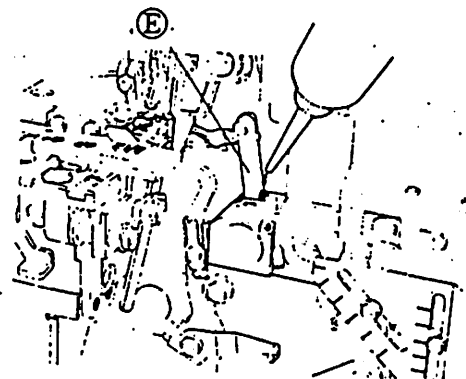
Replace the top cover and tighten the 6 screws.

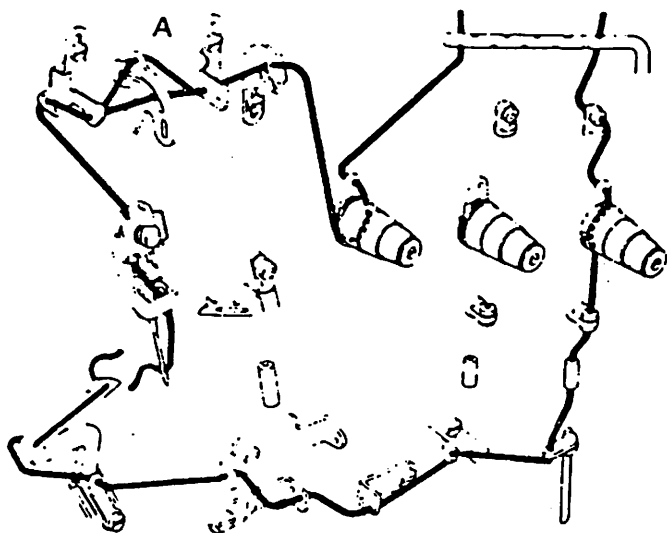
LUBRICATION



(187)

Lubricate the oil hole C, the needle holder guide D and the upper looper holder E before running the machine.

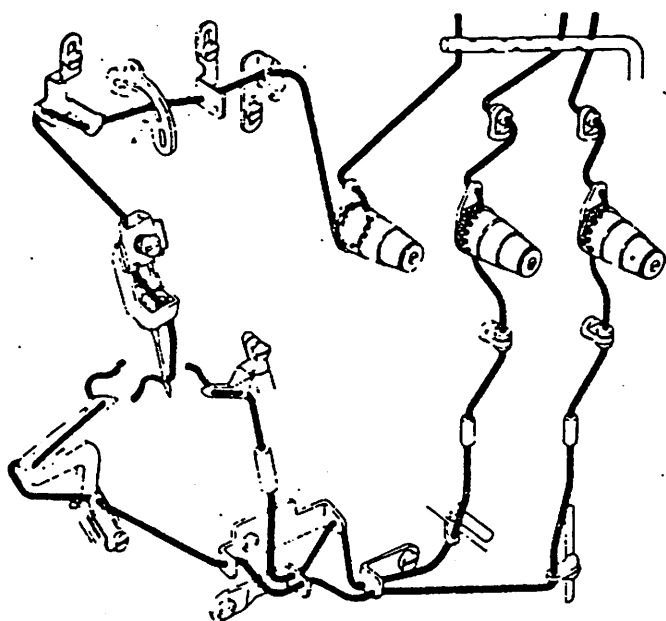
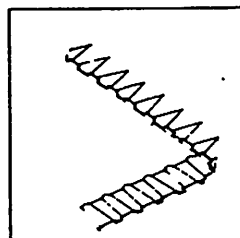




(188) - E52 -
1-needle 2-thread

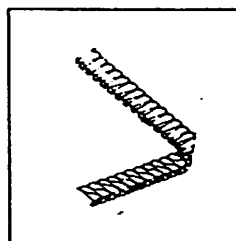
In the case of stretch threads or non-stretch threads when the stitch length is longer than 2.8mm, pass the needle thread through hole A as shown.

503

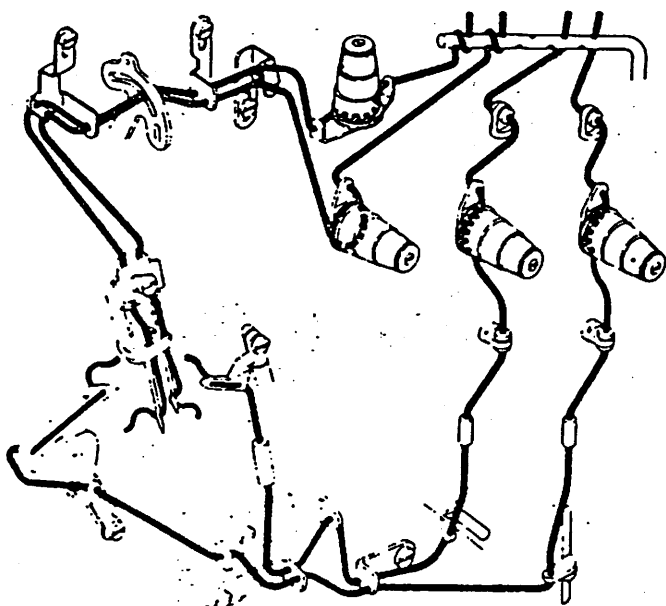
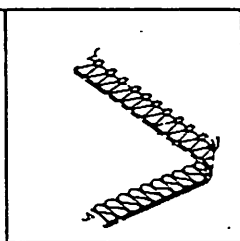


(189) - E52 -
1-needle 3-thread

504

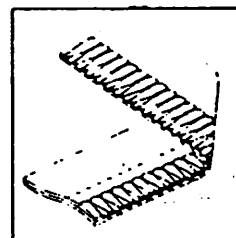


505

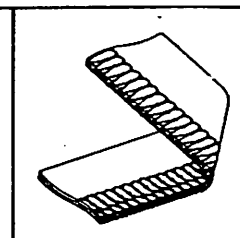


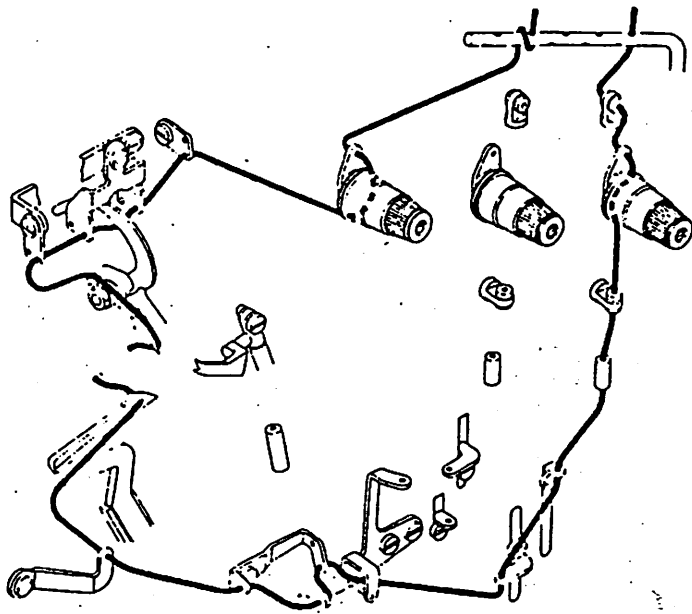
(190) - E52 -
2-needle 4-thread

512



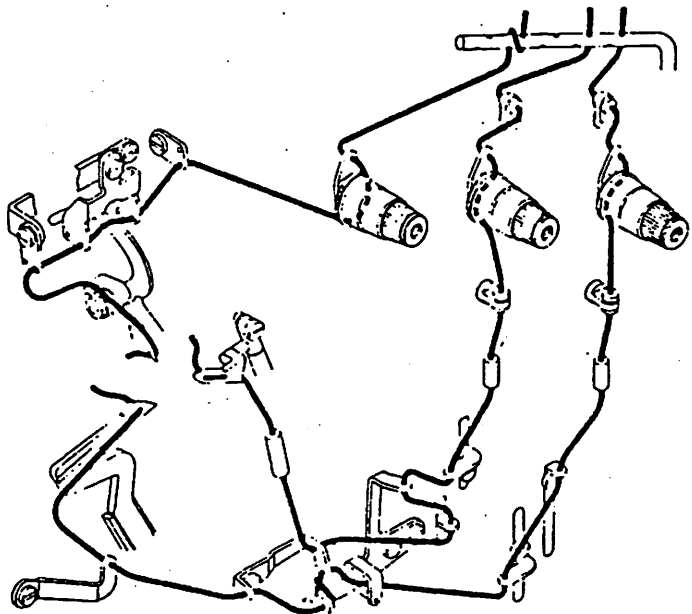
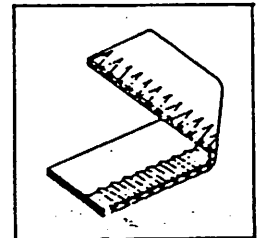
514





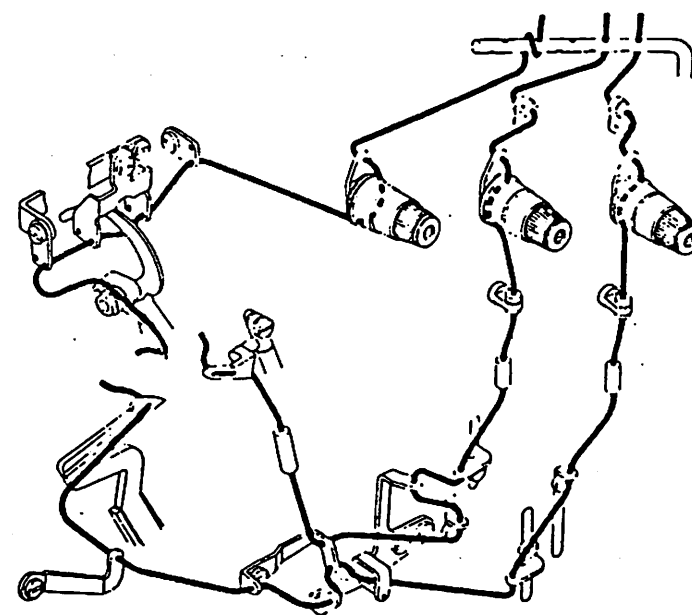
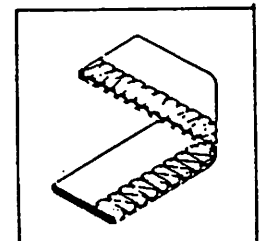
(191) - E56 -
1-needle 2-thread

503



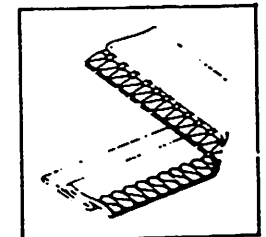
(192) - E56 -
1-needle 3-thread
(plain seaming)

504

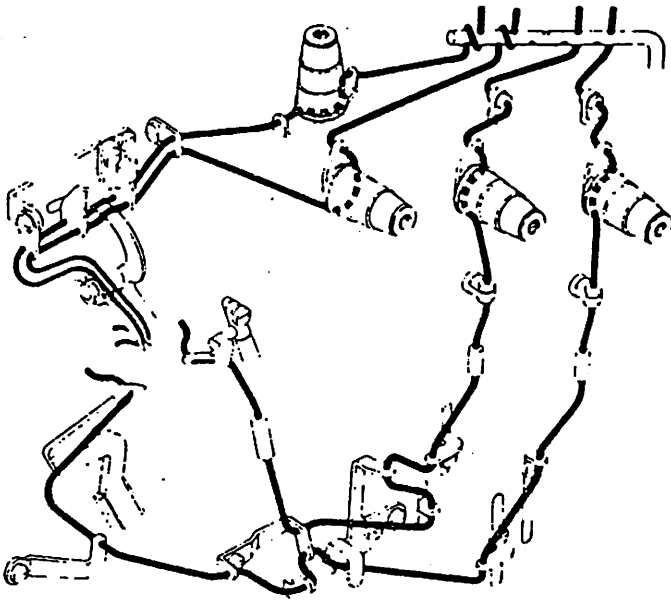


(193) - E56 -
1-needle 3-thread
(blindstitch hemming)

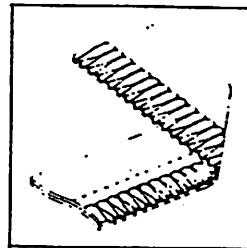
505



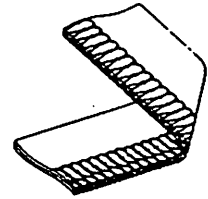
(194) - E56 -
2-needle 4-thread



512

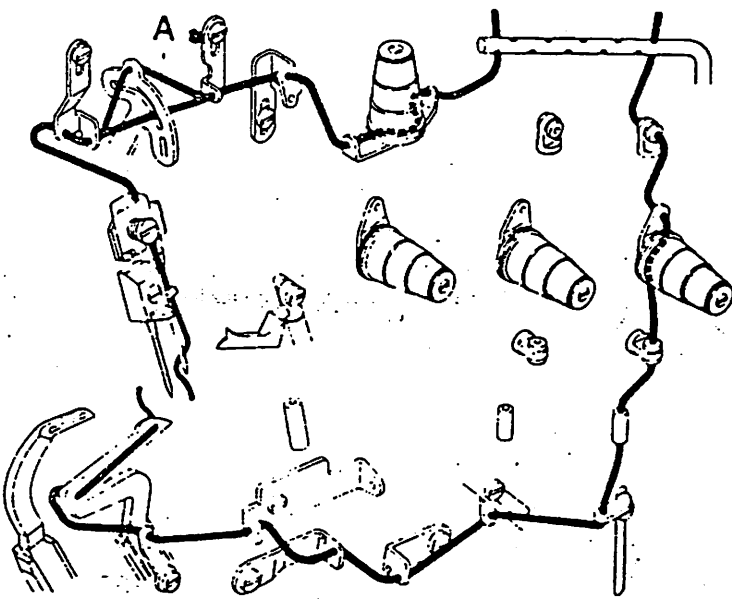


514

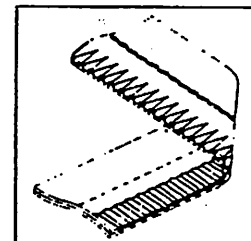


(195) - E32 -

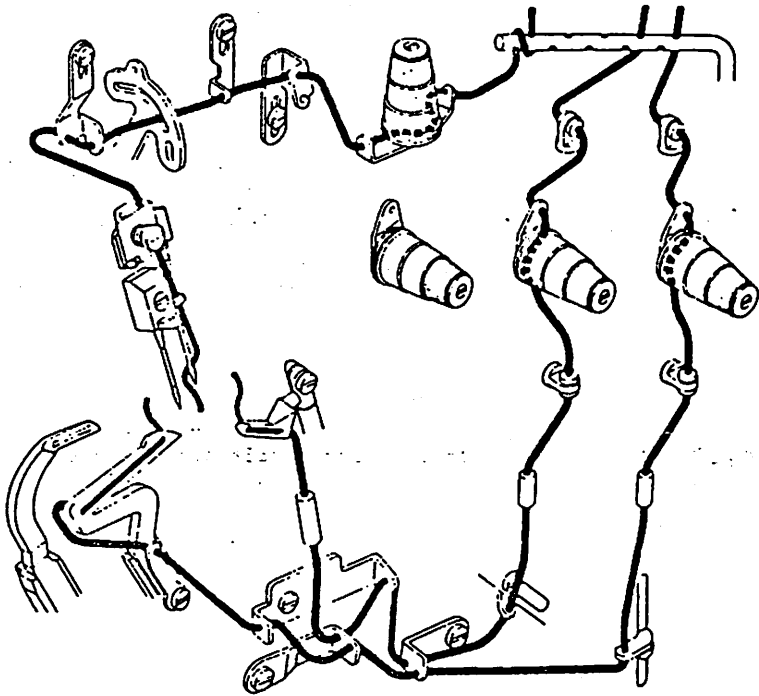
In the case of stretch threads or non-stretch threads when the stitch length is longer than 2.8mm, pass the needle thread through hole A as shown.



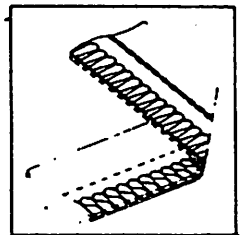
515



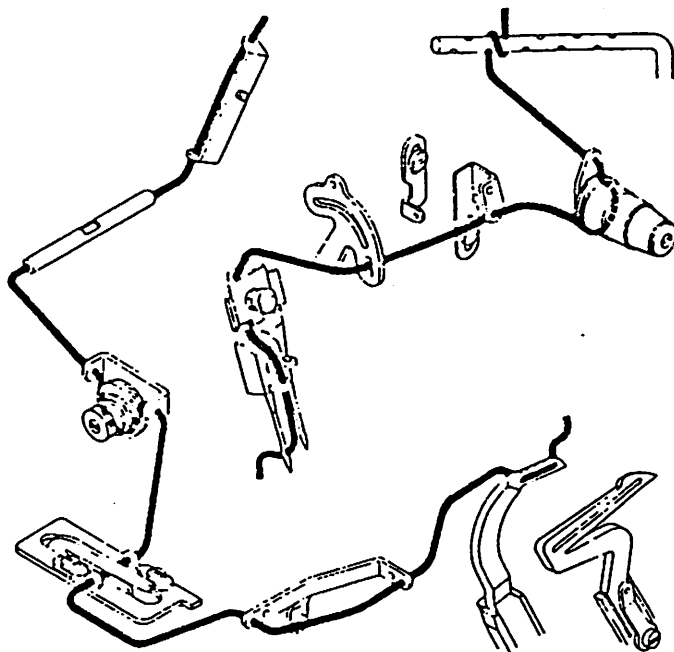
(196) - E32 -



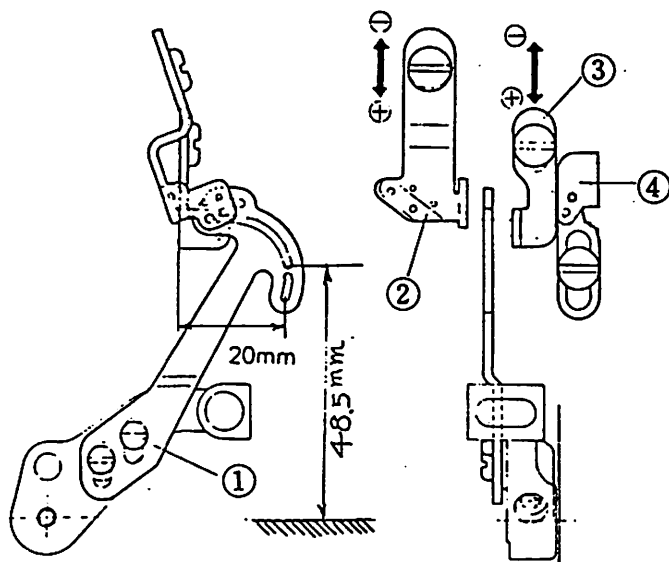
516



(197) - E32 -
Double chainstitch thread



NEEDLE THREAD CONTROL



(lower looper in extreme left position)

198. (E52)

Needle Thread Guides 2, 3
Setting of these guides vary depending on stitch type.
Stitch Types 504, 512, 514:
Set guides in their lowest position, '+' direction.

Note: if polyester thread is used for both needle and looper threads when sewing thin fabric, then set guides in their highest position. If they are set in their lowest position, stitch formation will vary depending on machine speed.

Stitch Types 503, 505:

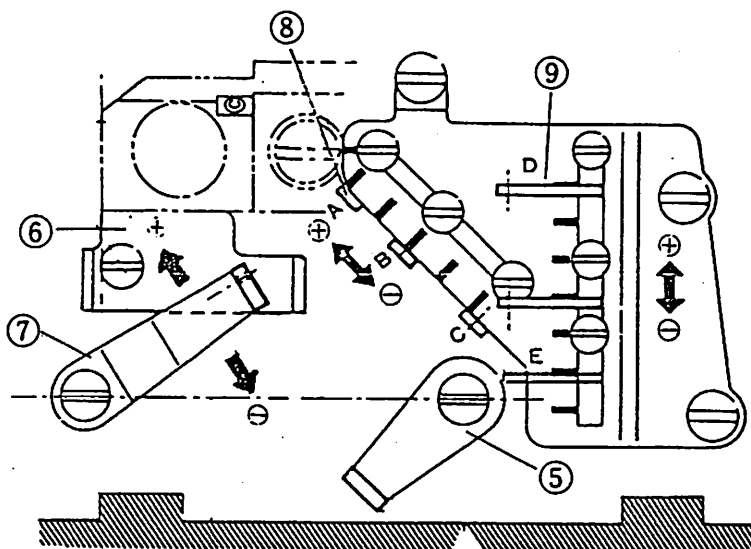
Set guides in their highest position, '-' direction.

Note: move guides 2, 3 in the '+' direction for a tighter needle thread, and in the '-' direction for a looser needle thread in seam.

Needle Thread Guide Right 4

Set guide in the center of screw slot.

LOOPER THREAD CONTROL



(lower looper in extreme right position)

199. (E52)

Upper Looper Thread Guide 8
Setting of this guide varies depending on stitch type and thread.
Stitch Types 504, 505, 514 and 503 (serging, stitch length more than 2.8mm):

Set guide to B.

Stitch Types 512, 503 (blindstitch hemming) and 503 (serging, stitch length less than 2.8mm):

Set guide to C.

Note: when using stretch threads such as wooly threads, set guide to A for all stitch types.

Lower Looper Thread Takeup 7

Note: when using wooly threads (G-type) and seam requires more thread in it then set takeup 2mm more in the '+' direction than standard for all stitch types.

Lower Looper Thread Guide 9

Setting of this guide varies depending on stitch type and thread.
Stitch Type 504, 505, 512, 514:

Set guide to E.

Stitch Type 503:

Set guide to D.

Note: when using stretch threads such as wooly threads, set guide to D for all stitch types.

Move takeup 7 and guides 8 and 9 in the '+' direction for more thread in seam and in the '-' direction for less.

NEEDLE THREAD CONTROL

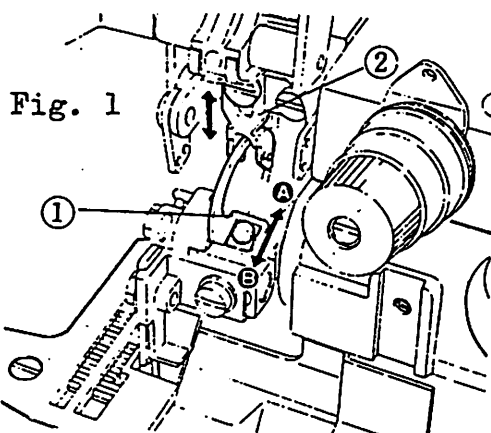


Fig. 1

200. (E56)

Needle Thread Takeup, Needle Thread Guide (Fig. 1)

1. Refer to Table 8 and set needle thread takeup 1 correctly.
2. The standard setting for needle thread guide 2 is in its lowest position.

Table 8

Stitch Type	Threads	Application	Stitch Length	Position of Takeup 1
504. 512.514	3 4	Seaming	minimum - maximum	Ⓑ
503 505	2 3	Blindstitch Hemming	3.8mm and less(7 S P 1 and more) 4.3mm and more(6 S P 1 and less)	Ⓑ Ⓐ
503	2	Serging	3.8mm and less(7 S P 1 and more) 4.3mm and more(6 S P 1 and less)	Ⓑ Ⓐ

LOOPER THREAD CONTROL

Fig. 2

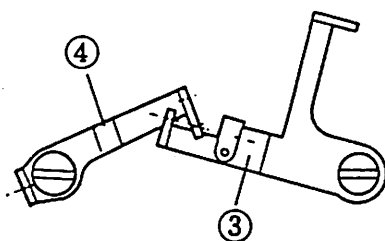
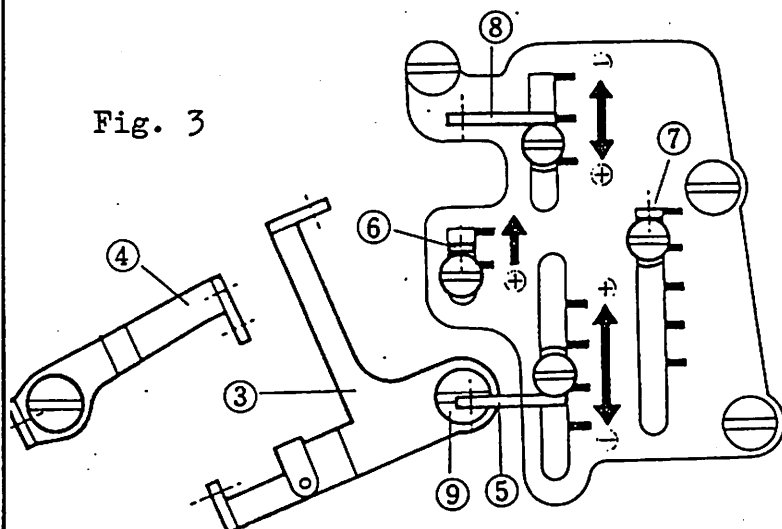


Fig. 3

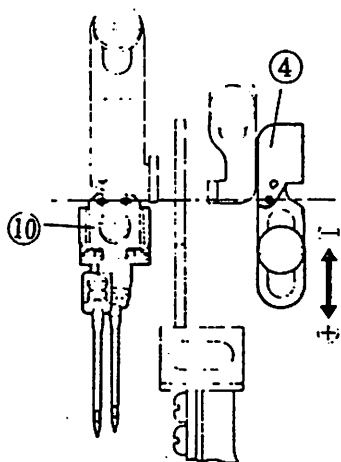
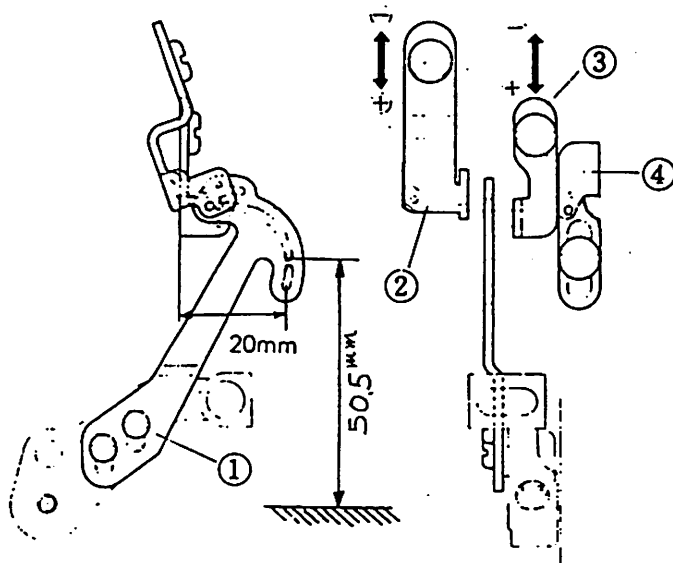


201. (E56)

Looper Thread Takeup, Thread Guide (Figs. 2, 3)

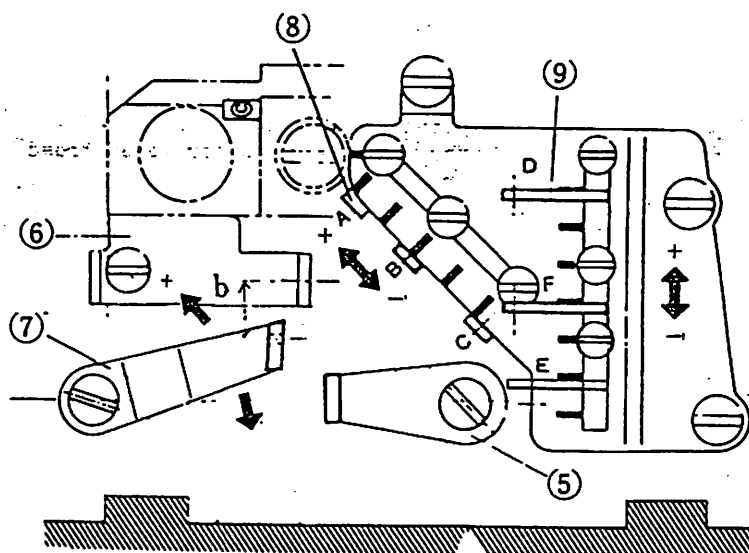
1. Set upper surface of thread guide 5 level with center of screw 9.
 2. Set thread guide 6 midway between the two lines.
Set thread guide 7 at top of slot.
 3. Set thread guide 8 in middle of slot.
 4. Settings of thread guides vary slightly depending on operation, threads, stitch type etc.
- o Move thread guides in the '+' direction for more thread and in the '-' direction for less thread in the seam. .

NEEDLE THREAD CONTROL



(lower looper in extreme left position)

LOOPER THREAD CONTROL



(lower looper in extreme right position)

202. (E32)

Needle Thread Guides 2, 3

Settings of these guides vary slightly depending on stitch type. Stitch Type 516:

Set then in the center of slot.

However, in the case of E32-450,451 machines set them in their highest position.

Note 1: if polyester threads are used for both needle and looper threads to sew thin fabric, then set both needle thread guides 2 and 3 in their highest positions. ('-' direction). If they are set in the '+' direction then stitch formation will be uneven.

Note 2: move guides 2 and 3 in the '+' direction for a tighter needle thread and in the '-' direction for a looser needle thread in seam.

Needle Thread Guide 4

Set thread guide so that its eyelet and the eyelet of thread retainer 10 are level when needle is in its highest position.

203. (E32)

Lower Looper Thread Takeup 7

In the case of E32-450,451 machines set 'b' to 4 - 5mm.

Note: when using wooly threads (G-type) and seam requires more thread, then set takeup 2mm more in the '+' direction than standard.

Upper Looper Thread Guide 8

Setting varies depending on thread and stitch type.

Stitch Type 515 (stitch length less than 2.8mm):

Set guide to C.

Stitch Type 515 (stitch length more than 2.8mm) and 516:

Set guide to B.

Note 1: in the case of E32-450,451 machines set guide to B regardless of stitch type.

Note 2: when using stretch threads such as wooly threads, set guide to A regardless of stitch type.

Lower Looper Thread Guide 9

Setting varies depending on thread and stitch type.

Stitch Type 515:

Set guide to D.

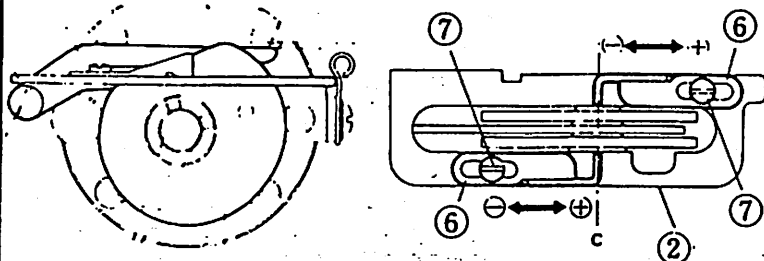
Stitch Type 516:

Set guide to E.

Note 1: when using stitch type 516 on E32-450,451 machines, set guide to F.

Note 2: when using stretch threads such as wooly threads, set guide to D regardless of machine or stitch type.

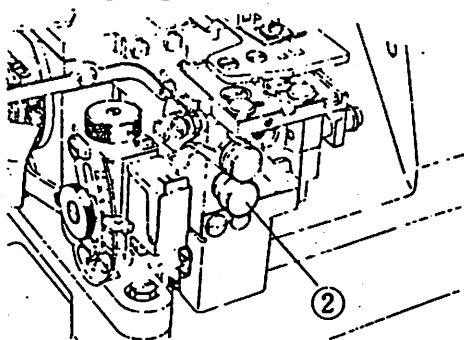
CHAINSTITCH LOOPER THREAD CONTROL



204. (E32)

- o Adjustment of double chainstitch looper thread depends on sewing conditions such as type of thread, stitch length etc. This adjustment is made by moving the thread guides 6.
- o Move thread guides 6 in the '+' direction for more thread in seam and in the '-' direction for less.

STITCH LENGTH ADJUSTMENT



Pulley Setting and main Feed Dog movement Table 4

max. diff. feed ratio	Pulley Setting						
	1	2	3	4	5	6	7
1:2	1mm	1.5mm	2mm	2.5mm	3mm	3.5mm	3.8mm
1:3	0.7mm	1mm	1.4mm	1.7mm	2mm	2.3mm	2.5mm
1:1.3	1.6mm	2.3mm	3.1mm	3.9mm	4.7mm	5.4mm	5.9mm
1:4	0.6mm	0.9mm	2.2mm	1.5mm	1.8mm	2.1mm	—

205.

Adjustment

1. Press in pushbutton 2 and turn pulley until it engages.
 2. With the pushbutton still pressed in, turn the pulley until desired stitch length is obtained.
- o Table 4 shows the relationship between pulley scale setting and the amount of movement of main feed dogs.
 - o This relationship varies depending on type of cloth, diff. feed ratio etc. Adjust stitch length according to your sewing conditions.

DIFFERENTIAL FEED RATIO ADJUSTMENT

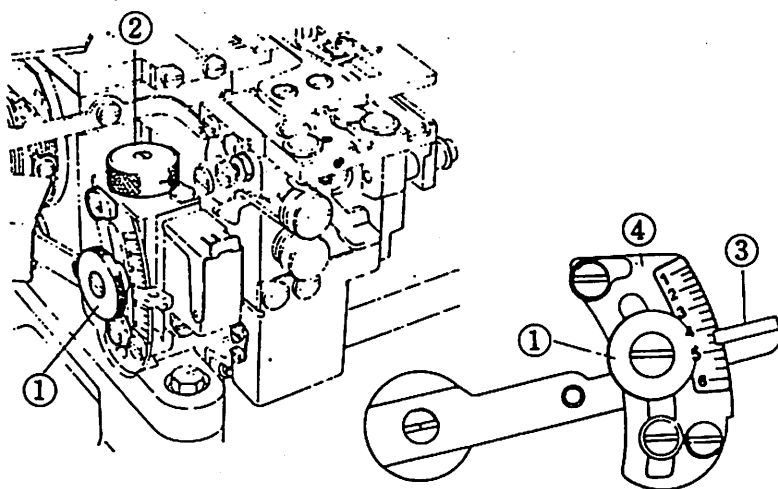


Table 5

Lever Setting		1	2	3	4	5	6
Diff. Feed Ratio	1:1.3	—	1:0.7	1:0.9	1:1.1	1:1.3	—
	1:2	1:0.7	1:1	1:1.4	1:1.7	1:2	—
	1:3	1:1	1:1.5	1:2	1:2.5	1:3	—
	1:4	1:1.1	1:1.6	1:2.3	1:2.8	1:3.3	1:4

206.

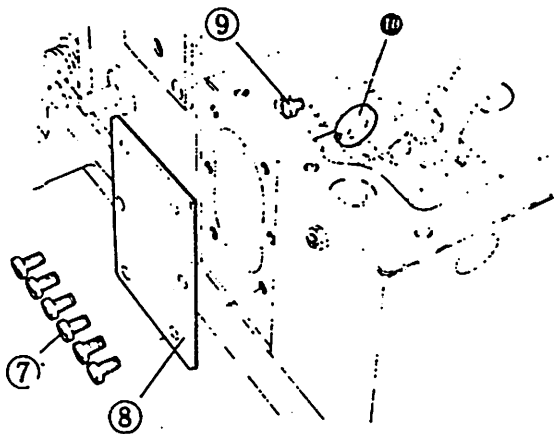
The differential feed ratio is the ratio between the amount of main feed dog movement and the amount of diff. feed dog movement. When the amount of diff. feed dog movement is greater than the amount of main feed dog movement, then the fabric is cramped (positive diff. feed). When the amount is less than the fabric is stretched (negative diff. feed). Set the correct diff. feed ratio depending on the operation and fabric.

Adjustment

1. Open cloth plate and loosen nut 1.
2. Turn screw 2 anti-clockwise for a bigger diff. feed ratio (fabric cramped) and turn it clockwise for a smaller diff. feed ratio (fabric stretched).
3. Tighten nut 1.

- o Table 5 shows the relationship between diff. feed ratio and setting of lever 3.

FEED DOG TILT



207.

The standard setting of the feed dog tilt is such that the teeth of all the feeds are level when they first appear above the top surface of the needle plate.

- o However, in the case of extremely elastic materials the feed dogs should tilt backwards, and in the case of materials where puckering or ply shift is a problem, they should tilt forwards.

Adjustment

1. Remove screws 7 and take off cover plate 8.
 2. Loosen screw 9.
 3. Turn pulley and move feed dogs to their rearmost position.
 4. Turn screw 10 and tighten screw 9 so that feed bars have desired tilt.
- o When this adjustment is made it is essential to re-adjust feed dog height.
 - o When making this adjustment, be sure to push screw 10 and tighten screw 9 so that there is no side-play in the feed bars.

AUXILIARY FEED DOG HEIGHT

Fig. 1

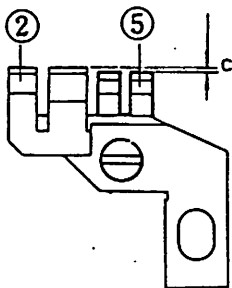
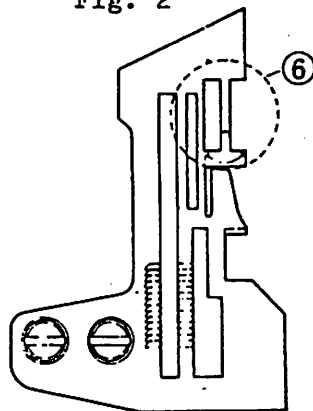


Fig. 2



208. (E52, E56)

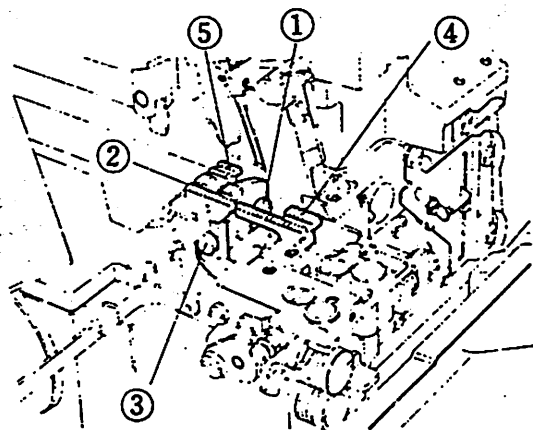
1. The height of the auxiliary feed dogs depends on whether or not there is a chaining land.
 2. The chaining land is the thread chain guide 6 which faces the chaining-off finger on the needle plate. (See Fig. 2).
- o When a chaining land is present, then the top of the auxiliary feed dogs should be 0.3mm below main feed dogs - (Fig. 1, 'c')
 - o When there is no chaining land then they should be 0.8mm below main feed dogs (i.e. 'c'=0.8mm).

209. (E32)

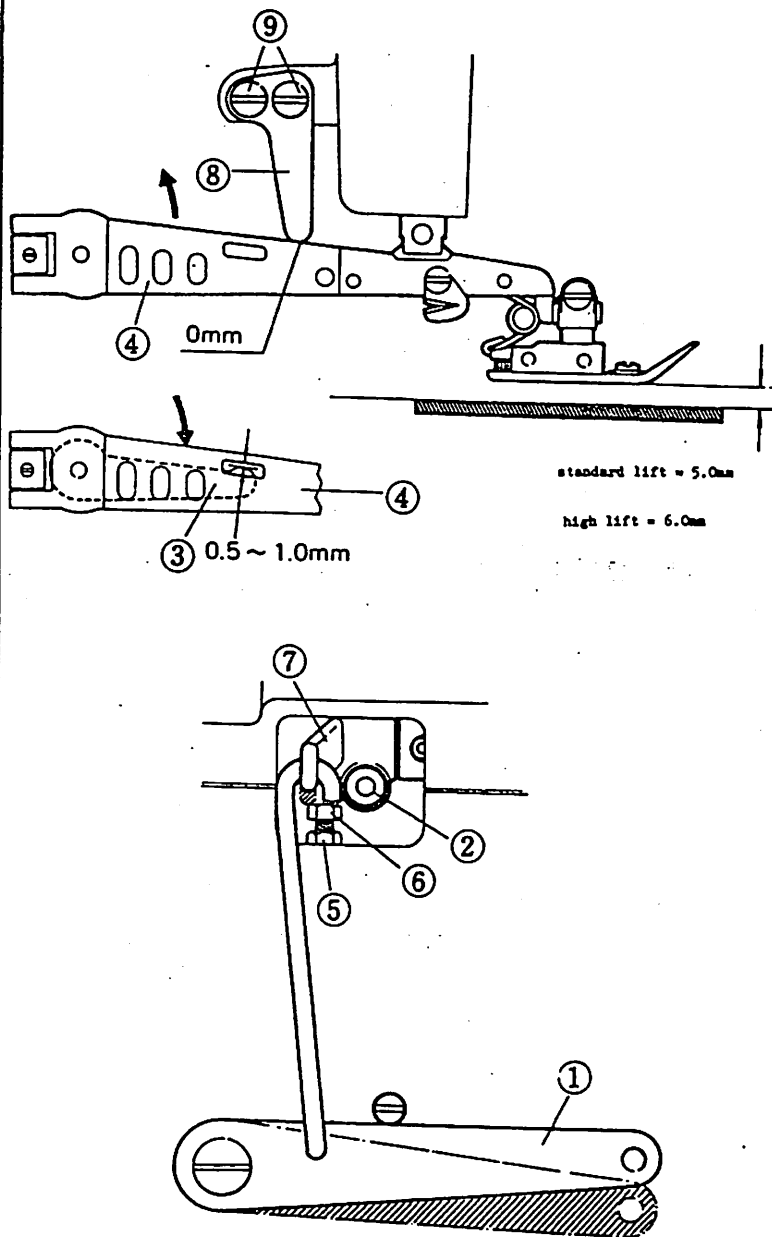
1. The auxiliary feed dog height depends on machine type. Refer to Table 6 and Fig. 1 and set them correctly.

Table 6

model	Auxiliary Feed Dog Height
E 32-420	0.3mm
E 32-430	
E 32-440	0.5mm
E 32-450	
E 32-451	



PRESSER FOOT LIFT ADJUSTMENT



210.

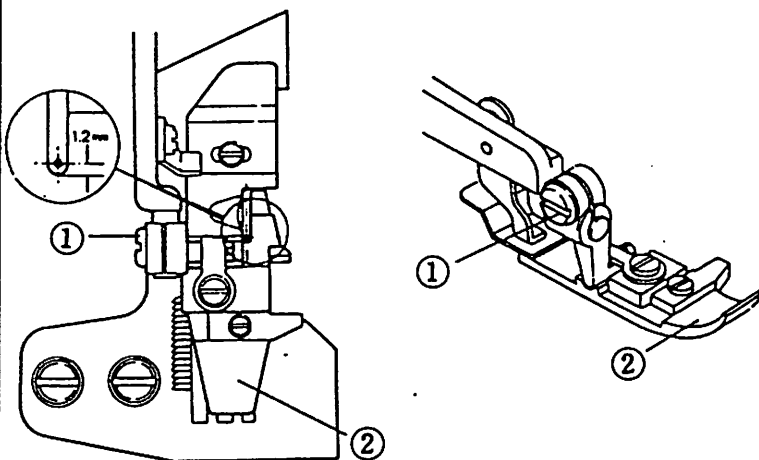
The presser foot lift is the distance from the top of the needle plate to the bottom of the presser foot. Standard lift is 5.0mm and high lift is 6.0mm.

This setting is obtained by adjusting the distance which foot lift lever 1 can move.

Adjustment

1. Turn pulley and move feed dogs to their lowest position.
2. Loosen clamp screw 2.
3. Set the clearance between foot lift shaft 3 and presser arm to 0.5 - 1.0mm. Tighten screw 2.
4. Loosen nut 5 and lower stopper 6.
5. Push down foot lift lever 1 until distance between top of needle plate and bottom of presser foot is correct. In this position, set stopper 6 so that it touches intermediate lever 7 and then tighten nut 5.
6. Lift presser foot the correct amount, move stopper 8 so that it lightly touches the top of presser arm 4 and tighten screw 9.

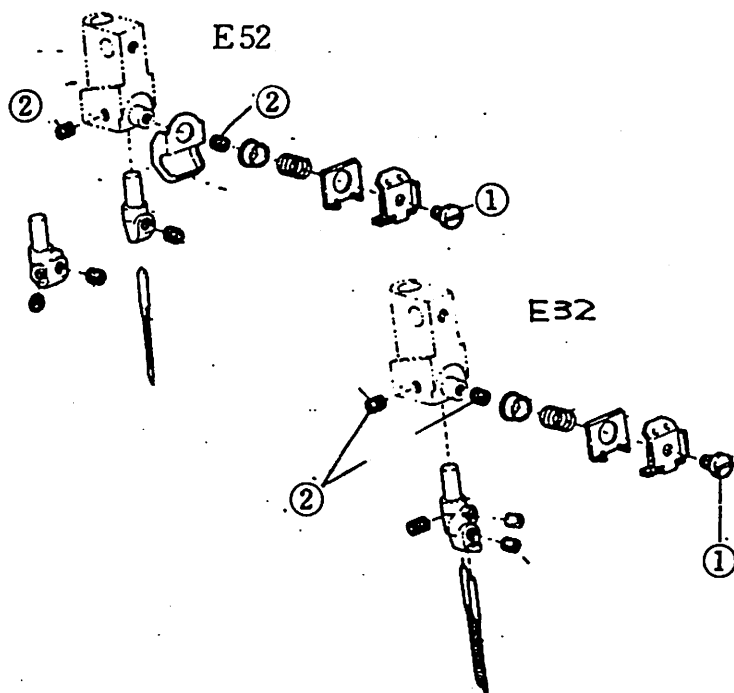
PRESSER FOOT ALIGNMENT



211.

1. Loosen presser foot pressure adjusting screw.
2. Move presser foot 2 until presser foot needle hole and needle plate needle hole are aligned.
3. Press presser foot down firmly onto needle plate and tighten screw 1.
4. Tighten presser foot pressure adjusting screw and obtain correct presser foot pressure.

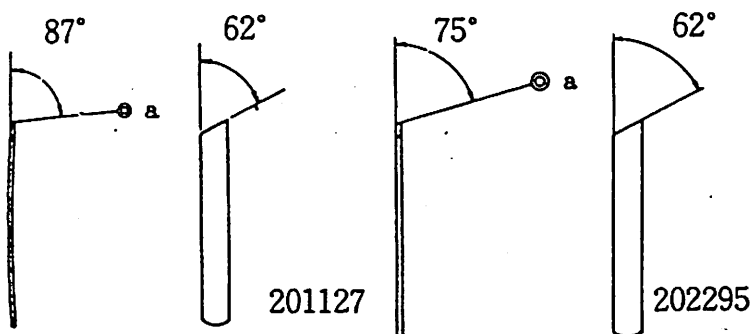
NEEDLE HOLDER REPLACEMENT



212. (E32 E52)

1. Remove needle thread retainer screw 1.
2. Loosen the 2 needle holder screws 2 and remove needle holder.
3. Fit new needle holder and lightly tighten the 2 screws 2. Check needle drop point and tighten the 2 screws 2 securely.
4. Replace needle thread retainer as shown in diagram. Tighten screw 1.

SHARPENING KNIVES

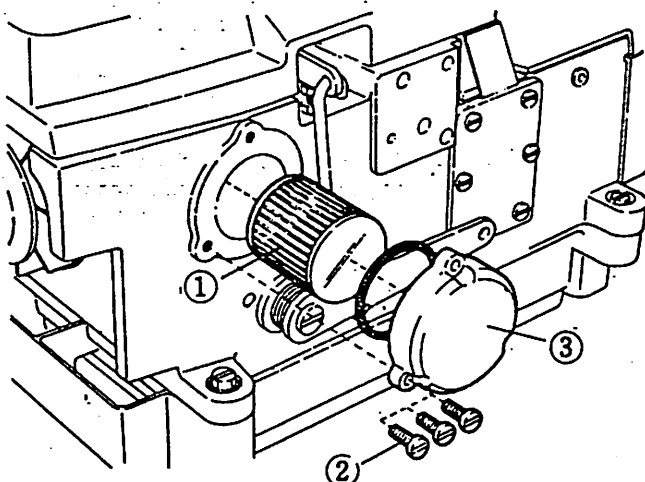


213.

The upper knife is carbon tipped and only needs sharpening infrequently. If the cutting quality of knives becomes poor during this time then lower knife should be sharpened.

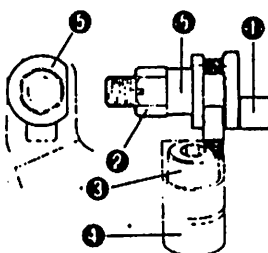
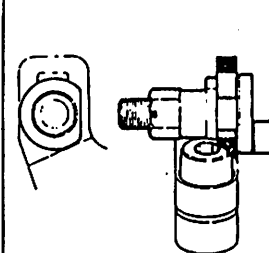
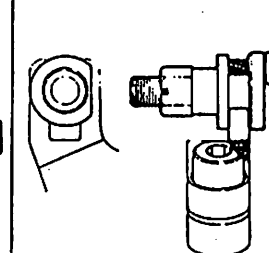
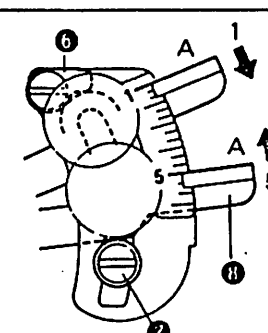
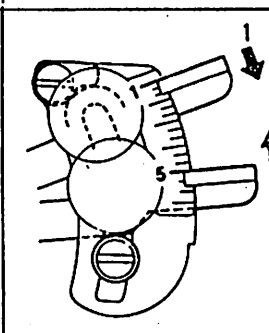
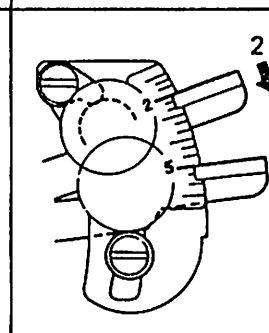
- o When re-grinding lower knife, it is especially important that the part marked 'a' has a sharp cutting edge.
- o When re-grinding upper knife a special grinder is necessary. We therefore recommend that a spare knife is kept and that sharpening is entrusted either to us or to a specialist agent.

OIL FILTER INSPECTION



214.

1. Remove screws 2 and take off cover 3.
2. Take out oil filter 1 and inspect it. If it is clogged, then either clean or replace it.
3. Replace filter in its original position.

	1 : 2	1 : 3	1 : 1.3
1 Changing Position and Direction of Pin 1			
2 Positioning Stoppers 6 and 7			
3 Adjusting Feed Dog Movement	<p>Diff. Feed</p> <p>1. Set pulley to '7'. 2. Move feed dogs to rearmost position. Set crank 9 so that diff. feed dogs do not move if lever 8 is moved up and down.</p> <p>Main Feed</p> <p>1. Maintain position described above. Set lever 8 to '1'. 2. Set crank 4 so that when feed dogs are in front-most position, clearance between main and diff. feed dogs is 0.5mm.</p>	<p>Diff. Feed</p> <p>The same as 1:2</p> <p>Main Feed</p> <p>1. Maintain position described above. Set lever 8 to '1'. 2. Set crank 4 so that when feed dogs are in front-most position, clearance between main and diff. feed dogs is 1.0mm. o Shirring machines: clearance is 0.5mm.</p>	<p>Diff. Feed</p> <p>The same as 1:2</p> <p>Main Feed</p> <p>1. Maintain position described above. Set lever 8 to '2'. 2. Set crank 4 so that when feed dogs are in front-most position, clearance between main and diff. feed dogs is 0.5mm.</p>

CHANGING DIFFERENTIAL FEED CAPACITY

215.

Adjustment

1 Changing Direction of Pin 1

1. Loosen nut 2 about 6mm.
2. Loosen screw 3, move crank 4 to left and turn pin 1 180°.
3. Return crank 4 to original position and tighten nut 2.
4. See section 3 in table on the left (Regulating Feed Dog Movement) and tighten screw 3.

1 Changing Position of Pin 1

1. Loosen nut 2, change position of pin 1 and re-tighten nut 2.
- NB Note direction of washer 5.

2 Positioning Stoppers 6 and 7

1. 1:2 and 1:3 machines.
Set stoppers 6, 7 so that surface A of lever 8 can move between '1' and '5'.
2. 1:1.3 machines. Set stoppers so that lever can move between '2' and '5'.

- o Table 7 shows relationship between lever and feed ratio.

3 Adjusting Feed Dog Movement

After adjusting crank 9 or 4, set pulley to '7', lever to '5' and check that feed dogs do not touch needle plate.

- o See gauge parts list in parts catalog if they are changed.

- o A 1:4 feed ratio is also available. See your dealer.

Table 7

max. diff. feed ratio	Lever Setting					
	1	2	3	4	5	6
1 : 1.3	—	1 : 0.7	1 : 0.9	1 : 1.1	1 : 1.3	—
1 : 2	1 : 0.7	1 : 1	1 : 1.4	1 : 1.7	12	—
1 : 3	1 : 1	1 : 1.5	1 : 2	1 : 1.5	1 : 3	—
1 : 4	1 : 1.1	1 : 1.6	1 : 2.3	1 : 2.8	1 : 3.3	1 : 4

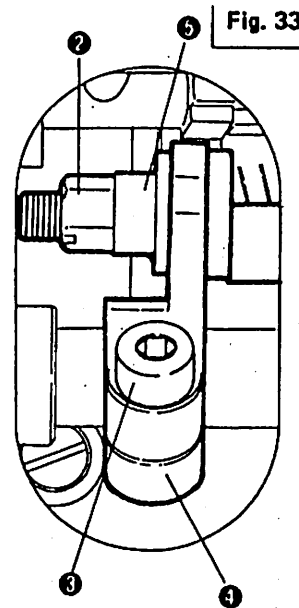


Fig. 33

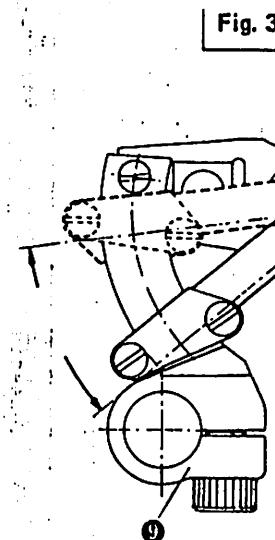


Fig. 34

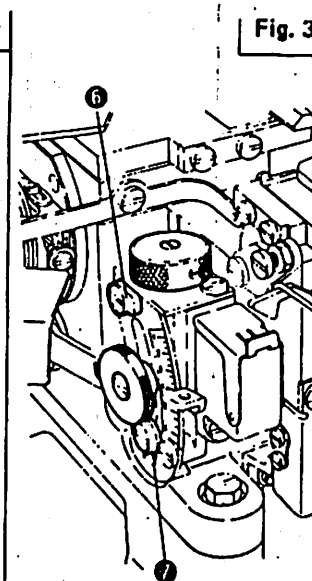


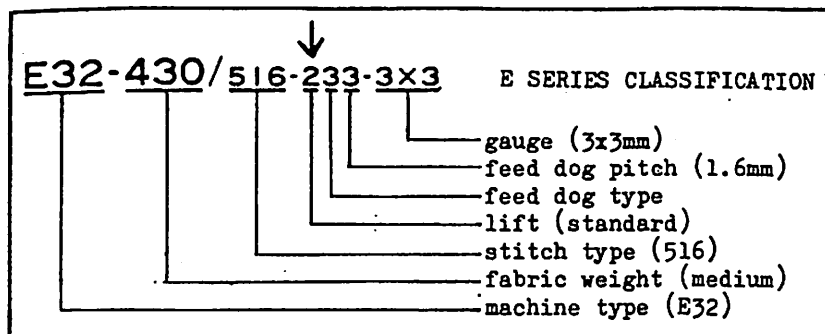
Fig. 35

FOR OLD TYPE MACHINES

STANDARD ADJUSTMENTS

216.

For machines manufactured before Jan 1, 1980 (machine #7605896 and before) make adjustments according to the measurements given below.



arrowed digit indicates lift



- 1 4x3mm (low lift)
- 2 5x5mm (standard lift)
- 3 6x6mm (high lift)

NEEDLE HEIGHT

217.

E52 (1-needle)	E52 (2-needle)	E32
<p>standard lift $a = 9.5 - 9.7\text{mm}$ high lift $a = 10.8 - 11.0\text{mm}$</p>	<p>10.8 ~ 11.0mm</p>	<p>standard lift $a = 9.5 - 9.7\text{mm}$ high lift $a = 10.8 - 11.0\text{mm}$</p>

LOWER LOOPER

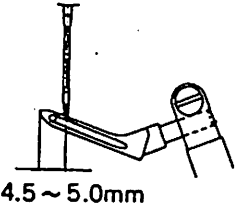
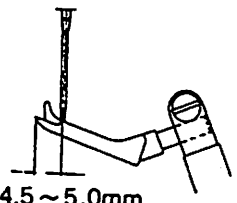
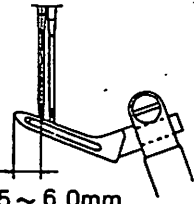
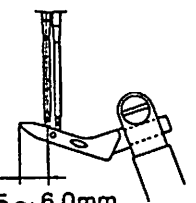
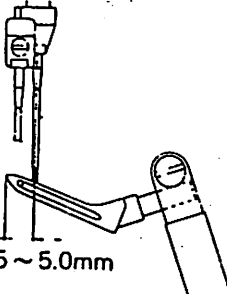
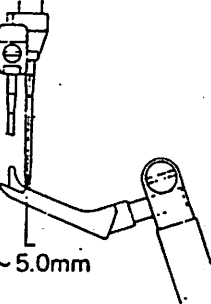
218.

E52 (1-needle)	E52 (2-needle)	E32
<p>standard lift $a = 3.4 - 3.6\text{mm}$ high lift $a = 3.0 - 3.2\text{mm}$</p>	<p>3.0 ~ 3.2mm</p>	<p>standard lift $a = 3.4 - 3.6\text{mm}$ high lift $a = 3.0 - 3.2\text{mm}$</p>

FOR OLD TYPE MACHINES

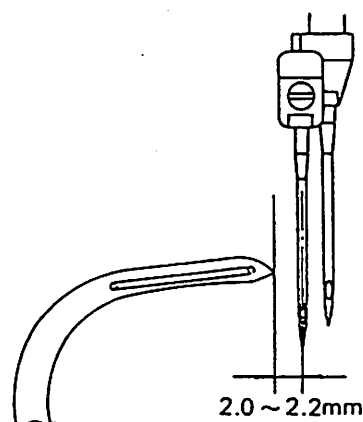
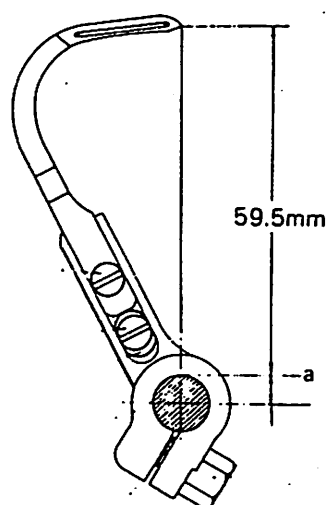
UPPER LOOPER

219.

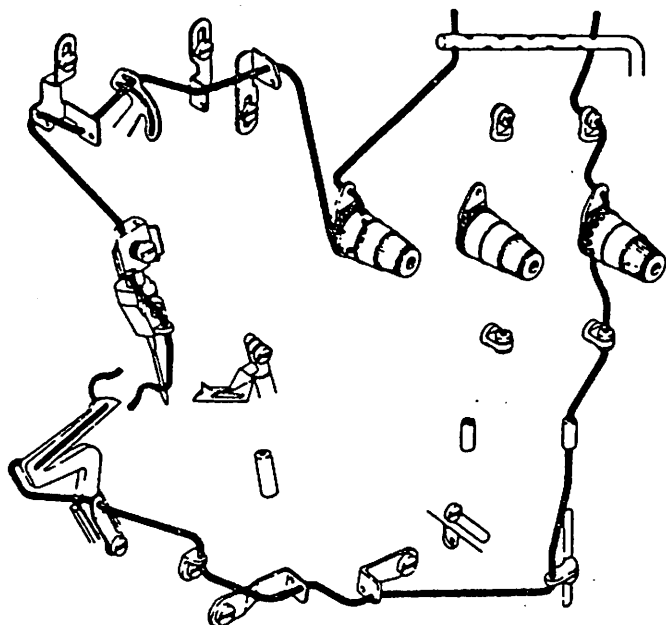
E52 (1-needle)	E52 (2-needle)	E32	
 <p>4.5 ~ 5.0mm</p>  <p>4.5 ~ 5.0mm</p>	<p>stitch type 514</p>  <p>5.5 ~ 6.0mm</p> <p>stitch type 512</p>  <p>5.5 ~ 6.0mm</p>	 <p>4.5 ~ 5.0mm</p> <p>stitch type 516</p>	 <p>4.5 ~ 5.0mm</p> <p>stitch type 515</p>

DOUBLE CHAINSTITCH LOOPER

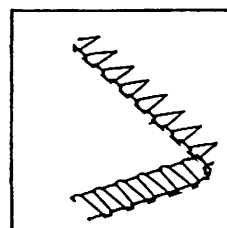
220.



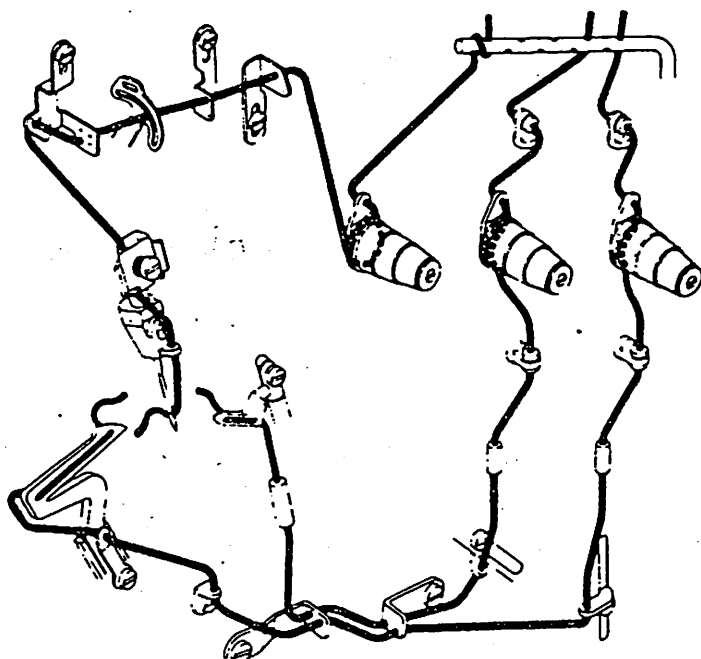
221. - E52 -
1-needle 2-thread



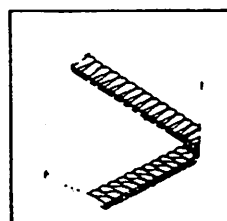
503



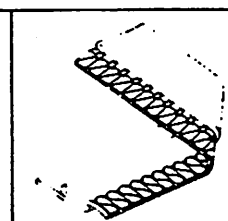
222. - E52 -
1-needle 3-thread



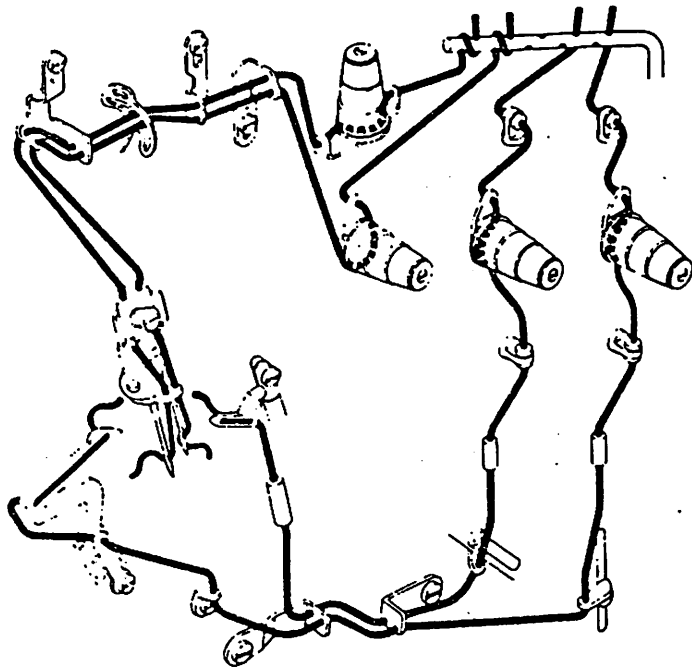
504



505

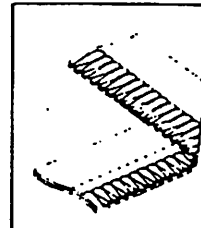


FOR OLD TYPE MACHINES

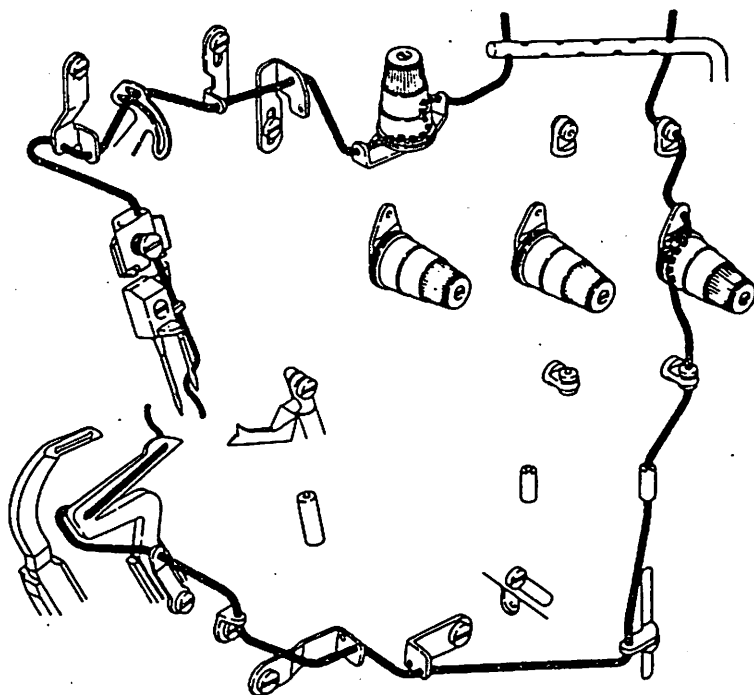
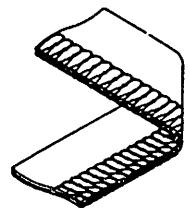


223. - E52 -
2-needle 4-thread

512

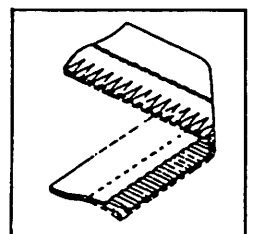


514

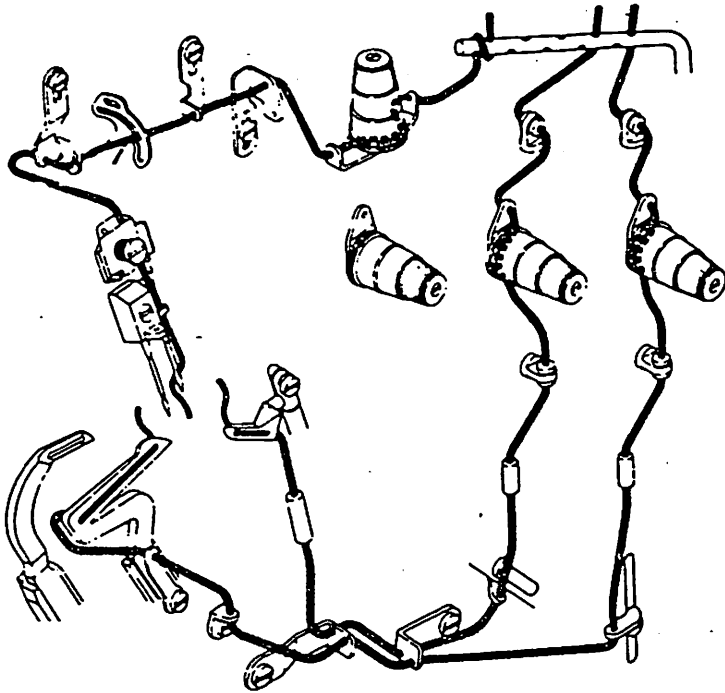


224. - E32 -

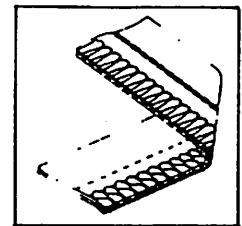
515



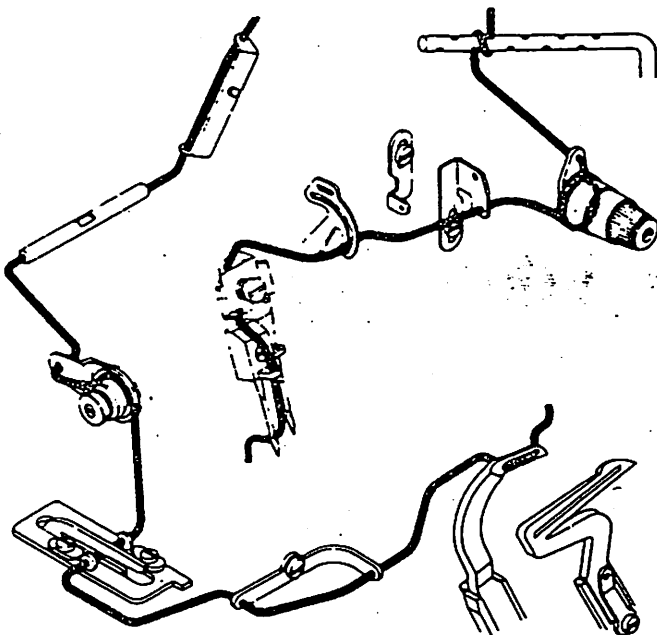
225. - E32 -



516



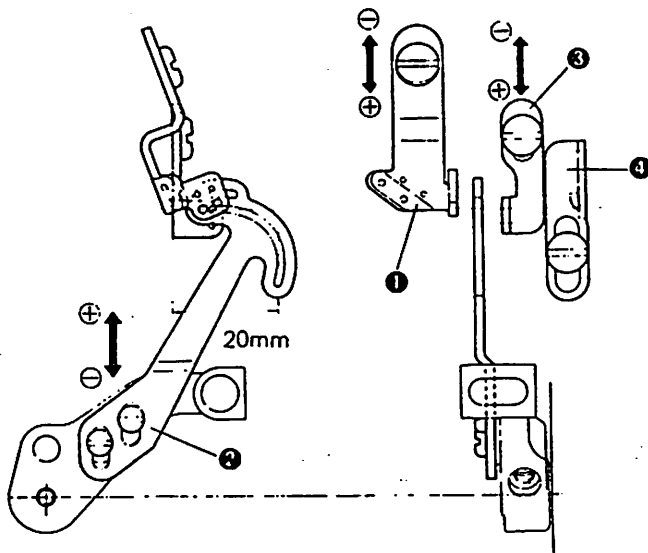
226. - E32 -



FOR OLD TYPE MACHINES

NEEDLE THREAD CONTROL

Fig. 1



(lower looper in extreme left position)

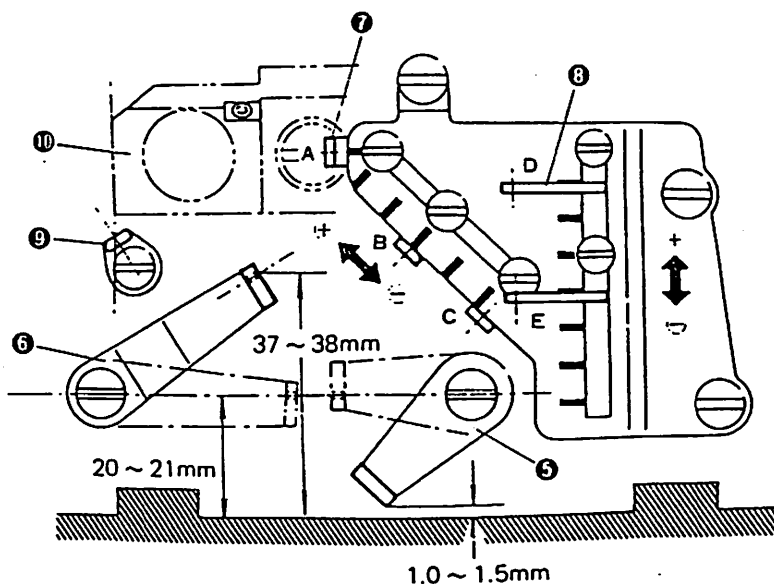
227. (E52)

Needle Thread Takeup, Needle Thread Guide (Fig. 1)

1. Set needle thread guide left 1 in its lowest position.
2. Set needle thread takeup 2 so that when needle is in its lowest position the lower eyelet of thread guide 1 is level with the thread slot in thread takeup 2.
3. Set needle thread guide center 3 in its lowest position.
 - o In the case of stitch type 503 and 505 (blindstitch hemming), set thread guides 1 and 3 in their highest positions.
4. Set needle thread guide right 4 in the center of long slot.
 - o Move takeup 2 and thread guides 1 and 3 in the '+' direction for a tighter needle thread and in the '-' direction for a looser needle thread in the seam.

LOOPER THREAD CONTROL

Fig. 2



(lower looper in extreme right position)

228. (E52)

Looper Thread Takeup, Guide (Fig. 2)

1. Settings of upper looper thread takeup 5 and lower looper thread takeup 6 are as follows:
 - o in the case of stitch type 512 then, with upper looper in its leftmost position, set them as shown by the dotted lines.
 - o in the case of stitch types 503, 504, 505 and 514 then, with looper in its lowest position, set them as shown by the solid lines.
2. Setting of thread guide 7:
 - A = stretchy threads such as wool wooly threads
 - B = plain seaming and blindstitch hemming
 - C = stitch type 512
3. Setting of thread guide 8:
 - D = stretchy threads such as wooly threads
 - E = plain seaming and blindstitch hemming
4. Set thread guide 9 at an angle as shown so that it does not touch looper holder guide base 10
 - o Settings of thread guides 7 and 8 vary depending on stitch type, thread and operation.
 - o Move thread guides in the '+' direction for more thread and in the '-' direction for less thread in the seam.

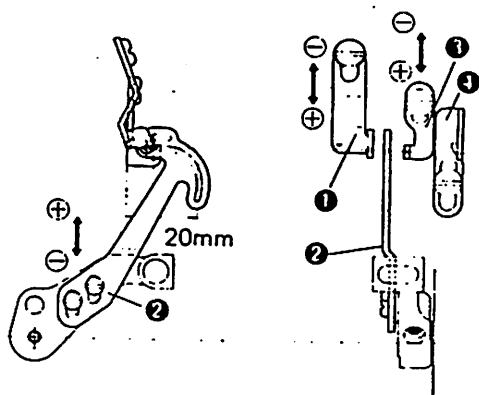


Fig. 1

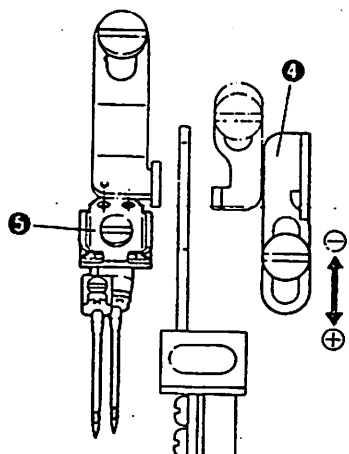


Fig. 2

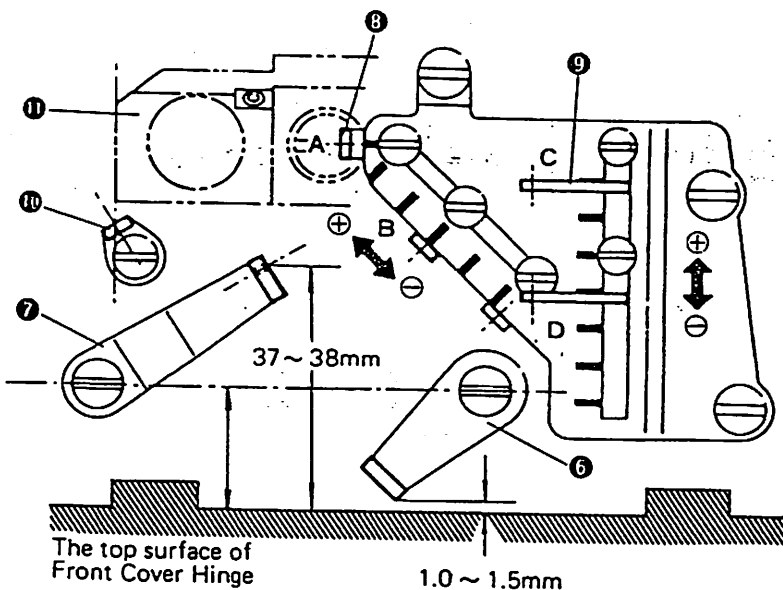
(lower looper in extreme left position)

229. (E32)

Needle Thread Takeup, Needle Thread Guide (Figs. 1, 2)

1. Set needle thread guide left 1 in its lowest position.
2. Set needle thread takeup 2 so that when needle is in its lowest position, the eyelet of guide 1 and the thread slot of takeup 2 are level.
3. Set needle thread guide center 3 in its lowest position.
 - o In the case of stitch type 503 set needle thread guides 1 and 3 in their highest positions.
4. Set needle thread takeup right 4 so that when needle is in its highest position, the thread eyelets of retainer bracket 5 and of needle thread guide right 4 are level.
 - o Move needle thread takeup 2 and thread guides 1, 3 and 4 in the '+' direction for a tighter needle thread and in the '-' direction for a looser needle thread in the seam.

Fig. 3



(lower looper in extreme right position)

230. (E32)

Looper Thread Takeup, Guides (Fig. 3)

1. Set upper looper thread takeup 6 and lower looper thread takeup 7 when upper looper is in its lowest position.
2. Settings of guide 8:
 - A = stretchy threads such as wooly threads.
 - B = plain seaming
3. Settings of guide 9:
 - C = stretchy threads such as wooly threads
 - D = plain seaming
4. Set thread guide 10 so that it does not touch upper looper holder guide base 11 and is inclined as shown in the diagram.
 - o Settings of thread guides 8 and 9 vary slightly depending on thread and operation.
 - o Move thread guides 8 and 9 in the '+' direction for more thread in the seam and in the '-' direction for less.