

INSTRUCTIONS FOR MECHANICS

LUBRICATION

CAUTION! Oil has been drained from the main reservoir before shipment, so the reservoir must be filled to the proper level at plug screw (A, Fig. 1) as indicated on oil gauge (B), before beginning to operate. The capacity of the reservoir is 12 ounces (340.2 gr.). Run machine slowly for several minutes to distribute the oil to the various parts. Full speed operation can then be expected without damage.

RECOMMENDED OIL

Use a straight mineral oil of a Saybolt viscosity of 90 to 125 seconds at 100° Fahrenheit in the main reservoir. This is equivalent to UNION SPECIAL specification No. 175. Fill main reservoir at plug screw in upper crank chamber cover (A, Fig. 1) and check oil level at gauge (B). Oil is at maximum safe operating level when needle is to the black line, located to the right of "OPERATE" zone, marked "FULL". Oil should be added when needle is to the black line, located to the left of "OPERATE" zone, marked "LOW". The recommended oil is available in 16 fluid ounce (453.6 gr.) cans No. 28604 R.

CAUTION! It is important that these machines not be over filled.

It is recommended that a new machine, or one that has been out of service for an extended period be lubricated as follows: Remove the head cover, clean out lint and directly oil the needle bar link and the needle bar. Replace head cover as no further hand oiling will be required. Run machine slowly for several minutes to distribute oil to the various parts.

For machines in operation check the oil for dirt and lint deposits at reasonable intervals. If dirty, change the oil. An oil change is recommended every 2000 operating hours, or once a year. Oil may be drained from main reservoir by removing plug screw (C, Fig. 1) located below the cloth plate at front of the machine, or by removing the lower crank chamber cover, located at the back of machine.

A daily check before the morning start should be made, to see that the oil level is at a safe operating level, as outlined in the first paragraph. Oil which has gone through the machine is filtered and pumped back into the main reservoir, making too frequent oilings unnecessary. Excessive oil in the main reservoir may be drained by removing plug screw (C, Fig. 1) located below the cloth plate at the front of the machine. After draining oil, wipe the hole and plug screw dry, paint hole and screw with a little gasket cement, and re-assembly screw.

NOTE: Looper avoid and feed lift eccentric receive oil thru the mainshaft, so when assembling be sure oil holes in the eccentric line up with oil holes in mainshaft when spot screw is in time spot.

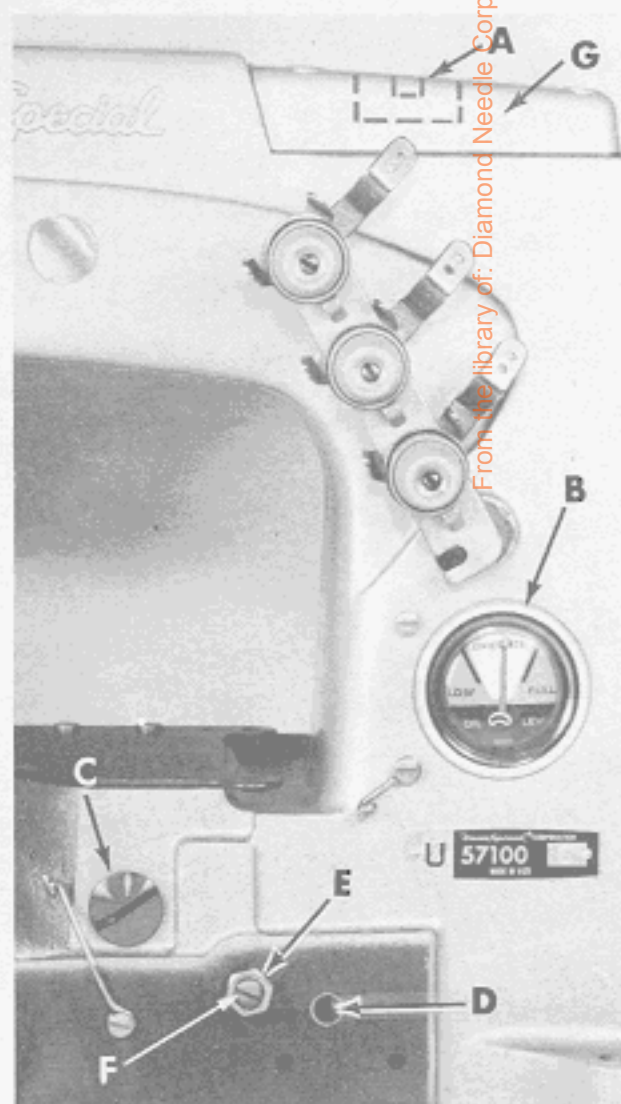
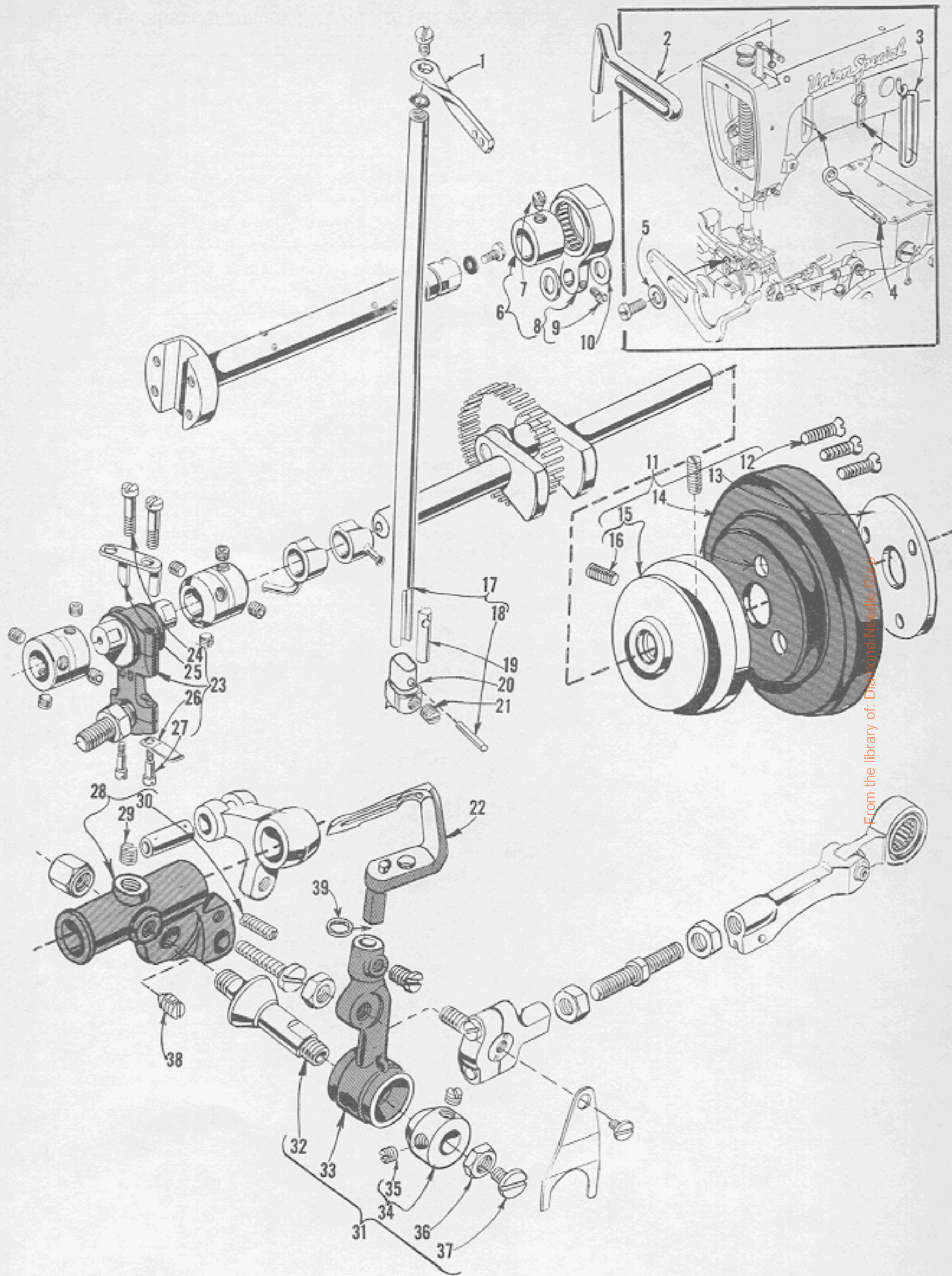


Fig. 1

OIL GAUGE

The oil gauge is set at the factory to show the proper oil level in the reservoir. Should an adjustment become necessary, however, the following steps should be followed:

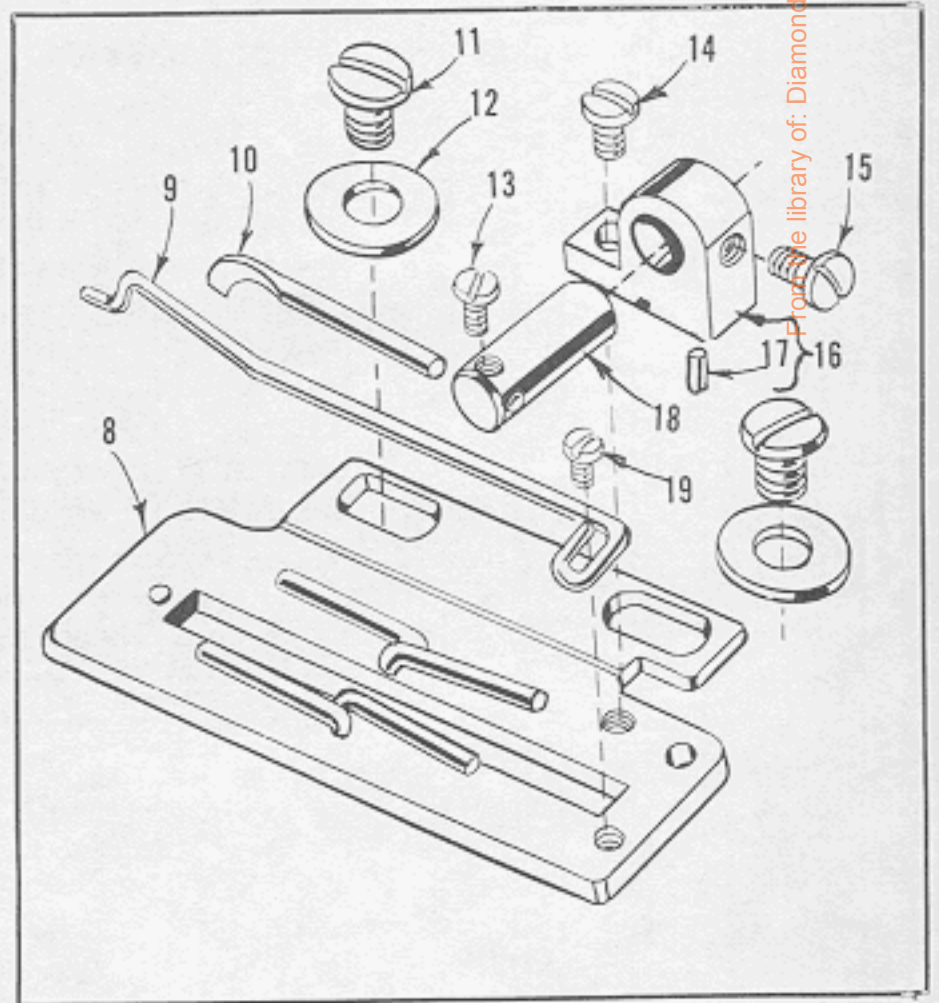
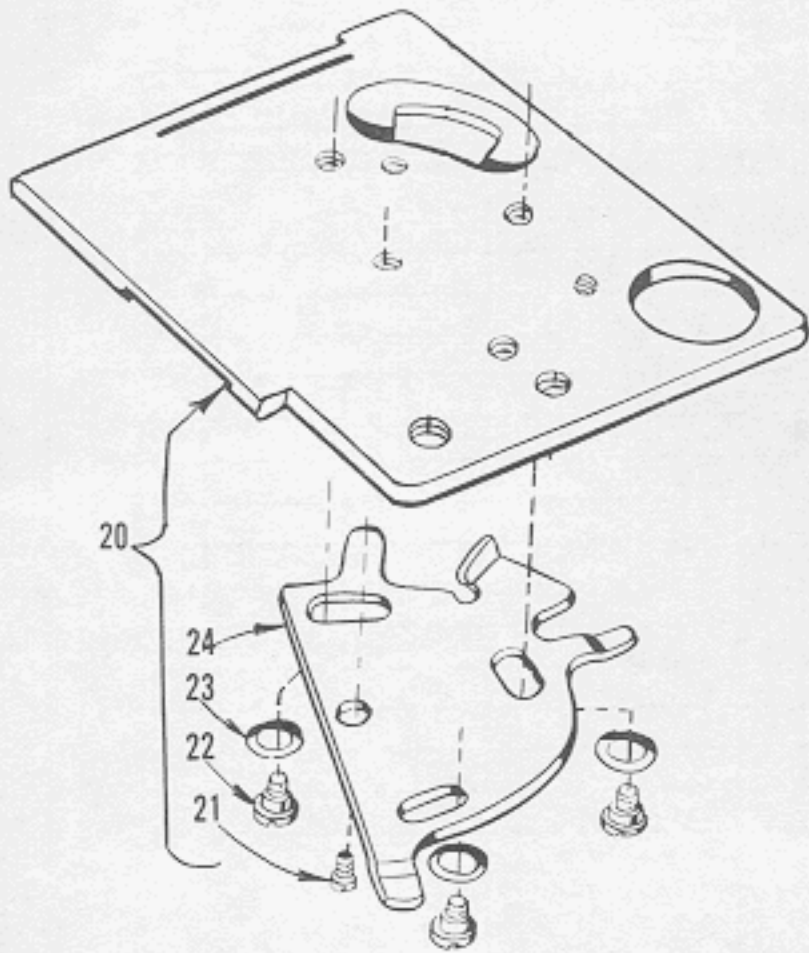
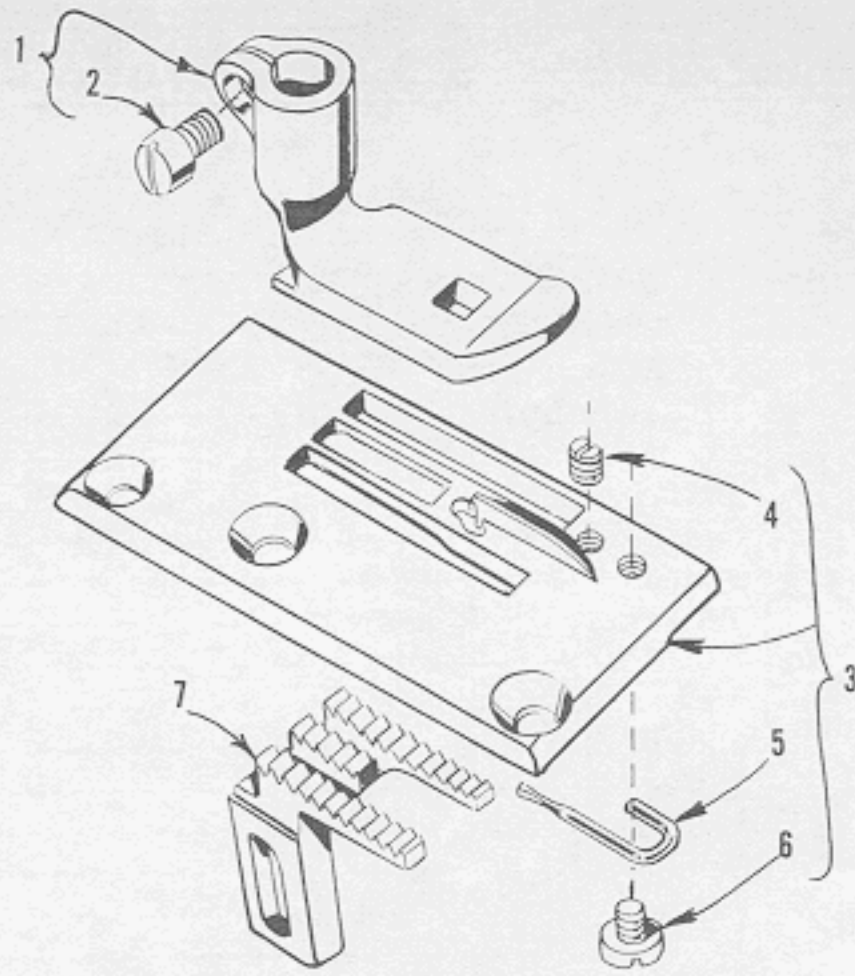


From the library of: Diamond Needle Corp.

THREAD EYELETS, FEED LIFT ECCENTRIC, NEEDLE BAR, HANDWHEEL ASSEMBLY,
 LOOPER DRIVING AND LOOPER ROCKER PARTS

| Ref. No. | Part No. | Description | Amt. Req. |
|-------------|--------------|---|--------------|
| 1 | 56458 A | Needle Bar Thread Eyelet----- | 1 |
| 2 | 52170 | Needle Thread Take-up Wire----- | 1 |
| 3 | 539 | Needle Thread Frame Eyelet----- | 1 |
| 4 | 56458 | Needle Lever Thread Eyelet----- | 1 |
| 5 | 61434 G | Washer, for needle guard----- | 1 |
| 6 | 29476 NM-080 | Feed Lift Eccentric Assembly, .080 inch (2.03 mm) throw----- | 1 |
| 7 | 22894 AA | Screw----- | 1 |
| 8 | 57845 B | Eccentric Link Assembly----- | 1 |
| 9 | 77 | Screw----- | 1 |
| 10 | 39543 N | Thrust Washer for feed bar----- | 2 |
| 11 | 56321 J | Handwheel Assembly----- | 1 |
| 12 | 22574 | Screw----- | 3 |
| 13 | 61321 L | Retaining Plate----- | 1 |
| 14 | 56321 D | Handwheel----- | 1 |
| 15 | 56321 H | Pulley----- | 1 |
| 16 | 22894 AB | Screw----- | 2 |
| 17 | 57117 | Needle Bar, marked "EY"----- | 1 |
| 18 | 56 C | Tapered Stop Pin----- | 1 |
| 19 | 56 GV | Needle Wedge----- | 1 |
| 20 | 56 V | Needle Clamp Collar----- | 1 |
| 21 | 88 | Screw----- | 1 |
| 22 | 52107 | Looper----- | 1 |
| 23 | 29105 AG | Looper Drive Lever Crank Assembly----- | 1 |
| 24 | 22587 K | Bearing Cap Screw, upper----- | 2 |
| 25 | 56343 C | Ball Joint Guide Fork----- | 1 |
| 26 | 56343 E | Oil Splasher----- | 1 |
| 27 | 22559 A | Bearing Cap Screw, lower----- | 2 |
| 28 | 56344 C | Looper Rocker Frame----- | 1 |
| 29 | 98 | Set Screw----- | 1 |
| 30 | 719 | Stop Screw----- | 1 |
| 31 | 29192 AD | Looper Rocker Assembly----- | 1 |
| 32 | 51745 | Looper Rocker Cone Stud----- | 1 |
| 33 | 57113 | Looper Rocker, marked "AE"----- | 1 |
| 34 | 15465 F | Looper Rocker Cone----- | 1 |
| 35 | 88 | Screw----- | 2 |
| 36 | 258 A | Lock Nut----- | 1 |
| 37 | 22829 | Lock Nut Screw----- | 1 |
| 38 | 96 | Screw----- | 1 |
| 39 | 21210 A | Looper Collar----- | 1 |

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Product Library of: Diamond Needle Corp

PRESSER FOOT, THROAT PLATE, FEED DOG, CLOTH PLATE COVER
AND LOOPER THREAD TAKE-UP PARTS

| Ref. No. | Part No. | Description | Amt. Req. |
|-------------|-------------|--|--------------|
| 1 | 8620 K-1/8 | Presser Foot----- | 1 |
| 2 | 91 | Screw----- | 1 |
| 3 | 8624 K-1/8 | Throat Plate----- | 1 |
| 4 | 28 C | Screw, for adjusting loop retainer----- | 1 |
| 5 | 27 V | Loop Retainer, marked "AY"----- | 1 |
| 6 | 28 | Screw, for loop retainer----- | 1 |
| 7 | 8605 J | Feed Dog, 16 teeth per inch (1.59 mm per tooth)----- | 1 |
| 8 | 57757 A | Cast-off Support Plate----- | 1 |
| 9 | 52904 G | Cast-off Wire----- | 1 |
| 10 | 51204 | Looper Thread Retaining Finger----- | 1 |
| 11 | 22569 C | Screw, for cast-off support plate----- | 2 |
| 12 | 69 H | Washer, for cast-off support plate screw----- | 2 |
| 13 | 87 U | Screw, for looper thread retaining finger----- | 1 |
| 14 | 22768 | Screw, for retaining finger support bracket----- | 1 |
| 15 | 77 | Screw, for cast-off wire support----- | 1 |
| 16 | 52904 E | Retaining Finger Support Bracket----- | 1 |
| 17 | 50-216 Blk. | Dowel Pin----- | 1 |
| 18 | 51204 A | Cast-off Wire Support----- | 1 |
| 19 | 73 A | Screw, for cast-off wire----- | 1 |
| 20 | 56381-222 | Cloth Plate Cover----- | 1 |
| 21 | 22845 B | Pivot Screw----- | 1 |
| 22 | 22760 A | Screw----- | 3 |
| 23 | 35772 H | Washer----- | 3 |
| 24 | 51281 AC | Cloth Plate Cover Spring----- | 1 |

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OIL GAUGE (Continued)

1. Place the machine upright on a level table or bench.
2. Remove the oil reservoir plug screw (C, Fig. 1) and tip machine forward to drain oil from the reservoir.
3. Make sure all oil is drained from main reservoir.
4. Remove lower crank chamber cover, located at the back of the machine.
5. Fill main reservoir to a level even with the bottom contour of the knee press shaft bushing (D, Fig. 1).
6. Loosen lock nut (E) on the calibrating screw (F), and turn the screw to the left or right until the gauge needle rests on the black line, located to the left of "OPERATE" zone, marked "LOW".
7. Tighten lock nut (E) and replace plug screw (C) and lower crank chamber cover.
8. Add oil so that gauge needle rests on the black line, located to the right of "OPERATE" zone, marked "FULL".

NEEDLE LEVER BEARING OILER

Remove the head cover and upper crank chamber cover (G, Fig. 1). Check position of needle lever bearing oiler (A, Fig. 2) located inside the arm casting, below the upper crank chamber cover, which lubricates the needle lever stud (B). Make sure it is tilted downwardly and that its delivery end (C) contacts the inside wall of the bed casting at the back, just above the notch of the needle lever shaft bushing. (Do not allow the oiler to rest on the needle lever). Allow $\frac{1}{64}$ inch (.40 mm) clearance as in Figure 2.

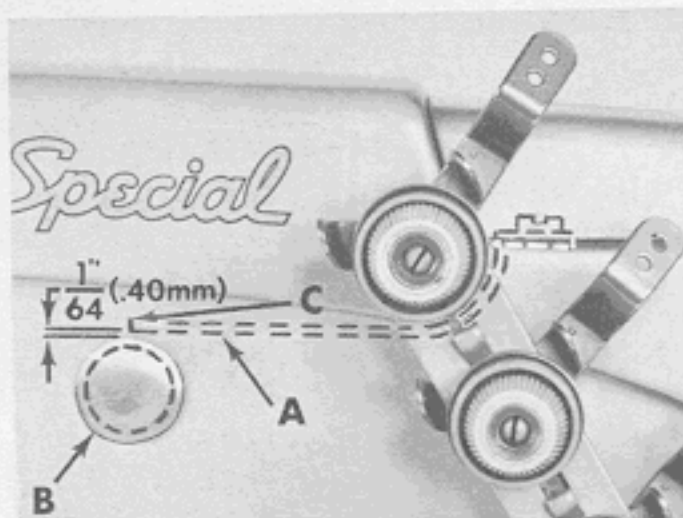
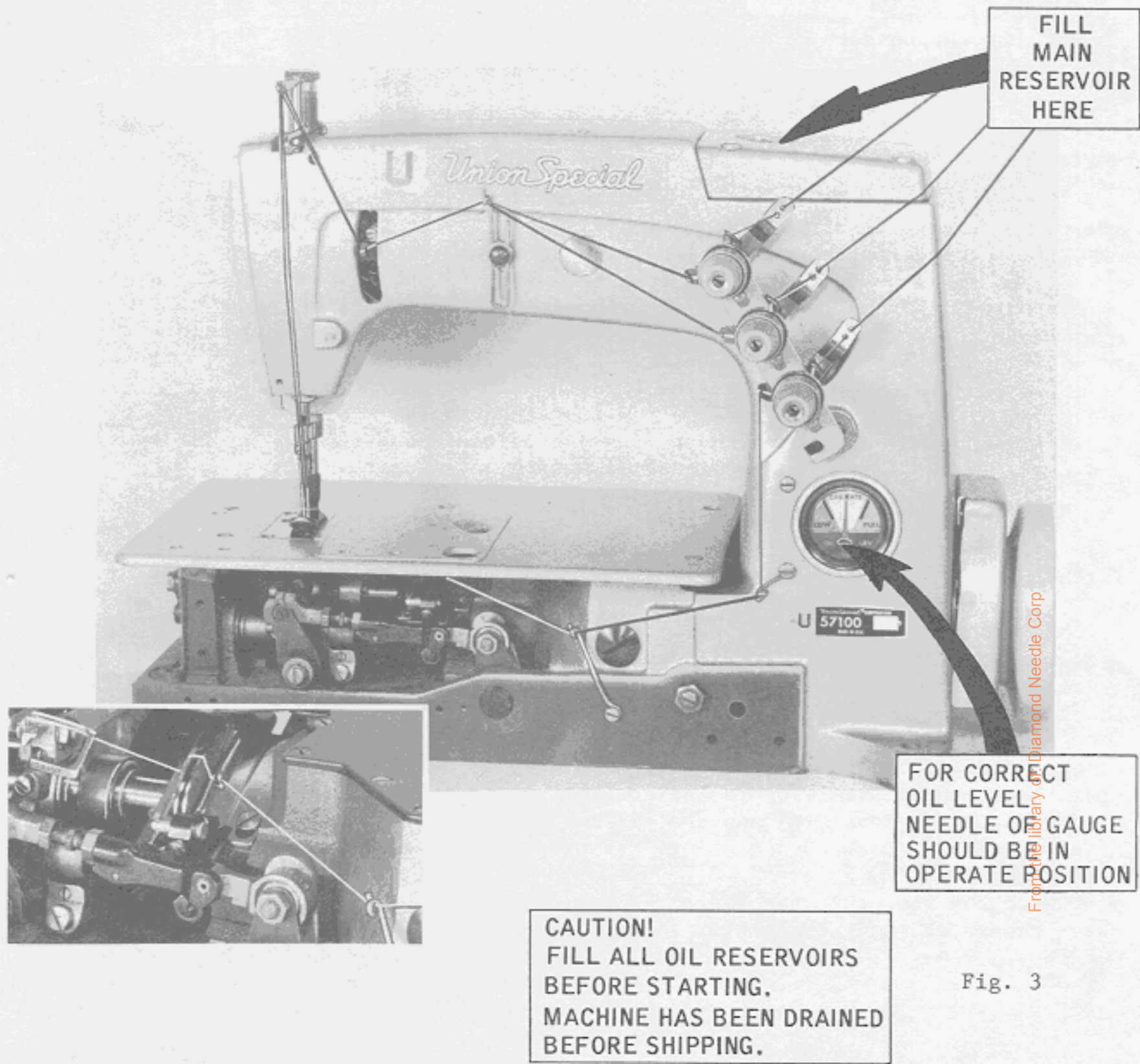


Fig. 2



FILL
MAIN
RESERVOIR
HERE

FOR CORRECT
OIL LEVEL
NEEDLE OF GAUGE
SHOULD BE IN
OPERATE POSITION

CAUTION!
FILL ALL OIL RESERVOIRS
BEFORE STARTING.
MACHINE HAS BEEN DRAINED
BEFORE SHIPPING.

Fig. 3

THREADING AND OILING DIAGRAM FOR STYLE 57100 C

Thread machine as indicated above. The looper threading has been enlarged for clarity.

The oil has been drained from the machine before shipping and the reservoir must be filled before starting to operate. Maintain oil level in "OPERATE" position and add oil when needle is to the black line located to the left of the "OPERATE" zone marked "LOW". The machine is automatically lubricated and no oiling other than keeping the main reservoir filled is necessary. For further lubricating instructions refer to paragraphs on "LUBRICATION" and "RECOMMENDED OIL".

ALIGNING THE NEEDLE BAR

Insert a new set of needles (Type and Size as required) and align the needle bar so that the needles correspond with the vertical face of the needle guard. To turn needle bar (A, Fig. 4), loosen needle bar clamp screw (B) and turn bar as required. Tighten clamp screw.

SYNCHRONIZING LOOPER AND NEEDLE MOTIONS

Insert the looper in the looper rocker and turn handwheel in operating direction until the point of the looper (A, Fig. 5), moving to the left is even with the left side of the right needle (B). Note the height of the eye of the needle with respect to the looper point, then turn handwheel in the reverse direction until the looper point again moves to the left, and is even with the left side of the right needle. If the motions synchronize, the height of the eye of the needle with respect to the looper point will be the same. A variation of .005 inch (.127 mm) is allowable. If the distance from the eye of the needle to the point of the looper is greatest when the pulley is turned in the operating direction move the looper drive shaft synchronizing stud (C) to the rear. Moving it in the opposite direction acts the reverse.

Moving of the looper drive lever shaft synchronizing stud is accomplished as follows: Loosen the clamp screw (D) of the looper drive lever. To move stud to rear (away from operator), a light tap with a small hammer, directly on the stud is all that is required. To move stud forward (toward operator), remove the cloth plate, throat plate support, oil reservoir top cover and oil reservoir back cover, then, a light tap on the looper drive lever rocker shaft, toward the operator, is all that is required. Note: Looper drive lever (E, Fig. 5) has an oil seal collar and an "O" ring between it and the bed casting. All end play must be removed from the looper drive lever rocker shaft by compressing the "O" ring until drive lever (E) and the oil seal collar make metal to metal contact with the bed casting. Tighten screw (D).

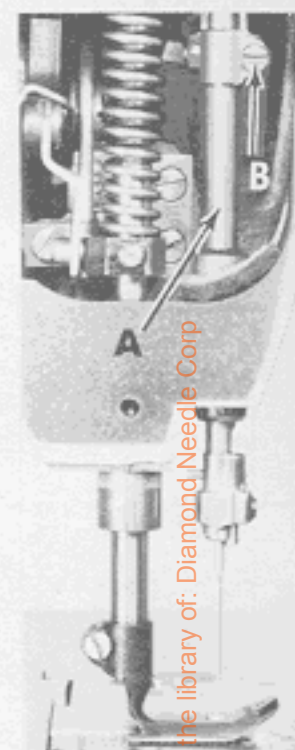


Fig. 4

With the looper at the extreme right end of its travel, check the location of the center line of the right looper connection rod bearing, using gauge No. 21227 CX. Remove nut (F, Fig. 5) and place hole in gauge over threaded stud. The left end of the gauge should locate against the right side of the looper rocker cone (G). If adjustment is necessary, loosen the clamp screw (D) and reposition the looper drive lever (E) as required. Tighten clamp screw. If gauge is not available, setting can be checked with a scale. The distance between the center line of the looper rocker cone and the center and the center line of the looper lever stud should be $4 \frac{1}{16}$ inch (103.19 mm) (Fig. 5).

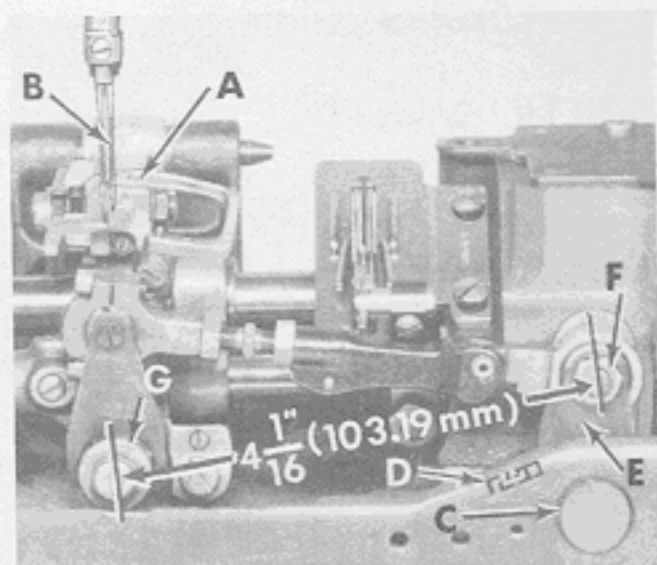


Fig. 5

SETTING THE LOOPER

Insert two new needles in the needle seat, type and size as specified. The looper gauge is $\frac{5}{32}$ inch (3.97 mm), set the looper (A, Fig. 6) so the distance between the center of the two needles (B) to the point of the looper is $\frac{5}{32}$ inch (3.97 mm), when the looper is at its farthest position to the right. Looper gauge No. 21225- $\frac{5}{32}$ can be used advantageously in making this adjustment.

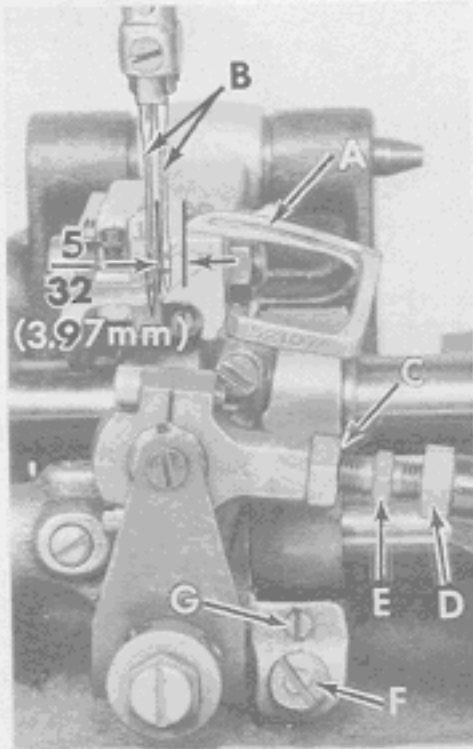


Fig. 6

If adjustment is required, loosen nut (C, Fig. 6) (it has a left hand thread) and nut (D) on connecting rod (E), turn the connecting rod forward or backward to obtain the $\frac{5}{32}$ inch (3.97 mm) dimension. Retighten both nuts, first nut (D). Then nut (C). Make sure the left ball joint is in vertical position and does not bind after adjustment.

The looper is set correctly in line-of-feed, if, as it moves to the left, behind the needle, its point (A, Fig. 7) brushes, but does not pick at the rear of the needle (B).

If adjustment is necessary, loosen lock screw (F, Fig. 6) and turn stop screw (G) as required. Turning stop screw clockwise sets the looper to the rear and turning it counterclockwise acts the reverse. Holding looper to the front while making

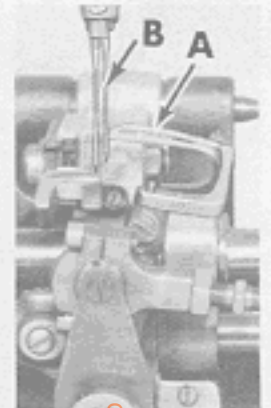


Fig. 7

this adjustment may prove helpful. Tighten lock screw when setting is obtained and recheck the adjustment.

SETTING HEIGHT OF NEEDLE BAR

The height of the needle bar (A, Fig. 8) is correct when the top of the left needle's eye is $\frac{1}{64}$ inch (.40 mm) below the underside of the looper, when the point of looper, moving to the left, is even with the left side of this needle. If adjustment is necessary, loosen screw (B) and reposition needle bar (A) up or down as required and retighten screw. Care must be taken not to disturb the alignment of the needle bar while making this adjustment, as the needles are to have equal clearance on both the right and left sides of the needle slots in throat plate.

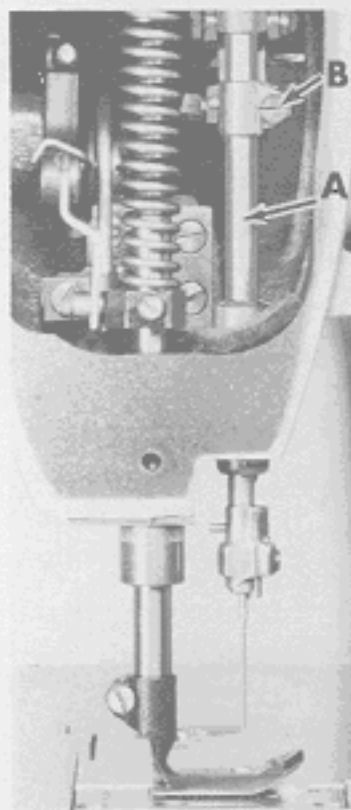


Fig. 8

1/64 inch (.40 mm) cannot be obtained then the distance which the prong projects over the corner may be slightly altered by loosening the looper set screw (C) and applying pressure on the heel of the looper in the required direction while retightening the screw. The point of the looper will then have to be reset with respect to the back of the needles by adjusting the looper rocker.

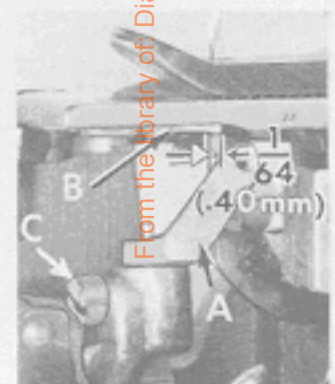


Fig. 9

SETTING THE LOOPER AND LOOP RETAINER

The looper and loop retainer are set correctly when the following conditions prevail: (1) Turn the handwheel in the operating direction until the looper (A, Fig. 9) moving to the right and the left corner of the recess is under the prong of the loop retainer (B). At this point the prong should project $\frac{1}{64}$ inch (.40 mm) over the looper, from back to front (Fig. 9). If this

(2.) When the looper moves to the right and passes under the prong of the loop retainer there should be a minimum amount of clearance between the top of the looper and the underside of the prong, or just enough to permit a piece of paper to be drawn between them. The adjustment is made by means of a small screw (A, Fig. 10), that passes through the throat plate and bears against the top of the loop retainer.



Fig. 10

SETTING THE FEED DOG

Set the feed dog (A, Fig. 11) in the throat plate (B) so there is equal clearance on all sides. See that the tips of the teeth extend the depth of a tooth or approximately $\frac{3}{64}$ inch (1.19 mm) above the throat plate and are parallel with the throat plate at high point of travel. Adjust the supporting screw (C), under the feed dog, to maintain this setting. Screw (D) is used to hold feed dog in position.

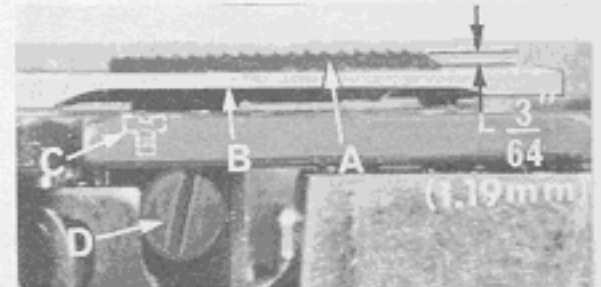


Fig. 11

If feed dog teeth are not parallel with the throat plate, loosen nut (A, Fig. 12) and turn screw (B) clockwise to lower the front teeth, and counterclockwise to raise the front teeth. Retighten nut when feed dog is set properly.

CAUTION: See that there is sufficient space between underside of feed dog and top of looper.

Should it be necessary to move the feed dog to the left or right, loosen screws (A, Fig. 13) which hold the feed rocker (B) onto the feed rocker shaft (C), and move feed rocker to desired position and retighten screws. Make sure the feed rocker arm (D) does not bind after making this adjustment.

When the handwheel is turned in the operating direction the feed dog should have equal clearance on both ends of the throat plate slots with feed travel set to desired stitch length.

Should it be necessary to move the feed dog forward or backward, loosen nut (E, Fig. 13) which clamps the feed rocker arm to the feed rocker and move the feed rocker forward or backward as needed and retighten nut.

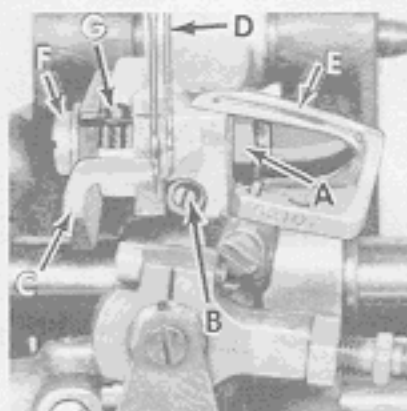


Fig. 12

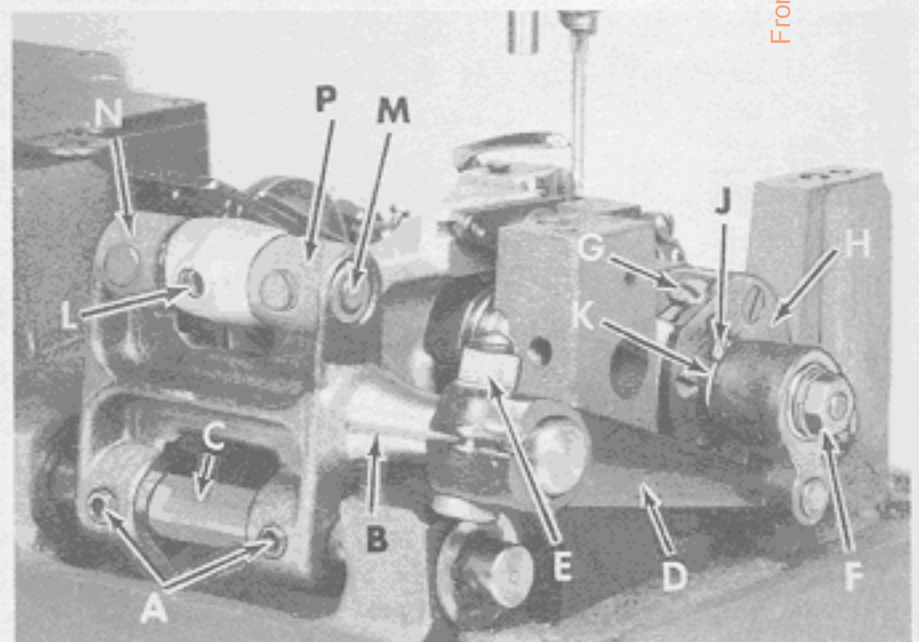


Fig. 13

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CHANGING STITCH LENGTH

Set the stitch to required length. This is accomplished by loosening the locknut (F, Fig. 13) 1/2 turn (it has a left hand thread) on the end of the stitch regulating stud and turning the stitch adjusting screw (G) located under the left end of the cloth plate, in the head of the main shaft (H), which is marked with "L" and "S". Turning the screw clockwise shortens the stitch (moves stitch regulating stud toward the "S") and turning it in a counterclockwise direction lengthens the stitch (moves stitch regulating stud toward the "L"). Retighten the locknut securely. To prevent destructive damage to the feed drive bearing, the Key screw (J) must engage the "U" shaped key slot in the ferrule (K).

NOTE: Any change in stitch length will necessitate a corresponding change in the rear needle guard setting.

The feed rocker assembly may require lubrication or repair after years of operation. This can be accomplished as follows: Loosen nuts (E, F, Fig. 13) and remove nut (F). Remove feed rocker arm (D) from machine by rocking slightly. Loosen screws (A) and remove stop collar on right end of shaft (C). The shaft can now be withdrawn. Loosen Allen screw (L) and remove shaft (M). Now, repack bearings.

When packing bearings the parts must be clean and grease should be applied directly from the tube to avoid contamination. Tube of grease can be supplied under the part number 28604 P. Greased bearings are located at (N, P, Fig. 13). If grease sealed bearings are replaced they should be pressed in flush with the casting. To assemble, reverse the procedure described in the previous paragraph. Start tapered end of shafts first, twisting slightly when entering the grease seals to prevent damage. Check for proper adjustment of feed dog as described under "Setting the Feed Dog". Also check to see that there is no binding at any point.

SETTING THE REAR NEEDLE GUARD

Set the rear needle guard (C, Fig. 12) horizontally so that it does not quite contact the rear of the right needle (D) when at its most forward point of travel. A clearance of .005 inch (.127 mm) is permissible. It should be set as low as possible, yet have its vertical face approach within about 3/64 inch (1.19 mm) of the needle, until the point of the looper (E), moving to the left, is even with the needle. To move needle guard forward or backward, merely loosen screw (F), move needle guard as required, and retighten screw. To raise or lower needle guard, loosen screw (F), and turn screw (G) clockwise to lower needle guard and counterclockwise to raise it. Retighten screw (F) after guard is properly set.

NOTE: A change in stitch length will require a change in rear needle guard setting.

THREAD TENSION RELEASE

The thread tension release is set correctly when it begins to function as the presser foot is raised to within 1/8 inch (3.18 mm) of the end of its travel and is entirely released when the presser foot has reached its highest position.

If adjustment is needed, loosen tension release lever screw (A, Fig. 14), located at the back of the machine and move tension disc separator as required. Retighten screw. After adjustment there should be no binding at any point.

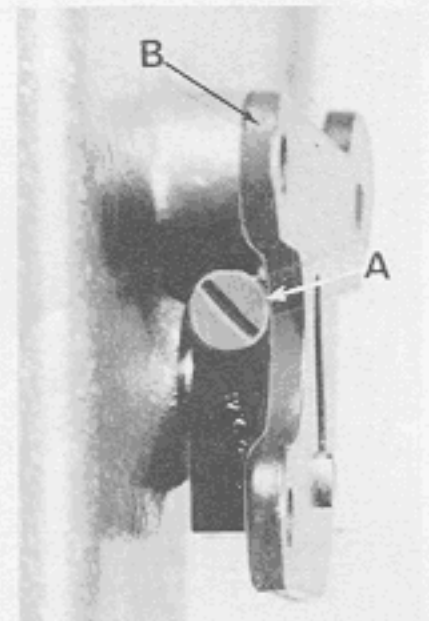


Fig. 14

SETTING HEIGHT OF PRESSER BAR

The height of the presser bar (A, Fig. 15) is set correctly if it is possible to remove the presser foot when the foot lifter lever (B, Fig. 14) is fully depressed. Also there should be approximately 1/16 inch (1.59 mm) clearance between lower surface of the presser bar connection and guide (B, Fig. 15) and the bottom surface of head opening in the bed when the foot lifter lever is released and the presser foot resting on the throat plate, with the feed dog down below the throat plate.

If adjustment is needed, turn handwheel in operating direction until the needle bar is in the low position and loosen screw (C). Then, while holding presser foot down on the throat plate surface, pry up presser bar connection and guide with a screwdriver to obtain the 1/16 inch (1.59 mm) setting and tighten screw. Check setting by turning handwheel so that needle bar is in its high position and see if presser foot can be removed as mentioned in previous paragraph.

SETTING THE PRESSER FOOT

Remove both needles (D, Fig. 15) and put presser foot (E) on to the presser bar (A), if not already in place. Do not tighten the clamp screw (F). It should be able to move freely on the presser bar. Place a piece of fabric in the machine to be corded and operate the machine. This will allow the presser foot to find its true position with respect to the guide on top of the throat plate. Now tighten the presser foot clamp screw. Replace the needles and check for clearance in needle hole in presser foot.

PRESSER FOOT PRESSURE

Regulate the presser spring regulating screw (A, Fig. 16) so that it exerts only enough pressure on the presser foot to feed the work uniformly when a slight tension is placed on the fabric. This is the knurled screw, located directly behind the needle bar in the head of the machine. Turning it clockwise increases the pressure, counterclockwise acts the reverse.

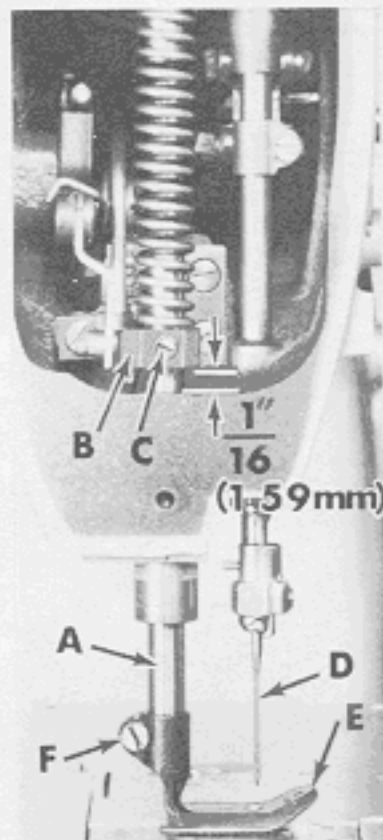


Fig. 15

SETTING NEEDLE THREAD TAKE-UP WIRE AND FRAME EYELET

Set the needle thread take-up wire (B, Fig. 16), located adjacent to the needle bar thread eyelet (C), so that its upper surface is even with the top of the holes in the needle bar thread eyelet when the needle bar has completed its downward stroke. Lower this setting for a smaller needle thread loop, and raise it for a larger loop. Set the needle thread frame eyelet (D) so that the eyelet hole is 3/4 inch

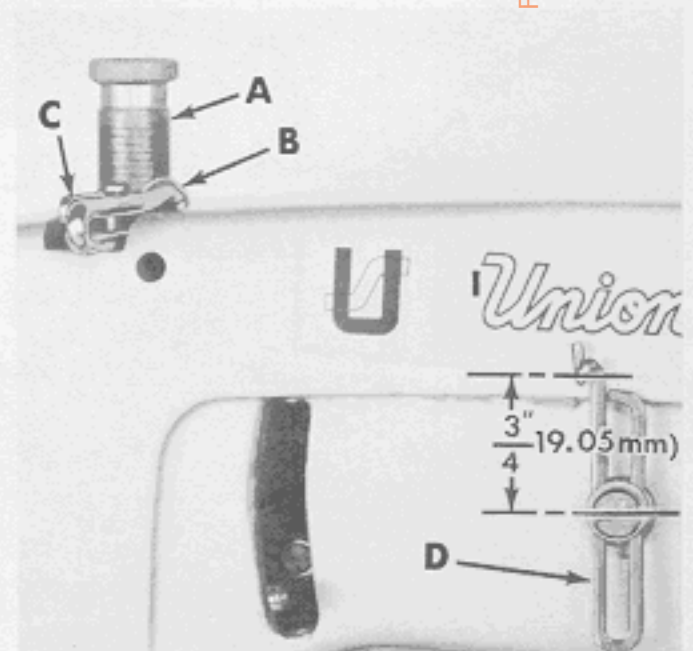


Fig. 16

(19.05 mm) above the attaching screw (Fig. 16).

THREADING

Draw the looper and needle threads into the machine and start operating on a piece of fabric. Refer to threading diagram (Fig. 3).

THREAD TENSIONS

Pull the needle thread through the eyelets and set the needle thread tension to produce uniform stitches on the under surface of the fabric.

The looper thread tension should be set so that the tension on the looper thread is just sufficient to steady the thread.

SETTING THE LOOPER THREAD RETAINING FINGER

The looper thread retaining finger (A, Fig. 17) located on the cast-off support (B) controls the amount of slack thread in the system and can be moved to any position. It should be set laterally so that it is midway between the two discs of the take-up (C) and the tip parallel with the discs.

The height and the lateral adjustment of the retaining finger affects the control of the looper thread as the looper moves to the left.

More looper thread is given to the stitch when the retaining finger is raised and set toward the takeup. However, if it is raised too high, the looper thread triangle may be wiped under the blade of the looper, causing triangle skips or pulled down stitches. This can be checked by observing the action of the looper thread as the looper moves to the left.

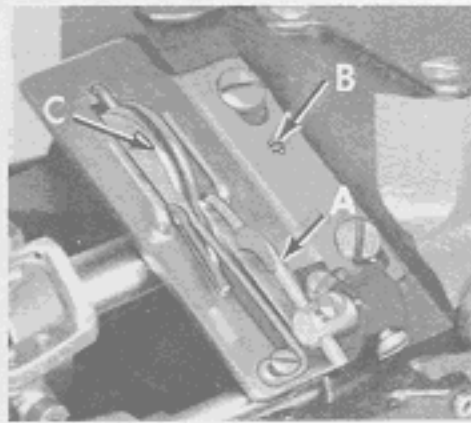


Fig. 17