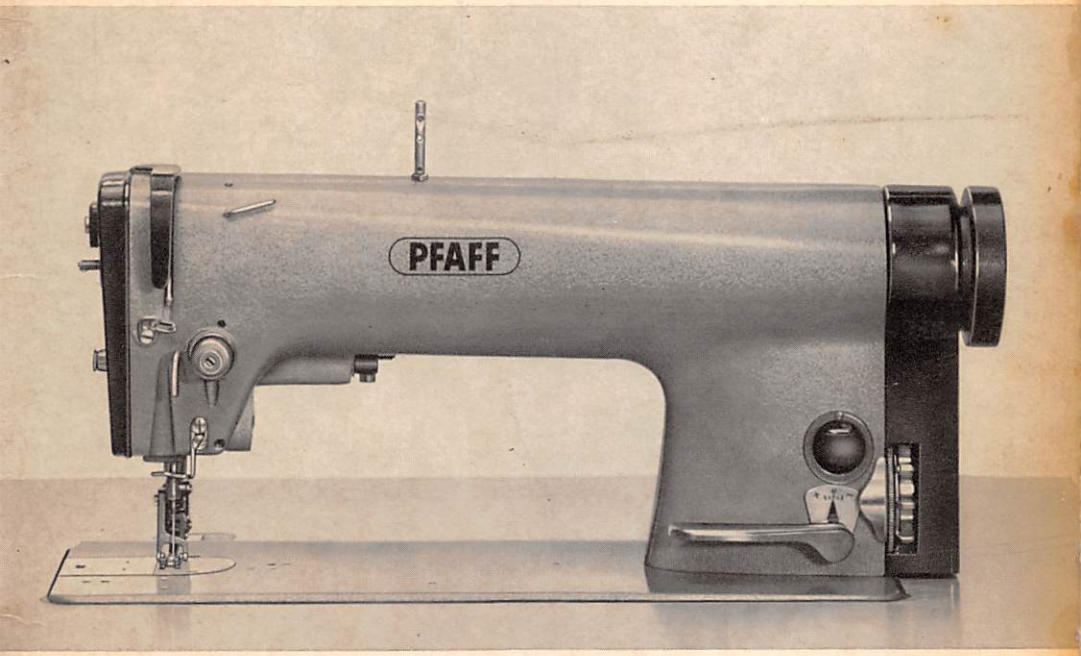
PFAFF®

467



R 9213

Instruction Book

and

Service Manual

PFAFF® 467

High-Speed Lockstitch
Sewing Machine Equipped
with Drop Feed and
Variable Top Feed

Instruction Book
and
Service Manual

G·M·PFAFF AG · KAISERSLAUTERN BRANCH

Foreword

This instruction book contains much valuable information about the Pfaff 467 high-speed sewing machine. Though not intended as a full-scale textbook capable of answering all questions related to sewing exhaustively, it offers sufficient information on the construction, function and operation of the various mechanisms to enable every operator to get to know her machine and attain maximum efficiency as quickly as possible.

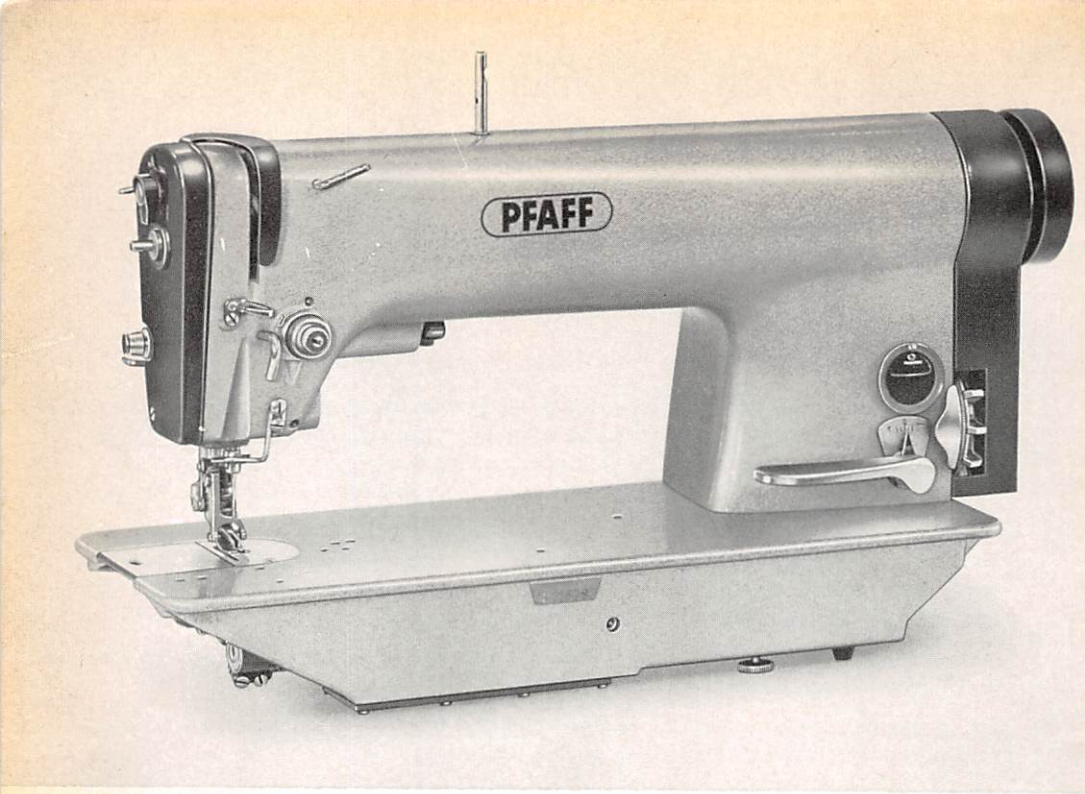
Since the Pfaff 467 is equipped with variable top feed which can be set so as to eliminate any creep of the top or bottom ply in stitching "problem" materials, the chapters dealing with the operation of the top feed control should be studied very carefully.

A special Service Manual is available for Pfaff machines 467-900 fitted with automatic needle positioner and thread trimmer (Order No. 12310).

The incorporation of an automatic needle positioner and thread trimmer eliminates many time-wasting motions and, thus, affords notable advantages. The operator has both her hands free to manipulate the work and can achieve a much higher output of work without tiring so soon.

The instructions for mechanics contained in the second part of this book will be welcomed by all who service our machines in the field because the additional mechanisms incorporated in the Pfaff 467 make greater demands on the mechanical skills of assemblers and adjusters alike.

G. M. PFAFF AG



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A. Operating Instructions

1. Brief Description

The Pfaff 467 is a high-speed lockstitch sewing machine which is specially designed for joining multiple plies of "problem" materials so that they will finish out evenly. It is chiefly employed for the production of light clothing and outerwear.

For this reason, it is fitted with drop feed and an additional vibrating presser which can be set to make the same, a shorter or a longer stroke than the feed dog, as appropriate.

Thanks to the incorporation of maintenance-free anti-friction bearings, pad lubrication in the gear case, gravity hook lubrication, and reservoir lubrication for the needle bar bearings, the time required for machine care is extremely low.

2. Varieties

To suit different requirements, the Pfaff 467 high-speed seamer can be converted to one of the following varieties by simply exchanging the sewing organization:

Model	Needle Hole Dia. in mm	Max. Stitch Length in s.p.m.	Needle Size in $^{1}/_{100}$ mm	Machine Speed in r.p.m.	Motor Order No.	Pulley Dia. in mm	Needle System
A (1.0)	1.0	5½	60	4,200	16-437 080-55	95	134
A Standard	1.2	5½	70	4,200	16-437 080-55	95	134
A (1.4)	1.4	5½	80	4,200	16-437 080-55	95	134
B Standard	1.6	5½	90–100	4,200	16-437 080-55	95	134
B (1.8)	1.8	5½	100; 110	4,200	16-437 080-55	95	134

3. Mounting the V-Belt

The machines are shipped with the belt guard removed. To mount the V-belt, lift the sewing head slightly and place the belt on the machine and motor pulleys.

Slightly turn out screws **a 1** and **a 2** (Fig. 1) and push the two belt guard sections together, holding them close to the arm standard so that the above screws enter the appropriate slots in the back wall of the belt guard.

To tighten these screws, insert the screwdriver through openings **b 1** and **b 2** (Fig. 1 a).

Both belt guard sections are secured to the arm standard by inserting screw **d** through hole **b 3** and spacing sleeve **c** in the rear section and into screwhole **d 1** in the machine base and tightening it securely.

Fig. 1 R 9145

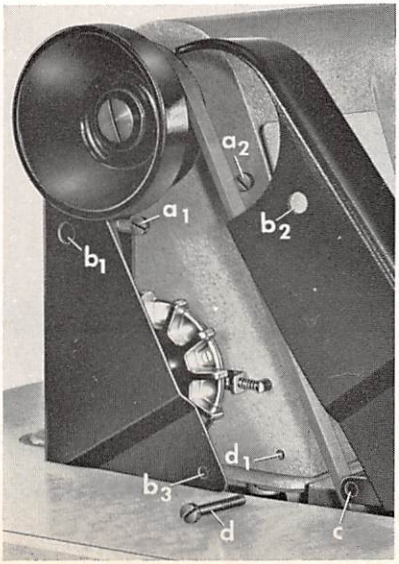
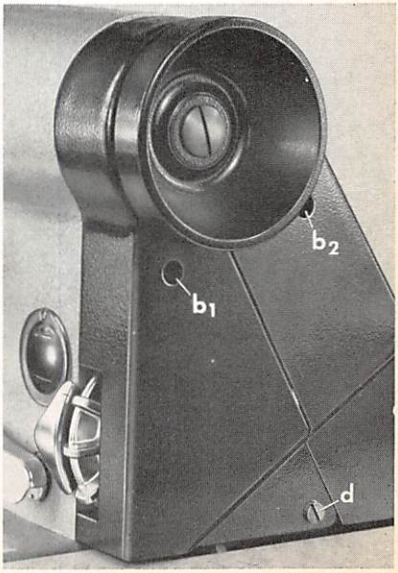


Fig. 1 a R 9144



4. Test-Running the Machine

Before you test-run the machine, carefully remove all dirt which may have accimulated in transit. Be sure to use only a brush and a cleaning rag for this purpose.

The Pfaff 463 must never be rinsed or cleaned with kerosene because there is a danger that the cleaning fluid enters the sealed-for-life bearings and dissolves the grease. For the same reason, kerosene or gasoline must not be used for regular cleaning of the machine.

Never attempt to eliminate hard working of the machine by squirting oil freely into the bearings which you believe to be responsible for this fault. If oil enters the sealed-for-life bearings, the grease will be thinned and flung out of the bearings, thus rendering permanent lubrication ineffective.

Before you connect the machine to the electric circuit, check to see that the line voltage is the same as that indicated on the rating plate of the motor, and that the motor pulley turns in the right direction. If the pulley turns in the wrong direction, merely exchange two wires in the motor terminal box.

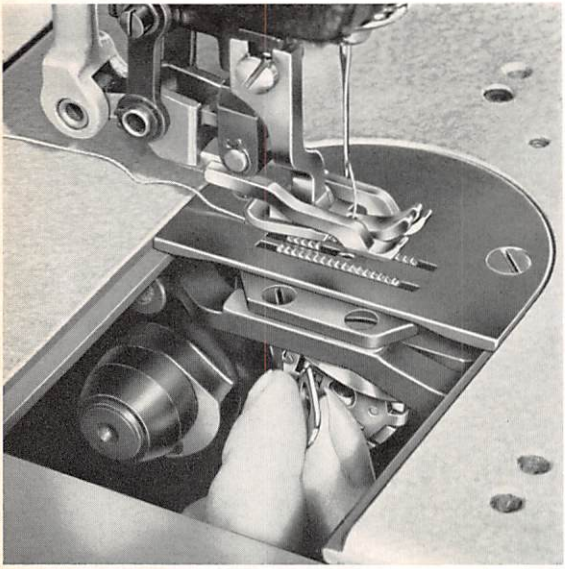


Fig. 2

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5. Removing the Bobbin Case

Raise the take-up lever to its highest position and open the bed slide so that you can see the sewing hook. Open the bobbin case latch with the nail of your left thumb and pull out the bobbin case by holding the latch with thumb and forefinger, as shown in Fig. 2.

While you hold the bobbin case by its open latch, the bobbin cannot fall out (Fig. 3).

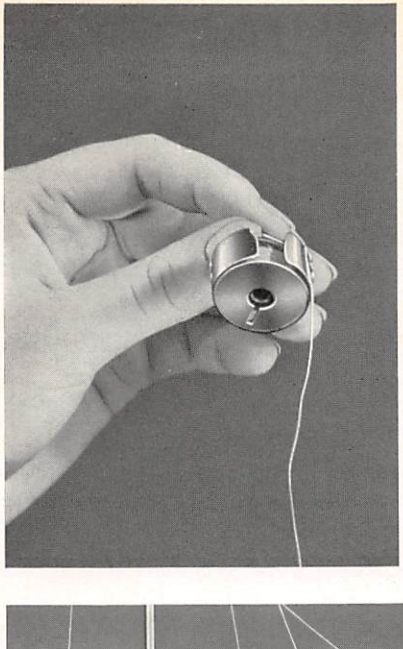

Fig. 3

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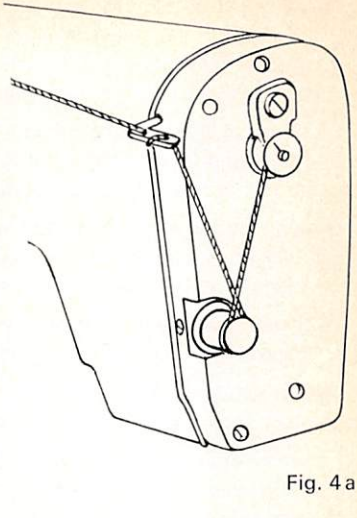

Fig. 4a

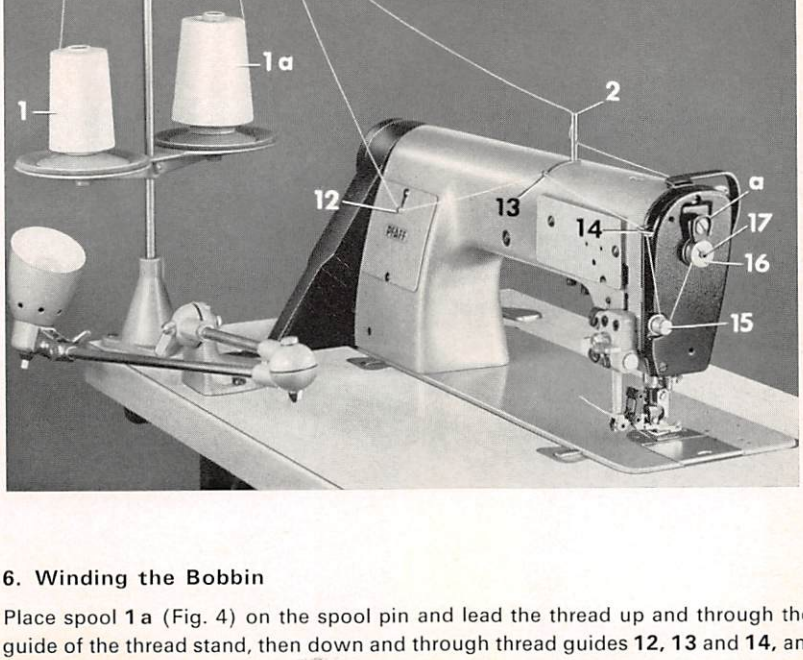

Fig. 4

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6. Winding the Bobbin

Place spool **1a** (Fig. 4) on the spool pin and lead the thread up and through the top thread guide of the thread stand, then down and through thread guides **12, 13** and **14,** and clockwise around thread retainer **15** (Fig. 4a). Wind a few clockwise turns of thread on bobbin **16** and place the bobbin on spindle **17** so that the key at its base enters the slot in the bobbin.

To engage the bobbin winder, simply depress stop latch **a** (Fig. 9) while the machine is running. This action causes the bobbin winder spindle to shift slightly to the right in which position it is retained until a sufficient amount of thread has been wound on the bobbin. The thread wound on the bobbin pushes the latch up and thereby stops the bobbin winder.

The amount of thread to be wound on the bobbin can be regulated by loosening screw **b** and setting stop latch **a** higher or lower, as may be required. Set the stop latch higher for more thread, or lower for less thread.

Depending on the type of thread used, the thread should be wound tighter or looser. The thread tension is regulated by turning thumb nut **18** back of the tension discs (Fig. 9). Turn the nut clockwise for a looser tension, or counter-clockwise for a tighter tension.

If the thread should pile up at one end of the bobbin, adjust the position of the tension stud. The set screw securing this stud in position can be reached from the left.

Whenever you have removed an empty bobbin from the machine, wind a few turns of thread on it, place it on the bobbin winder spindle and start the winder.

It is a waste of time to work with a single bobbin because the bobbin winder can be thrown into action only when the machine is running and the needle has to be unthreaded and rethreaded when the machine idles while winding the bobbin.

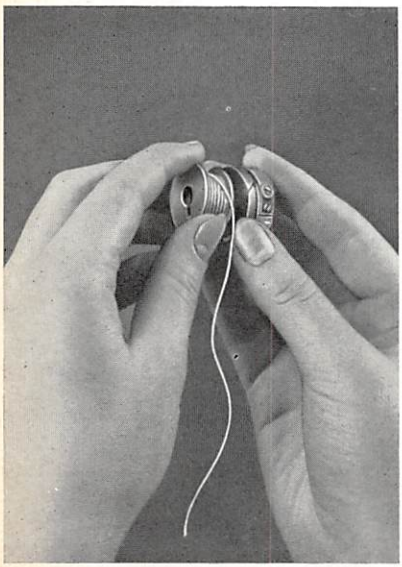


Fig. 5 R 5867

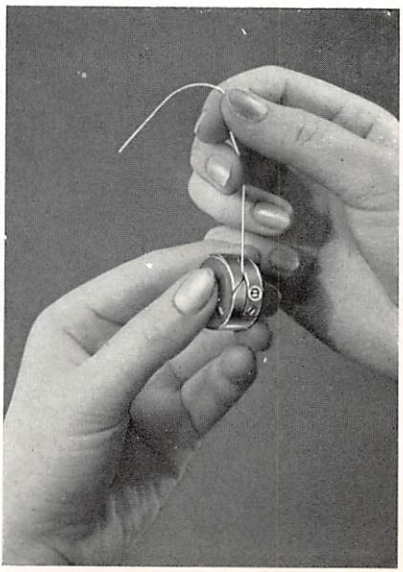


Fig. 6 R 5869

Fig. 7 R 5870

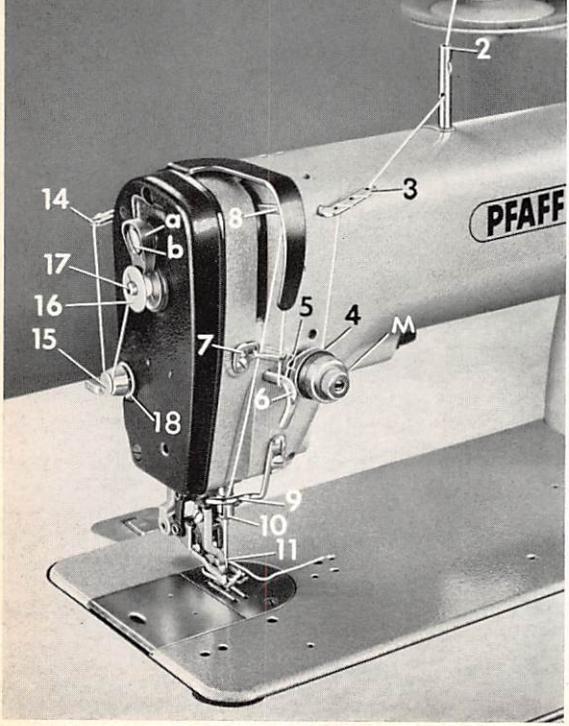
7. Threading the Bobbin

Insert a full bobbin into the bobbin case so that the thread draws on the top from the left toward the right (Fig. 5). Hold the bobbin firmly in the bobbin case, pull the thread into the slot (Fig. 6) and draw it under the tension spring and into the delivery eye (Fig. 7). Turn the bobbin case so that the end of the latch points toward you, and place it on the center stud in the bobbin case base. Press against the bobbin case until you hear it snap into place. Failure to observe this precaution may result in bobbin case or needle breakage.

8. Threading the Needle

Because of the high speed of this machine it is specially important that the thread passes to the needle smoothly. Lead the thread from spool **1** up to the top thread guide of the thread stand and down to thread guide **2** (Fig. 9), then from top to bottom through the vertical hole in thread guide **2** and next through the transverse hole, as shown in Fig. 8. This is absolutely necessary in order to prevent the thread from snarling up on the thread guide and breaking. Now pass the thread through thread guides **3** through **10**, and thread needle **11** from left to right, as illustrated in Fig. 9.

Fig. 9 R 9449



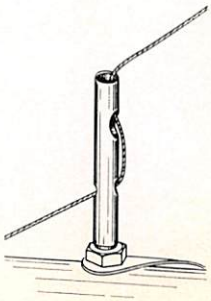


Fig. 8

9. Drawing Up The Bobbin Thread

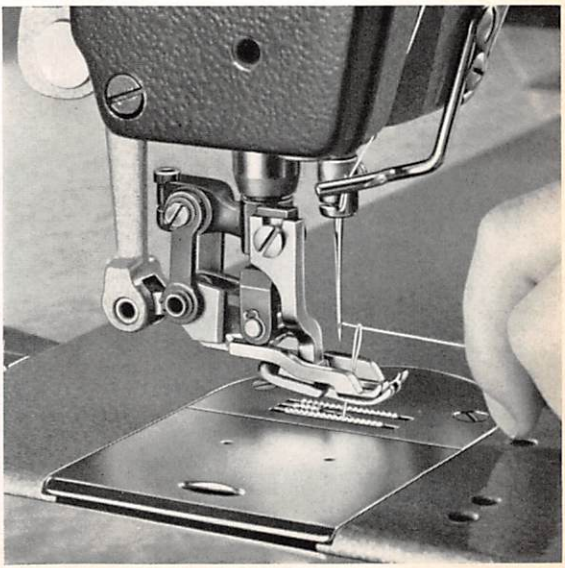
Hold the end of the needle thread and turn the balance wheel toward you until the needle moves down and up again. Lightly pull the needle thread to draw the bobbin thread up through the needle hole (Fig. 10). Lay both threads back under the presser foot.

Fundamentals of Machine Operation

Always turn the balance wheel until the take-up lever is at its highest position before you begin and after you have completed a seam. Failure to observe this rule may cause the thread to jam in the raceway of the sewing hook or slip out of the needle eye. If the take-up lever is at the top of its stroke, there is no need to hold both threads when sewing commences.

On special request, the Pfaff 467 can be supplied in subcl. -900 fitted with automatic needle positioner and thread trimmer which reduces handling time to a minimum. Switching the machine from forward the reverse sewing, raising or lowering the needle and trimming the threads, all are controlled by foot action, thus eliminating all superfluous motions, such as reaching for the balance wheel or the feed regulator lever and pulling up, positioning, holding or trimming the threads.

Fig. 10



R 9458

10. Regulating the Thread Tensions

The proper regulation of tensions is very important with the Pfaff 467 because this machine is chiefly intended for intricate sewing jobs requiring different feed settings. It greatly affects the neat appearance of the finished seam and its durability.

As a rule, both tensions should be set as light as possible in order to avoid puckering on "problem" materials.

Both tensions are correctly balanced if the needle and bobbin threads interlock in the center of the material, as shown in Fig. 11.

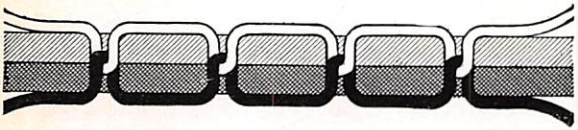


Fig. 11

The needle thread tension is increased by turning tension nut **M** (Fig. 12) in, and decreased, by turning it out.

The bobbin thread tension is regulated by means of the small hook screwdriver. Turn tension screw **X** in for more tension, or out, for less tension (Fig. 13).

The tension should be regulated according to the material to be sewn. Check to see that the stitches are tightly set, without causing seam puckering, and lie in a straight line.

Fig. 12 R 9155

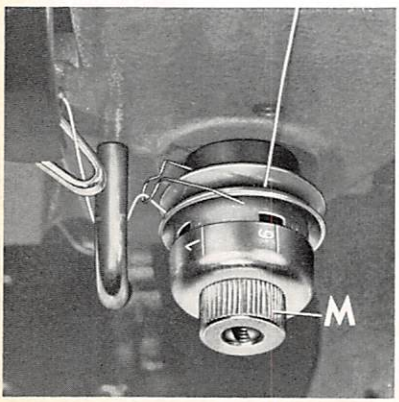
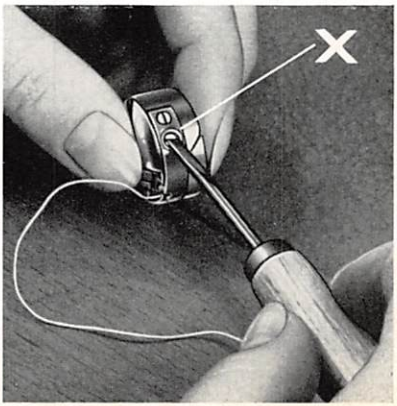


Fig. 13 R 6946



The grade of thread used plays an important part in meeting these requirements. Sheer fabrics call for a thin and soft thread, while stiff and resistant threads, because of their low resilience, are unsuitable for almost any fabric.

You will have to have a little experience in order to be able to tell which tension needs adjustment when you come across a seam as the one shown in Fig. 14. Here, the upper tension may be too tight or the lower tension too weak. In Fig. 15, the upper tension may be too weak or the lower tension too tight.

Fig. 14

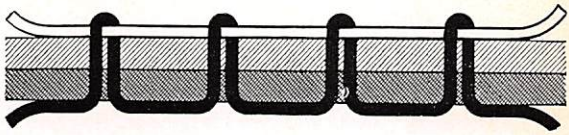
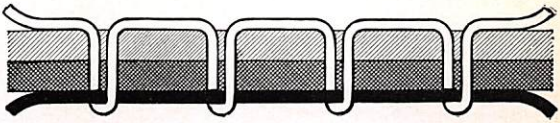


Fig. 15



To determine the correct bobbin thread tension, hold the thread end between thumb and forefinger and let the bobbin case hang freely. The tension should be strong enough to keep the bobbin case from being pulled down by its own weight. However, as you jerk your hand slightly, it should gradually slide down. Once the lower tension has been set correctly, the upper tension can be regulated accordingly.

If, after the lower tension has been set correctly, the thread should form small knots or kinks on top or bottom of the fabric, this condition can be corrected by adjusting the needle thread tension.

Always lower the presser bar lifter before you adjust the upper tension. When the presser bar is raised, it will automatically release the tension.

11. Regulating the Stitch Length

The maximum stitch length of the Pfaff 467 is 5½ per inch, or 4.5 mm.

The stroke of both the vibrating presser and the feed dog is regulated by turning stitch length control **n** after disengaging locking disc **o** (Fig. 16). On Pfaff 467 machines, the vibrating presser and the feed dog advance the material at the same rate only when pointer **z** is set on **0** (Fig. 16).

Depress finger-tip control **p** to reverse the direction of feed for backtacking the end of the seam.

n = Stitch length control
o = Stitch length locking disc
p = Reverse feed control
z = Top feed pointer

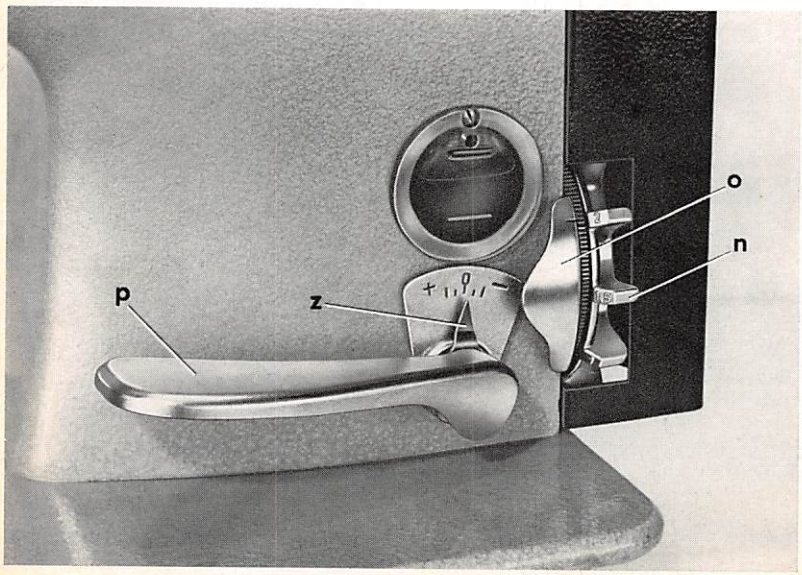


Fig. 16

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12. Varying the Top Feed Stroke

Depending on the type of work being performed, the stroke of the vibrating presser is increased or decreased in relation to the stroke of the feed dog by turning thumb screw **A** (Fig. 17) which is located under the bedplate. For easy identification, this screw has a concave surface.

Before varying the stroke of the vibrating presser by hand, thumb screw **B** should be turned out as far as it will go. Screw **B** is the same size as screw **A**, but differs from screw **A** in that it has a convex surface.

Turn in screw **A** to increase the stroke of the vibrating presser, or turn it out, to decrease it.

As screw **A** is turned in, pointer **z** swings to the left (toward +) and the top ply is gathered. It should be noted, however, that screw **A** must not be turned in beyond the point at which reverse feed control **p** begins to swing downward. This is the point at which the stroke of the feed dog, which is identical with the stitch length, begins to grow shorter.

When turning screw **A** out, pointer **z** swings to the right, (toward –) and the top ply is stretched (Fig. 16).

By decreasing the top feed stroke and thereby retarding the feeding of the top ply it is possible to gather the bottom ply to some extent.

It should be noted that screw **A** cannot be turned in when the machine has been set for its maximum stitch length of 5½ per inch, or 4.5 mm.

Thumb screw **B** serves to limit the stroke of the vibrating presser and is used when this stroke is varied by foot action while sewing. Thumb screw **A** determines the length of travel of the vibrating presser when the small treadle is inoperative, i.e. the more screw **A** is turned out, the shorter the stroke of the vibrating presser will be. As the tip of the small treadle is depressed, the stroke of the vibrating presser increases until it reaches its maximum of about $^{3}/_{16}$", or 4.5 mm, when the treadle is depressed completely. By turning thumb screw **B**, the stroke of the vibrating presser can be limited, as desired. Depressing the heel of the treadle switches the machine to reverse sewing. To backtack the end of a seam, press down the tip of the right treadle and briefly tip on the heel of the small treadle.

Varying the top feed stroke by foot action from gathering the bottom ply, to feeding both plies at the same rate, to gathering the top ply can be done after thumb screws **A** and **B** have been turned out completely. Thanks to the clear view of the top ply and the top feed regulator scale, controlling the top feed motion by foot action is not exactly difficult, but nevertheless calls for some skill on the part of the operator.

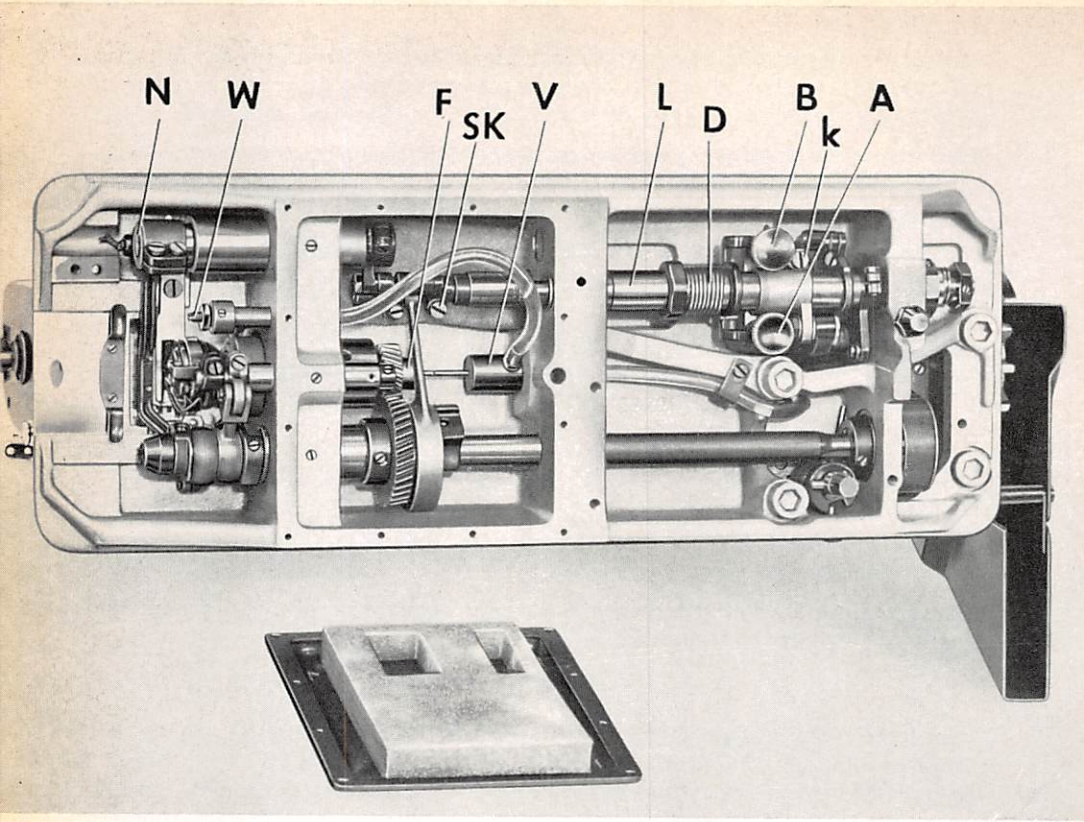


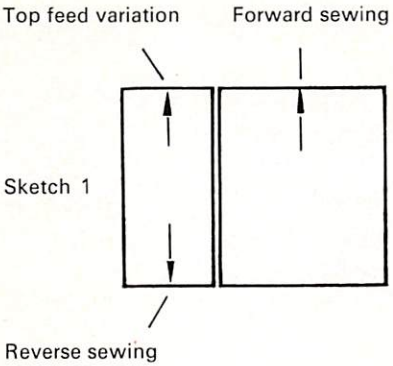
Fig. 17 Worm's eye view of the Pfaff 467 with gear case cover removed R 9385

A = Top feed regulating screw
B = Top feed limiting screw
D = Regulating crank torsion spring
F = Centrifugal switch for shut-off valve V
L = Lower top feed regulator shaft
N = Feed rock shaft crank
V = Oilflow shut-off valve
W = Hook lubrication regulating screw
k = Regulating crank clamp screw

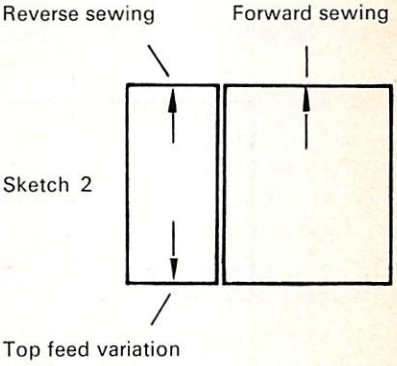
13. Treadle Operation

The Pfaff 467 is regularly supplied with two treadles which enable the operator to vary the stroke of the vibrating presser while sewing and to reverse the direction of feed by foot action.

The standard version of this treadle assembly is shown in sketch 1. If desired, the functions performed by the left treadle can be reversed, as shown in sketch 2.

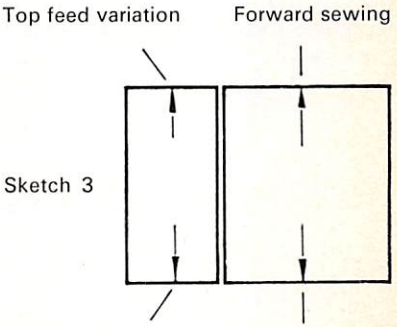


Sketch 1



Sketch 2

The only way to switch Pfaff machines 467-900 with automatic needle positioner and thread trimmer from forward to backward sewing is by depressing finger-tip control **p** (Fig. 16) by hand. Sketch 3 illustrates how the stroke of the vibrating presser, is varied, the needle raised and lowered and the threads trimmed by foot action.

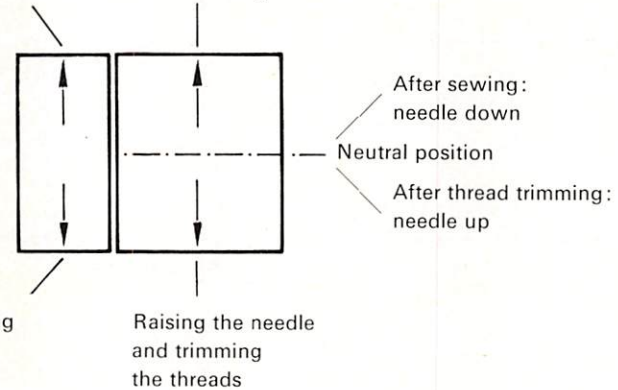


Sketch 3

The addition of new functions and the advantage afforded by combining all functions in one treadle have necessitated a redistribution of these functions on both treadles.

Pfaff 467-900/2 machines are so designed that sewing and thread trimming, the two most important phases of machine operation, are controlled by the right treadle. Varying the stroke of the vibrating presser and reversing the direction of feed, like on machines having no automatic thread trimmer, are controlled by the left treadle. In this case, the top feed variation may be controlled by depressing the tip or heel of this treadle, as desired.

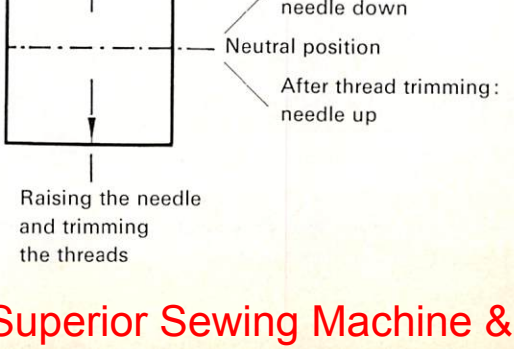
The various possibilities existing are illustrated in sketch 4 below:



Sketch 4

The above foot control is identified by subcl. -900/2 and is our standard version.

Since in many instances there is no need to vary the stroke of the vibrating presser while sewing, the Pfaff 467, on special request, can be supplied in subcl. -900/1 fitted with a single treadle. In this case, the stroke of the vibrating presser must be set by hand before sewing commences and the machine switched from forward to backward sewing by operating the reverse feed control by hand. This simplified foot control is illustrated in sketch 5.



Sketch 5

If the machine is fitted with an additional inching device, this device is attached to the Stop motor and controlled by depressing the treadle for forward sewing. When the tip of this treadle is depressed slightly, the inching device is energized for slow stitch-by-stitch sewing. As you continue to press down the tip of the treadle, the sewing speed increases until top speed is attained. If you want to sew at high speed right away, quickly press the tip of the treadle down as far as it will go.

When you have to turn a corner or sew an intricate section of the seam, relieve the pressure on the treadle until the inching device the pressure on the treadle until the inching device becomes operative and the machine sews stitch by stitch.

If you allow the treadle to return to its neutral position, the needle of subcl. -900/1 and -900/2 machines is lowered automatically. To bring the needle of a subcl. -900 machine to its lowest position, press down the heel of the right treadle. The work can then be turned and sewing be resumed.

After sewing has been completed, depress the heel of the right treadle on subcl. -900/1 and -900/2 machines, or the heel of the left treadle on subcl. -900 machines. This action causes the needle to be raised to its highest point and both threads to be trimmed to the proper length.

When the treadle is returned to its neutral position after the threads have been trimmed, the take-up lever remains at its highest point and the needle is positioned about $^{5}/_{16}$", or 8.0 mm, above the needle plate.

The work can now be easily removed and new work be inserted.

Machines fitted with automatic thread trimmer can be switched from full speed to thread trimming without slowing the machine down first.

Raising the Needle without Thread Trimming

Machines fitted with needle positioner and automatic thread trimmer can, in addition, be equipped with a knee lever which raises not only the presser foot, but also the needle, without initiating the thread trimming action.

On these machines, a light pressure against the knee plate raises the presser foot and a stronger pressure exerted subsequently also raises the needle to its highest point so that the work can be re-positioned.

14. Lifting the Presser Bar

Both the vibrating presser and the presser foot are mounted on the presser bar.

The presser bar lifting mechanism is enclosed in the machine arm. To mount the knee lever, push it over the lower end of vertical shaft **r** under the tabletop. The lever is held in place by angular bracket **s** which snaps into place after transverse driving pin **u** has entered cutouts **t** in right-angled coupling sleeve **q** (Fig. 18).

When the coupling sleeve is pushed onto the end of the shaft, resilient bracket **s** must be compressed to open it slightly.

Motion is transmitted from the vertical shaft to the presser bar by means of a crank, a connection and a bellcrank lever which raises the presser bar. A small hand lever at the back of the machine (Fig. 20) serves to lock the vibrating presser and the presser foot in their highest position. This lever is flicked to the left to retain the presser bar after it has been raised by knee action.

To facilitate the tilting back of the sewing head without removing the knee lever completely, the knee lever rock shaft is no longer screwed to the angular sleeve, but rather held in place by a spring-loaded pin **v** (Fig. 18) so that the knee lever can be pulled forward off its shaft with a slight jerk.

A new feature of the knee lever is its hinged foam-plastic-padded knee plate which is contoured to hug the operator's knee.

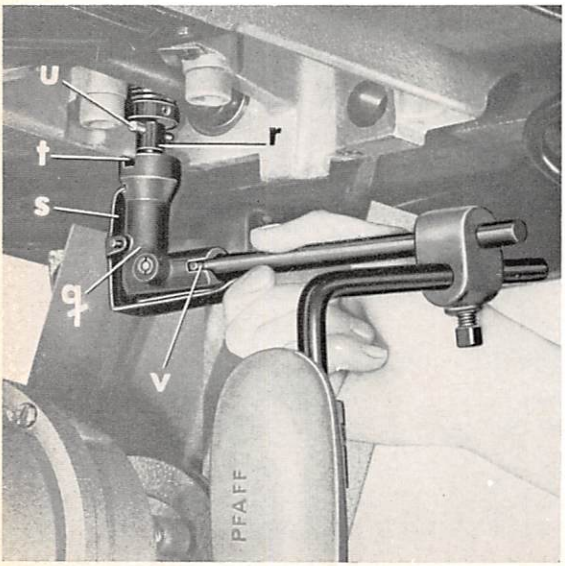


Fig. 18

R 9158

15. Regulating the Pressure on the Material

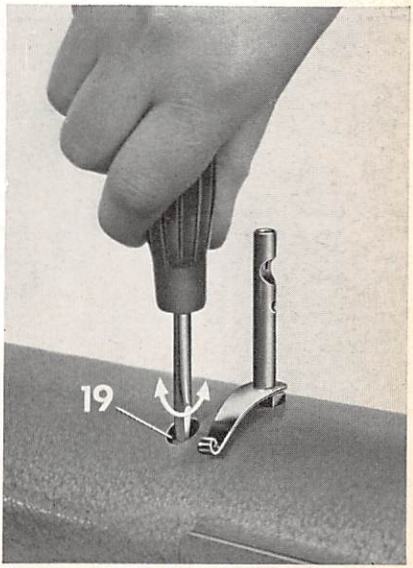
The amount of pressure to be exerted by the vibrating presser and the presser foot on the material in order to ensure smooth feeding must be adapted to the thickness and the nature of the fabric.

In our high-speed seamers, the conventional spiral spring has been replaced by a long flat spring which is incorporated in the machine arm and exerts a resilient and easily regulated pressure on the presser bar.

The pressure on the material is regulated by turning a long set screw which can be reached by inserting a short screwdriver through aperture **19** (Fig. 19) back of the spool pin.

Turn the regulating screw in for more pressure, or out, for less pressure.

Fig. 19



R 9147

16. Selecting the Correct Needle

Pfaff machines 467 in Models A and B use System 134, round-shank needles having a shank diameter of $^{5}/_{64}$", or 2.0 mm.

Insert the needle into the opening of the needle bar and push it up as far as it will go. Make sure the short groove faces toward the right.

The appearance of the finished seam is dependent on the correct relationship between needle, thread and fabric. Lightweight fabrics should be sewn with a thin needle in order to avoid ugly needle marks. When thick thread is used in a thin needle, the thread is likely to break. Thin thread used in a thick needle may cause skipped stitches.

Select the proper needle and thread sizes from the chart below:

Needle Size	Cotton	Silk	Synthetic
70–80	100	100	120–100
80–90	80	80	90–80
90–100	70	60	70–60
100–110	50	50	50
110–120	35	40	40

Be sure to buy branded needles only. Never use rusty needles.

Only superfinished needles ensure trouble-free sewing and prevent thread breakage. Rough-surfaced needles tend to overheat quickly and burn the thread. This is particularly true of synthetic threads which are very sensitive to heat and fuse easily.

For stitching synthetic threads, we recommend that you use superfinished, chromium-plated needles which may be obtained from us.

17. Machine Care

Although the Pfaff 467 is equipped with sealed-for-life anti-friction bearings, an automatic hook lubrication system and pad lubrication in the gear case and, thus, requires little additional maintenance, several bearings nevertheless have to be carefully lubricated by hand.

To oil the needle bar bearings, remove the face cover and put a few drops of oil into the foam-plastic-lined dents **x** and **y** (Fig. 20) on the upper and lower needle bar bushings. This should be done once or twice a week, depending on how many hours the machine is in operation each week. Occasionally put a few drops of oil on the presser bar felt washer.

Fig. 20

R 9447

Oil should also be applied to the top feed drive joints and to the oiling points marked by arrows in Fig. 40.

The oil level in the hook lubrication system can be inspected through the oil sight glass. If it is below the mark, top up the reservoir by inserting the spout of the oil can into the aperture at the top of the oil sight glass. Make sure the oil level does not rise above the red mark. Any quantity of oil in excess, or short, of the proper amount may cause irregularities in the oilflow.

If oil bubbles should occur in the hook oilline or the oilflow to the sewing hook has to be adjusted, call your maintenance man.

In order to ensure trouble-free sewing, form the habit of tilting the machine back once a day and removing the lint that has accumulated between feed dog and needle plate and in the vicinity of the sewing hook, using a brush for this purpose.

When you oil the needle bar bearings, take a brush and remove the dust which has accumulated at the needle-bar end of the machine. In this way, you prevent the particles of dressing which, in most instances, contain plastic, from mixing with the oil and forming an undesirable film on the parts.

The machine should be cleaned with a dry, soft rag on the underside regularly.

B. Service Instruction

18. The V-Belt Drive

When mounting the V-belt for the first time, care should be taken that it is not forced onto the motor pulley because a distorted belt wears out rapidly.

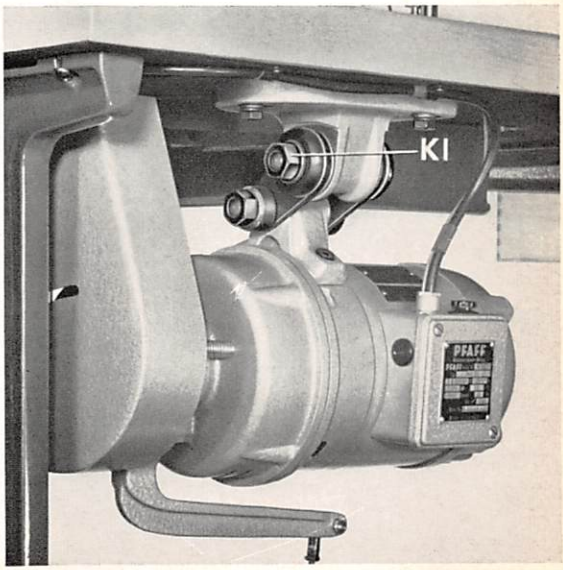
The various motors used to drive the Pfaff 467 are standard motors conforming to German DIN 42691 specifications. They are pivotally connected to the motor bracket by means of a hinge bolt and, after loosening nut **KI** or a screw, can be swung to any position that may be required to tension the belt correctly (Fig. 21).

Although the anti-friction bearings incorporated in the new high-speed seamers are designed to withstand great stress and eliminate the risk of excessive heating or seizing of the machine, we urge you to adjust the V-belt tension so meticulously that the belt is neither too tight nor too loose because both conditions may cause excessive wear.

There is no hard-and-fast rule for tensioning the V-belt, but it may be assumed that the belt tension is correct, if you can compress the belt about ¾ of an inch midway between both pulleys.

Tighten the hinge bolt nut or the binding screw on the motor bracket so that it will not come loose while sewing. A motor that hangs in the V-belt freely greatly reduces the service life of the V-belt.

Fig. 21



R 9157

19. Timing the Check Spring

The thread check spring serves to assist the take-up lever in taking up the slack thread which occurs as the lever descends, but is not yet required for the formation of the stitch. The downward stroke of the thread check spring is limited by a stop on the check spring regulator and can be adjusted by turning the regulator, as appropriate.

On the new high-speed seamer, the thread check spring regulator can be turned easily after loosening set screw **k** (Fig. 34) on the underside of the tension barrel. In order to be able to time the thread check spring correctly right away, without trying out different settings first, you must be fully conversant with its function.

The thread check spring is correctly timed if it is through acting when the needle reaches the goods.

To increase or decrease the check spring tension, simply turn the tension stud in the tension mechanism. Turn it clockwise to increase the tension, or counter-clockwise, to decrease it.

If turning the tension stud with a screwdriver should prove impossible, loosen screw **k** (Fig. 34) and take out the complete tension mechanism. Slightly loosen the set screw at the rear end of the thread check spring regulator. Then readjust the stroke of the spring meticulously.

20. Setting the Needle Bar at Correct Height

The needle and hook motions must be properly synchronized in order to obtain a perfect seam. The proper timing of both motions requires utmost accuracy.

Correlating the needle and hook motions so as to ensure proper loop formation normally is referred to as "adjusting the needle rise".

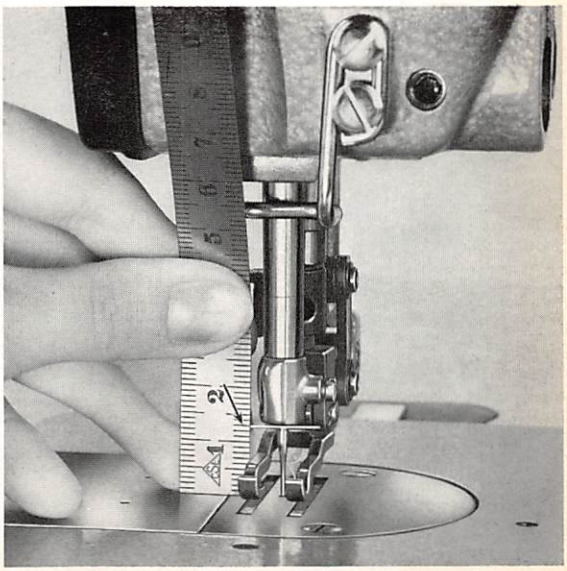
If the amount of needle bar rise must be reset, for instance, after the needle bar has been exchanged, begin by roughly setting the needle bar to the correct position as follows: Loosen the needle bar set screw, move the needle bar connecting link to its lowest position, and set needle the bar so that its bottom end is about $^1/_2$", or 13.0 mm, above the top surface of the needle plate (Fig. 22).

The amount of needle rise required to form the loop on Pfaff 467 machines, i.e. the distance by which the needle has to rise from the lowest point of its stroke, normally is about $^1/_{16}$", or 1.8 mm.

To set this amount correctly, it is recommended that you use the all-purpose gauge supplied by us (Order No. 91-129604-01).

Turn the balance wheel until the needle bar has reached the lowest point of its stroke. Slip the gauge onto the needle bar, pushing it against the lower needle bar bushing. Place clamp No. 880137/00 on the needle bar, push it up against the gauge and screw it down (Fig. 23). This done, pull out the gauge and cautiously turn the balance wheel in sewing direction until the clamp strikes the needle bar bushing. Now begin to time the sewing hook.

Fig. 22



R 9470

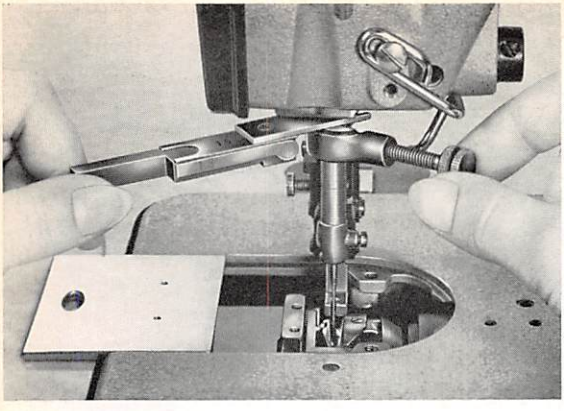


Fig. 23

R 9537

21. Timing the Sewing Hook

When the needle has passed the lowest point of its stroke and risen $^1/_{16}$", or 1.8 mm, to form the needle thread loop, the point of the sewing hook should be opposite its center line and $^1/_{32}$", or 0.8 mm, above the top of the needle eye.

If adjustment is required, remove the needle plate and loosen hook set screws **1** and **2** (Fig. 24). Then turn the sewing hook on its shaft, as may be required to meet the above condition.

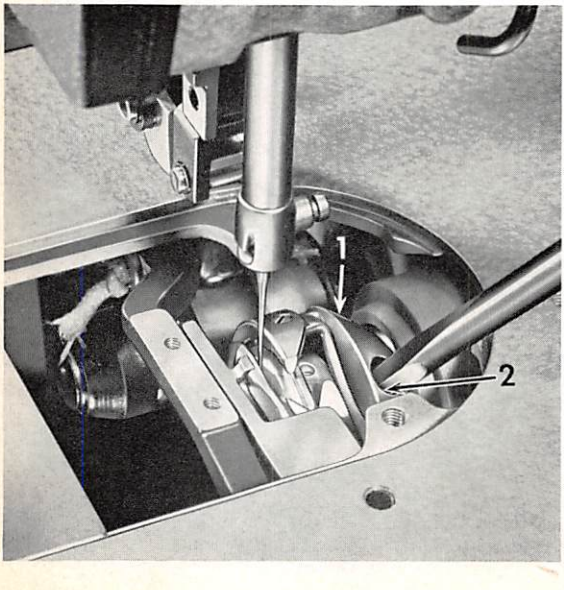


Fig. 24

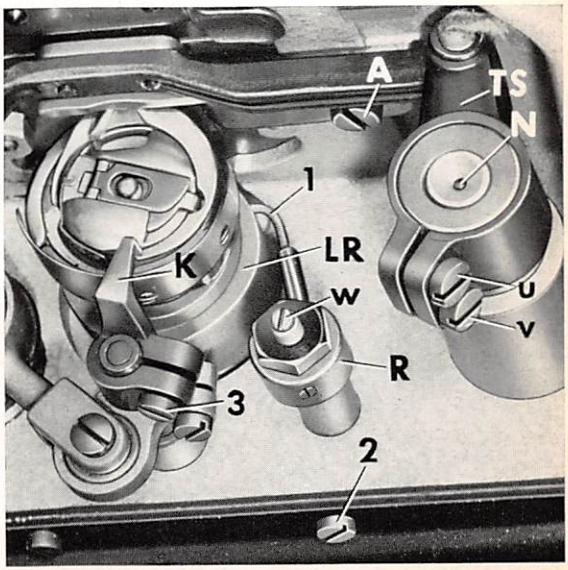
R 9488

At the same time, set the hook as close to the needle as possible, the proper clearance between both parts being .004", or 0.1 mm.

When adjusting the lateral position of the sewing hook, for example, after inserting a new hook, take care that the hub of the balancing collar does not bear against oil retainer ring **LR** (Fig. 25) which serves to conduct oil to the sewing hook and was introduced some time ago.

Emerging from oil flow regulating valve **R** (Fig. 24), the oil flows through copper tube **1** into oil retainer ring **LR** which is capped over the hook shaft bearing bushing and has a small borehole in its hub from which oil drips into the oil groove in the balancing collar.

Fig. 25



R 9169

22. Dismantling the Sewing Hook

Practised operators who have formed the habit of raising the take-up lever to its highest point when beginning or ending a seam, or of laying both threads back under the sewing foot when beginning to sew, will hardly ever encounter thread jamming in the hook raceway.

If thread should happen to jam in the raceway of the sewing hook, however, try to pull it out as you turn the balance wheel back and forth slightly. If this action fails to free the jammed thread, dismantle the sewing hook, as instructed below:

1. Pull out the knee lever and tilt the machine back.
2. Raise needle bar and take-up lever, provided the balance wheel can still be turned. If not, begin by unscrewing bobbin case position finger bracket **A** (Fig. 27).
3. Loosen binding screw **e** (Fig. 29) and swing opener finger **K** forward out of the range of action of the sewing hook.
4. Seize the bobbin case cap by its latch with thumb and forefinger and pull it out of the machine together with the bobbin.
5. Let the sewing head down again and unscrew needle plate and feed dog.
6. Take out the three hook gib screws **e1**, **e2** and **e3** (Figs. 26 and 28) and remove hook gib **d**. Do not confuse hook gib **d** with thread pull-off flange **f** (Fig. 28).

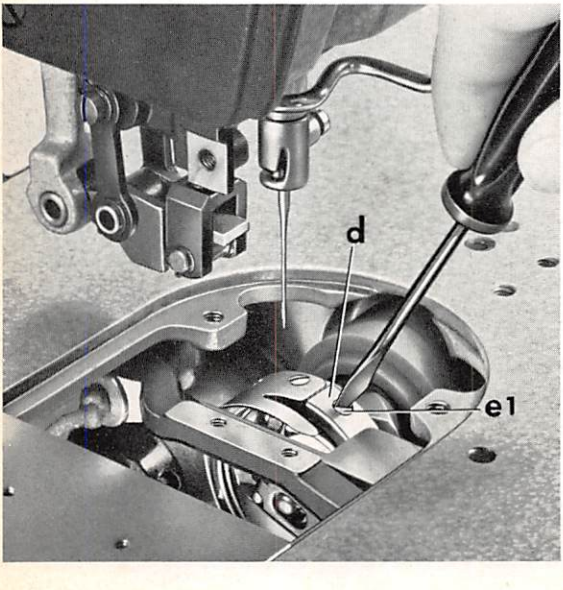
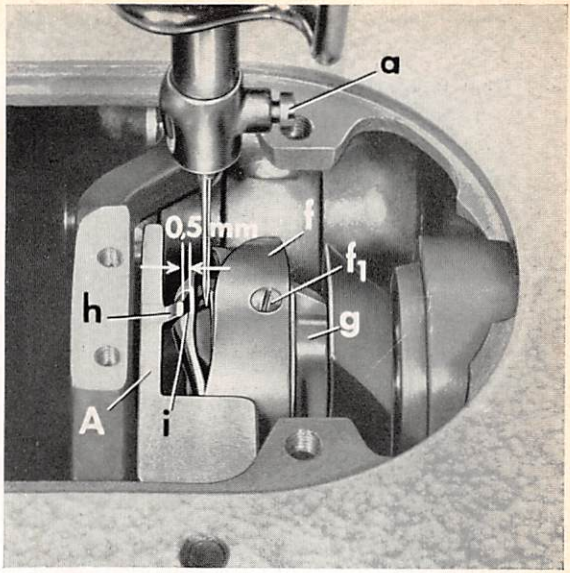


Fig. 26

R 9486

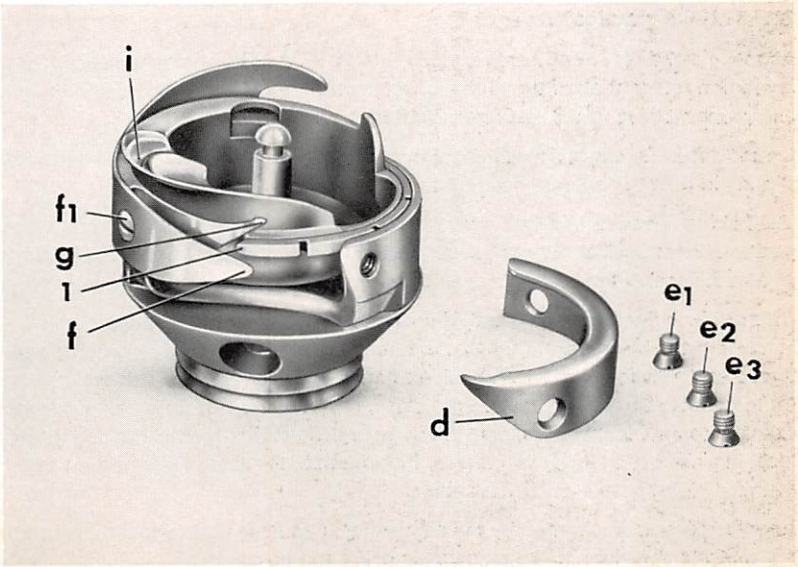
Fig. 27



R 9162

7. Rotate the balance wheel until slot **i** (Figs. 27 and 28) is in line with the first set screw **f1** on thread pull-off flange **f**. When in this position, the bobbin case base can be taken out of sewing hook **g**. This position is also illustrated in Fig. 28 from which it may be seen that point **1** of the bobbin case flange must be positioned between the two points of sewing hook **g** and thread pull-off flange **f**.

Fig. 28



R 5086

8. Seize the bobbin case base by its center stud and tilt it out of the sewing hook, pulling it down and to the left.

9. Thoroughly clean the hook raceway and the bobbin case flange and remove all lint with a pointed wooden instrument, never with a screwdriver.

10. Before you replace the bobbin case base, it is best to screw on bobbin case position finger bracket **A**. When replacing the bobbin case base, make sure finger **h** on bracket **A** enters slot **i** in the rim of the bobbin case base. Also check to see that there is a clearance about $^1/_{64}$", or 0.5 mm, wide between the tip of position finger **h** and the bottom of slot **i**.

11. Replace hook gib **d** and turn in set screws **e1, e2** and **e3.**

12. Swing the mechanical opener back to its original position and adjust as instructed in Chapter 24. This tricky job should be performed by your maintenance man.

23. The Mechanical Opener

All models of the Pfaff 467 are regularly fitted with a positive mechanical opener. The double-revolution rotary hook of the Pfaff 467 enters the needle thread loop at every other revolution and passes it around the stationary bobbin case.

On machines having no mechanical opener, the needle thread has to turn the bobbin case slightly in oder to make an opening through which it can pass.

The friction between hook raceway and bobbin case flange and the attendant pressure of the position finger against the wall of the position slot increase in proportion to the sewing speed so that the needle thread has to overcome a stronger resistance when opening a clearance gap.

On machines fitted with mechanical opener, the opener finger slightly rotates the bobbin case at the right time and contrary to the direction of sewing hook rotation so that the needle thread can pass freely between position finger and position slot. This ensures that the tension on the needle thread will remain the same, regardless of the sewing speed because it is not exposed to additional stress, particularly at higher sewing speeds. Since the danger of thread breaking has been largely eliminated, it is possible to use threads of a lower tensile strength even for high-speed sewing operations.

Another advantage afforded by the mechanical opener is that even lightweight fabrics can be sewn at full speed while the machine is being run in, or after a new hook has been inserted.

24. Timing the Mechanical Opener

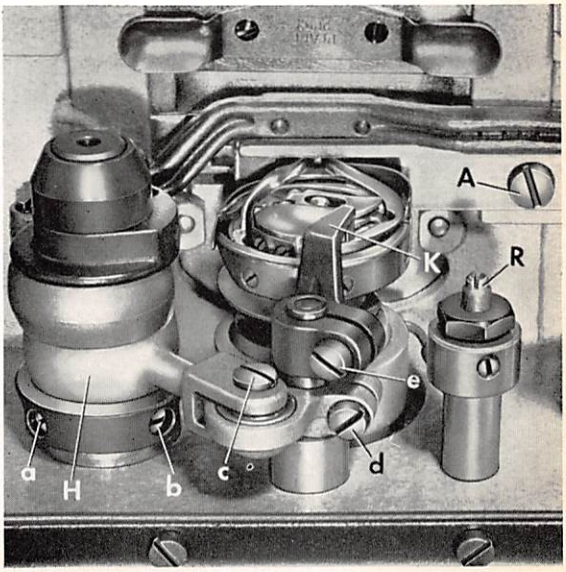
Accurate setting of the bobbin case opener seems to present a problem to many mechanics so that they prefer to render it inoperative rather than go to the trouble of adjusting it. Before you tackle this adjustment, it is imperative that you revert to Chapter 23 again in which the advantage afforded by this device are discussed in detail.

There are two different adjustments required:

1. The adjustment of the mechanical opener drive, and
2. the timing of the mechanical opener finger.

On the new high-speed seamers, the feed rock shaft is arranged on the right, and the feed lifting shaft on the left of the sewing hook, as seen from the hook-end of the machine. Moreover, the feed lifting shaft of the Pfaff 467 is of the rotating rather than the oscillating type and carries the feed lifting eccentric and, behind it, an eccentric which drives the bobbin case opener shaft. The throw of this eccentric is transmitted to the eccentric connecting rod, a crank mechanism and the bobbin case opener shaft. The oscillating motion of the bobbin case opener finger can be adjusted by loosening binding screw **e** (Fig. 29) and turning the opener finger on its shaft, as appropriate. The mechanical opener is set correctly on its shaft if the opener finger at its extreme left position contacts the projection on the bobbin case and rotates the latter counter-clockwise just sufficiently to center the position finger in the position slot and ensure that the needle thread can pass through the clearance gap freely. This gap should be .012", or 0.3 mm, wide (Fig. 31). Prerequisite for this is that the mechanical opener shaft is timed correctly. To time the mechanical opener, loosen both set screws **a** and **b** (Fig. 29) and rotate the rear eccentric on the feed lifting shaft.

Fig. 29



R 9163

The bobbin case opener is timed correctly if the bobbin case opener eccentric is at its extreme left position when the needle bar has passed the lowest point of its stroke and risen $^{1}/_{16}$", or 1.8 mm. When the eccentric is at this position, the clearance gap between the opener finger and the wall of the position slot is widest.

To make sure the mechanical opener has been timed correctly, check to see that the opener finger contacts the projection on the bobbin case and begins to rotate it when the hook has cast off the loop and its point has reached a position about midway between the right and top positions, i.e. at northeast.

Since the motion of the opener finger is very slow and hardly perceptible, we recommend that you push the bobbin case over to the right at the bottom and place a thin piece of paper between the finger and the projection on the bobbin case. When the finger begins to hold the paper in place, it has reached the position at which it will normally begin to rotate the bobbin case.

In adjusting the mechanical opener, care should be taken that there is a clearance of .03", or 0.8 mm, between the opener finger and the face of the bobbin case (Fig. 30), and of .012", or 0.3 mm, between the opener finger and the wall of the position slot (Fig. 31).

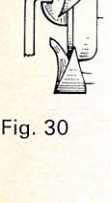


Fig. 30

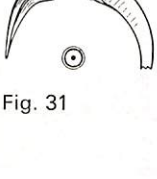


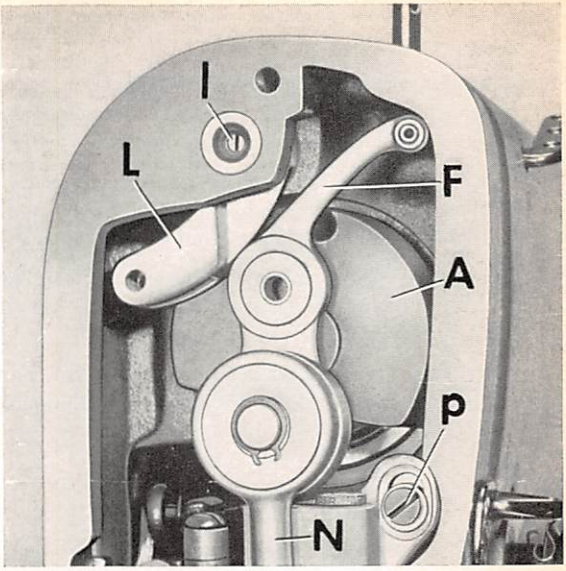
Fig. 31

25. Dismantling the Link Take-up

There are two procedures that may be followed:

In the first, take-up link **L** is left in the machine and is disconnected from take-up lever **F** by turning out screw **z** (Fig. 34). Swing the take-up lever up, and the link down, as shown in Fig. 32. Pull the take-up lever through the slot and out of the machine.

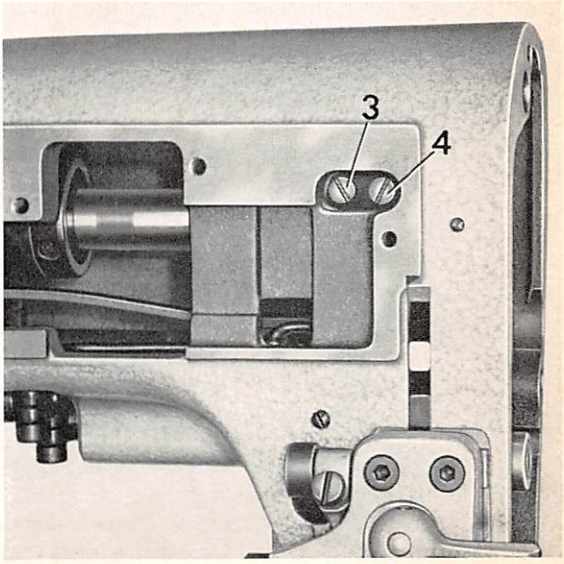
Fig. 32



R 9161

Turn the balance wheel until take-up crank set screws **3** and **4** appear in the aperture underneath the machine arm rear cover (Fig. 33). Loosen these screws, turn the balance wheel until the needle bar is at its lowest point, and let the take-up lever drop back through the slot into the machine. Now pull the take-up crank, together with the take-up lever and the needle bar connecting link, forward out of the needle bar crank.

Fig. 33



R 9485

The second possibility consists in dismantling the complete take-up lever assembly, including the take-up link.

To do this, pull the lower oil tube off the nipple of shut-off valve **V** (Fig. 42) and drain the oil into a clean vessel. Unscrew the oil reservoir back of the oil sight glass and detach from the reservoir the oil tube conducting oil to the take-up link hinge stud.

To facilitate seizing the take-up link hinge stud, replace plug screw **1** (Fig. 34) by a M 4 set screw. Loosen the three set screws that can be reached from above and pull the hinge stud, together with the oil tube, forward out of the machine.

To dismantle the take-up lever assembly, loosen take-up crank set screws **3** and **4**, as instructed above, swing take-up link **L** down onto the take-up crank at its left position, and pull the take-up assembly out of the needle bar crank.

When replacing the oil tube, check to see that the wick in the oil tube is not torn off and extends beyond the oil holes in the take-up link hinge stud.

26. Changing the Needle Bar

To dismantle the needle bar, remove needle, needle plate, feed dog, bobbin case position finger bracket and sewing hook. Loosen binding screws **q** and **r** in the needle bar connecting link (Fig. 34) and pull the needle bar down and out of the machine. In order to save the time-consuming repetition of timing the sewing hook and the mechanical opener, it is recommended to loosen set screws **p** (Fig. 34) and **g** (Fig. 23) of needle bar frame **S**, screw **z** (Fig. 34) in the take-up link, and take-up crank set screws **3** and **4** (Fig. 33). Swing away take-up link **L** and pull the needle bar frame, together with the take-up lever assembly, out of the machine. The needle bar can now be easily exchanged.

In replacing the needle bar frame, take care that the needle is centered sideways in the needle hole exactly. Before you tighten set screws **p** and **g** securely, turn the balance wheel to make sure the needle is centered correctly and the front-end parts work smoothly without having any play. If necessary, adjust the position of the needle in the needle hole in sewing direction. To do this, loosen eccentric stud set screw **g** and turn out needle bar frame top set screw **p**. Take a screwdriver and turn the eccentric stud underneath this screw to the right or left, as appropriate.

27. Dismantling the Presser Bar

Flat spring **B** (Fig. 34) is about 8", or 20.0 mm, long and slightly bent. Its semi-circular rear end rests on a stud screwed into the back wall of the machine and protruding on the inside. The long pressure regulating screw depresses flat spring **B** more or less so that its long tapering end exerts resilient pressure on a steel ball at the top of the presser bar. The presser bar spring can be easily removed from the machine arm after turning out the pressure regulating screw.

The Pfaff 467 has two presser bars, one inside the other. The pressure spring engages the steel ball which is embedded in grease and located at the top of the inner presser bar.

The upper end of the inner presser bar carries a bracket, while the lower end carries a roller bearing enclosing the vibrating presser fulcrum stud. The hollow outer presser bar carries another bracket at its top end and the vibrating presser lever assembly at its bottom end.

The presser foot is attached to the left-hand side of the mounting bracket located at the bottom of the outer presser bar.

Fig. 34

R 9447

28. Conversion to Another Subclass

To convert the machine to another subclass, remove presser foot, needle plate and feed dog, tilt the machine back and strip the vibrating presser.

Relieve the pressure of the presser bar spring by turning out pressure regulating screw **19** (Fig. 19).

Before you install a new vibrating presser, check to see that the mounting surfaces on the bracket and on the vibrating presser are clean.

Loosen binding screw **K** (Fig. 40) on the driving lever and check to make sure the vibrating presser works smoothly.

The guide should have a vertical clearance of .004", or 0.1 mm, maximum. Worn connections should be replaced by new ones. As you replace the feed dog and the needle plate, make sure the former moves freely in the feed slots.

After all the parts replaced have been adjusted correctly, reset the presser foot pressure.

29. Setting the Feed Dog at Correct Height

To facilitate this adjustment, it is recommended to use all-purpose gauge No. 91-129604-01 which is pushed over the feed slot so that its edges are in line with the edges of the needle plate. This gauge is held in place by the presser foot (Fig. 35). If the feed dog has been set correctly, all its teeth should contact the bottom of the recess on the underside of the gauge when the feed dog is at its highest point.

Prerequisite for setting the feed dog at the correct height is that its motion has been timed correctly, as instructed in Chapter 35.

To set the feed dog at the correct height, proceed as follows:

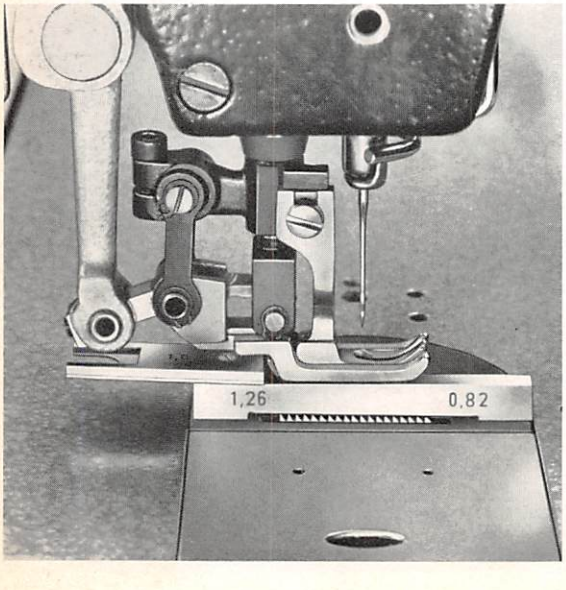
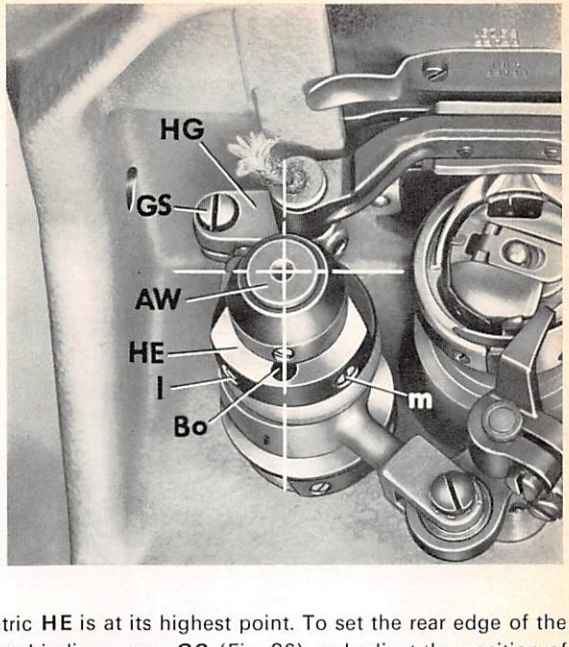


Fig. 35

R 9534

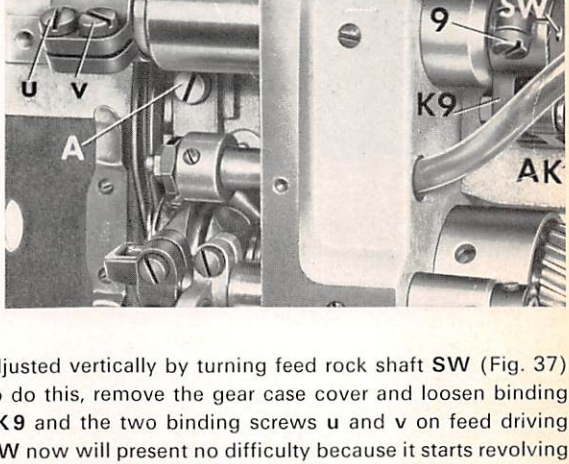
Fig. 36



R 9526

Check to see that feed lifting eccentric **HE** is at its highest point. To set the rear edge of the feed dog at the correct height, loosen binding screw **GS** (Fig. 36) and adjust the position of feed lifting link **HG**, as appropriate.

Fig. 37



R 9159a

The front end of the feed dog is adjusted vertically by turning feed rock shaft **SW** (Fig. 37) which has an eccentric left end. To do this, remove the gear case cover and loosen binding screw **9** on the right clamp crank **K9** and the two binding screws **u** and **v** on feed driving crank **TS.** Turning feed rock shaft **SW** now will present no difficulty because it starts revolving as crank **TS** is slowly swung from its foremost position toward the needle. The shaft can be easily secured in position by pressing against its end. Then the crank can be swung back, and turning the shaft can be repeated until the feed dog is set at the correct height.

Push the shaft toward the right and tighten binding screw **9** on clamp crank **K9** securely.

Set the machine for its longest stitch, turn the balance wheel and check to see that the feed rock shaft crank is not distorted on its shaft and the feed dog is centered in the feed slot. Tighten binding screws **u** and **v** securely.

30. Adjusting the Presser Foot

When you mount the presser foot on the machine, push it up against the bracket as far as it will go, then tighten the set screw securely.

When the presser bar is raised, i.e. the presser bar lifter is flicked to the left, there should be a clearance of about $^{3}/_{16}$", or 5.0 mm, between presser foot and needle plate and the needle should be centered in the needle hole of the presser foot.

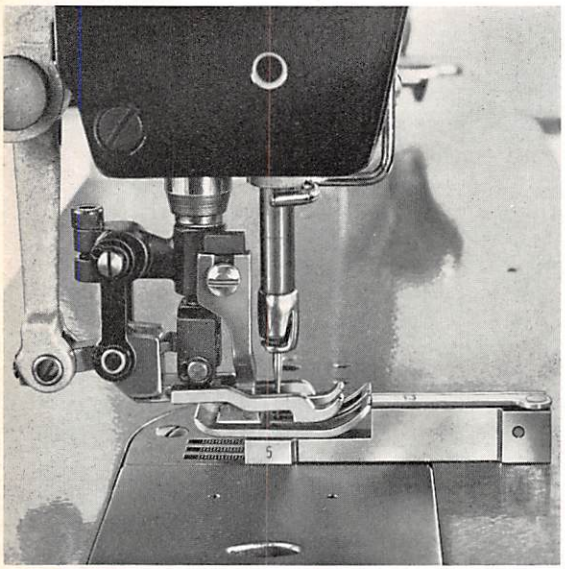


Fig. 38

R 9540

If adjustment is required, push all-purpose gauge No. 91-129604-01, which is 5.0 mm thick, horizontally between presser foot and needle plate (Fig. 38). Then loosen grub screw **G** (Fig. 40) on the driving lever connection and push the fulcrum stud out of its bearing. Next, loosen binding screws **a** and **b** on the two presser bar brackets (Fig. 34).

Adjust the presser foot until the needle is centered correctly in its needle hole and tighten binding screw **b** on the lower bracket securely. Replace the fulcrum stud in the driving lever bearing, making sure that it enters the hole easily and the vibrating presser moves freely. If there should be a bind, straighten the driving lever.

Tighten the screw on the upper presser bar bracket only after the vibrating presser has been adjusted properly.

As you tighten grub screw **G**, make sure it engages the flat spot on the fulcrum stud.

31. Adjusting the Vibrating Presser

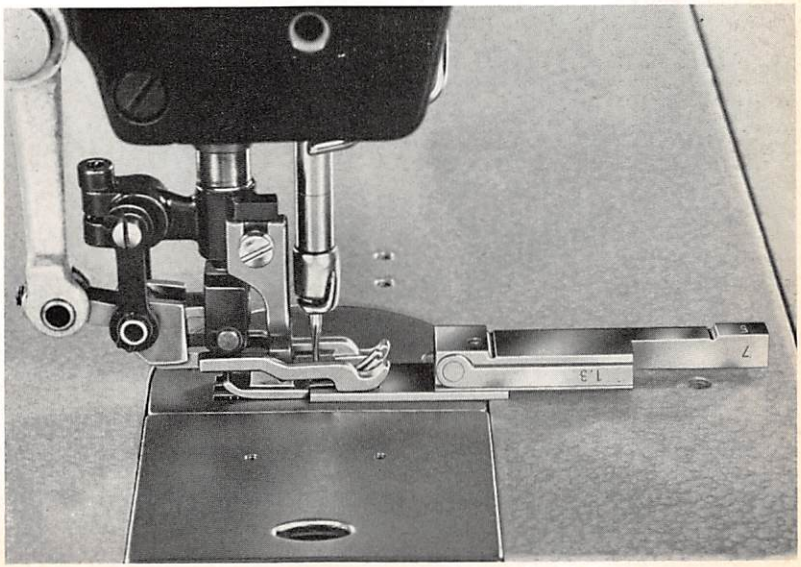
Lower the presser bar so that the presser foot rests on the needle plate. Then turn ther balance wheel until the roller at the top of the small two-armed lever behind the presser bar is positioned at its extreme left, as seen from the needle-bar end of the machine. Since the roller in this position is concealed by the presser bar and the needle bar connecting link, watch connecting link **V** (Fig. 34) which is visible below the lower presser bar bracket and is at its extreme right position when the roller is at its extreme left. Push the all-purpose gauge with the prongs of its 1.8 mm gauge blade under the vibrating presser (Fig. 39), press the upper presser bar bracket against the roller at the top of the two-armed lever, and tighten binding screw **a** securely.

As you do this, note the following:

The inner and outer presser bars are connected by various driving elements. Tightening binding screw **a** on the slotted presser bar bracket tends to cause the inner presser bar to rotate slightly so that the driving elements become wedged. To avoid this, exert a slight counter-pressure against the driving elements and the vibrating presser while tightening binding screw **a**. Then check whether the vibrating presser moves freely. If it does not, readjust while pushing it in the opposite direction slightly.

After this adjustment, tighten binding screw **K** on the driving lever securely (Fig. 40).

Fig. 39



R 9542

32. Correlating Top and Bottom Feeds

To ensure smooth feeding, the position of the vibrating presser should be adjusted in relation to the feed dog with great care. This is particularly important if both these parts have long tooth rows. A vibrating presser that engages the material with one or two teeth only may damage delicate fabrics.

Eccentric stud **Ez** (Fig. 40) at the top of the top feed drive connecting link serves to adjust the position of the vibrating presser in relation to the feed dog. To do this, loosen allen screw **i** and turn eccentric stud **Ez** to the right or left with the aid of a screwdriver until the correct setting is obtained.

The vibrating presser should be adjusted so that it engages the material consistently throughout its feed stroke.

After the adjustment, tighten screw **i** securely.

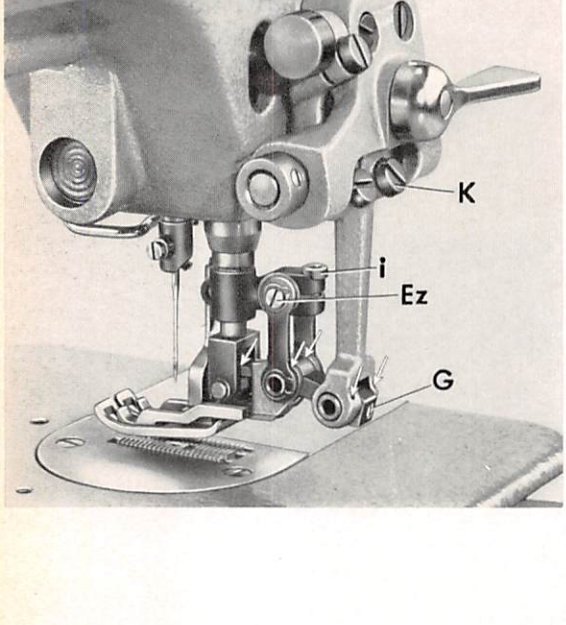


Fig. 40

R 9375

33. Adjusting the Vibrating Presser in Sewing Direction

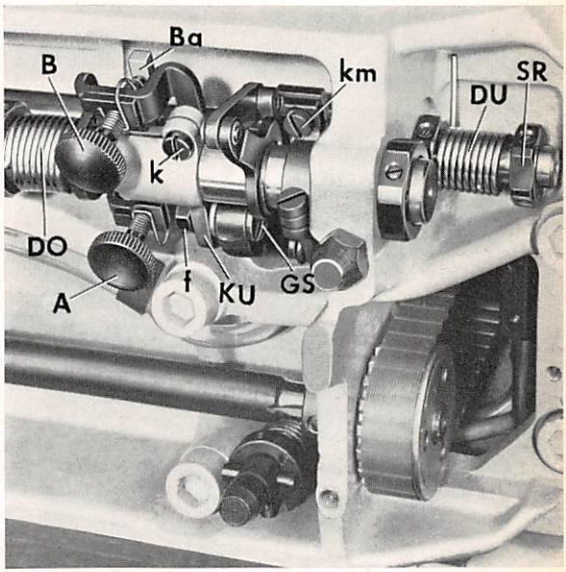
On subcl. -7 and similar machines, the vibrating presser should be adjusted in sewing direction so that its needle hole is in line with that in the needle plate, and on subcl. -6/2 and similar machines, so that the vibrating presser is centered in the frame-type shoe of the presser foot.

34. Zeroing the Top and Bottom Feeds

Set stitch length control **n** on 0 (Fig. 16). Then rotate the balance wheel and check to see that the vibrating presser and the feed dog make no perceptible motion in the direction of sewing.

If the feed dog should make any lengthwise motion, eliminate this motion by turning the upper feed regulating shaft. To do this, seize hexagon nut **SR** (Fig. 41) at the right-hand end of the shaft (which serves to tension torsion spring **DU**) with a SW 22 wrench and loosen binding screw **Km** on the ball-end clamp crank. Adjust the upper feed regulating shaft with a wrench while turning the balance wheel until the feed dog makes no motion at all.

Fig. 41



R 9483

Then tighten binding screw **Km** on the clamp crank.

Set stitch length control **n** on 4.5 and turn out regulating screw **B** completely. Then turn in regulating screw **A** until bar **Ba** contacts the upper feed regulating shaft.

As you make this adjustment, make sure the ball end remains in engagement in the slot of stitch length control **n**. This means that regulating screw **A** must be turned in only far enough to cause bar **Ba** to contact the upper feed regulating shaft lightly. Turning screw **A** in too far would disturb the setting of the upper feed regulating shaft which controls the drop feed motion.

The exact time when bar **Ba** contacts the shaft may be determined by watching reverse feed control **p** because at this time the latter starts descending. Loosen stitch length locking disc **o** and turn stitch length control **n** back to **0**. When you depress reverse feed control **p** now, it should swing down instantly without having any play. If the vibrating presser should make any lengthwise motion when stitch length control **n** is set on 0, adjust by turning crank **LK** on its shaft (Fig. 43), as may be required.

To do this, remove the arm standard rear cover and loosen the set screw on the clamp crank by inserting a screwdriver through the lower oval aperture. Adjust the position of crank **LK** on its shaft and tighten the set screw securely again. If, as a result of zeroing the top and bottom feeds, the position of the differential top feed scale should have been disturbed, center the scale in relation to the top feed pointer. Check whether torsion springs **DO** and **DU** (Fig. 41) are tensioned correctly and retension, if necessary.

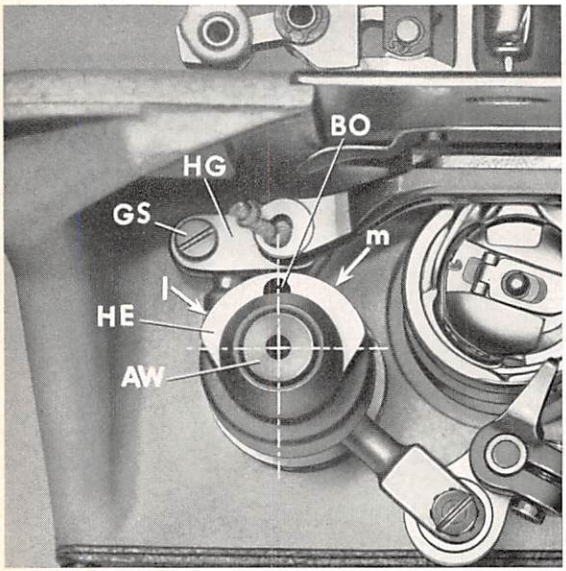


Fig. 41 a

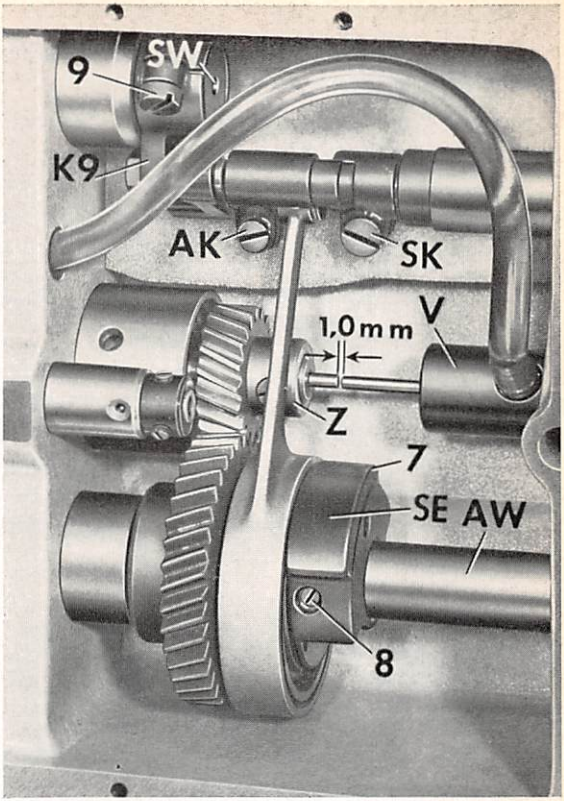
R 9472

35. Timing the Bottom Feed

When the machine is assembled at the factory, feed driving eccentric **SE** (Fig. 42) is adjusted meticulously with the aid of precision instruments. Hence, there should be no need normally to readjust the feed driving eccentric unless the basic timing relationship has been disturbed while repairing the machine.

To check whether the drop feed motion is timed correctly, turn stitch length control **n** (Fig. 16) to the maximum stitch length. Rotate the balance wheel until the needle bar has passed the lowest point of its stroke and risen about $^{1}/_{32}$", or 0.6 mm. Use all-purpose gauge No. 91-129604-00 for this setting.

Fig. 42



R 9159

Check to see that the feed dog makes no perceptible motion when you actuate reverse feed control **p**. If adjustment is required, remove the gear case cover, loosen set screws **7** and **8** and rotate feed driving eccentric **SE** on shaft **AW** until the feed dog makes no perceptible motion when you actuate reverse feed control **p** (with the needle bar set as instructed above). After this adjustment, tighten set screws **7** and **8** securely again.

Feed lifting eccentric **HE** (Fig. 41 a) is set correctly if opening **BO** in its balancing collar is positioned exactly perpendicularly above the center of lower drive shaft **AW** when feed driving eccentric **SE** is in the position described above.

To adjust, loosen set screws **l** and **m** and turn feed lifting eccentric **HE** on its shaft, as appropriate.

36. Timing the Top Feed

When checking, and possibly retiming, the top feed motion, keep in mind that this motion must be timed in relation to the dwell of the feed dog.

The motion of the vibrating presser should be reduced to **0** shortly after the needle bar has passed the top of its stroke.

According to the instructions contained in Chapter 35, the feed dog was set to make no perceptible motion when the needle bar has passed the lowest point of its stroke and risen about $^{1}/_{32}$", or 0.6 mm. Before synchronizing the top and bottom feeds, rotate the balance wheel until the needle bar has just passed the highest point of its stroke, set the machine for its longest stitch, and check to see that the feed dog makes no perceptible motion when you operate reverse feed control **p**.

With the feed dog at this position, loosen set screws **9** and **10** (Fig. 43) and rotate top feed driving eccentric **OS** until the vibrating presser makes no perceptible motion when the stroke of the feed dog is reduced to 0.

To facilitate rotating the top feed driving eccentric on the arm shaft, insert a suitable punch into the hole of the eccentric and hold the balance wheel steady as you rotate the eccentric to synchronize the dwell of the vibrating presser and of the feed dog. After the adjustment, tighten set screws **9** and **10** securely.

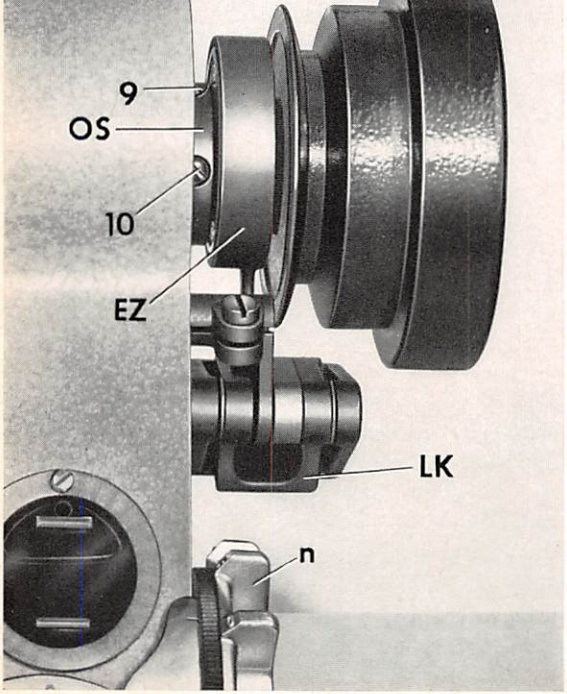


Fig. 43

R 9469

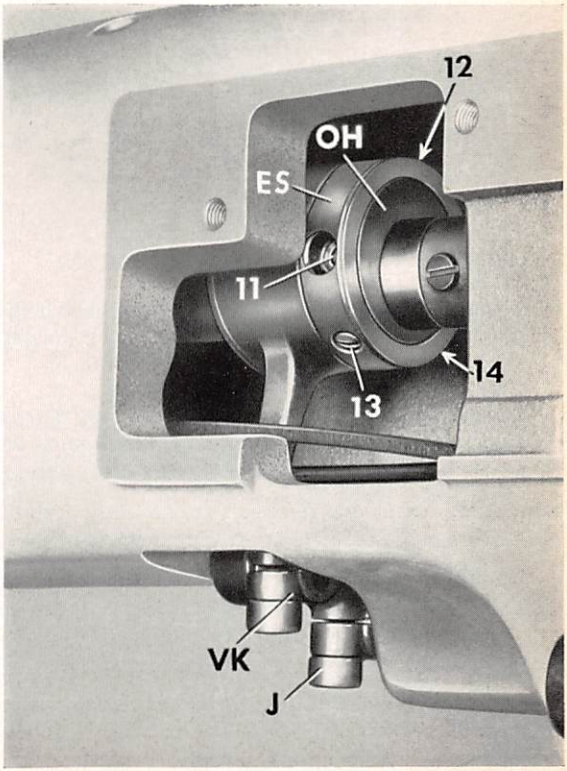
The lifting motion of the vibrating presser should be timed so that the latter descends onto the material perpendicularly from above when the feed points of the rising feed dog are flush with the surface of the needle plate. This setting should remain the same, regardless of the top feed stroke set. The vibrating presser should remain in engagement with the material throughout its feed stroke, and at the end of its stroke should rise perpendicularly again. The perpendicular motion at the beginning of its feeding action should be twice as large as that at the end of its stroke.

Adjustment is made by turning top feed driving eccentric **OH** on the arm shaft (Fig. 44), as may be required.

To do this, remove the machine arm rear cover and turn the arm shaft until set screws **11** and **12** can be loosened by inserting a hexagon socket screw wrench through the openings in set collar **ES.** Only one of these openings is visible in Fig. 44 exposing screw **11**. Be sure you do not loosen screws **13** and **14** which secure the set collar in position. After this adjustment, tighten set screws **11** and **12** securely.

If the vibrating presser should rise clear of the fabric before it has reached the end of its stroke, adjust the two-armed lever so that its roller contacts the inclined surface of the upper presser bar bracket a little later (i.e. so that it is positioned further to the right slightly).

Fig. 44



R 9473

If, on the other hand, the vibrating presser should remain in engagement with the material after it has reached the end of its stroke, adjust the position of the two-armed lever so that its roller is positioned further to the left.

Both these adjustments are made as follows:

Loosen allen screw **J** (Fig. 44) and swing crank **VK** down, if the vibrating presser rises too early, or up, if it rises too late.

To check whether the setting is correct, tighten allen screw **J** again.

Any adjustment of the two-armed lever necessitates a readjustment of the vertical position of the vibrating presser, as instructed in Chapter 32, and possibly a readjustment of the top feed lifting eccentric. The adjustability of the two-armed lever is limited, but the space available for adjustment is large enough to meet all conceivable requirements.

In adjusting the top and bottom feeds of the Pfaff 467, care should be taken that all parts are inserted in the correct position and work smoothly. This is important in order to ensure accurate feeding of "problem" materials and prevent damage to the parts.

37. Checking the Top Feed Motion

Since it cannot be avoided that parts having unfavorable tolerances are mated occasionally, it may happen that the strokes of the vibrating presser and of the feed dog differ slightly.

To check this, proceed as follows:

Set the machine for its maximum stitch length and the top feed pointer on 0. Lower the presser bar so that the vibrating presser and the presser foot rest on the feed dog. Rotate the balance wheel and watch the motion of both the vibrating presser and the feed dog.

If the strokes of the vibrating presser and of the feed dog are exactly the same length, both feeders will parts smoothly at the end of the feed stroke.

If, however, the vibrating presser makes a little jerk in the direction of feeding as it rises clear of the feed dog, its stroke is a little too long. If, on the other hand, the vibrating presser snaps back toward the operator slightly as it reaches the end of its stroke, the latter is a bit too short.

To remedy this condition, loosen nut **f** (Fig. 41) and reposition connecting rod hinge screw **GS** in the slot of crank **KU**. To make the stroke of the vibrating presser shorter, move hinge screw **GS** toward the feed regulating shaft, to make it longer, move it away from this shaft. After this adjustment, tighten nut **f** securely.

38. Machine Lubrication

Machine lubrication comprises two parts: oiling the needle bar bearings and replenishing the oil in the hook lubrication system, as discussed in Chapter 17. Both these functions are to be performed by the operator. Since each machine is an expensive piece of equipment and any damage caused by negligence may entail a costly loss, it is recommended that the maintenance man supervise the weekly machine care by the operators. In addition, he should tell them that

1. only a few drops of oil must be put into the oil dents at a time in order to prevent excess oil from soiling the work,
2. the small foam plastic pads must not be compressed with the tip of the oiler spot otherwise the transverse holes are exposed and the oil flow to the needle bar is endangered,
3. negligent oiling of the needle bar may cause binding of, and damage to, the front parts,
4. only oil dents **x** and **y** (Fig. 34) and occasionally the oil pad on the presser bar must be provided with oil,
5. the oil must never be topped up above the red mark or the reservoir be filled up completely because even if the shut-off valve is opened no oil can enter the hook lubrication system, and
6. the oil level must always be visible in the oil sight glass and must never drop below the lower mark because there is a danger that an air bubble will enter the oil tube and block the oil flow to the shutt-off valve when the oil level is too low.

39. Lubricating the Feed Regulating Shaft

The feed regulating shafts are rotated only when the stitch length is changed or when the direction of feed is reversed by depressing control **p**.

Both feed regulating shafts are carried in two brass bushings each. These are fitted with graphite pockets so that no additional lubrication is required.

40. Sealed-for-Life Anti-Friction Bearings

Sealed-for-life anti-friction bearings are high-precision bearings made of first-class material and filled with grease which is sealed by gaskets and an oil and gasoline-proof coating so that adequate lubrication is ensured for the entire life of the bearing and no additional servicing is required.

Subsequent lubrication of these bearings is not only superfluous, but also useless because the oil cannot enter a sealed bearing.

Never rinse one of these new high-speed seamers with kerosene or gasoline. If the front end of the machine should be too dirty and must be cleaned with kerosene, be careful that the kerosene does not come in touch with the sealed bearings. Before you clean this part of the machine, remove the foam plastic pads from the needle bar bearings. After the front end of the machine has been cleaned, insert new pads and oil them accordingly. Since kerosene removes the oil from the presser bar and the attached parts, these parts must be reoiled properly.

41. Lubricating Ordinary Ball and Needle Bearings

The ordinary ball and needle bearings incorporated in the machine are stationary. They carry the arm shaft, the lower main shaft and the hook shaft. Since these bearings do not make any motion, the grease remains evenly distributed over their entire surface and ensures adequate lubrication throughout the servoice life of the machine, thus obviating the use of sealed-for-life bearings. The latter are incorporated in moving parts, such as the take-up lever and the needle bar connecting link, because these parts move rapidly and reverse their direction of movement constantly so that the grease would be flung out of the bearings if the latter are not sealed for life.

An exception are needle bearings in the feed lifting and bobbin case opener eccentrics which are specially designed and protected against any loss of grease by lateral caps so that the grease will not be flung out while these parts move to and fro.

The ball bearing in the feed driving eccentric in the gear case is open and pad-lubricated.

42. The Pad Lubrication in the Gear Case

The feed driving and feed regulating mechanisms as well as the hook shaft driving gears in the gear case are lubricated by means of two oil-soaked foam plastic sheets. Unless some adjustment has to be made in the gear case, there is no need to open it until the oil has to be changed which normally will be the case about once or twice a year. To change the oil, place a plastic sheet under the machine to prevent oil soaking the table, tilt the machine back and remove the gear case cover. Use some cotton to absorb dripping oil. Soak the foam plastic sheets with 4 fl. oz., or 130 ccm, of oil.

It is recommended to replace the foam plastic sheets by new ones rather than go to the trouble of washing them in gasoline. New sheets may be ordered by Nos. 69299 and 69302. These sheets must be well soaked with 2.7 E/50°C sewing machine oil, Order No. 28001-120110, the same that is used in the hook lubrication system.

When you replace the foam plastic sheets, push the smaller one behind the feed regulating shaft and the crank drive. Insert the large sheet so that the oil tube fits in the small lateral slots on the outside, and the large spur gear runs freely in the large cutout of the sheet. In this way, any undersirable contact of the oil tube with moving parts is successfully eliminated.

Before you replace the gear case cover, make sure the gasket cemented onto its rim is not defective. Clean and degrease the gasket and the rim of the gear case before you replace the gear case cover. To do this, begin by turning in all screws loosely, then tighten them crosswise.

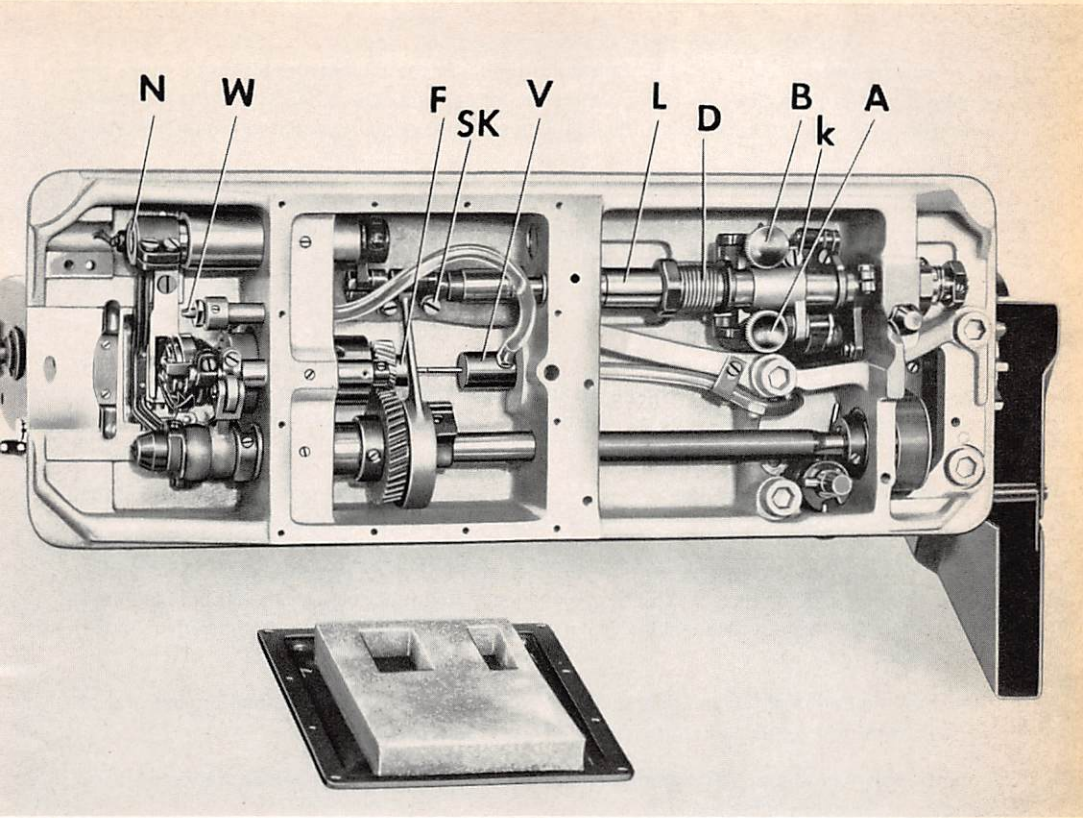


Fig. 45 R 9385

43. The Hook Gravity Lubrication System

The oil reservoir is secured to the machine arm by a screw at the top of the oil sight glass and has two oil nipples at its rear end. The right-hand nipple connects with the wick-filled oil tube which leads to the take-up lever hinge stud.

In assembling the machine, the oil tubes are inserted before the take-up lever assembly and the oil reservoir are installed. To insert the oil tubes, proceed as follows:

Soak a wick with oil and pull it into the take-up oil tube with a wire. Then lace the protruding end of the wick through the take-up lever link hinge stud and push the oil tube onto the end of the stud. Pass the end of the tube through the bearing in the front wall of the machine, the lug of the take-up lever link and the hinge stud rear bearing. As you push the oil tube into the machine arm, take care that it is positioned back of the pressure regulating screw and the vertical shaft in the arm standard and passes down on the left-hand side of the arm standard in order to prevent it from chafing against the arm shaft and the driving belt. Pull the end of the tube past the backside of the driving belt and out of the aperture on the front of the arm standard designed to receive the oil sight glass. Push the tube onto the right-hand nipple of the oil reservoir.

Push the second oil tube leading to shut-off valve **V** through the hole in the bedplate from below, lead it past the backside of the driving belt und pull it out of the aperture on the front of the arm standard. Push it onto the left-hand nipple of the oil reservoir. Both oil tubes are secured in position by clips. To prevent the shut-off valve oil tube chafing against the lower drive shaft, it is secured in place on the bedplate reinforcing rib by means of a clip (Fig. 45).

Insert the oil reservoir and secure it in place by a screw. Fill the reservoir with oil, using an oiler for this purpose. To prevent air bubbles forming in the tube leading to shut-off valve **V**, hold its end up until it is filled with oil completely. Then push it cautiously onto the nipple of the shut-off valve. The oil tube connecting shut-off valve **V** with oil flow regulating valve **R** (Fig. 25) is first pushed onto valve **R** and its opposite end then passed from left to right through the borehole in the gear case.

Oil is conducted from oil flow regulating valve **R** through a bent copper tube to oil retainer ring **LR** whence it drips through a small hole into the groove in the bottom of the sewing hook. The oil is pressed through an oil hole in the sewing hook into the hook raceway by centrifugal force.

When filling the hook oil reservoir or topping it up, take care that no air bubbles remain in the oil tube leading to shut-off valve **V** because this would interrupt the flow of oil.

If an air bubble should nevertheless have formed ahead of shut-off valve **V**, tilt the machine over so that it stands on its face. Lightly tap against the oil tube to move the air bubble to the bend in the tube, then let the machine down again so the air bubble rises to the surface in the oil reservoir.

If the above-mentioned procedure should not produce the desired result, pull the left end of the oil tube off the nipple and let the air bubble rise to the surface.

An air bubble which may have formed in the left section of the oil line can be removed by opening oil flow regulating valve **R**.

In order to prevent lint and dirt from entering the shut-off and oil flow regulating valve **s**, a 6-inch-long wick will be inserted into the lower end of the oil tube conducting oil from the oil reservoir to the shut-off valve on all machines assigned Serial No. 7740000 and up.

The oil flow to the sewing hook can be regulated to suit the type of work being performed by the machine. A more lavish supply of oil is needed, for instance, for seaming whole rolls of cloth at top speed than is required for short runs and intermittent operation.

The flow of oil to the sewing hook is decreased by turning screw **w** on valve **R** clockwise (Fig. 25), and increased by turning it counter-clockwise.

The correct setting for normal operation can be determined by a simple test, as follows:

Remove needle plate and feed dog and place a sheet of paper over the opening. Run the machine for about ten seconds at top speed. The setting is correct if two thin lines of spray oil about $^1/_4$ inch apart appear on the paper.

If the hook lubrication system should not work properly, particles of dressing and lint may have obstructed the fine oilhole in the rim of the sewing hook. To remedy this condition, remove the dirt with a piece of steel wire about .01", or 0.25 mm, thick. If this method does not work, remove the sewing hook and push a piece of elastic steel wire through the oilhole.

To interrupt the oil flow to the sewing hook when the machine is idle, shut-off valve **V** has been arranged between the oil reservoir and oil flow regulator valve **R**. This valve is opened by centrifugal switch **Z** on the hook shaft only after the machine has attained a medium rate of speed.

Shut-off valve **V** is set laterally so that there is a clearance of about .04", or 1.0 mm, between the valve stem and the plunger of centrifugal switch **Z** (Fig. 42).

The power of the pressure spring in shut-off valve is such that the plunger of centrifugal switch **Z** will not push the stem of valve **V** to the right to open the flow of oil until the machine has attained a medium rate of speed.

44. Lubricating the Feed Rock Shaft

The oscillating feed rock shaft conveys the feed motion from feed regulating shaft **L** to crank assemblies **SK** and **AK** in the gear case (Fig. 42), crank **TS** (Fig. 37) and the feed bar. This shaft is hollow and is lubricated with grease by means of nipple **N** (Fig. 45) at its left end. The grease enters the long bearing bushing through a number of concentric boreholes and ensures reliable lubrication of the shaft until it is given the next check-up scheduled.

45. Trouble Shooting

Skipping of Stitches

1. Incorrect threading.
2. Wrong needle system.
3. Needle inserted incorrectly.
4. Needle too thin for thread used.
5. Needle too thick for thread used.
6. Needle bent.
7. Needle at incorrect height.
8. Too wide a clearance between needle and point of hook (.004").
9. Needle bar rise insufficient.
10. Processing adhesive or heavily dressed materials.
11. Thread twisted too much.

Thread Breaking

1. For any of the reasons above.
2. Thread tensions too tight.
3. Knotty thread.
4. Thread having turned resistant due to extensive and dry storage.
5. Inferior quality thread.
6. Thread jamming in the hook race.
7. Rough edges of needle hole.
8. Thread having slipped from the spool and snarled up around the spool pin.
9. Incorrect setting of thread check spring.
10. Point of needle blunt due to bumping.

Needle Breakage

1. Needle bent and struck by point of hook.
2. Thread too thick for needle used.
3. Timing of hook upset after thread jamming.
4. Needle thread tension too tight.
5. Needle deflected by hard spots in material.
6. Needle bent due to pushing or drawing the material.
7. Feed motion in progress while needle stitches into material.
8. Hook set too close to needle.
9. Needle too thin for material processed.
10. Thread snarled up on spool pin.

Improper Feeding

1. Feed dog and vibrating presser set improperly.
2. Feed dog tooth pattern too fine for material processed.
3. Type of feed dog unfit for material processed.
4. Insufficient amount of pressure exerted by presser foot.
5. Lint accumulated between teeth of feed dog.
6. Points of teeth blunt.

Overheating

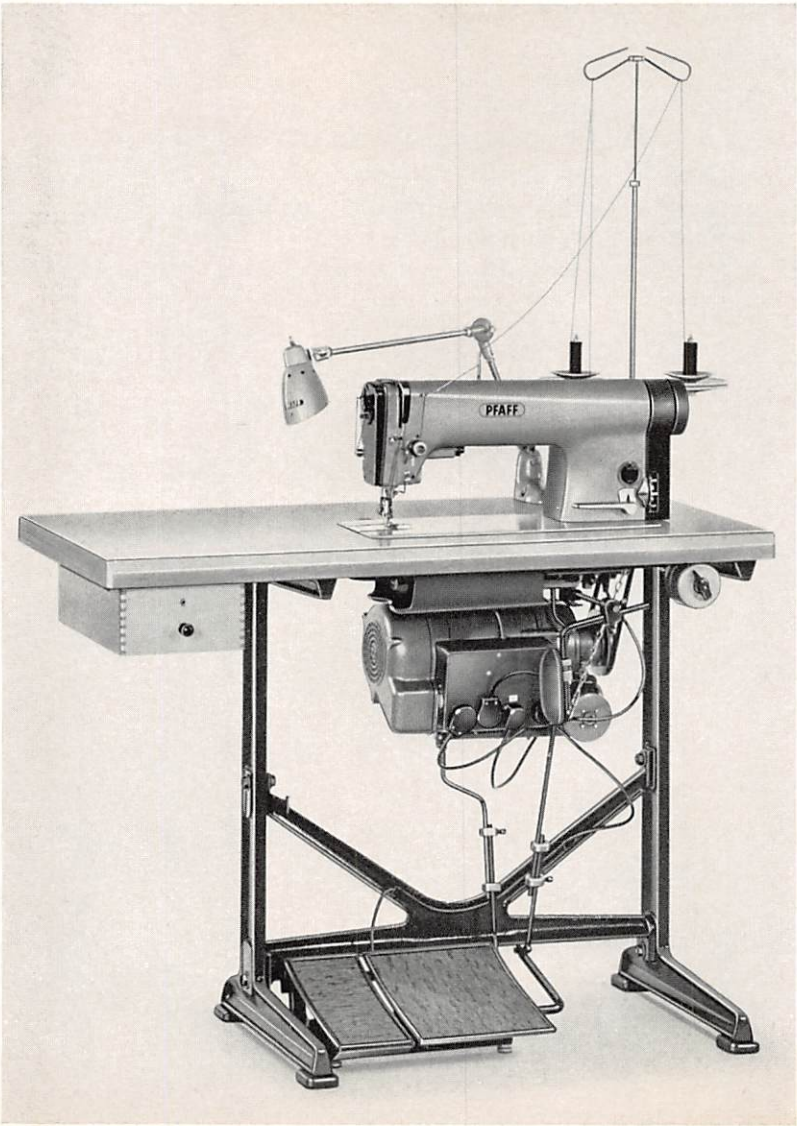
1. Needle bar bushings worn out due to lack of oil.
2. Oilhole in sewing hook clogged up so that hook overheats.
3. Hook oil flow regulating screw turned in too much.
4. Air bubble in oil line ahead of shut-off valve or excessive amount of oil in reservoir interrupt flow of oil to sewing hook.
5. V-belt tensioned too much so that it becomes hot, or motor positioning device out of adjustment.

Pfaff 467-6-900

fitted with automatic thread trimmer

and needle positioner and set up on asymmetric power table

Fig. 46



R 9456

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