

for 480 series machines

Thread puller/trimmer

Service Manual

Instructions for adjusting subcl. -900 thread trimmers on Pfaff 480 series machines

Important note

Never use a C-clamp on the needle bar of Pfaff 480-900 machines because this would damage its special coating.

The following tools, gauges and other equipment are required for adjusting the subcl. -900 thread trimmer of Pfaff 480 series machines.

1 set of screwdrivers with blades from 2 to 10 mm wide

1 set of allen keys from 1.5 to 6.0 mm

1 set of open-ended spanners from 7 to 14 mm

1 metal rule

1 5-mm-thick adjusting pin No. 13-030 341-05

1 adjusting gauge No. 61-111 642-19

1 circuit tester

sewing thread

1 Preparations for adjustment

- 1.1 Bearing plate in sewing head
- 1.1.1 Take out both face cover screws and remove the cover.

Note:

The bearing plate in the sewing head has five holes in it for blocking the machine at different positions of the needle bar (Fig. 1.0.1). After positioning the needle bar, push the adjusting pin into the appropriate hole so that it enters the recess in the disc behind it, thus blocking the machine.



1.0.1

The most essential parts of the thread puller/trimmer:





2.0.1

- 1 = interlocking latch
- 2 = control cam
- 3 = roller lever
- 4 = locking spring
- 5 = synchronizer
- 6 = carbon brush holder **
- 7 = thread catcher engaging shaft
- 8 = tension release lever
- 9 = micro switch **

- 10 = micro switch lever **
- 11 = engaging lever
- 12 = trip lever
- 13 = engaging solenoid
- 14 = micro switch, special version, subcl. -913/03 **
- 15 = connecting rod
 - 16 = thread catcher
 - 17 = trimming knife
- On machines equipped with Quick-Electronic-Stop motor or Efka-Variostop motor - synchronizer on balance wheel.
- ** On machines equipped with lever-operated Stop motor only.

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2.1

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2.0.2

Preliminary adjustment of control cam

Correct setting:

When the needle bar is at top dead center (pin in hole 5), the highest point of the cam lobe should be positioned exactly below the tip of interlocking latch 1 and the right-hand side of the cam should be in line with the right-hand side of the interlocking latch.



- 3.1 Take out the two screws 18 and remove both the washer and the locking spring.
- 3.2 Loosen screws 19 of control cam 2.
- 3.3 Also loosen screws 20 of the collar.
- 3.4 Strip the rod connecting the control unit and the trimming mechanism.
- 3.5 Bring the needle bar to top dead center and block the machine by inserting the pin in hole 5 of the bearing plate.
- 3.6 Turn control cam 2 in its normal direction of rotation until the highest point of the cam lobe is positioned exactly below the tip of interlocking latch 1.
- 3.7 Move control cam 2 laterally on its shaft until the right-hand side of its lobe is in line with the right-hand side of the interlocking latch.
- 3.8 In this position, tighten one of the two screws 19.
- ¹ 3.9 Push the collar up against the control cam and tighten one of its screws.
- 3.10 Pull the pin out of hole 5 and securely tighten the second screw 20 of the collar.
 - 3.11 Check this adjustment (see "Correct setting").

Roller lever

Correct setting:

With the machine in needle rise position (pin in hole 4), the roller of roller lever 3 should readily drop into the track of control cam 2.



4.1 Loosen clamp screw 21 of roller lever 3 and clamp screw 22 of trip lever 12.

- 4.2 Also loosen clamp screw 23 of micro switch lever 10.
- 4.3 Bring the needle bar to a position 1.8 mm past bottom dead center (needle rise position) and block the machine by inserting the pin in hole 4 of the bearing plate.
- 4.4 Make sure the clamp screw of the collar located at the extreme left of the engaging shaft points toward the front, push the shaft toward the right and at the same time move roller lever 3 until the roller drops readily into the track of control cam 2.

4.5 Push roller lever 3 into the track of control cam 2 so that its roller contacts the bottom of the track.

- 4.6 Make sure that the roller is positioned in the middle of the cam track, then securely tighten clamp screw 21 of the roller lever.
- 4.7 Check this adjustment (see "Correct setting") and pull the pin out of the hole in the bearing plate.

Engaging solenoid

Correct setting:

With the machine in needle rise position (pin in hole 4) and the engaging solenoid actuated, there should be a clearance of 0.2 to 0.3 mm between engaging lever 11 and interlocking latch 1.



- 5.1 Bring the needle bar to a position 1.8 mm past bottom dead center (needle rise position) and block the machine by inserting the pin in hole 4 of the bearing plate.
- 5.2 Loosen screw 24 of engaging solenoid 13.
- 5.3 Reach behind the trimmer casing from below and pull engaging lever **11** down until interlocking latch **1** drops down over it.
- 5.4 Push the solenoid plunger in as far as it will go and reposition the solenoid housing together with the plunger so that there is a clearance of 0.2 to 0.3 mm between engaging lever 11 and interlocking latch 1.
- 5.5 In this position, securely tighten screw 24 of engaging solenoid 13.
- 5.6 Check this adjustment (see "Correct setting") and pull the pin out of the hole in the bearing plate.

Trip lever

Correct setting:

With the machine in needle rise position (pin in hole 4) and roller lever 3 dropped into the cam track, there should be a clearance of abt. 0.2 mm between the roller of the roller lever and the bottom of the cam track.



- 6.1 Bring the needle bar to a position 1.8 mm past bottom dead center (needle rise position) and block the machine by inserting the pin in hole 4 of the bearing plate.
- 6.2 Make sure engaging lever 11 is engaged, i.e. interlocking latch 1 has dropped.
- 6.3 Push roller lever 3 into the track of control cam 2 until its roller contacts the bottom of the track, and hold it in this position.
- 6.4 Push trip lever 12 up against roller lever 3 and tighten its clamp screw 22 just lightly.
- 6.5 Turn trip lever 12 so that it contacts engaging lever 11 from below.
- 6.6 Set a clearance of abt. 0.2 mm between the roller and the bottom of the cam track by tapping roller lever 3.
- 6.7 In this position, securely tighten clamp screw 22 of trip lever 12.
- 6.8 Pull the pin out of hole 4.
- 6.9 Check this adjustment (see "Correct setting").

Engaging lever

Correct setting:

When the needle bar is at top dead center (pin in hole 5), there should be a clearance from 0.3 to 0.5 mm between the roller of roller lever 3 and the rim of control cam 2.



- 7.1 Make sure the engaging shaft and the engaging lever are at their starting positions.
- 7.2 Remove circlip 26 from the eccentric stud of the tension release lever and disconnect the connecting rod of the needle thread tension.

7.3 Bring the needle bar to top dead center and block the machine in this position by inserting the pin in hole 5 of the bearing plate.

- 7.4 Loosen the locknut of screw 25 and turn the latter until there is a clearance of 0.3 to 0.5 mm between the roller of roller lever 3 and the rim of control cam 2.
- 7.5 In this position, tighten the locknut of screw 25.
- 7.6 Tap the roller lever to check that you have adjusted the clearance correctly.
- 7.7 Pull the pin out of hole 5.

Micro switch actuating lever

(on machines equipped with lever-operated Stop motor only) If the machine has no micro switches (equipped with Electronic-Stop motor) note the pertinent instructions of the motor manufacturers.

Correct setting:

With the machine in needle rise position (pin in hole 4) and the engaging lever operated, there should be a clearance of abt. 0.6 mm between the housing of micro switches 9 and lever 10.



8.0.1

- 8.1 Bring the needle bar to a position 1.8 mm past bottom dead center (needle rise position) and block the machine by inserting the pin in hole 4 of the bearing plate.
- 8.2 Operate the engaging lever by hand.
- 8.3 Push micro switch actuating lever 10 along shaft 7 until it contacts both micro switches 9, and place the lever onto the switch pins from above without actually depressing them. Then set a clearance of abt. 0.6 mm between the housing of micro switches 9 and lever 10.
- 8.4 In this position, securely tighten clamp screw 23 of micro switch actuating lever 10.
- 8.5 Pull the pin out of hole 4.
- 8.6 Turn the balance wheel to bring shaft 7 to its starting position.
- 8.7 Check this adjustment (see "Correct setting").

9 Preliminary adjustment of synchronizer

9.1 On machines equipped with lever-operated Stop motor

Correct setting:

When the needle bar is at top dead center (pin in hole 5), there should be a clearance of abt. 1 mm between synchronizer 5 and carbon brush holder 6. Furthermore, there should be a distance of abt. 5 mm between the carbon brush holder and the notch on the rim of synchronizer 5, as seen in the direction of rotation.



- 9.1.1 Slightly loosen the two screws 27 of synchronizer 5.
- 9.1.2 Loosen the two screws 28 of the collar.
- 9.1.3 Reposition the collar together with the synchronizer until there is a clearance of abt. 1 mm between synchronizer 5 and carbon brush holder 6.
- 9.1.4 In this position, tighten both screws 28 on the collar.
- 9.1.5 Bring the needle bar to **top** dead center and block the machine by inserting the pin in hole **5**.
- 9.1.6 Turn synchronizer 5 in its normal direction of rotation, making sure that it remains in contact with the collar, until the notch on its rim is positioned abt. 5 mm past the carbon brush holder.
- 9.1.7 Pull the pin out of the hole in the bearing plate.
- 9.1.8 Tighten the two screws 27 securely.
- 9.1.9 Check this adjustment (see "Correct setting").

Correct setting:

When the take-up lever is at top dead center (pin in hole 2), the yellowmarked solenoid in the outer solenoid bracket 40 should be positioned above the opposite pole (see Fig. 9.0.3.). When the needle bar is at a position 4 mm past bottom dead center, the redmarked solenoid in the inner solenoid bracket 41 should also be positioned above the opposite pole (see Fig. 9.0.4.).



9.0.3

- 9.2.1 Pull the protecting cap off synchronizer 5 on the balance wheel.
- 9.2.2 Loosen screw 39.
- 9.2.3 Bring the take-up lever to top dead center and block the machine by inserting the pin in hole 2 of the bearing plate.
- 9.2.4 Set the outer solenoid bracket 40 with its yellow-marked solenoid above the opposite pole at the bottom (see Fig. 9.0.3.).
- 9.2.5 Pull the pin out of the hole in the bearing plate.
- 9.2.6 Bring the needle bar to a position 4.0 mm past bottom dead center.
- 9.2.7 Set the inner solenoid bracket 41 with its red-marked solenoid above the opposite pole at the bottom (see Fig. 9.0.4.).
- 9.2.8 In this position tighten screw 39.
- 9.2.9 Check this adjustment (see "Correct setting").
- 9.2.10 Replace the protecting cap of synchronizer 5.

On machines equipped with Efka-Variostop motor

Correct setting:

When the take-up lever is at top dead center (pin in hole 2) the slot in the outer control disc 42 should point downwards (see Fig. 9.0.5.). When the needle bar is at a position 4 mm past bottom dead center the slot of the inner control disc 43 should also point downwards (see Fig. 9.0.6).



9.0.5

- 9.3.1 Loosen the two screws and remove the protecting cover of synchronizer 5.
- 9.3.2 Bring the take-up lever to top dead center and block the machine by inserting the pin in hole 2 of the bearing plate.
- 9.3.3 Turn the outer centrol disc 42 so that its slot points downwards (see Fig. 9.0.5.).
- 9.3.4 Pull the pin out of the hole in the bearing plate.
- 9.3.5 Bring the needle bar to a position 4.0 mm past bottom dead center.
- 9.3.6 Turn the inner control disc 43 so that its slot points downwards (see Fig. 9.0.6.).
 - 9.3.7 Check this adjustment (see "Correct setting").
 - 9.3.8 Replace the protecting cover of synchronizer 5 and tighten the two screws.

Checking the micro switches

(on machines equipped with lever-operated Stop motor only)

If the machine has no micro switches (equipped with Electronic-Stop motor) note the pertinent instructions of the motor manufacturers.

Note:

For easy identification the four pins of the plug are marked clockwise from A to D. The numbers in parentheses (12 to 15) indicate the wires connected to them.

The pin next to the earth symbol is pin D (see Fig. 10.0.1).



10.0.1

- 10.1 Pull the four-pin plug out of the motor control panel socket marked "Synchronisator-Steckvorrichtung".
- 10.2 Lower the presser foot onto the needle plate.
- 10.3 Turn the balance wheel until the trimming mechanism is at rest.
- 10.4 Turn the balance wheel further until the inner switch-off track is positioned under the carbon brush.
- 10.5 In this position, no current must flow between pins A and C and between pins A and D. To check this use a circuit tester.
- 10.6 Operate the engaging solenoid by hand; this operates the two micro switches b3.
- 10.7 In this position, current must flow between pins A and C. However there must be **no** flow of current between pins A and D.
- 10.8 Turn the balance wheel until the engaging shaft springs back to its rest position.
- 10.9 Continue turning the balance wheel until the outer track of the synchronizer is positioned under the carbon brush.
- 10.10 In this position, current must flow between pins A and D. However there must be **no** flow of current between pins A and C.
- 10.11 On machines on which the needle "up" position does not set off the trimming action (subcl. -913/03), push the knee lever to the right as far as it will go. This action switches over switch b5.
- 10.12 In this position, no current must flow between pins A and D.
- 10.13 If micro switch b5 does **not** switch over when the knee lever is operated, adjust the two nuts on the connecting rod to the right of the actuating bracket accordingly.
- 10.14 If the switches do not work properly, check all connections and switches.

Thread catcher

Lateral adjustment

Correct setting:

The tip of thread catcher **16** should be exactly opposite the center line of the needle. Also, the thread catcher must not strike other parts during its motion.



11.0.1

11.1.1	Remove	needle	plate	and	feed	dog.
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- 11.1.2 Loosen screw 30 and remove the knife.
- 11.1.3 Bring the needle bar to bottom dead center.
- 11.1.4 Loosen both screws 29 of thread catcher 16.
- 11.1.5 Reposition thread catcher **16** so that its tip is in front of the needle, as seen in feed direction.
- 11.1.6 Adjust thread catcher 16 laterally so that its tip is exactly opposite the center line of the needle.
- 11.1.7 In this position, tighten both screws 29, making sure the thread catcher is in a horizontal position.
 - 11.1.8 Bring the needle bar to top dead center.
 - 11.1.9 Leave screw 30 loose for the adjustment of the knife.
 - 11.1.10 Check this adjustment (see "Correct setting").

Correct setting:

When thread catcher **16** is at its forward point of reversal, the rear edge of its cutout should be positioned 1 mm behind the front edge of the bobbin case position lug.



11.0.3

- 11.2.1 Push both ball joints of connecting rod **15** onto the studs on the trimming and control mechanisms.
- 11.2.2 Loosen both lock nuts of connecting rod 15 (right- and left-hand thread).
- 11.2.3 Bring the needle bar to bottom dead center.
- 11.2.4 Operate the solenoid plunger by hand so that the roller lever drops into the cam track.
- 11.2.5 Turn the balance wheel in its normal direction until thread catcher 16 is at its forward point of reversal.
- 11.2.6 Turn the central section of connecting rod 15 until the rear edge of the thread catcher cutout is positioned 1 mm behind the front edge of the bobbin case position lug.
- 11.2.7 In this position, lock the central section of connecting rod 15 by tightening both lock nuts.
- 11.2.8 Check this adjustment (see "Correct setting").
- 11.2.9 If the thread catcher has to be re-adjusted, loosen nut 44, adjust the position of the ball stud, and tighten nut 44 securely again.

Correct setting:

When the thread trimmer is at rest, there should be a clearance of abt. 0.5 mm between locking spring 4 and roller lever 3.





12.1 Replace locking spring 4 and the washer, but tighten its two screws 18 only lightly.

12.2 Push locking spring 4 up as far as it will go and position it laterally so that there is a clearance of 0.5 mm between it and roller lever 3.

12.3 In this position, securely tighten both screws 18 of locking spring 4.

12.4 Check this adjustment (see "Correct setting").

Final adjustment of control cam

Correct setting:

When the heel of thread pull-off flange 45 is positioned 2 mm past the center line of position finger 46 (as seen in feed direction), there should be a clearance of 2 mm between the tip of thread catcher 16 and the center line of the position finger.



- 13.1 Bring the needle bar to bottom dead center.
- 13.2 Operate engaging lever 1 (Fig. 4.0.2) by hand so that roller lever 3 (Fig. 13.0.1) drops into the track of cam 2.
- 13.3 Turn the balance wheel in its normal direction until there is a clearance of 2 mm between the heel of thread pull-off flange **45** and the center line of position finger **46**.
- 13.4 Loosen screw 19 which was tightened during preliminary adjustment.

13.5 **Turn control cam 2 until there is also a clearance of 2 mm between the tip of thread catcher 16 and the center line of the position finger, making sure that the setting described in par. 13.3 above is not disturbed.** (The distance from the tip of the thread catcher to the heel of the thread pull-off flange should be 4 mm.)

- 13.6 In this position tighten both screws 19, making sure that control cam 2 is up against the collar to its right.
- 13.7 Check this adjustment (see "Correct setting").

Knife

Correct setting:

When the needle bar is at bottom dead center, there should be a clearance of 3.5 mm between the needle and knife 17.

14.0.1



14.0.2

	14.1	On needle-feed machines, set the stitch length control at O.
	14.2	Bring the needle bar to bottom dead center.
	14.3	Push knife 17 under the adjusting slide.
0	14.4	Reposition knife 17 so that there is a clearance of abt. 3.5 mm between its front edge and the needle.
	14.5	In this position, slightly tighten knife screw 30.
	14.6	Operate the solenoid plunger by hand.
	14.7	Turn the balance wheel until the cutting ridge of the thread catcher is positioned shortly before the cutting edge of the knife.
)	14.8	Adjust knife 17 laterally so that its right edge does not protrude beyond the right-hand, recessed edge of the thread catcher (see arrow in Fig. 14.0.3).
	14.9	In this position, tighten screw 30 securely.
	14.10	Check this adjustment (see "Correct setting").

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15 Trimming test

- 15.1 Turn the balance wheel in its normal direction until the thread catcher is at its forward point of reversal.
- 15.2 Pull two threads into the thread catcher cutout and make a trimming test. (The threads must be properly cut.)
- 15.3 If one of the threads is not properly cut, loosen the two screws of the thread catcher and reposition the latter in relation to the trimming knife.
- 15.4 Make sure the tip of the thread catcher is exactly opposite the center line of the needle, then tighten the two thread catcher screws securely again.
- 15.5 Replace and screw on feed dog and needle plate, making sure the feed dog does not strike the sides of its cutout in the needle plate.
- 15.6 Replace the presser foot and, on unison-feed machines, also the vibrating presser.
- 15.7 Lower the presser foot onto the needle plate.

Correct setting:

When the tip of tension release lever 8 is at the highest point of the olive on shaft 7, the tension discs should be at least 0.5 mm apart.



- 16.1 Connect the tension release connecting rod to eccentric stud **31** and push the detent clip into the groove on the eccentric stud.
- 16.2 Bring the needle bar to **bottom** dead center and operate the solenoid plunger by hand.
- 16.3 Turn the balance wheel until shaft 7 is at its left point of reversal.
- 16.4 Slightly loosen the lock nut of eccentric stud 31.
- 16.5 Place a piece of thread between the tension discs and turn the eccentric stud until the thread is lightly held by the discs.
- 16.6 In this position, tighten the lock nut of eccentric stud 31.
- 16.7 Turn the balance wheel a little further; the tension discs must now release the thread immediately.
- 16.8 Continue turning the balance wheel until the tip of tension release lever 8 is at the highest point of the olive on shaft 7.
 - 16.9 In this position the tension discs must be at least 0.5 mm apart.
- 16.10 Turn the balance wheel until shaft 7 is at its rest position. The needle thread tension must be fully engaged now.
- 16.11 Slightly grease the olive of shaft 7 and check this adjustment (see "Correct setting").

Motor switch connecting rod (On machines equipped with lever-operated Stop motor only.) For machines equipped with Electronic-Stop motor follow the instructions given in the manufacturer's manual.)

Correct setting:

When the pedal is at rest, there should be a distance of 11 mm between the bottom edge of the connecting clamp and the snap ring.



17.1	Loosen screw 32 on the connecting clamp of the two-part motor switch
17.2	connecting rod. Place the pedal in the position most comfortable for the operator.
17.3	In this position, tighten screw 32 securely.
17.4	Loosen both lock nuts 33 and turn the bottom nut until there is a distance of 11 mm between the bottom edge of the connecting clamp and the snap ring when the pedal is at rest.
17.5	In this position, jam the top and bottom nuts.
17.6	Check this adjustment (see "Correct setting")

Motor switch lever rocker (On machines equipped with lever-operated Stop motor only.) For machines equipped with Electronic-Stop motor follow the instructions given in the manufacturer's manual.

Correct setting:

When the pedal is at rest, switches b1 and b2 should be open.





- 18.1 Turn out screw 35 on the motor switch lever until it is flush with the surface of rocker 34.
- 18.2 Also turn out screw 37 until its head protrudes abt. 4 mm above the surface of the rocker.
- 18.3 Turn screw 36 in as far as it will go.
- 18.4 Then turn screw 36 back out again until you hear micro switch b1 click as it switches over.
- 18.5 Turn screw 36 out a further 1/4 of a turn.
- 18.6 Turn screw 37 in until you hear micro switch b2 click as it switches over, too.
- 18.7 Then turn screw 37 back out again until you hear the click of micro switch b2 as it switches back.
 - 18.8 Turn screw 37 out by another 1/4 of a turn.
 - 18.9 Check this adjustment (see "Correct setting").

19 F	inal adjus	stment of s	ynchronizer
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Correct	After the trimming action, the descending needle should come to a stop
setting:	10 mm above the needle plate.

- 19.1 Make sure the V-belt is in place and turn on the master switch.
- 19.2 Slightly depress the front end of the pedal so that the machine runs at reduced speed.
- 19.3 Now heel the pedal; as you do this, the descending needle should come to a stop 10 mm above the needle plate.
- 19.4 If the needle stops earlier or later, i.e. more or less than 10 mm above the needle plate, re-adjust the synchronizer, as instructed in paras 9.1, 9.2 and 9.3.
- 19.5 Re-check the adjustment.
- 19.6 Thread the machine and make sewing and trimming tests.

Removing and replacing the control mechanism

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- 20.1 Pull the synchronizer plug (on Electronic-Stop motors also the thread trimmer plug) out of the socket on the motor control panel or the control box.
- 20.2 Loosen the support leg to the right of the control mechanism and pull the lead out of the clip underneath.



20.0.1

- 20.3 Remove detent clip 26 from eccentric stud 31 and disconnect the connecting rod.
- 20.4 Also disconnect the thread catcher connecting rod.
- 20.5 Unscrew and remove the three screws 38 of the control mechanism and take out the complete unit.
- 20.6 To re-fit the control mechanism, first bring the needle bar to bottom dead center.
- 20.7 If the machine is equipped with lever-operated Stop motor, insert the three carbon brushes and their holder and hold them with your thumb.
 - 20.8 If the unit is fitted with micro switch b5 (on subcl. -913/03) insert the connecting rod in the hole of the operating lever.

- 20.9. Place the control mechanism on the machine so that the holes for the three screws 38 are in line with those on the machine.
- 20.10. Insert the three screws 38 and screw them in finger-tight.
- 20.11 Operate the engaging solenoid by hand so that the roller of the roller lever drops into the cam track.
- 20.12 Reposition the control mechanism so that the roller of the lever is positioned exactly in the middle of the cam track. In this position, tighten the three screws **38** securely.
- 20.13. Re-fit the thread catcher connecting rod.
- 20.14. Feed the lead through the clip and re-tighten the support leg.
- 20.15. Re-connect the tension release connecting rod and replace detent clip 26 on eccentric stud 31.
- 20.16. Replace the synchronizer plug (on Electronic-Stop motors also thread trimmer plug) in the socket on the motor control panel or the control box.
- 20.17. Carry out a check by hand, taking special care that the interlocking latch releases the engaging lever.
- 20.18. If it does not, loosen the three screws 38 of the control mechanism and reposition the latter accordingly.
- 20.19. Afterwards, tighten the three screws 38 securely.

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