



**Adler cl. 221 and 221-FA
Instructions for Mechanics**

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1. Technical data

1.1 Class 221- with subclasses

Subclass	:	50-73	76-73	50-273	76-273	FA-50-73	FA-50-273
Needle system	:	7 x 23	7 x 23	7 x 23	7 x 23	7 x 23	7 x 23
Needle No.	:	180	180	180	180	180	180
Synth. sewing thread	Nm:	-	-	-	-	-	-
Braided thread	Nm:	15/3	15/3	15/3	15/3	15/3	15/3
Foot stroke, max.	mm:	20	20	20	20	20	20
Stitch length, max.	mm:	10	10	10	10	10	10
Bottom feed stroke (above throat plate)	mm:	1,6	1,6	1,6	1,6	1,6	1,6
Final feed	mm:	-	-	-	-	-	-
Alternating top feed stroke	mm:	12	12	12	12	12	12
Stitches/min., max.	max.:	1200	1200	1000	1000	1200	1000
Motor pulley Ø	mm:	95	90	80	80	67	58
Handwheel belt pully Ø	mm:	114	114	114	114	160	160
Motor speed 50 Hz	1/min:	1400	1400	1400	1400	2800	2800

Subclass	:	FA-76-73	FA-76-273
Needle system	:	7 x 23	7 x 23
Needle No.	:	180	180
Synth. sewing thread	Nm:	-	-
Braided thread	Nm:	15/3	15/3
Foot stroke, max.	mm:	20	20
Stitch length, max.	mm:	10	10
Bottom feed stroke (above throat plate)	mm:	1,6	1,6
Final feed	mm:	-	-
Alternating top feed stroke	mm:	12	12
Stitches/min., max.	max.:	1200	1000
Motor pulley Ø	mm:	67	58
Handwheel belt pully Ø	mm:	160	160
Motor speed 50 Hz	1/min:	2800	2800

The listed values refer to stitch off and adjustment data.



2. Completing the machine supplied with disassembled stand

- Supplied components
 1. Sewing head
 2. Stand parts with table top
 3. Motor with control box
 4. Reel stand
 5. Small parts and accessories
- Assembling the stand (Fig. 4)
 1. Connect both lateral parts of the stand
 - a) by bar C (slip each 1 washer on both bar ends)
 - b) with strut D
 - c) with pedal rest E
 2. Align the stand, placed upside down, with respect to the table top (placed on the ground) so that the stand rests at all 4 points
 3. Tighten all screws and nuts of the linking elements
 4. Screws the table top to the stand (see the marks)
- Mounting the motor
- Set the sewing machine on the table top and hand-in the hinges
- Place the V-belt in position and tension it accordingly by swinging the motor
- Fasten the belt guard to the machine head and to the motor
- Mount to reel stand
- Mount the remaining parts
- Establish electrical and pneumatic connections (note the specifications on the type plate)
- Check the direction of rotation
- Test with the material

3. Sewing machine

3.1 Adjusting the rocker

- With the stitch length being set for 0, the feeding foot bar should be distanced 13 mm from the presser foot bar (Fig. 13)
- Release the block by screw b/16 b and turn the rocker accordingly



3.2 Feed dog

3.2.1 Feed dog height

- Being in its topmost position, the feed dog should exceed the throat plate by 1 tooth height
- For checking, set the stitch regulator for 0 stitch length and turn the handwheel
- For correcting, adjust the feed dog support accordingly after having loosened its screw A/15

3.2.2 Position of the feed dog with respect to the needle

(Fig. 16 a)

- in lateral direction:
The needle should stitch in the middle of its hole
For correcting, loosen screws A/18 and displace the feed dog support laterally (2 screws must be on the flat surface of the feed shaft, Fig. 18)
- In feeding direction:
The needle should stitch in the front third part of the stitch hole
(for ensuring that the needle, sometimes heavily deviated when sewing backwards does not miss the stitch hole)
For correcting, loosen screws A/17/20 and displace the feed dog holder accordingly

3.2.3 Lifting movement of the feed dog

- The ascending feed dog and the descending needle should reach the throat plate level simultaneously
(The feed dog is at its topmost point when the needle is at its lower dead point)
- For checking, set the stitch regulator for 0 stitch length and turn the handwheel
- Turn the eccentric on the driving shaft after loosening the two screws B/15
(it can occur that one screw is in the groove of the driving shaft)

3.2.4 Feeding movement of the feed dog

- When the sewing machine, set for the maximum stitch length and with the thread take-up lever being at its topmost point, is turned on the feed dog will advance 1/2 - 1 tooth in the opposite sewing direction
- Turn the eccentric on the arm shaft accordingly after loosening the 3 screws A/25



3.3 Hook and needle bar height

3.3.1 Loop stroke

- In the factory, after adjusting the loop stroke of 2,5 mm, the belt wheel is fixed on the hook driving shaft (the screw D/20 is located in the borehole of the driving shaft)
- A slight modification of the loop stroke is only possible by the lateral displacement of the toothed wheel C/15 on the shaft
- When changing the belt pay attention to the proper engagement with the belt wheel and, for being sure, check the loop stroke of 2,5 mm:
 1. Set the stitch length of 0 and check whether the clutch is engaged
 2. Move the needle bar to its lowest point
 3. By means of the block press the gauge against the rocker and tighten the block (Fig. 30)
 4. Pull out the gauge and turn the handwheel in the direction of rotation until the block touches the rocker
 5. In this position the hook point should stand against the middle of the needle (Fig. 31)
 6. For correcting, modify the belt engagement with respect to the belt wheel

3.3.2 Needle bar height (Fig. 32)

- In the loop stroke position the hook point should stand against the middle of the groove
- For correcting, loosen screws A/13 and displace needle bar

3.3.3 Distance between the hook and the needle

- The distance between the hook point and the needle should amount to 0,1 mm (Fig. 32)
- Loosen 2 screws A, B/19 and shift the block accordingly
- In case of a needle size change between 160 and 180 or 200 check the distance
(The adjustment in the factory is done with the needle size 180)

3.3.4 Tooth play of the hook drive

- The tooth play should be as low as possible
- Adjust the eccentric sleeve accordingly after having loosened the thumb screw and the screw on the block (Fig. A, B, C/19)

3.3.5 Bobbin case holder in the thread cutter version

- The holding finger should not project beyond the inner edge of the bobbin case
(Fig. A/8 - otherwise the bobbin cannot be removed)
- Adjust the finger accordingly



3.4 Bobbin case lifter

3.4.1 General information

- The bobbin case is lifted by the finger at the moment of the thread passage
- The finger travel and the lifting moment are not adjustable

3.4.2 Lifting travel

- should correspond to the thread thickness
- For correcting, change the finger position (Fig. B/8)
- Wrong adjustments can have following consequences:
 - No bobbin case lifting function
 - Heavy noise
 - The bobbin case is projected against the other side of the nose, jumps back and clamps the thread

3.5 Feeding foot and presser foot

3.5.1 Equal stroke of feeding foot and presser foot

- Both feet should have the same stroke
- Adjust 0 stitch length
- Turn the machine and compare the strokes
- For correcting:
 - 1 Lift slightly the foot with the higher stroke off the throat plate
 2. Loosen the block with the screw on the shaft (Fig. B/2):
The lifted foot will be lowered by the presser foot spring down to the throat plate
 3. Repeat the adjustment until the strokes are equal

3.5.2 Feeding movement of the feeding foot

- This results from the adjustment of the feed dog advance
(The movement is ensured by the same eccentric)

3.5.3 Lifting movement of the feeding foot

- Condition for the control and adjustment:
 1. Equal stroke of the feeding foot and of the presser foot
 2. Correct feed dog lifting movement
- The feeding foot should reach the throat plate level at the same time as the ascending feed dog and the descending needle
- For controlling, turn the machine with the stitch length = 0
- For correcting, turn the eccentric on the arm shaft accordingly after loosening the screws A/29

3.5.4 Stroke height of the feeding foot and of the presser foot

- It is possible to select 4 different stroke heights according to the material to be sewn
- Connect the lever with one of the 4 holes of the driving lever (Fig. A/2)
 - Topmost hole: minimum stroke
 - Lowest hole: maximum stroke



3.5.5 Foot lift (Fig. 26)

- When both feet are resting on the throat plate, the distance between the lifting lever and the clamping block should amount to 0,5 mm
- In case of the pneumatic foot lift, the height of about 20 mm (18 mm) of the lifted feet is determined by the position of the fully introduced piston rod of the cylinder

3.5.6 Pressure of the sewing feet

- Adjust by the setting screw C/1 according to the material to be sewn

3.6 Thread tension lifting

- This is done when lifting the feet or magnetically during the cutting process
- The thread must pass freely through the lifted disk tension.

3.7 Check spring

- Spring way:
The check spring should be relaxed when the eye of the needle is submerging in the material
Adjust the stop accordingly (Fig. A/27)
- Spring tension:
Adjust according to the material to be sewn
(When the eye of the needle is plunging in the material, the spring must have pulled the thread up to the stop)
For correcting, loosen the screw and turn the bolt (Fig. B, C/27)

3.8 Safety clutch (Fig. 22)

- This should act when the hook is jammed
- For engaging the clutch, press the arresting button and turn the handwheel contrary to the direction of rotation
- Move the handwheel to and fro until the hook is again free (if the clutch is again disengaged, remove the bobbin case)
- The transferable torque is adjusted in the factory by the threaded pin A/22



4. Thread cutter

4.1 Sequence of function

- Release the pedal after sewing:
The machine will stop in the 1st position (see 4.12)
- Lower the pedal fully backwards:
The engaged magnet will move the thread pulling knife almost up to the counter knife (the upper and the lower thread will be seized)
Thread tension lifting magnet engaged
Rotation of machine at cutting speed
- The control cam moves the thread pulling knife completely against the counter knife
- In the 2nd position:
Thread cutting
Clamping the lower thread
Stop of the drive
Thread cutter magnet off: the thread pulling knife is returned by the spring in the initial position
Thread tension lifting magnet disengaged

4.2 General information

- After a skipped stitch the needle thread cannot be cut
- The length of the thread cut on the fabric ranges between about 10 and 12 mm

4.3 Control cam position

- The control cam determines the moment of the further swinging of the thread pulling knife
- With the thread take-up lever being at its topmost point, the distance at the narrowest point between the lever and the control cam surface should amount to 0,5 mm (Fig. 23)
- For correcting, loosen the screw (Fig. D/15)
- Possible consequences of a wrong adjustment:
The threads are not seized
The starting thread is too short

4.4 Lateral adjustment of the thread pulling knife

- The inside of the thread pulling knife should be flush with the inside of the hook ring (Fig. C, D/9)
- Effect the control with the thread take-up lever being in its topmost position
(Then the knife can be moved up to the hook ring)
- For correcting, loosen screws E/9
- In case of wrong adjustment
it is possible that the threads will not be seized,
it is possible that the thread pulling knife runs against the feed dog



4.5 Height of the thread pulling knife

- The distance to the hook ring should amount to 0,3 mm
- For correcting, loosen the setting ring and the two roller levers and adjust the height of the knife carrier accordingly (Fig. A, B C/11)
(Ensure that the two roller levers are not turned and that the shaft has no play)
- In case of wrong height:
 - it is possible that the threads will not be cut
 - it is possible that the thread pulling knife runs against the hook or the feed dog

4.6 Counter knife position with respect to the thread pulling knife

- With half knife overlapping the counter knife should be slightly pressed against the thread pulling knife
(The pressure will then grow with the increasing overlapping)
- Loosen 2 screws and shift the counter knife laterally
- For controlling the adjustment, cut the bobbin thread by hand by means of the thread pulling knife
- In case of an excessive pressure the knife will be worn faster

4.7 Overlapping of the thread pulling knife with respect to the counter knife

- When the lever stands at the highest point of the control cam, the back of the thread pulling knife should be flush with the cutting edge of the counter knife (Fig. 10)
- Loosen the screw and turn the lever on the shaft accordingly (Fig. A, B/21)

4.8 Position of the returned thread pulling knife

- In this position the distance between the highest point of the control cam and the roller lever should amount to 0,5 mm (Fig. 24)
- Loosen the screw and turn the plastic stop eccentric accordingly (Fig. A, E/24)

4.9 Position of the magnet

- With the thread pulling knife being returned, the distance between the magnet tappet and the lever should amount to about 1 mm
- For correcting,
 - either modify the position of the magnet
 - or turn the roller lever on the shaft after loosening the screws(Fig. C, D/21)

4.10 Wire spring (Fig. E/21)

- This should support the back motion of the thread pulling knife, being under pressure at the moment of overlapping
- Bend the spring accordingly



4.11 Bobbin thread clamp (Fig. C/8)

- It should ensure a certain bobbin thread length for a safe seam start
- Loosen the screws and
 1. adjust the spring with respect to the clamping groove of the counter-knife
 2. set the spring parallel to the thread pulling knife and so that a slight pressure is exerted
- For controlling, cut the thread by hand by means of the thread pulling knife and pull out the lower thread
- In case of a wrong adjustment problems at the seam start may occur

4.12 1st position

- In this position the hook point, after picking up the loop, should stand in the "11-12h" position (Fig. 36)
- Turn the handwheel in the respective position and adjust by means of the synchronizer:
 - In case of Quick: set the inner groove screen B/33 with respect to the light barrier
 - In case of Efka: set the inner groove screen by means of the white orientation points (Fig. 34 a)
- For controlling the position, lower the pedal briefly forwards and release it again. Move first the function selector in "1 needle" position.
 - In case of deviations turn the screen accordingly.
- Possible fault consequences:
 - Upper and lower thread will not be cut

4.13 2nd position

- Corresponds to the topmost position of the thread take-up lever
- Turn the handwheel in the respective position and adjust by means of the synchronizer
 - In case of Quick: set the outer nose screen C/33 with respect to the light barrier
 - In case of Efka: set the outer groove screen by means of the white orientation points (Fig. 34 b)
- For controlling the position, lower the pedal briefly forwards, then backwards, and release
 - In case of deviations turn the screen accordingly
- Possible fault consequences:
 - No cutting
 - The needle stands too deep



5. Additional equipment

5.1 Needle positioning (NP)

5.1.1 General information

- After cutting, the needle will project under the lifted foot if there is no needle positioning. For using the maximum fabric passage also for extremely thick material, the needle, after reaching the 2nd position, is moved in a position above the presser foot.
(The pneumatically driven needle positioning device turns the handwheel back by the hook driving shaft).

5.1.2 Needle position after NP process (Fig. B/20)

- The needle should stand in its topmost position
- For correcting, turn the clamping ring with the pin on the shaft accordingly

5.2 Automatic seam bartacking (RAP)

- For controlling the pneumatically operated stitch regulator it is necessary to have a constant pressure of 6 bar.
Therefore it is recommended to install a pressure regulator
- The bar length adjustment (number of stitches) is described in the instructions of the motor manufacturers
- The bartacking speed is set in the factory to 400 rpm, but it can be modified according to the requirements.
Please note that the bartack lengths must be modified if the bartacking speed has been changed

5.3 Pneumatic foot stroke adjustment (HP-16)

5.3.1 General information

- The foot stroke can be reset to its maximum value by operating the knee switch while sewing
This is required for instance when crossing thick seams
- When the knee switch has not been operated, the previously adjusted lower stroke will be effective

5.3.2 Minimum stroke (Fig. 35)

- This can be set by the stop screw in the coulisse

5.3.3 Maximum stroke

- This results from the limitation within the mechanism when the piston rod has been moved out



6. Speed adjustment

6.1 Quick NDK 880 with control box No. 5164

6.1.1 General information

- It is not necessary to adjust the speed if the machine class is specified when ordering the spare control box. The latter is then adjusted in the factory.
- Consequences of incorrect speeds:
"Continuous operation" of the machine
Incorrect operation of the thread cutter
- When using a mechanical speedometer, measure the speed directly on the synchronizer
- Adjust strictly in the specified sequence

6.1.2 Preparations on the machine

- Lift the sewing foot
- Remove the cover from the control box
(loosen 4 screws)

6.1.3 Adjusting positioning speed

- Operate the main switch
- Pull out the screen slide
- Operate the pedal briefly forwards and release it again
- Adjust by P1 the speed of 130 rpm

6.1.4 Adjusting the maximum speed

- Lower the pedal fully forwards
- Turn P2 clockwise until it can be felt that the speed decreases
- Turn P2 counter-clockwise until it can no longer be felt that the speed increases
- Release the pedal

6.1.5 Adjusting the speed curve

For adjusting a linear curve:

- Lower the pedal completely (12th step) and measure the maximum speed
- Release the pedal by one speed step (11th step) and, by means of P3, reduce the speed by 10-15 %
- Introduce the screen slide: the needle will stop in its lower position

6.1.6 Adjusting the cutting speed

- Pull out the screen slide
- Lower the pedal completely backwards and release it again
- Adjust by P6 the speed of 130 rpm
Introduce the screen slide: the needle will be stopped in its upper position

6.1.7 Move the machine in its starting position

- Stop the machine
- Screw-on the cover



6.2 Quick NDK 880 with control box No. AQ 5609 and 5809

6.2.1 General information

- It is not necessary to adjust the speed if the machine class is specified when ordering the spare control box.
The latter is then adjusted in the factory.
- Consequences of incorrect speeds:
"Continuous operation" of the machine
Incorrect operation of the thread cutter
- When using a mechanical speedometer, measure the speed directly on the synchronizer
- Adjust strictly in the specified sequence.

6.2.2 Preparations on the machine

- Lift the sewing foot
- Set the function selector on "needle in lower position"
- In case of automatic seam bartacking: cancel the initial and final bartacking (0 position)
- Separate the plug connections on the control box cover
- Remove control box cover
(loosen 4 screws and separate inner plug connection)

6.2.3 Basic adjustment of the 1st speed step

- Operate main switch
- Operate first step by pedal
- Set by P10 the speed of 100 rpm
- Release the pedal: the needle will be positioned at its lower point

6.2.4 Adjusting the speed curve

- For adjusting a linear curve, move CP3 in the central position
(slit standing vertically)

6.2.5 Adjusting the maximum speed

- (normally it is adjusted by Quick)
- Tread the pedal completely forwards
- Turn CP2 clockwise until it can be felt that the speed decrease
- Turn P2 counter-clockwise until it can no longer be felt that the speed increases
- Release the pedal

6.2.6 Adjusting the optimization speed

- Pull out screen slide from the synchronizer
- Lower the pedal completely forwards and release it quickly
(otherwise the machine will operate at cutting speed)
- Adjust by CP26 the speed of 800 rpm
- Introduce the screen slide: the needle will be stopped in its lower position (if, when positioning, the machine does not stop or if it stops only after several revolutions, modify the CP26 adjustment accordingly)



6.2.7 Adjusting cutting and positioning speed

- Pull out the screen slide
- Tread the pedal briefly forwards and release it again
- Set by CP6 the speed of 130 rpm
- Introduce the screen slide: the needle will be stopped in its lower position
- Pull out the screen slide
- Tread the pedal backwards completely and release it again
- Introduce the screen slide: the needle will be stopped in its upper position

6.2.8 In case of automatic seam bartacking: adjusting the initial bartacking speed

- Switch on initial and final bartacking (single or double)
- Pull out the screen slide
- Tread the pedal briefly forwards
- Set by CP8 (n_{Ar}) the speed of 400 rpm
- Introduce the screen slide: the needle will be stopped in its lower position

6.2.9 In case of automatic bartacking: adjusting the final bartacking speed

- Pull out the screen slide
- Tread the pedal backwards completely and release it again
- Set by CP9 (n_{Er}) the speed of 400 rpm
- Introduce the screen slide: the needle will be stopped in its upper position

6.2.10 Moving the machine in its starting position

- Switch off the machine
- Establish plug connections
- Screw-on the cover
- Lower the sewing foot

6.3 Efka with control box No. 8 E 31 and 8 E 32

6.3.1 General information

- Effect the adjustment when exchanging the efka control
- Consequences of incorrect speeds:
"Continuous operation" of the machine
Incorrect thread cutter operation
- When using a mechanical speedometer, measure the speed directly on the synchronizer
- Adjust strictly in the specified sequence

6.3.2 Preparations on the machine

- Lift the sewing foot
- Set function selector on "needle in lower position"
- In case of automatic seam bartacking:
Cancel initial and final bartacking



6.3.3 Adjusting cutting and positioning speed

- Operate the main switch
 - Operate the 1st step by pedal
 - Set by P1 the speed of 130 rpm
 - Release the pedal: the needle will be stopped in its lower position
 - Tread the pedal backwards completely and release it again
- The needle will be stopped in its upper position

6.3.4 Adjusting the bartacking speed in case of control box 8 E 32

Initial bartacking speed

- Switch on initial and final bartacking
- Loosen the cover by 2 screws
- Loosen both r/h plug connections
- Close the bridge b6
(quite at bottom on the right in the control box - see the label in the inside of the cover)
- Reconnect the plug with the switch box
- Tread the pedal briefly forwards and release it again
- Set by P4 the speed of 400 rpm
- Open the bridge b6: the needle will be stopped in its lower position
- Close the bridge b6

Final bartacking

- Tread the pedal backwards completely and release it again
- Set by P5 the speed of 400 rpm
- Open the bridge b6: the needle will be stopped in its upper position
- Replace the cover

6.3.5 Programming the bartacking (Fig. 28)

By means of the switch groups b70, b71, b72, b73, including each 4 individual switches, it is possible to determine the number of stitches (1-15) for the following bartacking seams:

b70: AR₂
 b71: AR₁
 b72: ER₁
 b73: ER₂

Each engaged switch has a certain value of stitches of 1, 2, 4 or 8. In disengaged state the stitch value is = 0.

Example: The Bartacking seam AR₂ should include 7 stitches.

Switch	On	Off	Stitch number value
1	x		1
2	x		2
3	x		4
4		x	0
			7



7. Maintenance plan

7.1 Daily

- Remove by compressed air several times daily the fluff accumulations at following points:
 - Needle thread guide and thread tension
 - Check spring
 - Hook and thread cutter
- Saturate with oil several times daily the felt in the hook
- Lubricate all points marked in fig. 12, 13, 14

7.2 Weekly (40 service hours)

- Mist oiler: control function and oil level
- Quick motor: clean the casing for the ventilation wheel
- Efka motor: clean the casing for the ventilation wheel

7.3 Monthly (160 service hours)

- V-belt: check for tension and wear

7.4 Quarterly (500 service hours)

- Toothed belt: check for tension and wear
- Pneumatic filter: clean the insert

7.5 Yearly (2000 service hours)

- Quick motor: check clutch play
- Efka motor: check clutch play









