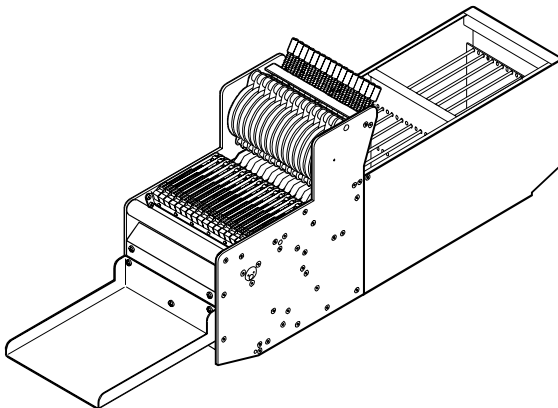


Magazine Upgrade Guide



TM8C - Revision 1

For MYDATA L-014-0866 Magazine Upgrade Kit

English

MYDATA
automation
WORLDWIDE

Magazine Upgrade Guide

TM8C - Revision 1

For MYDATA L-014-0866 Magazine Upgrade Kit

English

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The equipment described in this manual must be used exclusively with MYDATA placement machines.

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Magazine Upgrade Guide

This magazine upgrade guide contains instructions on how to upgrade a TM8C tape magazine and adjust the magazine after the upgrade.

 Before upgrading any TM8C tape magazine, read carefully the *Important Information* section found overleaf.

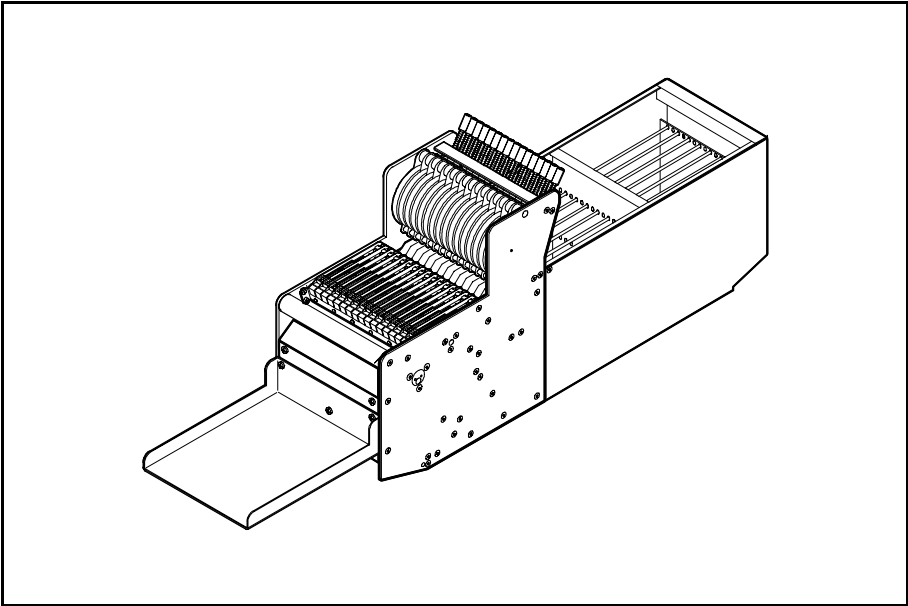
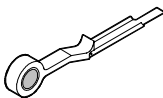


Figure 1. TM8C tape magazine

The magazine upgrade involves mainly to replace the following parts:



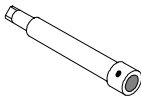
- Feeder arms



- Feeder wheel spacers



- TMC board spacer screws

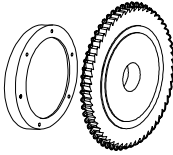


- Feeder motor driving shaft

Important Information

The following information is a revised version of MYDATA Service Bulletin 98015.

Feeder Wheels



The purpose of the TM8C upgrade is to reduce the feeder wheel spacing, i.e. the thickness of the feeder wheels plus the feeder wheel spacers.

This is achieved by changing to slightly thinner feeder wheel spacers.

Thinner wheels There are, however, feeder wheels that are slightly thinner than normal, and these wheels must not be further compensated by being upgraded.

Upgrading such a magazine makes the pick position distance between adjacent feeders to be less than 10mm, causing a high reject rate if a HYDRA system is used. And, it can make the entire feeder wheel pack to be too short, causing an inadequate friction.

Which wheels are thinner? A batch of feeder wheels manufactured in the summer of 1997 are slightly thinner than normal.

These wheels are transparent and they are found in TM8C magazines with the serial number most likely within the serial number interval 14704 - 14724, but they might be found within the larger serial number interval 14022 - 15298.

How to test the wheels? Before upgrading any TM8C magazines with the above serial numbers, check the feeder wheel thickness as follows:

- Put the magazine with the old transparent spacers in the machine.
- Using the positioning camera, measure the distance between magazine feeder 1 and feeder 16. A piece of white tape on these two feeders can be used to find a reference.

Normal wheels If the measured distance is more than 150.2mm, then the feeder wheels are normal and the upgrade can be performed as described on the following pages.

Thinner wheels If the measured distance is less than 150.2mm, then the feeder wheels are thinner than normal and you can choose one of the following two actions:

- Keep the present wheels and transparent spacers, provided the distance is correct, see below. In this case, put an extra label beside the *Revision 1* label referring to *Service Bulletin 98015*. The revision label is mentioned on [page 16](#).
- Renew all the feeder wheels and all the feeder wheel spacers.

Correct distance The correct distance between feeder 1 and feeder 16 is from 149.7mm to 150.3mm, measured as described above.

Tools Required

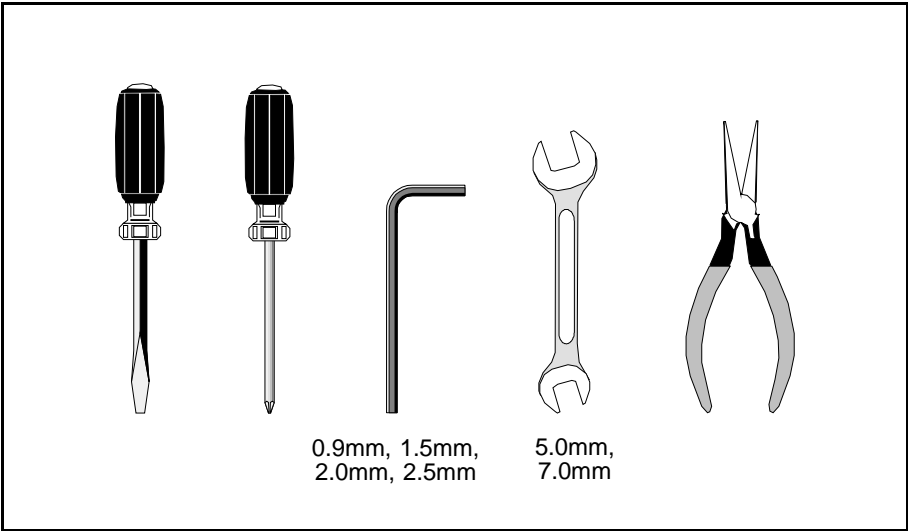


Figure 2. Tools required

Instruments Required

- Dynamometer (pulling), 0 - 6N
- MYDATA Magazine Pulse Counter, part # L-007-0022 (not necessary)

Unpacking the Magazine Upgrade Kit

The following items are included in the kit. Please, make sure that no item is missing.

Part #	Item	Qty.
P-014-0866-EN	Magazine Upgrade Guide (this guide)	1
L-014-0106C	Feeder arms, standard	15
L-014-0107C	Feeder arm, drive side	1
D-014-0853B-3	Spacers (for feeder wheels)	16
D-014-0643-4	Plastic washer (to eccentric shaft)	1
D-014-1040-4	Spacer screws (to TMC PCB)	2
M-IZ-3.2-A4	Securing washers (to spacer screws)	2
D-014-0614B-3	Driving shaft (to the motor)	1
K-010-0004	Revision 1 label	1

Dismantling

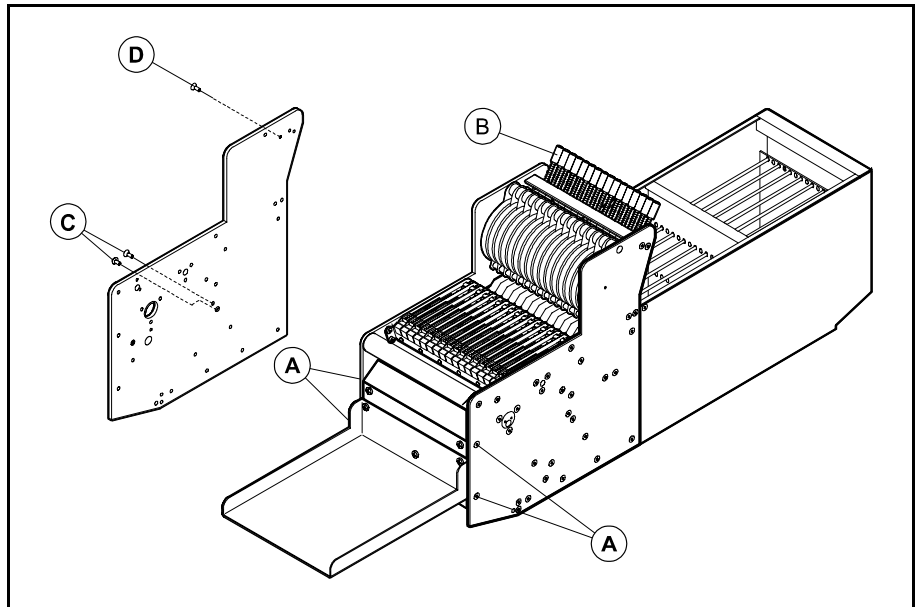


Figure 3. Dismantling the magazine

1. Remove the front cover plates by undoing the four fixing screws ('A' in Figure 3).
2. Release all the buttons for the cover tape take up reels (B).
3. On the right side of the magazine, undo the two screws at the solenoid bar (C) and the screw at the rubber covered driving shaft (D).
4. Turn the magazine over and put it down on its right side.

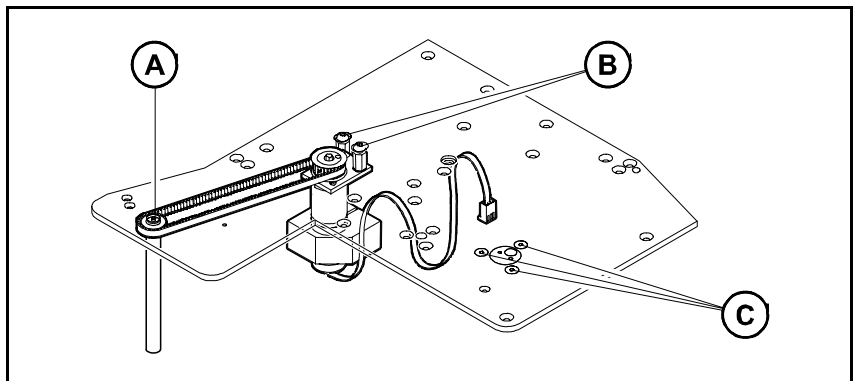


Figure 4. Detaching the end plate

Keep the screws in order with respect to the lengths and shapes.

5. Except for the screws at the rubber covered driving shaft ('A' in Figure 4), the motor (B), and the eccentric shaft (C), remove all the end plate screws.
6. Lift the end plate with the motor and the rubber covered driving shaft straight up from the magazine.
7. Disconnect the motor cable from the MS board.

Replacing Spacer Screws

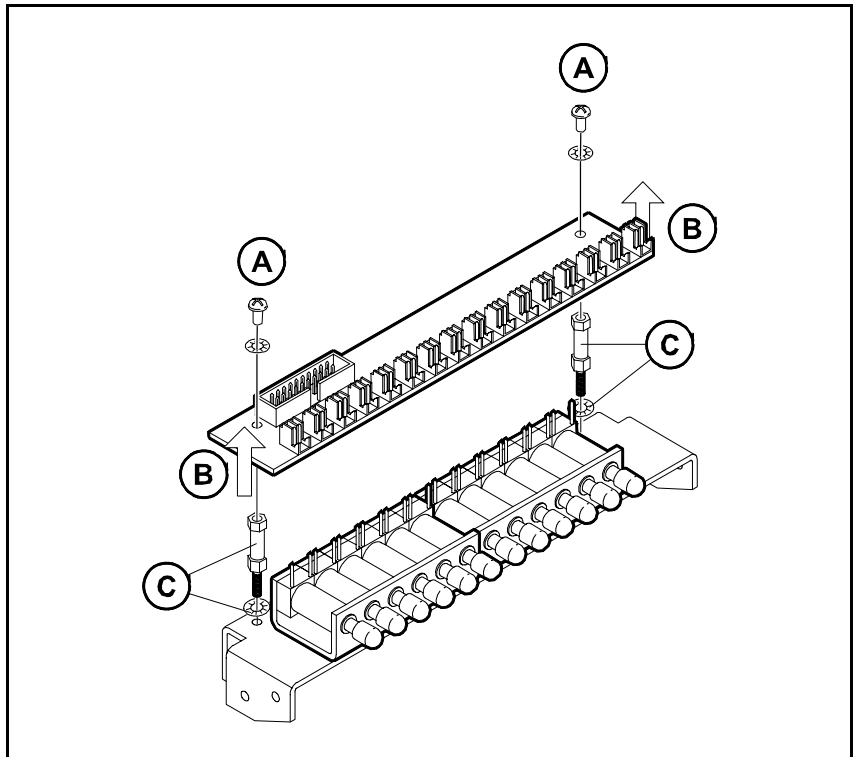


Figure 5. Solenoid bar

8. Disconnect the cable from the TMC board and lift the solenoid bar straight up.
9. On the solenoid bar, undo the two screws on the TMC board ('A' in Figure 5).
10. Carefully, remove the TMC board by pulling it up **alternately** at the board ends (B).



Do not lift the PCB up by pulling one board end only, because then you will bend the connector terminals.

11. Remove the spacer screws and the washers (C).
12. From the Magazine Upgrade Kit, replace these items, i.e. two spacer screws (D-014-1040-4) and two securing washers (M-IZ-3.2-A4).
13. Carefully, put the TMC board back and press it down on the connector terminals. Put the screws back and tighten them.

Replacing Feeder Arms

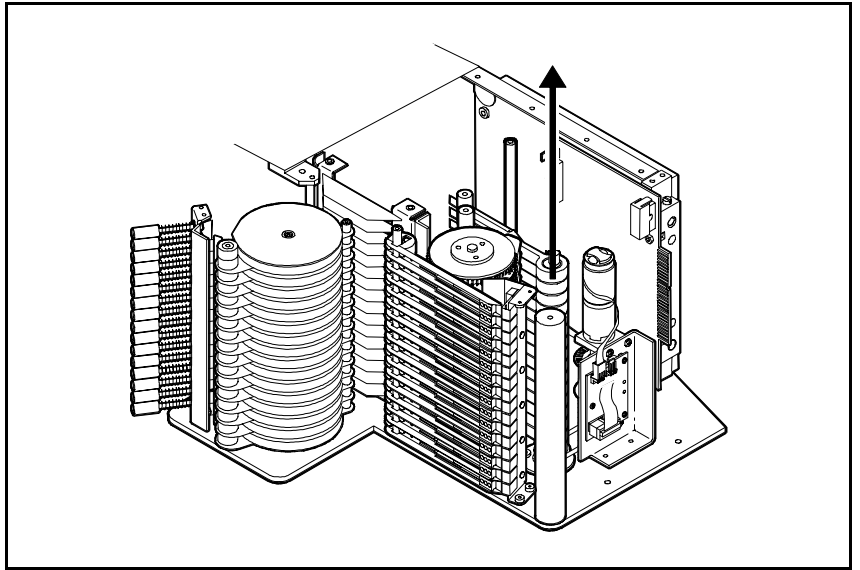


Figure 6. Removing feeder arms

14. Lift the 16 feeder arms and the 15 washers straight up from the shaft (see the arrow in Figure 6).

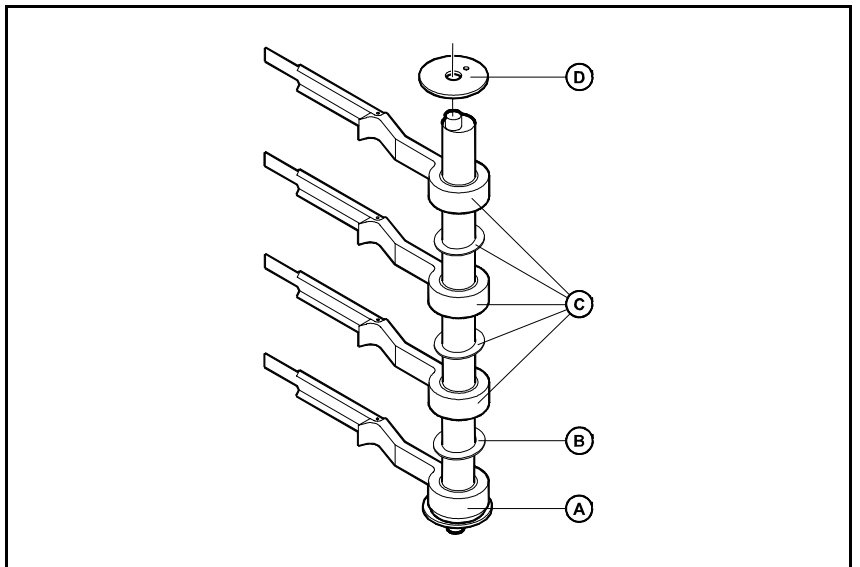


Figure 7. Reassembling feeder arms

15. From the Magazine Upgrade Kit, reassemble the drive side feeder arm (L-014-0107C, 'A' in Figure 7). Make sure that the feeder arm tip points towards the feeder wheel.
16. Put a washer on the drive side feeder arm (B).
17. From the Magazine Upgrade Kit, reassemble the 15 feeder arms (L-014-0106C) and put a washer between all feeders (C). No washer on the last feeder arm.
Keep the feeder arms clean from oil.
18. From the Magazine Upgrade Kit, put the plastic washer (D-014-0643-4) on the shaft on top of the last feeder arm (D).

Replacing Feeder Wheels and Spacers

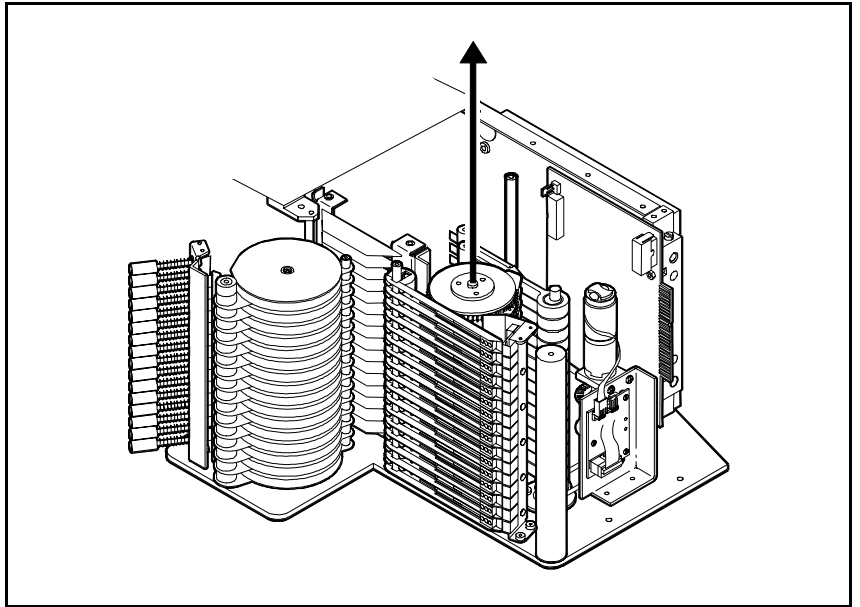


Figure 8. Removing feeder wheels

19. Lift the entire feeder wheel pack straight up (see the arrow in Figure 8).

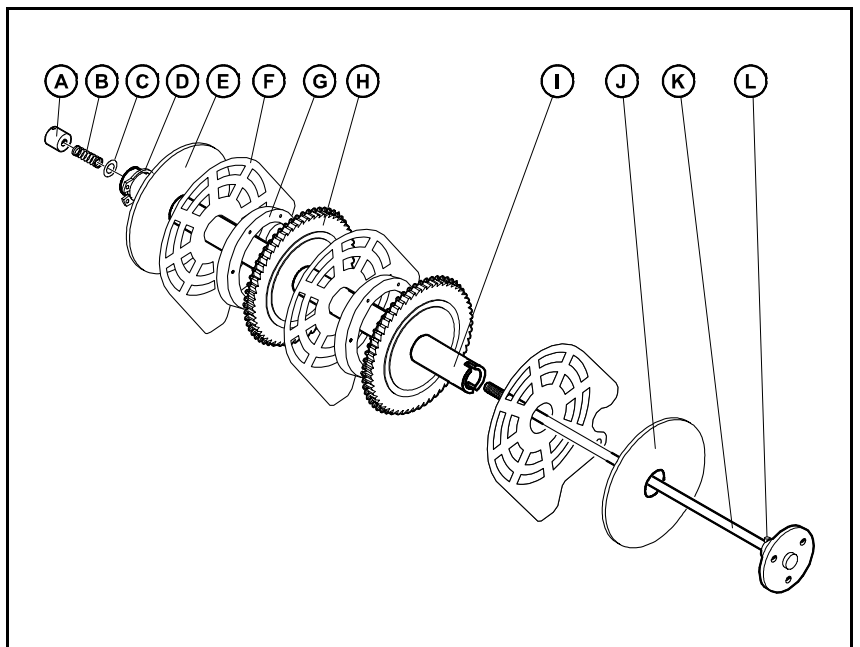
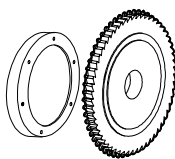


Figure 9. Feeder wheel pack

20. Undo the nut in the feeder wheel pack end ('A' in Figure 9).
21. Remove the spring (B) and washer (C).
22. From the other end of the feeder wheel pack, withdraw the axle (K), the big washer (J), and the first friction disc.

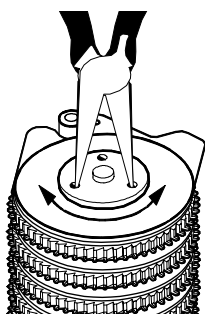


- 23.** Except for the last big washer (E) and the last friction disc (F), withdraw all the feeder wheels (H) with spacers (G) and friction discs (F).
- 24.** From the Magazine Upgrade Kit, replace the spacer (D-014-0853B-3) on a feeder wheel by removing the old spacer and properly pressing a new spacer on the feeder wheel. Put the feeder wheel on the shaft with the spacer facing towards the friction disc (see [Figure 9](#)), and put the next friction disc on the shaft.

Keep the friction discs clean from oil.

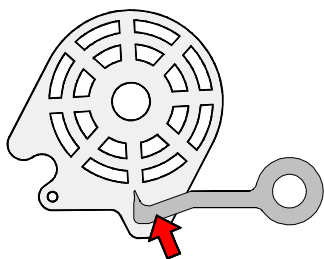
Repeat this procedure until all the 17 friction discs and 16 feeder wheels with spacers are assembled on the shaft. Make sure that the friction discs are turned as shown in [Figure 9](#).

- 25.** Reassemble the big washer (J) and insert the axle (K) into the shaft. Make sure that the pins on the axle (L) enter the shaft end notches.
- 26.** In the other end of the feeder wheel pack shaft, insert the washer (C), spring (B) and nut (A). Tighten the nut approximately to half of possible tightening length.
- 27.** Put the entire feeder wheel pack back into the magazine. Make sure that the adjacent shaft enters the friction disc recesses (you can see the adjacent shaft to the left of the pliers in the figure).
- 28.** By using a pair of tip pliers, turn the feeder wheel axle until two of the three threaded holes are parallel to the magazine length axis (the threaded holes correspond to the holes in the end plate).



Cleaning From Oil

- 29.** Clean thoroughly the friction discs and the feeder arms from oil.



If there is oil on the friction discs or on the feeder arms (see the arrow in the figure), then the feeder arms are caught by the capillary force of the oil. This will slow down the arm motion and it may prevent the arm from reaching the feeder wheel in time.

The new aluminium feeder arms are more sensitive to the oil capillary force than the old ones. So, keep the friction discs and feeder arms clean from oil.

Reassembling

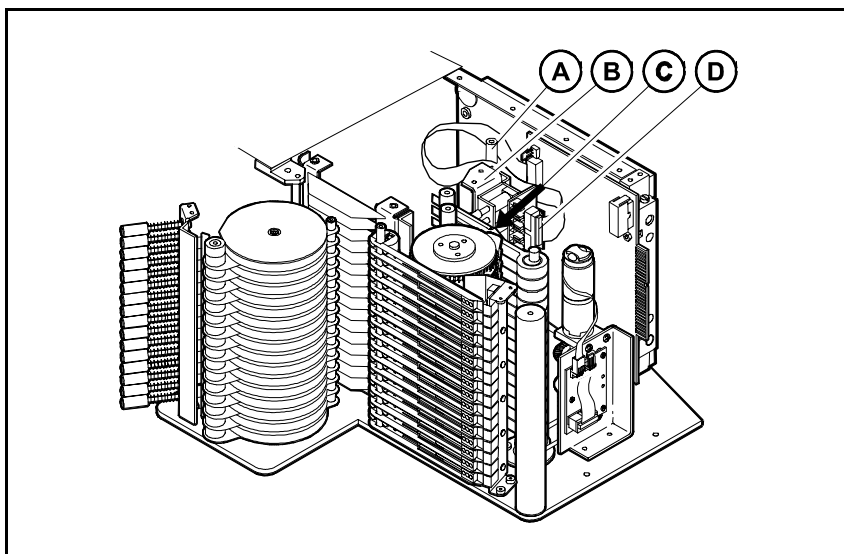


Figure 10. Reassembling

30. Put all the feeder arms between the friction discs ('C' in Figure 10).
31. Put the solenoid bar back to its place in the magazine (B).
32. Insert both the screws for the solenoid bar from below.

Make sure that the adjusting screw (protruding head) is inserted in the recessed hole and the fixing screw (countersunk head) in the countersunk hole. Do not tighten the screws.

33. Connect the cable to the solenoid bar (D).



Position the cable parts to the solenoid bar on each side of the cylindrical end plate support (A).

34. Reassemble the end plate with the motor and rubber covered driving shaft as follows:

- Lower the end plate straight down towards the magazine. Two shafts are to be entered through the end plate.
- Insert all the screws. Make sure you insert the right screws with respect to the length and head shapes.

Screws shorter or longer than the regular length are marked 'S' and 'L' respectively in [Figure 11](#).

- If the three threaded holes for the feeder wheel pack are not centered in the end plate holes, adjust the axle by inserting the tip pliers and turn the axle in the same way as before. You may need to lift the feeder wheel pack when inserting the three screws.
- Except for the two screws at the solenoid bar, tighten all the screws on this side of the magazine.

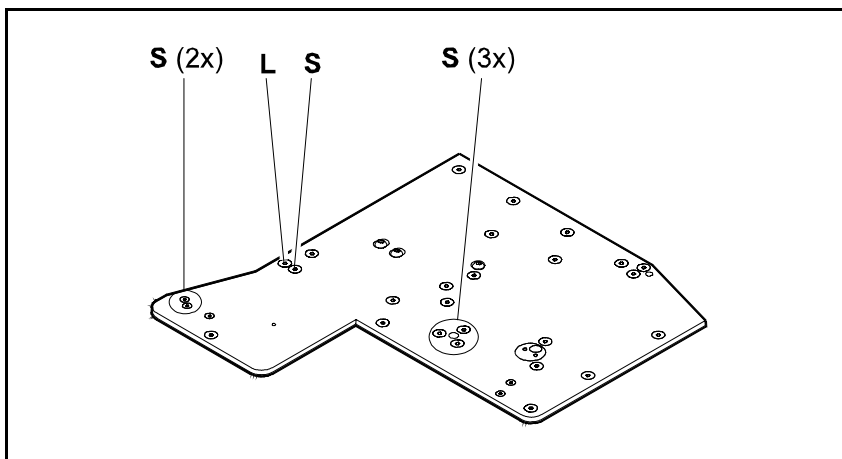


Figure 11. End plate screw length

- 35.** Turn the magazine over and insert the screw at the rubber covered driving shaft on the other side. Tighten the screw.
- 36.** Make sure that no feeder arm is jammed between the friction discs.

Adjusting Feeder Arm Gap

37. Turn the magazine to the regular position.
38. Slightly tighten both the countersunk screws at the solenoid bar (one at each side of the magazine).

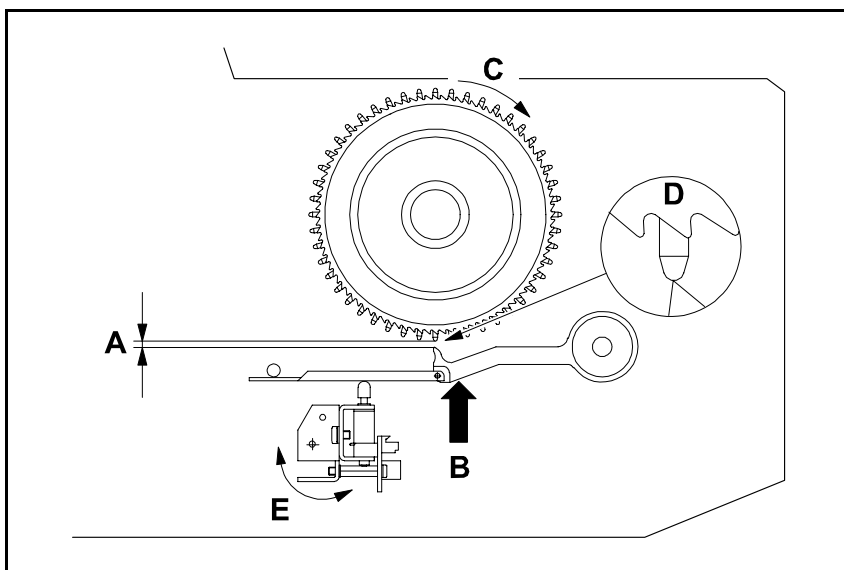


Figure 12. Feeder arm gap

39. Adjust the gap between the feeder wheels and the feeder arm tips ('A' in Figure 12) by turning the solenoid bar. The gap should be 0.5mm - 1.0mm.

Set the gap as follows:

- Lift the outermost feeder arm (B) by hand as much as the tip touches the feeder wheel.
 - Turn the feeder wheel (C) while the feeder arm is lifted.
 - Stop turning the feeder wheel when the top point of a tooth passes (D).
 - Compare the lifted feeder arm position to the released position and estimate the gap.
 - Turn the solenoid bar (E) until the gap is 0.5mm - 1.0mm.
 - Slightly tighten the adjusting screw (protruding head) at the solenoid bar.
 - Repeat the procedure for the outermost feeder arm on the opposite side.
40. Turn all the feeder wheels. The feeder arm tips **must not** touch the wheels. Readjust if necessary.
 41. Tighten the four solenoid bar screws.
 42. Check the gap again. Readjust if necessary.

Replacing Motor Shaft

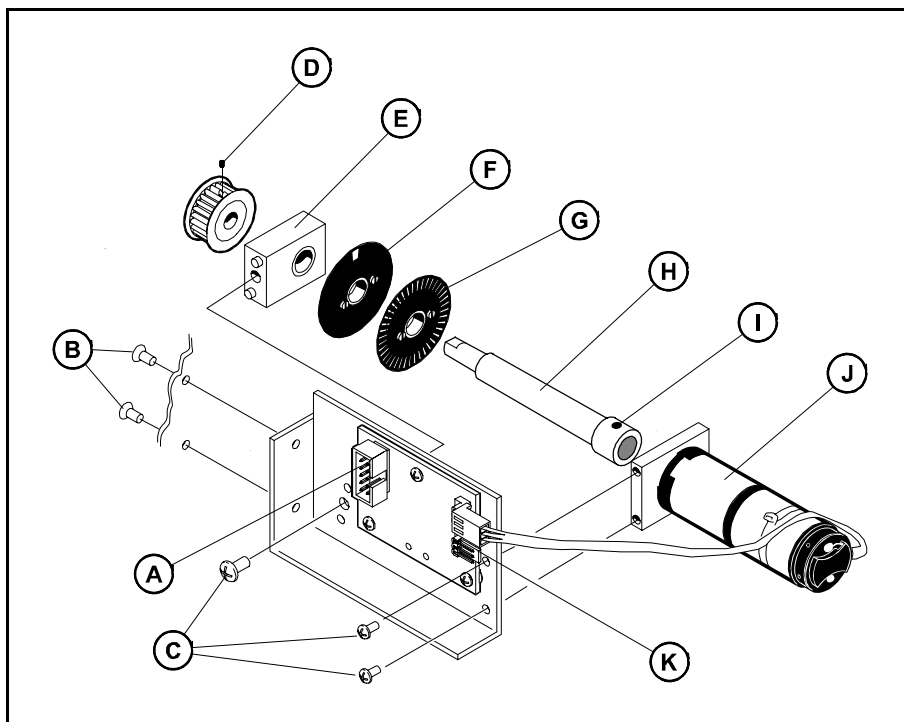


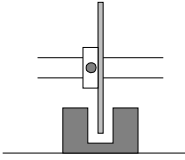
Figure 13. Feeder motor unit

43. Disconnect the big connector on the MS board ('A' in Figure 13).
44. Remove the motor base bracket by undoing the two fixing screws (B).
45. Detach the motor unit by undoing the three screws (C) at the two bearing brackets.
46. Loosen the pulley stop screw (D) using an 1.5mm Allen key and withdraw the pulley and the bearing bracket (E).
47. Separate the shaft (H) from the motor by loosening the shaft stop screw (I) using an 1.5mm Allen key.



Take a look at the code discs (F and G) on the shaft before dismantling. Note how the discs are turned.

48. Remove the code discs from the shaft after loosening the stop screws (0.9mm Allen key).
49. From the Magazine Upgrade Kit, put a new driving shaft (D-014-0614B-3) on the motor shaft. Make sure the stop screw (I) is pointed towards the notch in the motor shaft. Tighten the stop screw.
50. Put the code discs and the bearing bracket on the shaft. Make sure that you put the code discs in correct order on the shaft, and correctly turned, see Figure 13.



51. Put the motor with shaft back to the base bracket. Position the code discs in the optical sensor gaps (see the figure).
52. Insert and tighten the three bearing bracket screws (C).
53. Position the code discs in the middle of the optical sensor gaps and tighten the stop screws (the single hole code disc lightly because it is to be adjusted later on).
54. Put the pulley back. If the stop screw (D) is not located in the middle of the pulley, it should face the bearing bracket (see [Figure 13](#)). Make sure the stop screw is pointed towards the notch in the shaft. Tighten the stop screw.
55. Put the motor unit back into the magazine by putting the belt back on the pulley, inserting the two screws (protruding head uppermost), and slightly tighten the lower screw.
56. Stretch the belt by turning the motor unit and tighten both the screws.



The belt tension is also affected by the magazine pick-up position adjustment (Y position). If the eccentric discs that are used for this adjustment are turned more than 10° the belt tension should be readjusted.

57. Reconnect the cover tape take up reel motor cable to the lower connector (K) on the MS board, and the board interconnecting cable to the big connector (A).

Setting Code Disc Synchronization

The code disc synchronization can be set either by using a pulse counter device or without using this device. The following description comprises both the methods.

Using Pulse Counter

58. Connect the MYDATA pulse counter to the MS board ('A' in Figure 13).
59. Loosen the stop screw on the single hole code disc.

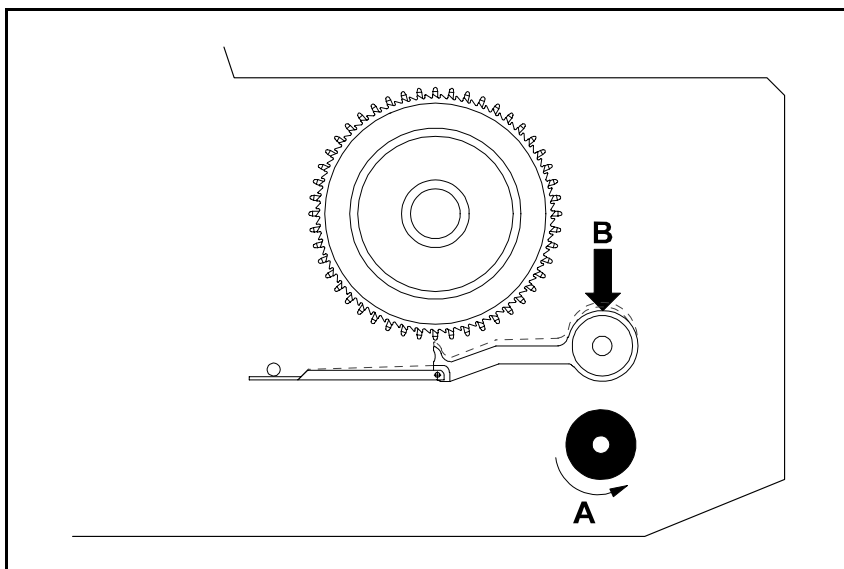
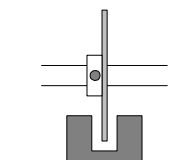
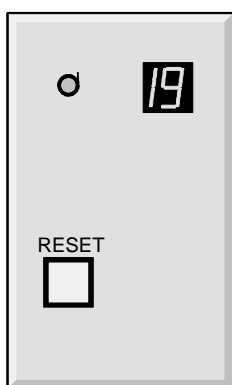


Figure 14. Setting the code disc with pulse counter

60. Turn the multi-hole code disc by hand ('A' in Figure 14) until the eccentric shaft with the feeder arms are at its lowest position (B).

The easiest way to determine the lowest position is to watch the arms through the empty hole below the eccentric shaft bearing in the end plate.



61. Reset the pulse counter by pressing the RESET button (see the figure).
62. Turn the multi-hole code disc by hand as shown in Figure 14 (A) until the pulse counter displays 19 pulses.
63. Without turning the multi-hole code disc, turn the single hole disc in the same direction until the LED on the pulse counter lights up.
64. Without turning the code discs, position the single hole code disc in the middle of the optical sensor gap (see the figure) and tighten the stop screw.
65. Check the setting by turning the shaft to the lowest position, resetting the pulse counter, and turning the code disc until the LED lights up. The pulse counter shall display 18 - 20 pulses. If not, repeat the setting.
66. Disconnect the pulse counter from the MS board and reconnect the regular board interconnecting cable.

Without Using Pulse Counter

- 67.** Loosen the stop screw on the single hole code disc.

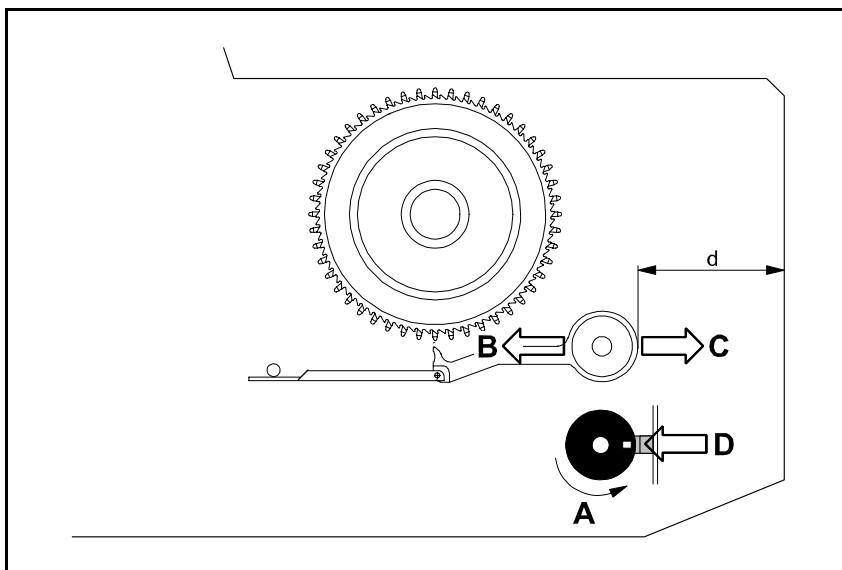
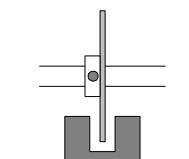


Figure 15. Setting the code disc without pulse counter

- 68.** Turn the multi-hole code disc by hand ('A' in Figure 15) until the eccentric shaft with the feeder arms are as far from the magazine front as possible (B), i.e. when the 'd' distance is maximum.
- 69.** Measure the 'd' distance and note it down as 'd1.'
- 70.** Continue turning the multi-hole code disc by hand until the eccentric shaft with the feeder arms are as close to the magazine front as possible (C), i.e. when the 'd' distance is minimum.
- 71.** Measure the 'd' distance and note it down as 'd2.'
- 72.** Calculate 'd3' as follows:

$$d3 = \frac{d1 + d2}{2} + 1.5$$

- 73.** Again, turn the multi-hole code disc until the 'd' distance equals the calculated 'd3' distance.
- 74.** Without turning the multi-hole code disc, turn the single hole code disc until the hole is in the optical sensor read off position (D).
- 75.** Without turning the code discs, position the single hole code disc in the middle of the optical sensor gap (see the figure) and tighten the stop screw.
- 76.** Check the setting by turning the single hole disc until the hole is in the optical sensor read off position and measure the 'd' distance. It shall correspond to the calculated 'd3' distance. If not, readjust the setting.



Measuring Feeder Wheel Friction

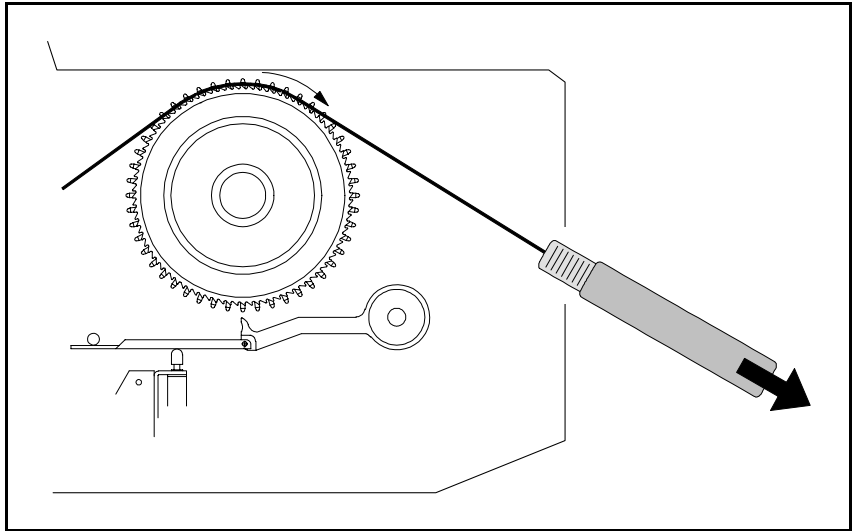


Figure 16. Feeder wheel friction measurement

77. Measure the feeder wheel friction by putting a piece of component tape on the feeder wheels and pull the tape using a dynamometer (see Figure 16). The force required to rotate each wheel shall be 1 - 5N. If necessary, adjust by turning the nut (A in [Figure 9](#)) clockwise to increase the friction, counter-clockwise to decrease it.

Finishing the Upgrade

78. Reassemble the front cover plate.
79. From the Magazine Upgrade Kit, apply the *Revision 1* label (K-010-0004) underneath the magazine, close to the other labels.

The upgrade is now completed. The following points should, however, also be performed to ensure a proper magazine function:

- Check the loading spring and replace it if necessary, see [page 17](#).
- Measure the cover tape lips on the pick-up rails and adjust if necessary, see [page 18](#).
- Measure the component carrier tape outlet springs on the pick-up rail and adjust if necessary, see [page 19](#).

Checking the Loading Spring

Some tape magazines, manufactured during 1995 and 1996, have got a poor loading spring which should be replaced. The spring is located underneath the magazine and it makes the magazine hook onto the machine magazine table.



To be able to determine whether the spring should be replaced or not, check the color of the spring and replace it if the spring is *black*. If the spring is *metal colored*, it should be kept.

The order number for this spring is:

MYDATA part # D-014-0659-4, *Loading spring*.

The spring is free of charge.

Measuring the Cover Tape Lips

The purpose of this measure is to adjust those magazines for which the cover tape lips are not bent according to the latest standard, which prevents components from jumping off the carrier tape pockets when the magazine performs component advancements.

The distance between the cover tape lip top and the lower pick-up rail surface should be 0.5mm, see Figure 17. This distance was earlier 0.8mm.

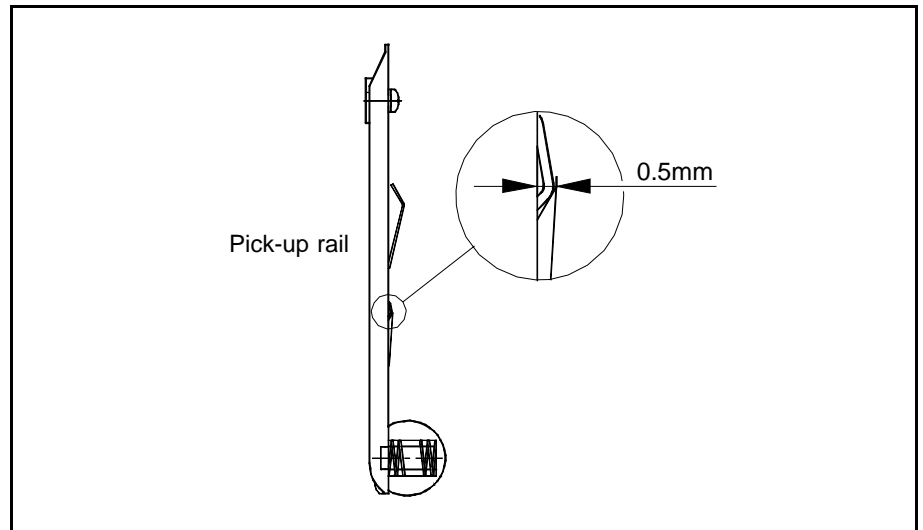


Figure 17. Cover tape lip

Perform the following points:

- Lift up the first pick-up rail.
- Measure the distance between the cover tape lip top and the pick-up rail surface as shown in Figure 17.
- If the distance is within $0.5\text{mm} \pm 0.05\text{mm}$, then proceed with the next step. If not, adjust the distance to $0.5\text{mm} \pm 0.05\text{mm}$.
- Repeat the previous steps on all the remaining pick-up rails.

In-depth information about this measure

If a cover tape lip is bent too much, then it will cause an increased number of pick failures as described below.

Assume that a component just slides away under a cover tape lip. This generates a vibration in the carrier tape. This vibration causes the previous component, just about to reach the pick position, to jump off the carrier tape pocket, and a pick failure is a fact.

By bending the cover tape lips less down, the mentioned pick failure will not happen.

Measuring the Carrier Tape Outlet Spring

The purpose of this measure is to adjust those magazines for which the carrier tape outlet springs are not bent according to the latest standard, which prevents components from jumping off the carrier tape pockets when the magazine performs component advancements.

The distance between the carrier tape outlet spring end and the lower pick-up rail surface should be maximum 1mm, see Figure 18. This distance was earlier more than 1mm.

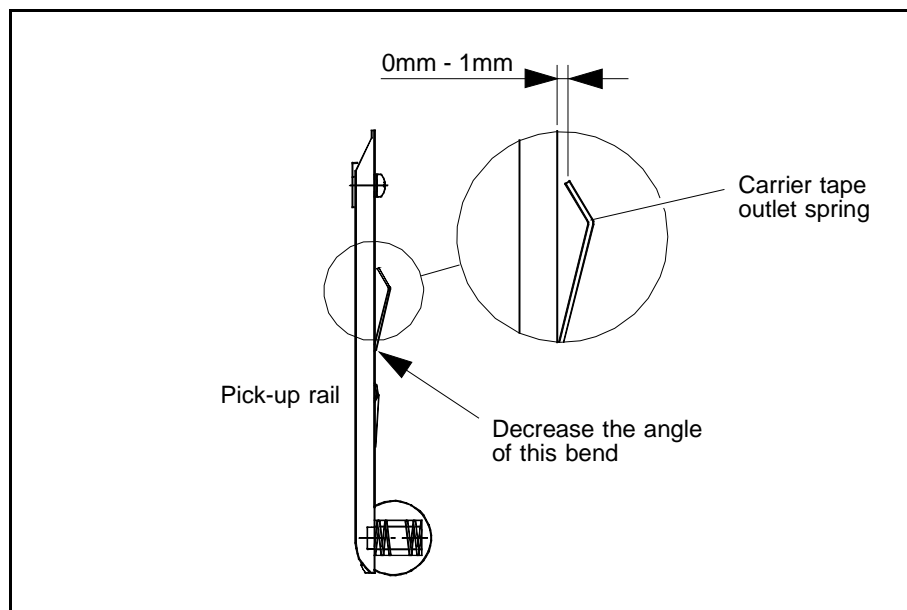


Figure 18. Carrier tape outlet spring

Perform the following points:

- Lift up the first pick-up rail.
- Measure the distance between the carrier tape outlet spring end and the pick-up rail surface as shown in Figure 18.
- If the distance is 0mm - 1mm, then proceed with the next step. If not, adjust the distance to 0mm - 1mm by decreasing the angle of the bent as indicated in Figure 18.
- Repeat the previous steps on all the remaining pick-up rails.

In-depth information about this measure

If a carrier tape outlet spring is bent too much, then it will cause an increased number of pick failures as described below.

Each carrier tape outlet spring forces the tape to follow the feeder wheel. When the feeder wheel pins leave the tape holes, they occasionally snap the tape and thus cause vibrations in the carrier tape. Such a vibration can cause an uncovered component to jump off the carrier tape pocket, and a pick failures is a fact.

The problem is solved if the curved bend of the spring only rests on the wheel.



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