Dealer4 Maintenance, Adjusting and Cleaning Manual ver: 1.1

Version information:

Ver 1.0: First issued : 14/04/2008

- use word “Board” instead of “Card Box”
- combine with “Delaer4 Adjusting Manual 1V0”

Ver 1.1 issued: 30/01/2014

- added Front Board Pocket Adjustment
- added Adjustment of Gates
- updated instructions and materials to represent newest version of Dealer 4 machines

1 Dealer4 Maintenance

In this manual the following signs are used to highlight important information:

Critical information for safety and proper machine operation. Always read and follow.

Warnings

Additional important information

The Dealer4 is designed to operate without any special maintenance. Apart from the cleaning and adjustment when required (see chapter 3) there is no other regular maintenance required. The Dealer4 does not require any lubrication, there are no belts, seals or any other elements which have to be replaced on a regular basis by the user.

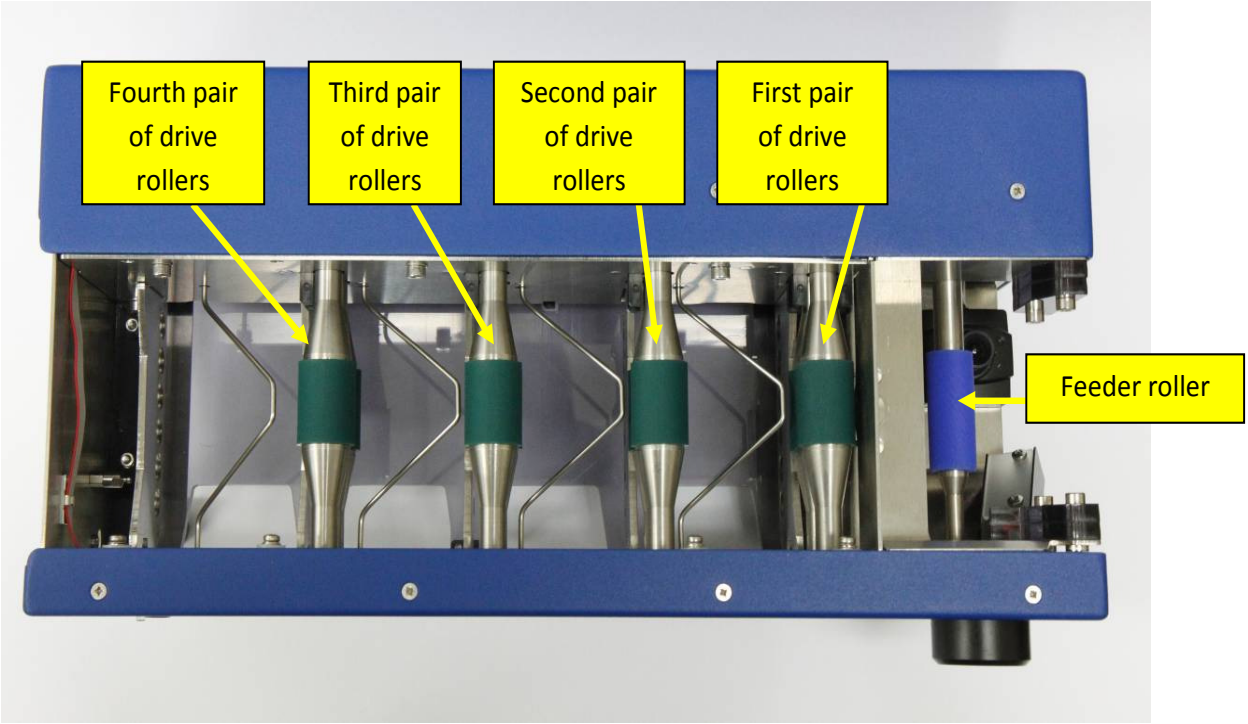
Despite that the Dealer4 is virtually maintenance free it is recommended that the machine be serviced by an authorized Service Center at least every 3 years or every 40000 dealt boards. During these services the machine will be disassembled, thoroughly cleaned, all parts will be checked and replaced if required. Then the machine will be adjusted and tested. Serviced machines will provide correct, reliable operation and decrease possibility of malfunction.

The only elements which are subject to wear during normal operation are the rubber rollers. There are two types of rollers used in the machine

- 4 Pairs of Green polyurethane rollers used as a Drive Rollers. Some older machines may still have black rubber Drive Rollers. These typically last 40000 deals.

For machines with a Serial Number less than 4218:
- 2 Black Rubber Feeder Rollers

For machines with a Serial Number 4218 and above:
- 1 Long Feeder Roller. These may be varying colors such as black, blue or grey.



Typically the first pair of rollers is worn the quickest because every card goes through this pair. The machine can still be used in this condition but the dealing process will become slow to the point where dealing will become impossible. It is therefore recommended that when roller wear is discovered – the machine should be sent in for a service.

The feeder roller will also wear and should be replaced along with the drive rollers every 40000 deals. A typical symptom of this wear is a repeatable “Feed Card Error” (Error 55 or 56). Please note that this error may also be due to a dirty roller (see Section 2.2) or incorrect Feeder Gap (see Section 3.1) as the symptoms can be the same.

2 Dealer4 Cleaning

Dealing cards is a dirty process. Cards collect dust, sweat, cosmetics and other chemicals from player's hands during play. This dirt is transferred to the machine parts. When a machine is too dirty the dealing process can be slowed down or will become impossible. Therefore regular cleaning is required for long and reliable operation of the Dealer4. There are four parts that require cleaning which are described in detail in the following paragraphs.

2.1 Cleaning tools

To clean the Dealer4 the following tools are required:

- Cotton gloves - it is recommended and most convenient to use gloves. If cotton gloves are not available any other cloth can be used.

- AirDuster - pressurized air in can (E.g. EAD from Electrolube).

- Small brush

- Cleaning agent –cleaning agent can be:

  - clean water – not the best but simplest and easily available.
  - methylated or ethylated spirits (methanol or ethanol alcohol), may be not available in all countries.
  - propanol or isopropanol – special kind of alcohol commonly used as solvent for electronic industries. (E.g. IPA from Electrolube)

Do not use soap or another detergents, any solvent, turpentine, any hydrocarbons (like petrol or WD40), rubber cleaners (rubber rejuvenator).

1. Alcohols are flammable liquids. Disconnect Dealer4 from mains before cleaning. Do not use in the presence of open flame. Clean only in well ventilated areas.

2. Alcohols can be an irritant for sensitive skin. In such cases it recommended to use rubber gloves during cleaning process.

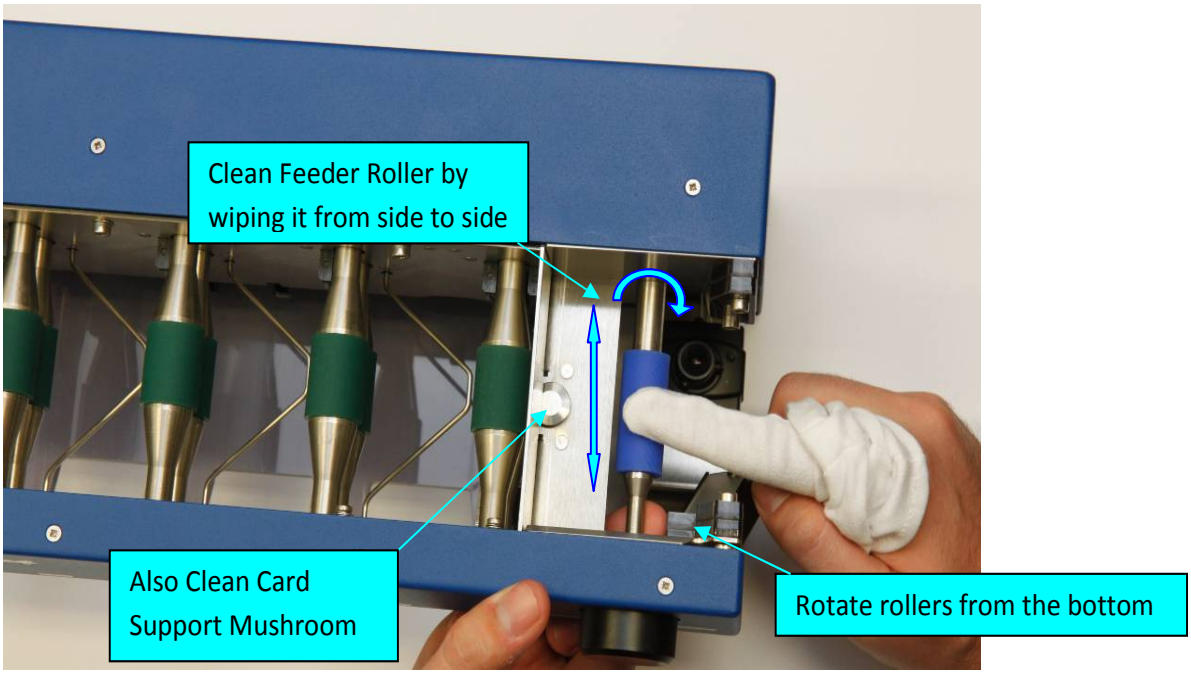
2.2 Cleaning Feeder Rollers

Feeder rollers are the parts which require the most frequent cleaning. When they become dirty the grip on the card decreases and the machine cannot feed correctly. The result will be a slowing down of the dealing process and "Card Feeding Error" (Error 55 or 56). Cleaning of the Feeder roller is usually required every 200-500 dealt boards and will depend on the condition of the cards used. It is recommended to get into the habit of cleaning the feeder roller daily after dealing is finished no matter how many boards were dealt.

To clean Feeder Roller please follow following steps:

1. Put the cotton gloves on the right hand index finger and dampen it with a cleaning agent. The cotton should not be too wet. If cotton is too wet the cleaning agent can get under the rubber which is not recommended. Do not spray cleaning agent directly onto the roller. Be sure that cleaning agent does not drop on the camera (can happened if cotton is too wet).

2. Put the left hand finger under the roller and rotate it slowly. The right hand finger with the cotton glove should clean the roller by rubbing it side to side as shown on the picture below:



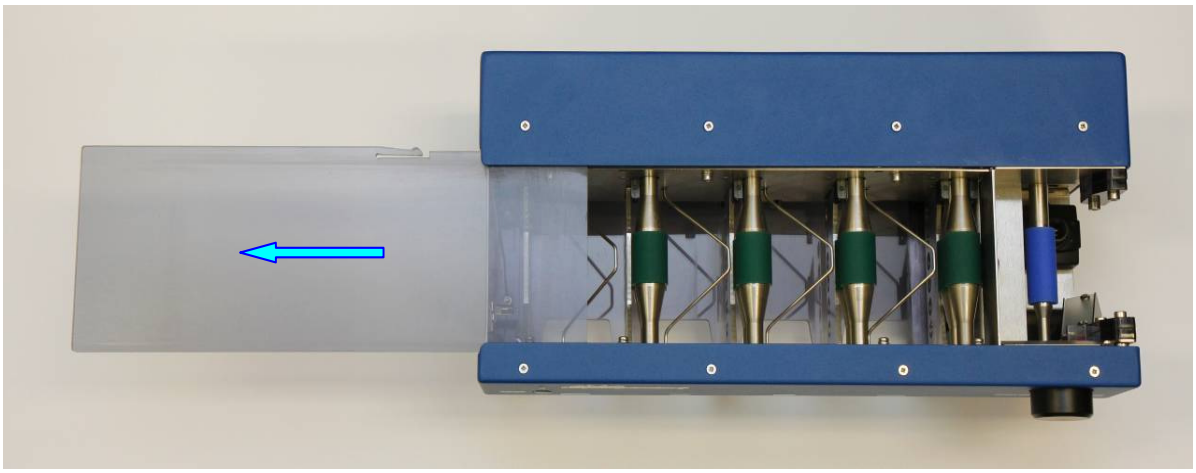
3. Also clean the Card Support Mushroom by wiping it with a wet cloth or glove.

4. After cleaning leave the machine to dry before starting to deal again.

2.3 Cleaning Driving Rollers

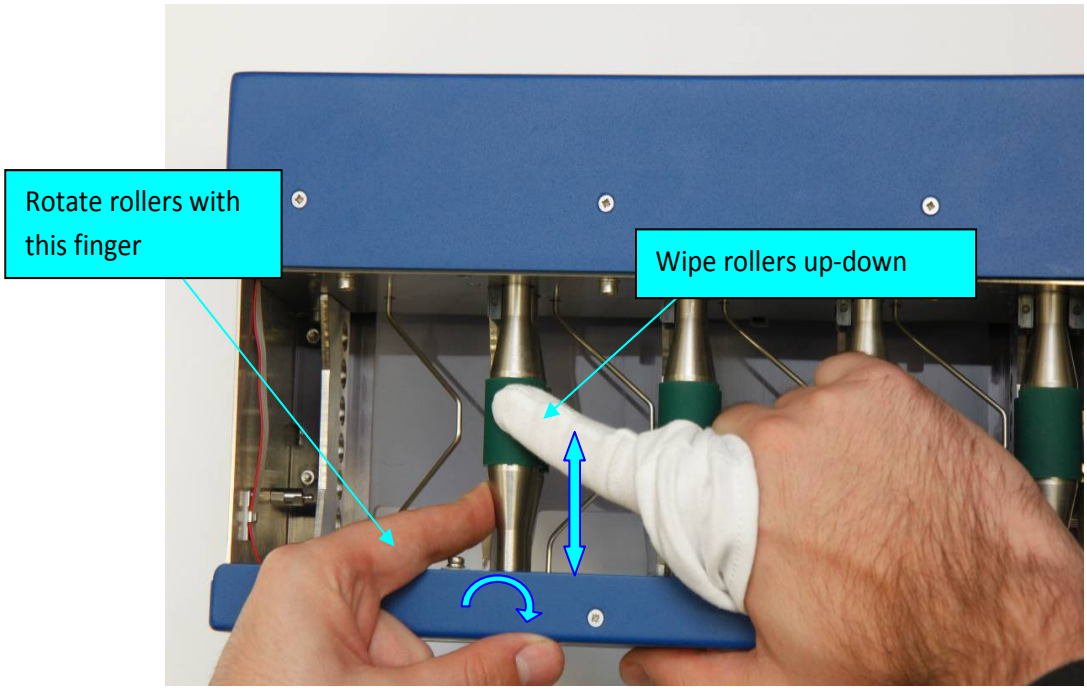
Driving rollers should to be cleaned every 1000 – 2000 boards dealt. If these rollers become too dirty it may slow down machine operation and in extreme cases make dealing impossible. To clean rollers please follow the steps outline below:

1. Take out the Machine cover by sliding it out to the left as shown:



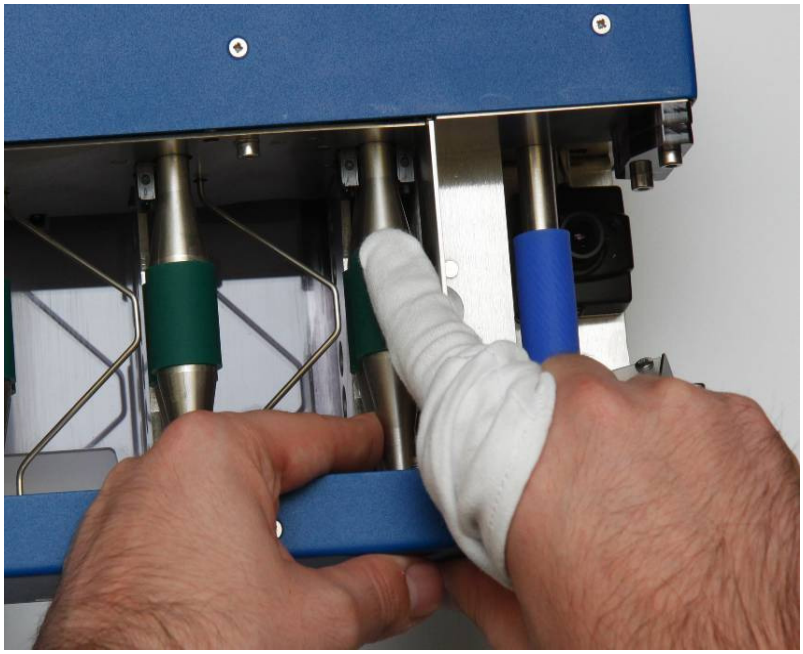
2. Put the cotton gloves on the index finger and dampen it with a cleaning agent. The cotton should not be too wet. If cotton is too wet the cleaning agent can get under the rubber which is not recommended. Do not spray cleaning agent directly onto the roller.

3. With one hand slowly rotate the top roller and wipe it with the damp cotton glove.

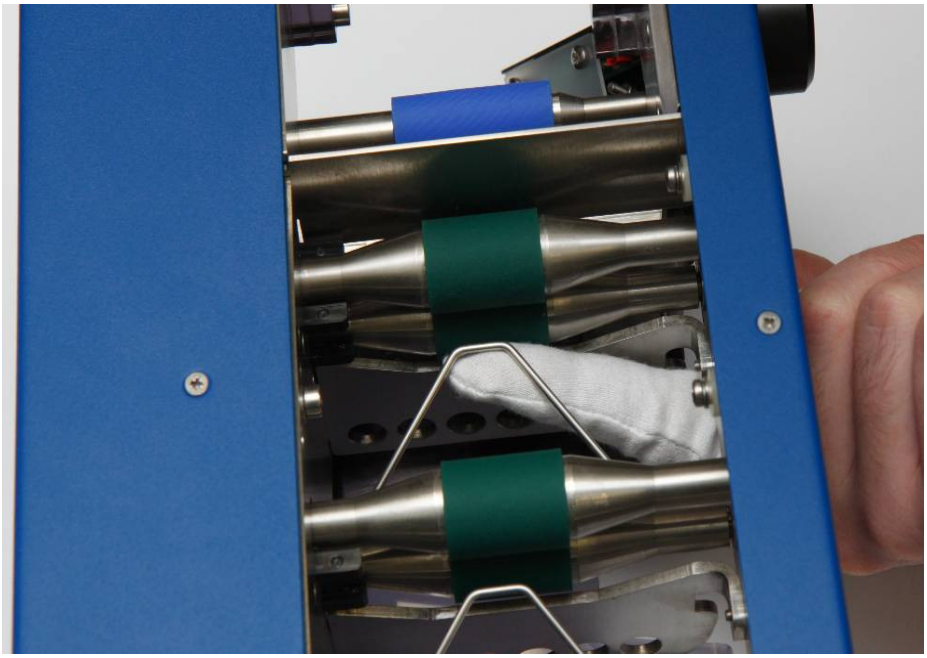


4. Similarly clean the bottom roller. When the top roller is rotated the bottom will rotate also, thus during cleaning it is easier to rotate the bottom roller by rotating the top one.

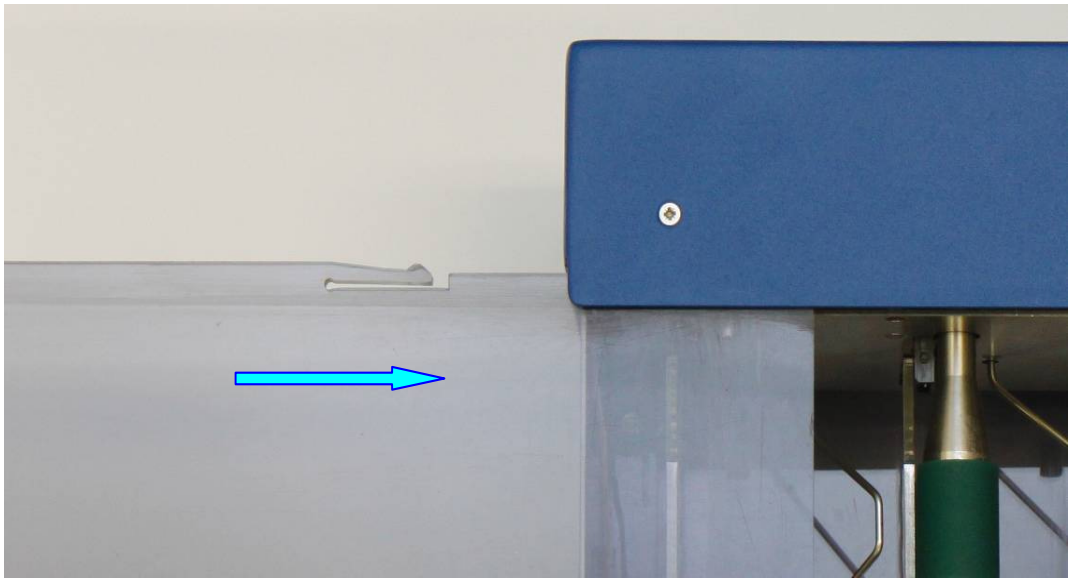
5. In the same way clean the third and second pair of rollers. The first pair has no access from the right side so it has to be cleaned from the top as shown below.



6. Cleaning the first bottom roller is the most difficult part. Rotate the top roller and clean the bottom one from the left side. Be careful not to bend the wire gate which directs cards into the “South” pocket.

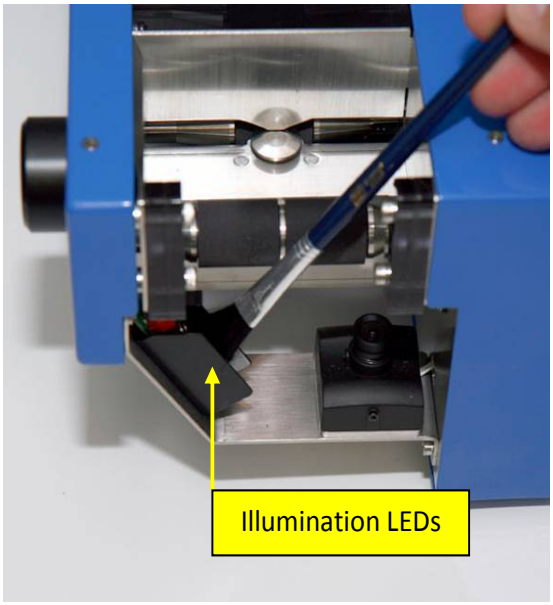


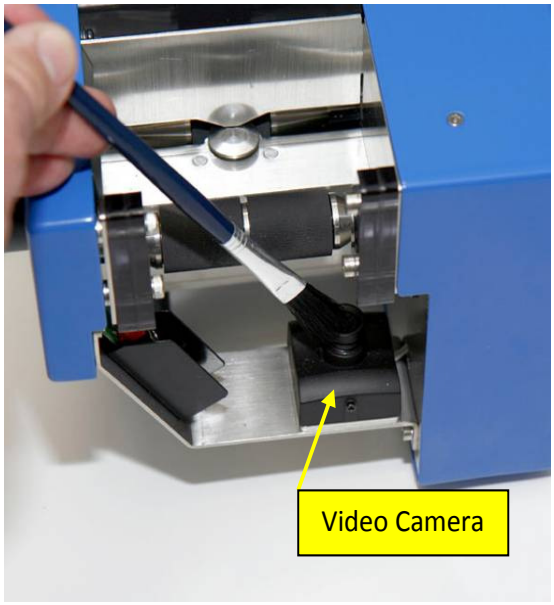
7. After cleaning leave the machine to dry. Slide the Top Cover back (please note that the Top Cover is not symmetrical so needs to be put back in the right direction). The machine is now ready to go.



2.4 Cleaning the Camera and illumination LEDs

Dust on the camera lens can block the card picture and make card recognition impossible. The camera lens and also the illumination LEDs should be cleaned at the same time as the driving rollers. To do this, use the AirDuster or a small brush:





Warning: Treat the camera lens with care just like any other opitcal equipment. The lens is best cleaned with a lens cleaning kit available from camera shops. These kits include lint free cloths, dusters and no harmful chemicals.

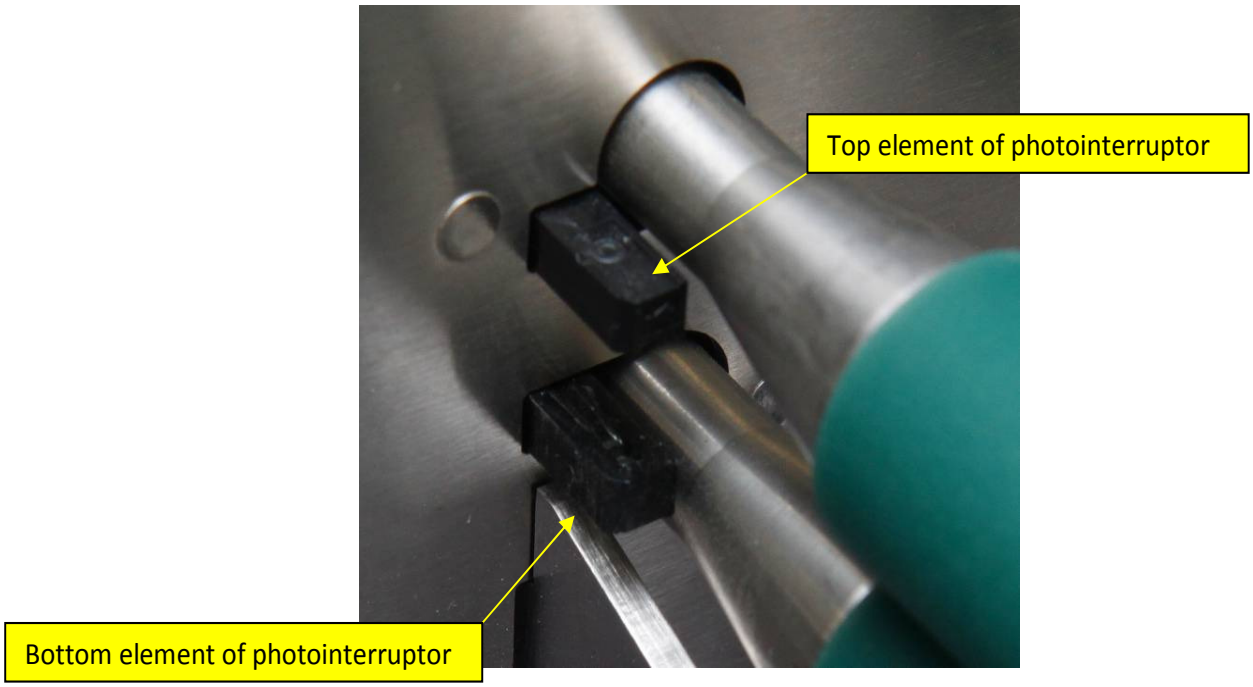
There are a couple of important rules when using AirDuster:

1. Usually Airduster is not pressurized air – it is liquid gas which evaporates when it leaves the can. The can should be operated only from the up-right position to a maximum of 60 deg down. If angle is bigger liquid can come out from the can and because it evaporates very quickly, it can freeze Dealer4 parts and leave some residue behind.

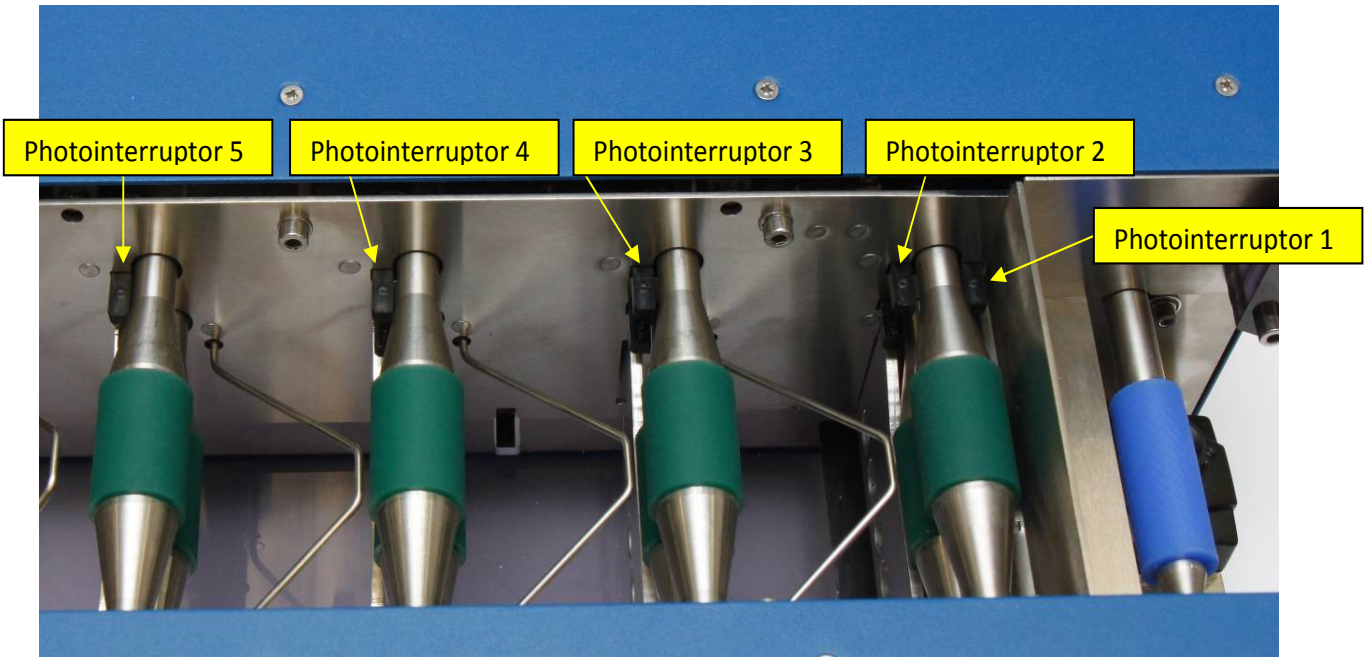
2. Use only short burst of air and do not put the end of the nozzle too close to the part being cleaned. This will prevent the part to getting too cold. Try to keep the nozzle a couple centimeters from the machine components.

2.5 Cleaning photointerruptors

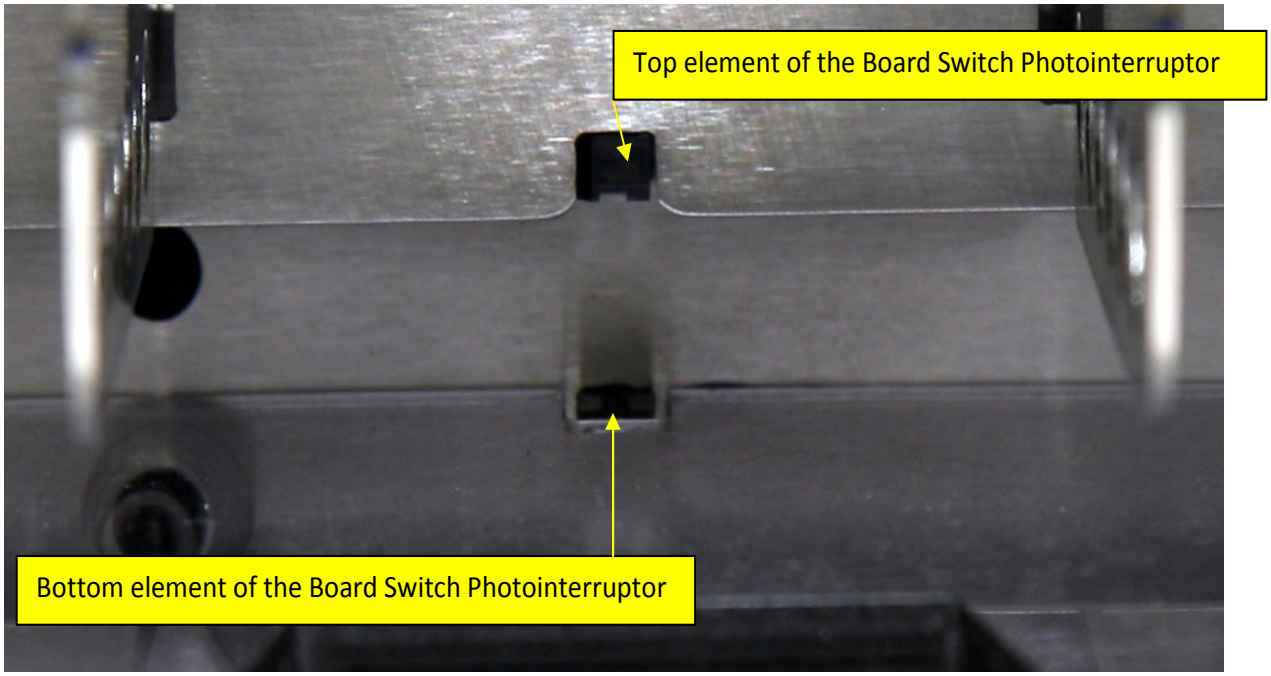
Photointerruptors are the small plastic parts located near the rollers. In the top part is the infrared light source and in the bottom part there is light sensing element. When card is located between these two elements the light beam is interrupted and this allows the Dealer4 to know the actual card position.



The photointerruptors play an important role in the dealing process. There are five photointerruptors in the machine on the left side of each roller pair and one more on the right side of the first roller.



Also for Dealer4 Machines with serial numbers from 4053 upwards, a similar photointerruptor is used as a Board Switch. This photointerruptor is located on the bottom of the machine at the back of the Board Pocket:

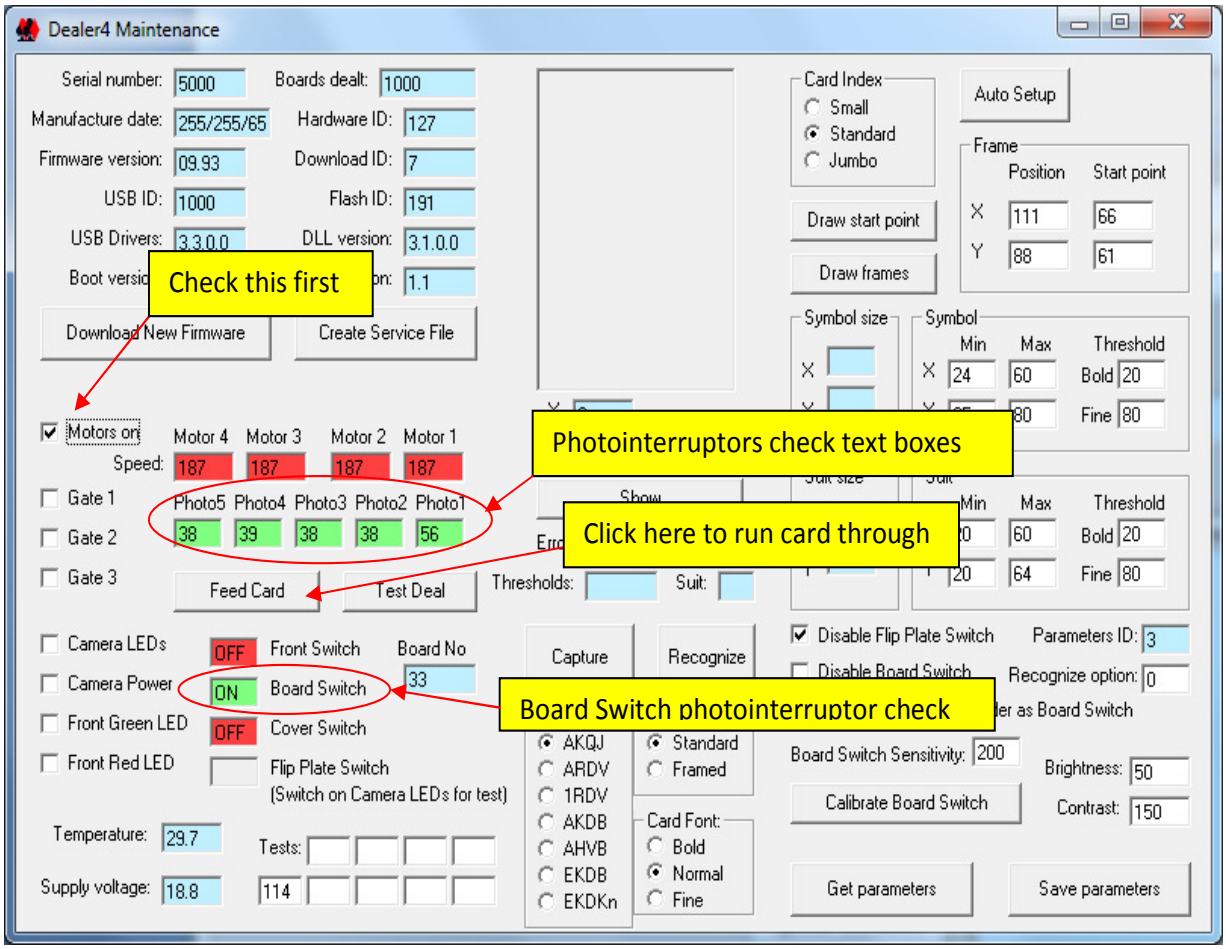


If any of the photointerruptors are too dirty the light beam can be blocked and Dealer4 will not operate correctly.

Operation of the photointerruptor can be checked on the “Maintenance” section of the Dealer4 software:

After entering the “Maintenance” window look at the five text boxes under Labels Photo5-1. With no card inside the machine all these boxes should be green. Check “Motor On”, put a deck of cards in the feeder and click “Feed Card”. The card will go through the machine. The Photo boxes become red for the moment when the card passes through them and should then be green again. If any of the boxes stay red after this operation that particular photointerruptor is dirty and requires cleaning.

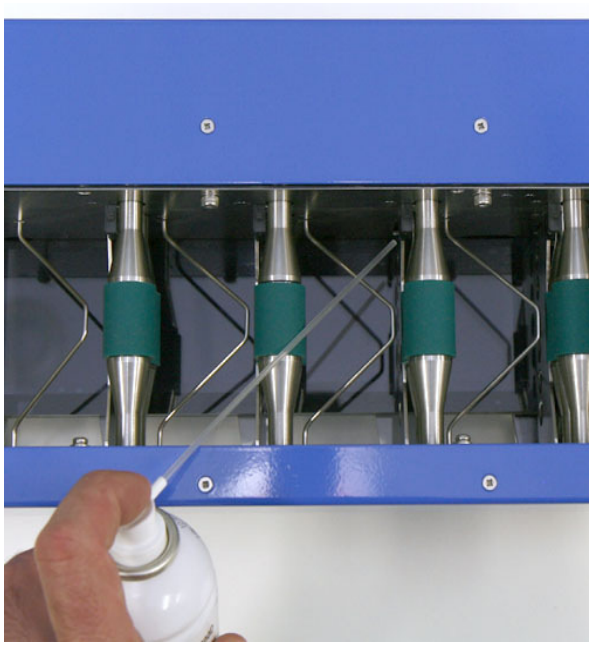
The Board Switch photointerruptor operation can be checked by observing the Board Switch text box when inserting and removing the board. When the board is inside the machine this text box should be green with ON text, when out of the machine – text box should be red with OFF text.

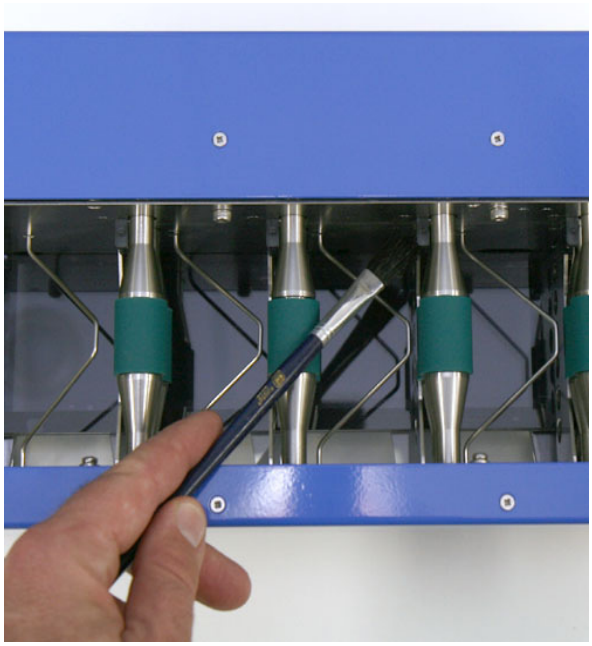


Not every dirty photointerruptor problem can be observed on the “Maintenance” screen. The photointerruptors should be cleaned if frequent Gate Errors (Error number: 1 to 8 or 17 to 24) or Card Jam Errors (Error number: 9 to 16) occur despite the “Maintenance” screen not showing any problems.

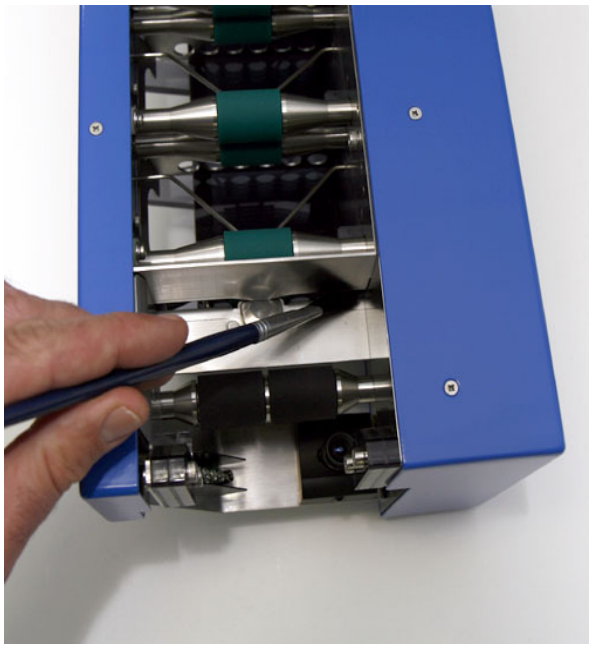
Note: Some another faults in the machine may have the same symptoms as a dirty photointerruptor. If cleaning of the photointerruptor does not help please ask a Service Centre for help.

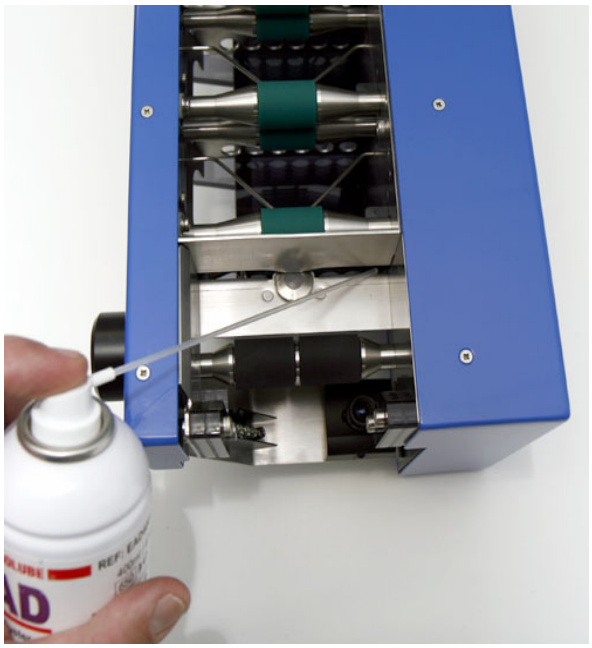
Cleaning photointerruptors can be done using the AirDuster or a small brush. Only the bottom element of the photointerruptor needs to be cleaned.





The best access to clean the first photointerruptor is from the Feeder side:



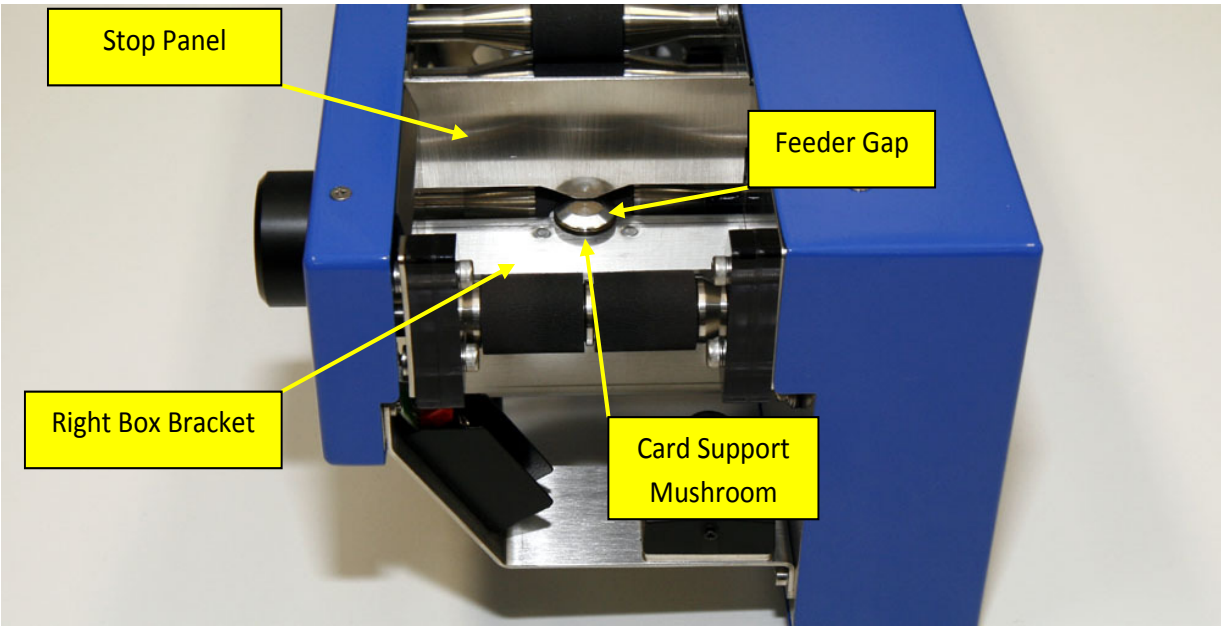


Clean the Board Switch photointerruptor in the same way.

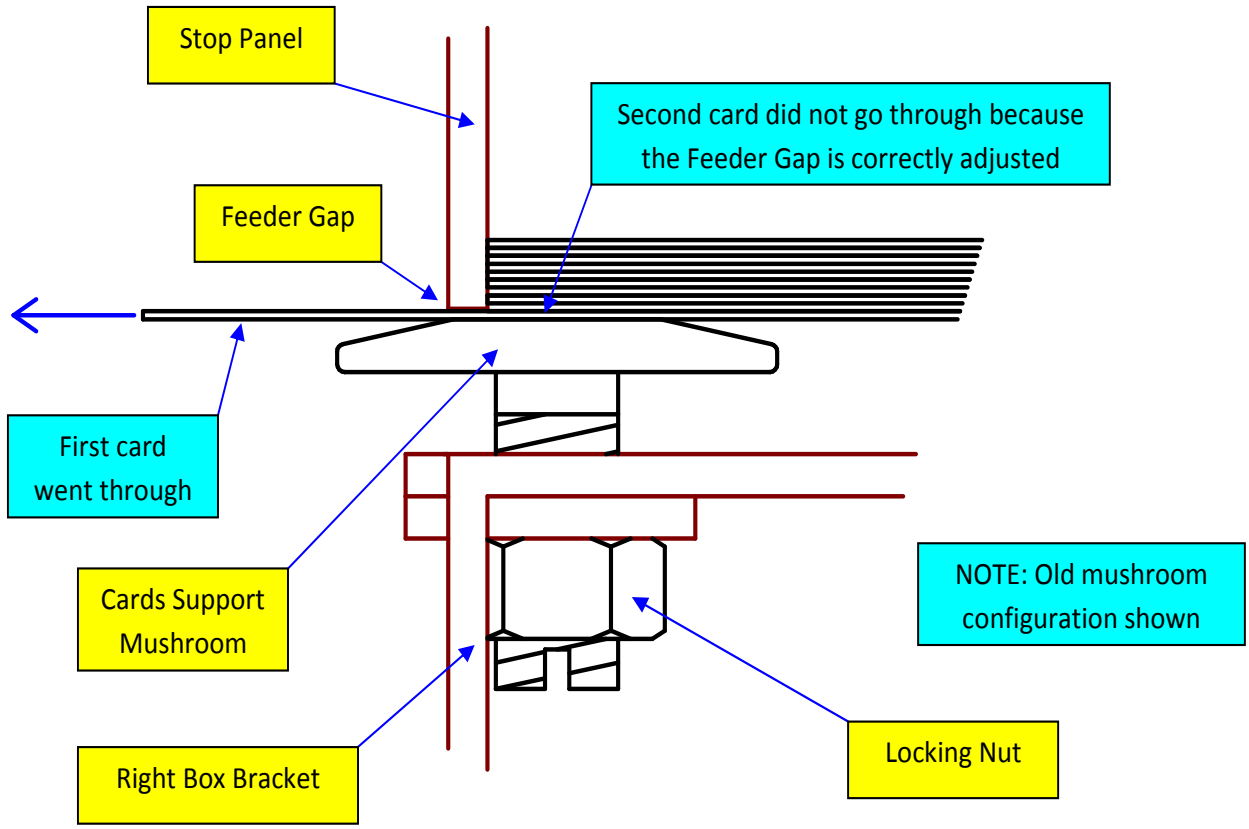
3 Dealer4 Adjustments

3.1 Feeder Gap Adjustment

Feeder Gap is a very important part of the Dealer4 card feeding mechanism. It allows only one card to be fed into the machine at any one time. The picture below shows the location of the Feeder Gap in the machine:



Drawing below shows how the Feeder Gap operates:



The correct Feeder Gap size is essential for proper Dealer4 operation. If the gap is too small it will be difficult or impossible to fit the cards through the gap. If the gap is too large two cards can through at the same time or the second card can block the first card.

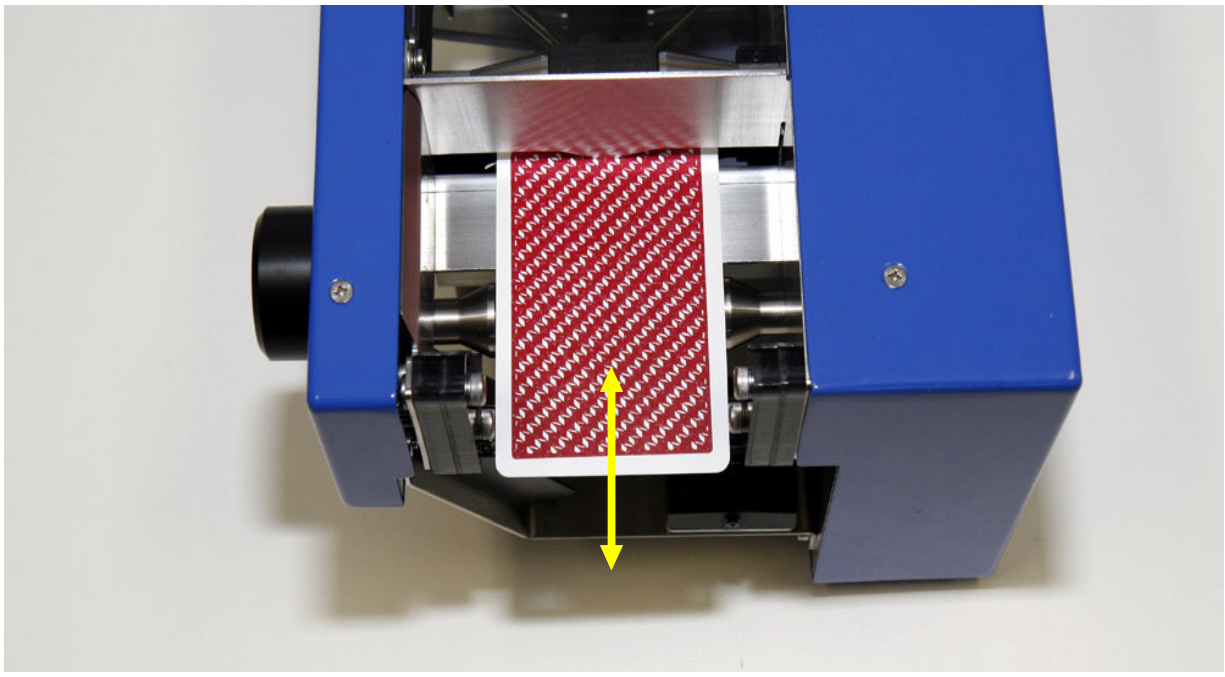
Most common errors that suggest and incorrect Feeder Gap size are: Card Feeding Error (Error 55 and 56), Gates Error (Errors 1 to 8 and 17 to 24), and also Duplicate Card Error (Error 54) in some special cases. Also a typical symptom of incorrect gap size is slow operation of the machine.

The Feeder Gap is set during Dealer4 manufacturing and usually does not need to be adjusted. However some specific situations may require adjustment. There are:

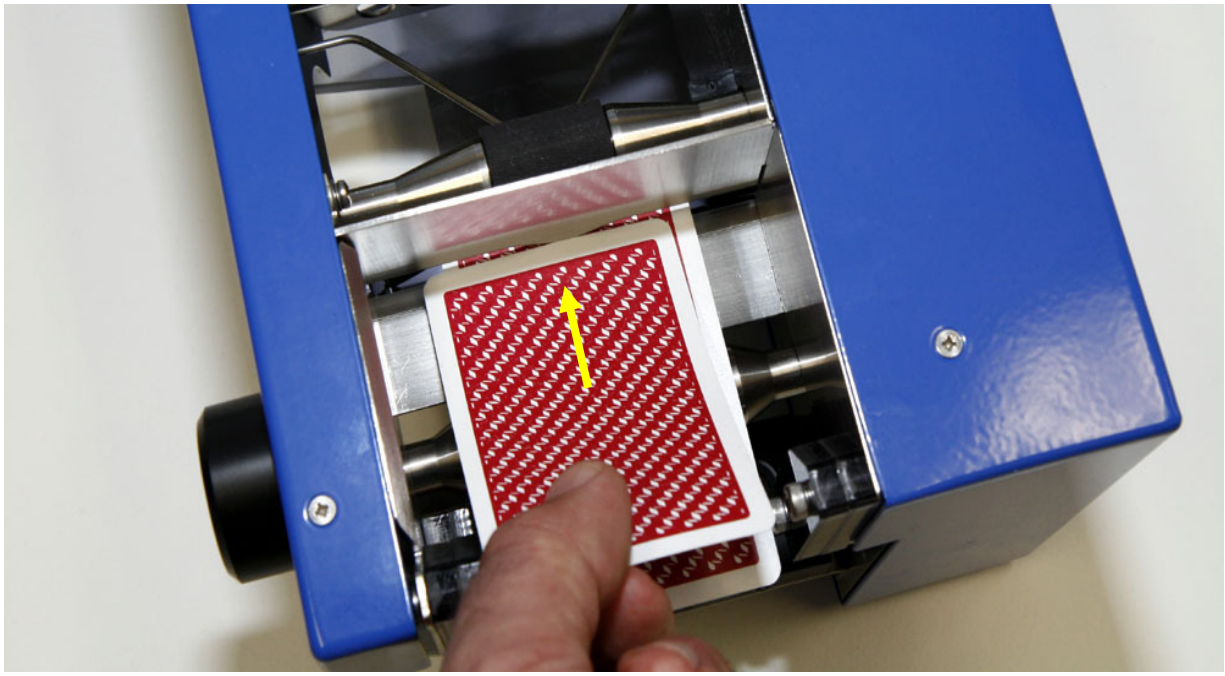
- Using non standard cards (thicker or thinner then normal)
- After machine disassembly and assembly (usually during machine service)
- Any another reason gap is changed (e.g. someone dropped machine on the floor)

Feeder Gap size depends on the card thickness and should be set to the 120%-140% of the card thickness. Most standard cards have a thickness of 0.3mm – and for such cards the gap should be set to 0.36-0.42mm (Factory setting is 0.40mm). The best method to check the gap is to measure it using Feeler Gauge (see chapter 3) but there is a simple test which should show if the gap is set correctly:

1. When machine is disconnected, fit one card into the Gap as shown below. Keep card horizontal (card should touch Feeder Roller) and move it back and forward. Card should fit into the Feeder Gap smoothly and should move without any resistance. (Do not fit the card too deep – if the card touches the first pair of driving rollers – some resistance will be felt which can be confusing). If there is any resistance when trying to move the card or if it is impossible to fit the card into the gap that means the Feeder Gap is too small.



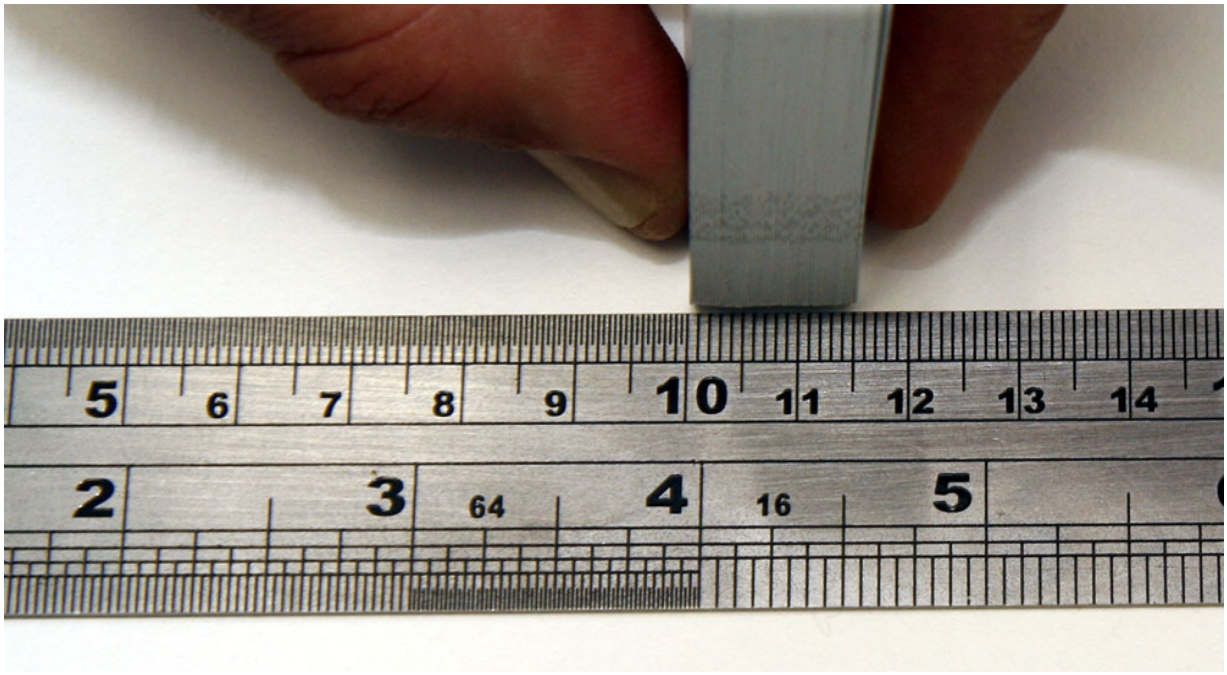
2. While the first card is still in the Feeder Gap try to fit a second one into the gap. This should be not possible. If the second card can fit into the gap even only slightly it means that gap is too large.



3.1.1 Define proper gap size

If thicker or thinner cards are to be used, it is necessary to measure them to define the optimal Feeder Gap size. Use a vernier caliper to do this:

If a vernier caliper is not available it is possible to measure card thickness using a standard ruler. Hold a full deck (52 cards) and measure thickness as shown below. Then divide the result by 52. This gives the thickness of a single card.



If card thickness is known the correct gap size can be calculated by multiply card thickness by 1.2 to 1.4.

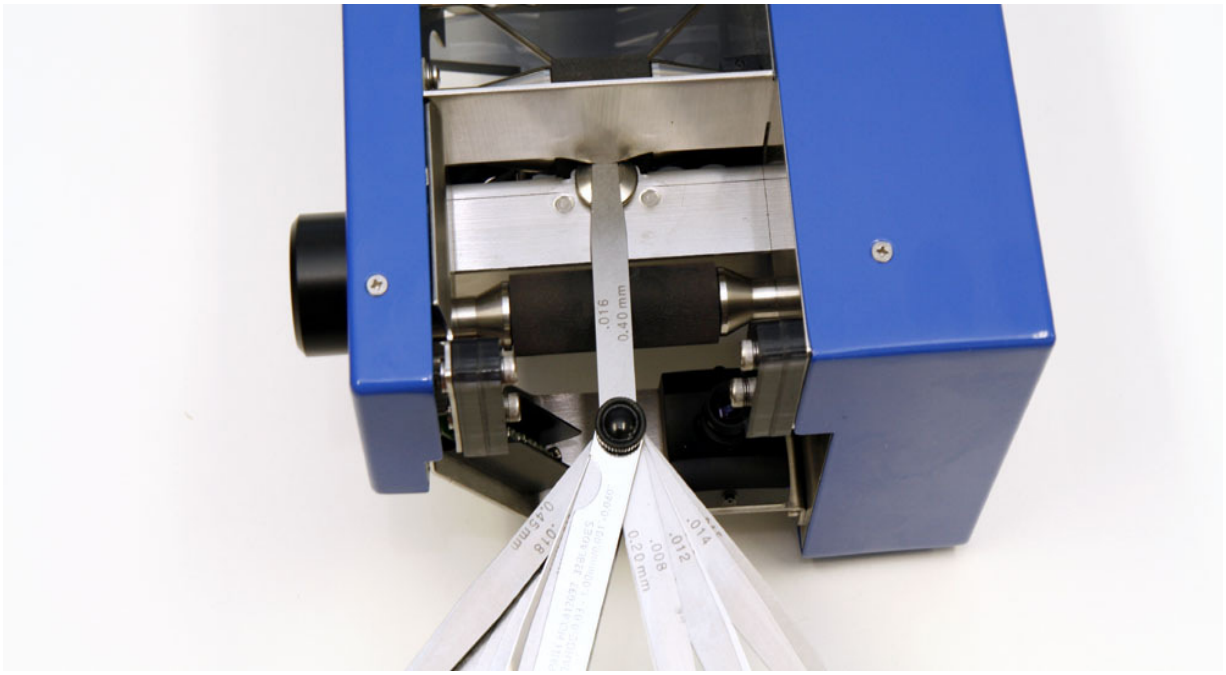
For example: Measuring the full deck gives a result of 15.5mm. Divide it by 52 gives thickness of the single card equal 0.298mm (rounded to 0.3mm). This value multiplied by 1.2 gives 0.36mm – this is minimum gap size, multiply by 1.4 gives 0.42mm – and this is maximum gap size. In this case use a 0.4mm gap. It is not necessary to set the gap with accuracy greater than 0.05mm. It is enough to use 0.25, 0.30, 0.35, 0.40, 0.45 or 0.50 sizes.

3.1.2 Measure existing gap size

A Feeler Gauge is required to measure the gap size. A Feeler Gauge can be purchased in any tool shop. Feeler gauges can cost from $4 to more then $200 for the high precision, high quality ones. For the gap measurement and adjustment the cheapest one is enough. Feeler gauges should have blades with 0.20, 0.25, 0.30, 0.35, 0.40, 045, 0.50mm sizes. Some cheaper ones have blades every 0.1mm (0.05, 0.10, 0.20, 0.30, 0.40, 0.50mm). These feeler gauges are OK to use if they have a 0.05mm blade – thus to get e.g. 0.35mm two blades need to be used together.

Note: New Feeler Gauges usually have blades covered by oil or grease to prevent rusting. Please wipe each blade with dry cloth to remove any oil or grease to prevent transfer to the machine parts.

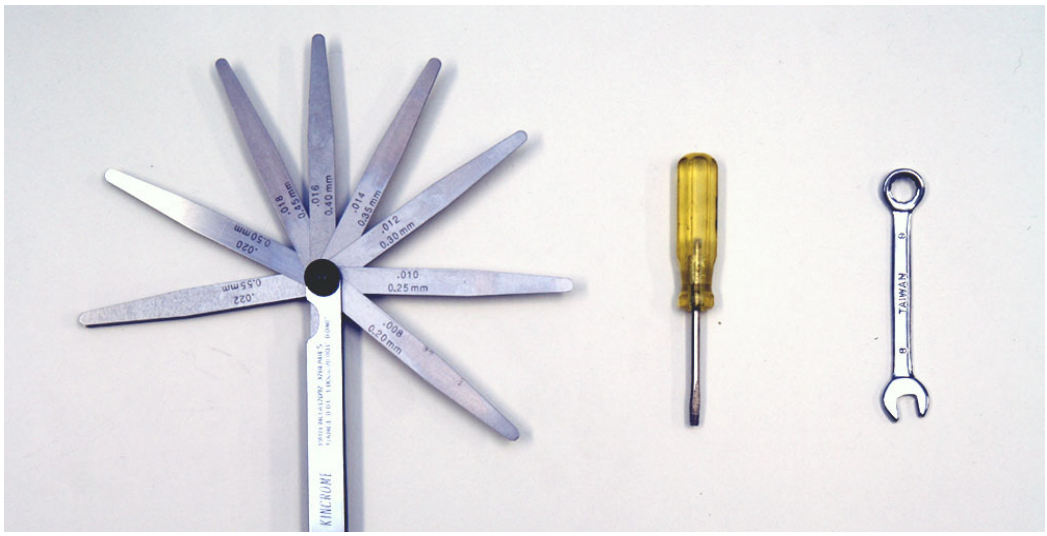
To measure the gap try to fit blades one by one into gap starting from thickest one until it will fit into gap. The thickness of this blade is the size of the gap. Compare this measurement with desired gap size.



3.1.3 Feeder gap adjustment for machines with serial numbers less than 5027

This section details the adjustment of the feeder gap for machines with serial numbers less than 5027. For newer machines please refer to Section 3.1.4.

To adjust the Feeder Gap following tools are needed.

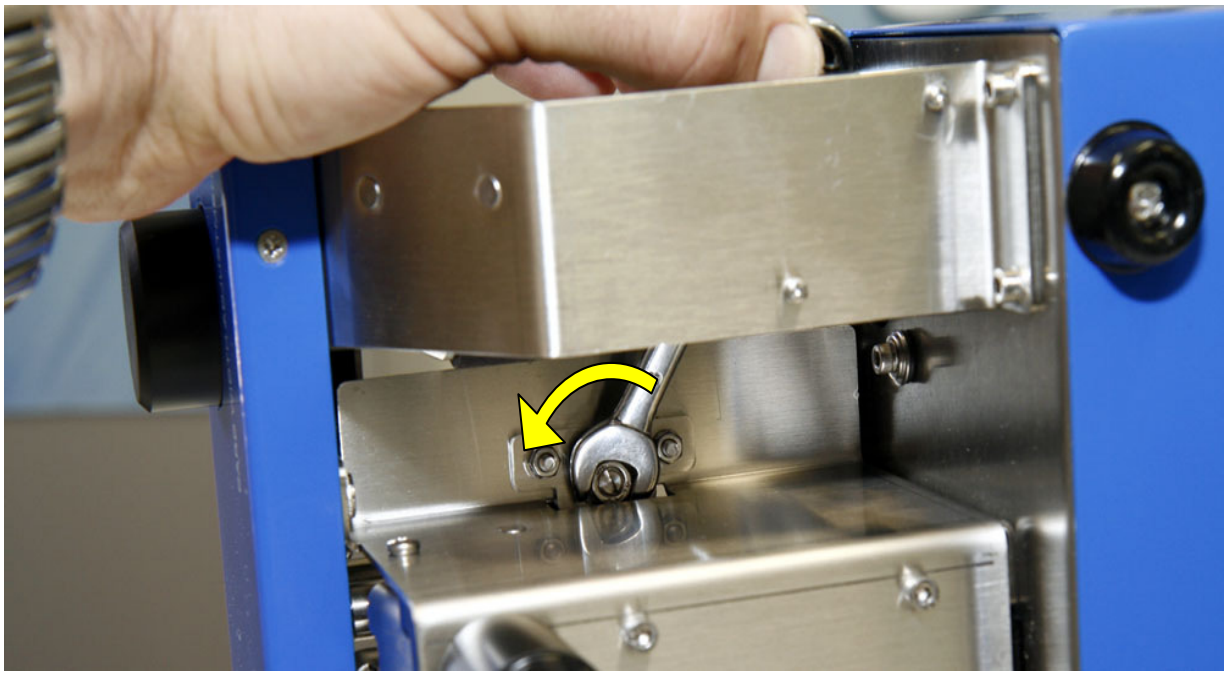


- Feeler Gauge
- Small flat screwdriver
- 8mm spanner

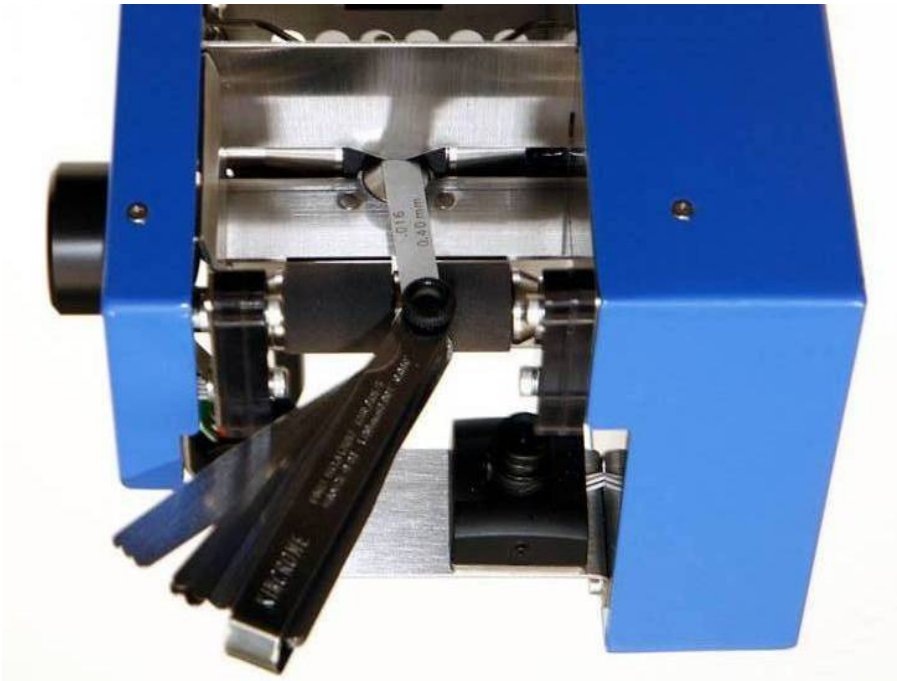
To adjust the Gap please follows the following steps:

1. Place machine on the rear cover:

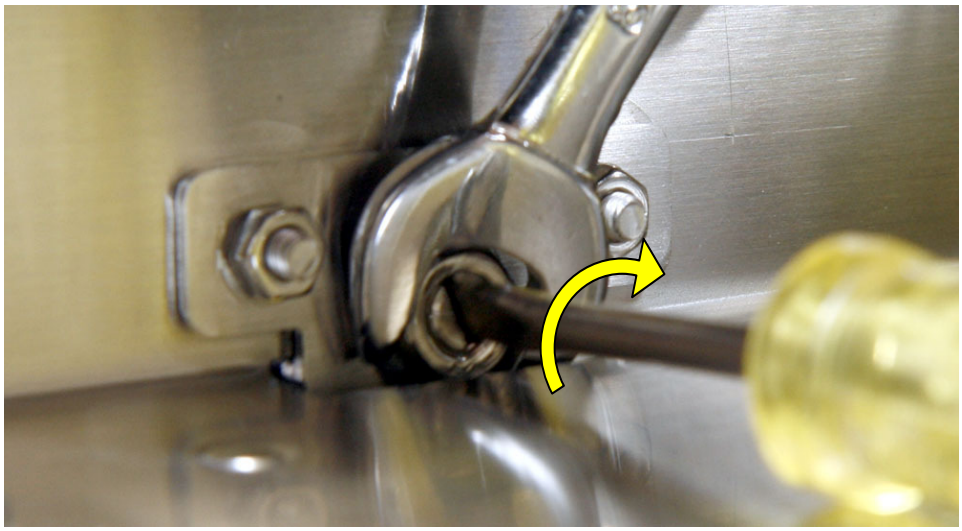
2. Unlock the locking nut using the 8mm spanner. A 1/4turn is required to unlock it.



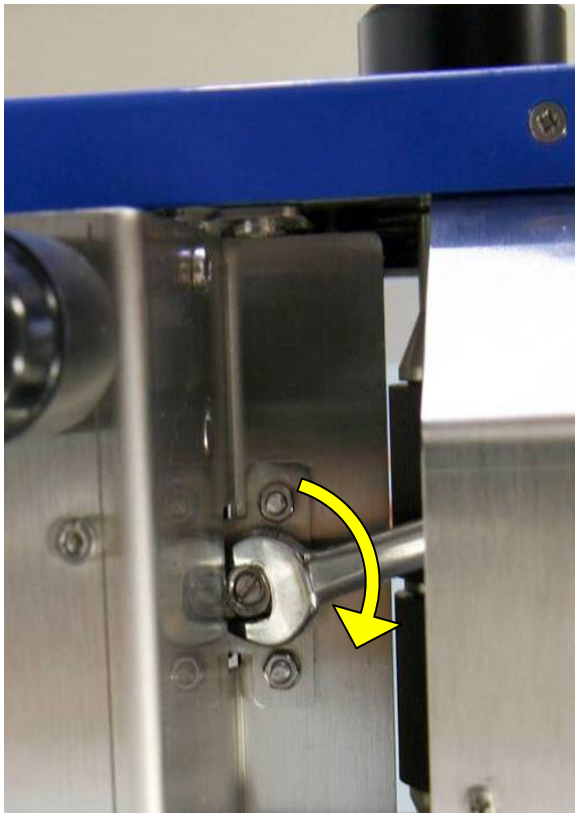
3. Put the Feeler gauge blade with the desired thickness into the Feeder Gap. If the blade does not fit (Feeder Gap is too small) rotate card support mushroom anticlockwise (when looking from the bottom) using a small flat screwdriver. This makes the gap bigger and will allow the Feeler Gauge blade to fit. Some early models (serial numbers from 4001 – 4012) are fitted with a card mushroom without a screwdriver slot. In this case the mushroom has to be rotated by hand.



4. With Feeler Gauge blade in the position shown above, rotate the mushroom clockwise until it touches the blade. Do not use to much force in this step – if the mushroom is rotated too much the Feeler Gauge blade may become difficult to remove. The Locking nut should be held by a spanner during this step to not disturb the rotation of the mushroom



5. Using the 8mm spanner to lock the locking nut:



6. Take out Feeler Gauge blade – the blade should come out without too much force but cannot be too lose. If it is too loose that means the gap is too big – if this happens - repeat steps 3-6.

7. Put machine back in the normal position and try to deal.

3.1.4 Feeder gap adjustment for machines with serial numbers 5028 and above

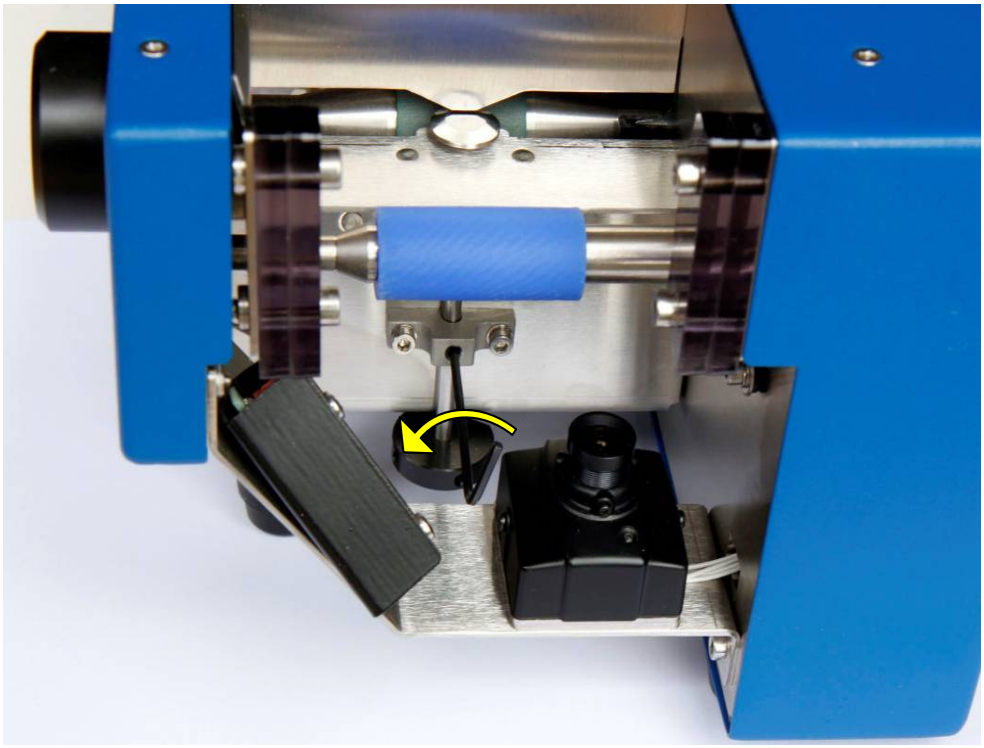
This section details the adjustment of the feeder gap for machines with the new hand adjustable mushroom. These are machines with serial numbers 5028 and above.

To adjust the Feeder Gap following tools are needed.

- Feeler Gauge
- 2.0 Allen or Hex key

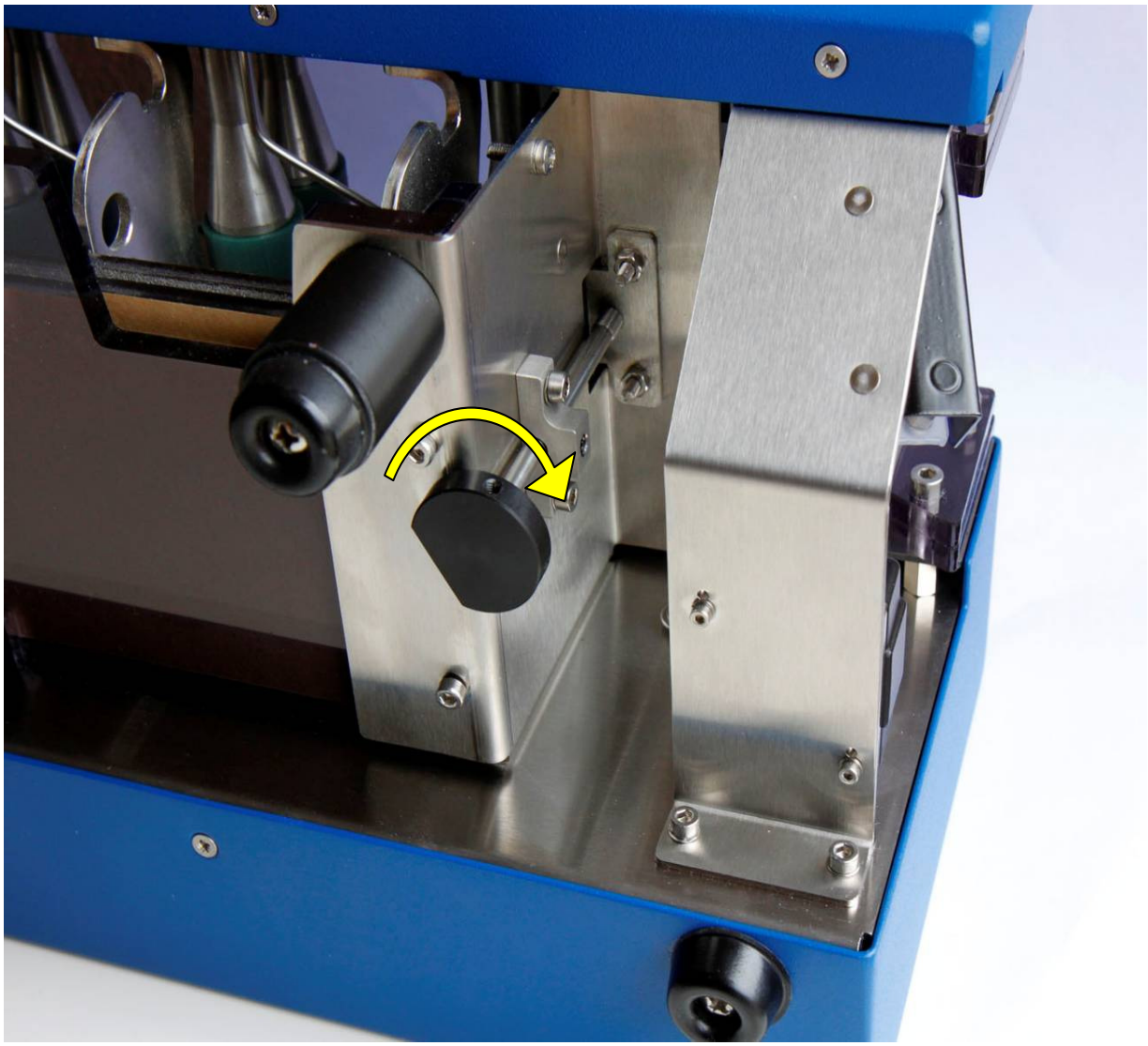
To adjust the Gap please follows the following steps:

1. Loosen the locking grub screw with a 2.0mm Allen or Hex key as shown.



2. Insert the 0.4mm Feeler Gauge blade into the feeder gap.

3. With the Feeler Gauge blade in this position rotate bottom mushroom knob clockwise until it touches the blade. Do not use to much force in this step – if the mushroom is rotated too much the Feeler Gauge blade may become difficult to remove. The Feeler Gauge should be tight in the gap but possible to remove without too much force.



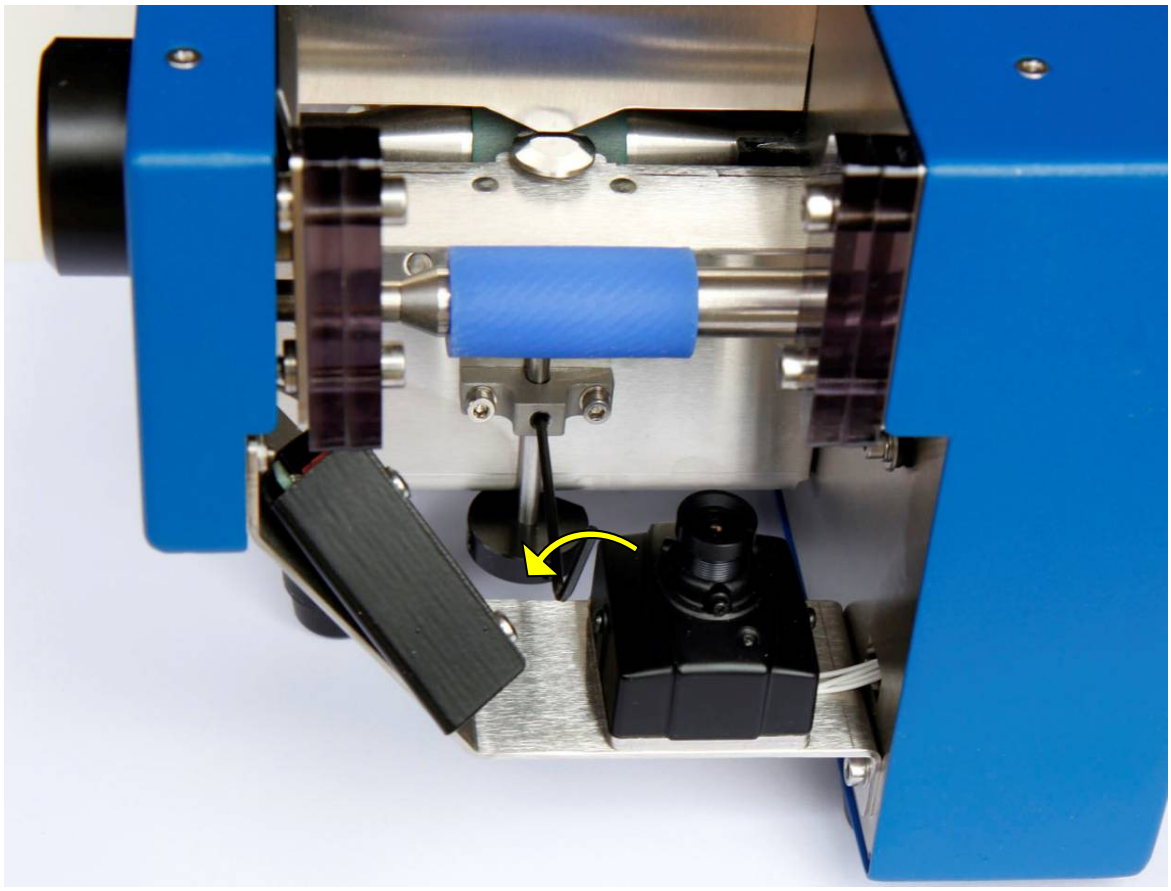
4. Tighten the locking grub screw to lock the mushroom in position.

A feeder gap size of 0.4mm is most common size however if cards are a different thickness then normal required gap size may be different. See Section 3.1.1 for more information on how to define the correct gap size.

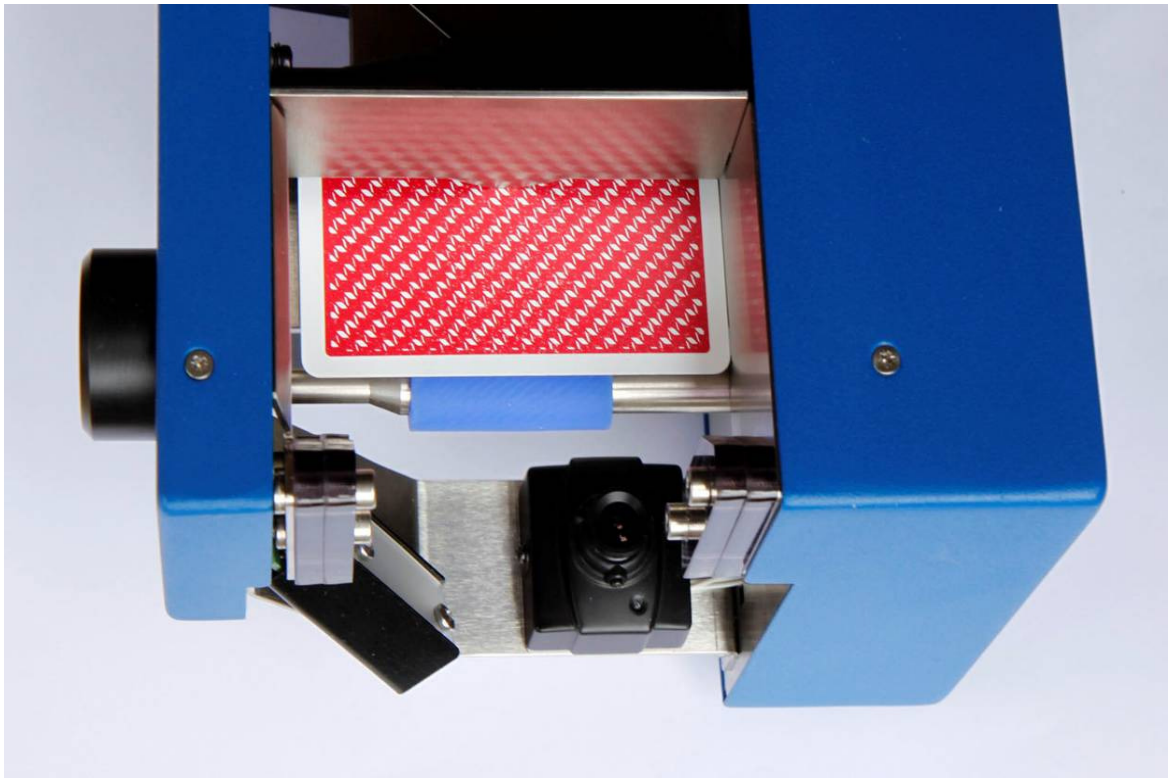
3.1.5 Adjusting the Feeder Gap without a Feeler Gauge

It is also possible to adjust the Feeder Gap without a Feeler Gauge. This method uses a card and is a quick way to adjust for varying card thickness however it is not as precise as the method described above.

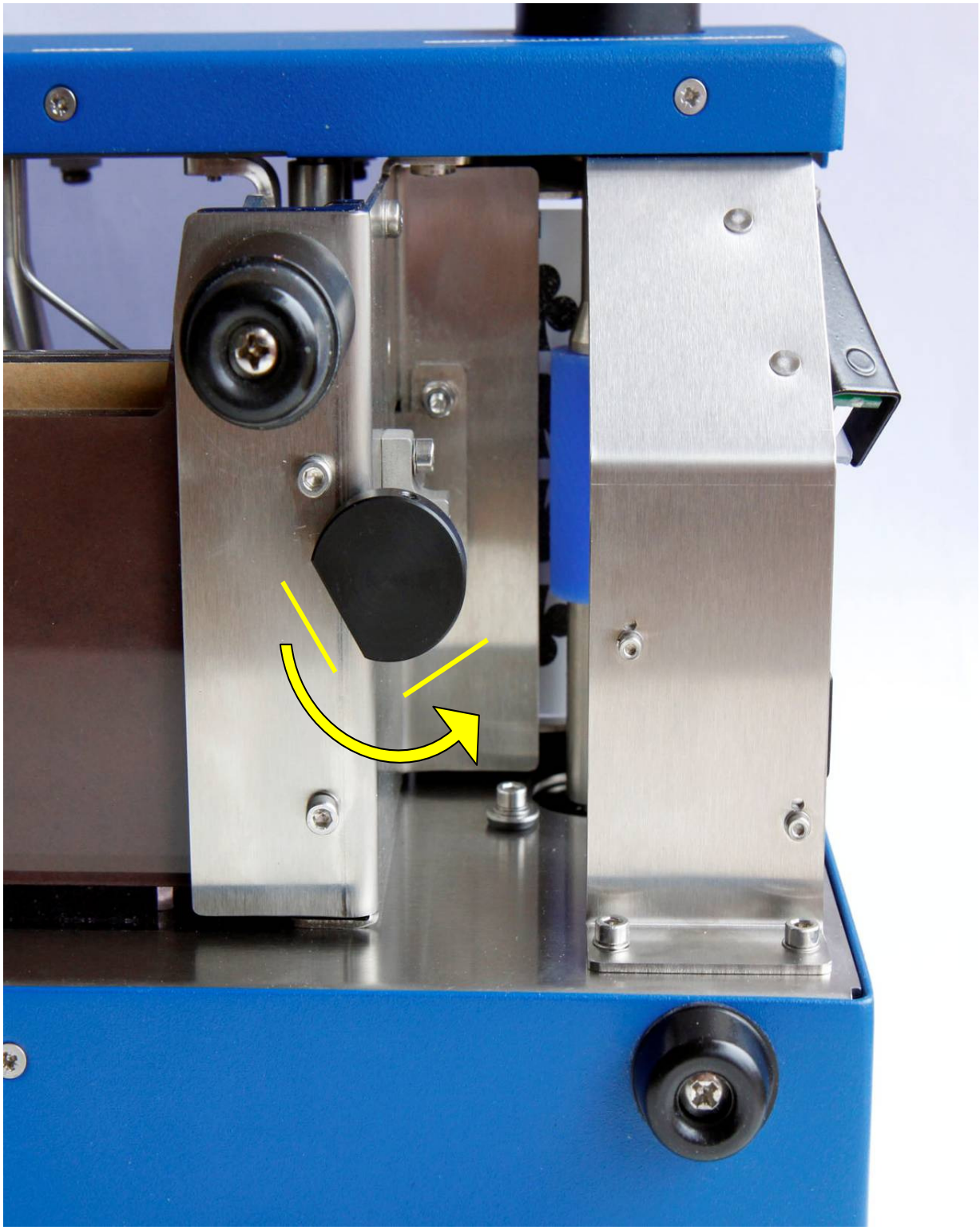
1. Loosen the Mushroom locking grub screw using a 2.0mm Allen or Hex key.



2. Put card into Feeder Gap:



3. Rotate the Bottom Mushroom Knob clockwise until the mushroom touches the card in such a way that the card cannot be moved by hand. Do not over tighten. Then rotate the Knob a 1/4 turn counterclockwise. Use flat part of the knob to define a 1/4 turn:



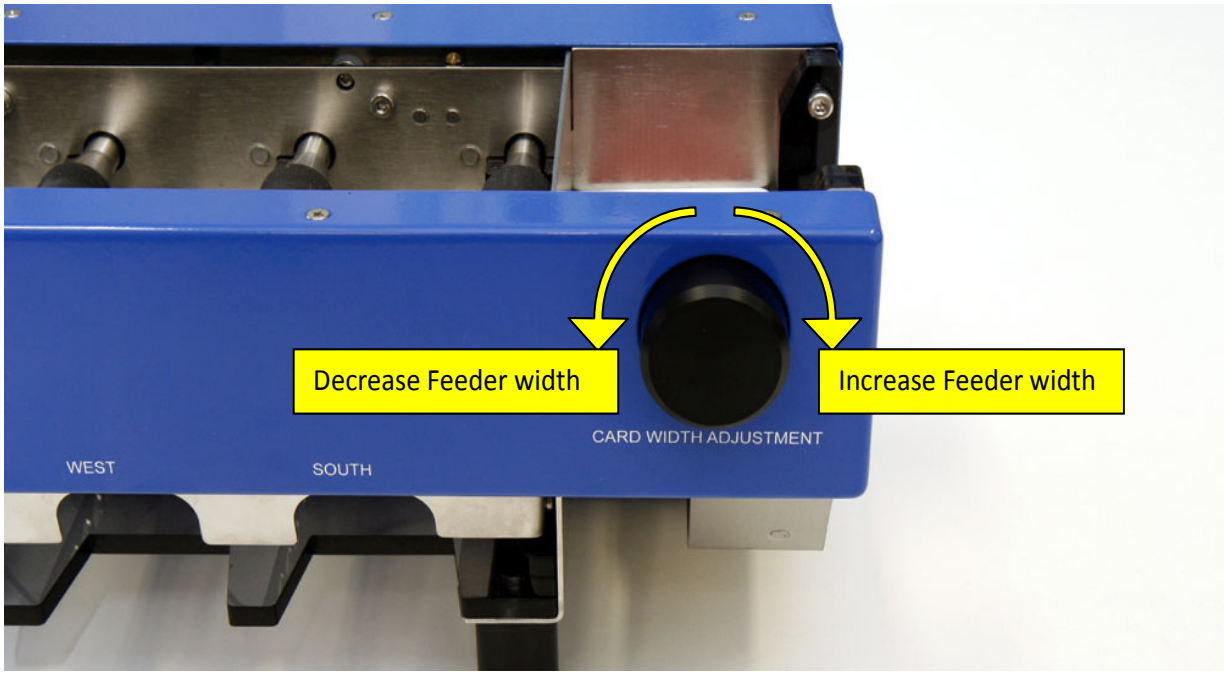
4. Now tighten the locking grub screw to lock the mushroom in position.

3.2 Card Width Adjustment

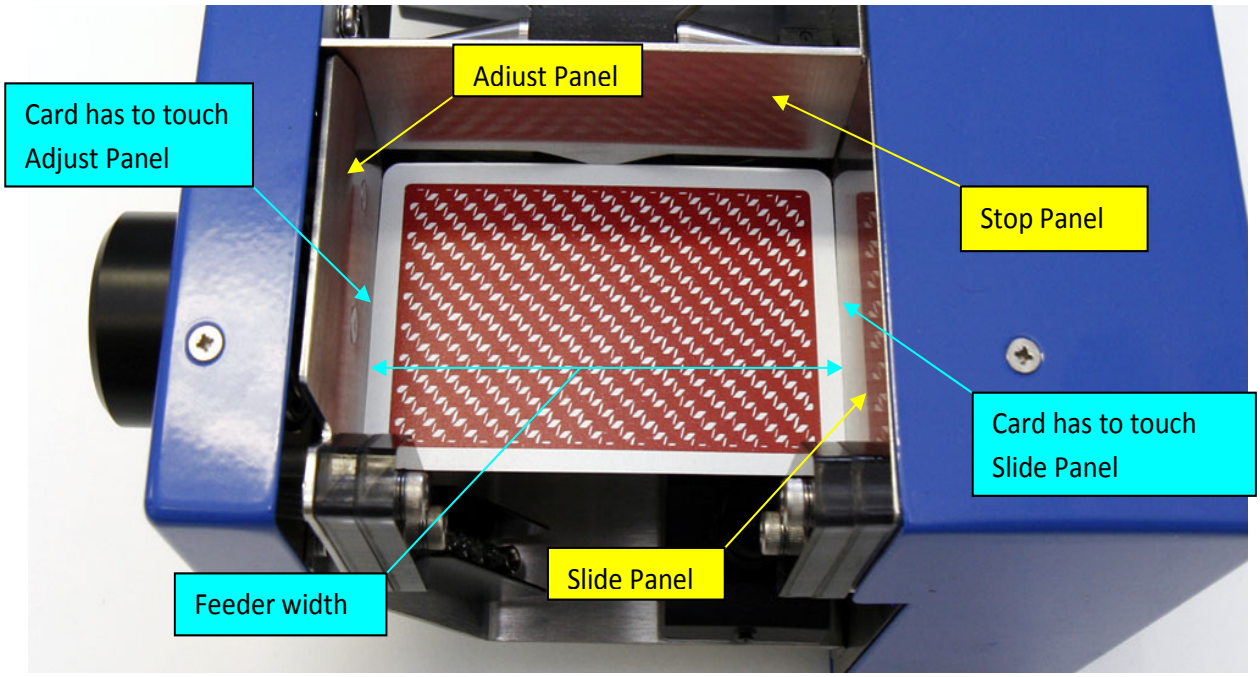
For smooth and fast Dealer4 operation, it is important to have the Card Feeder set to the correct width. Feeder width should always be set relative to the card width. A width that is too small can lead to problems with card feeding and even can make it impossible to fit cards into the Feeder. A width that is too large makes the feeding process more difficult (a card can rotate slightly and block itself) and the card symbols can go outside the viewing area of the camera.

An incorrect Feeder width can result in a number of different errors but most commonly Card Feeding Error (Error 55 or 56) and Card Recognize Error (Error 25 to 53).

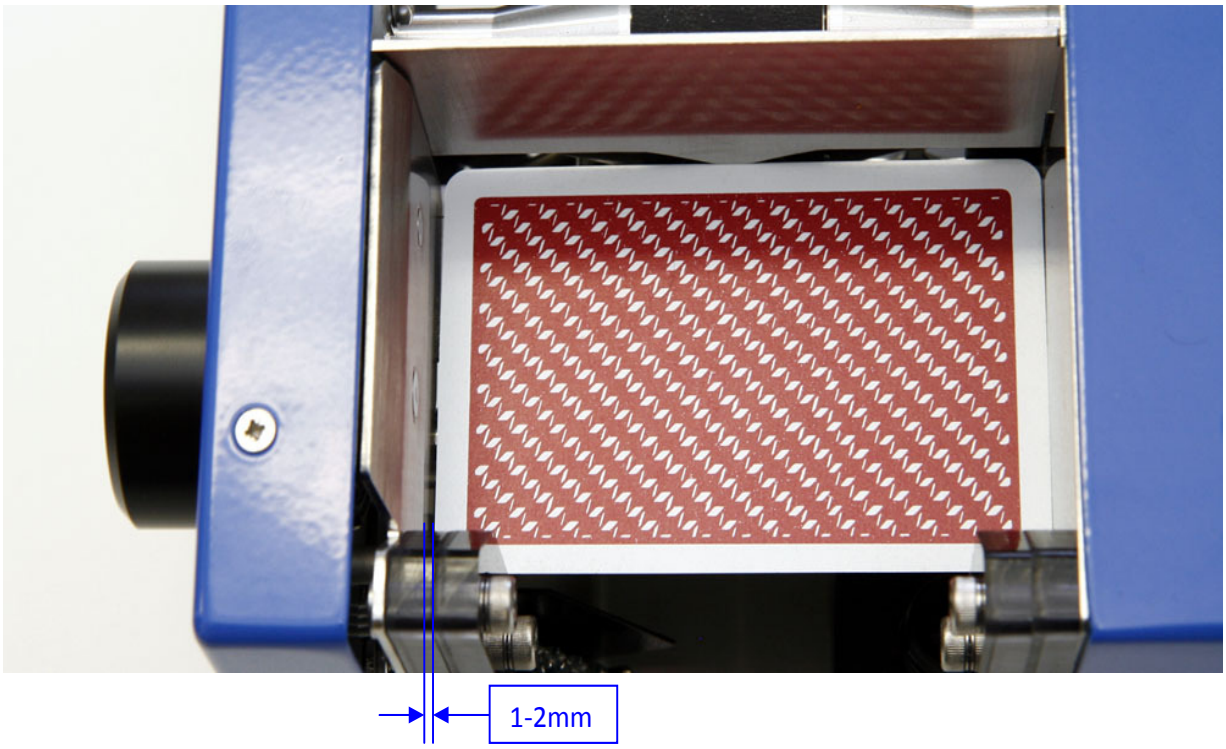
Card Feeder width should be set to be 1-2mm wider then the width of the card. It is adjusted by rotating the Card Width Adjustment Knob located on the front panel of the machine:



To adjust the card width, put one card into the Feeder and by turning adjustment knob set the adjust plate to touch the card on side:



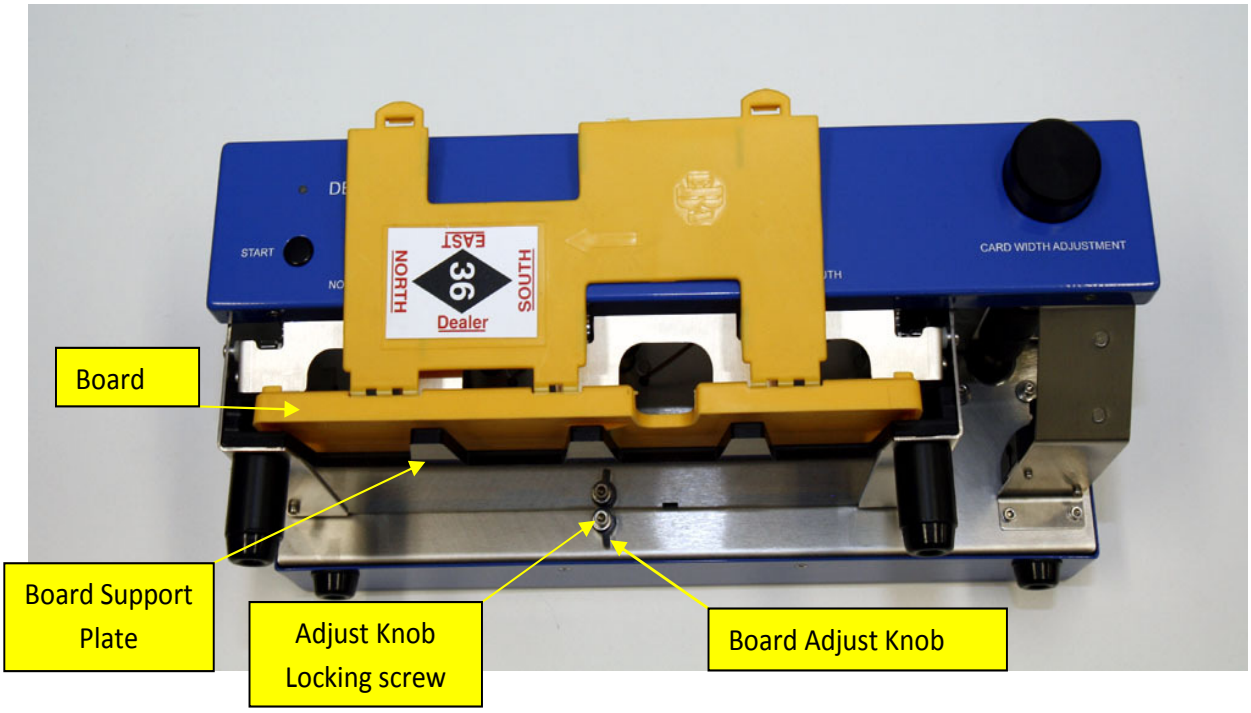
Then rotate adjustment knob 1.5 turns clockwise. This will move adjust panel by around 1.6mm and provides the correct Feeder width:



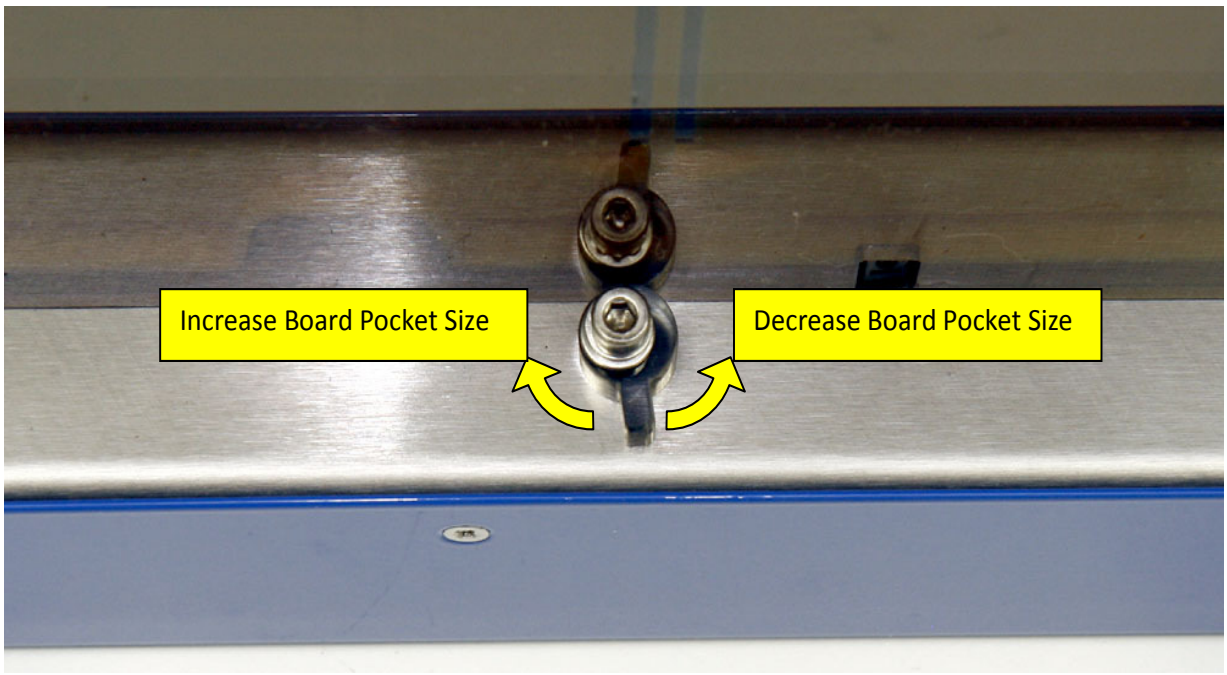
It may be necessary to adjust the Feeder width every time a new type (size) of card is used.

3.3 Board Pocket Adjustment

The Board should slide inside the machine without much force but on another hand it cannot be too loose because cards could slide between compartments. If the Board Pocket size is too small it will be difficult or impossible to slide the Board inside the machine:



To adjust the Board Pocket, a 3.0mm Alan key is required. The Board Pocket adjustment is performed by rotating the Board Adjust Knob located under the Board Support Plate:



To adjust please follow the following steps:

1. Unlock the Adjust Knob by loosening the locking screw using the 3mm Allen key.

2. Turn Adjust Knob to the left (clockwise).

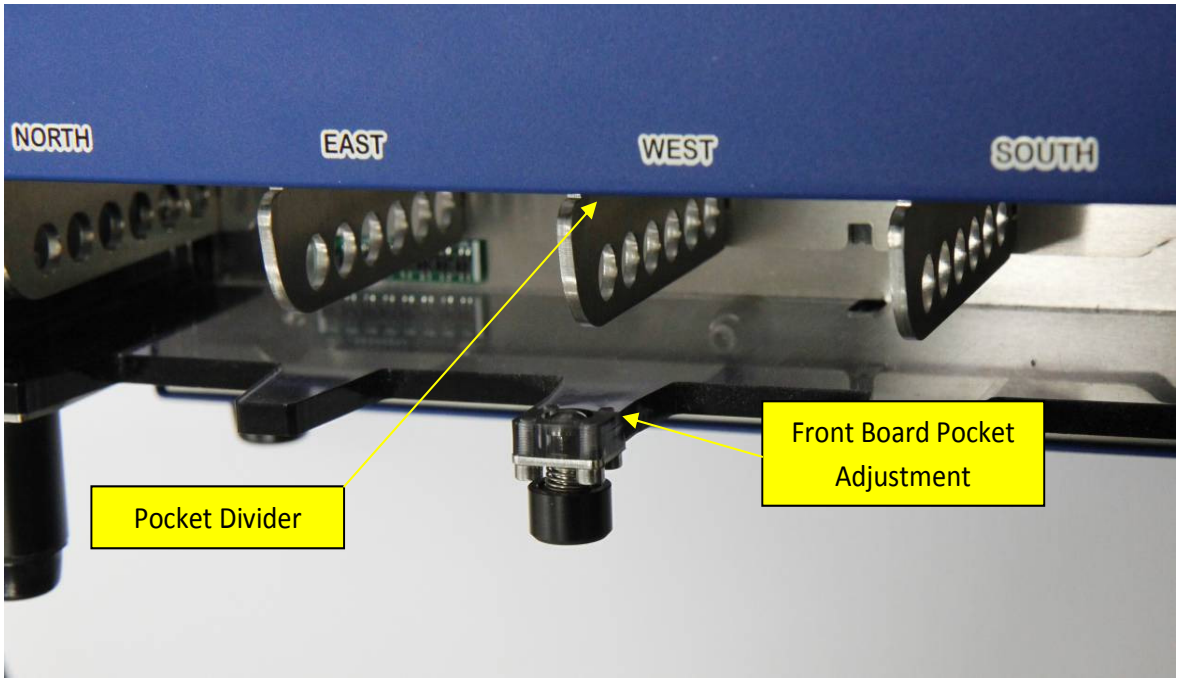
3. Slide Board into pocket.

4. Turn Adjust Knob to the right (anticlockwise) as much as will be possible but without using too much force. Tighten the Adjust Knob locking screw.

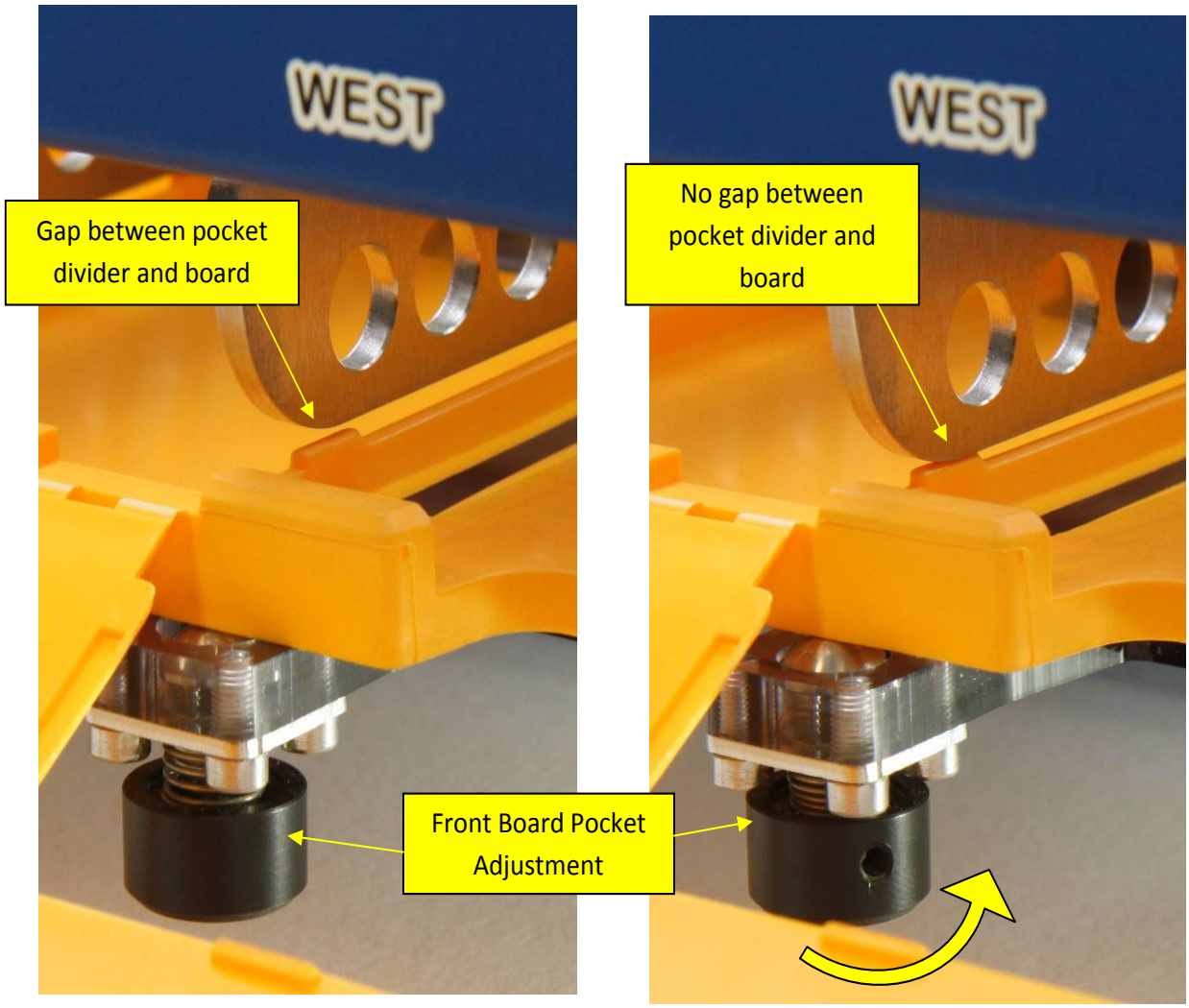
5. Check if the Board can be slide in and out smoothly. If is too hard to take out or put in – unlock the screw, turn the Adjust Knob a little bit to the left (clockwise) and lock the screw again.

3.4 Front Board Pocket Adjustment

Machines with serial numbers 5249 and above include a Front Board Pocket Adjustment. This adjustment can be used to bring the card pocket closer to the pocket dividers and therefore stoping cards sliding into other pockets.



The Front Board Pocket Adjustment can be fitted to any Dealer4 machines. Please contact as service center for more information and prices.



Turn the Adjustment knob until the board touches the pocket dividers. Do not over tighten.

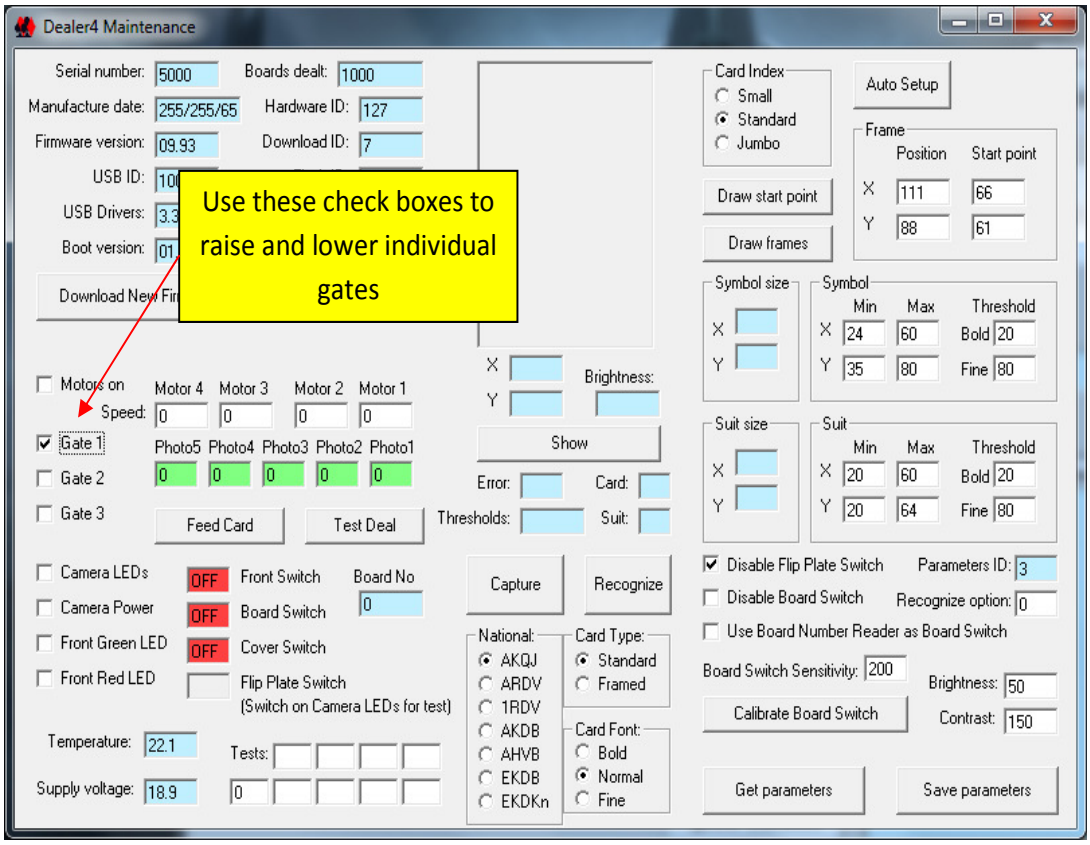
3.5 Inspection and Adjustment of Gates

It is sometimes possible for the wire gates to be bent out of position. This can occur during cleaning or during removal of jammed cards.

Bent gates can make dealing impossible and may cause repeated Gate Errors.

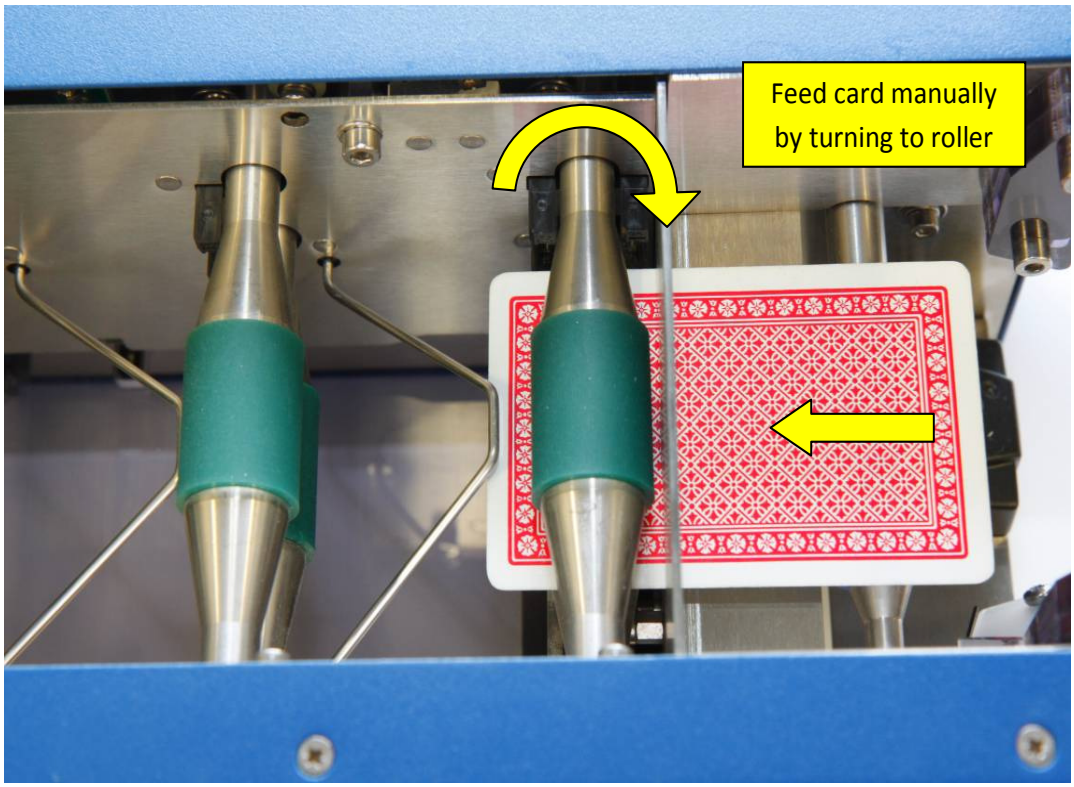
To check the position of the gate, follow these steps:

1. Connect the Dealer4 machine to a PC and go to the Maintenance Screen.
2. Check the appropriate “Gate” tick box. Images below show Gate 1 in the lowered and raised positions.

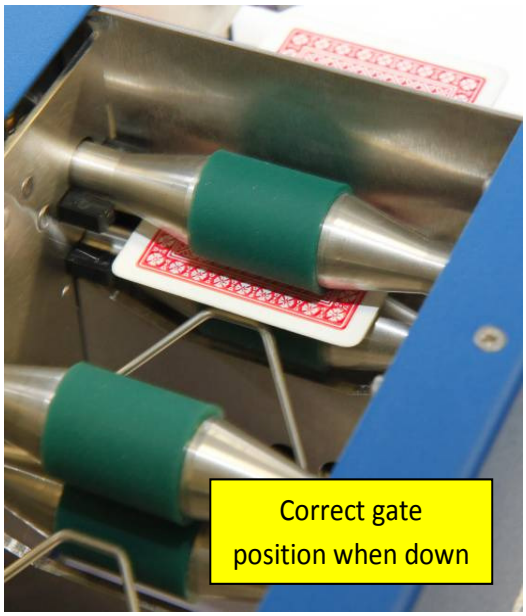


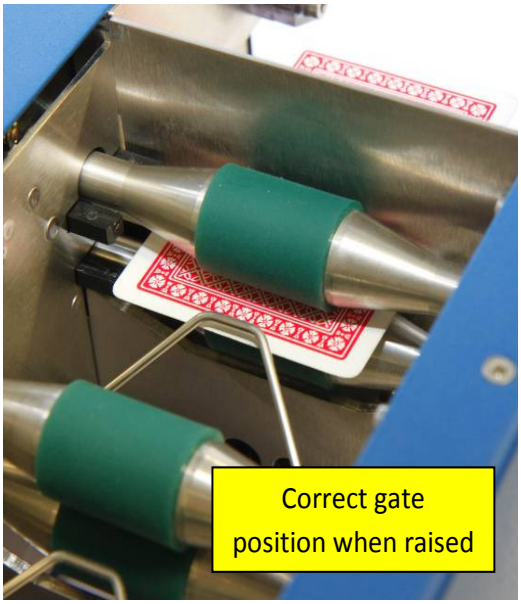
3. Feed a card in by manually turning the rollers. The card must pass over the gate when it's lowered and be deflected down when the gate is raised.
   Correct clearances are shown below.

WARNING: The machine is still powered up at this stage. Do not select any other options on the maintenance screen and be careful when touching moving parts.

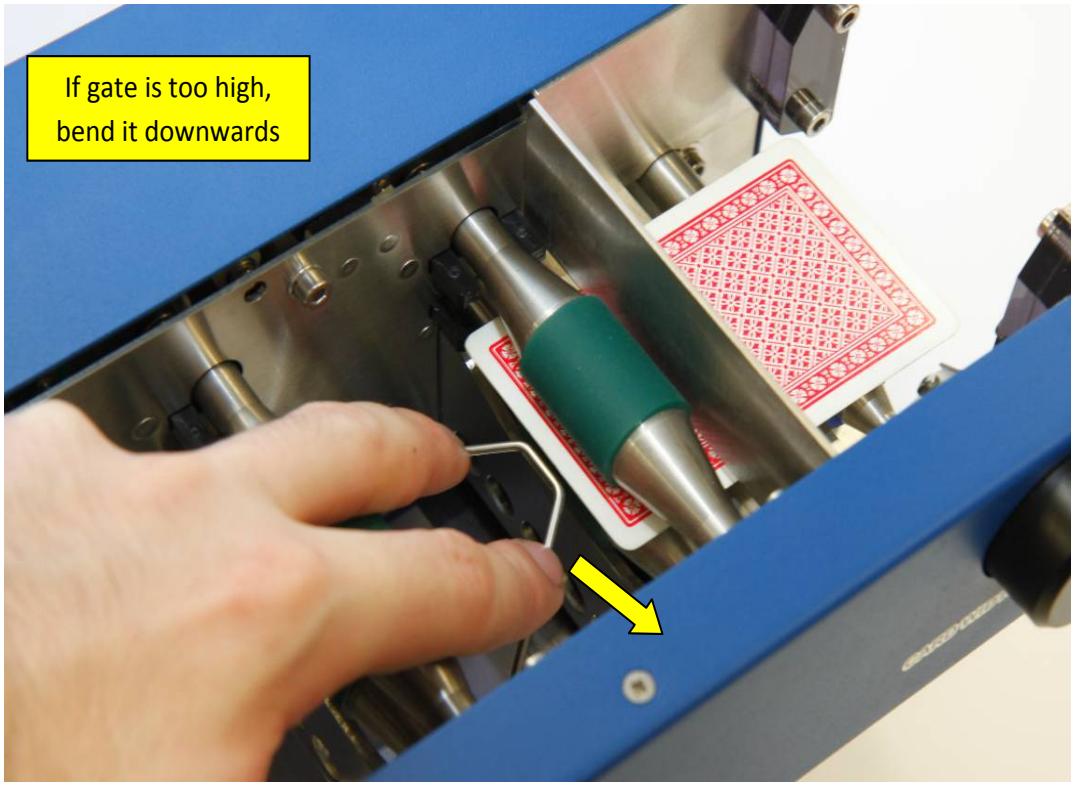


Insert card manually, and check the clearance between the gate and the card. In the lower position the gate should be around 1mm below the card. In the raised position the gate should be around 2mm above the card.

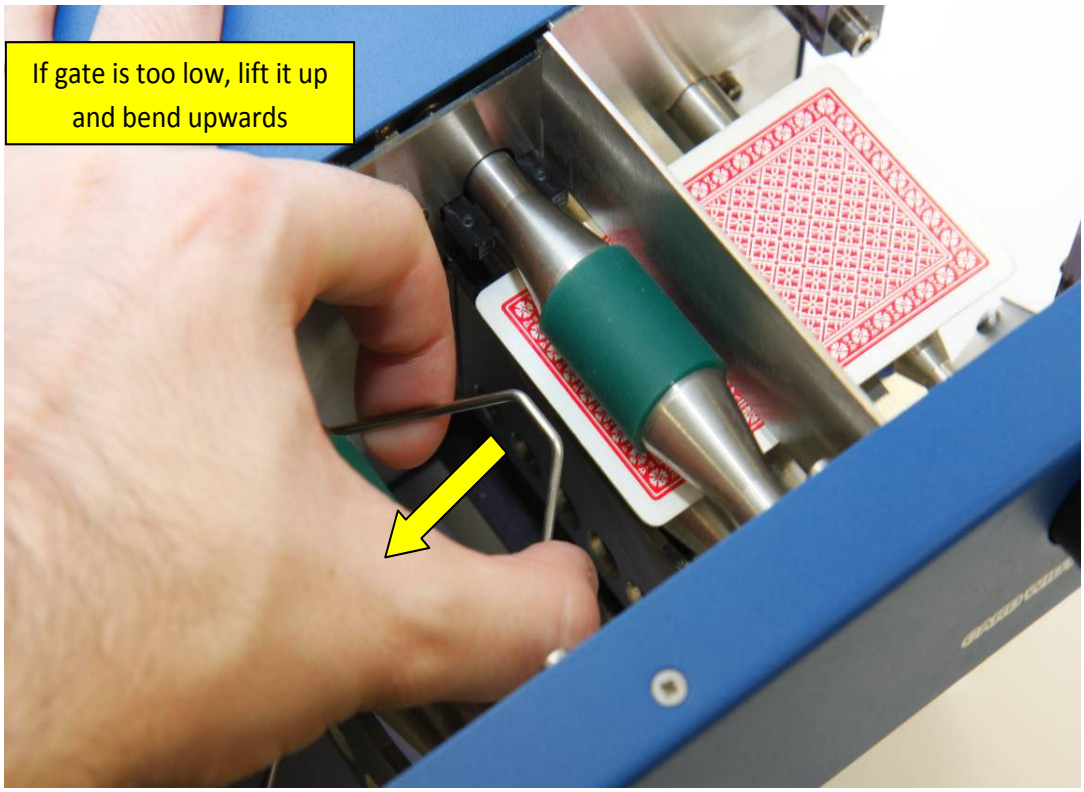




4. Once a problem gate has been identified, disconnect the machine completely and gently bend the gate as required.



If the gate is too high, bend it downwards. Bending the gate about 10 mm downwards should be enough.



If the gate is too low, lift it up and bend in the upwards direction. The gate will have to be raised about 10mm.

Once any gate adjustment is performed please check the gate position again by following the steps at the beginning of Section 3.5

WARNING: This is a delicate operation and should only be performed as a last resort. It is very easy to bend the gates incorrectly and make dealing impossible. If in doubt, please contact a Service Center.

If frequent gate errors occur it can be worth trying to fix the gates. Worst case scenario the machine will need to be sent to a Service Center anyway.