FORMAX®

Square IT
Squareback Booklet Finisher

MAINTENANCE MANUAL
FIRST EDITION

5/2018

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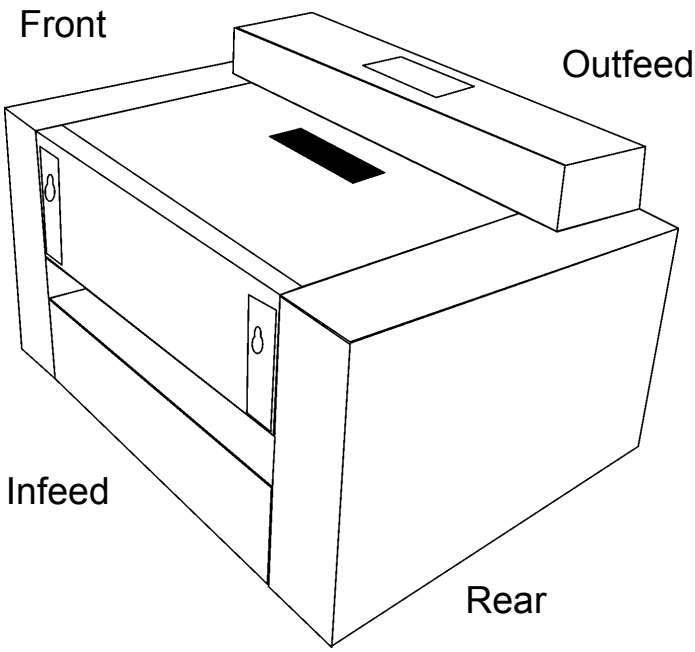
4 DETAILED DESCRIPTION



1.1 PREVENTIVE MAINTENANCE TABLE

Service interval: 250 000

CAUTION: If any of the checkpoints or other parts show indication of wear at any point, replace the part. When lubricating, clean the surface if necessary before applying new lubricant.

CHECK POINT	INSTRUCTION	250 000	500 000
All machine, Paper path etc.	Use vacuum cleaner, towels and brushes to clean the machine from paper dust.	Clean	Clean
Sensors	Use compressed air to clean the sensors and LEDs, Q1-Q9. See 4.1 for location.	Check/ clean	Check/ clean
Interlock switches	Check the function of the switches. Adjust according to 2.5.7 and 2.5.8. Make sure that all four switches are activated when the top cover and outfeed cover are closed.	Check/ adjust	Check/ adjust
Transport Belt	Check the transport belts for wear. - Use a soap solution when cleaning. - Replacement according to 2.6.1 and 2.6.2.	Check/ clean	Check/ clean
Pressure Roll	Check the o-rings and pressure roll assembly for wear. - Replacement according to 2.4.4. When replacing, replace the entire pressure roll assembly. - To change wear point: Grasp the roller. Move it 20-30mm (1 inch) sideways. Run the roller assembly to home position to verify wear point has been changed.	Change wear point & clean	Change
Link Arms for Clamps	Check the linkage for wear/increased play. Check that the lower clamp is moving when pressed by upper clamp. - When replacing, change the complete front and rear linkage assembly.	Check/ change	Check/ change
Upper Clamp	Apply grease on the infeed side of the clamp at location of both home positions only, to decrease friction vertically between ball bearings and clamps during pressing action.	Grease	Grease
Teflon Tape	Check the teflon tape for wear, change if necessary according to 2.6.3.	Check/ change	Check/ change
Slide Guides	Apply grease on the sliding surface according to 2.7.1	Grease	Grease
Dampers	Replace the dampers. - When changing adjust the stop guide according to 2.7.2.	Change	Change

2.1 GENERAL CAUTIONS

Using the ESD Ground Strap

Purpose
The purpose of the ESD (Electrostatic Discharge) ground strap is to preserve the inherent reliability and quality of electronic components handled by the Service Representative. The strap should be used whenever handling the circuit boards or any other ESD sensitive components.

Procedure
NOTE: *All procedures requiring use of the ESD ground strap will contain a caution referring to this procedure.*

1 Switch off the main power switch.
2. Make sure the power cord connects the machine to the wall outlet. The power cord and wall outlet must have ground.
3. Connect the claw end of the grounding cord to a chassis ground, such as earth wires screwed to chassis ground, unpainted frame or an unpainted bracket secured to the frame.
4. Connect the snap end of the blue cord to the snap on the adjustable wriststrap.
5. Place the adjustable wriststrap securely on the wrist.
   Wait for one minute to let the electrostatic be discharged from your body.
6. ESD sensitive components can now be handled without causing any ESD related damage.
7. New replacement PCBs and ESD sensitive components, as well as old defective PCBs should be handled during unpacking and repacking using the ESD ground strap. During the transfer from or to the packaging material, the PCB should be placed in the ESD bag the replacement PCB came in.

CAUTION
ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors.
NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

2.2 SPECIAL TOOLS

In order to facilitate the service of the Square IT, there are a few special tools needed.

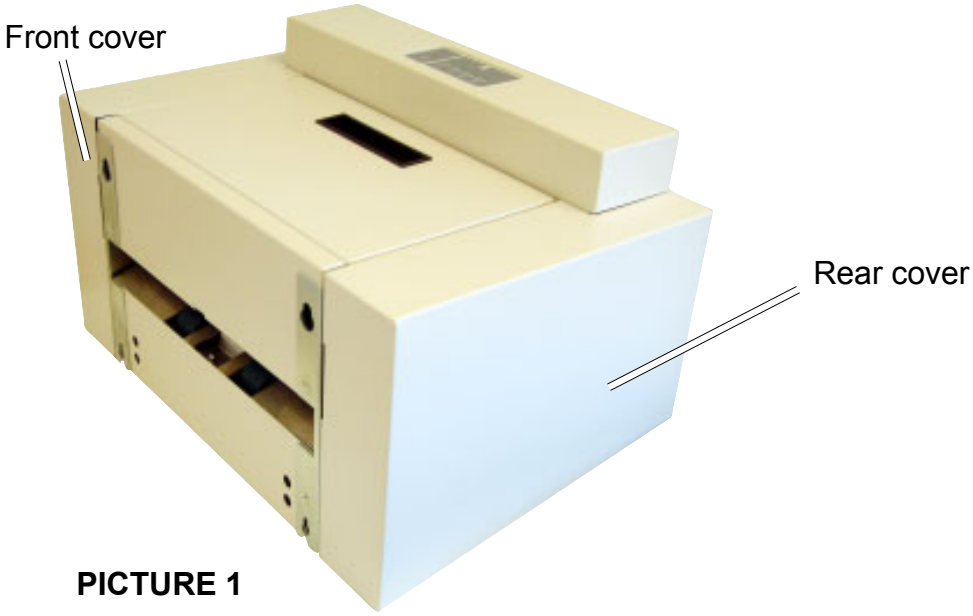
ESD Ground Strap

Torx 20 Screwdriver

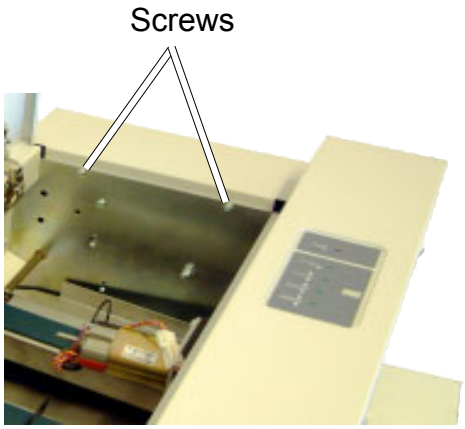
2.3.1 FRONT AND REAR COVERS

REMOVAL

1. Switch off the Main Power
2. Open top cover.
3. From inside, loosen the two screws on each cover. **PICTURE 2.**
4. Remove covers.



PICTURE 1



PICTURE 2

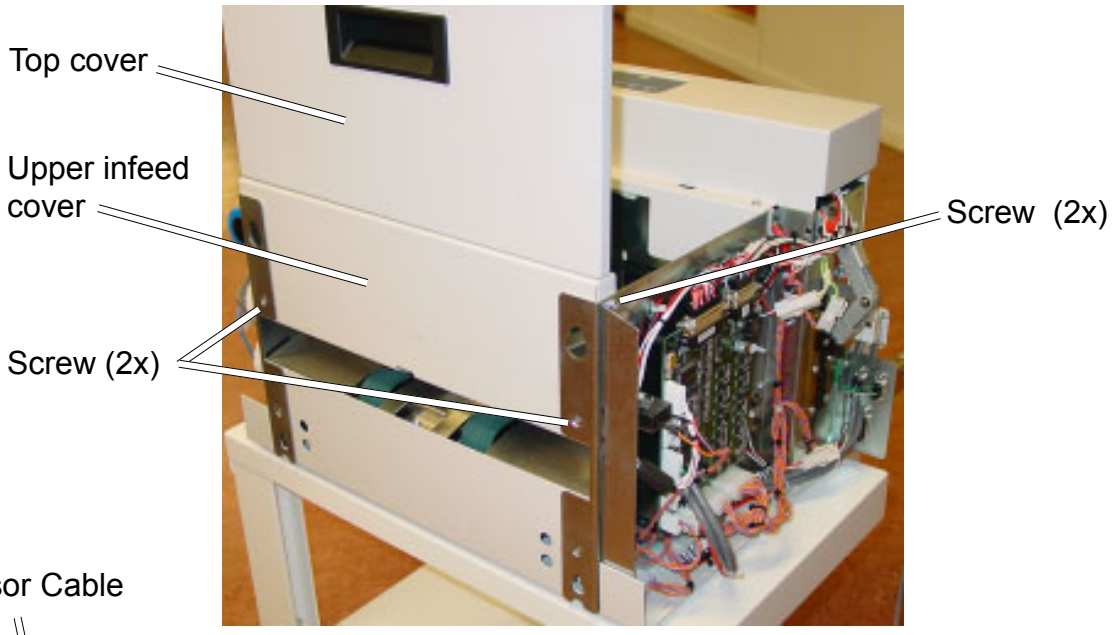
REPLACEMENT

1. Installation is an exact reversed procedure of removal.

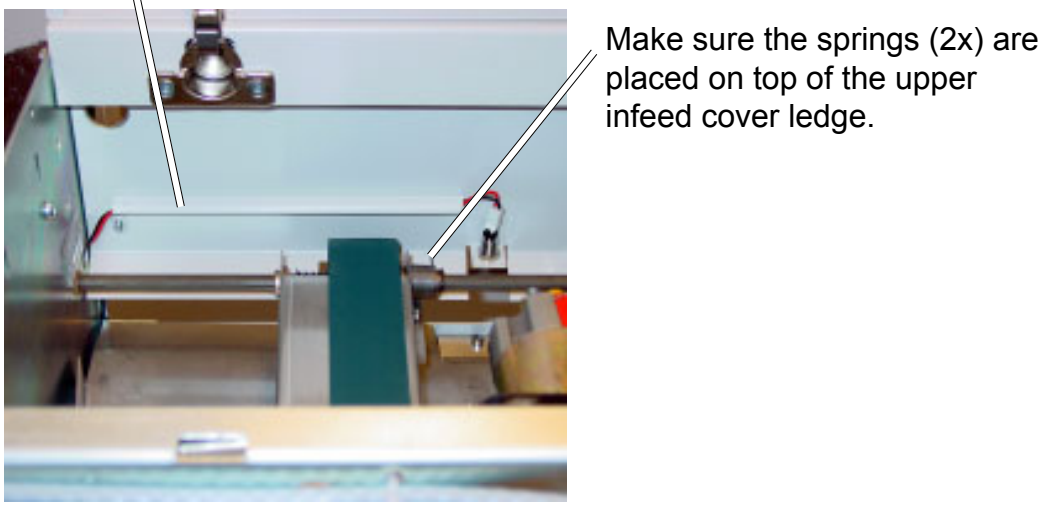
2.3.2 TOP COVER AND UPPER INFEED COVER

REMOVAL

1. Switch off the Main Power.
2. Undock the Square IT from the Trimmer
. Remove Front and Rear cover according to 2.3.1
3. Remove the Sensor cable from the cable canal. PICTURE 2
4. Remove the Screws (2+2) holding the upper infeed cover. PICTURE 1



PICTURE 1



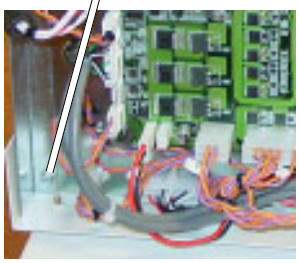
PICTURE 2

REPLACEMENT

1. Installation is an exact reversed procedure of removal.
2. Make sure both springs are placed on top of upper infeed cover ledge.

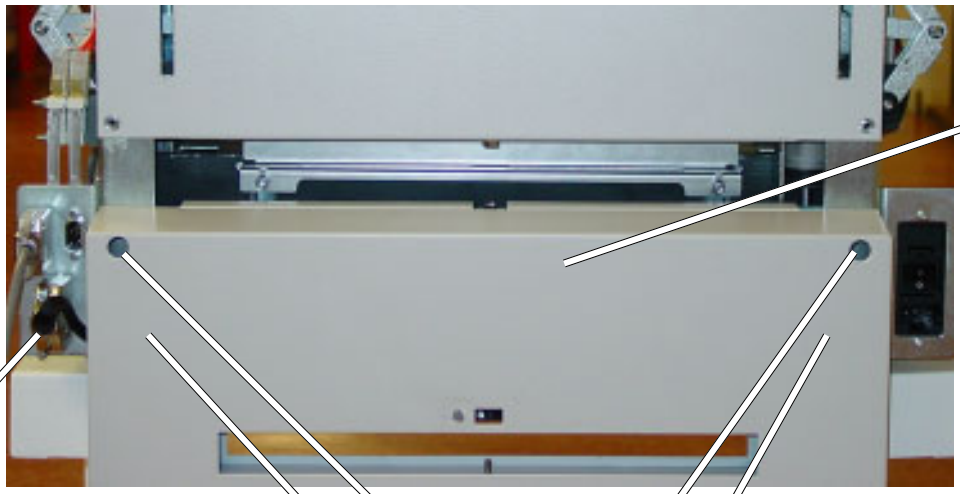
2.3.3 BOTTOM COVER

REMOVAL

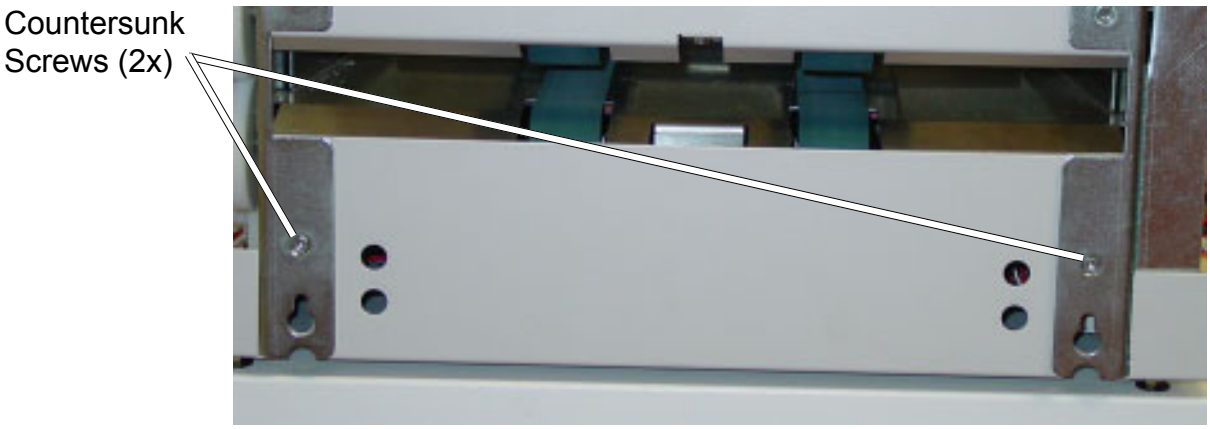


PICTURE 1

1. Switch off the Main Power.
2. Undock the Square IT from the Trimmer.
3. Remove Front and Rear Covers according to **2.3.1.**
4. Remove the screws locking machine to base (if base is present).
5. Disconnect the Stacker Plug from the receptacle. **PICTURE 2**
6. Remove Upper Outfeed Cover according to **2.3.4.**
7. Remove Screws (2x Torx 20) and Screws (2x Allen 5mm). **PICTURE 2**
8. Remove Lower Outfeed Cover. **PICTURE 2**
9. Remove the Countersunk Screws (2x). **PICTURE 3**
10. Remove Screw (1x) from lower rear side. **PICTURE 1**
11. Turn the machine over so it stands on the infeed end.
12. Grab the cover at the edge near the outfeed sensor and remove the cover carefully.
13. Disconnect the sensor plug.
14. Remove the Sensor cable from the cable canal.



PICTURE 2



PICTURE 3

REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.3.4 CONTROL PANEL COVER AND UPPER OUTFEED COVER

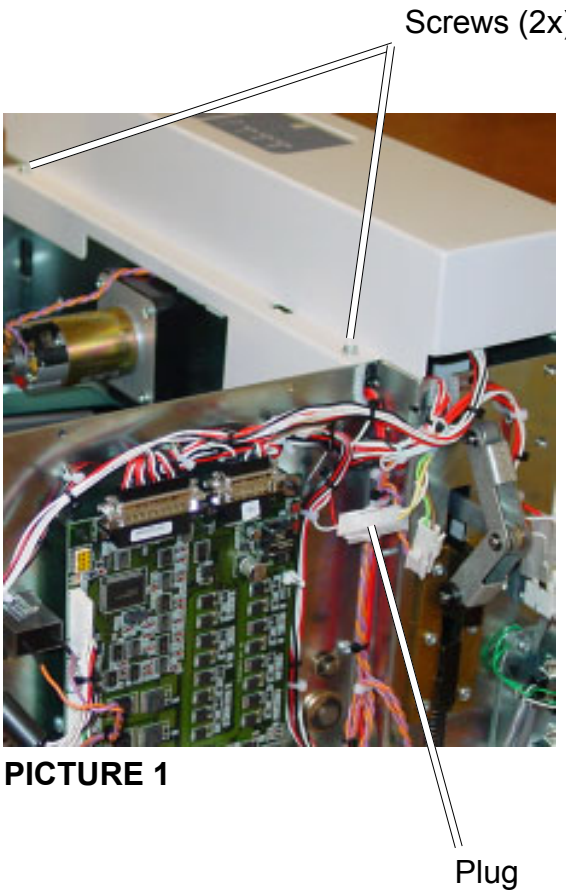
REMOVAL

CAUTION

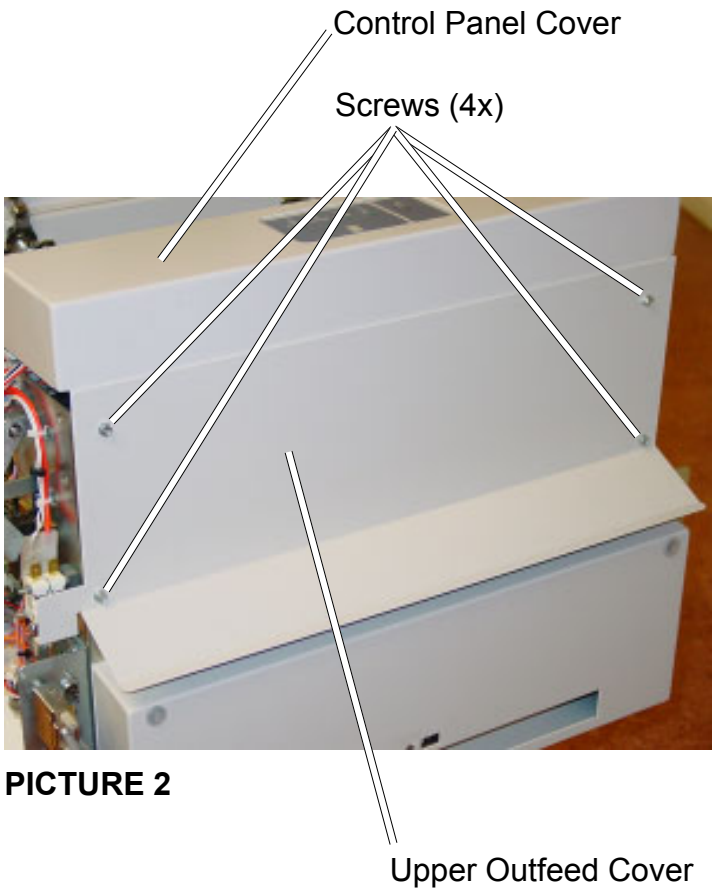
ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Switch off the Main Power.
2. Remove front and rear covers according to **2.3.1.**
3. Remove the Screws (4x). **PICTURE 2**
4. Remove the Upper Outfeed Cover. **PICTURE 2**
5. Remove the Screws (2x). **PICTURE 1**
6. Disconnect the plug.
7. Remove the Control Panel Cover carefully. **PICTURE 2**



PICTURE 1



PICTURE 2

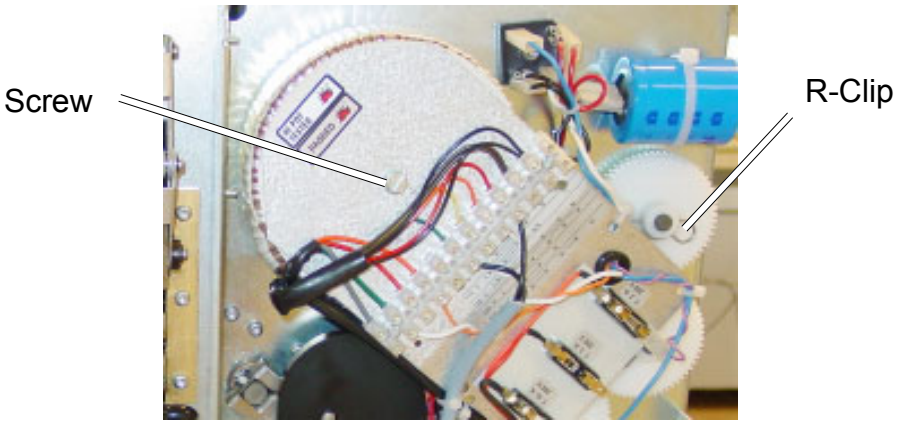
REPLACEMENT

1. Installation is an exact reversed procedure of removal.

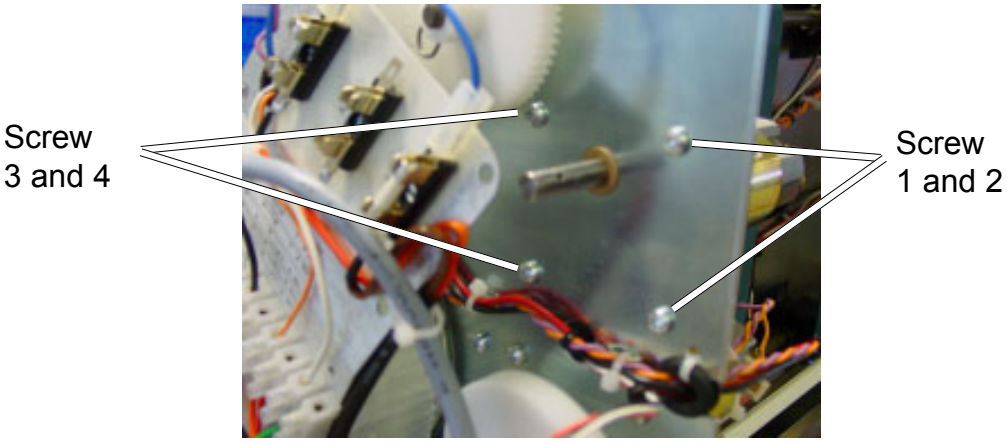
2.4.1 TRANSPORT BELT MOTOR (M1)

REMOVAL

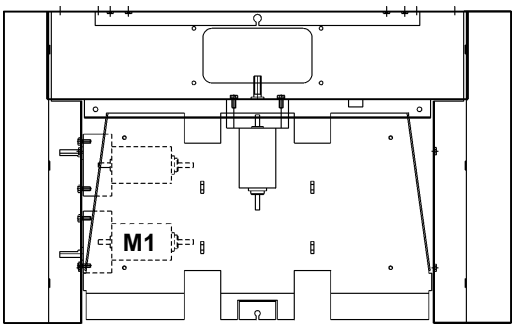
1. Switch off the Main Power.
2. Remove Front and Rear Covers according to **2.3.1.**
3. Remove Bottom Cover according to **2.3.3.**
4. Loosen the screw to the Transformer. **PICTURE 1**
5. Remove the R-pin holding the sprocket, then remove the sprocket. **PICTURE 1**
6. Disconnect the Motor.
7. Turn the Transformer to access and remove screws 1 and 2. **PICTURE 2**
8. Turn back the Transformer and remove screws 3 and 4. **PICTURE 2**
9. Remove the Motor.



PICTURE 1



PICTURE 2



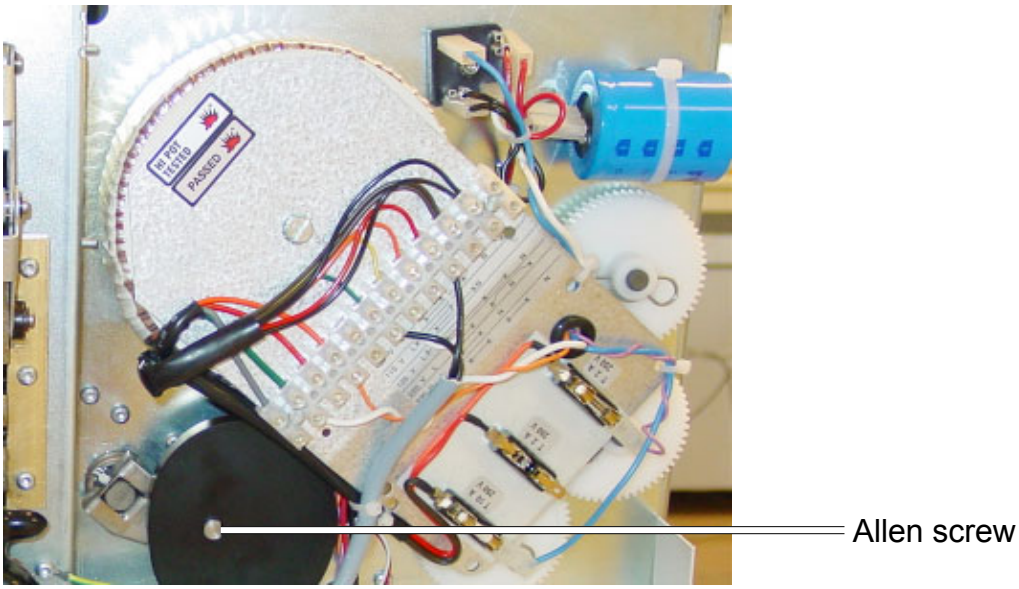
REPLACEMENT

1. Installation is an exact reversed procedure of removal.

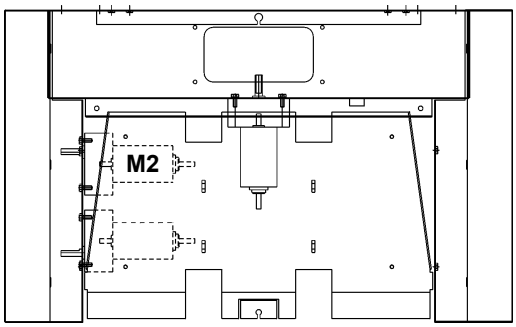
2.4.2 STOP GATE MOTOR (M2)

REMOVAL

1. Turn off the Main Power.
2. Remove Front and Rear covers according to **2.3.1.**
3. Remove Bottom Cover according to **2.3.3.**
4. Disconnect the motor.
5. Remove the cam by loosening the allen screw from the motor shaft. **PICTURE 1.**
6. Remove the screws (4) holding the motor.
7. Remove the motor.



PICTURE 1



REPLACEMENT

1. Installation is an exact reversed procedure of removal.
   Perform stop gate adjustment according to **2.7.2**

2.4.3 CLAMP MOTOR (M3)

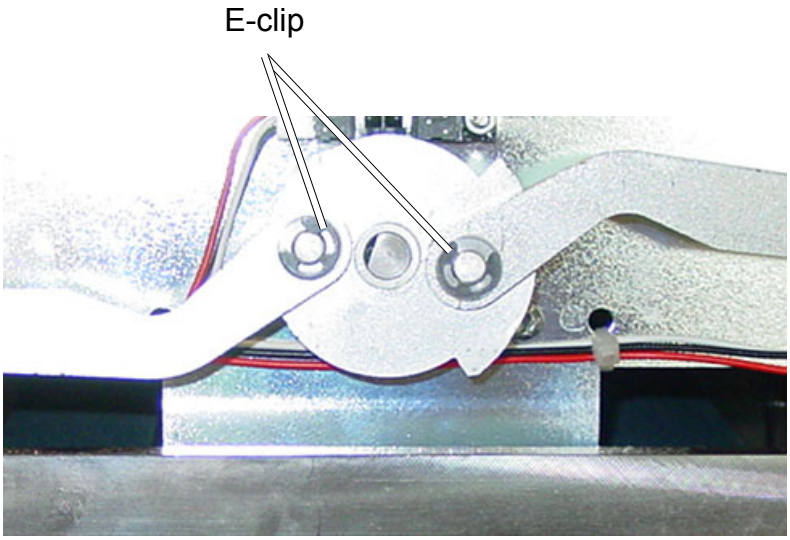
REMOVAL

CAUTION

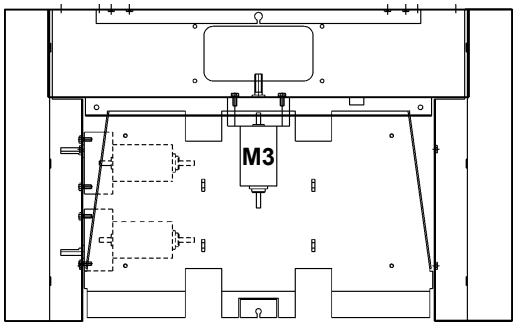
ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Switch off the Main Power.
2. Remove Control Panel Cover according to **2.3.4**.
3. Remove the E-Clips holding the arms on the driving disc. **PICTURE 1.**
4. Remove the driving disc by loosening the allen screw.
5. Disconnect the Motor.
6. Remove the screws (4) holding the motor.



PICTURE 1



REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.4.4 ROLL MOTOR (M4) AND PRESSURE ROLL

REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Set up the machine for By Pass mode.
2. Switch off the Main Power.
3. Remove the Bottom Cover according to **2.3.3.**
4. Remove the Control Panel Cover according to **2.3.4.**
5. Disconnect the Motor plug and sensor plug from the wire harness. **PICTURE 2**
6. Move the Roll Motor Assembly towards the center of the clamps.
7. Remove the two E-Clips holding the Motor. **FIGURE 1**
8. Lift out the Motor and Pressure Roll upwards.
9. Cut the cable ties all the way to the connectors, if the motor is to be removed completely. **PICTURE 2**

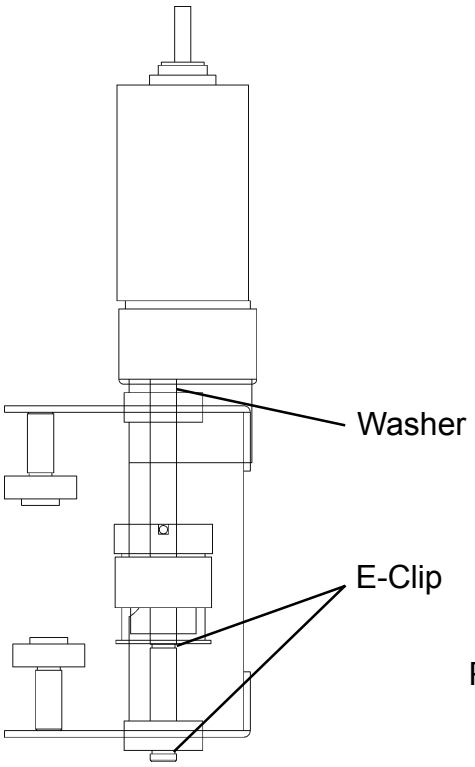
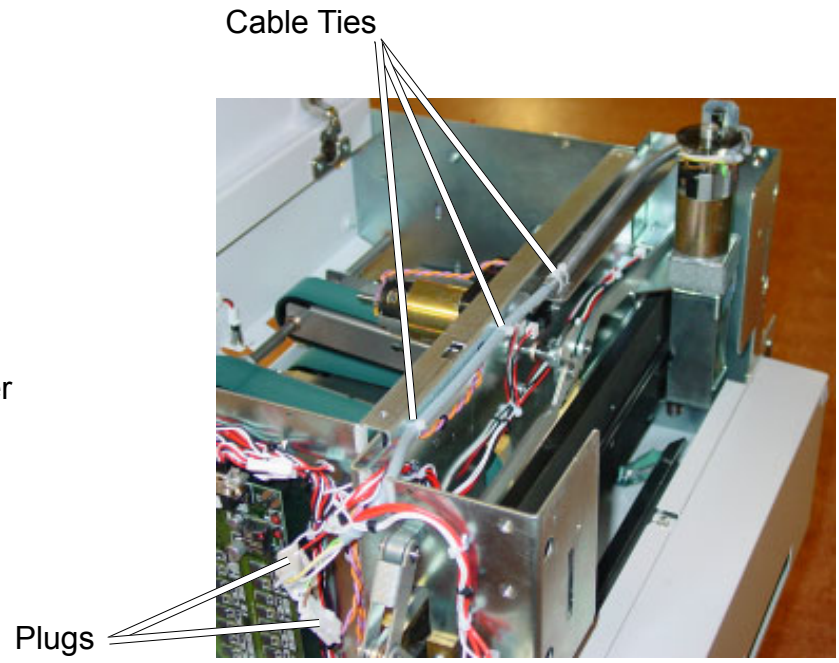


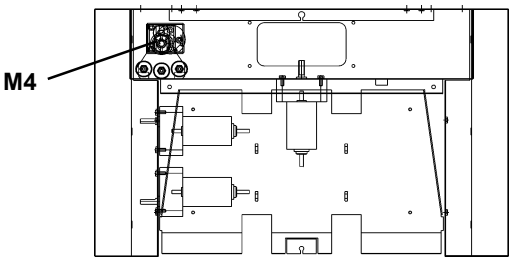
FIGURE 1



PICTURE 2

REPLACEMENT

1. Installation is an exact reversed procedure of removal.
2. Make sure the washer is outside the bushing.



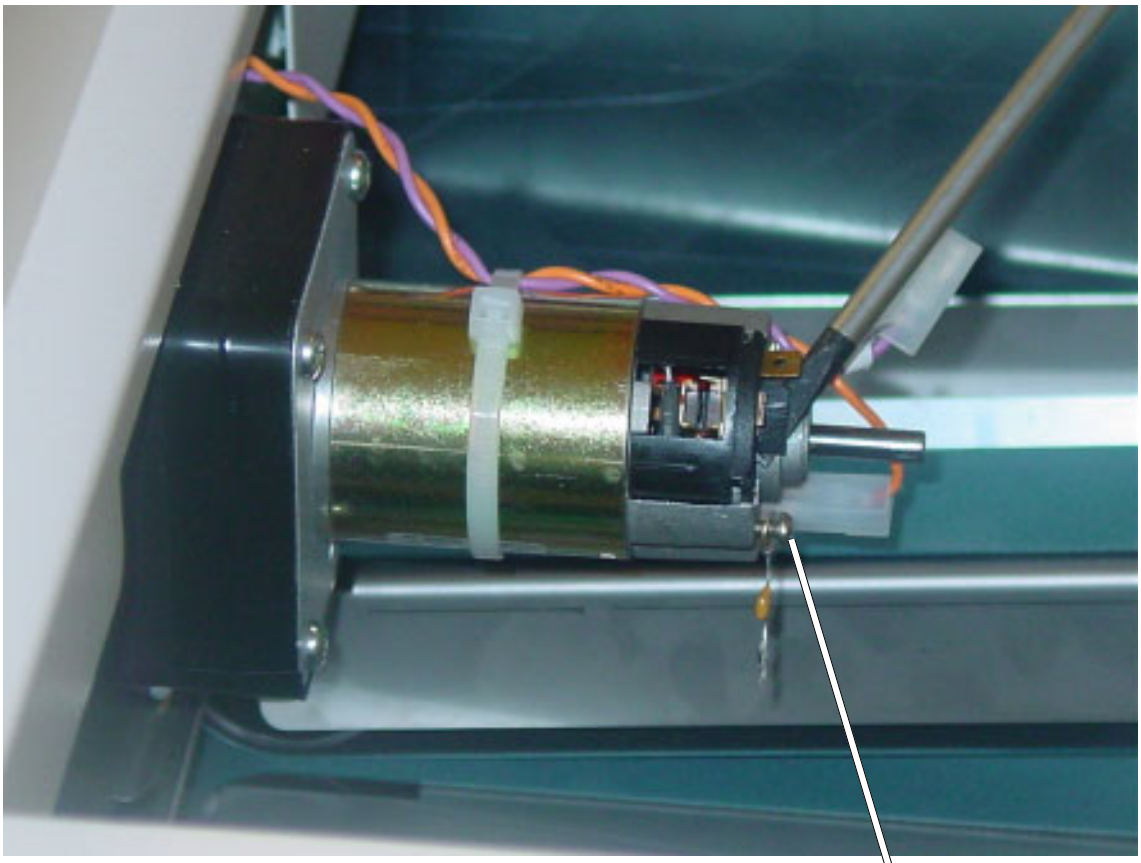
2.4.5 MOTOR M3 CLAMP MOTOR BRUSHES

PURPOSE

If the clamp motor starts to work slowly and/or jerky the brushes have to be replaced.

REMOVAL

1. Switch off the Main Power.
2. Disconnect the motor
3. Remove screws (x2). **PICTURE 1**
4. Bend out the plastic bracket holding the brush. **PICTURE 1**



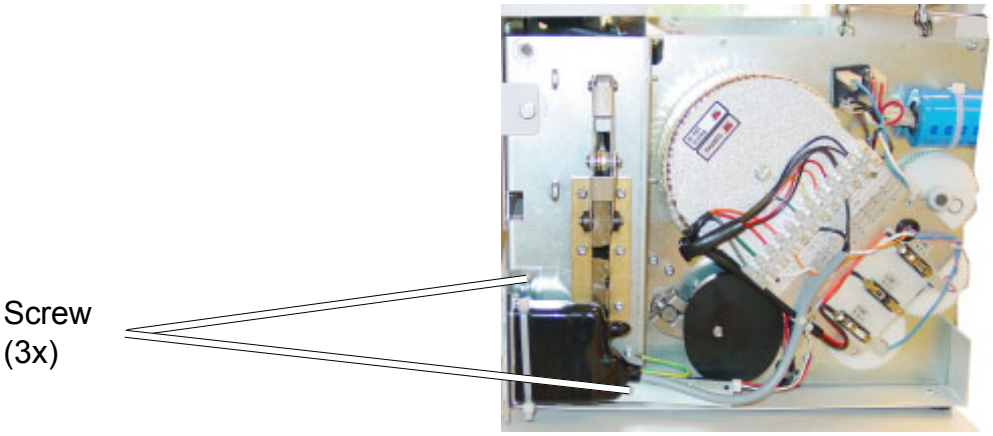
REPLACEMENT

1. Installation is an exact reversed procedure of removal.
2. Make sure the cables is mounted above the motor.

2.5.1 MOTOR M2 HOME POSITION SENSOR (Q1)

REMOVAL

1. Switch off the Main Power.
2. Disconnect the Power Cord.
3. Remove the Rear Cover according to **2.3.1.**
4. Disconnect the connector from the sensor.
5. Remove the sensor, by removing the sensor plate. **PICTURE 1**



PICTURE 1

REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.5.2 ROLL MOTOR rear and front SENSORS (Q2 and Q3)

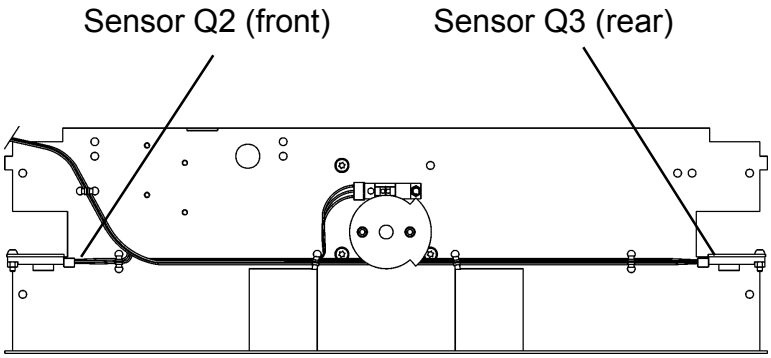
REMOVAL

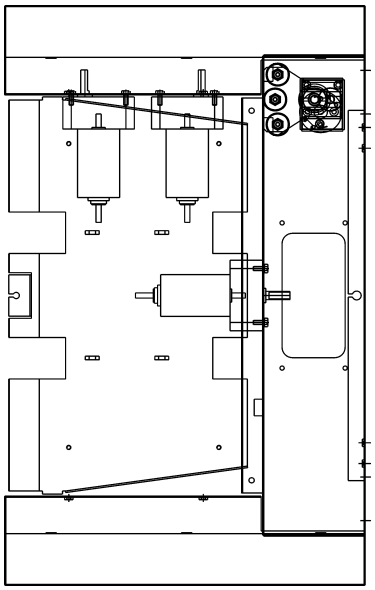
CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Set up the machine for By Pass.
2. Switch off the Main Power
3. Remove the Control Panel Cover according to **2.3.4.**
4. Disconnect the Sensor.
5. Remove the screw holding the sensor.





REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.5.3 MOTOR M3 HOME POSITON SENSOR (Q4)

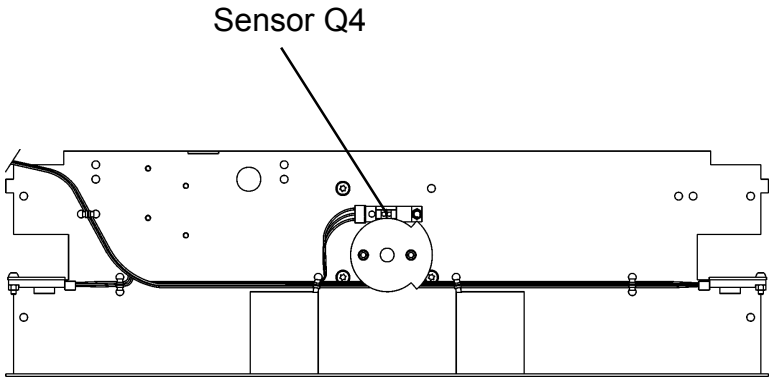
REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Switch off the Main Power
2. Remove the Control Panel Cover according to **2.3.4.**
3. Disconnect the Sensor.
4. Remove the screw holding the sensor.



REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.5.4 INFEED / OUTFEED SENSORS (Q5 and Q7)

REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

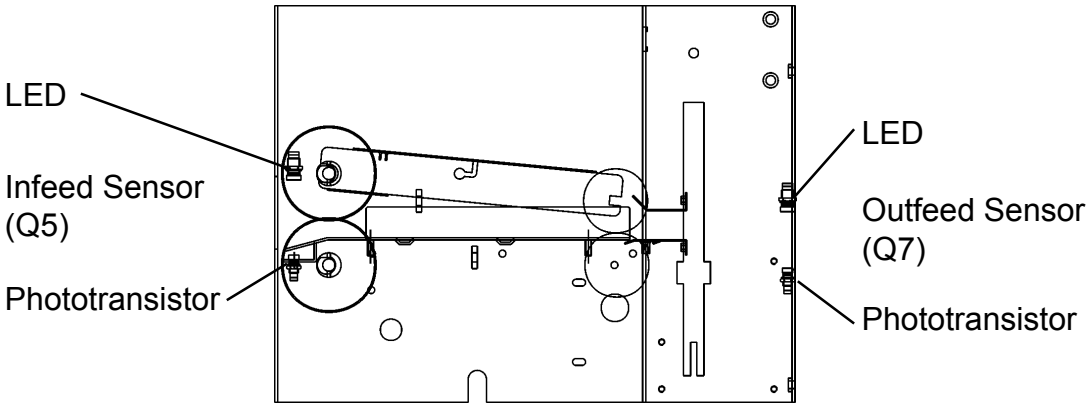
NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

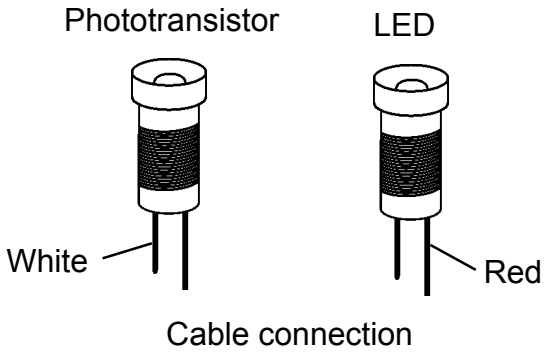
For Phototransistor:

1. Open Top Cover.
2. Remove Connector from LED.
3. Remove LED.

For LED:

1. Remove Lower Cover according to **2.3.3.**
2. For the Outfeed LED: Remove Upper Outfeed Cover according to **2.3.4.**
3. Remove Phototransistor.





Cable connection

REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.5.5 CLAMP SENSOR (Q6)

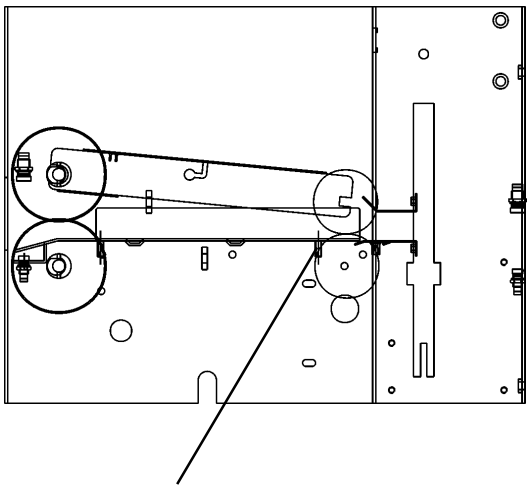
REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Remove Lower Cover according to **2.3.3.**
2. Disconnect the sensor.
3. Remove Sensor.



Sensor Q6

REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.5.6 MOTOR M4 ENCODER SENSOR (Q8)

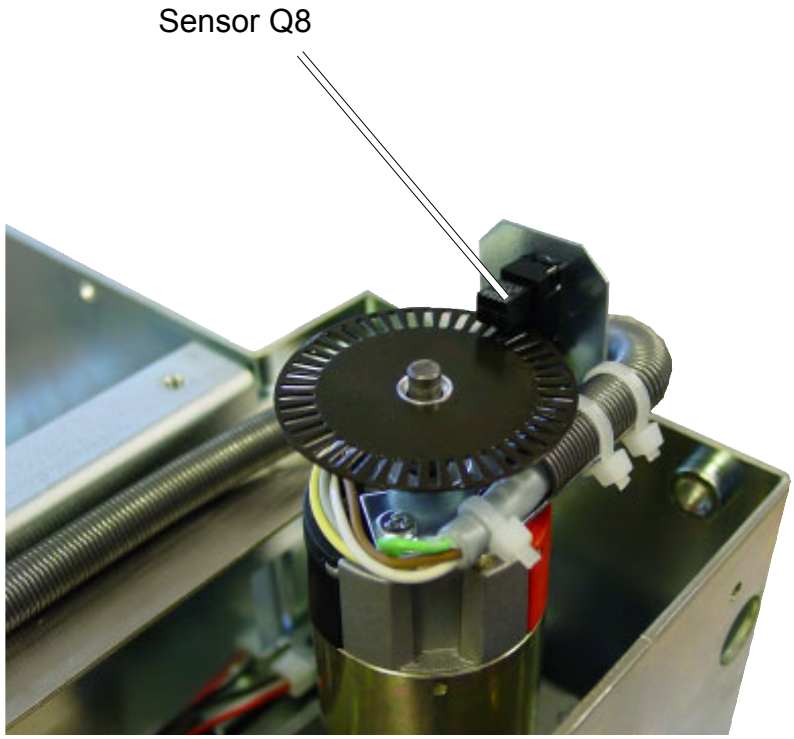
REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Switch off the Main Power.
2. Remove the Control Panel Cover according to **2.3.4.**
3. Disconnect the connector from the Sensor.
4. Remove the Sensor plate. **PICTURE 1**
5. Remove the Sensor.



PICTURE 1

REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.5.7 TOP COVER INTERLOCK SWITCHES

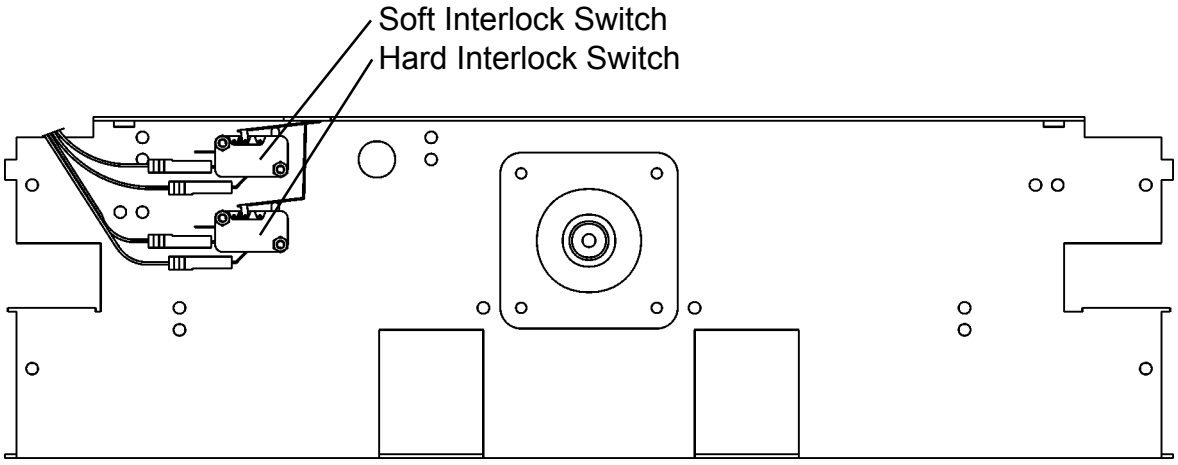
REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Switch off the Main Power.
2. Remove the Control Panel Cover according to **2.3.4.**
3. Disconnect the switches.
4. Remove the Switches.



REPLACEMENT

1. Installation is an exact reversed procedure of removal.
2. When opening the Top Cover, make sure the soft interlock switch breaks before the hard interlock switch.

2.5.8 OUT FEED COVER INTERLOCK SWITCHES

REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Remove the Rear Cover according to **2.3.1.**
2. Remove the Upper Outfeed Cover according to **2.3.4.**
3. Disconnect the connectors from the switches. **FIGURE 1**
4. Remove the nuts on the outside of the switches.
5. Remove the Switches.

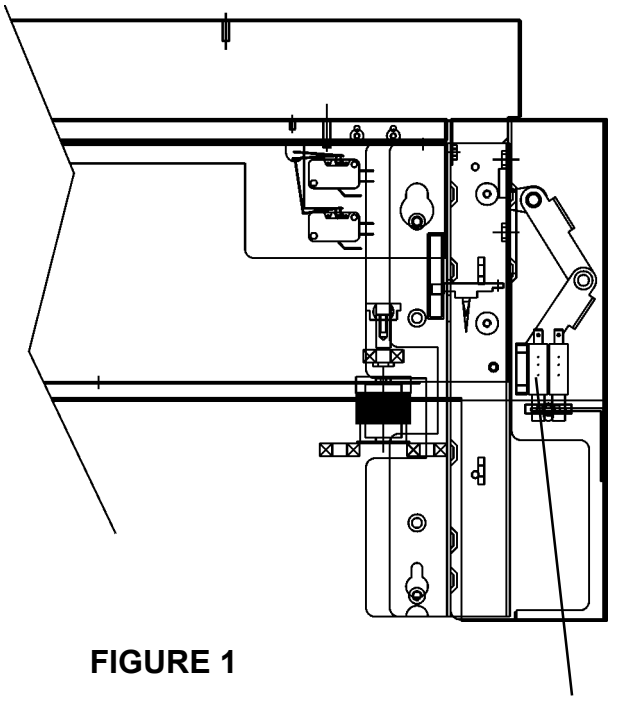


FIGURE 1

REPLACEMENT

1. Installation is an exact reversed procedure of removal.
2. Make sure both interlock switches are actuated when the Upper Outfeed Cover is installed.

2.6.1 UPPER TRANSPORT BELT

REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Remove front and rear covers according to **2.3.1.**
2. Remove top cover according to **2.3.2.**
3. Remove upper plastic gear. **PICTURE 1**
4. Remove the front E-Clip. **PICTURE 1**
5. Remove the rear E-Clip. **PICTURE 2**
6. Remove the front and the rear Bearings.
7. Move the shaft towards the transformer, lift up the IB end of the shaft and remove the shaft.

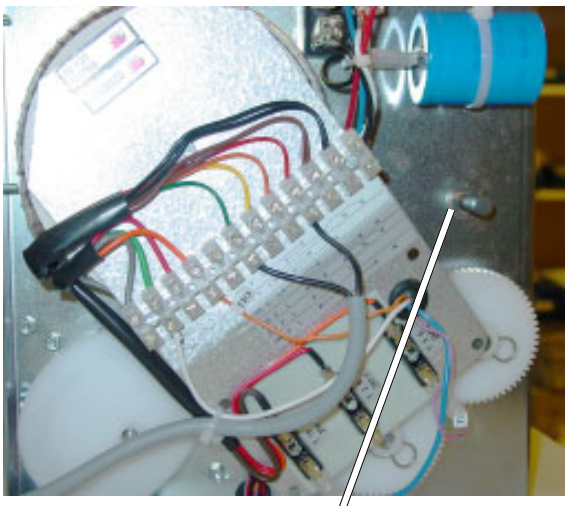


FIGURE 1

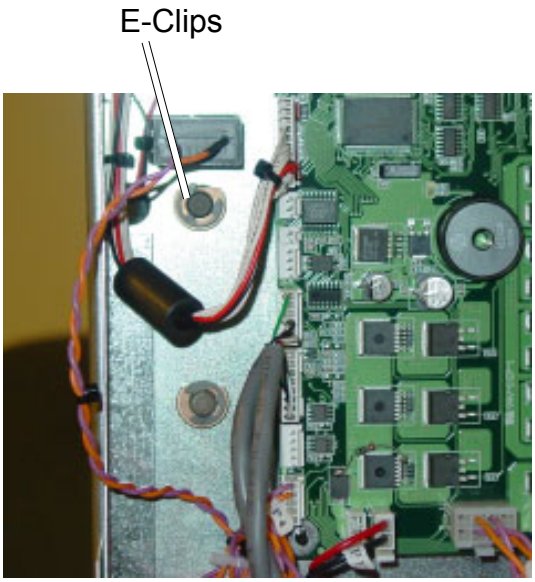


FIGURE 2

REPLACEMENT

1. Installation is an exact reversed procedure of removal.

2.6.2 LOWER TRANSPORT BELT

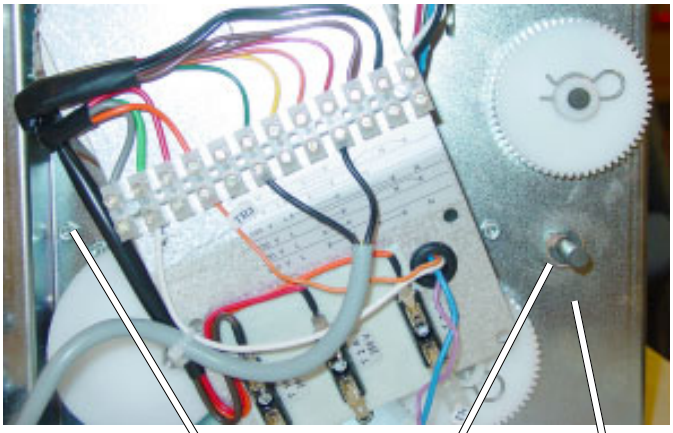
REMOVAL

CAUTION

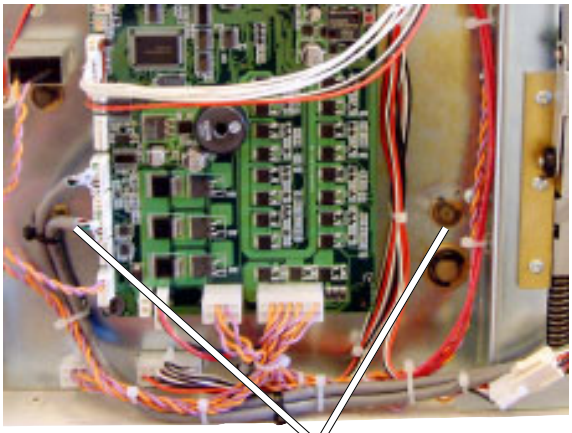
ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

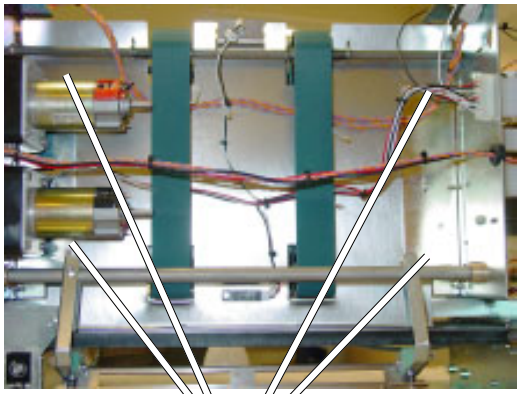
1. Remove the bottom cover according to **2.3.3.**
2. Remove middle gear. **PICTURE 1.**
3. Remove the rear E-Clips from both shafts. **PICTURE 2**
4. Remove the Screw holding one shaft and E-Clip holding the other shaft on the front side. **PICTURE 1**
5. Remove the nuts holding the sliding plate. **PICTURE 3**
6. Remove allen screws (x4) in lower bar holding the paper guide.
7. Disconnect infeed sensor.
8. Gently lift the Sliding plate and move the shafts to rear side.
9. Gently slide off the belts to front-side.



PICTURE 1



PICTURE 2



PICTURE 3

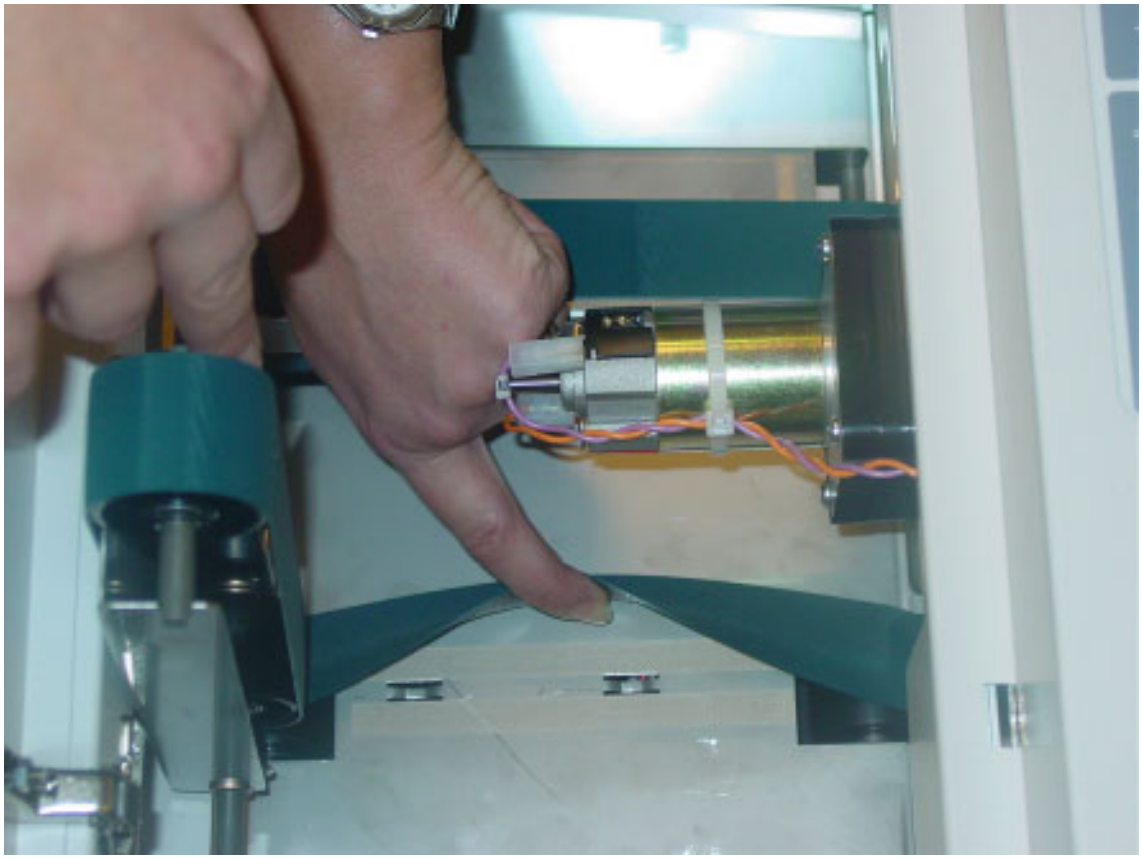
REPLACEMENT

Installation is an exact reversed procedure of removal.

2.6.3 TEFLON TAPE LOWER TRANSPORT BELT

REMOVAL

1. Lift the belt and remove the tephlon tape.



REPLACEMENT

1. Mount the new tephlon tape straps between the cut-outs for the rollers and on each side of the cut-outs for the cable ties.

2.7.1 SET CLAMPS

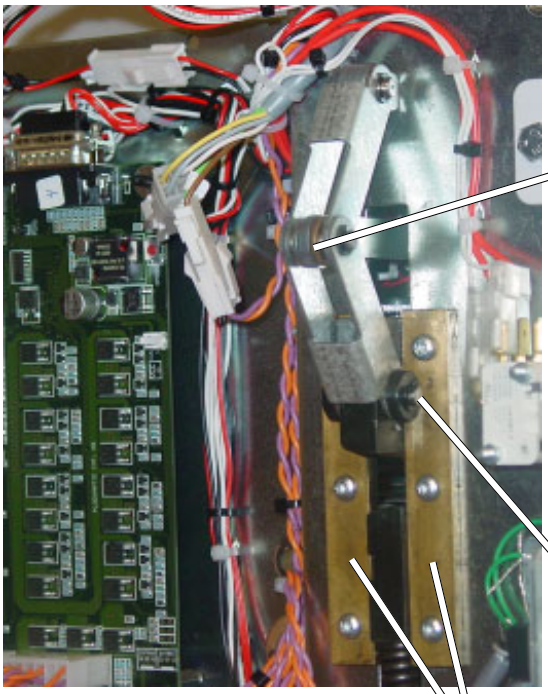
REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Set up the machine for By Pass mode.
2. Switch of the main power
3. Remove front and rear covers according to **2.3.1.**
4. Remove control panel cover according to **2.3.4.**
5. Remove upper and lower Paper Guides, **FIGURE 2**
6. Remove lower cover according to **2.3.3.**
6. Remove the shafts holding the pressure clamps on front and rear side. Loosen the E-clip on the flat side of the shaft. **PICTURE 1**
7. Remove the brass guides on the PCB side of the machine. **PICTURE 1**
8. Remove upper clamp.



PICTURE 1

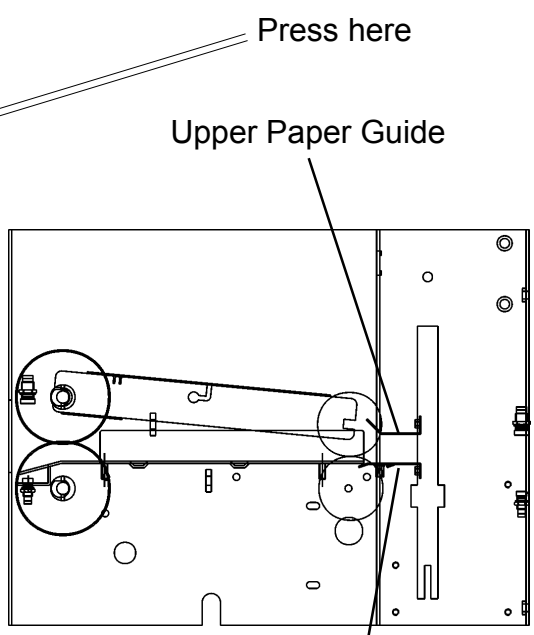
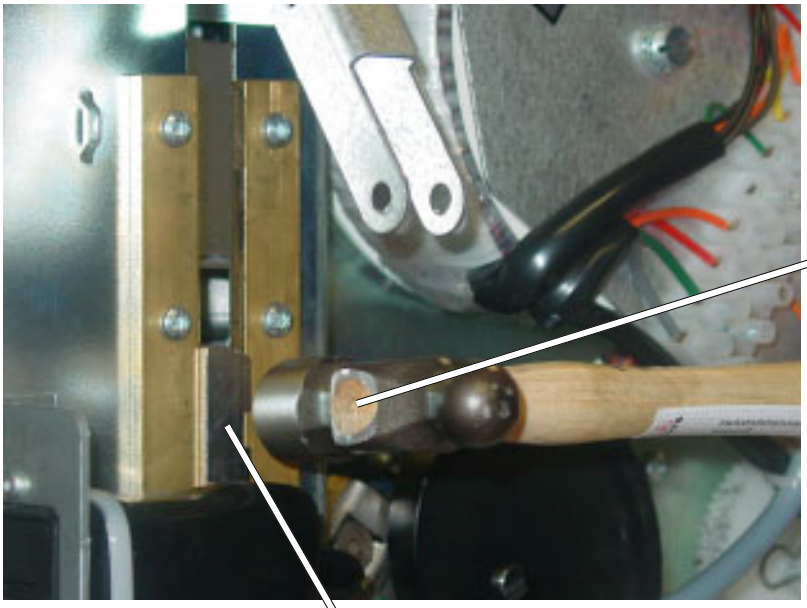
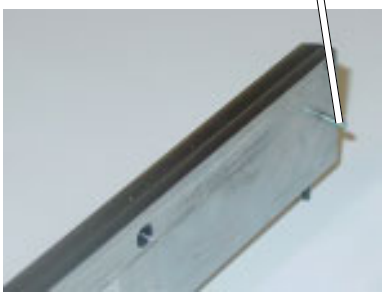


FIGURE 2

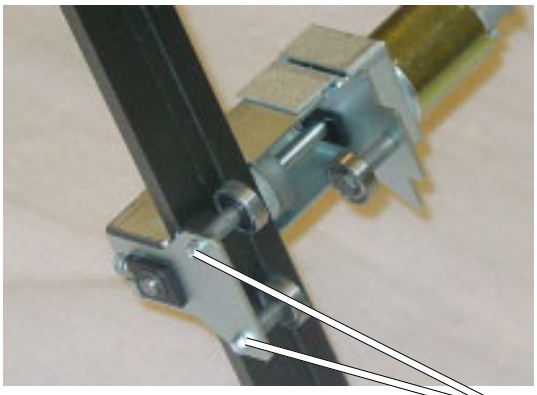
9. Gently loosen the lower clamp by tapping gently using a plastic hammer on lower clamp until the spring pressure is relieved. **PICTURE 3.**
10. Remove pins from clamp. **PICTURE 4.**
11. Remove the lowest 2 screws in roll pulley. **PICTURE 5.**
12. Hold the roll motor and remove the lower set clamp.



PICTURE 3



PICTURE 4



PICTURE 5

REPLACEMENT

1. Apply grease on bronze guides.
2. Installation is an exact reversed procedure of removal. When upper clamp is mounted, both clamps should be pressed together, see picture 1. Press with both hands on each side of the linkage. Use a plastic hammer and gently tap the lower clamp in its position, make sure the pins are centered.

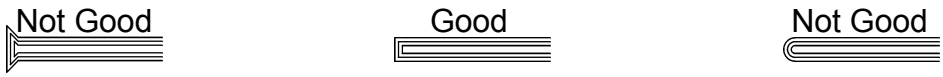
2.7.2 STOP GATE

Stop Gate Adjustment A

This procedure adjusts the appearence of the square folded spine of the booklet.

Depending on the amount of booklet spine that sticks out between the clamps, result will differ in the square appearance. The more of the booklet spine that sticks out, the larger the deformation zone forming the back.

1. Set the Mode to 1
2. Run a 6 sheet booklet of 80 gsm (20lb bond).
3. Check the appearence of the booklets according to the pictures below.
4. Adjust the stop gate by the two adjustment nuts to obtain correct result.
   NOTE: The nuts can be reached from the outfeed without removing any covers.



Tighten the Adjustment Nut

Loosen the Adjustment Nut

Stop Gate Adjustment B

This procedure must be performed if the mechanics regarding the stopgate has been altered, such as if stop gate motor or stop gate has been replaced.

1. Remove Front cover according to **2.3.1.**
2. Remove Control Panel Cover according to **2.3.4.**
3. Turn the Stop Gate Cam by the Stop Gate Motor so the Stop Gate is in the upper position.
4. Measure between the Lower Clamp and the stop gate on one side only (which side does not matter). The distance should be 7.5 ± 0.2 mm. **FIGURE 1**
5. Move the Stop Gate Motor M2 by turning the mounting screw to obtain measurement.
6. Perform the Stop Gate Adjustment A.

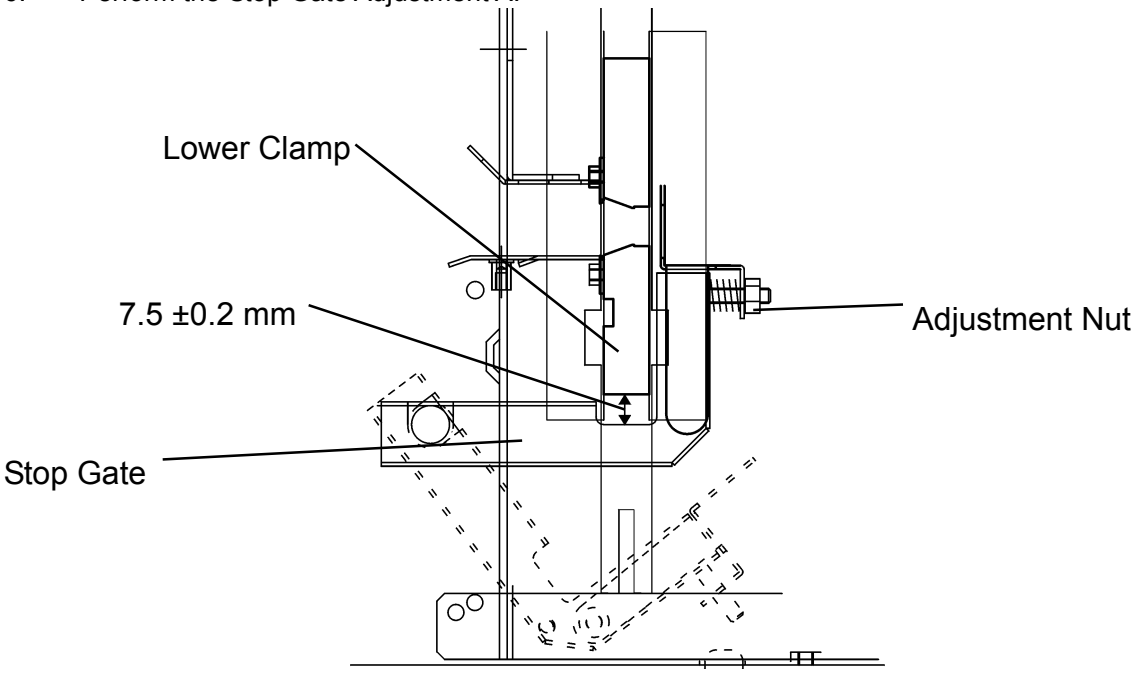


FIGURE 1

2.8.1 PCB MD6DC

REMOVAL

CAUTION

ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/ or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to 2.1.

NOTE: *Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.*

1. Switch off the Main Power.
2. Remove the Rear Cover according to **2.3.1.**
3. Remove all the connectors from the PCB.
4. Remove the PCB by squeezing the barbs on the standoffs securing the PCB.

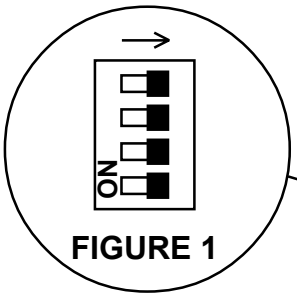
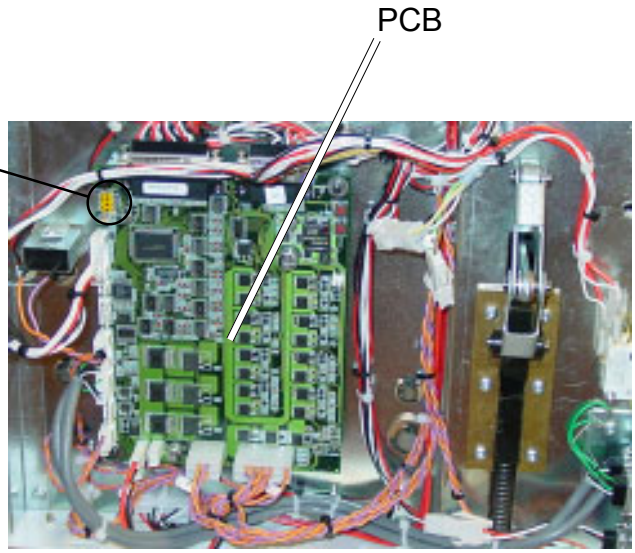


FIGURE 1



REPLACEMENT

1. Installation is an exact reversed procedure of removal.
2. Make sure the DIP switches are in off position **FIGURE 1**

3.1.1 Q1 (M2 STOP GATE SENSOR)

Initial Actions:

- Make sure that the sensor is clean.
- Check for bindings in the stop gate by running Motor M2, according to 3.5.
  If the Motor does not move, go to 3.1.10. M2 Open circuit.
- Make sure that the lock screw holding the cam, driving the Stop Gate, is properly tightened.
- Make sure that the connectors are properly installed.
- Check Fuse F1.

See wiring diagram, on the sensor connector (Sensor plugged in) measure between the Signal cable (Wht) and the Ground cable (Blk). When the sensor is blocked, the voltage should read appr. 4,8 VDC and when the sensor is clear the voltate should read appr. 0,6 VDC.

Y N

Check the wires for an open circuit: Vc+ (Red) to P 13.1 on PCB, Signal (Wht) to P13.2 on PCB and Ground (Blk) to P13.3 on PCB. Is there an open circuit?

Y N

Remove connector from sensor. At the connector measure voltage between Signal (Wht) and Ground (Blk). Voltage should read appr. 4,8 VDC.

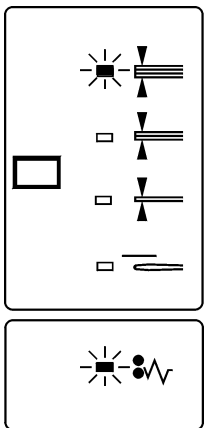
Y N

Replace the PCB.

Replace the sensor.

Locate problem on cable and repair as needed.

Go to 3.1.10. M2 Open Circuit.



3.1.2 Q2 (M4 FRONT SENSOR)

Initial Actions:

- Make sure that the Sensor is clean.
- Make sure that Motor M4 moves easily by running Motor M4, according to 3.5.
  If the Motor does not move, go to 3.1.12. M4 open circuit.
- Make sure that the E-Clips are properly installed. 2.4.4, Figure 1.
- Make sure that the Connectors are properly installed.
- Check Fuse F1.

See wiring diagram, on the sensor connector (Sensor plugged in) measure between the Signal cable (Wht) and the Ground cable (Blk). When the sensor is blocked the voltage should read appr. 4,8 VDC and when the sensor is clear the voltage should read appr. 0,6 VDC.

Y N

Check the wires for an open circuit: Vc+ (Red) to P13.4 on PCB, Signal (Wht) to P13.5 on PCB and Ground (Blk) to P13.6 on PCB. Is there an open circuit?

Y N

Remove Plug from sensor. At the connector measure Voltage between Signal (Wht) and Ground Blk). Voltage should read appr. 4,8 VDC.

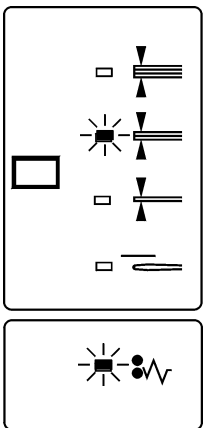
Y N

Replace the PCB.

Replace the sensor.

Locate problem on cable and repair as needed.

Go to 3.1.12. M4 open circuit.



3.1.3 Q3 (MOTOR M4 REAR SENSOR)

Initial Actions:

- Make sure that the sensor is clean.
- Check for bindings in the stop gate by running Motor M4, according to 3.5. If the Motor does not move, go to 3.1.12. M4 open circuit.
- Make sure that the cam, driving the Stop Gate, is properly installed.
- Make sure that the connectors are properly installed.
- Check Fuse F1.

See wiring diagram, on the sensor connector (Sensor plugged in) measure between the Signal cable (Wht) and the Ground cable (Blk). When the sensor is blocked the voltage should read appr. 4,8 VDC and when the sensor is clear the voltage should read appr. 0,6 VDC.

Y N

Check the wires for an open circuit: Vc+ (Red) to P13.7 on PCB, Signal (Wht) to P13.8 on PCB and Ground (Blk) to P13.9 on PCB. Is there an open circuit?

Y N

Remove connector from sensor. At the connector measure Voltage between Signal (Wht) and Ground (Blk). Voltage should read appr. 4,8 VDC.

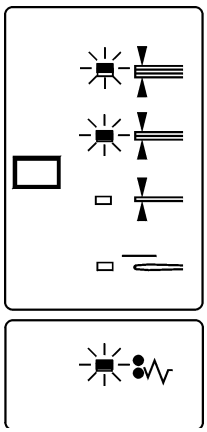
Y N

Replace the PCB.

Replace the sensor.

Locate problem on cable and repair as needed.

Go to 3.1.12. M4 open circuit.



3.1.4 Q4 (MOTOR M3 HOME POSITION SENSOR)

Initial Actions:

- Make sure that the sensor is clean
- Check for bindings in the clamp movement by running Motor M3, according to 3.5. If the Motor does not move, go to 3.1.11. M3 open circuit.
- Make sure that the Driving Disk on Motor M3 is not slipping on the outgoing shaft.
- Make sure that the connectors are properly installed.
- Check Fuse F1.

See wiring diagram, on the sensor connector (Sensor plugged in) measure between the Signal cable (Wht) and the Ground cable (Blk). When the sensor is blocked the voltage should read appr. 4,8 VDC and when the sensor is clear the voltage should read appr. 0,6 VDC.

Y

N

Check the wires for an open circuit: Vc+ (Red) to P13.10 on PCB, Signal (Wht) to P13.11 on PCB and Ground (Blk) to P13.12 on PCB. Is there an open circuit?

Y

N

Remove connector from sensor. At the connector measure Voltage between Signal (Wht) and Ground (Blk). Voltage should read appr. 4,8 VDC.

Y

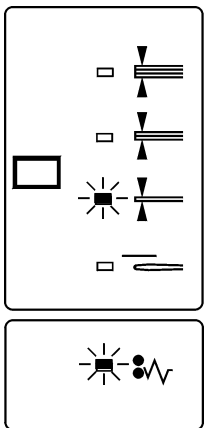
N

Replace the PCB.

Replace the sensor.

Locate problem on cable and repair as needed.

Go to 3.1.11. M3 open circuit.



3.1.5 Q5 (Infeed Sensor)

Initial Actions:
- Make sure that the sensor Is clean.
- Make sure that both the connectors are properly installed.
- Make sure that the Feeding belts, are moving smoothly by running Motor M1 according to 3.5. If the belts are not moving, go to 3.1.9. M1 open circuit.
- Check Fuse F1.

Is the LED emitting light?

Y
|
N
|
See wiring diagram, check the wires to the LED for an open circuit: V+ (Red) to P13.23 on PCB and Ground (Blk) to P13.16 on PCB. Is there an open circuit?

Y
|
N
|
Remove connector from LED, measure on connector. Voltage should read appr. 4.8 VDC. Locate problem on cable and repair as needed.

Y
|
N
|
Replace LED.

Replace PCB.

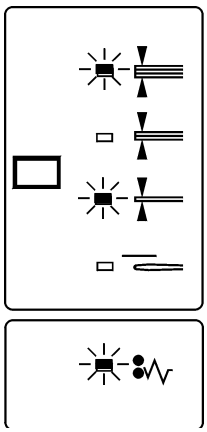
Put a paper between the LED and the photo transistor. Measure on the photo transistor.
Voltage should read appr. 4,8 VDC.

Y
|
N
|
See wiring diagram, check the photo transistor wires for an open circuit. Signal (Wht) to 13.24 on PCB and Ground (Blk) to P13.25 on PCB. Is there an open circuit?

Y
|
N
|
1 Replace photo transistor.
2 Replace PCB.

Locate problem on cable and repair as needed.

Replace PCB.



3.1.6 Q6 (CLAMP SENSOR)

Initial Actions:

- Make sure that the sensor is clean.
- Make sure that the connectors are properly installed.
- Make sure that the Feeding belts, are moving smoothly by running Motor M1 according to 3.5. If the belts are not moving, go to 3.1.9. M1 open circuit.
- Check Fuse F1.

See wiring diagram, on the sensor connector (Sensor plugged in) measure between the Signal cable (Wht) and the Ground cable (Blk). When the sensor is blocked the voltage should read appr. 4,8 VDC and when the sensor is clear the voltage should read appr. 0,6 VDC.

Y

N

Check the wires for an open circuit: Vc+ (Red) to P13.20 on PCB, Signal (Wht) to P13.21 on PCB and Ground (Blk) to P13.22 on PCB. Is there an open circuit?

Y

N

Remove connector from sensor. At the connector measure Voltage between Signal (Wht) and Ground (Blk). Voltage should read appr. 4,8 VDC.

Y

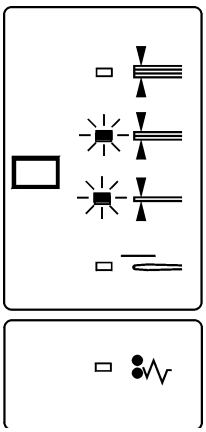
N

Replace the PCB.

Replace the sensor.

Locate problem on cable and repair as needed.

Go to Motor 3.1.9. M1 open circuit.



3.1.7 Q7 (OUTFEED SENSOR)

Initial Actions:

- Make sure that the sensor is clean.
- Make sure that both the connectors are properly installed.
- Make sure that the Feeding belts are moving smoothly by running Motor M1 according to 3.5. If the belts are not moving, go to 3.1.9. M1 open circuit.
- Check Fuse F1.

Is the LED emitting light?

Y N

N:
See wiring diagram, check the wires to the LED for an open circuit: V+ (Red) to P13.17 on PCB and Ground (Blk) to P14.10 on PCB. Is there an open circuit?

Y N

Y:
Locate problem on cable and repair as needed.

Remove connector from LED, measure on contact. Voltage should read appr. 4,8 VDC.

Y N

N:
Replace LED.

Y:
Replace PCB.

Put a paper between the LED and the photo transistor. Measure on the photo transistor.
Voltage should read appr. 4,8 VDC

Y N

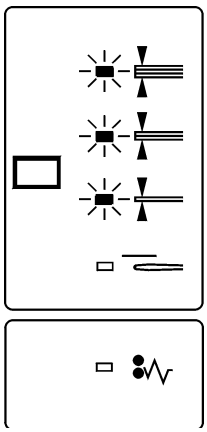
N:
See wiring diagram, check the photo transistor wires for an open circuit. Signal (Wht) to 14.18 on PCB and Ground (Blk) to P14.19 on PCB. Is there an open circuit?

Y N

Y:
1 Replace photo transistor.
2 Replace PCB.

N:
Locate problem on cable and repair as needed.

Replace PCB.



3.1.8 Q8 (MOTOR M4 ENCODER SENSOR)

Initial Actions:

- Make sure that the sensor is clean
- Make sure that the connector is properly installed.
- Check Fuse F1.
- Make sure that the Encoder Disc is properly tightened.

See wiring diagram, on the sensor connector (Sensor plugged in) measure between the Signal cable (Wht) and the Ground cable (Blk). When the sensor is blocked the voltage should read appr. 4,8 VDC and when the sensor is clear the voltage should read appr. 0,6 VDC.

Y N

Check the wires for an open circuit: Vc+ (Red) to P14.15 on PCB, Signal (Wht) to P14.14 on PCB and Ground (Blk) to P14.13 on PCB. Is there an open circuit?

Y N

Remove connector from sensor. At the connector measure Voltage between Signal (Wht) and Ground (Blk). Voltage should read appr. 4,8 VDC.

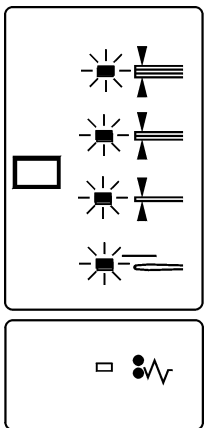
Y N

Replace the PCB.

Replace the sensor.

Locate problem on cable and repair as needed.

Go to Motor 3.1.12. M4 open circuit.



3.1.9 M1 Open Circuit (TRANSPORT BELT MOTOR)

Initial Actions:
- Make sure that the connectors are properly installed.
- Check Fuse F1.

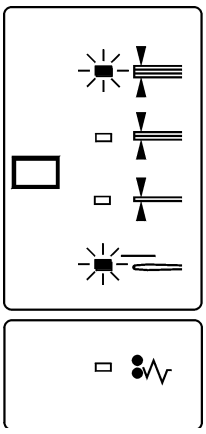
See wiring diagram, check the wires for an open circuit. V+ on Motor to P3.5 on PCB and V- on Motor to P3.7 on PCB. Are the wires OK?

Y
N
Locate problem on cable and repair as needed.

Check continuity between V+ and V- on Motor, Motor has an open circuit.

Y
N
Replace PCB.

Replace Motor.



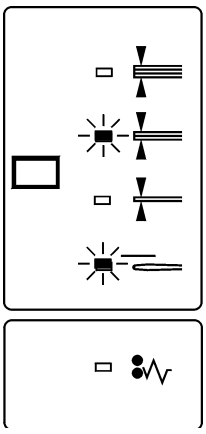
3.1.10 M2 Open Circuit (STOP GATE MOTOR)

Initial Actions:
- Make sure that the connectors are properly installed.
- Check Fuse F1.

See wiring diagram, check the wires for an open circuit. V+ on Motor to P2.2 on PCB and V- on Motor to P2.9 on PCB. Are the wires OK?

Y N
| |
| Locate problem on cable and repair as needed.
|
Check continuity between V+ and V- on Motor, Motor has an open circuit.

Y N
| |
| 1 Go to 3.1.1. sensor Q1.
| 2 Replace PCB.
|
Replace Motor.



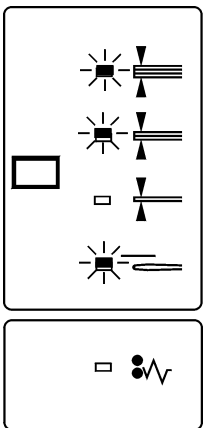
3.1.11 M3 Open Circuit (CLAMP MOTOR)

Initial Actions:
- Make sure that the connectors are properly installed.
- Check Fuse F1.

See wiring diagram, check the wires for an open circuit. V+ on Motor to P3.2 on PCB and V- on Motor to P3.3 on PCB. Are the wires OK?

Y N
| |
| Locate problem on cable and repair as needed.
|
Check continuity between V+ and V- on Motor, Motor has an open circuit.

Y N
| |
| 1 Go to 3.1.4. sensor Q4.
| 2 Replace PCB
|
Replace Motor.



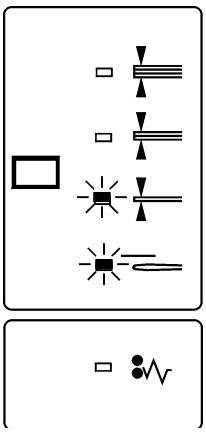
3.1.12 M4 Open Circuit (ROLL MOTOR)

Initial Actions:
- Make sure that the connectors are properly installed.
- Check Fuse F1.

See wiring diagram, check the wires for an open circuit. V+ on Motor to P2.3 on PCB and V- on Motor to P2.10 on PCB. Are the wires OK?

Y N
| |
| Locate problem on cable and repair as needed.
|
Check continuity between V+ and V- on Motor, Motor has an open circuit.

Y N
| |
| 1 Go to 3.1.2 / 3.1.3. sensor Q2 / Q3.
| 2 Replace PCB.
|
Replace Motor.



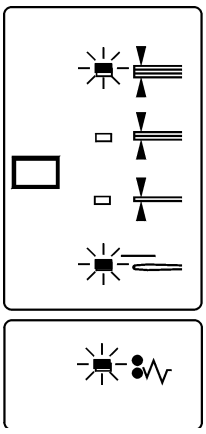
3.1.13 M1 Short Circuit (TRANSPORT BELT MOTOR)

Initial Actions:
- Check Fuse F1.

Use hand crank generator to turn Motor.
Motor turns?

Y
N
Replace Motor.

Replace PCB.



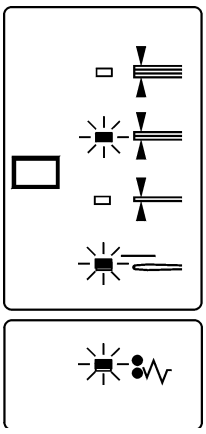
3.1.14 M2 Short Circuit (STOP GATE MOTOR)

Initial Actions:
- Check Fuse F1.

Use hand crank generator to turn Motor.
Motor turns?

Y
N
Replace Motor.

1 Go to 3.1.1. sensor Q1.
2 Replace PCB.



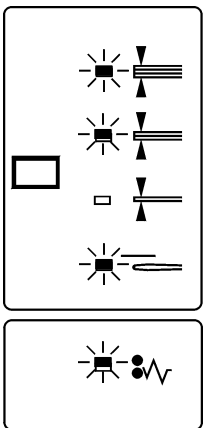
3.1.15 M3 Short Circuit (CLAMP MOTOR)

Initial Actions:
- Check Fuse F1.

Use hand crank generator to turn Motor.
Motor turn?

Y
1 Go to 3.1.4. sensor Q4.
2 Replace PCB.

N
Replace Motor.



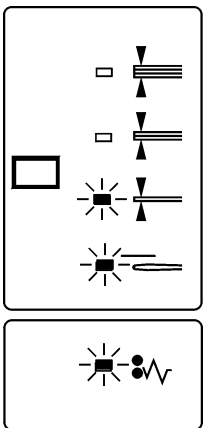
3.1.16 M4 Short Circuit (ROLL MOTOR)

Initial Actions:
- Check Fuse F1.

Use hand crank generator to turn Motor.
Motor turn?

Y N
| |
| Replace Motor.
|

1 Go to 3.1.8. sensor Q8
2 Replace PCB.



3.1.17 Unregulated 36V

Initial Actions:

Close the top cover.
Check Fuse F1.
Check Fuse F2.

Measure between Fuse F2 (Blue) and White on Terminal block. 26 VDC is measured?

Y

N
|
Check for Open or Short circuit between Transformer and Fuse F1, and between White on connection block and Transformer, repair as needed. Replace Transformer.

Measure Between Fuse F3 (Violet) and Orange on the Terminal block. 10 VDC is measured?

Y

N
|
Check for open or short circuit between Fuse F3 and Transformer, and between Violet on connection block and transformer, repair as needed. Replace Transformer.

Measure on RED and BLACK on Rectifier (out going). 36 VDC is measured?

Y

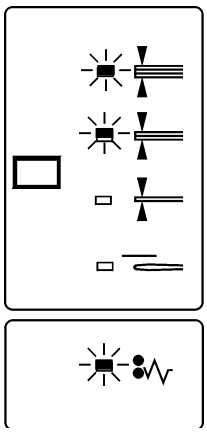
N
|
Replace Rectifier.

Check for open or short circuit between Red (+) on rectifier and P11 (Red) on PCB, and between Black (-) on rectifier and P 11 (Black) on PCB. An open or short circuit was found?

Y

N
|
Replace the PCB.

Locate problem on the cable and repaire as needed.



3.1.18 AC Power

The purpose of this procedure is to isolate the causes of AC power problems that result in a complete loss of AC power. This condition is indicated when there are no Control Panel indicators illuminated when the Main Power switch is applied.

Initial Actions

- If no LED´s on the control panel are working but the LED´s in the machine are emitting light, go to RAP 3.1.19 Display or Mode button not working.
- Check the Customers AC supply for the correct voltage at the point where the Square IT is connected.
- Ensure that the Power Cord is fully engaged when it is plugged into the Customers power supply and into the Line Filter.
- Ensure that the machine is set up for the correct voltage. See Installation sheet for transformer. wiring.
- Check that the main fuse, Fuse F1 and Fuse F2 are OK.

WARNING
Use caution when making the voltage measurements and always disconnect the Power Cord when it is necessary to work inside the Power Module. AC Power is present in the Line Module whenever the Power Cord is plugged into the Wall Outlet.
Use Wiring Diagram

Remove front cover according to 2.3.1. 230/115 VAC is measured between Black1 and Black2 on the Terminal block?
Y N
Check for open or short circuit between the Line Filter and the Terminal block.
Repair as needed.
Measure between Fuse F1 (Blue) and White on Terminal block. 26 VDC is masured?
Y N
Check for Open or Short circuit between Transformer and Fuse F1, and between White on Terminal block and Transformer, repair as needed. Replace Transformer.
Measure Between Fuse F2 (Violet) and Orange on the Terminal block. 10 VDC is measured?
Y N
Check for open or short circuit between Fuse F2 and Transformer, and between Violet on Terminal block and transformer, repair as needed. Replace Transformer.
Measure on RED and BLACK on Rectifier (out going). 36 VDC is measured?
Y N
Replace Rectifier.
Check for open or short circuit between Red (+) on rectifier and P11 (Red) on PCB, and between Black (-) on rectifier and P 11 (Black) on PCB. An open or short circuit was found?
Y N
Replace the PCB.
Locate problem on the cable and repair as needed.

3.1.19 Display or Mode Button not working

Initial Actions

- Check the Customers AC supply for the correct voltage at the point where the Square IT is connected.
- Ensure that the Power Cord is fully engaged when it is plugged into the Customers power supply and into the Line Filter.
- Ensure that the machine is set up for the correct voltage. See Installation sheet for transformer.
- Check Fuse F1.

Is any of the diodes on the display emitting light?

Y

Replace Display PCB.

N

Remove rear cover according to 2.3.1. Is the 24V indicator on the PCB emitting light?

Y

Is Connector P1 properly installed?

Y

Check Wires for Open or Short circuit.
Replace Display PCB.

N

Install connectors properly.

N

Is Connector P8 properly installed?

Y

Check Wires for Open or Short circuit.
Replace PCB.

N

Install Connectors properly

3.1.20 Q9 (STACKER SENSOR)

Initial Actions:

- Make sure that stacker tray is pushed in so the sensor is blocked.
- Make sure that the sensor is clean.
- Make sure that the sensor harness plug is connected in the receptacle.
- Make sure that all the connectors from PCB to sensor is properly installed.

See wiring diagram, on the sensor connector (Sensor plugged in) measure between the Signal cable (Wht) and the Ground cable (Blk). When the sensor is blocked the voltage should read appr. 0 VDC and when the sensor is clear the voltage should read appr. 5 VDC.

Y — N

Check the wires for an open circuit: Vc+ (Red) to P14.8 on PCB, Signal (Wht) to P14.7 on PCB and Ground (Blk) to P14.6 on PCB. Is there an open circuit?

Y — N

Remove connector from sensor. At the connector measure Voltage between Signal (Wht) and Ground (Blk). Voltage should read appr. 5 VDC.

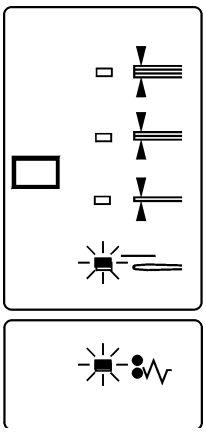
Y — N

Replace the PCB.

Replace the sensor.

Locate problem on cable and repair as needed.

Replace the PCB.



3.2 BLOWN FUSE CONDITION

CAUTION
Only use slow blow fuses.

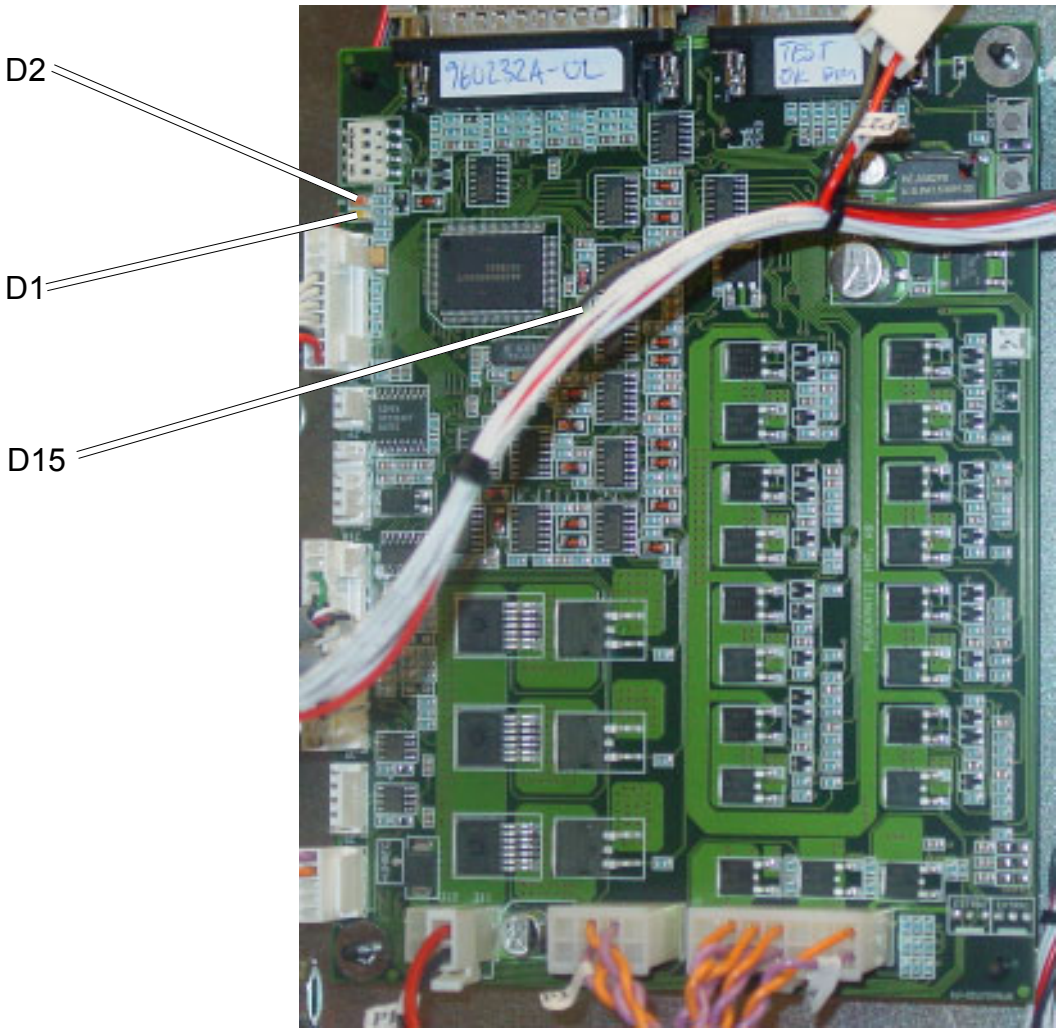
Fuse	Raiting		Symptom at power on
	115V	**210-230V**	
F1	6.3A	3.15A	No response
F2	10A	10A	All green panel LEDs are illuminated and the red panel LED is flashing
F3	2A	2A	No response

3.3 LEDS

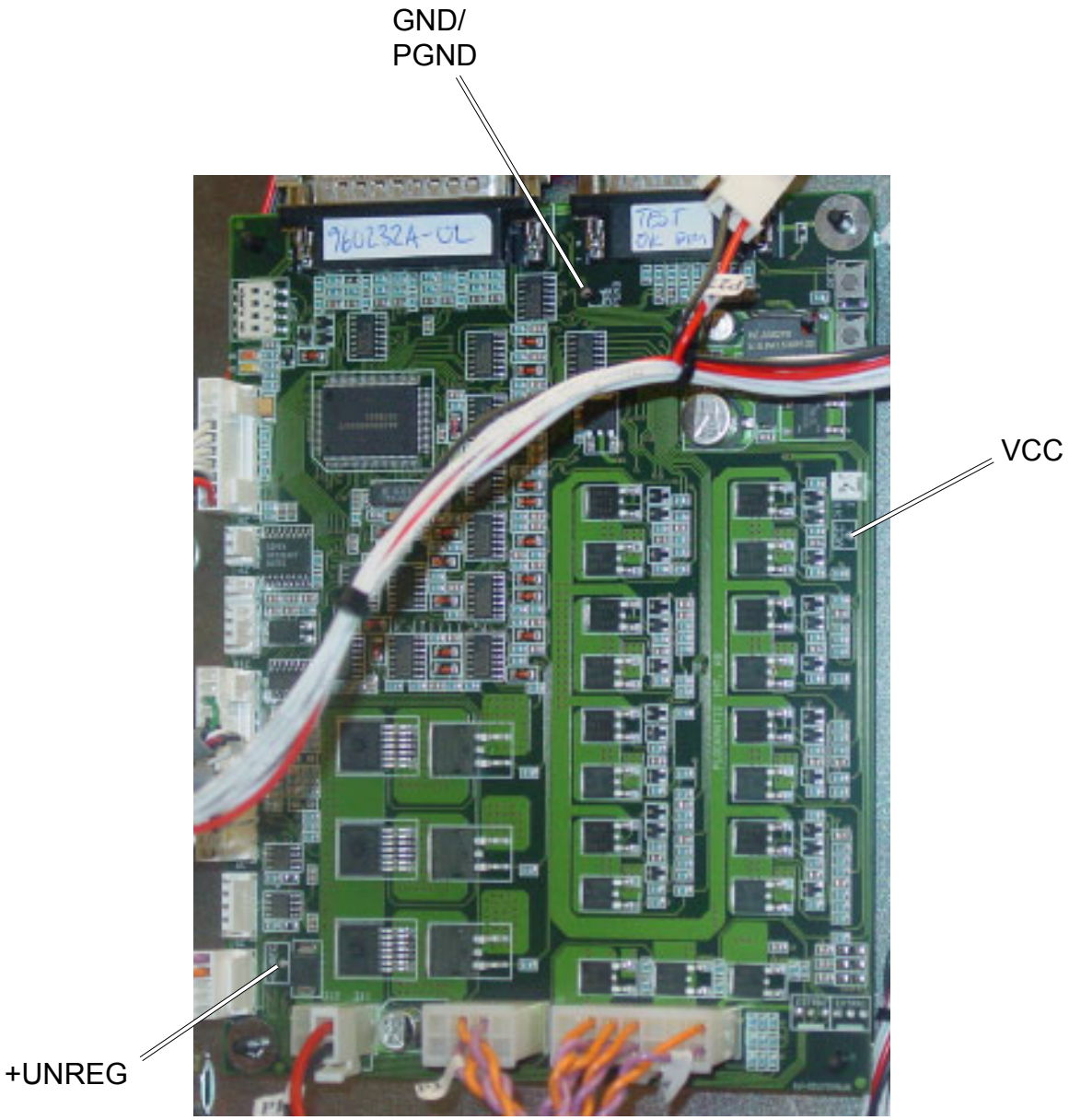
D1: Yellow LED flashes when power is on. The flashing indicates that a program is present and functioning. Should a download fail or the 5V be missing, LED would be extinguished.

D2: Red LED flashes whenever information is sent or received on the Internal CAN. If power is switched on but no operations are performed, LED is extinguished.
During program downloading the LED is flashing

D15: Green LED permanently extinguished. It has no direct function in this configuration.



3.4 TEST POINTS



+**UNREG**: Outgoing unregulated 36V, after interlock. Measure between Test Point +UNREG and Test Point GND/PGND using a voltmeter. The voltage will be shown on the voltmeter unless:
Voltage is outside allowed range range 29-43V. Voltage will be 0V.
Machine is interlocked (i.e the top cover is open). Voltage will be 0V.

VCC: Stabilised and rectified 5V made from incoming 10V AC from transformer. Measure between Test Point VCC and Test Point GND/PGND using a voltmeter. The voltage will be shown on the voltmeter. Range 4.9-5.1V.

GND / PGND: Ground /Power Ground is the minus when measuring either unregulated 36V (+UNREG) or 5V (VCC).

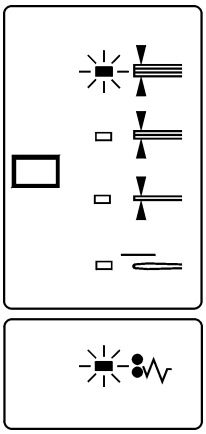
3.5.1 COMPONENT CONTROL

To control the function of each component individually in the machine.

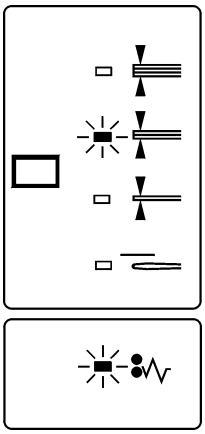
1. Switch off the Power.
2. Press and hold the button on the display and switch on the power.
   Keep the button pressed for an additional 3 seconds.
   You are now in the component control menu.
   - Pattern for start/stop M1 is shown.
3. Press the button repeatedly until you reach the desired function.
   See the pictures for LED patterns.
4. Press and hold the button for 1 second to select the desired function.
   - The corresponding green LEDs are flashing
5 Press the button to activate / deactivate the desired function.
6. To return to the component control menu,
   press and hold the button pressed for 1 second.
7. To exit component control, switch off the power.

NOTE

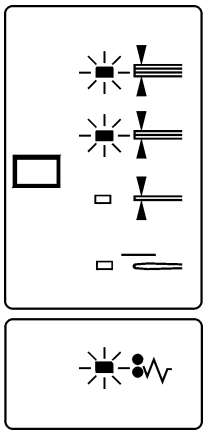
Function of red LED:
- *Illuminated when +UNREG (36V) is present.*
- *Flashes whenever a sensor is activated/deactivated*



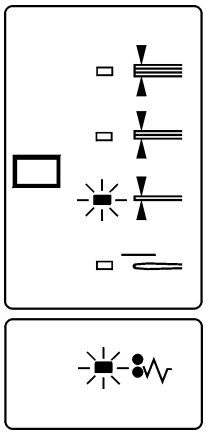
Start/Stop
Motor M1



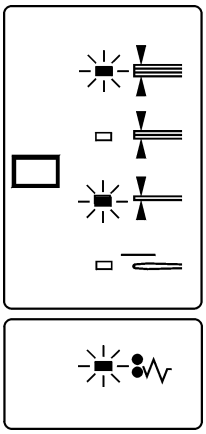
Start/Stop
Motor M2



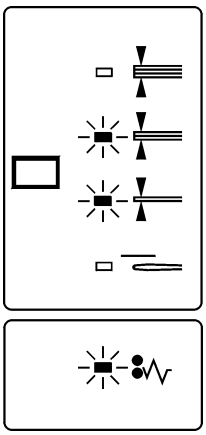
Start/Stop
Motor M3



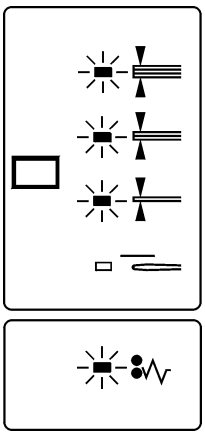
Start/Stop
Motor M4
- Make sure stop gate is down!



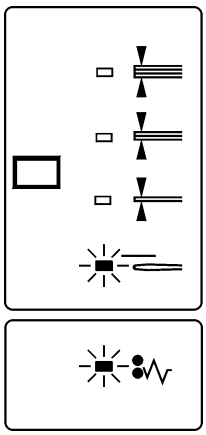
N/A



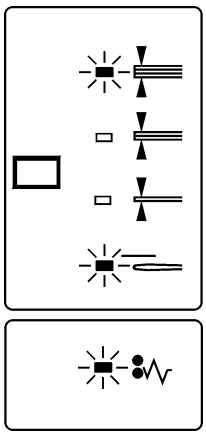
N/A



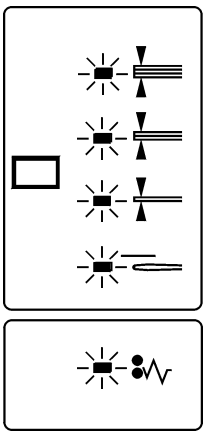
Step the Counter



Software Version



Diagnostics
- Can also be reached according to **3.7.**



Dead Cycle

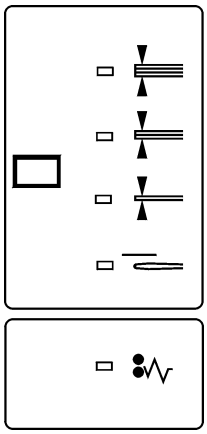
3.7 DIAGNOSTICS

1. Switch on the Power.
2. Close all covers (if top cover is open code for Unregulated 36V will appear).
3. Push in the stacker tray fully (otherwise code for Stacker Sensor will appear).
4. Press and hold the mode button for 7 seconds.
   After 1 second the LED`s start flashing. After 7 seconds, when all the LED's are lit, the self diagnostic starts, then release the button.
5. During the self diagnostics the LED D1 to D5 are flashing and running.

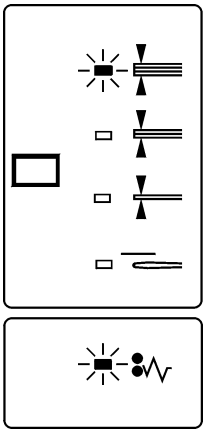
- Only one fault can be shown at a time.
- Two LED´s or more must be flashing to indicate a fault code.
- Push the mode button to return to run mode.

6. Trouble shoot the fault according to 3.1. Fault code description.

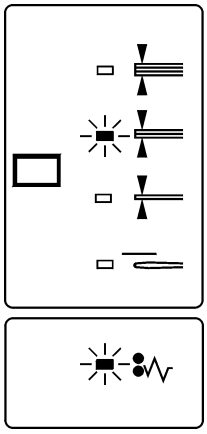
NOTE 1: If only one LED is flashing the self diagnostic is not started.
NOTE 2: The indicated fault must be repaired before the diagnostics can be run again to display another fault code.



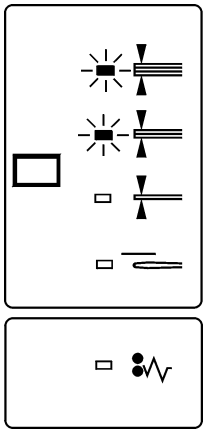
OK



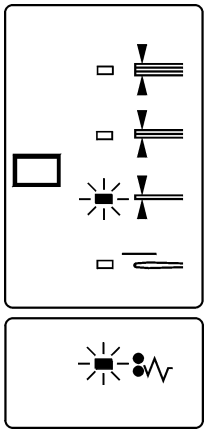
Q1 (M2 Home Position Sensor)



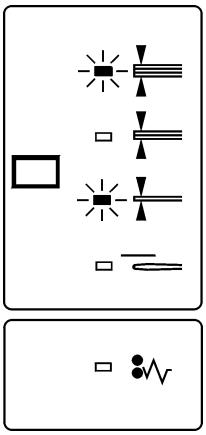
Q2 (M4 front sensor)



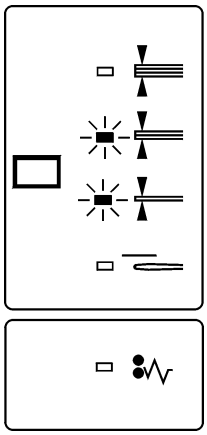
Q3 (M4 rear sensor)



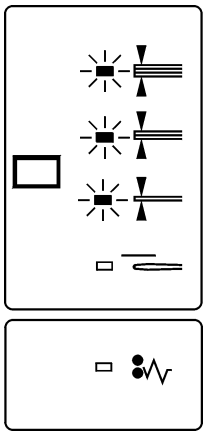
Q4 (M3 Home Position Sensor)



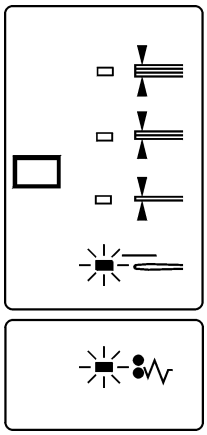
Q5 (Infeed sensor)



Q6 (Clamp Sensor

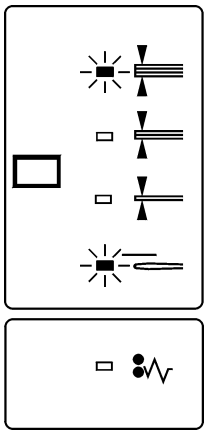


Q7 (Outfeed sensor)

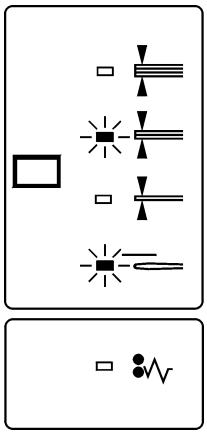


Q9 (Stacker sensor)

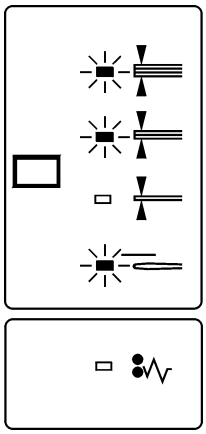
3.7 DIAGNOSTICS CONTINUES



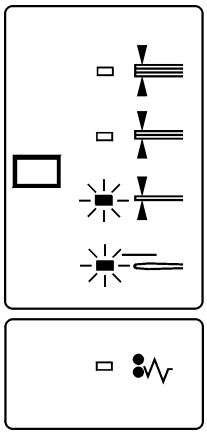
M1 Open Circuit



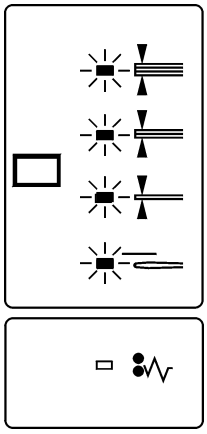
M2 Open circuit



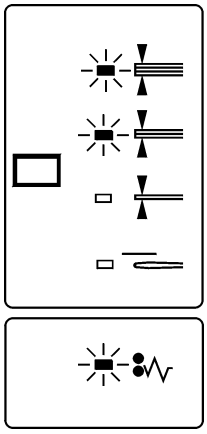
M3 Open Circuit



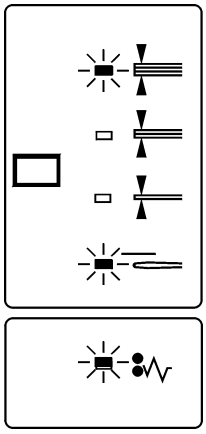
M4 Open Circuit



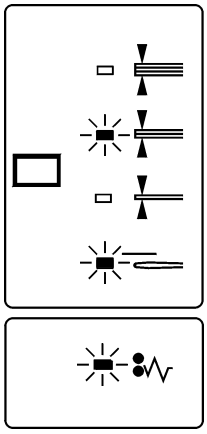
Q8 (Motor M4 Encoder sensor)



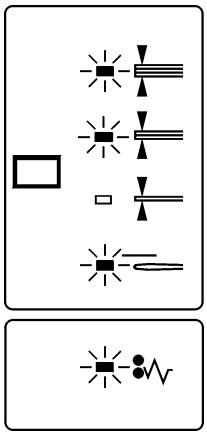
Unregulated 36V



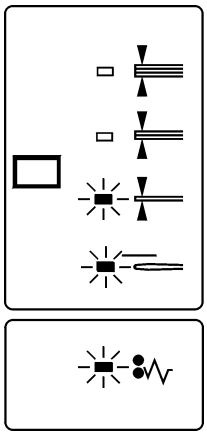
M1 Short circuit



M2 Short circuit

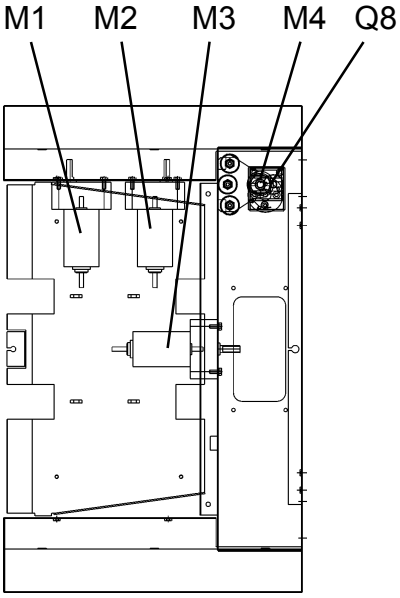


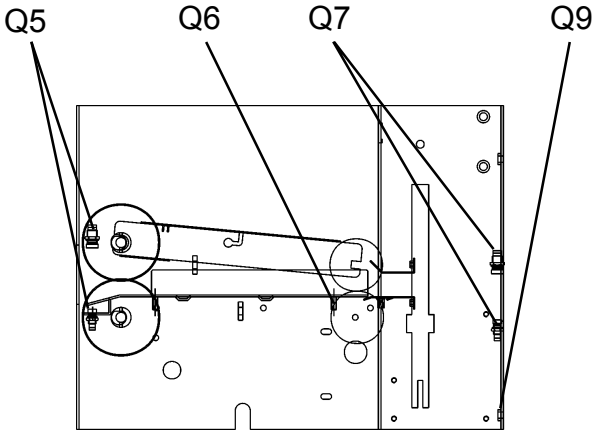
M3 Short circuit

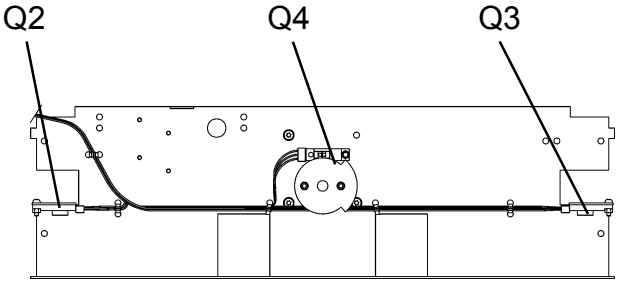


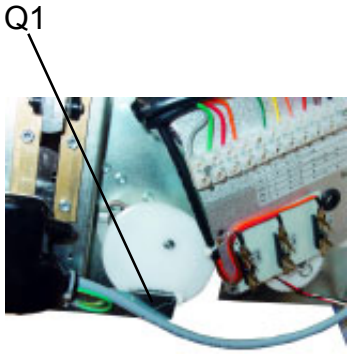
M4 Short circuit

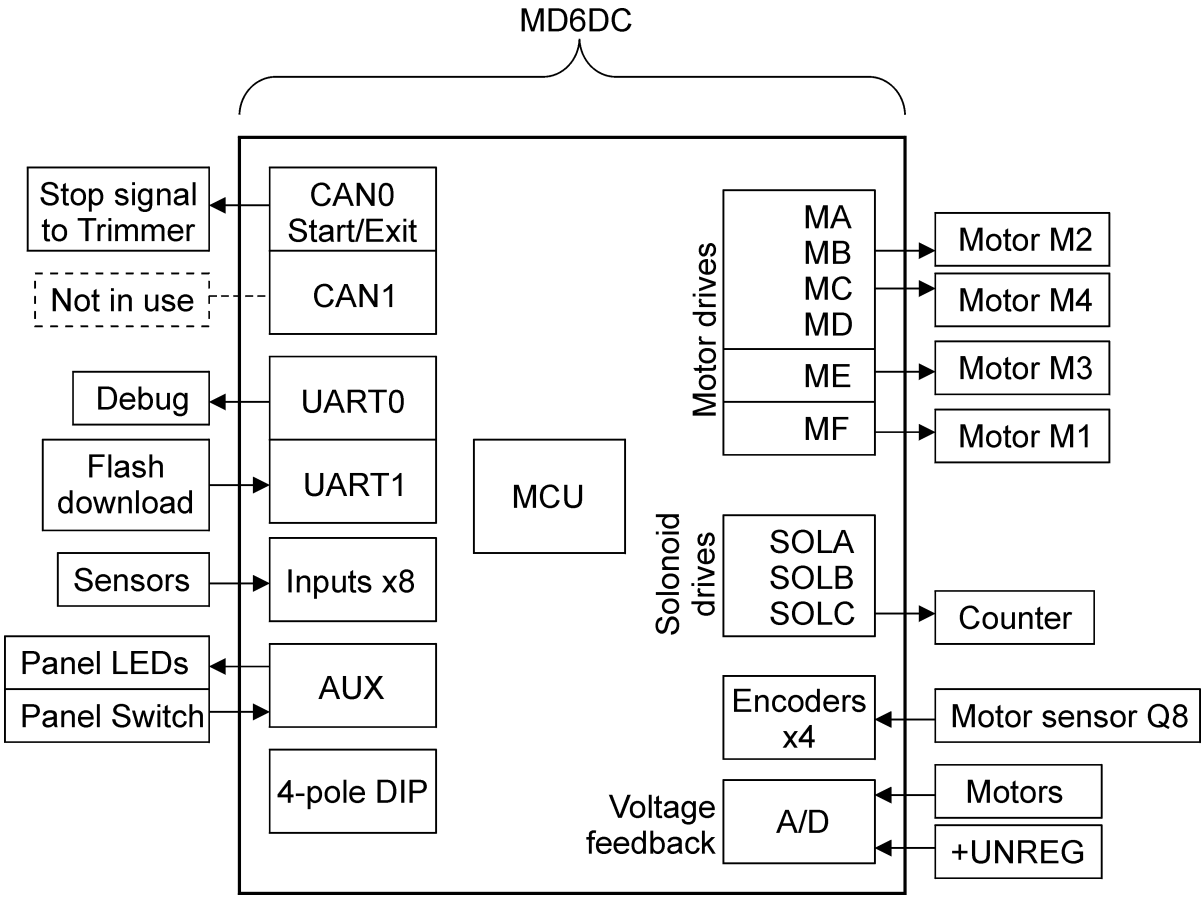
4.1 COMPONENT LAYOUT











The CAN0, Start/Exit is intended for external CAN communication. In this configuration without CAN the Exit is used as stop signal. The stop signal merges with the trimmer's jam lead which is further processed through the system as stop from external device. The Exit is sent upon jam or stacker full signal.

The motor drives:
MA-MD are for bi-directional motors with lower current
ME is for bi-directional motor with higher current.
MF is for one-directional motor with higher current.

As the Square IT does not have any solenoids, one of the solenoid drives is used for the electro-mechanical counter.

4.3 PRINCIPLE OF OPERATION

Initialization Cycle:

The Square IT performs an initialization and check-up when one of the interlocks has been opened and closed.

1. The Roll Motor M4 runs until it reaches one of it's home position sensors Q2 or Q3.
2. The Clamp Motor M3 runs until the home position sensor Q4 is covered. This is done to open up the distance between the Clamps.
3. All the paper path sensors are checked Q5, Q6 and Q7 to make sure that there is no paper in the machine.
4. Feeding Motor M1 is energized.
5. Stop Gate Motor M2 is run to home position, until Sensor Q1 is blocked.
6. The Square IT is now in standby mode.

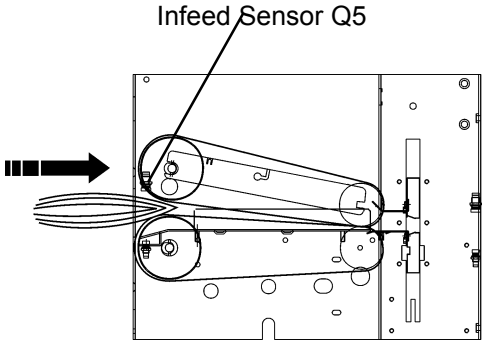


FIGURE 1

When a set is detected on the Infeed Sensor Q5 the Infeed Motor M1 is energized. **FIGURE 1.**

When the set is detected on Clamp Sensor Q6. **FIGURE 2.** Motor M1 Runs for 50 more Milli Seconds, then it stops. (If the set does not reach the Clamp Sensor a Jam is declared.)

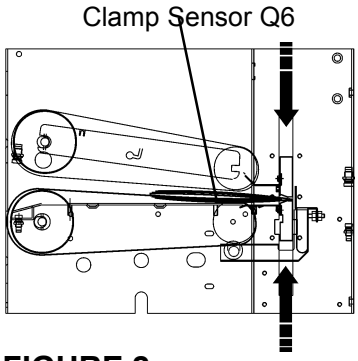


FIGURE 2

Depending on what mode the machine is set for the following happens:

Bypass mode:

This mode is for booklets that can not be Square Folded:

When Motor M1 has stopped, the Clamp Motor M3 is energized. When Sensor Q3 is blocked again Motor M3 is deenergized. This means that the Clamp motor is running one full cycle, this is done to increase the fold quality.

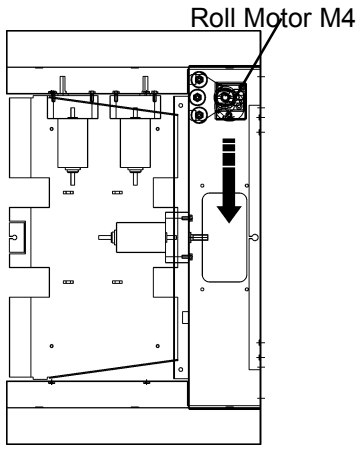


FIGURE 3

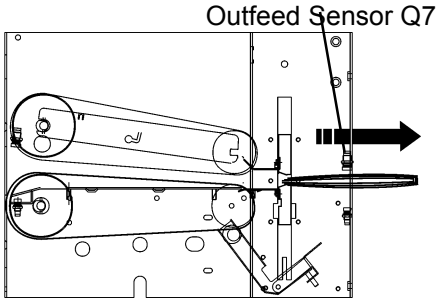


FIGURE 4

4.3 PRINCIPLE OF OPERATION CONTINUES

Mode 1:

This mode is for booklets with 6 to 10 sheets of paper that are being Square Folded.

1. When Motor M1 has stopped The Clamp Motor M3 is energized.
   When Sensor Q3 is unblocked Motor M3 is deenergized, now the Clamps are holding the booklet.

FIGURE 2

2. When the Clamps are holding the set, Stop Gate Motor M2 is energized.
   The stop gate is moving away from the Clamps until Sensor Q1 is unblocked.
3. When Sensor Q1 is unblocked Roller Motor M4 is energized.
   The Encoder Sensor Q8 starts counting pulses by reading the Encoder Disc.
   When the correct number of pulses has been counted the motor slows down, and when Sensor Q2 or Q3 is covered, the Motor stops. **FIGURE 3**
4. When The Roller Motor M4 has reached it's home position the Clamp Motor M2 is energized.
   When M2 Home Position Sensor Q1 is unblocked the Clamps are in their upper position.
5. When the Clamps are in their upper position Transport Belt Motor M1and Belt Stacker Motor are energized to feed out the set. **FIGURE 4**
   When the Outfeed Sensor Q7 is unblocked Motor M1 is deenergized.

Mode 2:

This mode is for booklets with 11 to 15 sheets of paper that are being Square Folded.

1. When Motor M1 is still running the Clamp Motor M3 and the Stop Gate Motor M2 are energized.
   When Sensor Q3 is unblocked Motor M3 is deenergized and when Sensor Q1 is unblocked, Motor M2 is deenergized. Now the Clamps are holding the booklet.
2. When Sensor Q1 and Q3 are unblocked Roller Motor M4 is energized.
   The Encoder Sensor Q8 starts counting pulses by reading the Encoder Disc.
   When the correct number of pulses has been counted the motor slows down, and when Sensor Q2 or Q3 is covered the Motor stops.
3. When the Roller Motor M4 has reached it's home position the Clamp Motor M2 is energized.
   When M2 Home Position Sensor Q1 is unblocked the Clamps are in their upper position.
4. When the Clamps are in their upper position Transport Belt Motor M1 is energized to feed out the set.
   When the Outfeed Sensor Q7 is unblocked Motor M1 is deenergized.

4.3 PRINCIPLE OF OPERATION CONTINUES

Mode 3:

This mode is for booklets with 16 to 24 sheets of paper that are being SquareFolded.

When Motor M1 is still running the Clamp Motor M3 and the Stop Gate Motor M2 are energized.
When Sensor Q3 is unblocked Motor M3 is deenergized and when Sensor Q1 is unblocked, motor M2 is deenergized. Now the Clamps are holding the booklet.

When Sensor Q1 and Q3 are unblocked Roller Motor M4 is energized.
The Encoder Sensor Q8 starts counting pulses by reading the Encoder Disc. When the correct number of pulses has been counted the motor slows down, and when sensor Q2 or Q3 is covered the Motor stops.

When The Roller Motor M4 has reached it's home position the Motor starts moving in the oposite direction. When the other home position sensor Q3or Q2 is covered Motor M4 is deenerized and Clamp Motor M2 is energized. When M2 Home Position Sensor Q1 is unblocked the Clamps are in their upper position.

When the Clamps are in their upper position Transport Belt Motor M1 is energized to feed out the set.
When the Outfeed Sensor Q7 is unblocked Motor M1 is deenergized.