

FORMAX[®]

FD 452
Envelope Opener

4/2022

Maintenance Manual
Second Edition

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1 Introduction

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Revision	2

Revision

List Of Changes

REVISION	DATE	REVISION CAUSE, MODIFICATION
1.0	September 2008	Creation of this document
2.0	October 2009	Updating
2.1	November 2009	Updating
2.2	January 2010	Updating
2.3	May 2010	Updating New chapter added: Speed Adjustment on page 46
3.0	October 2016	Updating, added: Replacing the envelope exit sensor on page 13. Introduced as from serial no. BK11460001 (IM-16 version II) Replacing the counter display (set/total counter) on page 12. Introduced as from serial no. BM12140026. (IM-16C)

2 Specifications

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Technical specifications

Dimensions	Width : Basic unit 400 mm (15.8") : Basic unit with catch tray 825 mm (32.5") Depth : 388 mm (15.3") Height : 230 mm (9.1")
Weight	Approximately 7 kg (15.5 lb)
Power source	As written on the type label 120V-230V AC / 60Hz/50Hz / 0,8A - 0,4A
Rate	300 letters per minute if DIN C6 in length
Feeder capacity	Maximum weight: 800g
Noise level	Lwa = 63 dB (A)
Material	Paper envelopes Minimum size: 90 x 140 mm (3.5" x 5.5") Maximum size: 260 x 330 mm (10.2" x 13.0") Maximum thickness: 4 mm (0.16")
Letter Opener Safety approval	CE SECURITE EN 60950 CB Report CE CEM <ul style="list-style-type: none"> • EN 55022 • EN 61000-3-2 • EN 61000-3-3 • EN 55024 US Regulatory FCC part 15 UL UL 60950 CSA C 22-2 / 950 Packaging ISTA 2A (2004) WEEE RoHS

3 Disassembly-Reassembly

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Security

Power Machine Off Before Disassembly!



MAIN POWER CABLE MUST REMAIN UNPLUGGED UNTIL END OF RE-ASSEMBLING.

Special risk



THERE IS A RISK OF INJURY BECAUSE THERE ARE MOVING PARTS.

Charged Capacitors



DO NOT TOUCH INSIDE POWER SUPPLY UNIT TO PREVENT ELECTRIC DISCHARGE DUE TO CHARGED CAPACITOR.

Cutting edges



ALTHOUGH MANUFACTURER TAKES CARE TO REDUCE RIDGE SHARPNESS, PLEASE HANDLE STEEL SHEETS CAREFULLY TO AVOID ALL RISKS OF CUT.

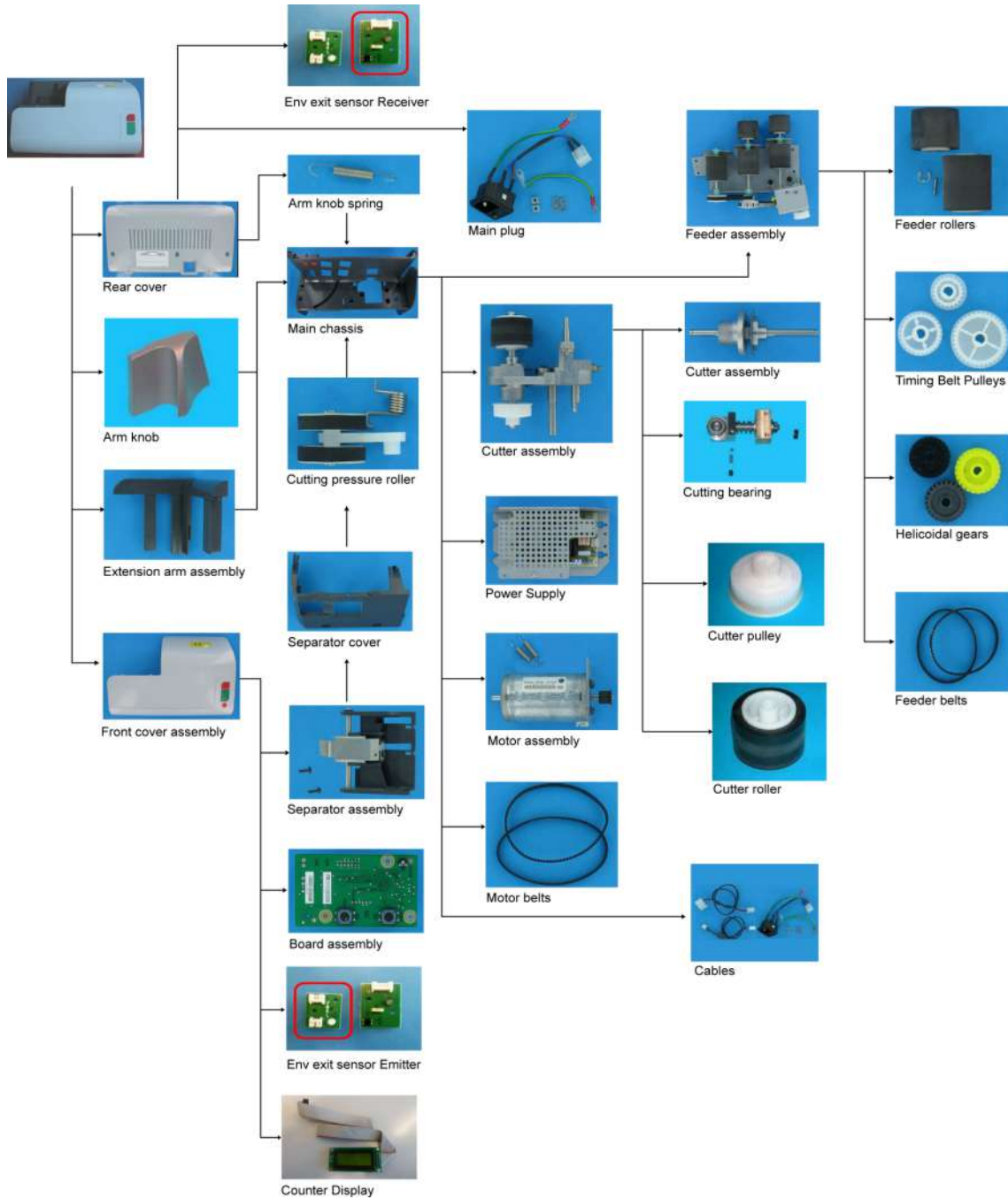
Tools for service

Minimum tools needed for service and disassembly:

- T10 (torx)
- T20 (torx)
- 3 mm Flat blade screwdriver
- Spring hook
- Multimeter (voltage and continuity check)
- 2.5 mm T-handle allen key
- Two 10 mm. open ended spanners.

Disassembly

Disassembly Overview



Rear Cover Disassembly

Rear Cover

1. Remove the three T20 screws **A**.



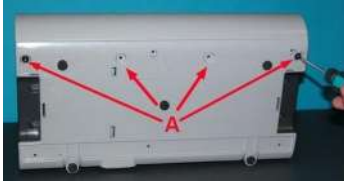
2. Pull the bottom according to the arrow **B** and unclip carefully the top of the cover.



Front Cover Disassembly

Front Cover

1. Remove the four T20 screws **A**.



2. Turn the unit back on its feet. Pull the bottom of front cover towards you and unclip carefully the left top section pressing the edge of the cover down.
3. Using a flat screwdriver, release the right hand side of the cover top section by lifting up both clips slightly.



Arm knob Disassembly

Arm Knob

1. To remove the Arm Knob pull it according to the arrow.



Extension arm Disassembly

Extension Arm Assembly

1. Pull the Extension Arm using the opening shown by the white circle.



2. Pinch the Extension Arm at the point shown by the circle and pull it in the direction of the arrow.



Board Assy Disassembly

Disassembly Path



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on page 9

Board Assy

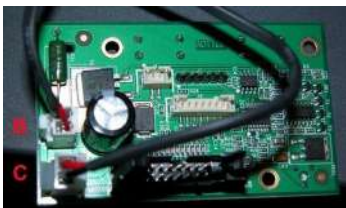
1. Remove the three T10 screws **A**.



2. Remove the Circuit Board, be aware of the wiring.



3. Unplug the connectors **B** and **C**.



Counter Display Disassembly

Disassembly Path



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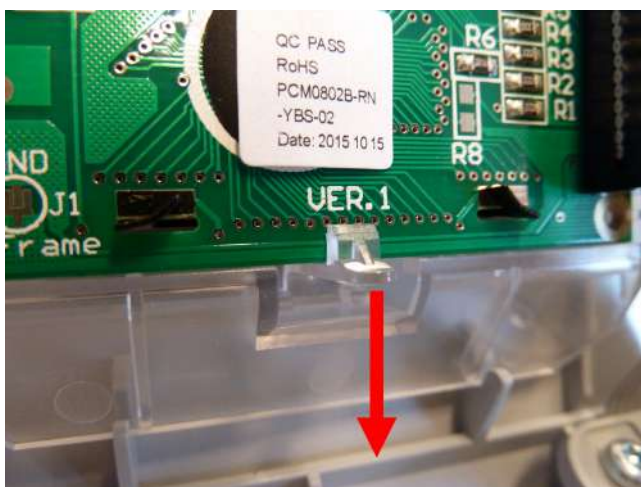
[Display](#)

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Counter Display Disassembly

Counter Display Disassembly

1. Carefully bend down the lip securing the display.



2. Tilt the Counter display at the bottom side and withdraw it from the display holder.
 3. To release the flat cable remove the two screws securing the cable fastener.
-

Envelope Exit Sensor Disassembly

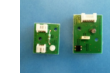
Disassembly Path



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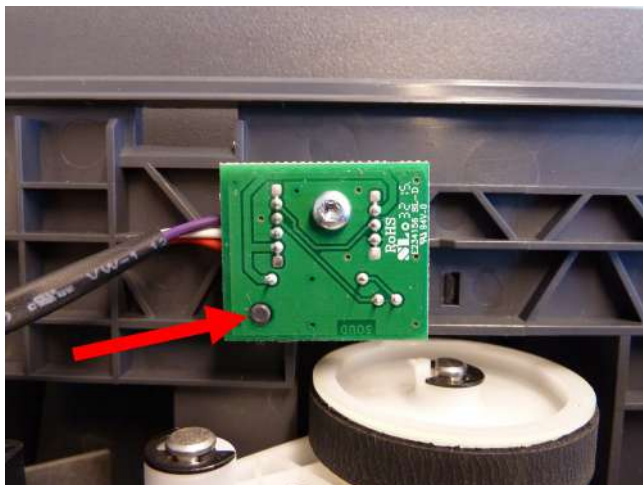


Exit sensor

Emitter Disassembly

Emitter Disassembly (front side)

1. Remove the screw securing the Emitter PCB.
2. Carefully disconnect the connector from the PCB.

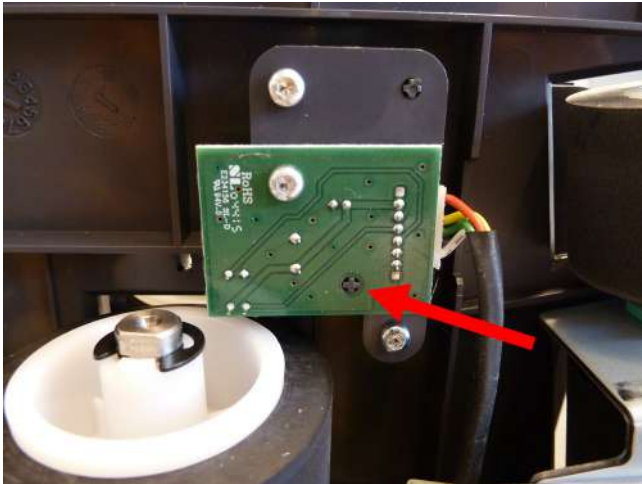


On replacement ensure that the cam fits the hole of the PCB (see arrow).

Receiver Disassembly

Receiver Disassembly (rear side)

1. Remove the screw securing the Receiver PCB.
2. Carefully disconnect the connector from the PCB.



On replacement ensure that the cam fits the hole of the PCB (see arrow).

Separator Assy Disassembly

Disassembly Path



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Separator Assembly

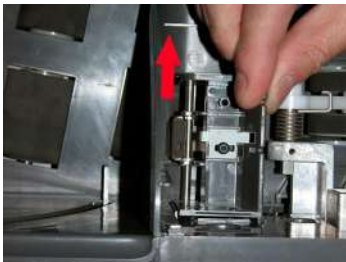


To adjust the separator refer to: [Separation Finger Adjustment](#) on page 45.

1. Loosen the two T10 screws **A**.



2. Lift and then pull the Separator to remove it.



3. Pass the screw heads through the slotted holes to remove the Separator assembly.



Separator cover Disassembly

Disassembly Path



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Separator Cover

1. Unlock the two locking levers shown by the arrows.



2. Lift the locking lever and then pull the Separator Cover in the direction shown by the arrow.



3. Do the same operation for the second locking lever.
4. To remove freely the Separator Cover, pull the Cutting Pressure Roller as shown by the picture and then lift the Separator Cover in the direction of the arrow.



Cutter counter roller Disassembly

Disassembly Path



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Cutting Pressure Roller

1. Remove the e-clip **A**.



2. Remove the roller and spring from the shaft.

To reassemble the Cutter roller, use a hook to pull the end **B** of the spring, then slide the roller behind the end of the spring.



Arm Knob Spring Disassembly

Disassembly Path

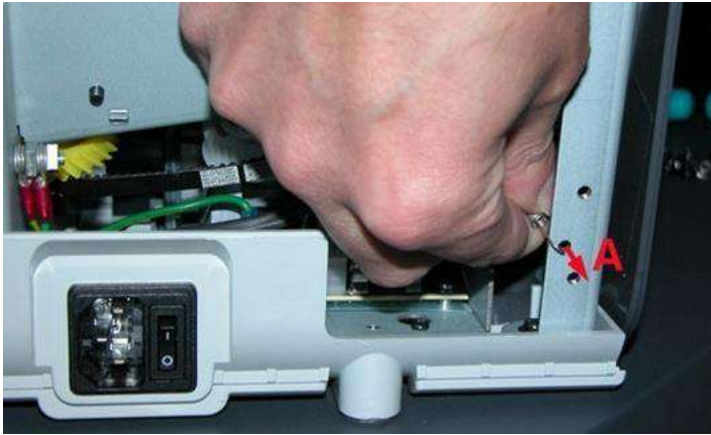


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Arm Knob Spring

1. Pull the Arm Knob Spring according to arrow **A** and remove it.



Main Chassis Disassembly

Disassembly Path



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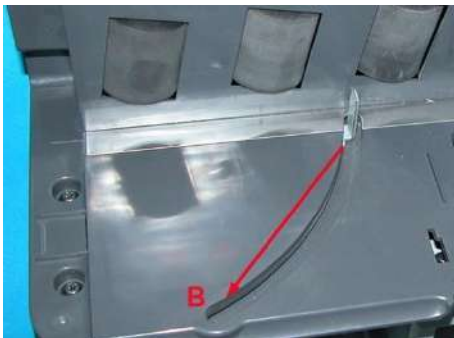


Main Chassis

1. Remove the seven T20 screws shown by the white circles.



2. Pull and maintain the pressure arm at point **B**, then remove the main chassis carefully.



Pull the Cutting Pressure Roller to disengage Main Chassis.

Feeder Disassembly

Disassembly Path



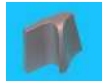
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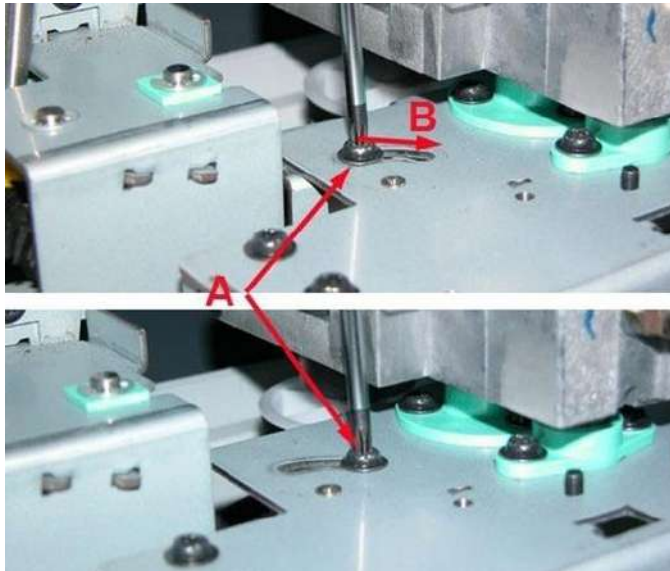


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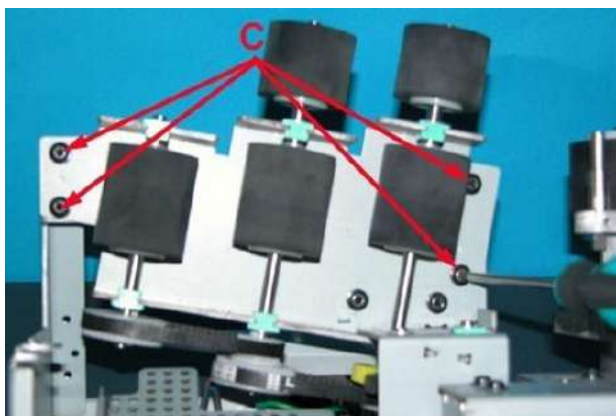
Feeder Assembly

1. Loosen the belt tensioner:

- Loosen the T20 screw **A**.
- Move the T20 screw according to arrow **B**.
- Tighten the T20 screw **A**.



2. Remove the four T20 screws **C**, then remove the feeder assembly.



Cutting Unit Disassembly

Disassembly Path



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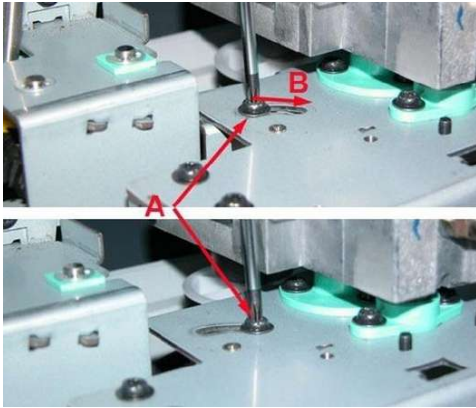
Cutting Unit



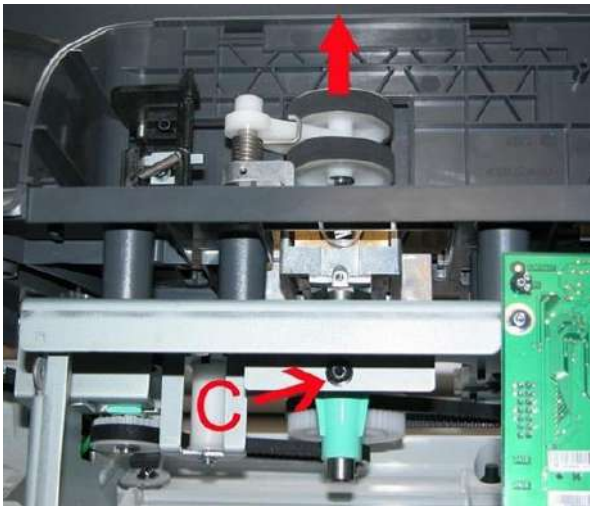
To adjust the Cutting Unit Assembly refer to: [Cutting Adjustment](#) on page 43.

1. Loosen the belt tensioner:

- Loosen the T20 screw **A**.
- Move the T20 screw according to arrow **B**.
- Tighten the T20 screw **A**.
- Uncouple the motor belt.



2. Remove the T20 screw **C**.



3. Pull the Cutting Unit Assembly according to the arrow.

Power Supply Disassembly

Disassembly Path



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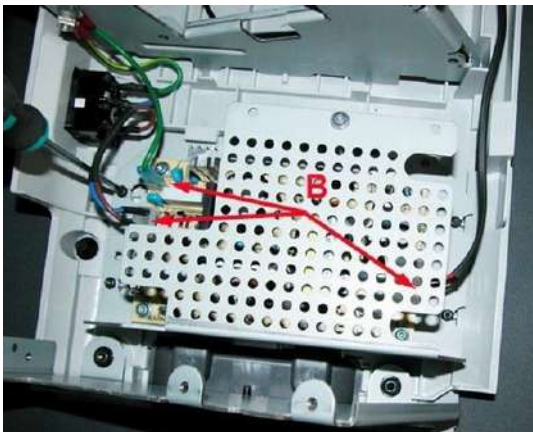
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Spring
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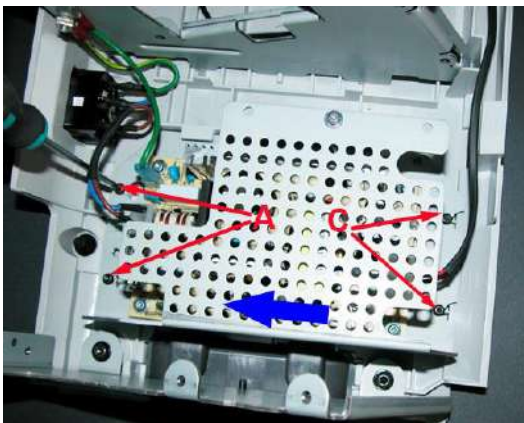
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page 19

Power Supply Assembly

1. Disconnect the three connectors **B**.



2. Loosen the two T10 screws at the back side **A**. Remove the two T10 screws at the front side **C**.



3. Slide the Power Supply Assembly carefully in the direction of the blue arrow and lift it.

Motor Disassembly

Disassembly Path



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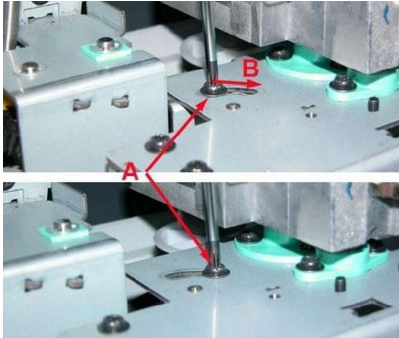


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Motor Assembly

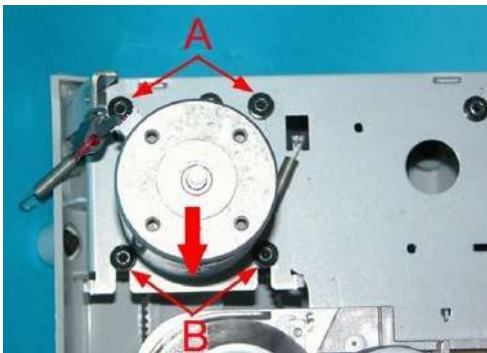
1. Loosen the belt tensioner:
 - Loosen the T20 screw **A**.
 - Move the T20 screw according to arrow **B**.
 - Tighten the T20 screw **A**.
 - Remove the motor belt.



2. Take off the two springs shown by the two circles.



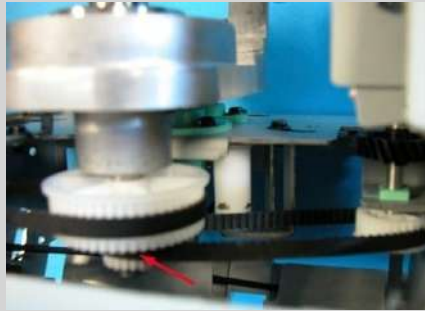
3. Remove the two screws **B**.



4. Loosen the two screws **A**.

- Slide the motor in the direction of the arrow to remove it.

For assembly, install screws and springs, but do not tighten the screws before putting the belts in place. Install the two belts as shown by the picture.



3

Main Plug Disassembly

Disassembly Path



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Main Plug

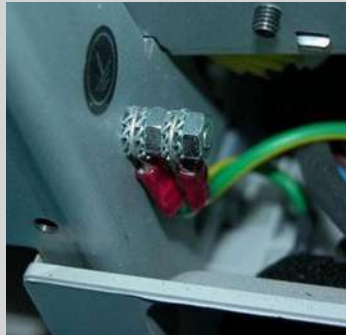
1. Remove the retaining nut **A**.



2. Make sure that all cables are removed.
3. Pinch the **B** edges of the plug and push it out of its location.



When you install the Main Plug the ground cables (green/yellow) are earthed at the point **A** between tooth lockwashers as shown by the picture.



Feeder Belts Disassembly

Disassembly Path



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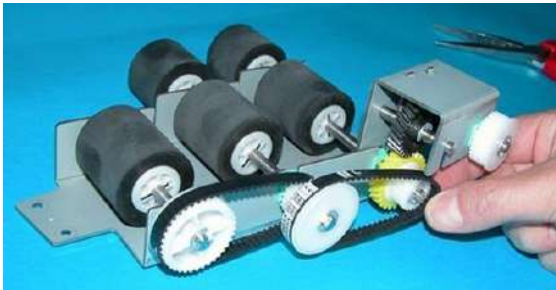


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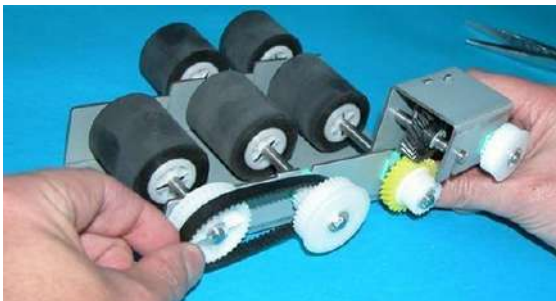


Feeder Belts

1. Remove the lower belt as shown on the illustration.



2. Remove the upper belt as shown on the illustration.



Helicoidal gears Disassembly

Disassembly Path



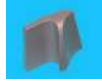
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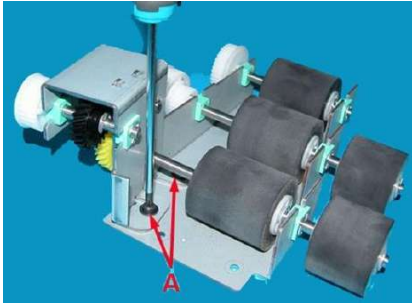


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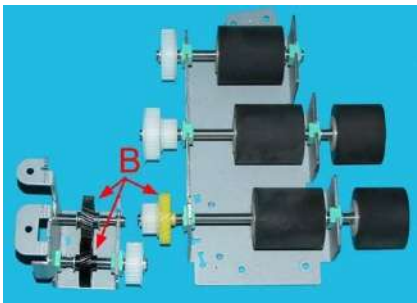


Helicoidal Gears

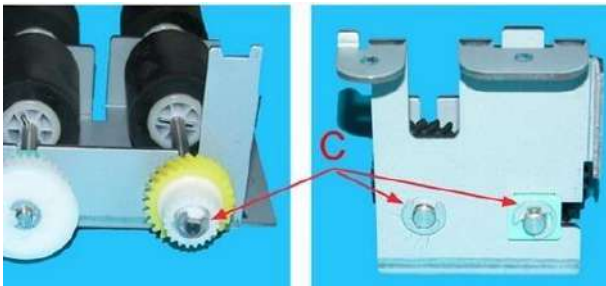
1. Remove the two T20 screws **A**.



2. Note the position of the three Helicoidal Gears **B**.



3. Remove the three e-clips **C** from the axles to get access to the Helicoidal Gears.



4. Remove the yellow Helicoidal Gear from the axle.
5. Remove the e-clips **D** to remove the Helicoidal Gears from the axles.



Timing belt pulleys Disassembly

Disassembly Path



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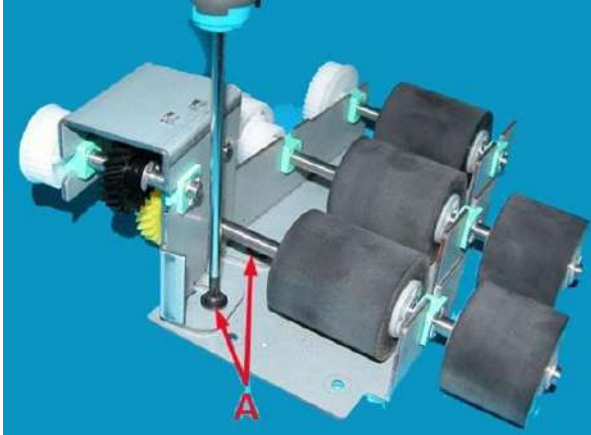


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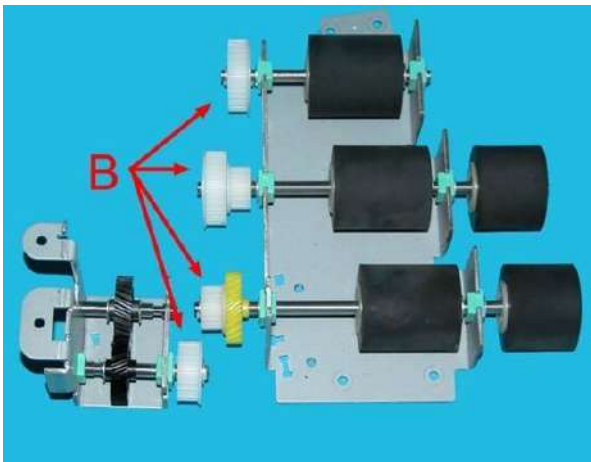


Timing Belt Pulleys

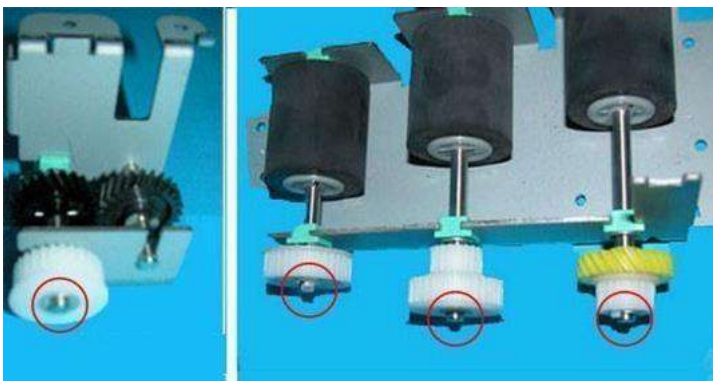
1. Remove the two T20 screws **A**.



2. Note the position of the Gears **B**.



3. Remove the e-clips shown by circles to remove the Timing Belt Pulleys.



Feeder Rollers Disassembly

Disassembly Path



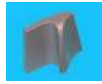
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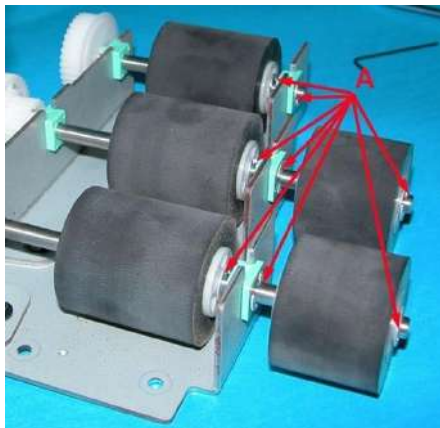


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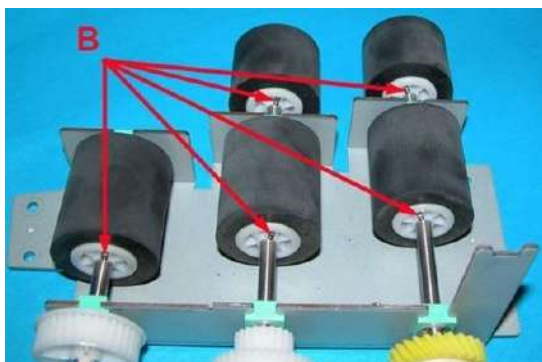


Feeder Rollers

1. Remove the e-clips **A** retaining the rollers.



2. Remove the rollers from the shafts and recover the locating pins **B**.



Cutter Pulley Disassembly

Disassembly Path



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3

Cutter Pulley

1. Remove the e-clip shown by the arrow, then remove the pulley from its axle.



Output roller Disassembly

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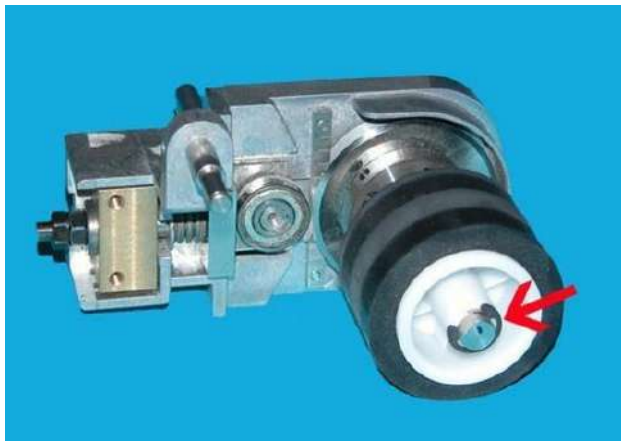


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Output Roller

1. Remove the e-clip shown by the arrow, then remove the roller from its axle.



Cutter assembly Disassembly

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Cutter Assembly



THE CUTTER KNIFE HAS VERY SHARP EDGES!! BE VERY CAREFUL!!



BE CAREFUL WHEN YOU REMOVE THE CUTTER ASSEMBLY THAT THE CUTTING EDGE DOES NOT TOUCH THE BALL BEARING.

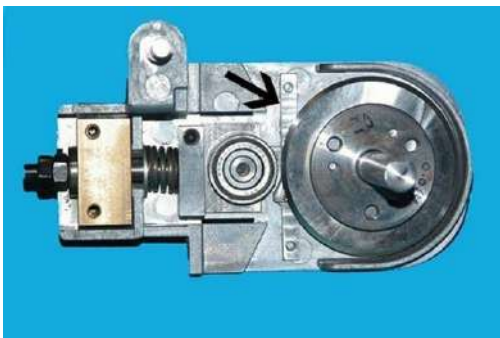


To adjust the distance between the Cutter Assembly and the ball bearing refer to: [Cutting Adjustment](#) on page 43.

1. Remove the two T10 screws shown by the circles to disassemble the deflector.



2. Remove the deflector shown by the arrow.

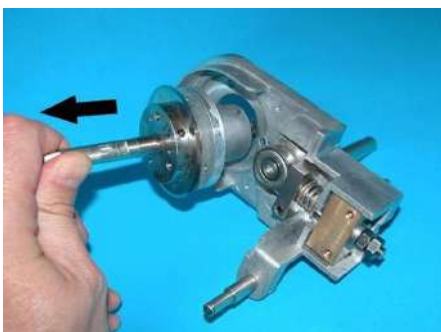


DO NOT TOUCH THE KNIFE!! IT IS VERY SHARP!!!

3. Remove the three T10 screws shown by the circles.



4. Remove the Cutter Assembly according to the arrow.



Cutting bearing Disassembly

Disassembly Path



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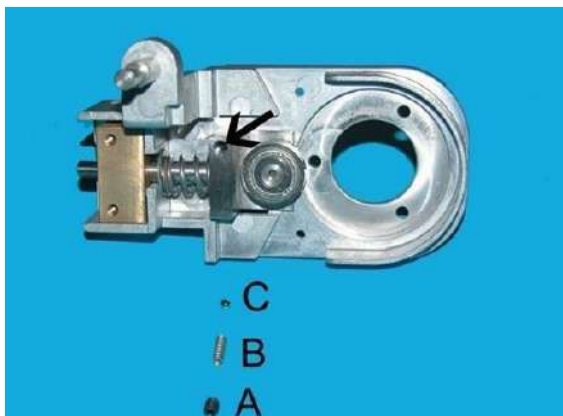
Cutting Bearing Assembly



To adjust the distance between the Cutter Assembly and the ball bearing refer to: [Cutting Adjustment](#) on page 43.

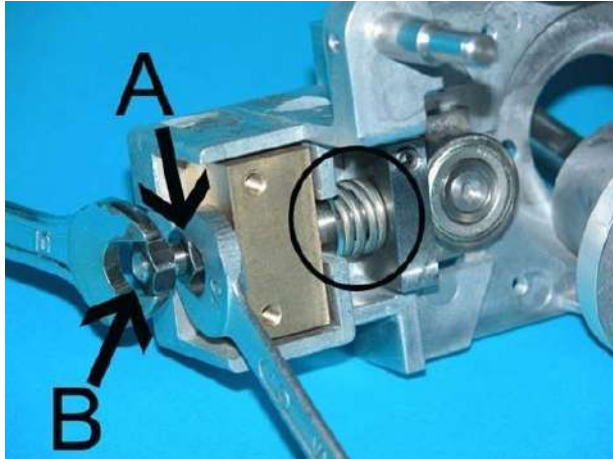
1. The precautions that follow must be done:

- Remove with allen key 2.5MM the hexagonal socket head screw **A** from the point shown by arrow.
- Remove the spring **B**.
- Remove the ball **C**.

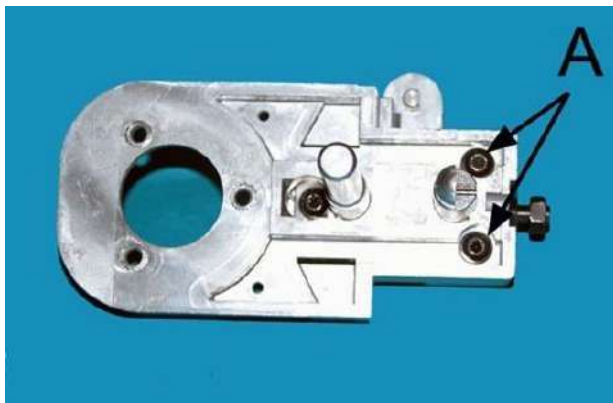


FIRST YOU HAVE TO REMOVE THE CUTTER ASSEMBLY.

2. Loosen locknut **B** using two open-ended spanners 10MM as shown by the picture.



3. Loosen nut **A** until you feel that the spring, shown by the circle, is almost unscrewed.
4. Remove the two T20 screws **A**.



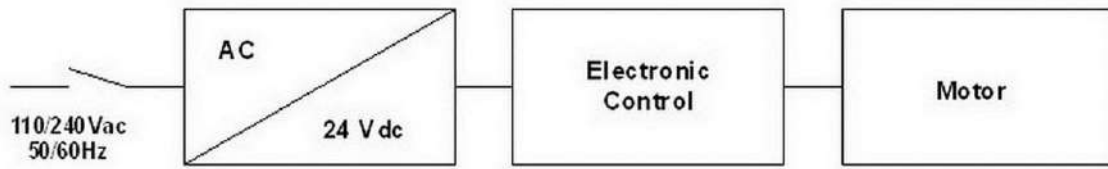
5. Remove the Cutting Bearing Assembly.



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Overview Diagram



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Cutting Adjustment

How to adjust the Cutting



INCORRECT ADJUSTMENT CAN CAUSE DAMAGE TO THE CUTTER.

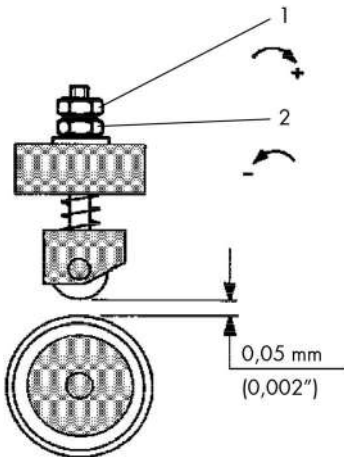


Only one side of the envelope must be cut.

1. Use the two lock nuts to adjust the distance between the cutter and the ball bearing.



2. To reduce slitting depth turn nut 2 counter clockwise. To increase slitting depth turn nut 1 clockwise.



3. The slitting depth must be set to 0,05 mm (0,002").



Leave the nuts counterlocked during adjustment. Do not unlock.



Adjust carefully stage by stage. The ball bearing must not come into contact with the cutter.

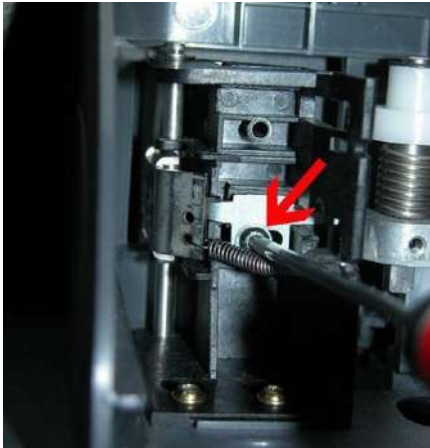


Check function using thin envelopes. Even thin envelopes should be opened reliably.

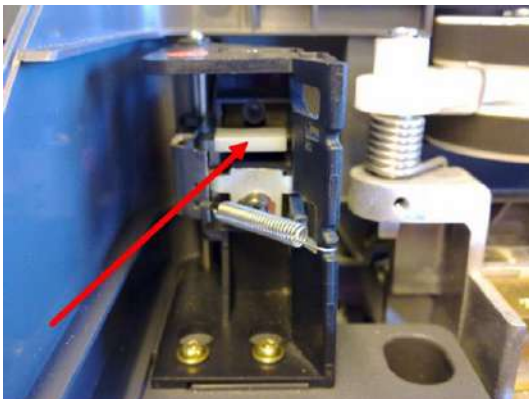
Separation Finger Adjustment

How to adjust the Separation Finger

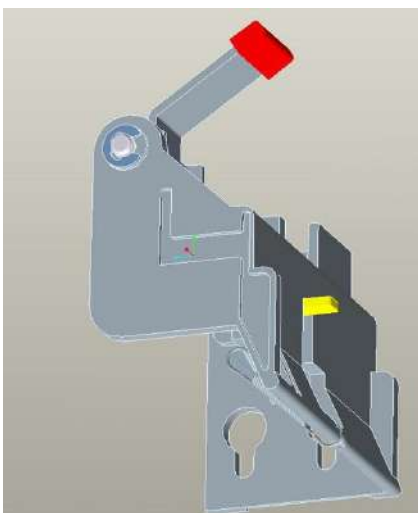
1. To get access to the Separation Finger refer to: [Front Cover Disassembly](#) on page 9.
2. Loosen the T10 screw.



3. Position of the special tool (capping) on the Separation assembly.



4. Position the special tool behind the Main Chassis.



5. Adjust the gap between the separation finger and the back side of the envelope track as follows:
 - Remove the separation assembly from the machine.
 - Put the capping on the separator finger This capping is located on the mainframe underneath the top cover.
 - Place the separator unit back in the machine.
 - Adjust the position of the finger so that the capping just touches the back side of the envelope track.
 - Remove the separator assembly.
 - Remove the capping tool.
 - Put the separator assembly back in the machine.
 - Close all covers and check the function of the separator.

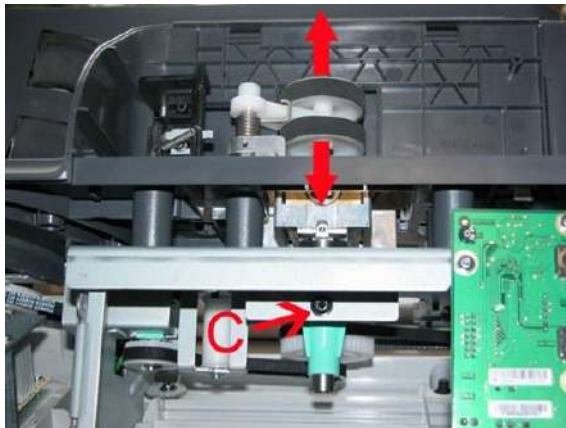
Cutting Height Adjustment

How to adjust the cutting height



Correct adjustment of the cutting is 1.5 mm +/- 0.3".

1. To get access to the Cutting Unit Assembly refer to: [Front Cover Disassembly](#) on page 9.
2. Loosen the T20 screw **C**.



3. Move the Cutting Unit Assembly up or down to adjust the height of the cutter (1.5 mm +/- 0.3").

Speed Adjustment

How to adjust the Speed





The IM-16 has to be set to a specific operational speed. The setting of the speed is stored in the control board and is affected by the main motor. In case of replacement of the main motor and/or control board the speed has to be adjusted according the following procedure:

1. The IM-16 has to be empty and switched off (power switch is located at the back of the machine near the power inlet).
2. Press and hold the green Start button and the red Stop button simultaneously.
3. Switch on the IM-16.
4. The machine starts to run on default speed.
5. Press a number of times the green button (-) or the red button (+) accordingly the number as mentioned on the sticker on the **main motor**.
6. Switch off the IM-16.

6 Spare Parts


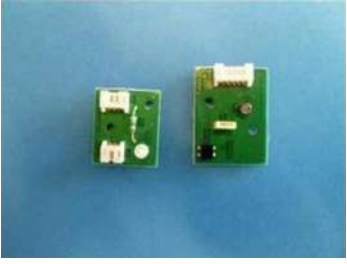
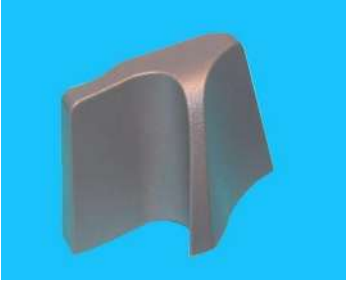

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Spare Parts Description

CUTTER PULLEY	4142561S 
CUTTING BEARING ASSEMBLY 1 - Bearing shaft assembly 2 - Nut H M6 3 - Ball bearing 4 - Spring 5 - Screw	4142553J 
CUTTER ASSEMBLY	4142530K 
EXTENSION ARM ASSEMBLY	4142557N 
FEEDER ASSEMBLY	4142549E

	
FEEDER BELTS KIT	4142548D
X 2	
FRONT COVER ASSY	A0012948
	
MAIN CHASSIS ASSEMBLY	4142547C
	
CABLES KIT	4142545A
<ul style="list-style-type: none"> 1 - Motor Cable 2 - Power supply Cable 3 - Power plug 4 - Cable (green/yellow) 5 - Tooth lockwashers X 4 6 - Nuts X 2 	
CABLE FOR SENSOR / EMITTER	A0001843

	
LCD Display Kit	A0012946
	
MOTOR ASSEMBLY KIT	4142560R
1 - Motor 2 - Springs X 2	
MOTOR BELTS KIT	4143182P
X 2	
CUTTER ROLLER	4142565W
	

PCB BOARD FOR IM-16 WITH SENSOR	4155828
	
SENSOR KIT ASSY	A0005795
	
ARM KNOB	4142555L
	
ARM KNOB SPRING	4142562T
	
CUTTING PRESSURE ROLLER KIT	4142551G
<p>1 - Roller 2 - Spring</p>	
POWER SUPPLY ASSEMBLY	4142563U

	
REAR COVER	4142564V
	
SEPARATOR ASSEMBLY	4142567Y
	
SEPARATION COVER KIT	A000651
	
TIMING BELT PULLEYS KIT	4142554K
1 - Large gear X 2 2 - Medium gear 3 - Small gear X 2	