BOOK FOLDER BF90 / BF90+

SERVICE MANUAL

January 12, 2004
Subject to change

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IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

Always connect the equipment to a properly grounded power source. In doubt, have the power source checked by a qualified electrician.

WARNING: Improper connection of the equipment grounding conductor can result in electrical shock.

Always follow all warnings marked on, or supplied with, the equipment.

Always locate the equipment on a solid support surface with adequate strength for the weight of the machine.

Always exercise care in moving or relocating the equipment.

Always keep magnets and all devices with strong magnetic field away from the machine.

Never use a ground adapter plug to connect the equipment to a power source that lacks a ground connection terminal.

Never attempt any maintenance function that is not specifically described in this documentation.

Never remove the covers or guards that are fastened with screws.

Never install the unit near a radiator or any other heat source.

Never override or “cheat” electrical or mechanical interlock devices.

Never operate the equipment if you notice unusual noises or odours. Disconnect the power cord from the power source and call your customer service engineer to correct the problem.

1. Before disassembling or assembling parts of the Booklet maker and peripherals. make sure that the Booklet maker power cord is unplugged,
2. The wall outlet should be near the Booklet maker and easily accessible.
3. Note that some components of the Booklet maker and peripherals are supplied with electrical voltage even if the main power switch is turned off.
4. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrical or mechanically driven components.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The Booklet maker and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Dispose of replaced parts in accordance with local regulations.

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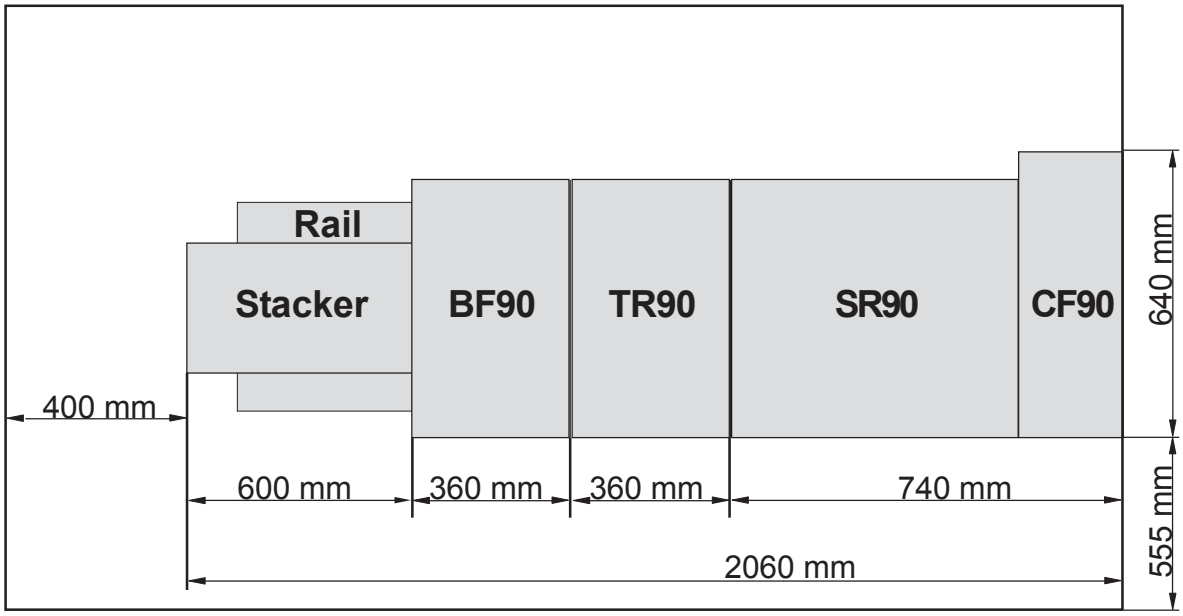
1. INSTALLATION PROCEDURE

1.1 INSTALLATION REQUIREMENTS

1.1.1 MINIMUM SPACE REQUIREMENTS



1.1.2 POWER REQUIREMENTS

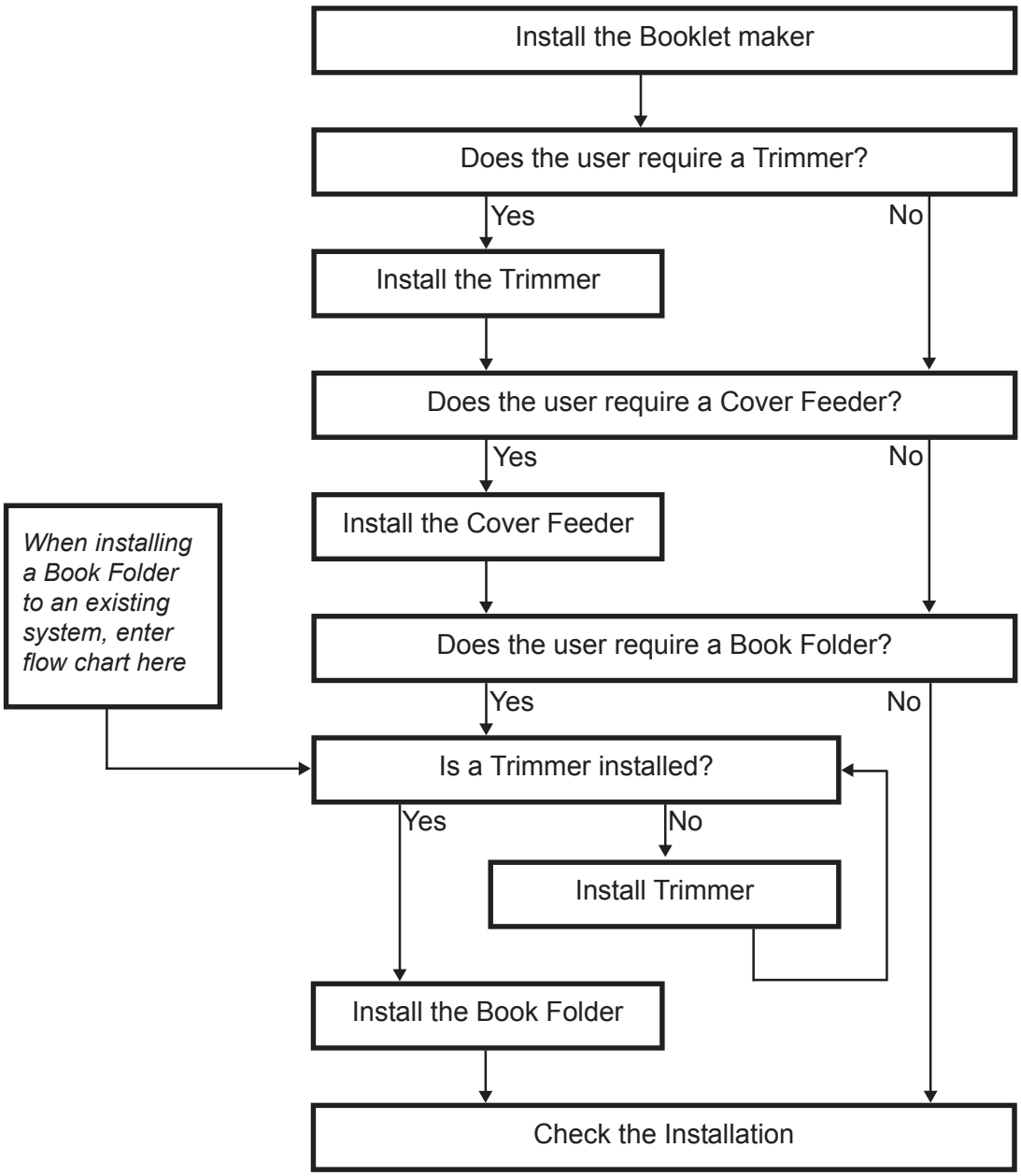
⚠ CAUTION

1. Make sure that the wall outlet is near the main machine and easily accessible. Make sure the plug is firmly inserted in the outlet.
2. Avoid multi-wiring.
3. Be sure to ground the machine.

1. Input voltage level:
   North America 115V, 50Hz/60Hz: 1,75 A
   Europe/Asia 230V, 50Hz/60Hz: 0,9 A
2. Permissible voltage fluctuation: ± 10%
3. Never set anything on the power cord.

1.2 INSTALLATION FLOW CHART

The following flow chart shows how to install the optional units more efficiently.



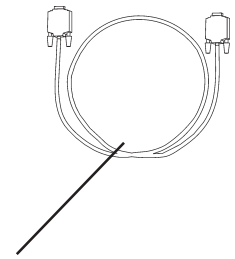
TR90 Trimmer: Enables On-line trimming. Especially thicker sets (> 4 sheets) look unprofessional because of ”creep”. TR90 will trim those edges (up to 12.5 mm / 1/2”).

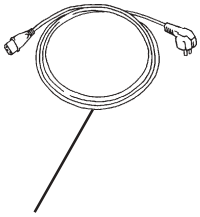
CF90 Cover Feeder: Enables the possibility to add colour covers to the booklets.

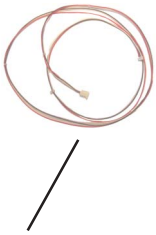
BF90 Book Folder Enables the possibility to give the booklets the perfect bound look.

1.3 BOOK FOLDER INSTALLATION

1.3.1 ACCESSORY CHECK


[A]


[B]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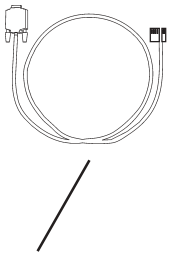
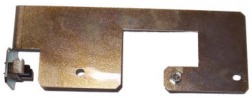
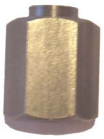

[D]


[E]


[F]


[G]


[H]


[I]


[J]


[K]


[L]


[M]

COM. BF90

[N]


[O]

Check the quantity and condition of the accessories in the box against the following list:

Description

A. Communication cable
B. Power cord
C. Sensor harness
D. Software downloading cable
E. Adapter PWB
F. Auto set thickness bracket, with spring
G. Sensor bracket, with sensor
H. Spacer pin x 2, screws x 2
I. External Interlock device
J. 25 mm washer x 2, screws 2
K. Extended trim bin x 2, screws x 4, nuts x 4
L. Rail extension
M. Tapping cable, 50mm / 2”
N. COM. BF90 sticker
O. Ground strap, screw x 1

1.3.2 INSTALLATION PROCEDURE

Unpacking

1. Remove all parts from the pallets.
2. Ensure all of the packing material is removed from inside and outside of the Book Folder.

Remove the belt stacker

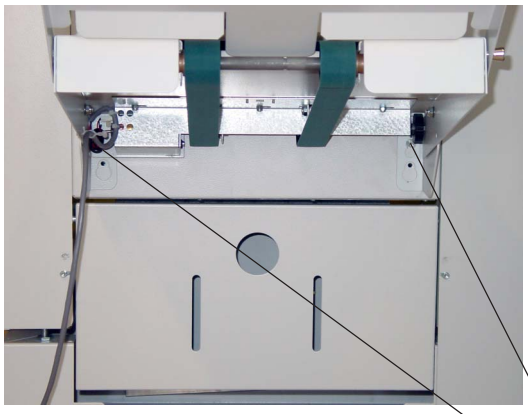


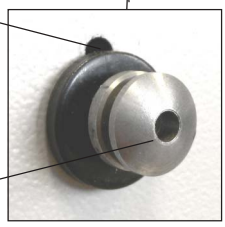
Figure showing the Trimmer TR90

[A]

Figure showing the Trimmer TR90

[B]

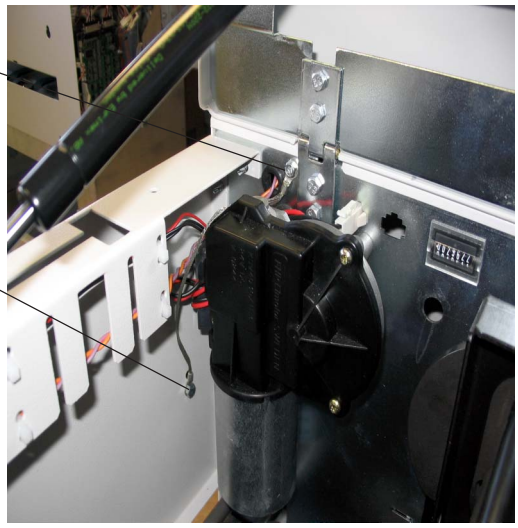
[C]



New picture

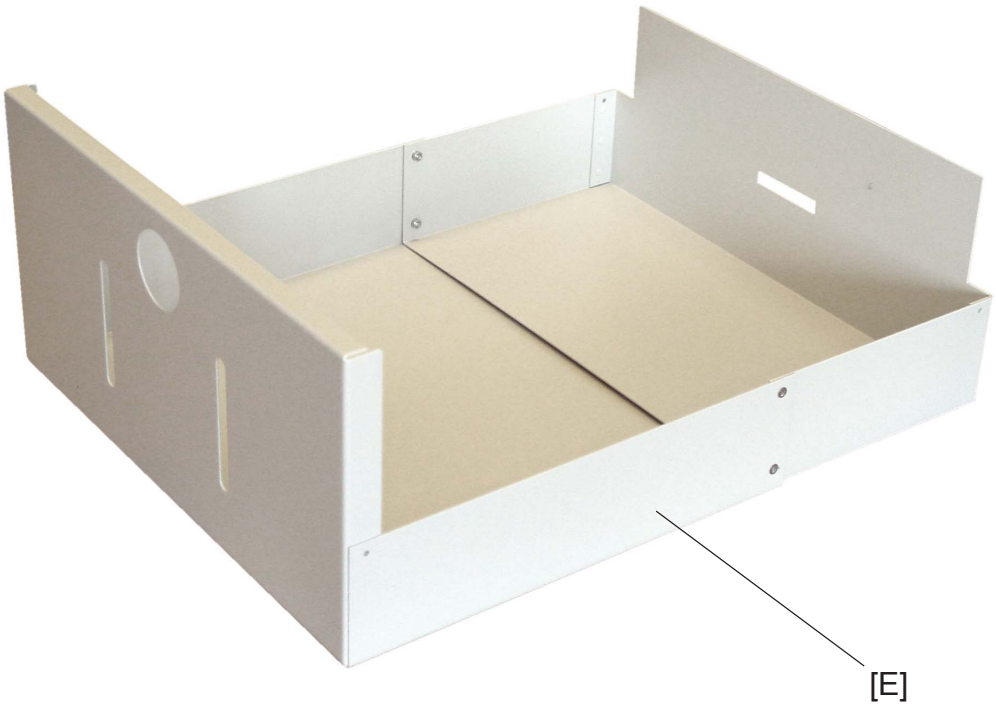
[D]

[E]



1. Disconnect the Power cord to the SR90 (x 1).
2. Remove screws [A] (x 2).
3. Disconnect the belt stacker cable (x 1).
4. Remove the belt stacker from the TR90.
5. Remove the positioning pins from the upper holes [B], used for the belt stacker (x 2).
6. Install the Ground strap to the left positioning pin [E], with the 25 mm washer and the screw from the installation kit, to the lower hole [C] (x 1, x 1).
7. Install the other end of the ground strap to the Top cover [D] (x 1 torx).
8. Install the right positioning pin, with the 25 mm washer and the screw from the installation kit, to the lower hole (x 1, x 1).

Extended trim bin



1. Remove the existing trim bin from the Trimmer. This trim bin can not be used together with the BF90.
2. Assemble the new Extended trim bin [E] with the four screws and nuts from the installation kit (x 4, x 4).

Installing the External Interlock device

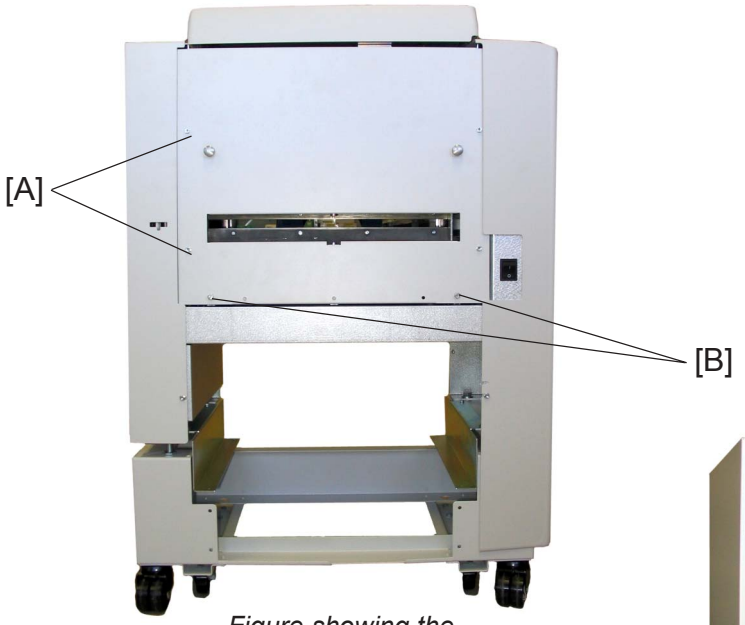


Figure showing the Book Folder BF90

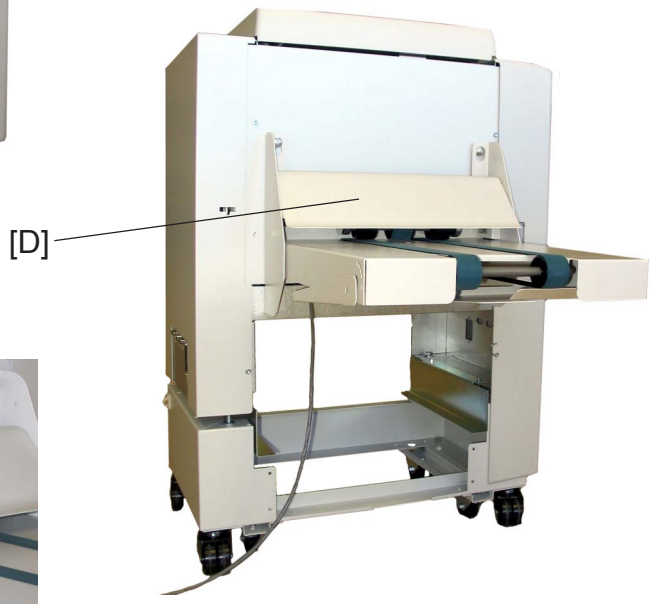
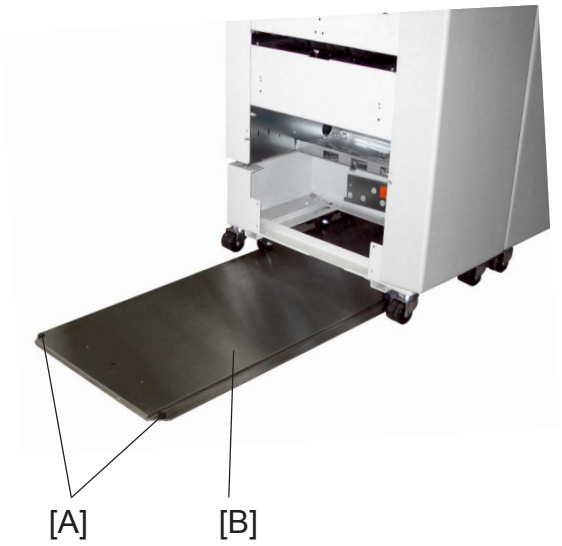
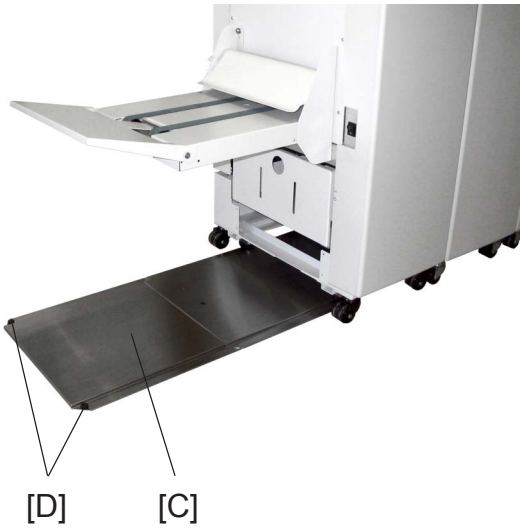


Figure showing the Book Folder BF90

1. Remove the screws [A] (x 2).
   NOTE: Keep the screws. They will be used later.
2. Loosen screws [B] (x 2).
3. Install the belt stacker on the Book folder.
4. Secure the belt stacker, by tightening screws [B] (x 2).
5. Install the external interlock device [C].
6. Secure the External Interlock device with the screws [A] you removed (x 2).
   NOTE: Make sure that the upper part [D] of the belt stacker is in the lower position.

Installing the Rail extension

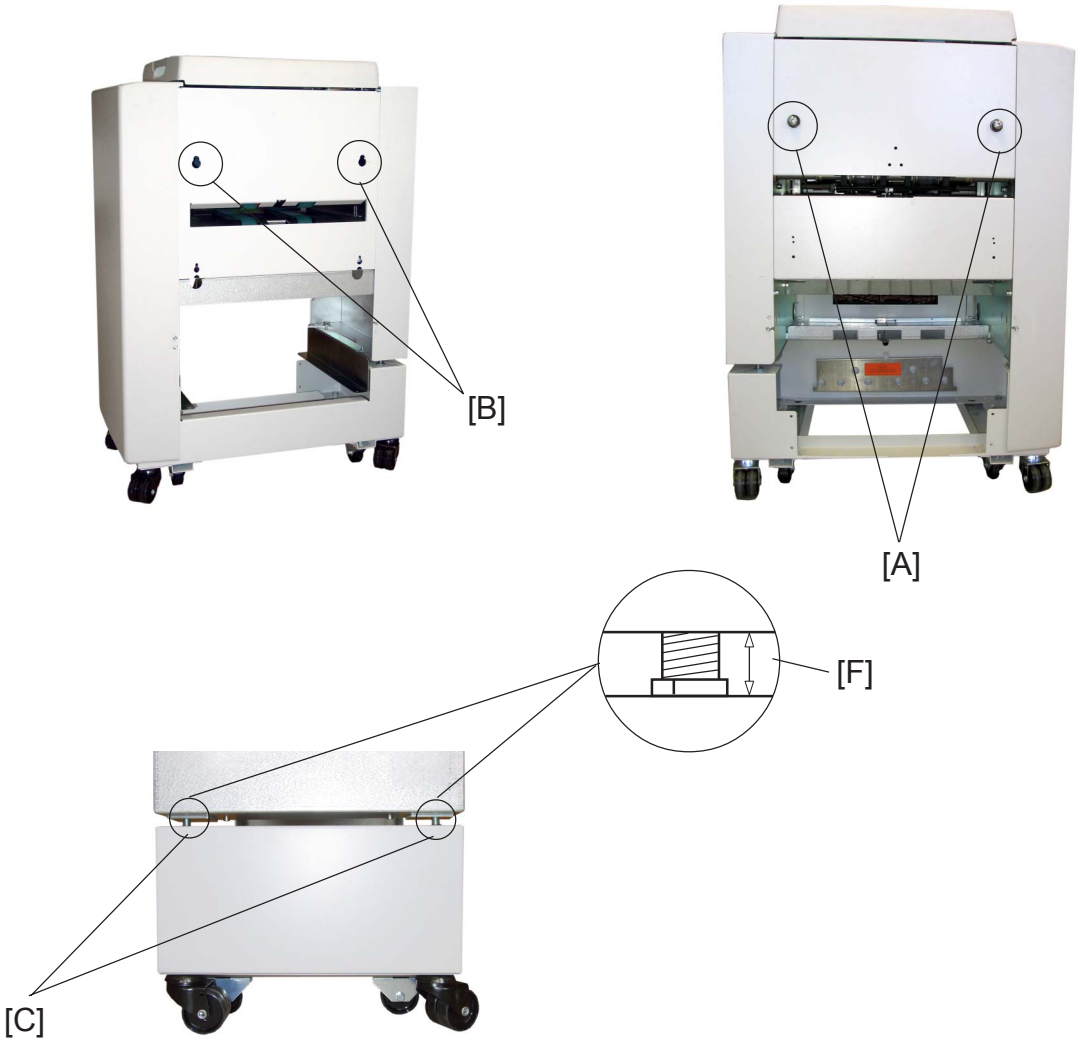




1. Remove the plastic stop's [A] from existing rail [B].
2. Install the rail extension [C] under the existing rail.
3. Place the Book Folder on the existing rail.
4. Install the plastic stops [D] on the rail extension [C].

1.3.3 ADJUSTMENTS

Height adjustment



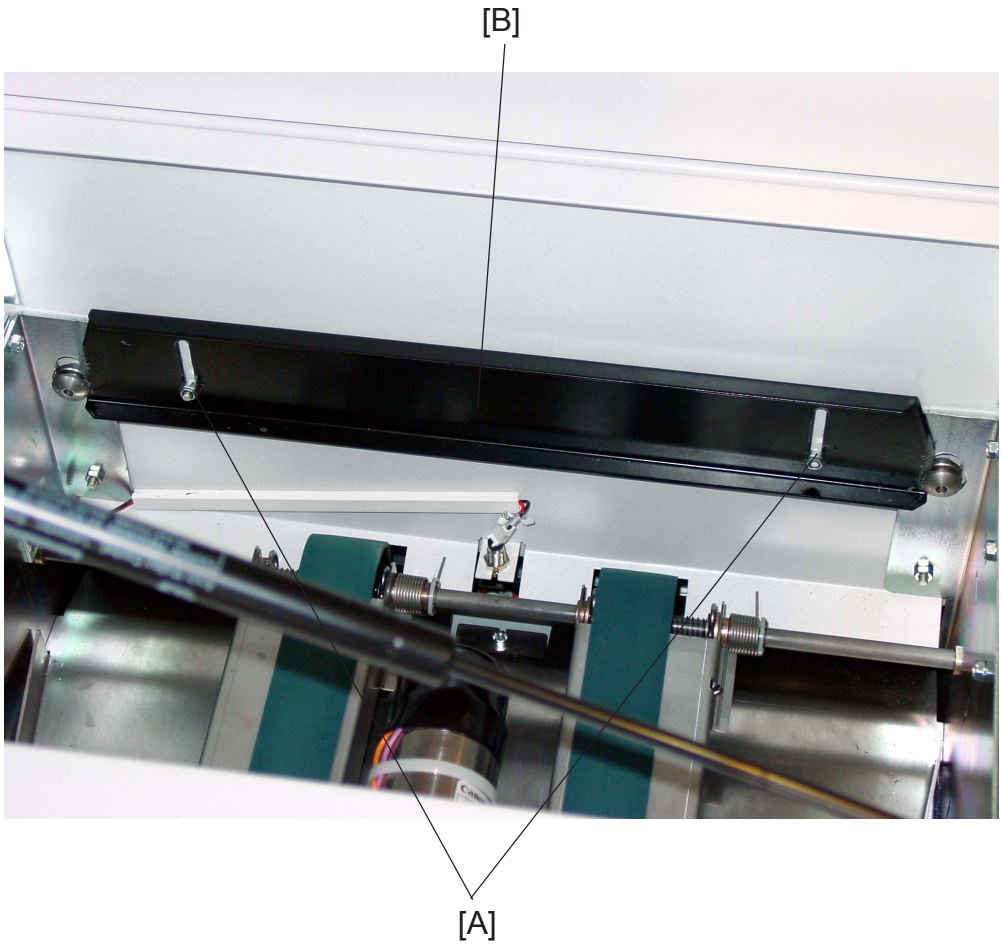
1. Remove the front cover of the Book Folder by removing two screws, and loosening two screws (x 4).
2. Move the Book Folder up to the Trimmer.
3. Adjust the height of the Book Folder, so that the positioning pins [A] on the Trimmer fits in the docking holes [B] on the Book Folder.

   Adjust by turning the four nuts [C] on the Book Folder with the castor tool (one revolution on the nuts is 1,5mm / 1/16” in height). Adjust on the front and rear side.

   NOTE: The Multi tool is located behind the rear cover of the SR90 (x 3).

The distance [F] on the right side, and the left side of the Book folder should be equal.

Docking



1. Loosen nuts [A] to the Locking bracket [B].
2. Dock the Book folder to the Trimmer.
3. Secure the Book folder by lifting the Locking bracket [B] and tightening nuts [A] (x 2).
   NOTE: Make sure that the locking bracket locks in the outer slots on the positioning pins.
4. Install the new Extended trim bin

1.3.4 CONNECTORS

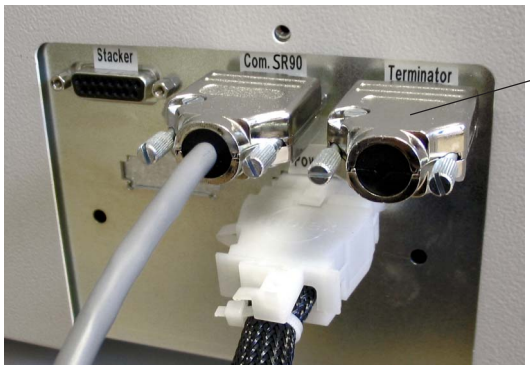


Figure showing the Trimmer TR90

Figure showing the Book Folder BF90

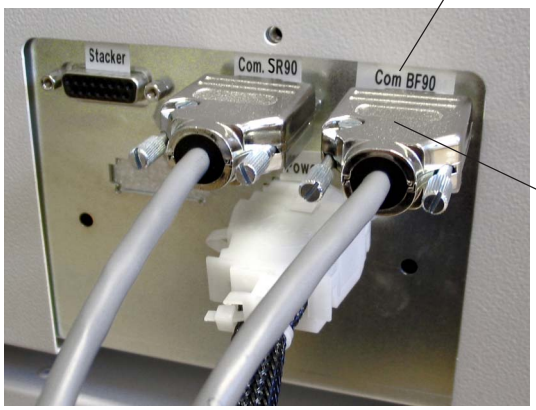


Figure showing the Trimmer TR90

[B]

[A]

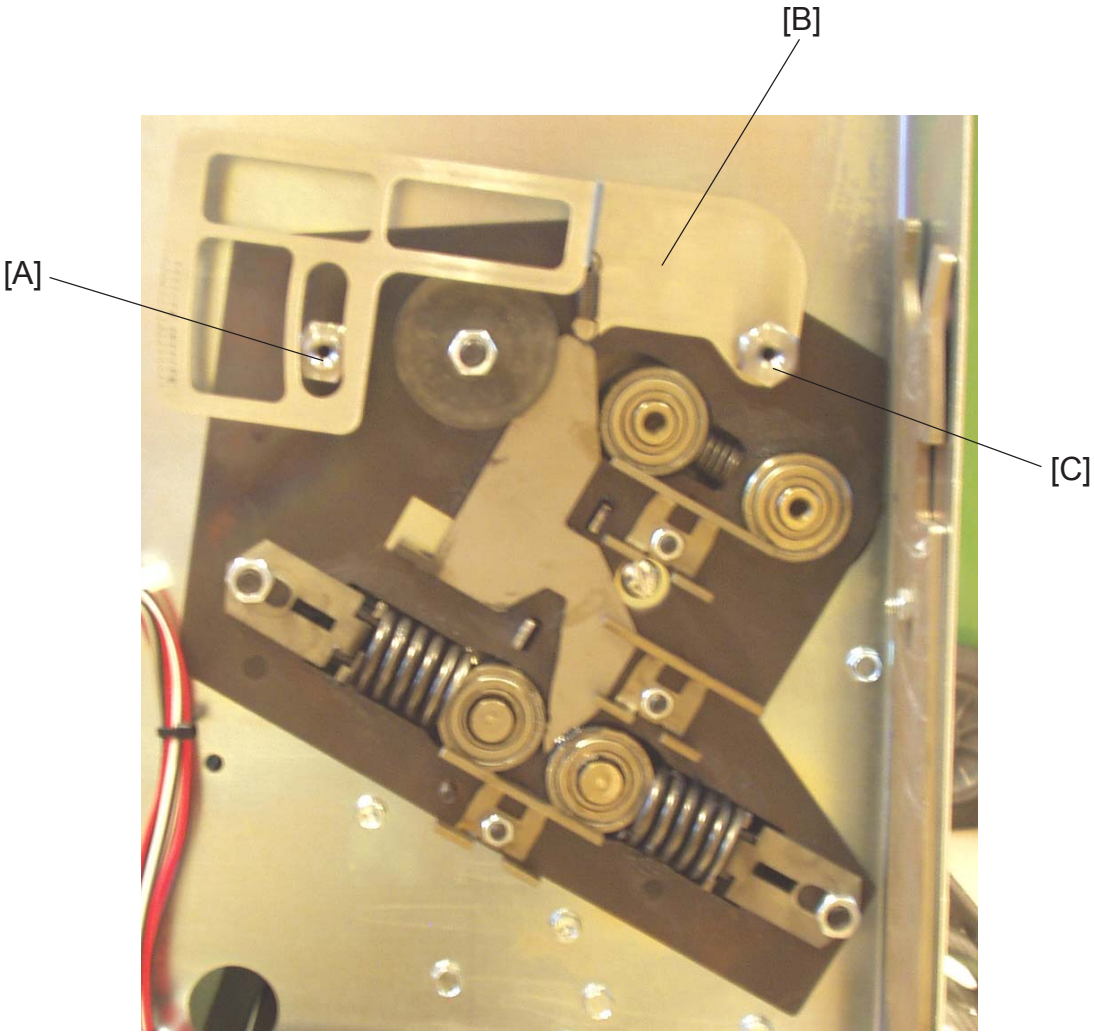
[C]

[D]

1. Connect the Belt stacker cable [A] to the Book Folder (x 1).
   NOTE: Do not connect the Belt stacker cable [A] to the Trimmer.
2. Move the Terminator plug [B] from the Trimmer to the Book Folder (x 1).
3. Install the COM. BF90 sticker [C], from the installation kit, over the “Terminator” sticker on the Trimmer.
4. Install the Communication cable [D] between the Trimmer and the Book Folder (x 1).
5. Hook up the cables on the cable holder on the Trimmer.

1.3.5 AUTO SET THICKNESS BRACKET

Auto set thickness bracket

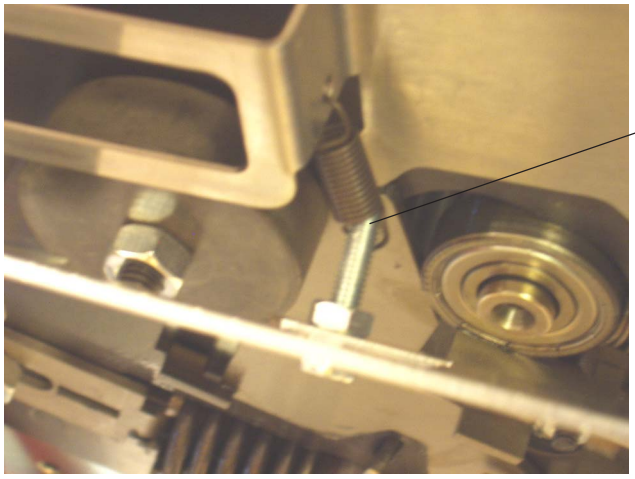


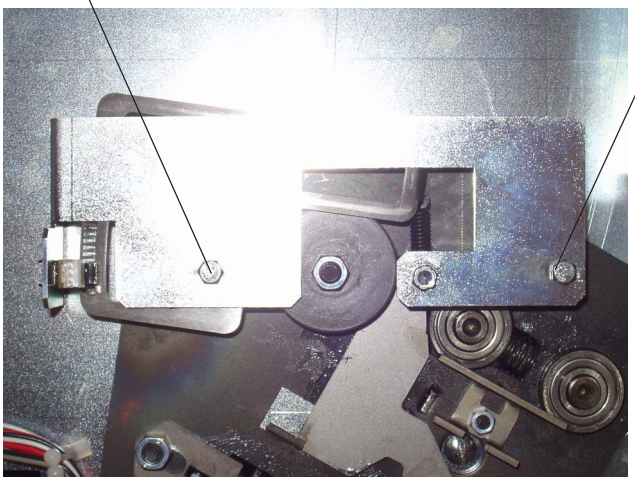
1. Remove the front and rear cover on the Booklet maker ((☛ Service Manual SR90 3.3.1).

⚠ CAUTION
ONLY install spacer pin [A] and [C] finger tight.
Over tightening may brake loos the screw from the Fold roller plate.

2. Install the Spacer pin [A], with the collar out.
3. Install the Auto set thickness bracket [B], and tighten it with the other Spacer pin [C] with the collar in.

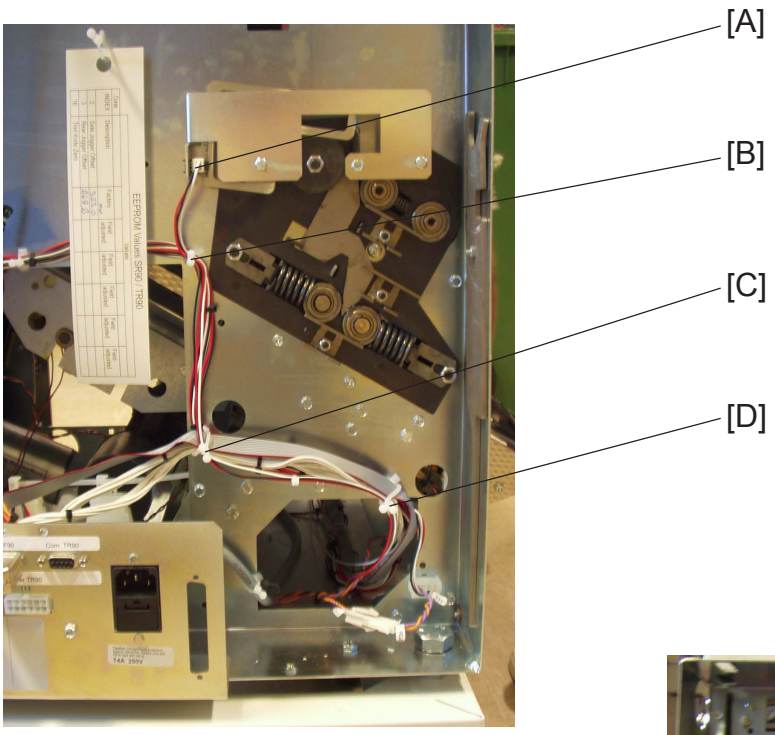
Sensor bracket

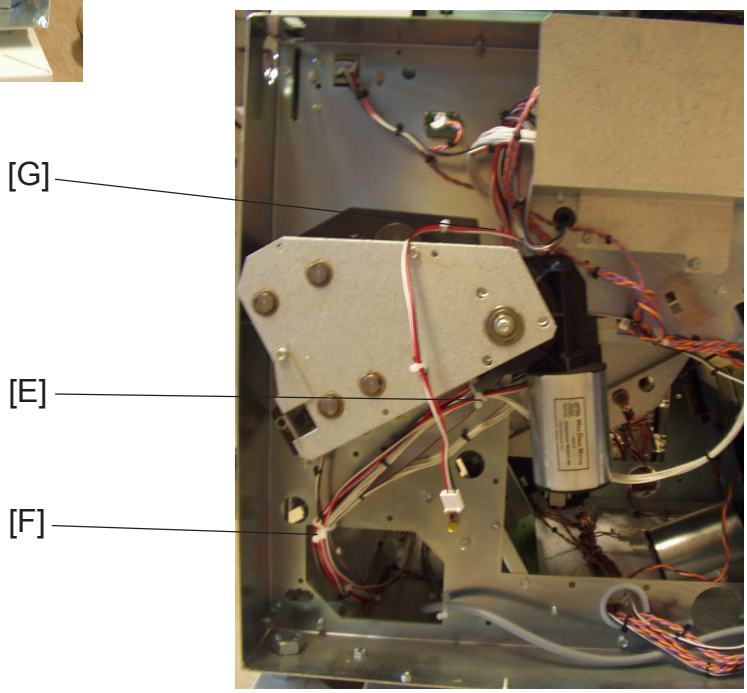




1. Place the spring [A] on the screw on the Sensor bracket.
2. Secure the Sensor bracket by tighten it with the screws [B] & [C] (x 2 torx).
   NOTE: Make sure that the Actuator runs in the sensor slot!

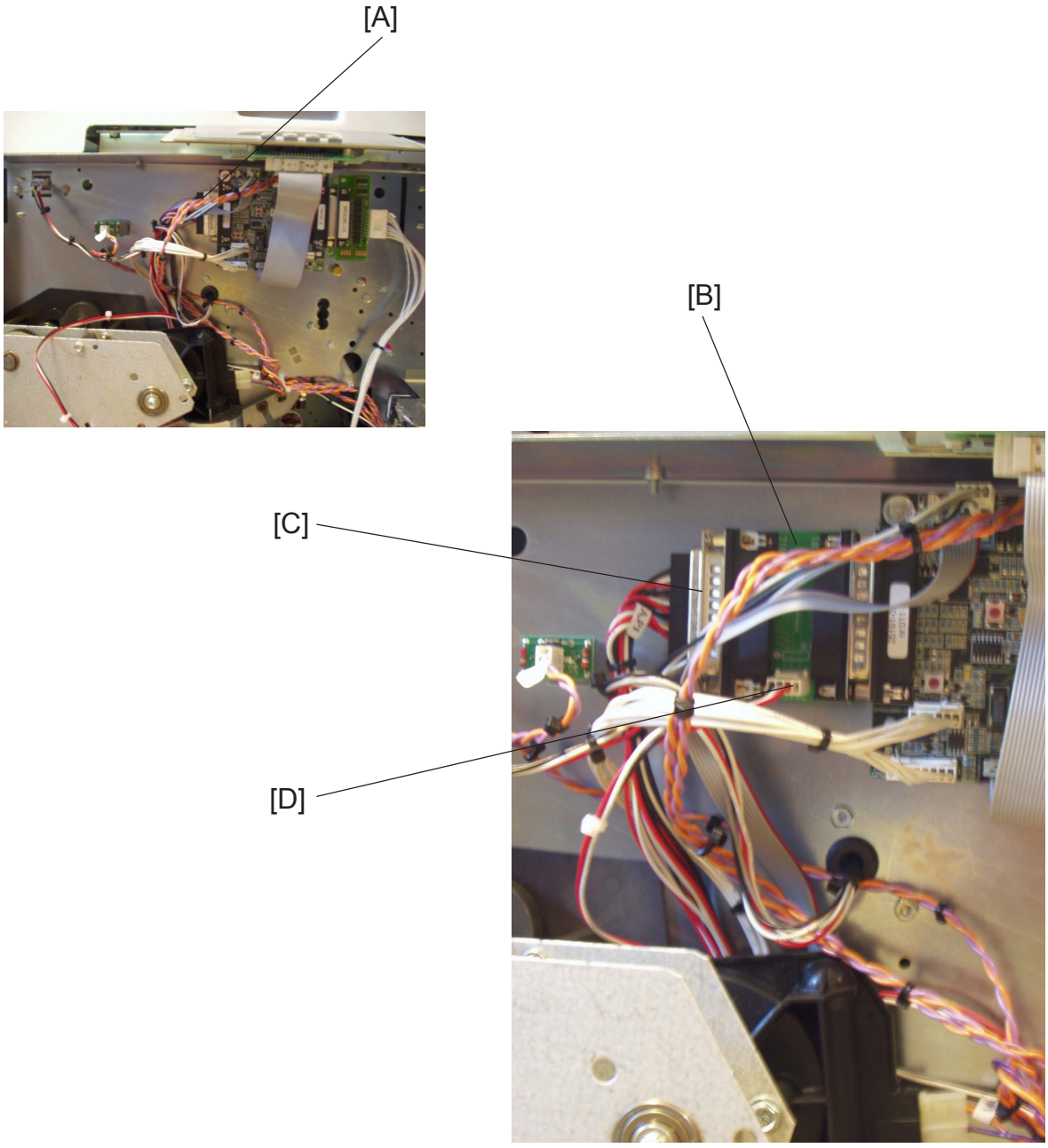
Auto set thickness sensor harness





1. Install sensor harness to sensor BM-Q21 [A] on the Sensor bracket (x 1).
2. Rout the harness through cable holders [B, C & D].
3. Continue routing the harness through the Booklet maker, to the front side.
4. Continue routing the harness through the cable holders [E & F], and behind Fold motor M6 [G].

Install Adapter PWB



1. Remove the protection cover to the CPU PCB, by loosening two screws (x 2).
2. Remove the D-sub cable [A] from the CPU PCB (x 1).
3. Install the Adapter PWB [B] to the CPU PCB.
4. Install the D-sub to the Adapter PWB [C] (x 1).
5. Install the Sensor harness to the Adapter PWB [D] (x 1).

1.3.6 LOAD NEW SOFTWARE TO SR90 CPU

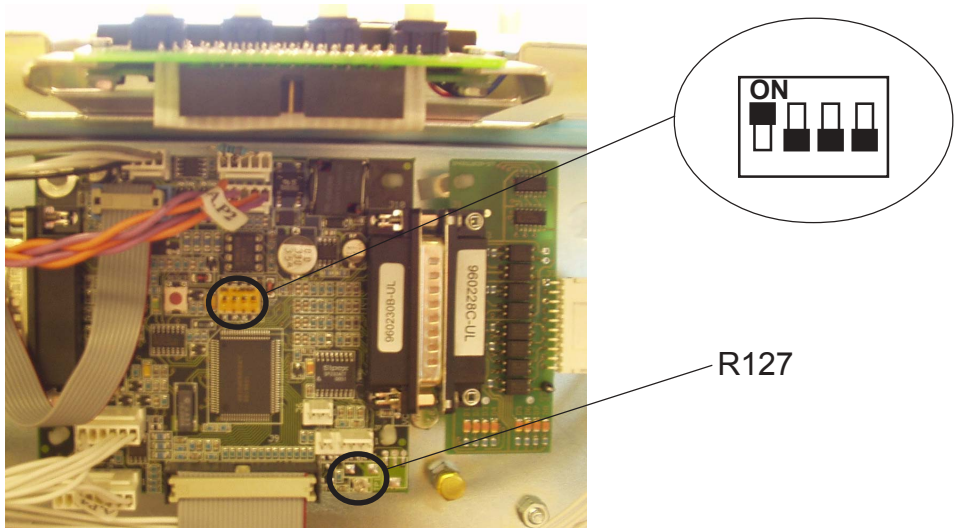
⚠ CAUTION

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 - Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure ((☛ 3.1).

When Installing the Book folder to the SR90 system, you will have some differences in the Service menu, such as BF90 Service. Therefore do you need to perform an EEPROM reset AFTER loading the new software to the SR90 CPU

1. Make sure that the Main Power is Off on the SR90.
2. Remove the Front Cover on the SR90 (Service Manual SR90 (☛ 3.3.1).
3. Set DIP-switch 1 to ON (up) position. When PWB Adapter is installed on the SR90 CPU PCB, DIP-switch 1 should always be set to ON.

   NOTE: When the PWB Adapter is NOT installed on the SR90 CPU PCB, all DIP-switches 1 - 4 should be set to normal OFF (down) position.
4. Run the SR90 CPU v2.01.exe file and follow the instruction in the program, or according to the latest bulletin.
5. When the download is complete, set the contrast of the LCD by turning the potentiometer R 127 (Service Manual SR90 (☛ 4.4).



1.3.7 EEPROM RESET

⚠ 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 - Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure ((☛ 3.1).

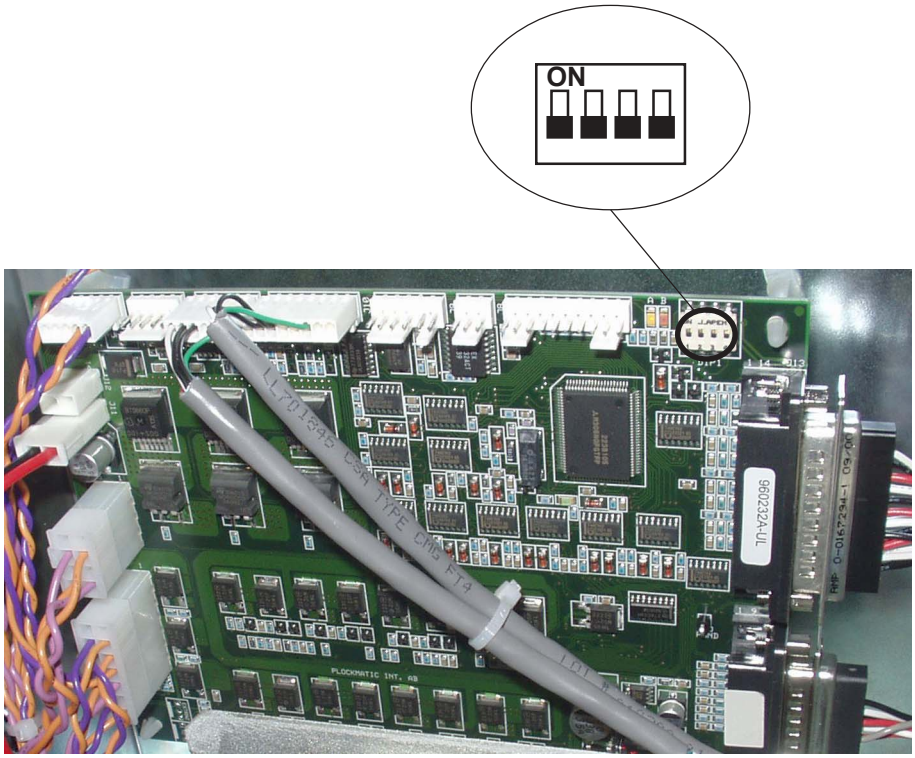
1. Make sure the main power to the Booklet maker is switched off.
2. Move DIP-switch 4 to up position on the SR90 CPU PCB.
3. Press and hold the leftmost button on the Control Panel.
4. Switch ON the main power switch.
5. Release the button on the Control Panel.
6. The text CLEARING EEPROM followed by DONE will be shown on the LCD:
7. Key in the password, press the OK button.
8. Press the ESC button.
9. Switch off the main power to the Booklet maker.
10. Move DIP-switch 4 back to down position on the SR90 CPU PCB.
11. Switch on the main power switch.
    - Default EEPROM values are restored.

1.3.8 LOAD NEW SOFTWARE TO TR90 MD6DC

⚠ 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 - Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure ((☛ 3.1).

1. Switch Off the Main Power Switch.
2. Remove Rear Cover ((☛ TR90 Service Manual 1.1.1).
3. Make sure all DIP-switches 1 - 4 is set to OFF (down) position.
4. Run the TR90 MD6DC v2.00.exe file and follow the instruction in the program, or according to the latest bulletin.



1.3.8 PAPER SIZE RESET

Executing Paper Size Reset

After the new software is loaded, it is important to perform a Paper size reset ((☛ Service manual SR90 5.4).

1.3.9 ENABLING THE BF90

1. Connect the power cord to the Book Folder [A] (x 1).
2. Power on the Book Folder.
3. Enter the service mode on the Booklet Maker by pressing and holding the leftmost menu button while powering on the Booklet Maker.
   NOTE: Do not enter the service mode through the Tools menu.
4. Key in the password.
5. Scroll down to BF90 Service and press the OK button.
6. Press the CHG button, so the “Installed:” is set to YES.
7. Press the OK button
8. Make sure that the stapler heads are removed, according to SR90 Service Manual ((☛ Service manual SR90 3.4.12).
9. Perform a self diagnosis.
   - Scroll up to Diagnostic and press the OK button.
   - Press the RUN button.
   - If the Diagnostic is OK, continue.
10. Power off the Booklet Maker.
11. Power off the Book Folder.
12. Reinstall the stapler heads according to SR90 Service Manual section ((☛ Service manual SR90 3.4.12).

Figure showing the Book Folder BF90

1.3.10 CHECK THE INSTALLATION

1. Power on the Book Folder.
2. Power on the Booklet Maker.
3. Power on the Printer.
4. Set up the Booklet Maker to Auto Paper size.
5. Set up the Book Folder to Auto.
6. Run five 10 sheet booklets of A3 (40 pages of A4 = a booklet containing 10 sheets of A3).
7. Check that the booklet has a square formed spine.
8. Run five 2 sheet booklets of A3 (8 pages of A4 = a booklet containing 2 sheets of A3).
9. Check that the booklet ***not*** has a Book folded spine.

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2 PREVENTIVE MAINTENANCE SCHEDULE

2.1 PM TABLE

NOTE: Amounts mentioned as the PM interval indicate the number of square folded sets.

Service interval: 200 000

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.

Symbol key: **C**: Clean, **R**: Replace, **L**: Lubricate, **I**: Inspect

BF90	200K	400K	NOTE	REFERENCE
All machine, paper path etc.	C	C	Blower brush.	
Sensors.	C	C	Blower brush.	Section 6
Transport belt.	C/I/R	C/I/R	Alcohol.	3.6.1 & 3.6.2
Pressure roller.	I/R	I/R	Inspect O-rings and pressure roller*. Change position of wear point of pressure roller. Replace Complete assy if needed.	3.4.4
Link Arms for Clamps.	I/R	I/R	Inspect Link Arms for wear. Replace if needed.	3.7.1
Lower Clamp	L	L	Check that the lower Clamp moves, when pressed by upper Clamp. Grease 501.	3.7.1
Upper Clamp	L	L	Grease 501.	3.7.1
Brass Guides	L	L	Grease 501.	3.7.1
Teflon Tape	I/R	I/R	Inspect, Replace if needed.	3.6.3
Dampers	R	R	Replace dampers. Adjust stop gage	3.7.2

* To prevent flatness of pressure roller.

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3. REPLACEMENT AND ADJUSTMENT

3.1 GENERAL CAUTIONS

⚠ CAUTION

Turn off the main power switch and unplug the machine before attempting any of the procedures in this section

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

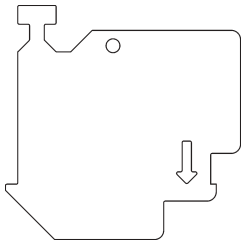
ESD Hazard! ESD (Electrostatic Discharge) can cause software crashes, data and/or communications problems. Failure to use proper ESD procedures will cause damage to electronic components (example: PCBs). ESD problems can be minimized by maintaining all machine ground connections, ensuring the proper handling of circuit boards/ sensors, refer to this procedure 3.1.
- Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.

3.2 SPECIAL TOOLS AND LUBRICANTS

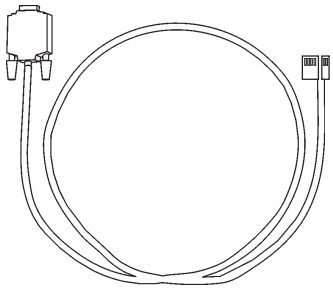
3.2.1 SPECIAL TOOLS

In order to facilitate the service of the BF90 there are a few special tools needed. Where part number is written it can be purchased from your supplier.

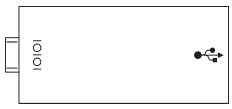
Tools are common with the tools in the SR90.



Interlock cheater



Software loading cable



USB converter

NOTE: For the BF90 system not to be interlocked (interlocked=36V interrupted), the Interlock switches must be activated. Use the Cheater to override the interlock for running the system with open top cover:

1. Hold the Cheater above the interlock so the arrows meet.
2. Put in the left end in the slot so it hooks under the bracket.
3. Push the Cheater down and to the right so it latches in place.

NOTE: Pull out the Trim bin to locate the Cheater.

3.2.2 REQUIRED TOOLS

Same tools as required for the SR90, plus:

Open wrenches:
13 mm

3.2.3 LUBRICANTS

Lubricants are common with the Lubricants in the SR90.

Grease:	**Part number:**
Grease : KS660 : SHI	G004-9668
Grease 501	5203-9502
Oil:	
Launa oil 40	5442-9103

3.2.4 SYMBOLS USED IN TEXT

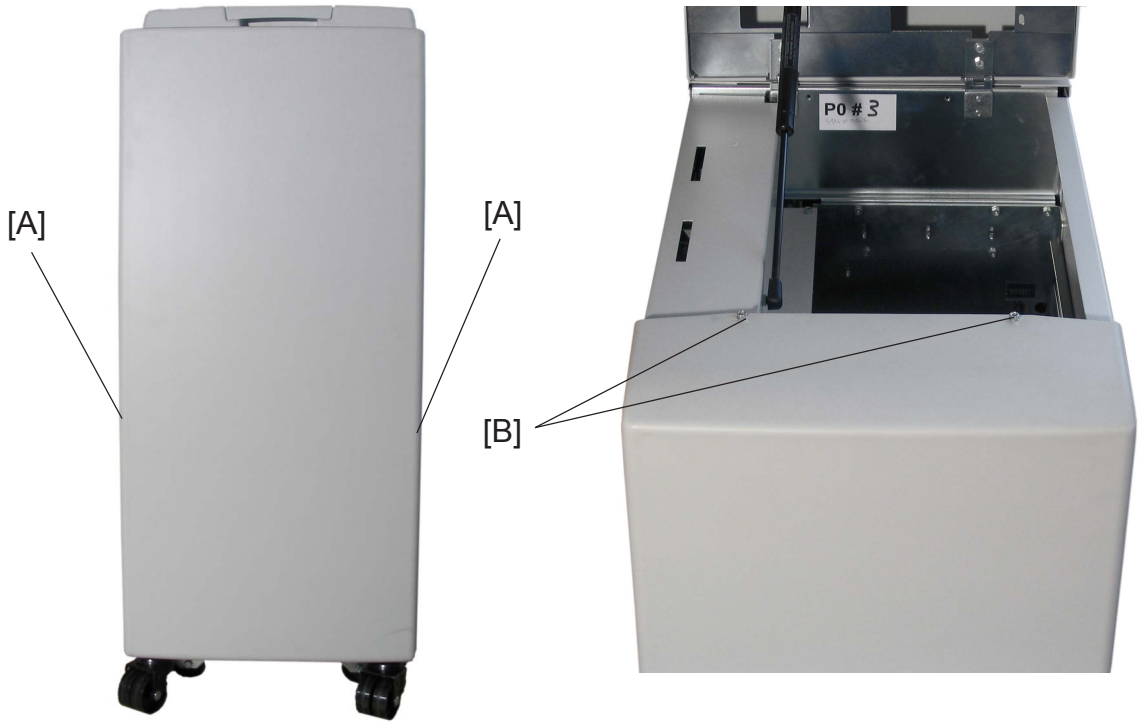
Go to section: Screw: Nut: Connector:

Allen screw: E-clip: Spring: Washer:

Use a Screwdriver: R-pin:

3.3 COVERS

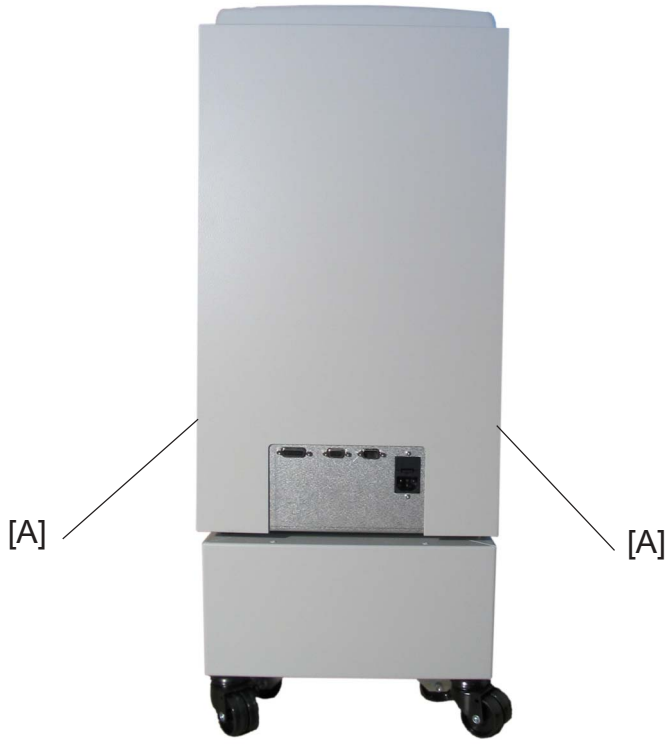
3.3.1 FRONT COVER



Removal

1. Open top cover.
2. Remove screws [A] (x 2).
3. Loosen screws [B] (x 2)

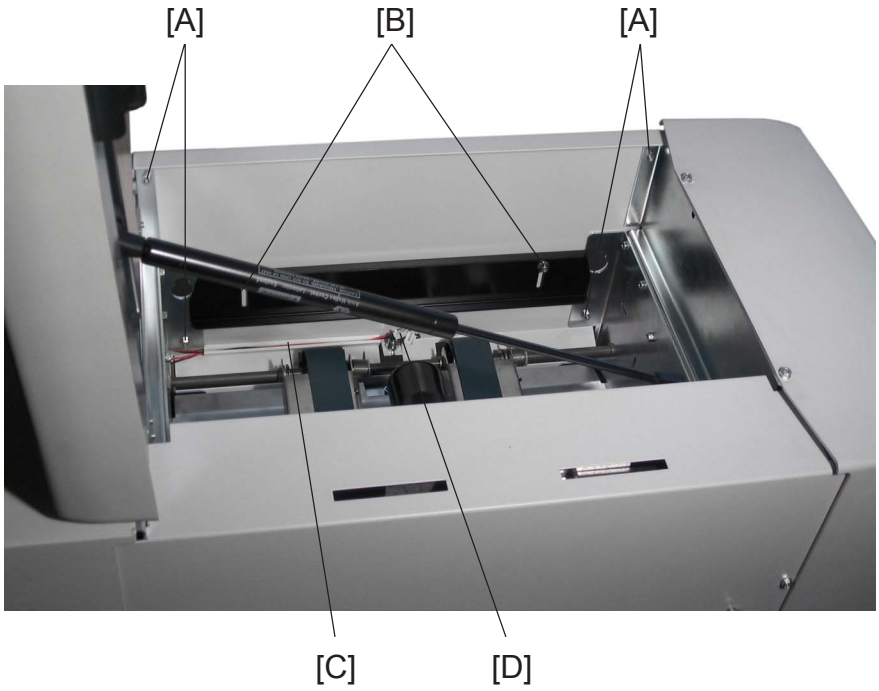
3.3.2 REAR COVER

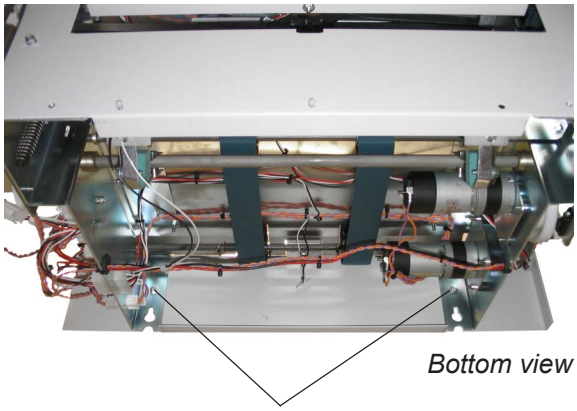


Removal

1. Loosen screws [A] (x 2).
   NOTE: Lift out lower part and unhook the Rear cover. REMEMBER to inactivate the External Interlock Device.

3.3.3 INFEED COVER





Bottom view

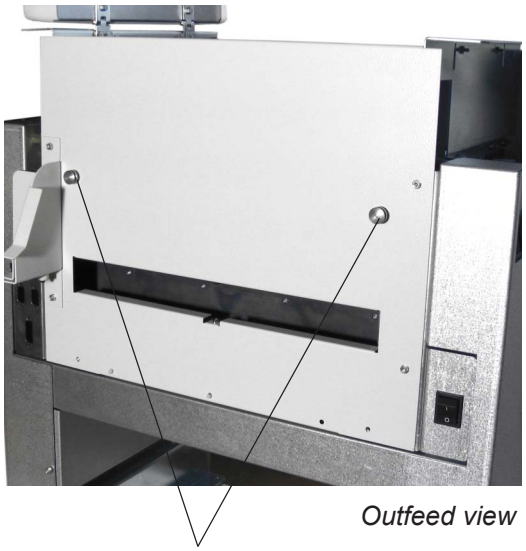
Removal

1. Open Top cover.
2. Remove nuts [A] (x 4).
3. Remove nuts [B] and remove locking bracket (x 2).
3. Use a screwdriver to open the cable holder [C] (x 1).
4. Remove connector [D].
5. Tilt machine ((3.3.6).
6. Remove nuts [E] (x 2).

Replacement

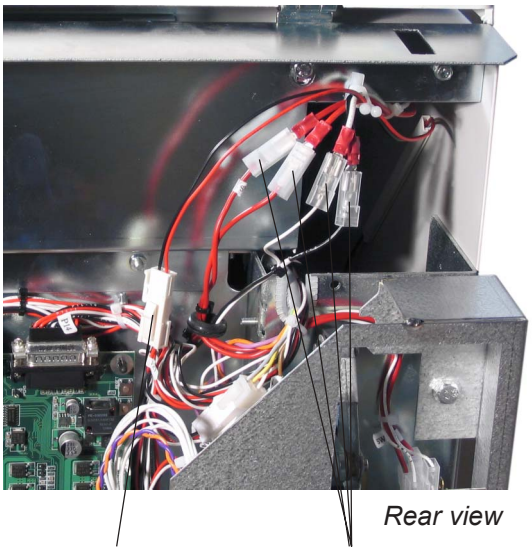
4. Reverse the removal procedure.
   NOTE: Make sure that the springs to the Upper Transport Belts are in correct position.

3.3.4 OUTFEED COVER



Outfeed view

[A]



Rear view

[C] [B]

[D]

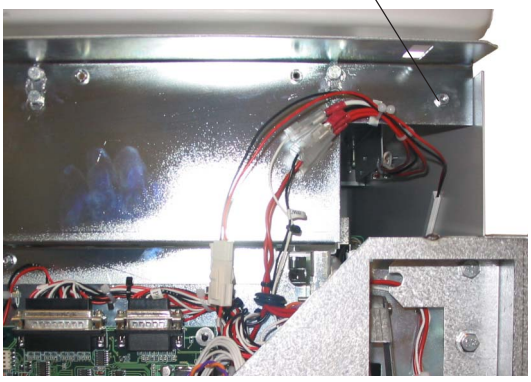
Removal

1. Remove Front and Rear cover ((☛ 3.3.1, 3.3.2).
2. Remove Positioning pins [A] (x 2).
3. Disconnect Interlock wiring [B] (x 4).
   NOTE: Replacement by wire colour.
4. Disconnect wiring to sensor Q7 LED [C] (x 1).
5. Remove Top cover gas spring lower end from joint [D].
   NOTE: Press plastic stud from pivot point.

3.3.4 OUTFEED COVER, CONTINUES

Outfeed view

[E] [F] [F] [F]



Rear view

Front view

[G]

Top view

6. Remove the External Interlock Device, by Removing screws [E] (x 2).
7. Remove screws [F] (x 6).
8. Lift Out feed cover carefully and disconnect wiring to sensor Q7 Phototransistor [F] (x 1).

3.3.5 TOP COVER

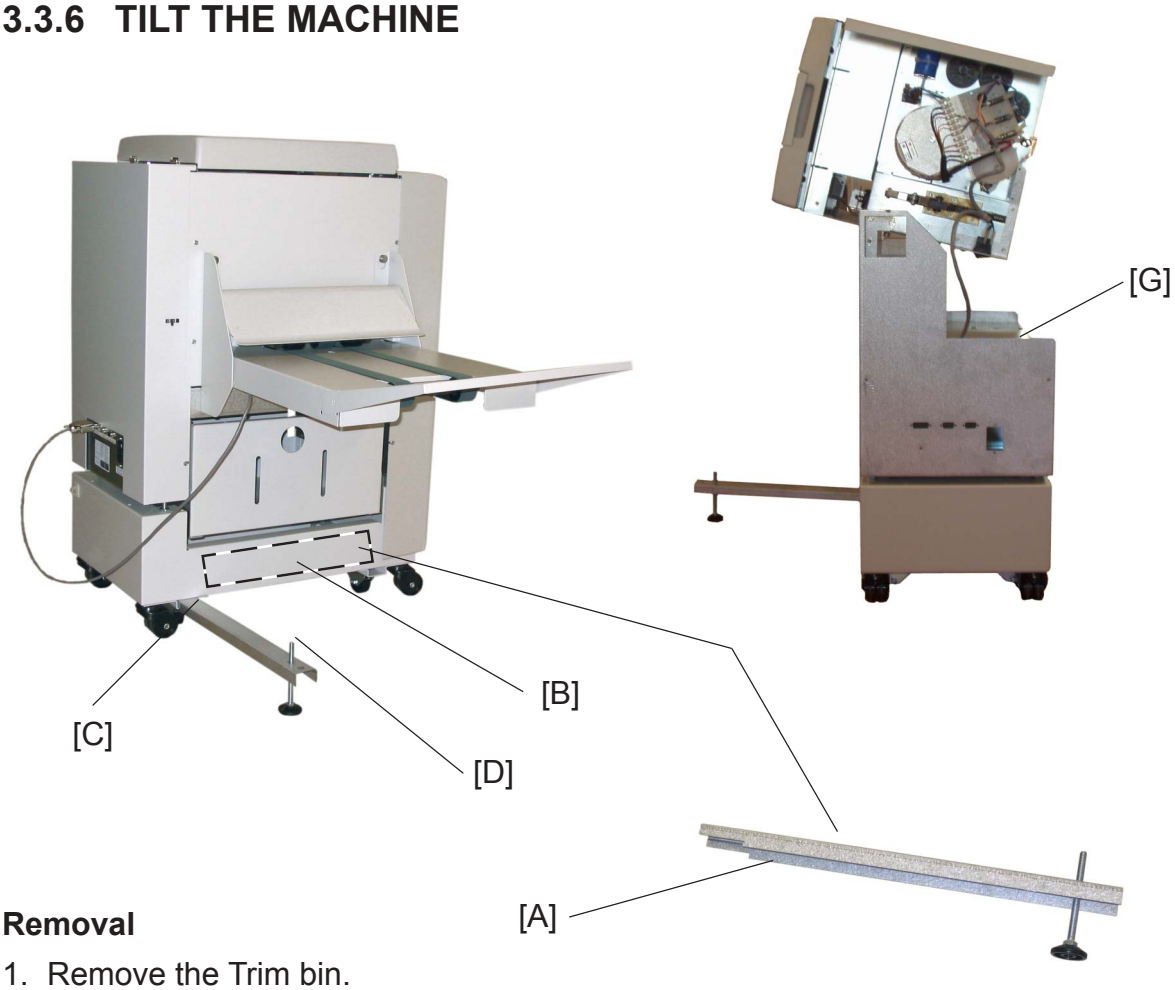
[A]

[B] [C]

Removal

1. Open Top cover.
2. Remove Top cover gas spring lower end from joint [A].
   NOTE: Press plastic stud from pivot point.
3. Remove screws [B] (x 4).
   NOTE: Nut plates (looking like [C]) will come loose inside Top cover.

3.3.6 TILT THE MACHINE



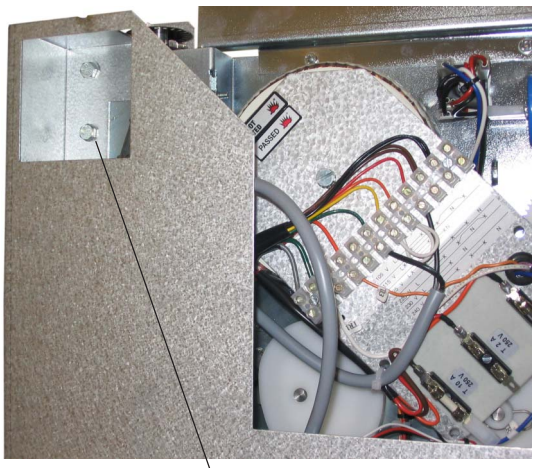
Removal

1. Remove the Trim bin.
2. Remove the Service bracket [A] from the Book folder base [B].
3. Place the Service bracket in the Book folder base [C].
4. Turn screw [D] on the Service bracket, until the Service bracket firmly contacts the floor.
5. Remove the screw [G] securing the machine with the base.
   NOTE: The screw is only used at the factory.
6. Remove the External Interlock Device (x 2).
7. Remove Front cover ((3.3.1).
8. Remove screw [E] (x 1).
   NOTE: Keep the screw. It will be used later.
9. Remove Rear cover ((3.3.2).
10. Remove screw [F] (x 1).
    NOTE: Keep the screw. It will be used later.
11. Tilt machine by lifting infeed cover.

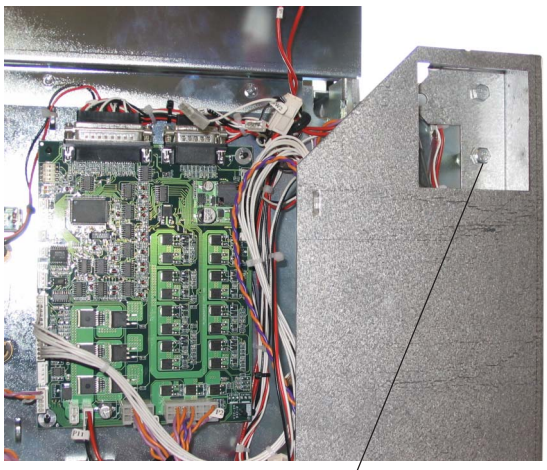
⚠ CAUTION

When lowering or raising the machine, lift in infeed area only.

3.3.6 TILT THE MACHINE, CONTINUES



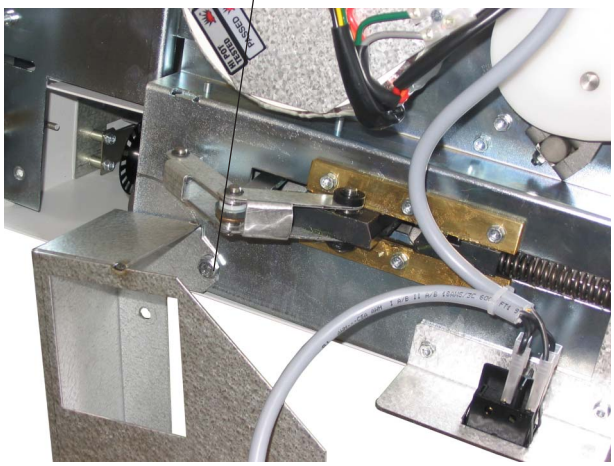
Front view



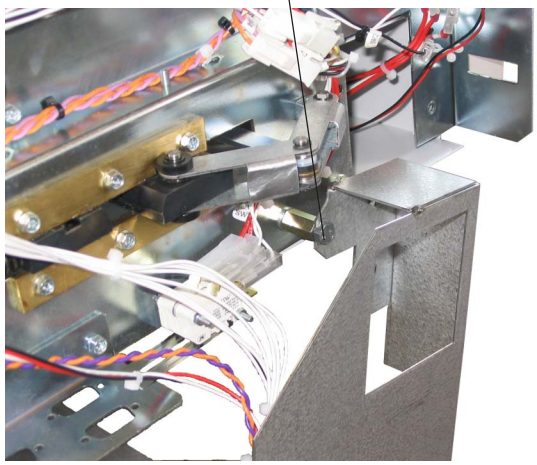
Rear view

[E]

[F]



Front view, machine tilted

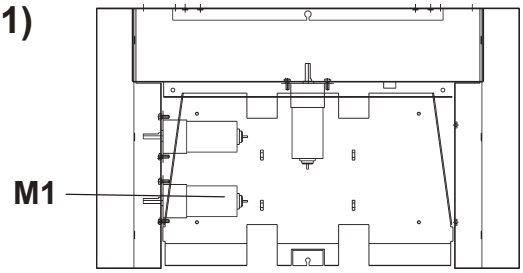


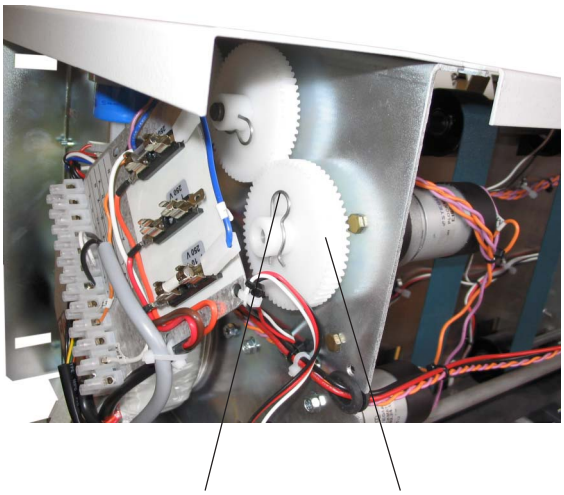
Rear view, machine tilted

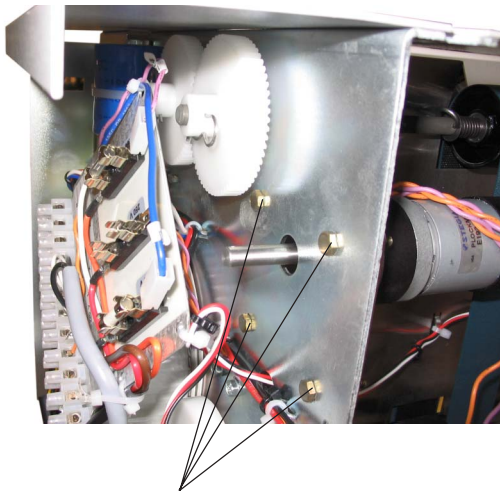
11. Secure machine with the screw [E] removed earlier (x1).
12. Secure machine with the screw [F] removed earlier (x1).

3.4 MOTORS

3.4.1 TRANSPORT BELT MOTOR (M1)







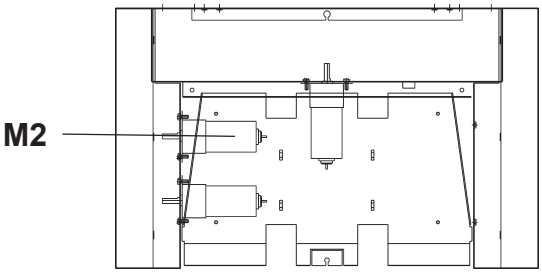
Removal

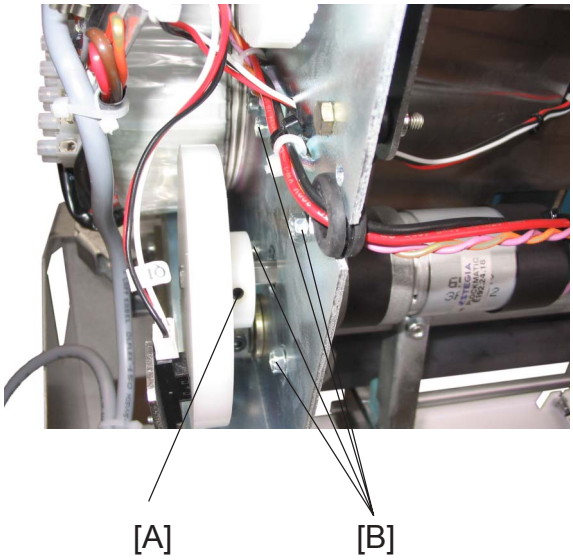
1. Tilt machine ((☛ 3.3.6).
2. Remove R-pin [A] (x 1).
3. Remove sprocket [B].
4. Disconnect the motor connectors (x 2) .
5. Remove screws [C] (x 4).
6. Remove Motor.

Replacement

1. Reinstall the motor, and secure it by tighten screws [C] (x 4).
2. Connect the motor connectors (x 2) .
   NOTE: The Orange wire on ”+”, and the Violet wire on ”-”.
3. Reverse the rest of the removal procedure.

3.4.2 STOP GATE MOTOR (M2)





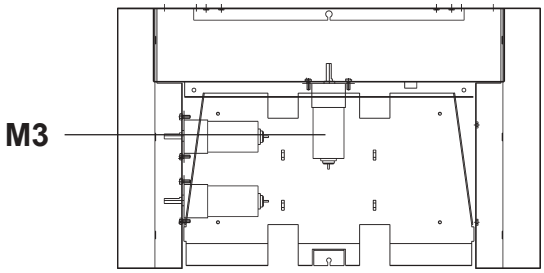
Removal

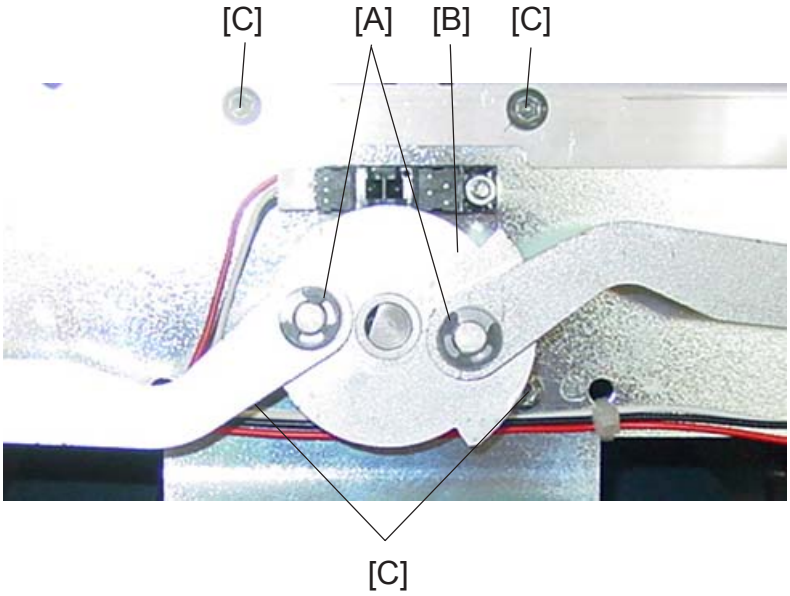
1. Tilt machine ((☛ 3.3.6).
3. Remove cam by loosening allen screw [A] (x 1).
4. Remove screws [B] (x4).
5. Disconnect the Motor (x 2).
6. Remove Motor.

Replacement

1. Reinstall the motor, but do not tighten screws [B] (x 4).
2. Connect the motor connectors (x 2) .
   NOTE: The Orange wire on ”+”, and the Violet wire on ”-”.
3. Reverse the rest of the removal procedure.
4. **Perform Stop Gate adjustment B ((☛ 3.7.2).**

3.4.3 CLAMP MOTOR (M3)





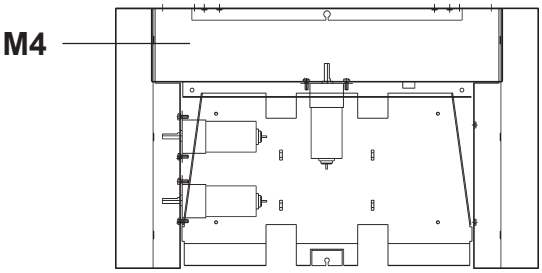
Removal

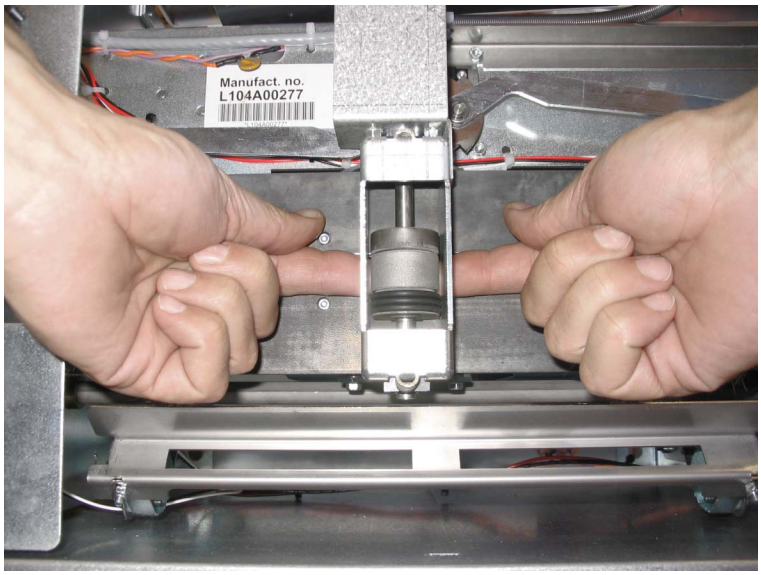
1. Remove Front Cover ((☛ 3.3.1).
2. Remove the E-Clips and Washer [A] (x 2, x 2).
3. Remove the driving disc [B] by loosening allen screw (x 1).
4. Disconnect the motor connector (x 2).
5. Remove screws [C] holding Motor (x 4).

Replacement

1. Reinstall motor, by tighten screw [C] (x 4).
2. Connect the motor connectors (x 2) .
   NOTE: The Orange wire on ”1”, and the Violet wire on ”2”.
3. Reverse the rest of the removal procedure.

3.4.4 ROLLER MOTOR (M4) AND PRESSURE ROLLER



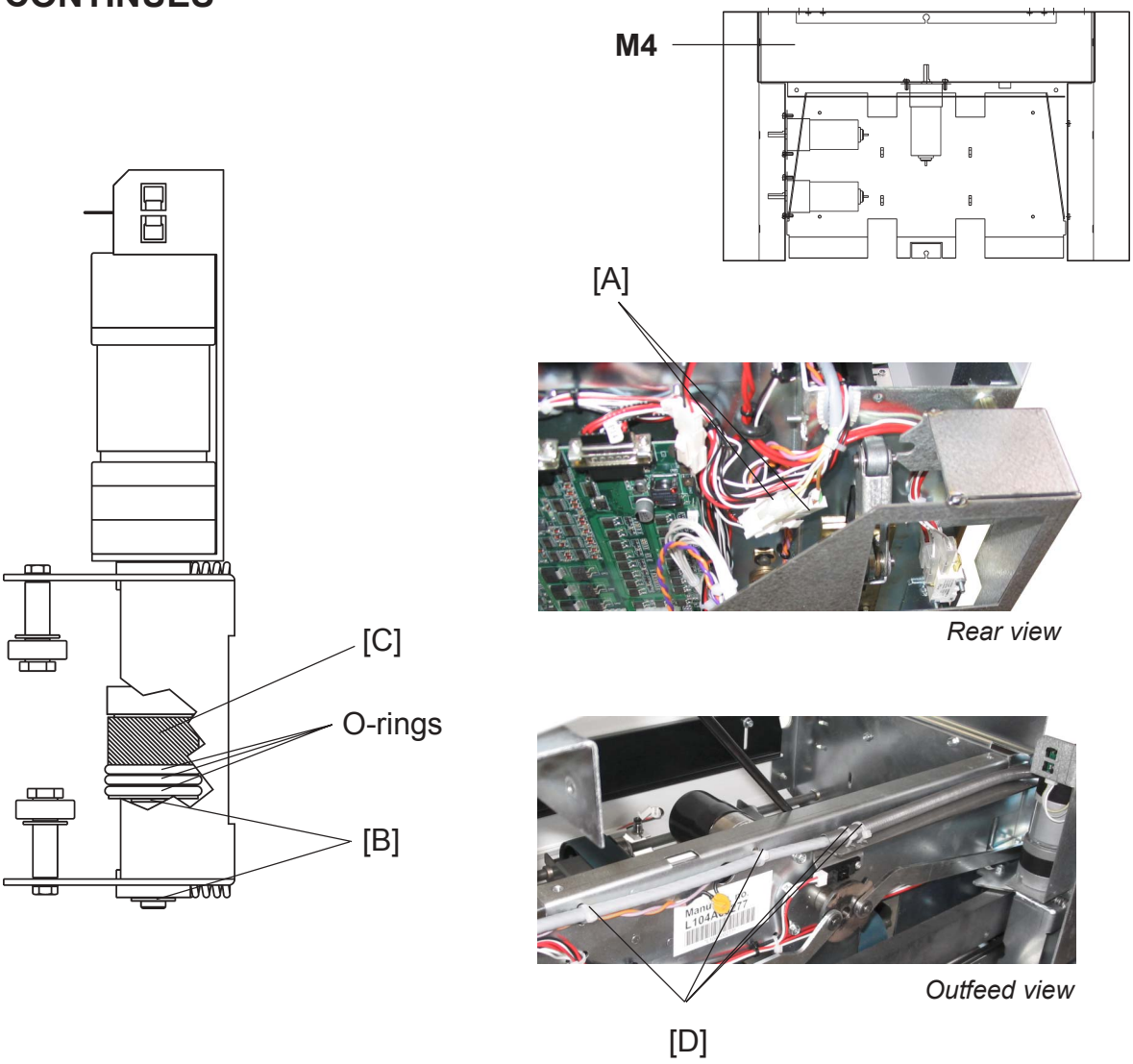


Changing of wear point

The wear point is the area on the roller that strikes the Booklet first, as the roller moves from the home position (left and right).

1. Remove outfeed cover ((☛ 3.3.4).
2. Move Roller Motor Assembly towards centre of clamps.
3. Stop Pressure Roller from moving by pressing with your fingers towards the Pressure Roller and out from the Clamps.
4. Move Roll Motor Assembly 20 to 30 mm's (1") sideways.

3.4.4 ROLLER MOTOR (M4) AND PRESSURE ROLLER, CONTINUES

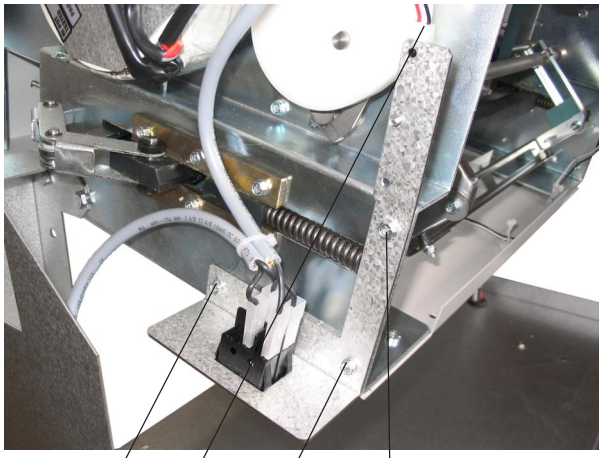


Removal

1. Remove Outfeed cover ((☛ 3.3.4).
2. Disconnect Motor plug M4, and sensor plug J26 [A] from wire harness (x 2).
3. Move Roller Motor assembly towards centre of the clamps.
4. Remove E-Clips [B] (x 2).
5. Lift out Motor and Pressure Roller [C] upwards.
6. Cut cable ties [D] all the way to connectors, when removing complete Motor.

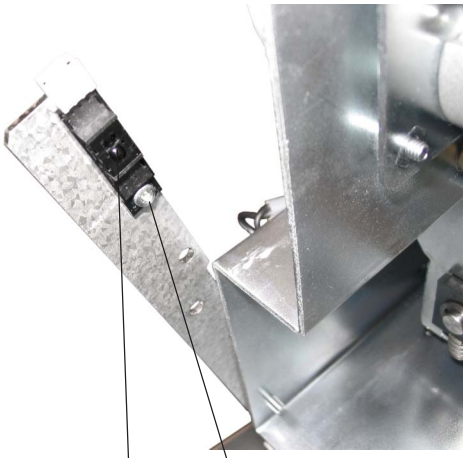
3.5 SENSORS AND SWITCHES

3.5.1 STOP GATE SENSOR (Q1)



Front view, machine tilted

[B] [A] [C] [B]

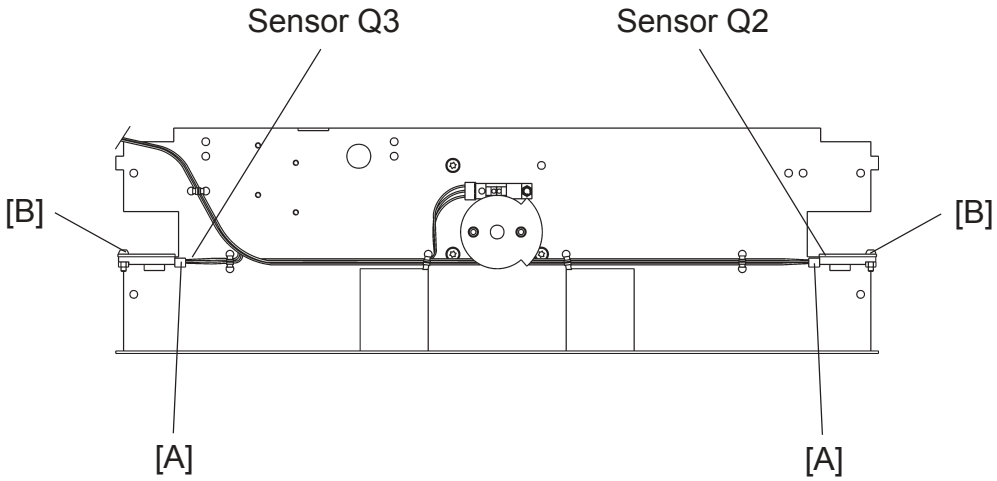


[E] [D]

Removal

1. Tilt machine ((☛ 3.3.6).
2. Disconnect connector [A] (x 1).
3. Remove screws [B] (x 2).
3. Loosen screw [C] (x 1).
4. Remove screw [D] and sensor [E].

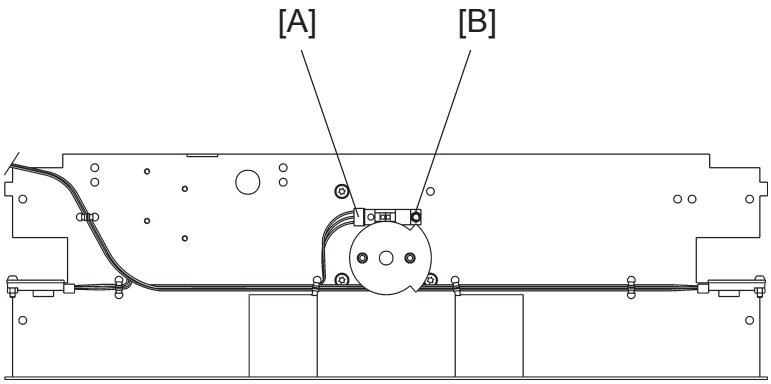
3.5.2 ROLLER MOTOR FRONT / REAR SENSORS (Q2 AND Q3)



Removal

1. Remove Outfeed Cover ((☛ 3.3.4).
2. Move Roller Motor assembly towards centre of the clamps.
3. Disconnect connector [A] (x 1).
4. Remove screw [B] (x 1).

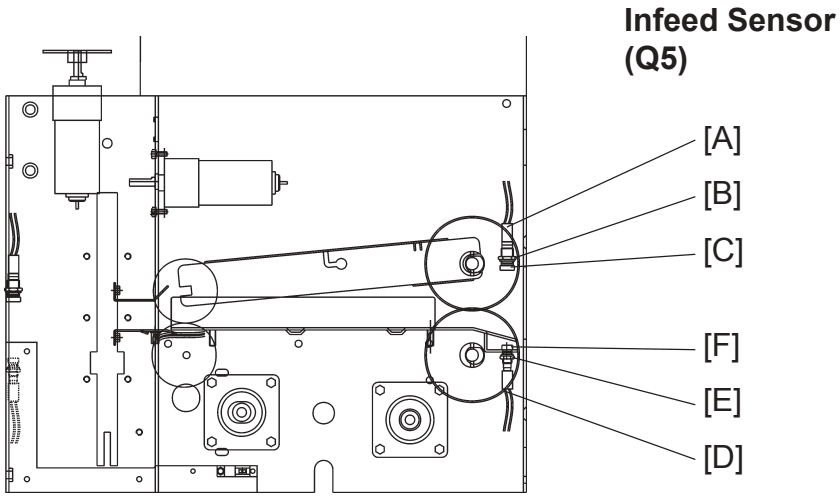
3.5.3 CLAMP MOTOR HOME POSITON SENSOR (Q4)



Removal

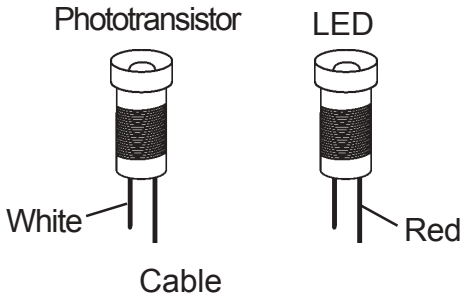
1. Remove Outfeed Cover ((☛ 3.3.4).
2. Disconnect connector [A] (x1).
3. Remove screw [B] (x1).

3.5.4 INFEED / OUTFEED SENSORS (Q5 AND Q7)



Removal Q5, LED

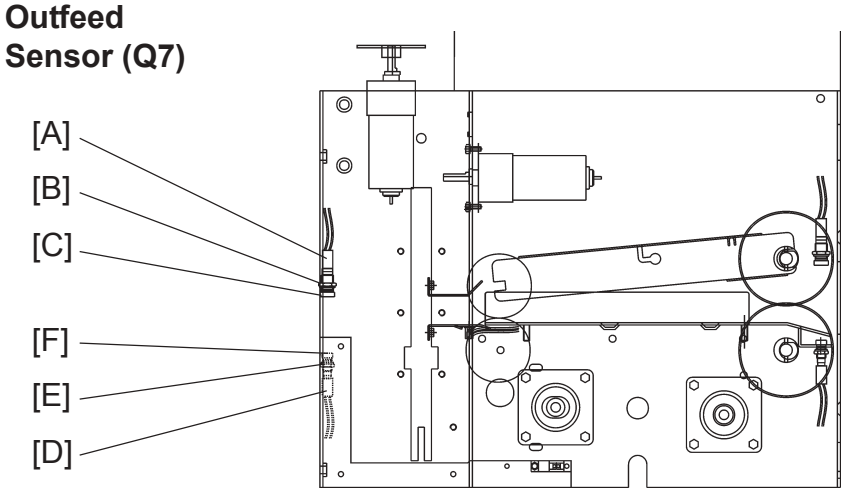
1. Open Top Cover.
2. Disconnect connector [A] (x 1).
3. Remove nut [B] (x 1).
4. Remove LED [C].



Removal Q5 ,phototransistor

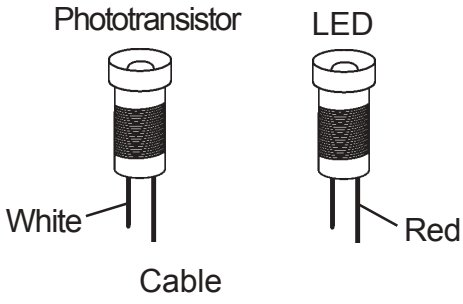
1. Tilt machine ((3.3.6).
2. Disconnect connector [D] (x 1).
3. Remove nut [E] (x 1).
4. Remove Phototransistor [F].

Outfeed Sensor (Q7)



Removal Q7, LED

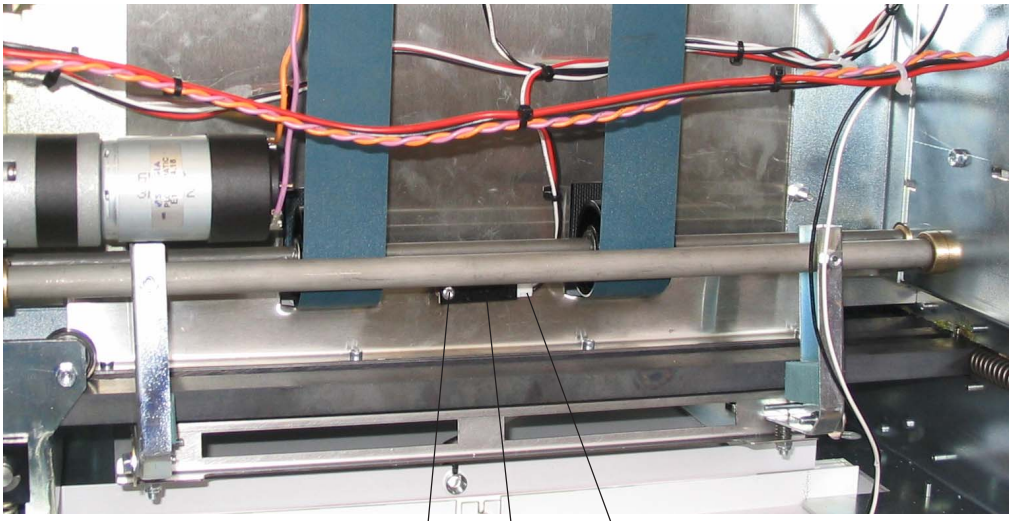
1. Remove Outfeed Cover ((☛ 3.3.4).
2. Disconnect connector [A] (x 1).
3. Remove nut [B] (x 1).
4. Remove LED [C].



Removal Q7 ,phototransistor

1. Tilt machine ((☛ 3.3.6).
2. Disconnect connector [D] (x 1).
3. Remove nut [E] (x 1).
4. Remove Phototransistor [F].

3.5.5 CLAMP SENSOR (Q6)



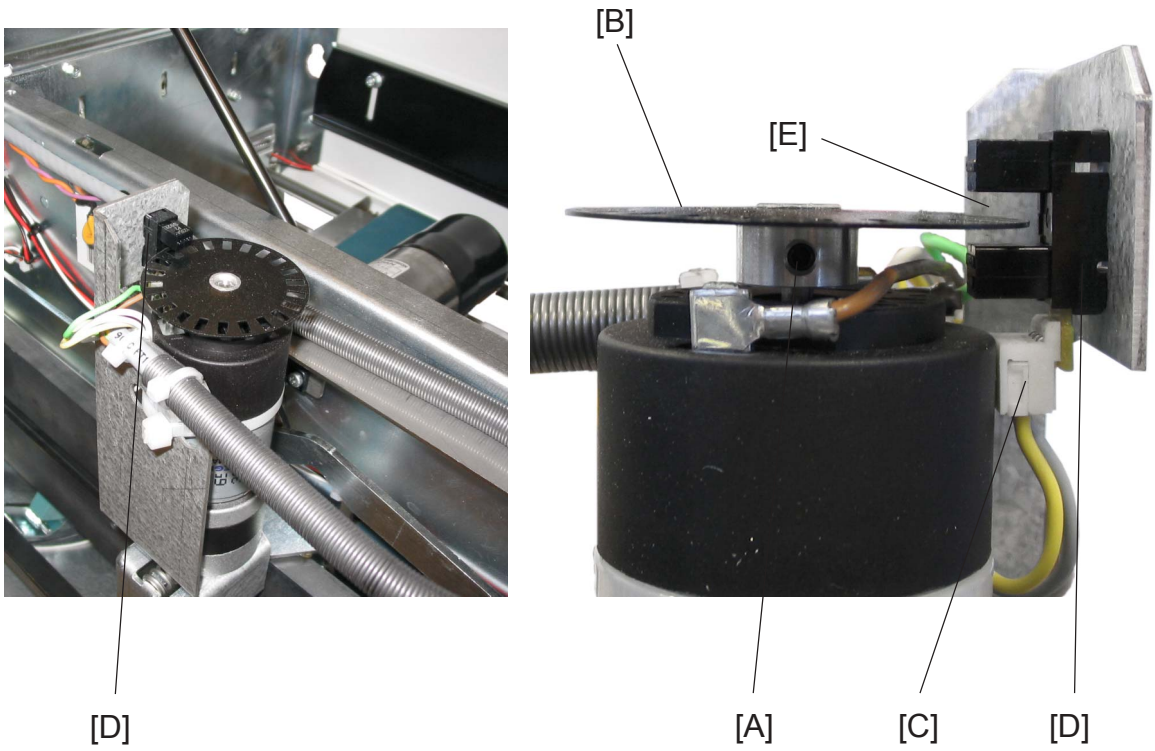
Bottom view

[B] [C] [A]

Removal

1. Tilt machine ((☛ 3.3.6).
2. Disconnect connector [A] (x 1).
3. Remove screw [B] (x 1).
4. Remove sensor [C].

3.5.6 MOTOR M4 ENCODER SENSOR (Q8)



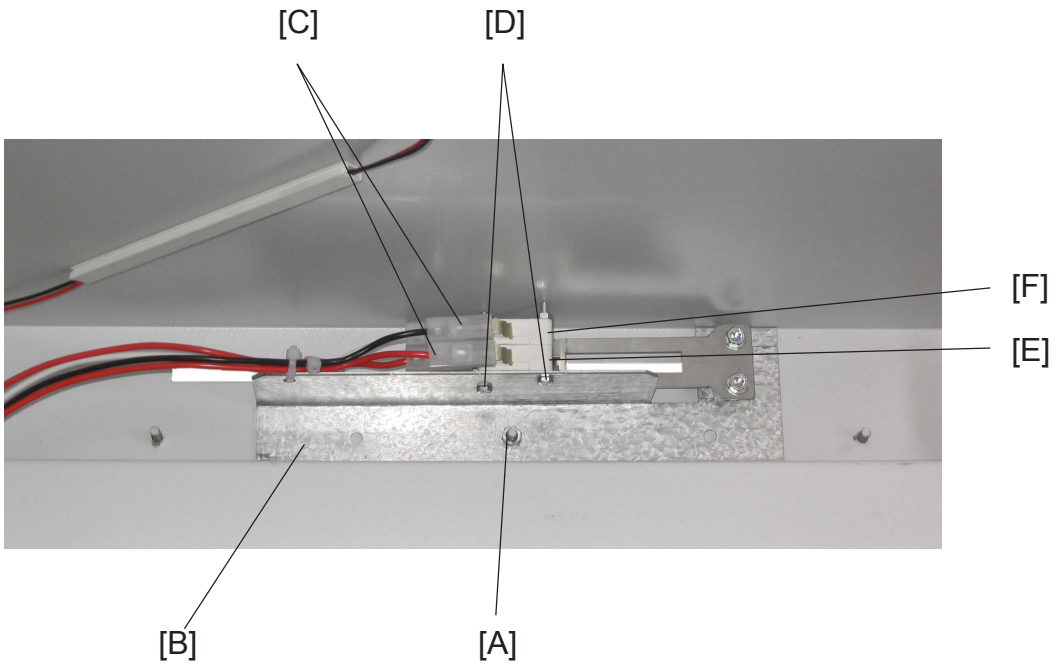
Removal

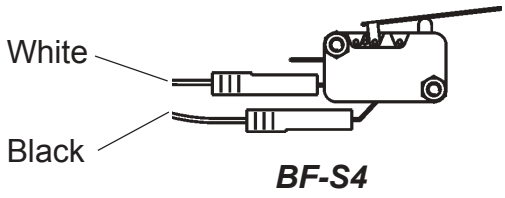
1. Remove Outfeed Cover ((☛ 3.3.4).
2. Loosen allen screw [A] and remove Tacho Disc [B] (x 1).
2. Disconnect connector [C] (x 1).
3. Remove sensor [D].

Replacement

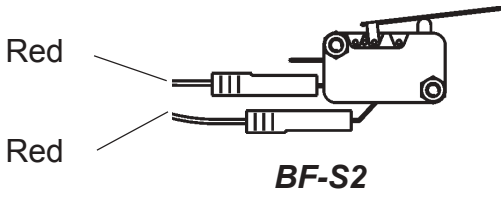
1. Reverse the removal procedure.
   NOTE: Install Tacho Disc in centre [E] of slot in sensor.

3.5.7 TOP COVER INTERLOCK SWITCHES (S2 & S4)





BF-S4



BF-S2

Removal

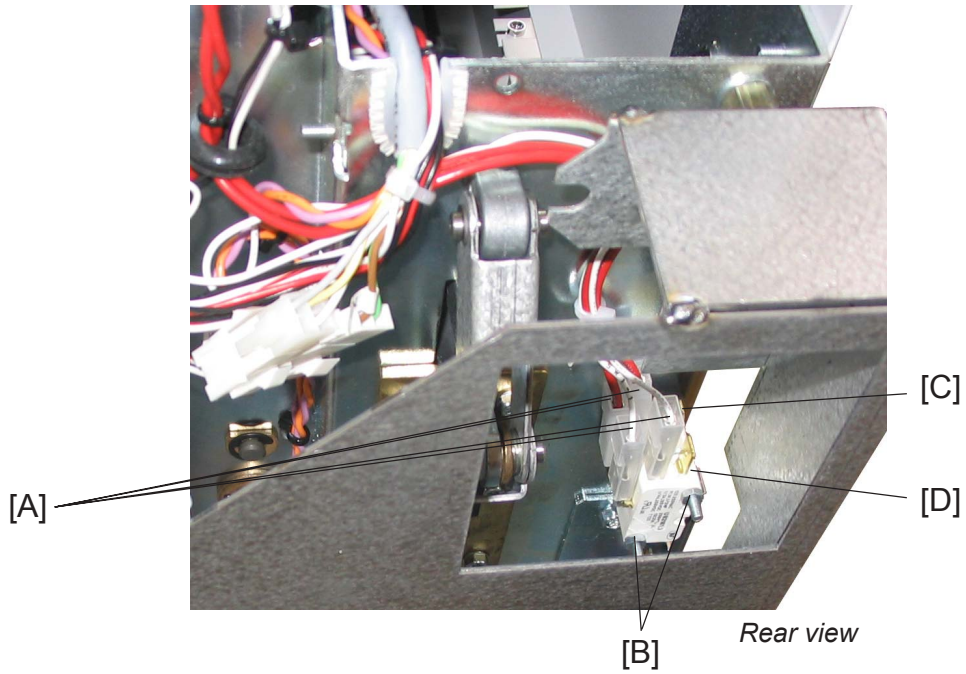
1. Remove Outfeed Cover ((☛ 3.3.4).
2. Remove nut [A] and remove switch bracket [B] (x 1).
3. Disconnect connectors [C] (x 4).
4. Remove nuts and screws [D] (x 2, x 2).
5. Remove switches BF-S4 [E] and BF-S2 [F].

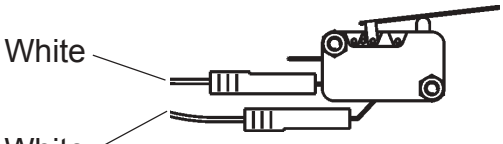
Replacement

1. Connect connectors [C] (x 4).
   NOTE: Connect the connectors according to figures.
2. Reinstall switches BF-S4 [E] and BF-S2 [F].
3. Reinstall the nuts and screws [D] (x 2, x 2).
   NOTE: Do not tighten the nuts to hard, that will result in broken switches.
4. Reverse the removal procedure.

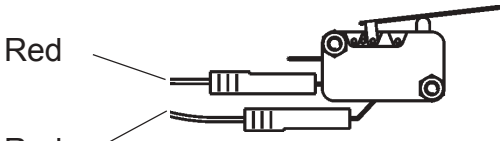
   NOTE: When opening the Top Cover, make sure the soft interlock switch [F] breaks before the hard interlock switch [E].

3.5.8 EXTERNAL INTERLOCK DEVICE INTERLOCK SWITCHES (S1 & S3)





BF-S1



BF-S3

Removal

1. Remove Outfeed cover ((☛ 3.3.4).
2. Tilt machine ((☛ 3.3.6).
3. Disconnect connectors [A] (x 4).
4. Remove nuts [B] (x 2).
5. Remove switches BF-S3 [C] 6 BF-S1 [D] and washer (x 2).

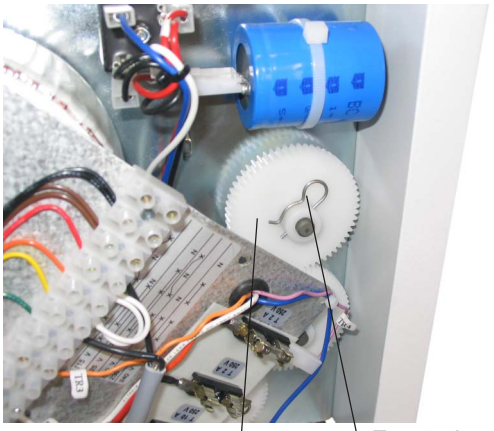
Replacement

1. Connect connectors [C] (x 4).
   NOTE: Connect the connectors according to figures.
2. Reinstall switches BF-S3 [C] and BF-S1 [D].
3. Reinstall the nuts [B] (x 2).
   NOTE: Do not tighten the nuts to hard, that will result in broken switches.
4. Reverse the removal procedure.

   NOTE: When opening the Top Cover, make sure the soft interlock switch [D] breaks before the hard interlock switch [C].

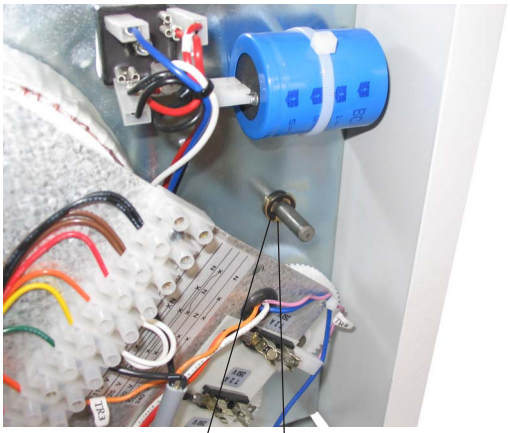
3.6 BELTS

3.6.1 UPPER TRANSPORT BELT



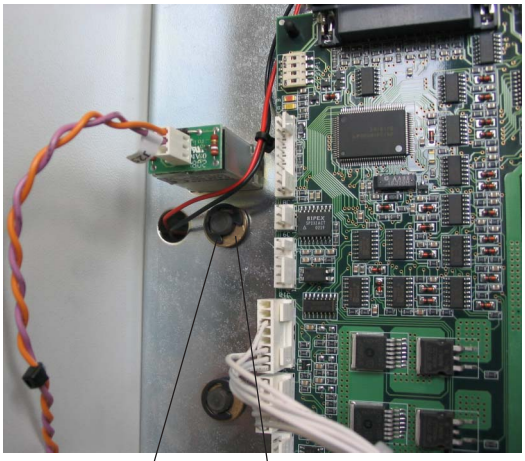
Front view

[B] [A]



Front view

[C] [D]



Rear view

[E] [F]

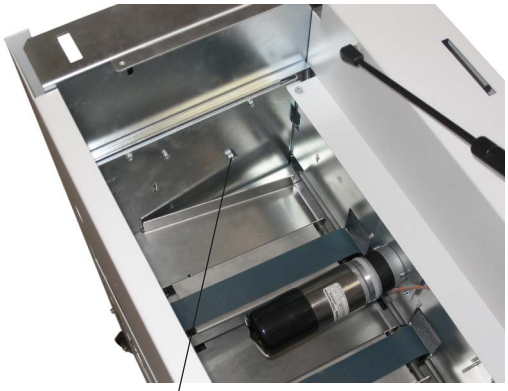
Top view

[G]

Removal

1. Remove Front and Rear cover ((☛ 3.3.1, 3.3.2).
2. Remove R-pin [A] and remove upper gear [B] (x 1).
3. Remove E-Clip [C] and bushing [D] (x1).
4. Remove E-Clip [E] and bushing [F] (x1).
5. Move the shaft towards the transformer. Lift up rear end of shaft [G] and remove shaft.

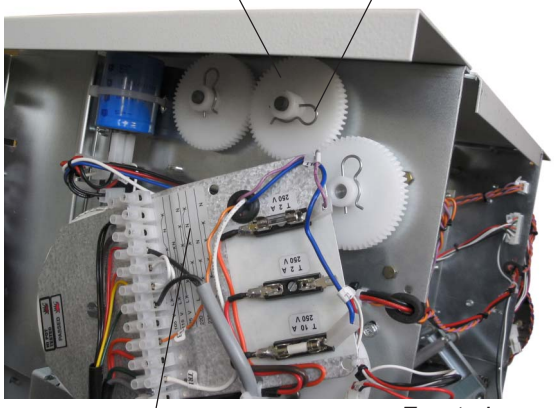
3.6.2 LOWER TRANSPORT BELT



Top view

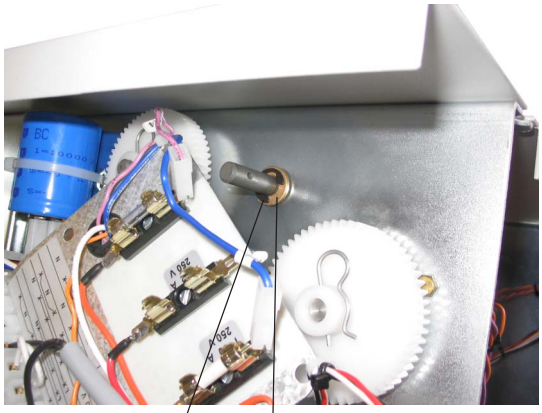
[A]

[C] [D]



Front view

[B]



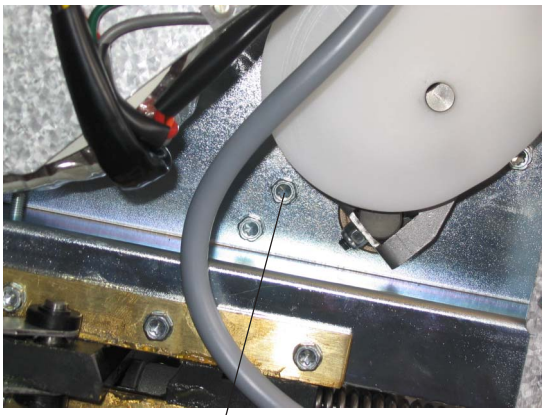
Front view

[C] [D]

Removal

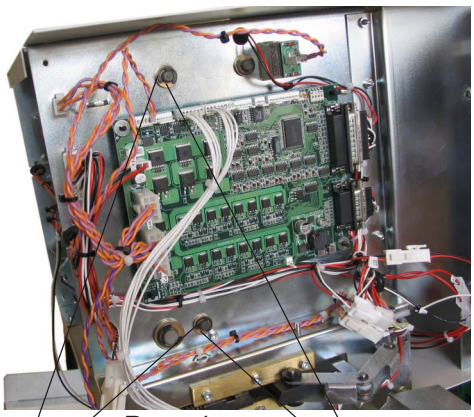
1. Remove Upper Transport Belt ((☛ 3.6.1).
2. Remove Infeed cover ((☛ 3.3.3).
3. Loosen nut [A] to transformer (x 1).
4. Rotate the Fuse plate CW [B].
5. Tilt machine ((☛ 3.3.6).
6. Remove R-pin [C] and remove middle gear [D] (x 1).
7. Remove E-Clip [E], and bushing [F] (x 1) .

3.6.2 LOWER TRANSPORT BELT, CONTINUES



Front view, machine tilted

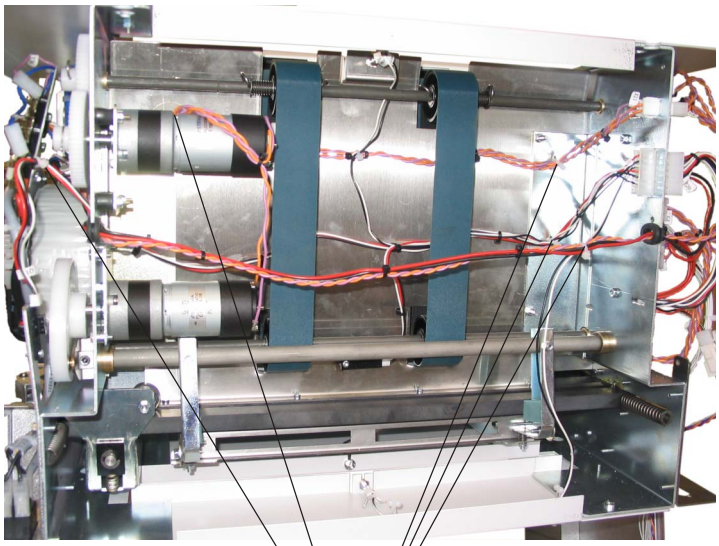
[G]



Rear view, machine tilted

[H] [I]

8. Remove Screw [G] (x 1).
9. Remove E-Clips [H], and bushings [I] (x 2).

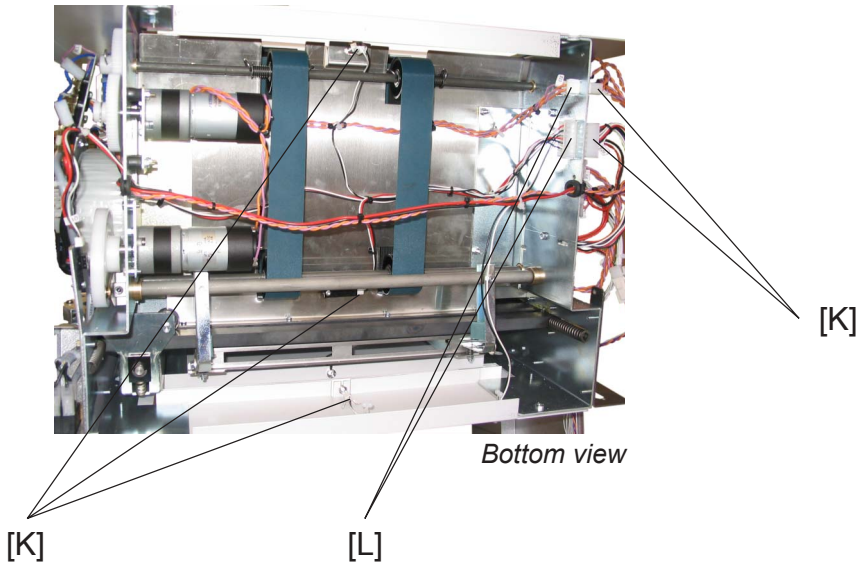


Bottom view

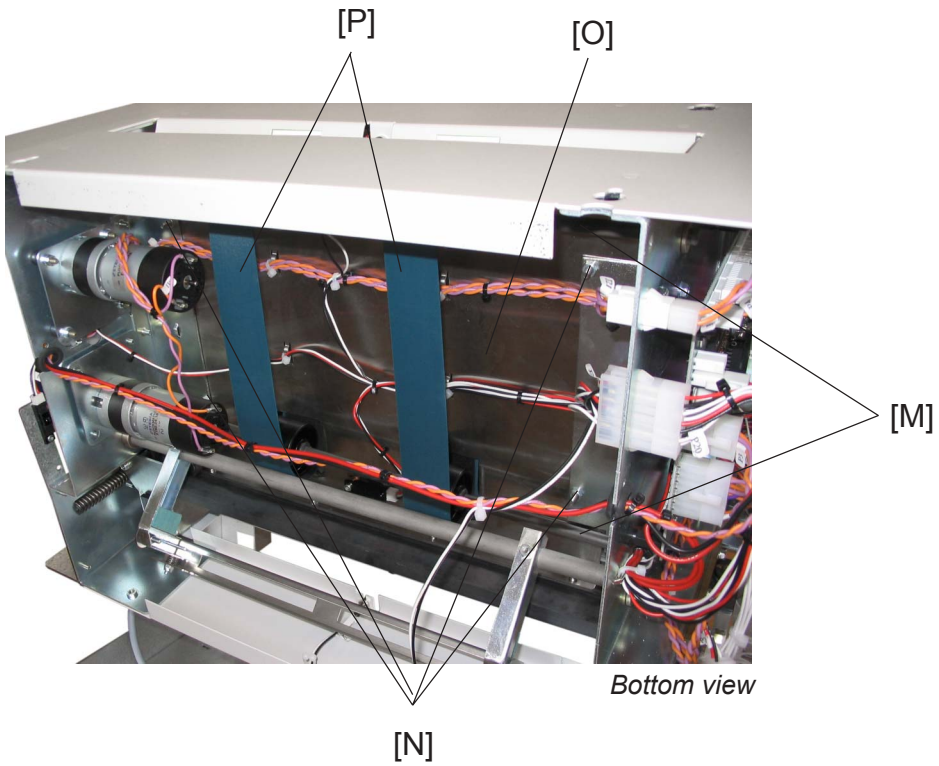
[J]

10. Cut cable ties [J] (x 5).

3.6.2 LOWER TRANSPORT BELT, CONTINUES

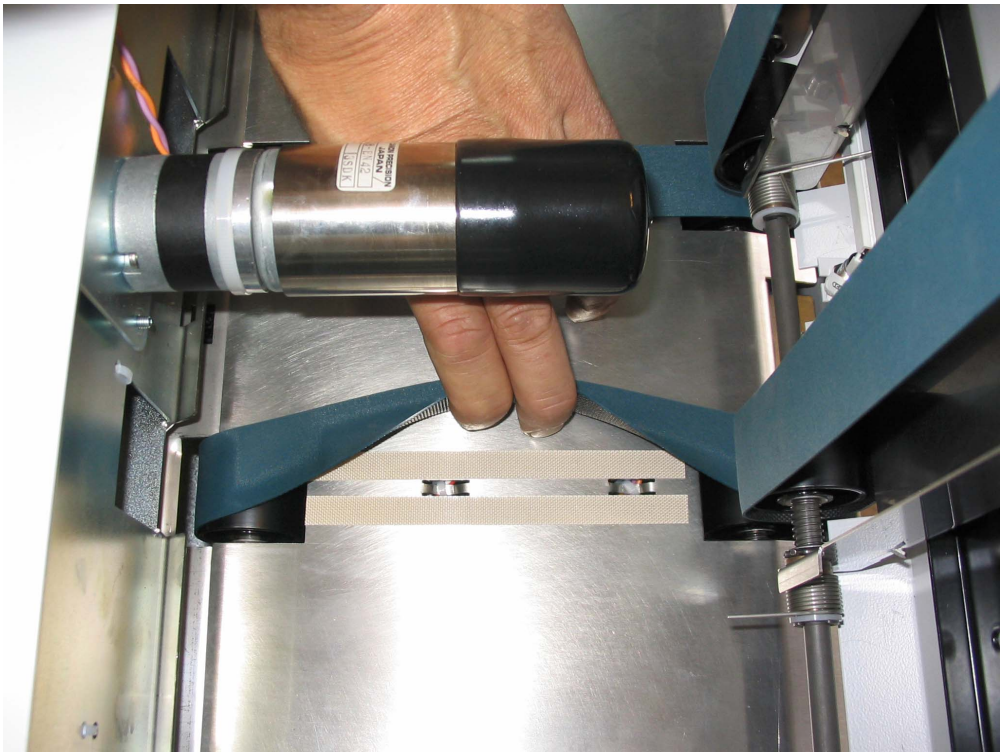


11. Disconnect connectors Q5, Q6, Q7, P20 and P21 [K] (x 5).
12. Remove connectors J20 and J21 [L] from machine frame (x 2).



13. Remove shafts [M] (x 2).
14. Remove nuts [N] holding the Sliding plate [O] (x 4).
15. Gently lift the Sliding plate.
16. Gently slide off the belts [P] to rear-side.

3.6.3 TEFLON TAPE LOWER TRANSPORT BELT



Removal

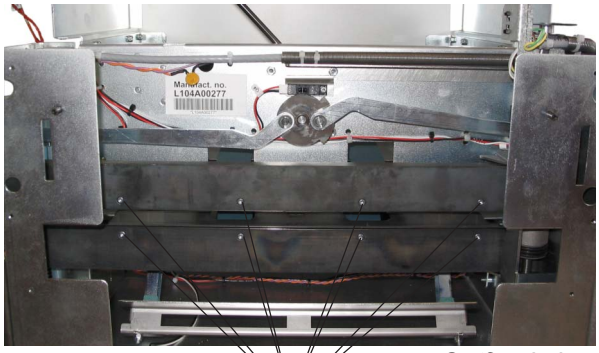
1. Open the Top cover.
2. Lift the upper Feed belt assembly.
3. Lift the lower Feed belt and remove Teflon tape.

Replacement

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

3.7 MECHANICS

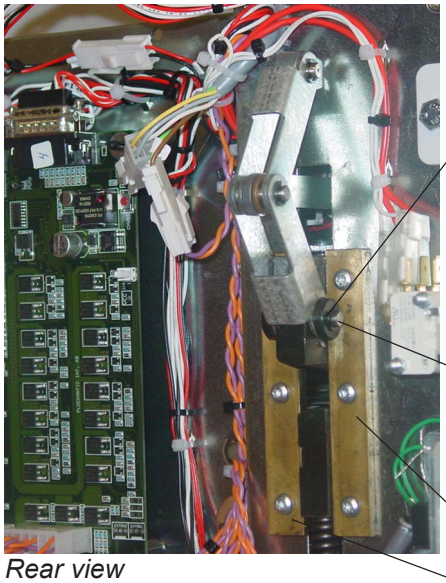
3.7.1 SET CLAMPS



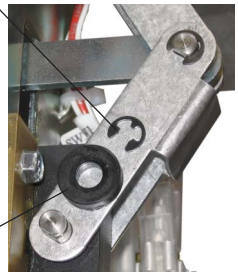
Outfeed view

[A]

[C]



Rear view



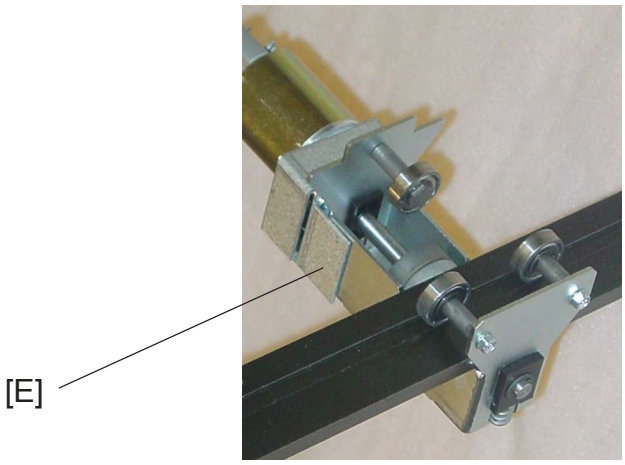
[B]

[D]

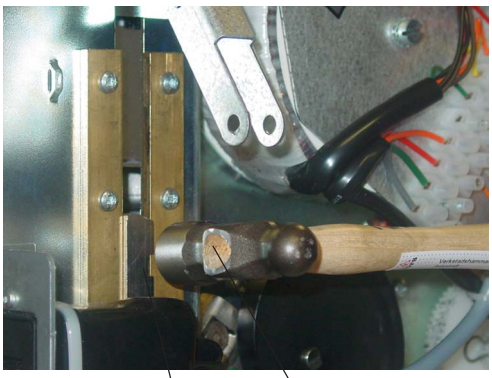
Removal

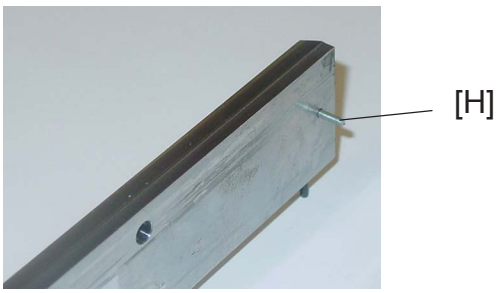
1. Remove Outfeed cover ((☛ 3.3.4).
2. Remove allen screws [A] for upper and lower Paper Guides (x 8).
3. Remove the upper and lower paper guide.
4. Tilt machine ((☛ 3.3.6).
5. Remove linkage shafts [B] holding the upper clamp on front side, by removing E-clip [C] on the side of the linkage shafts which has a chamfered end (x 1).
6. Remove linkage shafts holding the upper clamp on rear side, by removing E-clip on the side of the linkage shafts which has a chamfered end (x 1).
7. Remove the two brass guides [D] on the PCB side of the machine (x 6).

3.7.1 SET CLAMPS, CONTINUES



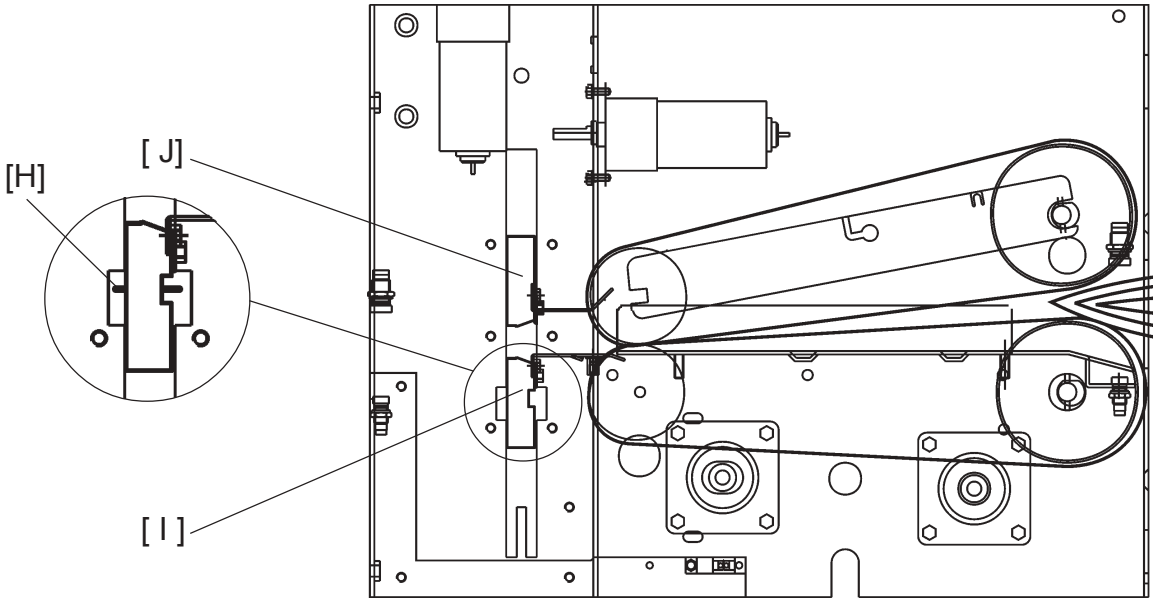
8. Remove upper clamp.
9. Grab the roller cage [E] (not the motor) and derail the ball bearings from the rail, downwards.





10. Loosen the lower clamp [F] by tapping gently, using a plastic hammer [G], on lower clamp front side until the spring pressure is relieved.
11. Hold the roller cage down and remove the lower set clamp.

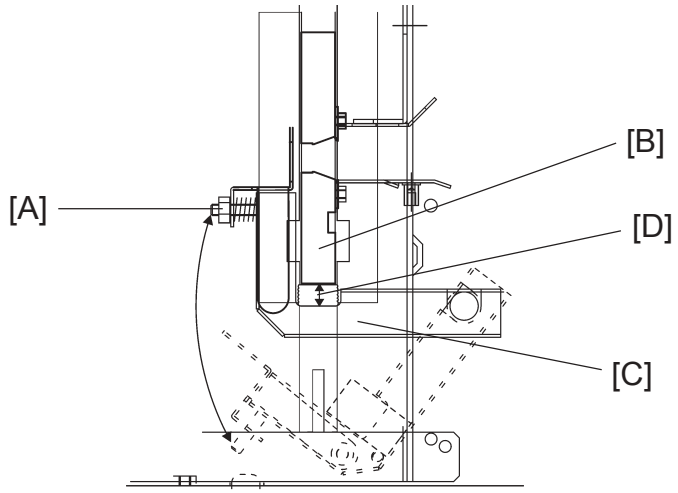
3.7.1 SET CLAMPS, CONTINUES

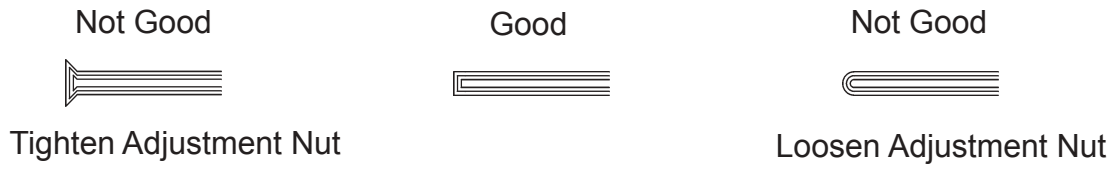


Replacement

1. Insert lower clamp [I], roller assembly, and springs in the machine.
2. Mount pins [H] centred in the lower clamp.
3. Apply grease on each end of the lower clamp by the pins.
4. Insert upper clamp [J].
5. Apply grease on clamp by brass guides.
   NOTE: Make sure no grease gets in contact with the roll.
6. Grease the upper clamp on the infeed side by the roll assembly's home position / turning points.
7. Mount the linkage shafts [B], to the upper clamp, and the E-clips on both front and rear side (C x 2).
   NOTE: Make sure flat end corresponds to flat on linkage.
8. Turn linkage to press down the lower clamp [I].
9. Push lower clamp in position.
10. Mount brass guides without tightening the screws (x 6).
    NOTE: Grease the brass guides.
11. Press the brass guides together and tighten the screws. There should be no play between guides and clamps (x 6).
    CAUTION: The clamps must be centred in the cut-outs.
12. Turn linkage afterwards to make sure that clamps moves without binding.
13. Clean clamps on outfeed side and press area with alcohol fluid.
14. Mount lower paper guide (x4).
15. Mount upper paper guide (x4).
16. Check Set Stop Gate adjustment ((3.7.2).
17. Reverse the removal procedure.

3.7.2 STOP GATE





Stop Gate Adjustment A

NOTE: Procedure adjusts appearance of Book folded spine of booklet.

1. Enter Service mode (Service manual SR90 (☛ 5.1).
2. In BF90 Service, set ”Adjust mode” to ON (Service manual BF90 (☛ 5.3.2).
3. Set up the Book Folder to Mode 1.
4. Run 6 sheet booklets of 80 gsm (20lb bond), from the Copier.
5. Check appearance of booklets according to pictures above.
6. Turn Adjustment Nuts [A] to obtain correct result.
   NOTE: Adjustment Nuts can be reached through outfeed cover.
7. In BF90 Service, set ”Adjust mode” to OFF (Service manual BF90 (☛ 5.3.2).
8. Run 6 sheet booklets of 80 gsm (20lb bond), from the Copier.
9. Check appearance of booklets according to pictures above.

3.7.2 STOP GATE, CONTINUE

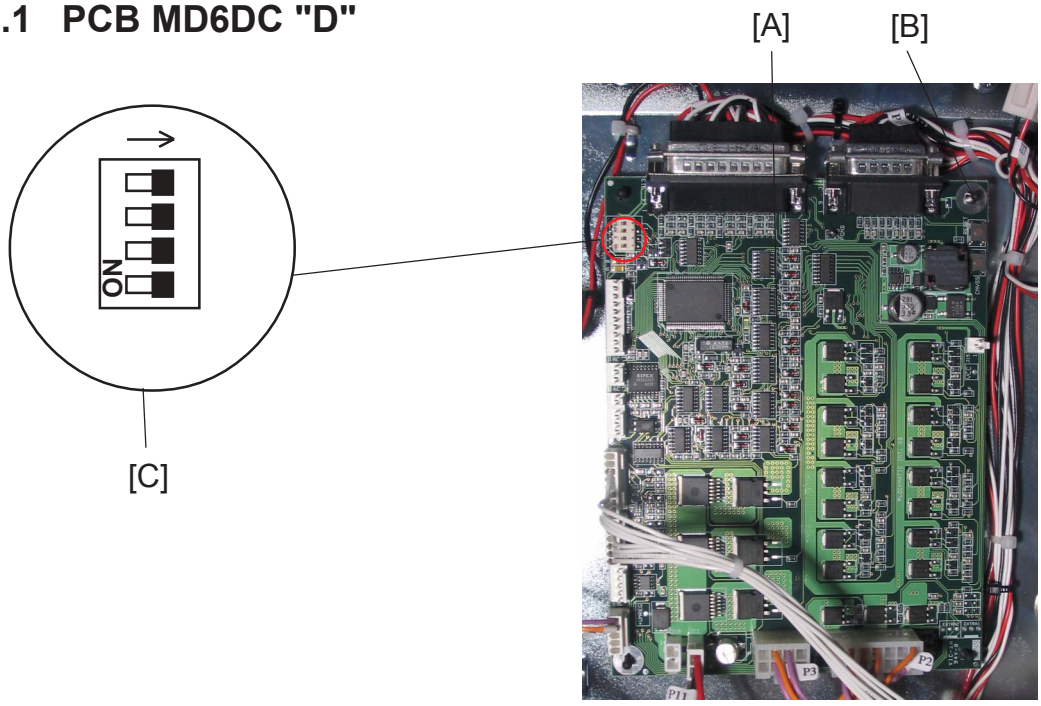
Stop Gate Adjustment B

NOTE: Procedure must be performed if mechanics regarding stopgate has been altered, such as if stop gate motor or stop gate has been replaced.

1. Tilt machine ((☛ 3.3.1).
2. Turn Stop Gate Cam by Stop Gate Motor so that Stop Gate is in upper position.
3. Measure between Lower Clamp [B] and Stop Gate [C] on one side only (which side does not matter). Distance [D] should be 7.5 ± 0.2 mm.
4. Loosen Stop Gate Motor M2 mounting screws and move Stop Gate Motor to obtain measurement (x 4).
5. Perform Stop Gate Adjustment A.

3.8 PCB

3.8.1 PCB MD6DC "D"



⚠ 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 this procedure 3.1.
- Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.

Removal

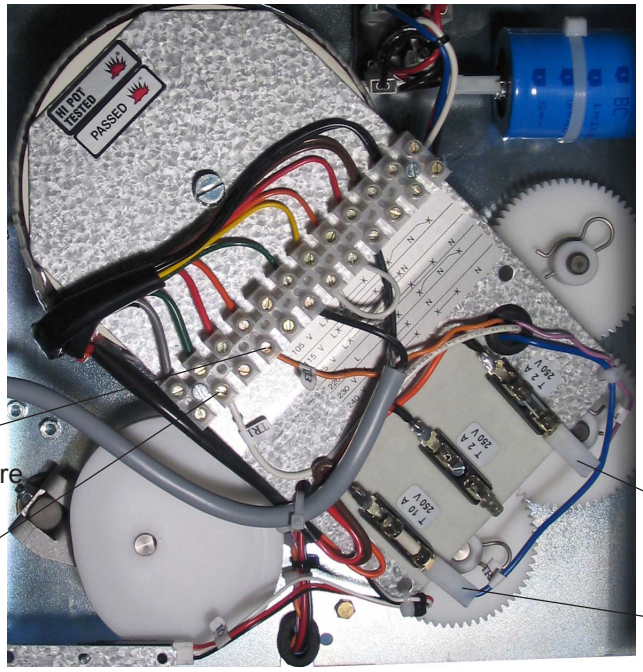
1. Remove Rear Cover ((☛ 3.3.2).
2. Remove all connectors from PCB [A] (x 8).
3. Remove PCB by squeezing barbs [B] on the standoffs (x4) securing PCB.

REPLACEMENT

1. Reverse the removal procedure.
   NOTE: Make sure all DIP switches are in off position [C].
   NOTE: Make sure correct software version is loaded in the PCB.

3.9 POWER REQUIREMENTS

3.9.1 TAPPING THE TRANSFORMER



Transformer in picture, tapped for 230V

105 V	LX——	X	X——	X N	X
115 V	LX——	X	X——	XN	
125 V	LX——	X	X——	X—— X	N
220 V	L	X—— X	X	N	X
230 V	L	X—— X	N		
240V	L	X—— X	X——	X	N

Removal

1. Remove Front Cover ((☛ 3.3.2).
2. Tap the Transformer according to table above.

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4. TROUBLESHOOTING

4.1 FAULT CODE DESCRIPTIONS

⚠ 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 - Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure ((☛ 3.1).

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BF-001

Fault code BF-001, indicates that the Transport Belt motor (BF-M1) has a short circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.

Procedure

Disconnect the motor plug M1. Run the SDS again. **Fault code BF-002 (Open circuit) is displayed?**

Y **N**

Disconnect plug D.P3 from PCB ”D”. Check wires for Short circuit across leads, the Orange wire M1 to D.P3-6 (violet) and the Violet wire M1 to D.P3-7 (orange). **Is there Short circuit?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace motor BF-M1.

BF-002

Fault code BF-002, indicates that the Transport belt motor (BF-M1) has an Open circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.

Procedure

Disconnect the motor plug M1. Enter Service mode and start Transport Belt motor (BF-M1) in check motors. Measure between the Orange wire M1 and the violet wire M1 (PWM 36V and ground). **The voltage is approximately 18 VDC?**

Y **N**

Disconnect plug D.P3 from PCB ”D”. Measure between J3-6 and J3-7 (PWM 36V and ground). **The voltage is approximately 18 VDC?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace motor BF-M1.

BF-003

Fault code BF-003, indicates that the Stop gate motor (BF-M2) had a Cycle time out.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.
- Check Fuse F3 on the Book Folder Transformer.
- Enter the Service mode and select Stop gate motor (BF-M2) in check motors.
- Make sure that the Stop gate sensor (BF-Q1) is installed correctly.

Procedure

Enter the Service mode and select Stop gate sensor (BF-Q1) in check sensors. **The Stop gate sensor indicates :1 when the sensor is blocked, and :0 when the sensor is unblocked?**

Y **N**

1. Replace sensor BF-Q1.
2. Disconnect plug D.P13 from PCB ”D”. Measure between J13-1 and J13-3 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Disconnect plug from sensor BF-Q1. Check wire for Continuity / Short circuit from, the white wire Q1 to D.P13-2. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug D.P13 to PCB ”D”. Measure between the red wire Q1 and the black wire Q1 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB ”D”.

Replace the BF-M2.

BF-004

Fault code BF-004, indicates that the Stop gate motor (BF-M2) has a short circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.

Procedure

Disconnect the motor plug M2. Run the SDS again. **Fault code BF-005 (Open circuit) is displayed?**

Y **N**

Disconnect plug D.P2 from PCB ”D”. Check wires for Short circuit across leads, the Orange wire M2 to D.P2-9 (violet) and the Violet wire M1 to D.P2-2 (orange). **Is there Short circuit?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace motor BF-M2.

BF-005

Fault code BF-005, indicates that the Stop gate motor (BF-M2) has an Open circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.
- Make sure that the allen screw to the white cam is tighten against the flat on the motor shaft.

Procedure

Disconnect the motor plug M2. Disconnect plug D.P2. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

1. Replace motor BF-M2.
2. Replace PCB ”D”.

BF-006

Fault code BF-006, indicates that the Clamp motor (BF-M3) had a Cycle time out.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.
- Check Fuse F3 on the Book Folder Transformer.
- Enter the Service mode and select Clamp motor (BF-M3) in check motors.
- Make sure that the Clamp motor Home position sensor (BF-Q4) is installed correctly.

Procedure

Enter the Service mode and select Clamp motor Home position sensor (BF-Q4) in check sensors. **The Clamp motor Home position sensor indicates :1 when the sensor is blocked, and :0 when the sensor is unblocked?**

Y **N**

1. Replace sensor BF-Q4.
2. Disconnect plug D.P13 and D.P14 from PCB ”D”. Measure between J14-1 and J13-12 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Disconnect plug from sensor BF-Q4. Check wire for Continuity / Short circuit from, the white wire Q4 to D.P13-11. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug D.P13 and D.P14 to PCB ”D”. Measure between the red wire Q4 and the black wire Q4 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB ”D”.

Replace the BF-M3.

BF-007

Fault code BF-007, indicates that the Clamp motor (BF-M3) has a short circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.

Procedure

Disconnect the motor plug M3. Run the SDS again. **Fault code BF-008 (Open circuit) is displayed?**

Y **N**

Disconnect plug D.P3 from PCB ”D”. Check wires for Short circuit across leads, the Orange wire M3 to D.P3-3 (violet) and the Violet wire M3 to D.P3-2 (orange). **Is there Short circuit?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace motor BF-M3.

BF-008

Fault code BF-008, indicates that the Clamp motor (BF-M3) has an Open circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.

Procedure

Disconnect the motor plug M3. Disconnect plug D.P3. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

1. Replace motor BF-M3.
2. Replace PCB ”D”.

BF-009

Fault code BF-009, indicates that the Roller motor (BF-M4) do not receive any displacement pulses.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.
- Enter the Service mode and select Roller motor (BF-M4) in check motors.
- Make sure that the Roller motor sensor (BF-Q8) is installed correctly.

Procedure

Disconnect the sensor plug Q8 to motor BF-M4. Measure between the yellow wire Q8 and the grey wire Q8 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug D.P14 from PCB ”D”. Measure between the J14-15 and J14-13 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Disconnect plug D.P14 from PCB ”D”. Check wires for Continuity / Short circuit from, the white wire Q8 to D.P14-14, the grey wire Q8 to D.P14-13, the yellow wire Q8 to D.P14-15. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

1. Replace motor BF-M4.
2. Replace PCB ”D”.

BF-010

Fault code BF-010, indicates that the Roller motor (BF-M4) had a Cycle time out.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.
- Check Fuse F3 on the Book Folder Transformer.
- Enter the Service mode and select Roller motor (BF-M4) in check motors.
- Make sure that the Roller motor Rear Home position sensor (BF-Q2) is installed correctly.
- Make sure that the Roller motor Front Home position sensor (BF-Q3) is installed correctly.

Procedure

Enter the Service mode and select Roller motor Front Home position sensor (BF-Q3) in check sensors. **The Roller motor Front Home position sensor indicates :1 when the sensor is blocked, and :0 when the sensor is unblocked?**

Y **N**

1. Replace sensor BF-Q3.
2. Disconnect plug D.P13 and D.P14 from PCB ”D”. Measure between J14-2 and J13-6 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Disconnect plug from sensor BF-Q3. Check wire for Continuity / Short circuit from, the white wire Q3 to D.P13-8. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug D.P13 and D.P14 to PCB ”D”. Measure between the red wire Q3 and the black wire Q3 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB ”D”.

Enter the Service mode and select Roller motor Rear Home position sensor (BF-Q2) in check sensors. **The Roller motor Rear Home position sensor indicates :1 when the sensor is blocked, and :0 when the sensor is unblocked?**

Y **N**

1. Replace sensor BF-Q2.
2. Disconnect plug D.P13 from PCB ”D”. Measure between J13-13 and J13-9 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Disconnect plug from sensor BF-Q2. Check wire for Continuity / Short circuit from, the white wire Q2 to D.P13-5. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Connect plug D.P13 to PCB ”D”. Measure between the red wire Q2 and the black wire Q2 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace wire Harness.

Replace PCB ”D”.

Pull the motor gently by hand. **Are you able to pull the motor back and forth without using a lot of force?**

Y **N**

Lubricate where needed.

Replace motor BF-M4.

Trouble-shooting

BF-011

Fault code BF-011, indicates that the Roller motor (BF-M4) has a short circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.

Procedure

Disconnect the motor plug M4. Run the SDS again. **Fault code BF-012 (Open circuit) is displayed?**

Y **N**

Disconnect plug D.P2 from PCB ”D”. Check wires for Short circuit across leads, the Orange wire M4 to D.P2-12 (violet) and the Violet wire M4 to D.P2-3 (orange). **Is there Short circuit?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace motor BF-M4.

BF-012

Fault code BF-012, indicates that the Roller motor (BF-M4) has an Open circuit.

Initial Actions

- Check Fuse F2 on the Book Folder Transformer.

Procedure

Disconnect the motor plug M4. Disconnect plug D.P2. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

1. Replace motor BF-M4.
2. Replace PCB ”D”.

BF-013

Fault code BF-013, indicates that the Infeed sensor (BF-Q5) is faulty.

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the Infeed photo transistor sensor, and the Infeed LED sensor (BF-Q5) is installed correctly.
- Check fuse F3 on the Book folder Transformer.

Procedure

Disconnect plug D.P13 from PCB ”D”. Measure between J13-23 and J13-16 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Disconnect plug from Infeed LED sensor BF- Q5. Check wire for Continuity / Short circuit from, from black wire Q5 to D.P13-16, the red wire Q5 to D.P13-23. **Is there continuity and no Short circuit?**

Y **N**

Replace wire Harness.

1. Replace Infeed LED sensor Q5.
2. Connect plug D.P13 to PCB ”D”. Disconnect plug from Infeed photo transistor sensor BF-Q5. Measure between black wire Q5 and white wire Q5 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug J20. Measure between P20-2 and P20-3 (5V and ground) in the plug J20. **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug D.P13 from PCB ”D”. Measure between J13-24 and J13-25 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace wire Harness to Infeed photo transistor sensor Q5.

Replace Infeed photo transistor sensor Q5.

BF-014

Fault code BF-014, indicates that the Clamp sensor (BF-Q6) is faulty.

Initial Actions

- Make sure that the Clamp sensor (BF-Q6) is installed correctly.
- Make sure that the sensor is clean.
- Make sure that the Feeding belts, are moving smoothly by running Motor M1 according to section 5, Service tables.
- Check fuse F3 on the Book folder Transformer.

Procedure

Disconnect plug to Clamp sensor BF-Q6. measure between black wire Q6 and red wire Q6. **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug J20. Measure between P20-4 and P20-6 (5V and ground) on plug J20. **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug D.P13 from PCB ”D”. Measure between J13-20 and J13-22. **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace wire Harness to Clamp sensor Q6.

Replace Clamp sensor Q6.

BF-015

Fault code BF-015, indicates that the Outfeed sensor (BF-Q7) is faulty.

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the Outfeed photo transistor sensor, and the Outfeed LED sensor (BF-Q7) is installed correctly.
- Check fuse F3 on the Book folder Transformer.

Procedure

Disconnect plug D.P13 and D.P14 from PCB ”D”. Measure between J13-17 and J14-10 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Disconnect plug from Outfeed LED sensor BF- Q7. Check wire for Continuity / Short circuit from, from black wire Q7 to D.P14-10, the red wire Q7 to D.P13-17. **Is there continuity and no Short circuit?**

Y **N**

Replace wire Harness.

1. Replace Outfeed LED sensor Q7.
2. Connect plug D.P13 and D.P14 to PCB ”D”. Disconnect plug from Outfeed photo transistor sensor BF-Q7. Measure between black wire Q7 and white wire Q7 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug D.P13 from PCB ”D”. Measure between J13-18 and J13-19 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Replace wire Harness.

Replace Outfeed photo transistor sensor Q7.

BF-150

Fault code BF-150, indicates that one of the interlock switches in the Book folder is faulty.

Initial Actions

- Power ON and Power OFF the Book folder (make sure that the Top cover interlock, and the External Interlock Device interlock is interlocked).
- Check Fuse F2 on the Book Folder Transformer.
- Enter the Service mode and check the Book folder voltmeter.

Procedure

Measure the Interlock switch SW1, SW2, SW3 and SW4, and make sure that they are OK. **Are all four switches OK?**

Y **N**

Replace the faulty switch.

Make sure Switch SW1 and SW2 is interlocked. Disconnect plug D.P14. Measure P14-3 and P14-4. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Measure J14-3 and J14-4 on PCB ”D”. **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Make sure Switch SW3 and SW4 is interlocked. Disconnect plug D.P11. Measure P11-1 and P11-2. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

Replace PCB ”D”.

BF-201

Fault code BF-201, indicates that during Run, the Infeed sensor (BF-Q5), was not blocked within timeout after the exit signal from the Trimmer, was detected.

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the Infeed sensor (BF-Q5), is installed correctly.
- Check fuse F3 on the Book folder Transformer.

Procedure

Enter the Service mode and select Infeed sensor (BF-Q5) in check sensors. Block, then unblock, the Q5 sensor with a sheet of paper. **The Infeed sensor (BF-Q5) sensor indicates :0 when the sensor is blocked, and :1 when the sensor is not blocked?**

Y **N**

Go to BF-013 fault code.

Make sure that nothing interferes with the paper coming out from the Trimmer, and going into the Book folder.

BF-202

Fault code BF-202, indicates that at ”initialization” or during Run, the Infeed sensor (BF-Q5), was blocked exceeding timeout.

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the Infeed sensor (BF-Q5), is installed correctly.
- Check fuse F3 on the Book folder Transformer.

Procedure

Enter the Service mode and select Infeed sensor (BF-Q5) in check sensors. Block, then unblock, the Q5 sensor with a sheet of paper. **The Infeed sensor (BF-Q5) sensor indicates :0 when the sensor is blocked, and :1 when the sensor is not blocked?**

Y **N**

Go to BF-013 fault code.

1. Make sure that nothing interferes with the paper path.
2. Make sure that the Feeding belts are moving as they should.
3. Clean the Feeding belts.

BF-203

Fault code BF-203, indicates that during Run, the Clamp sensor (BF-Q6), was not blocked within timeout.

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the Clamp sensor (BF-Q6), is installed correctly.
- Check fuse F3 on the Book folder Transformer.

Procedure

Enter the Service mode and select Clamp sensor (BF-Q6) in check sensors. Block, then unblock, the Q6 sensor with a sheet of paper. **The Clamp sensor (BF-Q6) sensor indicates :0 when the sensor is blocked, and :1 when the sensor is not blocked?**

Y **N**

Go to BF-014 fault code.

1. Make sure that nothing interferes with the paper path.
2. Make sure that the Feeding belts are moving as they should.
3. Clean the Feeding belts.

BF-204

Fault code BF-204, indicates that at ”initialization” or during Run, the Clamp sensor (BF-Q6), was blocked exceeding timeout.

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the Clamp sensor (BF-Q6), is installed correctly.
- Check fuse F3 on the Book folder Transformer.

Procedure

Enter the Service mode and select Clamp sensor (BF-Q6) in check sensors. Block, then unblock, the Q6 sensor with a sheet of paper. **The Clamp sensor (BF-Q6) sensor indicates :0 when the sensor is blocked, and :1 when the sensor is not blocked?**

Y **N**

Go to BF-014 fault code.

1. Make sure that nothing interferes with the paper path.
2. Make sure that the Feeding belts are moving as they should.
3. Clean the Feeding belts.

BF-206

Fault code BF-206, indicates that at ”initialization” or during Run, the Outfeed sensor (BF-Q7), was blocked exceeding timeout.

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the Outfeed sensor (BF-Q7), is installed correctly.
- Check fuse F3 on the Book folder Transformer.

Procedure

Enter the Service mode and select Outfeed sensor (BF-Q7) in check sensors. Block, then unblock, the Q7 sensor with a sheet of paper. **The Outfeed sensor (BF-Q7) sensor indicates :0 when the sensor is blocked, and :1 when the sensor is not blocked?**

Y **N**

Go to BF-015 fault code.

1. Make sure that nothing interferes with the paper path.
2. Make sure that the Stacker belts are moving as they should.
3. Clean the Stacker belts.

BM-Q21, Set thickness sensor Faulty

Initial Actions

- Make sure that the sensor Is clean.
- Make sure that the sensor Actuator runs in the sensor slot.
- Set up the Book folder to Auto, and run a 20 sheet booklet. If the Book folder is not performing the book folding action, continue below.

Procedure

Disconnect plug from sensor BM-Q21. Measure between black wire Q21 and white wire Q21 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Disconnect plug D.P102 from Adapter PWB. Measure between J102-2 and J102-3 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Disconnect the Adapter PWB from the CPU PCB. Measure between J1-23 and J1-25 (5V and ground). **The voltage is approximately 5 VDC?**

Y **N**

Replace PCB ”D”.

Replace Adapter PWB.

Check wire for Continuity / Short circuit from, the white wire Q21 to P102-4. **Is there Continuity and no Short circuit?**

Y **N**

Replace wire Harness.

1. Replace Adapter PWB.
2. Replace PCB ”D”.

Replace Set thickness sensor Q21.

Book folder does not Square fold a 4 sheet booklet

Initial Actions

- Make sure that the Book folder is set up to Mode 1.

Procedure

The Specification for the Book Folder BF90 is to perform the Square folding action on booklets with approximately 6 sheets/booklet, up to 20 sheet/booklet.

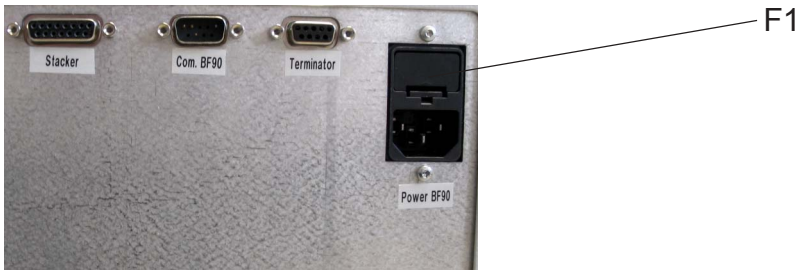
In [Auto] mode, the Booklet maker detects how may sheets there are in the booklet, and automatically set the Book folder to the correct mode.
NOTE: When the Book folder is set to [Auto] and the booklet has less than approximately 6 sheets/booklet, the Book folder will bypass the Square folding action, transporting the booklet out to the Belt stacker.

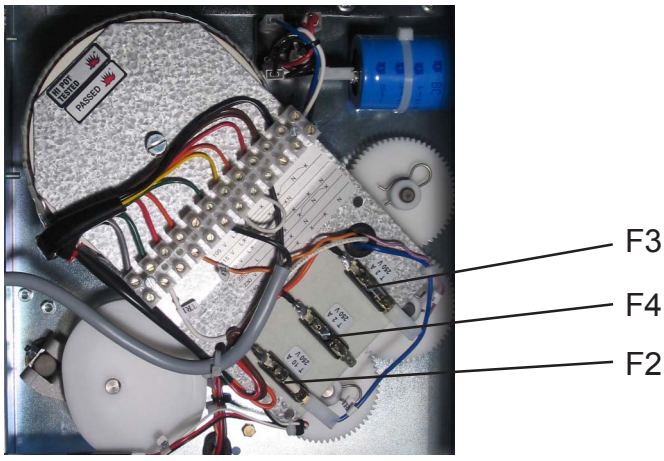
To be able to Square fold a booklet with approximately 5 sheet/booklet or less, the Book folder have to be set to [Mode 1].

4.2 BLOWN FUSE CONDITION

⚠ CAUTION
ONLY USE SLOW BLOW FUSES.

Fuse	Rating		Symptom at power on
	115V	210-230V	
F1	6.3A	3.15A	Power on the BF90, on UI
F2	10A	10A	Fault in Area E BF-150
F3	2A	2A	Power on the BF90, on UI
F4			Not in use in the BF90 configuration





4.3 LED'S

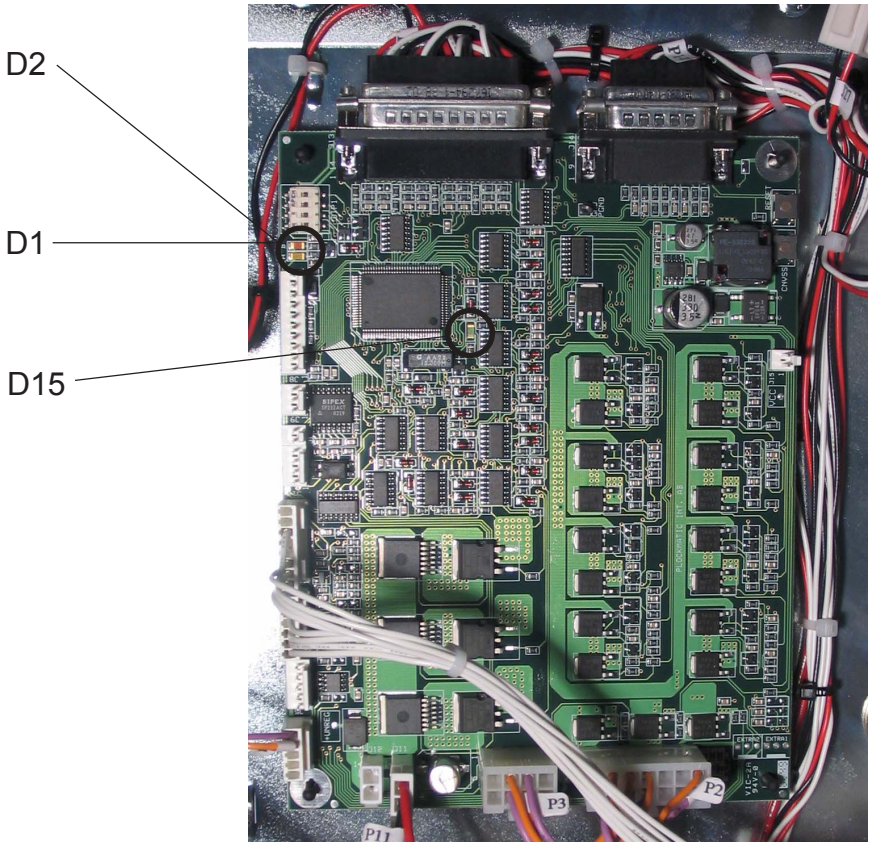
⚠ CAUTION

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 this procedure 3.1.
- Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.

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 OFF.

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 OFF.

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

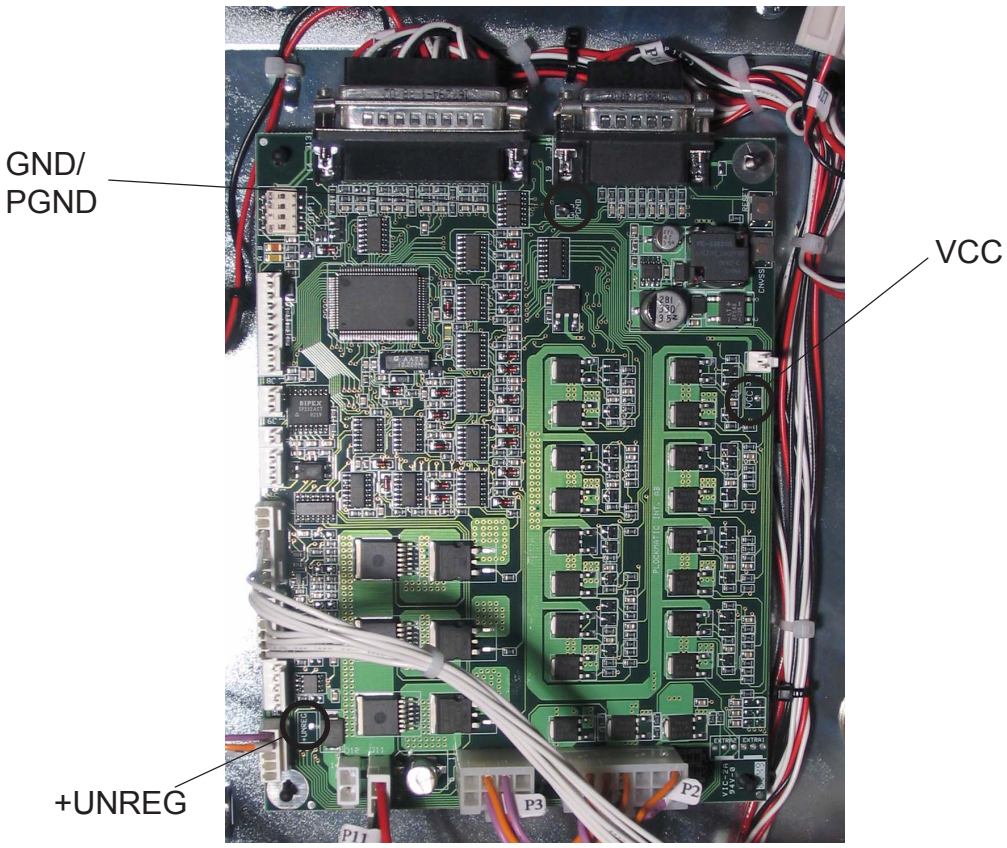


BF90-4-16

4.4 TEST POINTS

⚠ 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 this procedure 3.1.
- Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure.



+**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 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).

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5. SERVICE TABLES

5.1 SERVICE PROGRAM MODE

5.1.1 SERVICE PROGRAM MODE OPERATIONS

⚠ CAUTION

Never turn off the main power when motors are cycling. To avoid damaging the circuitry, stop the motor/motors running under the Check Motors menu, and then switch the main power off.

Explanation and how to use the service program is described in the Booklet Maker Service Manual ((☛ SR90 Service Manual 5.1.1). Only differences and news when installing the Book Folder (BF90) will be described here.

Checking Motors

The four motors in the BF90 are added under Check motors.

Checking Sensors

The eight sensors in the BF90 are added under Check sensors.
NOTE: There is no possibility to check sensor BM-Q21, Set thickness sensor.

Running Dead Cycling (free run)

The possibility to run Dead Cycle on the BF-90 is added.

Changing EEPROM values

Previous Index 8 (UI Reg Control) has been replaced by Book Folder counter.
UI Reg Control has been moved to Index 25.

Counters

New counter for the BF-90 is added.

Software version

Under the menu Tools you can check software version for the BF-90.

Voltmeter

The possibility to read the voltmeter on the BF-90 is added.

Self Diagnostics

The BF-90 is now included when running Diagnostics from the Service Program.

5.1.2 SERVICE PROGRAM MODE TABLES

Check motors and function

Book Folder

Motor	Normal Reading	Function
BF-M1	17,5V ±2V	Transport Belt motor transports the booklet in and out of the Book Folder.
BF-M2		Stop gate motor moves the stop gate up and down to stop the booklet in correct position.
BF-M3		Clamp motor open and closes the Set clamp, holding the booklet in place when the Roller motor are performing the book folding action.
BF-M4	12V ±2V ≈ 0,35m/s	Roller motor performs the book folding action.

Voltmeter

Voltage at	Range	Function
BF90	29-43V	Unregulated 36V (after interlock relay) distributed from Interlock PCB in Booklet maker. Voltage supplies: BF-M1 Transport belt motor BF-M2 Stop Gate motor BF-M3 Clamp motor BF-M4 Roller motor ST-M1 Belt stacker motor BF Set counter

Check sensors/switches and function

Book Folder

Sensor	Normal State	Function
BF-Q1	0 = Unblocked	Stop Gate sensor
BF-Q2	1 = Blocked*	Rear sensor
BF-Q3	0 = Unblocked*	Front sensor
BF-Q4	0 = Unblocked	Home position sensor
BF-Q5	0 = Unblocked	Infeed sensor
BF-Q6	0 = Unblocked	Clamp sensor
BF-Q7	0 = Unblocked	Outfeed sensor
BF-S1	1 = Blocked	External interlock device Interlock switch
BF-S2	1 = Blocked	Top cover Interlock switch
BF-S3	1 = Blocked	External interlock device Interlock switch
BF-S4	1 = Blocked	Top cover Interlock switch

NOTE: *BF-Q2 and BF-Q3 are home position sensors for the Roller motor. If one is blocked, the other must be unblocked and vice versa.

NOTE: There is no possibility to check sensor BM-Q21, Set thicknes sensor.

EEPROM Values

Index		Default	Function
0	Password	107	The password to enter service mode can be changed here.
1	STD Trim	004.50	Standard trim margin that is default presented in the user menu. Value reflects how many millimetres that will be trimmed off from the longest sheet (centre fold) in the booklet.
2	Side Jog Offset	≈327.5 mm	Reference regarding position for paper size adjustment. Value reflects paper size width at home position.
3	Length Offset	≈270 mm	Reference regarding position for paper size adjustment. Value reflects paper size length at home position.
4	Staple	0 -	The counter for the stapler. Value reflects the count of how much the stapler heads have cycled.
5	Fold	0 -	The counter for the folder. Value reflects the count of how much the fold knife has cycled.
6	Trim knife	0 -	The counter for the Trimmer. Value reflects the count of how much the Trimmer knife has cycled.
7	Cover feed	0 -	The counter for the Cover feeder. Value reflects the count of how many sheets the Cover feeder has delivered.
8	Book Folder	0 -	The counter for the Book Folder. Value reflects the count of how many Books the Book folder has delivered.
9	M3 BrakeCal0	≈-00040	The values reflect calibration of side jogger movement at break point in different positions.
10	M3 BrakeCal1	≈00023	
11	M3 BrakeCal2	≈00010	
12	M3 BrakeCal3	≈00050	
13	M1 Speed Low	≈00900	The values reflect calibration of Infeed motor M1and Fold roller motor M6 at power on.
14	M1 Speed High	≈01340	
15	M6 Speed	≈01800	
16	Zero Trim Offset	≈0	Fine tuning of trim margin. Value reflects deviation from real trim margin and STD trim margin.
17	TR-M1 Speed	≈01800	The value reflect calibration of Transport motor M1.
18	xCAN ID.no	015	Factory use only

EEPROM Values

Index		Default	Function
19	Service timeout	10	The value reflects the time that you can be logged in to service mode without touching any buttons before the machine closes the service mode.
20	Size A4	B=209,4 x H=296,5	The values reflects the actual size of the formats. It will also affect the auto formats.
21	Size A3	B=296,4 x H=418,5	
22	Size 8,5x11	B=215,3 x H=278,8	
23	Size 8,5x14	B=215,3 x H=355,0	
24	Size 11x17	B=278,8 x H=431,2	
25	UI Control reg	0 -	Factory use only.

NOTE: Previous Index 8 (UI Control reg) has been replaced by Book Folder counter.
UI Control reg has been moved to Index 25.

5.2 SOFTWARE DOWNLOAD

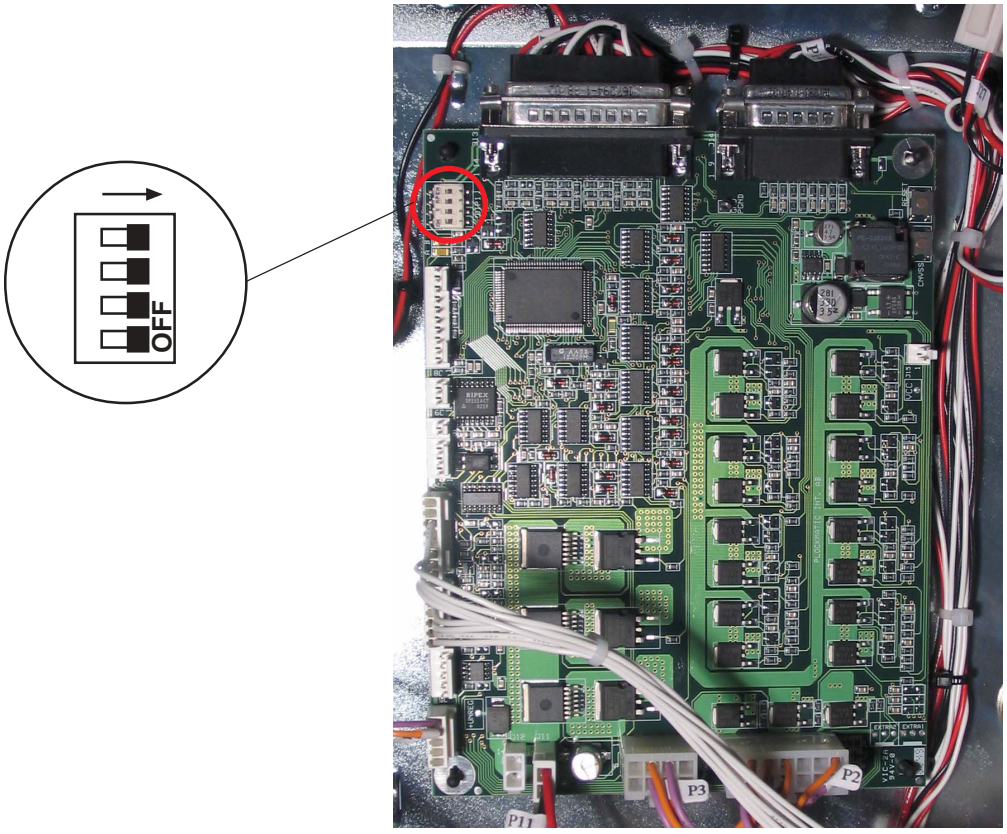
Downloading software to PCB MD6DC D in Book Folder

⚠ 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 - Use ESD protection when working near PCBs. Failure to use ESD protection is likely to result in a PCB failure ((☛ 3.1).

1. Switch Off the Main Power Switch.
2. Remove rear cover ((☛ 3.3.2).
3. Run the BF90 MD6DC v2.00.exe file and follow the instruction in the program, or according to the latest bulletin.

   NOTE: The DIP switches must be in the off position.



5.3 BF SERVICE

5.3.1 ENABLING THE BOOK FOLDER

In the Book Folder Service menu, you are able to Enable the Book folder

Enable the Book folder

At installation of the Book folder you have to Enable the Book folder, other wise the SR90 system do not recognise the machine.

1. Enter the Service Program mode.
2. Go to BF90 Service. Press the OK button.
3. Scroll to Installed: Press the CHG button, so it says YES in the UI.
4. Press the OK button.

5.3.2 ADJUSTMENT MODE

In the Book Folder Service menu, you are able to set up the Book folder to Adjustment mode. Use the Adjustment mode when adjusting the Square folding quality. When the Adjustment mode is set to ON, the Home position of the Stop gate is changed. So you will be able to adjust the Stop gate during run.

Adjustment mode

When performing **Stop gate adjustment A** ((☛ 3.7.2). Set the Adjustment mode to ON.

NOTE: When you are done with the adjustment, remember to set the Adjustment mode to OFF.

1. Enter the Service Program mode.
2. Go to BF90 Service. Press the OK button.
3. Scroll to Adjust mode: Press the CHG button, so it says ON in the UI.
4. Press the OK button.

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6. DETAILED SECTION DESCRIPTION

6.1 ELECTRICAL COMPONENT LIST

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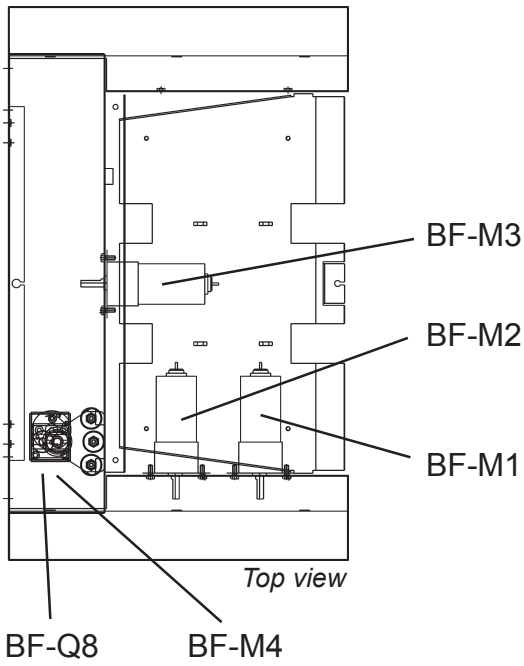
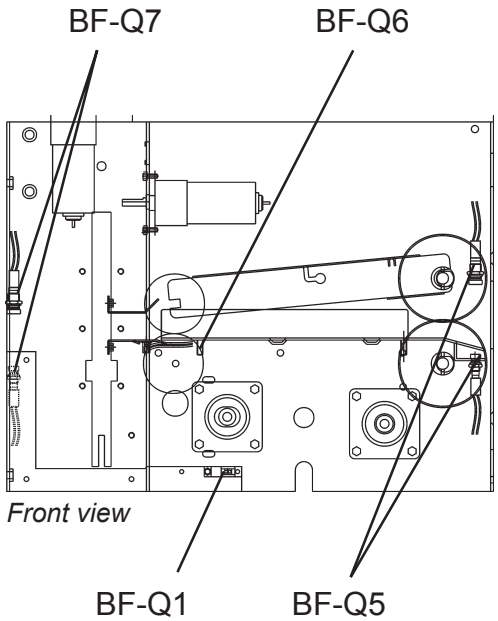
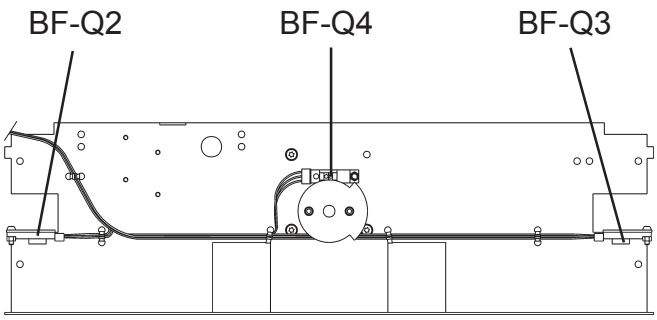
6.1.1 COMPONENT LAYOUT



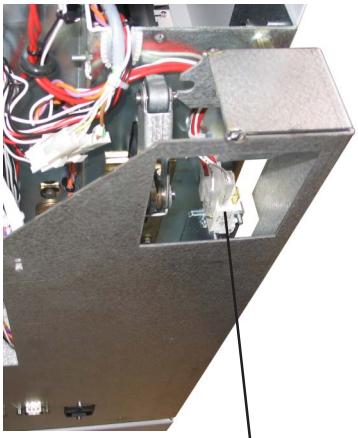
Top view



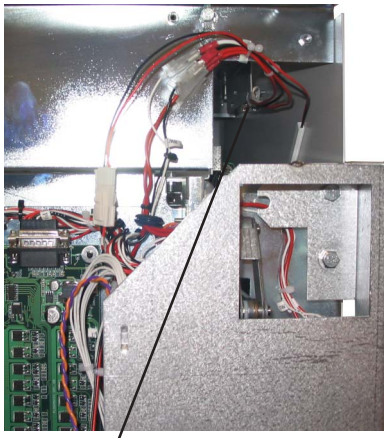
Front view



Set Clamp view,
seen from Outfeed view



Rear view



Rear view

External interlock device Interlock switches S1 & S3

Top cover Interlock switches S2 & S4

Main Power Switch S5

Stacker receptacle

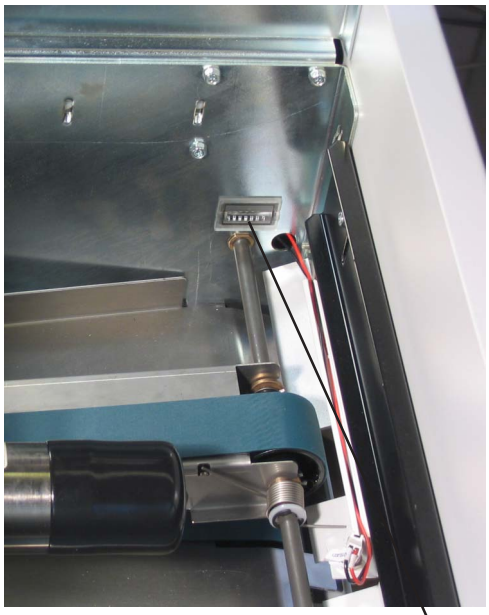
COM. BF90

Terminator

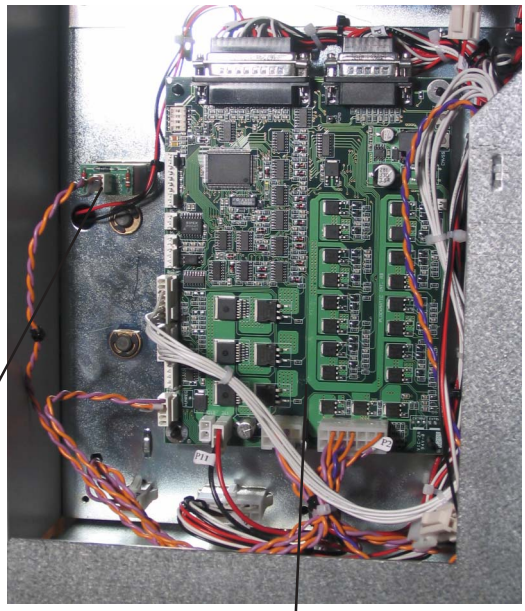
F1

Power receptacle / Line Filter

BF90-6-4



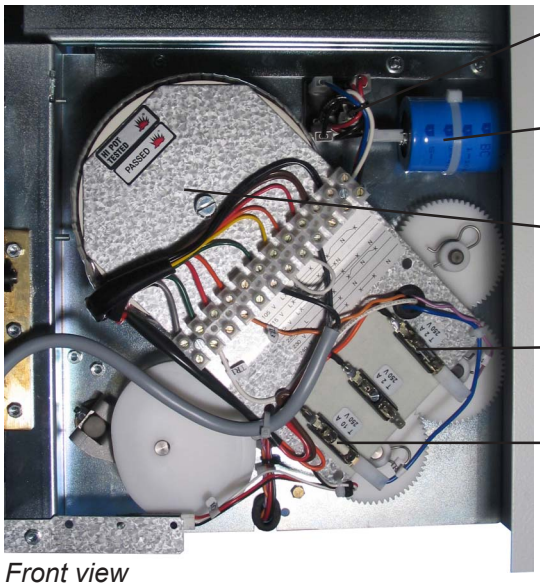
Top view,
Inside machine



Rear view

Set counter

PCB MD6DC "D"



Front view

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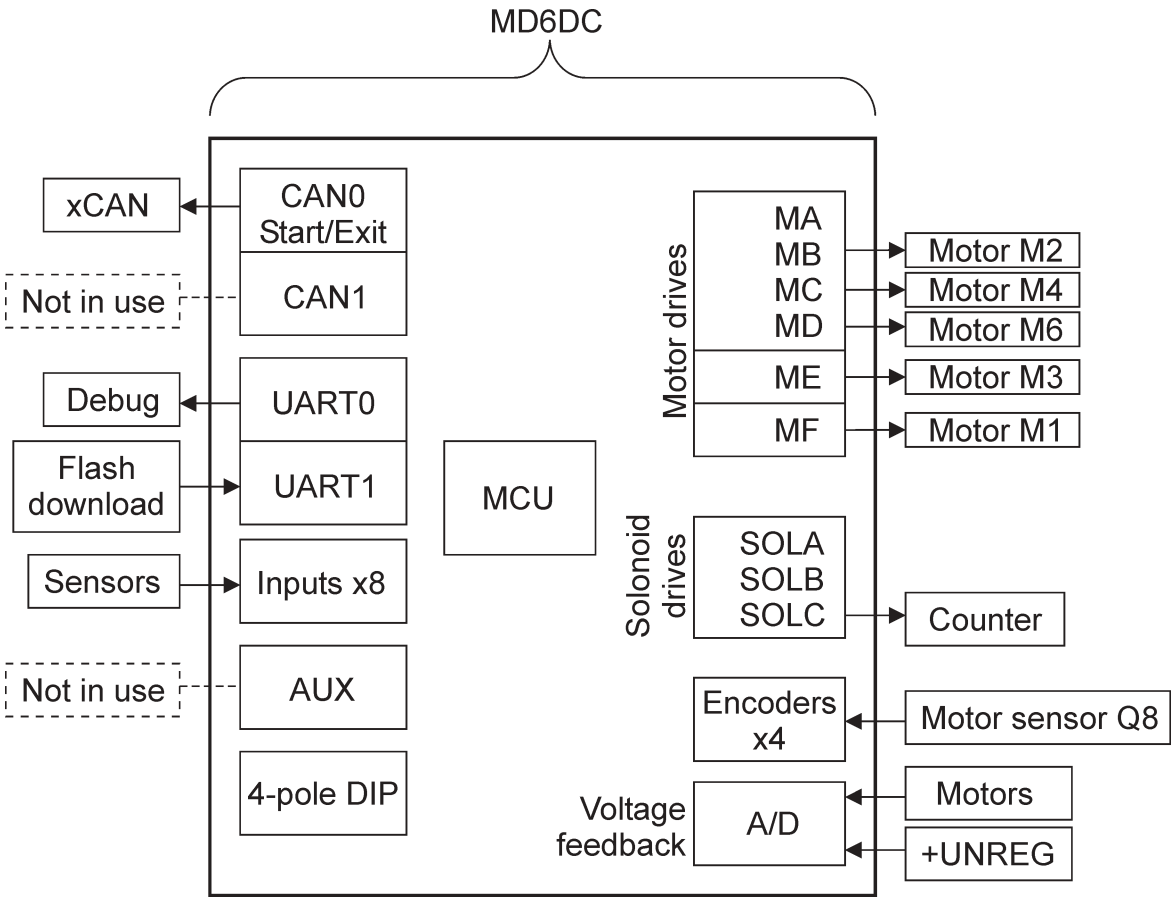
6.2 BOARD STRUCTURE

6.2.1 CONTROLLER MD6DC "D"



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 BF90 does not have any solenoids, one of the solenoid drives is used for the electro-mechanical counter.

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6.3 PRINCIPLE OF OPERATION

Square folding sequence:

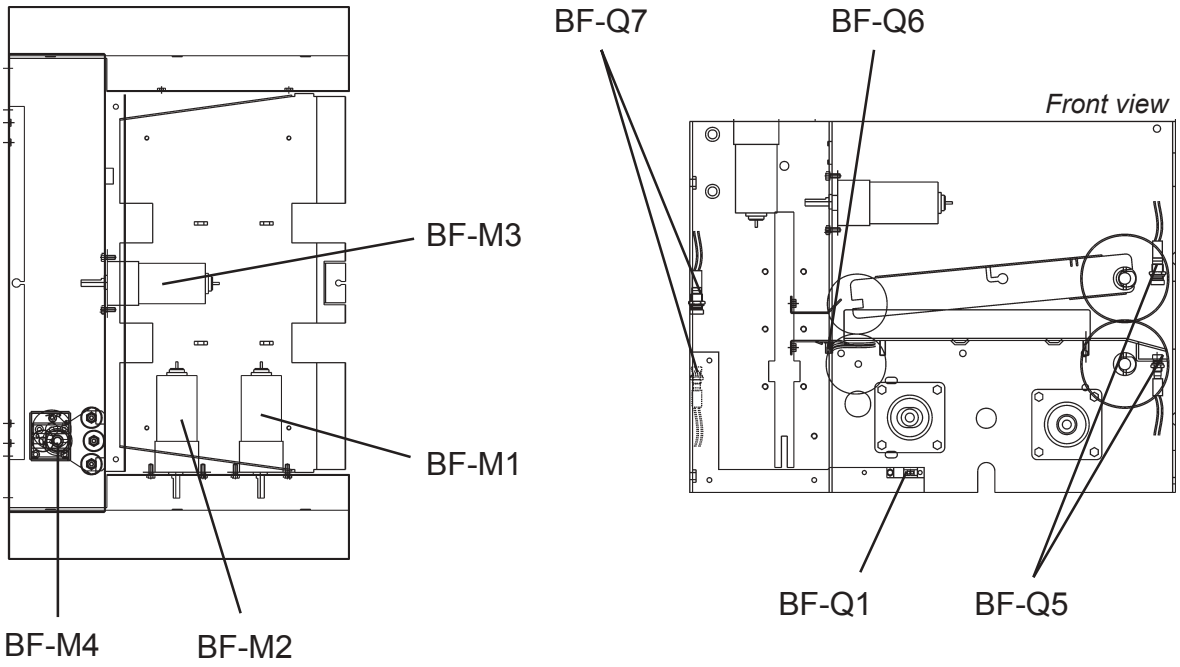
The stapled and folded booklet, and trimmed if selected, is transported up against the Stop gate in the Book folder. The booklet is then compressed by the Set Clamps, holding the booklet in place.

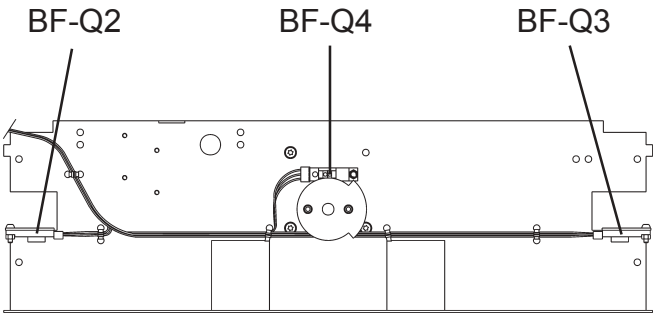
First the Stop gate moves downward and the Set Clamps compresses the Booklet. The Roller motor moves (rolling) over the spine of the Booklet, pressing it up against the Set clamps, producing the Square fold look.

When the Square folding sequence is completed, the Set Clamp moves up and leaves its grip of the booklet. The booklet is finally transported out on to the Belt stacker.

Initialization Cycle:

Top view





Set Clamp view,
seen from Outfeed view

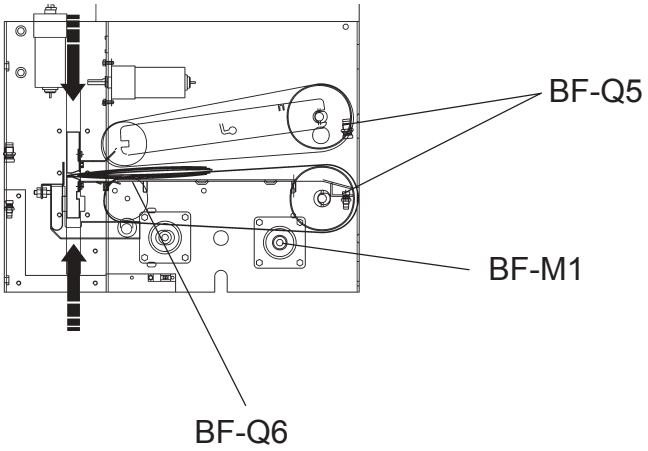
The BF90 performs an initialization-check at power on or when one of the interlocks has been opened and closed.

Clamp motor BF-M3 runs until the Clamp motor Home position sensor BF-Q4 is activated / deactivated, and reverses until sensor BF-Q4 is activated / deactivated. This is done to open up the gap between the Clamps. Stop Gate motor BF-M2 runs until the Stop gate sensor BF-Q1 is activated / deactivated. All the paper path sensors are checked BF-Q5, BF-Q6 and BF-Q7 to make sure that there is no paper in the machine. The Book Folder is now in Ready mode.

In OFF mode:

This mode is for booklets that cannot be Book folded:

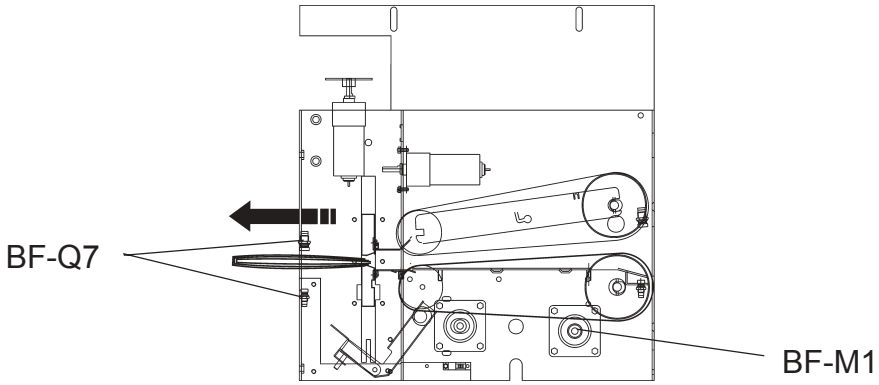
Front view



When Infeed sensor BF-Q5 is activated, the Transport belt Motor BF-M1 is energized. When Clamp sensor BF-Q6 is activated, Belt Stacker motor ST-M1 continues to feed out the set.

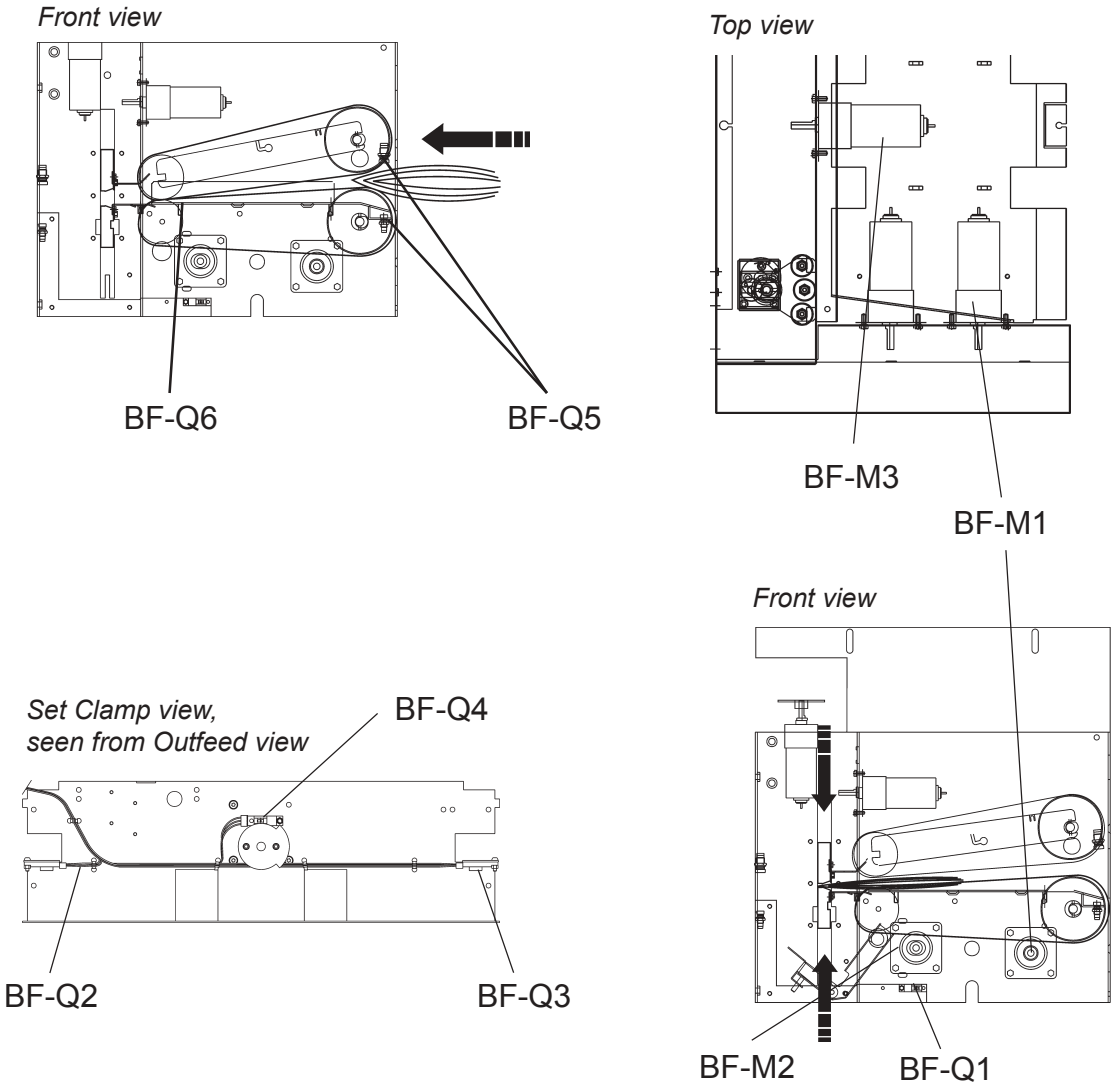
When Outfeed sensor BF-Q7 is activated and deactivated, Transport Belt motor BF-M1 and Stacker motor ST-M1 stops.

Front view



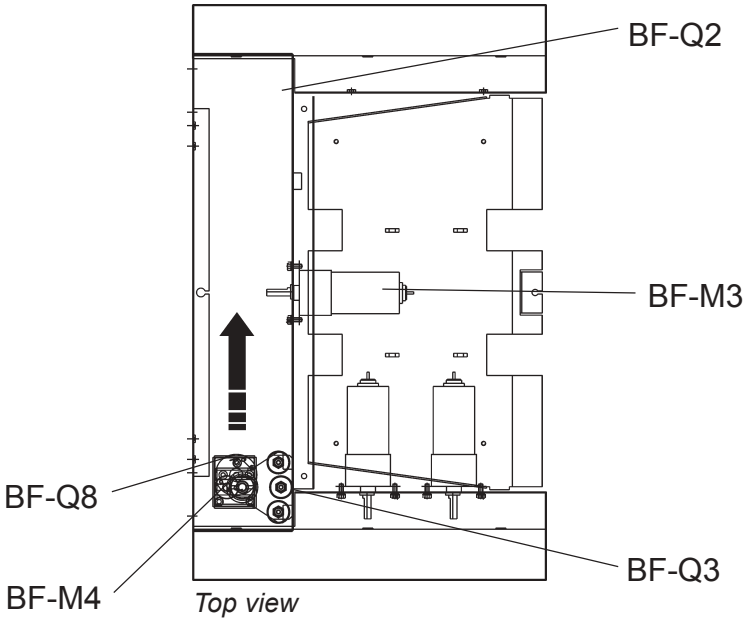
In Mode 1:

This mode is for booklets with approximately 6 to 10 sheets of paper that are being Book folded.



When Infeed sensor BF-Q5 is activated, the Transport belt Motor BF-M1 and Stop gate motor BF-M2 are energized, moving the Stop gate upwards. Motor BF-M2 runs until Stop gate sensor BF-Q1 becomes active, plus a certain amount of milliseconds. Motor BF-M1 Runs until Clamp sensor BF-Q6 is activated, plus a certain amount of milliseconds.

When Transport belt motor BF-M1 has stopped, Clamp motor BF-M3 is energized, moving the Clamps down wards. When Clamp motor Home position sensor BF-Q4 is activated / deactivated, Motor BF-M3 is denergized. When motor BF-M3 is denergized, motor BF-M2 is energized, moving the Stop gate down wards. Motor BF-M2 will run until sensor BF-Q1 becomes deactivated. Now the Clamps are holding the booklet, and Stop gate is down.



Top view

When Sensor BF-Q1 is deactivated, Roller motor BF-M4 is energized (moves (rolling) over the spine of the Booklet, pressing it up against the Set clamps, producing the Square fold look). The Encoder Sensor Q8 starts counting pulses by reading the Encoder Disc. When the correct number of pulses have been counted, motor BF-M4 slows down. When Sensor BF-Q2 or BF-Q3 is activated, motor BF-M4 stops.

When Roller motor BF-M4 has reached it's home position (BF-Q2 or BF-Q3), Clamp motor BF-M3 is energized, moving the Clamps upwards Motor BF-M3 runs until Clamp motor Home position Sensor BF-Q4 is activated / deactivated. The Clamps are now in their upper position.

When sensor BF-Q4 is deactivated, Transport Belt motor BF-M1 and Belt Stacker motor ST-M1 are energized to feed out the set. When Outfeed sensor BF-Q7 is Activated / Deactivated, Transport Belt motor BF-M1 and Stacker motor ST-M1 stops.

In Mode 2:

This mode is for booklets with approximately 11 to 15 sheets of paper that are being Book folded.

The difference between Mode 1 and Mode 2 is, that the Stop gate motor BF-M2 is energized at the same time as Clamp motor BF-M3 is energized. The result of this will be that the booklet will be pushed out a little, when being compressed by the Set Clamps, compared to Mode 1.

In Mode 3:

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

The difference between Mode 2 and Mode 3 is, that when Roller motor BF-M4 has reached it's home position, the motor BF-M4 reverses and starts moving in the opposite direction. The result of this is that the spine becomes flatter, compared to Mode 2.

In Mode AUTO:

When a set passes the fold rollers in the SR90, and forces them apart, sensor BM-Q21 starts counting pulses by reading the movement of the cam. Based on that information, the SR90 decides which mode is the most appropriate. That decision is then communicated to the BF90.

In all other respects the principle of operation is as already described.

NOTE: The Specification for the Book Folder BF90 is to perform the Square folding action on booklets with approximately 6 sheets/booklet, up to 20 sheet/booklet.

NOTE: When the Book folder is set to [Auto] and the booklet has less than approximately 6 sheets/booklet, the Book folder will bypass the Square folding action, transporting the booklet out to the Belt stacker.

SPECIFICATIONS

MAJOR SPECIFICATIONS

	Specifications	Remarks
Speed (Online usage)	2 A4/8.5x11” sheets from the copier 800 books/h	Maintain engine speed of SR90
	2 A3/11x17” sheets from the copier 500 books/h	Maintain engine speed of SR90
Maximum Speed	50 booklets / Min (A4), 33 / Min (A3)	(Off line usage)
Standard Paper Sizes	A4, A3, 8.5x11”, 8.5x14” & 11x17”	Custom sizes are available (SR90)
Paper Weight (Minimum)	64 gsm / 17 lb. Bond	Engine Duplex: 64 gsm
Paper Weight (Maximum)	240 gsm / 135 lb. Index / 90 lb. Cover	Engine Duplex: 163 gsm
Input /Output Sheets	2 - 20 Sheets (80 gsm / 20 lb. Bond, equivalent	Stapled
Input /Output Sheets	2 Sheets	Non Stapled Folding
Off line use	Possible	Stitch / Fold (2 staples)
Weight	46 Kg.	
Dimensions (LxHxD)	360 x 880 x 620 mm / 14.2 x 34.6 x 24.4”	Book Folder only
Power Source	105/115/125/220/230 50-60 Hz	± 10%
Power consumption	200 W or less	Continuous Operations

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