SERVICE MANUAL

(Machine Code: C249)

ESSENTIAL DIFFERENCES BETWEEN C249 AND C238 MODELS

Items	Remarks
New ink and master	New supplies for 400 dpi are used in this model.
Thermal head	A 400 dpi thermal head is used in this model.
Master Feed	Some new mechanisms have been added. Refer to the detailed section descriptions. • Master duct sensor • Master push mylar • Duct plate mechanism • Master buffer mechanism • Thermal head driving mechanism • Auto adjustable master set mechanism
Drum	New drum for 400 dpi are used in this model. *The drum for C238 does not use this mode.
New metal screen and cloth screen	New metal screen and cloth screen for 400 dpi are used in this model.
Ink idling roller	The ink idling roller has been added. This ensures that the first print has sufficient ink density even if the machine has not been used for long periods of time.
Auto adjustable printing pressure	Suitable print pressure works automatically under various conditions.
Air knife fan motor	The number of air knife fan motors has increased to separate paper from the drum.
Operation panel	The LCD has been added to operation panel.
Print key/Start key	You can replace the print key and start key.
New SP mode	Some SP modes have been added. Refer to the service tables for details.
New Error code	Some Error codes have been added. Refer to the troubleshooting section for details.
Preventive maintenance	Some PM items have been added. Refer to the preventive maintenance for details.
Side fence friction pad	The side fence friction pad does not included in the accessory parts. *You can use the side fence friction pad for C238 model.
PC Controller	China model is equipped standard the PC Controller (UC5). The other models can install optional PC Controller (EarlGray-Lt)

TABLE OF CONTENTS

1. INSTALLATION

1.1 INSTALLATION REQUIREMENTS

Carefully select the installation location. Environmental conditions greatly affect machine performance.

1.1.1 OPTIMUM ENVIRONMENTAL CONDITION

1. Temperature —10 to 30 °C (50 to 86 °F)
2. Humidity —20 to 90 % RH
3. Install the machine on a strong and level base. The machine must be level within 5 mm (0.2") both front to rear and left to right.

1.1.2 ENVIRONMENTS TO AVOID

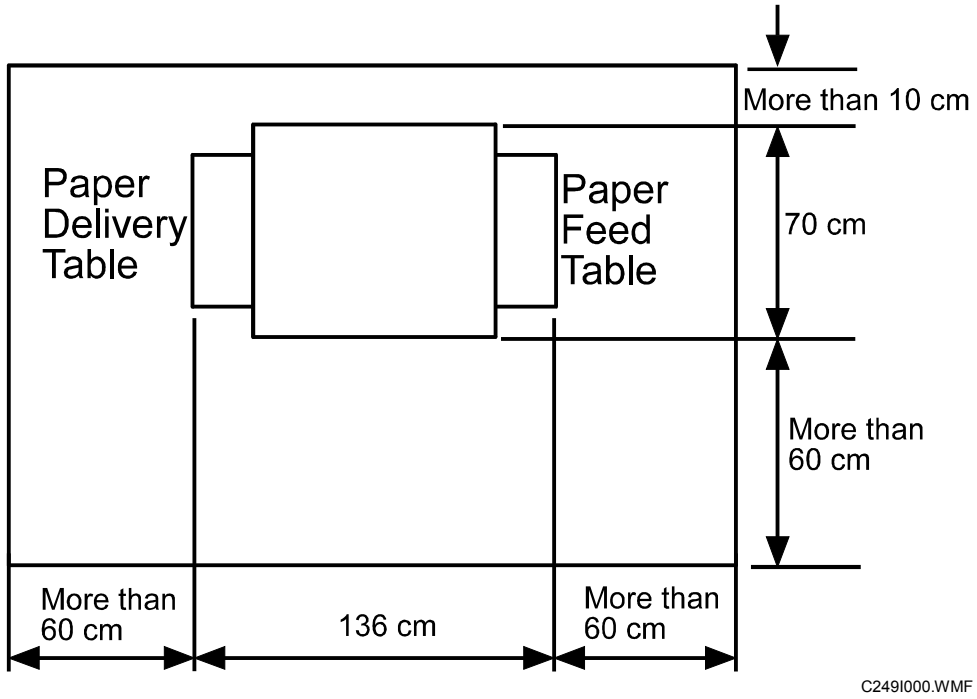
1. Locations exposed to direct sunlight or strong light (more than 1,500 lux).
2. Dusty areas.
3. Areas containing corrosive gases.
4. Locations directly exposed to cool air from an air conditioner or reflected heat from a space heater. (Sudden temperature changes from low to high or vice versa may cause condensation within the machine.)

1.1.3 POWER CONNECTION

1. Securely connect the power cord to a power source.
2. Make sure that the wall outlet is near the machine and easily accessible.
3. Make sure the plug is firmly inserted in the outlet.
4. Avoid multi-wiring.
5. Do not pinch the power cord.

1.1.4 MACHINE ACCESS

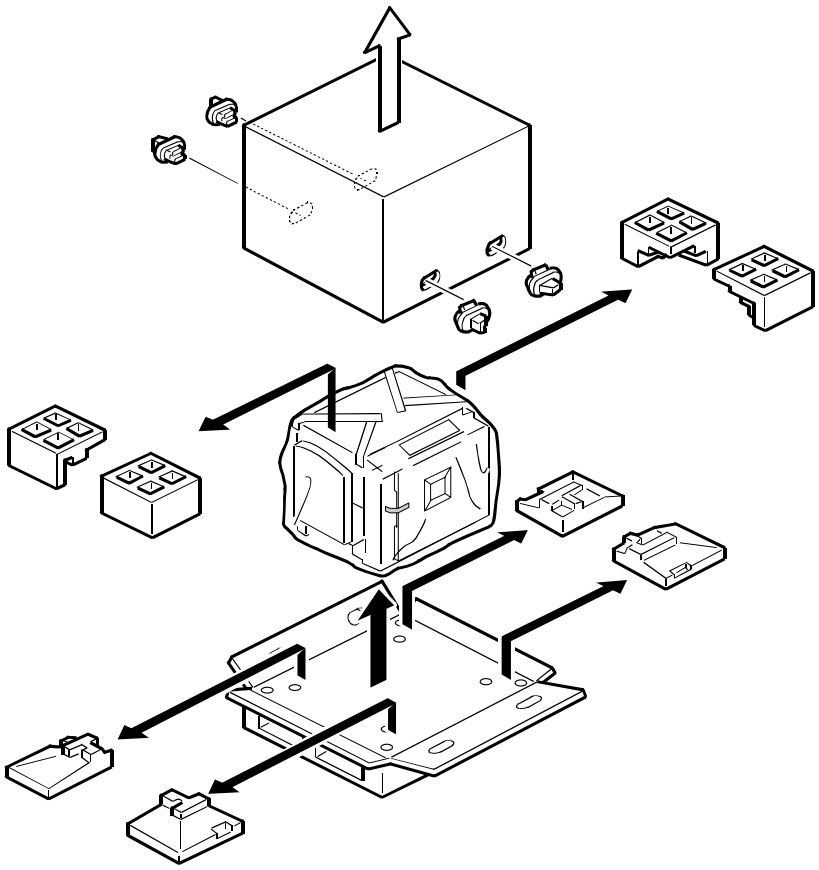
Place the machine near a power source, providing clearance as shown below.



1.2 INSTALLATION PROCEDURE

1.2.1 MAIN UNIT

Accessory Check

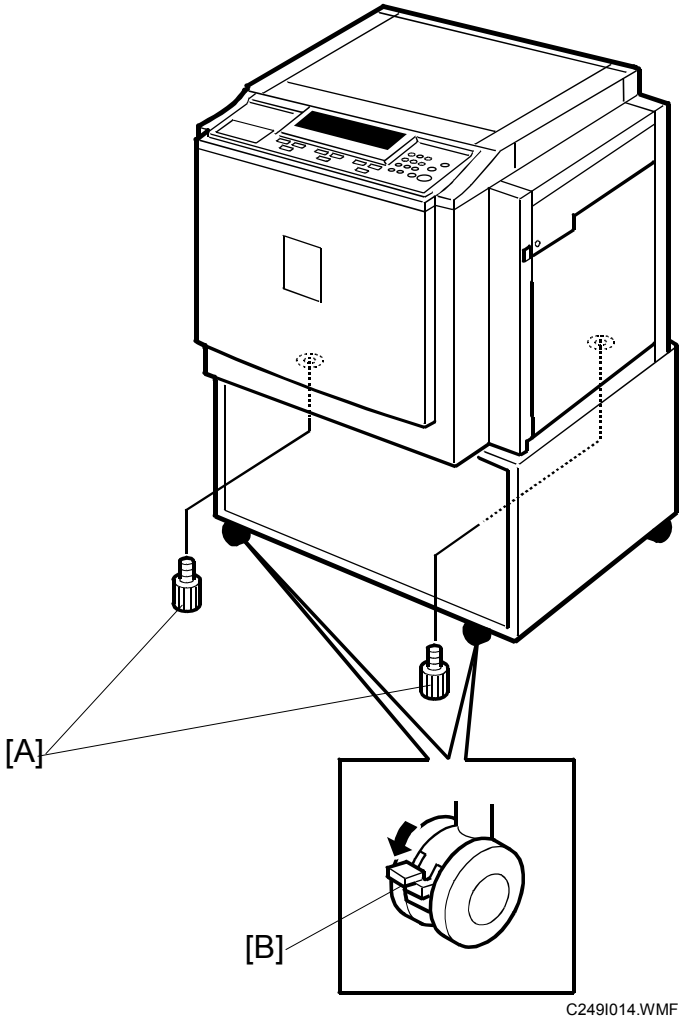


C249I019.WMF

Make sure that you have all the accessories listed below:

	Description	Q'ty
1.	Master Spool	2
2.	Operating Instructions	1
3.	NECR (Ricoh version only)	1
4.	Model Name Plates (C249-22, and -52 only)	1 set

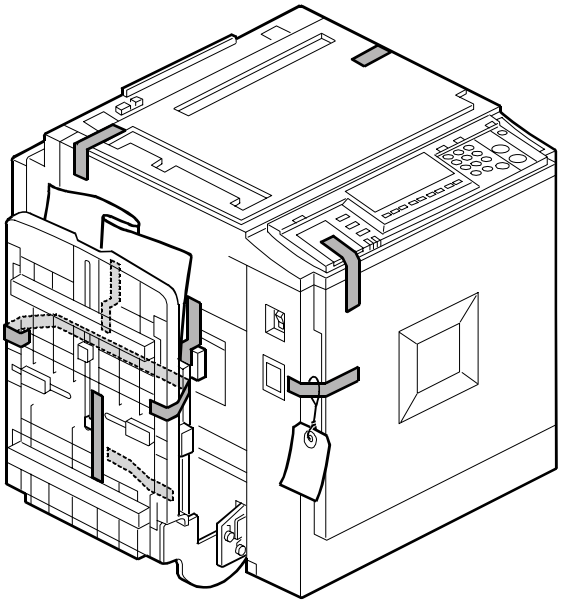
Installation Procedure



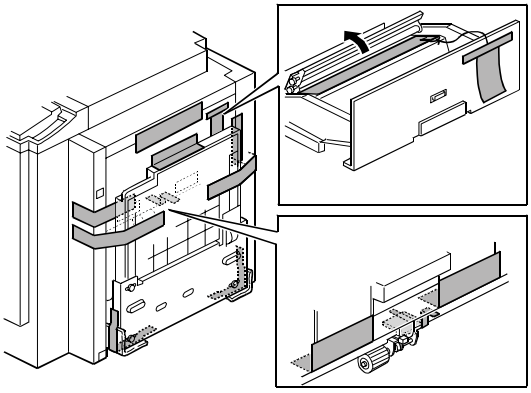
1. Unpack the box. When installing the optional table, mount the machine as shown (there are 2 screws [A] packed with the table).

⚠CAUTION

Only lift with the carrying handles on the bottom corners of the machine.
Secure the machine on the table with the 2 screws [A] provided. This prevents the machine from falling from the table when the platen cover is open.
Lock the casters of the table as shown [B], to prevent the machine from moving (e.g. when the drum is set).



C249I907.WMF



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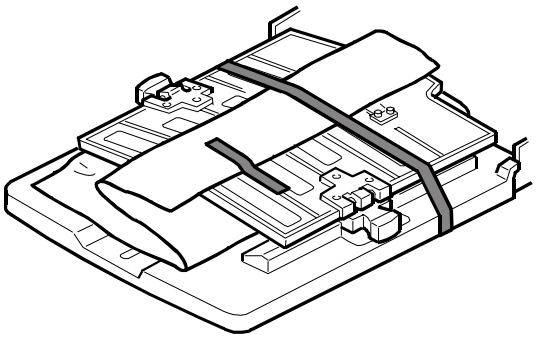

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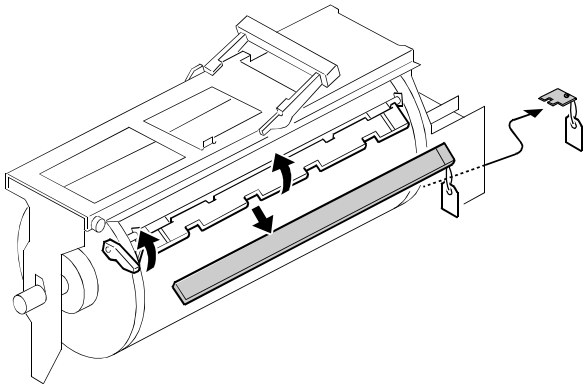
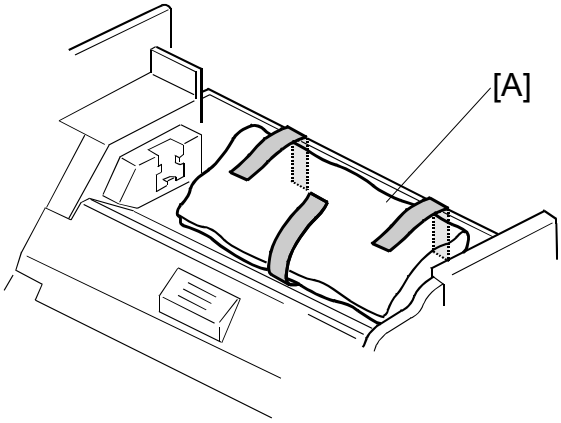


C249I020.WMF

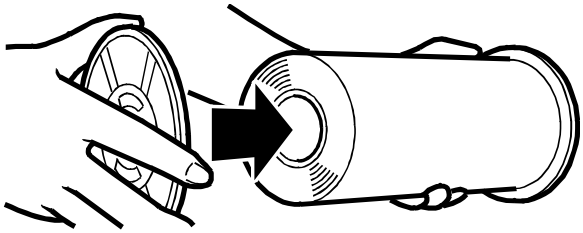
2. Remove the filament tape and string securing the covers and units as shown above.

3. Pull out the master making unit, and take out the accessory bag [A].



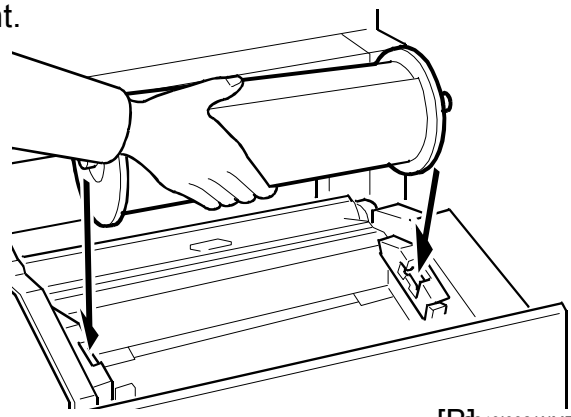
C249I038.WMF

4. Insert both spools into a new master roll.



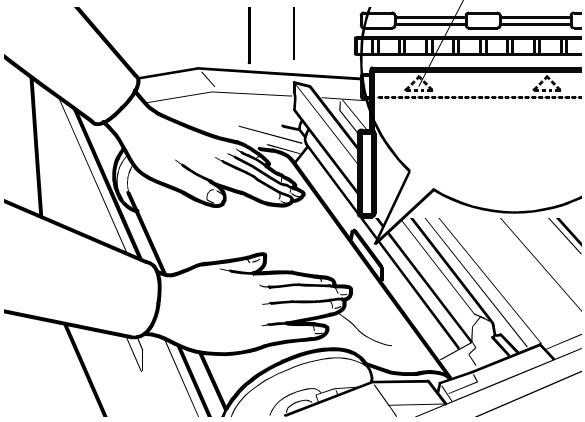
C249I030.WMF

5. Install the master roll as shown to the right.



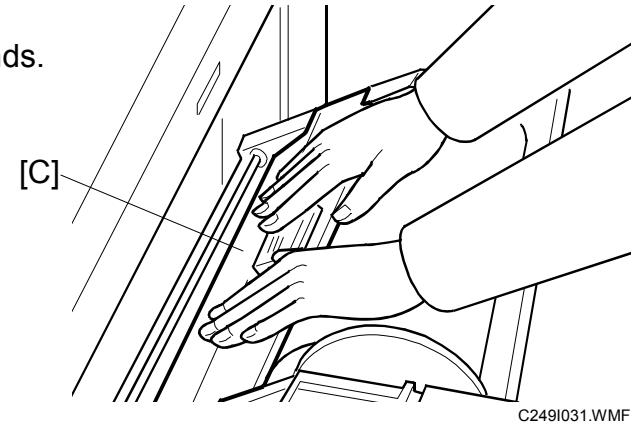
C249I032.WMF

6. Insert the leading edge of the master roll under the platen roller. The arrows [B] indicate the correct position of the master leading edge.



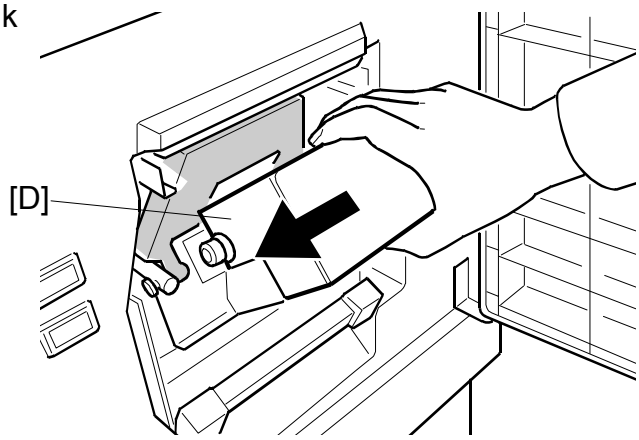
C249I910.WMF

7. Close the cover [C] using both hands.
8. Set the master-making unit.



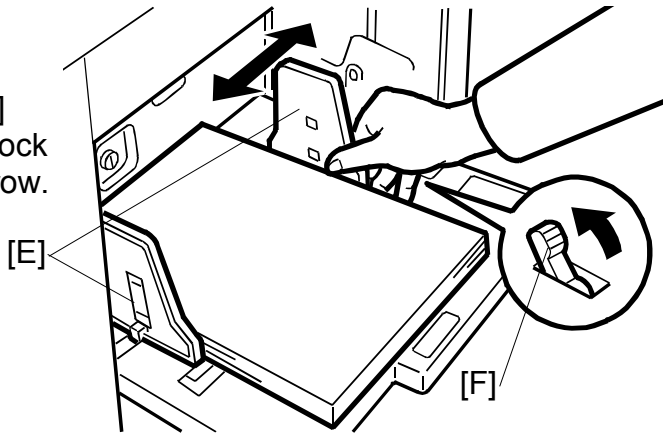
C249I031.WMF

9. Open the door, and insert a new ink cartridge [D].



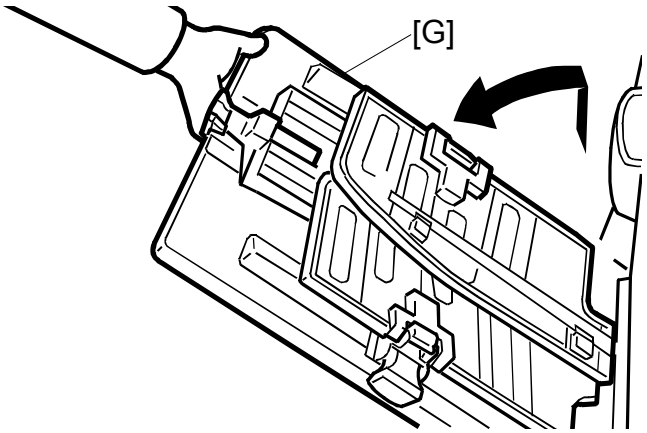
C249I034.WMF

10. Open the paper table, and load a stack of paper.
11. Make sure that the side plates [E] touch the paper gently. Shift the lock lever [F] in the direction of the arrow.



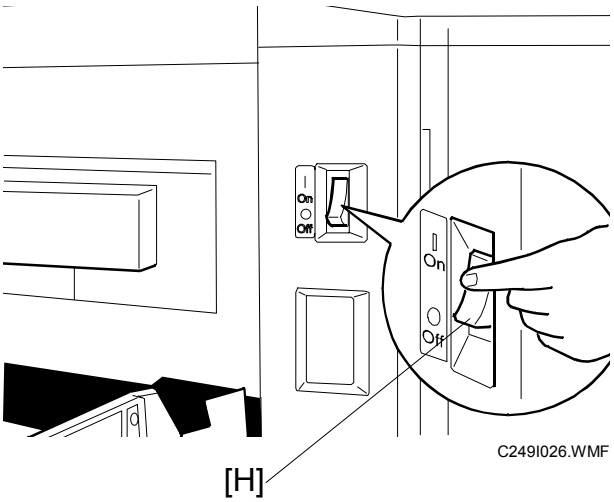
C249I028.WMF

12. Raise the paper delivery table [G] slightly, then gently lower it.
13. Lift the side plates and the end plate, and adjust them to the paper size.



C249I027.WMF

14. Firmly insert the power plug in the outlet.
15. Make sure that the wall outlet is near the machine and easily accessible.
16. Turn on the main switch [H].
17. Press the “Economy mode” key while holding down the “0” key, to supply ink inside the drum.
18. Make some test copies.



C249I026.WMF

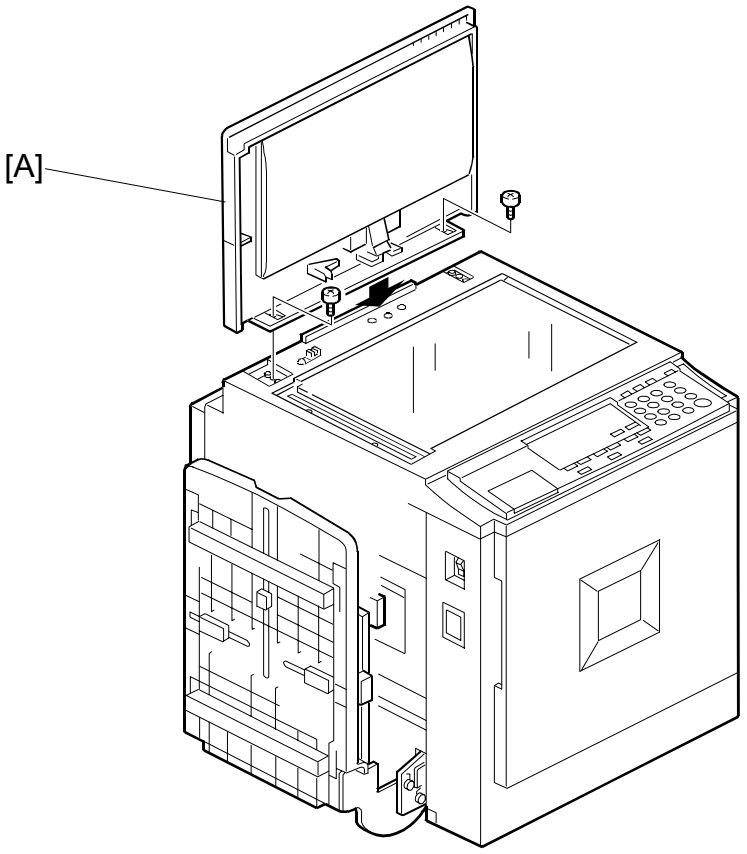
1.2.2 PLATEN COVER INSTALLATION (OPTION)

Accessory Check

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

Description	Q'ty
1. Stepped Screw	2

Installation Procedure



C249I001.WMF

1. Install the platen cover [A] (2 screws).

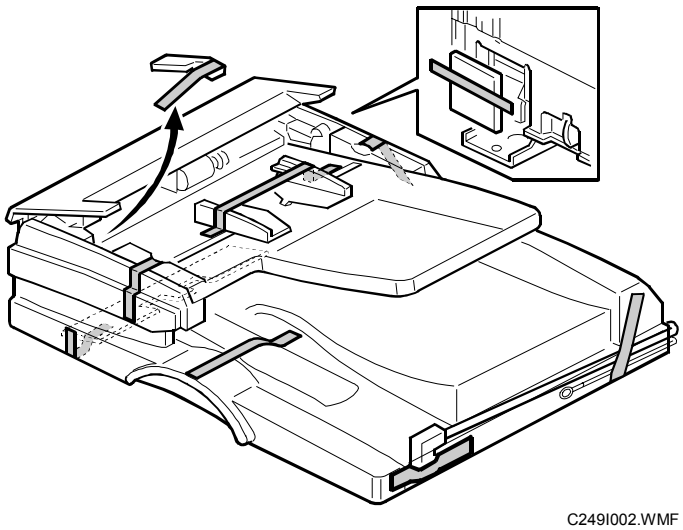
1.2.3 ADF INSTALLATION (OPTION)

Accessory Check

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

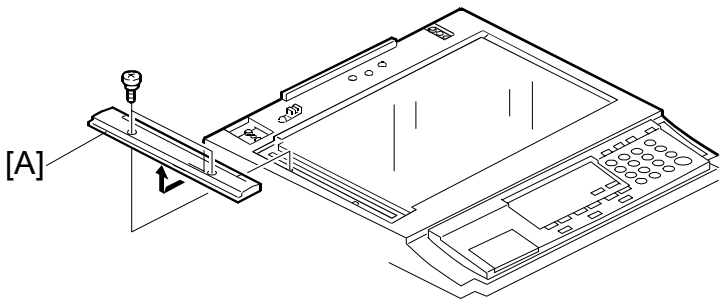
Description	Q'ty
1. Stepped Screw	2
2. Screws	3
3. Screwdriver	1
4. DF Exposure Glass	1
5. Decal - Exposure Glass	1
6. Decal - Scale - mm	1
7. Decal - Scale - inch	1
8. Scale Guide	1
9. Stabilizer Bracket	2
10. Thumbscrew	4
11. Caution Label	1

Installation Procedure

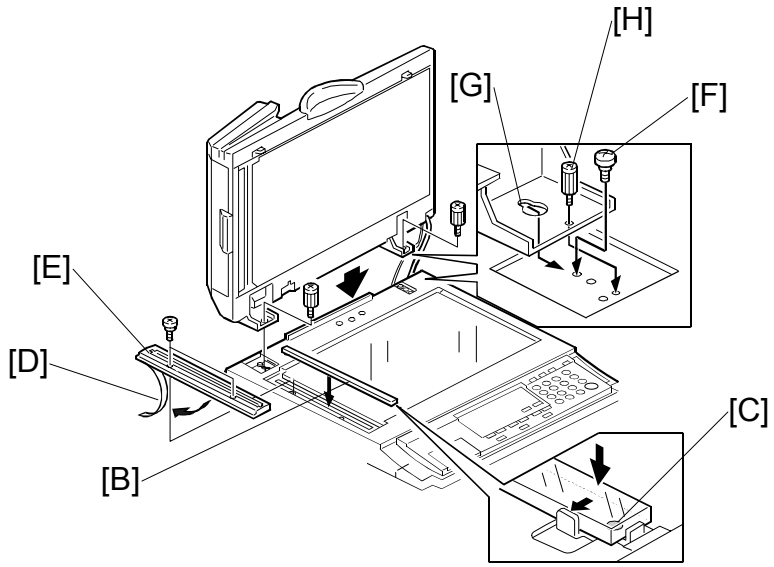


C249I002.WMF

1. Remove the strips of tape.

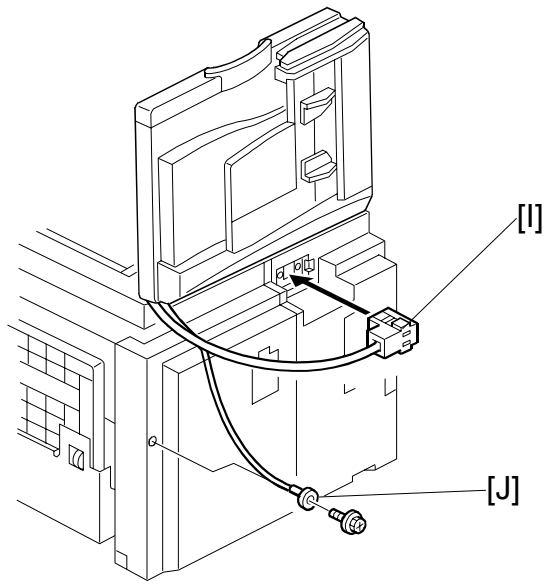


C249I003.WMF

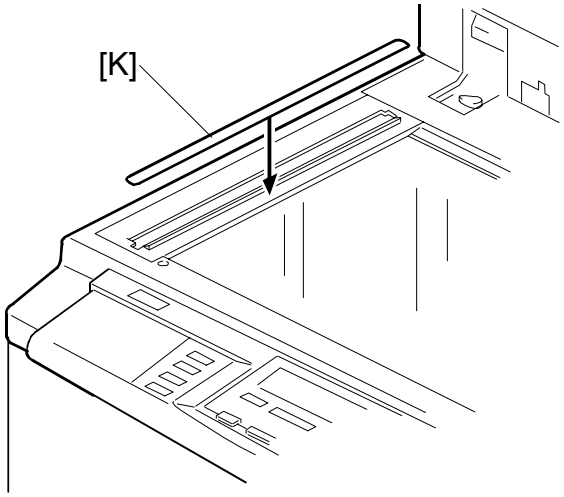


C249I004.WMF

2. Remove the left scale [A] (2 screws).
3. Place the DF exposure glass [B] on the glass holder.
   NOTE: When installing the DF exposure glass, make sure that the white point [C] is positioned at the lower front side, as shown.
4. Peel off the backing [D] of the double-sided tape attached to the rear side of the scale guide [E], then install the scale guide (2 screws removed in step 2).
5. Install the two stud screws [F].
6. Mount the DF by aligning the holes [G] in the DF with the stud screws, then slide the DF to the front as shown.
7. Secure the DF unit with two screws [H].



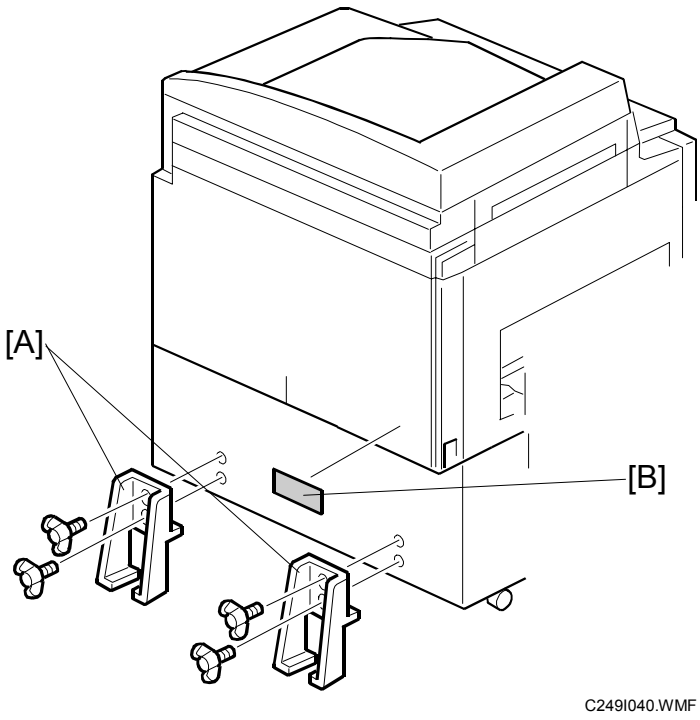
C249I018.WMF



C249I500.WMF

8. Connect the cables [I] and [J] to the main body.
9. Attach the scale decal [K] as shown.
10. Plug in the power cord, then turn the main switch on.
11. Make a full size copy using the ADF. Then check to make sure the side-to-side and leading edge registrations are correct. If they are not, adjust their values (do the adjustment procedures in section 5.7.3).

ADF stabilizer installation



1. Attach the two stabilizer brackets [A] to the back of the table using the thumbscrews (4 screws).
2. Attach the caution label [B], as shown.

⚠CAUTION
This procedure must be done to prevent the machine from falling backwards when the ADF is open.

1.2.4 TAPE MARKER (OPTION)

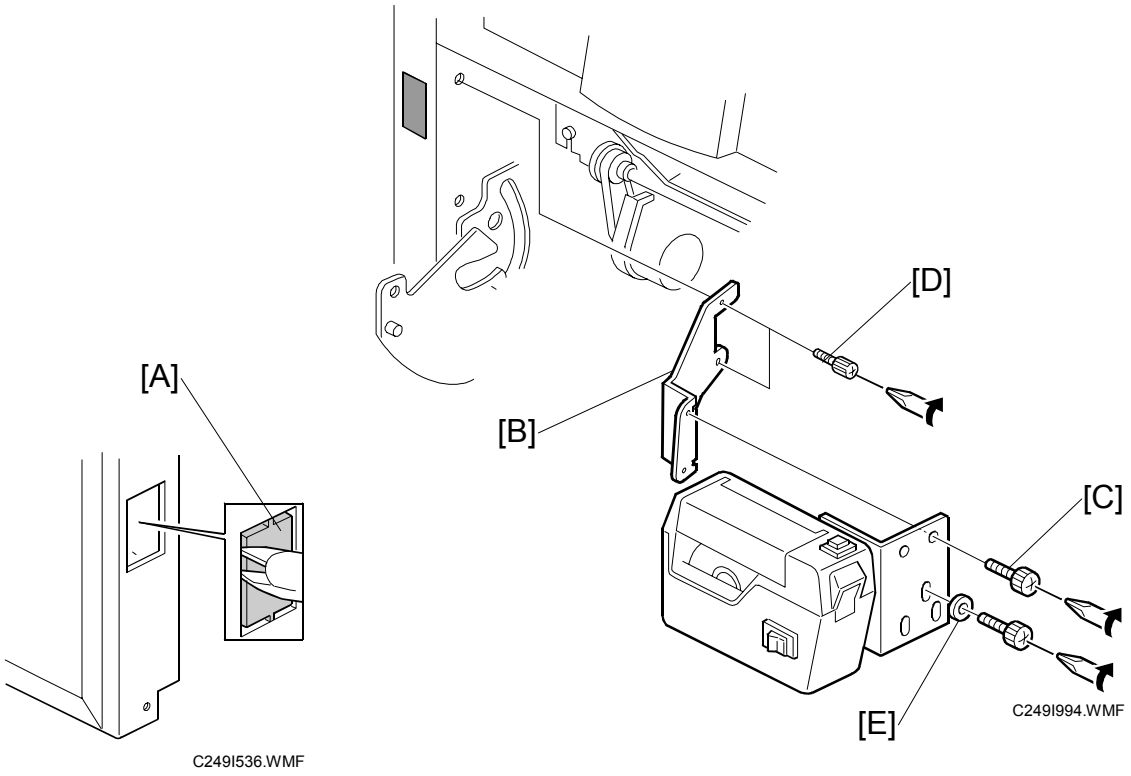
Accessory Check

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

Description	Q'ty
1. Knob Screw (C210, C217, C218, C219, C222, C223, C225, C228, C231, C237, C238, C247, C248 and C249 only)	2
2. Screw M4 x 25 (C211, C212, C213, C214, C216, C224, and C226 only).....	2
3. Hexagon Nut M4 (C211, C212, C213, C214, C216, C224, and C226 only).....	2
4. Auxiliary Bracket (C226 only).....	1
5. Auxiliary Bracket (C238, C247, and C249 only).....	1
6. Screw M4 x 8 (C226, C238, C247 and C249 only)	2
7. Lock Washer (C226 only).....	1
8. Lock Washer	1
9. Tape.....	1

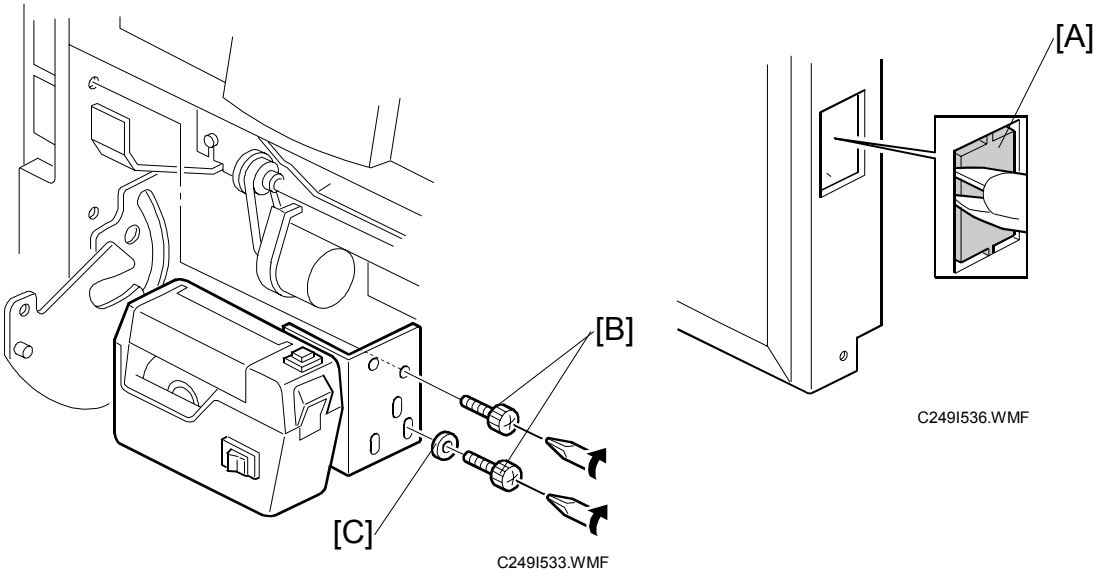
Installation Procedure

- For C238, C247 and C249 -



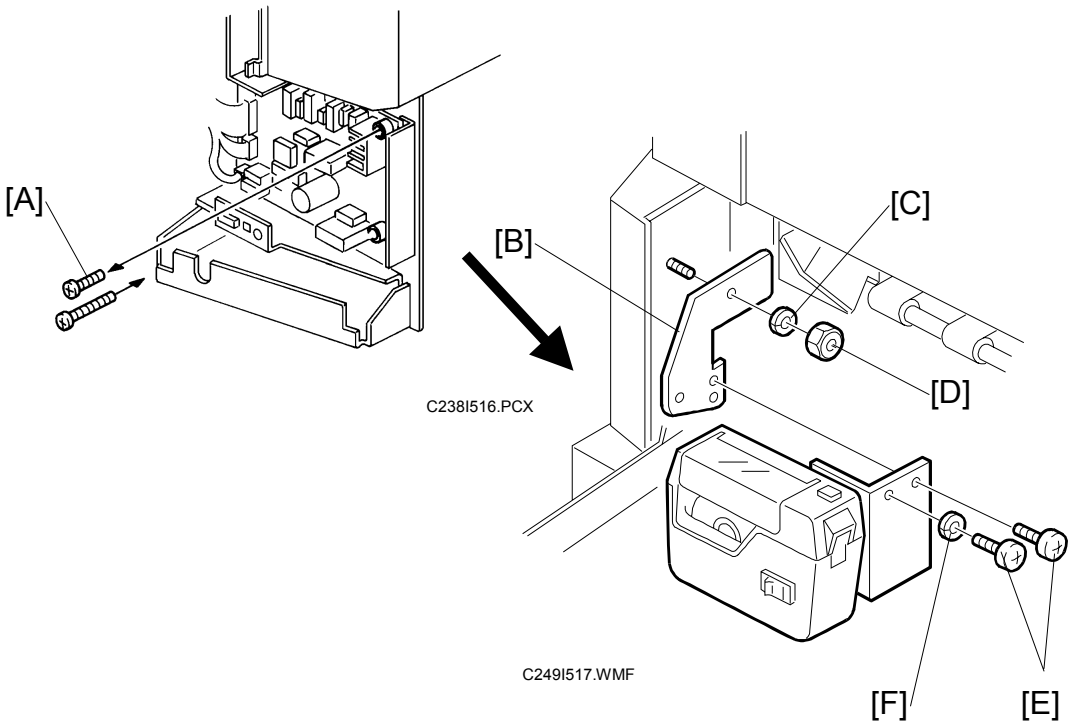
1. Turn off the main switch and unplug the power cord.
2. Remove the paper delivery plate (4 screws).
3. Cut the cap [A] off the rear cover of the main body with pliers, then connect the tape marker cable to the main body.
4. Install the auxiliary bracket [B] (#C5326502) on the tape marker with M4 x 8 screws (accessories) [C].
   NOTE: Install the lock washer [E] (accessories) with the lower of the two screws.
5. Install the tape marker on the main body with two knob screws [D] (accessories) in the two outer holes in the tape marker bracket.
6. Reinstall the paper delivery plate.
7. Refer to "Common Steps".

- For C231 , C237, and C248 -



1. Turn off the main switch and unplug the power cord.
2. Remove the paper delivery table (2 screws).
3. Remove the paper delivery plate (4 screws).
4. Cut the cap [A] off the rear cover with pliers, then connect the tape marker cable to the main body.
5. Install the tape marker on the main body with two knob screws [B] (accessories) in the two outer holes in the tape marker bracket.
   NOTE: 1) Tighten the knob screws with a screwdriver to prevent them from coming loose.
   2) Install the lock washer [C] (accessories) with the lower of the two knob screws.
6. Reinstall the paper delivery plate and paper delivery table.
7. Refer to "Common Steps".

- For C226 -



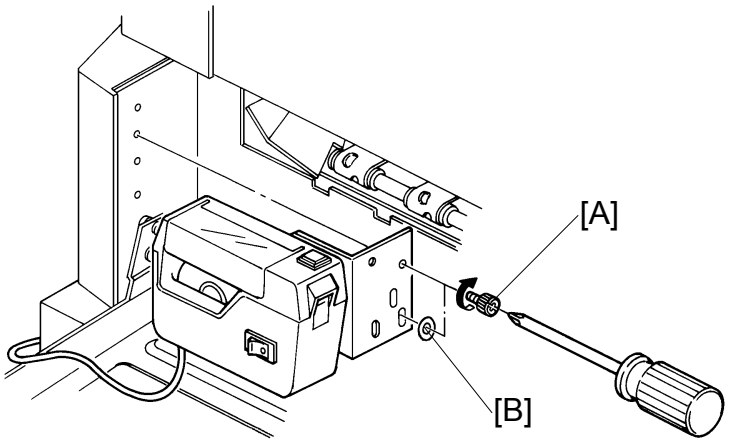
Main Body:

1. Turn off the main switch and unplug the power cord.
2. Remove the rear cover (6 screws).
3. Replace the screw [A], to secure the AC drive board with M4 x 25 screws (accessories).
4. Reinstall the rear cover.
5. Install the auxiliary bracket [B] on the main body with the hexagon nut [D] (accessories) as shown.
   NOTE: Install the lock washer [C] (accessories) with the nut.

Tape Marker:

6. Install the tape marker on the auxiliary bracket with two M4 x 8 screws [E] (accessories).
7. Install the lock washer [F] (accessories) with one of the two screws.
8. Refer to "Common Steps".

- For C210, C218, C219, C222, and C223 -

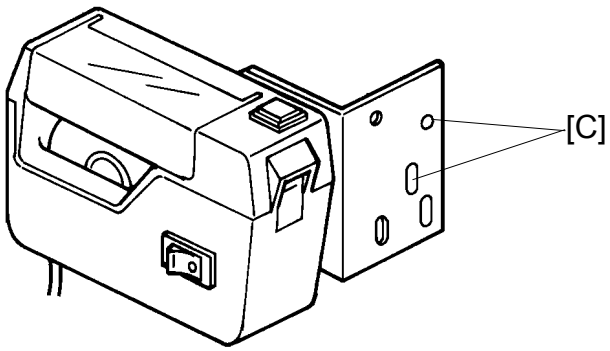


C238I502.PCX

1. Turn off the main switch and unplug the power cord.
2. Install the tape marker on the main body with two knob screws [A] (accessories) in the two outer holes in the tape marker bracket.
   NOTE: 1) Tighten the knob screws with a screwdriver to prevent them from coming loose.
   2) Install the lock washer [B] (accessories) with the lower of the two knob screws.
3. Refer to “Common Steps”.

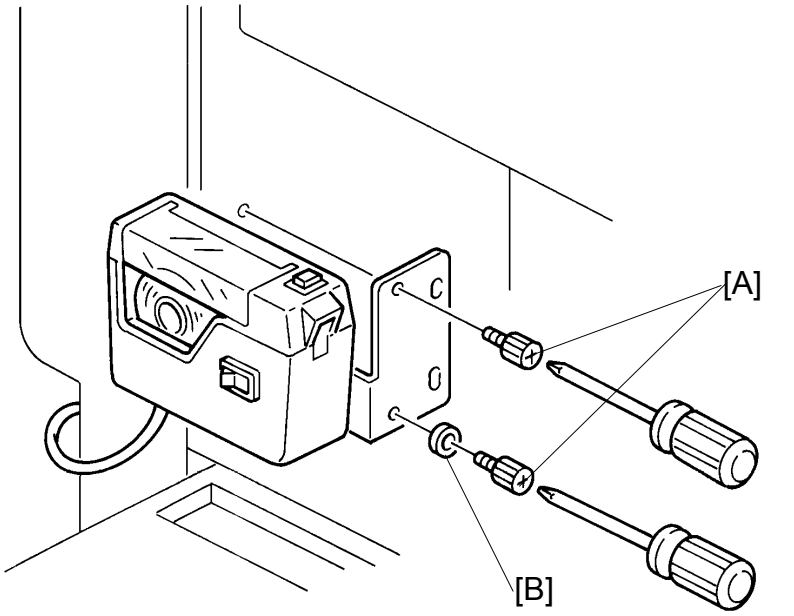
— For Model C228 and the models on which the new Paper Delivery Table is installed —

Use the two holes in the tape marker bracket [C] as shown below.



C238I504.PCX

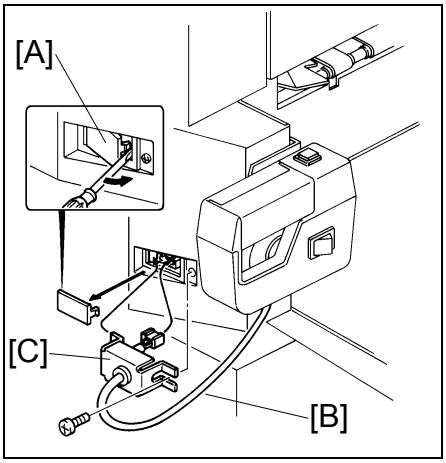
- For C217 and C225 -



1. Turn off the main switch and unplug the power cord.
2. Install the tape marker on the main body with two knob screws [A] (accessories) in the two inner holes of the tape marker bracket.
   NOTE: 1) Tighten the knob screws with a screwdriver to prevent them from coming loose.
   2) Install the lock washer [B] (accessory) with the lower of the two knob screws.
3. Refer to “Common Steps”.

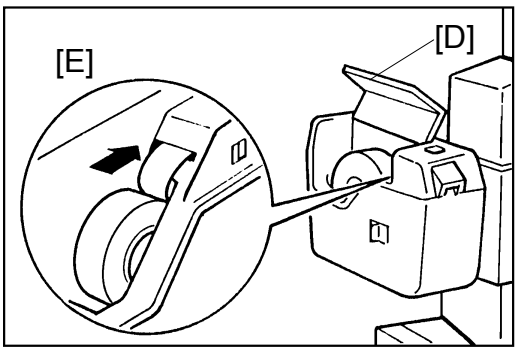
- Common Steps -

1. Remove the small cap in the rear cover of the main body [A]. Then, connect the tape marker cable [B] to the main body, and install the connector cover [C] using one of the rear cover securing screws. (For C238, C247 and C249, this has already been done.)



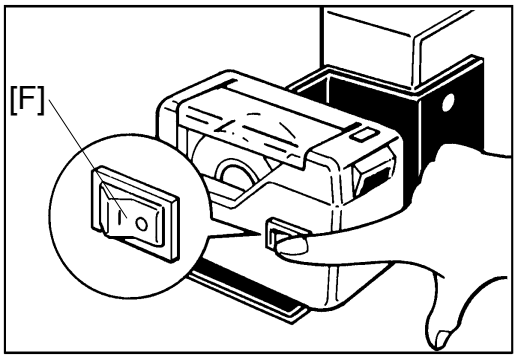
C238I518.PCX

2. Open the tape marker cover [D]. Then, insert the leading edge of the tape into the tape entrance until it stops as shown in the illustration [E].
   NOTE: Be sure that the tape is installed in the proper direction. If it is not, the tape marker will not work correctly.



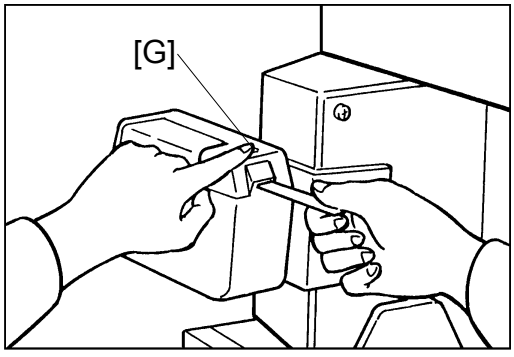
C238I519.PCX

3. Turn on the main switch of the main body and set the SP mode to activate the tape marker. (Refer to the service program table.)
4. Turn on the tape marker switch [F].



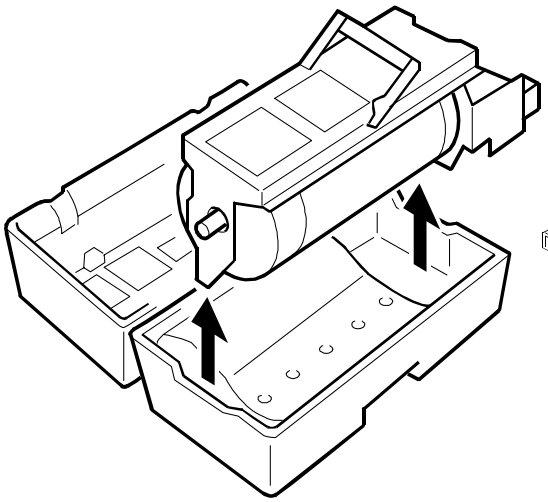
C238I520.PCX

5. Press the tape cut button [G] to cut off the leading edge of the tape.
6. Check the tape marker operation using the Memory/Class modes of the main body.

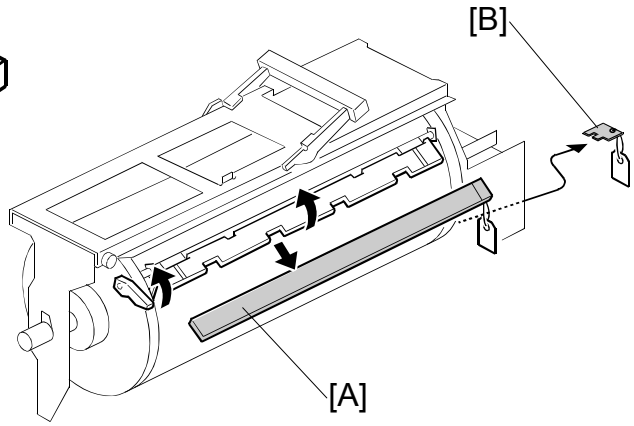


C238I521.PCX

1.2.5 OPTIONAL DRUMS



C249I534.WMF



C249I020.WMF

There are two types of drum units:

A3 Size: Color drum

A4 Size: Black drum (Black ink only)

1. Remove the protective sheet [A] and the lock [B] from the drum unit.
2. Remove the tape securing the ink holder.
3. Attach a color indicator decal to the drum case. The decal must be the same color as the ink in use.
4. Remove the drum unit.
5. Leave the master wrapped around the removed drum to protect the drum from dust and from drying.
6. Keep the removed drum unit in the drum case.
7. Install the drum unit.
   NOTE: The color drum indicator (or A4 drum indicator) on the operation panel stays lit when a drum is mounted in the machine.
8. Remove the ink cartridge cap.
9. Insert the ink cartridge in the ink holder.

2. PREVENTIVE MAINTENANCE

The maintenance tables are identical to the C238 model, with the exception of the back patch [A].

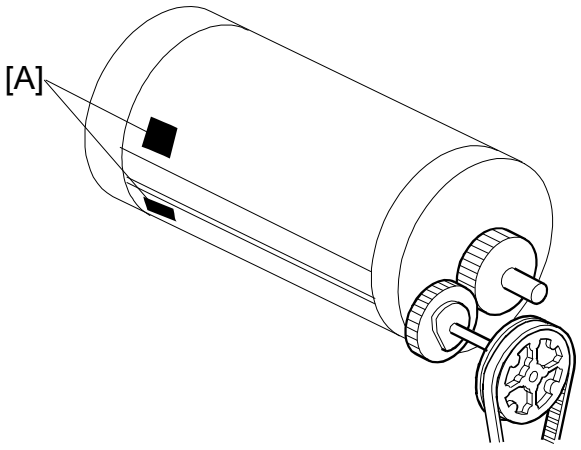
2.1 MAINTENANCE TABLE

The following items should be maintained periodically. There are two sets of intervals - one based on time and the other based on print count. For maintenance items with entries in both of them, use whichever comes first.

C: Clean, R: Replace, L: Lubricate, A: Adjust

Interval / Item	Time				Print Counter					EM	NOTE
	6M	1Y	2Y	3Y	1M	1.2M	2M	2.4M	3M		
Drum and Ink Supply											
Black Patch [A]	C	C	C	C							Dry Cloth

NOTE: The black patch [A] was added to PM Parts.



C249P001.WMF

3. REPLACEMENT AND ADJUSTMENT

Only items that were changed or newly added to the C249 model are described.

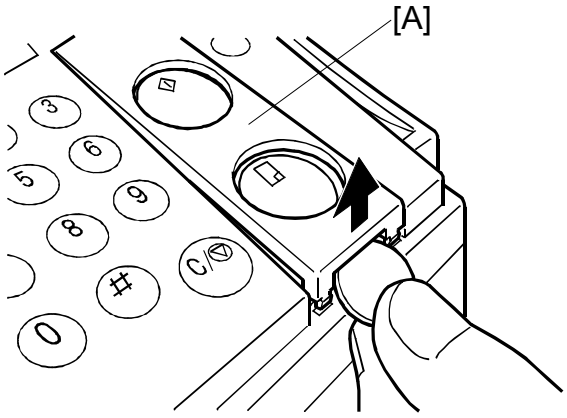
3.1 GENERAL CAUTION

⚠CAUTION

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

NOTE: This manual uses several symbols. The meaning of those symbols are as follows:
☛ : See or Refer to : screw : connector : E-ring : Clip

3.2 PRINT KEY / START KEY



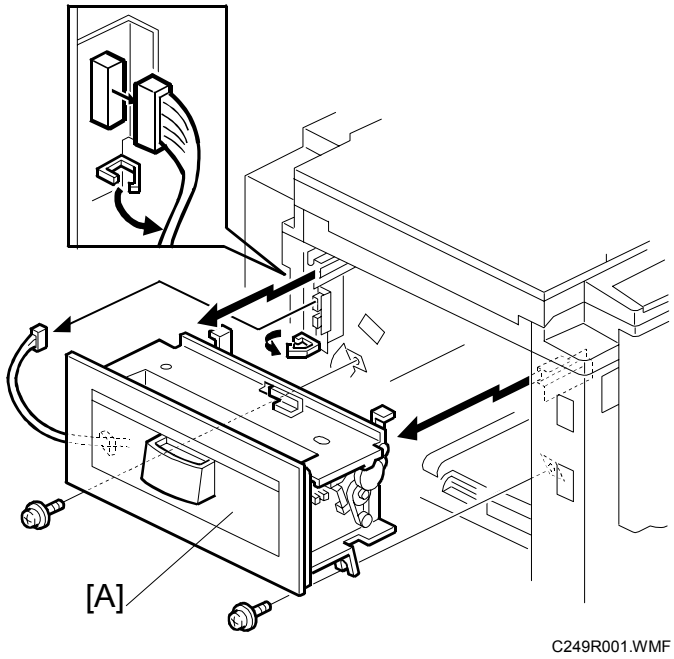
C249R120.WMF

C249R119.WMF

[A]: Key Cover
[B]: Print start key
[C]: Master making key

3.3 MASTER EJECT

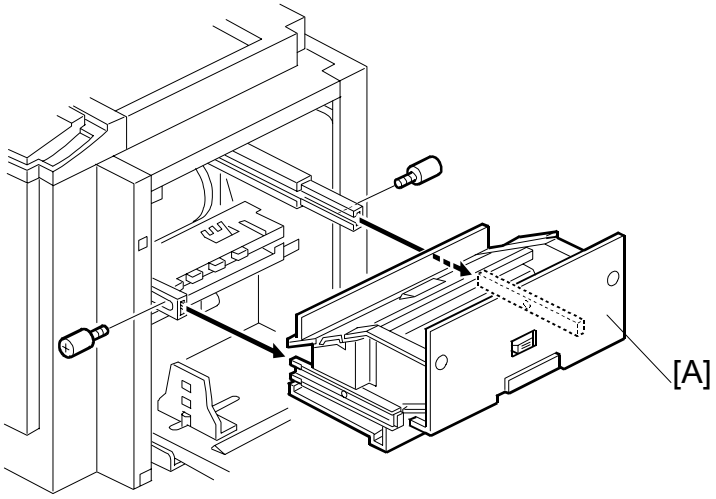
3.3.1 MASTER EJECT UNIT



[A]: Master eject unit (✋ x 1, 🔩 x 2, 1 clamp)

3.4 MASTER FEED

3.4.1 MASTER MAKING UNIT



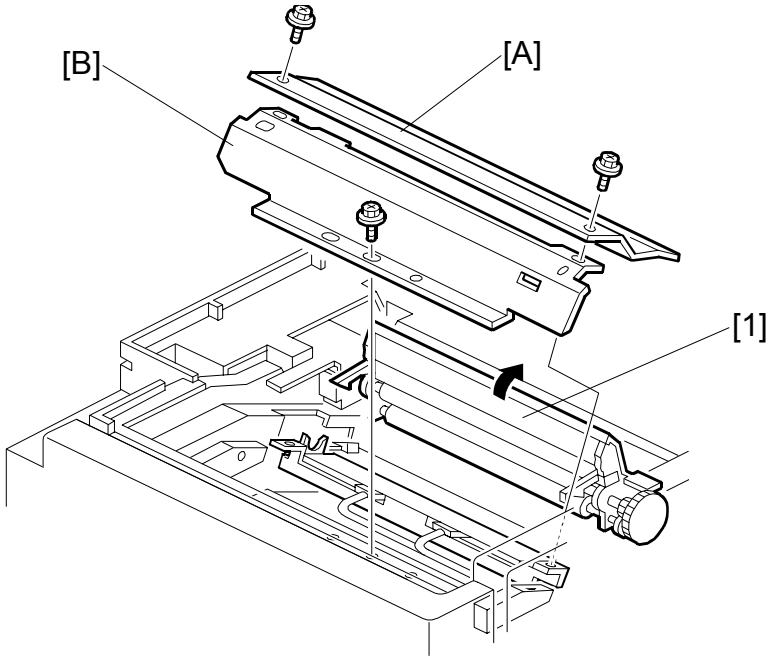
C249R121.WMF

[A]: Master making unit (🔩 x 2)

3.4.2 THERMAL HEAD

1. Connect the power plug. Then turn on the main switch to access SP mode.
2. Select SP5-74 (T/H driving motor - up), then press the enter (#) key and turn off the main switch.

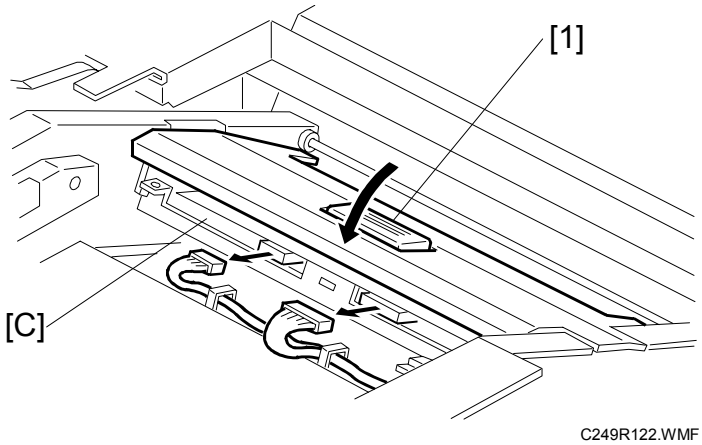
NOTE: 1) The thermal head is released, after about 2 seconds. (There is almost no sound of operation.)
2) The thermal head does not separate, unless it releases as mentioned above.



C249R049.WMF

- Master making unit (☛ 3.4.1)
- Open the platen roller unit [1].

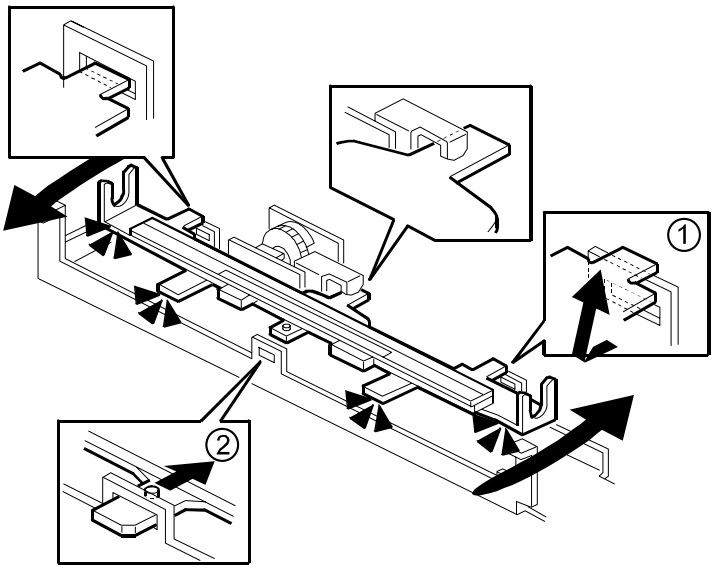
[A]: T/H upper cover (☞ x 2)
[B]: T/H side cover (☞ x 1)



C249R122.WMF

- Close the platen roller unit [1].

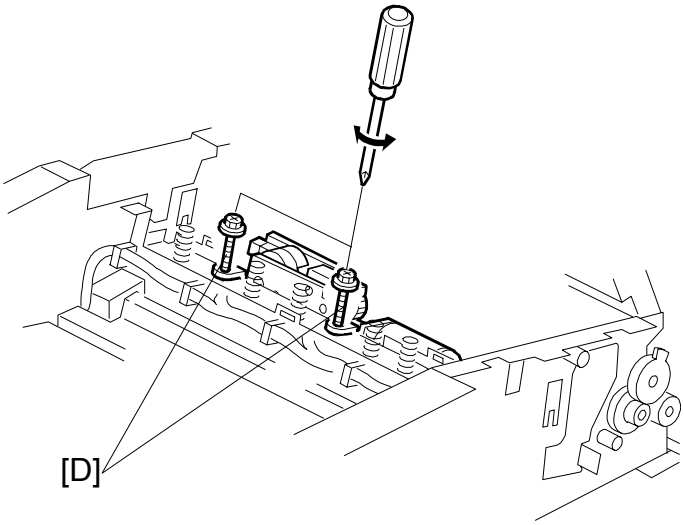
[C]: Thermal head (☞ x 2)



C249R116.WMF

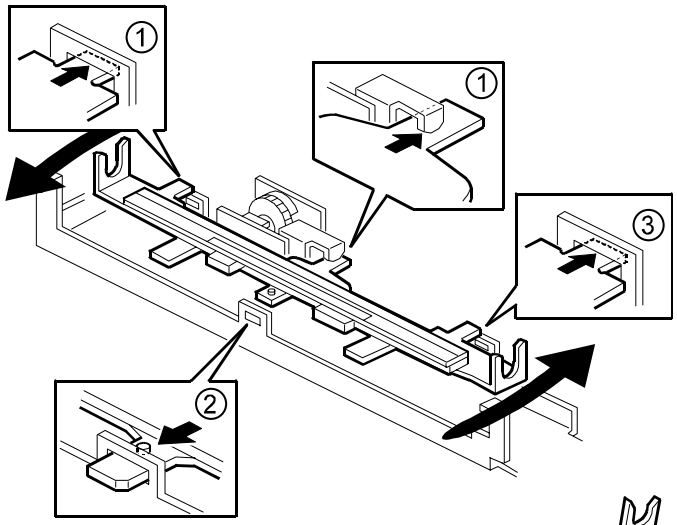
1. Turn the thermal head clockwise and remove a nail (①).
2. Turn the thermal head counterclockwise, and remove a nail (②).
3. Remove the thermal head slowly.

NOTE: If you cannot access SP modes, open the master making unit and loosen the 2 screws [D].

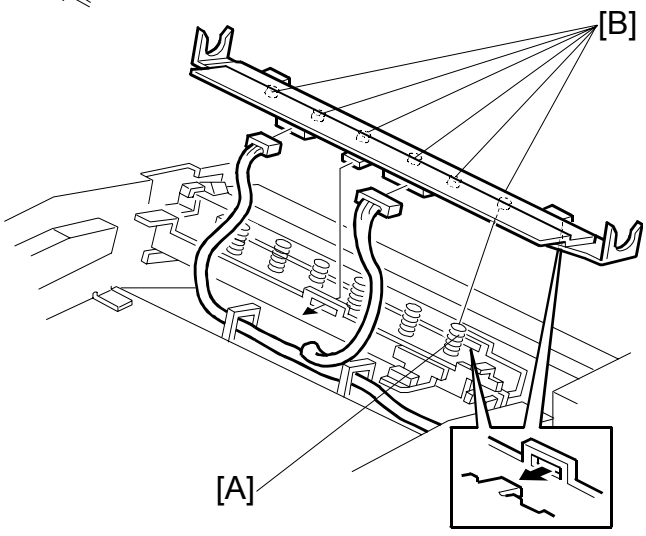


C249R110.WMF

Installation



C249R117.WMF



C249R030.WMF

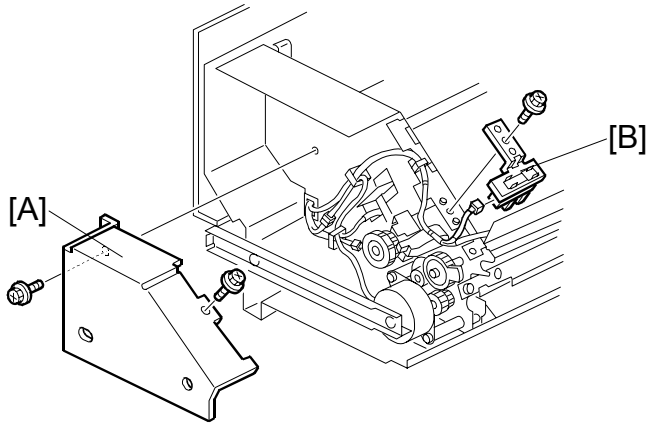
1. Insert in the nails (①) to the operation side and middle.
2. Turn the thermal head counterclockwise and insert in the nail (②) to in front.
3. Turn the thermal head clockwise and insert in the nail (③) to the non-operation side.

Make sure to follow the above procedure or the thermal head will not be installed correctly.

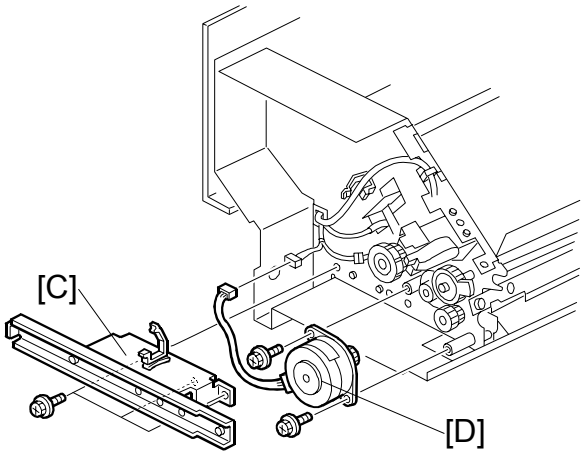
1) Fit the base's springs [A] over the protrusions [B] on the underside of the thermal head (6 points).
2) While fitting the tops of the springs [A] over the protrusions on the underside of the thermal head.
3) Make sure that all protrusions are properly fitted into the springs.

CAUTION: Adjust the thermal head voltage (☛ C238 Service Manual 3.5.3) after installing the new thermal head.

3.4.3 DUCT PLATE HP SENSOR / DUCT PLATE MOTOR



C249R101.WMF

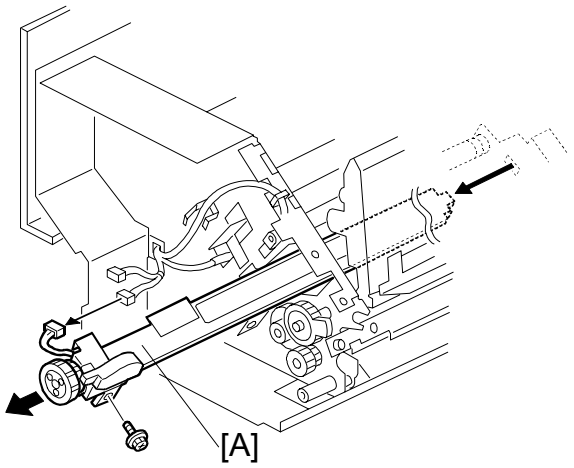


C249R102.WMF

- Master making unit (☛ 3.4.1)

[A]: Rear cover (🔩 x 2)
[B]: Duct plate HP sensor (🖐 x 1, 🔩 x 1)
[C]: Rear rail bracket (🔩 x 2)
[D]: Duct plate motor (🖐 x 1, 🔩 x 2)

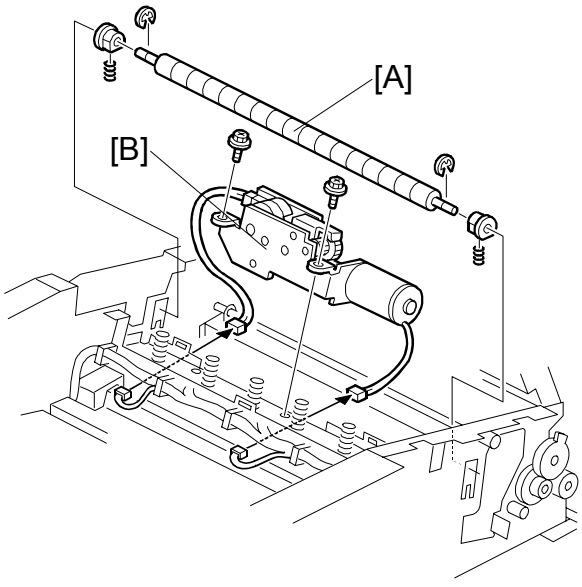
3.4.4 CUTTER UNIT



C249R103.WMF

[A]: Cutter unit (x 1, x 1)

3.4.5 THERMAL HEAD DRIVING UNIT



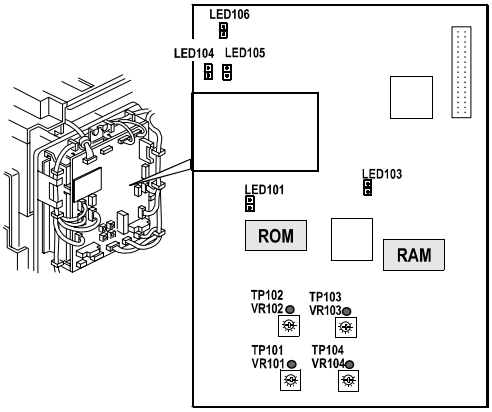
C249R105.WMF

- Thermal head (☛ 3.4.2)
- Rear cover (☛ C238 Service Manual 3.2.2)
- Cutter unit (☛ 3.4.4)

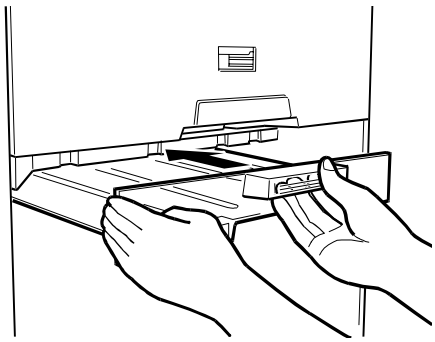
[A]: Anti-Static roller (x 2)
[B]: Thermal head driving unit (x 2, x 2)

3.4.6 DUCT JAM SENSOR ADJUSTMENT

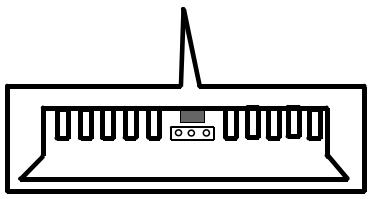
Ensures that the sensor detects when a master remains in the duct.



C249R124.WMF



C249R123.WMF



C249R113.WMF

Standard: 0.5 volts (within “+0.1” and “-0.1”volts)

Tools: Circuit tester

- Rear cover (☛ C238 Service Manual 3.2.2)

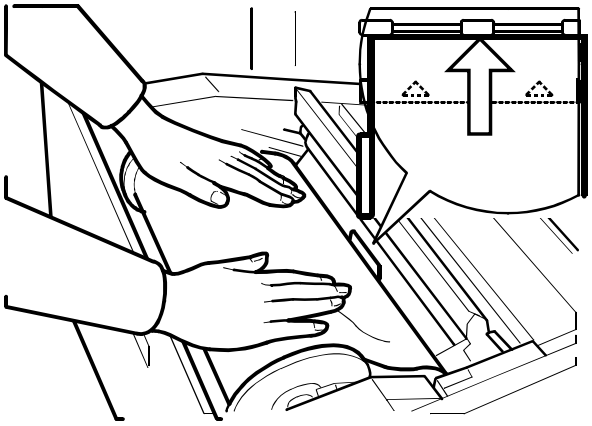
1. Confirm if a master remains in the duct. If a master remains in the duct, remove the master from the duct.
2. Connect the terminals of a circuit tester to TP102 and a grounded place (e.g. iron base)
3. Connect the power plug, and turn on the main switch to access SP mode.
4. Select SP6-52 (Duct jam sensor voltage).
5. Press the Print Start key.
6. Measure the voltage, and turn VR102 so that the value becomes between “-0.1” and “+0.1” volts from the standard value (0.5 volts)

NOTE: When the value of the voltage does not become the standard value, adjust the threshold level of the duct jam sensor. (SP6-52 : Duct jam sensor voltage)

Standard Value Master being	Threshold level (SP6-52)	Standard Value Master nothing
Above 2.0V	2.0V	0.5 ±0.1V

3.4.7 MASTER EDGE SENSOR ADJUSTMENT

Ensures that the sensor detects the leading edge of the master.



C249R133.WMF

Standard: 2.0 volts (within “+0.1” and “-0.1”volts)

Tools: Circuit tester

- Rear cover (☛ C238 Service Manual 3.2.2)

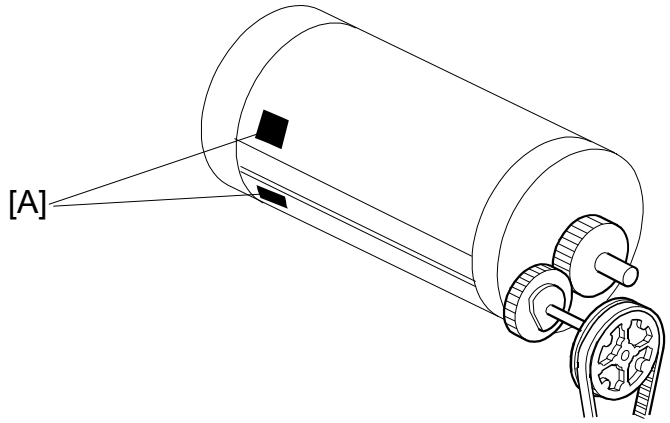
1. Connect the terminals of a circuit tester to TP103 and a grounded place (e.g. iron base)
2. Connect the power plug, and turn on the main switch to access SP mode.
3. Select SP6-51 (Master edge sensor voltage).
4. Remove the lower master tray.
5. Pull out the master-making unit from the machine and open the master set cover.
6. Insert the leading edge of the master under the master tension roller, then close the master set cover and reinstall the master-making unit to the machine.
7. Measure the voltage, and turn VR103 so that the value becomes between “-0.1” and “+0.1” volts from the standard value (2.0 volts).

NOTE: When the value of the voltage does not become the standard value, adjust the threshold level of the master edge sensor. (SP6-51 : Master edge sensor voltage)

Standard Value Master being	Threshold level (SP6-51)	Standard Value Master nothing
2.0 ±0.1V	2.8V	Above 3.3V

3.4.8 2ND DRUM MASTER SENSOR ADJUSTMENT

Ensures that the sensor detects if there is a master on the drum.



C249R126.WMF

Standard: 2.0 volts (within "+0.1" and "-0.1"volts)

Tools: Circuit tester

- Rear cover (☛ C238 Service Manual 3.2.2)

1. Confirm that the master wraps on the drum.
2. Connect the terminals of a circuit tester to TP104 and a grounded place (e.g. iron base)
3. Connect the power plug, and turn on the main switch to access SP mode.
4. Select SP6-53 (2nd drum master sensor voltage) and press the master-making key.
5. Measure the voltage, and turn VR104 so that the value becomes between "-0.1" and "+0.1" volts from the standard value (2.0 volts).
6. Turn off the main switch, then remove the master that is wrapped around the drum and install the drum in the main body.
7. Turn on the main switch to access SP mode.
8. Select SP6-53 (2nd drum master sensor voltage) and press the master-making key.
9. Check if the value of the voltage becomes below 0.8 volts.
10. If the voltage is not correct, clean the black patch [A] on the screen.

NOTE: When the value of the voltage does not become the standard value, adjust the threshold level of the 2nd drum master sensor. (SP6-53 : 2nd drum master sensor voltage)

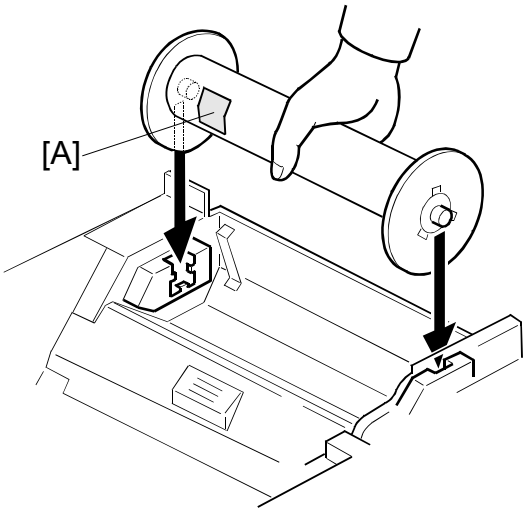
Standard Value Master being	Threshold level (SP6-53)	Standard Value Master nothing
2.0 ±0.1V	1.0V	Below 0.8V

3.4.9 MASTER END SENSOR ADJUSTMENT

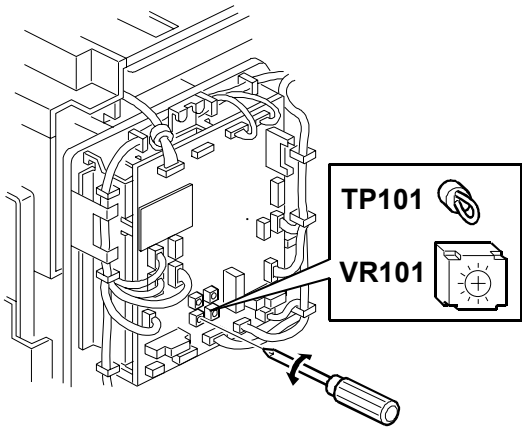
Ensures that the sensor detects the end mark (a solid black area) on the master roll.

Standard: 1.8 volts (within “+0.1” and “-0.1” volts)

Tools: Circuit tester, the core of a used master roll (the core has no master)



C249R114.WMF



C249R118.WMF

- Rear cover (☛ C238 Service Manual 3.2.2)

1. Connect the terminals of a circuit tester to TP101 and to a grounded place (e.g. iron base).
2. Put a piece of master [A] on the used master roll.
3. Place the core of the used master roll inside the master-making unit, and close the master-making unit.

NOTE: Detect a low fiber content paper side of a piece of paper to the master end sensor.

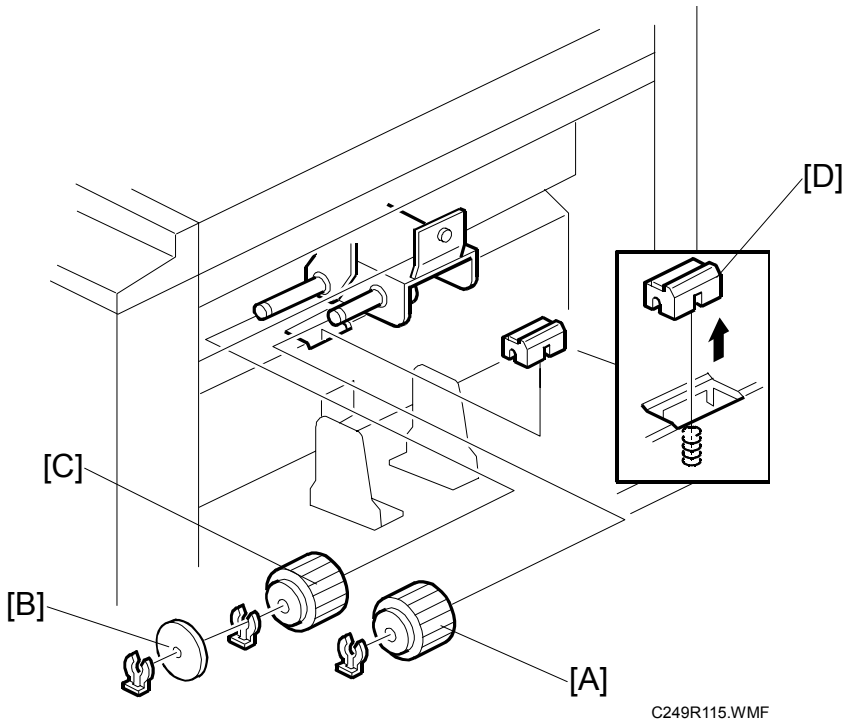
4. Connect the power plug, and turn on the main switch.
5. Measure the voltage, and turn VR101 so that the value becomes between “-0.1” and “+0.1” volts from the standard value (1.8 volts).

NOTE: When the value of the voltage does not become the standard value, adjust the threshold level of the master end sensor. (SP6-50 : Master end sensor voltage)

Standard Value Master being	Threshold level (SP6-50)	Standard Value Master nothing
Below 1.8V	1.9V	2.0 ±0.1V

3.5 PAPER FEED

3.5.1 PICK-UP ROLLER / PAPER FEED ROLLER / FRICTION PAD



- Lower the paper table.

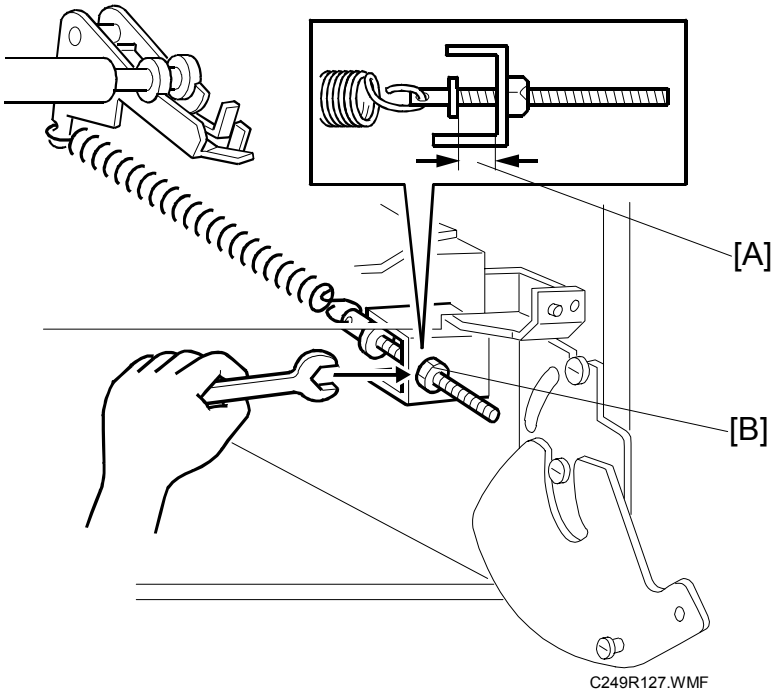
[A]: Pick-up roller (x 1)
[B]: Paper guide (x 1)
[C]: Feed roller (x 1)
[D]: Friction pad

3.6 PRINTING

3.6.1 PRINTING PRESSURE ADJUSTMENT

Improves print results without decreasing the run length.

Standard: Within 17 ± 0.2 mm

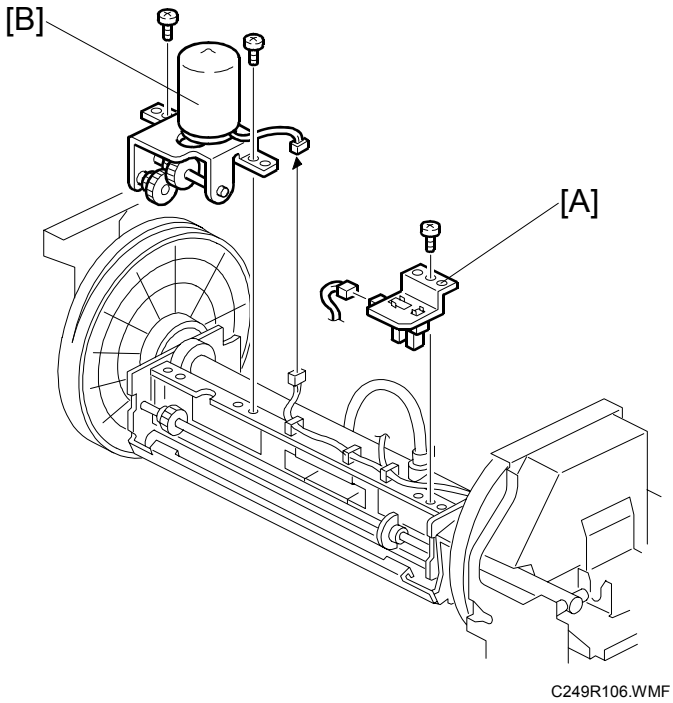


- Paper delivery unit (☛ C238 Service Manual 3.9.1)

1. Adjust the distance [A] to 17 ± 0.2 mm by turning the adjusting bolt [B].
2. Repeat the same procedure for the printing pressure spring at the non-operation side.

3.7 DRUM

3.7.1 INK IDLING MOTOR /INK IDLING ROLLER HP SENSOR



- Cloth Screen (☛ C238 Service Manual 3.8.2)
- Clamper / Metal Screen (☛ C238 Service Manual 3.8.3)

[A]: Ink idling roller HP sensor (✋ x 1, 🔩 x 1)
[B]: Ink idling motor (✋ x 1, 🔩 x 2)

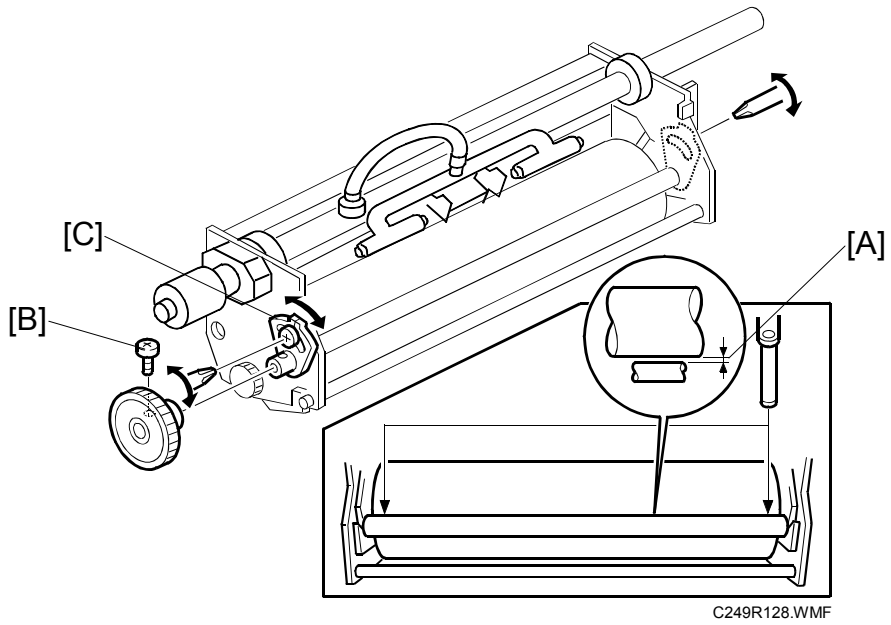
3.7.2 DOCTOR ROLLER GAP ADJUSTMENT

Controls ink thickness around the ink roller.

Standard: 0.07 mm gauge passes, 0.09 mm gauge does not.

Tools: Thickness gauge

CAUTION: Normally the doctor roller gap is not adjusted or changed. It tends to be difficult to change in the field. If the gap is too narrow, an uneven image may appear on the prints. If it is too wide, too much ink will be applied to the drum screens, resulting in ink leakage from the drum.



- Ink roller unit (☛ C238 Service Manual 3.8.5)

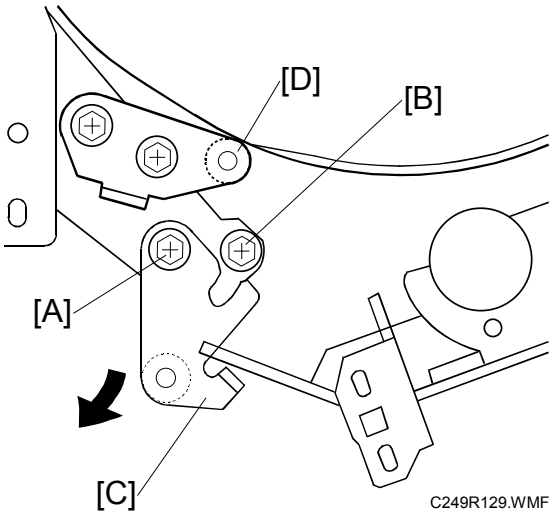
1. Make sure that a 0.07 mm gap gauge goes through the gap [A] between the ink and doctor rollers, and that a 0.09 mm gap gauge does not.
   NOTE: 1) The gap should be checked at both ends of the doctor roller. Insert a gap gauge at each end of the roller. The gap tends to be larger for the center.
   2) While the gap gauge is inserted, hold the doctor and ink rollers with your fingers in order to stop the rollers from rotating.
   3) While the gap gauge is inserted, hold the end of the gap gauge.
2. If the gap is out of the standard, loosen the screw [B] and adjust the gap by turning the cam bushing [C] for the front and for the rear.
   NOTE: Make sure to repeat the adjustment for both ends of the rollers.

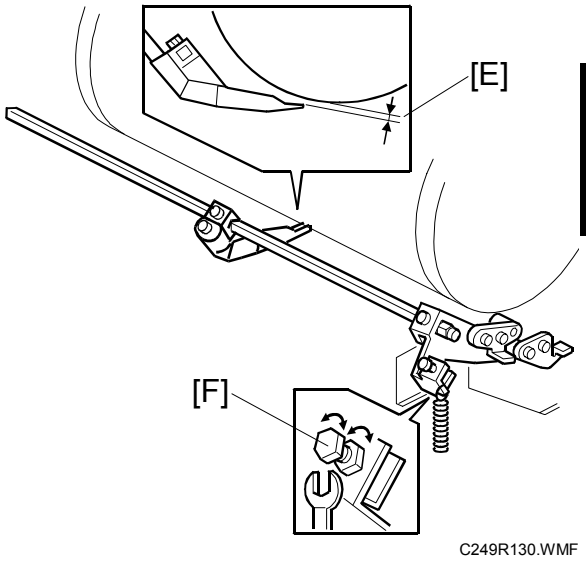
3.7.3 EXIT PAWL ADJUSTMENT

Ensures that the exit pawls can move out of the way of the drum master clamper while the drum is rotating.

Clearance adjustment

Standard: Within 0.80 ± 0.15 mm



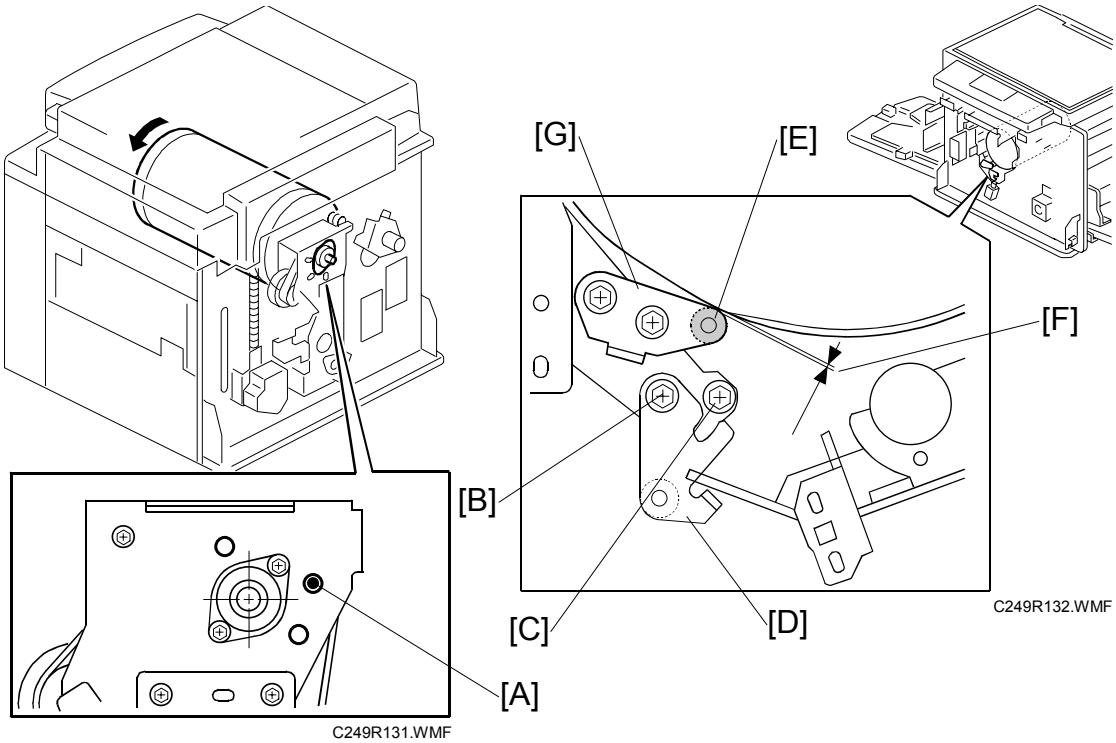


- Front cover (☛ C238 Service Manual 3.2.1)

1. Loosen screw [A] then screw [B] in this order (do not remove them). Make sure that the bracket [C] becomes free from engagement and the cam follower [D] contacts the drum flange.
2. Using a gap gauge, measure the clearance [E] between the drum surface and the exit pawls. It should be 0.80 ± 0.15 mm.
3. If the clearance is not correct, adjust the clearance by turning the bolt [F].
4. Reposition the bracket [C] and tighten the screws [A] and [B].
5. Do the timing adjustment (see the next page).

Timing adjustment

Standard: 0 or less than 0.5 mm



- Front cover (☛ C238 Service Manual 3.2.1)
- Rear covers (☛ C238 Service Manual 3.2.2)
- Do this after the clearance adjustment.

1. Turn the drum manually until the recess in the drum drive gear meets the positioning hole [A] in the bracket, as shown.
2. Loosen screw [B] then screw [C] in that order (do not remove them). Make sure that the bracket [D] becomes free from engagement and the cam follower [E] contacts the drum flange.
3. Measure the gap [F] between the cam follower and cam face (front drum flange). It should be 0 to 0.5 mm.
4. If the gap is not correct, loosen the two screws securing the cam follower bracket [G].
5. Re-tighten the two screws while pushing the cam follower against the cam face. Make sure that the gap [F] is 0 or less than 0.5 mm.
   NOTE: Do not push the cam followers too strongly against the cam.
6. Re-position the bracket [D] and tighten the screws [B] and [C].

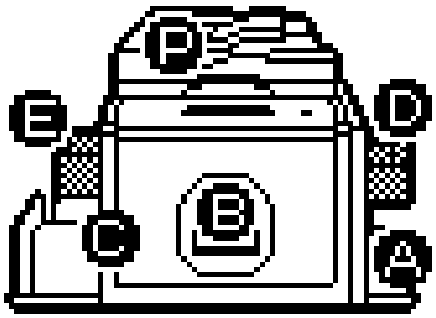
4. TROUBLESHOOTING

Only items that were changed or were added to the C249 model are described.

4.1 ERROR CODES

No.	Symptom	Possible cause
E-10	Thermal Head Energy Pulse error The CPU detects an abnormal ID signal from the thermal head energy control pulse.	Thermal head connector Thermal head MPU
E-40	Thermal Head ID error The CPU detects an abnormal ID signal from the thermal head.	Thermal head MPU Thermal head connector disconnected
E-41	Idling roller HP sensor remains on or off The idling roller HP sensor does not change status within 4.0 seconds after the idling roller motor on signal is generated.	Idling roller HP sensor Ink idling motor
E-42	Duct plate error The duct plate HP sensor does not change status within 4.0 seconds after the duct plate motor on signal is generated.	Duct plate HP sensor Duct plate motor
E-43	Printing Pressure error The printing pressure HP sensor does not change status within 4.0 seconds after the printing pressure motor on signal is generated.	Printing pressure HP sensor Printing pressure motor
E-44	MPU ASIC error The machine detects a failure in the MPU ASIC.	MPU
E-47	Thermal head driving error The thermal head HP sensor does not change status within 4.0 seconds after the thermal head driving motor on signal is generated.	Thermal head HP sensor Thermal head driving motor

4.2 ELECTRICAL COMPONENT DEFECTS



C249T001.BMP

4.2.1 SENSORS

Component	Condition	Symptom
Ink Idling Roller HP Sensor	Open	E-41 is displayed.
	Shorted	E-41 is displayed.
Printing Pressure HP Sensor	Open	E-43 is displayed.
	Shorted	E-43 is displayed.
Duct Jam Sensor	Open	The “D” jam indicator is lit.
	Shorted	There is a master in the lower master tray, nevertheless the duct jam sensor does not detect a master and master vacuum fans does not absorb a master and E-01 is displayed.
Duct plate HP sensor	Open	E-42 is displayed.
	Shorted	E-42 is displayed.
Master Edge Sensor	Open	The “D” jam indicator is lit.
	Shorted	The “D” jam indicator is lit.

4.2.2 SWITCHES

Component	Condition	Symptom
Lower Master Tray Set Switch	Open	Master making begins nevertheless the lower master tray is open and master vacuum fans does not absorb a master and E-01 is displayed.
	Shorted	The “Lower Master Tray is Open” indicator is lit.

4.2.3 LINES

Component	Condition	Symptom
+5v (CN102-4)	Wire (or PSU) broken	The machine does not turn on.
+5v (CN102-2, 3)		The machine does not turn on, but LED103 on the MPU blinks.
+12v (CN102-9)		The LCD/LED on the operation panel does not indicate and LED103 on the MPU blinks.
-12v (CN102-8)		The machine makes an Image of many black stripes.
+24v (CN111-3, 4, 5, 6)		E-47 is displayed, and the output mode in SP mode does not turn anything on except the main motor.
+24v (CN111-1)		E-13 is displayed, and SP5-13, 14, 15 (master eject motor/ pressure plate motor output mode) does not turn the motor on.

4.3 FUSE, LED, VR, DIP-SW, AND TP TABLES

4.3.1 BLOWN FUSE CONDITIONS

PSU

No.	Rate	Symptom
FU701, 702	5.0 A	E-47 is displayed, and the output mode in SP mode does not turn anything on except the main motor.

4.3.2 LED'S

MPU

No.	Function
LED101	Monitors the paper feed circuit in the MPU. Usually, this LED is blinking at intervals of 2 seconds.
LED102	Not used.
LED103	Monitors the CPU operation. Usually, this LED is blinking at intervals of 1 second.
LED104	Monitors the master end sensor. When the sensor detects a master, this LED is lit. (☛3.4.9)
LED105	Monitors the master edge sensor. When the sensor detects a master, this LED is lit. (☛3.4.7)
LED106	Monitors the duct jam sensor. When the sensor detects a master, this LED is lit. (☛3.4.6)

4.3.3 VR'S

MPU

No.	Function
VR101	Adjusts the master end sensor (☛3.4.9)
VR102	Adjusts the duct jam sensor (☛3.4.6)
VR103	Adjusts the master edge sensor (☛3.4.7)
VR104	Adjusts the 2nd drum master sensor (☛3.4.8)

4.3.4 TEST POINTS

MPU

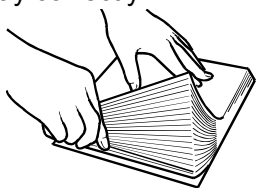
No.	Function
TP101	Measures the master end sensor voltage. (☛3.4.9)
TP102	Measures the duct jam sensor voltage. (☛3.4.6)
TP103	Measures the master edge sensor voltage. (☛3.4.7)
TP104	Measures the 2nd drum master sensor voltage. (☛3.4.8)

4.4 OTHERS

Discussed in accordance with C238/C249

O/I: Operation Instruction
S/M: Service Manual

4.4.1 PAPER FEED PROBLEMS

Model	Phenomenon	Cause	Solution
C249 C238	Paper feed jam (A Jam)	Dust build up effects operation of the registration sensor. Sensor does not give correct detection.	Clean Registration sensor with a dry cloth. Replace the registration sensor. Clean the registration roller shaft.
C249 C238		The feed roller drops out of its bearing causing deforming to the paper feed arm.	Bend the paper feed roller back its original position. (☛ RTB #RC238005) Replace the sleeve fixed shift. (☛ MB #MC238011)
C249 C238	Multiple sheet feeding	Paper does not shuffle.	Fan the paper as shown below. Then set the paper in the paper feed tray correctly.  C249T903.WMF Feed pressure is set as thin paper. (☛ C238/C249 O/I Operation - Printing on thick or thin paper) Separation pressure is set as strong. (☛ C238 S/M 6.7.3) Use the side fence friction pads C238: Side Fence Friction Pads are included. C249: Use the Side Fence Friction Pads from C238.
C249 C238	Paper feed problems for thin paper.	Feed and separation pressures are set too strong for thin paper.	Feed pressure is set as thin paper. (☛ C238/C249 O/I Operation - Printing on thick or thin) Separation pressure is set as weak. (☛ C238 S/M 6.7.3) Replace to special order friction pad. (A friction coefficient is low. ＊Use the side fence friction pads if multiple sheet feeding occurs even if the friction pad has been changed.)

Trouble-shooting

Model	Phenomenon	Cause	Solution
C249 C238	Non-feed jam	Feed pressure is weak.	Feed pressure is set as thick paper. (☛ C238/C249 O/I Operation - Printing on thick or thin) Separation pressure is set as weak. (☛ C238 S/M 6.7.3)
C249 C238	Thick paper peels on leading edge	Feed pressure is strong.	Separation pressure is set as weak. (☛ C238 S/M 6.7.3) Replace the friction pad. ＊Use the side fence friction pads if multiple sheet feeding occurs even if the friction pad has been changed.
C249 C238	Paper skew	Amount of buckle for registration is not correct.	Adjust SP6-20 (the amount of buckle for registration). (☛ C238 S/M 5.7.5, C249 S/M 5.7.6) Increase the value: The occurrence of paper skew will be reduced, but the paper is more likely to slip and the registration position may be incorrect. Decrease the value: The paper registration position will be correct. **Caution**: Once this has been changed, the registration position will be out of order.
C249 C238	Shift paper registration	The position of registration is not correct.	Adjust SP6-21(the paper registration position). (☛ C238/C249 S/M 5.7.3)
C249 C238		The retry mode for paper feed is ON. (Even though registration sensor does not turn on, it will not jam. The drum will rotate one more time, and paper will be fed.)	Turn off SP2-33 (Re feeding setting). (☛ RTB #RC238008) (☛ C249 S/M 5.3.4) **Caution**: A jam might occur after you turn the machine off.

Feed pressure/Separation pressure adjustment

Paper	**Thin** Soft paper which is difficult feed by normal	**Normal** 47g/m^2 to 128g/m^2	**Thick** 157 g/m^2 to 203.3 g/m^2
Feed pressure (Lever)	Thin paper (weak)	Normal paper (Normal)	Thick paper (strong)
Separation Pressure (Scale)	Strong	Normal	Weak

NOTE: Adjust feed pressure at first. If it does not improve, then adjust the separation pressure.

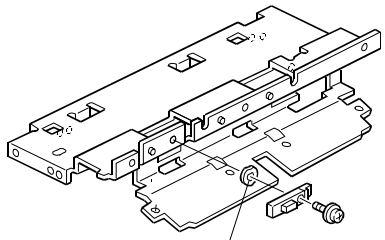
4.4.2 PAPER EJECTION ERRORS

Model	Phenomenon	Cause	Solution
C249 C238	Non-feed jam (Thin paper)	The suction of the vacuum fan is too strong at paper delivery unit.	Attach the air reduction sheet at the vacuum fan. (MB #MC238010) **Note**: Feed jam may occur for thick paper.
C238	Non-feed jam	The transport belt of paper delivery unit may slip.	Clean paper dust in the delivery unit. Replace the transport belt. (☛ MB #MC238013)
C249 C238	paper wrap jam	Adjustment of exit pawl is wrong.	Adjust the exit pawl. (☛ C238 S/M 3.9.3, C249 S/M 3.7.3)
C249 C238	Holds jam (near the press roller)	The gap between the press roller and paper delivery unit is too big.	Attach paper guide sheet at the vacuum fan. (☛ MB #MC238010)
C249 C238	Paper stuck is bad.	The positions of paper delivery side plates and end plate are not right.	Adjust the position of paper delivery side plates and end plate to fit the paper size.

4.4.3 MASTER FEED ERRORS

Model	Phenomenon	Cause	Solution
C238	Master delivery incorrect	Master is wrapped around the platen roller and the tension roller.	Replace the thermal head guide with a stronger one. (☛ MB #MC238012)
C249	Master feed jam (D jam)	Suction becomes weaker as pieces of Master enter into duct and vacuum fan.	Pull out the master feed tray, and remove the broken of Master pieces. (☛ C238/C249 O/I Troubleshooting - Clearing Misfeeds)

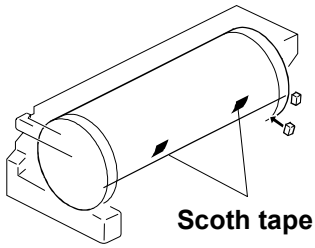
4.4.4 MASTER DELIVERY ERRORS

Model	Phenomenon	Cause	Solution
C249 C238	Double masters on drum	The drum master sensor gives incorrect detection.	Clean the drum master sensor with a dry cloth or replace the drum master sensor. If the situation does not improve with, insert the washer under the sensor.  C249T902.WMF **Washer**

4.4.5 DRUM ERRORS

Model	Phenomenon	Cause	Solution
C249 C238	Does not supply ink.	Ink detection board not working. Broken ink detecting pins.	Make sure SP2-10 (ink detection) is ON. Clean the ink detecting pins. Adjust ink detection volume. (☛ C238/C249 S/M 5.7.2) Change ink detection board. (☛ MB #MC238022)
C238		Ink sticks to the base of ink detecting pins.	Clean the ink detection pins. Then attach the ink pipe cover. (☛ MB #MC238006)
C249 C238	Ink supply error	Air is mixing in the ink pack.	Flush out the air from Ink pack. Caution: Don't remove out Ink pack.
C249 C238		Defective ink pump	Adjust or replace the ink pump. (☛ C238 S/M3.8.4)
C238	Leak ink from end of drum.	Mylar comes off from metal and cloth screen.	Change the cloth screen. (☛ MB #MC238021)
C249 C238		The doctor gap in the drum is too wide.	Adjust the doctor gap. (☛ C238 S/M 3.8.6, C249 S/M 3.7.2)
C249 C238	Drum cannot be set properly.	The bearing of drum drive part comes off.	Attach the spacer. (☛ RTB #RC238009, MB #MC238024)

4.4.6 POOR IMAGE

Model	Phenomenon	Cause	Solution
C249 C238	Blank image	Double masters on drum (Incorrect detection of a drum master sensor)	☛ "Phenomenon : Double masters on drum"
C249 C238		Incorrect operation of a printing pressure lever.	Adjust the gap of press roller release lever. (☛ C238 S/M 3.7.2)
C249 C238	Faint image	Ink detection errors.	☛ "Phenomenon : Does not supply ink". Adjust doctor gap. (☛ C238 S/M 3.8.6, C249 S/M 3.7.2)
C249 C238		A metal screen causes small chunks of ink to clog the drum if the machine has not been used for a long period of time.	Clean the metal screen with alcohol. **Caution**: Be careful around the mylar. Replace the metal screen.
C249 C238	Faint image	Master separates from the clamp due to an incorrect setting of the doctor gap.	Adjust doctor gap. (☛ C238 S/M 3.8.6, C249 S/M 3.7.2)
C249 C238	Shift paper registration	The position of registration is not right.	Adjust SP6-21 (the paper registration position). (☛ C238・C249 S/M 5.7.3) (☛ RTB #RC238003)
C238	Side to side registration problem	Side pads.	Upgrade firmware and adjust the paper feed tray at the same time. (☛ MB #MC238001, RTB #RC238002)
C238	Area from the leading edge to about 30mm down for doubled or blurred images.	The amount of buckle is not enough at press roller.	Change the guide plate sheet. (☛ MB #MC238009)
C249 C238	Ink is on the paper's leading edge.	The point of paper tears master. * Envelop, thick paper and etc, which have shape edge, tend to tear the master easy.	Scotch tape is stuck on the broken parts of the master.  **Scoth tape** C249T904.WMF When paper is set to paper feed tray, place the paper upside down. This will prevent hitting part of master constant with the paper edge.

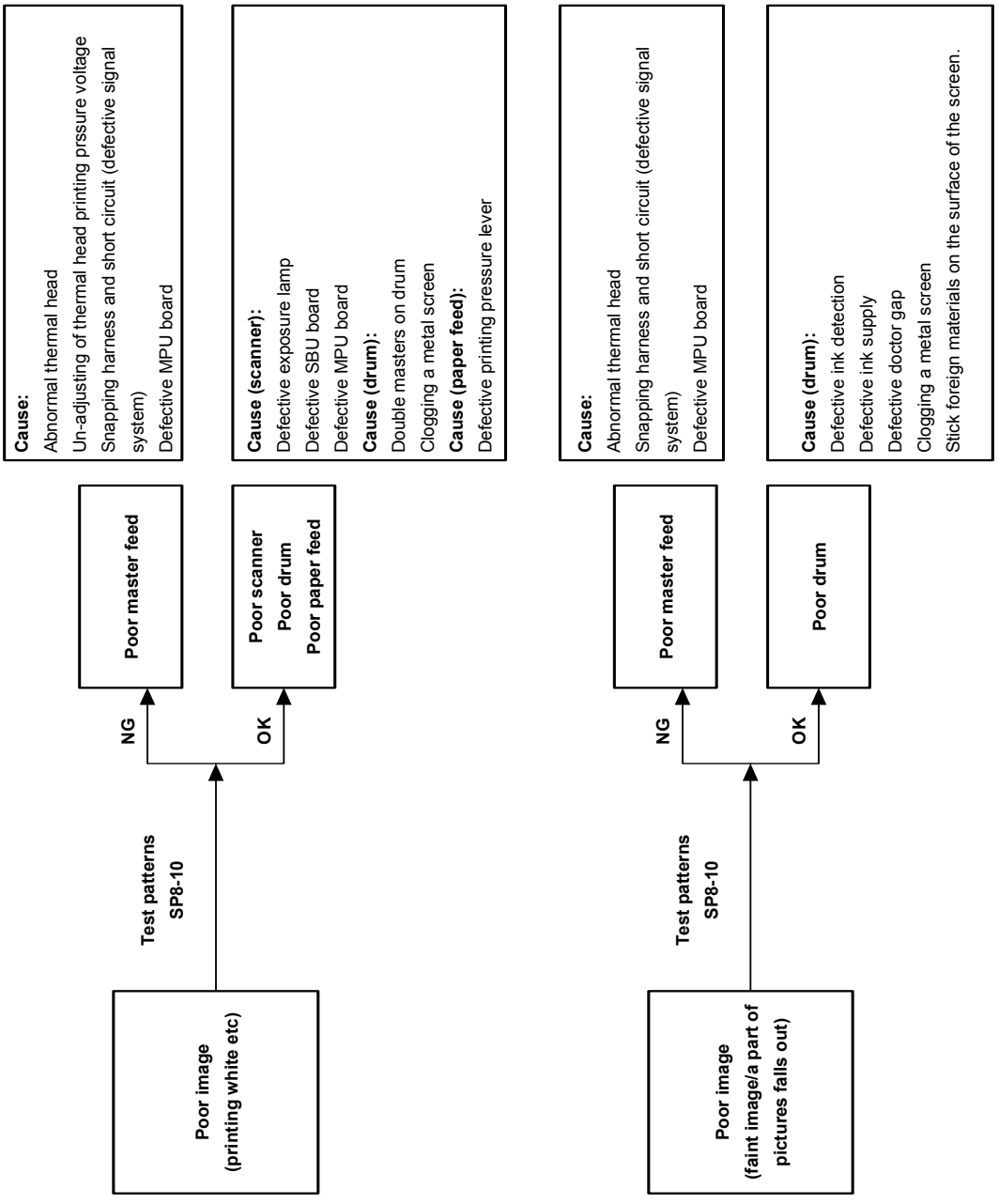
Model	Phenomenon	Cause	Solution
C249 C238	Immediately after making master, first few prints become striped pattern.	Low ink short supply. Masters were changed several times without making many prints and caused the ink supply to decrease.	Turn off Auto cycle mode. Ink is added by pushing "0+Economy mode". (☛ C238/C249 S/M 1.2.1)
C249 C238	Part of image is not shown	Foreign materials may have stuck on the surface of the screen.	Remove foreign materials from the surface.
C238	Dirty paper feed roller (Double sided printing)	Stained with ink	Clean paper feed roller Clean under paper feed roller. Do not print on the backside of a paper until the ink on the front side has dried.

4.4.7 OTHERS

Model	Phenomenon	Cause	Solution
C249 C238	Difficult to remove ink from exterior cover and so on.	Ink is present on the cover surface.	Clean the surface with a plastic eraser
C249 C238	When MPU is changed, the information that user input is lost.	Replace to the new RAM with new MPU.	Install the RAM, which was on the old MPU, to the new MPU. ＊ Be sure to do VR adjustments for sensors etc. (☛ C238 S/M 3.2.3)
C249 C238	Unusual operation	Due to static electricity.	Make sure the machine is secure. A fixed screw acts as a ground. The machine must be kept secure for the ground screw to operate.
C249 C238		A harness snapped and caused a short circuit.	Check if there is snapping harness or short circuit. Unplug the machine. Then plug it back in again.
C249 C238		Unknown	**Caution**: Record the settings before clearing memory. Clear the memory with SP7

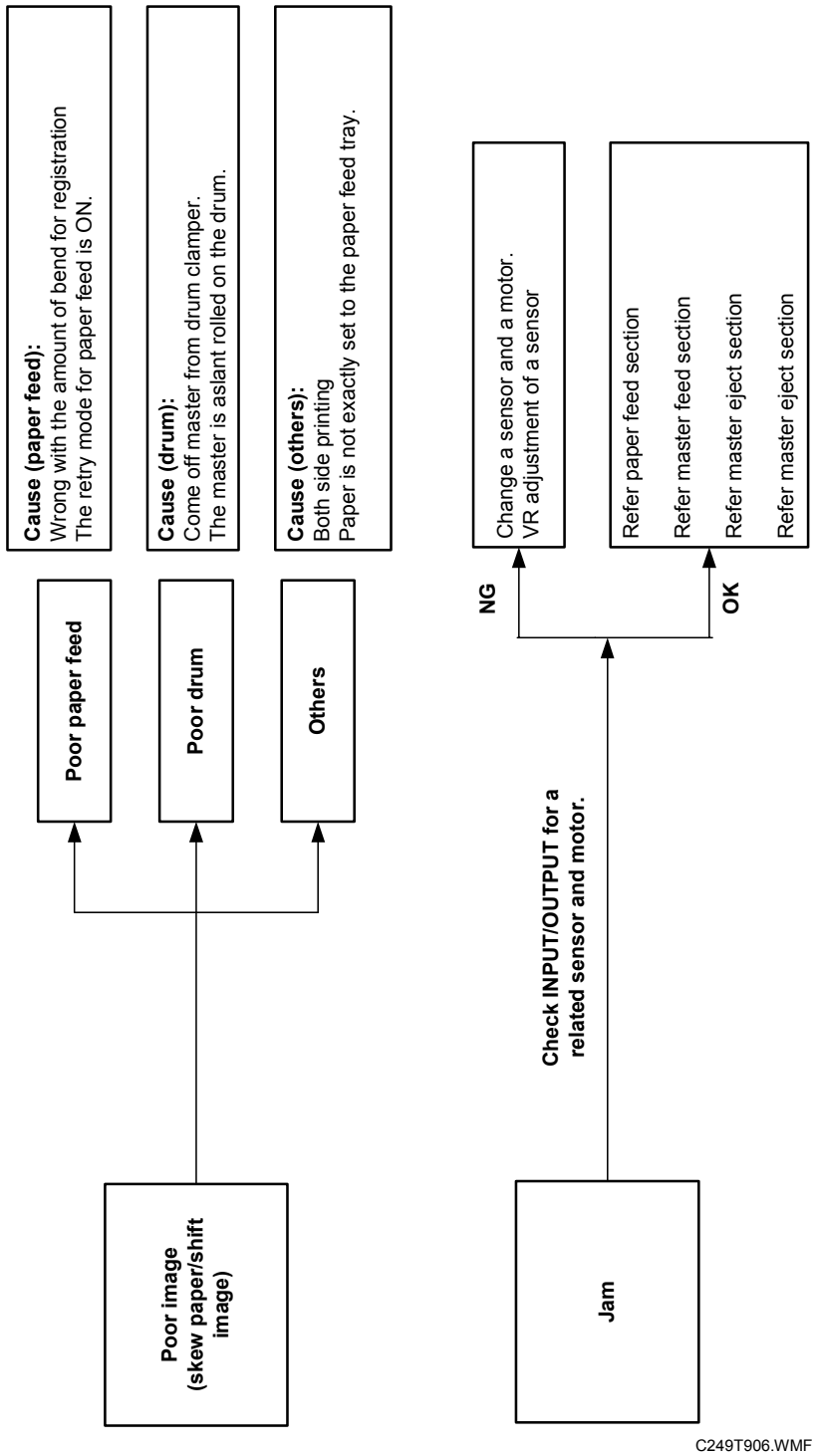
4.4.8 USER INSTRUCTIONS

Model	Phenomenon	Cause	Solution
C249 C238	B jam	Miss master setting (Insert the master too deep.)	Do not insert master to deeply. The point of master is united with ▲ mark when master is set.
C249 C238	D jam	Exit pawl of clamper	When master is taken off, exit pawl clamper should not be on the master clamper.



C249T905.WMF

Trouble-shooting



C249T906.WMF

5. SERVICE TABLES

Some SP modes were changed or newly added for the C249 model. The following table shows all of the items in the service program mode.

NOTE: The Service Program Mode is for use by service representatives only so that they can properly maintain product quality. If this mode is used by anyone other than service representatives for any reason, data might be deleted or settings might be changed. In such case, product quality cannot be guaranteed any more.

5.1 USING SERVICE PROGRAM MODES

Use the service program modes (SP modes) to check electrical data, change operating modes, and adjust values.

5.1.1 ACCESSING SP MODES

Entering SP Mode

1. Key in the following sequence.

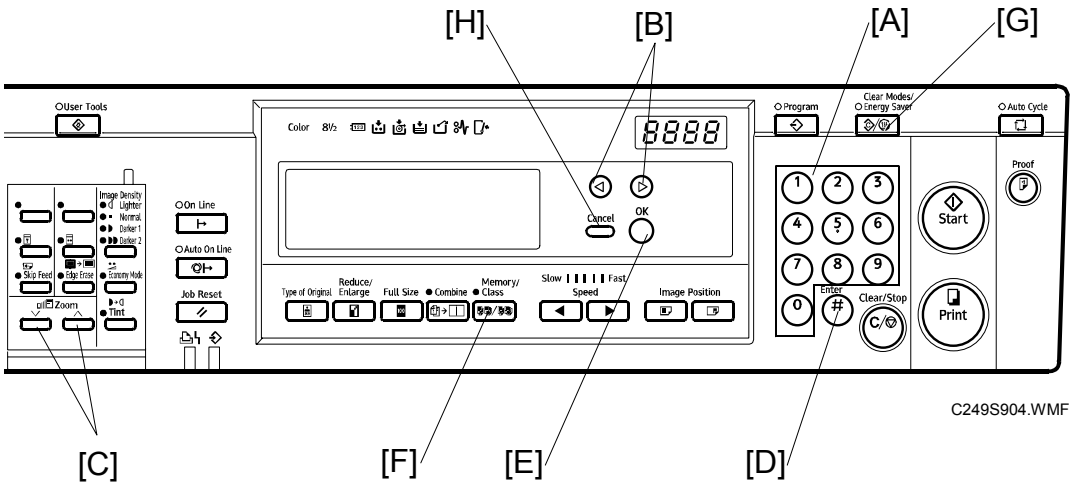
   User Tools → 1 → 0 → 7 → #

   - Hold the # key down for longer than 3 seconds.

Leaving SP Mode

Press the User Tools key one or more times.

5.1.2 HOW TO SELECT A PROGRAM NUMBER



1. Using the number keys [A] or the ◁▷keys [B] or the zoom keys [C], enter the desired main menu number (listed below), then press the Enter key [D] or the OK key [E].

   Main menu number list:

   1. Copy data, 2. Basic settings, 3. System settings, 4. Input mode
   5. Output mode, 6. Adjustment, 7. Memory clear, 8. System test

2. Using the number keys or the ◁▷ keys or the zoom keys, enter the desired sub-menu number, then press the Enter key or the OK key.

3. Enter the desired value or mode using the number keys (SP modes are listed in the service program tables).
   NOTE: 1) Use the Memory/Class [F] key to toggle between "+" and "-".
   2) To enter a decimal place, you do not have to enter a decimal point. For example, to enter "1.5" just press "1" and "5" keys.

4. Press the Enter key or the OK key to store the displayed setting.

5. Follow the "Change Adjustment Values or Modes" procedure below.
   NOTE: To cancel the SP mode, press the Clear Modes/Energy Saver key [G] or the Cancel key [H].

5.2 MAIN MENU NO.1: COPY DATA

5.2.1 SP TABLE

No.	Menu Items	Function
1-1	Total master counter	
1-20	Total print counter	
1-50	D - master clamp jam	☛ 6.8.3
1-51	E - master eject jam	☛ 6.8.1
1-52	E - master compressing jam	☛ 6.8.1
1-53	A - paper non-feed jam	☛ 6.8.5
1-54	A - paper registration jam	☛ 6.8.5
1-55	B - paper wrapping jam	☛ 6.8.4
1-56	C - paper delivery jam	☛ 6.8.6
1-57	P - original feed - in jam	☛ 6.8.2
1-58	P - original feed - out jam	☛ 6.8.2
1-59	D - master feed jam	☛ 6.8.3
1-60	D - master cut jam	☛ 6.8.3
1-61	D - mater duct jam	☛ 6.8.3
1-70	Main firmware part number	☛ 5.2.2
1-71	I/O ROM part number	
1-72	Serial number	
1-73	Main firmware version	
1-75	Serial number (Factory)	
1-80	Error code history	☛ 5.2.3
1-81	Telephone number display	
1-160	Not used	
1-161	Key counter setting check	

5.2.2 SP1-70: MAIN FIRMWARE PARTS NUMBER

Displays the main firmware parts number and the suffix.

5.2.3 SP1-80: ERROR CODE HISTORY

Displays the latest 40 records of the SC codes. Use the ◁▷ keys to view the records.

5.3 MAIN MENU NO.2: BASIC SETTINGS

5.3.1 SP TABLE

No.	Menu Items	Default	Settings
2-1	Default print speed	3	1 to 5
2-2	Default image position	0.0	-15.0mm to +15.0mm
2-4	Destination code	249-XX	
2-5	Not used	0	0 to 2
2-6	Image position display	1	0:Slow 1:Normal 2:Fast
2-7	Chinese display setting (China model only)	0	0 to 1 (☛ 5.3.2)
2-10	Ink detection board	On	Off/On (Off is used for tests, and for removing ink from the drum ☛ C238 S/M 3.8.)
2-11	Paper end sensor	On	Off/On (Off is used for tests.)
2-12	Drum master sensor	On	Off/On (Off is used for tests.)
2-13	Platen cover sensor	On	Off/On (Off is used for tests.)
2-14	ADF cover sensor	On	Off/On (Off is used for tests.)
2-15	Paper length sensor	On	Off/On
2-20	Destination setting	Other	Other/Japan
2-21	Ink setting	0	0 to 1
2-22	Double count-up (A3)	0	0: Not used, 1: Master counter only, 2: Master counter and print counter
2-31	Ink Auxiliary Supply (Not used)	0	0:After 1:Before 2:No
2-32	Ink supply after trial	Off	Off/On (☛ 5.3.3)
2-33	Re - Feeding setting	On	Off/On (☛ 5.3.4)
2-34	Slow starting mode	45rpm	30rpm/45rpm (☛ 5.3.5)
2-35	Printing pressure adjust	0	-2 to 2 (☛ 5.3.6)
2-36	Ink idling roller setting	1	0 to 2 (☛ 5.3.7)
2-37	Paper delivery motor speed	0	-55 to 55%
2-38	Idling after print	On	Off/On (☛ 5.3.8)
2-39	T/H control by temp: color	On	Off/On
2-40	T/H control ink temp: black	On	Off/On
2-41	T/H energy control	7	0 to 50% (☛ 5.3.9)
2-42	T/H energy control - eco	15	0 to 50% (☛ 5.3.9)
2-43	T/H control by temp: A4	On	Off/On
2-44	T/H energy control: A4 drum	12	0 to 50%
2-45	T/H energy control: A4 eco	15	0 to 50%
2-50	T/H swinging mode (Not used)	On	Off/On
2-51	T/H swinging quantity (Not used)	2	±1 to 5mm
2-60	Bold letter mode	Off	Off/On (☛ 5.3.10)

5.3.2 SP2-7: CHINESE DISPLAY SETTING (CHINA MODEL ONLY)

To change the warning message after you have made a mistake to set different masters to the machine depends on the selling company.

0: Ricoh master type

1: Gestetner master type

5.3.3 SP2-32: INK SUPPLY AFTER TRIAL

Ink is detected and supplied after the trial print when this SP is on,.

5.3.4 SP2-33: RE - FEEDING SETTING

When the machine performs re-feeding, the paper registration position can be up to 5mm out of range. If this incorrect position is not acceptable to the customer, change this SP mode to “OFF”.

ON: Re- feeding is on (factory setting).

OFF: Re- feeding is off.

5.3.5 SP2-34: SLOW STARTING MODE

Increase the image density of trial prints.

The figures below are drum-rotating speeds. A setting of “30rpm” will increase the image density of trial prints.

This mode was added because trail print images are lighter than with other models.

Setting	Trial Print	1st Print	2nd Print	3rd Print	4th Print	5th Print	6th Print
30rpm	30rpm	45rpm	60rpm	75rpm	90rpm	105rpm	120rpm
45rpm	45rpm	60rpm	75rpm	90rpm	105rpm	120rpm	120rpm

5.3.6 SP2-35: PRINTING PRESSURE ADJUSTMENT

Changes the printing pressure of all printing speed (60 to 120 rpm).

NOTE: 1) Adjust this SP mode after adjusting the printing pressure. (☛ 3.6.1)
2) When adjust printing pressure of each printing speed or temperature, use SP6-70 to 87.

5.3.7 SP2-36: INK IDLING ROLLER SETTING

Ensures that first print has sufficient ink density even if the machine was not used for a long time.

The idling roller motor turns to press the drum idling roller against the inner surface of the drum screen.

0: OFF

1: The machine enters the drum idling mode after master is ejected.

2: The machine enters the drum idling mode after master is made.

5.3.8 SP2-38: IDLING AFTER PRINT

Ensures that first print has sufficient ink density even if the machine was not used for a long time.

When this SP is on, the idling roller motor turn to press the drum idling roller against the inner surface of the drum screen after printing.

5.3.9 SP2-41, 2-42: THERMAL HEAD ENERGY CONTROL

2-41: The default is 7%. This means that during normal printing mode, the thermal head energy is 93% of the maximum possible (100 – 7).

2-42: The default is 10%. This means that in economy printing mode, the thermal head energy is reduced by another 10%. With the default settings, this means that the thermal head energy is 83% of maximum power (100-7-10).

5.3.10 SP2-60: BOLD MODE: LETTER MODE ONLY

Makes bold outline of the letter image.

5.4 MAIN MENU NO.3: SYSTEM SETTINGS

5.4.1 SP TABLE

No.	Menu Items	Default	Settings
3-1	Input the present time	-	☛ 5.4.2
3-2	Input Tel number	-	
3-3	Input serial number	-	
3-4	Input installation data	-	☛ 5.4.3
3-10	Key counter setting	No	No/Yes

5.4.2 SP3-1: INPUT THE PRESENT TIME

Input the year, the month / date, and the time in that order. Press the Enter key between each one.

Input the last two digits of the present year (two-digit number).

↓#

Input the present month (two-digit number).

↓#

Input the present date (two-digit number).

↓#

Input the present hour (two-digit number).

↓#

Input the present minute (two-digit number).

↓#

Input the present second (two-digit number).

↓#

Example: 2003/January/27th/13:00:00

03

↓#

01

↓#

27

↓#

13

↓#

00

↓#

00

↓OK

5.4.3 SP3-4: INPUT INSTALLATION DATE

Input installation date in that order. Press the Enter key between each one.

Input the last two digits of the present year (two-digit number).

↓#

Input the present month (two-digit number).

↓#

Input the present date (two-digit number).

↓#

Example: 2003/January/27th/13:00:00

03

↓#

01

↓#

27

↓OK

5.5 MAIN MENU NO.4: INPUT MODE

5.5.1 SP TABLE

No.	Menu Items
4-1	Scanner HP sensor
4-2	Platen cover sensor
4-9	Thermal head HP sensor
4-10	Master making unit set switch
4-11	Master set cover sensor
4-12	Cutter HP switch
4-13	Master end sensor
4-14	Eject box set switch
4-15	Master eject sensor
4-16	Pressure plate HP sensor
4-17	Pressure plate limit SN
4-18	Ink detection signal
4-19	Color drum signal
4-20	A4 drum signal
4-21	Drum set signal
4-22	Clamper open sensor
4-23	Clamper close sensor
4-24	Drum master sensor
4-25	Master eject position SN
4-26	Paper exit timing sensor
4-27	Printing pressure HP sensor
4-28	2nd drum master sensor
4-30	Table lowering switch
4-31	Table lower sensor
4-32	Paper height sensor
4-33	Paper end sensor
4-34	Paper length sensor
4-35	Paper width signal 0
4-36	Paper width signal 1
4-37	Paper width signal 2
4-38	Paper width signal 3
4-39	Paper width signal 4
4-40	Paper width signal 5
4-41	Registration sensor
4-42	Feed start timing sensor
4-43	2nd feed timing sensor
4-44	Paper exit sensor

No.	Menu Items
4-50	Door safety switch
4-60	ADF connecting signal
4-61	ADF cover sensor
4-62	ADF registration sensor
4-63	ADF original trailing SN
4-64	ADF original set sensor
4-65	ADF original length SN 1
4-66	ADF original length SN 2
4-67	ADF original width sensor 1
4-68	ADF original width sensor 2
4-69	ADF open sensor
4-70	Key counter signal
4-80	Master edge sensor
4-81	Duct plate HP sensor
4-82	Lower master tray switch
4-83	Duct jam sensor
4-90	Ink idling roller HP sensor
4-91	Ink temperature

5.6 MAIN MENU NO.5: OUTPUT MODE

5.6.1 SP TABLE

No.	Menu Items
5-1	Exposure lamp (xenon lamp)
5-2	Scanner motor - scan
5-3	Scanner motor - return
5-4	Scanner to HP
5-5	Duct plate motor - close
5-6	Duct plate motor - open
5-7	Duct plate motor: to HP
5-8	Duct fan motor
5-9	Master feed motor - Backward
5-10	Master feed motor – Forward
5-11	Cutter motor – forward
5-12	VHD signal (☛ C238 S/M 3.5.3)
5-13	Master eject motor
5-14	Pressure plate motor: limit
5-15	Pressure plate motor: to HP
5-16	Main motor: 15 rpm
5-17	Main motor: 30 rpm
5-18	Main motor: 60 rpm
5-19	Main motor: 75 rpm
5-20	Main motor: 90 rpm
5-21	Main motor: 105 rpm
5-22	Main motor: 120 rpm
5-23	Clamper motor: to open
5-24	Clamper motor: to close
5-25	Ink pump motor
5-26	Pressure release solenoids
5-27	Ink idling motor
5-28	Ink idling roller: down
5-29	Ink idling roller: up
5-30	Table motor - down
5-31	Table motor - up
5-32	Paper feed motor: 15 rpm
5-33	Paper feed motor: 30 rpm
5-34	Paper feed motor: 60 rpm
5-35	Paper feed motor: 75 rpm
5-36	Paper feed motor: 90 rpm
5-37	Paper feed motor: 105 rpm
5-38	Paper feed motor: 120 rpm
5-39	Registration motor: 15 rpm
5-40	Registration motor: 30 rpm
5-41	Registration motor: 60 rpm
5-42	Registration motor: 75 rpm

No.	Menu Items
5-43	Registration motor: 90 rpm
5-44	Registration motor: 105 rpm
5-45	Registration motor: 120 rpm
5-46	Air knife fan motors
5-47	Vacuum fan motor
5-48	Paper delivery motor - low
5-49	Paper delivery motor - high
5-50	Paper counter
5-51	Master counter
5-60	ADF motor
5-61	ADF feed clutch
5-62	ADF pick-up solenoid
5-63	Key counter signal
5-64	Not used
5-70	Master re-setting
5-71	Master push Mylar - push
5-72	Master push Mylar - free
5-73	Cutter motor - reverse
5-74	T/H driving motor - up
5-75	T/H driving motor - down
5-76	Blower fan motor
5-80	Printing pressure motor HP
5-81	Move to pressure 1
5-82	Move to pressure 2 (HP)
5-83	Move to pressure 3
5-84	Move to pressure 4
5-85	Move to pressure 5
5-90	Main motor to HP
5-91	Main motor to Master clamp
5-92	Main motor : 45rpm
5-93	Paper feed motor : 45rpm
5-94	Registration motor : 45rpm
5-100	All indicators on the panel

5.7 MAIN MENU NO.6: ADJUSTMENT

5.7.1 SP TABLE

No.	Menu Items	Default	Settings
6-1	Main-scan position - platen	0.0	-5.0 to 2.0 mm (☛ 5.7.3)
6-2	Main-scan position - ADF	0.0	-5.0 to 5.0 mm (☛ 5.7.3)
6-3	Scan start position - platen	0.0	-2.0 to 5.0 mm (☛ 5.7.3)
6-4	Scan start position - ADF	0.0	-5.0 to 5.0 mm (☛ 5.7.3)
6-5	Scanning speed - platen	0.0	-5.0 to 5.0 % (☛ 5.7.3)
6-6	Scanning speed - ADF mode	0.0	-5.0 to 5.0 % (☛ 5.7.3)
6-10	Master writing speed	0.0	-5.0 to 5.0 % (☛ 5.7.3)
6-11	Master writing length (Not used)	0.0	-5.0 to 5.0 %
6-20	Registration buckle	18	0 to100 pluses (☛ 5.7.6)
6-21	Paper registration position	0.0	-5.0 to 5.0 mm (☛ 5.7.3)
6-27	Master making density - Tint	1	0: Pale, 1: Normal, 2: Dark
6-28	Master making density - Photo	1	0: Pale, 1: Normal, 2: Dark
6-29	Master making density - LtrPht	1	0: Pale, 1: Normal, 2: Dark
6-30	Master making density - Letter	1	0: Pale, 1: Normal, 2: Dark
6-31	SBU calibration	–	Start with # key (☛ 5.7.4)
6-32	MTF filter - Letter : M	1	0 to 7 (☛ 5.7.5)
6-33	MTF filter - Letter : S	1	0 to 7 (☛ 5.7.5)
6-34	MTF filter – Letter/Photo : M	4	0 to 7 (☛ 5.7.5)
6-35	MTF filter – Letter/Photo : S	4	0 to 7 (☛ 5.7.5)
6-36	MTF filter - Photo : M	1	0 to 7 (☛ 5.7.5)
6-37	MTF filter - Photo : S	1	0 to 7 (☛ 5.7.5)
6-40	Ink detection adjustment	–	(☛ 5.7.2)
6-50	Master end sensor voltage	–	0.5 to 3.5V (☛ 3.4.9)
6-51	Master edge sensor voltage	–	1.5 to 3.5V (☛ 3.4.7)
6-52	Duct jam sensor voltage	–	0.5 to 3.5V (☛ 3.4.6)
6-53	2nd drum master sensor voltage	-	0.5 to 3.5V (☛ 3.4.8)
6-60	Master returning value	100	0 to 200〔0.1mm〕(☛ 5.7.7)
6-61	Master length - A3 drum (Not used)	5400	4200 to 6000〔0.1mm〕
6-63	Master length – A4 drum (Not used)	3400	3000 to 6000〔0.1mm〕
6-64	Master pushing value (Not used)	50	0 to 100〔pulse〕(☛ 5.7.8)
6-70	Trial pressure: low temp	2	1 to 5 (☛ 6.6.1)
6-71	60rpm pressure: low temp	1	1 to 5 (☛ 6.6.1)
6-72	75rpm pressure: low temp	3	1 to 5 (☛ 6.6.1)
6-73	90rpm pressure: low temp	4	1 to 5 (☛ 6.6.1)
6-74	105rpm pressure: low temp	5	1 to 5 (☛ 6.6.1)
6-75	120rpm pressure: low temp	5	1 to 5 (☛ 6.6.1)
6-76	Trial pressure: normal temp	2	1 to 5 (☛ 6.6.1)

No.	Menu Items	Default	Settings
6-77	60rpm pressure: normal temp	1	1 to 5 (☛ 6.6.1)
6-78	75rpm pressure: normal temp	2	1 to 5 (☛ 6.6.1)
6-79	90rpm pressure: normal temp	3	1 to 5 (☛ 6.6.1)
6-80	105rpm pressure: normal temp	4	1 to 5 (☛ 6.6.1)
6-81	120rpm pressure: normal temp	5	1 to 5 (☛ 6.6.1)
6-82	Trial pressure: high temp	2	1 to 5 (☛ 6.6.1)
6-83	60rpm pressure: high temp	1	1 to 5 (☛ 6.6.1)
6-84	75rpm pressure: high temp	1	1 to 5 (☛ 6.6.1)
6-85	90rpm pressure: high temp	2	1 to 5 (☛ 6.6.1)
6-86	105rpm pressure: high temp	3	1 to 5 (☛ 6.6.1)
6-87	120rpm pressure: high temp	5	1 to 5 (☛ 6.6.1)
6-100	Paper registration 15rpm	0	-40 to 40 (☛ 5.7.9)
6-101	Paper registration 30rpm	0	-40 to 40 (☛ 5.7.9)
6-102	Paper registration 45rpm	0	-40 to 40 (☛ 5.7.9)
6-103	Paper registration 60rpm	0	-40 to 40 (☛ 5.7.9)
6-104	Paper registration 75rpm	0	-40 to 40 (☛ 5.7.9)
6-105	Paper registration 90rpm	0	-40 to 40 (☛ 5.7.9)
6-106	Paper registration 105rpm	0	-40 to 40 (☛ 5.7.9)
6-107	Paper registration 120rpm	0	-40 to 40 (☛ 5.7.9)
6-108	Paper Regist: skip:15rpm	0	-40 to 40
6-109	Paper Regist: skip: 30pm	0	-40 to 40
6-110	Paper Regist: skip: 45rpm	0	-40 to 40
6-111	Paper Regist: skip: 60rpm	0	-40 to 40
6-112	Paper Regist: skip: 75rpm	0	-40 to 40
6-113	Paper Regist: skip: 90rpm	0	-40 to 40
6-114	Paper Regist: skip: 105rpm	0	-40 to 40
6-115	Paper Regist: skip: 120rpm	0	-40 to 40
6-116	Paper middle bulge: 15rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-117	Paper middle bulge: 30rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-118	Paper middle bulge: 45rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-119	Paper middle bulge: 60rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-120	Paper middle bulge: 75rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-121	Paper middle bulge: 90rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-122	Paper middle bulge: 105rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-123	Paper middle bulge: 120rpm (Not used)	0	-100 to 100 (☛ 5.7.10)
6-124	Paper front bulge: 15rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-125	Paper front bulge: 30rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-126	Paper front bulge: 45rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-127	Paper front bulge: 60rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-128	Paper front bulge: 75rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-129	Paper front bulge: 90rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-130	Paper front bulge: 105rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-131	Paper front bulge: 120rpm (Not used)	0	-90 to 8 (☛ 5.7.11)
6-132	Paper Regist: A4 drum 15 (Not used)	0	-40 to 40
6-133	Paper Regist: A4 drum 30 (Not used)	0	-40 to 40
6-134	Paper Regist: A4 drum 45 (Not used)	0	-40 to 40
6-135	Paper Regist: A4 drum 60 (Not used)	0	-40 to 40

No.	Menu Items	Default	Settings
6-136	Paper Regist: A4 drum 75 (Not used)	0	-40 to 40
6-137	Paper Regist: A4 drum 90 (Not used)	0	-40 to 40
6-138	Paper Regist: A4 drum 105 (Not used)	0	-40 to 40
6-139	Paper Regist: A4 drum 120 (Not used)	0	-40 to 40
6-140	Paper Regist: skip: A4: 15 (Not used)	0	-40 to 40
6-141	Paper Regist: skip: A4: 30 (Not used)	0	-40 to 40
6-142	Paper Regist: skip: A4: 45 (Not used)	0	-40 to 40
6-143	Paper Regist: skip: A4: 60 (Not used)	0	-40 to 40
6-144	Paper Regist: skip: A4: 75 (Not used)	0	-40 to 40
6-145	Paper Regist: skip: A4: 90 (Not used)	0	-40 to 40
6-146	Paper Regist: skip: A4: 105 (Not used)	0	-40 to 40
6-147	Paper Regist: skip: A4: 120 (Not used)	0	-40 to 40
6-148	Paper middle bulge: A4: 15 (Not used)	0	-100 to 100
6-149	Paper middle bulge: A4: 30 (Not used)	0	-100 to 100
6-150	Paper middle bulge: A4: 45 (Not used)	0	-100 to 100
6-151	Paper middle bulge: A4: 60 (Not used)	0	-100 to 100
6-152	Paper middle bulge: A4: 75 (Not used)	0	-100 to 100
6-153	Paper middle bulge: A4: 90 (Not used)	0	-100 to 100
6-154	Paper middle bulge: A4: 105 (Not used)	0	-100 to 100
6-155	Paper middle bulge: A4: 120 (Not used)	0	-100 to 100
6-156	Paper front bulge: A4: 15 (Not used)	0	-90 to 8
6-157	Paper front bulge: A4: 30 (Not used)	0	-90 to 8
6-158	Paper front bulge: A4: 45 (Not used)	0	-90 to 8
6-159	Paper front bulge: A4: 60 (Not used)	0	-90 to 8
6-160	Paper front bulge: A4: 75 (Not used)	0	-90 to 8
6-161	Paper front bulge: A4: 90 (Not used)	0	-90 to 8
6-162	Paper front bulge: A4: 105 (Not used)	0	-90 to 8
6-163	Paper front bulge: A4: 120 (Not used)	0	-90 to 8

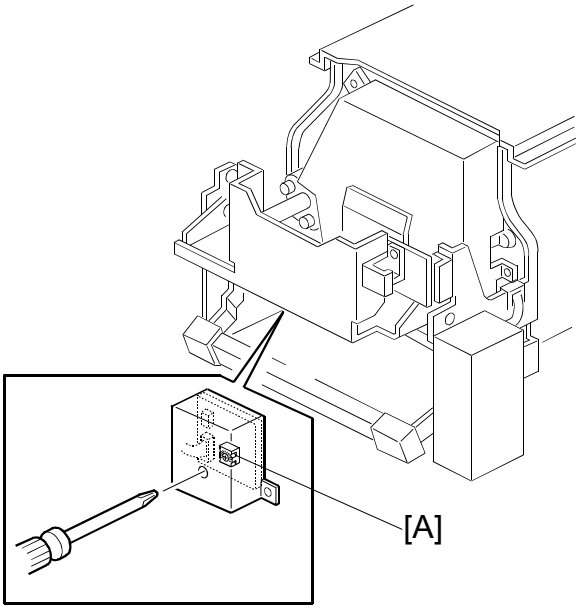
5.7.2 SP6-40: INK DETECTION ADJUSTMENT

Ensures that the CPU detects a no ink condition.

CAUTION: Before attempting this procedure, wipe off the ink around the ink roller. To do this, set SP2-10 (ink detection) to OFF, and feed paper until ink ends. After finishing the procedure, do not forget to return SP2-10 to the default (ink detection on).

Access SP6-40, and open the door cover. Then turn the VR1 [A] on the ink detection board until the display becomes "3.0 u" (3 μs).

NOTE: When the drum has ink inside, the machine displays "----".



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5.7.3 IMAGE ADJUSTMENT (SP6-10, -21, -5, -3, AND -1)

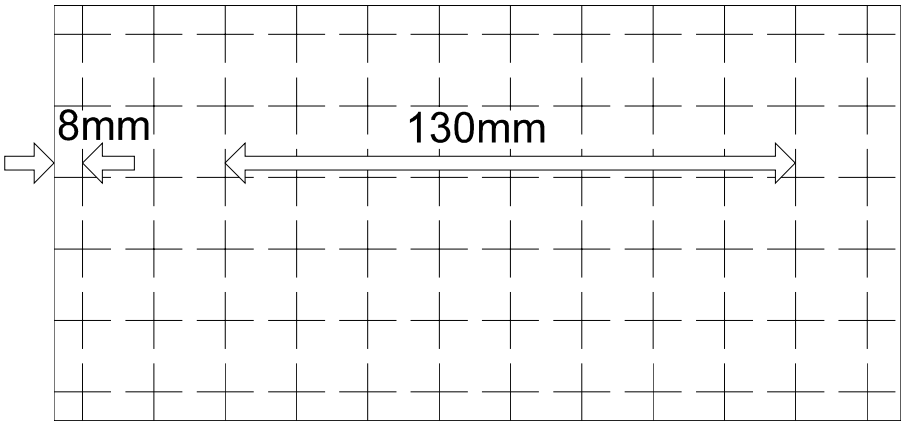
Adjusts the image position on prints by changing the SP settings.

Adjust the following in the given order.

When correcting errors made when printing with the controller, use only the first two procedures. When correcting errors made when printing with scanned originals, do all six adjustments in the given order.

This adjustment is required every time the RAM on the MPU has been replaced.

SP6-10: Master writing speed



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1. Input SP8-10 (Test patterns) and enter “6”, then press the Start key.
2. Exit the SP mode, print 10 copies at 90 rpm (speed 3). Use the 10th print for the adjustment.
3. The length of the 8 squares in the feed direction should be 130 mm, as shown above.
4. If it is not, calculate the reproduction ratio using the following formula.
   {(130 - Value) / 130} x 100 = ± X.X % (Round off to one decimal place)
   Example: If the value is 133, {(130 - 133) / 130} x 100 = - 2.3 %
5. Access SP6-10, input the calculated ratio, and press the Enter key.
6. Repeat the procedure to make sure that the ratio is correct.

SP6-21: Paper registration position

1. Input SP8-10 (Test patterns) and enter “6”, then press the Start key.
2. Exit the SP mode, print 10 copies at 90 rpm (speed 3). Use the 10th print for the adjustment.
3. The space between the leading edge and the next line should be 8 mm, as shown above.
4. If it is not, access SP6-21, input the difference and press the Enter key.
   Example: If the value is 7 mm, 7 - 8 = -1.0
5. Repeat the procedure to make sure that the gap is correct.

SP6-05: Scanning speed - platen

SP6-06: Scanning speed - ADF

1. Make copies of the test pattern printed during the previous adjustments (☛ previous page), in platen mode at 90 rpm (speed 3). Use the 10th print for the adjustment.
2. The length of the 8 squares in the feed direction should be 130 mm.
3. If it is not, calculate the reproduction ratio using the following formula.
   {(130 - Value) / 130} x 100 = ± X.X % (Round off to one decimal place)
   Example: If the value is 133, {(130 - 133) / 130} x 100 = - 2.3 %
4. Access SP6-05, input the calculated ratio, and press the Enter key.
5. Check again to make sure that the ratio is correct.
6. Make copies of the test pattern in ADF mode and repeat the process using SP6-06.

SP6-03: Scanning start position - platen

SP6-04: Scanning start position - ADF

1. Make copies of the test pattern printed during the previous adjustments (☛ previous page), in platen mode at 90 rpm (speed 3). Use the 10th print for the adjustment.
2. The space between the leading edge and the next line should be 8 mm.
3. If it is not, access SP6-03, input the gap value and press the Enter key.
   Example: If the value is 7 mm, 7 - 8 = -1.0
4. Repeat the procedure to make sure that the gap is correct.
5. Make copies of the test pattern in ADF mode and repeat the process using SP6-04.

SP6-01: Main scan position - platen

SP6-02: Main scan position - ADF

1. Make a copy in platen mode at 90 rpm (speed 3).
2. Measure the difference between the center of the main-scan on the original and on the print.
3. Access SP6-01, input the gap value and press the Enter key. (If you input a positive value, the image moves towards the operation side.)
4. Repeat the procedure to make sure that there is no difference.
5. Make a copy in ADF mode and repeat the process using SP6-02.

5.7.4 SP6-31: SBU CALIBRATION

Adjusts the SBU after the MPU or the white plate located behind the original scale is replaced.

1. Place a stack of 10 sheets of paper on the exposure glass.
2. Access SP6-31 and then press the Enter key to start the auto calibration.

5.7.5 SP6-32 TO 37: MTF FILTER

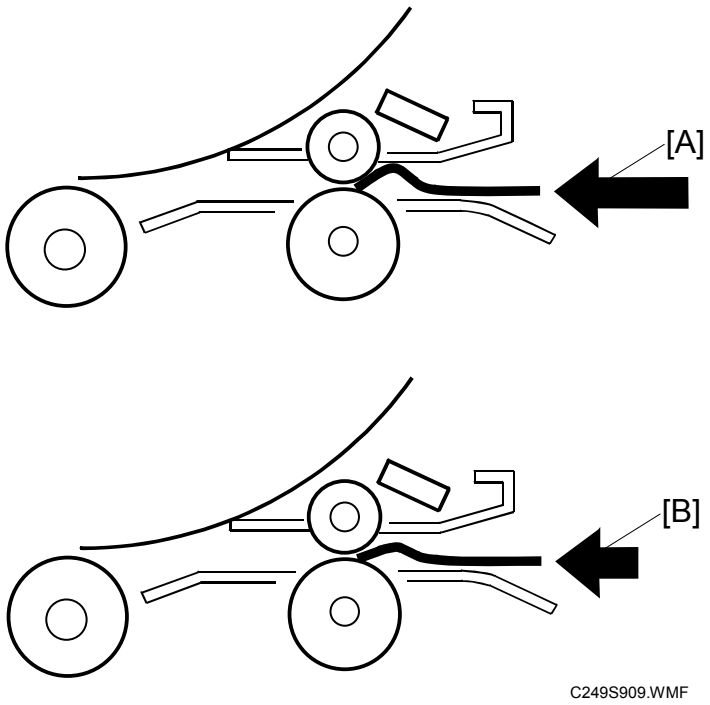
Sharpens image, however moiré can become more apparent.

Refer to the following table for the relationship between this SP mode value and filter strength (the relationship is not linear).

Value	Strength of Filter
7	X 4
6	X 2
0	X 1
5	X 1/2
4	X 1/4
3	X 1/8
2	X 1/16
1	X 1/32

5.7.6 SP6-20: REGISTRATION BUCKLE (NOT USED)

Adjusts the paper skew and the paper registration slippage.



[A]: **Increase the value**
The occurrence of paper skew will be reduced, but the paper is more likely to slip and the registration position may be incorrect.

[B]: **Decrease the value**
The paper registration position will be correct.

5.7.7 SP6-60: MASTER RETUR VALUE

The master registration value can be made exact by adjusting the amount of master feeding after detecting the leading edge of master. This is done at the time when auto adjustable has been master set.

Bigger number: increases feeding
Smaller number: decreases feeding
One memory: 0.1mm

5.7.8 SP6-64: MASTER PUSHING VALUE (NOT USED)

This adjusts the pressure between the master push Mylar and the drum.
Bigger number: increases the pressure
Smaller number: decreases the pressure

5.7.9 SP6-100 TO 107: PAPER REGISTRATION - EACH SPEED

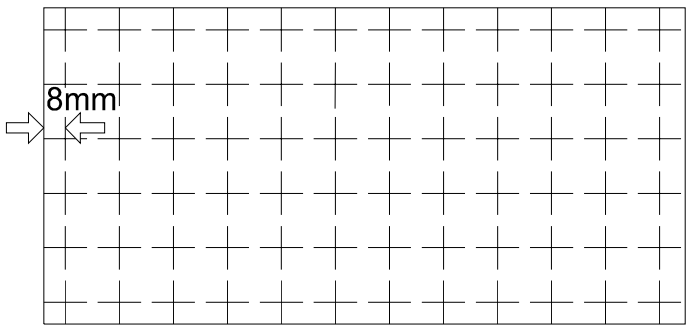
The following procedure allows the image position to be adjusted for each speed (15, 30, 60, 90 and 120 rpm)

NOTE: If you want to adjust the image position for all the speed at the same time, use SP6-21 (Paper registration position).

1. Set SP2-34 (Slow starting mode) to a value of “30 rpm” (print from 30rpm).
2. Set SP8-10 (Test patterns) to a value of “6”, then press the Start key.
3. Access SP4-91 (Ink temperature), check a value of the ink temperature.
4. Make 6 copies at speed 5 (finishing with 120 rpm). Perform the adjustment below for all 6 copies.
   Trail print: 30 rpm
   1st print : 45 rpm
   2nd print: 60 rpm
   3rd print: 75 rpm
   4th print: 90 rpm
   5th print: 105 rpm
   6th print: 120 rpm

NOTE: When values of the ink temperature are low (below 15 degree) or high (28 degree or above), make 7 copies at speed 5. Perform the adjustment below for 6 copies expect for 2nd print.
Trail print: 30 rpm
1st print : 45 rpm
~~2nd print: 45 rpm~~
3rd print: 60 rpm
4th print: 75 rpm
5th print: 90 rpm
6th print: 105 rpm
7th print: 120 rpm

5. The distance between the leading edge and first line should be 8mm, as shown below.



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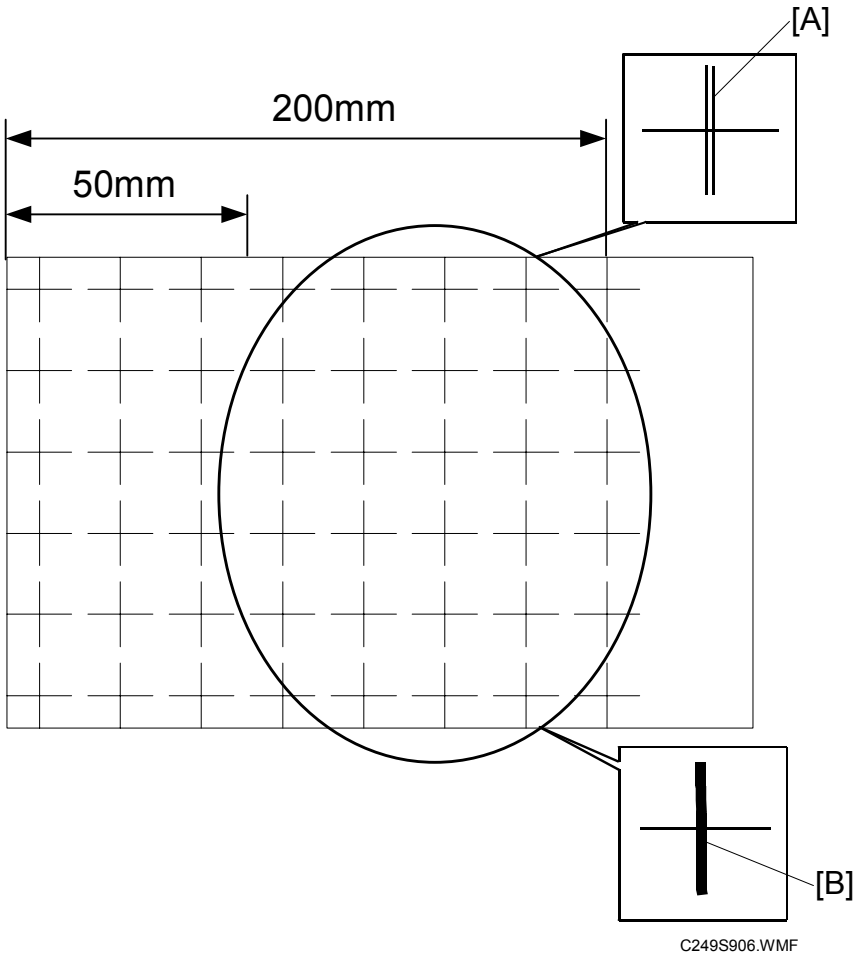
6. If this distance is not 8mm, access SP6-101 to 107 and then input a value to adjust the distance (range: -40 to 40, step: 1) for each of 6 copies samples (i.e. 30, 60, 75, 90, 105 and 120 rpm samples).
   The higher the value, the narrower the distance between the leading edge and 1st line becomes (and vice-versa). Also, each step corresponds to approximately 0.58mm. Input the value that will bring the distance to 8mm.
7. Perform the adjustment again for any of the samples that are still outside the 8mm standard.
8. Return SP2-34 (Slow starting mode) to the value it was at before the adjustment.

5.7.10 SP6-116 TO 123: PAPER MIDDLE BUCKLE (NOT USED)

Adjusts doubled [A] or blurred [B] images (e.g. bold lines, text) for each printing speed (15,30, 60, 75, 90, 105, 120 rpm), by changing SP settings.



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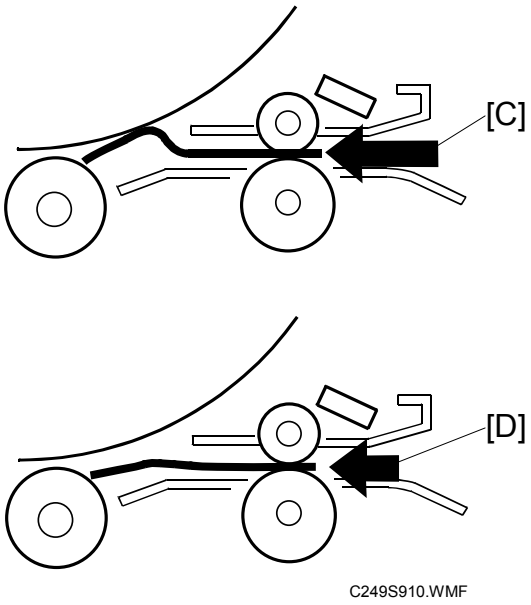

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1. Set SP2-34 (Slow starting mode) to a value of “30 rpm” (print from 30rpm).
2. Set SP8-10 (Test patterns) to a value of “6”, then press the Start key.
3. Access SP4-91 (Ink temperature), check a value of the ink temperature.
4. Make 6 copies at speed 5 (finishing with 120 rpm). Perform the adjustment below for all 6 copies.
   Trail print: 30 rpm
   1st print : 45 rpm
   2nd print: 60 rpm
   3rd print: 75 rpm
   4th print: 90 rpm
   5th print: 105 rpm
   6th print: 120 rpm

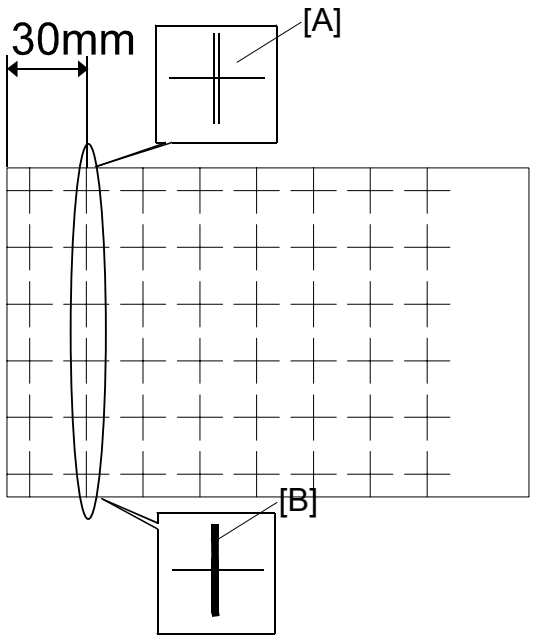
NOTE: When values of the ink temperature are low (below 15 degree) or high (28 degree or above), make 7 copies at speed 5. Perform the adjustment below for 6 copies expect for 2nd print.
Trail print: 30 rpm
1st print : 45 rpm
~~2nd print: 45 rpm~~
3rd print: 60 rpm
4th print: 75 rpm
5th print: 90 rpm
6th print: 105 rpm
7th print: 120 rpm

5. Check the area from the leading edge to about 50 to 200mm down for any doubled or blurred images.
6. If any are present, access SP6-117 to 123 and then input a value to adjust the doubled or blurred images (range: -100 to 100, step: 1) for each of 6 copies samples (i.e. 30, 60, 75, 90, 105 and 120 rpm samples).

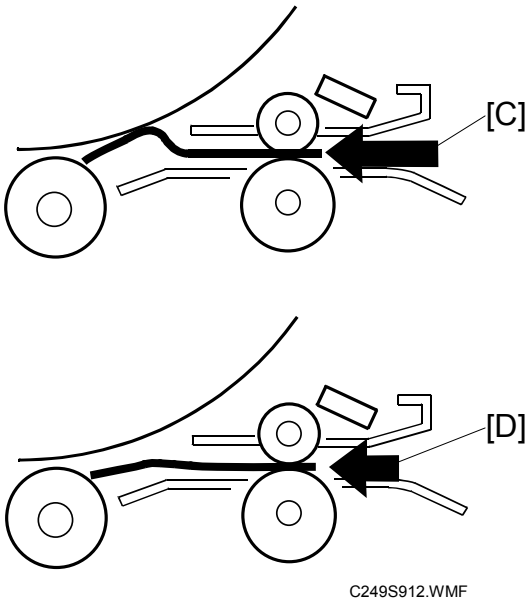
   Higher values ([C]): Blurred images improve, doubled images tend to be more noticeable.
   Lower values ([D]): Doubled images improve, blurred images tend to be more noticeable.
7. Perform the adjustment again where necessary.
8. Return SP2-34 (Slow starting mode) to the value it was at before the adjustment.

5.7.11 SP6-124 TO 131: PAPER FRONT BUCKLE (NOT USED)

Adjusts doubled [A] or blurred [B] images (e.g. bold lines, text) for each printing speed (15,30, 60, 75, 90, 105, 120 rpm), by changing SP settings.



C249S911.WMF



C249S912.WMF

1. Set SP2-34 (Slow starting mode) to a value of “30 rpm” (print from 30rpm).
2. Set SP8-10 (Test patterns) to a value of “6”, then press the Start key.
3. Access SP4-91 (Ink temperature), check a value of the ink temperature.
4. Make 6 copies at speed 5 (finishing with 120 rpm). Perform the adjustment below for all 6 copies.
   Trail print: 30 rpm
   1st print : 45 rpm
   2nd print: 60 rpm
   3rd print: 75 rpm
   4th print: 90 rpm
   5th print: 105 rpm
   6th print: 120 rpm

NOTE: When values of the ink temperature are low (below 15 degree) or high (28 degree or above), make 7 copies at speed 5. Perform the adjustment below for 6 copies expect for 2nd print.
Trail print: 30 rpm
1st print : 45 rpm
~~2nd print: 45 rpm~~
3rd print: 60 rpm
4th print: 75 rpm
5th print: 90 rpm
6th print: 105 rpm
7th print: 120 rpm

5. Check the area from the leading edge to about 30mm down for any doubled or blurred images.
6. If any are present, access SP6-125 to 131 and then input a value to adjust the doubled or blurred images (range: -90 to 8, step: 1) for each of 6 copies samples (i.e. 30, 60, 75, 90, 105 and 120 rpm samples).

   Higher values ([C]): Blurred images improve, doubled images tend to be more noticeable.
   Lower values ([D]): Doubled images improve, blurred images tend to be more noticeable.
7. Perform the adjustment again where necessary.
8. Return SP2-34 (Slow starting mode) to the value it was at before the adjustment.

5.8 MAIN MENU NO.7: MEMORY CLEAR

5.8.1 SP TABLE

No.	Menu Items	Default	Settings
7-1	Factory settings clear	-	Hold 0 & push # to clear (☛ 5.8.2)
7-3	Total counter clear	-	Hold 0& push # to clear
7-4	Jam/Error data clear	-	Hold 0 & push # to clear

5.8.2 SP7-1: FACTORY SETTINGS CLEAR

This resets all SP settings except for the following SP numbers.

- SP2-20: Destination settings
- SP3-01: Present time
- SP6-All: Adjustments

5.9 MAIN MENU NO.8: SYSTEM TEST

5.9.1 SP TABLE

No.	Menu Items	Default	Settings
8-1	Download main firmware	-	Start with # key (☛ 5.9.2)
8-2	Upload main firmware	-	Start with # key (☛ 5.9.3)
8-10	Test patterns	6	Pattern 6 (1-9) A4 start with # (☛ 5.9.4)
8-19	Free run - ADF	100%	50 to 200%
8-20	Free run - scanner	100%	50 to 200%
8-21	Paper feed at 15rpm	Off	Off/On(☛ 5.9.5)
8-22	Free run - Paper feed (15 rpm)	Off	Off/On(☛ 5.9.6)
8-23	30->45->60 rpm print mode	Off	Off/On
8-30	All indicators on the panel	-	Active when start press
8-31	Not used	Off	Off/On

5.9.2 SP8-1: DOWNLOAD MAIN FIRMWARE

Upgrades the main firmware using a flash memory card.

1. Before downloading new firmware, check the current version with SP1-70 (☛ 5.2.2).
2. Prepare a flash memory card with the latest firmware.
3. Turn off the main switch and disconnect the power cord.
4. Remove the rear card cover.
5. Plug the flash memory card into the connector on the MPU.
6. Connect the power cord, then turn on the main switch.
7. Access SP8-1 and press the OK key. Press the “Enter(#)” key.
8. Press the Enter key. (It takes about 2.0 minutes to complete.)
9. Check that the “Completed” is displayed.
10. Turn off the main switch, and remove the flash memory card.

5.9.3 SP8-2: UPLOAD MAIN FIRMWARE

Writes firmware to a flash memory card (P/N' #A2309352)from the machine.

1. Refer to steps 3 to 5 of section 5.9.2.
2. Connect the power cord, then turn on the main switch while holding the Clear modes key.
3. Access SP8-2 and press the OK key. Press the "Enter(#)" key.
4. Refer to steps 8 and 10 in section 5.9.2.

5.9.4 SP8-10: TEST PATTERNS

Makes prints without using the scanner.

Access SP8-10 and select the number "6", then press the "Enter(#)" key.

Other numbers are as shown below, but do not use them except the number "6".

1: Grid, 2: Vertical, 3: Horizontal gray, 4: Vertical gray, 5: 16 grays,
6: Cross, 7: Diagonal grid, 8: 256 grays, 9: 64 grays

5.9.5 SP8-21: PAPER FEED TEST (15 RPM)

Feeds paper at the lowest speed (15 rpm).

1. Set a stack of paper on the paper feed table.
2. Access SP8-21 and press the OK key.
3. Exit the SP mode and enter the number of sheets that you want to feed.
4. Press the Print key.
5. To exit this mode, turn off the main switch.

5.9.6 SP8-22: FREE RUN PAPER FEED (15 RPM)

Drives the paper feed mechanism at the lowest speed (15 rpm) without paper.

1. Access SP8-22 and press the OK key.
2. Exit the SP mode and enter the number of times that you want to repeat the paper feed cycle.
3. Press the Print key.
4. To exit this mode, turn off the main switch.

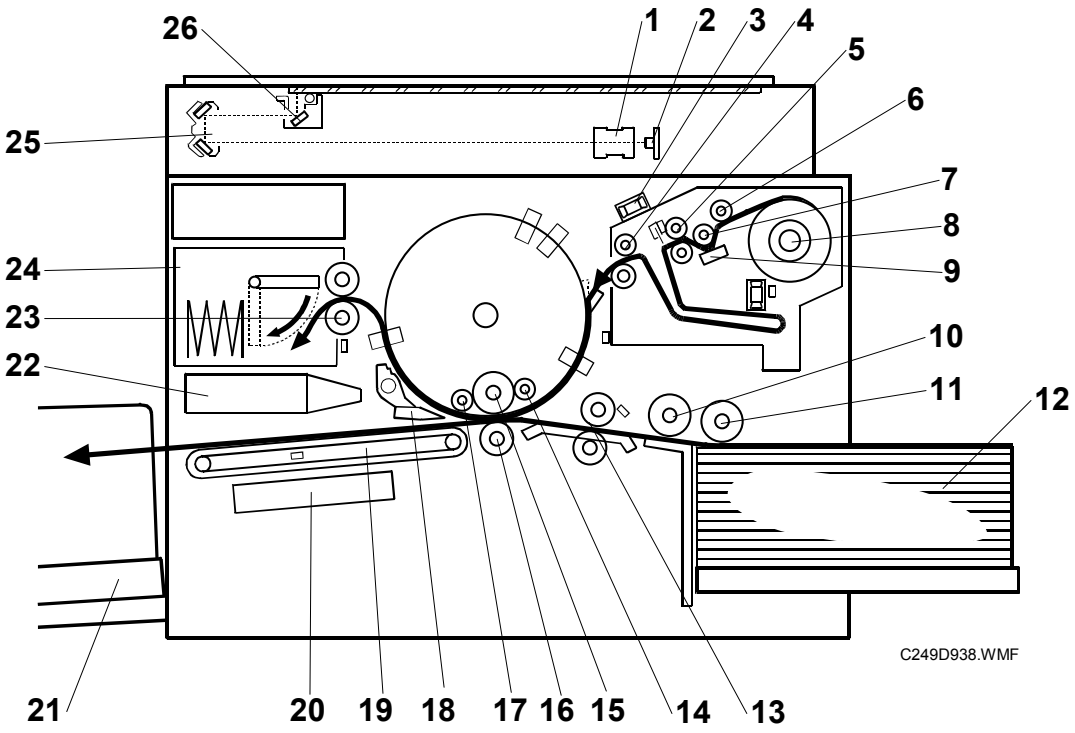
6. DETAILED SECTION DESCRIPTIONS

Only detailed descriptions unique to the C249 model are explained in this section.

The “master-making unit” is almost the same as the C238 model.

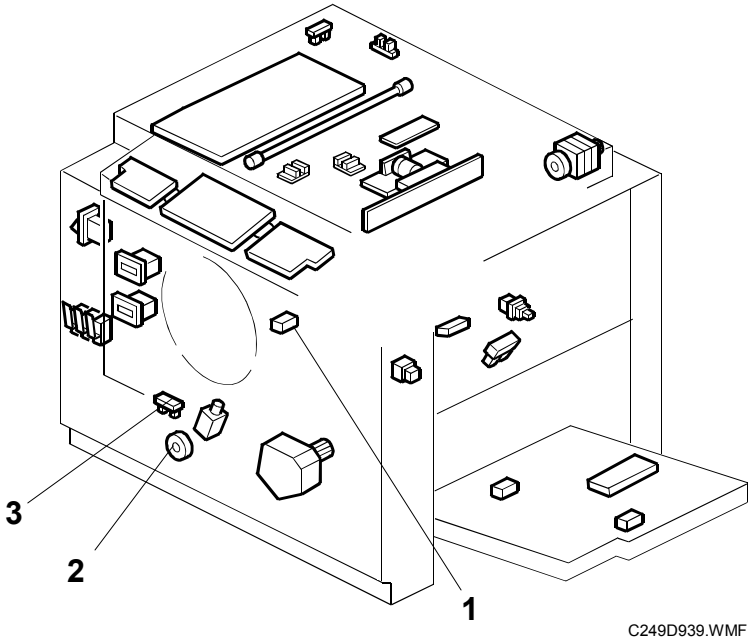
6.1 MECHANISM OVERVIEW

6.1.1 COMPONENT LAYOUT

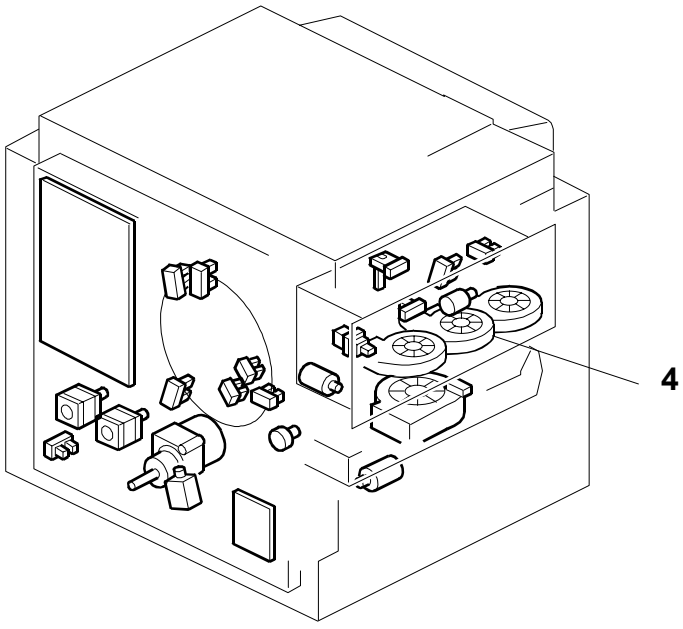


1. Lens
2. CCD and SBU
3. Blower fan motor
4. Tension roller
5. Master feed roller
6. Master set roller
7. Platen roller
8. Master Roll
9. Thermal head
10. Paper separation roller
11. Paper feed roller
12. Paper table
13. Registration rollers
14. Doctor roller
15. Ink roller
16. Press roller
17. Idling roller
18. Exit pawl
19. Transport belts
20. Vacuum fan motor
21. Paper delivery table
22. Air knife fan motors
23. Master eject rollers
24. Master eject box
25. 2nd scanner
26. 1st scanner

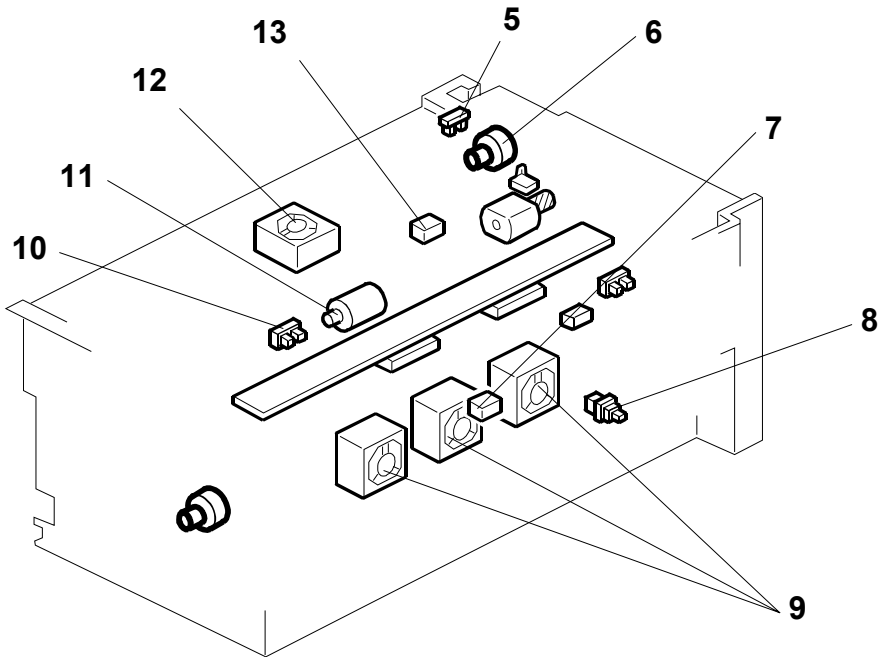
6.1.2 ELECTRICAL COMPONENT LAYOUT



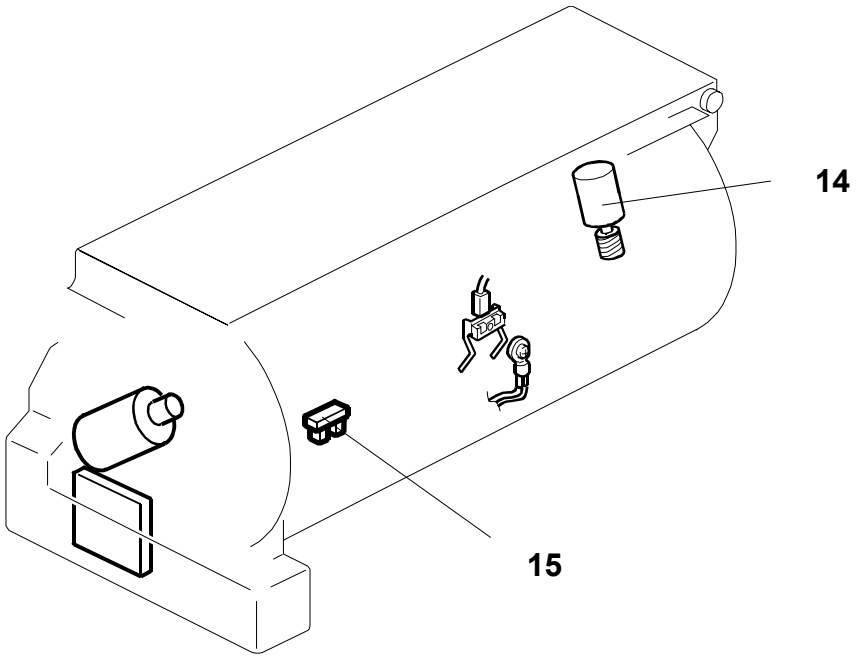
C249D939.WMF



C249D064.WMF



C249D940.WMF



C249D941.WMF

Motors

No.	Component	Function
2	Printing pressure motor	Raises and lowers the pressure roller.
4	Air knife fan motor 3	Provides air to separate the leading edge of the paper from the drum.
6	Duct plate motor	Opens or closes the duct plate at entrance of the duct.
9	Duct fan motors	Provides suction to guide the master into the duct.
11	Thermal head driving motor	Raises and lowers the thermal head.
12	Blower fan motor	Provides air to separate the master.
14	Ink idling motor	Presses or releases the idling roller against the drum screen.

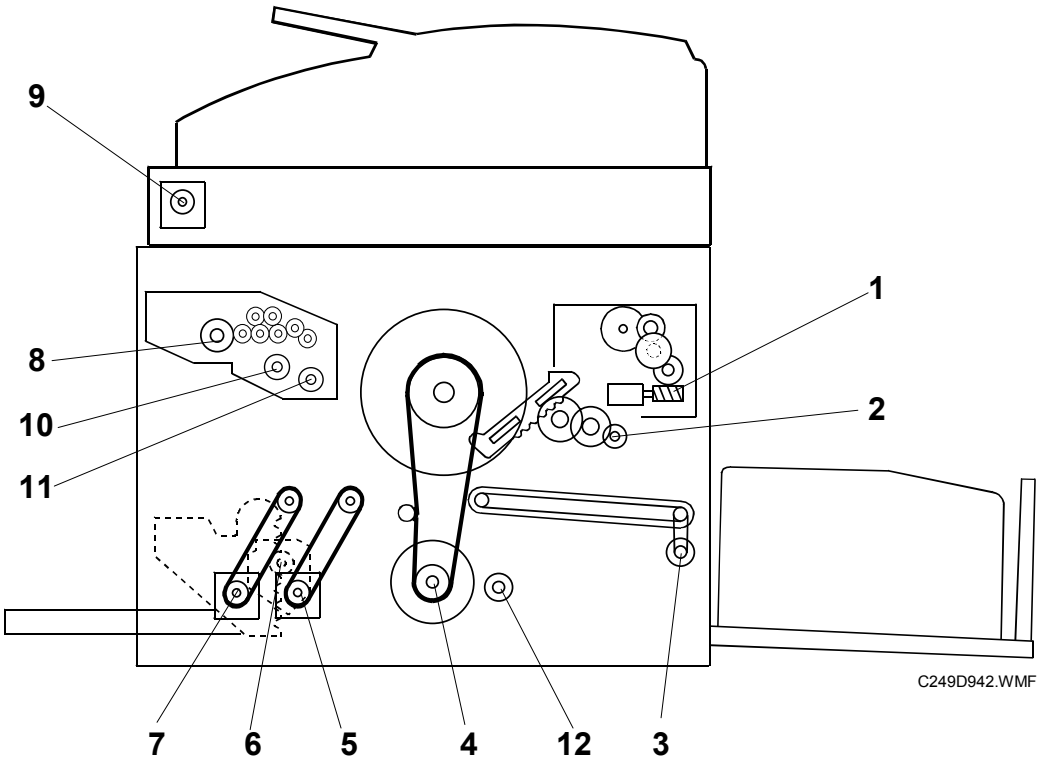
Switches

No.	Component	Function
8	Lower master tray set switch	Checks if the lower master tray is installed.

Sensors

No.	Component	Function
1	2nd drum master sensor	Detects if there is a master on the drum.
3	Printing pressure HP sensor	Detects when the printing pressure is at the home position.
5	Duct plate HP sensor	Detects when the duct plate is at the home position.
7	Duct jam sensor	Detects when a master remains in the duct.
10	Thermal head HP sensor	Detects when the thermal head is at the home position.
13	Master edge sensor	Detects the leading edge of the master.
15	Ink idling roller HP sensor	Detects when the idling roller is at home position.

6.1.3 DRIVE LAYOUT

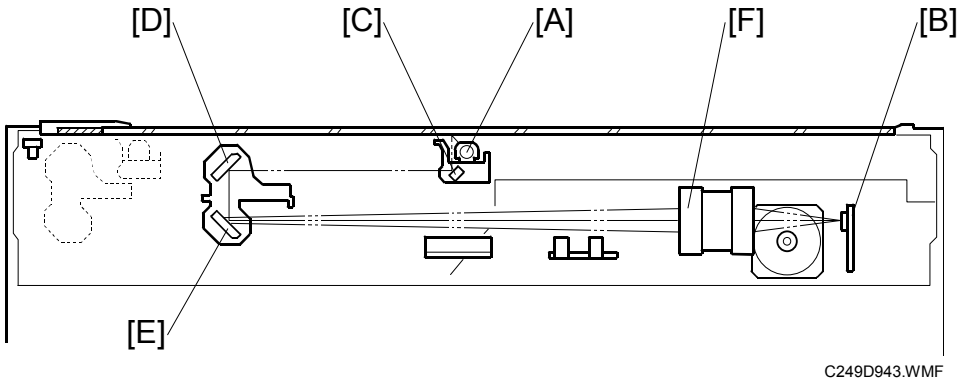


1. Pressure plate motor
2. Clamper motor
3. Paper delivery motor
4. Main motor
5. Registration motor
6. Table motor
7. Paper feed motor
8. Master feed motor
9. Scanner motor
10. *Thermal head driving motor
11. *Duct plate motor
12. *Printing pressure motor

*: New for #C249

6.2 SCANNER UNIT

6.2.1 OVERVIEW

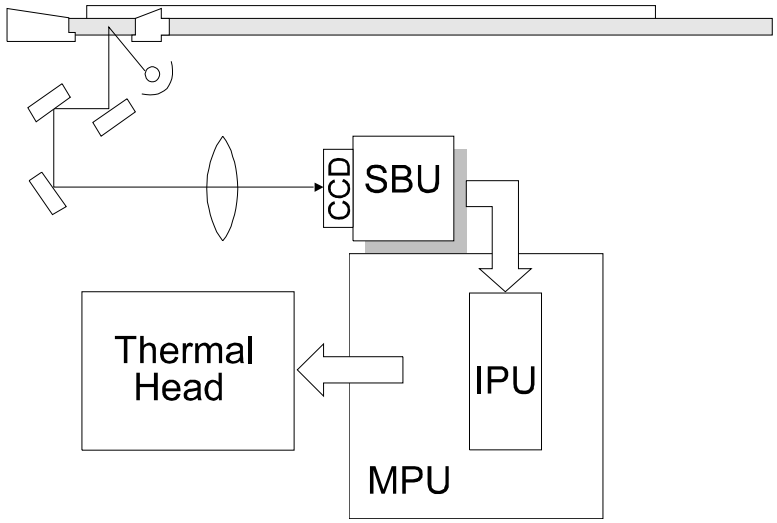


[A]: Exposure lamp
[B]: Charge coupled device (CCD)
[C]: First mirror
[D]: Second mirror
[E]: Third mirror
[F]: Lens

- The exposure lamp is a xenon lamp (DC 24V).
- Light reflected off the original is directed onto a CCD via the mirrors and the lens.
- The main-scan resolution is 600 dpi, because the CCD is 600 dpi. This model always reduces the amount of scanned data to 400 dpi. (☛ 6.3.4)
- The sub-scan resolution is 400 dpi.

6.3 IMAGE PROCESSING

6.3.1 OVERVIEW



- The CCD line has 7,450 pixels and the resolution is 600 dpi (23.6 lines/mm).
- The A/D converter in the SBU transforms the analog signals into 8-bit digital signals.

The MPU carries out the following processes on the image data:

Auto shading
↓
Filtering (MTF, SMOOTHING)
↓
Magnification
↓
Binary processing

6.3.2 MTF FILTER

- The MTF filter enhances the desired image qualities.
- The MTF filter is used in all modes (Letter, Letter/Photo, Photo, and Tint).
- This model has SP mode adjustments.

6.3.3 SMOOTHING FILTER

- The Smoothing filter enhances the desired image qualities.
- The Smoothing filter is used in Photo mode only.
- This model has no SP mode adjustments.

6.3.4 MAIN SCAN ENLARGEMENT/REDUCTION

- Changing the scanner speed enables reduction and enlargement in the sub-scan direction.
- The processing for main-scan enlargement/reduction is the same as in the previous digital machines
- The thermal head is 400 dpi, but the CCD is 600 dpi. Therefore, this model always reduces the amount of scanned data by half before printing.

6.3.5 THERMAL HEAD

Specifications

Length: 292.6 mm

Number of thermal head elements: 4068 dots

Density of thermal head elements: 400 dpi

Thermal head control

The thermal head contains heating elements at a density of 400 dpi. The thermal heating elements melt the over-coating and polyester film layers of the master, in accordance with the image signal for each pixel.

The PSU applies power (VHD) to the thermal heating elements. The power source varies from one head to another because the average resistance of each element varies. Therefore, when replacing the thermal head or power supply unit, it is necessary to readjust the applied voltage to the specific value for the thermal head.

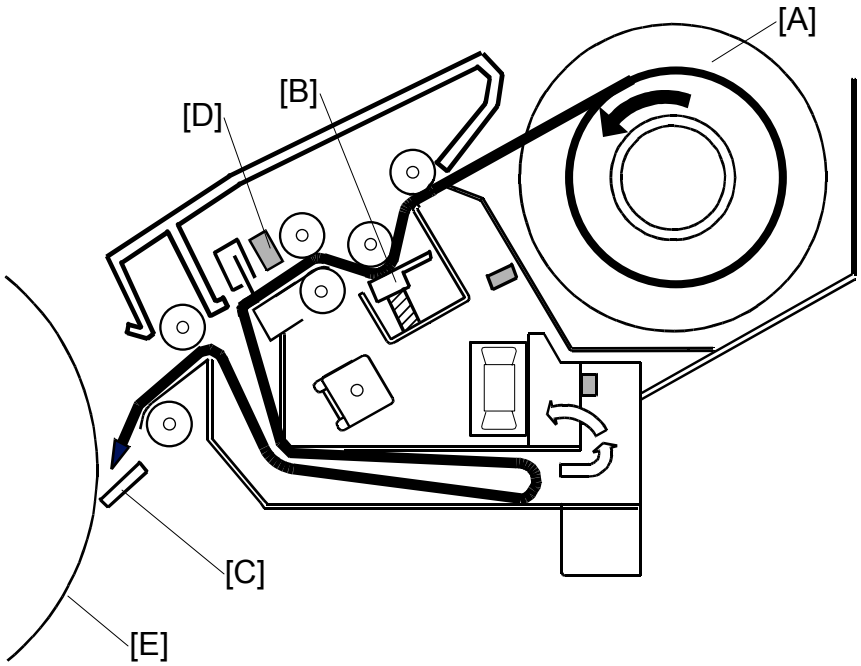
Thermal head protection

The thermistor on the thermal head provides thermal head protection, preventing the thermal head from overheating when processing a solid image. The CPU checks for any abnormal condition when the Start key is pressed; it displays an error code on the operation panel as follows:

No.	Symptom	Possible cause
E-04	Thermal Head Overheat The temperature of the thermal head is greater than 54°C when the Start key is pressed.	Overheat (wait for the thermal head to cool down) Thermal head
E-09	Thermal Head Thermistor Open The thermistor output voltage is over 4.9 volts.	Thermal head thermistor Thermal head connector
E-10	Thermal Head Energy Pulse error The CPU detects an abnormal ID signal from the thermal head energy control pulse.	Thermal head connector Thermal head MPU
E-40	Thermal Head ID error The CPU detects an abnormal ID signal from the thermal head.	Thermal head MPU Thermal head connector disconnected

6.4 MASTER FEED

6.4.1 OVERVIEW



The master feed unit makes an image on the master and feeds the master to the drum.

Procedure

The machine feeds the master from the master roll [A].

↓

The thermal head [B] makes an image on the master.

↓

Clamper [C] opens. (The drum is at the master feed position.)

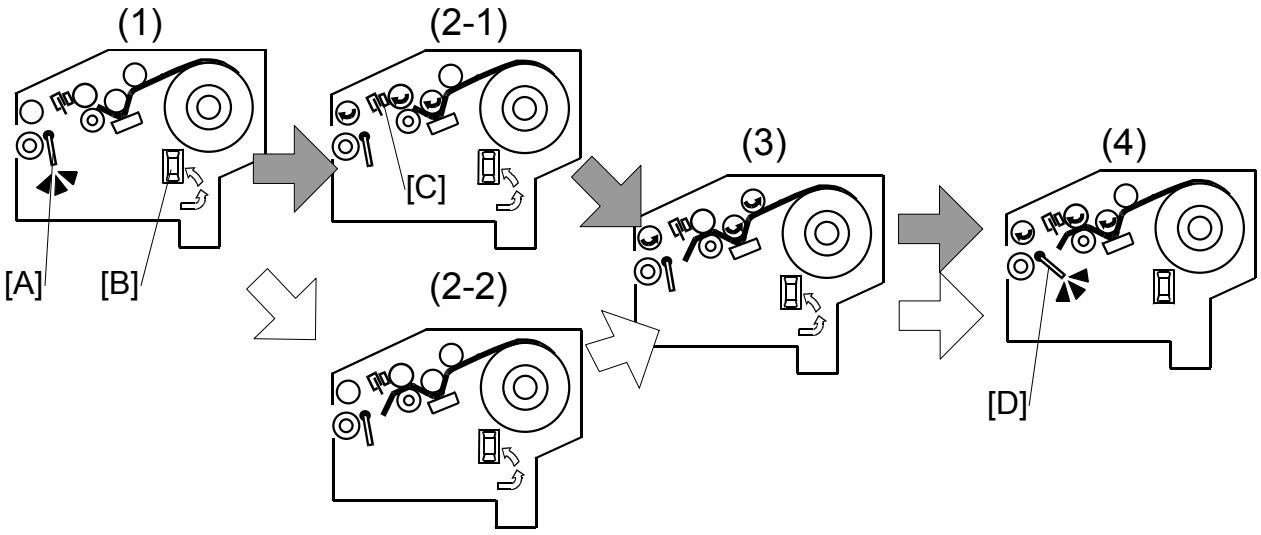
↓

The clamper clamps the master. At this time, the cutter [D] cuts the master.

↓

The master is wrapped around the drum [E].

6.4.2 AUTO ADJUSTABLE MASTER SET



C249D066.WMF

When the customer sets the master to the master making unit, the machine automatically adjust the position of the leading edge of the master.

Procedure

The duct plate moves to the open position [A] from middle position. (1)

↓

The master vacuum fans [B] turns on. (1)

↓

The master vacuum fans turns on after 2.0 seconds. The master feed motor feed the master 40 mm when the master edge sensor [C] does not detects the master. (2-1)

If the master edge sensor detects the master, the master feed motor does not feed the master. (2-2)

↓

The master feed motor reverses the master until the master edge sensor does not detect the master. (3)

↓

The master feed motor feeds the master until the master edge sensor detect the master. (3)

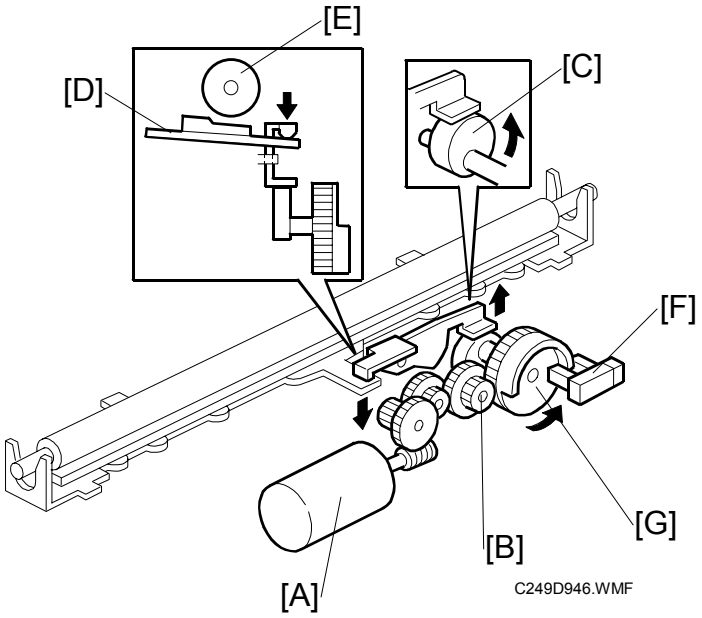
↓

The duct plate moves to the middle position [D] from the open position. (4)

↓

The master vacuum fans turns off. (4)

6.4.3 THERMAL HEAD DRIVING MECHANISM



Mechanism

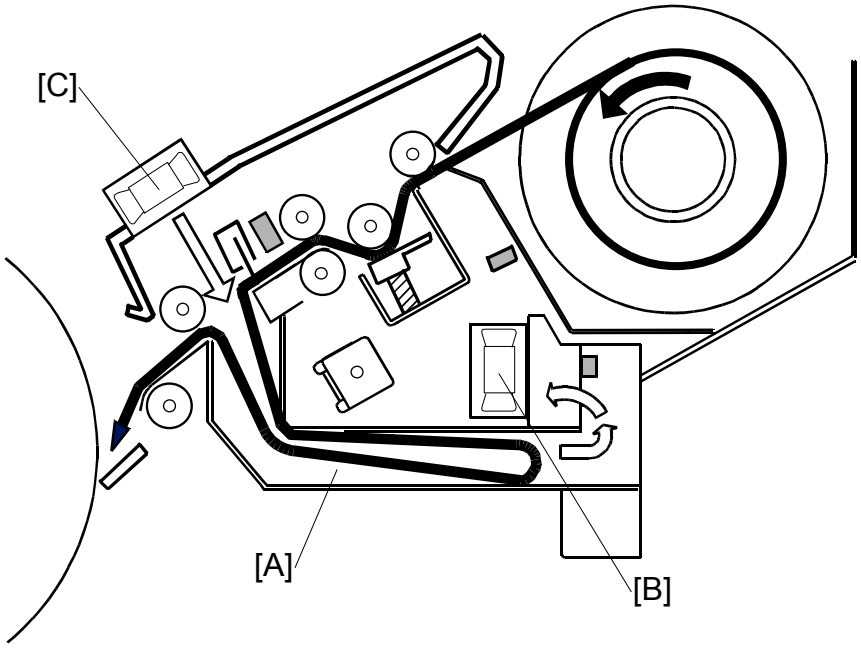
Thermal head driving motor [A]
↓
Gears [B]
↓
Thermal head release cam [C]
↓
Thermal head base [D] is released from the platen roller [E].

Thermal head HP sensor [F] has two stop positions:

- Platen roller apply position
- Platen roller release position

The actuator disk [G] interrupts the thermal head HP sensor [D] when the thermal head base [D] is released from the platen roller [E].

6.4.4 MASTER BUFFER MECHANISM



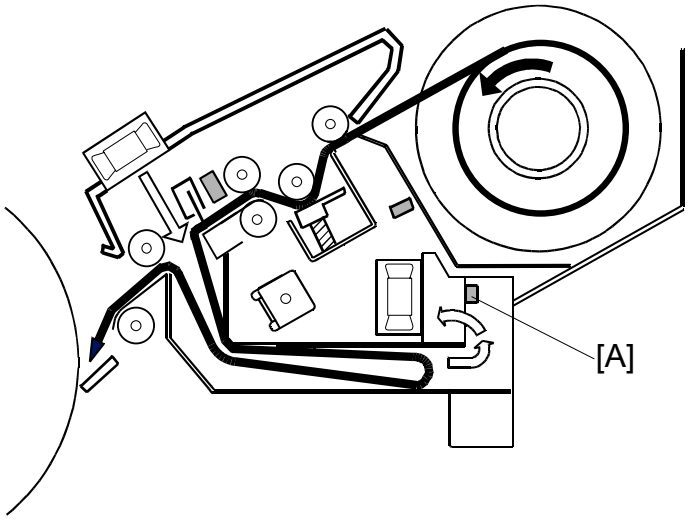
C249D929.WMF

The master is wrapped around the drum to not let air enter between the master and the drum when the master is wrapped around the drum.

The master is stored in the master buffer duct [A] by the three master vacuum fans [B] after the thermal head transfers the image to it. The stored master is fed out from the duct when the drum reaches the master making position after the master has ejected.

The blower fan motor [C] provides air to separate the master in the maser buffer duct.

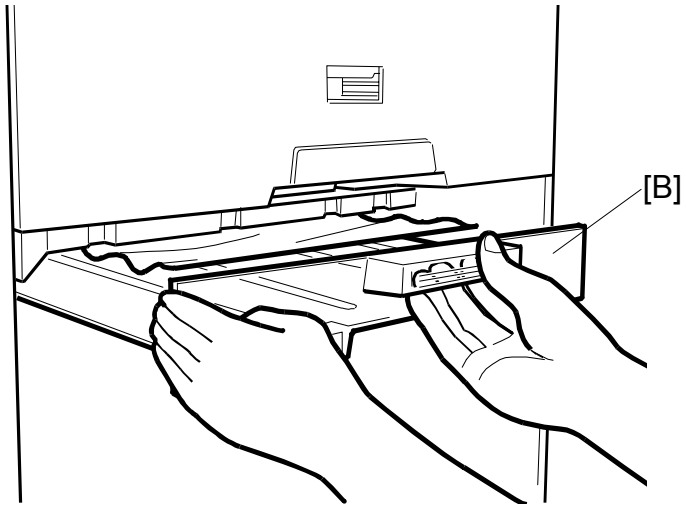
6.4.5 DETECTION OF MASTER IN THE LOWER MASTER TRAY



C249D929.WMF

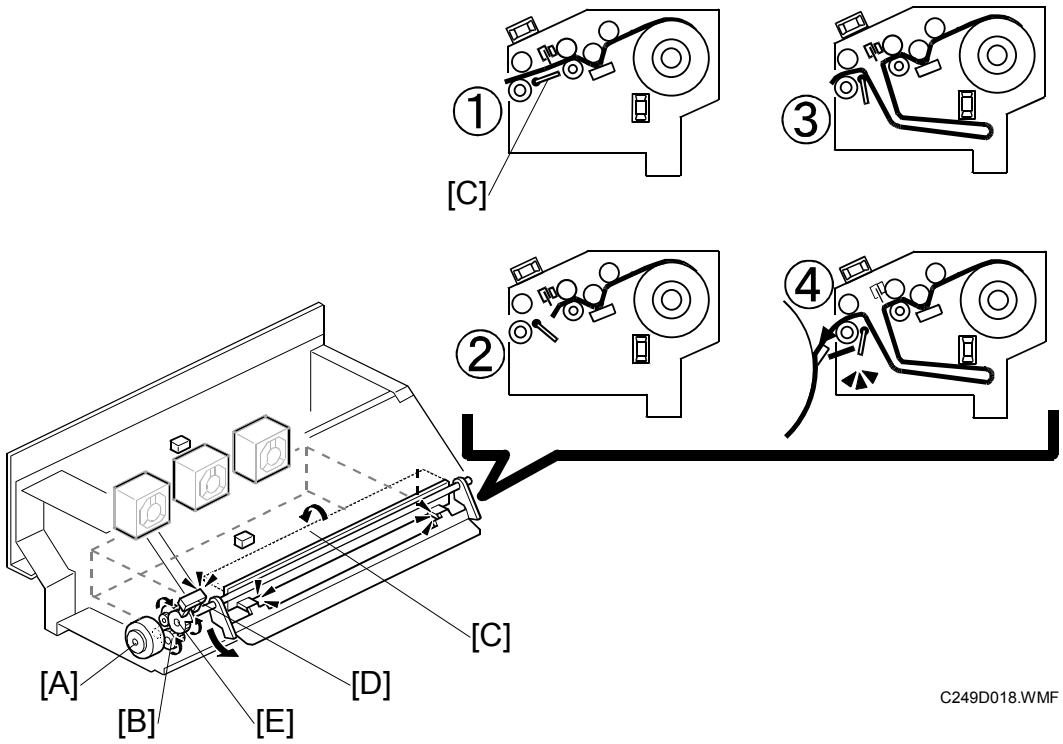
[A]: Duct jam sensor

- The duct jam sensor [A] detects whether there is a master in the lower master tray or not.
- When the duct jam sensor detects master, the “D” jam indicator comes. If this happens, open the lower master tray [B] and remove the misfed master.



C249D065.WMFF

6.4.6 DUCT PLATE MECHANISM



Mechanism

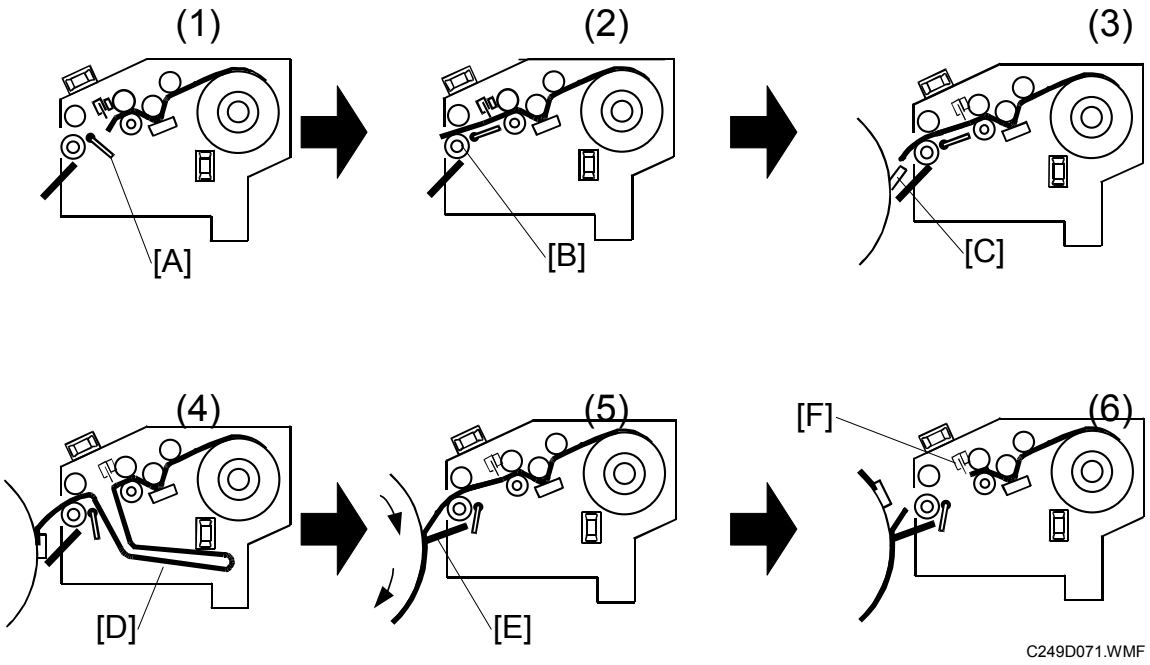
Duct plate motor [A]
↓
Gears [B]
↓
The duct plate [C] moves

The duct plate motor HP sensor [D] has four stop positions:

- The duct plate close position (①)
- The duct plate middle position (②)
- The duct plate open position (③)
- The master push mylar apply position (④)

The actuator disk [E] interrupts the duct plate HP sensor [D] when the duct plate opens.

Procedure



The duct plate [A] is in the middle position before printing. (1)

↓

The duct plate moves to the close position when the master is fed until the master tension roller [B] catches the leading edge of the master. (2)

↓

Clamper [C] opens. (The drum is at the master feed position.) (3)

↓

The duct plate moves to the open position when the clamper clamps the master. At this time, the master is stored in the master buffer duct [D]. (4)

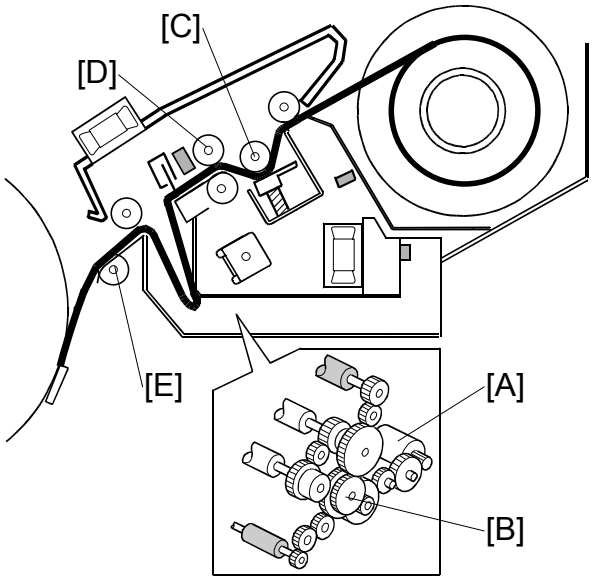
↓

The duct plate moves the master push mylar [E] after the clamper clamps the master. At this time, the master push mylar contacts with the master on the drum (5).

↓

The cutter [F] cuts the master after the master is wrapped around the drum (6).

6.4.7 MASTER FEED MECHANISM



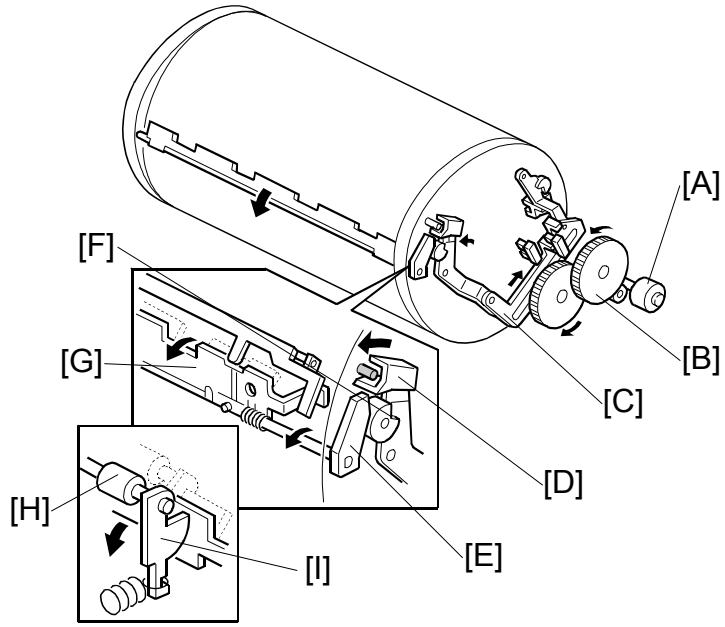
Mechanism

Master feed motor [A] (stepper motor)
↓
Gears [B]
↓
Platen roller [C], master feed roller [D]
↓
Feeds the master (The thermal head makes an image on the master.)

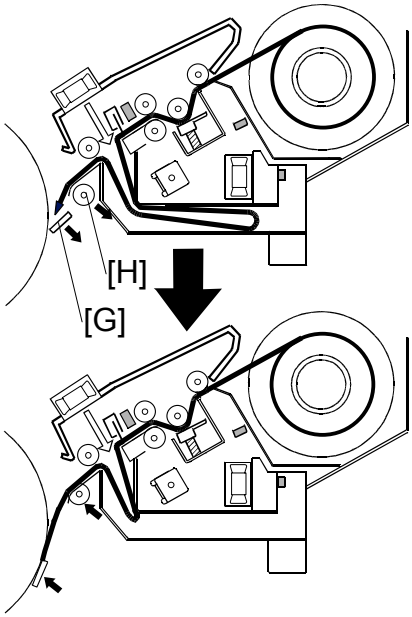
Procedure

1. After the old master has been ejected, the drum stops at the master feed position and the master clamper opens, ready to clamp the new master.
2. When the clamper is open, the tension roller releases and the master is fed to the clamper on the drum. For details of the tension roller, see the next section.
3. After the clamper closes, the master feed motor feeds the master while the drum rotates intermittently at 15 rpm.
4. The tension roller [E] keeps the master under tension. Without this roller, the master would crease when the drum turns continuously during wrapping around the drum. This reduces the master making time.
5. The main motor turns off when the drum is at the master eject position. The master feed motor continues to feed the master until master making has completed. Then the master feed motor turns off, and cutting is done.
6. Springs press the thermal head against the platen roller.

6.4.8 CLAMPER AND TENSION ROLLER MECHANISM



C249D947.WMF



C249D002.WMF

Mechanism

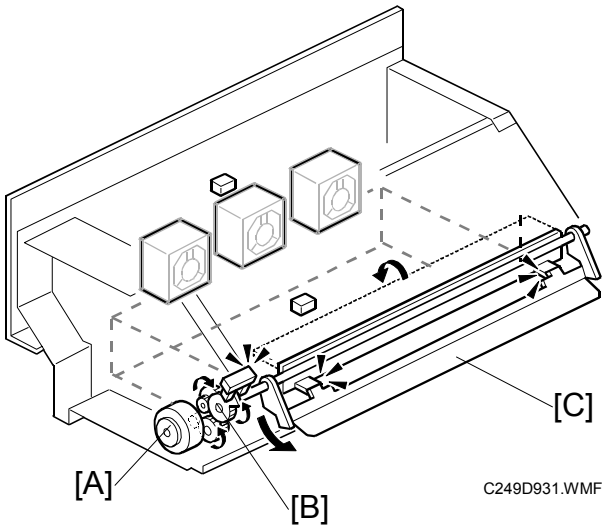
Clamper motor [A]
↓
Gears [B]
↓
Link [C]
↓
Drum guide [D]
↓
Lifts the lever [E], engages and locks the drum pin [F], and opens the clamper plate [G].
↓
Releases the tension roller [H].
↓
Feeds the master into the clamper.

Procedure

- When the old master has been ejected, the drum is stopped at the master feed position. The master clamper clamps the leading edge of the new master before the drum starts to turn again.
- The tension roller [H] normally presses against the master feed guide plate to apply tension to the master during master wrapping. When the clamper opens, it pushes the tension roller arms [I] and moves the tension roller away from the guide plate to allow the master to be fed into the master clamper.

6.4.9 MASTER PUSH MYLAR

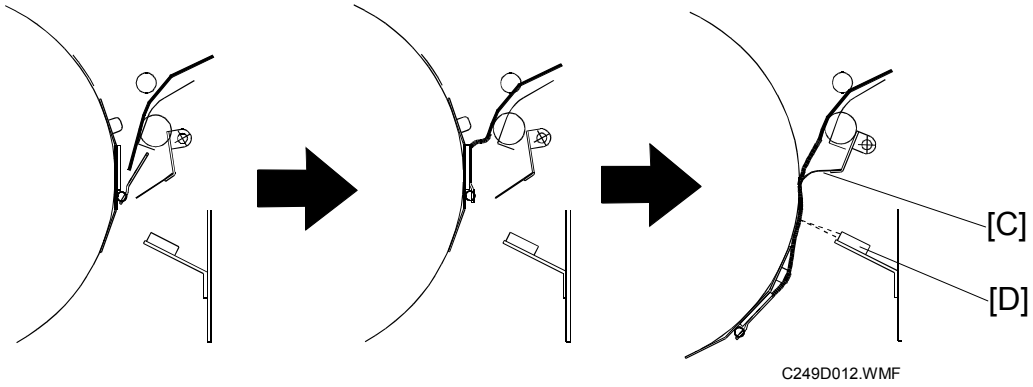
Mechanism



Mechanism

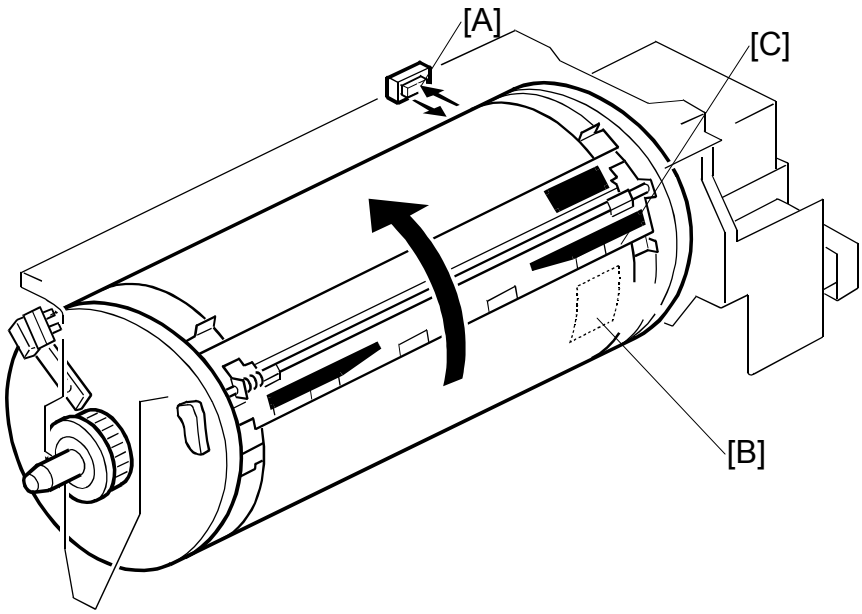
Duct plate motor [A]
↓
Gears [B]
↓
The master push mylar [C] contacts with the master on the drum.

The master push mylar contacts with the master on the drum to distribute ink through the master.



- The 2nd drum master [D] sensor prevents contact with the master push mylar and the drum when there is no master on the drum.

6.4.10 2ND DRUM MASTER SENSOR



C249D932.WMF

Mechanism

The 2nd drum master sensor [A] detects a black patch on the screen [B] even if there is no master on the drum.

↓

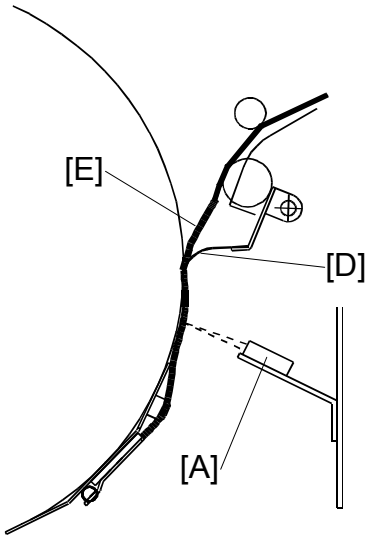
The 2nd drum master sensor detects black patch on the clamper [C] even if there is no master on the drum.

↓

The master push mylar [D] contacts with the master [E] on the drum.

[A]: 2nd drum master sensor
[B]: Black patch on the screen
[C]: Black patch on the clamper

- The 2nd drum master sensor prevents contact with the master push mylar and the drum when there is no master on the drum.



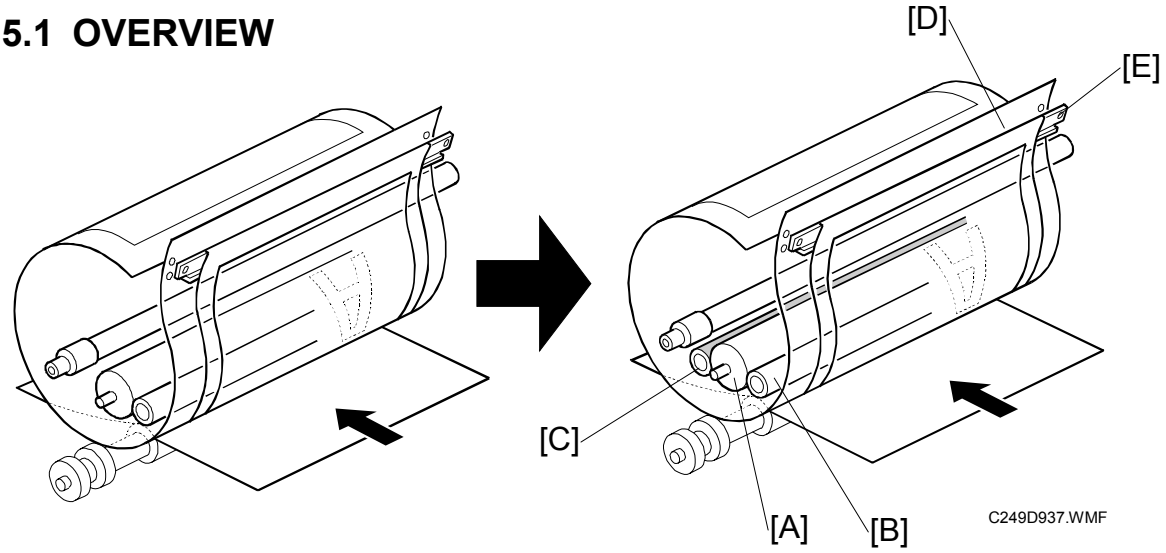
C249D013.WMF

6.4.11 RE-CUTTING MECHANISM

- If the CPU can not detect the master eject position sensor (drum HP) signal within 5.0 seconds after the main motor turns on by master cut miss, the cutter tries to cut the master again. The cutter cuts the master a second time, and the jam indicator lights. If the cutter does not cut the master the second time, the E-06(Main Motor error) indicators lights.

6.5 DRUM

6.5.1 OVERVIEW



- The ink idling roller [C] has been added. This ensures that the first print has sufficient ink density even if the machine was not used for a long time.

Procedure

Ink is supplied inside the drum, through the drum shaft.

↓

The ink roller [A] and the doctor roller [B] spread the ink evenly on the screens.

The drum idling roller [C] supply ink to the screens and master before and after printing.

↓

Ink passes through the metal screen [D].

↓

Ink passes through the cloth screen [E].

↓

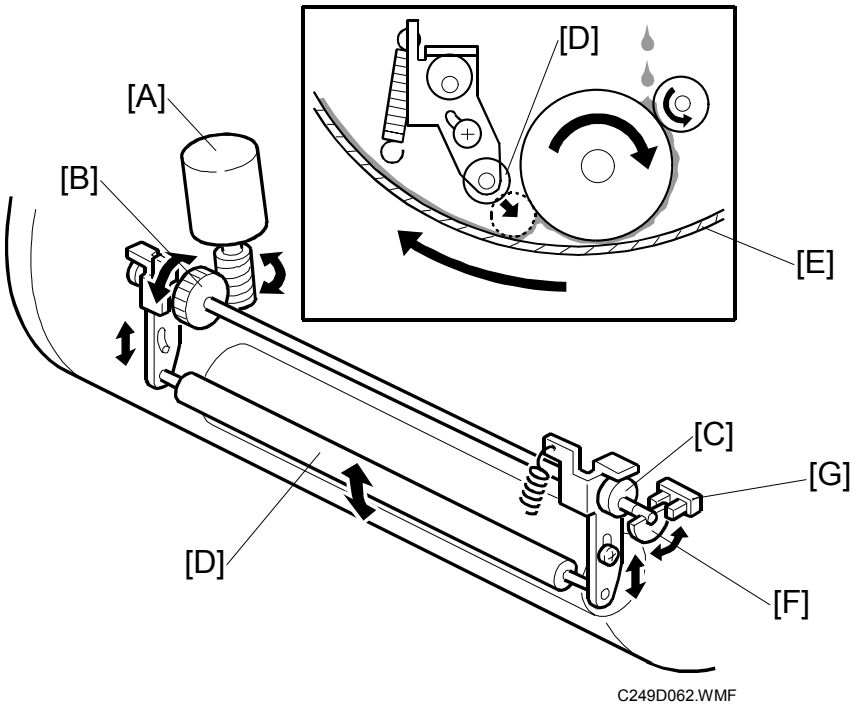
Ink passes through the holes in the master that were made by the thermal head.

↓

Ink reaches the paper.

NOTE: 1) The drum is driven by the main motor and turns only clockwise.
2) The main motor speed and the drum stop positions are controlled by the monitoring the motor encoder.
3) The ink pump, which is outside the drum, supplies ink from the ink cartridge to the drum through the drum shaft.

6.5.2 DRUM IDLING MECHANISM



Mechanism

Ink idling motor [A]

↓

Gears [B]

↓

Cam [C]

↓

Drum idling roller [D] rotates

↓

The drum idling roller puts the ink onto the screen and master before and after printing.

The machine enters the drum idling mode before and after printing. This ensures that the first print has sufficient ink density even if the machine was not used for a long time.

The idling roller motor [A] turns to press the drum idling roller against the inner surface of the drum screen [E].

The actuator disk [F] interrupts the idling roller HP sensor [G] when the drum idling roller is in contact with the drum screen.

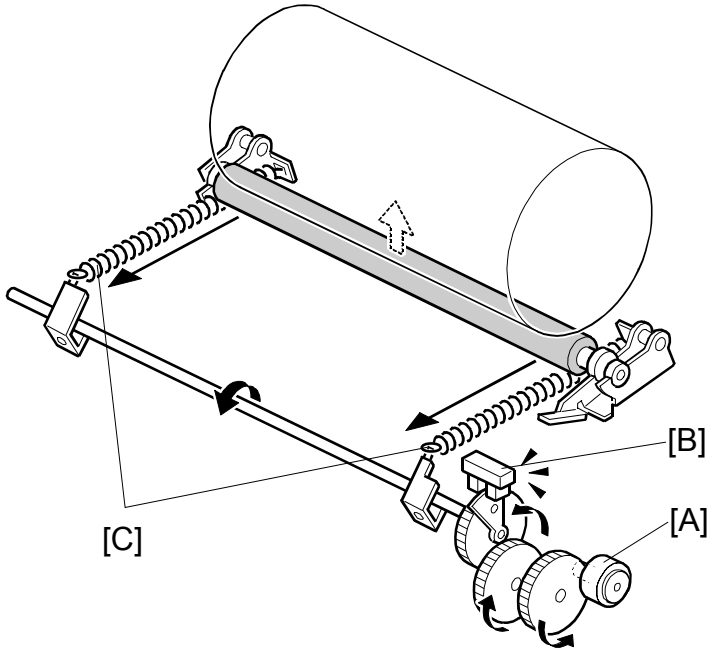
The number of drum idling rotations depends on temperature and period of machine inactivity, as shown in the following table.

NOTE: 1) User Tools 4-11 can change the number of rotations for each of these conditions.
2) The drum rotations speed during idling is fixed at 30 rpm.

Period/ Temperature	Less than 2 hours	2 to 4 hours	4 to 24 hours	Over 24 hours
High (28degree or above)	0	0	2	3
Normal (15 to 28 degree)	0	0	2	3
Low (below 15degree)	0	2	3	3

6.6 PAPER FEED

6.6.1 AUTO ADJUTABLE PRINTING PRESSURE MECHANISM



C249D948.WMF

The printing pressure motor [A], the printing pressure sensor [B] and printing pressure spring [C] were added to the press roller to control the image density of each printing speed or temperature. The printing pressure depends on temperature and printing speed, as shown in the following table.

NOTE: You can change the print pressure for each of these conditions with SP6-70 to 87. (☛ 5.7.1)

Temperature/ Print Speed	Low (Below 15degrees)	Normal (15 to 28 degrees)	High (28degree and above)
Trial Print	Printing Pressure 2	Printing Pressure 2	Printing Pressure 2
1st Print (60rpm)	Printing Pressure 1	Printing Pressure 1	Printing Pressure 1
2nd Print (75rpm)	Printing Pressure 3	Printing Pressure 2	Printing Pressure 1
3rd Print (90rpm)	Printing Pressure 4	Printing Pressure 3	Printing Pressure 2
4th Print (105rpm)	Printing Pressure 5	Printing Pressure 4	Printing Pressure 3
5th Print (120rpm)	Printing Pressure 5	Printing Pressure 5	Printing Pressure 5

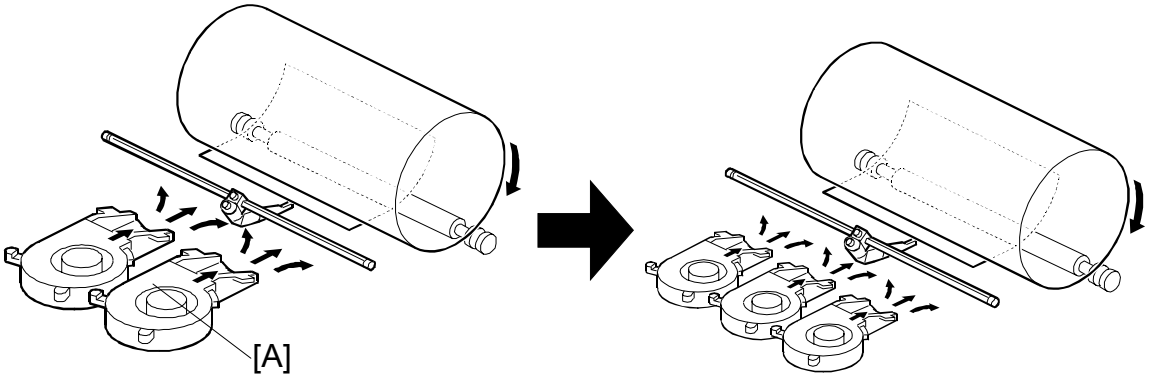
Bigger number: increases the pressure

Smaller number: decreases the pressure

6.7 PAPER DELIVERY

6.7.1 PAPER SEPARATION FROM THE DRUM

Air knife

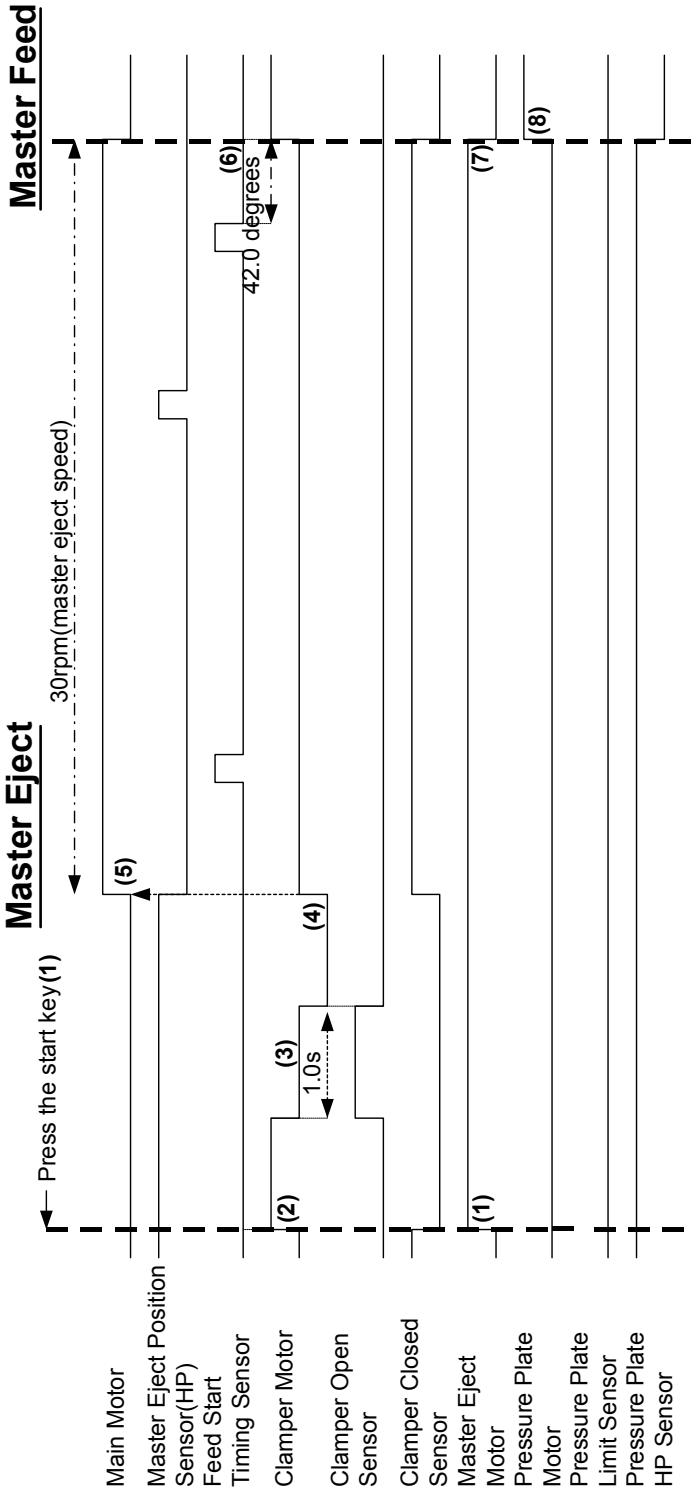


C249D063.WMF

- To separate paper from the drum, the number of air knife fan motors has been increased 2 to 3.

TIMING CHART

6.7.2 MASTER EJECT / MASTER FEED



C249D900.WMF

Master eject

(1) The master eject motor turns on when you press the Start Key,.

(2) When the master eject motor turns on, the clamper motor turns to open the clamper.

(3) After the clamper opens for 1.0 seconds, the clamper motor turns to close the clamper.

(4) The clamper closes.

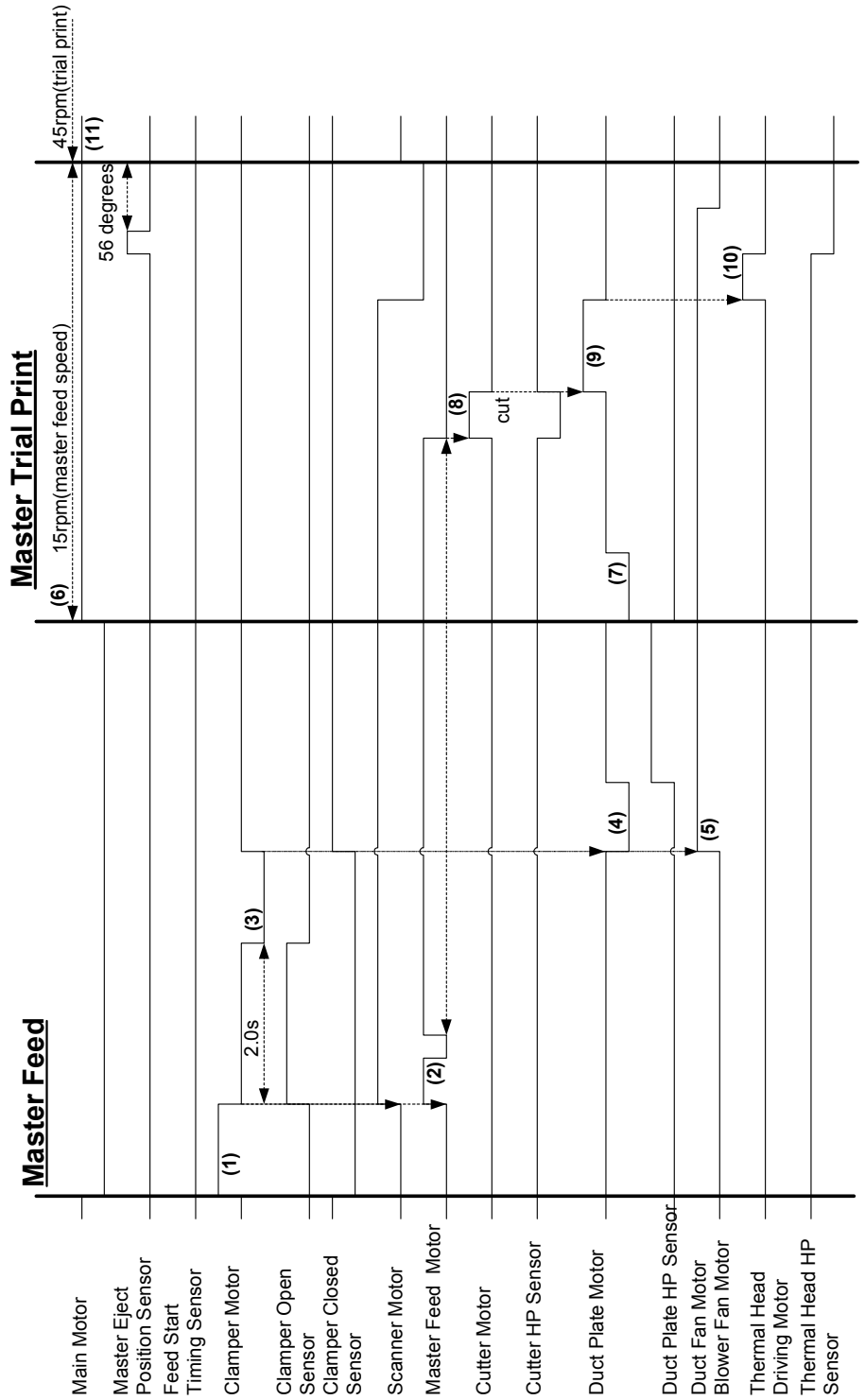
(5) When the clamper is closed, the main motor turns on.

(6) The drum is at the feed start timing sensor position plus 42 degrees.

(7) The master eject motor and main motor turn off.

(8) The pressure plate presses and turns the pressure plate motor.
(After 18.0 seconds, the pressure plate motor turns off.)

6.7.3 MASTER WRAPPING



C249D901.WMF

Detailed Descriptions

Master feed

(1) The clamper motor turns to open the clamper.

(2) When the clamper is open, the master feed motor turns on. The master feed motor feeds the master at 45 mm.

(3) After 2.0 seconds, the clamper motor turns to close the clamper.

(4) When the clamper is closed, the duct plate motor turns to move the duct plate to the open position.

(5) The duct fan motors and the blower fan motor turn on.

(6) When the master feed motor has fed the master 430 mm, the main motor turns on.

(7) The duct plate motor turns to contact with the master push mylar to the master on the drum.

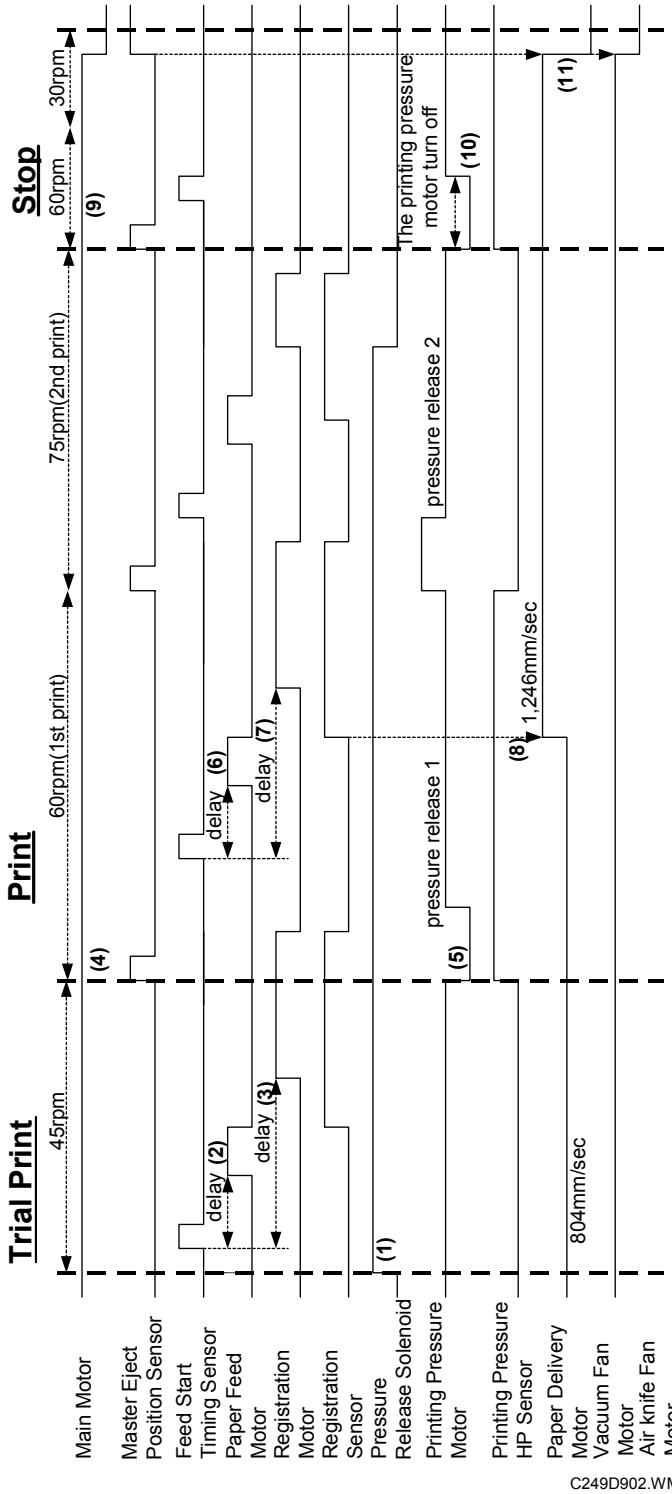
(8) When the master feed motor has fed the master 540 mm, the master feed motor stops, and the master is cut.

(9) When the cutter has cut the master, the duct plate motor turns to release the master push mylar. Them the duct plate moves to the middle position.

(10) When the drum is at the master eject position sensor, the thermal head driving motor turns on.

(11) When the drum is at the master eject position plus 56 degree, the speed goes to 45 rpm.

6.7.4 PRINTING



Detailed Descriptions

Trial print

(1) The pressure release solenoid turns on.

(2) After the drum is at the feed start timing sensor plus feed delay time, the paper feed motor turns on.

(3) When the drum is at the feed start timing sensor plus registration delay, the registration motor turns on.

(4) When the drum is at the master eject position sensor, the speed goes to 60 rpm.

Printing

(5) When the drum is at the master eject position sensor, the printing pressure motor turns on.

(6) After the drum is at the feed start timing sensor plus feed delay time, the paper feed motor turns on.

(7) After the feed start timing sensor plus registration delay, the registration motor turns on.

(8) When the registration sensor detects the paper, the speed of the paper delivery motor goes to 1264 mm/ sec.

Stop

(9) When the drum is at the master eject position sensor, the speed goes down to 60rpm.

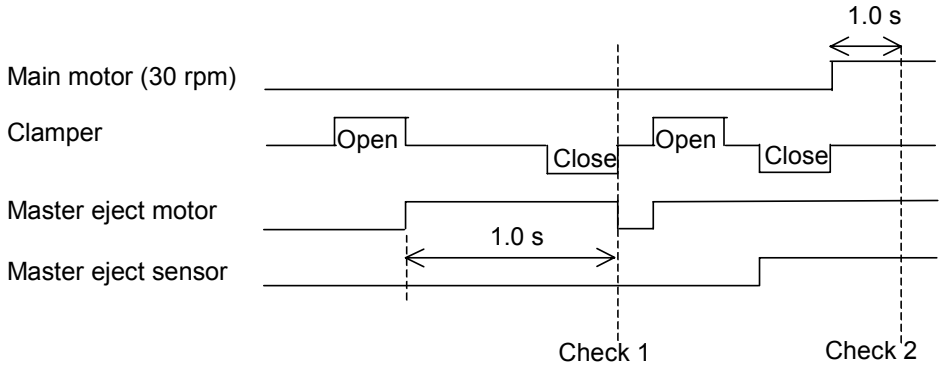
(10) The printing pressure motor turns off.

(11) When the main motor turns off, the paper delivery motor, the vacuum fan motor and the air knife fan motors turn off.

6.8 JAM DETECTION

6.8.1 MASTER EJECT JAM (B JAM LOCATION INDICATOR)

Picking up the used master from the drum



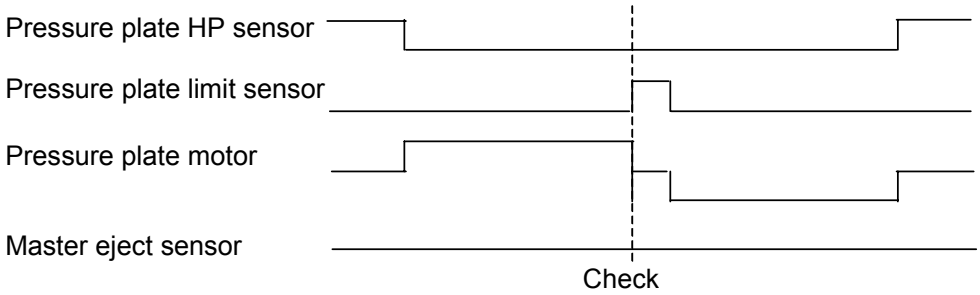
C249D903.WMF

Jam check timing: When the clamper open sensor is on (clamper open).

Check 1: If the master eject motor is still on after 1.0 second, and the master eject sensor doesn't detect the master, the machine goes on to check 2.

Check 2: When the clamper opens and closes again, and the drum has rotated 1.0 s, if the master eject sensor doesn't detect the master, the B jam indicator will light.

Compressing the used master



C249D904.WMF

Jam check timing: When moving the pressure plate.

Check: If the master eject sensor detects a master when the pressure plate limit sensor turns on (pressure plate at lower limit), the B, E jam indicator lights.

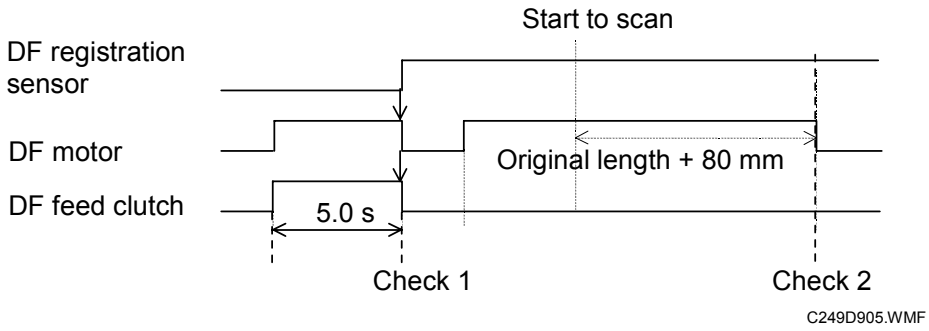
Just after turning on the main switch

Jam check timing: Just after the main switch has been turned on.

Check: If the master eject sensor is on (master detected), the B, E jam indicator lights.

6.8.2 DF JAM (P JAM LOCATION INDICATOR)

Feeding in the original



Jam check timing: When an original is placed in the DF.

Check 1: If the DF motor has operated for 5.0 seconds since the start key was pressed, and the DF registration sensor still doesn't detect the original, the P jam indicator lights.

Feeding out the original

Jam check timing: During original feed-out.

Check 2: When the DF has fed the original length plus 80 mm, the DF registration sensor still detects the original, the P jam indicator lights.

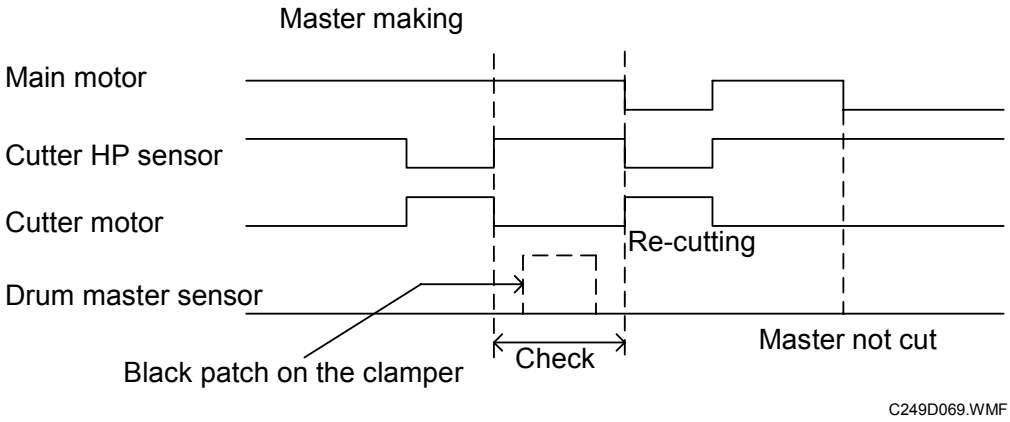
Turning on the main switch/closing the DF cover

Jam check timing: Just after turning the main switch on, and when the DF cover is closed.

Check: If the DF registration sensor detects an original, the P jam indicator lights.

6.8.3 MASTER FEED JAM (D JAM LOCATION INDICATOR)

Cutting the master (master not cut)



Jam check timing: When the master is clamped in the clamper and cutting is taking place.

Check : While the drum is rotating from when the cutter home position sensor turns on (cutter at home position) until the master eject position sensor turns on (drum at master eject position). If the drum master sensor detects a master on the black patch on the clamper, then the D jam indicator lights.

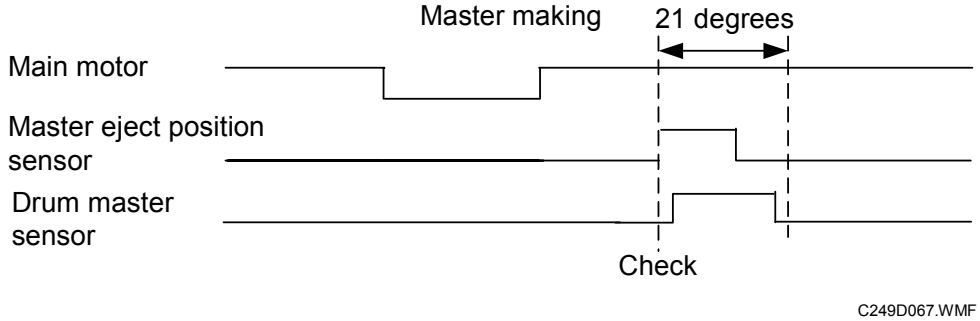
Check : If the CPU cannot detect the master eject position sensor (drum HP) signal within 5.0 seconds after the main motor turns on by master cut miss, the cutter tries to cut the master again. The cutter cuts the master the second time, and the jam indicator lights. If the cutter does not cut the maser the second time, the E-06 (Main Motor error) indicators lights.

Cutting the master (cutter unit problem)

Jam check timing: When the master is clamped in the clamper and cutting is taking place.

Check: During master cutting, if the cutter HP sensor does not turn on (cutter does not reach home position) at the desired time. When the cutter motor reverses to the cutter reach home position, the D jam indicator lights. When the cutter motor reverses, the cutter does not reach home position, the E-01 (Cutter error) indicators lights.

Clamping the master



Jam check timing: When the master is wrapping around the drum.

Check: When the drum has turned 21 degrees since the master eject position sensor turns on (drum at master eject position), if the drum master sensor doesn't detect a master, then the D jam indicator lights.

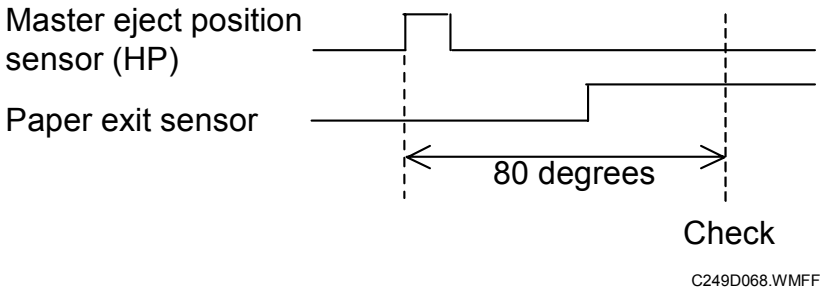
Reaming the master in the lower master tray

Jam check timing: When the clamper open sensor is on (clamper open).

Check: When the duct jam sensor detects master in the lower master tray, the D jam indicator lights.

6.8.4 DRUM JAM (B JAM LOCATION INDICATOR)

Wrapping jam



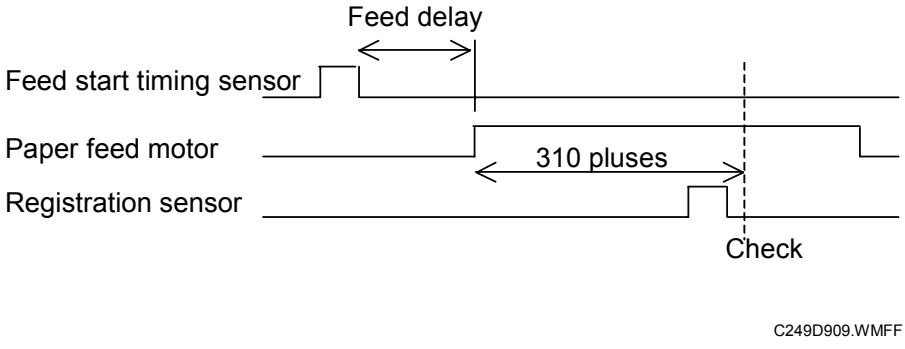
Jam check timing: When printing.

Check : When the drum has turned 80 degrees since the master eject position sensor turned on (drum reached master eject position), and the paper exit sensor still doesn't detect the paper, then the B jam indicator lights.

Check : When the drum has turned 80 degrees since the master eject position sensor turned on (drum reached master eject position), and the registration sensor detect the paper, then the A+B jam indicator lights.

6.8.5 PAPER FEED JAM (A JAM LOCATION INDICATOR)

Paper feed



Jam check timing: When the machine starts to feed. (When the feed delay time has passed since the feed start timing sensor turned on [drum at feed start position].)

Check: If after the paper feed motor has fed 310 pulses, the re-feeding function starts. The paper feed motor re-starts, and if the registration sensor doesn't detect paper again after 310 pulses, the A jam location indicator lights.

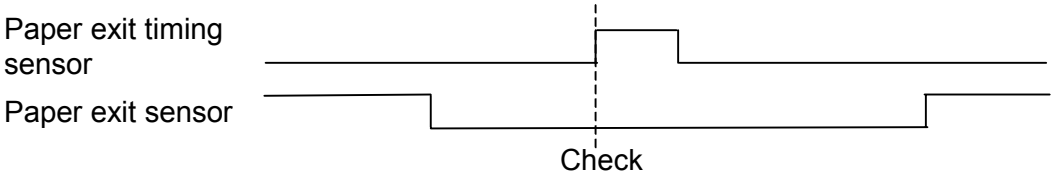
Turning on the main switch/end of paper feed

Jam check timing: Just after the main switch is turned on, or when paper feed has finished.

Check: If the registration sensor detects paper, the A+B jam indicator lights.

6.8.6 PAPER DELIVERY JAM (C JAM LOCATION INDICATOR)

Paper delivery



Jam check timing: When printing.

Check: When the paper exit-timing sensor turns on (drum at paper exit timing position), if the paper exit sensor detects paper, the C jam location indicator lights.

Drum: 360 degrees = 1020 pulses

Jam check timing: Just after the main switch is turned on, or when drum rotation has finished.

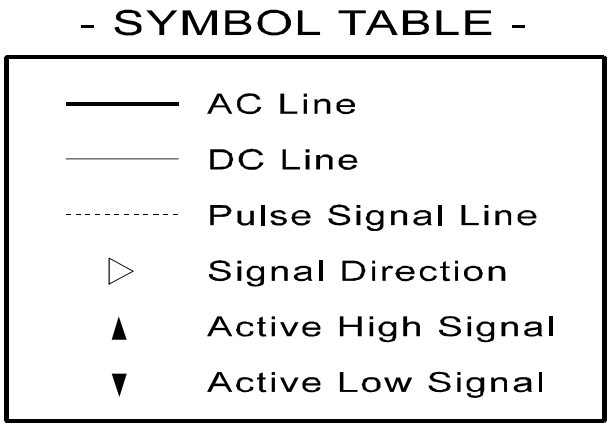
Check: When the paper exit sensor detects paper, the C jam location indicator lights.

7. POINT TO POINT DIAGRAM

- Location Map
- Section A
- Section B
- Section C
- Section D
- Section E
- Section F
- Section G
- Section H
- Section I

- Location Map Option
- Section A Option
- Section B Option
- Section C Option
- Section D Option
- Section E Option

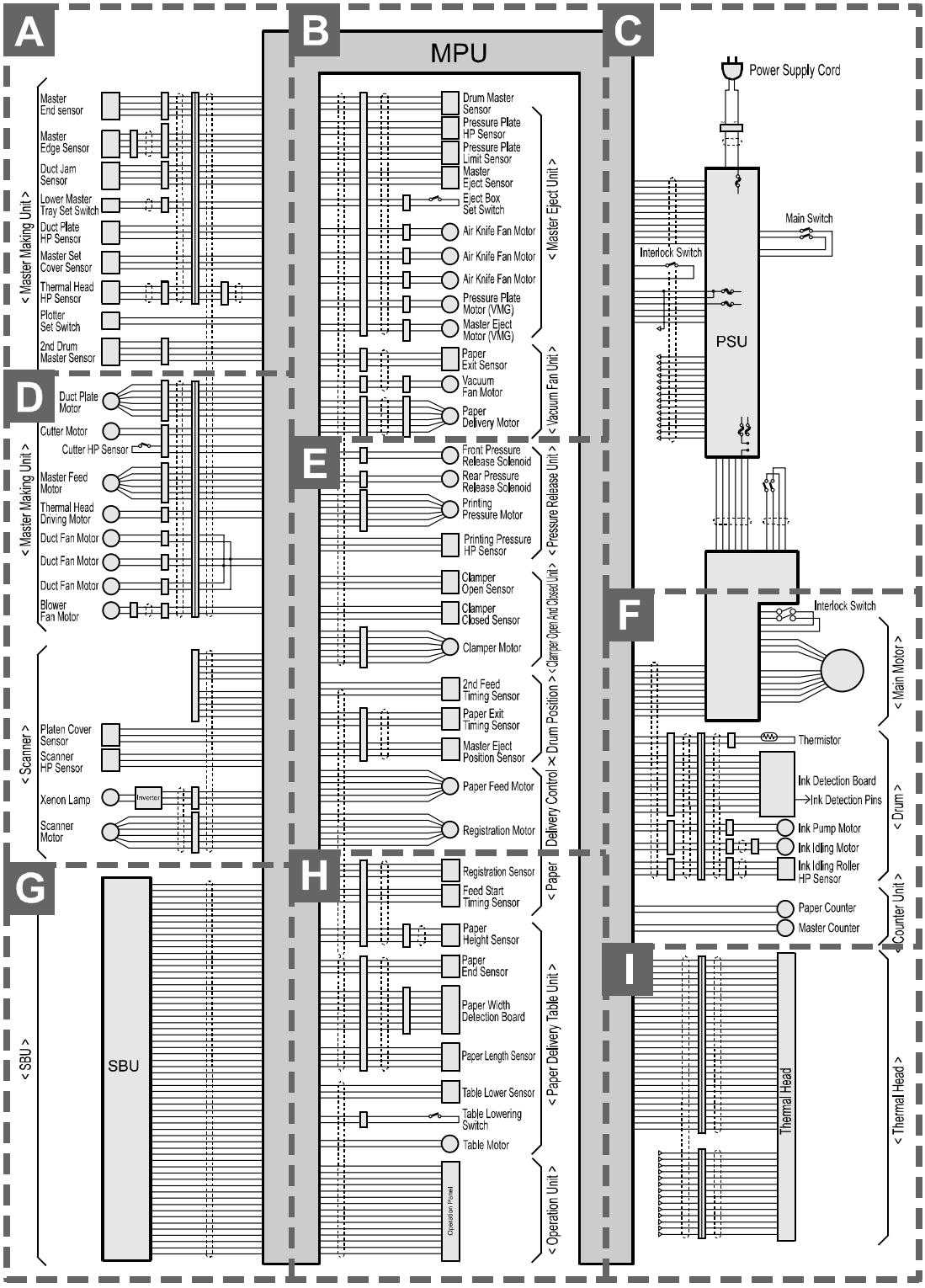
NOTE: The symbols used in the diagrams are as follows:



PP2.WMF

Location Map

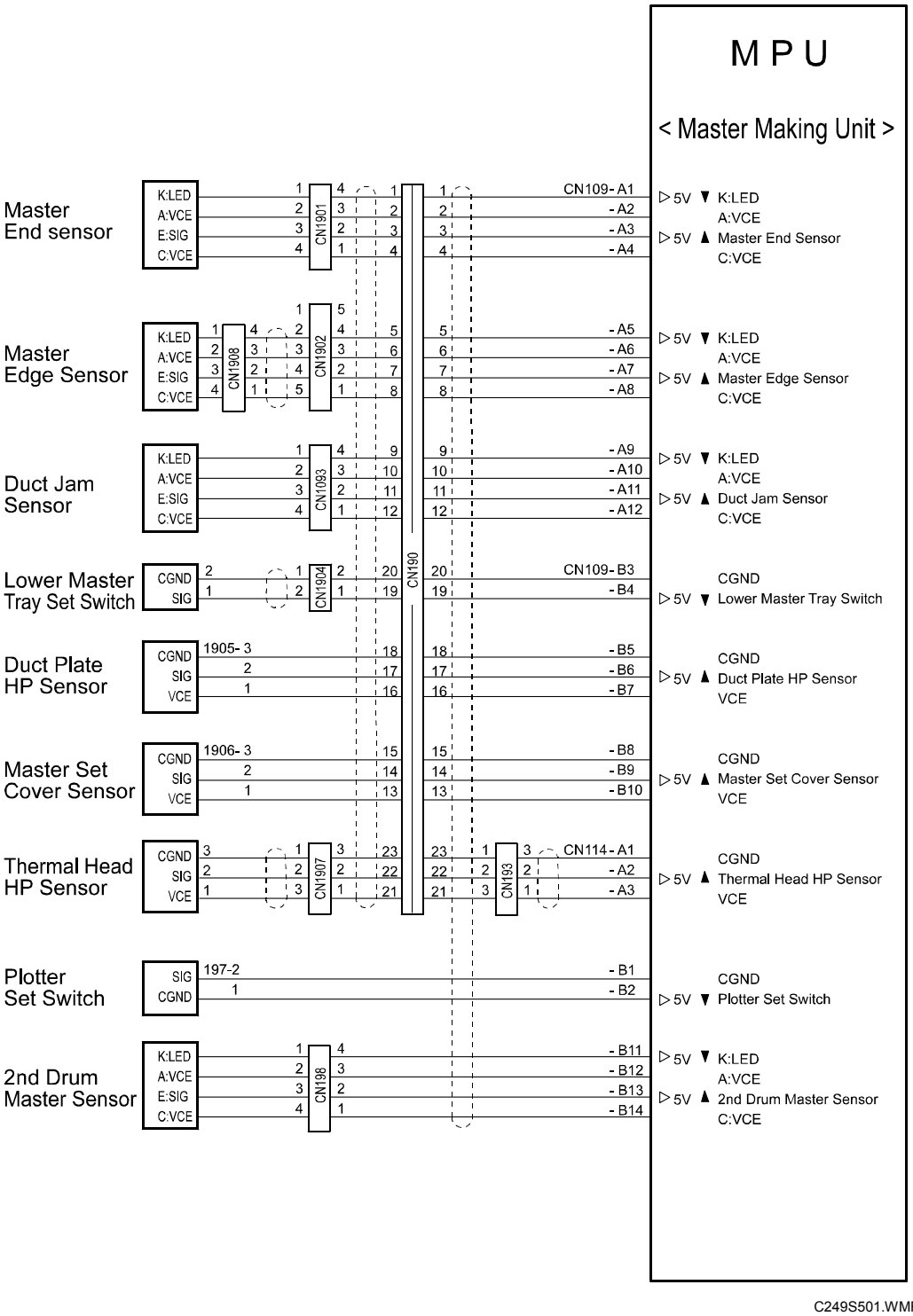
Location Map



C249S500.WMF

Section A

Section A

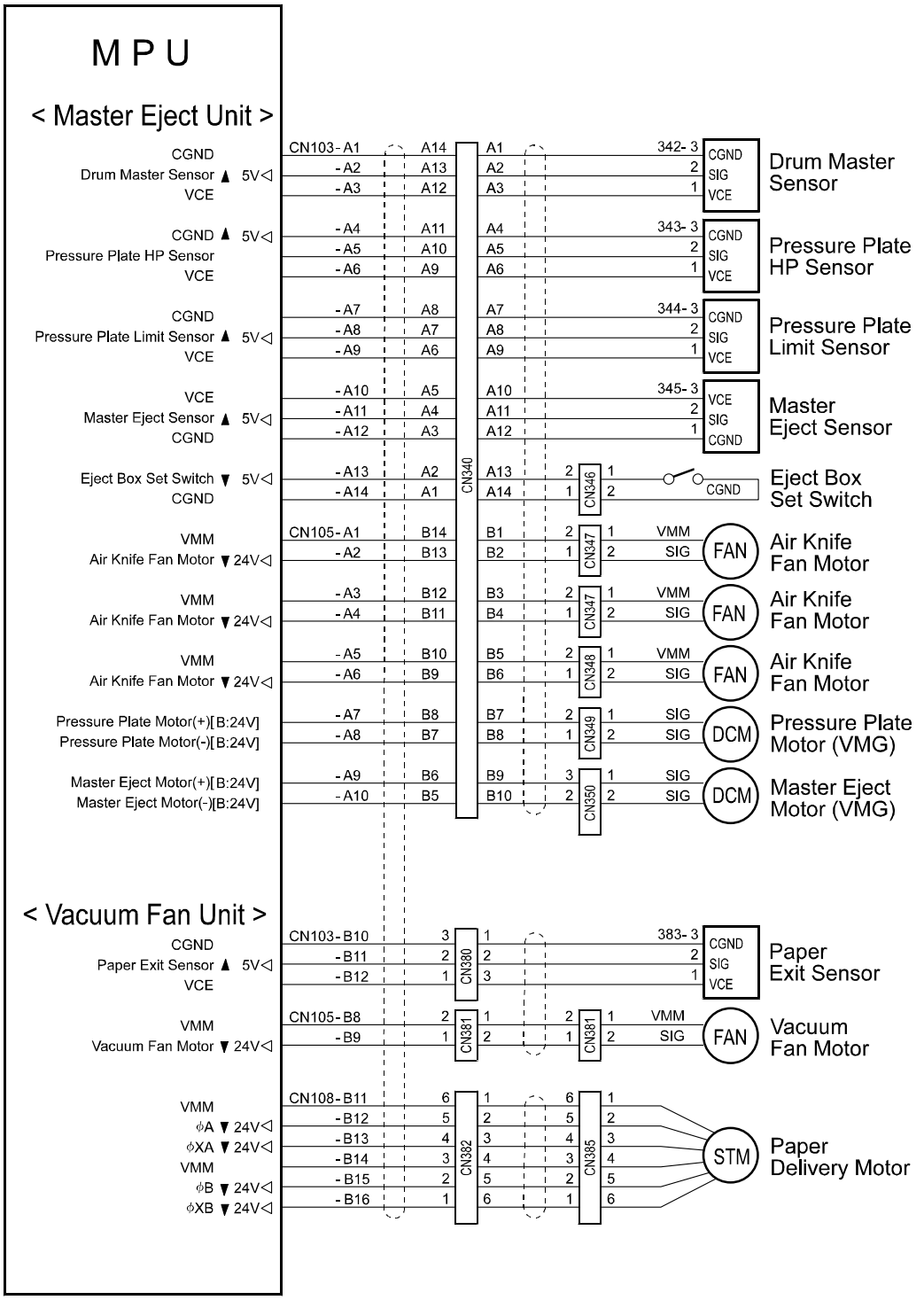


C249S501.WMF

P to P

Section B

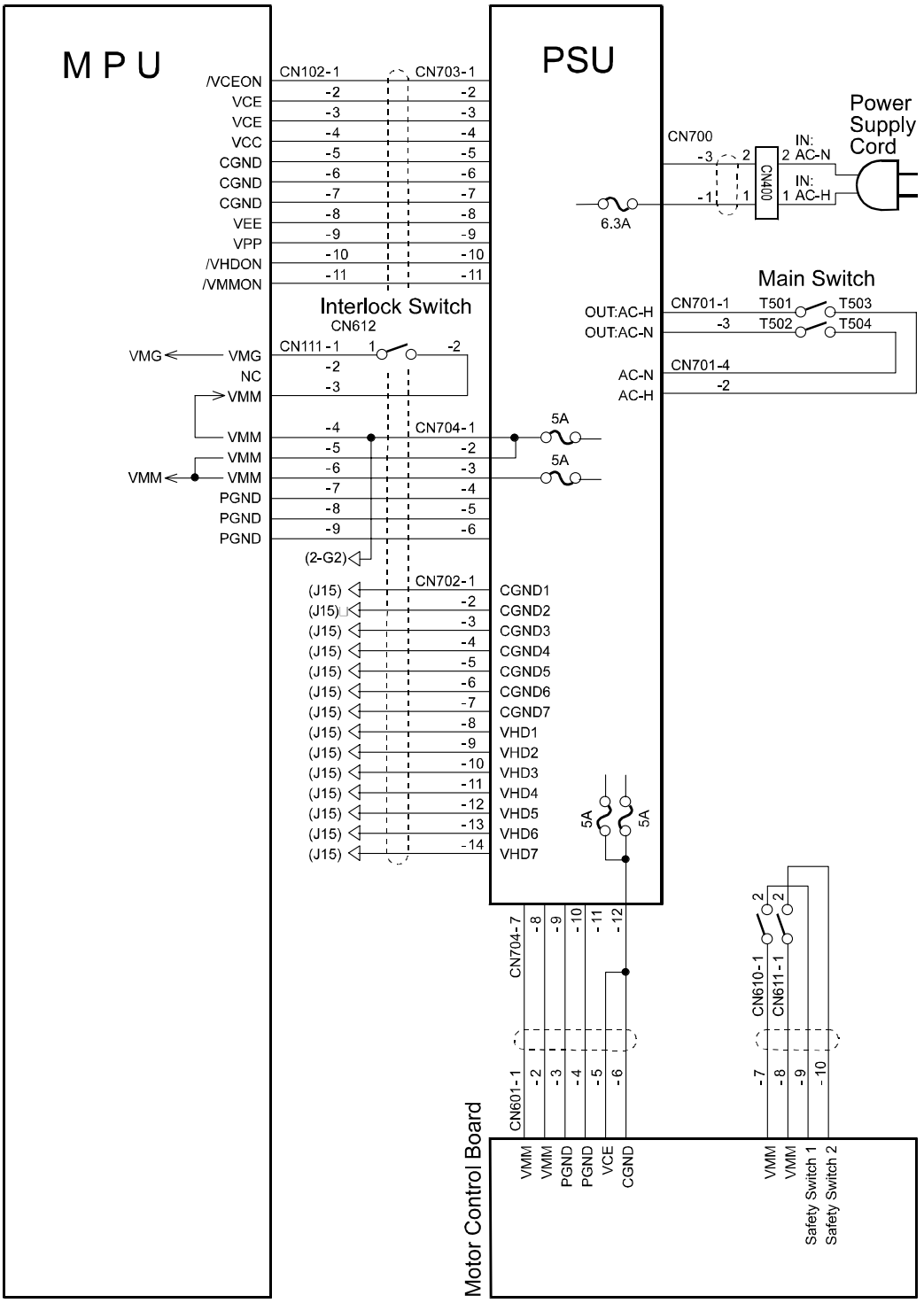
Section B



C249S502.WMF

Section C

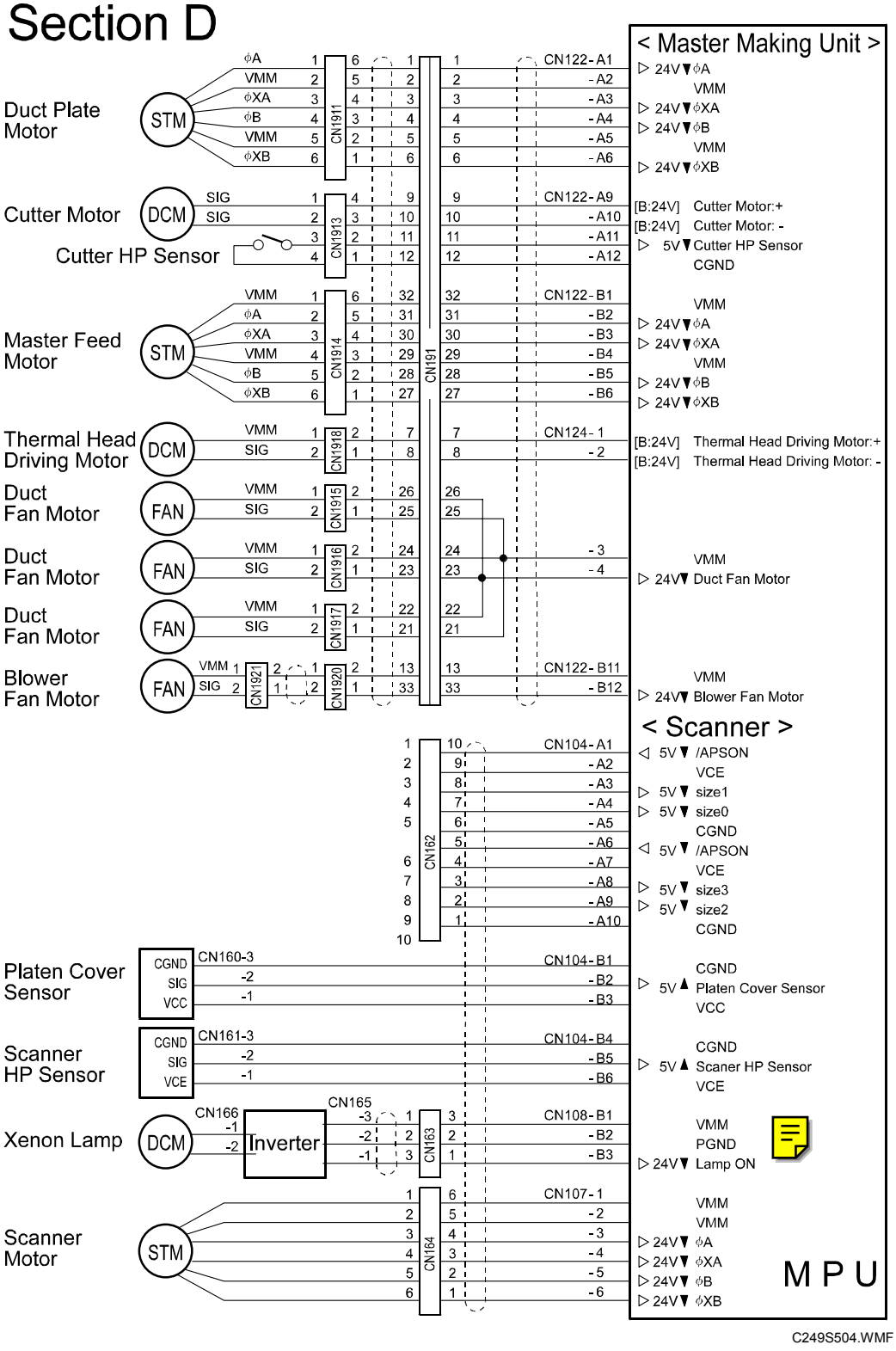
Section C



C249S503.WMF

P to P

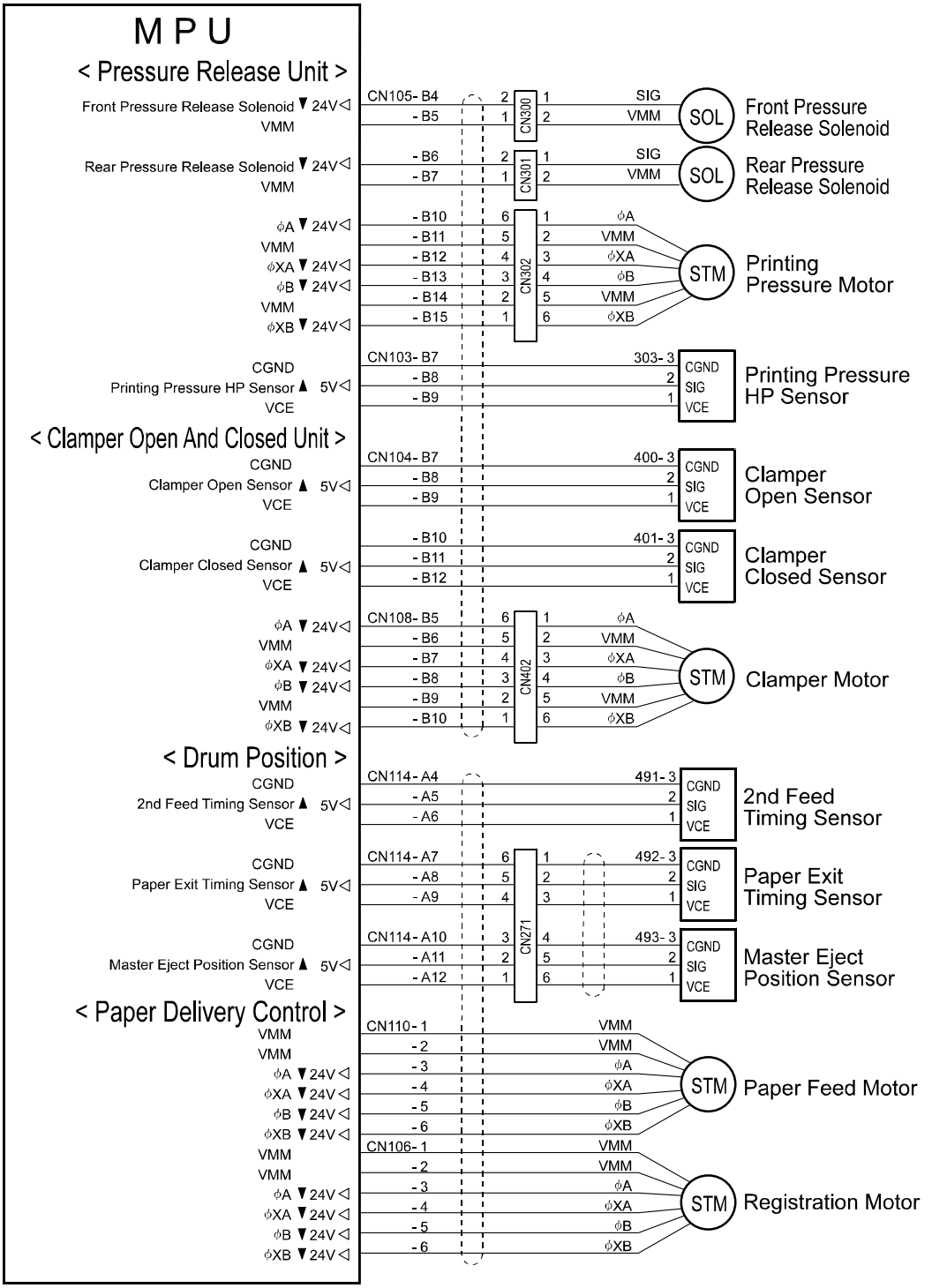
Section D



C249S504.WMF

Section E

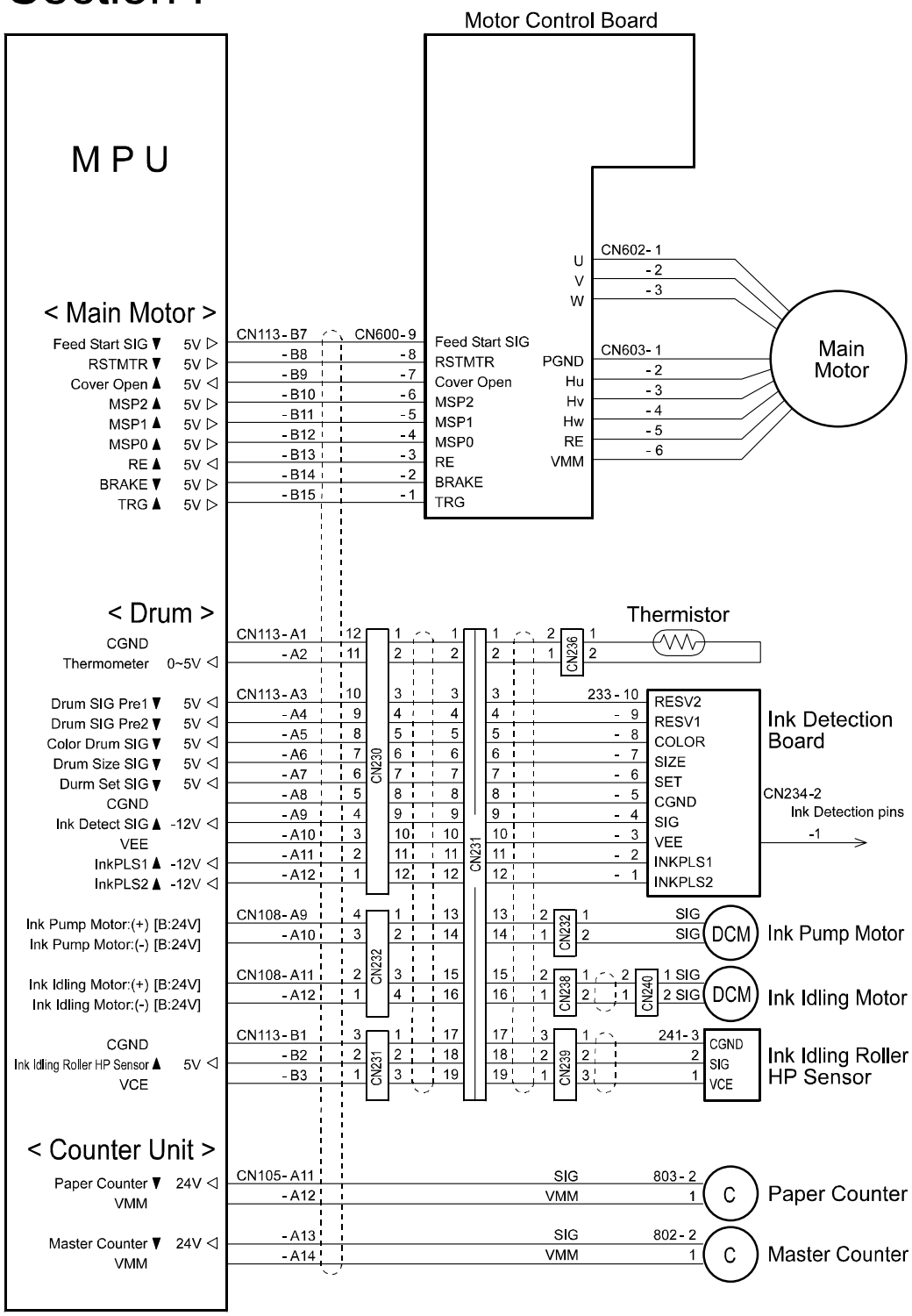
Section E



C249S505.WMF

P to P

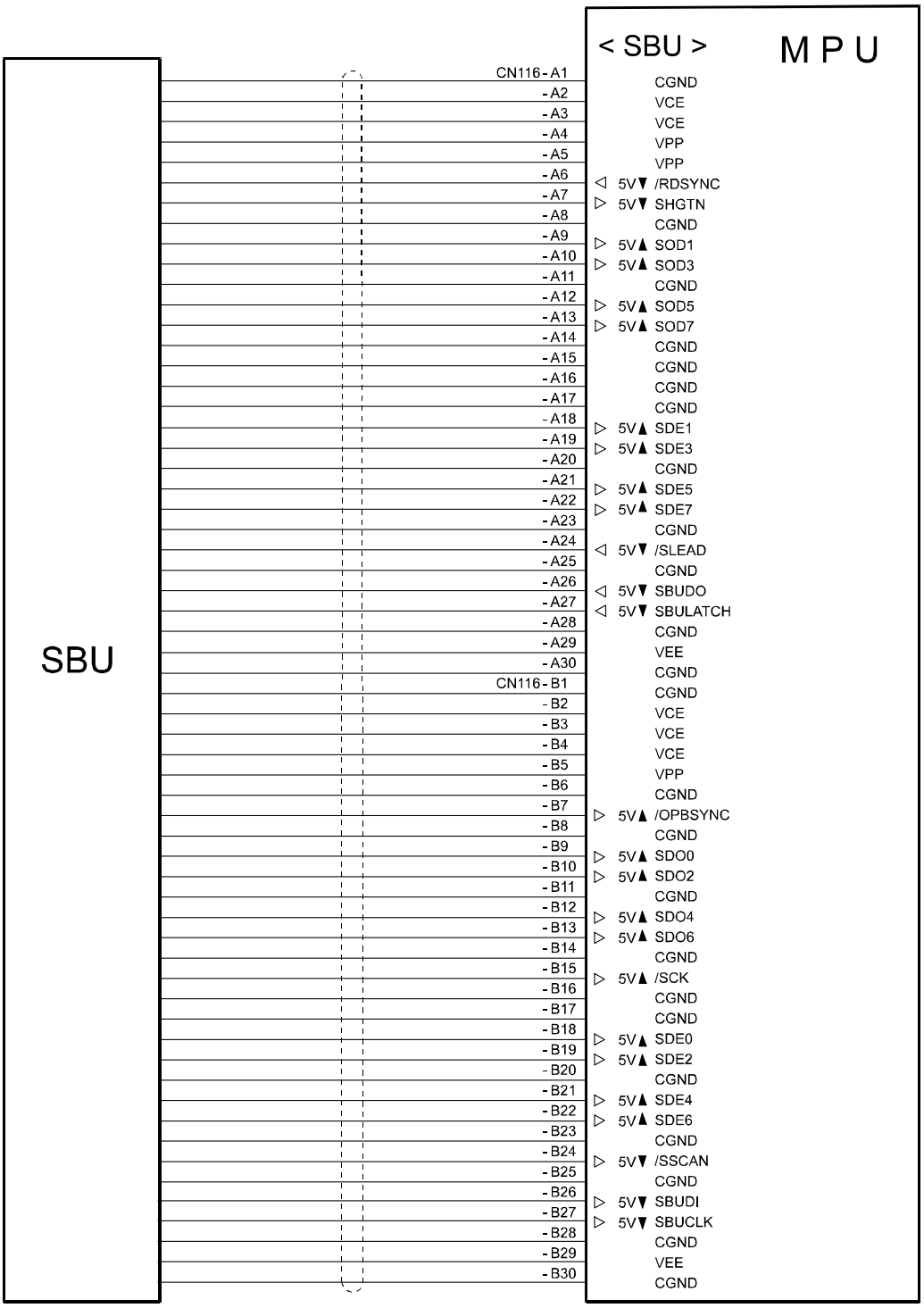
Section F



C249S506.WMF

Section G

Section G

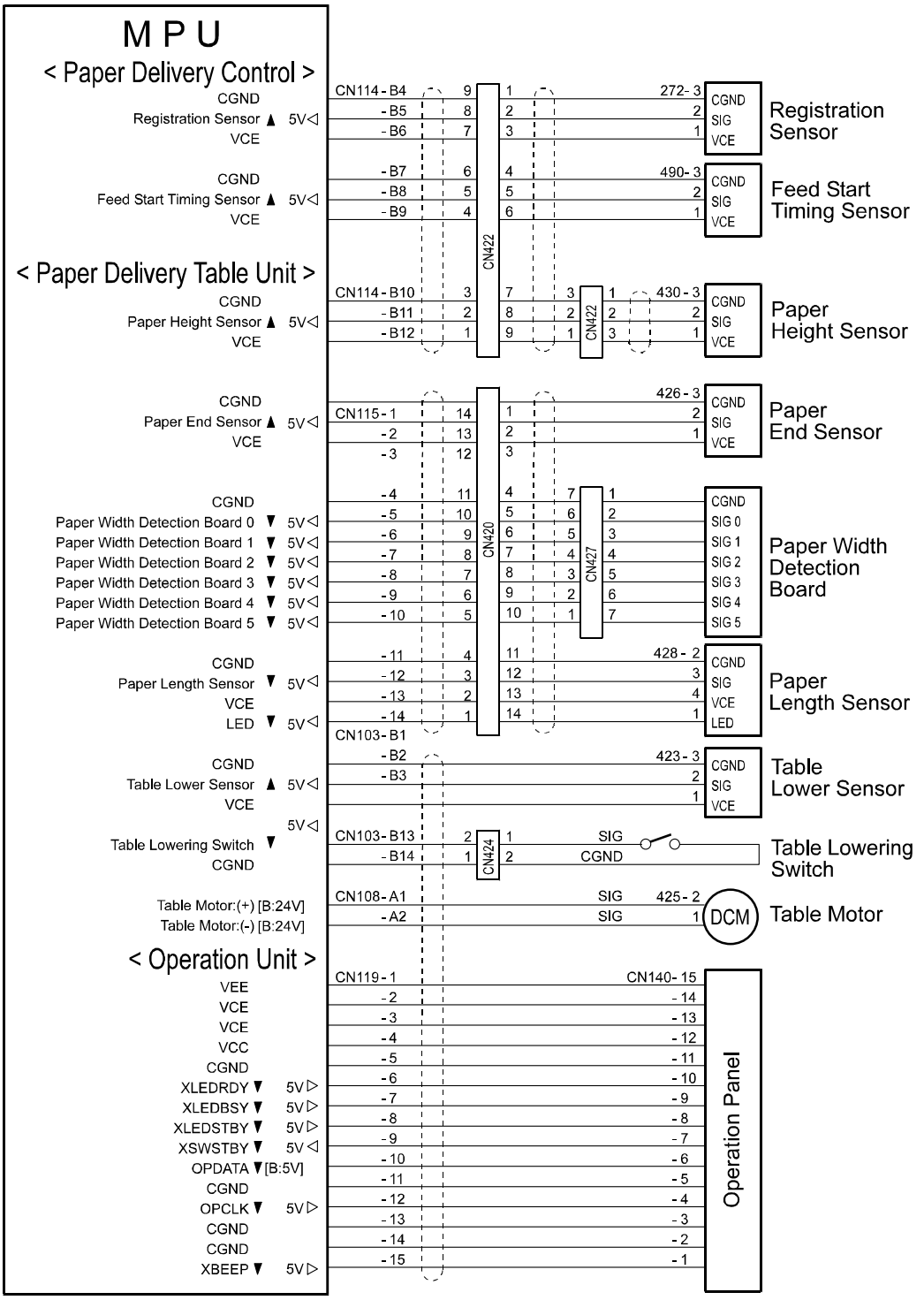


C249S507.WMF249S507.WMF

P to P

Section H

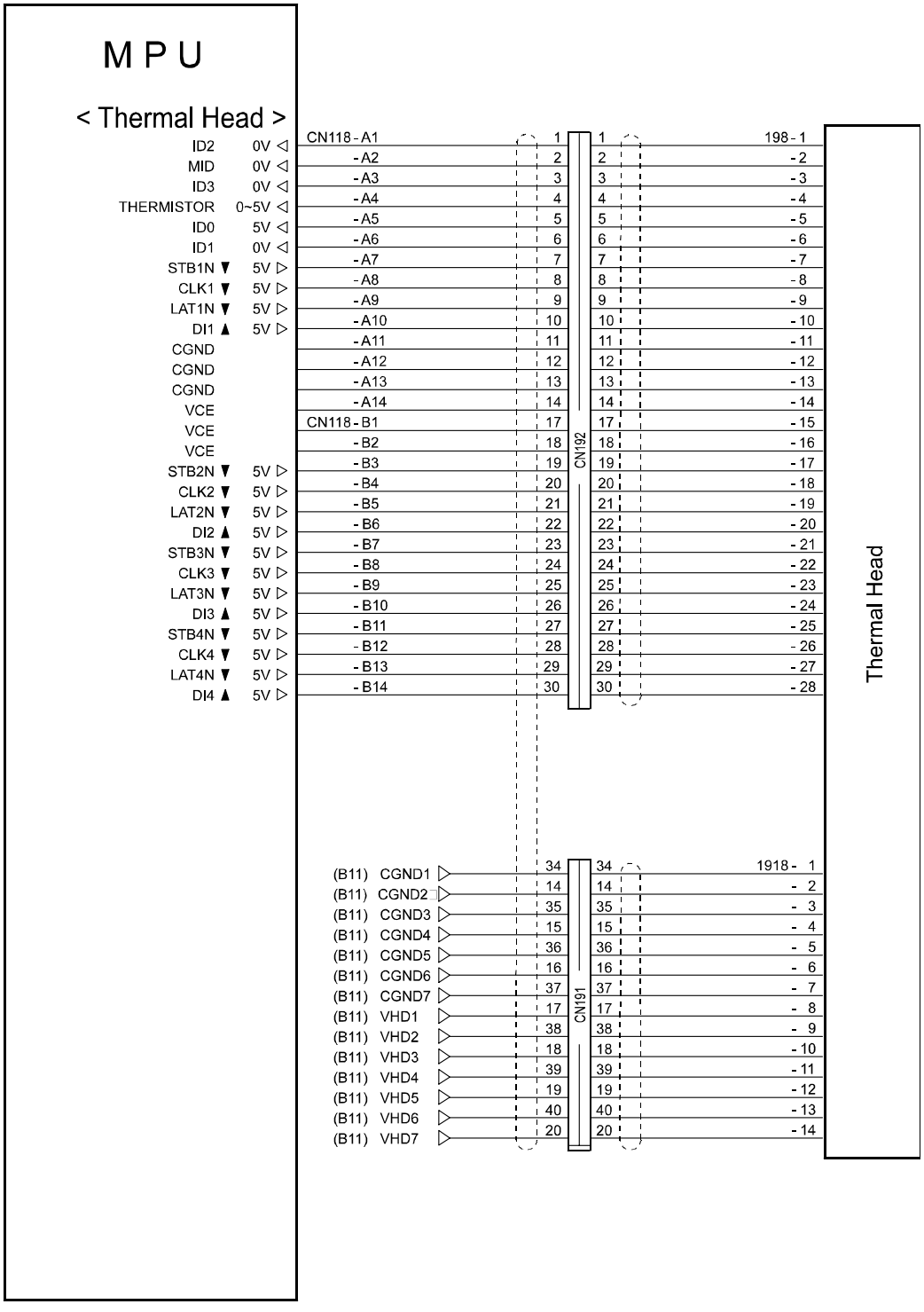
Section H



C249S508.WMF

Section I

Section I

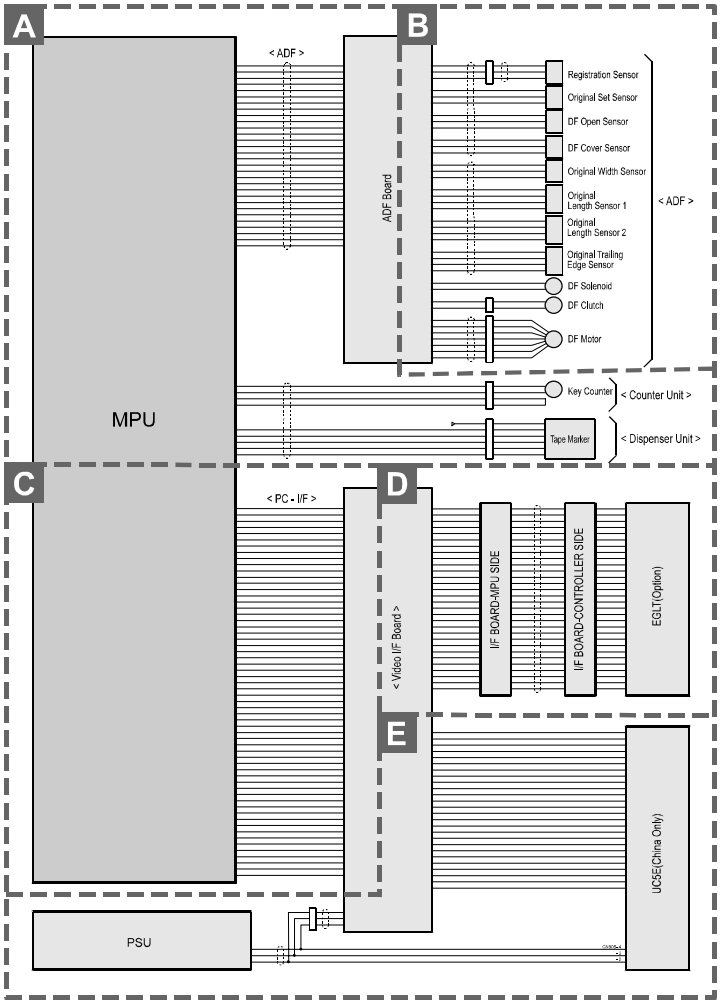


C249S509.WMF

P to P

Location Map Option

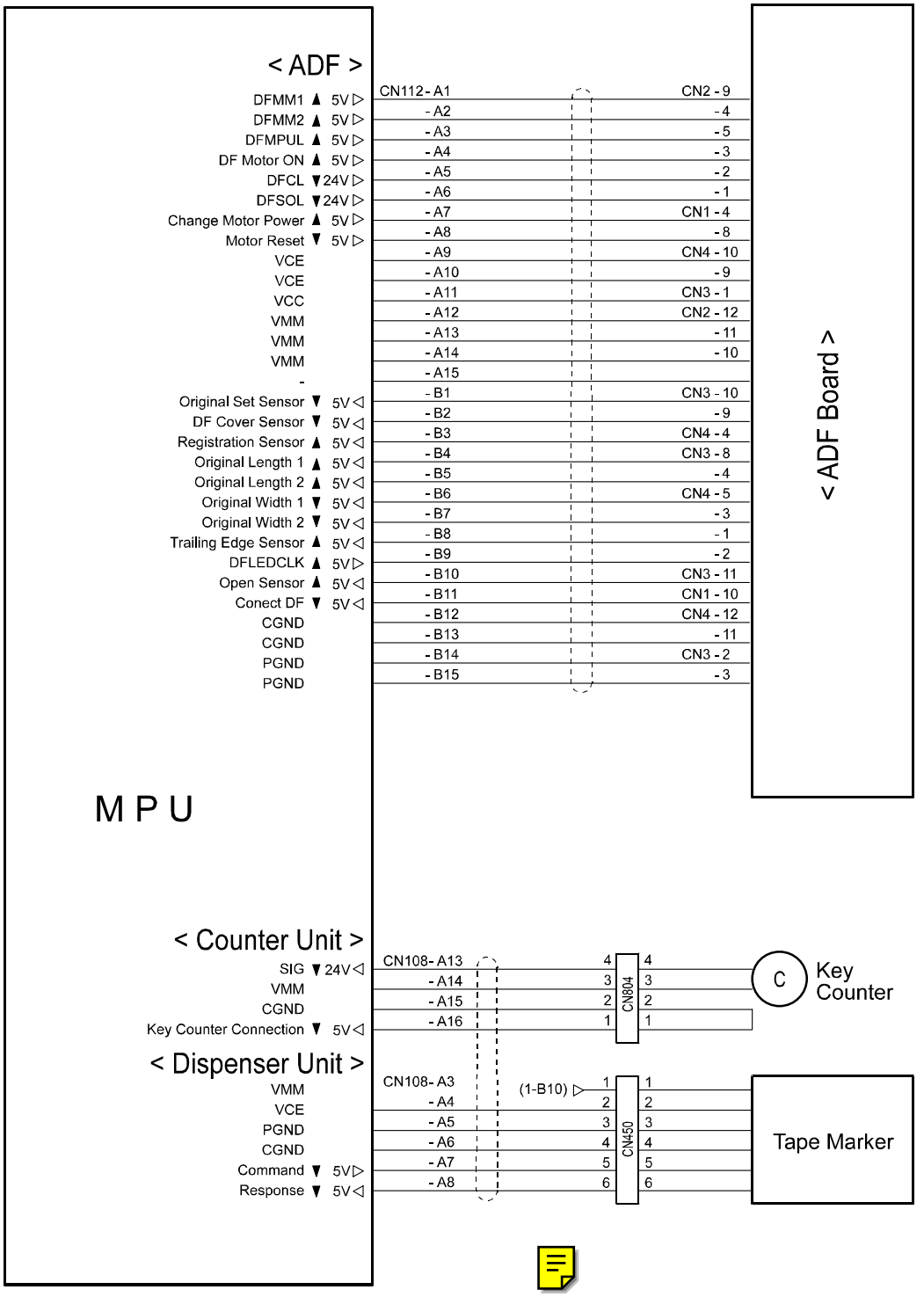
Location Map Option



C249S510.WMF

Section A Option

Section A

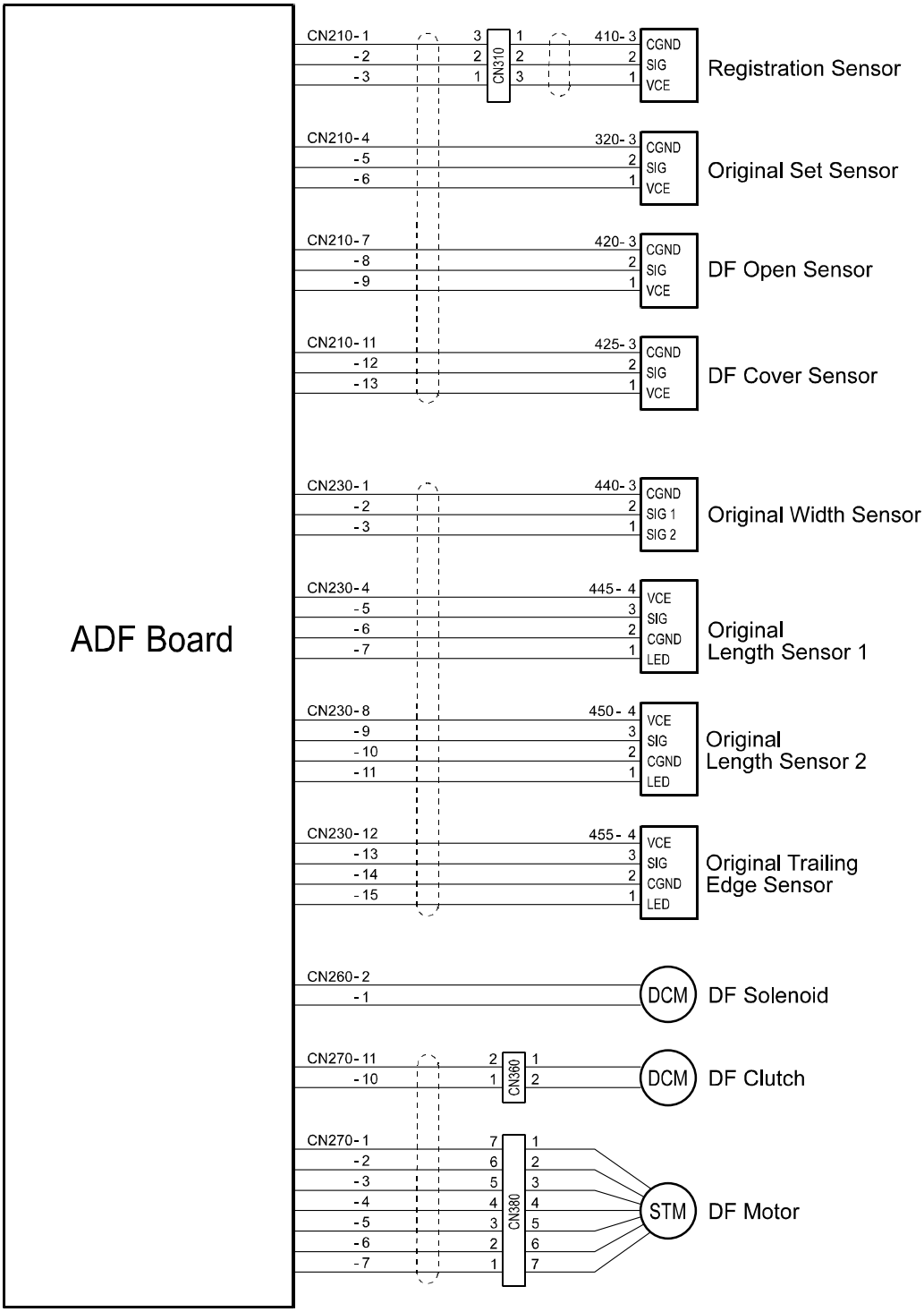


C249S511.WMF

P to P

Section B Option

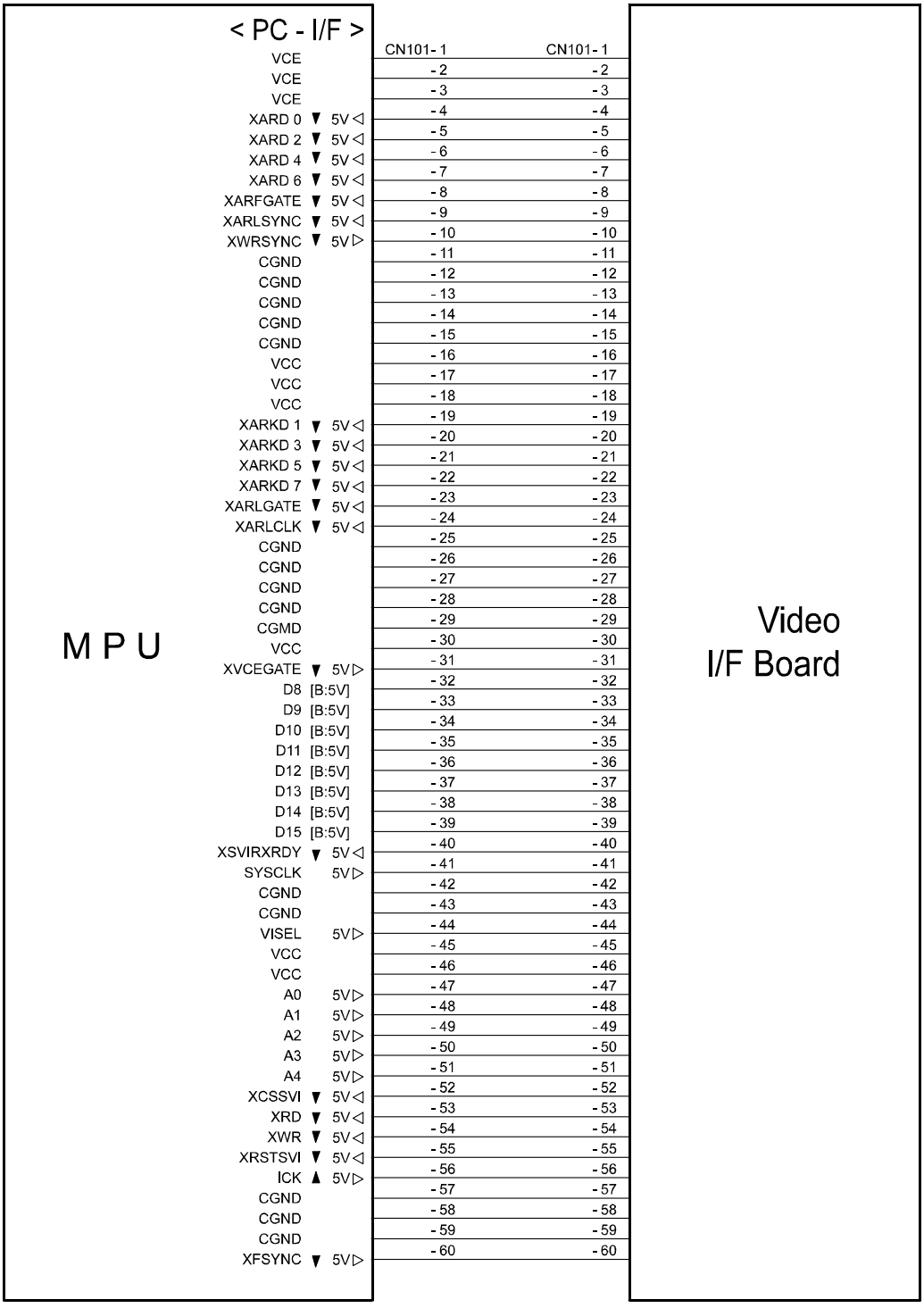
Section B



C249S512.WMF

Section C Option

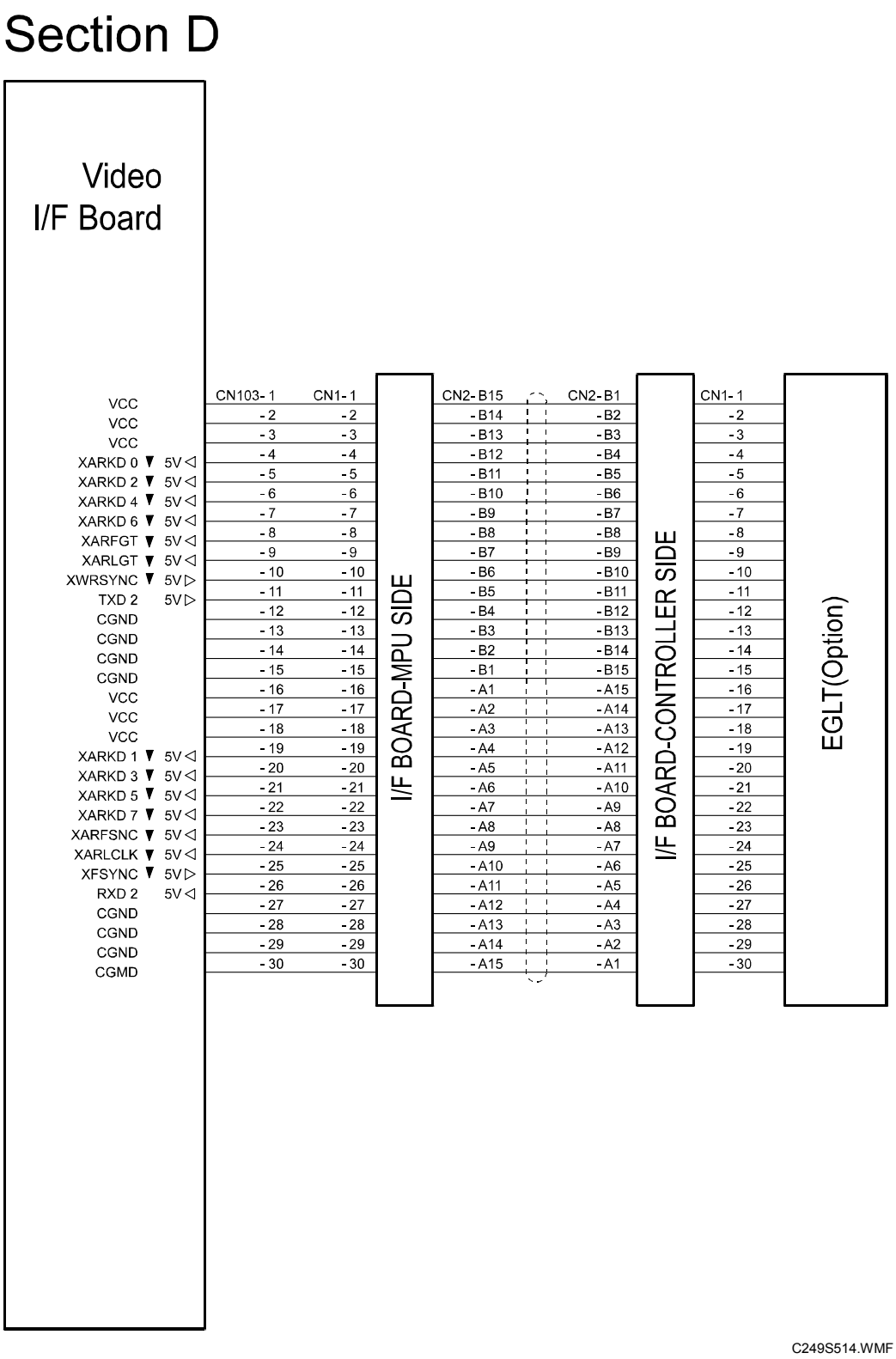
Section C



C249S513.WMF

P to P

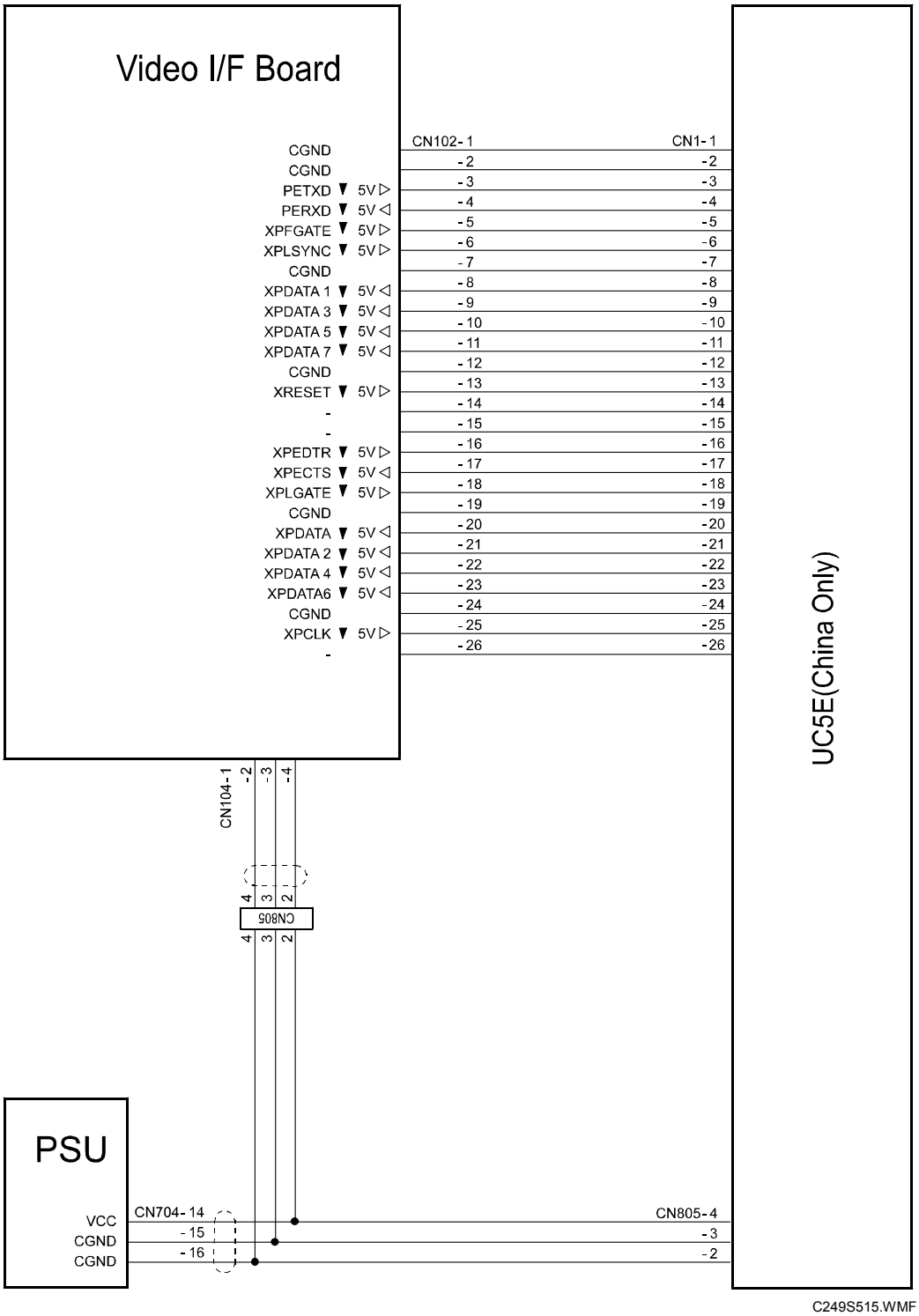
Section D Option



C249S514.WMF

Section E Option

Section E



C249S515.WMF

P to P

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Configuration:	Stand Alone
Master Process:	Digital with 400 dpi thermal head
Scanning (Pixel Density):	400 dpi
Originals:	Sheet/Book
Printing process:	Fully automatic one-drum stencil system
Original Size:	Maximum 304.8 x 432 mm / 12.0" x 17.0"
Copy Paper Size:	Maximum 297 x 432 mm / 11.6" x 17.0" Minimum 70 x 148 mm / 2.8" x 5.9"
Copy Paper Weight:	47.1 – 209.3 g/m^2, 12.5 – 55.6 lb.
Printing Area:	A3 drum 290 x 410 mm / 11.4" x 16.1" A4 black drum 200 x 290 mm / 7.8" x 11.4"
Printing Speed:	60, 75, 90, 105, 120 sheets/minute (5 steps)
Master Eject Box Capacity:	65 masters (Normal conditions)
Reproduction Ratios:	3 enlargements and 4 reductions

	A3 version	DLT version
Enlargement	141% 122% 115%	155% 129% 121%
Full Size	100%	100%
Reduction	93% 87% 82% 71%	93% 77% 74% 65%

Zoom:	50% to 200%, in 1% steps
Power Source:	America 120 V, 60 Hz Europe, Asia 220 – 240 V, 50/60 Hz

Spec.

Power Consumption:

	Mainframe + PC Controller		
	NA	**EU, AA (Except for Chinese Version)**	**CHN**
Copying 60 rpm	Not above 235 W	Not above 230 W	Not above 230 W
Copying 90 rpm	Not above 250 W	Not above 240 W	Not above 240 W
Copying 120 rpm	Not above 280 W	Not above 260 W	Not above 260 W
Master making	Not above 270 W	Not above 255 W	Not above 255 W
Standby (Energy saver mode)	Not above 10 W	Not above 14 W	Not above 12 W

Noise Emission

	Sound Power Level	**Operating Position Sound Power Level**
Standby:	Not above 43 dB(A)	Not above 27 dB(A)
Copying 60 rpm:	Not above 75 dB(A)	Not above 60 dB(A)
Copying 90 rpm:	Not above 78 dB(A)	Not above 63 dB(A)
Copying 120 rpm:	Not above 80 dB(A)	Not above 66 dB(A)

NOTE: The above measurements were made in accordance with ISO 7779 standard.

Dimensions (W x D x H)
Tables closed: 790 x 700 x 640 mm (31.1" x 27.6" x 25.2")
Tables opened: 1360 x 700 x 640 mm (53.6" x 27.6" x 25.2")

NOTE: Measurement Conditions
1) Without the ADF
2) Without the table

Weight: America, Europe, Asia (Except for Chinese Version)
85 kg (187.4 lb)
China
87 kg (191.8 lb)
(Excluding ADF, platen cover, ink, and master)

Master Process Time:	Less than 24 seconds (A4 copying) Less than 29 seconds (A3 copying) **NOTE:** Measurement Conditions 1) 100%size
Paper Table Capacity:	1,000 sheets (80 g/m^2, 20 lb)
Paper Delivery Table Capacity:	1,000 sheets (80 g/m^2, 20 lb)
Leading Edge Margin:	5 ± 3 mm
Trailing Edge Margin:	2 mm
Side Registration Adjustable Range:	± 10 mm
Vertical Registration Adjustable Range:	± 15 mm
Master Type:	Thermal master roll type: 320 mm width, 110 m/roll Yield: 200 masters/roll (A3 Drum) 270 masters/roll (A4 Drum) Maximum run length per master: 4,000 prints
Master Storage Conditions:	Temperature: 0 °C to 40 °C Humidity: 10% to 95% RH Recommended maximum storage period: One year after production date Note: Avoid locations exposed to direct sunlight.
Ink Type:	600 ml cartridge type Available colors: Black, Red, Blue, Green, Brown, Purple, Yellow, Navy, Maroon, Orange, Teal, and Gray

Ink Storage Conditions:

Temperature:
-5 °C to 40 °C
(Optimal conditions: 15 °C to 25 °C)

Humidity:
10% to 95% RH
(Optimal conditions: 20% to 70% RH)

Recommended maximum storage period:
18 months after production date

Note: Avoid locations exposed to direct sunlight.

Optional Equipment:

- Platen cover
- Automatic document feeder
- Color drum
- A4 black drum
- Tape marker (dispenser)
- Key Counter
- PC Controller (EarlGray-Lt)

Note: China model is equipped a standard PC Controller (UC5).