Model EM-D2
Machine Code: C280

Field Service Manual

18 March 2013

Important Safety Notices

Responsibilities of the Customer Engineer

Customer Engineer

Maintenance shall be done only by trained customer engineers who have completed service training for the machine and all optional devices designed for use with the machine.

Reference Material for Maintenance

- Maintenance shall be done using the special tools and procedures prescribed for maintenance of the machine described in the reference materials (service manuals, technical bulletins, operating instructions, and safety guidelines for customer engineers).
- In regard to other safety issues not described in this document, all customer engineers shall strictly obey procedures and recommendations described the "CE Safety Guide".
- Use only consumable supplies and replacement parts designed for use of the machine.

Before Installation, Maintenance

Shipping and Moving the Machine

⚠CAUTION

- Work carefully when lifting or moving the machine. If the machine is heavy, two or more customer engineers may be required to prevent injuries (muscle strains, spinal injuries, etc.) or damage to the machine if it is dropped or tipped over.
- Personnel moving or working around the machine should always wear proper clothing and footwear. Never wear loose fitting clothing or accessories (neckties, loose sweaters, bracelets, etc.) or casual footwear (slippers, sandals, etc.) when lifting or moving the machine.
- Always unplug the power cord from the power source before you move the product. Before you move the product, arrange the power cord so it will not fall under the product.

Power

⚠WARNING

- Always disconnect the power plug before doing any maintenance procedure. After switching off the machine, power is still supplied to the main machine and other devices. To prevent electrical

shock, switch the machine off, wait for a few seconds, then unplug the machine from the power source.

- Before you do any checks or adjustments after turning the machine off, work carefully to avoid injury. After removing covers or opening the machine to do checks or adjustments, never touch electrical components or moving parts (gears, timing belts, etc.).
- After turning the machine on with any cover removed, keep your hands away from electrical components and moving parts. Never touch the cover of the fusing unit, gears, timing belts, etc.

Installation, Disassembly and Adjustments

⚠CAUTION

- After installation, maintenance, or adjustment, always check the operation of the machine to make sure that it is operating normally. This ensures that all shipping materials, protective materials, wires and tags, metal brackets, etc., removed for installation, have been removed and that no tools remain inside the machine. This also ensures that all release interlock switches have been restored to normal operation.
- Never use your fingers to check moving parts causing spurious noise. Never use your fingers to lubricate moving parts while the machine is operating.

Special Tools

⚠CAUTION

- Use only standard tools approved for machine maintenance.
- For special adjustments, use only the special tools and lubricants described in the service manual. Using tools incorrectly, or using tools that could damage parts, could damage the machine or cause injuries.

During Maintenance

General

⚠CAUTION

- Before you begin a maintenance procedure: 1) Switch the machine off, 2) Disconnect the power plug from the power source.

Safety Devices

⚠WARNING

- Never remove any safety device unless it requires replacement. Always replace safety devices immediately.
- Never do any procedure that defeats the function of any safety device. Modification or removal of a safety device (fuse, switch, etc.) could lead to a fire and personal injury. Always test the operation of the machine to ensure that it is operating normally and safely after removal and replacement of any safety device.
- For replacements use only the correct fuses or circuit breakers rated for use with the machine. Using replacement devices not designed for use with the machine could lead to a fire and personal injuries.

Organic Cleaners

⚠CAUTION

- During preventive maintenance, never use any organic cleaners (alcohol, etc.) other than those described in the service manual.
- Make sure the room is well ventilated before using any organic cleaner. Use organic solvents in small amounts to avoid breathing the fumes and becoming nauseous.
- Switch the machine off, unplug it, and allow it to cool before doing preventive maintenance. To avoid fire or explosion, never use an organic cleaner near any part that generates heat.
- Wash your hands thoroughly after cleaning parts with an organic cleaner to contamination of food, drinks, etc. which could cause illness.
- Clean the floor completely after accidental spillage of silicone oil or other materials to prevent slippery surfaces that could cause accidents leading to hand or leg injuries. Use dry rags to soak up spills.

Power Plug and Power Cord

⚠WARNING

- Before serving the machine (especially when responding to a service call), always make sure that the power plug has been inserted completely into the power source. A partially inserted plug could lead to heat generation (due to a power surge caused by high resistance) and cause a fire or other problems.
- Always check the power plug and make sure that it is free of dust and lint. Clean it if necessary. A dirty plug can generate heat which could cause a fire.

- Inspect the length of the power cord for cuts or other damage. Replace the power cord if necessary. A frayed or otherwise damaged power cord can cause a short circuit which could lead to a fire or personal injury from electrical shock.
- Check the length of the power cord between the machine and power supply. Make sure the power cord is not coiled or wrapped around any object such as a table leg. Coiling the power cord can cause excessive heat to build up and could cause a fire.
- Make sure that the area around the power source is free of obstacles so the power cord can be removed quickly in case of an emergency.
- Make sure that the power cord is grounded (earthed) at the power source with the ground wire on the plug.
- Connect the power cord directly into the power source. Never use an extension cord.
- When you disconnect the power plug from the power source, always pull on the plug, not the cable.

After Installation, Servicing

Points to Confirm with Operators

At the end of installation or a service call, instruct the user about use of the machine. Emphasize the following points.

- Show operators how to remove jammed paper and troubleshoot other minor problems by following the procedures described in the operating instructions.
- Point out the parts inside the machine that they should never touch or attempt to remove.
- Confirm that operators know how to store and dispose of consumables.
- Make sure that all operators have access to an operating instruction manual for the machine.
- Confirm that operators have read and understand all the safety instructions described in the operating instructions.
- Demonstrate how to turn off the power and disconnect the power plug (by pulling the plug, not the cord) if any of the following events occur: 1) something has spilled into the product, 2) service or repair of the product is necessary, 3) the product cover has been damaged.
- Caution operators about removing paper fasteners around the machine. They should never allow paper clips, staples, or any other small metallic objects to fall into the machine.

Safety Instructions for this Machine

Prevention of Physical Injury

1. Before disassembling or assembling parts of the machine and peripherals, make sure that the machine and peripheral power cords are unplugged.
2. The plug should be near the machine and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. The inside and the metal parts of the fusing unit become extremely hot while the machine is operating. Be careful to avoid touching those components with your bare hands.
5. To prevent a fire or explosion, keep the machine away from flammable liquids, gases, and aerosols.

Health Safety Conditions

1. If you get ink in your eyes by accident, try to remove it with eye drops or flush with water as first aid. If unsuccessful, get medical attention.
2. If you ingest ink by accident, induce vomiting by sticking a finger down your throat or by giving soapy or strong salty water to drink.

Observance of Electrical Safety Standards

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

Safety and Ecological Notes for Disposal

- Dispose of replaced parts in accordance with local regulations.
- Used ink and masters should be disposed of in an environmentally safe manner and in accordance with local regulations.

⚠CAUTION

- The danger of explosion exits if a battery of this type is incorrectly replaced.
- Replace only with the same or an equivalent type recommended by the manufacturer.
- Discard used batteries according to the manufacturer's instructions.

The Aim of Anti-tip Components and Precautions

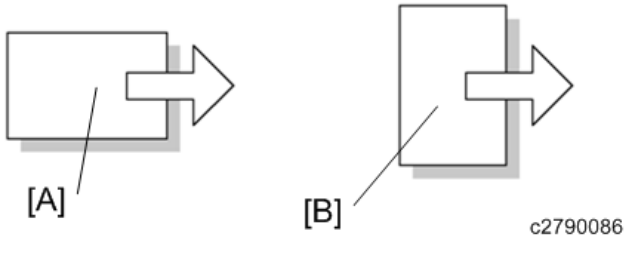
- The anti-tip components are necessary for meeting the requirements of IEC60950-1, the international standard for safety.
- The aim of these components is to prevent the products, which are heavy in weight, from toppling as a result of people running into or leaning on the products, which can lead to serious accidents such as persons becoming trapped under the product. (U.S.: UL60950-1, Europe: EN60950-1)
- Therefore, removal of such components must always be with the consent of the customer. Do not remove them on your own.

Symbols and Trademarks

Symbols

This manual uses several symbols. The meanings of those symbols are as follows:

	Bearing
	Clamp
	Clip ring
	Connector
	E-ring
	Hex screw
	Screw
	See or Refer to
	Spring
	Timing belt



[A]: Short Edge Feed (SEF)

[B]: Long Edge Feed (LEF)

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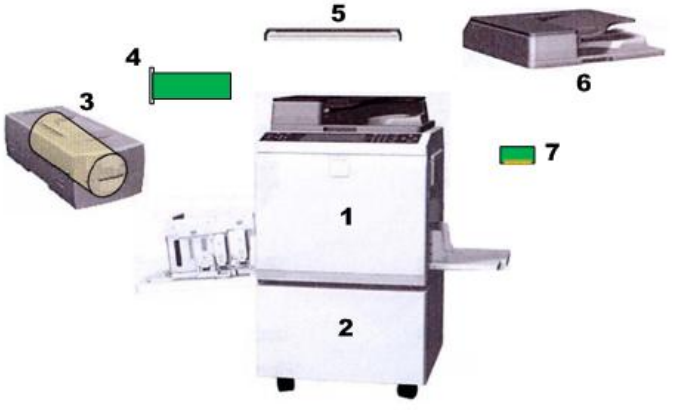
New Features

Configuration



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No.	Item	Comment
1	Main unit	
2	Table	
3	Drums	A4, A3, DLT available
4	Extension HDD	Document storage option
5	Platen cover	Exposure glass cover
6	ADF	Auto Document Feeder
7	PS3 Module	Controller option
	RPCS	Network printer controller built-in

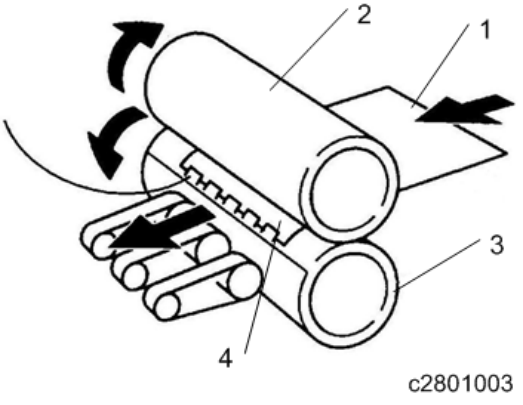
Left, Right Views

c2801002

No.	Item	Comment
1	Paper delivery tray	Holds 1,000 sheets
2	Master eject box	A3 drum: 100 masters DLT drum: 90 masters A4 drum: 140 masters
3	Main frame	New color scheme
4	Emblem	New
5	Operation panel	New
6	ADF	Auto Document Feeder
7	Master tray	
8	Paper feed tray	Holds 1,000 sheets

Improvements

Paper Registration

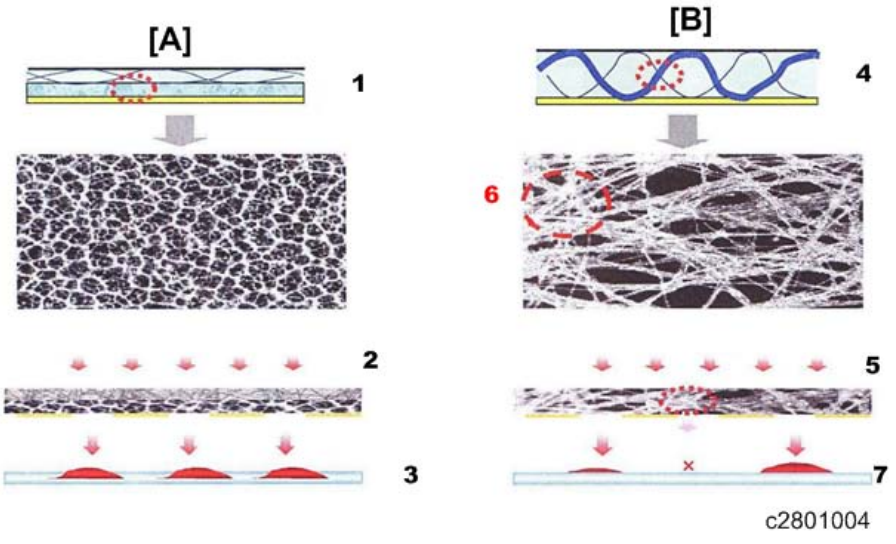


No.	
1	Paper
2	Drum
3	Press cylinder
4	Paper clamper

Better registration leads to more efficient printing.

- The paper clamping system for paper registration has been improved. It allows only up 0.25 mm of slippage.
- This system produces beautiful prints in many colors on a variety of special papers.
- The color separation feature of the optional Postscript module can also deliver near full color images.

High Quality Master Material



No.	Item
[A]	HQ Master
1	Pulp micro-porous film
2	Ink
3	Paper
[B]	Conventional Master
4	Tissue film
5	Ink
6	Fiber tangle
7	Paper

High quality masters (pulp micro-porous film) eliminate poor print quality caused by fiber tangle that can occur with conventional masters (tissue film).

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1. 1. Product Information

Guidance for Those Familiar with Predecessor Machines

Unit Names

Common Name	Product Name	NA	EU/AA
Main Unit	Ricoh DD6650P NRG DD6650P Gestetner DD6650P Savin DD6650P*1 Lanier DD6650P*1 Standard SD710	C280-17	C280-27
ADF	ADF DF7000	D578-51	
Platen Cover	Platen Cover Type 3352	D593-01	
DLT Drum	Drum Type 90 (11"x17")	C630-19	---
A4 Drum	Drum Type 90 (A4)	---	C631-59
A3 Drum	Drum Type 90 (A3)	---	C630-80
PS3 Module	PostScript 3 Board Type 2	C640-59	
Extension HDD	Extension HDD Type 1	C634-57	

*1 Brand Plaque in NA – C280-33, C280-34

This machine is identical to the C262 series with these exceptions:

- The ADF (or platen cover) of the PD-D1 are available for use with this machine.
- This machine does not support the IEEE 802.11b Wireless LAN option.

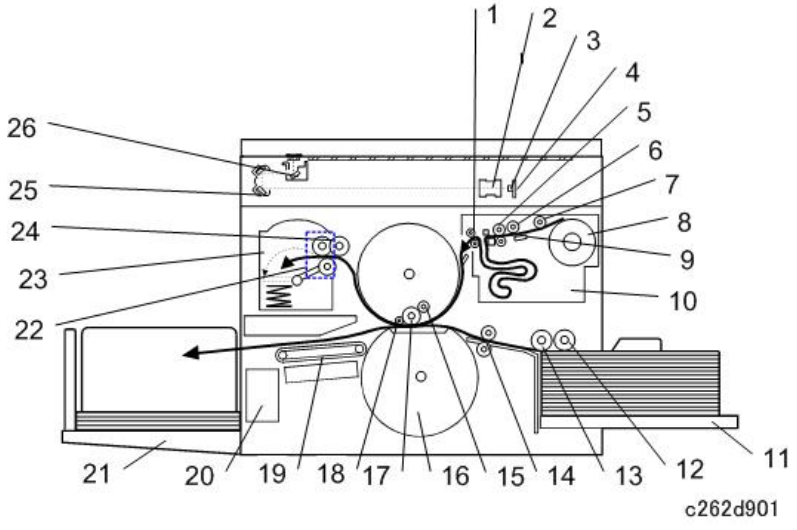
Specifications

See “Appendices” for the following information:

- Main Unit
- Supported Paper Sizes
- Software Accessories
- Optional Equipment

Overview

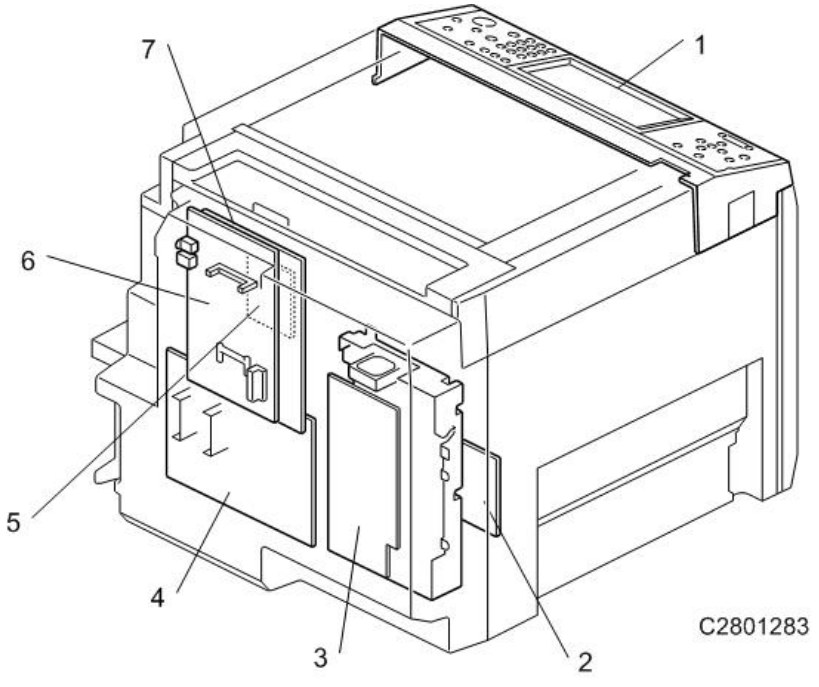
Major Parts



1	Master Feed Control Roller	14	Registration Rollers
2	Lens	15	Doctor Roller
3	CCD	16	Pressure Cylinder
4	SBU	17	Ink Roller
5	Tension Roller	18	Idling Roller
6	Platen Roller	19	Transport Belts
7	Master Set Roller	20	Job Separator Unit
8	Master Roll	21	Paper Delivery Table
9	Thermal Head	22	Master Eject Rollers
10	Master Buffer Duct	23	Master Eject Box
11	Paper Table	24	Master Pick-up Roller
12	Paper Pick-up Roller	25	2nd Scanner
13	Paper Feed Roller	26	1st Scanner

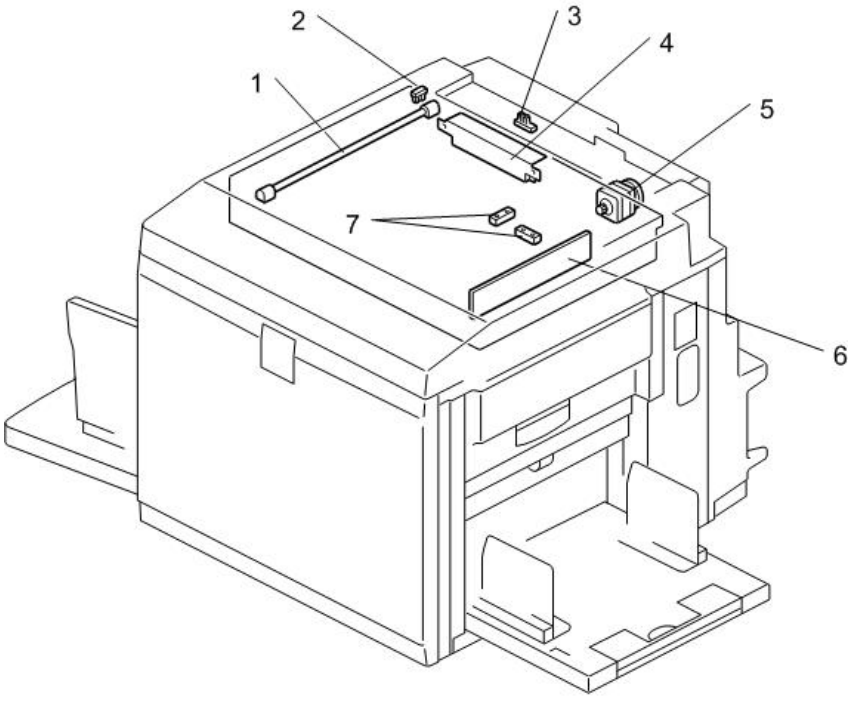
Electrical Component Layout

Printed circuit board layout



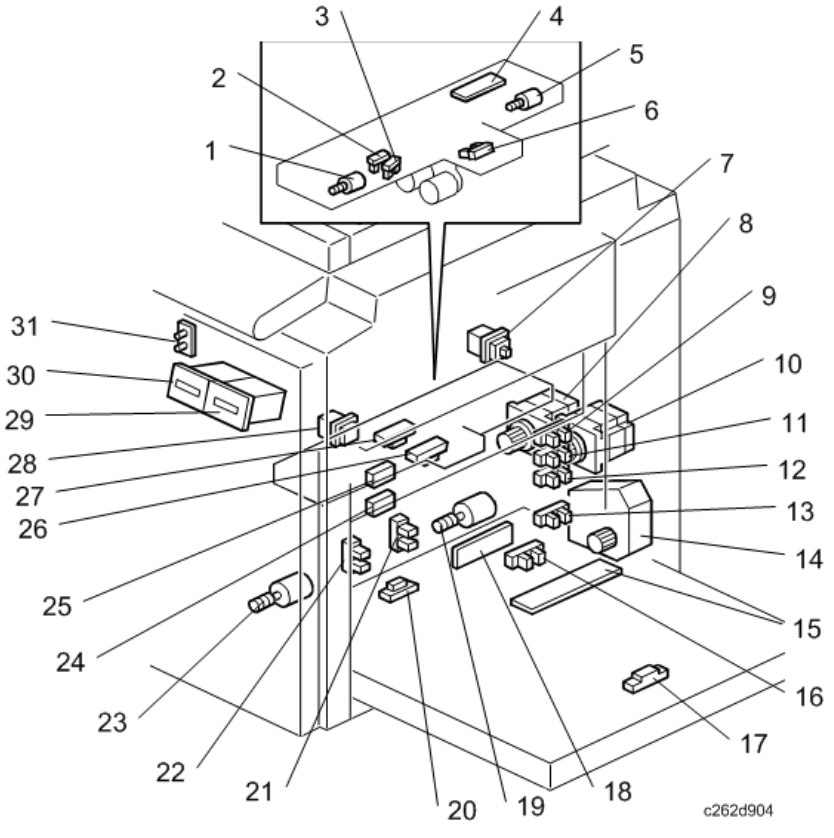
No.	Name	Function
1	Operation Panel Board	Controls the operation panel.
2	Main Motor Control Board	Controls the main motor speed.
3	Power Supply Unit (PSU)	Provides DC power to the machine.
4	I/O Board	Controls the mechanical components.
5	Double Feed Detection Board	Detects double feeds
6	Application Control Unit (ACU)	This is the main control board for the machine.
7	Engine Control Unit (ECU)	Controls the engine functions, both directly and through other boards.

Scanner Section



No.	Name	Function
1	Exposure Lamp (Xenon Lamp)	Applies lights to the original for exposure.
2	Scanner HP Sensor	Detects when the scanner is at home position.
3	Platen Cover Sensor	Detects if the platen cover is open or closed.
4	Lamp Stabilizer	This supplies power to the exposure lamp.
5	Scanner Drive Motor	Drives the scanner.
6	CCD and SBU	Makes a video signal from the scanned original.
7	Original Length Sensor 1, 2	Detect the length of the original on the exposure glass.

Paper Feed Section

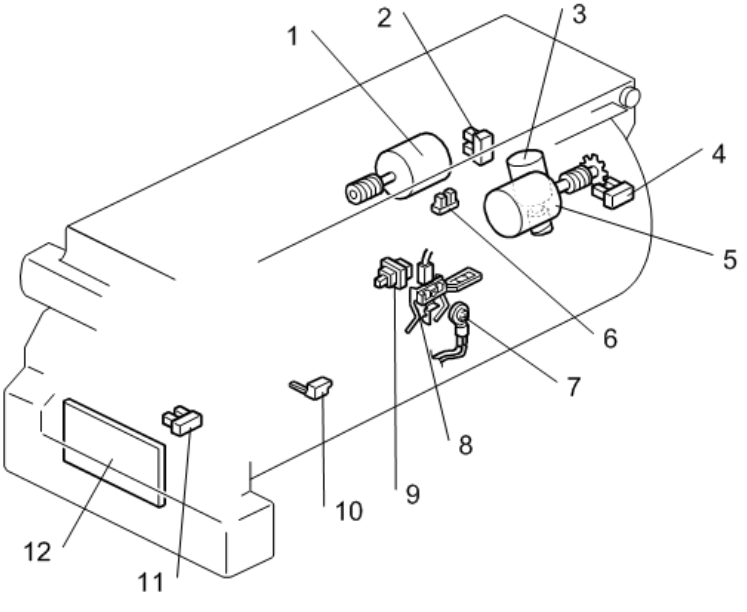


No.	Name	Function
1	Registration Pressure Motor	Releases the pressure between the registration rollers, to allow jammed paper to be removed easily.
2	Registration Roller Press Sensor	Detects when the registration roller is in the correct position for paper feed.
3	Registration Roller Release Sensor	Detects when the registration roller is in the correct position for jam removal.
4	Feed Pressure Detection Board	Sends data about the paper feed pressure to the CPU.
5	Feed Pressure Motor	Drives the paper feed pressure adjustment mechanism.
6	Paper Height Sensor	Detects if the top of the paper stack on the paper table is at the paper feed height.

No.	Name	Function
7	Master Making Unit Set Switch	Checks if the master making unit is set.
8	Registration Motor	Feeds the paper to align it with the image on the master on the drum.
9	Remaining Paper Sensor 1	Detects the amount of paper remaining on the paper table.
10	Paper Feed Motor	Feeds the paper from the paper table.
11	Remaining Paper Sensor 2	Detects the amount of paper remaining on the paper table.
12	Remaining Paper Sensor 3	Detects the amount of paper remaining on the paper table.
13	Paper Table Lower Limit Sensor	Detects when the paper table is at its lower limit position.
14	Paper Table Motor	Raises and lowers the paper table.
15	Paper Width Detection Board	Sends data about the paper width on the paper table to the CPU.
16	Paper Table Set Sensor	Detects if the paper table is closed.
17	Paper Length Sensor	Detects when long paper is on the paper table.
18	Separation Pressure Detection Board	Sends data about the paper separation pressure to the CPU.
19	Separation Pressure Motor	Drives the paper separation pressure adjustment mechanism.
20	Paper End Sensor	Detects when the paper table runs out of paper.
21	Friction Pad Position Sensor 1	Checks the position of the friction pad (used for paper separation).
22	Friction Pad Position Sensor 2	Checks the position of the friction pad (used for paper separation).
23	Friction Pad Shift Motor	Switches between the normal pad and custom pad (these pads are used for paper separation).
24	Double Feed Sensor - Receiver	Detects paper double-feeds.

No.	Name	Function
25	Double Feed Sensor - Emitter	Detects paper double-feeds.
26	Paper Registration Sensor	Detects paper approaching the registration roller.
27	Paper Feed Timing Sensor	Detects paper approaching the paper clamper in the pressure cylinder.
28	Paper Table Lowering Switch	Lowers the paper table.
29	Print Counters	Keeps track of the total number of copies.
30	Master Counters	Keeps track of the total number of masters made.
31	Drum Home Position Indicator (LEDs)	LEDs that indicates the drum position.

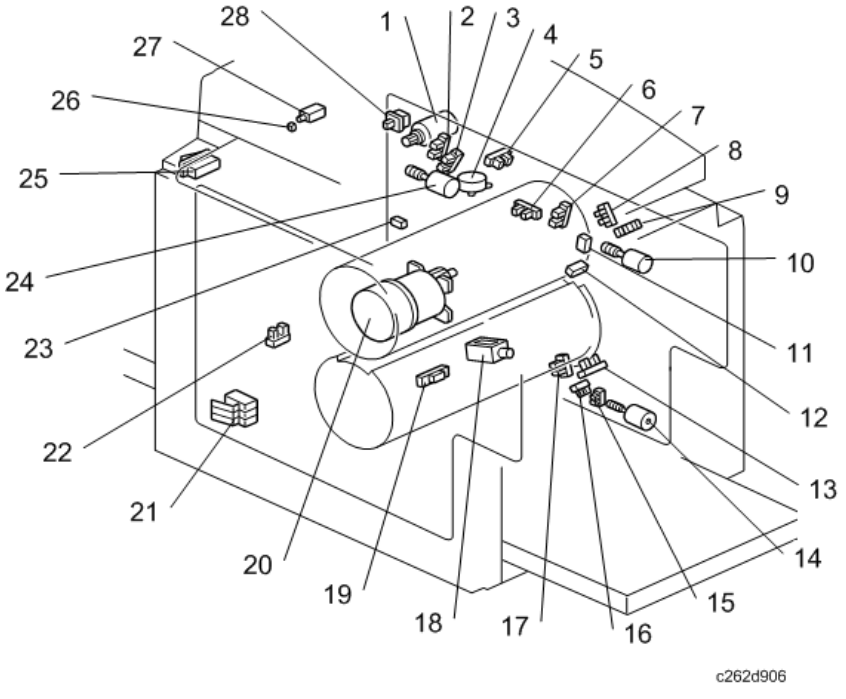
Drum Unit



No.	Name	Function
1	Ink Pump Motor	Drives the ink pump to supply ink.
2	Drum Shift HP Sensor	Detects when the drum screen is at the home position (the side-to-side image shift is 0).

No.	Name	Function
3	Idling Roller Motor	Presses or releases the idling roller against the drum metal screen.
4	Drum Shift Sensor	Sends the image positions data to the CPU for display on the operation panel.
5	Drum Shift Motor	Slides the drum metal screen position to the front or rear for the side-to-side image shifting mode.
6	Ink Pump Sensor	Monitors the operation of the ink pump to count how many cycles it has moved.
7	Thermistor	Detects the temperature inside the drum to adjust various processes.
8	Ink Detection Pin	Detects if ink is present in the drum.
9	Ink Cartridge Set Switch	Detects if the ink cartridge is in place.
10	Ink Flow Sensor	Detects when the ink level is too high. This is a backup for the ink detection pins, to prevent ink flooding inside the drum.
11	Idling Roller HP Sensor	Detects when the idling roller is at the home position.
12	Ink Detection Board	Checks if there is ink in the drum.

Master Eject, Pressure Cylinder, and Other Sections

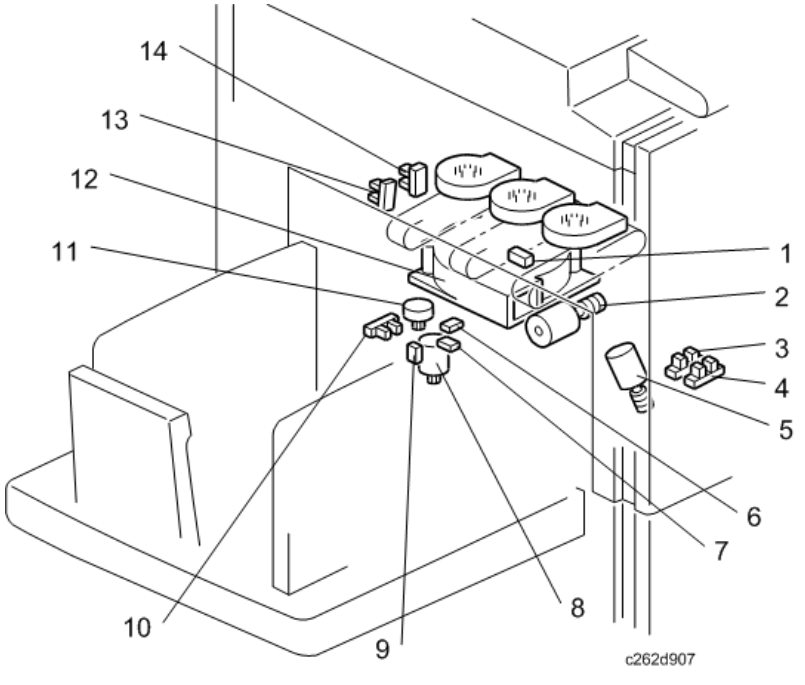


No.	Name	Function
1	Master Eject Motor	Sends used masters into the master eject box.
2	Pressure Plate HP Sensor	Detects when the pressure plate is at the home position.
3	Pressure Plate Limit Position Sensor	Detects when the pressure plate is at the lowest position.
4	Image Shift Motor	Makes a phase difference between the positions of the drum and pressure cylinder for the up/down image shifting mode.
5	Image Shift HP Sensor	Detects if the pressure cylinder is at the home position (The up/down image shift is 0).
6	2nd Drum Position Sensor	Checks the drum position.
7	1st Drum Position Sensor	Checks the drum position.
8	Clamper Close Position Sensor	Detects when the clamper is in the closed position.

No.	Name	Function
9	Clamper Open Position Sensor	Detects when the clamper is in the open position.
10	Clamper Motor	Opens or closes the drum master clamper.
11	2nd Drum Master Sensor	Detects if there is a master on the drum, to detect master clamping errors.
12	1st Drum Master Sensor	Detects if there is a master on the drum when the Start Key is pressed.
13	Feed Encoder	Detects fluctuations in the pressure cylinder rotation.
14	Printing Pressure Adjustment Motor	Adjusts the printing pressure to the correct value for the current temperature and speed of printing. This is done to prevent changes in image density.
15	Printing Pressure HP Sensor	Detects when the printing pressure mechanism is at the home position (this is pressure level 2).
16	Printing Pressure Position Sensor	Detects the printing pressure level when the printing pressure mechanism is at a different position from the home position (level 2)
17	Feed Start Sensor	Checks the pressure cylinder position for the paper feed start timing.
18	Printing Pressure Release Solenoid	There are two solenoids: one at the front and one at the rear. They pull the release arms to apply the printing pressure against the drum.
19	Lower Wrapping Jam Sensor	Detects paper wrapping jams on the pressure cylinder.
20	Main Motor	Drives the drum, pressure cylinder, and paper delivery unit components.
21	Cover Safety Switch	Checks if the front door is set correctly.
22	Drum Home Position Sensor	The green LED at the front of the machine lights when this sensor turns on.
23	Master Eject Sensor	Detects master eject misfeeds.
24	Pressure Plate Motor	Raises and lowers the pressure plate in the master eject box.

No.	Name	Function
25	Main Switch	Turns the power on or off.
26	Eject Box Lock Sensor	Detects the status of the master eject box lock mechanism.
27	Master Eject Box Lock Solenoid	Locks the master eject box, so that old masters cannot be removed. This security feature can be cancelled only by the machine's administrator.
28	Eject Box Set Switch	Checks if the master eject box is installed.

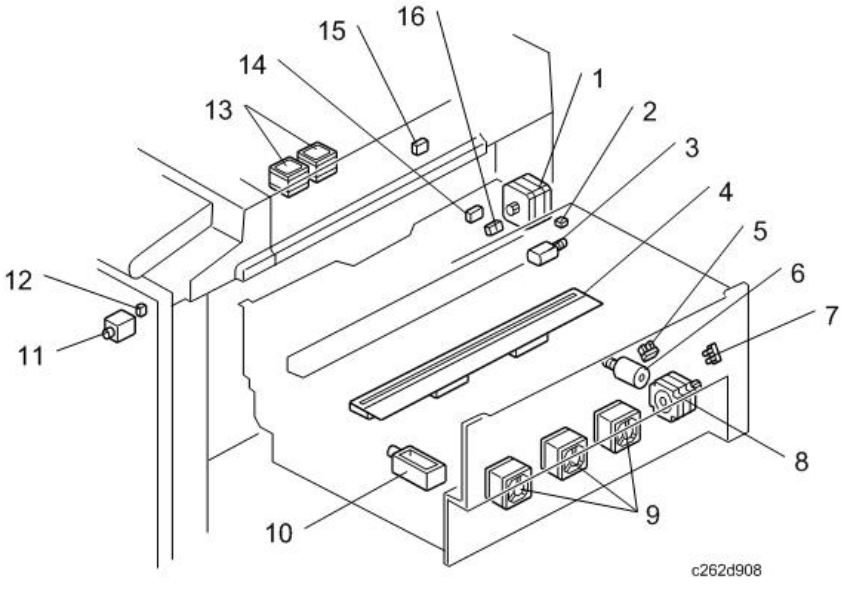
Paper Delivery Section



No.	Name	Function
1	Paper Exit Sensor	Detects paper misfeeds at the exit.
2	Wing Guide Motor	Changes the position of the paper wing guides in the paper delivery unit.
3	A3 Cam Sensor	Detects when the A3 printing pressure cam is used.
4	A4 Cam Sensor	Detects when the A4 printing pressure cam is used.

No.	Name	Function
5	Pressure Cam Shift Motor	Switches the cams for the small master and full size master to apply the appropriate printing pressure.
6	Slider Position Sensor	Detects when the job separator slider is fully moved towards the paper in the delivery table.
7	Slider HP Sensor	Detects when the job separator slider is at the home position.
8	Slider Lift Motor	Moves the sliding arm in the job separator unit up or down.
9	Paper Sensor	Detects when the job separator slider touches the paper on the delivery table.
10	Slide Upper Limit Sensor	Detects when the job separator slider is at the uppermost position.
11	Job Separator Motor	Drives the sliding arm in the job separator unit.
12	Transport Vacuum Fan	Provides suction so that paper is held firmly on the transport belts.
13	Wing Upper Position Sensor	Detects when the paper wing guides are in the upper position.
14	Wing Lower Position Sensor	Detects when the paper wing guides are in the lower position.
15	Air Knife Fans	Three fans provide air to separate the paper leading edge from the drum.

Master Making Unit



No.	Name	Function
1	Master Feed Control Motor	Controls the master feed control roller operation to feed the master.
2	Cutter HP Switch	Detects when the cutter is at the home position.
3	Cutter Motor	Cuts the master after completing the master making.
4	Thermal Head	Burns the image of the original onto the master.
5	Platen Release Sensor	Detects when the platen pressure is applied against the thermal head.
6	Platen Release Motor	Applies or releases the pressure between the platen roller and the thermal head.
7	Master Amount Sensor	Detects the speed of rotation of the master roll, to determine the length of master that remains on the roll.
8	Master Feed Motor	Feeds the master to the drum.
9	Master Suction Fans	Three fans provide suction to guide the master into the buffer duct.
10	Duct Entrance Solenoid	Opens or close the plate at the entrance of the master buffer duct.

No.	Name	Function
11	Master Making Unit Lock Solenoid	Locks the master making unit in position during printing, so that the user cannot accidentally remove it at the incorrect time.
12	Master Making Unit Lock Sensor	Detects the status of the master making unit lock mechanism.
13	Master Buffer Fans	Two fans make sure that the folds of the master do not stick together in the master buffer duct.
14	Master Edge Sensor	Detects the leading edge of the master when a new master roll in installed.
15	Master End Sensor	Detects when the master runs out.
16	Master Set Sensor	Detects whether a master roll is present.

2. 2. Installation

Installation Requirements

Carefully select the installation location because environmental conditions have a great effect on machine performance.

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.

Environments to Avoid

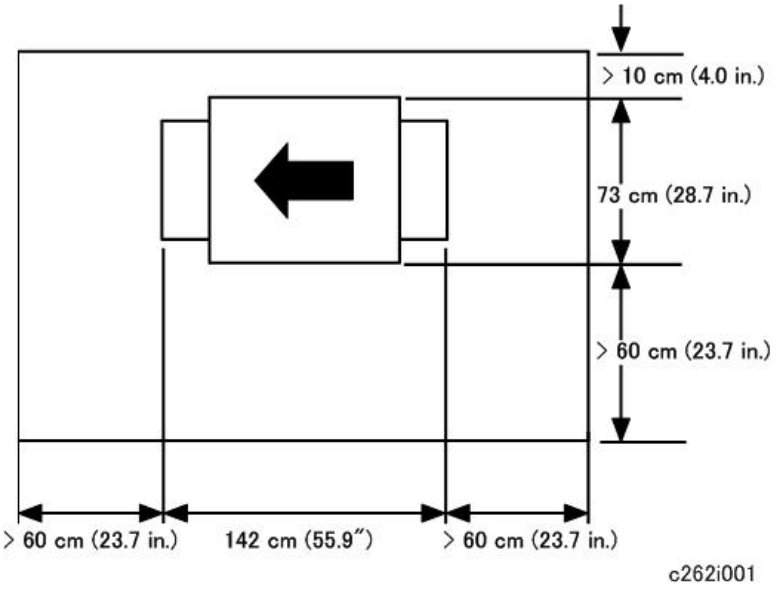
1. Locations exposed to direct sunlight or strong light (more than 1,500 lux).
2. Dusty areas.
3. Areas containing corrosive gases.
4. Locations directly exposed to cool air from an air conditioner or reflected heat from a space heater. (Sudden temperature changes from low to high or vice versa may cause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

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.

Access to the Machine

Place the machine near a power source with enough space around the machine as shown below.



Power Sockets for Peripherals

⚠CAUTION

- Be sure to plug the cables into the correct sockets.

[A]	**ADF**. Rated Voltage of Output Connector Accessory: DC 24

Main Machine Installation

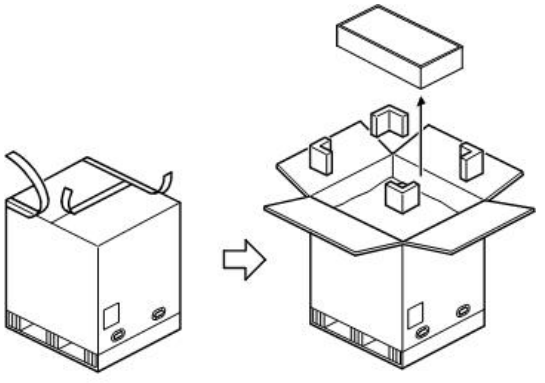
Accessory Check

Make sure that you have all the accessories listed below:

No.	Description	Quantity
1.	Model name plates (C280-33, C280-34 only)	1
2.	Model name plate cover (C280-33, C280-34 only)	1
3.	Carrying handle stopper	4
4.	Ferrite Core	1
5.	NECR	1
6..	Manuals for this machine (Printed Manuals)	1
7.	Easy Operation Guide (Printed Manuals)	1
8.	Safety Information (Printed Manuals)	1
9.	Preparations for use as a Printer (Printed Manuals)	1
10.	CD-ROM Manuals (Including Operating Instructions)	1
11.	CD-ROM (Document Management Utility)	1
12.	CD-ROM (Printer Driver)	1

Installation Procedure

Machine Installation

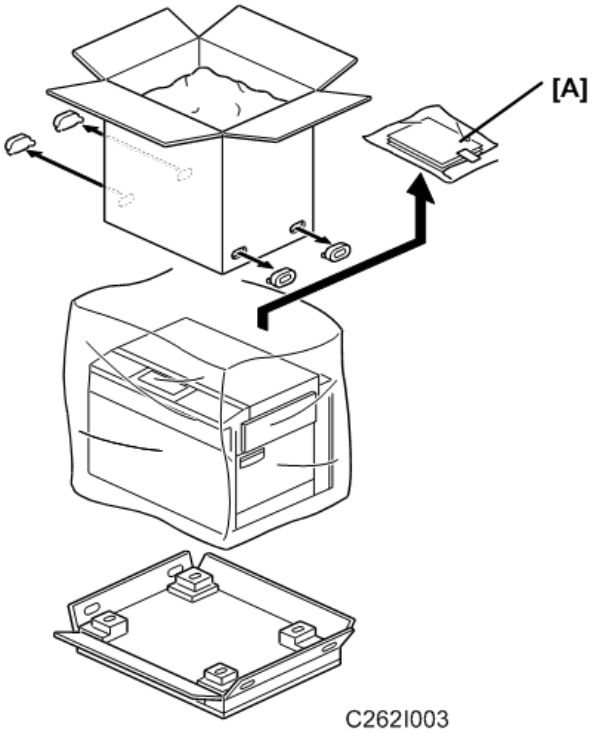


C262I002

Important

- **Open the box from the top. If the box is lifted off the machine from the bottom, the paper delivery table may be damaged.**

1. Open the box.
2. First, take out the small box [A], which contains the paper delivery table to prevent it from being damaged.

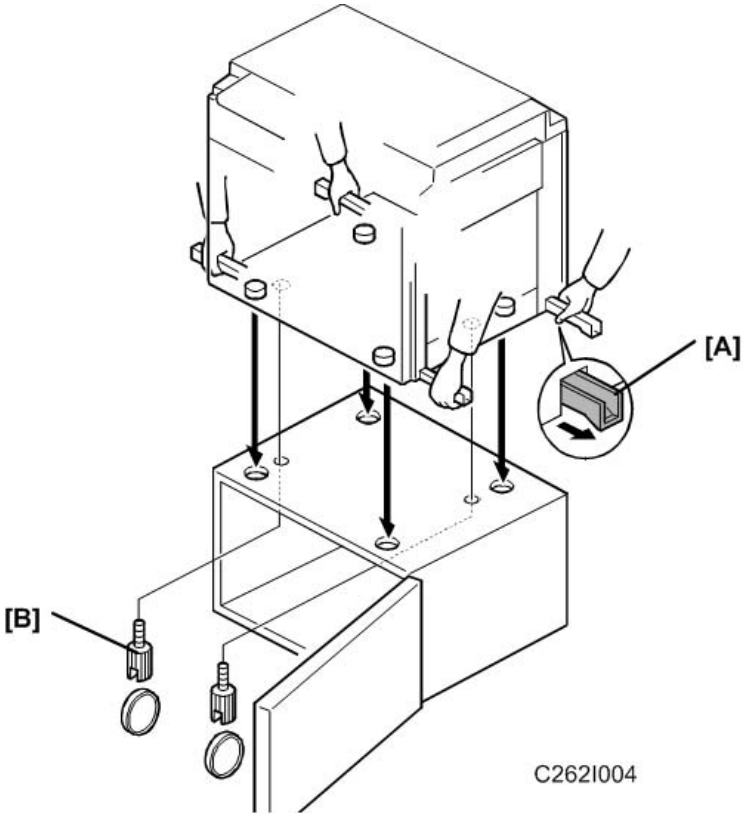


C262I003

3. Continue to unpack the box. Make sure that the accessory bag [A] is included.

c2801150

4. Remove the tape, shipping materials, and the power cord from outside the machine.

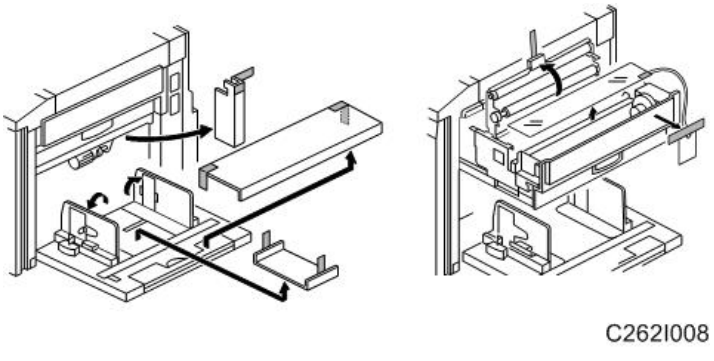


5. Lift the machine by the carrying handles [A] on the bottom.

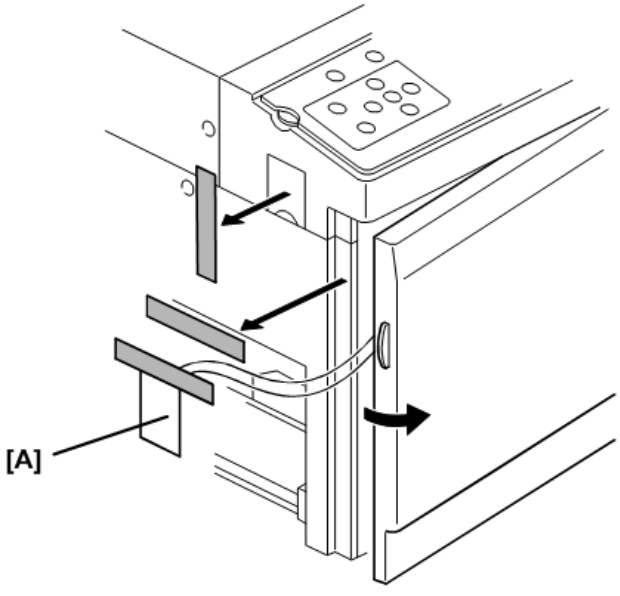
Important

- **Always use the carrying handles to lift the machine to prevent pinching your fingers between the main body and the table during installation. (The gap between the bottom of the main body and the table is very small.)**
- **Be sure to attach screws [B], or static electricity will build up inside the machine.**

6. When you install the optional table, mount the machine on the table with the screws [B] packed with the table (x2).

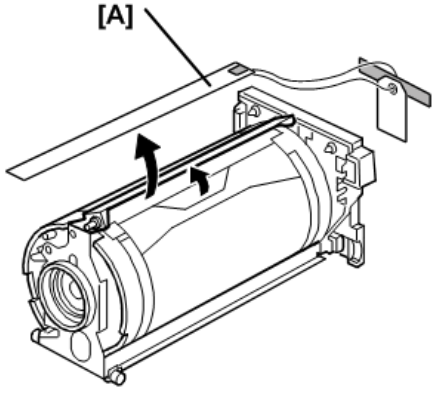


7. Remove all tape and shipping material from inside the machine.



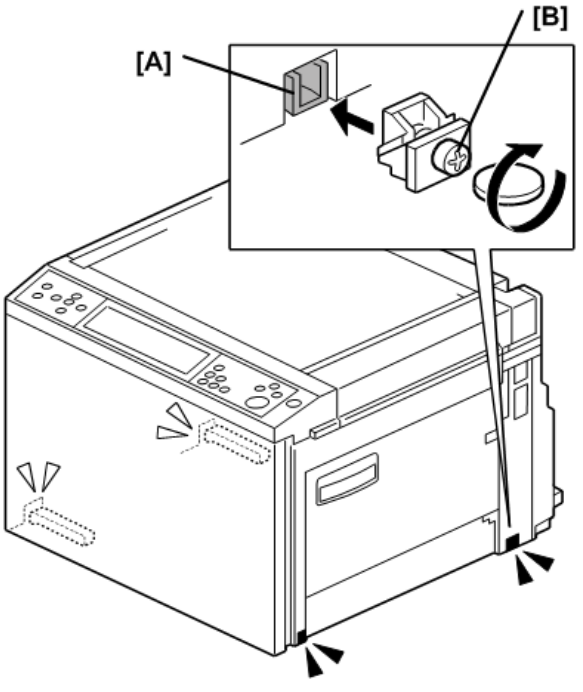
C262I045

8. Open the front door and remove the tape and shipping material [A].



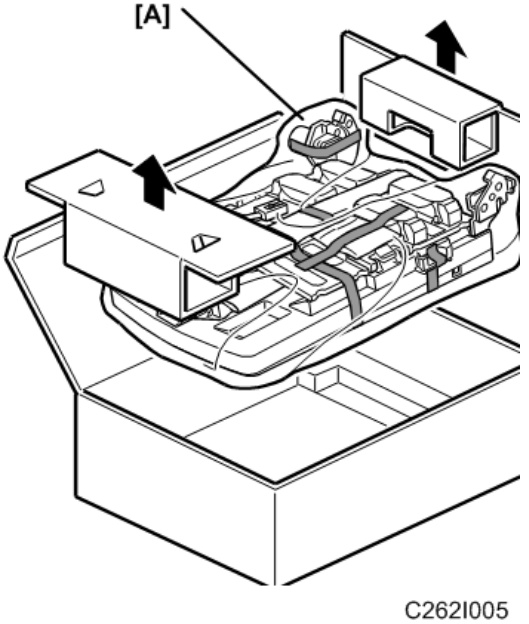
c262I009a

9. Open the front cover, and slide out the drum unit. Then, remove the master clamper protective sheet [A].



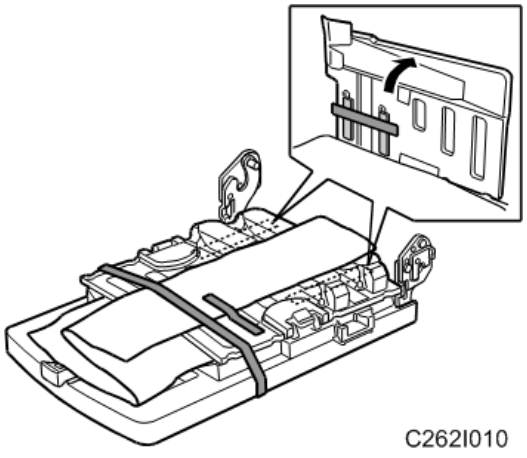
c262i021

10. Insert the carrying handle [A] in the machine, and attach the carrying handle stopper [B].



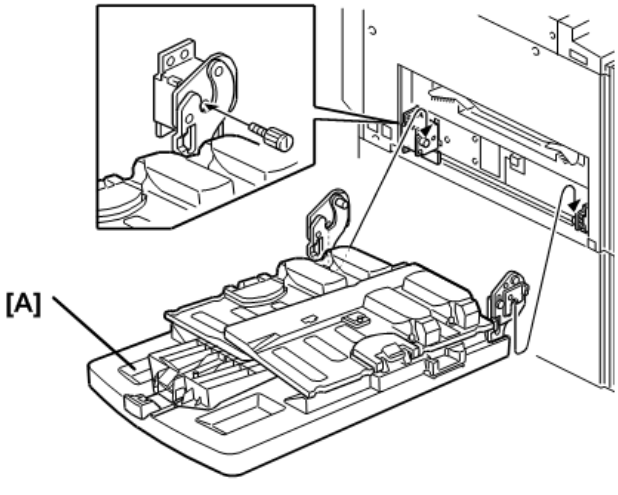
C262I005

11. Remove the paper delivery table [A] from the box.



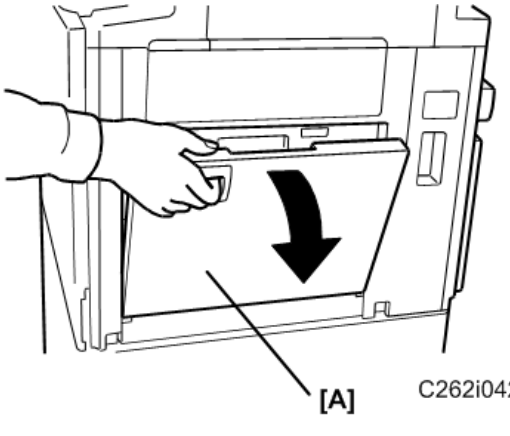
C262I010

12. Remove the tape that secures the paper delivery table.



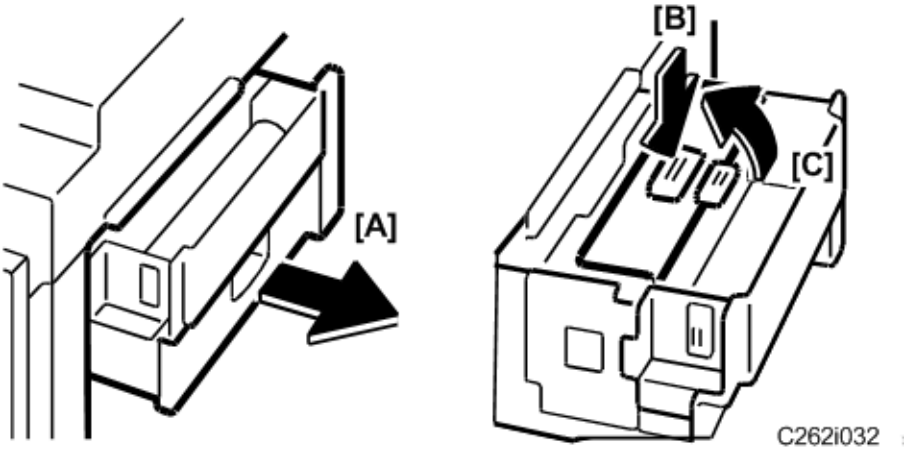
C262I011

13. Attach the paper delivery table [A] (◆ x2).

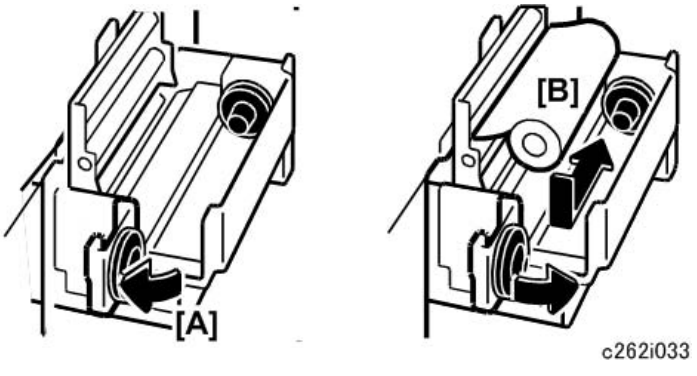


C262i042

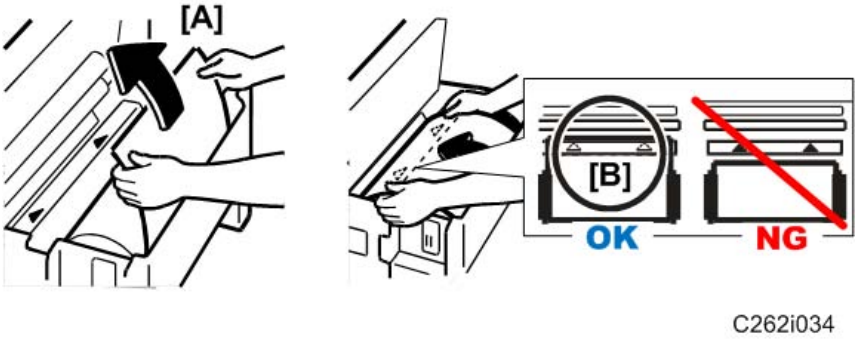
14. Open the paper table [A].



15. Pull out the master making unit [A] until it stops.
16. Push the button [B], and open the master guide [C].

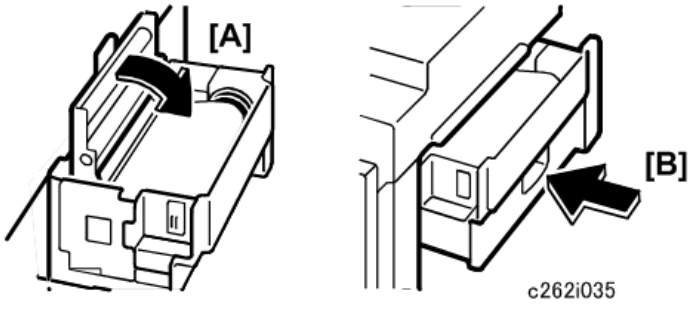


17. Open the master tray cover [A].
18. The master roll [B] must be positioned as shown in the illustration.
19. Close the master tray cover [A].

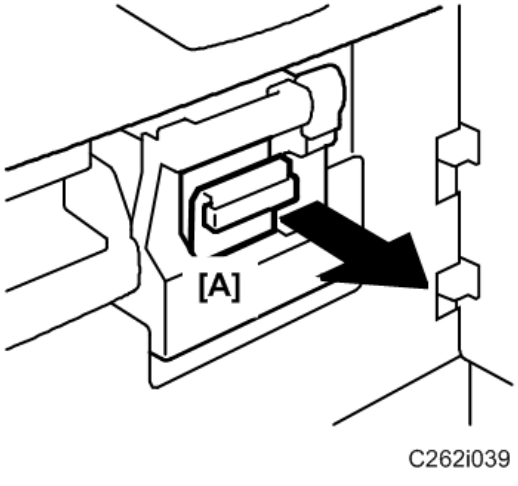


20. Insert the master roll [A].

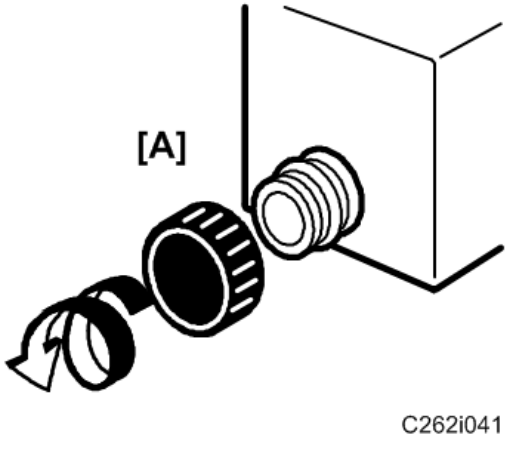
21. Make sure the leading edge reaches the interior [B] of the master holder.



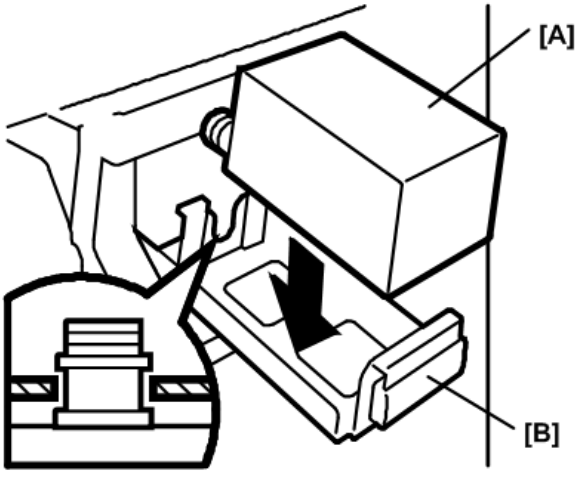
22. Close the master guide [A].
23. Push in the master making unit [B] until it stops.



24. Open the front cover, and pull out the ink holder [A].

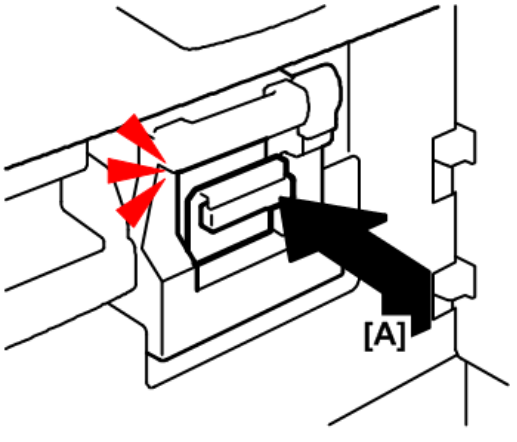


25. Remove the cap of the new ink cartridge [A].



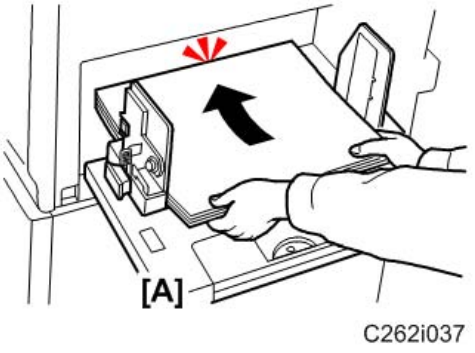
C262i026

26. Insert the new ink cartridge [A] into the ink holder [B].



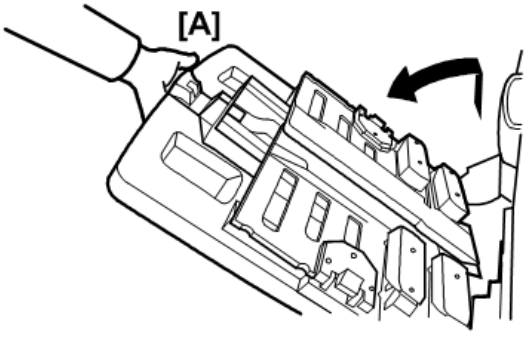
C262i040

27. Return the ink holder [A] to its original position until it clicks, and close the front cover.



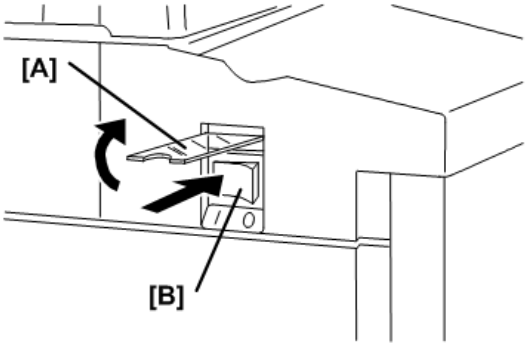
C262i037

28. Put a stack of paper on the paper table [A].



c262i036

29. Raise the paper delivery table [A] slightly, then gently lower it.
30. Lift the side plates and the end plate, and adjust them to the paper size.
31. Install the platen cover or ADF ☛ Platen Cover, ADF.
32. Make sure that the wall outlet is near the machine and easily accessible, and then firmly insert the plug in the wall outlet.



c262i038

33. Open the main switch cover [A], and turn on the main switch [B].
34. Place the original on the exposure glass or ADF.
35. Make a master and make 30 prints with this master. Do this at least three times, until the image quality is acceptable.

Note

- Because this is a new drum, the ink is supplied automatically. This takes about 2 minutes.

Date/Time Setting

Use the User Tools menu to set the current date and time.

1. On the operation panel, press the [User Tools] key.
2. On the touch-panel, touch "System Settings".

3. Touch the "Timer Setting" tab.
4. Touch "Set Date" then enter the date.
5. Touch "Set Time" then enter the time.

SP Codes Setting

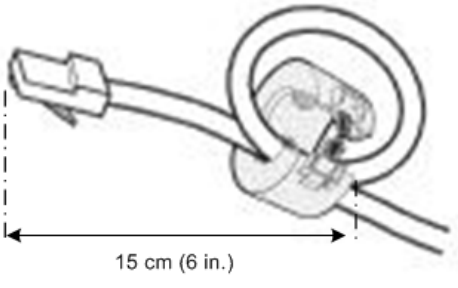
SP	Menu	Function
3-001-6	Tel. Number for Service	Do this SP and input the contact numbers of the customer engineer. These numbers are shown when a service call is issued.
3-001-9	Master Name Input	These names appear when the user pushes the Inquiry button on the User Tools screen.
3-001-10	Ink Name Input	

Changing the Operation Panel Language

There are only two languages in the machine. If you need to change the language, please refer to the firmware update procedure.

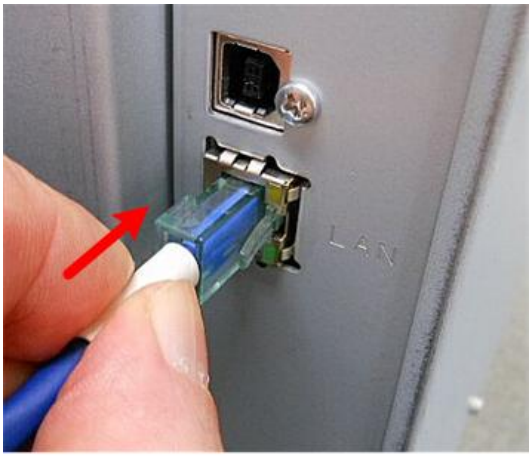
Connecting the Machine to a Computer

1. Turn off the power switch.



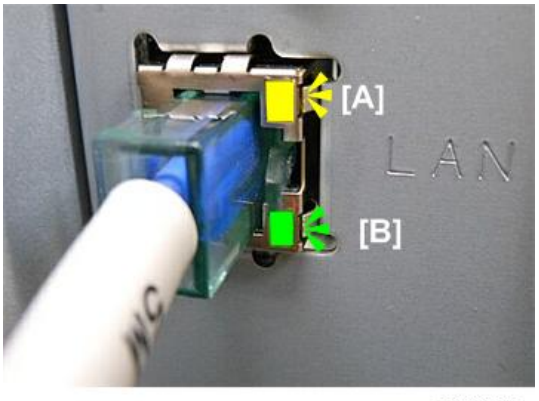
c2801005

2. Attach the ferrite core to the machine side of a network interface cable.



c2801006

3. Connect the network interface cable to the jack on the board.
4. Connect the other end of the interface cable to the network.
5. Turn on the power switch.



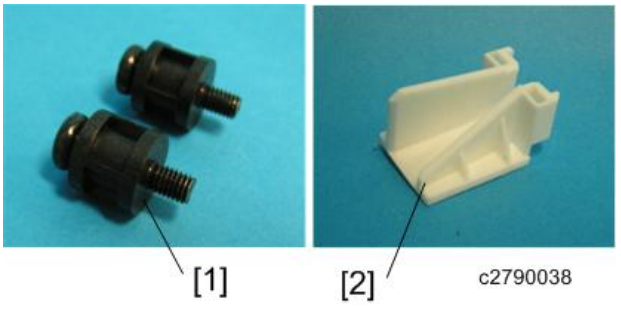
c2801007

6. Check the LEDs on the Ethernet port.
    - "[A]" is ON when 100BASE-TX is in use and OFF when 10BASE-T is in use.
    - "[B]" is ON when the machine is securely connected to the network.

Platen Cover (D593)

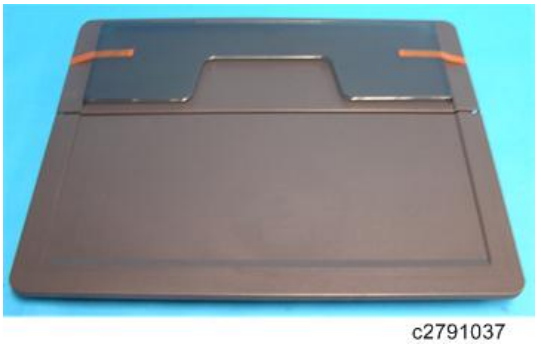
Accessory Check

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

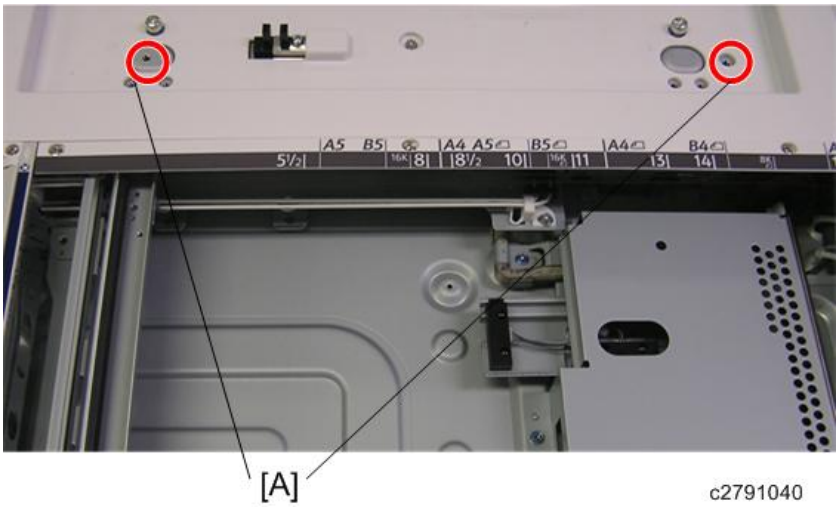


No.	Description	Quantity
1	Stepped Screw	2
2	Guard Rail Filler	1

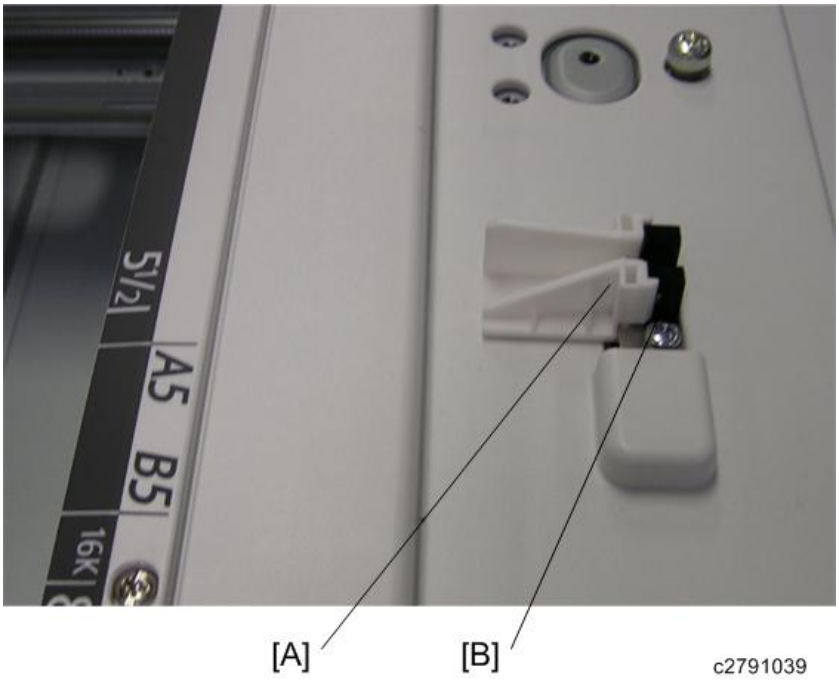
Installation Procedure



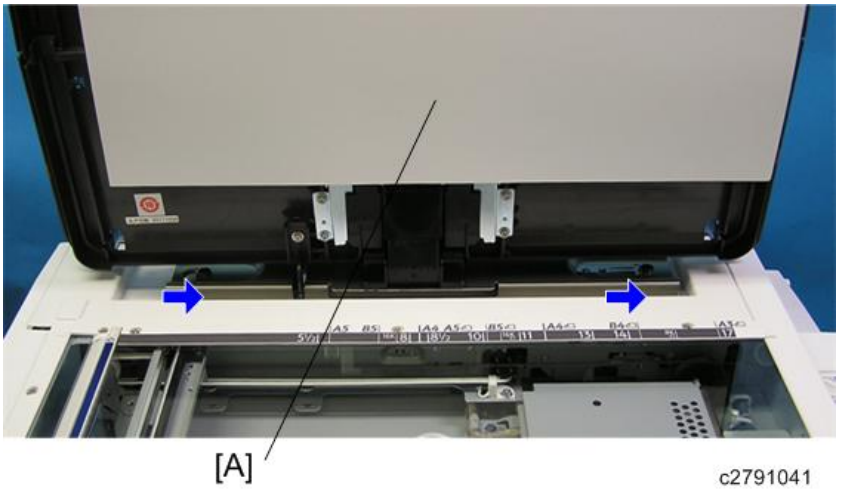
1. Remove the strips of tape.



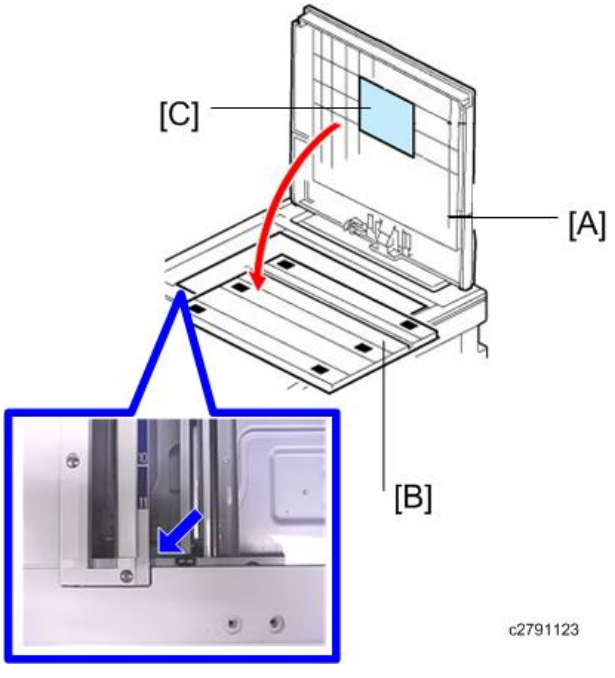
2. Insert the two stepped screws [A] on the top of the machine.



3. Peel off the double sided tape from the guard rail filler [A] and place it by the platen cover sensor [B].



4. Mount the platen cover [A] by aligning the screw keyholes over the stud screws.
5. Slide the platen cover toward the right of the machine.



6. From the platen cover [A], remove the platen sheet [B].

Note

- The SMC sheet is contained in the front cover[C].

7. Place the platen sheet on the exposure glass.

8. Slowly close the platen cover, gently pressing it against the platen sheet so that the sheet sticks to the cover.
9. Open the platen cover again and lightly hold the Velcro part.

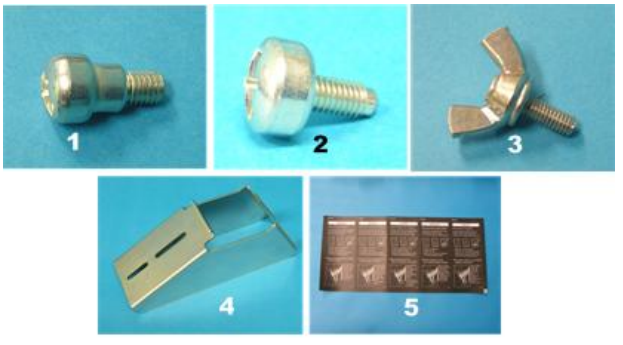
Note

- When placing the platen sheet on the exposure glass, make sure to align it with the front left corner.

10. Turn on the main switch.
11. Place an original on the exposure glass and confirm that it can be printed properly.

Auto Document Feeder (D578)

Accessory Check



c2791004

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

No.	Description	Quantity
1	Stepped Screw	2
2	Screw	2
3	Thumbscrew	4
4	Stabilizer Bracket	2
5	ADF exposure glass cleaning decal	1
	EMC ADDRESS:RIC	1

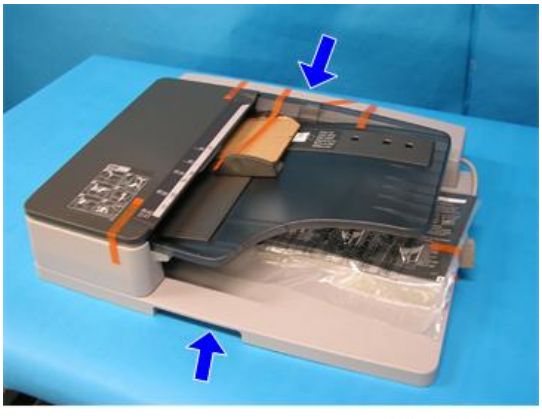
The Aim of Anti-tip Components and Precautions

- The anti-tip components are necessary for meeting the requirements of IEC60950-1, the international standard for safety.
- The aim of these components is to prevent the products, which are heavy, from toppling as a result of people running into or leaning on the products, which can lead to serious accidents such as persons becoming trapped under the product. (U.S.: UL60950-1, Europe: EN60950-1) Therefore, removal of such components must always be with the consent of the customer.
- Do not remove them.

Installation Procedure

C2791011

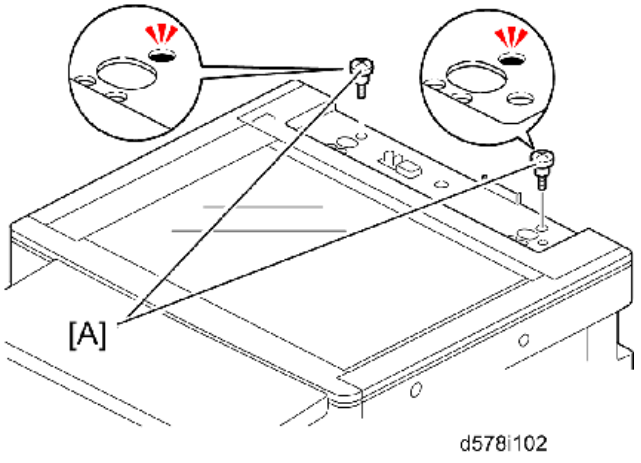
1. Remove the strips of tape.



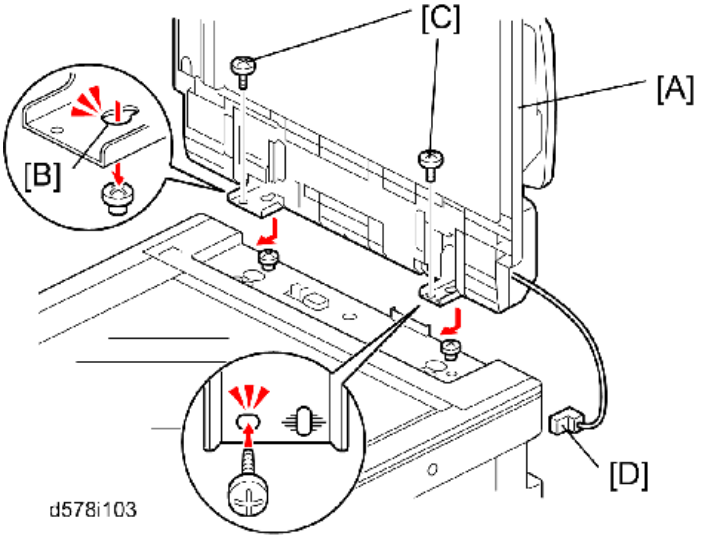
C2791036

Important

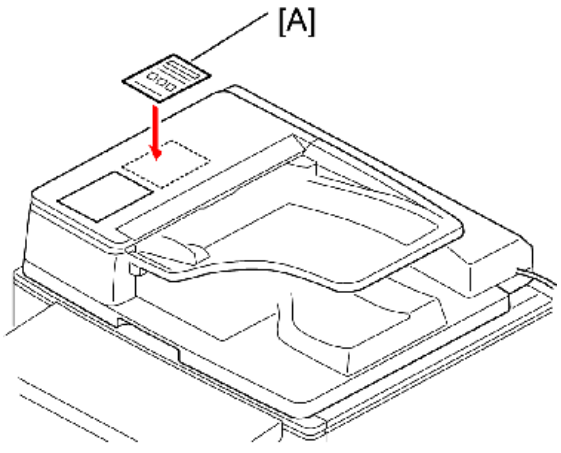
- When unloading the ADF from a pallet, hold the front and rear sides of the ADF .



2. Insert the two stud screws [A] on the top of the machine.

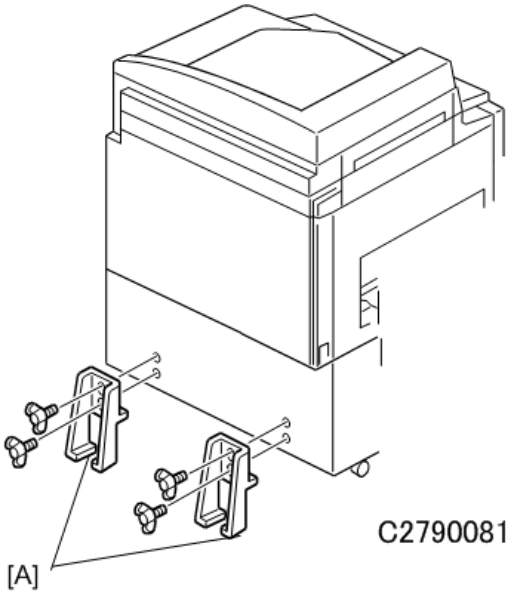


3. Mount the ADF [A] by aligning the screw keyholes [B] of the ADF support plate over the stud screws.
4. Slide the ADF toward the front of the machine.
5. Secure the ADF with the two knob screws [C].
6. Attach the interface cable [D] to the inlet of the machine.



7. Attach the original setting and ADF exposure glass cleaning decal [A] to the top cover as shown.
8. Plug in and turn on the main power switch, and then check the ADF operation.

ADF Stabilizer Installation



1. Attach the two stabilizer brackets [A] to the back of the table using the thumbscrews (x4).

Important

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

Configuration of Options

SP6-1-2 Scan and Writing Adjustment - Main Scan Position – DF

1. Enter "6" for SP8-5-1 (Test Pattern – Grid), and then press [Start].
2. Leave the SP mode, and then print 10 copies in platen mode at 90 rpm (Speed 3).
3. Compare the prints with the original and then determine if there is any deviation from the center of the original in the main scan direction. If you see any deviation, measure the difference between the center of the main scan on the original and the prints.
4. Open SP6-1-2, and then enter the measurement for the amount of deviation.

   Note

   - If you enter a negative value, the image will move toward the operation side.
5. Repeat the procedure until there is no difference between the original and the prints.

SP6-1-4 Scan and Writing Adjustment – Scan Start Position – DF

1. Enter "6" for SP8-5-1 (Test Pattern – Grid), and then press [Start].
2. Leave the SP mode, and then print 10 copies in platen mode at 90 rpm (Speed 3).
3. Measure (in the direction of feed) the distance from the leading edges of the samples to where the pattern starts. The measurement should be 8 mm.
4. If the measured distance is not 8 mm, open SP6-1-4, and then enter the difference.

   Note

   - If the measurement was 7 mm, then 8 mm – 7 mm = 1 mm. Enter a "1".
5. Repeat the procedure until there is no difference between the original and the prints.

SP6-1-6 Scan and Writing Adjustment – Scanning Speed – DF

The image should be measured precisely in the sub scan direction and adjusted if necessary.

Note

- The adjustment for this measurement must be done with SP6-1-7 (Scan and Writing Adjustment – Master Writing Speed).

Setting range: ±5% (Scanner/ADF)

Default: 0

Note

- Setting +0.1 lengthens the image in the sub scan direction.

- Setting -0.1 shortens the image in the sub scan direction.

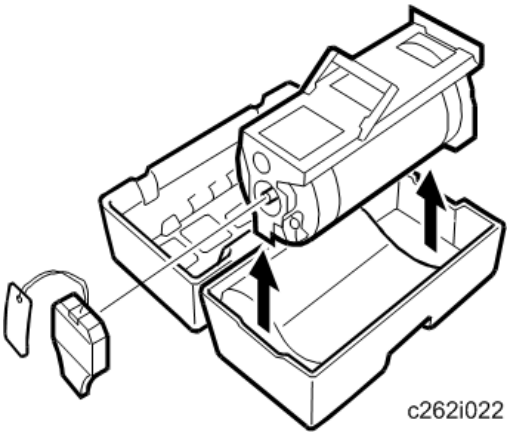
Procedure

1. Print the grid pattern with SP8-5-1.
2. Count 10 squares, and then measure the length of the 10 squares. The measurement should be 130 mm
3. If the measurement is not 130 mm, do the following calculation.

(130 – Measurement) / 130 x 100 = ±X.X% (Round off to one decimal)

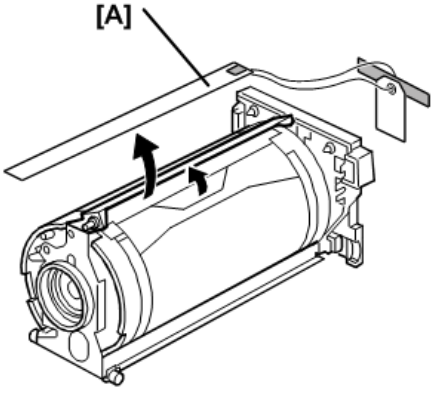
1. Enter this value for SP6-1-6.

Additional Drums (Option)



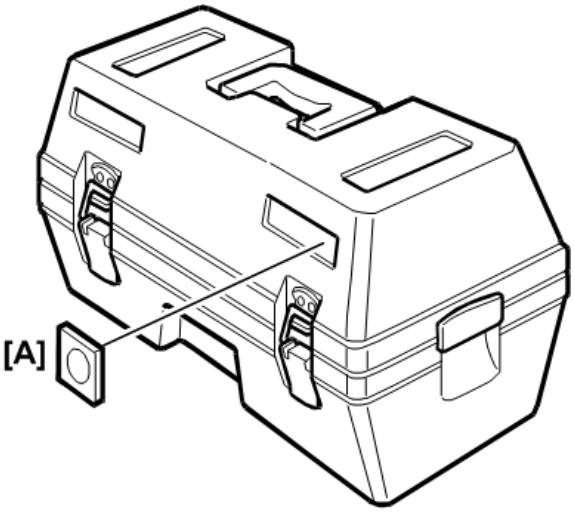
There are three types of drum units:

- **A3 Size**: Color or black
- **DLT Size**: Color or black
- **A4 Size**: Black only



c262I009a

1. Remove the master clamper protective sheet [A] from the drum unit.
2. Remove the tape that secures the ink holder.



c262i023

1. Attach a color indicator decal [A] to the drum case. The decal must be the same color as the ink in use.
2. Remove the drum unit.
3. Leave the master wrapped around the removed drum, to protect the drum from dust and from drying.

Note

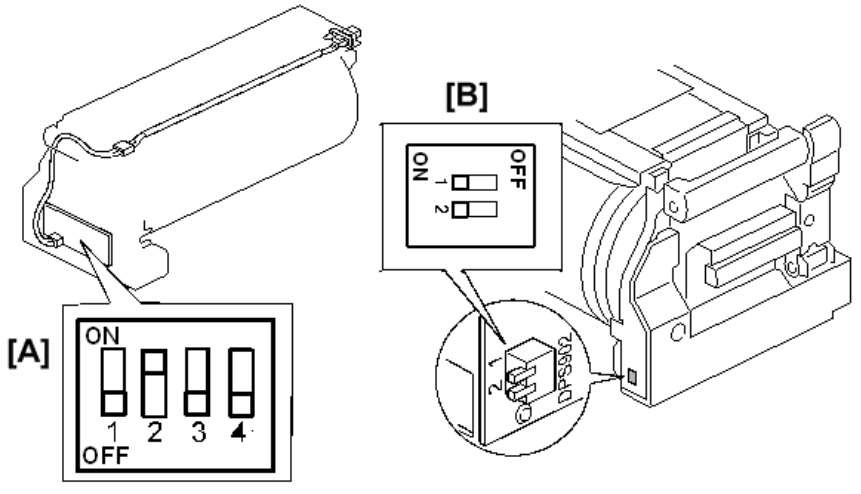
- If the operator is concerned about security, make a new blank master to wrap around the drum. The user's master (now on the drum) will go into the locked eject box.

4. Keep the removed drum unit in the drum case.
5. Install the drum unit.

Note

- The color drum indicator on the operation panel stays lit when a drum is installed in the machine.

6. Remove the ink cartridge cap.
7. Insert the ink cartridge in the ink holder.
8. Make sure that SP 2-10-1 to 4 and DPS902 have the correct settings for the color of ink that is used.



C262I902

1. First, set the DIP switch 901 (for drum-type detection) on the ink detection board [A] to color drum. To do this, DIPSW 901-1 must be off and 901-2 must be on.
2. Second, set the DPS902 dip switches [B] on the drum to specify the ID of the color.

   Four color IDs can be recognized.

DPS902	1	2
ID0	OFF	OFF
ID1	ON	OFF
ID2	OFF	ON
ID3	ON	ON

3. Third, with SP 2-10-1 to -4, you can specify the meaning of each of these 4 ID codes.
   - 2-10-1 specifies the meaning of ID0
   - 2-10-2 specifies the meaning of ID1
   - 2-10-3 specifies the meaning of ID2
   - 2-10-4 specifies the meaning of ID3

   There are 15 possible colors that can be specified with SP 2-10-1 to -4.

Allocation of color codes

0	1	2	3	4	5	6	7
Other	Red	Blue	Green	Brown	Gray	Yellow	Purple

0	1	2	3	4	5	6	7
8	9	10	11	12	13	14	
Maroon	Navy	Orange	Teal	Red Base	Blue Base	Yellow Base	

Default: 0 (other)

- For example, if you install a drum with DPS 902-1 and -2 both set to OFF (this means "ID0"), and if this drum contains blue ink, then set SP 2-10-1 to 2 (blue). Then "blue" will be shown on the display panel when this drum is installed.
- The names in the above table are fixed in the software. So, for example, if the drum contains gold-colored ink, the selected color should be 14 (yellow base).

1. Place the original on the exposure glass or ADF.
2. Make a master and make 30 prints with this master. Do this at least three times, until the image quality is acceptable.

Note

- Because this is a new drum, the ink is supplied automatically. This takes about 2 minutes.

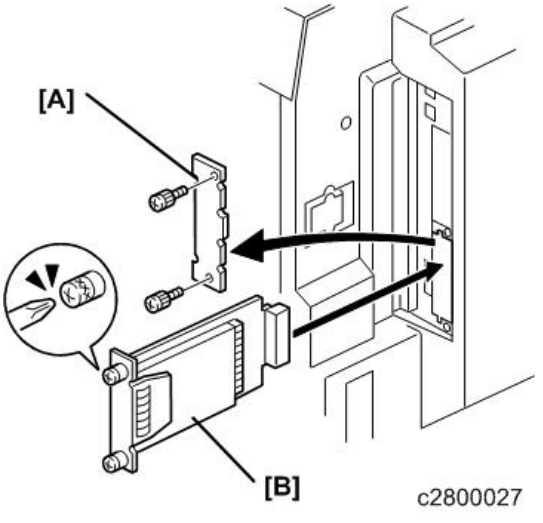
Extension HDD Type 1 (Option)

Accessory Check

Check the quantity and condition of the accessories in the box against this list.

No.	Description	Quantity
1.	HDD	1

Installation Procedure



1. Turn the machine off.
2. Install the HDD [A] in the slot and secure it with the screws (x2).
3. Turn the machine on and print a configuration page to make sure that the machine can see the Printer Hard Disk Drive ☛ Configuration Page

   User Tools> Online Printer Features> List/Test Print> Configuration Page

   - After you turn the power on, the machine displays "Please wait" while stamp data is transferred to the hard disk. This takes about 1 minute.
   - If the disk is not formatted, the machine will automatically format the disk and transfer the stamp data.
   - You can format the hard disk with SP 7-7-1. But the stamp data will not transfer automatically. So, after you format the hard disk, you must copy the stamp data to the hard disk with SP 8-2-11.

Important

- When you replace the hard disk, be careful about handling the old hard disk because it contains the user's private information.

Postscript3 Board Type 2 (Option)

Accessory Check

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

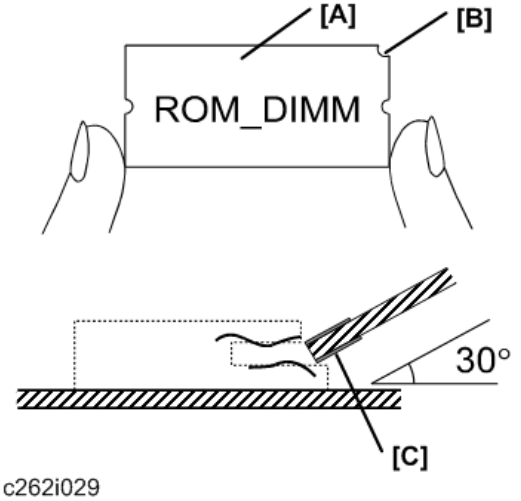
No.	Description	Quantity
1.	DIMM	1
2.	Decal - PostScript	1

Inserting DIMMs

Read this section carefully before installation, so that you know how to insert the DIMMs correctly. Follow the procedure below to connect the DIMMs to the controller board.

Important

- **Incorrect insertion can damage the controller board or cause a bad connection between the DIMM and controller contacts.**
- **If the upper contact is pushed in and bent, the resulting poor connection could cause the entire system to not operate.**



c262i029

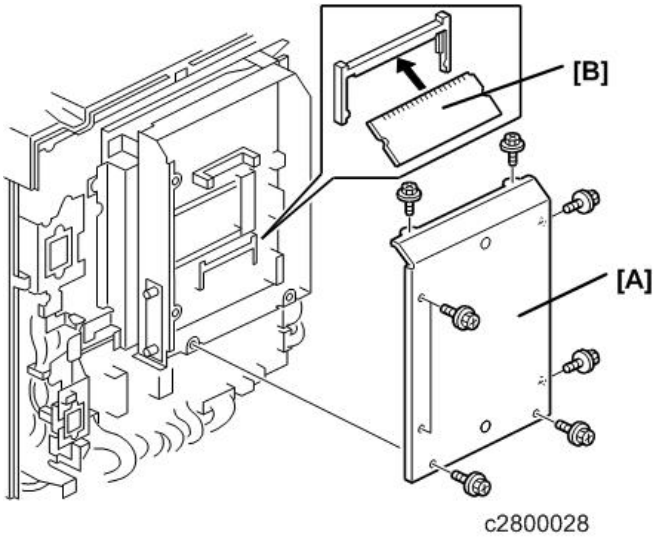
1. Hold the ROM DIMM with the edge connector [A] pointing toward the slot and the notch [B] on the DIMM in the upper right corner.
2. Insert the edge connector [C] into the slot at a 30-degree angle from the surface of the board.

Note

- If the angle is too low, the upper contact could bend.
- Always make sure that the DIMM is inserted correctly.

3. Move the outside edge of the ROM DIMM up and down slightly until it works into the connector, then gently press it down level with the controller board.

Installation Procedure



1. Turn the machine off.
2. Remove the rear cover (x6).
3. Remove the controller cover [A] (x8).
4. Insert the PS3 module [B] into Slot 2.
5. Turn the machine on and print a configuration page to make sure that the machine can see the Adobe PostScript", "Adobe PDF" notations ☛ Configuration Page

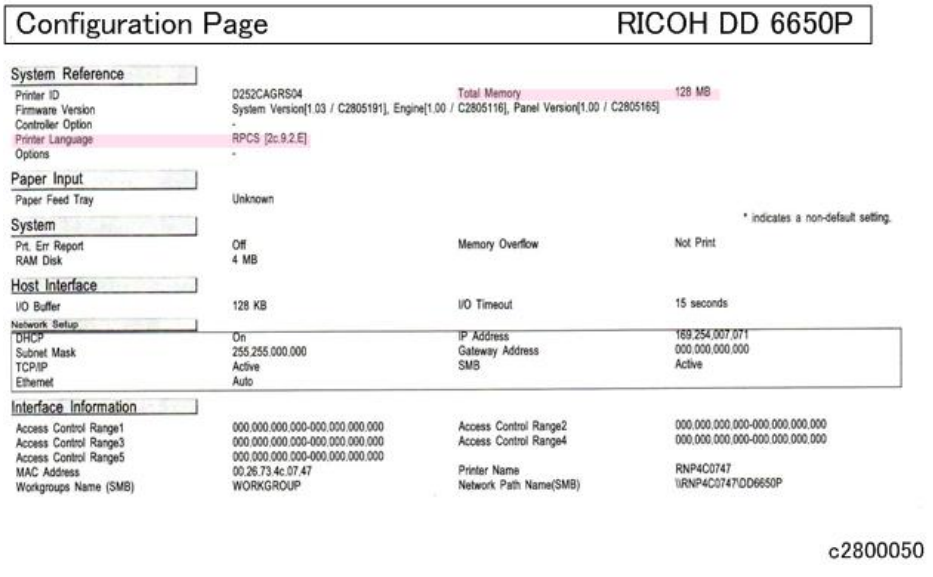
   User Tools> Online Printer Features> List/Test Print> Configuration Page

Configuration Page (Example Printout)

This is an example of a configuration page.

To print the Configuration Page:

1. Press [User Tools]
2. Touch "Online Printer Features" > "List/Test Print" > "Configuration Page"



Configuration Page RICOH DD 6650P

System Reference

Printer ID	D252CAGRS04	Total Memory	128 MB
Firmware Version	System Version[1.03 / C2805191], Engine[1.00 / C2805116], Panel Version[1.00 / C2805165]		
Controller Option	-		
Printer Language	RPCS [2c.9.2.E]		
Options	-		

Paper Input

Paper Feed Tray	Unknown		

* indicates a non-default setting.

System

Prt. Err Report	Off	Memory Overflow	Not Print
RAM Disk	4 MB		

Host Interface

I/O Buffer	128 KB	I/O Timeout	15 seconds

Network Setup

DHCP	On	IP Address	169.254.007.071
Subnet Mask	255.255.000.000	Gateway Address	000.000.000.000
TCP/IP	Active	SMB	Active
Ethernet	Auto		

Interface Information

Access Control Range1	000.000.000.000-000.000.000.000	Access Control Range2	000.000.000.000-000.000.000.000
Access Control Range3	000.000.000.000-000.000.000.000	Access Control Range4	000.000.000.000-000.000.000.000
Access Control Range5	000.000.000.000-000.000.000.000		
MAC Address	00.26.73.4c.07.47	Printer Name	RNP4C0747
Workgroups Name (SMB)	WORKGROUP	Network Path Name(SMB)	\\RNP4C0747\DD6650P

c2800050

3. 3. Preventive Maintenance

Preventive Maintenance

See “Appendices” for the Maintenance Table.

4. 4. Replacement and Adjustment

Before You Begin

⚠CAUTION

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

Before you start to work on the machine, always do the following:

- If there are print jobs queued in the machine printer buffer, print them out.
- Turn off the main switch and disconnect the power cord and the network cable.

Special Tools

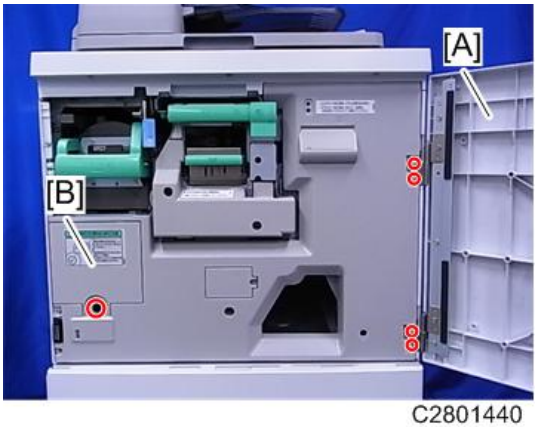
The following are the special tools used for service.

Description	Part No.	Comments
Main Drive Securing Tool Kit	C229 9000	Drum securing tool and two positioning shafts as a set. For main drive positioning
Scanner Positioning Pin Kit	A006 9104	4 pins as a set. For scanner wire installation
SD Card	B6455010	For updating firmware
PCMCIA Card Adapter	B6456700	For upload the data into an SD card
USB Reader/Writer	B6456800	For upload the data into an SD card

Covers, Exposure Glass

Exterior Cover Removal

Front

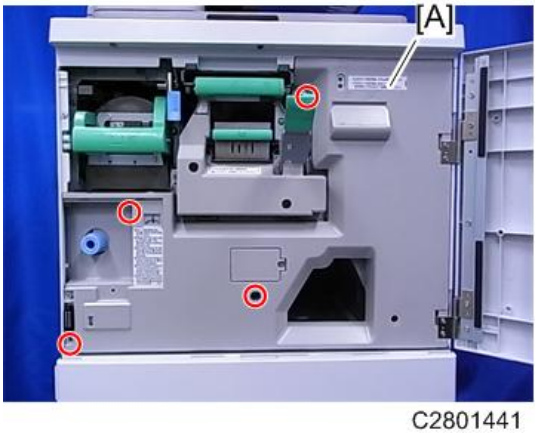


C2801440

[A] Door (x4)

[B] Cap x1, Knob (x1)

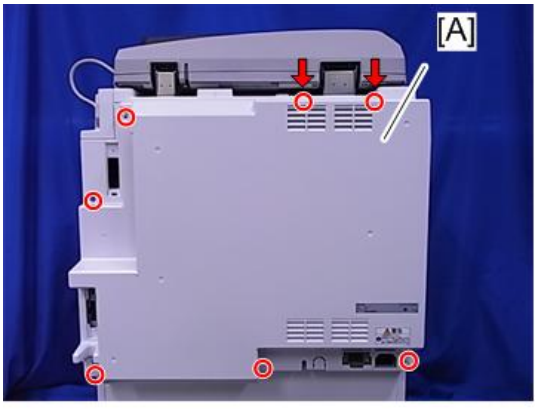
Inner Cover



C2801441

[A] Inner cover (x4)

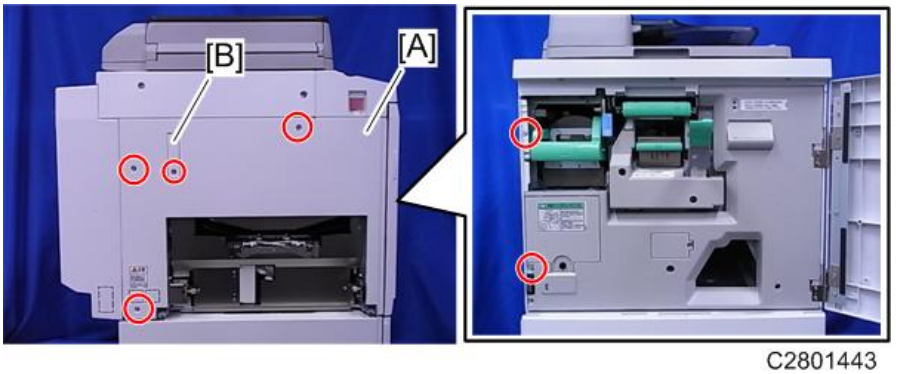
Rear



C2801442

[A] Rear cover (x7)

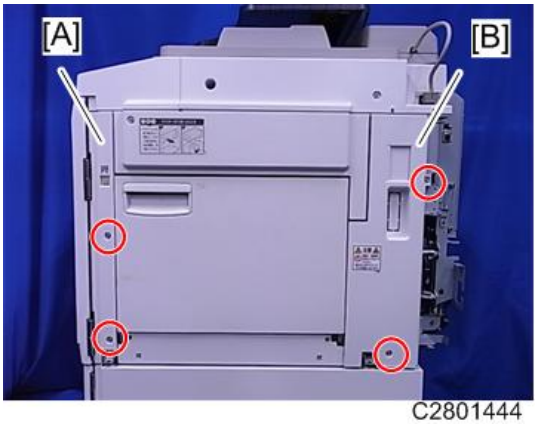
Right



C2801443

[A] Right cover (x5)

[B] Left cap cover (x1)

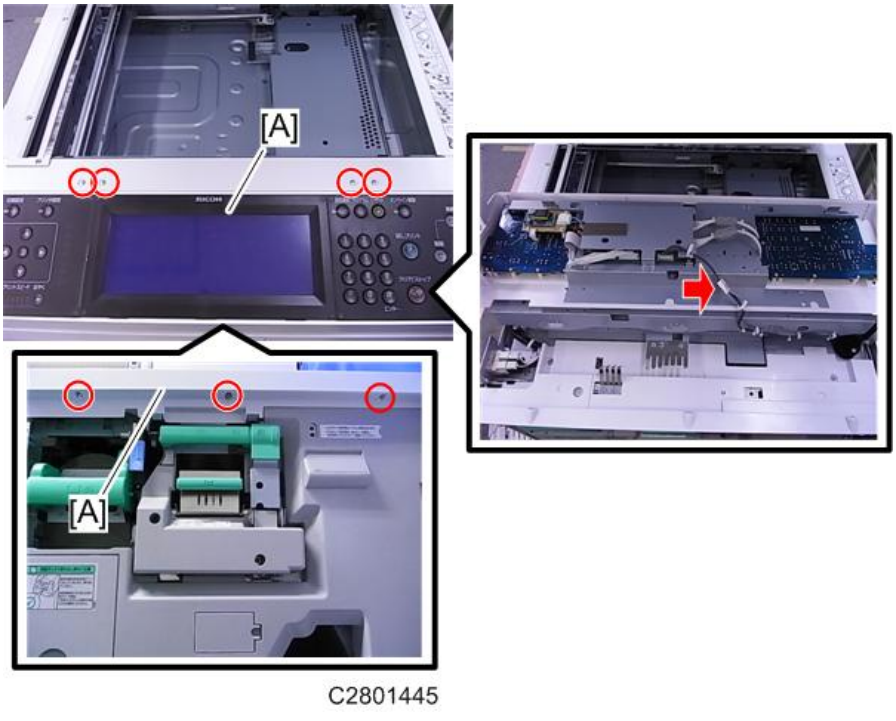


C2801444

[A] Front right cover (x2)

[B] Rear right cover (x2)

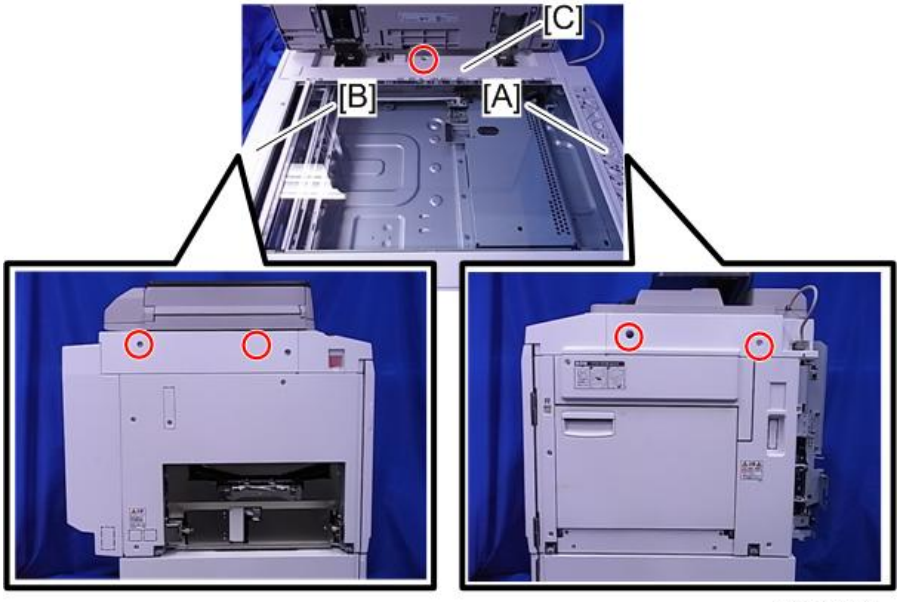
Operation Panel



C2801445

[A] Operation panel (x7, x1)

Scanner Covers



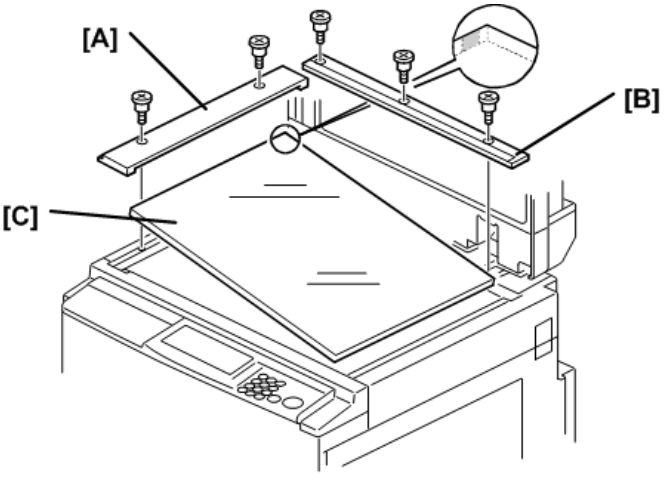
C2801446

[A] Right scanner cover (x2)

[B] Left scanner cover (x2)

[C] Rear scanner cover (x1)

Exposure Glass, Scales



c262r003

[A] Left scale (x2)

[B] Upper scale (x3)

[C] Exposure glass

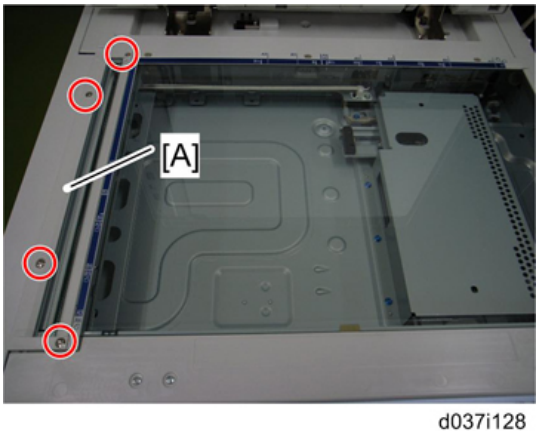
Important

- When you install the glass, make sure that the dot is at the rear left corner as shown in the diagram.

Scanner Unit

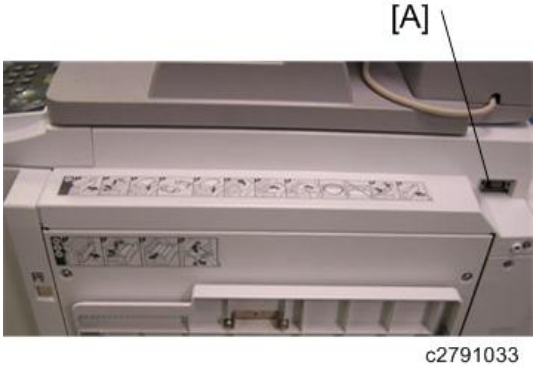
Exposure Glass

1. Open the ADF or platen cover.



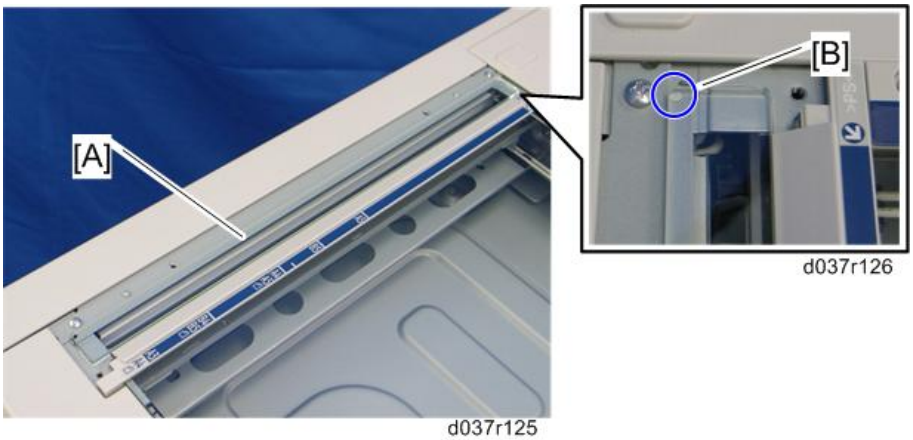
d037i128

2. Glass cover [A] (x4)



c2791033

3. Disconnect the DF I/F cable [A]

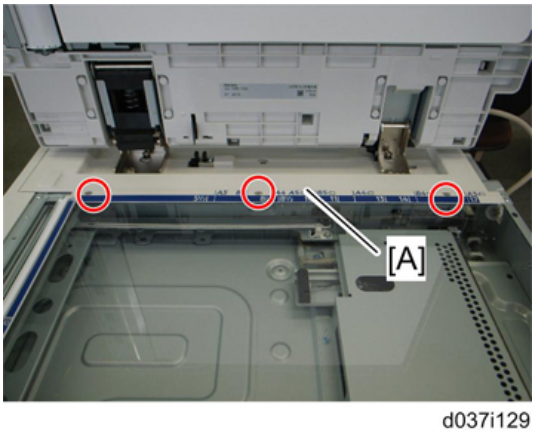


d037r125 d037r126

4. ADF exposure glass [A]

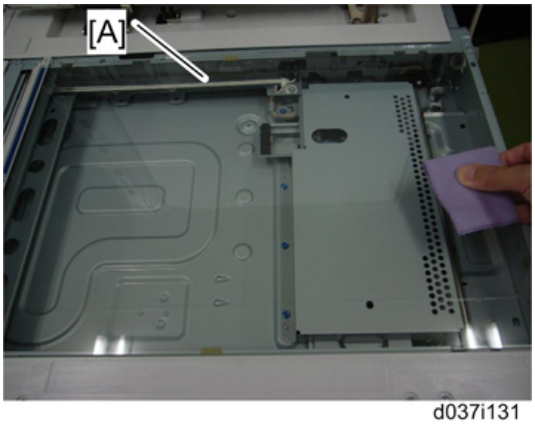
Note

- Position the white marker [B] at the rear left corner when you reattach the ADF exposure glass.



d037i129

5. Rear scale [A] (x3)



d037i131

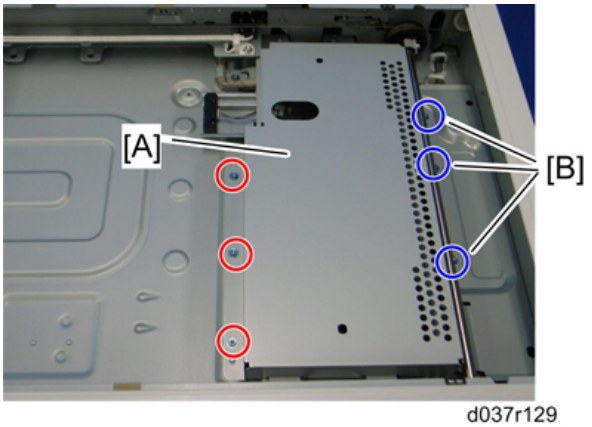
6. Exposure glass [A] with left scale

Note

- Position the marker at the front left corner when you reattach the exposure glass.

Original Length Sensors

1. Remove exposure glass, left scale.

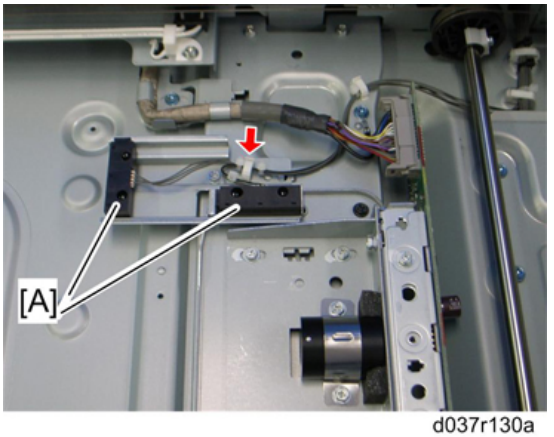


d037r129

2. SBU cover [A] (x6)

Note

- The three screws [B] do not need to be fully removed. Just loosen them to remove the SBU cover.

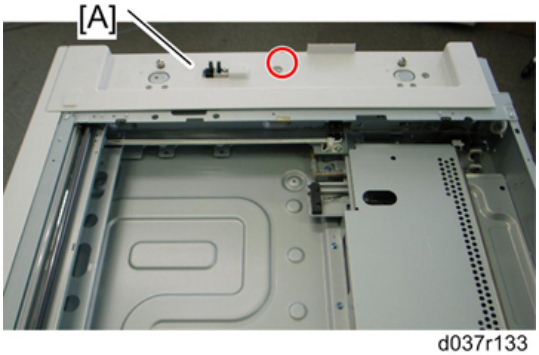


d037r130a

3. Original length sensors [A] (hooks, x1, x1 each)

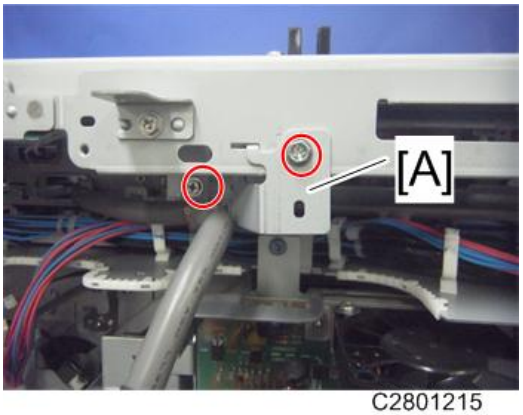
Exposure Lamp

1. Remove:
    - ADF
    - Rear cover
    - Operation panel
    - Exposure glass



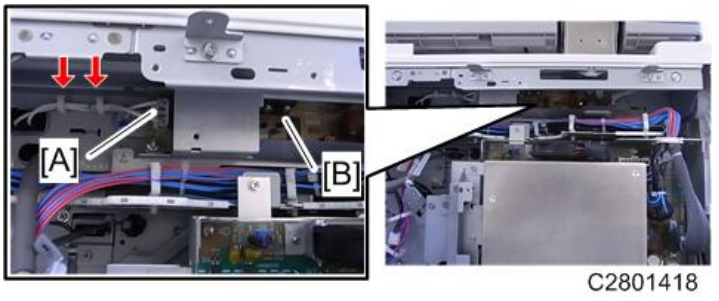
d037r133

2. Remove the scanner rear cover.
3. Disconnect the ADF, ground wire, and then open the MPU board.

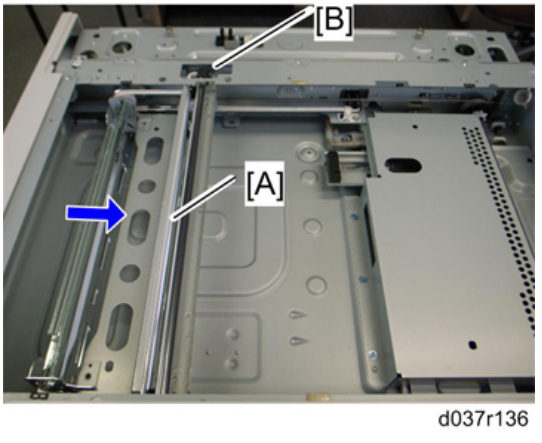


C2801215

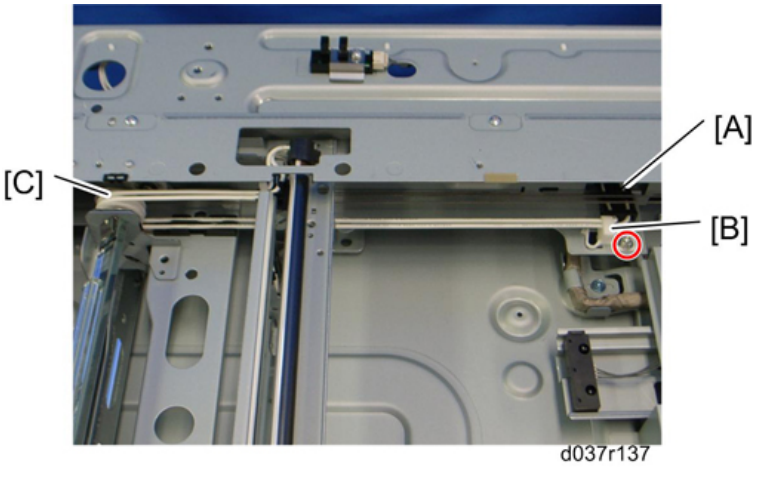
4. Disconnect the scanner harness bracket [A] (x2).



5. Disconnect connector [A] from the lamp stabilizer [B] (x2, x1)



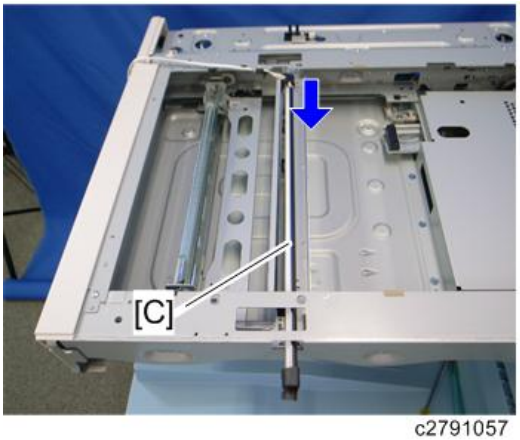
6. Move the carriage unit [A] to cutout position [B].



7. Remove hook [A] and clamp [B] (x1, x1).
8. Disconnect pulley [C] (hooks).
9. Pulley [C].

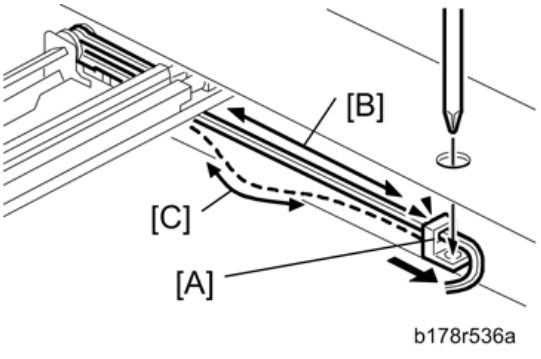
Note

- Keep the cable guide for reassembling.



10. Remove exposure lamp [A] in direction of arrow.

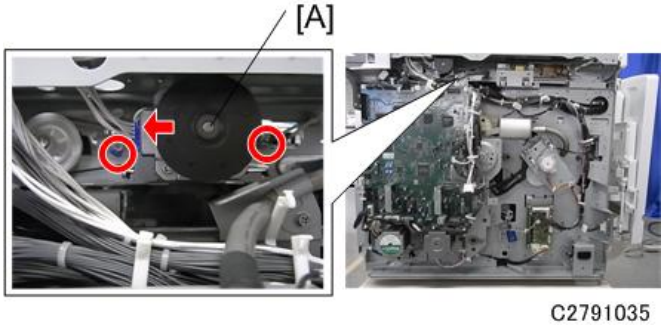
Reassembling



1. Run the cable so there is no slack.
2. Slide the adjustor clamp [A] to adjust the cable slack ([B]: Good, [C]: Not good).

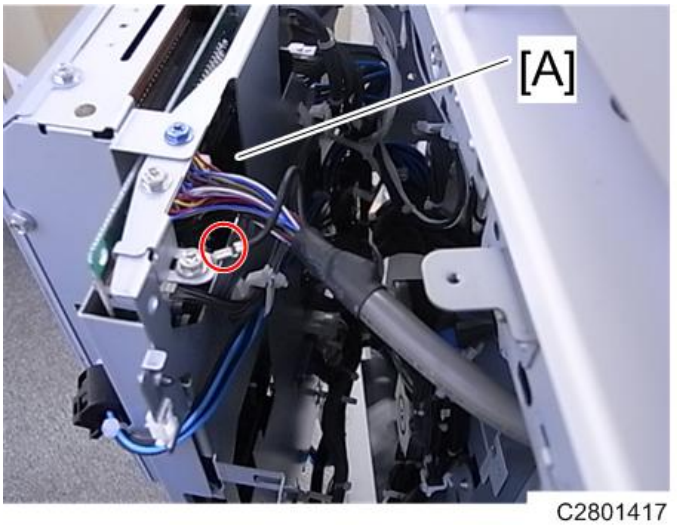
Scanner Motor

1. Rear cover



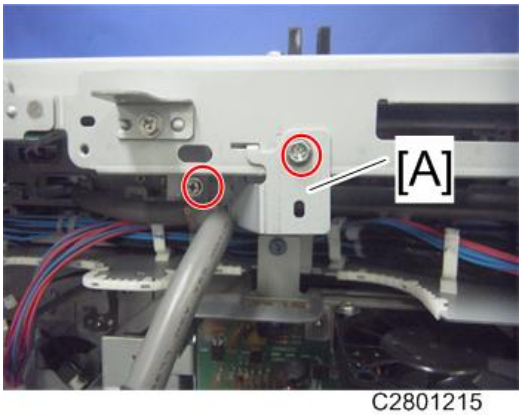
C2791035

2. Remove the scanner rear cover.



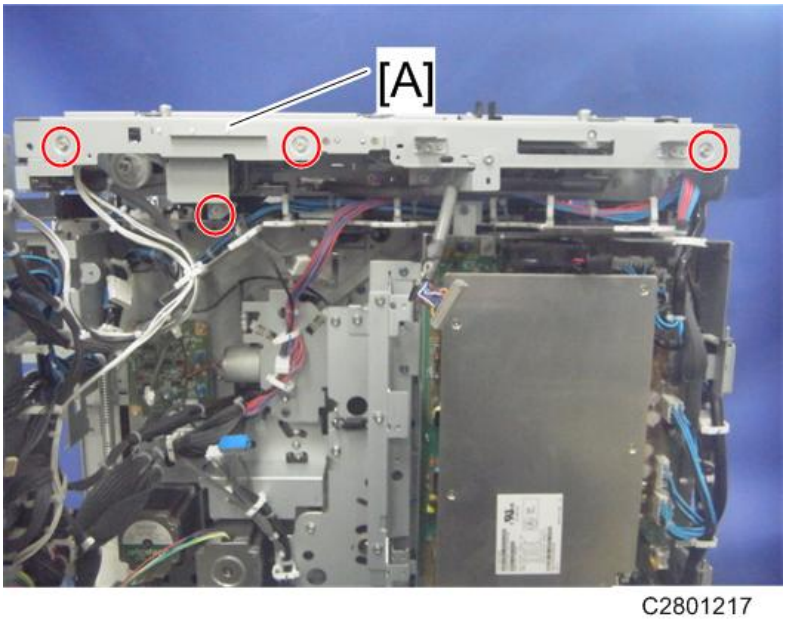
C2801417

3. Remove ADF connector [A], ground wire, and then open the MPU board (x1, x1).



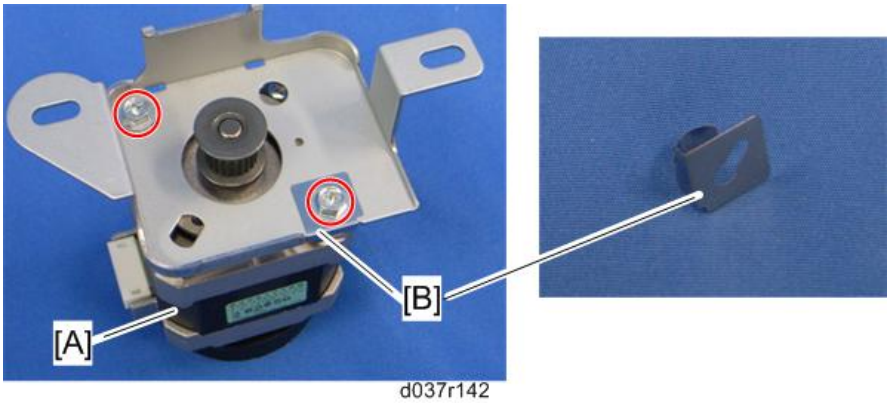
C2801215

4. Remove scanner harness bracket [A] (x2).



C2801217

5. Remove stay [A] (x4).
6. Scanner motor assembly [A] (x2, x1, x1, x1)



d037r142

7. Separate the scanner motor [A] and ground plate [B] (x2)

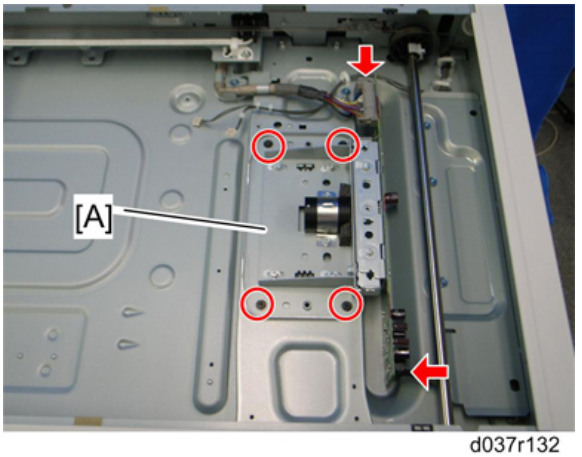
Note

- Make sure that the ground plate [B] is attached when installing the scanner motor in the scanner motor bracket.
- Do the scanner image adjustment after replacing the scanner motor

Sensor Board Unit (SBU)

1. Remove exposure glass

2. Original length sensor assembly (x2, x2, x2)

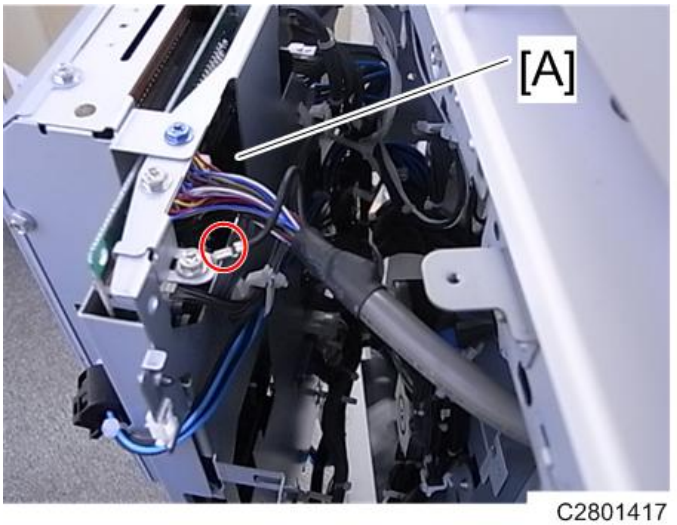


d037r132

3. Sensor board unit [A] and ground screw (x5, x2)

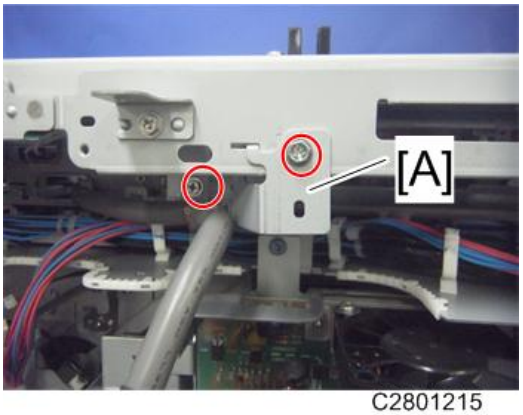
Exposure Lamp Stabilizer

1. Remove the rear cover.
2. Remove the scanner rear cover.



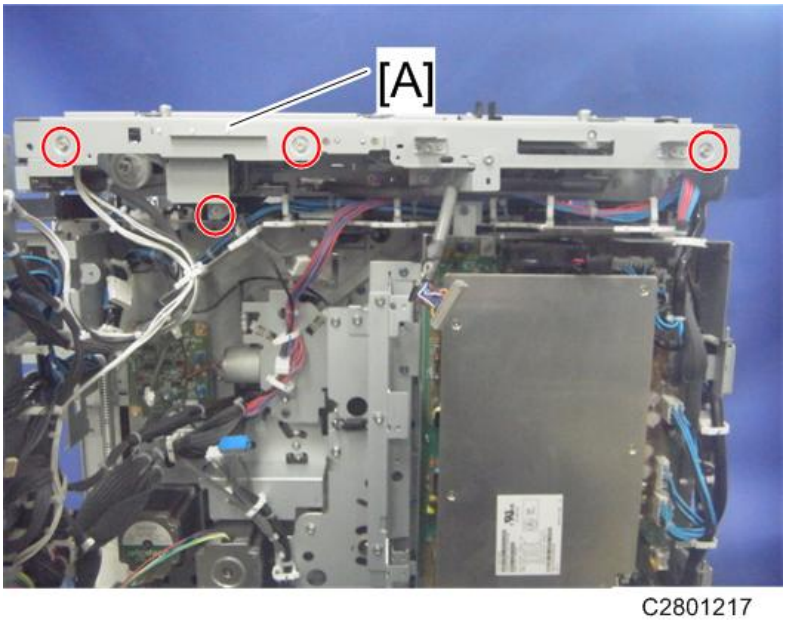
C2801417

3. Remove ADF connector [A] and ground wire, and then open the MPU board (x1, x1).



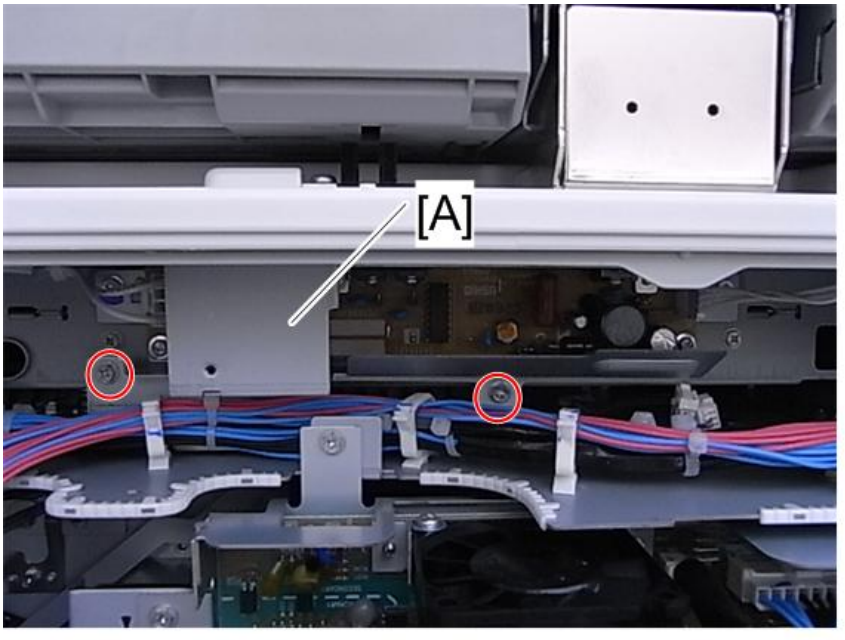
C2801215

4. Remove scanner harness bracket [A] (x2).



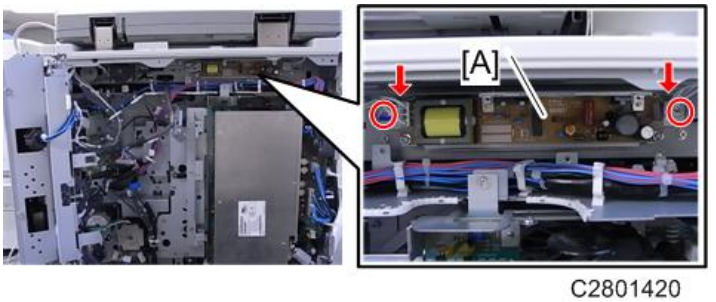
C2801217

5. Remove stay [A] (x4).



C2801415

6. Remove bracket [A] (x2).

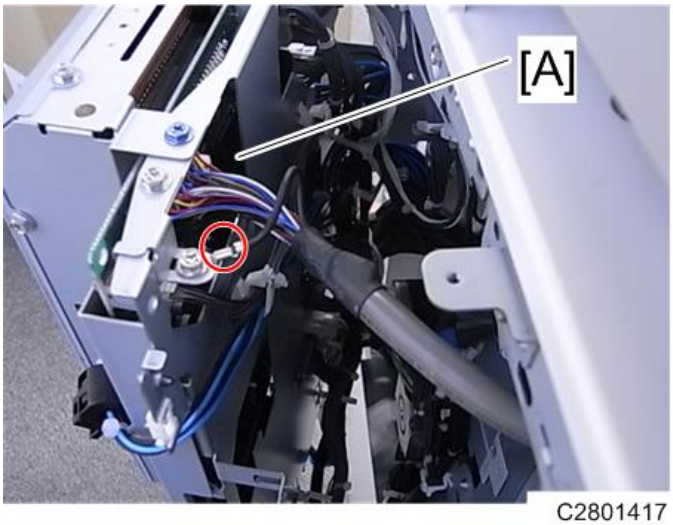


C2801420

7. Remove the stabilizer unit (x2, x2).

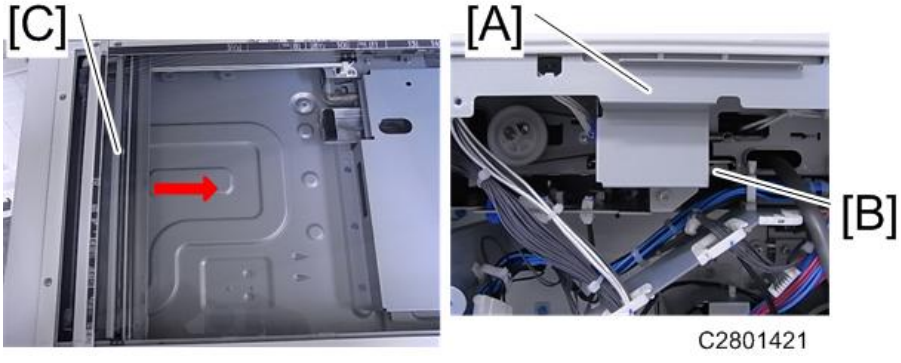
Scanner HP Sensor

1. Remove rear cover.
2. Remove scanner rear cover



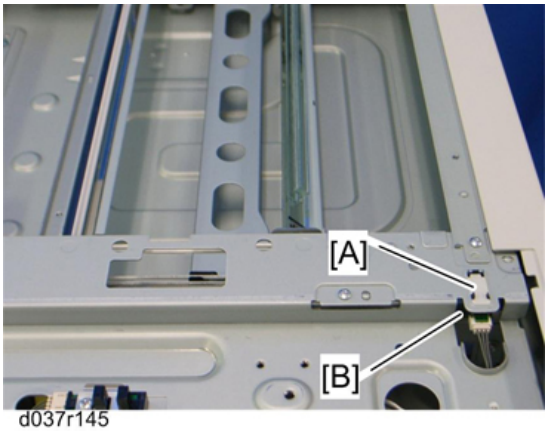
C2801417

3. Disconnect the ADF connector [A] and ground wire, and then open the MPU board (x1, x1).



C2801421

4. Behind bracket [A] rotate the scanner motor [B] clockwise to move the exposure lamp unit [C] as far as the plate on the right..

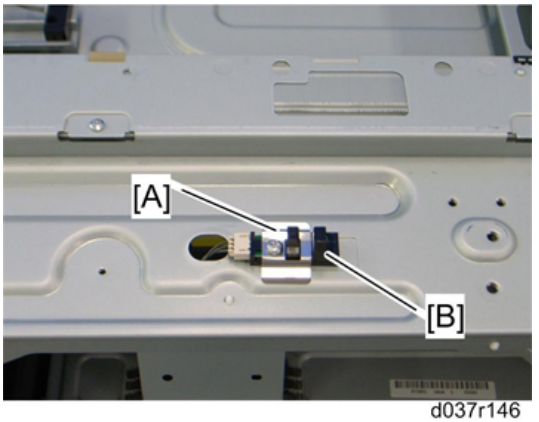


d037r145

5. Remove the mylar [A].
6. Remove the scanner HP sensor [B] (x1, hooks).

Platen Cover Sensor

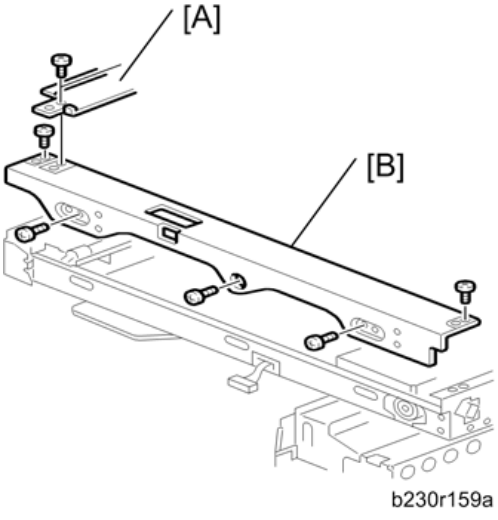
1. Remove scanner rear cover.



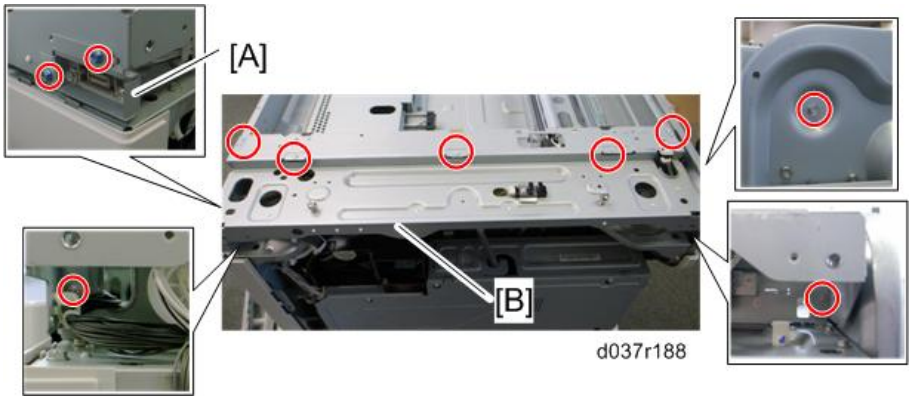
2. Holder bracket [A] (1)
3. Platen cover sensor [B] (x1)

Front Scanner Wire

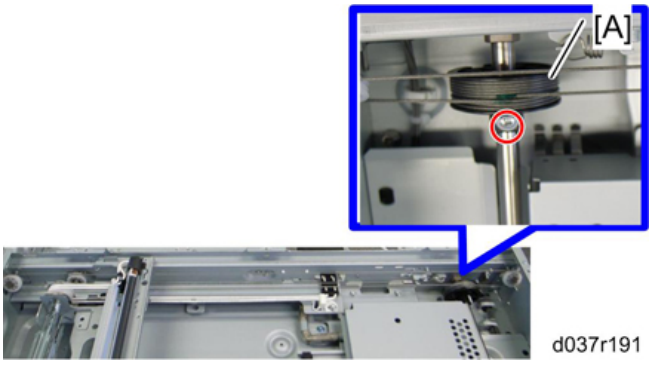
1. Remove:
   - Rear cover
   - Operation panel
   - Exposure glass
   - Left cover



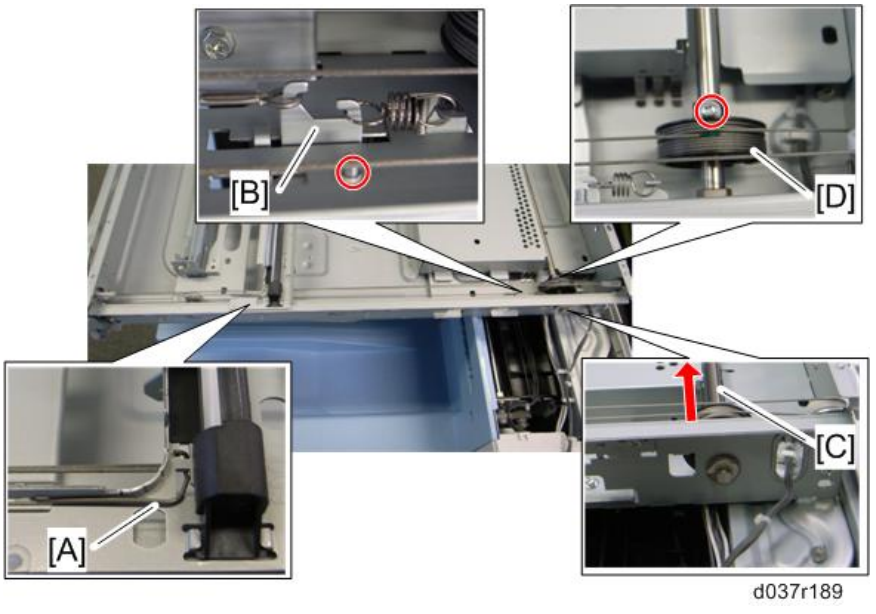
2. Remove scanner left stay [A] (x3).
3. Scanner front frame [B] (x5, x3)



4. Take aside the connector bracket [A] (x2).
5. Remove scanner rear frame [B] (x8, x All, x All)
6. Remove the scanner motor.

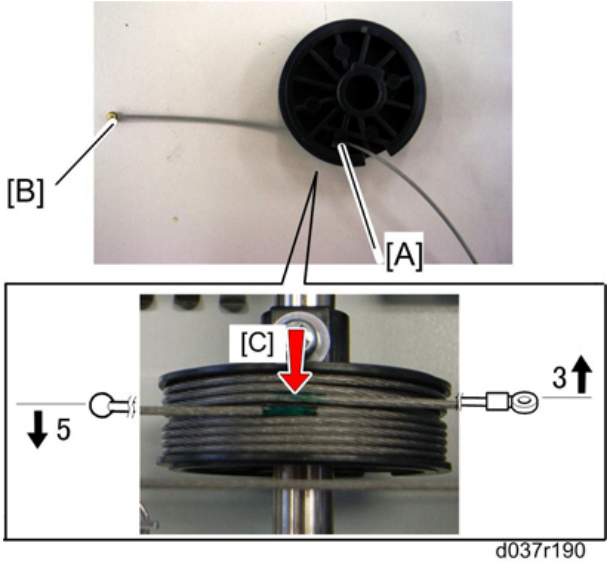


7. Rear scanner drive pulley [A] (x1)



8. Front scanner wire clamp [A]
9. Loosen the front scanner wire bracket [B] (x1)
10. Front scanner wire.
11. Move the shaft [C] in the red arrow direction (x1: at front), and remove the scanner drive pulley [D] (x1).

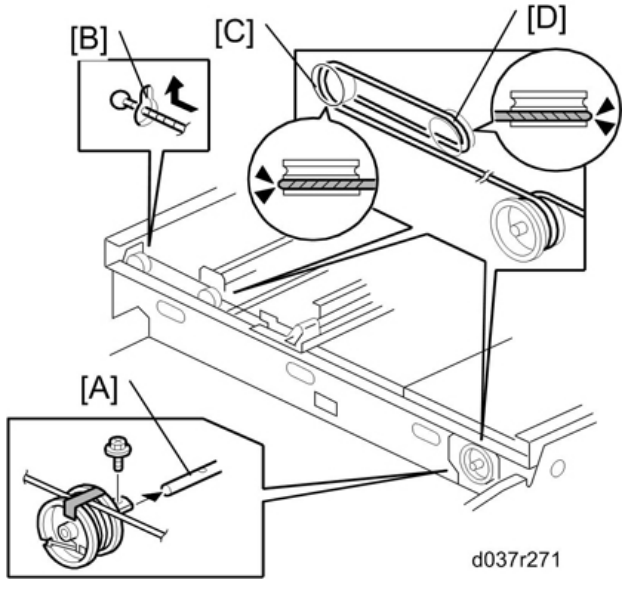
Reinstalling the Front Scanner Wire



1. Position the center ball [A] in the middle of the forked holder.
2. Pass the right end (with the ball) [B] through the square hole. Pass the left end (with the ring) through the notch.
3. Wind the right end counterclockwise (shown from the machine's front) five times. Wind the left end clockwise three times.

Note

- The two green marks [C] come together when you have done this. Stick the wire to the pulley with tape. This lets you easily handle the assembly at the time of installation.

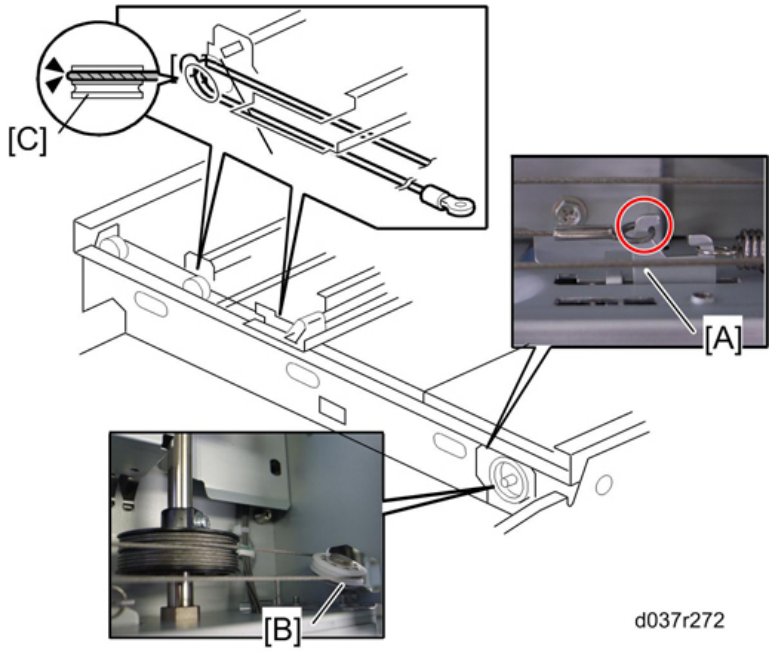


4. Install the drive pulley on the shaft [A] (×1, ×1).

Note

- Do not attach the pulley to the shaft with the screw at this time.

5. Insert the left end into the slit [B]. The end should go via the rear track of the left pulley [C] and the rear track of the movable pulley [D].

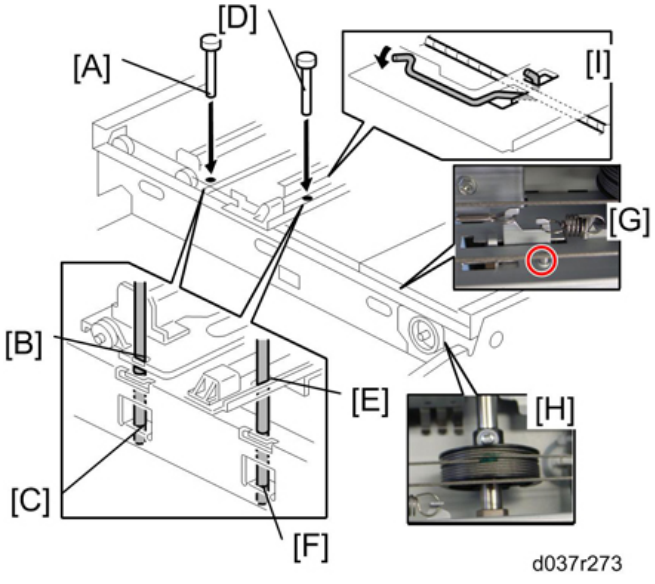


6. Hook the right end onto the front scanner wire bracket [A]. The end should go via the rear track of the right pulley [B] and the rear track of the movable pulley [C].

Note

- Do not attach the scanner wire bracket with the screw at this time.

7. Remove the tape from the drive pulley.



8. Insert a scanner positioning pin [A] through the 2nd carriage hole [B] and the left holes [C] in the front rail. Insert another scanner positioning pin [D] through the 1st carriage hole [E] and the right holes in the front rail [F].
9. Insert two more scanner positioning pins through the holes in the rear rail.
10. Screw the drive pulley to the shaft [G].
11. Screw the scanner wire bracket to the front rail [H].
12. Install the scanner wire clamp [I].
13. Pull out the positioning pins.

Note

- Make sure the 1st and 2nd carriages move smoothly after you remove the positioning pins. Do Steps 8 through 13 again if they do not.

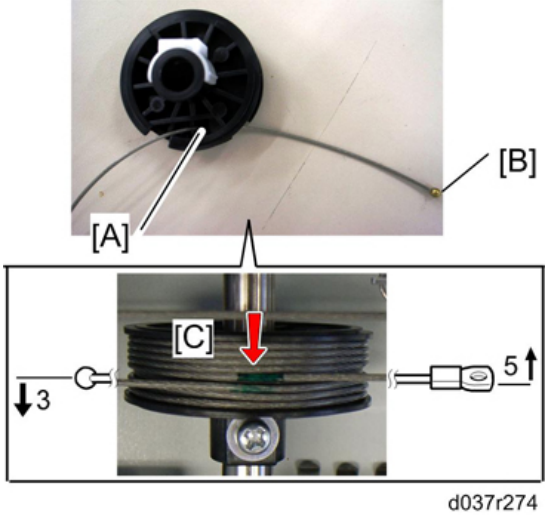
Rear Scanner Wire

1. Remove:
    - Rear cover

- Operation panel
- Exposure glass
- Left cover

2. Remove front scanner wire (see above).
3. Remove:
   - Scanner front frame
   - Scanner left stay
   - Scanner rear frame
4. Follow Steps 10 to 14 in the "Front Scanner Wire" procedure. You can remove the rear scanner wire in the same way as replacing the front scanner wire.

Reinstalling the Rear Scanner Wire



1. Position the center ball [A] in the middle of the forked holder.
2. Pass the left end (with the ball) [B] through the drive pulley notch. Pass the right end (with the ring) through the drive pulley hole.
3. Wind the left end [B] clockwise (shown from the machine's front) five times. Wind the right end counterclockwise three times.

   Note

   - The two green marks [C] come together when you do this. Attach the wire to the pulley with tape. This lets you easily handle the assembly at the time of installation.
4. Install the drive pulley on the shaft.

Note

- Do not attach the pulley on the shaft with the screw at this time.

5. Install the wire.

Note

- The winding of the wire on the three pulleys at the rear of the scanner should be the same as the winding on the three pulleys at the front. This must show as a mirror image.

Example:

- At the front of the machine, the side of the drive pulley with the three windings must face the front of the machine. At the rear of the machine, it must face the rear.
- Do Steps 7 to 13 for reinstalling the front scanner wire in this section.

Copy Image Adjustment

Leading Edge Registration Adjustment

Purpose: To adjust the leading edge registration on prints by changing the image scanning start positions in platen and ADF modes.

Adjustment standard:

- Within -2.0 to 5.0 mm (in platen mode)
- Within 0 ±5.0 mm (in ADF mode)

Important

- **This adjustment is required every time the ECU has been replaced.**

1. Turn on the main switch, and make a copy in platen mode. The image position on the trial print that is automatically made after making a master tends to be not constant. Do not use the trial print to check the copy image.
2. Measure the difference between the leading edge registration of the original and the print. If the registration does not meet specifications, go to the next step.
3. Open SP6-001-3 (Scan Start Position Adjustment - Platen Mode).
4. Adjust the gap.
5. Exit the SP mode and make a copy.
6. Re-measure the leading edge registration to ensure it is within specifications. If the registration meets specifications, go to the next step.
7. Make a copy in ADF mode and repeat the same steps using SP6-001-4 (Scan Start Position - DF Mode).
    - The specification in ADF mode is 0±5.0 mm.
    - The master clamping position is adjustable using SP6-003-1 (Master Clamp Registration).
    - Changing the clamping position with this SP also adjusts the leading edge registration. Normally, do not use this SP mode for adjusting the leading edge registration.

Side-to-Side Registration Adjustment

Purpose: To adjust the side-to-side image position on prints by changing the main-scan positions in platen and ADF modes.

Adjustment standard:

- Within -5.0 to 5.0 mm (in platen mode)
- Within 0±5.0 mm (in ADF mode)

Important

- **This adjustment is required every time the ECU has been replaced.**

1. Turn on the main switch, and make a copy in platen mode.
    - The image position on the trial print that is automatically made after making a master tends to be inconstant.
    - Do not use the trial print to check the copy image.
2. Measure the difference between the side-to-side edge registration of the original and the print. If the registration does not meet specifications, go to the next step.
3. Open SP6-001-1 (Main-scan Position - Platen Mode).
4. Adjust the gap.
5. Exit the SP mode and make a copy.
6. Re-measure the side-to-side registration to ensure it is within specifications. If the registration meets specifications, go to the next step.
7. Make a copy in ADF mode and repeat the same steps using SP6-001-2 (Main-scan Position - DF Mode). The specification in ADF mode is 0 to 5.0 mm.

Vertical Magnification Adjustment

Purpose: To adjust the vertical magnification to within the adjustment standard by changing the master writing speed.

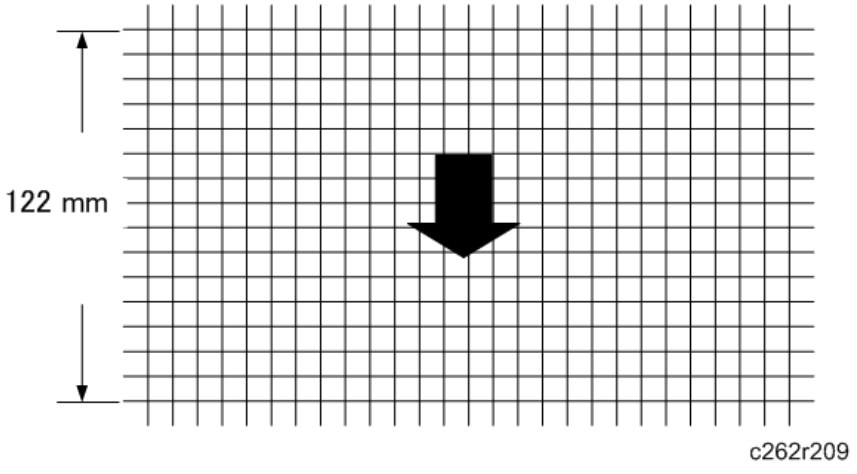
Adjustment standard:

- Within 100±1.0%

Important

- **This adjustment is required every time the ECU is replaced.**

1. Turn on the main switch, open SP8-005-1 (TH Test Patterns), and print pattern number 6.
2. On the printout, measure the distance of 15 intervals in the sub-scan direction, as shown in the diagram.



1. The distance should be 122 mm. If it is not 122 mm, calculate the necessary adjustment with the following formula.

[(122 - measured value) / 122] x 100 = x.x %

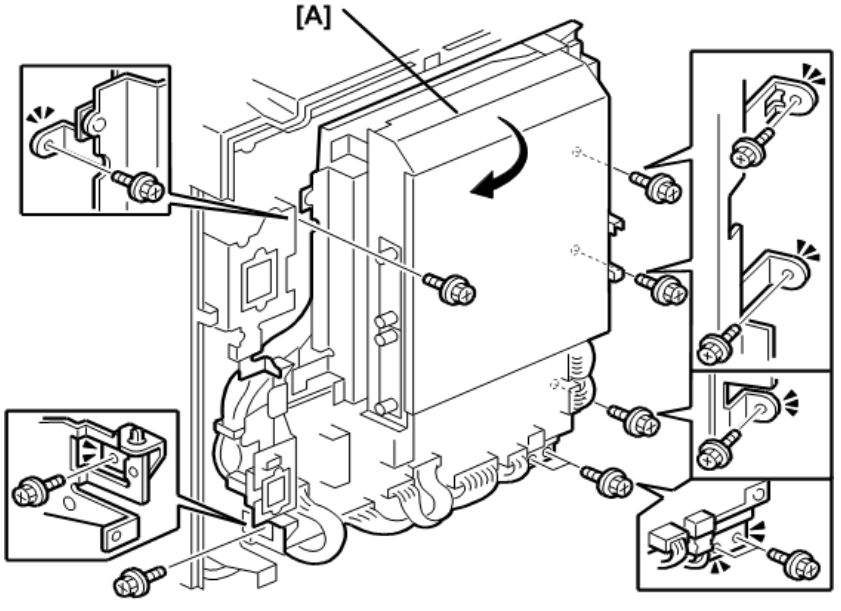
1. Open SP6-001-7 (Master writing speed) and adjust the value (x.x %).
2. Open SP8-005-1 (TH Test Patterns) and print pattern number 6.
3. Check the distance of 15 intervals in the sub-scan direction again, to ensure it is within specifications

Note

- The image scanning speed can be adjusted with SP6-001-5, -6 (Scanning speed).
- If you change the speed with this SP, the vertical magnification also changes.
- Normally, do not use this SP mode to adjust the vertical magnification.

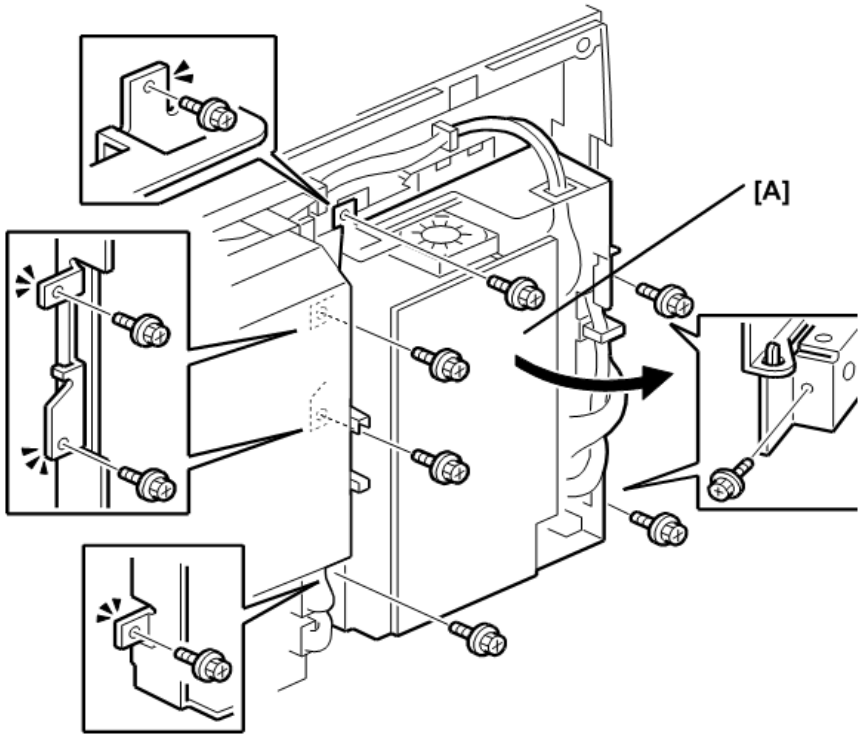
Boards

ACU and ECU, PSU Opening Procedure



- Rear Cover p.75

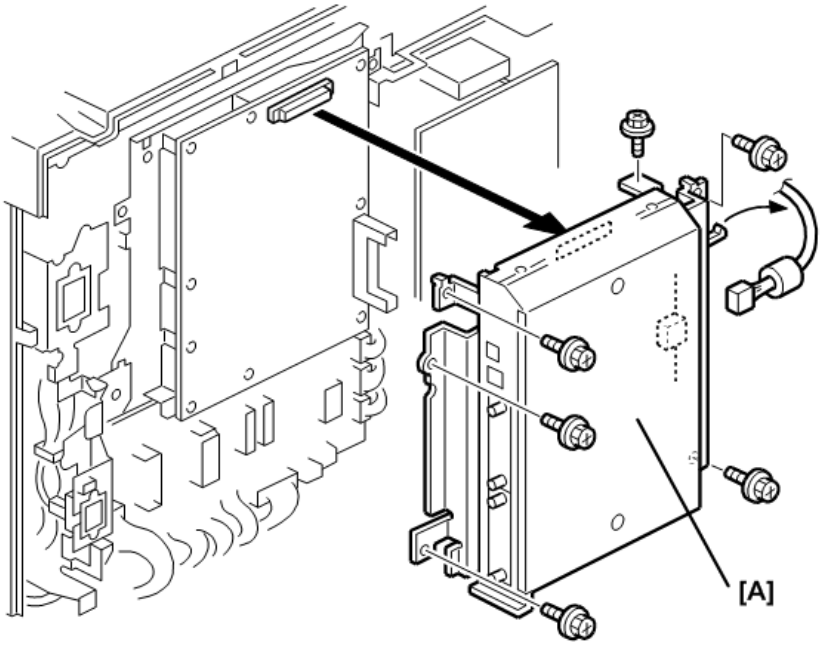
  [A] Open out the ACU - ECU assembly (x6)



c262r030

[A] Open out the PSU (x6)

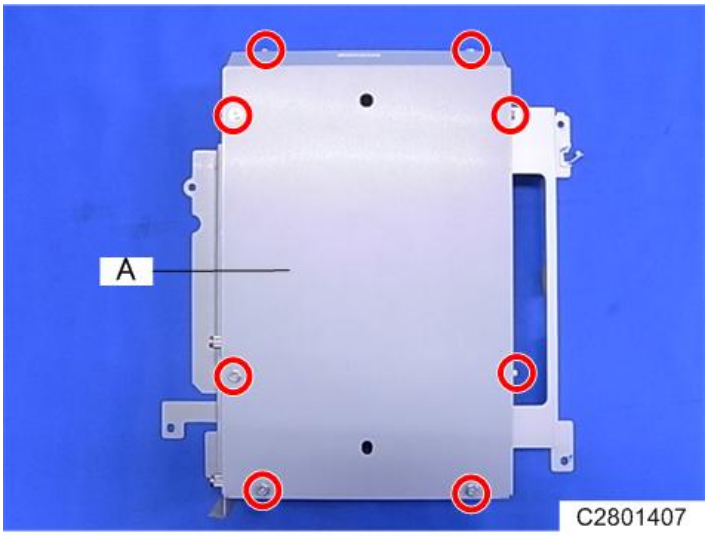
ACU, ECU, I/O



c262r016

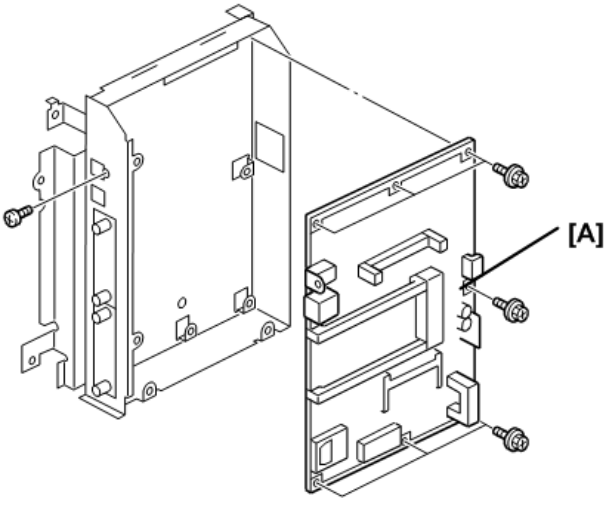
- Rear cover p.75

  [A] ACU assembly (x6, x1)



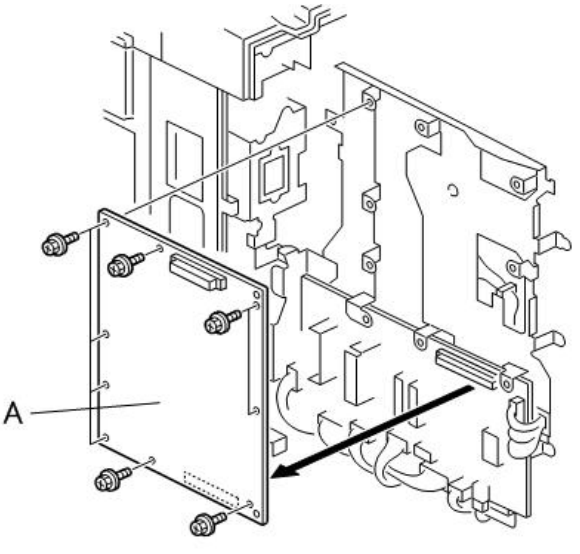
C2801407

[A] Controller cover (x8)



c262r018

[A] ACU (x7)

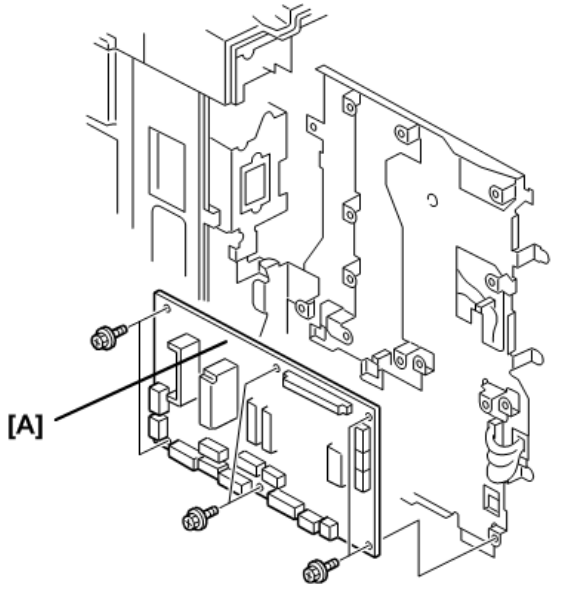


C2801409

[A] ECU (x9, x11)

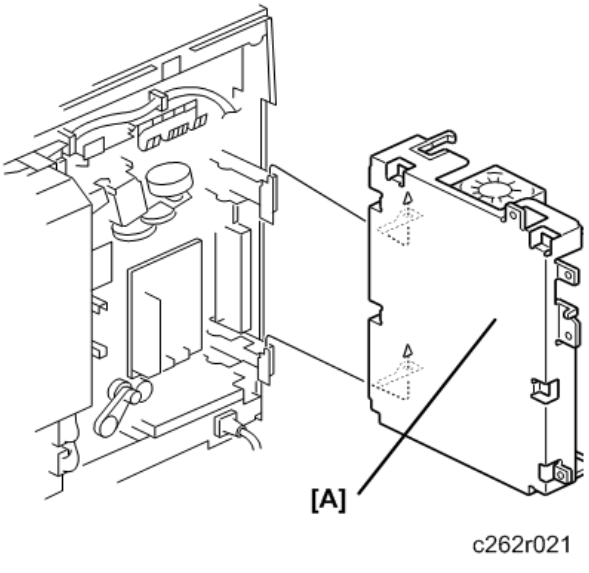
After you install the new ECU, do these adjustments:

- SBU Calibration ☛ 3.3.6 SBU (Sensor Board Unit) Calibration
- Copy Image Adjustments ☛ p.100
- Also see ECU and I/O Board Replacement



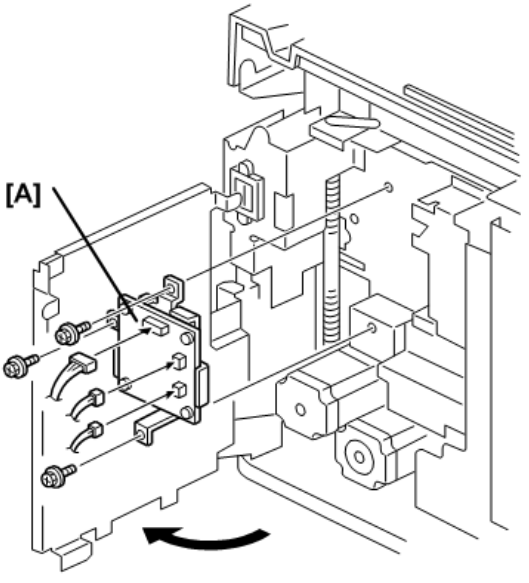
[A] I/O (x6, x16)

PSU



- Rear Cover p.75
- [A] PSU (x6 , x11)
- Do the thermal head voltage adjustment after you install the new PSU. p.134

Double Feed Detector Board



c262r158

- Rear cover p.75
- ECU p.103
- [A] Double feed detector board (x3, x3)

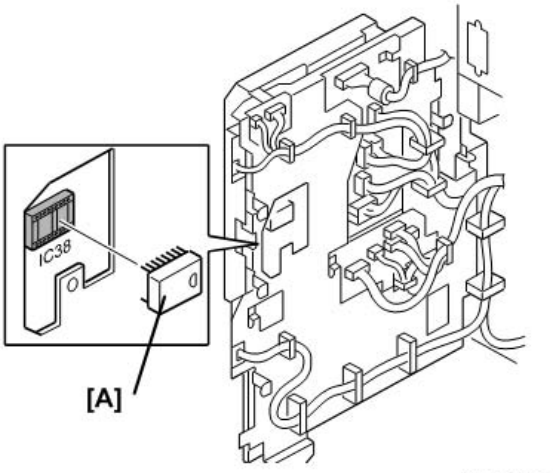
ECU and I/O Replacement, NVRAMS

SP mode data and other adjustment data are stored in the backup RAM on the ECU. There are adjustable potentiometers on the I/O. Therefore, after the ECU and/or I/O are replaced, the following adjustments are needed.

After the ECU is replaced

The SP mode data returns to the default. Save the data SP mode in order to restore it later. If possible, print out all system parameter lists with SP8-001-1 to SP8-001-15.

- Do all the copy image adjustments. p.100
- Master end sensor adjustment. p.135



c262r157

- If you use the backup RAM [A] (IC27) from the old ECU on the new one, all data, including data in the SP modes, will be restored.
- You do not have to do the above procedures. (The battery inside the RAM preserves the data if the RAM is removed from the ECU.)

After the I/O board is replaced

Carry out the adjustments for the 1st drum master, 2nd drum master, master eject, master set sensor, master end, and master edge sensors.

When both the ECU and I/O board are replaced

Do all of the above adjustments. (The adjustments listed for the ECU are not necessary if you put the old RAM on the new ECU.)

SP Mode Settings after Replacing an NVRAM

NVRAM for the ACU

When the NVRAM for the ACU is replaced, the following data will lost:

- Machine code
- Serial number
- Option settings
- Optional counter

After you replace the NVRAM, do the following SP modes:

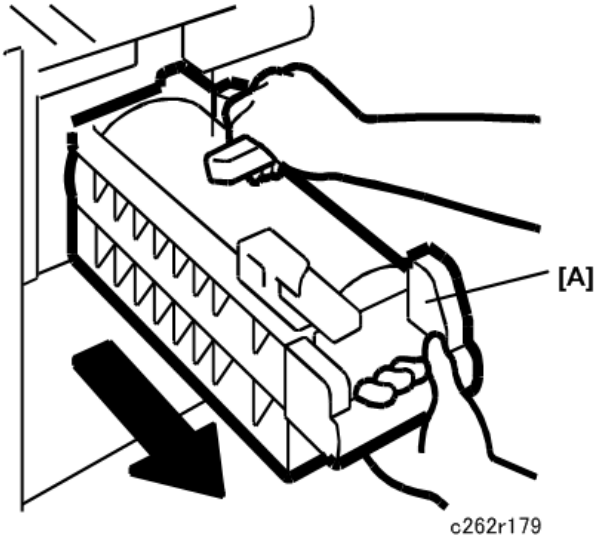
- **SP7-1-1 Memory Clear - Factory setting**: Clears the setting so that the electrical counter will reset and start to count. The electrical counter will not count unless you do this procedure.
- **Machine Code Setting**: When the machine code is set, the destination, language, and so on will be set automatically, so that all the settings do not have to be set individually.
- **Serial Number**: Set the machine's serial number.

NVRAM for the ECU

After the NVRAM for the ECU is replaced, the settings that were made at the factory for this machine will be lost. These settings are written on the sheet of paper stored under the front cover. Set all the SP modes according to the sheet of paper under the front cover.

Master Eject Section

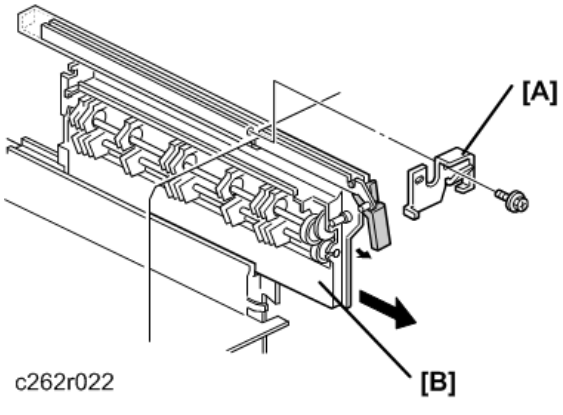
Master Eject Box



- Open the front cover.

  [A] Master eject box

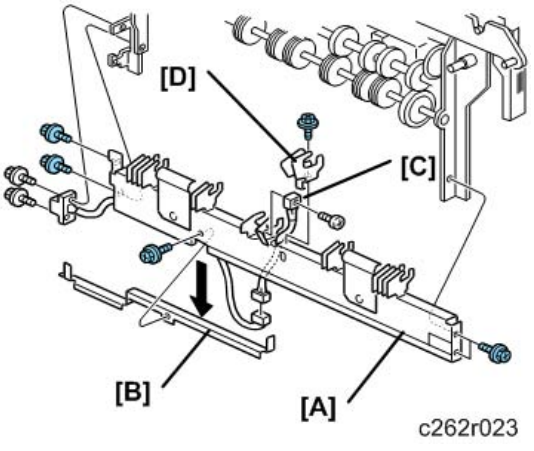
Master Eject Roller Unit, Master Eject Sensor



- Open the front cover.

  [A] Supporter (x1)

  [B] Master eject roller unit



[A] Lower master eject roller unit (x6)

[B] Master eject sensor cover (x1)

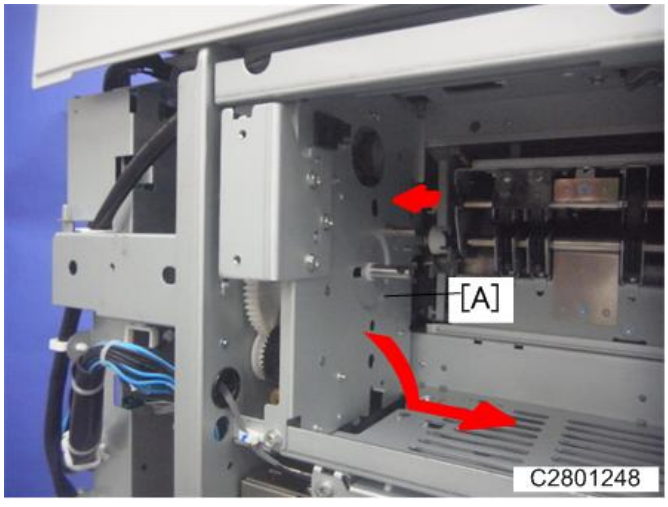
[C] Master eject sensor bracket (x1)

[D] Master eject sensor (x1, x1)

- Do the master eject sensor adjustment after you install the new master eject sensor. p.114

Master Eject Drive Unit, Sensors and Motors

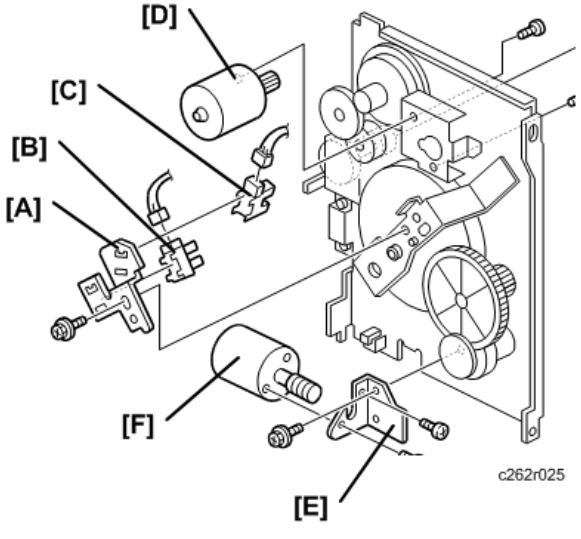
- Rear Cover p.75
- PSU p.103
- Left scanner cover p.75
- Master eject box p.111
- Master eject roller unit p.111



[A] Master eject drive unit (x2, x4)

To remove the master eject drive unit [B]:

- Slide it out towards the paper delivery direction, and pull down the top of the unit towards the operation panel. (See the arrows in the illustration.)
- The master eject drive unit is connected to the cables from the sensor and the motor. Remove the master eject drive unit carefully.



[A] Sensor bracket (x1)

[B] Pressure plate HP sensor (x1)

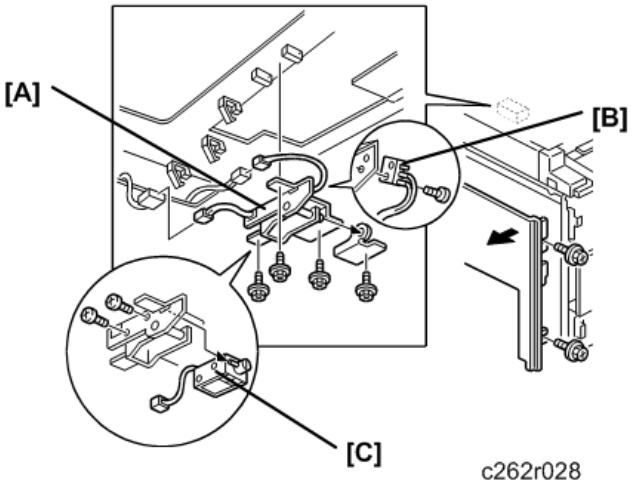
[C] Pressure plate limit position sensor (x1)

[D] Master eject motor (x2)

[E] Pressure plate motor bracket (x2)

[F] Pressure plate motor (x2)

Master Eject Box Lock Solenoid



- Left cover p.75
- Master eject box p.111

  [A] Master eject box lock solenoid bracket (x4, x2)

  [B] Master eject box lock sensor (x1)

  [C] Master eject box lock solenoid (x2)

Master Eject Sensor Adjustment

Purpose: To ensure that the sensor detects the ejected master properly.

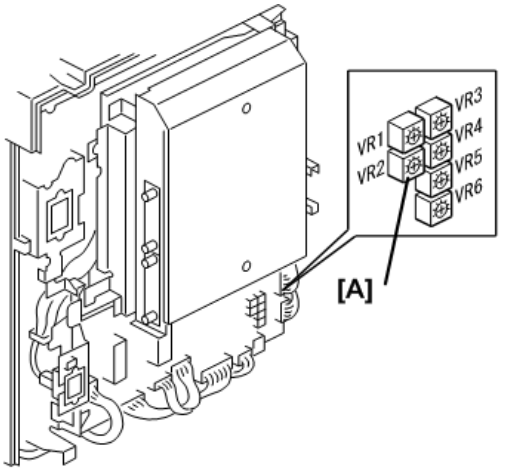
Standard: 1.5 volts (within "+0.1" and "-0.1" volts)

The sensor adjustment is required in the following cases:

- When the sensor is replaced.
- When the I/O board is replaced.

Important

- **While adjusting, be sure to attach all exterior covers to avoid external light.**
- **Do not turn the VRs excessively.**
- **If the sensor is dirty, clean or replace it.**

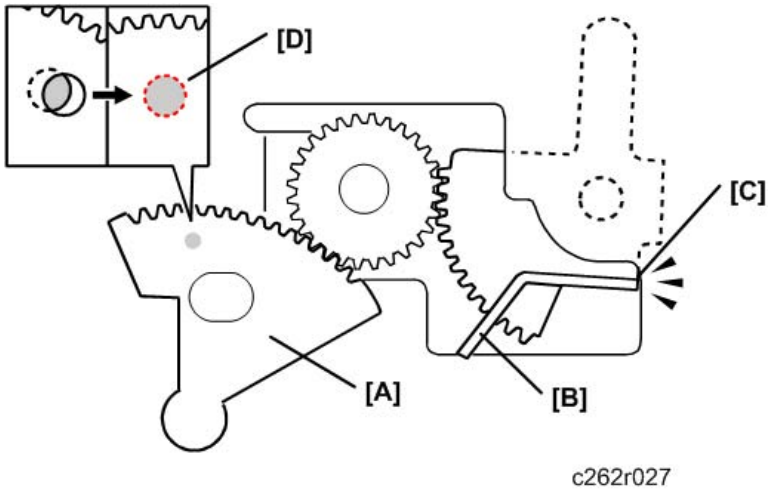


c262r026

- Rear cover p.75
- Master eject box p.111
- Make sure that the master eject box and drum are installed.

1. Turn on the main switch, then access SP6-4-1 (Master Eject Sensor).
2. The sensor input voltage is displayed on the operation panel. Turn VR2 [A] on the I/O board to the right until the value is between 1.4 and 1.6 volts.
3. Leave the SP mode.

Reassembling the Master Pick-Up Roller Drive Gears



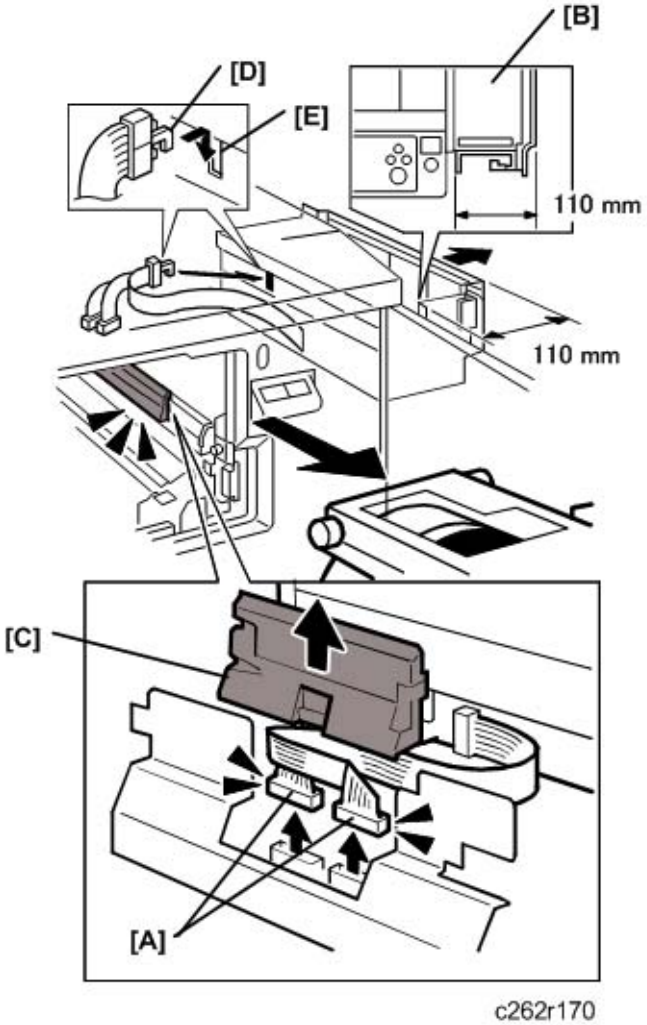
c262r027

Purpose: When the master pick-up roller drive sector gear [A] or master eject clamper drive arm [B] have been removed, they must be re-installed in the correct position.

1. The master eject clamper drive arm [B] must be flush with the cutout [C] n the frame, as shown.
2. While you hold the arm in the above position, install the sector gear [A]. The small positioning hole in the sector gear [D] must exactly overlap the positioning hole in the frame, as shown.

Master Feed Section

Master Making Unit



Important

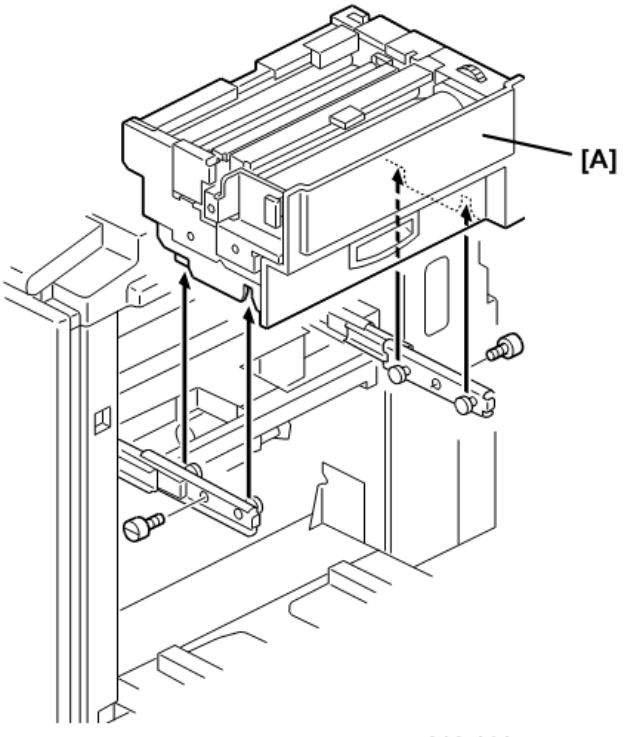
- **When you remove the master making unit from the main frame, make sure to disconnect the two connectors [A].**
- Drum unit ☛ p.143

1. Pull out the master making unit [B]. Make sure that the distance between the main frame and the edge of the master making unit is 110 mm or less. If you pull the unit out more than 110 mm, you cannot do step 4.

2. Remove the connector cover [C].
3. Remove the two connectors [A].
4. Check that the hook on the flat cable [D] is attached to notch [E] in the master feed control roller bracket.

Important

- **This hook must always be attached when you install the master making unit, to prevent damage to the cable.**

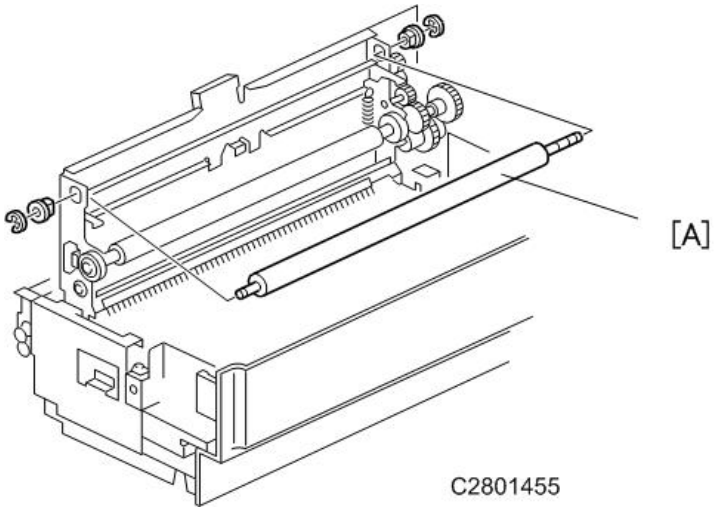


1. Remove the master making unit [F] (x2).

Important

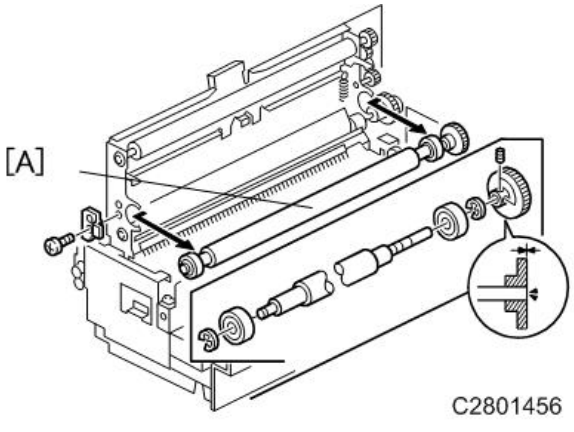
- **After you re-install the master making unit, be sure to re-attach its two connectors.**

Master Set Roller, Platen Roller, Upper Tension Roller

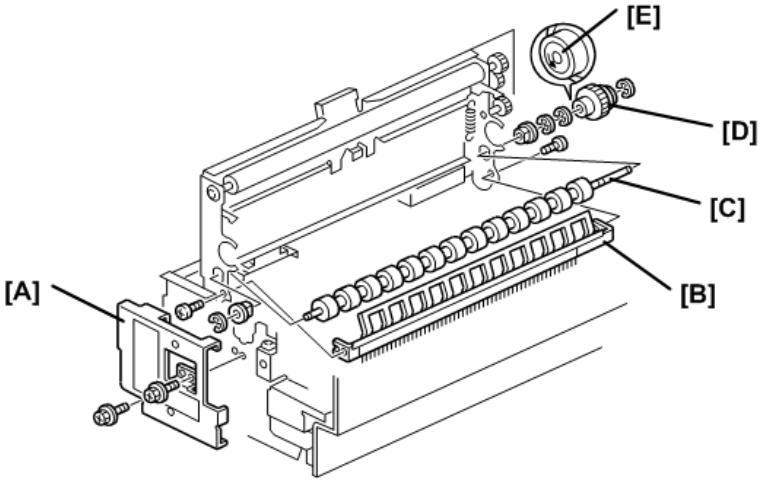


- Master making unit ☛ p.117

  [A] Master set roller (x2)



[A] Platen roller (x2, x4)



c262r152

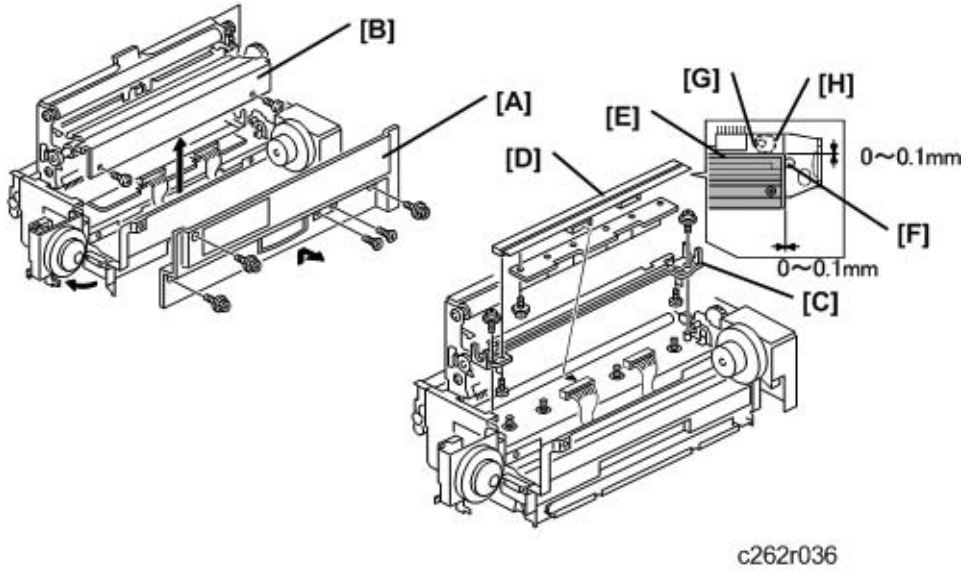
[A] Front bracket (x2)

[B] Tension roller guide (x3)

[C] Upper tension roller (x4)

- When you install the one-way clutch [D], position the one-way clutch and marking [E] as shown in the diagram.

Thermal Head



c262r036

- Master making unit ☛ p.117

[A] Master making unit right cover (x5)

[B] Thermal head cover (x2)

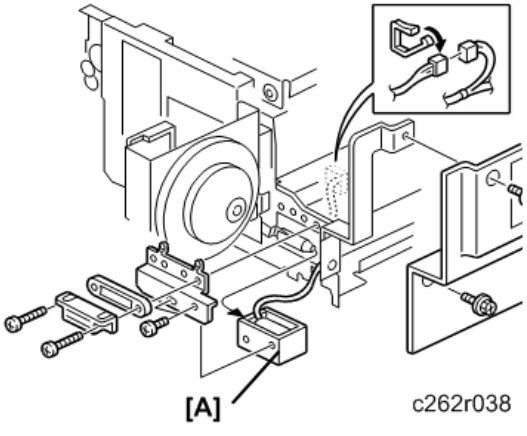
[C] Thermal head base (x2, x2)

[D] Thermal head (x10)

Re-installation

1. When you re-install the thermal head, make sure that these distances are 0 to 0.1 mm
   - At the right edge of the thermal head: The distance between the thermal head [E] and the projection [F]
   - At the left and right edges of the thermal head: The distance between the thermal head [E] and the thermal head guide plate [G].
   - At the left and right edges of the thermal head: The distance between the thermal head [E] and the eccentric bushing [H].
2. After the replacement, adjust the thermal head voltage ☛ p.134
3. Make sure that there is no foreign material on the thermal head surface (especially on the heating elements).
4. Never touch the surface with bare hands. If you do touch it, clean the surface with alcohol.
5. Also, do not touch the surface of the master film with bare hands.
6. Connect and disconnect the connectors carefully.
7. Keep them horizontal. Also, make sure that they are reconnected firmly.
8. Never touch the terminals of the connectors with bare hands.

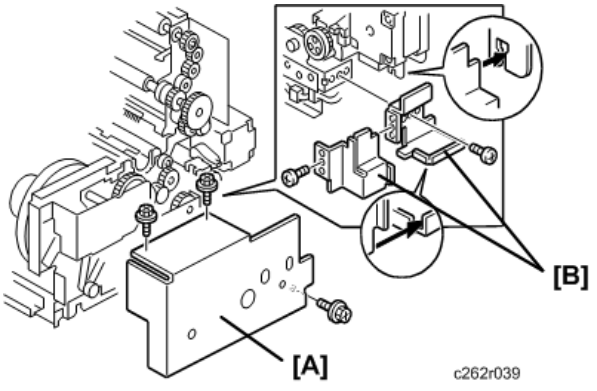
Duct Entrance Solenoid



- Master making unit ☛ p.117
- Master making unit right cover ☛ p.120

[A] Duct entrance solenoid (x4, x1)

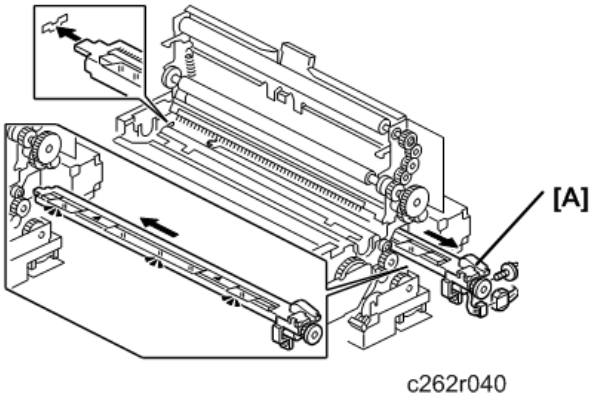
Cutter Unit, Master Feed Control Motor, Clamp Tension Roller, Upper Master Feed Control Roller



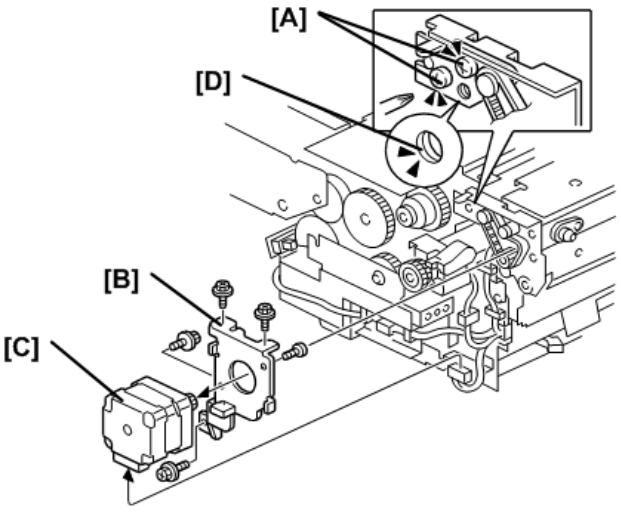
- Master making unit p.117

  [A] Master making unit rear cover (x3)

  [B] Harness covers (x2)



[A] Cutter unit (x1, x1)



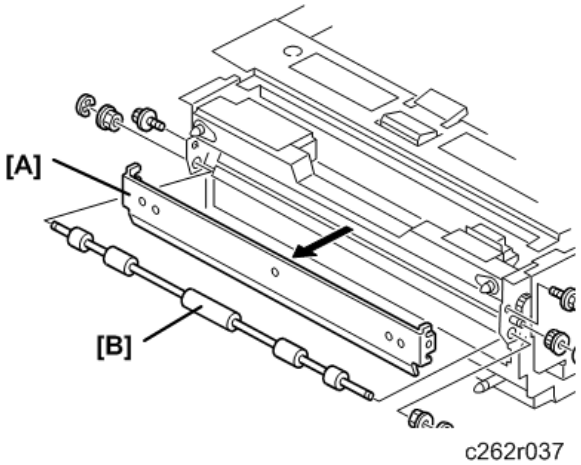
c262r041

[A] Loosen the screws that hold the tension bracket.

[B] Master feed control motor bracket (x3, x1)

[C] Master feed control motor (x2)

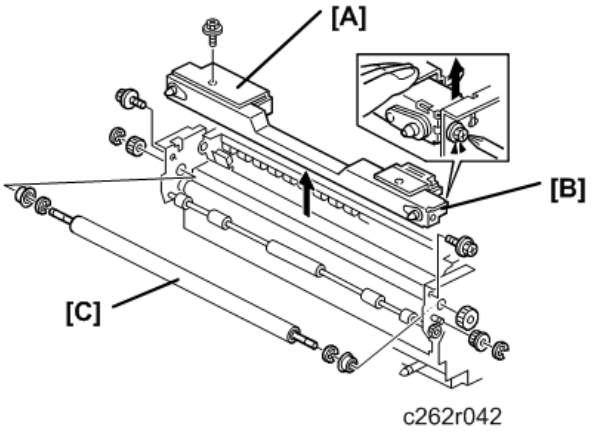
- When you tighten the screws to secure the tension bracket [A], make sure that the small holes in the rear frame are in line with the small hole in the tension bracket [D], as shown.



c262r037

[A] Master feed control roller bracket (x2)

[B] Clamp tension roller (x3)



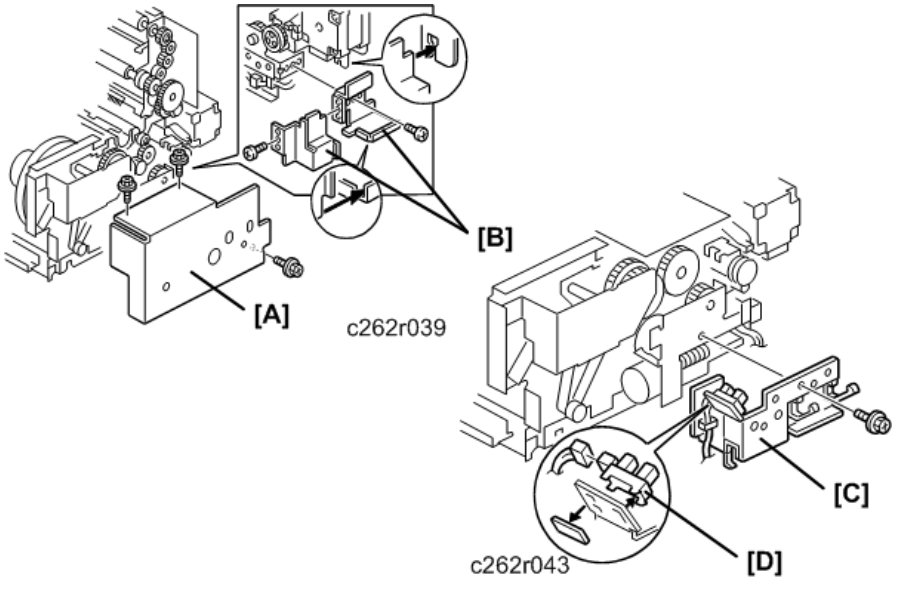
4

[A] Master edge sensor cover (x1)

[B] Master making unit frame (x2)

[C] Upper master feed control roller (x4)

Platen Release Sensor, Platen Release Motor



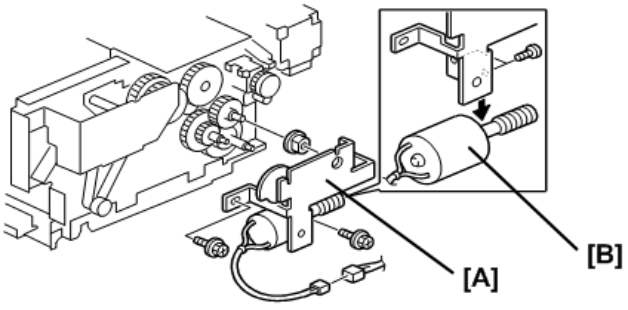
- Master making unit p.117
- Master making unit right cover p.120

  [A] Master making unit rear cover (x3)

  [B] Harness covers (x2)

  [C] Cover bracket (x1)

[D] Platen release sensor (x1)



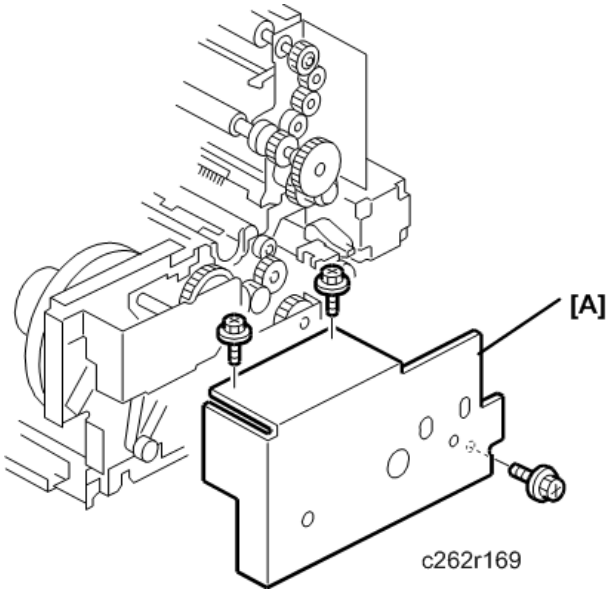
c262r044

[A] Platen release motor bracket (x2, x1)

[B] Platen release motor (x2)

- When you install the platen release motor bracket, make sure that the gear is positioned correctly. p.133

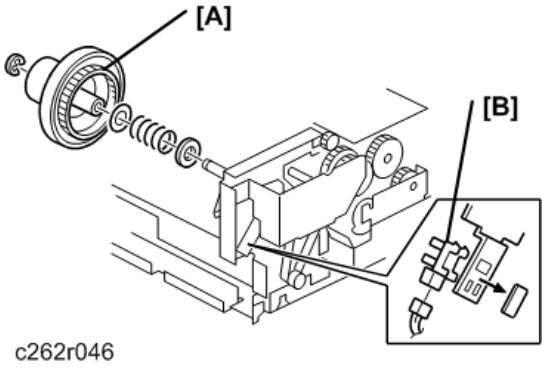
Master Amount Sensor



c262r169

- Master making unit p.117
- Master making unit right cover p.120

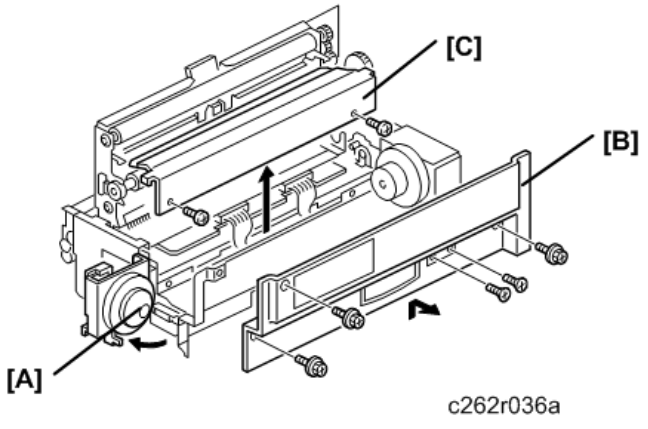
  [A] Master making unit rear cover (x3)



[A] Rear master flange (x1)

[B] Master amount sensor (x1)

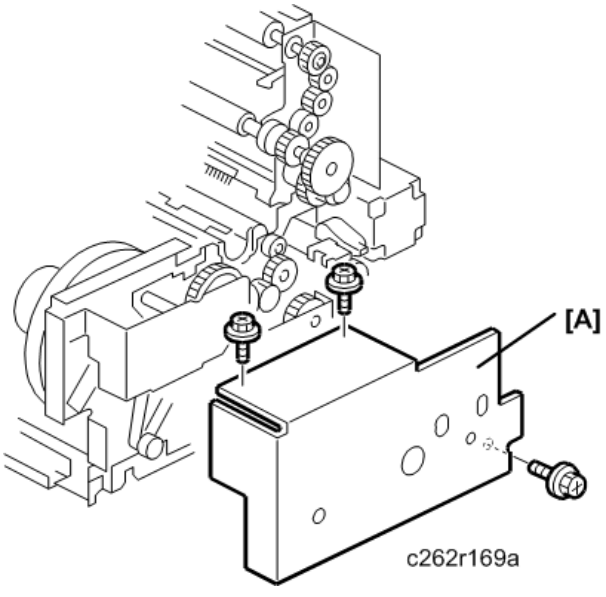
Master Suction Fans, Master Feed Motor



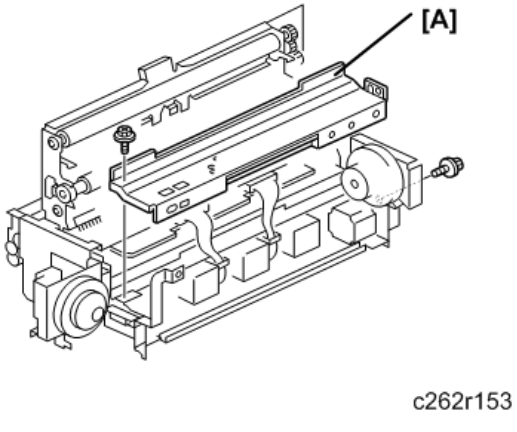
- Master making unit☛ p.117
- Open the master tray cover [A].

  [B] Master making unit right cover (x5)

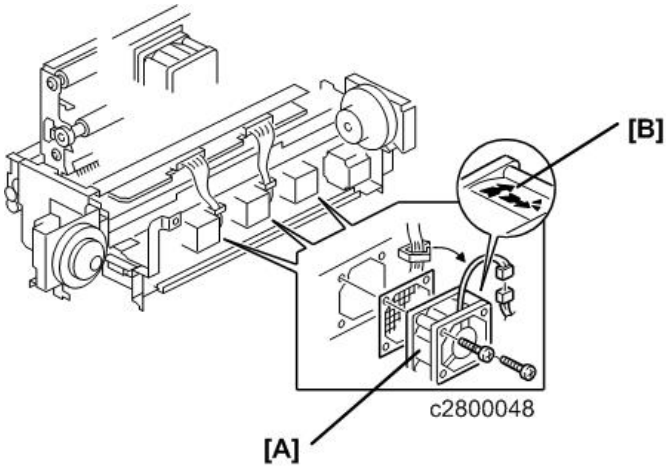
  [C] Thermal head cover (x2)



[A] Master making unit rear cover (x3)

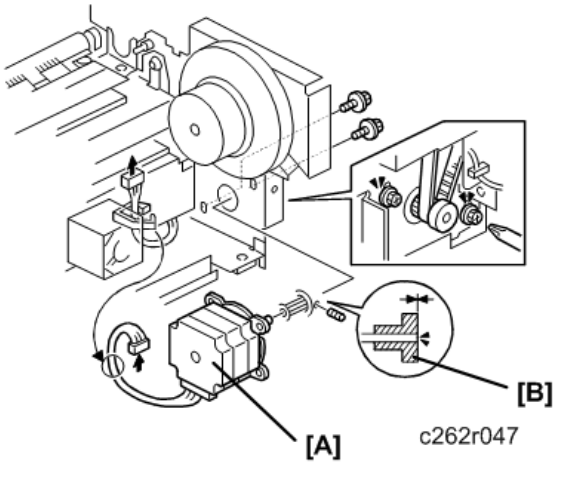


[A] Lower master cover (x2)



[A] Master suction fans (x2, x1)

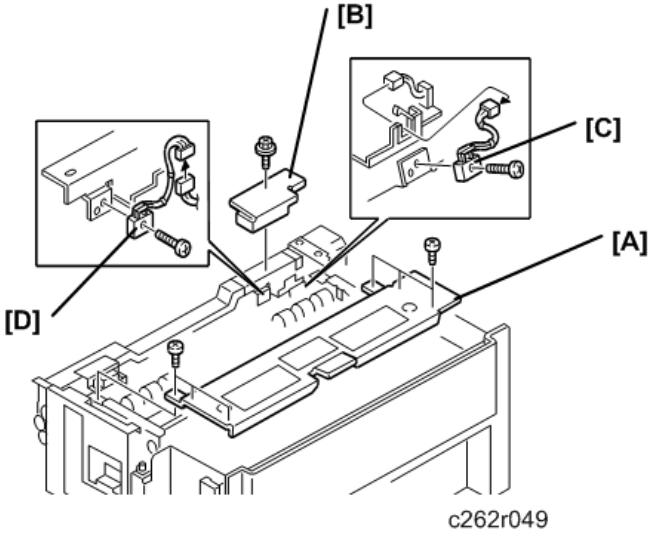
- When you install the master suction fans, position the cable and marking [B] as shown in the diagram.



[A] Master feed motor (x2, x1)

- Make sure that the end of the master feed motor shaft is flush with the edge of the pulley [B].

Master Set Sensor, Master Edge Sensor



- Master making unit ☛ p.117

  [A] Master set cover (x6)

  [B] Master edge sensor cover (x1)

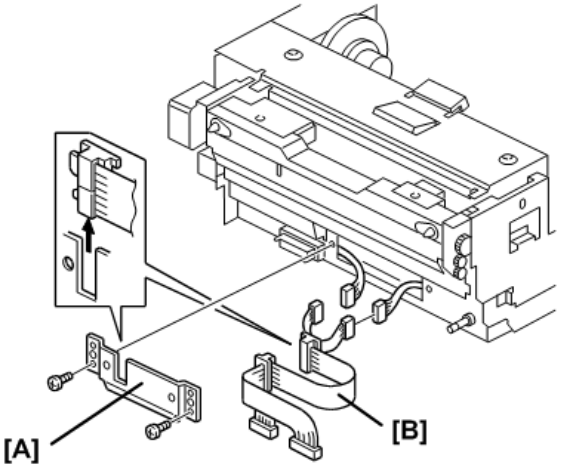
  [C] Master set sensor (x1, x1)

- Do the master set sensor adjustment after you install the new master set sensor. ☛ p.136

  [D] Master edge sensor (x1, x1)

- Do the master edge sensor adjustment after you install the new master edge sensor. ☛ p.136

Flat Cable



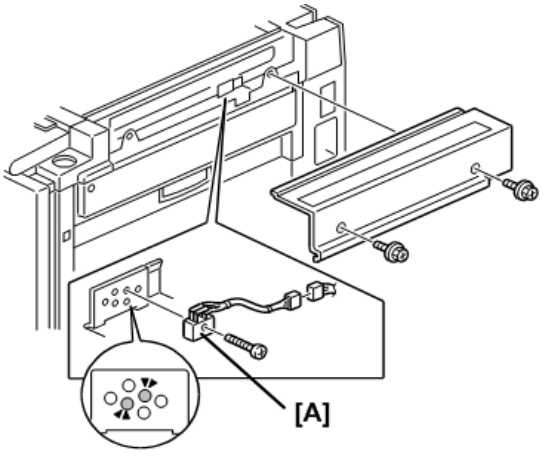
c262r176

- Master making unit ☛ p.117

[A] Cable cover (x2)

[B] Flat cable (x2)

Master End Sensor

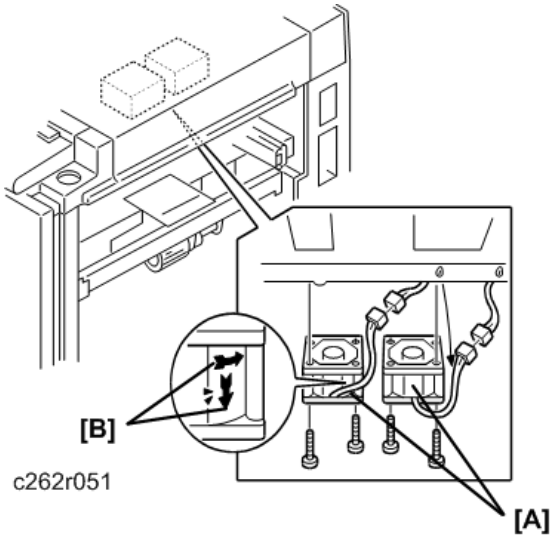


c262r050

- Right scanner cover ☛ p.77

  [A] Master end sensor (x1, x1)

Master Buffer Fans

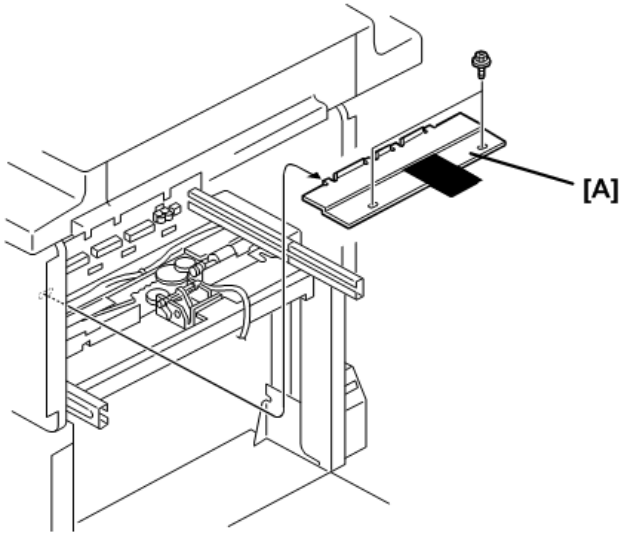


- Master making unit ☛ p.117

  [A] Master buffer fans (x2, x1 each)
- When you install the fans, position the cable and marking [B] as shown in the diagram.

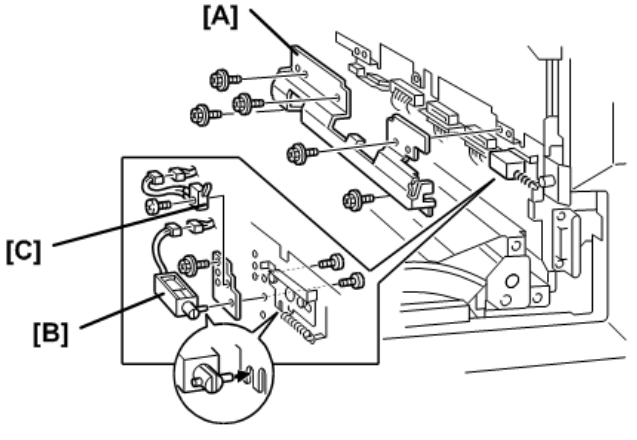
Unit Lock Solenoid, 2nd Drum Master Sensor

- Master making unit ☛ p.117
- Drum unit ☛ p.143



c262r053

[A] Feed cover (x2)

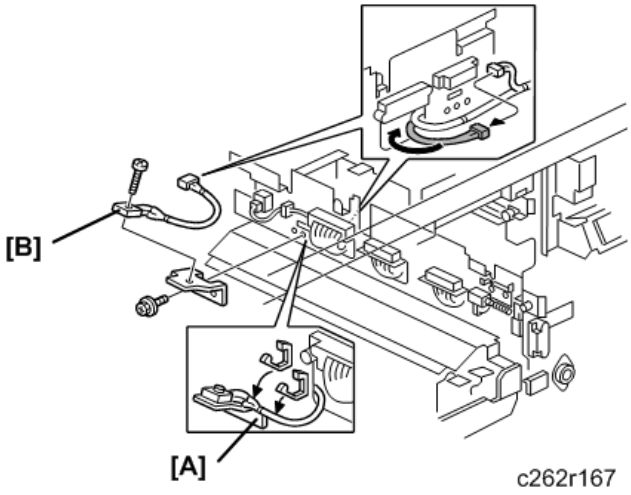


c262r052

[A] Sensor bracket (x5)

[B] Master making unit lock solenoid (x2, x1)

[C] Master making unit lock detector (x1, x1)

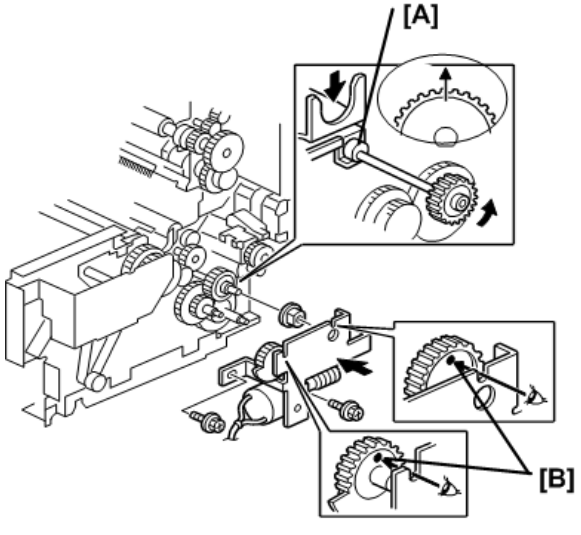


[A] 2nd drum master sensor bracket (x1, x1)

[B] 2nd drum master sensor (x1)

- Do the 2nd drum master sensor adjustment after installing the new 2nd drum master sensor. ☛ p. 157

Platen Release Cam Adjustment



Purpose: After the platen release mechanism is disassembled, the platen release cam [A] must be reinstalled in the correct position.

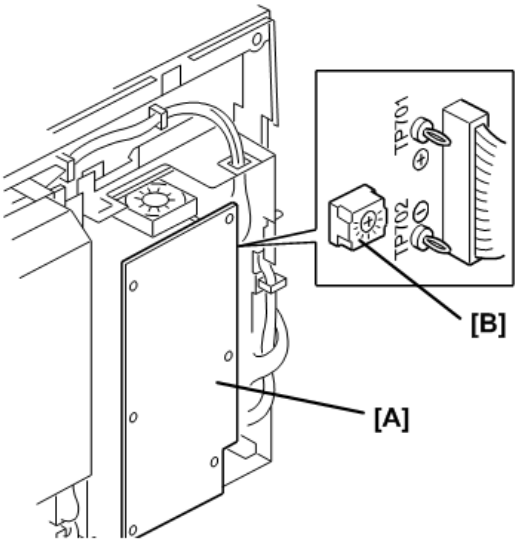
Procedure: When you tighten the screws to secure the mechanism, make sure that the small holes in the gears [B] are in line with the cutouts in the bracket, as shown.

Thermal Head Voltage Adjustment

Important

- **The voltage value affects the durability of the thermal head, and is different for each thermal head.**
- **Refer to the exact voltage value that is labeled on each thermal head.**
- **The adjustment range is between + 0 and ±0.1 volts from the specified value. Never set it out of this range even if there is an image quality problem.**
- **This adjustment is always required after the thermal head or PSU is replaced.**

Purpose: To maintain master making quality and extend the lifetime of the thermal head.



1. Turn off the main switch. Then, remove the rear cover to access the PSU [A].
2. Check the voltage on the thermal head decal. (The value is different for each thermal head.)
3. Turn on the main switch and open the SP mode, and then select SP 5-010-13 (the thermal head voltage output mode).
4. Press the [Start] key to apply the voltage to the thermal head. The voltage is continually supplied while the [Start] key is held down.

   As another way to apply the voltage:

   - Press the [#] key instead of the Start key.
   - However, after the [#] key is pressed, the machine will not stop supplying the voltage until you press the [Clear/Stop] key or cancel the SP mode.

Important

- **To protect the thermal head, never leave the voltage on for a long time.**

5. 5. Measure the voltage between pins TP701 (VHD) and TP702 (GND) on the PSU. Make sure that it is between + 0 and ±0.1 volts from the specified value that you read from the decal in Step 2.
6. If necessary, adjust the voltage by turning RV1 [B] on the PSU.
   - To increase the voltage: Turn RV1 clockwise
   - To reduce the voltage: Turn RV1 counterclockwise
7. Leave the SP mode.

Master End Sensor Adjustment

Purpose: To ensure that the sensor detects the end mark (a solid black area) on the master roll. The sensor adjustment is required:

- When the sensor is replaced.
- When the I/O board is replaced.
- When the ECU is replaced.

Standard: 0.8 volts

Note

- If the sensor is dirty, clean or replace it.

1. Turn on the main switch, then access SP6-004-2 (Sensor Voltage and Threshold Adjustment for Master End Sensor).
2. The sensor threshold value is displayed on the operation panel. Enter 1.1 (volts) with the number keys.
3. Leave the SP mode.

Master Edge Sensor Adjustment

Purpose: To ensure that the sensor detects the master properly. Sensor adjustment is required:

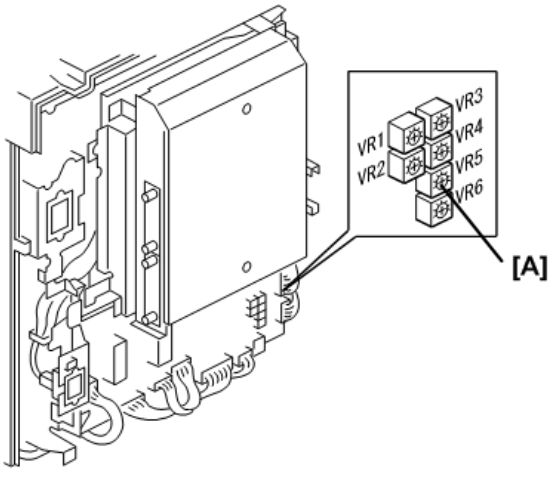
- When the sensor is replaced.
- When the I/O board is replaced.

Standard: 0.9 volts (within "+0.1" and "-0.1" volts)

Important

- **While adjusting, make sure to attach all exterior covers to avoid external light.**
- **Do not turn the VRs excessively.**

- **If the sensor is dirty, clean or replace it.**



c262r026a

- Rear cover ☛ p.76
- Master roll

Important

- **The master roll must not be installed for this adjustment.**

1. Turn on the main switch, and then open SP6-004-3 (Sensor Voltage and Threshold Adjustment for Master Edge Sensor).
2. Press the [Start] key.
   - The duct entrance plate opens automatically. The duct plate will stay open for 30 seconds, then it will close automatically.
   - Do the adjustment (step 3) before the duct entrance plate closes.
   - If you cannot complete the adjustment before the plate closes, then press Start again to open the plate.
3. The sensor input voltage is displayed on the operation panel. Turn VR5 [A] on the I/O board to the right until the value is between 0.8 and 1.0 volt.
4. Leave the SP mode.

Master Set Sensor Adjustment

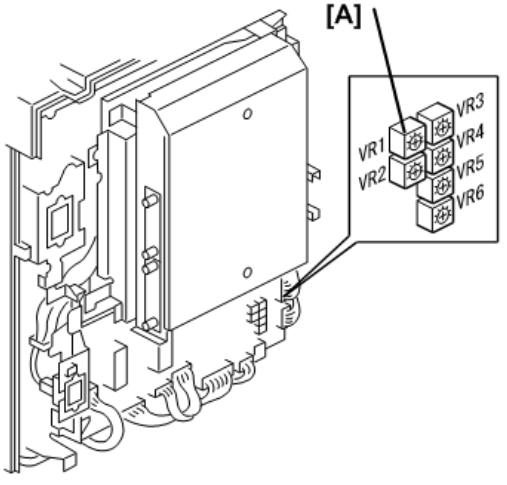
Purpose: To ensure that the sensor detects the master properly. The sensor adjustment is required:

- When the sensor is replaced.
- When the I/O board is replaced.

Standard: 1.0 to 1.1 volts

Important

- **While adjusting, make sure to attach all exterior covers to avoid external light.**
- **Do not turn the VRs excessively.**
- **If the sensor is dirty, clean or replace it.**



c262r026b

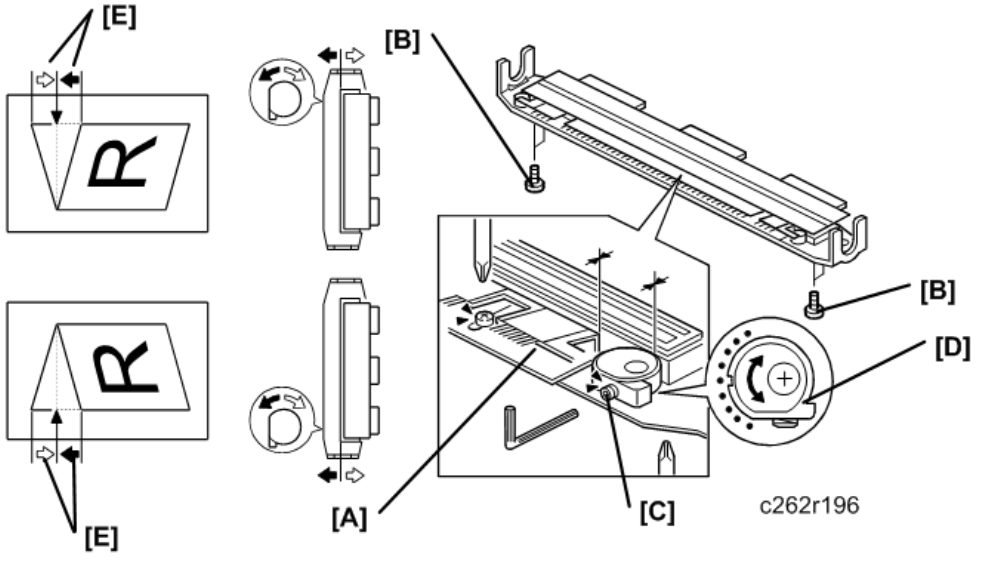
- Rear Cover ☛ p.76

1. Turn on the main switch, and then open SP6-004-4 (Sensor Voltage and Threshold Adjustment for Master Set Sensor).
2. Pull out the master making unit from the machine and open the master set cover.
3. Insert the leading edge of the master under the master set sensor. Then close the master set cover and reinstall the master making unit in the machine.
4. The sensor input voltage is displayed on the operation panel. Turn VR1 [A] on the I/O board to the right until the value is between 1.0 and 1.1 volts.
5. Pull out the master making unit from the machine and open the master set cover.
6. Remove the master from the master making unit. Then close the master set cover and reinstall the master making unit in the machine.
7. Check if the value of SP6-004-4 is 3.0 volts or more.
8. If the sensor input voltage is 3.0 volts or more, adjustment is completed.
9. If the sensor input voltage is less than 3.0 volts, adjust VR1 until the sensor input voltage is 3.0 volts or more
10. Leave the SP mode.

Thermal Head Alignment Adjustment

Purpose: To make sure that the original image is correctly reproduced without skew.

- Master making unit ☛ p.117
- Master making unit right cover ☛ p.120
- Thermal head cover ☛ p.120
- Thermal head base ☛ p.120



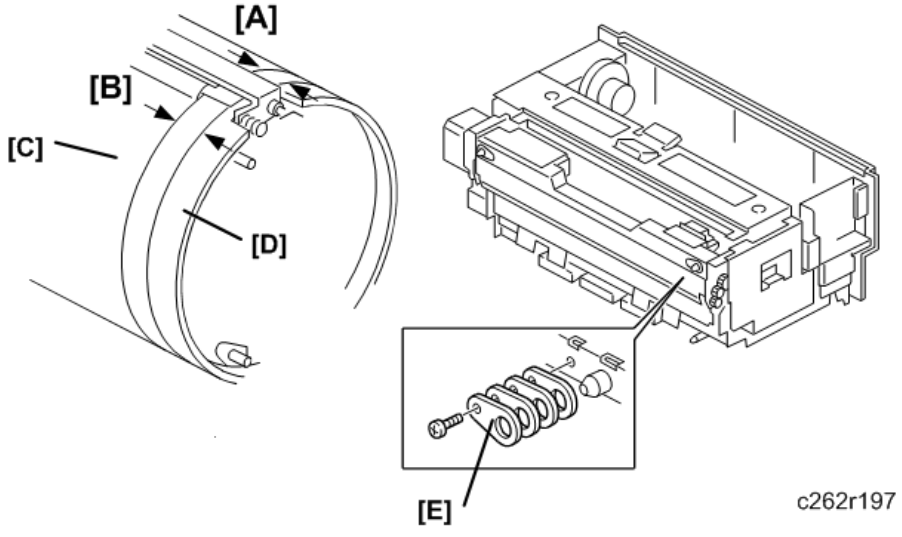
1. Remove the thermal head guide plate [A].
2. Loosen the four screws [B] that secure the thermal head base.
3. Loosen the Allen screws [C].
4. Turn the eccentric bushing [D] at the operation side or the non-operation side. If the eccentric bushings [D] are turned one graduation, the image skew amount [E] is corrected by 0.2 mm.
5. Tighten the Allen screws [C].
6. Tighten the four screws [B] that secure the thermal head base.
7. Install the thermal head guide plate [A].

   When you install the thermal head base and the thermal head guide plate, make sure that these are positioned correctly. ☛ p.120
8. Install the thermal head base, thermal head cover, and master making unit right cover. ☛ p.120
9. Install the master making unit. ☛ p.117
10. Make a new master and checked if the image skew is correct.

Master Making Unit Parallel Adjustment

Purpose: To make sure that the master is correctly wrapped around the drum without skew.

1. Make a new master. The machine will wrap this master around the drum.



1. Take out the drum unit from the machine.
2. Measure the clearance at the leading edge [A] and the trailing edge [B] between the edge of the master [C] and the edge of the metal screen [D].
   - Standard for A4 drums, A3 drums, and DLT drums: 32.0 mm

- Remove the master making unit. ☛ p.117

1. Add or remove spacers to adjust the position of the master making unit, if necessary.

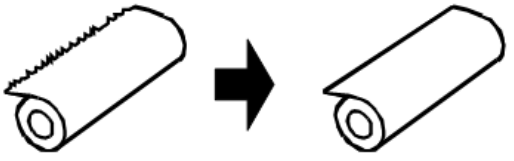
   Example: If the value at the leading edge is 32.0 mm and the value at the trailing edge is 31.8 mm ([A] minus [B] = 32.0 - 31.8= 0.2), remove the spacer [E] at the operation side on the master making unit.
   - If [A] minus [B] = a positive value, decrease the thickness of spacers at the operation side.
   - If [A] minus [B] = is a negative value, decrease the thickness of spacers at the non-operation side.
   - If one spacer is removed, the master skew is corrected by 0.2 mm.
2. Install the master making unit in the duplicator.
3. Make a new master and checked if the master skew is correct.

Master Edge Trimming Procedure

Purpose: To even off the leading edge of the master roll, if the edge was not cut evenly. This happens, for example, after a master misfeed (D-Jam).

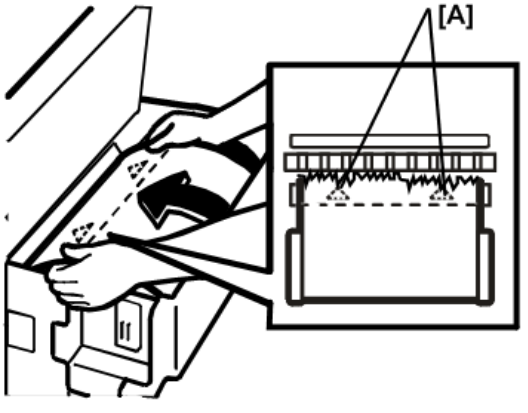
Important

- **The following procedure cannot be done if a misfeed or SC error condition was not corrected**



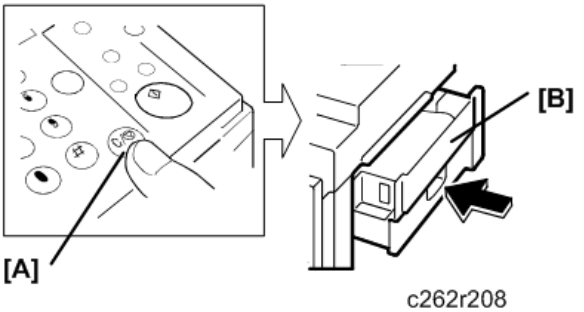
c262r206

1. Load the master roll in the master making unit.



c262r207

1. Feed the leading edge manually until it covers the two arrow marks [A].



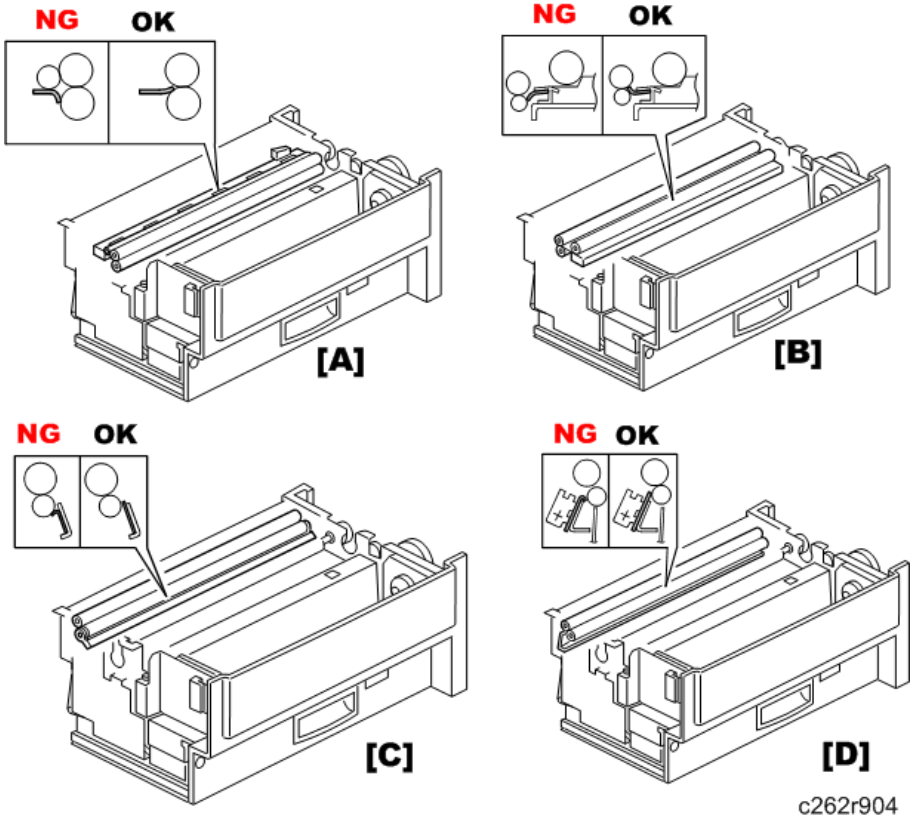
c262r208

1. Press and hold the [Clear/Stop] key [A]. While holding this key down, push in the master making unit [B].
    - The machine will then trim the leading edge.

- After this is completed, a beep will be heard and the operation panel will show "Master Misfeed" and "Remove the cut master".

2. Open the master making unit and remove the trimmed portion.

Master Feed Mylar Positioning



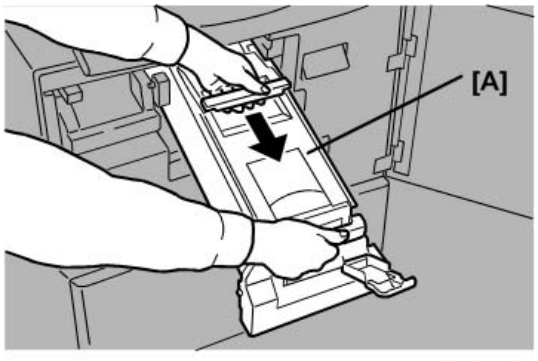
No.	Comment
[A]	Cutter unit - After the tension roller
[B]	Thermal head base – Before the tensor roller
[C]	Buffer duct entrance plate – Before the master feed control roller
[D]	Lower master feed control roller – Exit guide plate

Purpose: These strips of mylar are easily put in the wrong position. Take care to set these properly to avoid master jams.

Procedure: When replacing or removing the thermal head, the cutter unit, the master duct, or the guide plate of the lower master feed control roller, install the lower tension roller or lower master feed control roller as shown in the illustration.

Drum Section

Drum Unit

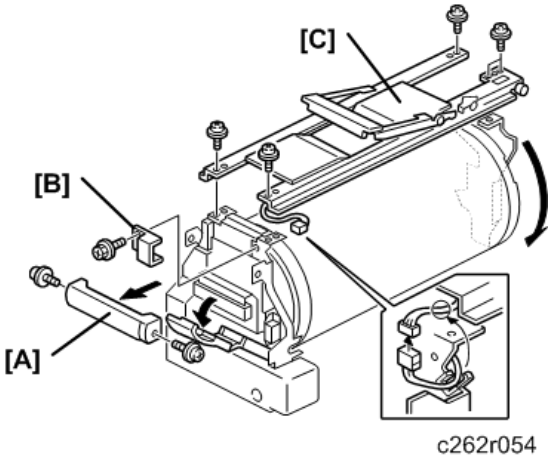


c262r178

- First, open the front cover.

  [A] Drum unit

Drum Cloth Screen



c262r054

[A] Drum release grip (x2)

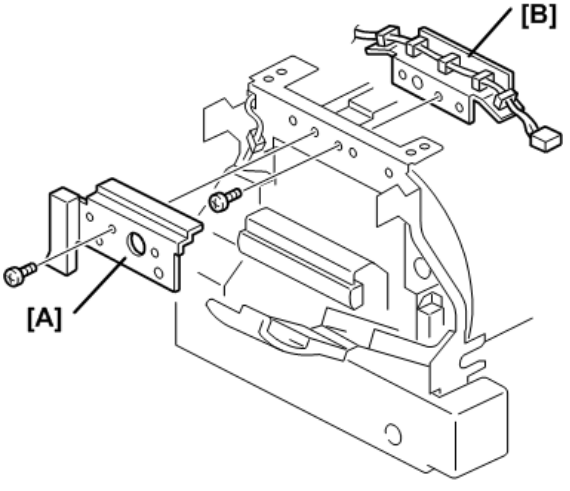
[B] Connector cover (x1)

[C] Drum handle (x5, x1)

Note

- Do not set the drum unit upside down.

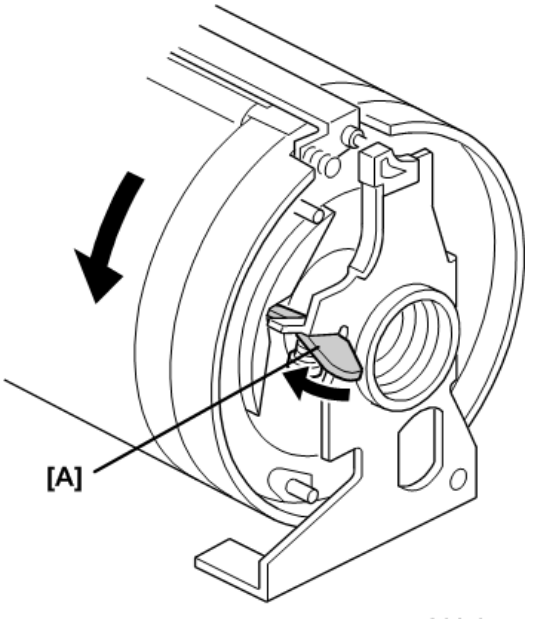
- However, if you must set it upside down, wipe off the ink around the ink roller first (use SP2-2-1, select OFF, and feed paper until ink ends).
- After you complete work on the machine, be sure to reset SP2-2-1 to its default (ink detection ON)



c262r055

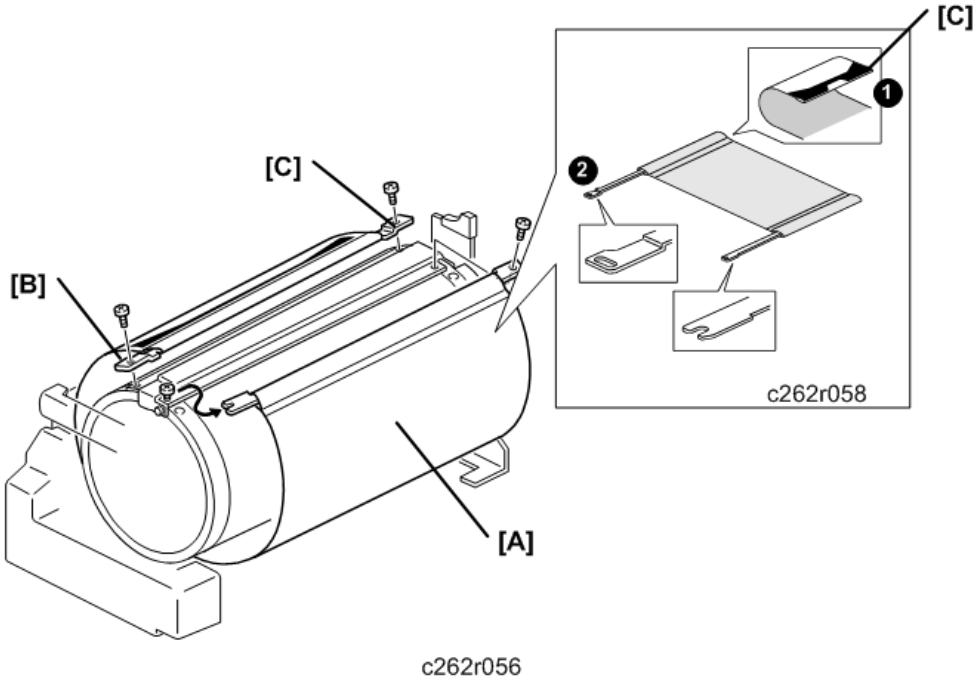
[A] Front bracket (x1)

[B] Front inner bracket (x1)



c262r057

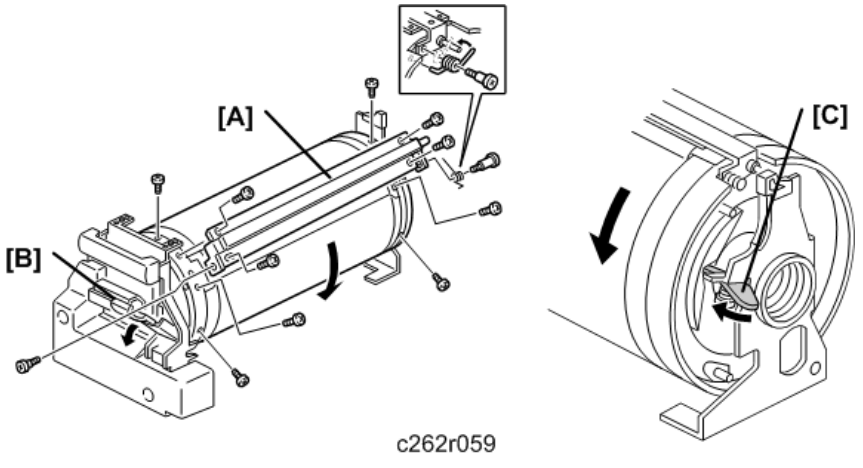
- Loosen the stopper [A].
- Turn the drum until the clamper unit is positioned on the top of the drum.



[A] Drum screen (x4)

1. Follow these guidelines:
    - Never scratch the cloth screen or metal screen.
    - When replacing the cloth screen, spread the screen around the metal screen while strongly pulling the stay [B]. Adjust the stay so that it is parallel to the master clamper, then tighten the screws.
    - When installing the new screen, the black sensor patch [C] must be to the left of the master clamper. Position the clamper on the top of the drum, and view from the operation side (refer to the above illustration.)
    - Make sure that the correct side of the screen is facing up ①
    - Make sure that the stays for securing the cloth screen are positioned correctly ②.
2. After you install a new cloth screen, reset the counter for this part with SP 3-4-1.

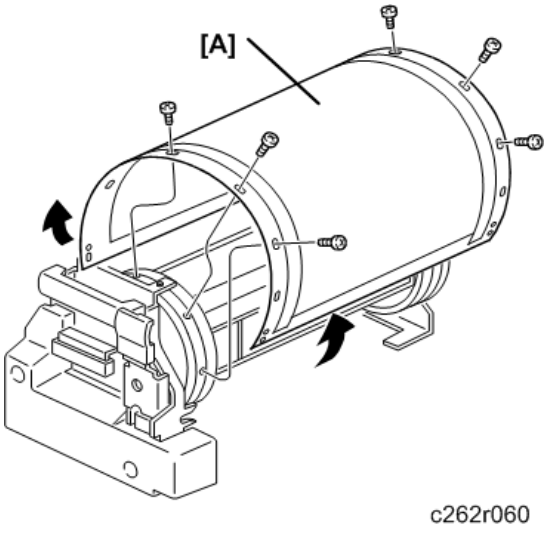
Drum Master Clamper, Metal Screen



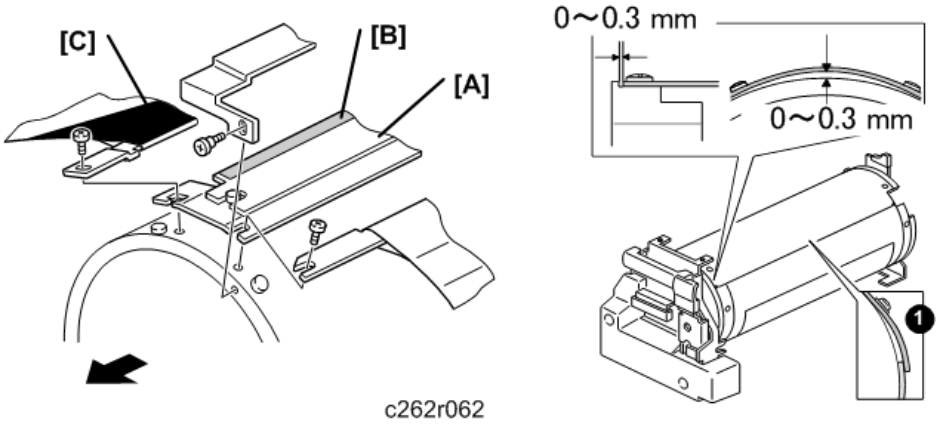
- Drum cloth screen ☛ p.143

  [A] Drum clamper (x2)

1. To remove the drum clamper screw on the operation side, turn the drum into the position shown in the first diagram and pull out the lever [B]. To rotate the drum, release the stopper [C] on the rear of the drum.
2. When replacing the drum clamper, install the spring on the opposite side as shown in the illustration.
3. Do not put the drum unit upside down. However, if you must put it upside down, wipe off the ink around the ink roller first (use SP2-002-1, select OFF, and feed paper until ink ends). After you complete your work on the machine, make sure to return SP2-2-1 to its default (ink detection ON).



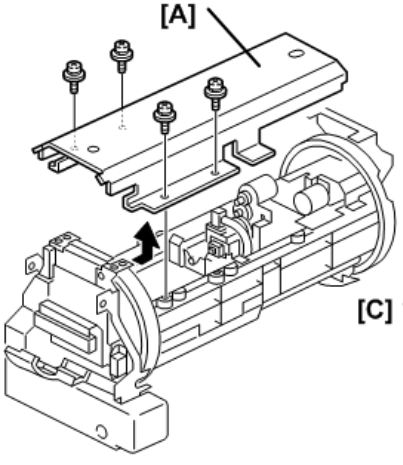
[A] Metal screen (x12)



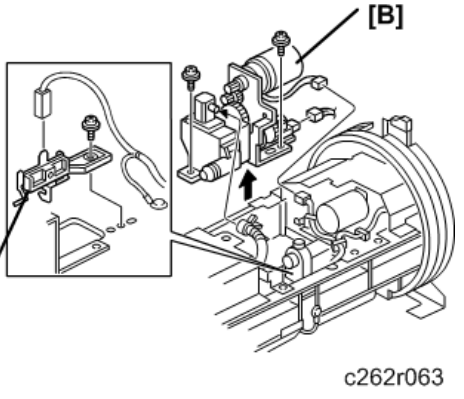
Observe the following points:

1. Do not scratch the cloth screen or metal screen.
2. Make sure that the correct end of the metal screen is overlapping. (Refer to the lower right part of the upper illustration.)
3. When attaching the metal screen to the drum flanges, wrap it so that the gap is correct. (Refer to the upper part of the upper illustration.)
4. When installing the master clamper [A], make sure that it is the correct way around. The side with the sandpaper [B] must be facing the black patch [C].
5. The standard position for the screen ① (the left side overlaps, as viewed from the operation panel).
6. Do not allow the inside of the master clamper to become dirty with ink. If it is dirty with ink, the master may slip off and the image position on the prints will move toward the trailing edge of the print during a printing run.
7. Use a cloth dampened with water to clean the inside of the master clamper. Do not use alcohol or other solvents. The clamping force of the magnet will be weakened.

Motors and Sensors in the Drum



c262r164



c262r063

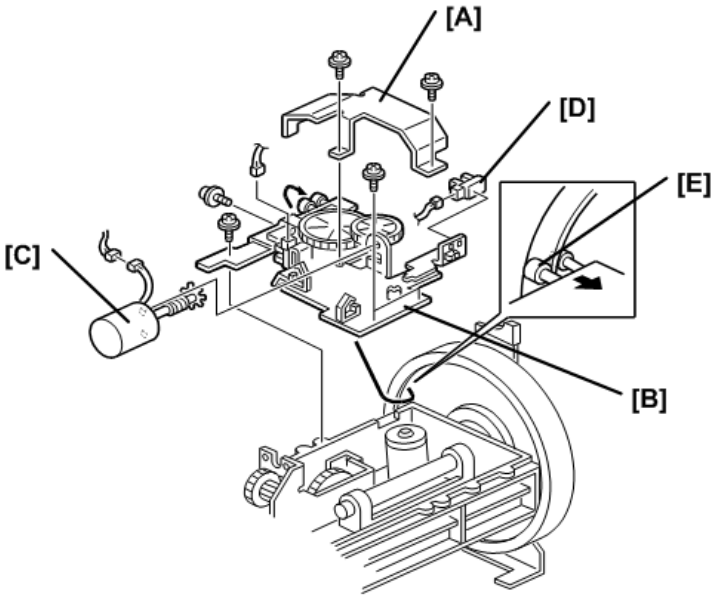
- Drum cloth screen ☛ 3.8.2
- Drum clamper ☛ p.146
- Metal screen ☛ p.146

Pull out the ink cartridge holder.

[A] Ink cartridge cover (x4)

[B] Ink pump unit (x3, x1)

[C] Ink detection pin (x1, x1)



c262r064

[A] Drum shift motor cover (x2)

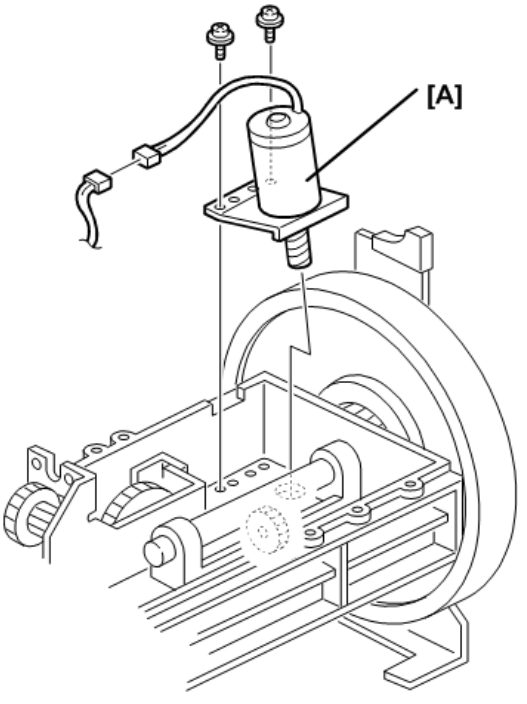
[B] Drum shift motor unit (x4, x4)

[C] Drum shift motor

[D] Drum shift HP sensor

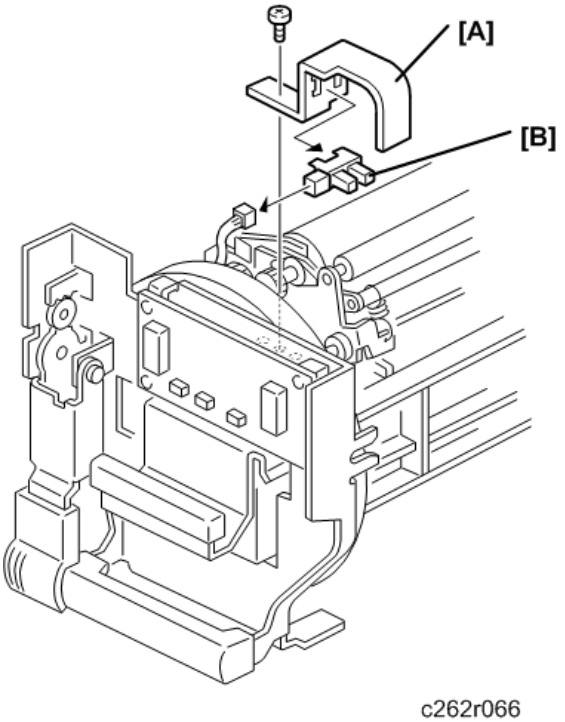
Re-installation

When reinstalling the drum shift motor unit, insert the bearings [E] into the drum flange edge, as shown.



c262r065

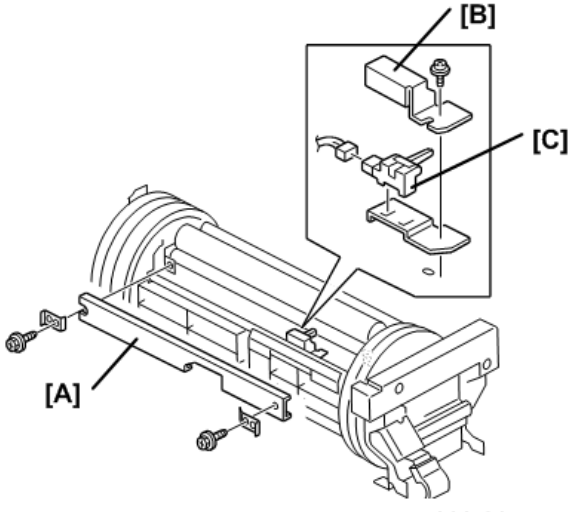
[A] Idling roller motor (x2, x1)



c262r066

[A] Sensor bracket (x1)

[B] Idling roller HP sensor (x1)

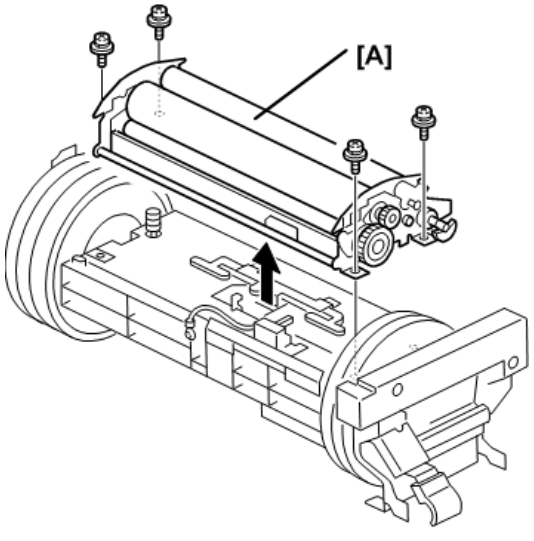


c262r067

[A] Ink supply roller cover (x2)

[B] Sensor bracket (x1)

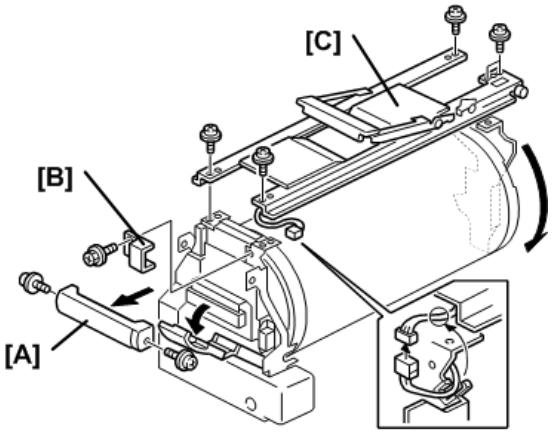
[C] Ink flow sensor (x1)



c262r165

[A] Ink supply roller unit (x4)

Ink ID Detection/Ink Flow Sensor Connector

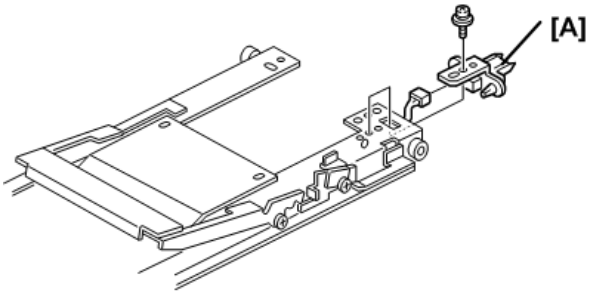


c262r054a

[A] Drum release grip (x2)

[B] Connector cover (x1)

[C] Drum handle (x5, x1)



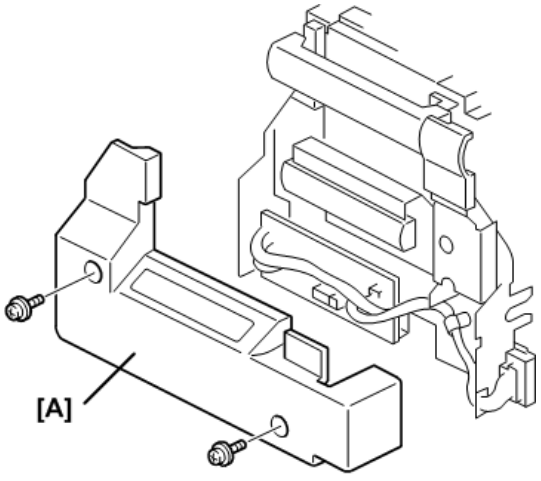
c262r166

[A] Ink ID detection/Ink flow sensor connector (x1, x1)

Ink Roller Gap Adjustment

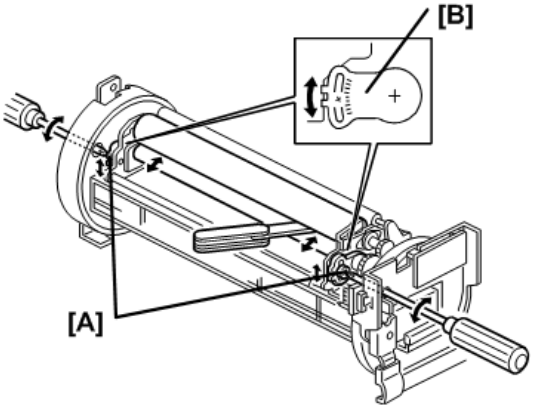
Purpose: To ensure that ink on the ink roller spreads evenly on the drum screen.

1. Remove the drum unit from the machine.



c262r154

1. Remove the drum front cover [A] (x2).
2. Remove the drum cloth and metal screens from the drum unit. ☛ p.143
3. Wipe off the ink around the ink roller and the doctor roller.



c262r068

1. Insert a 0.08 mm gap gauge between the doctor roller and the ink roller, and then, make sure that a 0.1 mm gauge cannot pass through the gap. Check the gap at the left, center, and right.
2. If the gap is not correct, loosen the screws [A] on both sides and adjust the gap by turning the eccentric bushings [B] at each side.

Ink Detection Adjustment

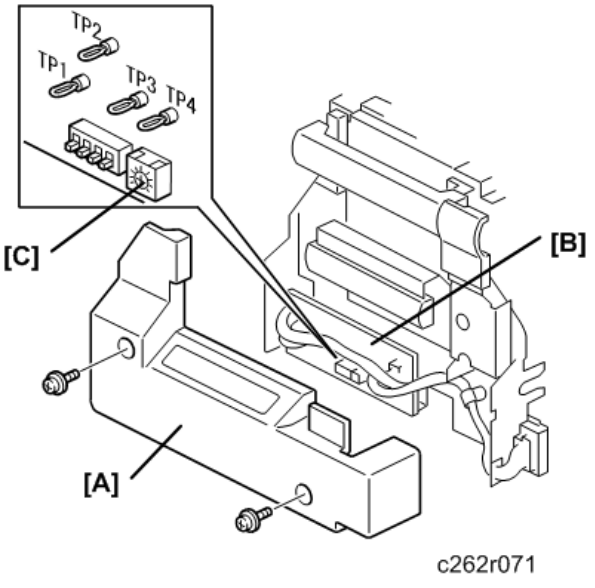
Purpose: To ensure correct detection of a no-ink condition when all the ink has been consumed.

Before you do this procedure:

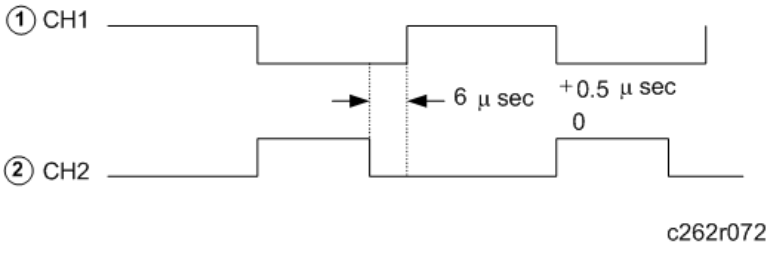
- Remove the ink around the ink roller.
- To do this, set SP2-2-1 (ink detection) to OFF, and then feed paper until the ink reaches the end condition.

Important

- **After you complete the following procedure, be sure to return SP2-2-1 to its default setting (ink detection ON).**

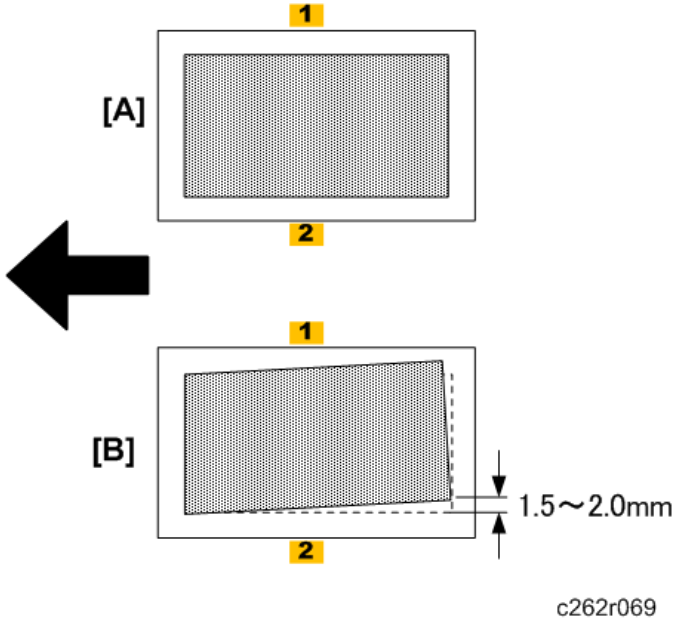


1. Remove the drum front cover [A].
2. Connect the probes and grounding lead of an oscilloscope to the following points on the ink detection board [B]:
   - Probe CH1 to TP1
   - Probe CH2 to TP2
   - Grounding lead to TP3 and TP4
3. Select the 5mu range.
4. Turn ON the main switch.
5. Make sure that the waveform is as shown in the top half of the following diagram when the ink detection pin is not in contact with the ink.



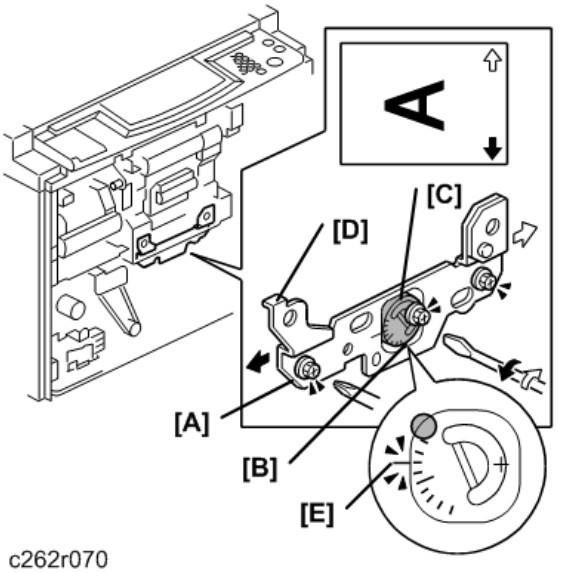
1. If incorrect, adjust the standard signal by turning VR901 [C] on the ink detection board (see previous illustration).
   ① Standard signal
   ② Detection signal

Drum Position Adjustment



[A]	Normal image
[B]	Abnormal image
[1]	Non-operation side
[2]	Operation side

Purpose: To prevent the back edge of the master from coming 1.5 to 2.0 mm closer on the non-operation side during printing and causing the image to skew on the paper.



c262r070

1. Loosen the three screws [A] [B].
2. Turn the eccentric bushing [C], if the back edge of the master comes close to the non-operation side.
   - As a rough guide, if the edges moved to the non-operation side by 1.0 mm, turn the eccentric bushing [C] counterclockwise one graduation.
   - Please check the machine after adjusting, because the effect of moving the bushing by one graduation differs for each machine. To do this, print about 1000 sheets and compare the 10th sheet with the 1000th sheet.
3. Tighten the screw [B].
4. Shift the drum position plate [D] in the paper table direction (to the right) and tighten the two screws [A].

   Note

   - [E] is the standard position for the eccentric bushing.

1st Drum Master Sensor Adjustment

Purpose: To ensure that the sensor detects the master properly. The sensor adjustment is required:

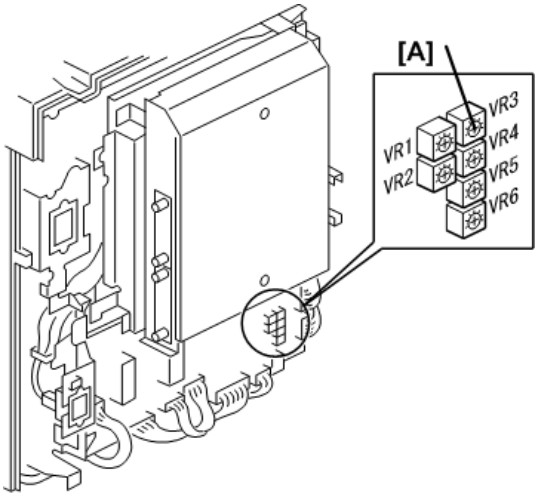
- When the sensor is replaced.
- When the I/O board is replaced.

Standard: 1.0 to 1.2 volts

Important

- **While adjusting, make sure to attach all exterior covers to avoid external light.**
- **Do not turn the VRs excessively.**
- **If the sensor is dirty, clean or replace it.**
- Rear Cover ☛ p.76

1. Remove the master that is wrapped around the drum, and install the drum in the main body.
2. Turn on the main switch, then open SP6-004-5 (Sensor Voltage and Threshold Adjustment for 1st drum master sensor).



c262r026c

3. The sensor input voltage is displayed on the operation panel. Turn VR3 [A] on the I/O board to the right until the value is between 1.0 and 1.2 volts.
4. Set SP2-006-8 (Make master without printing) to "On", and then press the [Start] key while holding down the [.] key. This wraps a blank master around the drum.
5. Open SP6-004-5 (Sensor Voltage and Threshold Adjustment for 1st drum master sensor).
6. The sensor input voltage is displayed on the operation panel. Check if it is 3.0 volts or more.
7. If the sensor input voltage is 3.0 volts or more, adjustment is completed.
8. If the sensor input voltage is less than 3.0 volts, adjust VR3 until the sensor input voltage is 3.0 volts or more
9. Leave the SP mode.

2nd Drum Master Sensor Adjustment

Purpose: To ensure that the sensor detects the master properly. The sensor adjustment is required:

- When the sensor is replaced.

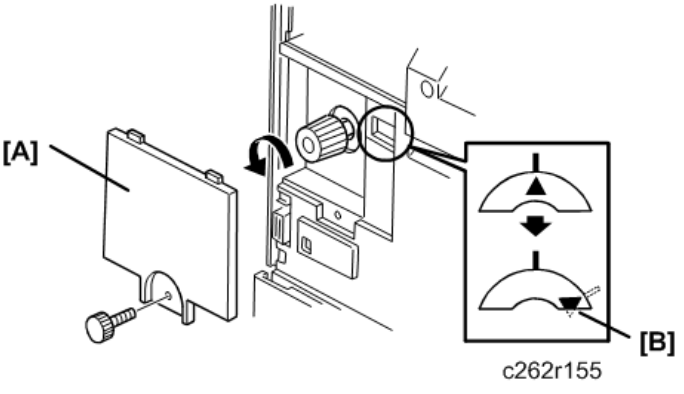
- When the I/O board is replaced.

Standard: 1.0 to 1.2 volts

Important

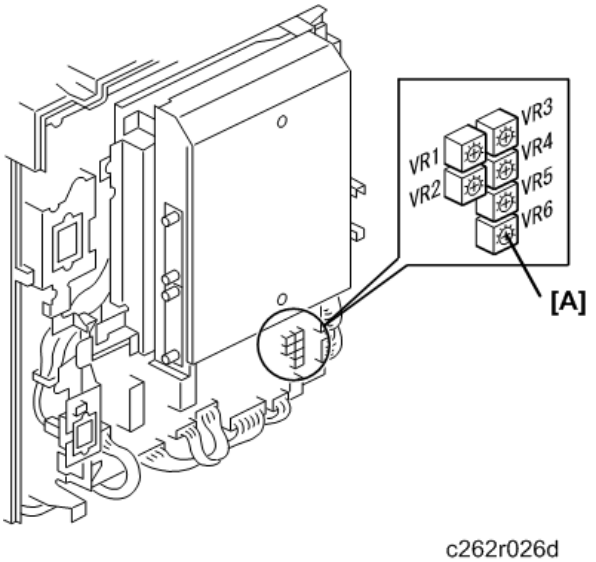
- **While adjusting, make sure to attach all exterior covers to avoid external light.**
- **Do not turn the VRs excessively.**
- **If the sensor is dirty, clean or replace it.**
- Rear Cover ☛ p.76

1. Remove the master that is wrapped around the drum, and install the drum in the main body.



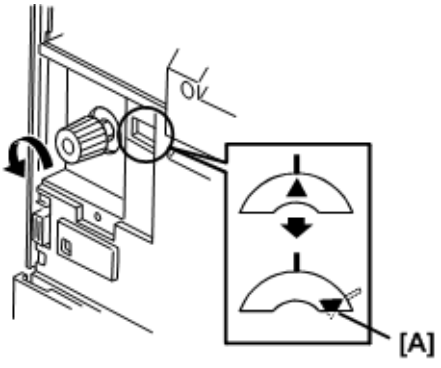
c262r155

1. Remove the knob cover [A] and turn the knob until the indicator moves to the point shown [B]. This step moves the black patch on the drum screen to the sensor.
2. Turn on the main switch, then access SP6-004-6 (Sensor Voltage and Threshold Adjustment for 2nd drum master sensor).



c262r026d

1. The sensor input voltage is displayed on the operation panel. Turn VR6 [A] on the I/O board to the right until the value is between 1.0 and 1.2 volts.
2. Set SP2-006-8 (Make master without printing) to "On", and then press the [Start] key while holding down the [.] key. This wraps a blank master around the drum.

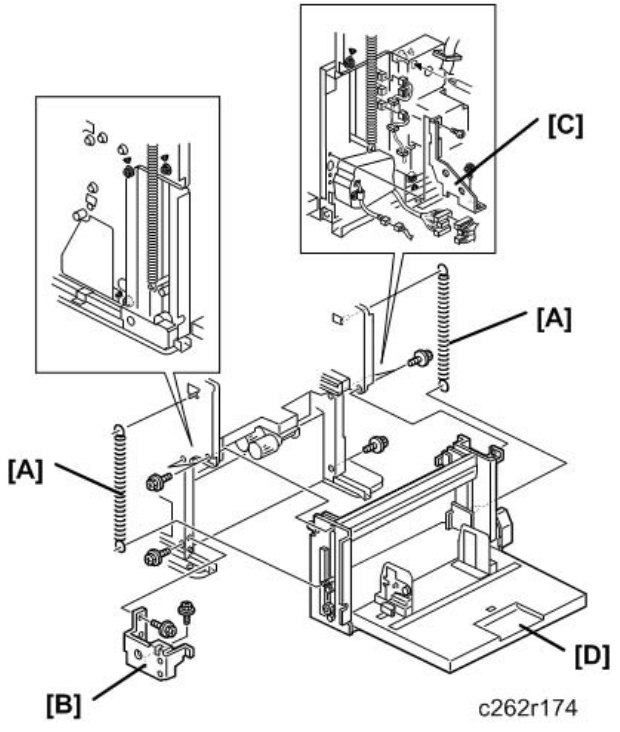


c262r155a

3. Turn the knob until the indicator moves to the point shown [A]. This step moves the black patch on the drum screen to the sensor.
4. Open SP6-004-6 (Sensor Voltage and Threshold Adjustment for 2nd drum master sensor).
5. The sensor input voltage is displayed on the operation panel. Check if it is 3.0 volts or more.
6. If the sensor input voltage is 3.0 volts or more, adjustment is completed.
7. If the sensor input voltage is less than 3.0 volts, adjust VR6 until the sensor input voltage is 3.0 volts or more
8. Leave the SP mode.

Paper Feed Section

Paper Table Unit, Paper Feed Assembly



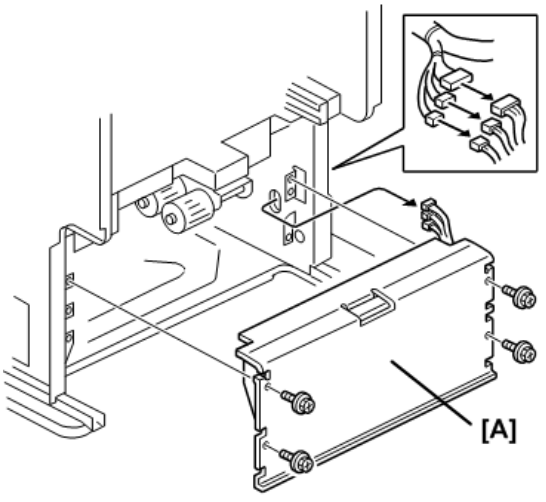
- Front cover, Knob cover, Inner cover ☛ p.75
- Rear cover, Right rear cover, Right front cover ☛ p.75
- Open out the ACU - ECU assembly ☛ p.103

  [A] Springs

  [B] Front bracket (x2)

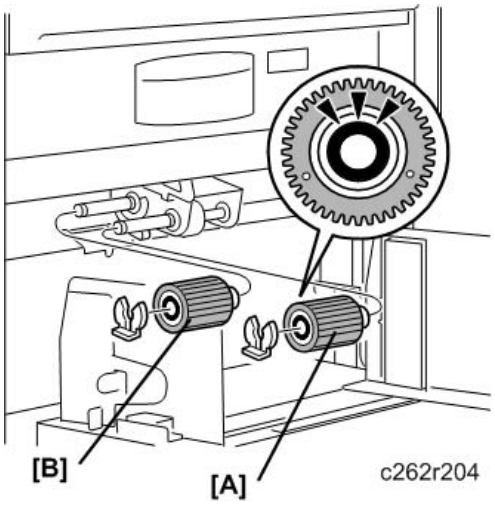
  [C] Rear bracket (x2)

  [D] Paper table unit (x6, x7)



[A] Paper feed assembly (x4, x3)

Pick-Up Roller, Paper Feed Roller



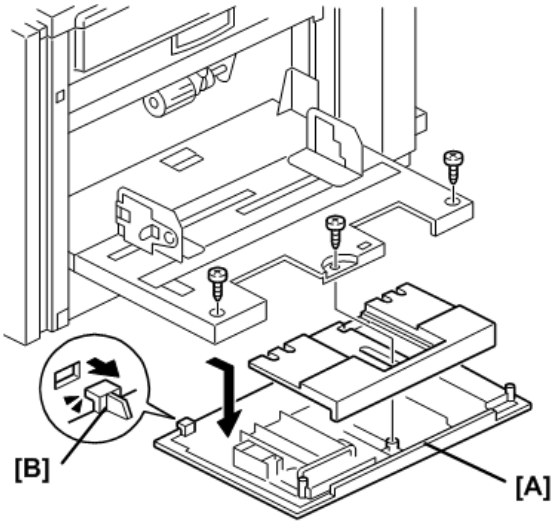
[A] Pick-up roller (x1)

[B] Paper feed roller (x1)

Re-installation

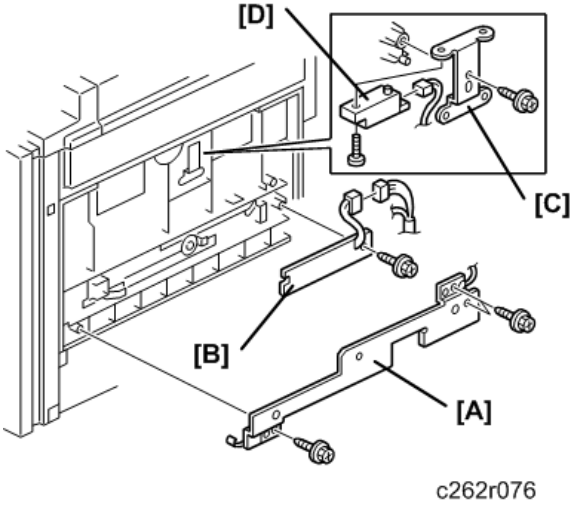
1. When you install the pick-up roller and the paper feed roller, position the one-way clutch correctly. (The clutch must point towards the front of the machine, as shown in the diagram.)
2. After you install a new feed roller, reset the counter for this part with SP 3-4-3.
3. After you install a new pick-up roller, reset the counter for this part with SP 3-4-4.

Paper Width Detection Board



[A] Paper table rear cover (x3)

- Carefully push out the two hooks [B] with a screwdriver.



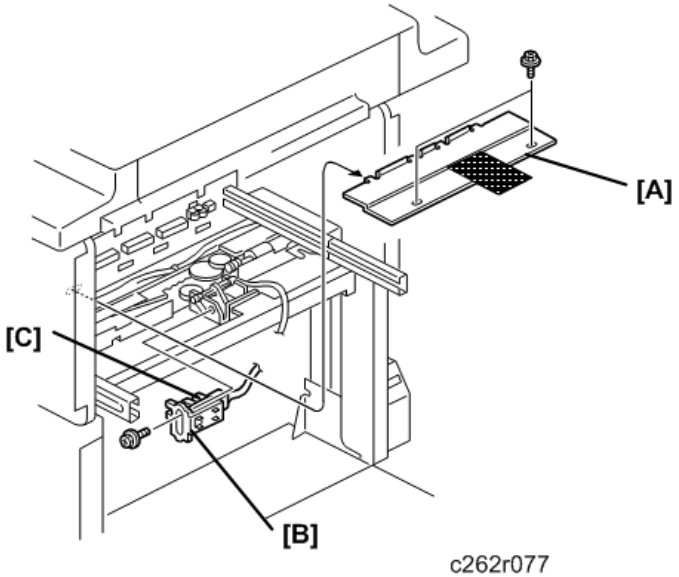
[A] Paper width detection board bracket (x3)

[B] Paper width detection board (x1, x1)

[C] Paper length sensor bracket (x1)

[D] Paper length sensor (x1, x1)

Paper Height Sensor

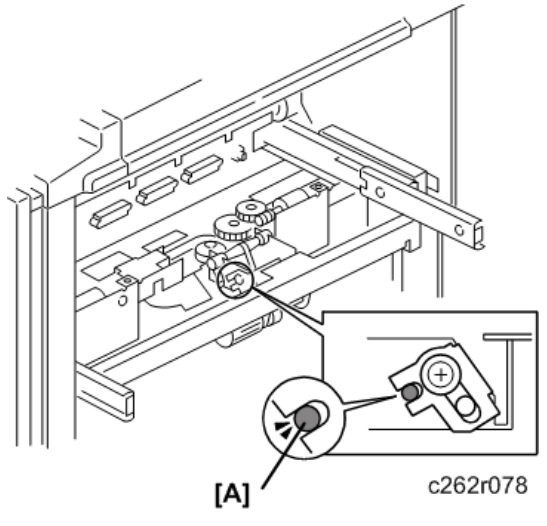


- Master making unit p.117

  [A] Feed cover (x2)

  [B] Paper height sensor bracket (x1, x1)

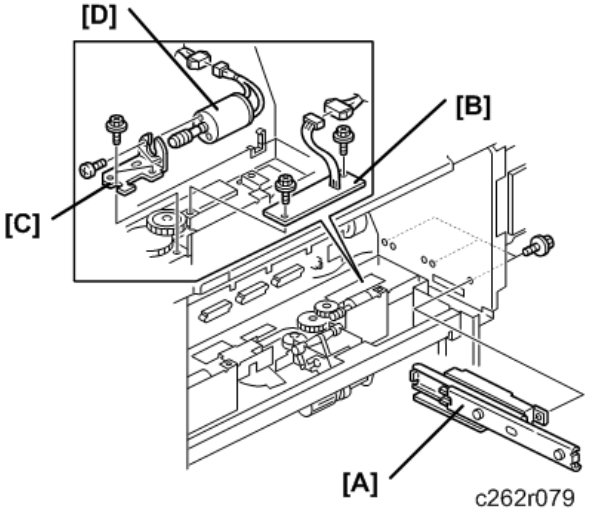
  [C] Paper height sensor



Re-installation

When you install the paper height sensor bracket, make sure that the small hole in the stay [A] is in the line with the cutout in the bracket, as shown above.

Feed Pressure Motor, Feed Pressure Detection Board



- Master making unit ☛ p.117
- Feed cover ☛ p.163
- Open the ACU - ECU assembly ☛ p.103
- Double feed detector board ☛ p.108

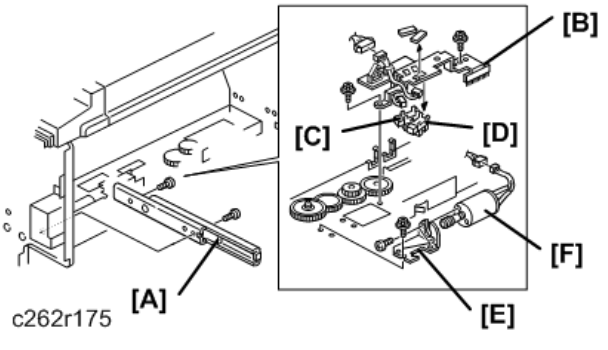
  [A] Rear rail bracket (x3)

  [B] Feed pressure detection board (x2, x1)

  [C] Feed pressure motor bracket (x2, x1)

  [D] Feed pressure motor (x2)

Registration Pressure Motor, Registration Roller Press Sensor, Registration Roller Release Sensor



- Master making unit ☛ p.117

- Feed cover ☛ p.163

  [A] Front rail bracket (x2)

  [B] Registration roller sensor bracket (x2, x1)

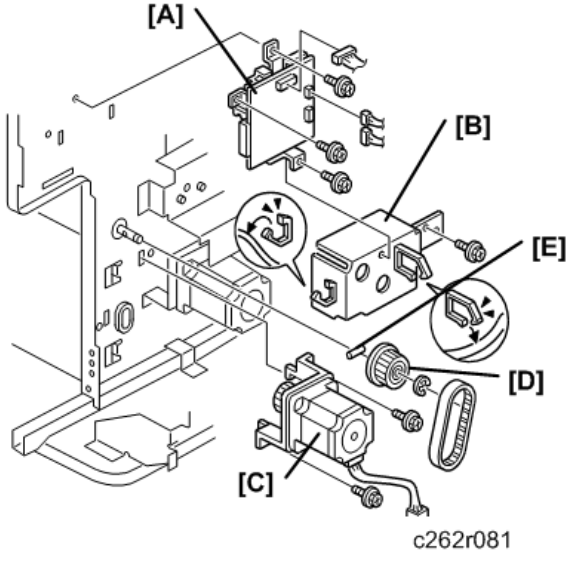
  [C] Registration roller press sensor (x1)

  [D] Registration roller release sensor (x1)

  [E] Registration pressure motor bracket (x2, x1)

  [F] Registration pressure motor (x2)

Paper Registration Sensor, Paper Feed Timing Sensor



- Rear cover, Right rear cover ☛ p.75
- Master making unit ☛ p.117
- Feed cover ☛ p.163
- Paper table unit ☛ p.160
- Paper feed assembly ☛ ☛ p.160
- Open out the ACU - ECU assembly ☛ p.103

  [A] Double feed detector board (x 3, x3)

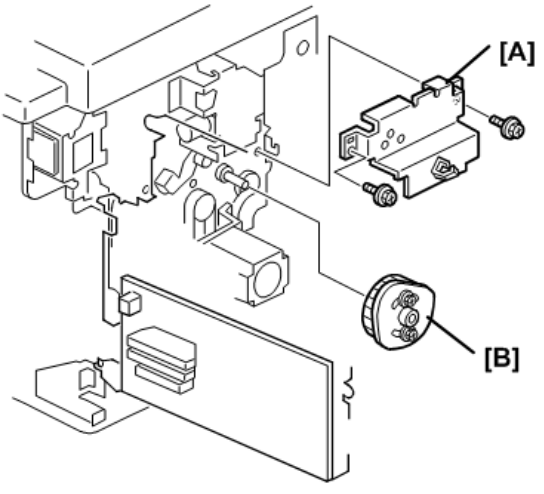
  [B] Motor cover (x1)

  [C] Paper feed motor (x2)

  [D] Pulley (x1)

Important

- **Do not lose the key [E] from the pulley.**



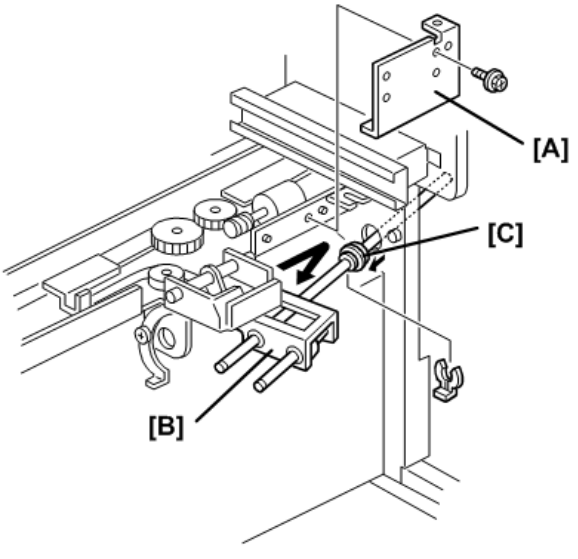
c262r086

[A] Lifting cam bracket (x2)

[B] Registration roller lifting cam

Re-installation

- There is a correct position for the cam.
- Because of this, when you reinstall the cam, do the registration roller lifting cam position adjustment. ☛ p.173

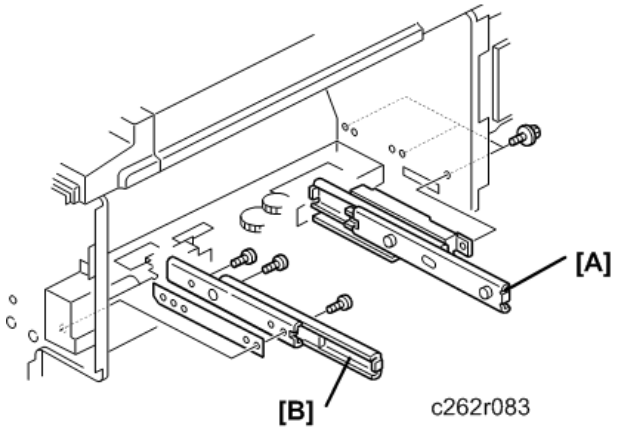


c262r082

[A] Right paper guide plate (x1)

[B] Paper feed roller unit (x1)

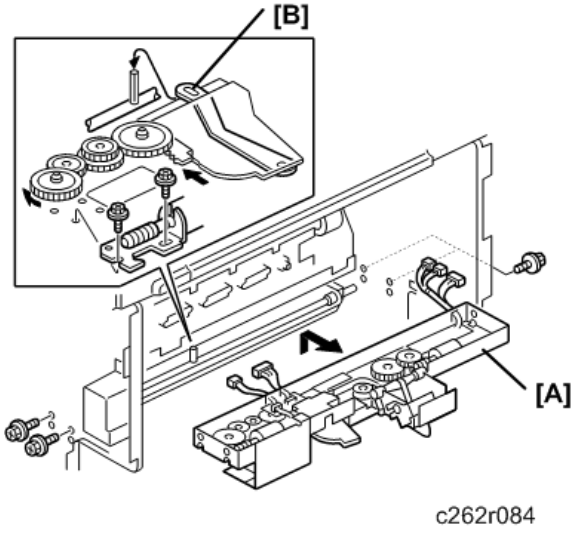
- Slide the bushing [C] towards the operation side.



- Front cover, Inner cover, Knob cover p.75

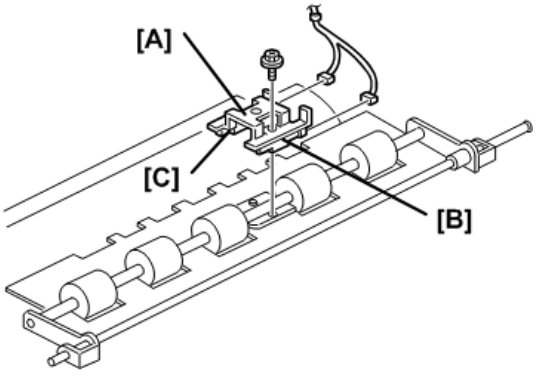
  [A] Rear rail bracket (x3)

  [B] Front rail bracket (x2)



[A] Feed pressure unit (x4, x5)

- When tightening the feed pressure unit, pass the pin through the small hole in the bracket [B], as shown.



c262r085

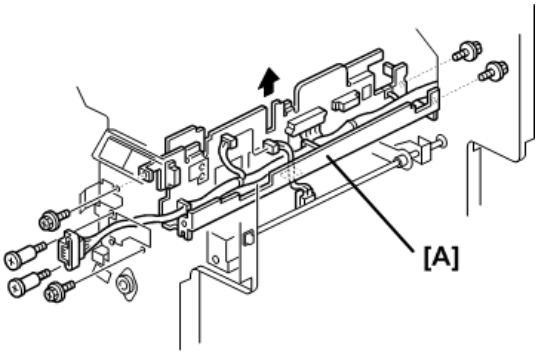
4

[A] Sensor bracket (x1, x2)

[B] Paper registration sensor

[C] Paper feed timing sensor

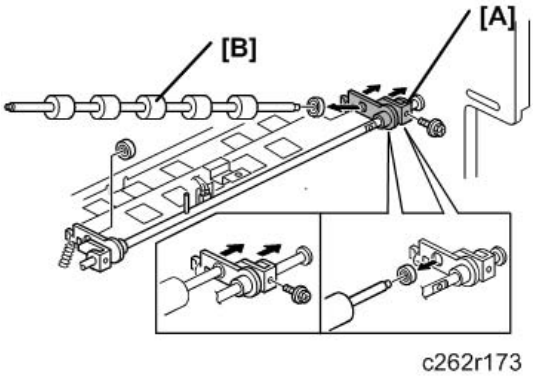
Upper Registration Roller



c262r172

- Paper registration sensor, Paper feed timing sensor p.165

  [A] Upper stay (x5, x1)
- Push up the upper stay

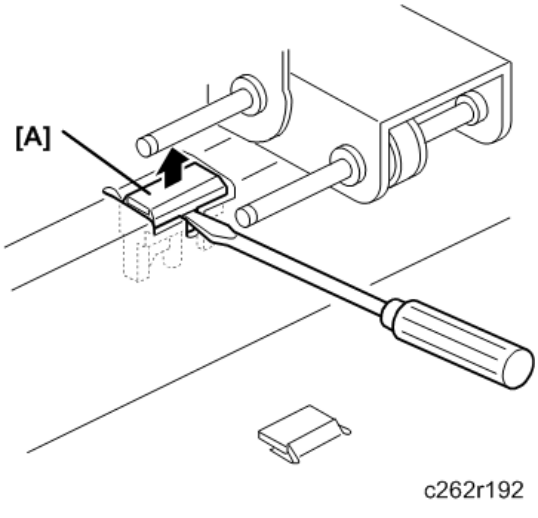


[A] Upper registration rear bracket

- Slide the upper registration rear bracket [B] towards the non-operation side.

  [B] Upper registration roller

Friction Pads



- Pick-up roller, Paper feed roller ☛ p.161

  [A] Friction pad

Here are some more important points about the friction pad:

- Friction pad A is the standard friction pad. It is black.
- Friction pad B is the special" friction pad. It is grey.

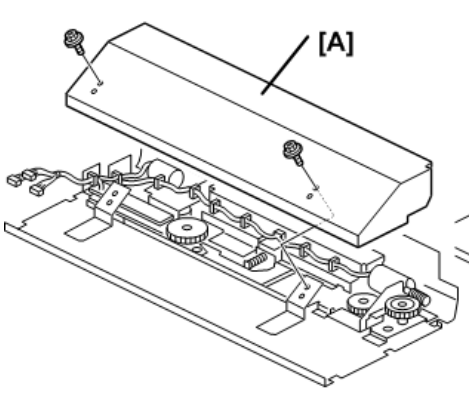
If you cannot see the correct friction pad at [A] as shown above, use SP 5-42 to move the necessary pad to [A].

- To move friction pad A to the replacement position, turn on the main switch, then access SP 5-42-1, and push the Start key.
- To move friction pad B to the replacement position, turn on the main switch, then access SP 5-42-2, and push the Start key.

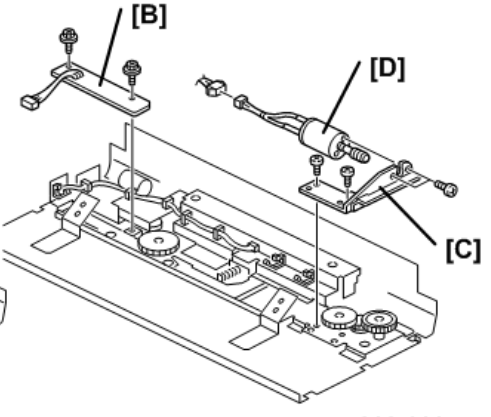
After you install a new friction pad, reset the PM counter:

- Friction pad A: SP3-4-5
- Friction pad B: SP3-4-6

Separation Pressure Detection Board, Friction Pad Shift Motor



c262r171a



c262r089

- Paper feed assembly ☛ p.160

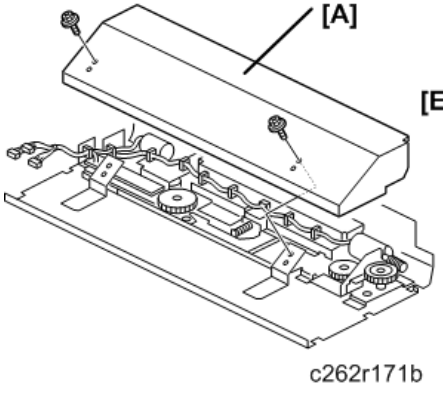
  [A] Friction pad unit cover (x2)

  [B] Separation pressure detection board (x2)

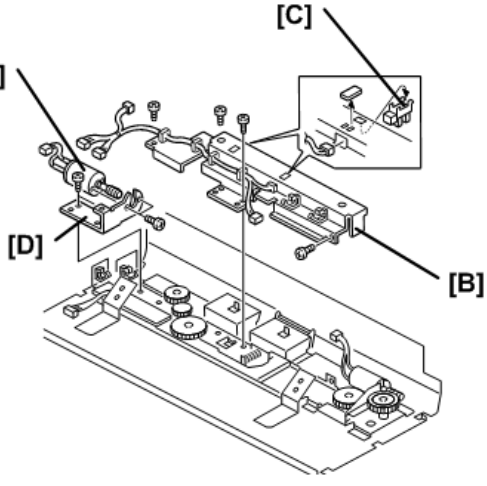
  [C] Friction pad shift motor bracket (x2, x1)

  [D] Friction pad shift motor (x2)

Separation Pressure Motor, Friction Pad Position Sensors 1, 2



c262r171b



c262r088

- Paper feed assembly ☛ p.160

  [A] Friction pad unit cover (x2)

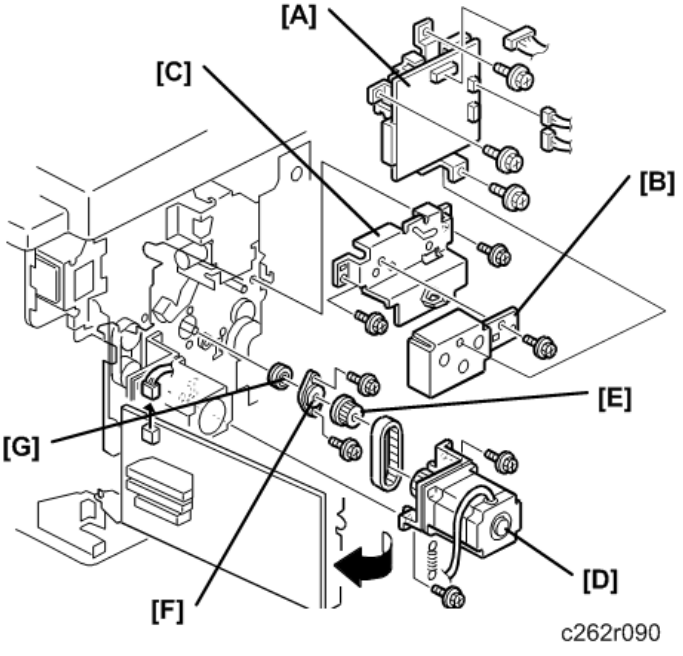
  [B] Friction pad position sensor bracket (x4, x3)

  [C] Friction pad position sensors 1, 2

  [D] Separation pressure motor bracket (x2, x1)

  [E] Separation pressure motor (x2)

Lower Registration Roller



- Front cover, Knob cover, Inner cover ☛ p.75
- Rear cover, Right rear cover, Right front cover ☛ ☛ p.75
- Open out the ACU - ECU assembly ☛ p.103
- Pressure cylinder ☛ p.180

  [A] Double feed detector board (x3, x3)

  [B] Pulley cover (x1)

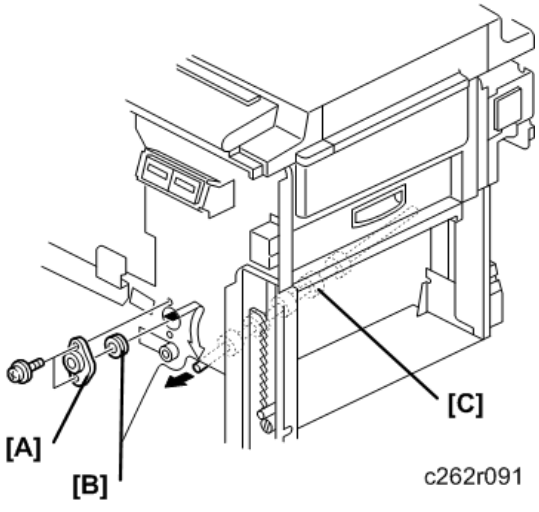
  [C] Lifting cam bracket (x2)

  [D] Registration motor (x2, x1)

  [E] Pulley (Allen screw x2)

  [F] Bearing holder (x2)

  [G] Bearing (x1)



[A] Bearing holder (x2)

[B] Bearing

[C] Lower registration roller

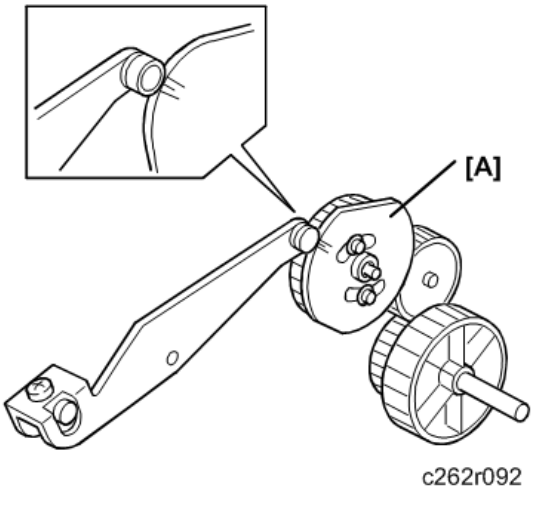
- Slide the lower registration roller [C] towards the operation side.

Registration Roller Lifting Cam Position Adjustment

Purpose: To ensure smooth paper feed from the registration roller to the drum.

Important

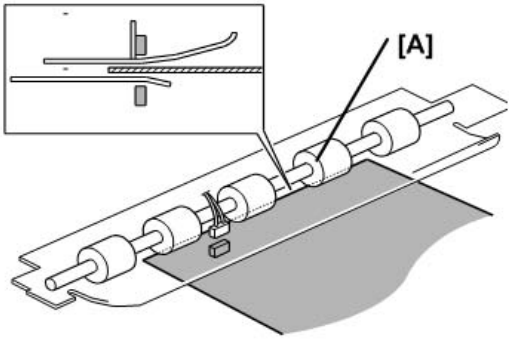
- **Make sure that the drum is at home position before the adjustment.**



1. When installing the registration roller lifting cam [A] on the shaft, align the cam follower (a bushing) at the center or within one division to the right of the center.
2. If the cam follower cannot be put in the correct place:
    - Try to change the gear meshing.
    - Also, try to readjust the position by loosening the screw holding the cam to the gear.
    - To obtain a perfect adjustment, you must eliminate any gear play by applying clockwise pressure to the cam (with the gear) during the adjustment.

Double Feed Sensor Adjustment

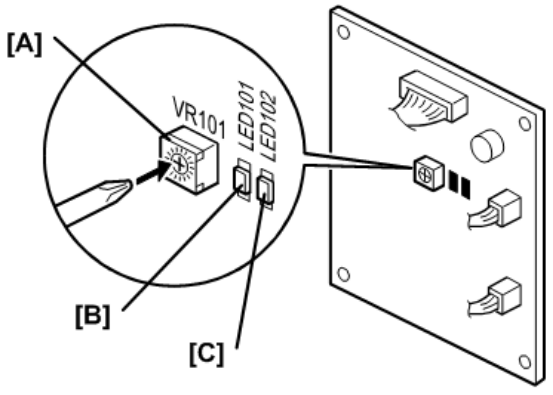
Purpose: To ensure that the sensor detects paper double feeds.



c262r160

- Rear cover ☛ p.75
- Open out the ACU - ECU assembly ☛ p.103

1. Turn on the main switch.
2. Feed a sheet of the customer's typical print paper from the paper feed table into the machine until the leading edge runs against the feed roller [A].

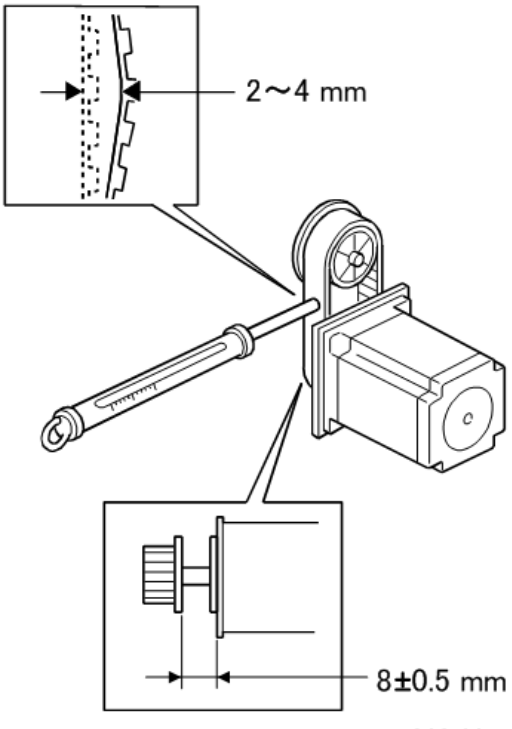


c262r159

1. Turn VR101 [A] clockwise until LED101 [B] on the double feed detection board lights.
2. Turn VR101 [A] counterclockwise until both LED101 [B] and LED102 [C] turn on.
3. Turn VR101 [A] counterclockwise until LED102 [C] turns off.

Timing Belt Tension Adjustment for the Paper Feed Motor

Purpose: To ensure smooth paper feed.

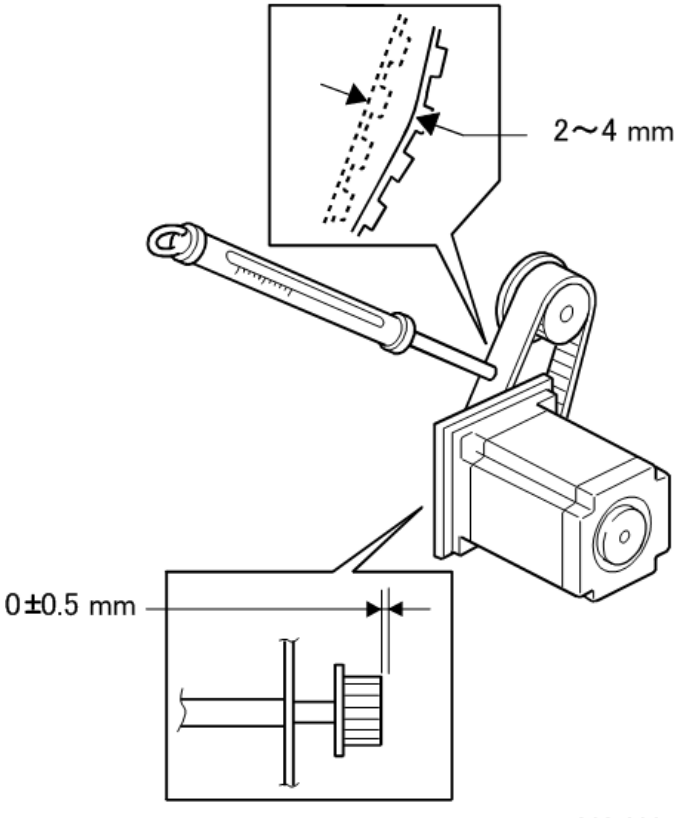


c262r095

1. Make sure that the distance between the motor and the flange is 8.0±0.5 mm.
2. Apply a 500 g load to the center of the belt using a tension gauge.
3. Make sure that the belt deflects between 2 to 4 mm. If the tension is incorrect, move the motor up or down.

Timing Belt Tension Adjustment for the Registration Motor

Purpose: To ensure smooth paper feed.



1. Make sure that the distance between the end of the lower registration roller shaft and the edge of the pulley is 0±0.5 mm.
2. Apply a 500 g load to the center of the belt using a tension gauge. Make sure that the belt deflects between 2 to 4 mm. If the tension is correct, move the motor up or down.

Paper Feed and Separation Pressure Adjustment

Paper feed pressure adjustment

Purpose: To ensure smooth paper feed from the paper table.

- The user has a choice of three different settings for the paper feed pressure (Standard, Frequent, Very Frequent). The user sets this between jobs depending on how often they think no-feed errors are occurring.
- The setting is returned to the default by pressing the Clear Modes key or turning the main switch off and back on. The default setting is Standard.
- The pressure applied for each setting can be adjusted by SP mode.

1. Select SP mode 6-009-1, 6-009-2 and 6-009-3.
    - SP6-009-10, 11, 12 are for special paper types (basically for **envelopes**).
    - SP6-009-1, 2, 3 are for **standard paper type**s.
    - SP6-009-4, 5, 6 are for **thick paper**.
    - If the user has programmed as User 1 or User 2, you can change the paper feed pressures with SP6-009-13, 14, 15 and SP6-009-16, 17, 18.

2. Change the settings as necessary:
    - Defaults for SP6-009-1 (Standard): 3, SP6-009-2 (Frequent): 5, SP6-009-3 (Very Frequent): 6
    - The available pressure levels are from 0 to 6. (0 is the weakest, 6 is the strongest.)

Paper Separation Pressure Adjustment

Purpose: To ensure paper separation.

- The user has a choice of three different settings for the separation pressure (Standard, Frequent, Very Frequent). The user sets this between jobs depending on how often they think multi-feed errors are occurring.
- The setting is returned to the default by pressing the Clear Modes key or turning the main switch off and back on.
- The pressure applied for each setting can be adjusted by SP mode.

1. Select SP mode "6-010-1", "6-010-2" and "6-010-3".
    - SP6-010-10, 11, 12 are for **special paper types**.
    - SP6-010-1, 2, 3 are for **standard paper types**.
    - SP6-010-4, 5, 6 are for **thick paper**.
    - If the user has programmed as User 1 or User 2, you can change the paper feed pressures with SP6-010-13, 14, 15 and SP6-10-16, 17, 18.

2. Change the settings as necessary.
   - Defaults for SP6-010-1 (Standard): 4, SP6-010-2 (Frequent): 5, SP6-010-3 (Very Frequent): 6
   - The available pressure levels are from 0 to 6. (0 is the weakest, 6 is the strongest.)

Paper Feed Length Adjustment

Paper Feed Motor Stop Timing Adjustment

Purpose: To ensure that the paper reaches the registration roller properly.

- Changing the paper feed motor stop timing with SP6-031-2 changes the paper feed length for the paper feed roller.
- Do not change SP6-014 and 6-015 (these change the paper feed start timing).

Procedure for Main Unit

1. Turn on the main switch, then access the SP mode.
2. Enter SP6-031-2.
3. Increase or decrease the value on the display.

   Before changing the value:
   - Check the current setting, in case you need to recover the previous setting. (Default for SP6-031-2: "21")
   - Changing the value by +1 increases the paper feed motor on-time and feeds the paper an extra 0.3 mm.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

Paper Clamping Timing Adjustment

Purpose: To ensure that the paper reaches the paper clamper on the pressure cylinder properly. Changing the paper clamping timing with SP6-027 to 29 changes the paper feed length for the paper registration roller.

Important

- **Do not change SP6-020 to 6-024 (these change the registration motor start timing). In addition, do not change SP6-031-1, -4, -5, or -6**

Procedure:

1. Turn on the main switch, then access the SP mode.

2. Enter SP6-027-1 to 8 (Paper Clamp Timing Pulse).
    - The paper clamping timing depends on the paper type selected at the operation panel, and the print speed.
    - SP6-027-1 to 8 are the adjustments for normal paper only.
    - For thick paper, use SP6-028-1 to 8.
3. Increase or decrease the value on the display.

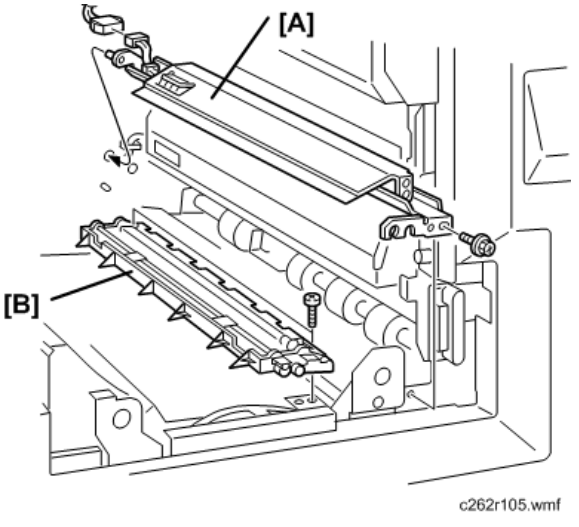
    Before changing the value:
    - Check the current setting, in case you need to recover the previous setting.
    - Changing the value by +1 decreases the registration motor's on-time and feeds the paper 0.3 mm less.
4. Leave the SP mode, then check the paper feed performance. If the problem still occurs, repeat the above steps.

Printing Section

Pressure Cylinder, Paper Clamper

Take care when removing and replacing the pressure cylinder because the pressure cylinder is made of soft rubber. Also, the encoder in the rear of the pressure cylinder can be easily damaged.

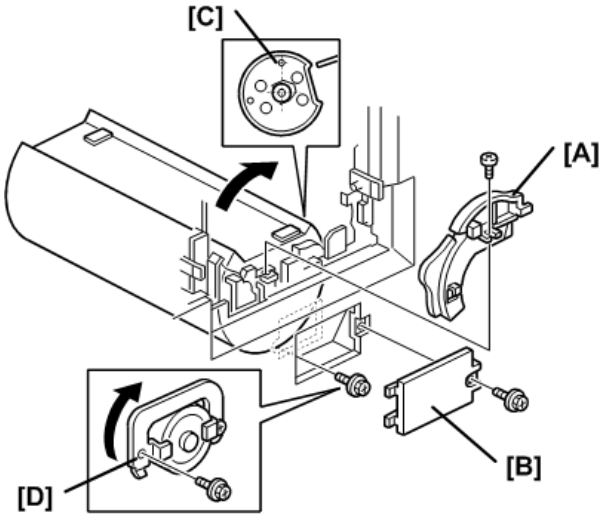
Removal procedure



- Drum unit ☛ p.143
- Left cover ☛ p.75
- Paper delivery unit ☛ p.225
- Air knife fan unit ☛ p.225
- Paper exit pawl ☛ p.224

  [A] 1st drum master sensor bracket (x1, x1)

  [B] Paper clamper (x2)

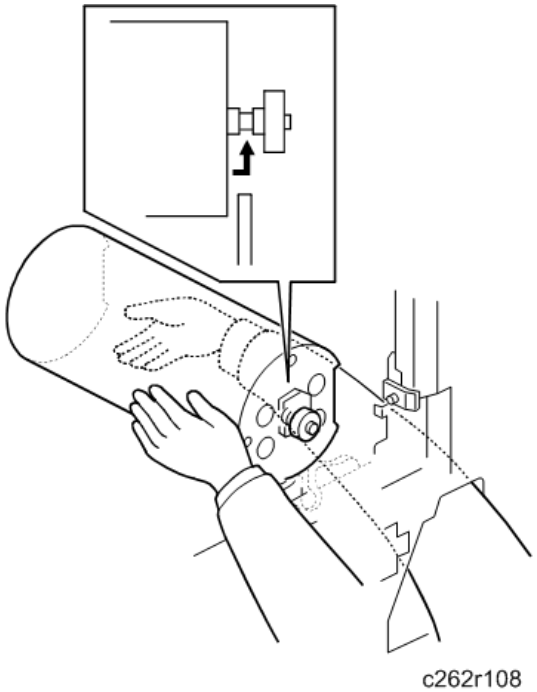


c262r106

[A] White cam (x1)

[B] Cover (x1)

1. Turn the pressure cylinder clockwise 80 degrees, so that the positioning hole [C] in the side of the pressure cylinder is at the top.(The flat part of the pressure cylinder faces towards the upper right, as shown.)
2. Remove the screw and flip over the stopper [D] from left to right.

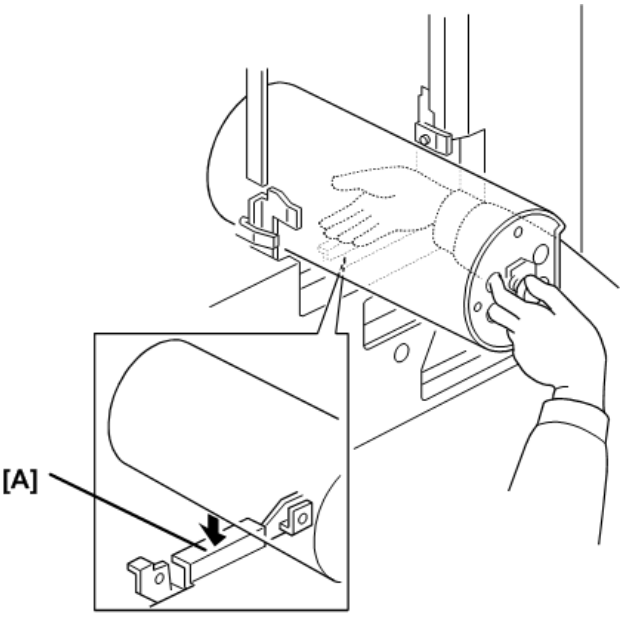


c262r108

1. Put the right hand into the side trapezoid hole (for removing lower wrapping jams), and support the bottom of the cylinder.
2. Pull it a little toward you (to disengage the join behind the cylinder). Then, push up to the drum position.

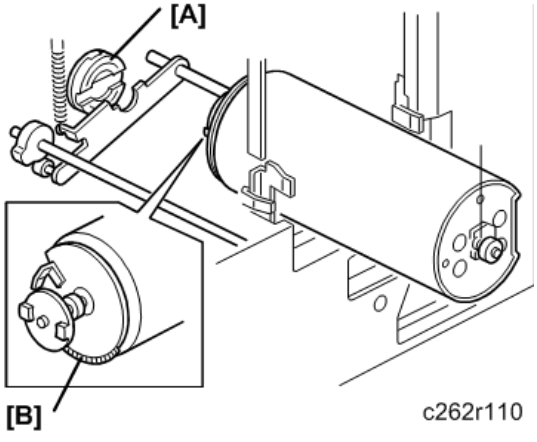
Important

- **There is an encoder plate at the rear of the pressure cylinder. Be careful not to damage it when removing the pressure cylinder.**



1. Pull the pressure cylinder toward you, and put it on the flat area of the inner cover [A].
2. With the left hand, hold the bearing tightly, putting fingers into the holes as shown.
3. Support the rear of the pressure cylinder with the right hand. Then, bring out the cylinder using both hands

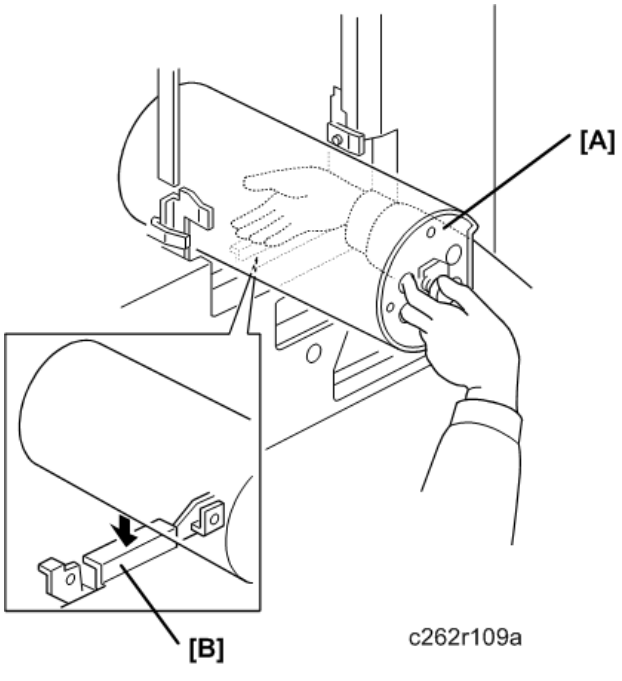
Reinstallation Procedure



- Take care not to turn the drive accidentally after removing the pressure cylinder.
- When the drive is in position, the cutout (for engagement) in the drive conductor (white disk) [A] is positioned horizontally but leans to the upper right just slightly.

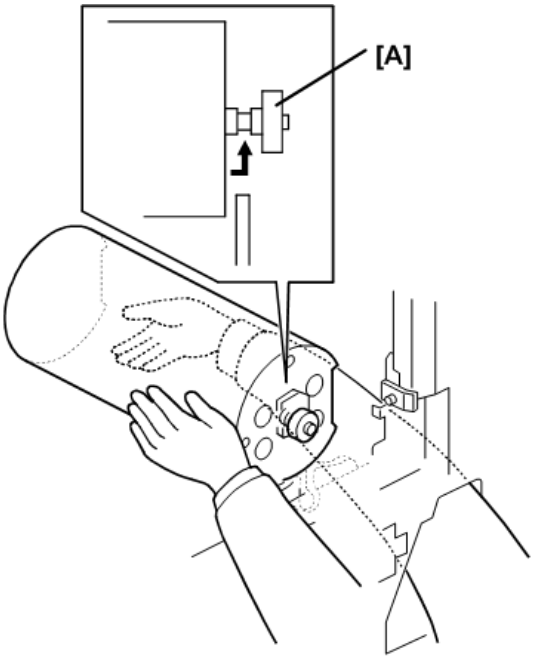
Important

- **There is an encoder plate (B) at the rear of the pressure cylinder. Be careful not to damage it when installing the pressure cylinder.**



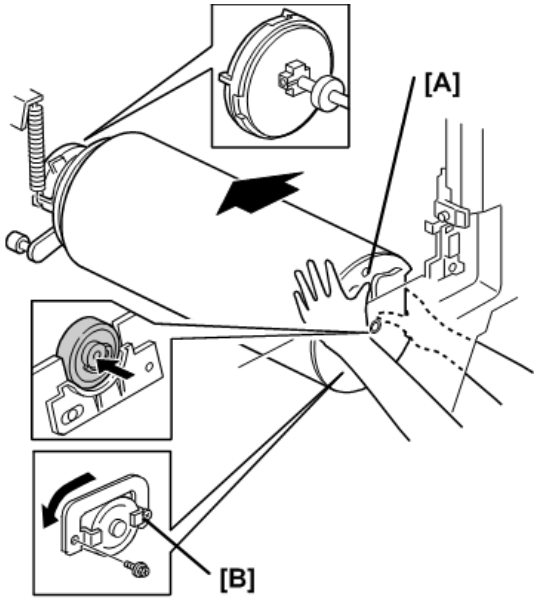
1. Hold the pressure cylinder so that the round hole [A] is uppermost. Rest the pressure cylinder on the flat area of the inner cover [B].

2. White the left hand, hold the bearing tightly, putting fingers into the holes as shown.
3. Support the rear of the pressure cylinder with the right hand into the side trapezoid hole (for removing lower wrapping jams), and support the bottom of the pressure cylinder.



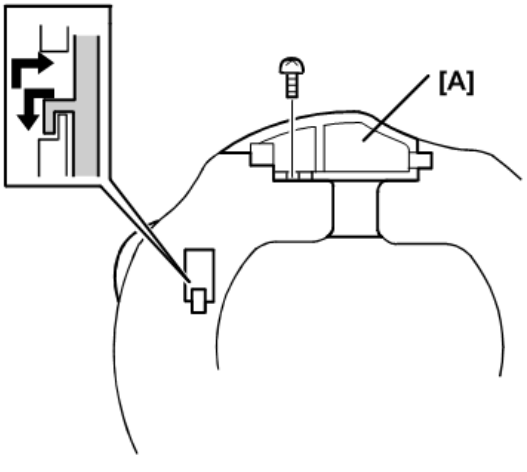
c262r108a

1. Put the pressure cylinder into the hole where the drum was. Use both hands.
2. Install the pressure cylinder, while positioning the thinnest part of the shaft of the bearing [A] with the clamper cam (the black cam) as shown above. Position the bearing on the bearing holder.



c262r111

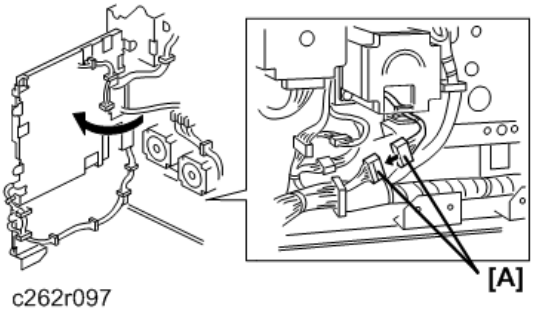
1. While the round hole [A] is uppermost, push the pressure cylinder towards the non-operation side (to engage the join behind the cylinder).
    - If it cannot enter, push while slightly turning the pressure cylinder, and check if the joint is engaged properly by turning the pressure cylinder slightly.
    - Set the bearing stopper [B] as shown.



c262r107

1. Install the white cam [A] as shown.
2. Reassemble the machine.
3. After you install a new paper clamper, reset the counter for this part with SP 3-4-2.

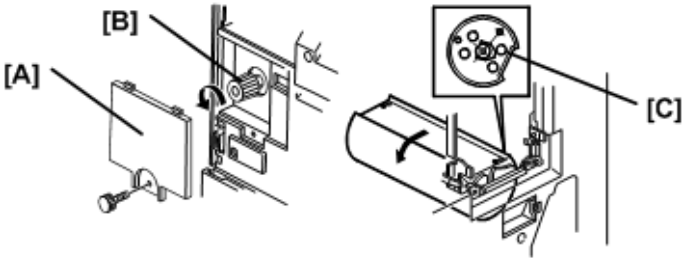
Feed Encoder, Feed Start Sensor, Feed Encoder Harness, Feed Encoder Cleaning Brush



c262r097

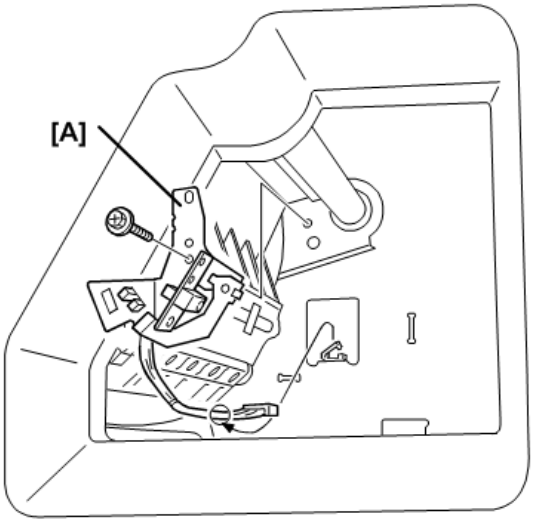
- Drum unit ☛ p.143
- Rear cover ☛ p.75
- Open out the ACU - ECU assembly ☛ p.103

1. Disconnect the connector [A] from the rear of the machine (x1).



c262r098

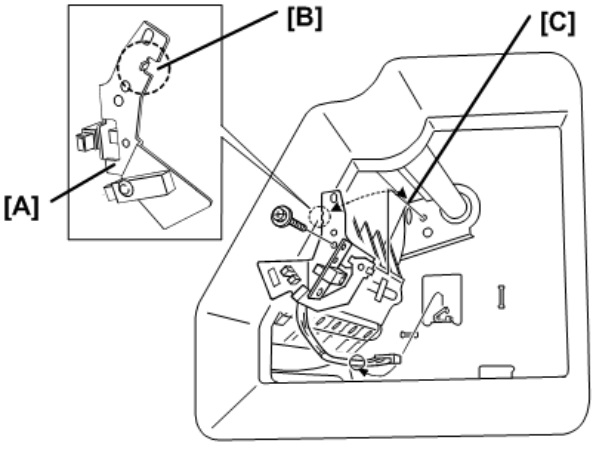
1. Remove knob cover [A] (x1)
2. Turn the knob [B] until the flat part of the cylinder [C] is in the position shown.



c262r102

1. Remove feed encoder bracket [A] (x1)

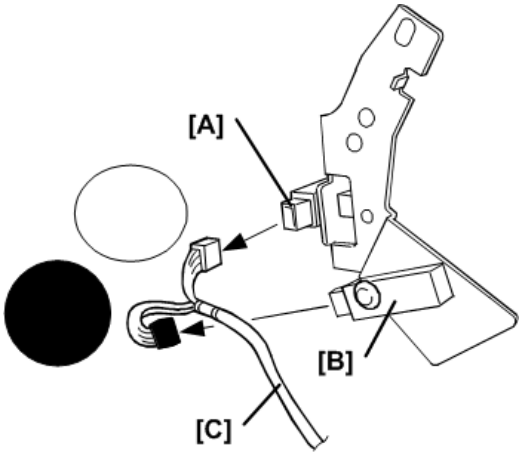
Re-Installation



c262r099

When re-installing the feed encoder bracket [A]:

- Be sure to put the hook [B] on the feed encoder bracket in the correct place on the main unit [C]
- Attach the hook exactly at the corner.



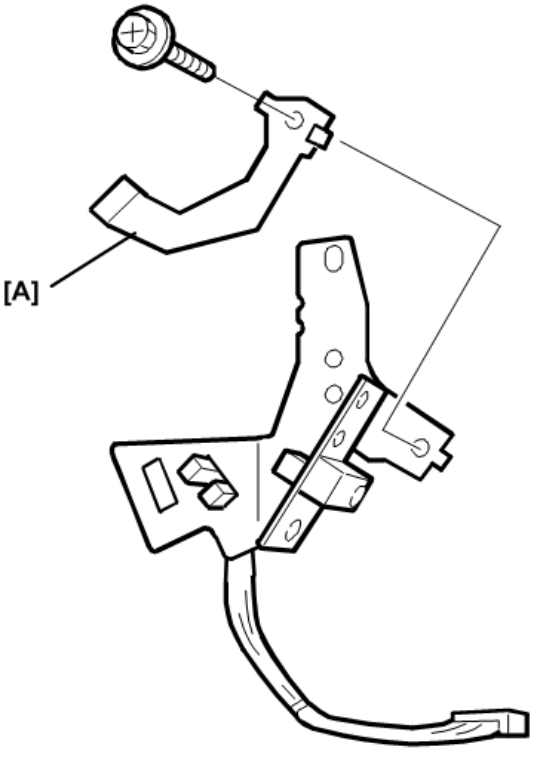
c262r103

[A] Feed encoder (x1)

[B] Feed start sensor (x1)

[C] Feed encoder harness

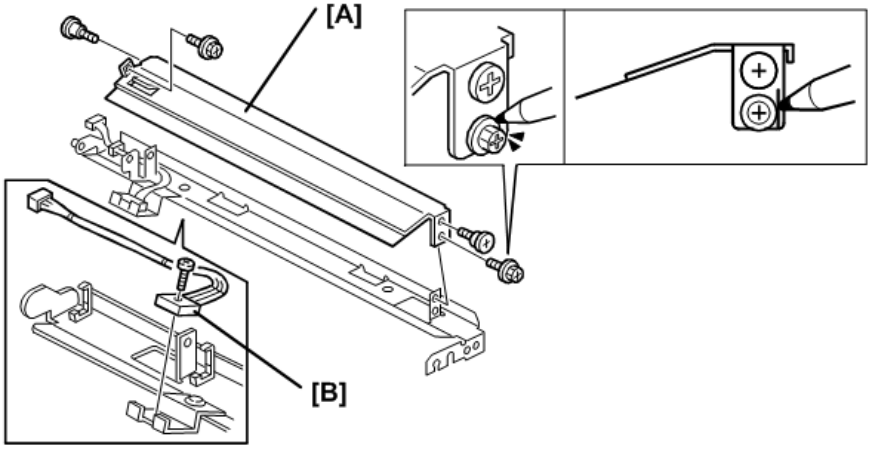
- The white connector goes to the feed encoder [A].
- The yellow connector goes to the feed start sensor [B].



c262r194

[A] Feed encoder cleaning brush (x1)

1st Drum Master Sensor



- Drum unit ☛ p.143
- 1st drum master sensor bracket ☛ p.180

  [A] 1st drum master sensor guide (x4)

Before you remove the bracket:

- Make a mark on the screw and the bracket.
- This will show you how much to tighten the screw before you do the 1st drum master sensor guide adjustment.

Re-installation

- After you re-install the 1st drum sensor guide, do the 1st drum master sensor guide adjustment ☛ p.189

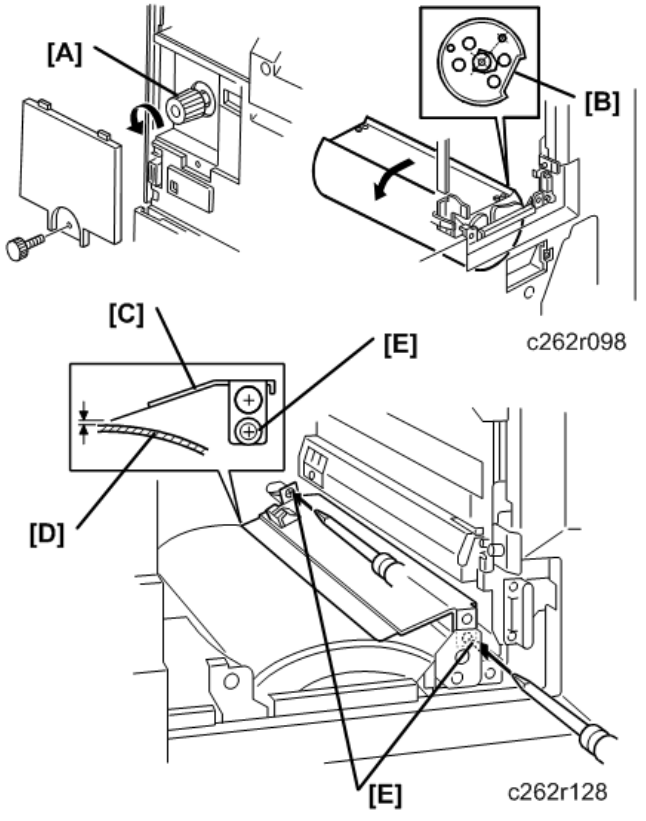
  [B] 1st drum master sensor (x1, x1)
- Do the 1st drum master sensor adjustment after installing the new 1st drum master sensor. ☛☛ p.189

1st Drum Master Sensor Guide Adjustment

- Drum unit ☛ p.143
- Knob cover ☛ p.75

1. Apply the printing pressure as follows, to push the pressure cylinder up to the printing position.

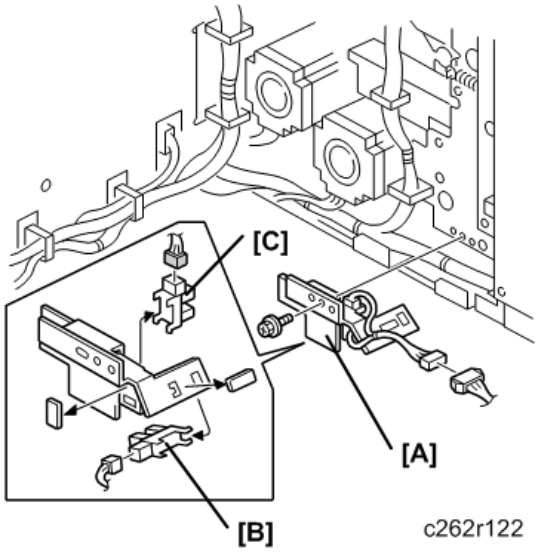
- Access SP5-64-2 for the printing pressure release solenoid, and select "Start".



- Turn the knob [A] until the flat part of the cylinder [B] is in the position shown.
- Leave SP mode.

1. Adjust the clearance between the 1st drum master sensor guide [C] and the surface of the pressure cylinder [D] until it is 0.5 to 1.0 mm (loosen the 2 screws [E]).

Printing Pressure HP Sensor, Printing Pressure Position Sensor, Pressure Cam Shift Motor

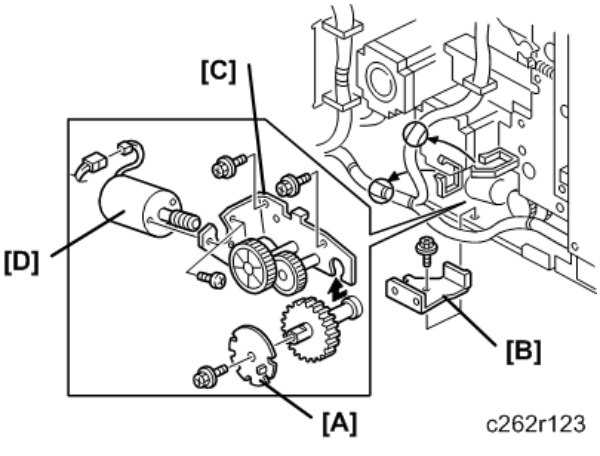


- Rear cover ☛ p.75
- ECU ☛ p.103

  [A] Printing pressure sensor bracket (x1, x1)

  [B] Printing pressure position sensor (x1)

  [C] Printing pressure HP sensor (x1)



[A] Encoder (x1)

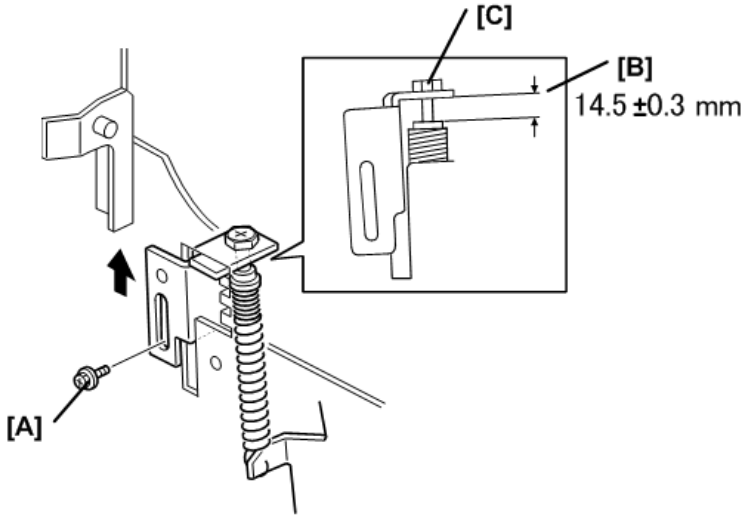
[B] Bracket (x1)

[C] Print pressure adjustment motor unit (x2, x1)

[D] Print pressure adjustment motor (x3)

Printing Pressure Adjustment

Purpose: To improve the print results.

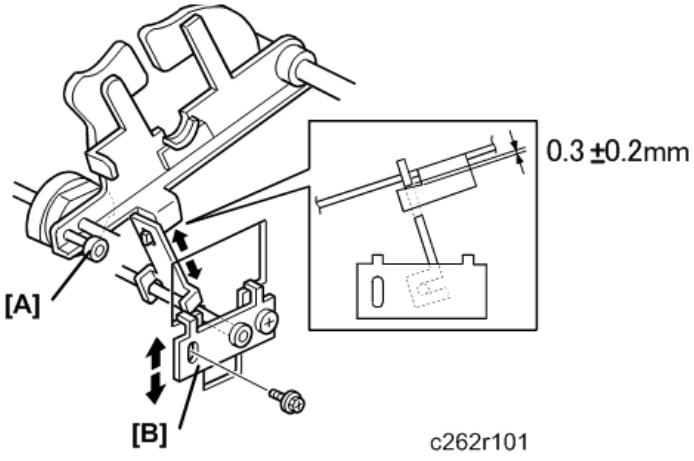


c262r100

1. Move the printing pressure bracket to its highest position, then tighten the screw [A].
2. Adjust the clearance [B] to 14.5±0.3 mm by turning the bolt [C].

Printing Pressure Release Arm Gap Adjustment

Purpose: To ensure that the printing pressure lever is disengaged when the printing pressure release solenoid is energized.



1. Rotate the printing pressure cams so that the arm moves to the lowest position.

   Note

   - Use the main drive rotation knob. When the top of the cam meets the bearing [A] while turning the knob, the arm is at the lowest position.

2. Adjust the clearance between the hook and the printing pressure release arm by moving the bracket [B] up and down. The clearance must be 0.3±0.2 mm.
3. Do the same at the non-operation side.

Main Drive, Image Shift Drive Section

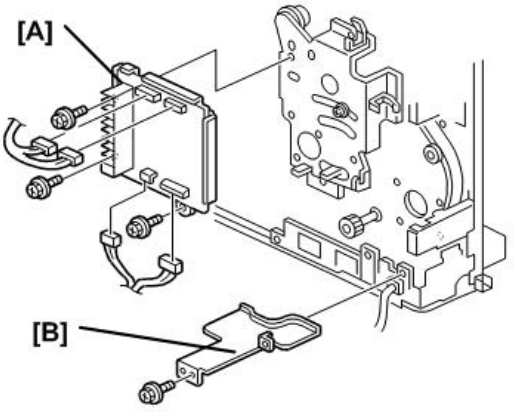
Main Motor and Torque Limiter

Removal Procedure

1. Turn off the main switch and disconnect the power plug.
2. Remove the following parts:

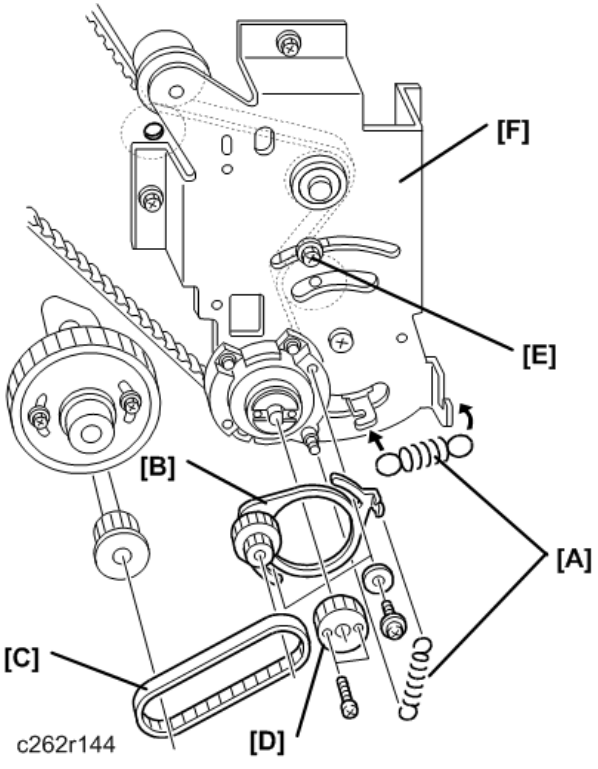
- Drum unit ☛ p.143
- Rear cover ☛ p.75
- Left cover ☛ p.75
- Paper delivery unit ☛ p.225
- Air knife fan unit ☛ p.225
- Job separator unit ☛ p.226
- Printing Pressure Cam Shift Unit ☛ p.226

From the rear



c2801378

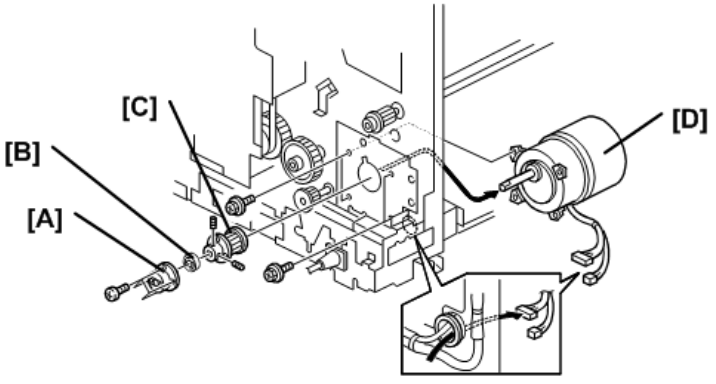
1. Swing out the PSU ☛ p.103
2. Remove the main motor control board [A] (x3, x4).
3. Remove the wire protection cover [B] (x2, x1).



1. Remove the springs [A] (x2).
2. Remove the pulley bracket [B] (x2).
3. Remove the timing belt [C].
4. Remove the gear [D] (x2).
5. Loosen the screw [E].
6. Remove the bracket [F] (x5, x3, x2).

Important

- **One of the screws is under the main wire harness. Take care not to damage the wire harness when you remove it.**



c262r180

1. Remove:

   [A] Bracket (x4).

   [B] Bearing.

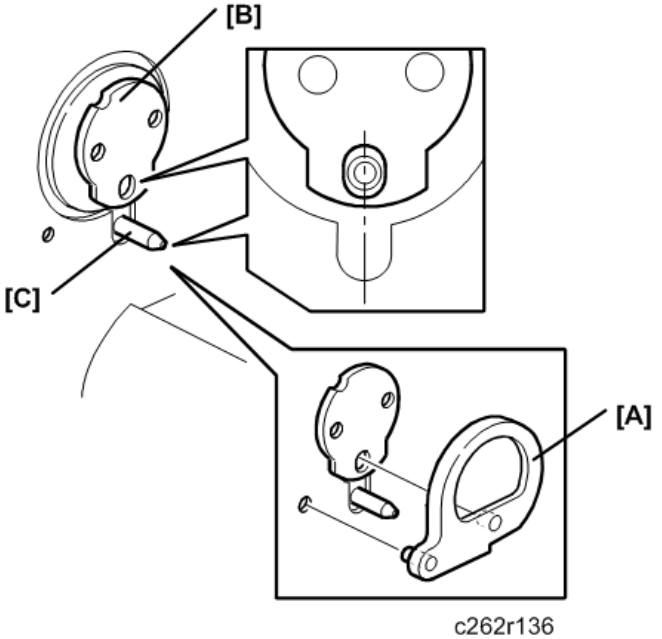
   [C] Torque limiter (Allen screws x 2).

   [D] Main motor (x4).

Re-installation Procedure

After you replace the main motor, you must adjust the exit pawl drive timing. ☛ p.229

The following procedure shows the correct way to do this.

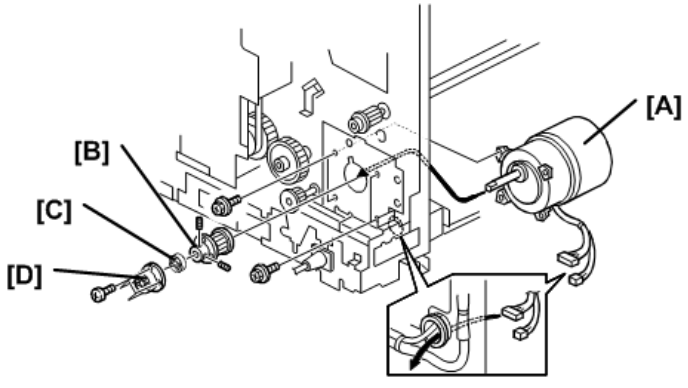


c262r136

1. Make sure that the drum drive disk is in the home position by setting the drum drive securing tool [A].

   Service Tools

   - The tools are available as a service part. The part number is #C2299000 (three parts as set).
   - If the special tool is not available, align the elongated hole in the drum drive disk [B] with the shaft [C] below it, as shown.



c262r181

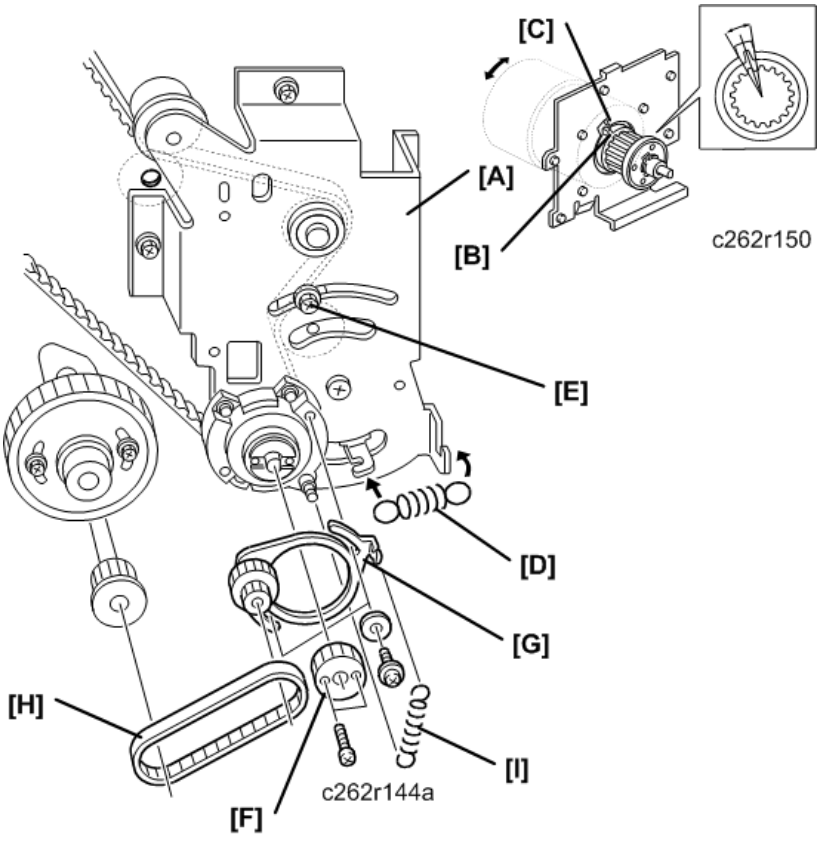
1. Install:

   [A] Main motor (x4).

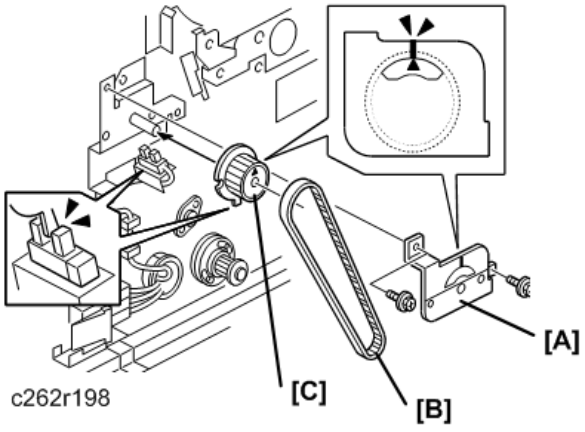
   [B] Torque limiter (Allen screws x2).

   [C] Bearing.

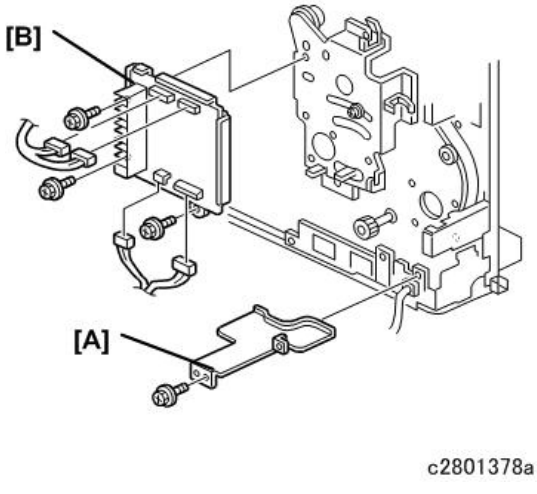
   [D] Bracket (x4).



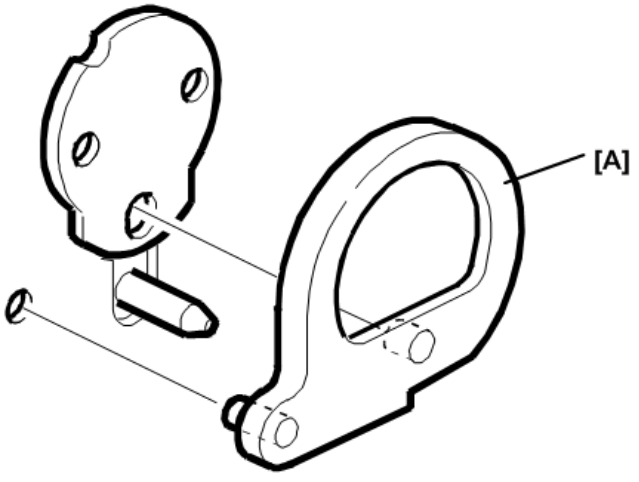
1. Install the bracket [A] (x5, x 3, x2).
2. Align the pawl [B] of the torque limiter with the cutout [C] in the bracket as shown.
3. Attach the spring [D] and secure the screw [E].
    - If the cutout and pawl are in line, the main motor drive is OK.
    - If they are not aligned, remove the spring [D], then make sure that the cutout and pawl are aligned.
4. Install the gear [F] (x2).
5. Install the pulley bracket [G] and the timing belt [H] (x2).
6. Install the spring [I].
7. Adjust the exit pawl drive timing. ☛ p.229



1. Remove the indicator disk bracket [A] and the timing belt [B] (x2).
2. Install the indicator disk bracket [A] and the timing belt [B] when the line and arrow on the indicator disk [C] are in line (x2), and the actuator is in the sensor, as shown in the diagram.



1. Install the wire protection cover [A] (x2).
2. Install the main motor control board [B] (x3, x4).

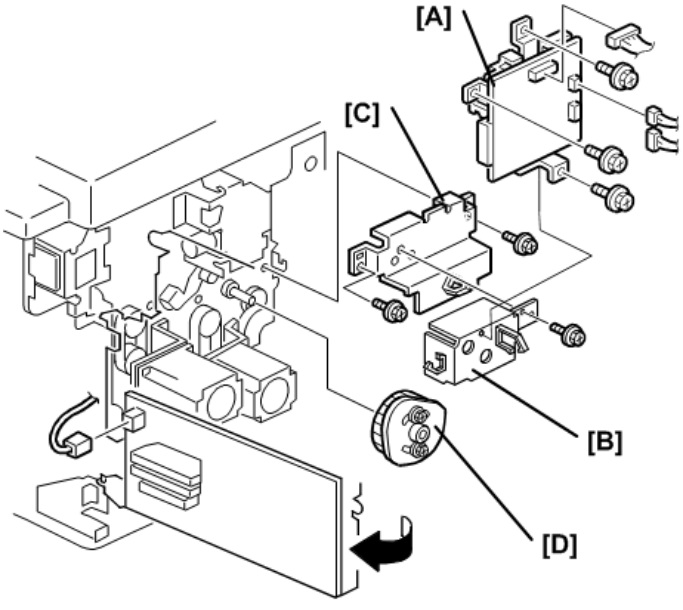


1. Remove the drum drive securing tool [A].
2. Install:
    - PSU ☛ p.107
    - Job separator unit ☛ p.226
    - Paper delivery unit ☛ p.225
    - Air knife fan unit ☛ p.225
    - Paper delivery cover ☛ p.225
    - Left cover ☛ p.75
    - Rear cover ☛ p.75
    - Drum unit ☛ p.143

Main Drive Mechanism (Main Drive Timing Belt)

Disassembly Procedure

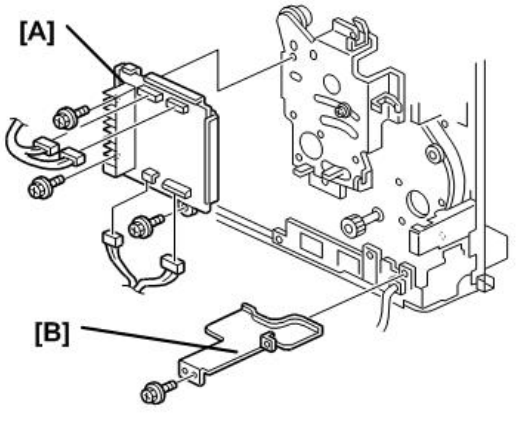
1. Turn off the main switch and disconnect the power plug.
2. Remove the rear cover ☛ p.75
3. Swing out the ACU-ECU assembly and PSU. ☛ p.103



c262r142

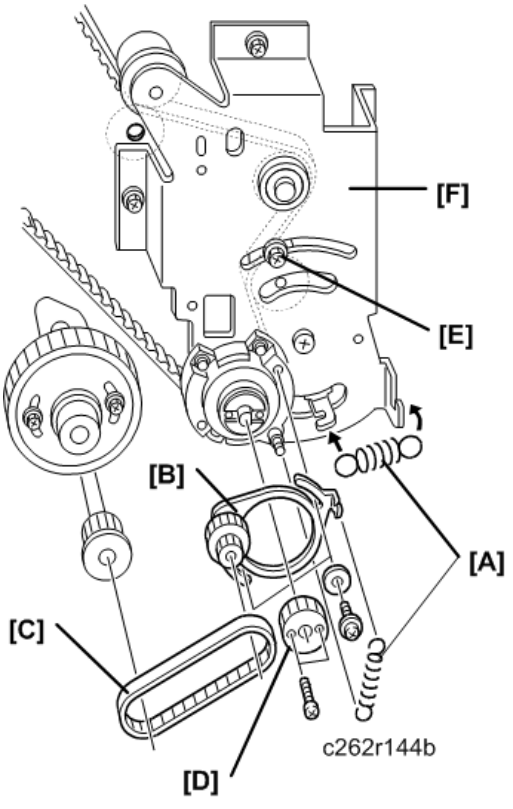
1. Remove the double feed detector board [A], the motor cover [B] and the lifting cam bracket [C].
2. Remove the registration roller lifting cam [D].

From the rear



c2801378

1. Remove the main motor control board [A] (x3, x4).
2. Remove the wire protection cover [B] (x2).

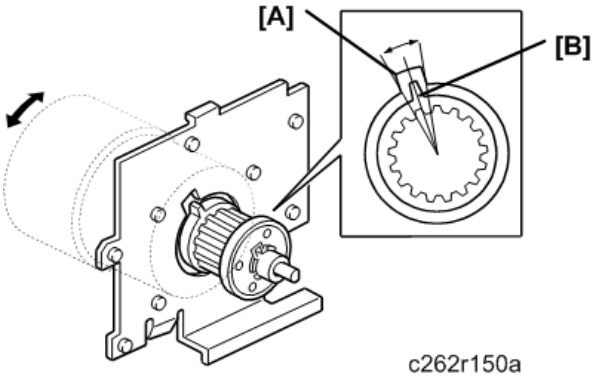


1. Remove springs [A] (x2).
2. Remove the pulley bracket [B] (x2).
3. Remove the timing belt [C] (x1).
4. Remove gear [D] (x2).
5. Loosen the screw [E]
6. Remove the bracket [F] (x5, x2, x2).

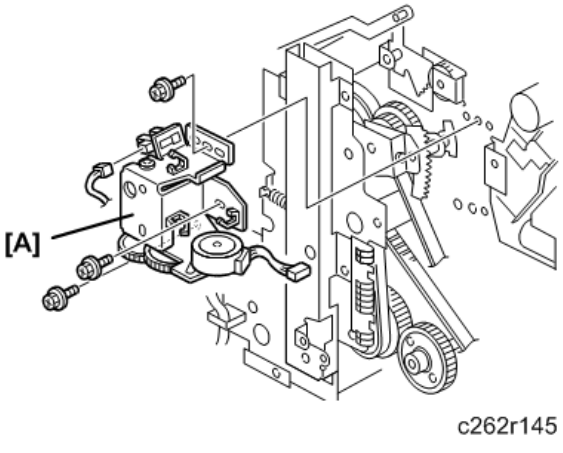
Important

- **One of the screws is under the main wire harness. Take care not to damage the wire harness when you remove it**

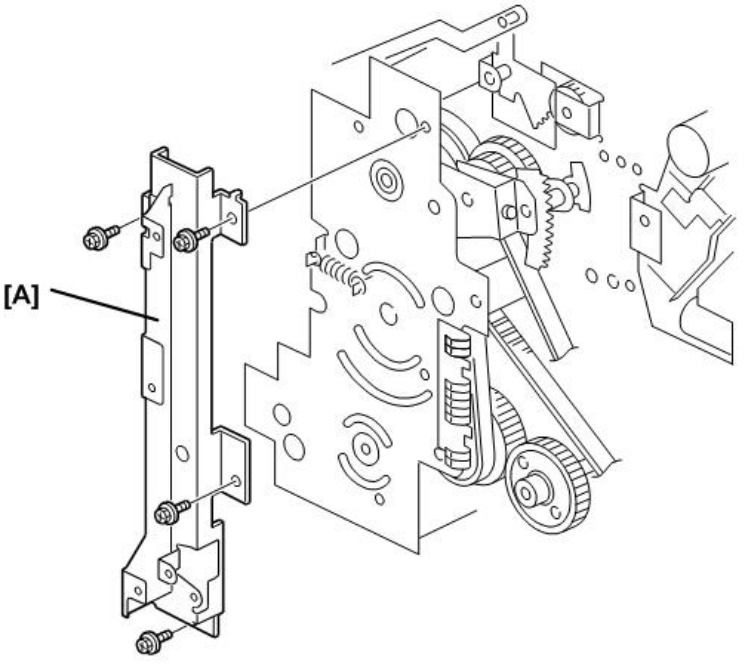
Re-installation



When re-installing the bracket, be sure to align the cutout in the bracket [A] with pawl on the torque limiter [B] as shown above.

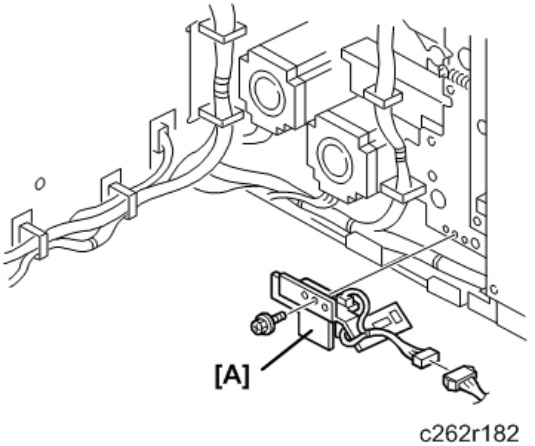


1. Remove the image shift unit [A] (x4, x2, x3).



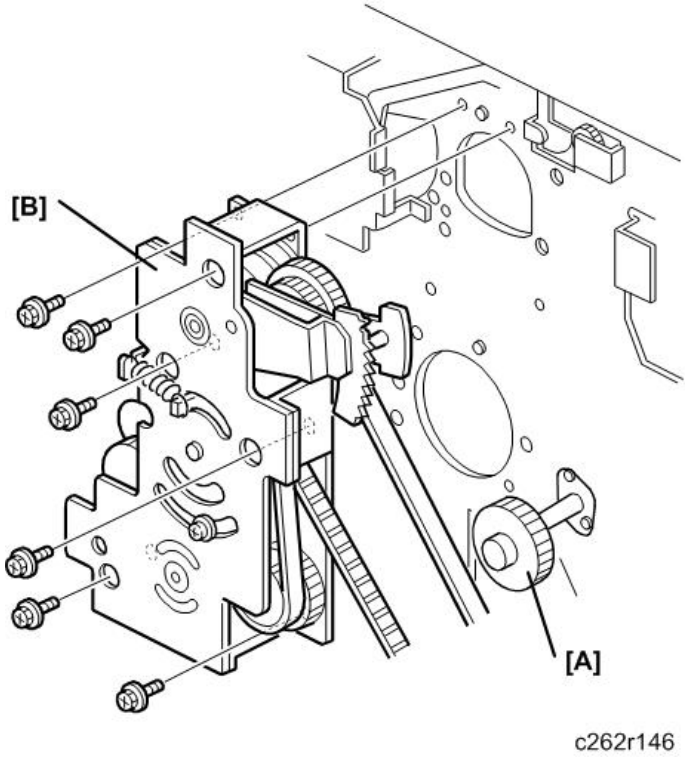
c2801393

1. Remove the supporter for the ACU-ECU assembly and PSU [A] (x4).



c262r182

1. Printing pressure sensor bracket [A] (x1, x1).



1. Remove the printing pressure cam drive gear [A] (x2).
2. Remove the main drive unit [B] (x6, x1).

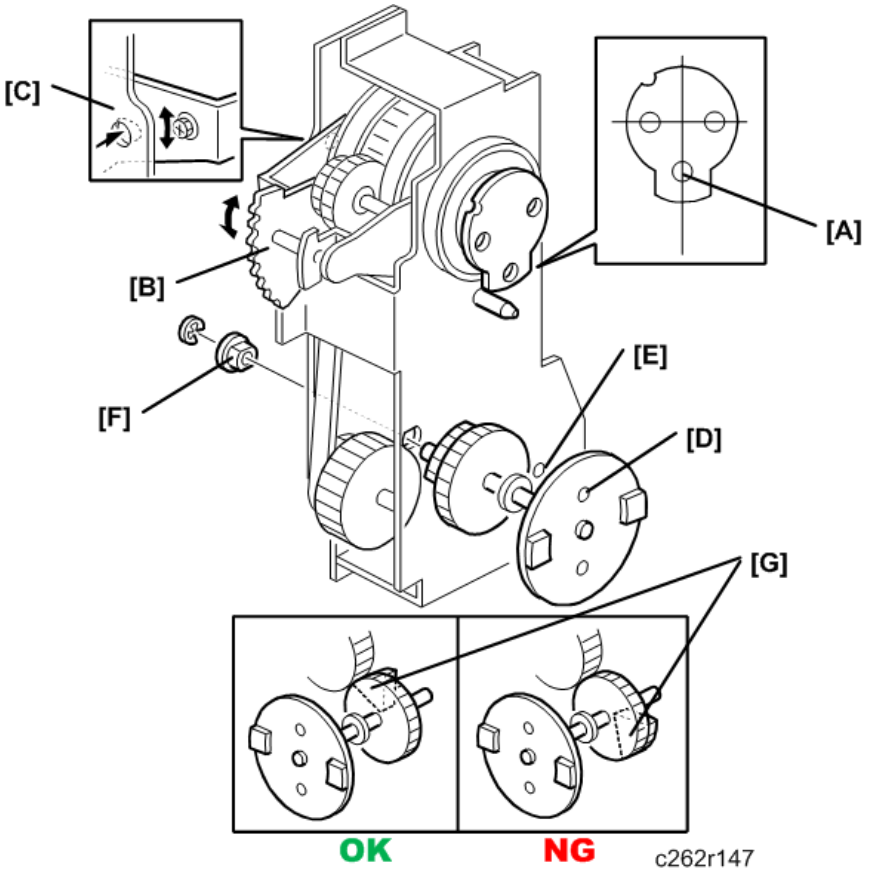
Reassembly Procedure

The following items must be checked or set while reinstalling the main drive section:

- Drum home position
- Image shifting arm home position
- Pressure cylinder drive reinstalling position
- Scissors gear reinstalling position
- Printing pressure cam drive gear reinstalling position
- Registration roller lifting cam reinstalling position
- Paper exit pawl drive cam reinstalling position
- Pressure cylinder rotation knob position

Procedure 1: Re-setting Important Parts

The procedure describes setting the drum drive disk, image shifting arm, pressure cylinder drive disk, and scissors gear in their home positions



1. To set the drum drive disk in the home position, align the elongated hole [A] in the drum drive disk straight down by turning the disk.
2. Set the image shift arm [B] in the home position. To do this, align the hole in the upper plate [C] with the elongated hole in the image shift arm.
3. Align the hole in the pressure cylinder drive disk [D] with the hole in the side plate of the drive unit [E], then install the bushing [F] (one E-ring).

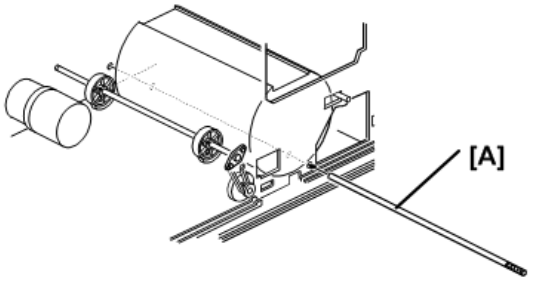
   Before installing the bushing [F]:

   - Make sure that the scissors gear [G] also meshes with the next gear.
   - If the scissors gear is set incorrectly by 180 degrees, the scissors gear will not mesh with that gear. (See "OK" and "NG" in the diagram above.)

Installing the main drive unit on the machine rear frame

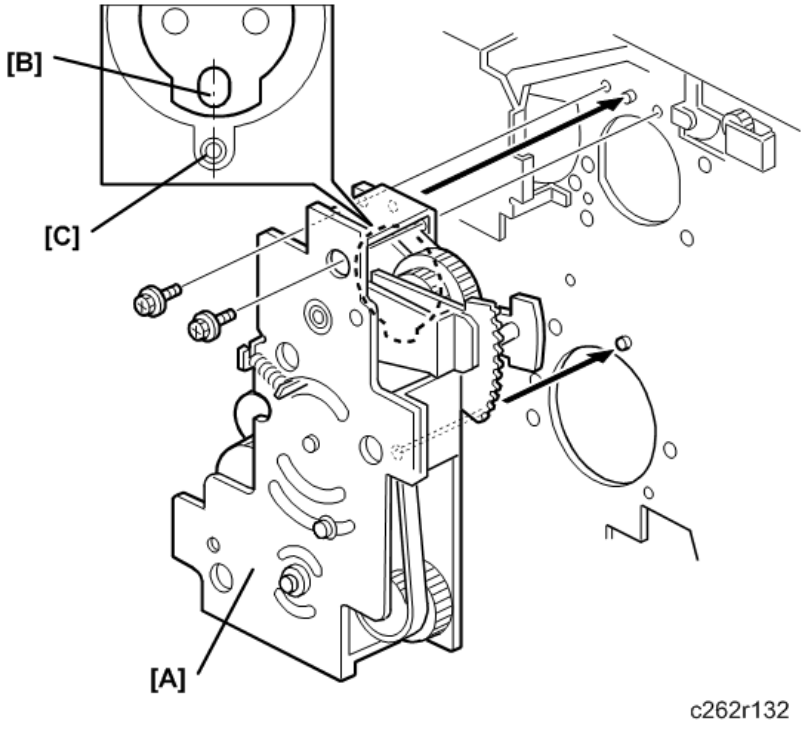
From the operation side

1. Remove the front cover, the knob cover and the inner cover ☛ p.75

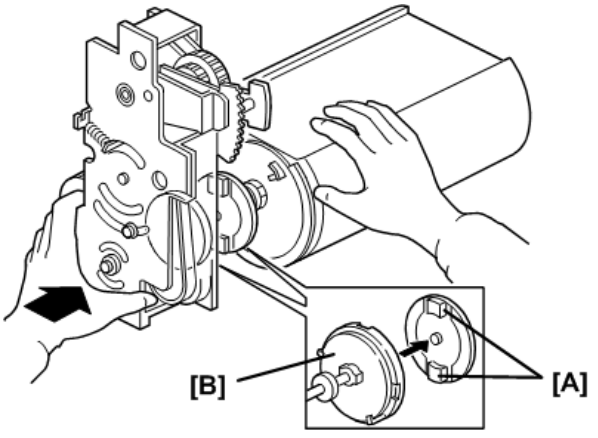


1. From the operation side of the machine, insert the positioning shaft [A] (special tools) to secure the pressure cylinder in the home position. Pass one shaft through the pressure cylinder as shown.

From the paper exit side



1. Secure the main drive unit [A] on the machine rear frame (x2).
    - Install the two screws temporarily, because you must tighten them in **Step 8**.
    - When installing the main drive unit, align the elongated hole in the drive disk [B] with shaft [C] above it, as shown.

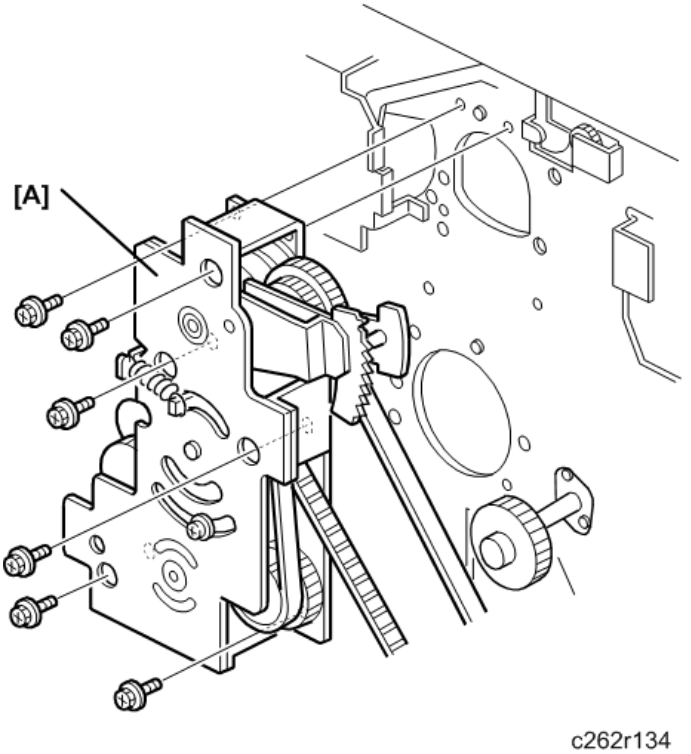


c262r133

2. While aligning and holding the pressure cylinder horizontally as shown, set the main drive unit so that the convex points of the pressure cylinder drive disk [A] meet the concave points of the pressure cylinder drive transmission disk [B] (made of white plastic).

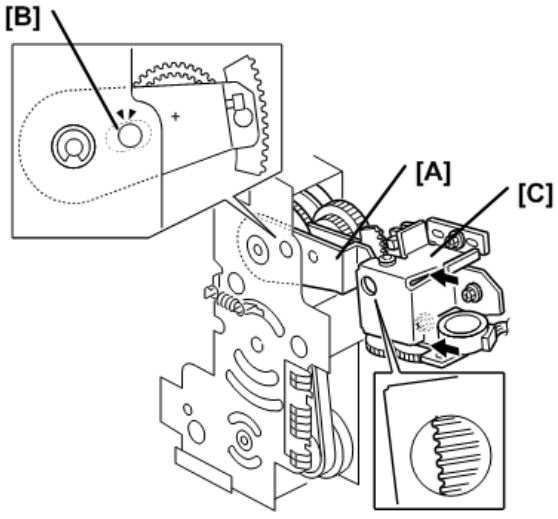
Note

- Hold the drum drive disk, image shifting arm, pressure cylinder drive disk, and scissors gear in their home positions as explained in Steps 1, 2 and 3



c262r134

1. Secure the main drive unit [A] on the machine rear frame (x6).



c262r135

1. Make sure that the image shift arm [A] is in the home position. To do this, align the hole in the upper plate [B] with the elongated hole in the image shift arm (as explained in step 2).
2. Push the image up/down shift drive unit [C] against the image shift arm sector gear, and secure the unit (x4, x2, x3).

Note

- Ensure that the unit is set without any play.
- Do not push on the unit too strongly. Ensure that the image shift arm moves smoothly after securing the unit. If it does not, SC303 will be displayed at power up.

3. Install the main drive timing belt on the main motor shaft, and re-attach the parts in the main motor area. (Refer to steps 5 through 15 of the Disassembly procedure.)
4. Remove the positioning shaft (this was inserted in step 5 of the reassembly procedure).

Procedure 2: Fine adjustment using the special tools

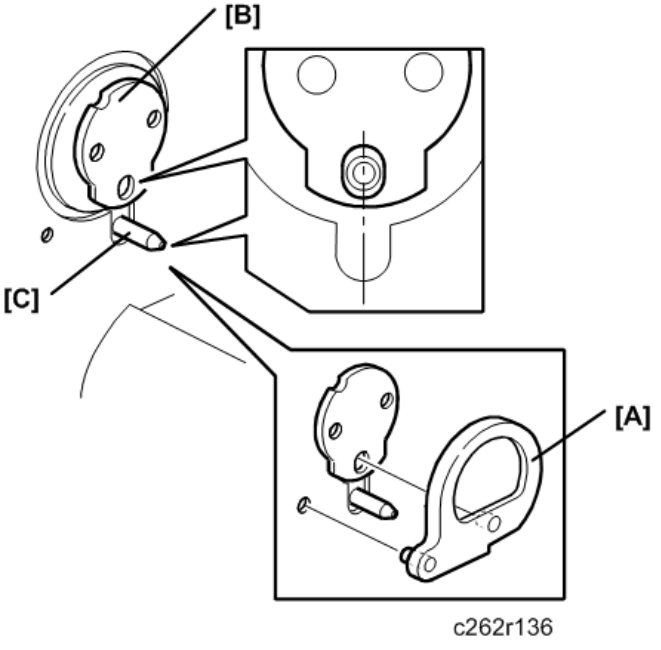
- Left cover ☛ p.75
- Paper delivery cover ☛ p.225
- Air knife fan unit ☛ p.225
- Paper exit pawl ☛ p.224

1. Install the drum unit in the machine.
2. Install the front cover.
3. Close the front cover, connect the power plug, then turn on the main switch. The up/down image shifting mechanism will initialize.
    - This procedure is needed to return the image shift arm to its home position.

- If the image shift arm is not returned to home position exactly in this step, correct positioning for each main drive part will not be obtained.

4. Turn off the main switch, and disconnect the power plug.

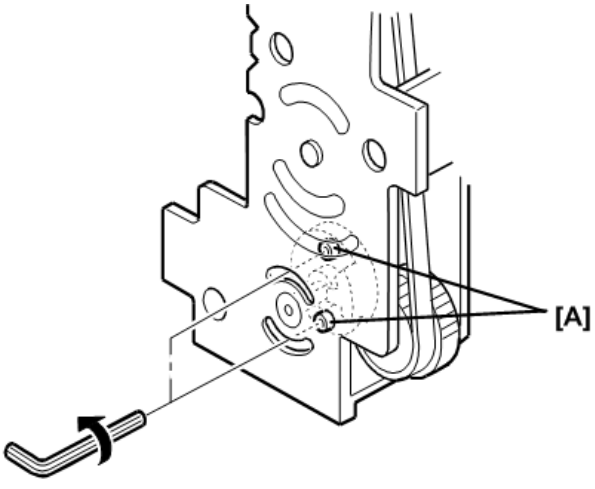
- Knob ☛ p.75
- Paper delivery unit ☛ p.225
- Printing pressure shift cam unit ☛ p.226



1. Make sure that the drum drive disk is in the home position, by installing the drum drive securing tool [A].

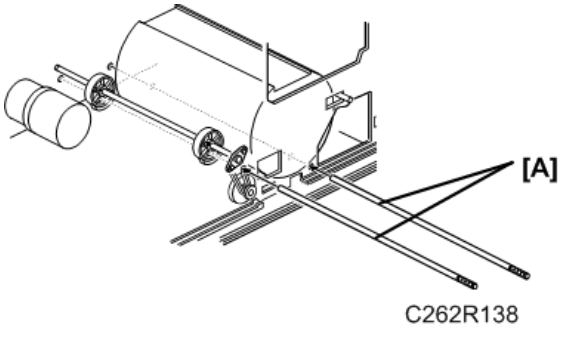
   Service Tools

   - The tools are available as a service parts (Part number is #C2299000).
   - If the special tool is not available, align the elongated hole in the drum drive disk [B] with the shaft [C] below it, as shown.



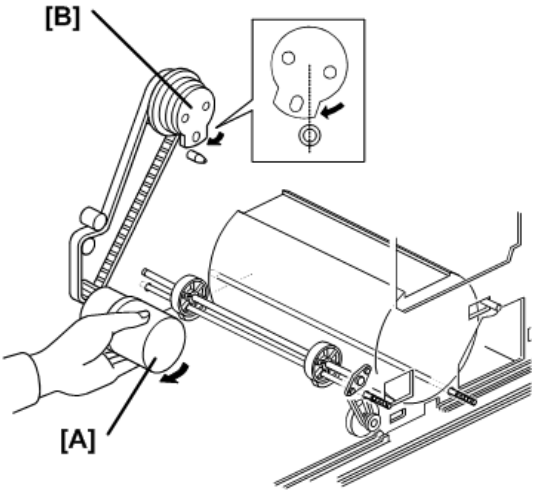
c262r137

1. From the rear, loosen the two screws [A] to allow the pressure cylinder drive gear to turn freely. **Do not remove the screws**.



C262R138

1. From the operation side of the machine, insert the two positioning shafts [A] (special tools) to secure the pressure cylinder and printing pressure cams in their home positions.
   - Pass one shaft through the pressure cylinder as shown.
   - Pass the other shaft through the two printing pressure cams as shown.

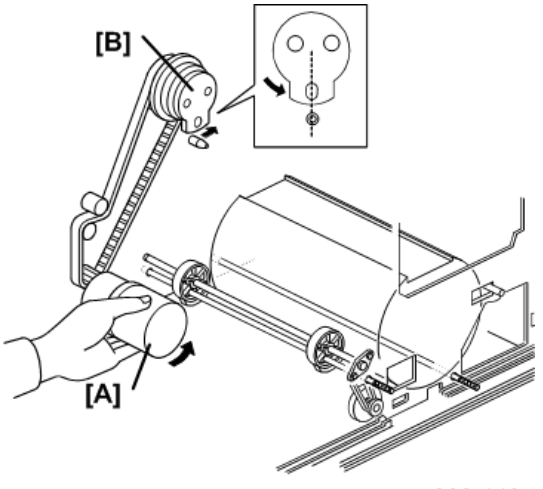


c262r139

1. Remove only the drum dive-securing tool (leave the two positioning shafts). Then turn the main motor [A] clockwise by hand until the drum drive disk [B] has turned about 10 degrees, as shown.

Note

- The motor will not turn smoothly since the drive is secured with the special tools; this is normal.



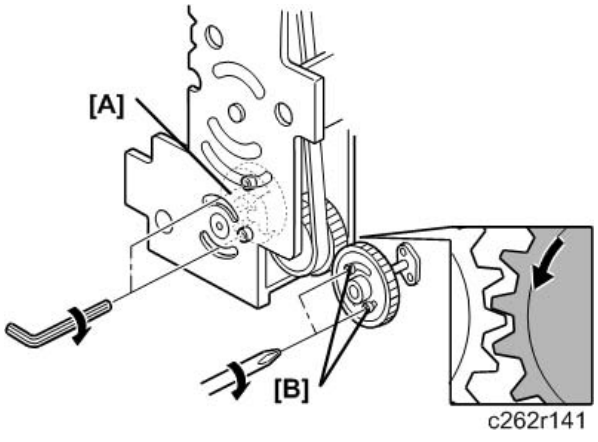
c262r140

1. Turn the main motor [A] counterclockwise, and set the drum drive disk [B] in the home position. (If the disk is turned too much at this point, reset from Step 19.)

Important

- **These steps are required to put gear play in the direction opposite to the printing direction. Turn the main motor by hand in the above order (Steps 20 and 21).**

- **If the motor is turned in wrong order, the main drive will turn slightly when the two shafts (special tools) are removed. If you turned it in the wrong order, return to step 20 then do step 21.**



1. Set the drum drive-securing tool once again. (See step 17.)

Important

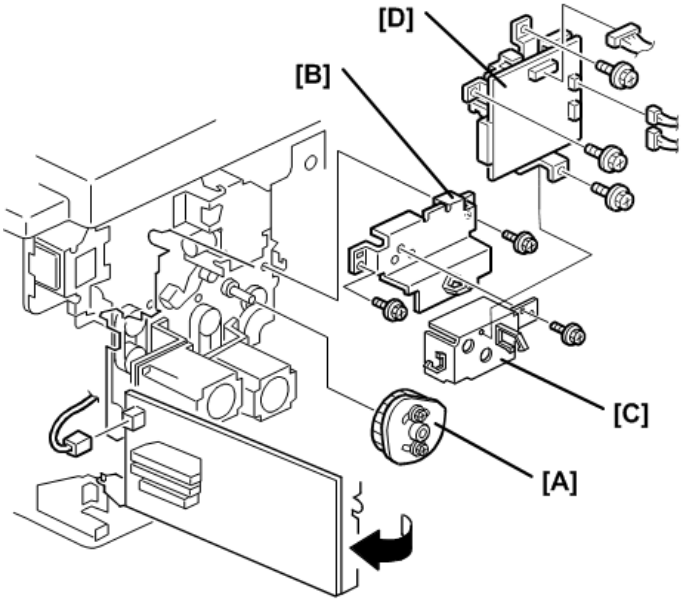
- **Do not turn the drum drive disk by force while setting the tool. If you turned the disk, return to Step 20 then do Step 21**

2. Secure the pressure cylinder drive gear [A] (x2).
3. Install the printing pressure cam drive gear and firmly tighten the 2 screws [B].

   To remove gear play:

   - Secure the cam drive gear while turning it counterclockwise (as viewed from the rear).
   - Secure the cam drive gear by tightening the two screws in the middle of the curved oval holes. This allows for the maximum adjustable range for later repositioning of the gear.

Procedure 3: Finishing



c262r142a

1. Install the registration roller lifting cam [A]. ☛ p.173
2. Install the lifting cam bracket [B], the motor cover [C], and the double feed detector board [D]
3. Install the exit pawl, and adjust the paper exit pawl drive timing. ☛ p.229
4. Adjust the pressure cylinder rotation knob. ☛ p.219
5. Remove all special tools (the drum drive-securing tool and two positioning shafts).
6. Adjust the gap between the exit pawl and the drum. Also adjust the gap between the paper scraper and the pressure cylinder. ☛ p.228, p.230
7. Install the printing pressure shift cam unit. ☛ p.226
8. Install the air knife fan unit. ☛ p.225
9. Install the paper delivery unit. ☛ p.225
10. Install the paper delivery cover. ☛ p.225
11. Install the knob. ☛ p.75
12. Install the left cover. ☛ p.75
13. Install the front cover, inner cover and knob cover ☛ ☛ p.75

Copy Image Check Procedure after Main Drive and Image Up/Down Shifting Drive Section Re-assembly

When the main drive mechanism is disassembled and assembled, the image position on copies may fluctuate due to play in the drive components.

Whenever you disassemble the main drive mechanism, you must check the following items for the copy quality:

When the image position on copies is not constant

- *Check the pressure cylinder position.

  Use the positioning shaft (a special tool) to check if the position of the pressure cylinder is correct.

When the leading edge margin of copies (6 mm) is not constant

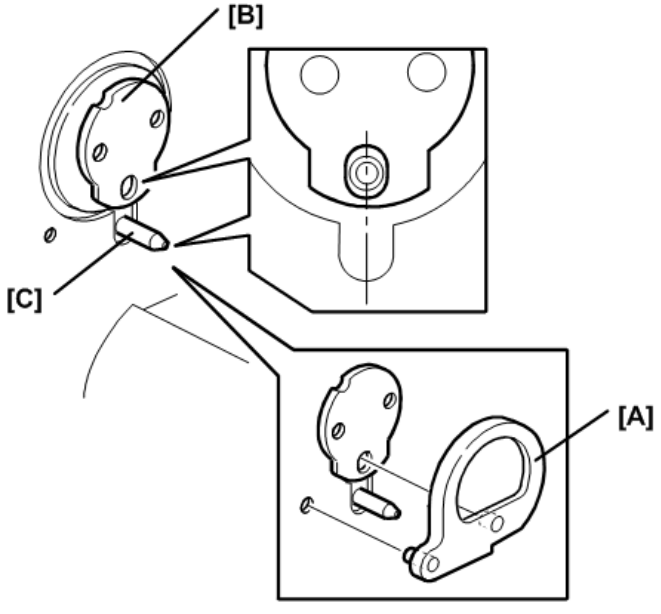
- *Check the position of the printing pressure cams.

  Use the positioning shaft (a special tool) to check if the cam position is correct. ☛ p.200

Other procedures if copy image problems are still detected

- *Check the image up/down shift drive unit position. ☛ p.221, p.220,
- Check the image shift gear play. ☛ p.221
- Check the scissors gear position. ☛ p.200

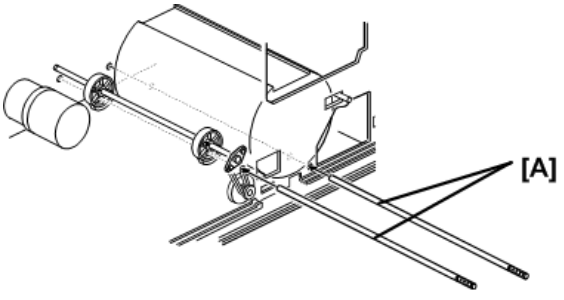
1. Turn off the main switch and disconnect the power plug. Then remove these parts:
   - Drum unit ☛ p.143
   - Front cover, knob cover, inner cover ☛ p.75
   - Rear cover ☛ p.75
   - Paper delivery unit ☛ p.225
   - Printing pressure cam shift unit ☛ p.226



1. Make sure that the drum drive disk is in the home position, by installing the drum drive securing tool [A].

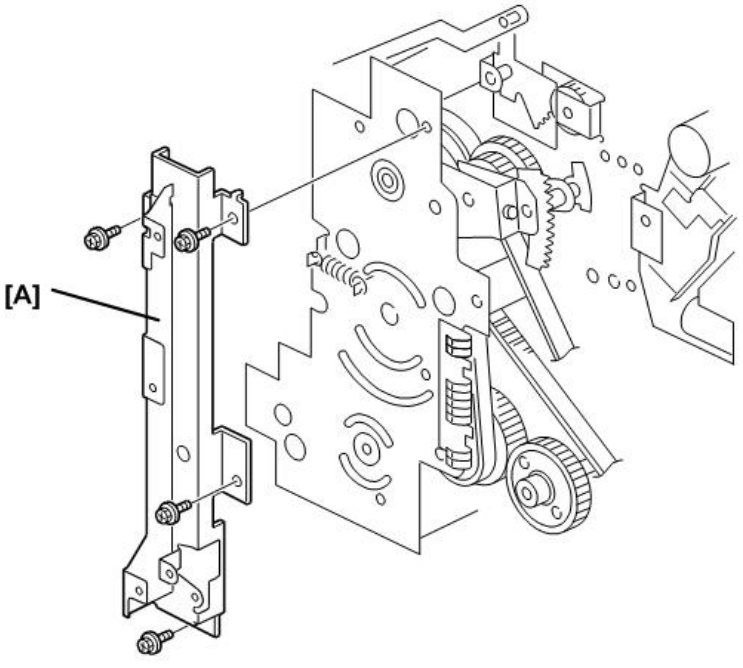
   Service Tools

   - The tools are available as service parts (Part number is #C2299000).
   - If the special tool is not available, align the elongated hole in the drum drive disk [B] with the shaft [C] below it, as shown.



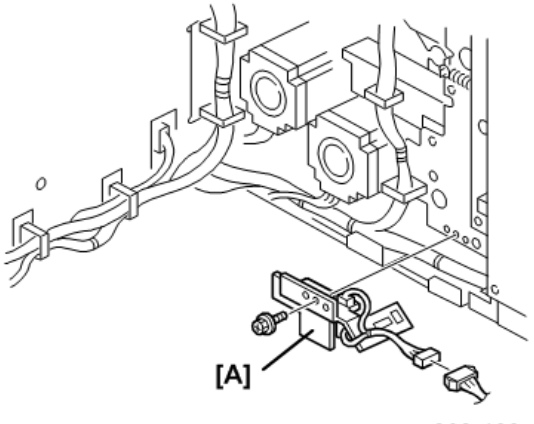
C262R138

1. From the operation side of the machine, insert the positioning shafts [A] (special tools) to secure the pressure cylinder and printing pressure cams in the their home positions.
   - Pass one shaft through the pressure cylinder as shown.
   - Pass the other shaft through the two printing pressure cams as shown.
2. Swing out the ACU-ECU assembly and PSU ☛ p.103



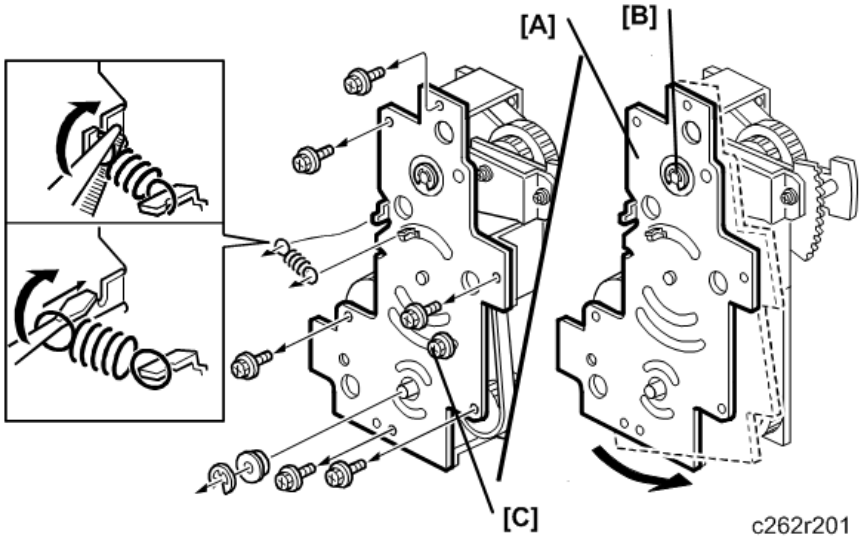
c2801393

1. Remove the supporter for the ACU-ECU assembly and PSU [A] (x4).



c262r182

1. Remove the printing pressure sensor bracket [A] (x1, x1).

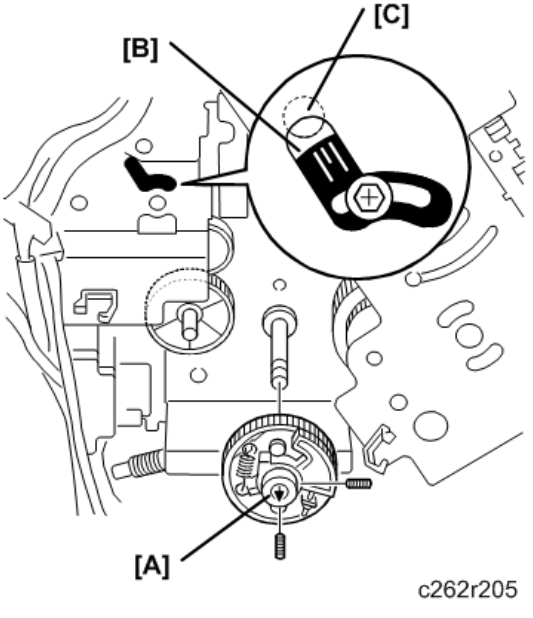


1. Remove the upper cover [A] (x7, x1, x1, x1).

Important

- **Do not remove the bearing and E-ring [B].**

2. Loosen the screw [C].
3. Turn the upper cover [A] counterclockwise.

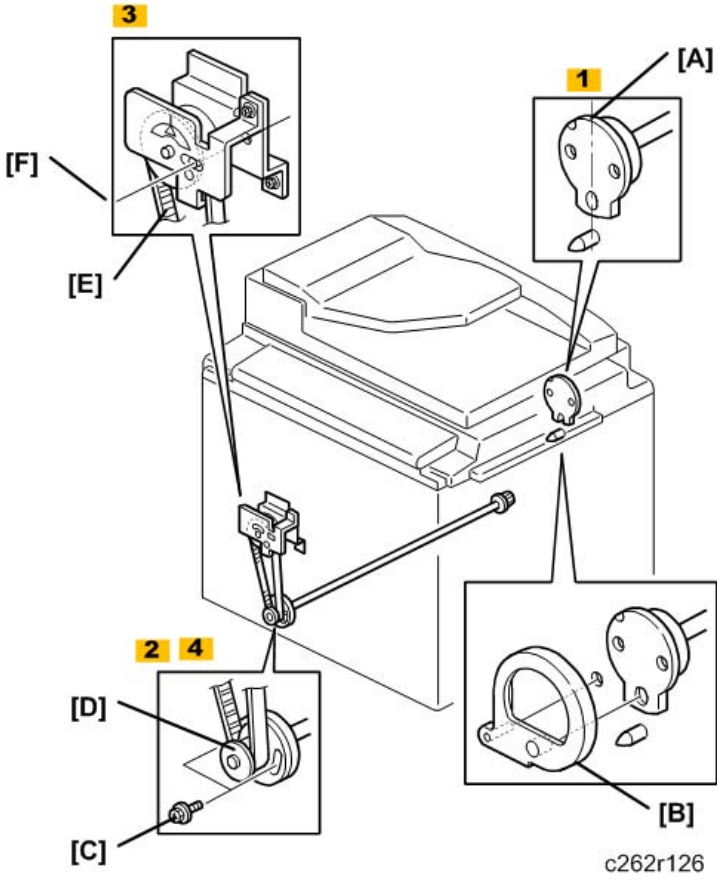


1. Remove the scissors gear [A] (Allen screws x 2).

Note

- When replacing the scissors gear, check the registration roller lifting cam position [B], as shown. (The short central line must be aligned with the center of the circular hole [C].)

Pressure Cylinder Rotation Knob Adjustment



1. Set the drum drive securing tool [B] (a special tool) as shown to hold the drum drive at home position.

Note

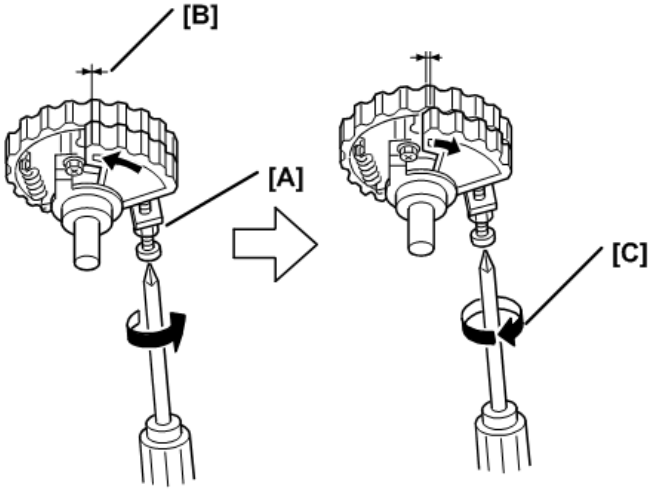
- If the special tool is not available, align the long hole of the drum drive disk [A] exactly with the shaft below it.

2. Loosen two screws [C] so that the pulley [D] freely turns.
3. Turn the timing belt [E] by hand until the triangle mark on the indicator disk meets the center division. (When the indicator disk is in the correct position, the hole in the disk and the two holes in the bracket are in line, as shown [F].

4. Retighten the two screws [C] to secure the pulley in position.

Scissors Gear Position Adjustment

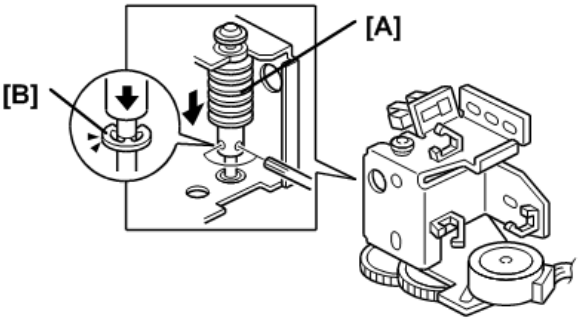
Purpose: If the position of the scissors gear is not correct, the paper feed registration will vary.



c262r121

1. Loosen the lock nut [A].
2. Tighten the screw, so that the gear meshes on both gears are aligned as shown [B].
3. Turn the screw fully counterclockwise circle to loosen it, as shown [C].
4. Holding the screw, tighten the lock nut [A].

Image Up/Down Shift Worm-Gear Position Adjustment



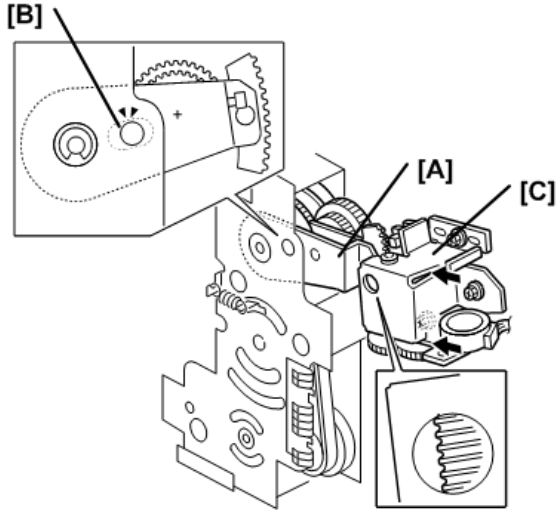
c262r120

1. Fully push down the worm gear [A], and push down E-ring [B] of the worm gear shaft.

2. While holding them together, secure with the hex screws. (x2)

Image Up/Down Shift Drive Unit Position Adjustment

Purpose: To take out any play while using the image up/down shifting function.



c262r119

1. Set the image shift arm [A] in the home position. Align the hole in the upper plate with the elongated hole in the image shift arm [B].
2. Push the image up/down shift drive unit [C] against the image shift arm sector gear, and secure the unit (x3, x3).

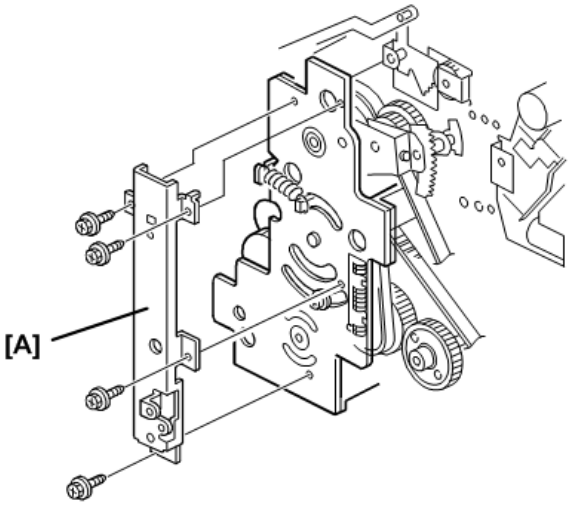
Note

- Set the arm without play in the vertical direction of the image shift arm.
- **Do not push too strongly**. Check if the image shift arm moves smoothly after securing the unit. If it does not, SC303 will appear at power on.

Image Shift Gear Pressure Adjustment

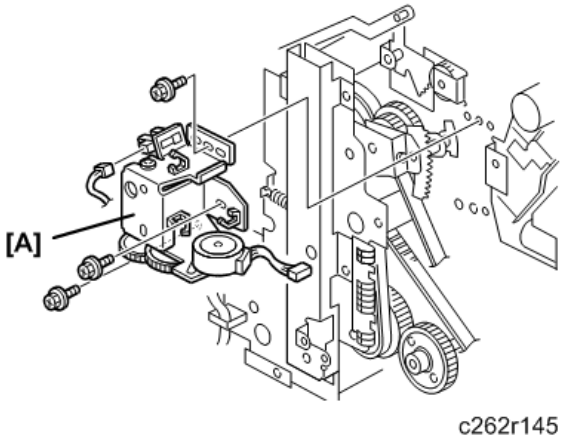
Purpose: To remove play while using the image gear, and to make sure that the image shift gear moves smoothly along the drum drive gear.

1. Turn off the main switch and disconnect the power plug, and then remove these parts:
   - Drum unit ☛ p.143
   - Rear cover ☛ p.75
2. Swing out the ACU-ECU assembly and PSU. ☛ p.103



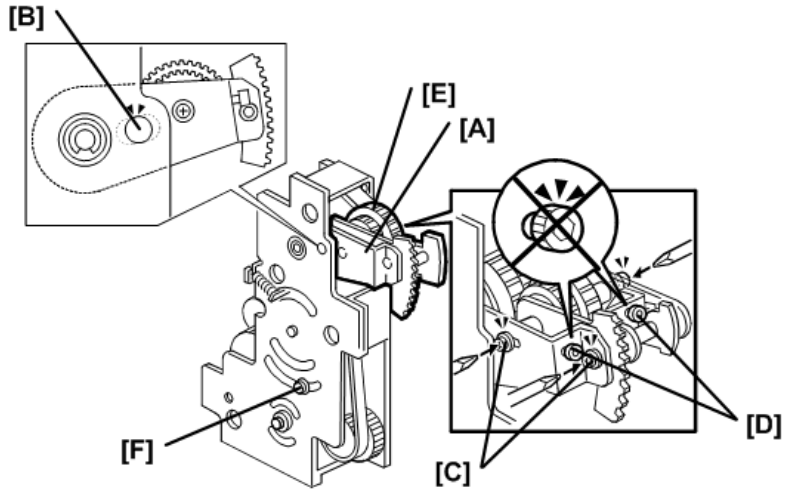
c262r193

1. Remove the supporter for the ACU-ECU assembly and PSU [A] (x4).



c262r145

1. Remove the image shift unit [A] (x4, x2, x3).



c262r202

1. Set the image shift arm [A] in the home position. To do this, align the hole in the upper plate [B] with the elongated hole in the image shift arm.
2. Loosen the three screws [C]. The play between the image shift gear and the drum drive gear is automatically removed.

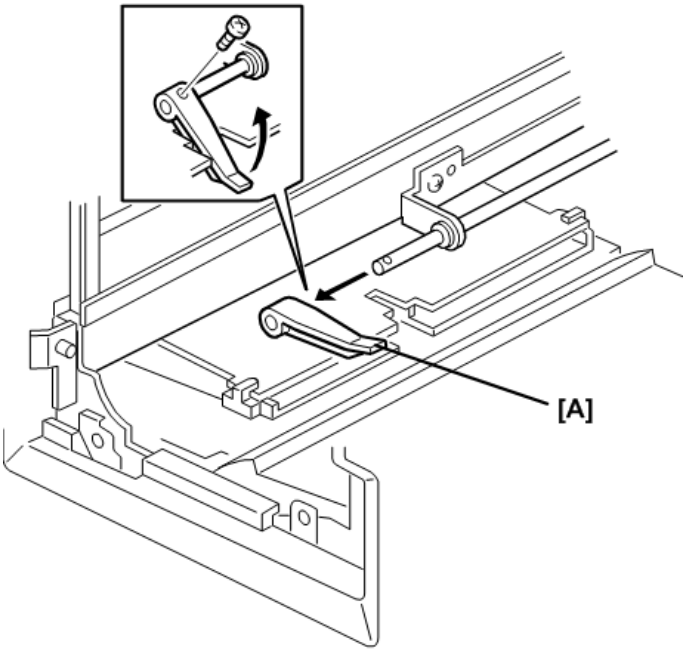
Important

- **Do not touch the two hexagon bolts [D]. If you do, it can damage the image shift gear [E].**

3. Move the image shift arm [A] up and down and set it in the home position again.
4. Secure the three screws [C].
5. Install the image shifting unit as shown in the previous illustration (x3, x2).
6. Loosen the screw [F] and secure it again.

Paper Delivery Section

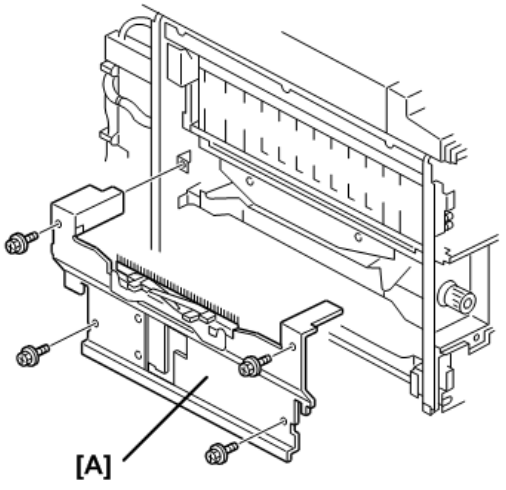
Paper Exit Pawl



- Drum unit ☛ p.143

  [A] Paper exit pawl (x1)

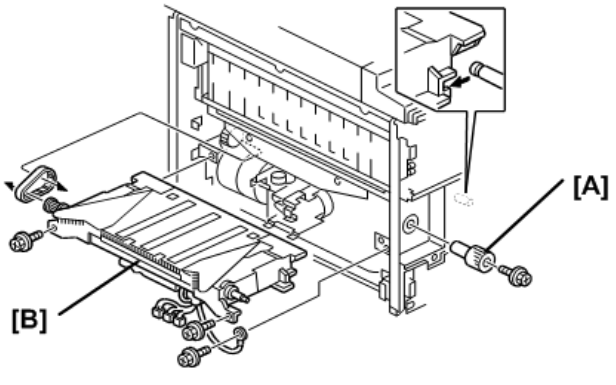
Paper Delivery Unit, Air Knife Fan Unit, Paper Pick-Off Plate



c262r114

- Left cover ☛ p.75
- Knob cover ☛ ☛ p.75

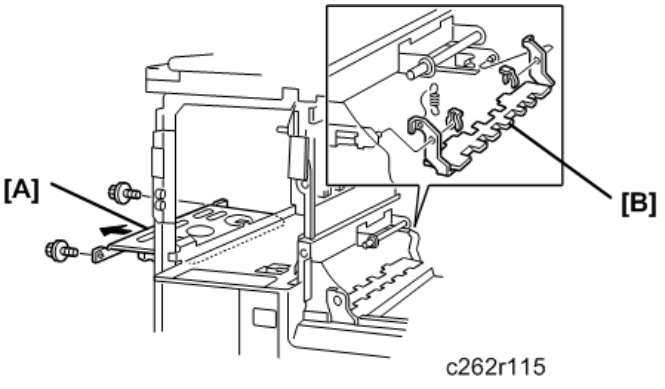
[A] Paper delivery cover (x4)



c262r113

[A] Knob (x1)

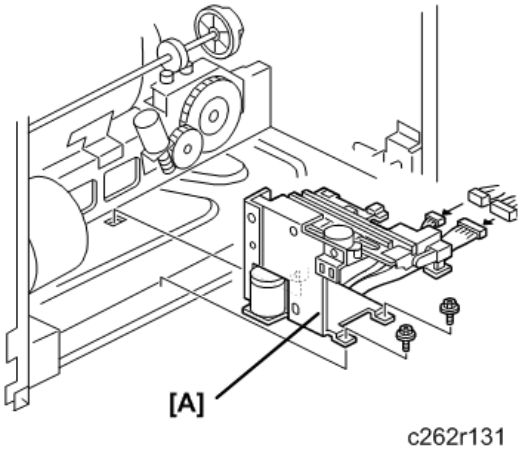
[B] Paper delivery unit (x3, x3)



[A] Air knife fan unit (x2, x1)

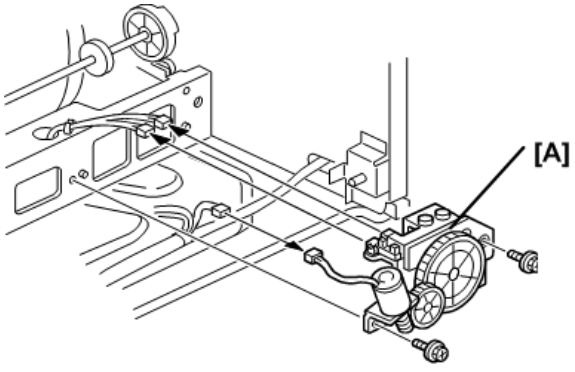
[B] Paper pick-off plate (x2, x1)

Job Separator Unit, Printing Pressure Cam Shift Unit



- Paper delivery unit p.225

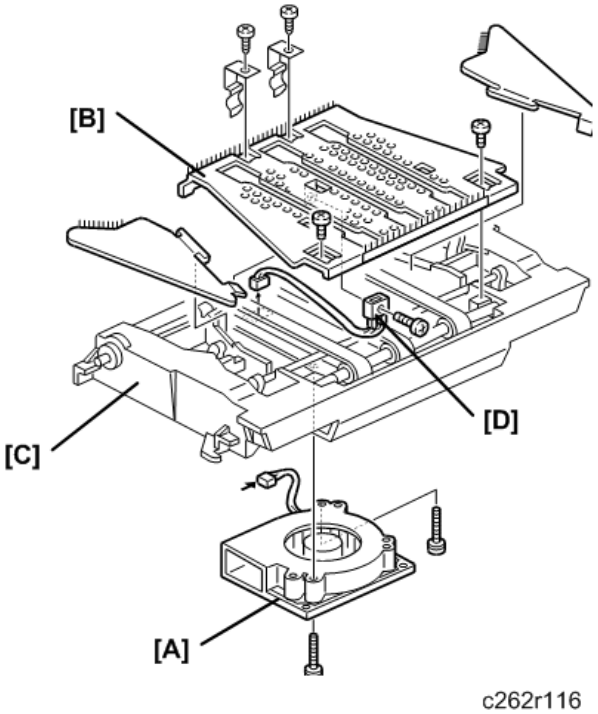
  [A] Job separator unit (x2, x2)



c262r130

[A] Printing pressure cam shift unit (x2, x3)

Paper Exit Sensor, Transport Vacuum Fan



c262r116

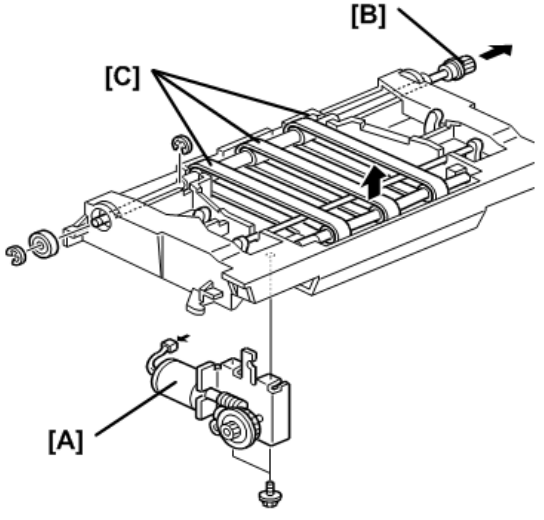
- Paper delivery unit p.225

  [A] Transport vacuum fan (x2, x1)

  [B] Upper cover (x4, x1)

  [C] Paper guide wings

[D] Paper exit sensor (x1)



c262r117

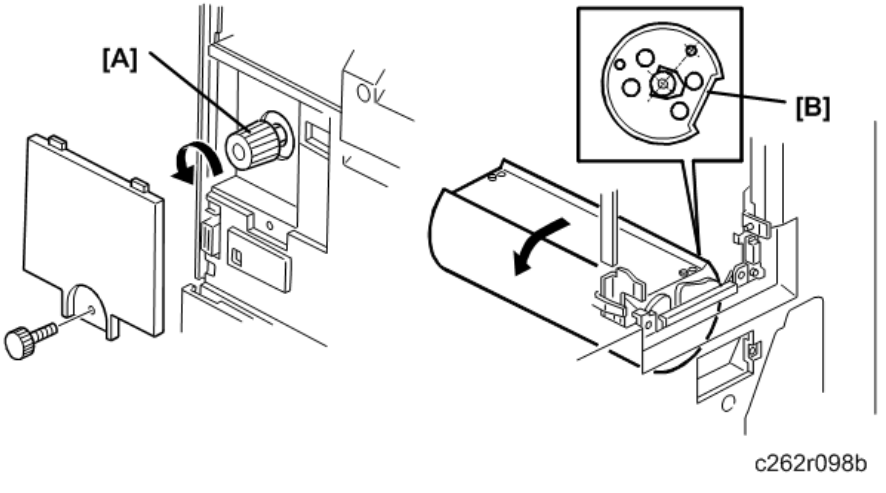
[A] Wing guide motor unit (x2, x1)

[B] Drive roller shaft (x2)

[C] Transport belts

Gap Adjustment Between Paper Pick-Off Plate and Pressure Cylinder

Purpose: To ensure smooth paper feed to the paper delivery unit.

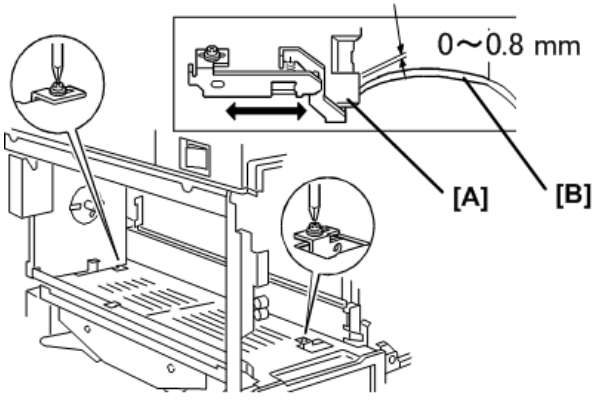


c262r098b

- Drum unit p.143

- Master eject box ☛ p.111
- Left cover ☛ p.75
- Knob cover ☛ p.75

1. Apply the printing pressure, as described below, to push the pressure cylinder up to the printing position.
   - Access SP5-64-2, and select "Start" for the printing pressure release solenoid.
   - Turn the knob [A] until the flat part of the cylinder [B] is turned by approximately 120° (the starting position is with the flat part at the top).
   - Leave SP mode.



c262r118

1. Adjust the clearance between the paper pick-off plate [A] and the surface of the pressure cylinder [B] until it is 0 to 0.8 mm (loosen the 2 screws).

Important

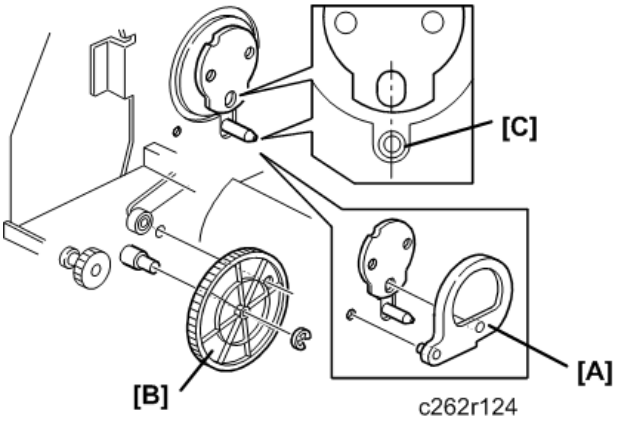
- **Be sure to do this adjustment after pushing the pressure cylinder up to the printing section.**
- **If the gap is adjusted with the pressure cylinder in the non-printing section, the paper pick-off plate will damage the pressure cylinder when the machine pushes the pressure cylinder up to apply the printing pressure because the gap will be too small.**

Paper Exit Pawl Drive Timing Adjustment

Purpose: To ensure smooth feed, and to ensure that the exit pawl does not touch the master clamper on the drum.

Note

- You must adjust this after the main drive belt or the main motor is replaced.



- Drum unit ☛ p.143
  - Paper delivery unit ☛ p.225

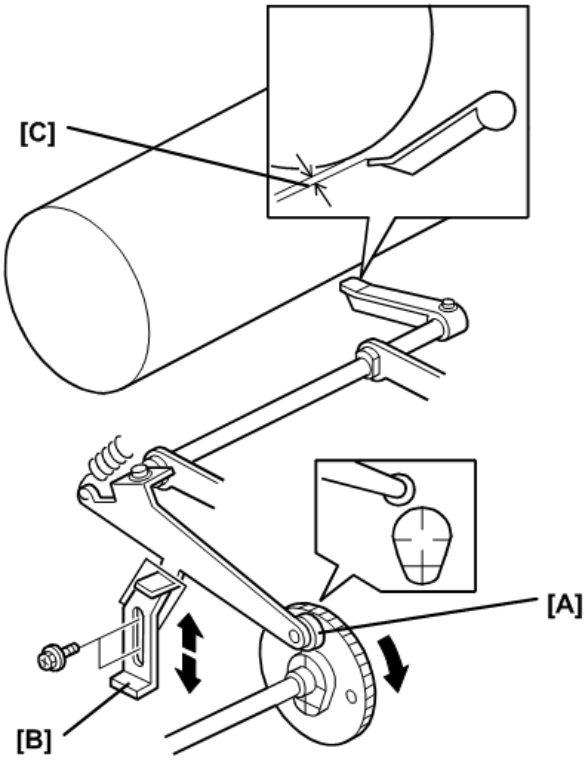
1. Make sure that the drum drive disk is in the home position.

- Normally, the disk is in the home position after the drum is removed.
- If necessary, set the drum securing tool [A] to make sure that the drum drive disk is in the home position.
- If the special tool is not available, align the long positioning hole in the drum drive disk exactly with the shaft [C] below it as shown above.

1. Make sure that the positioning holes in the rear frame and the drive gear [B] are in line as shown [C].
2. If the holes are in line, the paper exit pawl drive timing is OK. If they are not, remove the gear [B] and reinstall it so that the holes are in line.

Gap Adjustment between Exit Pawl and Drum

Purpose: To ensure that the paper is delivered without paper wrap or damage.



1. Turn the main drive manually, so that the bearing [A] of the exit pawl arm rides on the low point of the cam.

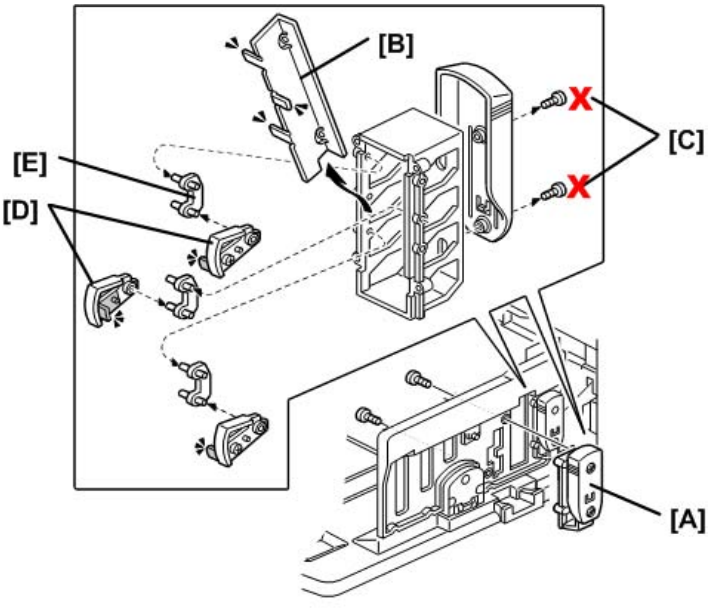
Note

- Use the main drive rotation knob to turn the main drive.

2. By moving the adjusting plate [B], adjust the clearance [C] between the drum and the top of the exit pawl until it is 1±0.5 mm.

Chocks

Operation Side



c262r183

[A] Chocks (x2)

[B] Buffer fin bracket (x2 [C])

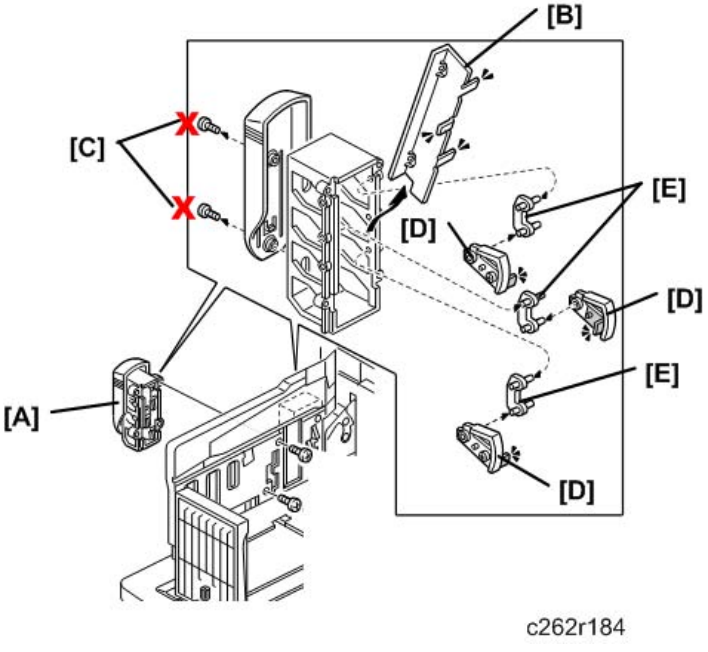
Note

- Normally, do not disassemble parts [B] to [E] in the field.
- **Do not remove [C].**

[C] Buffer fin

[D] Buffer fin link

Non-operation Side



[A] Chocks (x2)

[B] Buffer fin bracket (x2 [C])

Note

- Normally, do not disassemble parts [B] to [E] in the field.
- **Do not remove [C].**

[C] Buffer fin

[D] Buffer fin link

Service Remarks

Scanner Section

1. **Xenon Lamp**. Do not touch the xenon lamp while it is on, or you might receive a weak electrical shock.
2. **Scanner Wire Installation**. A special tool is needed.
3. **Sensor Board Unit (SBU) Calibration**. When the ECU is replaced or the standard white plate located behind the original scale is replaced, the SBU must be calibrated with SP6-005-1.

Master Eject Section

Master Pick-up Roller Drive Gear and Master Clamper Drive Arm Positions. These parts must be positioned correctly.

Master Feed Section

1. **Thermal Head 1**. When installing the thermal head, there are important points to note.
2. **Thermal Head 2**. When replacing the thermal head, be sure to adjust the voltage supplied to the thermal head
3. **Master Vacuum Fan Position**. The fan must be positioned correctly.
4. **Master Feed Mylar Positions**. When replacing or removing the:
   - Thermal head
   - Cutter unit
   - Master duct
   - Guide plate of the lower master feed control roller

   the strips of mylar can be easily positioned incorrectly during installation of the lower tension roller or lower master feed control roller.

Paper Feed Section

1. **Paper Pick-up Roller and Paper Feed Roller 1.** Be careful to install the rollers the correct way around. They have a one-way clutch inside.
2. **Paper Pick-up Roller and Paper Feed Roller 2**. Do not touch the surfaces of the rollers with bare hands.

Drum and Drum Drive Section

1. **Doctor Roller**. Normally, the doctor roller gap is not adjusted or changed. It tends to be difficult to adjust in the field. If the gap becomes narrower, an uneven image may appear on the prints. If it becomes wider, too much ink will be applied to the drum screens, resulting in ink leakage from the drum.
2. **Drum Master Clamper**.
    - Do not allow the inside of the clamping plate to become dirty with ink.
    - Do not use alcohol or other solvents to clean the inside of the clamping plate. Use a cloth dampened with water.
3. **Ink Roller Unit**. Do not disassemble the ink roller unit. Each part between the front and rear side plates of this unit has been precisely adjusted on the production line to keep the doctor and ink rollers parallel against the drum shaft.

Main Drive Section

Main Drive Adjustment. Special tools are needed for the adjustment.

Electrical Components

1. **ECU and I/O Boards**. After replacing the ECU or I/O board, some adjustments are needed. See "3.5.5 ECU and I/O Board Replacement".
2. **ACU, ECU, and Power Supply Unit**. To access the rear of the machine, the ACU, ECU, and I/O board have to be moved out of the way.
3. **Power Supply Unit**. When replacing the power supply unit, be sure to adjust the voltage supplied to the thermal head.
4. **Program Update**. To update the machine's software, an SD card is needed. Follow all cautions in the procedures in the manual.
5. **Sensor Adjustments**. Adjustment is needed for the following sensors (SP6-4)
    - Master eject sensor
    - Master end sensor
    - Master edge sensor
    - Master set sensor
    - 1st drum master sensor
    - 2nd drum master sensor

    For details, see the adjustment procedures for each sensor.

Touch Panel Position Adjustment

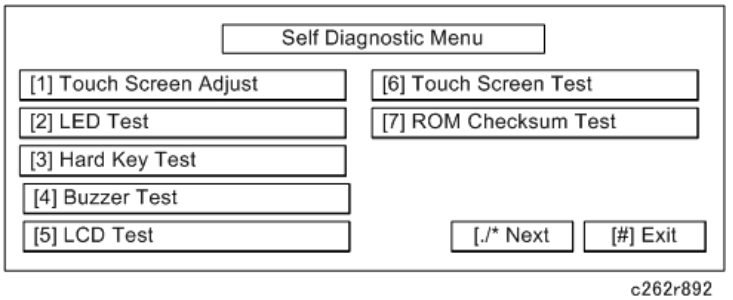
It is necessary to calibrate touch panel:

- After replacing the operation panel
- After replacing the controller board
- If the touch panel detection function does not operate correctly

Note

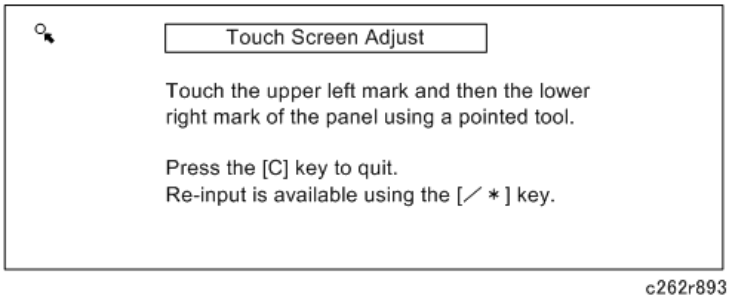
- Do not use selections [2] to [9] on the Self-Diagnostic Menu. These items are for design use only.

1. Press [C], press [1][9][9][3], press [Clear] 5 times to open the Self-Diagnostics menu.



c262r892

2. On the touch screen press "Touch Screen Adjust" or press [1].



c262r893

3. Use a pointed (not sharp) tool to press the upper left mark .
4. Press the lower right mark when shows.
5. Touch a few spots on the touch panel to make sure that the marker "+" shows exactly where the screen is touched.
6. Press Cancel. Then start from Step 2 again if the "+" mark does not show where the screen is touched.
7. Press [#] OK on the screen (or press [#]) when you are finished.
8. Touch [#] Exit on the screen to close the Self-Diagnostic menu. Save the calibration settings.

Firmware Update

Overview

This machine uses SD cards as the media for new firmware.

There are five kinds of firmware for this machine

1. **ACU**. Controls the machine, through other boards
2. **ECU**. Controls the engine functions, both directly and through other boards.
3. **ADF**. Controls the Document Feeder.
4. **Operation Panel**. Controls the operation panel.
5. **Language**. Firmware for the wording on the operation panel.
6. **PS3**. For PostScript 3. There are 2 files in this firmware module

Note

- PS3 has separate files in one firmware module.
- ACU, ECU, ADF, Panel and Language have one file for each firmware module.

Preparing to Download Firmware

1. Make a folder name "romdata" on the SD card (this step is only necessary when the SD card is used for the first time).
2. Make a folder called "C280" inside the "romdata" folder (this step is not necessary if this C280 folder already exists).

Type of Firmware	File Name	Remarks	Location
ACU	C280****X_#_sd.bin	ACU:1file. Can Store different versions	/romdata/C280/
ECU	C280****X_#_sd.bin	ECU:1file. Can Store different versions	/romdata/C280/
ADF	D578****X.fwu	ADF:1file. Can Store different versions	/romdata/C280/
Panel	C280****X_#_sd.bin	Panel:1file. Can Store different versions	/romdata/C280/

Type of Firmware	File Name	Remarks	Location
Lang.	C280****X_#_sd.bin	Language:1file. Can Store different versions	/romdata/C280/
PS3	C640****_#-1_sd.bin C640****_#-2_sd.bin	PS3:2file. Cannot Store different versions	/romdata/C280/

******: Part number, X**: suffix, #: Version No.

1. The SD card can be shared with other files (firmware for other duplicators, MFPs, etc.).
2. Transfer the firmware files into the "C280" folder

   Important

   - **For ACU, ECU, ADF, Panel and Language: If different versions of the firmware are stored on the SD card, the machine displays all versions of the firmware on the operation panel. You can upgrade or downgrade by selecting the necessary firmware. However, only one version for Postscript should be stored on the SD card (versions cannot be mixed on the same SD card).**
   - **The firmware should always be in the "C280" folder (Second level) - "romdata" folder (First Level). If not, the machine cannot find the firmware.**
   - **Put C280 firmware in the "C280" folder.**
3. Wait until the data is transferred completely.

   Important

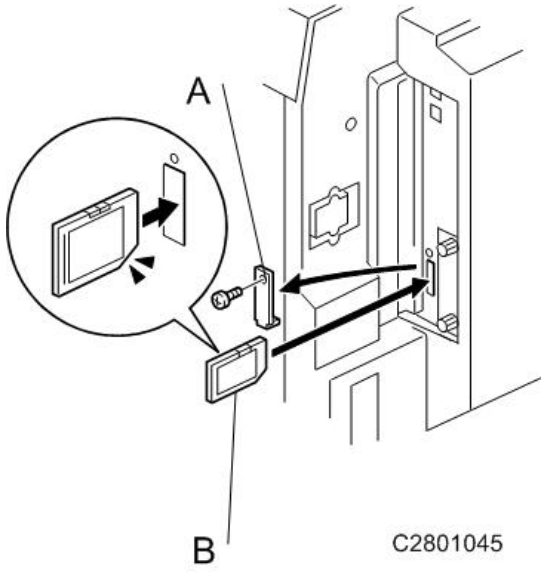
   - **Do not remove the SD card from the PC until after all data is transferred (at this time, the PC says that it is safe to remove the card).**
4. Compare the size of the file on the PC and the file on the SD card. If the sizes are different, the data was not transferred completely.

   Important

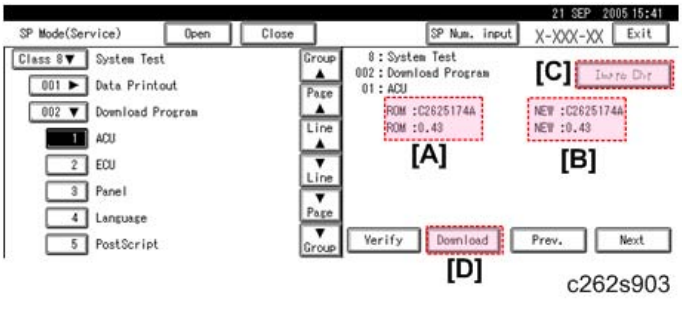
   - **Do not take out the SD card until after you turn off the PC or disconnect the USB Reader/ Writer.**

Downloading the Firmware to the Machine

1. Turn off the power

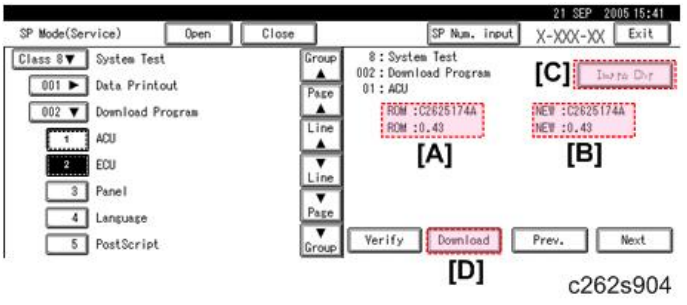


2. Put the SD card [A] in slot [B] of the ACU board.
3. Turn on the power again
4. Enter the SP mode (SP8-2 Download Program).
5. Select the function that you want to update (see below).



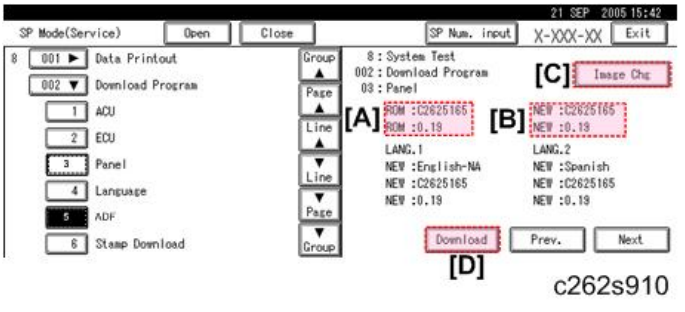
ACU: SP8-2-1 Controller

- On the left (indicated by ROM) [A], you can see the firmware version that is now in the machine. On the right (indicated by NEW) [B], you can see the firmware version on the SD card.
  More than one version can be stored on the card. Use the Image Chg button [C] to select the version that you want to download.
- After selecting, push the 'Download' [D] button to start downloading.



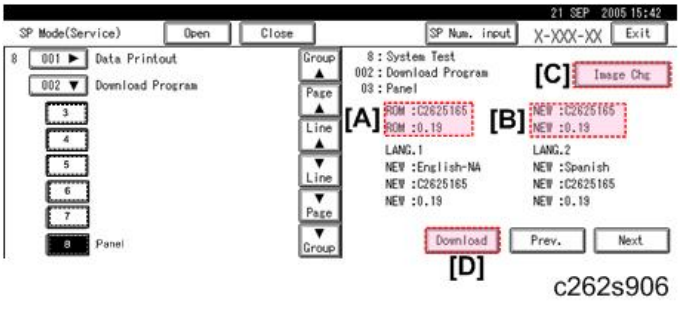
ECU: SP8-2-2 Engine

- On the left (indicated by ROM) [A], you can see the firmware version that is now in the machine. On the right (indicated by NEW) [B], you can see the firmware version on the SD card.
  More than one version can be stored on the card. Use the Image Chg button [C] to select the version that you want to download.
- After selecting, push the 'Download' [D] button to start downloading.



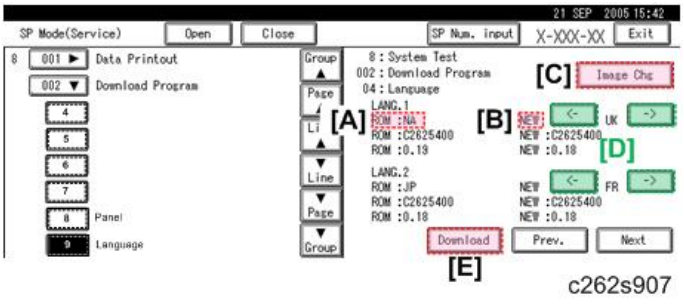
ADF: SP8-2-5

- On the left (indicated by ROM) [A], you can see the firmware version that is now in the machine. On the right (indicated by NEW) [B], you can see the firmware version on the SD card.
  More than one version can be stored on the card. Use the Image Chg button [C] to select the version that you want to download.
- After selecting, push the 'Download' [D] button to start downloading.



Panel: SP8-2-8

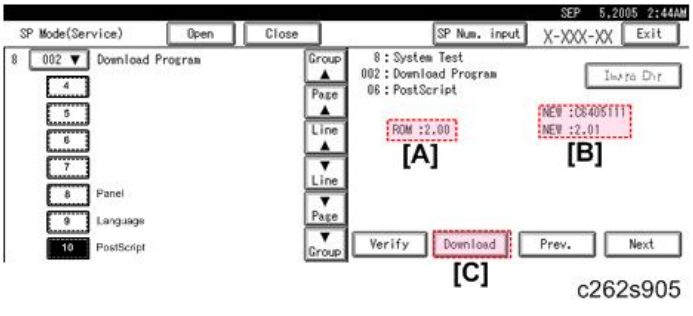
- On the left (indicated by ROM) [A], you can see the firmware version that is now in the machine. On the right (indicated by NEW) [B], you can see the firmware version on the SD card.
- More than one version can be stored on the card. Use the Image Chg button [C] to select the version that you want to download.
- After selecting, push the 'Download' [D] button to start downloading.



Language: SP8-2-9

The machine can have two languages (LANG1, LANG2).

- On the left (indicated by ROM) [A], you can see the firmware versions that are now in the machine. On the right (indicated by NEW) [B], you can see the firmware versions on the SD card.
- More than one version can be stored on the card. Use the Image Chg button [C] to select the version that you want to download.
- Then, use the arrow buttons [D] to scroll through the possible languages. If you do not wish to change one of the two language firmware modules in the machine, select 'NON' with the arrow keys. After selecting, push the 'Download' [E] button to start downloading.



PS3: SP8-2-10

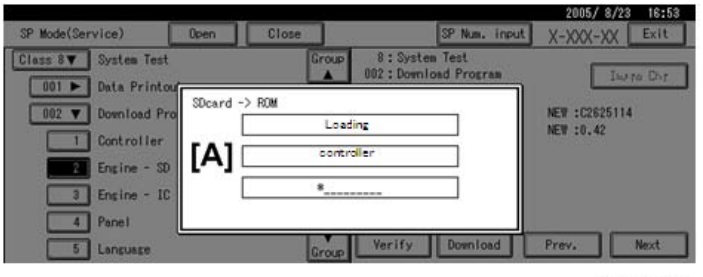
- On the left (indicated by ROM) [A], you can see the firmware version that is now in the machine. On the right (indicated by NEW) [B], you can see the firmware version on the SD card.
  Only one version can be displayed on the operation panel.

- Push the 'Download' button [C] to start downloading.

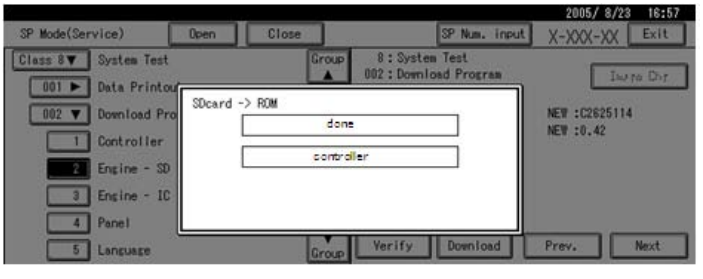
The approximate download times are:

Module	Time
ACU	3 min. 30 sec.
ADF	4 min.
ECU	8 min. 30 sec.
PS3	4 min.
Panel	3 min.30 sec.
Language	1 min.

6. Shut down the main switch after one of these things occurs.
   - ACU, ECU, PS3: The operation panel changes from "Loading" to "done"
   - The number of asterisks (*) [A] increases during the downloading.



c262s909



c262s908

- For "Panel, language" the green LED on the Start button stops flashing and then lights and stays on.
- For "Panel and Language firmware", the operation panel will not display the status during the download; check the start button to check the status of the download.

If the downloading did not finish correctly:

- ACU, ECU, PS3: An error message will be shown on the operation panel.
- Panel, Language: Does not change from flash to steady light.

If an error occurred during the download, do the download again when the display panel shows the SP mode screen. If this is not possible, the related board, and possibly the ACU must be replaced.

- ACU: Replace the ACU board.
- ECU: Replace the ECU board.
- PS3: Replace the PS3 unit.
- Panel: Replace the operation panel.
- Language: Replace the operation panel.

1. Take out the SD card if you finished downloading all modules. Or, if you need to download another firmware module, start from step 1 again.

   Important

   - **Do not insert or extract the SD card when the machine power is on.**
   - **Do not shut off the power when the firmware is downloading.**

Errors During Firmware Update

If an error occurs during a download, an error message will be shown in the first line. The error code consists of the letter "E" and a number ("E20", for example).

Error Message Table

No.	Meaning	Solution
2	SD card error	• Release the SD card, re-insert it. • Replace the SD card.
3	Engine error	• Correct the data on the SD card • Replace the ECU and then update the ECU firmware.
7	Controller memory error	Cycle the machine off/on. Replace the ACU, and then update the ACU firmware.
20	Cannot map logical address	Make sure the SD card is installed correctly, or use a different SD card.
21	Cannot access memory	HDD connection not correct, or replace the hard disk.

No.	Meaning	Solution
22	Cannot decompress compressed data	The ROM data on the SD card is not correct, or data is damaged.
23	Error occurred when ROM update program started	Controller program defective. If the second attempt fails, replace the ACU board.
24	SD card access error	Make sure the SD card is installed correctly, or use a different SD card.
31	Data incorrect for continuous download	Install the SD card with the remaining data necessary for the download, then re-start the procedure.
32	Data incorrect after download interrupted	Do the recovery procedure for the module, then repeat the installation procedure.
33	Incorrect SD card version	The firmware on the SD card is not correct, or data is damaged.
34	Module mismatch - Correct module is not on the SD card	The data on the SD card is not correct. Get the correct data (Japan, Overseas, OEM, etc.) then install again.
35	Module mismatch – Module on SD card is not for this machine	SD update data is not correct. The data on the SD card is for a different machine. Get the correct data then install again.
36	Cannot write module – Cause other than E34, E35	SD update data is not correct. The data on the SD card is for a different machine. Get the correct data then install again.
40	Engine module download failed	Replace the data for the module on the SD card and try again, or replace the ECU board.
42	Operation panel module download failed	Replace the data for the module on the SD card and try again, or replace the operation panel.
44	Controller module download failed	Replace the data for the module on the SD card and tray again, or replace the ACU board. The write-protect switch on the SD card is ON. Turn it off.
45	PS module download failed	Replace the data for the module on the SD card. Replace the ACU. Replace the PS module

Service Program Mode

The “Appendices” for the following information.

- 1. Data Logging
- 2. Basic Settings
- 3. System Settings
- 4. Input Test Mode
- 5. Output Test Mode
- 6. System Adjustment
- 7. Memory Data Clear
- 8. System Test
- 9. Printer Controller.

5. 6. Troubleshooting

Service Call Codes

⚠WARNING

- Never turn off the main power when the power LED is lit or flashing.
- To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

Note

- If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
- If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.

Electrical Component Defects

Jam Name/Type Table

Jam Name	Jam Type
Paper feed	A Jam
Drum	B Jam
Paper eject	C Jam
Master feed	D Jam
Master eject	E Jam
ADF	P Jam
Paper remaining	A or B Jam

Scanner

Name	State/Symptoms
Scanner HP sensor	The sensor stays on (detects that the scanner is in home position, but it is not)
	• If the sensor does not turn off two seconds after the main switch is turned on, SC100 occurs (defective scanner drive motor)
	The sensor stays off (detects that the scanner is not in home position, but it is)
	• If the sensor does not turn on 10 seconds after the main switch is turned on or the start button is pushed, SC100 occurs (defective scanner drive motor)
Original length / width sensors	Original not detected, but an original is present
	• The printed image shifts when Auto Reduce/Enlarge, image rotation, or image repeat is used
	Original detected, but no original is present

Name	State/Symptoms
	• The printed image shifts when Auto Reduce/Enlarge, image rotation, or image repeat is used
Platen cover sensor	Detects that the cover is open, but the cover is closed
	• The machine will start after you push the Start button two times.
	Detects that the cover is closed, but the cover is open
	• The image in the border will be erased.

ADF

Name	State/Symptoms
Feed sensor: cover open	Machine prompts "Close ADF cover" after the main switch is turned on.
Feed sensor: cover closed	A P jam occurs when ADF tries to feed the original after [Start] is pressed with the cover open.
Skew sensor: original present	A P jam occurs when the main switch is turned on.
Skew sensor: no original present	A P jam occurs after the [Start] key is pressed and the prescribed time for normal feed has elapsed..
Registration sensor: original present	A P jam occurs when the main switch is turned on.
Registration sensor: no original present	A P jam occurs after the [Start] key is pressed and the prescribed time for normal feed has elapsed.
Exit sensor: original present	A P jam occurs when the main switch is turned on.
Exit sensor: no original present	A P jam occurs after the [Start] key is pressed and the prescribed time for normal feed has elapsed.
Original set sensor: original present	When [Start] key is pressed with an original on the tray, the copy executes correctly. But if an original is on the exposure glass, a P jam occurs. Because the machine does not that the last page has been fed, when the A4 cut mode is used the A3 size master will not wrap on the drum. The machine will not enter the energy save mode.

Name	State/Symptoms
Original set sensor: no original present	The machine displays "Set original" when [Start] button is pressed. If [Start] is pressed again, the machine will scan the exposure glass. The machine cannot recover from energy save mode.
Original width sensor: original present	When [Start] is pressed, the machine detects original width as the widest possible size and output image shifts up or down. The machine displays an alert if there is a size mismatch, and automatic magnification/reduction or image rotation may not execute correctly.
Original width sensor: no original present	When [Start] is pressed, the printed image shifts up or down. The machine displays an alert if there is a size mismatch, and automatic magnification/ reduction or image rotation may not execute correctly.
Length sensor: original present	Incorrect operation may occur in A4 cut mode. The machine displays an alert if there is a size mismatch, and automatic magnification/ reduction or image rotation may not execute correctly.
Length sensor: no original present	When [Start] is pressed, part of the image may be cut off at the trailing edge, and the trailing edge will be white. Incorrect operation may occur in A4 cut mode. The machine displays an alert if there is a size mismatch, and automatic magnification/ reduction or image rotation may not execute correctly.
Lift-up sensor: open	Same as "Original set sensor: original present" above.
Lift-up sensor: closed	Same as "Original set sensor: no original present" above.

Master Making Unit

Name	State/Symptoms
Master end sensor	Detects a master on the roll, but no master is present
	• The machine will display 'master end' after master making. (In normal operation, 'master end' will be shown before master making.)
	Detects no master on the roll, but a master is present

Name	State/Symptoms
	• The machine detects the end of the master roll and will not start to make a master
Master set sensor	Detect a master, but no master is present
	• If there is no master at the master set roller, the machine will show a D jam.
	Detects no master, but a master is present
	• The machine displays "set the master", but the master is set correctly.
Master edge sensor	Detect a master, but no master is present
	• A D jam will be displayed when the Start button is pushed (master clamp error)
	Detects no master, but a master is present
	• A D jam occurs because the machine tries to feed the master to the standby position; but a master is already there (master set error).
Platen release sensor	Stays on (detects that platen pressure is applied, but it is not)
	• If the sensor does not turn off 5 seconds after the start button is pushed, SC211 occurs (platen release motor lock).
	Stays off (detects that platen pressure is released, but it is applied)
	• If the sensor does not turn on 5 seconds after the start button is pushed or the platen release motor starts, SC211 occurs (platen release motor lock).
Cutter HP switch	Stays on (detects that the cutter is not at home position, but it is)
	• If the cutter HP switch does not turn off 3 seconds after the start button is pushed and the cutter motor starts, SC210 occurs (cutter unit error).
	Stays off (detects that the cutter is at home position, but it is not)
	• If the cutter HP switch does not turn off 3 seconds after the start button is pushed and the cutter motor starts, SC210 occurs (cutter unit error).

Name	State/Symptoms
Master making unit lock sensor	Detects 'locked', but the unit is not locked
	• If the sensor does not turn off when the machine tries to release the lock, SC213 occurs.
	Detects 'unlocked', but the unit is locked
	• If the sensor does not turn on after the start button is pushed to try to lock the master making unit, the machine displays "master making unit is not set".

Drum

Name	State/Symptoms
1st drum master sensor	Detects a master, but there is no master at the sensor
	• The machine displays "E jam" when master making is started. A paper upper wrapping jam occurs when printing is started.
	Does not detect a master, but there is a master at the sensor
	• The machine displays "no master" after the main switch is turned on. After the Start button is pushed: 1) When a master is on the drum, another master will be wrapped around the drum. This means that two layers of master will be on the drum.2) When there is no master on the drum, printing cannot be done.
2nd drum master sensor	Detects a master, but there is no master at the sensor
	• The trial print will cause an upper wrapping jam.
	Does not detect a master, but there is a master at the sensor
	• A master clamp error occurs.
1st drum position sensor (symptom after the main switch is turned on)	The sensor detects the drum is not at the 1st position, but it is there.
	• If the sensor does not turn off more than 3.74 seconds after the main switch is turned on, SC300 occurs (main motor lock)

Name	State/Symptoms
	The sensor detects the drum is at the 1st position, but it is not
	• If the sensor does not turn on more than 3.74 seconds after the main switch is turned on, SC300 occurs (main motor lock)
1st drum position sensor (symptom during master making)	The sensor detects the drum is not at the 1st position, but it is
	• Drum rotation (low speed) will not stop when the Start button is pushed.
	The sensor detects the drum is at the 1st position, but it is not
	• SC313 (clamper lock) when the Start button is pushed
1st drum position sensor (symptom during printing)	The sensor detects the drum is not at the 1st position, but it is
	• Drum rotation will not stop when the Start button is pushed.
	The sensor detects the drum is at the 1st position, but it is not
	Drum rotation will not stop when the Start button is pushed.
2nd drum position sensor (symptom after the main switch is turned on)	The sensor detects the drum is not at the 2nd position, but it is
	• Nothing happens after the main switch is turned on.
	The sensor detects the drum is at the 2nd position, but it is not
	• Nothing happens after the main switch is turned on.
2nd drum position sensor (symptom during master making)	The sensor detects the drum is not at the 2nd position, but it is
	• SC313 (clamper lock) when the Start button is pushed
	The sensor detects the drum is at the 2nd position, but it is not
	• The master eject mechanism will not stop when the Start button is pushed.

Name	State/Symptoms
2nd drum position sensor (symptom during printing)	The sensor detects the drum is not at the 2nd position, but it is
	• An upper wrapping jam occurs when the Start button is pushed.
	The sensor detects the drum is at the 2nd position, but it is not
	• The drum will not stop after one sheet of paper is fed when the Start button is pushed.
Drum home position sensor	The sensor detects the drum is not at the home position, but it is
	• The green LED stays lit and the red LED stays off.
	The sensor detects the drum is at the home position, but it is not
	• The green LED stays off and the red LED stays lit. SC302 (drum home position sensor error) occurs after the drum tries to move to home position 3 times when the front cover is opened and closed.
Thermistor	Short circuit
	• SC307 occurs immediately after the main switch is turned on.
	Broken wire
	• SC306 occurs immediately after the main switch is turned on.
Ink detection pin	Detects ink, but there is no ink
	• The printed image is patchy because ink is not supplied when the Start button is pushed.
	Does not detect ink, but ink is present
	• Excess ink is supplied, but the overflow sensor will detect the overflow and prevent the ink leakage. Replace or clean the ink detection pin
Ink cartridge set switch	Detects a cartridge, but no cartridge is present
	• The printed image will be pale, because the drum tries to supply ink without an ink cartridge.
	Does not detect a cartridge, but a cartridge is present

Name	State/Symptoms
	• The machine displays "Set ink cartridge" after the main switch is turned on.
Drum shift sensor	Does not detect a signal
	• If a signal does not come from the encoder for 6 seconds, SC305 occurs (drum shift motor lock).
Drum shift HP sensor	Does not detect a signal
	• SC304 (drum shift motor lock) occurs if one of these two conditions occurs: 1) The drum does not go back to home position within 3 seconds. 2) The drum does not go to the requested drum shift position within 6 seconds.
Ink pump sensor	Stays on
	• If the sensor does not turn off, SC308 (ink pump motor lock) occurs.
	Stays off
	• If the sensor does not turn on, SC308 (ink pump motor lock) occurs.
Idling roller HP sensor	Stays on (detects that the idling roller is at home position, but it is not)
	• If the sensor does not turn off more than 4 seconds after the main switch is turned on, SC315 (idling roller motor lock) occurs. • If the sensor does not turn on more than 4 seconds after the main switch is turned on, SC315 (idling roller motor lock) occurs.

Master Eject

Name	State/Symptoms
Eject box set switch	Detects the box, but there is no box
	• There is no place to eject the master. Because of this, used masters will be ejected into the machine's cavity.

Name	State/Symptoms
	Does not detect the box, but the box is installed
	• The machine displays "Set the master eject box", after the main switch is turned on.
Pressure plate limit position sensor	Does not detect the pressure plate
	• SC400 occurs if one of these things occurs: 1) The pressure plate limit position sensor or the pressure plate HP sensor do not turn on after more than 8 seconds. 2) The number of edges in the sensor signal is less than 4 when the masters are compressed for more than 6 seconds. 3) The movement between the position of print pressure and HP takes more than 6 seconds. The movement between the master eject position and HP takes more than 3 seconds.
Pressure plate HP sensor	Does not detect the pressure plate at home position
	• SC400 occurs if one of these things occurs: 1) The pressure plate limit position sensor or the pressure plate HP sensor do not turn on after more than 8 seconds. 2) The number of edges in the sensor signal is less than 4 when the masters are compressed for more than 6 seconds. 3)The movement between the position of print pressure and HP takes more than 6 seconds. The movement between the master eject position and HP takes more than 3 seconds.
Master eject sensor	Detects a master, but there is no master
	• A master eject error occurs.
	Does not detect a master, but there is a master
	• A master eject error occurs, but the master was ejected correctly.
Eject box lock sensor	Detects that the box is locked, but it is released
	• The eject box lock solenoid does not release the lock after the main switch is turned on or the security mode is canceled. SC401 occurs.
	Detects that the box is not locked, but it is locked

Name	State/Symptoms
	• The eject box lock solenoid does not lock the box after the main switch is turned on or the security mode is canceled. It is not possible to install the master eject box.

Paper feed

Name	State/Symptoms
Paper registration sensor	Detects paper, but there is no paper
	• A jam occurs after the main switch is turned on.
	Does not detect paper, but there is paper
	• A jam occurs when the Start button is pushed.
Paper feed timing sensor	Detects paper, but there is no paper
	• A jam occurs after the main switch is turned on.
	Dose not detect paper, but there is paper
	• A jam occurs when the Start button is pushed.
Feed start sensor	Detect the actuator, but it is not there
	• SC503:
	Does not detect the actuator, but it is there
	• SC503
Paper width detection board	Detects paper, but there is no paper
	• The printed image shifts if the paper width detection board detects the wrong paper size.
	Does not detect paper, but there is paper
	• The paper width detection board cannot detect the paper size.
Paper length sensor	Detects a long paper size, but it is not long paper

Name	State/Symptoms
	• Pressure is applied between the drum and pressure cylinder after the trailing edge of the paper on the drum, and ink will transfer to the pressure cylinder.
	Does not detect a long paper size, but it is long paper
	• The image will be patchy near the trailing edge, because pressure is not applied near the trailing edge.
Paper table lower limit sensor	Detects the paper table, but it is not at the lower limit position.
	• If the sensor does not turn off more than 7.5 seconds after the paper feed table starts to move up, SC520 (paper feed lock) occurs.
	Does not detect the paper table at the lower limit position, but it is there.
	• The paper table motor does not stop at the lower limit position. If the sensor does not turn off more than 7.5 seconds after the paper feed table starts to move up, SC520 (paper feed lock) occurs.
Paper height sensor	Detects that the top of the stack is at the correct height for paper feed, but it is not.
	• A jam occurs because the paper feed table does not move up when the Start button is pushed.
	Detects that the top of the stack is not at the correct height for paper feed, but it is.
	• If the paper table does not stop within 7.5 seconds, SC521 (paper table motor lock) occurs.
Paper table set sensor	Detects that the table is closed, but it is open.
	• The machine displays "Open the paper table" after the main switch is turned on.
	Detects that the table is open, but it is closed.
	• The paper table does not move up after the Print button is pushed.
Paper end sensor	Detects paper, but there is no paper

Name	State/Symptoms
	• A jam occurs when the Print button is pushed.
	Does not detect paper, but there is paper
	• The machine displays "Add paper" after the main switch is turned on.
Feed pressure detection board	Detects pressure, but there is not.
	• The feed pressure detection board detects the pressure continually when the print button is pushed. SC500: Feed pressure motor lock
	Does not detects pressure, but there is pressure.
	• The feed pressure detection board does not detect the pressure continually when the print button is pushed. SC500: Feed pressure motor lock
Separation pressure detection board	Detects pressure, but there is not.
	• The separation pressure detection board detects the pressure continually when the print button is pushed. SC501: Separation pressure motor
	Does not detects pressure, but there is pressure.
	• The separation pressure detection board does not detect the pressure continually when the print button is pushed. SC501: Separation pressure motor
Friction pad position sensor 1	Stays on (detects a friction pad, but one is not there)
	• If the sensor does not turn off for 5 seconds when the friction pad is changing to thick paper, SC505 occurs (friction pad shift motor).
	Stays off (does not detect a friction pad, but one is there)
	• If the sensor does not turn on for 5 seconds when the friction pad is changing to normal paper, SC505 occurs (friction pad shift motor).
Friction pad position sensor 2	Stays on (detects a friction pad, but one is not there)

Name	State/Symptoms
	• A paper jam or double feed occurs, because the friction pad does not stop at the correct position.
	Stays off (does not detect a friction pad, but one is there)
	• If the sensor does not turn on for 5 seconds when the friction pad is changing, SC505 occurs (friction pad shift motor).

Printing and Pressure Cylinder

Name	State/ Symptoms
Clamper open position sensor	Stays on (detects that clamper is open, but it is not)
	• If the sensor does not turn off when the clamper motor is opening and closing the clamper, SC314 (clamper motor lock) occurs.
	Stays off (detects that clamper is closed, but it is not)
	• If the sensor does not turn on when the clamper motor is opening and closing the clamper, SC314 (clamper motor lock) occurs.
Clamper close position sensor	Stays on (detects that clamper is closed, but it is not)
	• If the sensor does not turn off when the clamper motor is opening and closing the clamper, SC313 (clamper motor lock) occurs. Stays off (detects that clamper is not closed, but it is). If the sensor does not turn on when the clamper motor is opening and closing the clamper, SC313 (clamper motor lock) occurs.
Image shift HP sensor	Detects that the image shift mechanism is not at HP, but it is at HP.
	• If the sensor does not turn on for 12 seconds after the main switch is turned on, SC303 occurs.
	Detects that the image shift mechanism is at HP, but it is not.
	• If the sensor does not turn off for 12 seconds after the main switch is turned on, SC303 occurs.

Name	State/ Symptoms
Feed encoder	Does not detect the signal
	• Machine issues SC502.

Paper Eject

Name	State/Symptoms
Wing upper position sensor	Stays on (detects that the wing is at the upper position, but it is not)
	• If the sensor does not turn off when the wing guide motor moves down, SC507 (wing guide motor lock) occurs.
	Stays off (detects that the wing is not at the upper position, but it is)
	• If the sensor does not turn on when the wing guide motor moves up, SC507 (wing guide motor lock) occurs.
Wing lower position sensor	Stays on (detects that the wing is at the lower position, but it is not)
	• If the sensor does not turn off when the wing guide motor moves up, SC506 (wing guide motor lock) occurs.
	Stays off (detects that the wing is not at the lower position, but it is)
	• If the sensor does not turn on when the wing guide motor moves down, SC506 (wing guide motor lock) occurs.
Paper exit sensor	Detects paper, but there is no paper
	• A C jam occurs after the main switch is turned on.
	Does not detect paper, but there is paper
	• A paper upper wrapping jam occurs when the Print button is pushed.
A4 cam sensor	Stays on (detects the cam, but it is not at the A4 position)
	• If the cam does not move for 5 seconds when the Start button is pushed, SC309 (pressure cam shift motor) occurs.
	Stays off (does not detect the cam, but it is at the A4 cam position.

Name	State/Symptoms
	• If the cam does not move for 5 seconds when the Start button is pushed, SC309 (pressure cam shift motor) occurs.
A3 cam sensor	Stays on (detects the A3 cam, but it is not at the A3 position)
	• If the cam does not move for 5 seconds when the Start button is pushed, SC310 (pressure cam shift motor) occurs.
	Stays off (does not detect the cam, but it is at the A3 cam position.
	• If the cam does not move for 5 seconds when the Start button is pushed, SC310 (pressure cam shift motor) occurs.
Lower wrapping jam sensor	Detect paper, but there is no paper.
	• The machine displays "lower wrapping jam" after the main switch is turned on.
	Does not detect paper, but there is paper.
	• The machine displays "upper wrapping jam", when a lower wrapping jam occurs.

Paper Separation

Name	State/Symptoms
Slider position sensor	Stays on (detects the slider, but it not there)
	• If the sensor does not turn off, SC511 occurs.
	Stays off (does not detect the slider, but it is there).
	• If the sensor does not turn on when the Start button is pushed, SC511 occurs during printing.
Paper sensor	Stays on (detects that the slider touched the paper, but it did not touch the paper)
	• If the sensor does not turn off, SC508 occurs.
	Stays off (does not detect the surface of paper)
	• If the sensor does not turn on, SC508 occurs.

Name	State/Symptoms
Slider HP sensor	Stays on (detects the slider, but it is not at home position)
	• If the sensor does not turn off, SC510 (slider lift motor lock) occurs.
	Stays off (does not detect the slider, but it is at home position)
	• If the sensor does not turn on, SC510 (slider lift motor lock) occurs.
Slider upper limit sensor	Stays on (detects the slider, but it is not at the upper limit position.)
	• If the sensor does not turn off, SC509 occurs.
	Stays off (does not detect the slider, but it is at the upper limit position)
	• If the sensor does not turn on, SC509 occurs.

Fuses on Boards

Name	State	Symptoms
F700 (PSU)	Open	The power supply does not turn on.
F703 and F704 6.3A (PSU)	Open	SC300: Main motor lock
F701 and F702 6.3A (PSU)	Open	24V is cut off. SC300: Main motor lock
F1 12A (Main motor control board)	Open	SC300: Main motor lock

Note

- F701 and F702, F703 and F704 are connected in parallel to protect the board.
- If one fuse is broken, the machine works if the other fuse does not break. But replace the broken fuse as soon as possible.

DIP SW, LED, VR, TP, and Fuse Tables

Test Points

Ink Detection Board

Number	Usage
TP1	Ink Level
TP2	Ink Level
TP3, TP4	-12V

DIP Switches

Ink Detection Board

Drum detection

DPS901	-1	-2	-3	-4
Standard A3/DLT Drum	ON	ON	OFF	OFF
Optional A3/DLT Drum	OFF	ON	OFF	OFF
Optional A4 Drum	ON	OFF	OFF	OFF
Not used	OFF	OFF	OFF	OFF

Note

- Do not turn the all the dip switches off, or the machine will detect that there is no drum.
- Do not change DIPSW-3 because it is used for TC-IIR. If the setting is changed, an error could be displayed on the operation panel or there could be an effect on image quality.
- DIPSW-4 is not used.

Color detection

DPS902	-1	-2
Color ID0 (Default)	OFF	OFF

DPS902	-1	-2
Color ID2	ON	OFF
Color ID3	OFF	ON
Color ID4	ON	ON

ACU

SW2	OFF	ON
1	SD card boot	ROM boot
2	Normal boot	Boot only ROM monitor
3	Not used	Not used
4	Not used	Not used

Note

- For normal operation, keep the all switches OFF.

Number	SW	Setting
SW3	Push Switch	When the main switch is turned on while pushing SW3, the ACU board will go to the detailed self-check mode.

Potentiometers

I/O Board

No,	Usage
VR1	Master set sensor adjustment
VR2	Master Eject Sensor Adjustment
VR3	1st Drum Master Sensor Adjustment
VR4	Master End Sensor Adjustment (Do not adjust)
VR5	Master Edge Sensor Adjustment
VR6	2nd Drum Master Sensor Adjustment

Power Supply Board

Number	Usage
RV1	Thermal Head Voltage Adjustment
RV2	+5VE Voltage Adjustment (Do not adjust)

Ink Detection Board

No.	Usage
VR901	Ink Detection Board Adjustment (see section 3.8.7)

LEDs

MPU

No.	Function
LED1	Monitors the RAM and SARM operation on the CPU. This LED is lit if there is a problem.
LED2	Monitors the CPU operation. Usually, this LED is blinking.

I/O Board

No.	Function
LED1	Monitors the CPU operation. Usually, this LED is blinking.

ACU

No.	Function
LED1	Monitors the CPU operation. Usually, this LED is blinking.

Operation Panel

No.	Function
LED1	Monitors FPGA operation. Usually flashing.
LED2	
LED3	
LED4	Monitors RAM and SRAM operation on CPU. Lights if there is a problem.
LED5	Monitors CPU operation. Usually flashing.

Note

- The green LED of the start button on the operation panel displays the status of firmware downloading in normal; therefore, it is not necessary to open the operation panel.

Fuses

Power Supply Unit

Fuse	Rated Current	Protect
F700	10A	Power Supply Unit
F701/ F702	6.3A x 2	I/O Board
F703/ F704	6.3A x 2	Main Motor Drive Board
F705	2A	Not used

Note

- F701 and F702, F703 and F704 are connected in parallel to protect the board. If one fuse is broken, the machine works if the other fuse does not break. But replace the broken fuse as soon as possible.

Main Motor Drive Board

Fuse	Rated Current	Protect
F1	12A	Main Motor

I/O Board

Fuse	Protect
FU1	Not used

Service Call Code List

See “Appendices” for the following information.

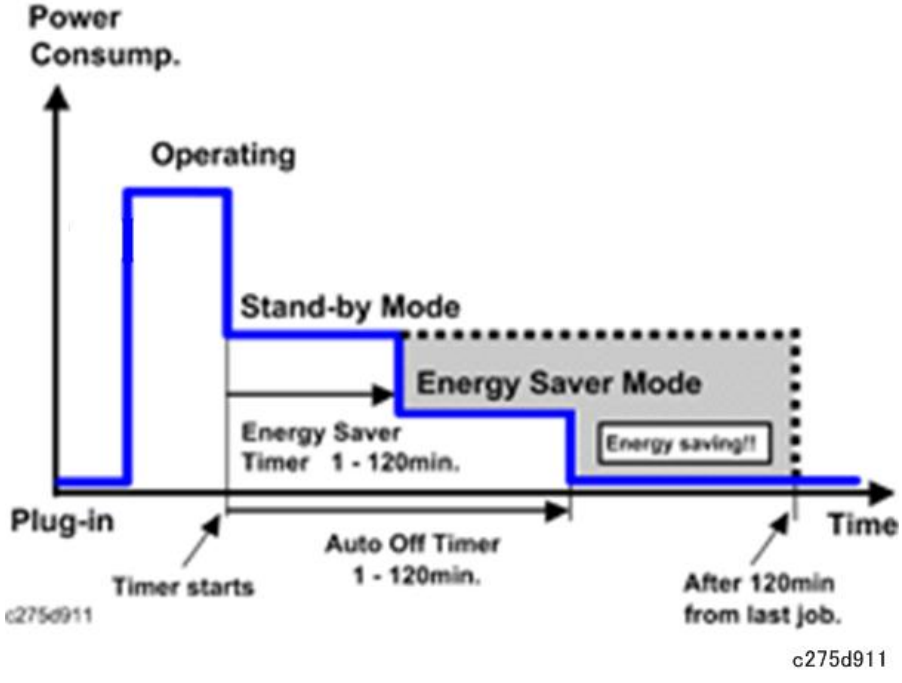
- SC100: Scanner
- SC200: Master Making Unit
- SC300: Drum
- SC400: Master Exit
- SC500: Paper Delivery and Exit
- SC600: Electrical Components
- SC700: Options
- SC800: ACU
- SC900: ACU

6. Energy and Paper Saving

Energy Save

Energy Save Diagram

Customers should use energy saver modes properly, to save energy and protect the environment.



The area shaded grey in this diagram represents the amount of energy that is saved when the timers are at the default settings. If the timers are changed, then the energy saved will be different. For example, if the timers are all set to 120 min., the grey area will disappear, and no energy is saved before 120 min. expires.

Timer Settings

The user can set these timers with User Tools (System settings)

- Energy saver timer (1 – 120 min): Low Power Mode. Default setting: 1 minute
- Auto off timer (1 – 120 min): Off

  Default settings:

C280	1min.

Note

- The energy saver timer and the auto off timer cannot be used at the same time. Only one is available.

Recommendation

We recommend that the default settings should be kept.

- If the customer requests that these settings should be changed, please explain that their energy costs could increase, and that they should consider the effects on the environment of extra energy use.
- If it is necessary to change the settings, please try to make sure that the Auto Off timer is not too long. Try with a shorter setting first, such as 30 min., then go to a longer one (such as 60 min.) if the customer is not satisfied.
- If the timers are all set to the maximum value, the machine will not begin saving energy until 120 minutes has expired after the last job. This means that after the customer has finished using the machine for the day, energy will be consumed that could otherwise be saved.

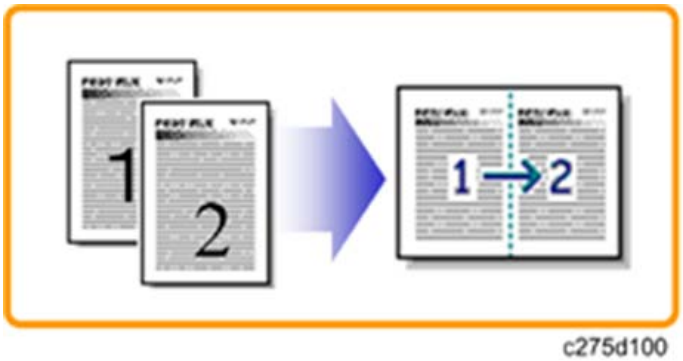
Paper Save

Effectiveness of the Combine Function

The combine function reduces the amount of paper used. This means that less energy overall is used for paper production, which improves the environment.

Combine mode

Reduce paper volume in half!



Recommendation

Please explain the above features to the customers, so that they can reduce their paper usage.

C280

The following table shows paper savings and how the counters increase for some simple examples of single-sided jobs.

If combine mode is used, the total counters work in the same way as explained previously. The following table shows paper savings and how the counters increase for some simple examples of combine jobs.

Originals	Simplex Sheet used	Paper Saved
1	2	0
2	2	1

MEMO

Model EM2
Machine Code: C280

Appendices

18 March 2013

TABLE OF CONTENTS

1. Appendix 1: Specifications

Specifications

Main Unit

Configuration	Desktop	
Master Process	Digital with 600 dpi thermal head	
Scanning (Pixel Density)	600 dpi CCD	
Originals	Sheet/Book: Less than 10 kg	
Printing process	Fully automatic stencil system, with one drum and a pressure cylinder.	
Original Size	Platen	Max. 297 x 432 mm (11.6" x 17.0")
	ADF	Max. 297 x 432 mm (11.6" x 17.0") Min. 148 x 210 mm (5.8" x 8.3")
Print Paper Size	Max. 325 x 447 mm (12.8" x 17.6") Min. 70 x 148 mm (2.8" x 5.8")	
Print Paper Weight	47.1 to 209.3 g/m2 (12.5 to 55.6 lb.)	
Printing Area	A3: 290 x 412 mm, DLT: 11.4" x16.6" 290 x 412 mm (11.4 x 16.2 in.) Excluding NA 290 x 422 mm (11.4 x 16.6 in.) NA only	
Printing Speed		
Up to A3/DLT SEF	60, 75, 90, 105, 120, 135 sheets/minute (6 steps)	
Greater than A3/DLT SEF (420/432 mm)	60, 75, 90, 105, 120 sheets/minute (5 steps)	
Master Eject Box Capacity	A3 drum: 100 masters DLT drum: 90 masters A4 drum: 140 masters	
Magnification Ratios	4 enlargement and 5 reduction	

		A3 Version	DLT Version
	Enlargement	200%	200%
		141%	155%
		122%	129%
		115%	121%
	Full size	100%	100%
	Reductions	93%	93%
		87%	85%
		82%	77%
		71%	74%
		61%	65%
		50%	50%
Zoom	50% to 200% (1% steps)		
Power Source	North America: 120 V, 60 Hz Europe, Asia: 220 – 240 V, 50/60 Hz		

Power Consumption (C280)*1		
Item	**US**	**EU, AA**
Copying 60 rpm	< 185 W	< 180 W
Copying 90 rpm	< 225 W	< 215 W
Copying 120 rpm	< 245 W	< 260 W
Copying 135 rpm	< 280 W	< 265 W
Master making	< 185 W	< 180 W
Standby	< 45.7 W	< 43.8 W
Standby (Energy Save)	< 5.4 W	< 6.7 W
*1 Main unit + ADF + HDD + PS3 module + RAM		

Noise Emission		Sound Power Level	Operating Position Power Level
	Standby	38 dB	24 dB
	Copying 600 rpm	73 dB	59 dB
	Copying 90 rpm	76 dB	61 dB
	Copying 120 rpm	79 dB	65 dB
	Copying 135 rpm	81 dB	67 dB

Dimensions (w x d x h)*2	Table closed	750 x 730 x 1025 mm (29.5 x 28.7 x 40.4")	
	Table open	1420 x 730 x 1105 mm (55.9 x 28.7 x 43.5")	
*2 Measured with ADF and table			
Weight	With Platen:	104.5 kg (230 lb)	
	With ADF:	112.5 kg (247.5 lb)	
Master Process Time	ADF	A4 copying	< 25 sec.
		A3 copying	< 36 sec.
	Platen	A4 copying	< 18 sec.
		A3 copying	< 27 sec.

Paper Table Capacity	1000 sheets (55 kg / 64 g/m^2 / 17 lb)
Paper Delivery Table Capacity	1,000 sheets (55 kg / 64 g/m^2 / 17 lb)
Leading Edge Margin	Less than 6 mm
Trailing Edge Margin	2 mm (when using ADF)
Side Registration Adjustable Range	±10 mm (Width > 308 mm ±1.5 mm, minimum movable unit: 0.25 mm)
Vertical Registration Adjustable Range	± 15 mm (Minimum movable unit: 0.25 mm)
Master Type	

Thermal master roll type			320 mm width, 110 m/roll
Yield			200 masters/roll (A3 Drum)
			190 masters/roll (DLT Drum)
			320 masters/roll (A4 Drum)
Maximum run length per master:			4,000 prints
Master Storage Conditions:			
Temperature			0°C to 40°C (32°C to 90°F)
Humidity			10% to 95% rH
Storage		Time	Up to 1 year after production date
		Stacking	4 cartons (max.) (avoid direct sunlight)
Ink			1000 ml cartridge
			Available colors: Red, Blue, Green, Brown, Gray, Yellow, Purple, Maroon, Navy, Orange, Teal, Violet, Gold, Hunter Green, Burgundy, Reflex blue
Ink Storage Conditions			
	Temperature	Range	-5°C to 40°C (-23°F to 104°F)
		Optimum	15°C to 25°C (59°F to 77°F)
	Humidity	Range	10% to 95% rH
		Optimum	20% to 70% rH
	Storage	Time	Up to 18 months after production date (use the ink as soon as possible)
		Stacking	10 cartons (avoid direct sunlight)
Options			• **Color drum** • **A4 drum** • **Platen cover** • **Auto document feeder** • **TC-IIR** • **HDD kit (Controller Option)**

Controller Options	• PS3 module

Supported Paper Sizes

Paper Feed (mainly Europe and Asia)

Paper sizes	Size (W × L)
A3 SEF	297 × 420 mm
B4 JIS SEF (Japanese Industrial Standard)	257 × 364 mm
A4 LEF	297 ×210 mm
A4 SEF	210 × 297 mm
B5 JIS LEF	257 × 184 mm
B5 JIS SEF	184 × 257 mm
A5 SEF	148 ×210 mm
B6 JIS SEF	128 ×182 mm
A6 SEF	105 ×148 mm
F LEF	13" ×8"
Others	Vertical: 148 - 432 mm, Horizontal: 70 - 297 mm

Paper Feed (mainly North America)

Paper sizes	Size (W x L)
Ledger	11" x 17"
Legal SEF	8.5" x 14"

Paper sizes	Size (W x L)
Letter LEF	11" x 8.5"
Letter SEF	8.5" x 11"
Half Letter LEF	8.5" x 5.5"
Half Letter SEF	5.5" x 8.5"
Others	Vertical: 5.8" - 17", Horizontal: 2.8" - 11.7"

Software Accessories

The printer drivers and utility software are provided.

Printer Drivers

The following OS are supported (Only 32 bit)

- Windows XP Professional Edition (*)
- Windows XP Home Edition
- Windows 2003 Server Standard Edition (*)
- Windows 2003 Web Edition (*)
- Windows 2003 R2 (*)
- Windows Vista Home Basic
- Windows Vista Home Premium
- Windows Vista Home Enterprise (*)
- Windows Vista Home Ultimate (*)
- Windows Server 2008 (*)
- Windows Server 2008 R2 (*)
- Windows 7 Starter
- Windows 7 Home Premium
- Windows 7 Professional
- Windows 7 Ultimate

(*)Exclude Cluster and Terminal

Utility Software

Software	Description
Smart Device Monitor for Admin	• Switch to / come out of Energy Saver mode • Monitor multiple printers in use / Create groups • Display the printer status / settings • Make printer settings • Check print job histories of documents identified by user codes
Web Image Monitor	• Display the printer status / settings • Check print job status and history, or deleting the print job • Make printer settings • Network protocol settings • Security settings
Desktop Binder – Smart Device Monitor	• Peer-to-Peer print function • Display an error / a completion message • Monitor multiple printers in use • Display up to 100 print jobs

Optional Equipment

Auto Document Feeder

Paper Size/Weight:	Size	A3 to A5, DLT to HLT
	Weight	40 to 128 g/m^2 (10 to 34 lb.)
Table Capacity:	50 sheets (80 g/m^2, 20 lb)	
Power Consumption:	50W	
Power Source	DC24V±10%, DC5V±5%, DC5VE±5% From mainframe	
Dimensions (W x D x H):	550 × 496 × 120 mm (21.7" × 19.5" × 4.7")	
Weight:	10 kg (22 lb.)	

2. Appendix 2: PM Tales

Maintenance Table

The following items must be maintained periodically.

Symbol key: **C**: Clean, **R**: Replace, **L**: Lubricate, **A**: Adjust **PM**: PM visit

⚠WARNING

- Turn off the main power switch and disconnect the machine before you do any procedure in this section.

	600K	1200K	2400 K	3000K	Life	PM	Notes
Scanner/Optics							
Scanner/Optics							
Exposure Glass						C	Damp Cloth
Master Making Unit							
Thermal Head		C			R	C	Damp Cloth (Alcohol) Expected Life: 30K masters
Platen Roller		C				C	Damp Cloth (Alcohol) Expected Life: 30K masters
Cutter Unit					R		Damp Cloth (Alcohol) Expected Life: 30K masters
Master Feed Control Roller					R		Expected Life: 30K masters
Platen Roller					R		Expected Life: 30K masters
Paper Feed							

	600K	1200K	2400 K	3000K	Life	PM	Notes
Paper Pick-up Roller		R				C	Damp Cloth (Alcohol)
Paper Feed Roller		R				C	Damp Cloth (Alcohol)
Friction Pads		R				C	Damp Cloth (Alcohol)
Registration Roller						C	Damp Cloth (Alcohol)
Paper End Sensor						C	Dry Cloth
Paper Length Sensor						C	Dry Cloth
Paper Pick-up Roller Bushing				L			Motor Oil (SAE #20)
Paper Feed Roller Bushing				L			Motor Oil (SAE #20)
Paper Exit Pawl Drive Gear				L			Lubricate the shaft with Alvania #2
Main Drive Unit					R		Expected Life: 7500K prints
Image Shifting Gear				L			Lubricate the surface of the gear with Alvania #2
Double Feed Sensor						C	Dry Cloth
Lower Wrapping Jam Sensor		C				C	Dry Cloth
Drum and Ink Supply							
Drum Master Sensor		C				C	Dry Cloth
Black Sensor Patch		C				C	Dry Cloth

	600K	1200K	2400 K	3000K	Life	PM	Notes
Cloth Screen				R			
In/Outside of Drum		C				C	Dry Cloth (Cleaner)
Clamper magnet		C				C	Dry Cloth (Cleaner)
Ink Nozzle		C				C	Dry Cloth
Drum Drive Pin				L			Remove the drum from the machine. Lubricate the pin with Alvania #2
Others							
Pressure Cylinder						C	Damp Cloth (Alcohol)
Paper Clamper (on Pressure Cylinder)			R			C	Damp Cloth (Alcohol)
Feed Encoder						C	
Feed Start Sensor						C	Damp Cloth (Alcohol)
Feed Encoder Brush Bracket					R		Expected Life: 6000K prints
ADF (Option)							
DF Feed Roller						C	Dry Cloth

After you replace the following parts, reset the PM counters with SP 3-4:

- Cloth screen
- Paper clamper
- Pick-up roller
- Paper feed roller

- Friction pad A/B
- Feed encoder brush bracket.

To reset a counter, access the SP, then push 'Replace' on the screen, then 'Yes'. The replacement history for that part will appear on the screen.

3. Appendix 3: Service Call Tables

SC100: Scanner

SC100	Scanner motor lock
	• The HP sensor did not go on within 15 sec. during the carriage homing operation (scanner started scanning from the OFF position in the other direction). • The HP sensor did not go OFF after the scanner read the prescribed distance from the HP sensor ON position.
	• Defective scanner HP sensor • Scanner wire slip-off • Defective scanner motor

SC101	SBU malfunction
	• After power on, or after the machine returned to full operation from the energy save mode, the signal level of the SBU failed to adjust automatically. • The signal level of the SBU became abnormal during scanning. • The cause of a malfunction in the SBU is displayed in the SP mode.
	• SBU harness or cable loose, broken defective • SBU defective

SC200: Master Making Unit

SC200	Thermal head ID error
	The CPU detects an abnormal ID signal from the thermal head.
	• Defective thermal head • Defective ECU • Bad connection at thermal head, for example a fragment of the master roll is present.

SC201	Thermal head energy pulse error
	The CPU detects an abnormal thermal head energy control pulse.
	• Defective ECU

SC202	Thermal head thermistor short
	The signal from the thermal head thermistor reaches more than 2.82 volts.
	• Thermistor open circuit • Related connector disconnected

SC203	Thermal head temperature abnormal
	When the Start key is pressed, a temperature of 54°C or more is detected at the thermal head.
	• Thermistor short • Defective thermal head

SC210	Cutter unit error
	• The cutter HP sensor does not turn off after turning on the cutter for more than 3 s. • The cutter HP sensor does not turn on after turning on the cutter for more than 2.9 s, and the cutter HP sensor does not turn on after turning on the cutter motor in the opposite direction for more than 5 s.
	• Defective sensor • Defective motor • Jammed master

SC211	Platen release motor lock
	• The sensor does not turn off for more than 5 s after the platen release motor on signal is generated. • The sensor does not turn on for more than 5 s after the platen release motor on signal is generated.
	• Defective sensor • Defective motor

SC212	Master cut error
	The master edge sensor remains on after the first master cut recovery operation. (Normally, the master is cut if the master edge sensor detects a mis-cut master the first time.)
	• Defective master edge sensor • Defective cutter unit • Defective master vacuum fans • Jammed master

SC213	Master Making Unit lock solenoid error
	The master making unit lock sensor does not turn off after releasing the master making unit lock solenoid.
	• Defective master making unit lock solenoid • Defective master making unit lock sensor.

SC214	Master feed control motor drive abnormal
	The machine detected that the motor drive board is overloaded or overheated. A temporary condition, or the integrated circuit of the drive board is damaged.
	• Cycle the machine off/on • Replace the motor

SC215	Master feed motor drive board abnormal
	An overloaded or overheated circuit was detected on the drive board.

	• A temporary condition, or the integrated circuit of the drive board is damaged. • Cycle the machine off/on • Replace the motor

SC300: Drum

SC300	Main motor lock (1st drum position sensor does not turn on)
	At power on or when the drum returns to home position, the 1st drum position sensor is not activated for more than 5 s after the main motor on signal is generated.
	• Defective sensor • Defective main motor • Defective main motor drive board • Defective FU703+704 on the PSU • Damage gear of main motor

SC301	Main motor lock (motor control signal error)
	The CPU on the motor control board detects an abnormal signal from the main motor encoder.
	• Defective main motor • Defective main motor drive board

SC302	Main Motor lock (Drum Home position sensor error)
	When the drum is at the home position, drum home position sensor does not turn on 3 continuous times.
	• Defective sensor

SC303	Image shift motor lock (HP sensor error)
	At power on, the sensor signal does not change for more than 12 s after the image shift motor on signal is generated.
	• Defective sensor • Defective motor

SC304	Drum shift motor lock (HP sensor error)
	At power on, the sensor signal does not change for more than 3 s after the drum shift motor on signal is generated.

	Defective sensor Defective motor

SC305	Drum shift motor lock (no encoder pulse)
	At power on or when the image side-to-side shift mode is selected, the CPU detects no encoder pulse from the sensor for more than 6 s after the drum shift motor on signal is generated.
	• Defective sensor

SC306	Drum thermistor shut off
	The signal from the thermistor cuts off.
	• Thermistor circuit cut off

SC307	Hot Ink
	The temperature of ink is more than 54°C (129°F)
	• Thermistor short

SC308	Ink pump motor lock
	The sensor signal does not change status after the ink pump motor on signal is generated for 8 s.
	• Defective sensor • Defective motor • Defective ink pump

SC309	Pressure cam shift motor lock (A4 cam sensor remains on or off)
	The sensor does not change status for more than 5 s after the pressure cam shift motor on signal is generated.
	• Defective sensor • Defective motor

SC310	Pressure cam shift motor lock (A3 cam sensor remains off or on)

	The sensor does not change status for more than 5 s after the pressure cam shift motor on signal is generated.
	• Defective sensor • Defective motor

SC311	Pressure cam shift motor lock (HP sensor error)
	When the motor is moving, the HP sensor is not activated more than 8.5 s
	• Defective sensor • Defective motor

SC312	Pressure cam shift motor lock (Position sensor error)
	When the motor is moving, the position sensor is not activated more than 8.5 s
	• Defective sensor • Defective motor

SC313	Clamper motor lock (Clamper close position sensor error)
	• When the master clamper is being opened, the sensor is not activated after the clamper motor on signal is generated. • The motor is not de-activated for more than 4 s
	• Defective clamper close position sensor • Defective motor • Defective drum guide drive • Defective 2nd drum position sensor • Defective movement of clamper

SC314	Clamper motor Lock (Clamper open position sensor error)
	• When the master clamper is being opened, the sensor is not activated after the clamper motor on signal is generated. • The motor is not de-activated for more than 4 s

	• Defective clamper open position sensor • Defective motor • Defective drum guide drive • Defective 2nd drum position sensor • Defective movement of clamper

SC315	Idling roller motor lock
	The motor does not activate for more than 4 s after the signal is generated.
	• Defective idling roller • Defective motor • Defective sensor

SC400: Master Exit

SC400	Pressure plate motor lock
	• The both pressure plate HP sensor and limit position sensor does not ON for more than 8 s after the pressure plate motor on signal is generated. • The pressure plate does not reach home while traveling from the master eject ready position to the compression position for more than 3 s after the pressure plate motor on signal is generated. • The pressure plate does not reach the home position from the pressure position for more than 6 s after the pressure plate motor on signal is generated. • The pressure plate does not reach pressure prelate limit position for 4.5 s (A3) and 3.5 s (A4).
	• Defective sensor • Defective motor • Jammed master

SC401	Master Eject Box lock solenoid error
	The eject box lock sensor does not Off after lifting lock twice.
	• Defective box lock solenoid • Defective sensor

SC500: Paper Delivery and Exit

SC500	Feed pressure motor lock
	The sensor does not change status for more than 6 s after the feed pressure motor on signal is generated.
	• Defective feed pressure detection board • Defective feed pressure motor

SC501	Separation pressure motor lock
	The sensor does not change status for more than 6 s after the separation pressure motor on signal is generated.
	• Defective separation pressure detection board • Defective separation pressure motor

SC502	Feed encoder error
	The CPU detects an abnormal signal from the feed encoder.
	• Defective I/O board • Defective sensor • Defective encoder

SC503	Feed start sensor error
	The sensor is not activated for more than 5 s after the main motor on signal is generated.
	• Defective sensor

SC505	Friction pad shift motor lock
	The sensor's status remains the same after the motor turns for 5 s.
	• Defective sensor • Defective motor

SC506	Wing guide motor lock (Wing lower position error)

	• When the wing guide moves upwards, the sensor is not de-activated for more than 6 s after the wing guide motor on signal is generated. • When the wing guide moves downwards, the sensor is not activated for more than 6 s after the wing guide motor on signal is generated.
	• Defective sensor • Defective motor • Defective wing guide • Overrunning of the sensor slit

SC507	Wing guide motor lock (Wing Upper position error)
	When the wing guide moves upwards, the sensor is not activated for more than 6 s after the wing guide motor on signal is generated. When the wing guide moves downwards, the sensor is not de-activated for more than 6 s after the wing guide motor on signal is generated.
	• Defective sensor • Defective motor • Defective wing guide

SC508	Slider lift motor lock (paper sensor)
	• When the slider moves downwards, the sensor is not activated for more than 7 s after the slider lift motor on signal is generated. • When the slider moves upwards, the sensor is not de-activated for more than 9 s after the slider lift motor on signal is generated.
	• Defective sensor • Defective motor • Defective ECU board • Motor belt has come off

SC509	Slider lift motor lock (Slider upper limit sensor)
	• When the slider moves upwards, the sensor is not activated for more than 9 s after the slider lift motor on signal is generated. • When the slider moves downwards, the sensor is not de-activated for more than 9 s after the slider lift motor on signal is generated.

	• Defective sensor • Defective motor • Defective ECU board • Mechanism blocked by foreign material

SC510	Job Separator motor lock (Slider HP sensor)
	When the slider moves toward the delivery table, the sensor is not de-activated for more than 5 s after the job separator motor on signal is generated.
	• Defective sensor • Defective motor • Defective ECU board • Mechanism blocked by foreign material

SC511	Job Separator motor lock (Slider position sensor)
	When the slider returns, the sensor signal does not change status for more than 5 s after the job separator motor on signal is generated.
	• Defective sensor • Defective motor • Defective ECU board • Mechanism blocked by foreign material • The cover pad over-runs its correct position

SC512	Registration Press Motor lock
	The registration roller release sensor does not change the status for more than 3 s after the Registration press motor on signal is generated.
	• Defective motor • Defective registration roller release sensor

SC515	Paper feed motor drive board defective
	An overloaded or overheated circuit was detected on the drive board.

	• A transient phenomenon, or the integrated circuit of the drive board is damaged. • Cycle the machine off/on • Replace the motor

SC516	Registration motor drive board defective
	An overloaded or overheated circuit was detected on the drive board.
	• A transient phenomenon, or the integrated circuit of the drive board is damaged. • Cycle the machine off/on • Replace the motor

SC517	Image shift motor drive board defective
	An overloaded or overheated circuit was detected on the drive board.
	• A transient phenomenon, or the integrated circuit of the drive board is damaged. • Cycle the machine off/on • Replace the motor

SC520	Paper table lock (paper table lower limit sensor)
	When the table moves upwards, the sensor does not change status for more than 7.5 s after the paper table motor on signal is generated.
	• Defective sensor • Defective motor • Mechanism blocked by foreign material • Defective gear • A spring has come off

SC521	Paper table lock (paper table height sensor)
	When the table moves upwards, the sensor does not change status for more than 7.5 s after the paper table motor on signal is generated.

	• Defective sensor • Defective motor • Mechanism blocked by foreign material • Defective gear • A spring has come off

SC600: Electrical Components

SC600	NVRAM (ECU) version differ
	There is no version history in the program of NVRAM
	• Update the firmware

SC601	Flash ROM (ECU) error
	Upload error to Flash ROM
	• Defective ECU

SC602	Ri20 error
	At power on, or after the machine returned to full operation from energy save mode, the system reboot did not end normally.
	• MPU defective (DSP for image processing abnormal)

SC603	MSU error
	The machine detects a failure in the memory control ASIC. The memory control ASIC cannot access to RAM normally.
	• Defective ECU board • Replace the RAM on the ECU board

SC604	Make-up RAM error
	The RAM for the make-up pattern data cannot be reset.
	• Defective ECU

SC605	Shut off solenoid lock
	Does not shut off for more than 6 s after the shut off solenoid on signal is generated.
	• Defective main switch

SC607	GADRC3/GAPNC3 error

	At power on, or after the machine returned to full operation from energy save mode, the system reboot did not end normally.
	• MPU defective

SC608	GAMKUP2 error
	At power on, or after the machine returned to full operation from energy save mode, the system reboot did not end normally.
	• MPU defective

SC670	Engine response error
	After powering on the machine, a response is not received from the engine within the specified time.
	• Loose connection between ACU and ECU board • Defective ECU board • Defective ACU board

SC672	Operation Panel Error
	Operation panel does not display correctly.
	• Defective software of ACU or panel • Defective ACU

SC700: Options

SC780	ADF gate signal error
	The ADF gate signal did not go ON within 10 sec. after the original started to move from the original registration position. Or, the ADF gate signal went ON but failed to go OFF within 30 sec.
	• Harness loose, broken, defective • Board defective

SC781	ADF connection defective
	An I/F cord other than the one designed for use with the ADF was used to connect the ADF.
	• Incorrect installation of option • Harness loose, broken, defective • Board defective

SC800: ACU

SC818	Watch-dog error
	While the system program is running, other processes do not operate at all.
	• Defective ACU board • Software error (ACU)

SC819	Kernel panic error
	Processing cannot be continued by kernel
	• Software error (ACU)

SC820	Self-Diagnostic Error: CPU
	The central processing unit returned an error during the self-diagnostic test.
	• ACU board defective • Software defective (ACU)

SC821	Self-Diagnostic Error: ASIC
	The ASIC returned an error during the self-diagnostic test because the ASIC and CPU timer interrupts were compared and determined to be out of range.
	• ACU board defective

SC822	Self-Diagnostic Error: HDD
	The hard disk drive returned an error during the self-diagnostic test
	• HDD defective • HDD connector defective • ACU board defective

SC823	Self-diagnostic Error: NIC
	The network interface control returned an error during the self-diagnostic test
	• Defective ACU board

SC824	Self-diagnostic Error: NVRAM
	The resident non-volatile RAM returned an error during the self-diagnostic test.
	• NVRAM of ACU board damaged or abnormal • ACU board defective • NVRAM socket damaged

SC826	Self-diagnostic Error: RTC
	A one second measurement of the he timer of the CPU and RTC (Real Time Clock) is more than 1 second off.
	• ACU board defective

SC827	Self-diagnostic Error: RAM
	The resident RAM returned a verify error during the self-diagnostic test.
	• Defective ACU board

SC828	Self-diagnostic Error: ROM
	The resident read-only memory returned an error during the self-diagnostic test.
	• ACU board defective • Firmware defective (ACU)

SC829	Self-diagnostic Error: DIMM-RAM
	The DIMM-RAM returned an error during the self-diagnostic test.
	• DIMM-RAM defective • ACU board defective

SC835	Self-Diagnostic Error: Centro device
	Loopback test error.
	• Loopback connector not detected • IEEE1284 connector defective • ACU board defective

SC836	Self-diagnostic Error: Resident Font ROM
	The resident font ROM returned an error during the self-diagnostic test.
	• Defective ACU board

SC837	Self-diagnostic Error: Optional Font ROM
	The optional font ROM returned an error during the self-diagnostic test.
	• Defective ACU board

SC838	Self-diagnostic Error: Clock generator
	The setting value of the clock generator is wrong
	• Defective ACU board

SC850	Network I/F Abnormal
	The IP address is the same as another device on the network
	• Change the IP address • ACU board defective

SC851	IEEE 1394 I/F Abnormal
	IEEE1394 interface error
	• IEEE1394 interface board defective • ACU board defective

SC853	Wireless LAN card not detected
	The wireless LAN card is not detected before communication is established, though the wireless LAN board is detected.
	• Loose connection

SC854	Wireless LAN card not detected
	The wireless LAN card is not detected after communication is established, though the wireless LAN board is detected.

	• Loose connection

SC855	Wireless LAN card error
	An error is detected in the wireless LAN card.
	• Loose connection • Defective wireless LAN card

SC856	Wireless LAN board error
	An error is detected in the wireless LAN board.
	• Defective wireless LAN board • Loose connection

SC857	USB interface error
	The USB interface cannot be used due to a driver error.
	• Defective USB driver • Loose connection

SC860	Startup without HDD connection at main power on
	The hard disk connection is not detected.
	• Initialize HDD • Defective HDD • Damaged data

SC861	Startup without HDD detection at power switch on
	The hard disk connection is not detected.
	• Defective HDD • HDD connector loose or defective • Defective ACU

SC862	Maximum number of bad sectors detected on HDD

	Up to 101 bad sectors have appeared in the area on the hard disk where image data is archived, and the hard disk may require replacement.
	• Defective HDD

SC863	Startup without HDD data lead
	Data stored on the hard disk is not read correctly.
	• A bad sector occurred during operation of the HDD

SC864	HDD data CRC error
	During operation of the HD, the HDD responded with a CRC error.
	• Data transfer was abnormal in the data read from the HDD. • Defective HDD

SC865	HDD access error
	The hard disk detected an error.
	• Error detected other than the bad sectors error (SC863) or the CRC error (SC864

SC900: ACU

SC900	Electronic total counter error
	The value of the total counter has already exceeded 9,999,999
	• NVRAM of ACU board defective

SC920	Printer application error
	An error is detected in the printer application program.
	• Defective software • Unexpected hardware resource error (e.g., memory shortage)

SC990	Software performance error
	The software attempted to perform an unexpected operation.
	• Software of ACU defective • Internal parameter incorrect • Insufficient working memory

SC991	Software continuity error
	The software attempted to perform and unexpected operation. However, unlike SC990, the object of the error is continuity of the software
	Software bug Internal parameter incorrect Insufficient working memory

SC992	Undefined error
	An undefined error has occurred.

SC998	Application start error
	After power on the application does not start within 60 s. (All applications neither start nor end normally.)

	• Software defective • An option required by the application (RAM, DIMM, board) is not installed

4. Appendix 4: SP Mode Tables

Service Program Table

Main Menu Number List

No.	Menu	Description
1	Data Logging	Various counters and logged data
2	Basic Settings	Various settings
3	System Settings	Settings used at installation
4	Input Test Mode	Sensor on/off status check
5	Output Test Mode	Motors and other components on/off check
6	System Adjustment	Various adjustments
7	Memory Data Clear	Resets or clears the SP mode data
8	System Test	Various data printouts and system tests
9	Printer Controller	Controller data print out and System tests

Note

- In this model, the User Tool settings cannot be accessed with SP mode.

1. Data Logging

1-1	Master Counter	
1	Total Master Counter	Total master counter.
2	Total Master Counter - ADF	Master counter made in ADF mode.

1-2	Master Counter – Original size	
1	A3/DLT	Master counters for each original size used. '-L': Lengthwise feed (SEF)
2	B4/LG	
3	A4-L/LT-L	
4	A4/LT	
5	B5-L	
6	B5	
7	Other Size	

1-3	Master Counter – Original Type	
1	Letter Mode	Master counters for each original type used.
2	Letter/Photo Mode	
3	Photo Mode	
4	Pencil Mode	
5	Pale Mode	

1-4	Master Counter – Paper Type

1	Standard Paper	Master counters for each paper type used.
2	Thick Paper	
3	Thin Paper	
4	Special	
5	User Setting 1	
6	User Setting 2	

1-5	Master Counter - Copy Mode	
1	Economy Mode 1	Master counters for various copy modes.
2	Economy Mode 2	
3	Combine 2 Originals	
4	Combine 4 Originals	
5	2 Repeats	
6	4 Repeats	
7	8 Repeats	
8	16 Repeats	
9	Custom Repeats	
10	Enlargement Mode	
11	Reduction Mode	
12	Zoom Mode	
13	Directional Magnification	
14	Auto Magnification	
15	Slight Reduction	
16	Make-up Mode	
17	Margin Erase - Original	
18	Margin Erase – Copy	

19	Centering	
20	Online Mode	
21	Scanner Overlay - Scanner	
22	Scanner Overlay - Online	
23	Scanner Overlay - Org. Storage	
24	Format Overlay - Scanner	
25	Format Overlay - Org. Storage	
26	Default Stamp	

1-5	Master Counter - Copy Mode	
27	Up/Down shift	Master counters for various copy modes.
28	Side Shift	
29	Short Master	
30	Image Rotation	
31	Class - By Class	
32	Class - By Original	
33	Class - By Manual No.	
34	Class - By Year and Class	
35	Job Separator	
36	Auto Cycle	
40	Online Sort	
41	Original Storage	
42	Original Storage - Web	

1-8	Print Counter	
1	Total Print Counter	Total print counter.

2	Color Drum – Other	Print counter made with the optional color drums.
3	Color Drum – Red	
4	Color Drum – Blue	
5	Color Drum – Green	
6	Color Drum – Brown	
7	Color Drum – Gray	
8	Color Drum – Yellow	
9	Color Drum – Purple	
10	Color Drum – Maroon	
11	Color Drum – Navy	
12	Color Drum – Orange	
13	Color Drum – Teal	
14	Color Drum – Red Base	
15	Color Drum – Blue Base	
16	Color Drum – Yellow Base	

1-9	Print Counter - Size

1	Over A3/DLT	Print counters for each paper size used. '-L': Lengthwise feed
2	A3/DLT	
3	B4/LG	
4	A4-L/LT-L	
5	A4/LT	
6	B5-L	
7	B5	
8	A6-L	
9	Under A6-L	
10	Other Size	

1-10	Print Counter – Paper Type	
1	Standard Paper	Print counters for each paper type used.
2	Thick Paper	
3	Thin Paper	
4	Special Paper	
5	User Setting 1	
6	User Setting 2	

1-14	Print Counter - C/O

1	1 - 3 Prints	Print counter per original.
2	4 - 5 Prints	
3	6 - 10 Prints	
4	11 - 20 Prints	
5	21 - 30 Prints	
6	31 - 50 Prints	
7	51 - 70 Prints	
8	71 - 100 Prints	
9	101 - 200 Prints	
10	201 - 500 Prints	
11	501 - 1000 Prints	
12	1001 - 2000 Prints	
13	2001 - 3000 Prints	
14	3001 - 4000 Prints	
15	4001 - 6000 Prints	
16	6001 - 8000 Prints	
17	8001 - 10000 Prints	
18	More than 10000 Prints	

1-15	Master/Paper Feed Error Ratio

1	Master Set Error	Counters for various types of jams. Jam ratios are also displayed.
2	Master Clamp Error	
3	Master Cut Error	
4	Master Eject ON Check	
5	Master Pressure Plate Error	
6	Master Eject OFF Check	
7	Paper Registration ON Check	
8	Paper Feed Timing ON Check	
9	Paper Feed Timing OFF Check	
10	Paper Upper Wrapping	
11	Paper Lower Wrapping	
12	Paper Exit OFF Check	
13	DF Feed-in Error	
14	DF Feed-out Error	

1-16	Paper Jam Count – Paper Type

1	Jam P0 Standard 60 rpm	Feed-in jams and registration roller jams for various paper sizes and paper types.
2	Jam P0 Standard 75 rpm	
3	Jam P0 Standard 90 rpm	
4	Jam P0 Standard 105 rpm	
5	Jam P0 Standard 120 rpm	
6	Jam P0 Standard 135 rpm	
7	Jam P0 Thick 60 rpm	
8	Jam P0 Thick 75 rpm	
9	Jam P0 Thick 90 rpm	
10	Jam P0 Thick 105 rpm	
11	Jam P0 Thick 120 rpm	
12	Jam P0 Thick 135 rpm	
13	Jam P0 Thin 60 rpm	
14	Jam P0 Thin 75 rpm	
15	Jam P0 Thin 90 rpm	
16	Jam P0 Thin 105 rpm	
17	Jam P0 Thin 120 rpm	
18	Jam P0 Thin 135 rpm	
19	Jam P0 Others 60 rpm	
20	Jam P0 Others 75 rpm	
21	Jam P0 Others 90 rpm	
22	Jam P0 Others 105 rpm	
23	Jam P0 Others 120 rpm	
24	Jam P0 Others 135 rpm	

25	Jam P1 Standard 60 rpm	Registration roller jams (when the paper feed timing sensor stays on) for various paper sizes and paper types.
26	Jam P1 Standard 75 rpm	
27	Jam P1 Standard 90 rpm	
28	Jam P1 Standard 105 rpm	
29	Jam P1 Standard 120 rpm	
30	Jam P1 Standard 135 rpm	
31	Jam P1 Thick 60 rpm	
32	Jam P1 Thick 75 rpm	
33	Jam P1 Thick 90 rpm	
34	Jam P1 Thick 105 rpm	
35	Jam P1 Thick 120 rpm	
36	Jam P1 Thick 135 rpm	
37	Jam P1 Thin 60 rpm	
38	Jam P1 Thin 75 rpm	
39	Jam P1 Thin 90 rpm	
40	Jam P1 Thin 105 rpm	
41	Jam P1 Thin 120 rpm	
42	Jam P1 Thin 135 rpm	
43	Jam P1 Others 60 rpm	
44	Jam P1 Others 75 rpm	
45	Jam P1 Others 90 rpm	
46	Jam P1 Others 105 rpm	
47	Jam P1 Others 120 rpm	
48	Jam P1 Others 135 rpm	

49	Jam P2 Standard 60 rpm	Upper wrap, lower wrap, and feed-out jams for various paper sizes and paper types.
50	Jam P2 Standard 75 rpm	
51	Jam P2 Standard 90 rpm	
52	Jam P2 Standard 105 rpm	
53	Jam P2 Standard 120 rpm	
54	Jam P2 Standard 135 rpm	
55	Jam P2 Thick 60 rpm	
56	Jam P2 Thick 75 rpm	
57	Jam P2 Thick 90 rpm	
58	Jam P2 Thick 105 rpm	
59	Jam P2 Thick 120 rpm	
60	Jam P2 Thick 135 rpm	
61	Jam P2 Thin 60 rpm	
62	Jam P2 Thin 75 rpm	
63	Jam P2 Thin 90 rpm	
64	Jam P2 Thin 105 rpm	
65	Jam P2 Thin 120 rpm	
66	Jam P2 Thin 135 rpm	
67	Jam P2 Others 60 rpm	
68	Jam P2 Others 75 rpm	
69	Jam P2 Others 90 rpm	
70	Jam P2 Others 105 rpm	
71	Jam P2 Others 120 rpm	
72	Jam P2 Others 135 rpm	

1-20	Other Counter

1	Set Master	
2	Ejected Master	
3	Ink Pump Rotation	
4	Master End	
5	Ink End	
6	Master Eject Box Full	Number of times the eject master box is full.
7	Original Counter ADF	The total number of times the ADF was used.
8	Original Counter Platen	The total number of times the platen was used.
9	Misfeed Setting Counter	Number of times the user changed the 'Misfeed' setting for paper feed or separation pressures.
10	Double feed Setting Change	Number of times the user changed the 'Double Feed' setting for paper feed or separation pressures.
11	Start Error Message	Number of times an error message appeared when the Start key was pressed.
12	Original Storage – Scanner	Number of times the user stored an original with the scanner, without printing immediately.
13	Original Storage – Online	Number of times the user stored an original by sending it from a PC.

1-21	Machine Information	
1	Original Storage - Online	Displays serial numbers of the machine and options.
2	ROM Versions and Serial Number	Displays the ROM number and serial number of the machine and options.
3	Power On Time	Displays the time that power was turned on.
4	Counter - Read Only	Displays the Electrical Counter. It cannot be reset.
5	Counter - Read Only @ Remote	

1-22	Service Information

1	Telephone Number for Service	Enter data with SP3-1-6 at installation if required.
2	Service Call Counter	Displays the latest 40 Service Call codes.

1-23	Double Feed Counter	
1	From Paper Table 60 rpm	The number of double feeds from the paper table.
2	From Paper Table 75 rpm	
3	From Paper Table 90 rpm	
4	From Paper Table 105 rpm	
5	From Paper Table 120 rpm	
6	From Paper Table 135 rpm	

1-24	Sales Mode Change Record **Japan Only**
1	Economy Mode – Sorter Mode
2	Japanese Display Type
4	Ink Supply Pre-Printing
5	Color Drum ID0
6	Color Drum ID1
7	Color Drum ID2
8	Color Drum ID3
9	Optional Charge Counter
10	Counter Method
11	Print Per Count
12	Count Timing
13	Max Print Per Master
14	Job Separation Setting
15	Key Counter Setting
16	Paper Delivery Table

17	Main Scan Position – DF
18	Scan Start Position – DF
19	Scanning Speed – DF
20	Clear Printer Settings
21	NIB NVRAM Clear
22	HDD Format – All
23	HDD Format – Image Files
24	HDD Format – Fonts
25	HDD Format – Job Log
27	Vender
28	Master On Drum
29	No Image Master On Drum
30	Double Feed - Paper Feed Station

1-25	PM Parts Replacement Record
	The record of the PM parts replaced. When you do SP3-4 after you replace the PM parts, the data is stored here.
1	Cloth Screen
2	Paper Clamper
3	Paper Pick-up Roller
4	Paper Feed Roller
5	Friction Pad A
6	Friction Pad B
7	Feed Encoder Brush Bracket

1-90	SBU Error Location Display
1	Hard Error (bit)

2	Adjust Error (bit)
3	Level Error (bit)

2. Basic Settings

2-1	Defaults Panel Setting
1	Print Speed
	[1 to 6/**3**/1 cpm] 1: 60, 2: 75, **3: 90**, 4: 105, 5: 120, 6: 135
2	Image Position Top/Bottom
	[-15.0 to 15.0/0/0.25 mm]
3	Image Position Left /Right
	[-10.0 to 10.0/0/0.25 mm] • To detect the size of the drum, the machine refers to the DIP switch settings on the drum. But A3 and DLT have the same DIP switch configuration. Then the machine uses this SP to tell the difference between A3 and DLT. • The drum size detected by the machine changes the master making area. It also affects the available range for the default image position shift (top/bottom, SP2-1-2). **Note**: There is no A4 setting for this SP, because the machine automatically detects an A4 drum by the DIP switch setting, and adjusts the master making area and image shift accordingly.

	Drum Selection	Allowed Range (SP2-1-2)
	DLT Drum	-10 mm to + 10 mm (0.25 mm)
	A3 Drum	-15 mm to + 15 mm (0.25 mm)
	Important: For the DLT drum, the display shows -15 mm to + 15 mm. But you must enter a value in the range of -10 mm to + 10 mm.	

4	Make-up Pattern
	[1 to 40/1/1 mm]

2-2	Disable Detection
	These SP codes enable/disable various sensors for test purposes. [**ON**/OFF]
1	Ink Detection

2	Paper Length Detection
3	Paper Size Detection
4	Drum Master Detection
5	Platen Cover Set Detection
6	ADF Close Detection

2-4	Destination Setting
1	Machine Code Setting
	By entering the machine code (e.g. for C262-52, input 262-52), the following values go to the factory settings for that model: • Machine destination (SP2-4-4) • Display language • Drum Selection (SP2-4-3) • Vendor selection (SP2-4-5) **Note:** • 280-17: Ricoh North America • 280-27: Ricoh Europe
3	Drum Selection
	[A3/DLT] • To detect the size of the drum, the machine refers to the DIP switch settings on the drum. Butt A3 and DLT have the same DIP switch configuration. Then the machine uses this SP to tell the difference between A3 and DLT. • The drum size detected by the machine changes the master making area. It also affects the available range for the default image position shift (top/bottom, SP2-1-2). **Note**: There is no A4 setting for this SP, because the machine automatically detects an A4 drum by the DIP switch setting, and adjusts the master making area and image shift accordingly.

	Drum Selection	Allowed Range (SP2-1-2)
	DLT Drum	-10 mm to + 10 mm (0.25 mm)
	A3 Drum	-15 mm to + 15 mm (0.25 mm)

	Important: For the DLT drum, the display shows -15 mm to + 15 mm. But you must enter a value in the range of -10 mm to + 10 mm.
4	Machine Destination
	0: Japan 1: North America 2: Europe 3: China
5	Vendor Selection
	Different depends on the destination

2-5	Thermal Head Energy Setting	
1	Ink Temp Control – Black	
	[**ON**/OFF]	
3	Standard – Black [0 to 50/**7**/1%]	Thermal head energy in standard and economy modes, as percentage of full power.
4	Economy Mode 1 – Black [0 to 50/**17**/1%]	
5	Economy Mode 2 – Black [0 to 50/**27**/1%]	
11	Ink Temp Control – Color	
	[**ON**/OFF]	
13	Standard – Color [0 to 50/**7**/1%]	Thermal head energy in standard and economy modes, as percentage of full power.
14	Economy Mode 1 – Color [0 to 50/**17**/1%]	
15	Economy Mode 2 – Color [0 to 50/**27**/1%]	
18	Economy Mode 1 Down Limit - Color [0 to 50/**40**/1%]	
19	Economy Mode 2 Down Limit - Color [0 to 50/**50**/1%]	

If Ink Temp Control - Black (SP2-5-1) or Color (2-5-11) are switched on, the energy supplied to the thermal head will depend on the temperature of ink measured by the thermistor in the drum, as shown by the formulas in the table below. This setting can be adjusted for Black and Color separately. Thermal head energy settings used in the formulas:

- [Y]: Standard, Black (SP2-5-3): 7%, Color (SP2-5-13): 7%
- [Z]: Economy Mode 1, Black (SP2-5-4): 17%, Color (SP2-5-14): 17%
- [Z]: Economy Mode 2, Black (SP2-5-5): 27%, Color (SP2-5-15): 27%
- [T]: The temperature of the ink

Drum	Ink Temp Control (SP2-5-1, 11)	Mode	Less than 20°C	20°C or more
Black/Color	ON (Default)	Standard	-Y%	-(Y+(T-20) x2)% The limit is 23%
		Economy 1	-(Y+Z)%	-(Y+(T-20) x2+Z)% The limit is 40%
		Economy 2	-(Y+Z)%	-(Y+(T-20) x2+Z)% The limit is 50%
	OFF	Standard	-Y%	
		Economy 1, 2	-(Y+Z)%	

2-6	Other Setting
1	APS/A5 Size Detection [0 to 1/0] This SP determines how the machine behaves if the APS sensors cannot detect the original because it is too small. 0: No (No original detected) Default 1: Yes (A5 assumed)
3	A3 Master 2 Count Up [0 to 2/**0**/1] 0: The counters increments by 1 only. (Default) 1: The master counter increments by 2. 2: The master and print counters both increment by 2.

4	Master Eject Attempt Number
	This specifies the number of master eject attempts before an error is indicated. [1 to 3/**1**/1] When the master eject mechanism cannot take the master off the drum, the mechanism will try for the number of times set with this SP. When the master is removed, the mechanism will stop.
5	Auto Master Save Select [0 to 1/**0**/1] 0: Auto 1: OFF • **Auto**: If the original is A4 LEF or shorter, the master will be half-sized (A4 for an A3 drum). This decreases master consumption. • **Fix A3 size**: The master will always be A3 size.
6	Ink Supply After Trial Print [ON/**OFF**] ON: Ink is supplied while a trial print is made after making a new master.
7	Ink Supply Timing [0 to 2/0/1] This SP determines when ink is detected and supplied. There are three possible settings. • **0**: After': Ink detection and supply are done when a print job finishes. • **1**: Before': They are done when the Print Start key is pressed (and before starting printing). • **2**: No': Ink is not added except during normal printing. **Note**: • If the machine detects a low ink condition during printing, ink is supplied regardless of this setting. • To minimize the wait time for drum idling, ink supply prior to starting printing has been eliminated by setting this mode to '0: After' as the default.
8	Master on Drum [ON/**OFF**] • This SP lets the user wrap a blank master around the drum. This should be done if a drum will not be used for a long time. If a normal used master is used, the holes in the master will let the ink become dry. Also, if the drum is removed, people can see the content of the master. • To wrap a blank master around the drum, the user must press the "." button and the Start button together.

14	TH Writing Position [ON/**OFF**] • If this is set to 'ON', the thermal head writing position is moved a small amount between masters. The amount is set with SP2-6-15 (Thermal Head Writing Position Shift Amount) automatically. This changes the side-to-side margin on the master. • This prevents the same parts of the thermal head from being used all the time, because if masters that contain the same image (such as a logo) are made frequently, this can burn out the thermal head. **Default**: OFF
15	TH Writing Pos Shift Amount [1 to 5/**2**/1 mm]
16	Print Pressure Fixing Mode [ON/**OFF**] The print pressure is fixed to the value of SP2-6-17 (Print Pressure In Fixing Mode). Otherwise, the print pressure will be changed by the print speed and the temperature. Default: OFF (pressure is changed by print speed and temperature)
17	Print Pressure in Fixing Mode [0 to 6/**3**/1]
18	Print Pressure Shift Amount [-2 to 2/**0**/1] The same amount of print pressure is added to all the print pressure settings (SP 6-54 to 6-58). The maximum pressure is 6, and the minimum pressure is 0. If you enter a value that takes the pressure outside this range, it is ignored, and either 6 or 0 will be used.
20	6th Speed Paper Limit [**ON**/OFF] ON: 135 cpm is disabled for A3/DLT SEF or longer. • Paper longer than A3/DLT SEF can cause a paper exit jam. Because of this, the machine cannot use the 6th speed print for paper that is longer than A3/DLT SEF. • If this SP is set to 'off', this limitation will be ignored. **Important**: When this setting is 'off', a paper exit jam could occur for paper larger than A3/DLT SEF after printing out about 600 sheets. Stop the print job when there are about 600 sheets of paper on the paper delivery table.

21	Image Shift Correction – 60rpm [0 to 12/**0**/1]	Adjust these SPs if there are differences in the image position for different print speeds. **Note**: Set value x 0.25 mm
22	Image Shift Correction – 75rpm [0 to 12/**0**/1]	
23	Image Shift Correction – 90rpm [0 to 12/**0**/1]	
24	Image Shift Correction – 105rpm [0 to 12/**0**/1]	
25	Image Shift Correction – 120rpm [0 to 12/**4**/1]	
26	Image Shift Correction – 135rpm [0 to 12/**6**/1]	
27	No Image Master On Drum (See description below for 2-6-28). [ON/**OFF**]	
28	No Image Master On Drum Number [1 to 10/1] When there is too much ink in the drum, you must remove the ink. To do this, you must make a blank master, then remove the ink. 1. First, set SP 2-6-27 to ON. This enables the rest of this procedure. 2. Press the "Auto Cycle" button and the Start button together. The machine automatically wraps a master around the drum, applies pressure to transfer the ink into the master (at this time, the drum rotates a set number of times), and removes the master. Then another blank master is wrapped, to prevent the ink in the drum from becoming dry. • During this procedure, the excess ink in the drum transfers to the master. If there is a lot of excess ink, you must make more than one master. SP 2-6-28 sets the number of masters that are made. After you finish, you can keep SP 2-6-27 on. Then if the problem occurs again, you can instruct the user by phone or mail about how to do the above procedure, and you do not have to go there yourself.	

30	Master Compression Time A3/DLT [0 to 3] 0: 4.5 sec. 1: 4.0 sec. 2: 3.5 sec. 3: 3.0 sec.
31	Master Compression Time A4 [0 to 1/0] 0: 3.5 sec. 1: 3.0 sec.
32	Drum Master Out & Wrap Setting [ON/**OFF**]
40	Scan Shade on Margin Adjustment [Shade mask size Up/**Shade mask size Down**]
50	Master Slippage Adjustment [ON/**OFF**]
71	Black – 60rpm [1 to 5/**2**/1]
72	Black – 75rpm [1 to 5/**1**/1]
73	Black – 90rpm [1 to 5/**2**/1]
74	Black – 105rpm [1 to 5/**3**/1]
75	Black – 120rpm [1 to 5/**4**/1]
76	Black – 135rpm [1 to 5/**5**/1]
77	Color – 60rpm [1 to 5/**2**/1]

78	Color – 75rpm [1 to 5/**1**/1]
79	Color – 90rpm [1 to 5/**1**/1]
80	Color – 105rpm [1 to 5/**1**/1]
81	Color – 120rpm [1 to 5/**3**/1]
82	Color – 135rpm [1 to 5/**3**/1]

2-10	Color Drum ID Setting							
	Use this SP to assign colors to the drum ID numbers. For details, see 'Drum – Ink Supply and Kneading – Color Drum ID Detection' in Detailed Section Descriptions. [15 Colors/**Other**] There are 15 possible colors that can be specified with SP 2-10-1 to -4.							
	Color codes							
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	Other	Red	Blue	Green	Brown	Gray	Yellow	Purple
	8	**9**	**10**	**11**	**12**	**13**	**14**	
	Maroon	Navy	Orange	Teal	Red Base	Blue Base	Yellow Base	
1	ID 0							
2	ID 1							
3	ID 2							
4	ID 3							

2-13	Paper Feed Setting

1	Paper Feed Retry Setting [**ON**/OFF]

3. System Settings

3-1	Installation Setting
	Use these SP codes to input the serial numbers, etc. Do these at installation if required. The data is used in the data printout mode in the system test. (SP3-1-1 can be seen in SP1-21-1. SP3-1-6 can be seen in SP1-22-1.)
1	Serial Number
6	Phone Number - Service
7	Phone Number - Supply Order
8	Phone Number – Sales
9	Product Name - Master
10	Product Name – Ink
11	Time
12	Installation Date
13	First Power On Date

3-2	Unit Setting
1	Job Separation [NO/**YES**]
2	Key Counter [**NO**/YES] Set to Yes if installed.
3	Optional Counter Type [0 to 4/**0**/1] 0: None 1: Add.card 2: Sub.card 3: Prepaid Card 4: Coin Rack

4	Paper Delivery Table **Japan Only** [**NO**/YES]
6	Sorter **Japan Only** [**NO**/YES]
10	Double Feed Sensor [NO/**YES**] Set to 'No' if a customer's paper type causes problems with the double feed sensor.

3-4	PM Parts Replacement Record
	After all PM parts are replaced, use the SP for each replaced part and push the 'Replace' button, then push 'Yes'. • The date, and the print and master counters at the time of replacement will be stored in the machine. • The parts for which this information can be recorded are: Cloth screen, Paper clamper, Pick-up roller, Paper feed roller, Friction pad A/B, Feed Encoder Brush Bracket. **Note:** Be sure to push the 'Replace' button then 'Yes' each time you replace a part. If you do not do this, the information is not recorded correctly. Use this information for checking the service lives of PM parts
1	Cloth Screen
2	Paper Clamper Unit
3	Paper Feed Roller
4	Paper Pick-up Roller
5	Friction Pad A
6	Friction Pad B
7	Feed Encoder Brush Bracket

4. Input Test Mode

4-1	Scanner Unit
1	Scanner HP Sensor
2	Platen Cover Sensor
3	Original Length Sensor 1
4	Original Length Sensor 2

4-10	Master Making Unit
1	Master Making Unit Set Switch
2	Master Making Unit Lock Sensor
3	Cutter HP SW
4	Master Set Sensor
5	Master End Sensor
6	Master Edge Sensor
8	Platen Release Sensor
9	Thermal Head Temperature
11	Master Amount Sensor

4-20	Master Eject Unit
1	Eject Box Set Switch
2	Master Eject Sensor
3	Pressure Plate HP Sensor
4	Pressure Plate Limit Pos. SN
5	Eject Box Lock Sensor

4-30	Paper Feed Table

1	Paper Table Lowering Switch
2	Paper Table Lower Limit Sensor
3	Paper Table Height Sensor
4	Paper Table Set Sensor
5	Remaining Paper Sensor 1
6	Remaining Paper Sensor 2
7	Remaining Paper Sensor 3

4-31	Paper Feed Table – Paper
1	Paper End Sensor
2	Paper Length Sensor
3	Paper Width Detection 0
4	Paper Width Detection 1
5	Paper Width Detection 2
6	Paper Width Detection 3
7	Paper Width Detection 4
8	Paper Width Detection 5

4-40	Paper Feed Pressure Detection
1	Feed Pressure 0
2	Feed Pressure 1
3	Feed Pressure 2
4	Feed Pressure 3

4-41	Separation Pressure Detection
1	Separation Pressure 0
2	Separation Pressure 1

3	Separation Pressure 2
4	Separation Pressure 3

4-42	Friction Pad
1	Friction Pad Position Sensor 1
2	Friction Pad Position Sensor 2
3	Friction Pad Position – Standard
4	Friction Pad Position – Special

4-50	Paper Transport
1	Paper Registration Sensor
2	Paper Feed Timing Sensor
3	Paper Feed Start Sensor
5	Lower Wrapping Jam Sensor
6	Paper Exit Sensor
7	Pressure Cylinder Feed Encoder
8	Wing Upper Position Sensor
9	Wing Lower Position Sensor
10	Registration Roller Press SN
11	Registration Roller Release SN

4-60	Around the Drum
1	1st Drum Position Sensor
2	2nd Drum Position Sensor
3	Drum Home Position Sensor
4	Drum Type Check 0
5	Drum Type Check 1

6	Color Drum ID 1
7	Color Drum ID 2
8	1st Drum Master Sensor
9	2nd Drum Master Sensor
10	Clamper Close Position Sensor
11	Clamper Open Position Sensor
12	A3 Cam Sensor
13	A4 Cam Sensor
14	Printing Pressure HP Sensor
15	Printing Press Position Sensor

4-61	Image/Drum Shift HP SN
1	Drum Shift Sensor
2	Drum Shift HP Sensor

4-62	Ink
1	Ink Pump Sensor
2	Ink Cartridge Set Switch
3	Ink Detection
4	Ink Flow Sensor
5	Idling Roller HP Sensor
6	Thermostat – Ink Temperature

4-80	Other Section
1	Cover Safety Switches
2	Main Motor Lock Detect
3	Relay Guide Set Sensor

4-90	Job Separator Unit
1	Slider Upper Limit Sensor
2	Paper Sensor
3	Slider Position Sensor
4	Slide HP sensor

4-100	ADF
1	ADF Original Length Sensor 1 (B5)
2	ADF Original Length Sensor 2 (A4)
3	ADF Original Length Sensor 3 (LG)
4	ADF Original Width Sensor S
5	ADF Original Width Sensor M
6	ADF Original Width Sensor L
7	ADF Original Width Sensor LL
8	ADF Original Set Sensor
9	ADF Original Trailing Edge Sensor
10	ADF Original Skew Correction Sensor
11	ADF Registration Sensor
12	ADF Exit Sensor
13	ADF Cover Sensor
14	ADF Lift-up Sensor
15	ADF Original Set Signal

4-170	Options
1	Key Counter Detection
2	Key Card Detection

5. Output Test Mode

5-001	Scanner Unit
1	Xenon Lamp
2	Drives Scanner – Scan
3	Drives Scanner – Return
4	Drives Scanner – HP

5-010	Master Making Unit
1	Master Feed Motor
2	Platen Release Motor - Forward
3	Platen Release Motor - Reverse
4	Master Feed Control Motor - Forward
5	Master Feed Control Motor - Reverse
6	Cutter Motor - Forward
7	Cutter Motor - Reverse
8	Cutter Motor - HP
9	Master Suction Fan 1
10	Master Suction Fan 2
11	Master Buffer Fan
12	Duct Entrance Solenoid
13	Thermal Head ON
14	Platen Roller Pressure ON
15	Platen Roller Pressure OFF
18	Unit Lock Solenoid - Lock
19	Unit Lock Solenoid - Unlock

5-020	Master Eject Unit
1	Master Eject Motor – Forward
2	Master Eject Motor – Reverse
3	Pressure Plate Motor – Limit
4	Pressure Plate Motor – Release
5	Pressure Plate Motor – HP
8	Eject Box Lock Solenoid ON
9	Eject Box Lock Solenoid OFF

5-030	Paper Feed Table
1	Paper Table Motor - Up
2	Paper Table Motor - Down

5-040	Paper Feed Pressure Motor
1	Feed Pressure Motor – Up
2	Feed Pressure Motor – Down
3	Feed Pressure Min
4	Feed Pressure 1
5	Feed Pressure 2
6	Feed Pressure 3
7	Feed Pressure 4
8	Feed Pressure 5
9	Feed Pressure Max

5-041	Separation Pressure Motor
1	Motor Up
2	Motor Down

3	Eject Position
4	Separation Pressure Min
5	Separation Pressure 1
6	Separation Pressure 2
7	Separation Pressure 3
8	Separation Pressure 4
9	Separation Pressure 5
10	Separation Pressure Max

5-042	Friction Pad Shift Motor
1	Standard
2	Special

5-043	Paper Registration Pressure
1	Registration Pressure ON
2	Registration Pressure OFF
3	Regist Pressure Motor Forward
4	Regist Pressure Motor Reverse

5-050	Paper Feed Motor
1	Slowest
2	30 rpm
3	1st Speed
4	2nd Speed
5	3rd Speed
6	4th Speed
7	5th Speed

8	6th Speed
9	Reverse Slowest
10	Reverse 30 rpm
11	Reverse 1st Speed
12	Reverse 2nd Speed
13	Reverse 3rd Speed
14	Reverse 4th Speed
15	Reverse 5th Speed
16	Reverse 6th Speed

5-051	Registration Motor
1	Slowest
2	30 rpm
3	1st Speed
4	2nd Speed
5	3rd Speed
6	4th Speed
7	5th Speed
8	6th Speed

5-052	Paper Delivery
1	Wing Guide Motor – Up
2	Wing Guide Motor – Down
3	Air Knife Fan – Side
4	Air Knife Fan – Center
5	Transport Suction Fan

5-060	Drum Rotation
1	Slowest
2	1st Speed
3	2nd Speed
4	3rd Speed
5	4th Speed
6	5th Speed
7	6th Speed

5-061	Clamper Motor
1	Clamper Motor – Open
2	Clamper Motor – Close

5-062	Image Shift Motor
1	Image Shift Motor – Left
2	Image Shift Motor – Right
3	Drum Shift Motor – Up
4	Drum Shift Motor - Down

5-063	Drum Idling Roller
1	Drum Idling Roller – ON
2	Drum Idling Roller – Return

5-064	Around The Drum
1	Ink Pump Motor
2	Print Press Release Solenoid
3	Pressure Cam Shift Motor - A3

4	Pressure Cam Shift Motor - A4
5	Drum Position LED - GREEN
6	Drum Position LED - RED
7	Printing Pressure 1
8	Printing Pressure 2
9	Printing Pressure 3
10	Printing Pressure 4
11	Printing Pressure 5
12	Printing Pressure 6
13	Printing Pressure 7
14	Pressure Cam Shift Motor FWD
15	Pressure Cam Shift Motor REV

5-070	Counter
1	Print Counter Up
2	Master Counter Up

5-080	Other Sections – Main Body
1	All Indicators On
2	PSU Fan Motor
3	Auto Shut Off

5-090	Job Separator Unit
1	Slider Lift Motor - Up
2	Slider Lift Motor - Down
3	Job Separator Motor - Forward

4	Job Separator Motor - Reverse

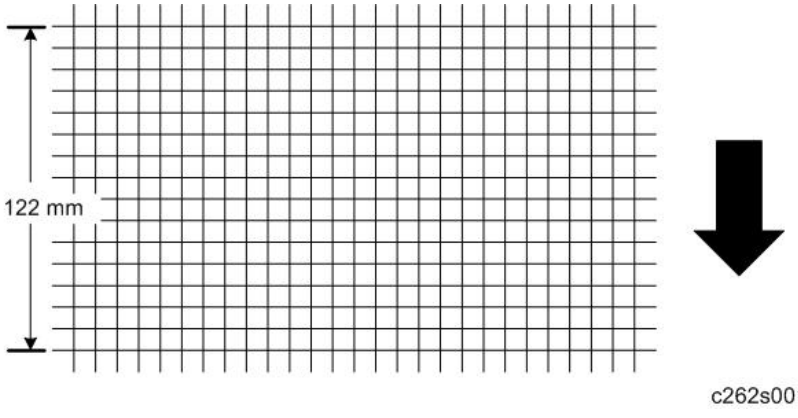
5-100	Document Feeder Unit
1	ADF Paper Feed Motor Forward
2	ADF Paper Feed Motor Reverse
3	ADF Transport Motor Forward
4	ADF Transport Motor Reverse
5	ADF Paper Feed Clutch
6	ADF Pick-up Solenoid
7	ADF Reverse Solenoid
8	ADF F-Gate Signal On

5-170	Options
1	Count-up Key Counter
2	Count-up Key Card

6. System Adjustment

6-1	Scan & Writing Adjustment
1	Main Scan Position – Platen Side-to-side registration adjustment. [-5.0 to 2.0/**0**/0.1 mm] • Entering a positive number moves the image away from the operation panel side of the machine. • Use the point (.) key to switch between + and –.
2	Main Scan Position – DF Side-to-side registration adjustment [-5.0 to 5.0/**0**/0.1 mm] • Entering a positive number moves the image away from the operation panel side of the machine. • Use the point (.) key to switch between + and –.
3	Scan Start Position – Platen Scanning start line adjustment. [-2.0 to 5.0/**0**/0.1 mm] • Entering a positive number moves the image away from the leading edge of the printer paper. • Use the point (.) key to switch between + and –.
4	Scan Start Position – DF Scanning start line adjustment. [-5.0 to 5.0/**0**/0.1 mm] • Entering a positive number moves the image away from the leading edge of the printer paper. • Use the point (.) key to switch between + and –.
5	Scanning Speed – Platen [-5.0 to 5.0/0/1%] See description below for SP-6-1-6.

6	Scanning Speed – DF [-5.0 to 5.0/**0**/1%] Entering a positive value stretches the image on the master. Entering a negative value shrinks it. Use the point (**.**) key to switch between + and –. **Procedure:** 1. Put a scale on the exposure glass and make a copy of it. Measure the image of the scale on the output. 2. Use the following formula to calculate the necessary adjustment to this SP. 3. [(Length of the scale – Length of the image of the scale) / Length of the scale] x 100 = x.x % **Important**: • Normally, do not use this SP mode to adjust the vertical magnification. • Use it only if the vertical magnification is not satisfactory by adjusting Master Writing Speed (SP6-1-7). • Acceptable settings: -5.0% to 5.0%. Default: 0

7	Master Writing Speed [-5.0 to 5.0/**0**/0.1%] This changes the master feed motor speed. Entering a positive value stretches the image on the master. Entering a negative value shrinks it. Use the point (**.**) key to switch between + and –. **Important**: Adjust this SP mode before adjusting the Scanning Speed (SP6-1-5/6). **Procedure:** 1. Enter SP8-5-1 (TH Test Patterns) and print pattern number 6. 2. On the printout, measure the distance of 15 intervals in the sub-scan direction, as shown in the diagram.  c262s001 1. The distance should be 122 mm. If it is not 122 mm, calculate the necessary adjustment with the following formula. [(122 – measured value) / 122] x 100 = x.x% • Acceptable settings: ±5.0% • Default: 0
8	Master Writing Length **Not Used** [-5.0 to 5.0/**0**/1%]
9	Main Master Writing Position [-3.0 to 3.0/**0**/1 mm]
10	Trail Edge Margin [0 to 2/**0**/1 mm
11	Skew Correction – ADF [-5.0 to 5.0/0/0.1 mm]

12	Scale Shadow Mask – Platen [2.0 to 10.0/2.0/0.1 mm]

6-2	Master Making Density	
1	Letter	[0 to 2/**1**/1]
2	Letter/Photo	
3	Photo	
4	Pencil	
5	Pale	

0: Pale 1: Normal 2: Dark

- The default is 1: Normal.
- Changing this moves the user's image density settings up or down one notch.

Density	-2	-1	0	1	2	3
0	Pale	Normal	Slight Dark	Dark		
1		Pale	Normal	Slight Dark	Dark	
2			Pale	Normal	Slight Dark	Dark

6-3	Master Clamp Adjustment
1	Master Clamp Registration [-10 to 10/**0**/0.1 mm] This SP determines how far after the leading edge the master is clamped. • A larger value clamps the master further away from the leading edge, and moves the image closer to the leading edge of the paper. • Do not use this SP to adjust leading edge registration. Use SP6-1-3 and -4 for that.

6-4	Sensor Voltages/ Thresholds
	The uses of SP codes 1 to 6 are explained in various parts of the Replacement and Adjustment section.

1	Master Eject Sensor [1.5 to 3.0 V/2.5/0.01V]
2	Master End Sensor [0.1 to 3.0V/0.8/0.1V]
3	Master Edge Sensor [1.5 to 3.0 V/2/0.01V]
4	Master Set Sensor [1.5 to 3.0/2.8/0.01V]
5	1st drum master sensor [1.5 to 3.0 V/2.5/0.01V]
6	2nd drum master sensor [1.5 to 3.0 V/2.5/0.01V]
7	List of Sensor Adjustments A list of the following sensor adjustments is displayed: • Master End Sensor (ROLL) • Master Eject Sensor (EJCT) • Master Edge Sensor (TOP) • Master Set Sensor (SET) • 1st Drum Master Sensor (MST1) • 2nd Drum Master Sensor (MST2) The voltage output from the sensors is shown in the top line of the display. You can use the + and – buttons on the right side of the display to adjust the boundary conditions for On or Off on the bottom line of the display. • When you are checking the master edge sensor, you must push the Start key to open the master buffer duct entrance plate. • The duct plate will stay open for 30 seconds, then it will close automatically. If you want to close the plate before 30 seconds, press the Start key again. • When the plate is open, 'TOP' will be shown on the display as white-on-black.

6-5	Sensor Board Unit Adjustment
1	Standard White Execution

2	Standard White Confirmation
4	Analog Gain Adjustment: RED
5	Analog Gain Adjustment: GREEN
6	Analog Gain Adjustment: BLUE
7	Digital Gain Adjustment: RE
8	Digital Gain Adjustment: RO
9	Digital Gain Adjustment: GE
10	Digital Gain Adjustment: GO
11	Digital Gain Adjustment: BE
12	Digital Gain Adjustment: BO

6-6	MTF Filter Setting
1	Letter Mode - Main Scan [0 to 8/**2**/1]

A stronger filter leads to a sharper image, but 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
8	X 4
7	X 2
6	X 1
5	X 1/2
4	X 1/4
3	X 1/8
2	X 1/16
1	X 1/32
0	0

Note: This setting is effective only if SP6-59 (filter corrections) is set to "MTF filters"

2	Letter Mode - Sub Scan [0 to 8/**1**/1]
3	Letter Photo Mode – Main Scan [0 to 8/**2**/1]
4	Letter Photo Mode - Sub Scan [0 to 8/**1**/1]
7	Photo Mode - Main Scan [0 to 8/**2**/1]
8	Photo Mode - Sub Scan [0 to 8/**1**/1]
9	Pencil Mode - Main Scan [0 to 8/**2**/1]
10	Pencil Mode - Sub Scan [0 to 8/**1**/1]
11	Tint Mode - Main Scan [0 to 8/**2**/1]
12	Tint Mode - Sub Scan [0 to 8/**1**/1]

6-7	Drum Master Length Adjust
	Adjust if the cut length of the master is not correct. [-5 to 5/**0**/1 mm]
1	A3 Drum
2	DLT Drum
3	A4 Drum
5	A4 Cut

6-8	Ink Detection Pulse Adjustment

1	Ink Detection Pulse

6-9	MisFeed – Paper Feed Pressure	
	These SP modes determine the paper feed pressures that are automatically applied during paper feed. The feed pressure used by the machine is controlled by: • The paper type selected by the user (normal, thick, thin, special, user 1, user 2), • The frequency at which non-feeds are occurring (this estimate can be input by the user). • "0" is lowest feed pressure, and "6" strongest feed pressure	
1	Normal Paper	[0 to 6/**3**/1]
2	Normal Paper – Sometimes	[0 to 6/**5**/1]
3	Normal Paper – Frequently	[0 to 6/**6**/1]
4	Thick Paper	[0 to 6/**4**/1]
5	Thick Paper – Sometimes	[0 to 6/**5**/1]
6	Thick Paper – Frequently	[0 to 6/**6**/1]
7	Thin Paper	[0 to 6/**1**/1]
8	Thin Paper – Sometimes	[0 to 6/**3**/1]
9	Thin Paper – Frequently	[0 to 6/**5**/1]
10	Special Paper	[0 to 6/**3**/1]
11	Special Paper-Sometimes	[0 to 6/**4**/1]
12	Special Paper – Frequently	[0 to 6/**5**/1]
13	User 1	[0 to 6/**5**/1]
14	User 1 – Sometimes	[0 to 6/**6**/1]
15	User 1 – Frequently	[0 to 6/**6**/1]
16	User 2	[0 to 6/**5**/1]
17	User 2 – Sometimes	[0 to 6/**6**/1]
18	User 2 – Frequently	[0 to 6/**6**/1]

6-10	Double Feed - Separation Press These SP modes determine the paper separation pressures that are automatically applied during paper feed. The separation pressure used by the machine is controlled by: • The paper type selected by the user (normal, thick, thin, special, user 1, user 2), • The frequency at which double-feeds are occurring (this estimate can be input by the user). • "0" is the lowest separation pressure, and "6" is the strongest separation pressure	
1	Normal Paper	[0 to 6/**3**/1]
2	Normal Paper – Frequently	[0 to 6/**5**/1]
3	Normal Paper - Frequently	[0 to 6/**6**/1]
4	Thick Paper	[0 to 6/**1**/1]
5	Thick Paper - Sometimes	[0 to 6/**2**/1]
6	Thick Paper – Frequently	[0 to 6/**4**/1]
7	Thin Paper	[0 to 6/**2**/1]
8	Thin Paper - Sometimes	[0 to 6/**4**/1]
9	Thin Paper – Frequently	[0 to 6/**6**/1]
10	Special Paper	[0 to 6/**1**/1]
11	Special Paper - Sometimes	[0 to 6/**2**/1]
12	Special Paper - Frequently	[0 to 6/**4**/1]
13	User 1	[0 to 6/**2**/1]
14	User 1 – Sometime	[0 to 6/**4**/1]
15	User 1 - Frequently	[0 to 6/**6**/1]
16	User 2	[0 to 6/**2**/1]
17	User 2 - Sometimes	[0 to 6/**4**/1]
18	User 2 - Frequently	[0 to 6/**6**/1]

19	Normal Paper - Low Temp Mode **ON**/OFF If temperature is 19°C or lower (measured by the drum thermistor), the separation pressure is increased by 1 automatically for all settings. The maximum pressure is 6.
20	Thick Paper – Low Temp Mode **ON**/OFF If temperature is 19°C or lower (measured by the drum thermistor), the separation pressure is increased by 1 automatically for all settings. The maximum pressure is 6.

6-11	Friction Pad	
	The machine switches the friction pads depending on the paper type selected by the user (standard, special, thick, user 1, user 2).	
1	Normal Paper	[**Standard**/Special]
2	Thick Paper	[Standard/**Special**]
3	Thin Paper	[Standard/**Special**]
4	Special Paper	[Standard/**Special**]
5	User1 Paper	[**Standard**/Special]
6	User2 Paper	[**Standard**/Special]

6-12	Paper Clamp Adjustment	
	The machine clamps the paper or does not clamp it, depending on the paper type selected by the user (standard, thick, thin, special, user 1, user 2). The settings for user 1 and user 2 depend on the type of paper that the user has set these up for.	
1	Normal Paper	[**Yes**/No]
2	Thick Paper	[**Yes**/No]
3	Thin Paper	[**Yes**/No]
4	Special Paper	[**Yes**/No]
5	User 1 Paper	[**Yes**/No]

6	User 2 Paper	[**Yes**/No]

6-13	Delivery Wing Angle	
	The machine lifts or lowers the wings depending on the paper type selected by the user (standard, thick, thin, special, user 1, user 2). The settings for user 1 and user 2 depend on the type of paper that the user has set these up for.	
1	Normal Paper	[Lower/**Upper**]
2	Thick Paper	[**Lower**/Upper]
3	Thin Paper	[Lower/**Upper**]
4	Special Paper	[**Lower**/Upper]
5	User 1 Paper	[Lower/**Upper**]
6	User 2 Paper	[Lower/**Upper**]

6-14	1st Paper Feed Delay **DFU**	
	This SP changes the feed motor on timing after the feed start timing sensor is activated. • There is a separate adjustment for each print speed. • It is controlled based on the start timing, after the first actuator on the rear of the pressure cylinder turns on the feed start sensor. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 32767/**290**/1]
2	30 rpm	[0 to 32767/**500**/1]
3	60 rpm	[0 to 32767/**193**/1]
4	75 rpm	[0 to 255/**106**/1]
5	90 rpm	[0 to 255/**48**/1]
6	105 rpm	[0 to 255/**54**/1]
7	120 rpm	[0 to 255/**20**/1]
8	135 rpm	[0 to 255/**1**/1]

6-15	1st Paper Feed Delay – Thick **DFU**	
	This SP changes the feed motor on timing for thick and special paper modes after the feed start timing sensor is activated. • There is a separate adjustment for each print speed. • It is controlled based on the start timing, after the first actuator on the rear of the pressure cylinder turns on the feed start sensor. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 32767/**370**/1]
2	30 rpm	[0 to 32767/**580**/1]
3	60 rpm	[0 to 32767/**273**/1]
4	75 rpm	[0 to 255/**186**/1]
5	90 rpm	[0 to 255/**128**/1]
6	105 rpm	[0 to 255/**74**/1]
7	120 rpm	[0 to 255/**40**/1]
8	135 rpm	[0 to 255/**20**/1]

6-16	1st Paper feed Pulse **DFU**	
	This SP changes the registration motor on timing after the feed start timing sensor is activated.) • To improve the separation of paper, the paper feed roller is made to turn more slowly. • There is a separate adjustment for each print speed. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 255/**50**/1]
2	30 rpm	[0 to 255/**50**/1]
3	60 rpm	[0 to 255/**50**/1]
4	75 rpm	[0 to 255/**50**/1]
5	90 rpm	[0 to 255/**50**/1]
6	105 rpm	[0 to 255/**18**/1]
7	120 rpm	[0 to 255/**18**/1]

8	135 rpm	[0 to 255/**18**/1]

6-17	1st Paper Feed Pulse – Thick	
	This SP changes the registration motor on timing for thick paper after the feed start timing sensor is activated.) • To improve the separation of paper, the paper feed roller is made to turn more slowly. • There is a separate adjustment for each print speed. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 255/0/1]
2	30 rpm	
3	60 rpm	
4	75 rpm	
5	90 rpm	
6	105 rpm	
7	120 rpm	
8	135 rpm	

6-18	2nd Paper Feed Delay	
	Do not adjust. (Changes the registration motor on timing in special paper mode after the feed start timing sensor is activated.)	
1	30 rpm	[0 to 32767/**630**/1]
2	60 rpm	[0 to 32767/**333**/1]
3	75 rpm	[0 to 32767/**267**/1]
4	90 rpm	[0 to 32767/**208**/1]
5	105 rpm	[0 to 255/**160**/1]
6	120 rpm	[0 to 255/**126**/1]
7	135 rpm	[0 to 255/**97**/1]

6-19	2nd Paper Feed Delay – Thick	
	Do not adjust. (Changes the registration motor on timing in special paper mode after the feed start timing sensor is activated.)	
1	30 rpm	[0 to 32767/**630**/1]
2	60 rpm	[0 to 32767/**333**/1]
3	75 rpm	[0 to 32767/**267**/1]
4	90 rpm	[0 to 32767/**208**/1]
5	105 rpm	[0 to 255/**160**/1]
6	120 rpm	[0 to 255/**126**/1]
7	135 rpm	[0 to 255/**97**/1]

6-20	Registration Roller Delay **DFU**	
	Changes the registration motor on timing in thick paper mode after the feed start timing sensor is activated, when the A4 drum is used.) • There is a separate adjustment for each print speed. • It is controlled based on the registration roller start timing, after the second actuator on the pressure cylinder turns on the feed start sensor. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 255/**37**/1]
2	30 rpm	[0 to 255/**37**/1]
3	60 rpm	[0 to 255/**34**/1]
4	75 rpm	[0 to 255/**31**/1]
5	90 rpm	[0 to 255/**27**/1]
6	105 rpm	[0 to 255/**22**/1]
7	120 rpm	[0 to 255/**17**/1]
8	135 rpm	[0 to 255/**11**/1]

6-21	Regist Roller Delay – Thick **DFU**

	Do not adjust. (Changes the registration motor on timing (when using the skip feed mode) after the feed start sensor is activated.) • There is a separate adjustment for each print speed. • It is controlled based on the registration roller start timing, after the second actuator on the pressure cylinder turns on the feed start sensor. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 255/**37**/1]
2	30 rpm	[0 to 255/**37**/1]
3	60 rpm	[0 to 255/**35**/1]
4	75 rpm	[0 to 255/**33**/1]
5	90 rpm	[0 to 255/**28**/1]
6	105 rpm	[0 to 255/**24**/1]
7	120 rpm	[0 to 255/**19**/1]
8	135 rpm	[0 to 255/**12**/1]

6-22	Regist Roller Delay – Special **DFU**	
	Do not adjust. (Changes the registration motor on timing after the feed start timing sensor is activated, when the A4 drum is used.) • There is a separate adjustment for each print speed. • It is controlled based on the registration roller start timing, after the second actuator on the pressure cylinder turns on the feed start sensor. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 255/**37**/1]
2	30 rpm	[0 to 255/**37**/1]
3	60 rpm	[0 to 255/**34**/1]
4	75 rpm	[0 to 255/**32**/1]
5	90 rpm	[0 to 255/**27**/1]
6	105 rpm	[0 to 255/**22**/1]

7	120 rpm	[0 to 255/**16**/1]
8	135 rpm	[0 to 255/**12**/1]

6-23	A4 Regist Roller Delay **DFU**	
	Do not adjust. (Changes the registration motor on timing (when using the skip feed mode) after the feed start sensor is activated.) • There is a separate adjustment for each print speed. • It is controlled based on the registration roller start timing, after the second actuator on the pressure cylinder turns on the feed start sensor. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 255/**37**/1]
2	30 rpm	[0 to 255/**37**/1]
3	60 rpm	[0 to 255/**32**/1]
4	75 rpm	[0 to 255/**30**/1]
5	90 rpm	[0 to 255/**26**/1]
6	105 rpm	[0 to 255/**21**/1]
7	120 rpm	[0 to 255/**15**/1]
8	135 rpm	[0 to 255/**9**/1]

6-24	A4 Regist Roller Delay – Thick **DFU**	
	Do not adjust. (Changes the registration motor on timing (when using the skip feed mode) after the feed start sensor is activated.) • There is a separate adjustment for each print speed. • It is controlled based on the registration roller start timing, after the second actuator on the pressure cylinder turns on the feed start sensor. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	16 rpm	[0 to 255/**37**/1]

2	30 rpm	[0 to 255/**37**/1]
3	60 rpm	[0 to 255/**33**/1]
4	75 rpm	[0 to 255/**31**/1]
5	90 rpm	[0 to 255/**27**/1]
6	105 rpm	[0 to 255/**22**/1]
7	120 rpm	[0 to 255/**18**/1]
8	135 rpm	[0 to 255/**10**/1]

6-25	Skip Regist Roller Delay **DFU**	
1	16 rpm	[0 to 255/**37**/1]
2	30 rpm	[0 to 255/**37**/1]
3	60 rpm	[0 to 255/**33**/1]
4	75 rpm	[0 to 255/**30**/1]
5	90 rpm	[0 to 255/**26**/1]
6	105 rpm	[0 to 255/**21**/1]
7	120 rpm	[0 to 255/**15**/1]
8	135 rpm	[0 to 255/**9**/1]

6-26	A4 Skip Regist Roller Delay **DFU**	
1	16 rpm	[0 to 255/**37**/1]
2	30 rpm	[0 to 255/**37**/1]
3	60 rpm	[0 to 255/**32**/1]
4	75 rpm	[0 to 255/**30**/1]
5	90 rpm	[0 to 255/**26**/1]
6	105 rpm	[0 to 255/**21**/1]
7	120 rpm	[0 to 255/**15**/1]
8	135 rpm	[0 to 255/**9**/1]

6-27	Paper Clamp Timing Pulse	
	The amount of paper feed into the paper clamper can be adjusted with this SP mode. Adjust this when there is damage to the leading edge, and upper and lower paper wrapping. There are separate adjustments for different paper types and print speeds: • To decrease the amount of paper bending, increase the value of the SP. • To increase the amount of paper bending, decrease the value of the SP.	
1	16 rpm	[0 to 255/**188**/1]
2	30 rpm	[0 to 255/**185**/1]
3	60 rpm	[0 to 255/**199**/1]
4	75 rpm	[0 to 255/**200**/1]
5	90 rpm	[0 to 255/**200**/1]
6	105 rpm	[0 to 255/**201**/1]
7	120 rpm	[0 to 255/**201**/1]
8	135 rpm	[0 to 255/**201**/1]

6-28	Paper Clamp Timing Pulse – Thick	
	The amount of paper feed into the paper clamper can be adjusted with this SP mode. Adjust this when there is damage to the leading edge, and upper and lower paper wrapping. There are separate adjustments for different paper types and print speeds: • To decrease the amount of paper bending, increase the value of the SP. • To increase the amount of paper bending, decrease the value of the SP.	
1	16 rpm	[0 to 255/**188**/1]
2	30 rpm	[0 to 255/**188**/1]
3	60 rpm	[0 to 255/**196**/1]
4	75 rpm	[0 to 255/**197**/1]
5	90 rpm	[0 to 255/**198**/1]
6	105 rpm	[0 to 255/**201**/1]

7	120 rpm	[0 to 255/**202**/1]
8	135 rpm	[0 to 255/**203**/1]

6-29	P Clamp Timing Pulse-Special	
	The amount of paper feed into the paper clamper can be adjusted with this SP mode. Adjust this when there is damage to the leading edge, and upper and lower paper wrapping. There are separate adjustments for different paper types and print speeds: • To decrease the amount of paper bending, increase the value of the SP. • To increase the amount of paper bending, decrease the value of the SP.	
1	16 rpm	[0 to 255/**188**/1]
2	30 rpm	[0 to 255/**188**/1]
3	60 rpm	[0 to 255/**193**/1]
4	75 rpm	[0 to 255/**194**/1]
5	90 rpm	[0 to 255/**194**/1]
6	105 rpm	[0 to 255/**193**/1]
7	120 rpm	[0 to 255/**194**/1]
8	135 rpm	[0 to 255/**203**/1]

6-30	Paper Feed Jam Check Pulse	
	This SP mode adjusts the amount of time from starting the paper feed roller until jam detection. If the time is long, paper miss-feed is improved; but paper cannot be fed if it is too long. **Important**: Do not use this adjustment, unless you are instructed by your service manager.	
1	Normal Paper	[0 to 255/**153**/1]
2	Thick Paper	[0 to 255/**169**/1]

6-31	Paper Clamp Timing

1	Feed Timing Pulse **DFU** [0 to 255/**163**/1]
2	Feed Stop Timing Pulse [0 to 255/21/1] The amount of paper buckle at the registration roller can be adjusted. The amount of paper buckle increases by 0.3 mm if you increase the setting by 1. **Important**: • Adjust this SP mode before adjusting the Feed Slow Down Timing (SP6-31-8). • See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.
4	Print Position 2 Setting **DFU** [0 to 255/103/1]
5	Print Position 1 Setting DFU [0 to 255/**140**/1]
6	Print Position 2 Setting – Thick **DFU** [0 to 255/**103**/1]
7	Print Position 1 Setting – Thick **DFU** [0 to 255/**140**/1]
8	Feed Slow Down Timing [0 to 255/**32**/1] This adjusts the time that the machine starts to decrease the paper speed to adjust the paper buckle at the registration roller. **Important** • Normally, do not use this SP mode to adjust the amount of paper buckle at the registration roller. • Use it only if the amount of paper buckle is not satisfactory after adjustment to Feed Stop Timing Pulse (SP6-31-2).

6-32	Paper Clamp Timing-User1

1	Feed Stop Timing Pulse [0 to 255/**25**/1] See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.

6-33	Paper Clamp Timing-User2
1	Feed Stop Timing Pulse [0 to 255/**25**/1] See Replacements and Adjustments – Paper Feed Length Adjustment for how to use.

6-34	Regist Roller Speed	
	For accurate paper registration, the machine lowers the registration roller rotation speed depending on the paper type selected by the user (standard, special, thick, user 1, user 2). • Usually, the 'high' speed setting (3% higher than the low) results in better registration. • However, when thick paper is used, it should be lowered because thick paper strongly pushes the paper clamper. • This causes friction to the smooth rotation of the pressure cylinder due to play in the cylinder's drive transmission.	
1	Normal	[Slow/**Fast**]
2	Thick	[**Slow**/Fast]
3	Thin	[Slow/**Fast**]
4	Special	[**Slow**/Fast]
5	User 1	[Slow/**Fast**]
6	User 2	[Slow/**Fast**]

6-54	Print Pressure – Very Low Temperature
	Adjust the print pressure at very low temperature (less than 15 °C)

1	Trial Print	[0 to 6/**5**/1]
2	16 rpm	[0 to 6/**0**/1]
3	30 rpm	[0 to 6/**5**/1]
4	1st Speed	[0 to 6/**3**/1]
5	2nd Speed	[0 to 6/**4**/1]
6	3rd Speed	[0 to 6/**5**/1]
7	4th Speed	[0 to 6/**6**/1]
8	5th Speed	[0 to 6/**6**/1]
9	6th Speed	[0 to 6/**6**/1]

6-55	Print Pressure – Low Temperature	
	Adjust the print pressure at low temperature (15 to 19 °C).	
1	Trial Print	[0 to 6/**3**/1]
2	16 rpm	[0 to 6/**0**/1]
3	30 rpm	[0 to 6/**0**/1]
4	1st Speed	[0 to 6/**1**/1]
5	2nd Speed	[0 to 6/**3**/1]
6	3rd Speed	[0 to 6/**4**/1]
7	4th Speed	[0 to 6/**5**/1]
8	5th Speed	[0 to 6/**5**/1]
9	6th Speed	[0 to 6/**6**/1]

6-56	Print Pressure - Normal Temperature	
	Adjust the print pressure at normal temperature (19 to 25 °C)	
1	Trial Print	[0 to 6/**1**/1]
2	16 rpm	[0 to 6/**0**/1]
3	30 rpm	[0 to 6/**0**/1]

4	1st Speed	[0 to 6/**1**/1]
5	2nd Speed	[0 to 6/**2**/1]
6	3rd Speed	[0 to 6/**3**/1]
7	4th Speed	[0 to 6/**3**/1]
8	5th Speed	[0 to 6/**4**/1]
9	6th Speed	[0 to 6/**5**/1]

6-57	Print Pressure – High Temperature	
	Adjust the print pressure at high temperature (25 to 29 ºC)	
1	Trial Print	[0 to 6/**1**/1]
2	16 rpm	[0 to 6/**0**/1]
3	30 rpm	[0 to 6/**0**/1]
4	1st Speed	[0 to 6/**1**/1]
5	2nd Speed	[0 to 6/**1**/1]
6	3rd Speed	[0 to 6/**2**/1]
7	4th Speed	[0 to 6/**3**/1]
8	5th Speed	[0 to 6/**4**/1]
9	6th Speed	[0 to 6/**4**/1]

6-58	Print Pressure – Very High Temperature	
	Adjust the print pressure at very high temperature (more than 29 ºC)	
1	Trial Print	[0 to 6/**1**/1]
2	16 rpm	[0 to 6/**0**/1]
3	30 rpm	[0 to 6/**0**/1]
4	1st Speed	[0 to 6/**0**/1]
5	2nd Speed	[0 to 6/**0**/1]

6	3rd Speed	[0 to 6/**1**/1]
7	4th Speed	[0 to 6/**2**/1]
8	5th Speed	[0 to 6/**3**/1]
9	6th Speed	[0 to 6/**3**/1]

6-59	Filter Correction		
	The filter that is chosen depends on the original type that was selected at the operation panel. The standard settings are: • 0: No correction • 1: MTF: Letter mode and Pencil mode • 2: Adaptation: Letter/Photo mode and Pale mode • 3: Smoothing: Photo mode		
1	Letter	1	[0 to 3/**1**/1]
2	Letter/Photo	2	[0 to 3/**2**/1]
3	Photo	3	[0 to 3/**3**/1]
4	Pencil	1	[0 to 3/**1**/1]
5	Tint	2	[0 to 3/**2**/1]

RTB 1a, 2a
SP 6-96 added

7. Memory Data Clear

7-1	Memory Clear
1	Factory Setting
2	User Setting
3	User Program Setting
4	Sales Change Record

7-2	Counter Clear
1	Total Print
2	Paper Jam/Error Logging
3	Master Jam/Error Logging

7-3	Code Clear
1	User Code
2	Key Operator Code
3	Security Code Clear
	This is the password that the user must input to disable high security mode temporarily. You can also disable high security mode temporarily with SP 8-7-3.

7-4	Paper Feed System Clear
1	Feed Pressure
2	Separation Pressure
3	Friction Pad
4	Wing Guide Angle
5	Feed Control Data
6	Feed Control Pulse

7-5	Image Adjustment Clear
1	MTF Filter

7-7	HDD Formatting
1	All Areas

8. System Test

8-1	Data Printout
1	Job Log
2	User Code
3	SC & Jam
4	Jam/Error Detail
5	User Item
6	PM Part Replacement Record
7	Defaults – System
8	Defaults – Master/Print/Online
9	Class
10	Basic Setting
11	Input Test
12	Output Test
13	All System Adjustment
14	Paper Feed Adjustment
15	Option Adjustment
50	Output Data SD Card

8-2	Download Program
1	ACU
2	ECU
5	ADF
8	Panel
9	Language

10	PostScript

8-5	TH Test Patterns
	[0 to 9/-/1] 1: Grid 2: Vertical 3: Horiz grey 4: Vert grey 5: 16 greys 6: Cross 7: Diag grid 8: 256 greys 9: 64 greys

8-6	Free Run – Scanner/ADF
1	Scanner Free Run/Magnify
	[50 to 200/100/1%]
2	ADF Free Run/Magnify
	[50 to 200/100/1%]

8-7	Other Tests
1	APS Sensor Check Mode
2	LCD Data Download Mode [On/**OFF**]
3	Temporary Security OFF [On/**OFF**]

9. Printer Controller

9-1	Test Mode		
1	Output Data Print	Normal/HexDump/ SD card	
2	Service Summary Print		
3	NIB Summary Print		
5	Bit SW#1		
	Note: Do not change settings 0 to 3, 4-7. Leave them set to "0".		
	Bit SW		**Default**
	0	Not used	0
	1	Not used	0
	2	Not used	0
	3	Enables and disables PCL/PS switching. 0: Enable. PCL/PS switching possible. 1: Disable. PCL/PS switching not possible.	0
	4	Not used	0
	5	Not used	0
	6	Not used	0
	7	Not used	0

In normal operation, an image that is sent from the computer is printed out. But with this SP mode, the image is changed to hex data and then output on paper or to an SD card. There are three settings:

- 0: Normal (Default setting)
- 1: Hex Dump. In a hex dump the image is changed to hex data, and the hex data is printed out on paper.This mode continues until main power is shut off. In some cases, there will be a large quantity of data, and many masters will be consumed to print out the hex dump. Be careful when you use this mode.
- 2: SD card. The image is changed to hex data, and the hex data is transferred to an SD card on the ACU board.

  Procedure:

1. Turn off the main switch.
2. Set the SD card.
3. Turn on the main switch.
4. Set SP9-1-1 to "SD card" and get out from the SP mode.
5. Send the data from a computer.
   The 'data in' LED on the machine blinks during the data transfer, and the LED turns off when the data transfer is finished (the transfer takes a few seconds).
6. Set SP9-1-1 to "Normal".
7. Turn on the main switch
8. Remove the SD card from the machine.

Important: Do not take out the SD card before you turn off the main switch and set the SP mode to "Normal".

9-2	Clear Mode
1	Clear Printer Settings
2	NIB NVRAM

MEMO