



KONICA MINOLTA

DIRECT DIGITIZER

REGIUS MODEL 110

CODE NO.0902



Service Manual

CE 0197

Manufacturer:

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Introduction

The Direct Digitizer REGIUS MODEL 110 is designed to read REGIUS Plates using a photostimulable luminescent material as an X-ray detector.

This manual states the cautions and steps for the service engineers who will perform repair or maintenance of this equipment (or the system including this equipment).

After reading through the manual, please keep it close so you can refer whenever needed.

Cautions

1. Unauthorized reproduction of any part of this manual is prohibited.
2. The contents of this manual are subject to change without notice.
3. Any discrepancies, errors or omissions noted should be communicated to the manufacturer.
4. Notwithstanding item 3. above, the manufacturer accepts no responsibility whatsoever for any loss or decrease in profits arising from usage of the product.

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How to Use This Manual

Configuration of This Manual

Caution about the safety and operation of this equipment are described in following 8 chapters in this manual.

Chapter 1: Warning and Caution Regarding Safety

This chapter describes the caution regarding the safety before performing the repair/maintenance.

Chapter 2: Before Repair

This chapter describes the basic knowledge about the equipment before performing the repair/maintenance.

Chapter 3: Troubleshooting

This chapter describes how to handle when there is a trouble on the equipment.

Chapter 4: Confirm Operation Using the Service Tool

This chapter describes how to confirm the operation of the REGIUS MODEL 110.

Chapter 5: Disassemble and Assemble

This chapter describes how to disassemble and assemble the equipment.

Chapter 6: Adjustment

This chapter describes how to adjust each units, which is necessary in repair/maintenance.

Chapter 7: Periodic Maintenance

This chapter describes how to perform periodical maintenance of the equipment.

Chapter 8: Appendix

This chapter contains technical information that can be referenced during repair/maintenance.



Service tool on the REGIUS console will be used for setting and operation confirmation of the equipment. Please see the install/service manual of the REGIUS console for the operation of service tool.

The reference point (title) to the REGIUS consol install/service manual listed in this manual is as of May 21, 2007.

Alert Symbol Marks







Alert symbol marks are cautioning the interested person about the item or operation that might cause a danger to the operator or other people during the repair/maintenance of the equipment (and system including the equipment).

Read these messages and follow instructions carefully.

Also, read and understand the instructions and safety standards before performing repair/maintenance of the equipment.

Description of safety icon

- Symbols indicating that caution (including danger and warning) should be taken

					
General Caution	Fire Caution	Electrical Shocks Caution	High Temperature Caution	Rotating Object Caution	Magnetism Warning

- Symbols indicating prohibited act

						
Prohibited	Do not touch	Do not disassemble	Do not touch with a wet hand	Do not expose to moisture	Mobile phone prohibited	Do not connect multiple wires

- Symbols indicating compulsory or required act

	
Ground	Remove plug from outlet

Signal Words

Signal words indicate the degree of potential hazards in the product.

There are three degrees of caution labels, and each is used depending on the level of risk and damage caused by incorrect use and mishandling.

DANGER

This is used for a direct and urgent danger that can cause death or severe injury, major damage to the property like complete destruction of the equipment, or fire, if not avoided.

WARNING

This is used for a indirect (potential) danger that can cause death or severe injury, major damage to the property like complete destruction of the equipment, or fire, if not avoided.

CAUTION

This is used for a danger that can cause minor or mid-level injury, partial destruction of equipment, or loss of data in the computer, if not avoided.

		Probability of damage	
		High	Low
Body injury (or damage to property)	Death or severe injury (serious damage)	DANGER	WARNING
	Mid-level or minor injury (minor damage)	WARNING or CAUTION	CAUTION
Damage to property only		CAUTION	

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Chapter 1

Safety Warnings and Cautions

The caution regarding the safety before performing the repair/
maintenance is described here.

1.1	Warning Labels	1-2
1.2	Safety Caution	1-5

1.1 Warning Labels

Various warning labels are attached to REGIUS MODEL 110 as shown below.

Understand the meaning of the warning labels, and handle with care on the parts with warning cables during the installation or repair/maintenance is performed.

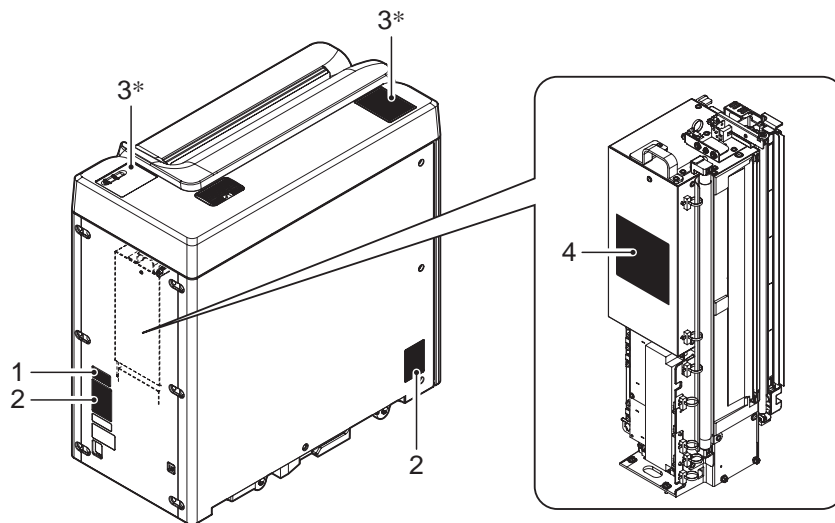


Caution

Do not peel off or smudge the affixed label to prevent accidents during the service. Affix new label if the label is peeled off or you cannot read the dirty label.

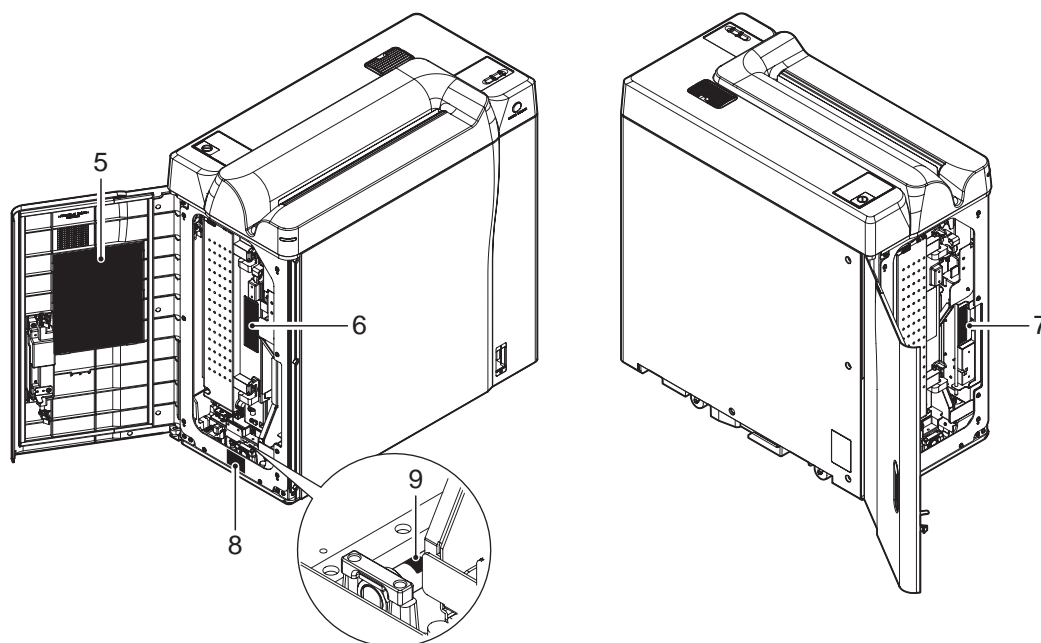
1.1.1 Position and Type of Warning Label



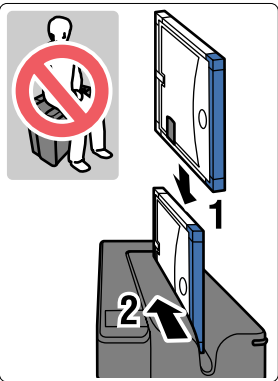
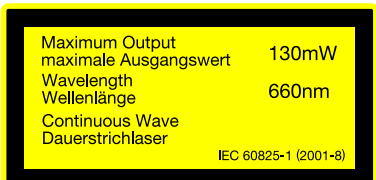


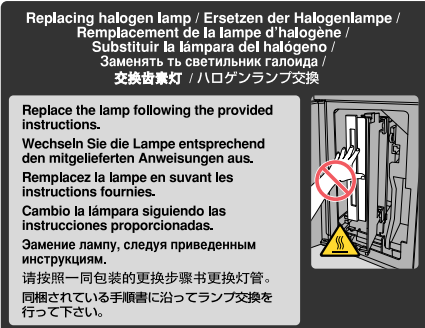

Exterior and optic unit


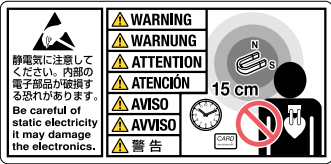



*: Position will differ depending on the operation panel position.

Inside second front door



No.	Contents/Warning label	No.	Contents/Warning label
1	Class 1 laser product  <p>クラス1レーザー製品 CLASS 1 LASER PRODUCT LASER KLASSE 1</p>	2	Laser caution 
3	Do not sit 	4	Laser output  <p>Maximum Output 130mW maximale Ausgangswert Wavelength 660nm Wellenlänge Continuous Wave Dauerstrichlaser IEC 60825-1 (2001-8)</p>  <p>△ 注意 内部の電子部品が破損する可能性がありますので、このユニットに触れるときには静電気に注意して下さい。 △ CAUTION Be careful of electrostatic when touching this unit as it may damage the electronic components inside the unit. Apply measures against electrostatic when touching this unit.</p>
5	Clearing a jam and lamp replacement procedures  <p>Clearing a jam / Beheben eines Staus / Résoudre un bourrage / Retirar el papel atascado / Устранение замятия / 卡住时的处理 / ジャム処理</p>  <p>Replacing halogen lamp / Ersetzen der Halogenlampe / Remplacement de la lampe d'halogène / Substituir la lámpara del halógeno / Заменять светильник галогенда / 交換卤素灯 / ハロゲンランプ交換</p> <p>Replace the lamp following the provided instructions. Wechseln Sie die Lampe entsprechend den mitgelieferten Anweisungen aus. Remplacez la lampe en suivant les instructions fournies. Cambio la lámpara siguiendo las instrucciones proporcionadas. Замена лампы, следуя приведенным инструкциям. 请按照一同包装的更换步骤书更换灯管。 同梱されている手順書に沿ってランプ交換を行って下さい。</p>	6	High Temperature Caution  <p>△ CAUTION High temperature! △ VORSICHT Heisse Oberfläche! △ ATTENTION Température élevée! △ PRECAUCIÓN ¡Temperatura alta! △ CUIDADO Temperatura alta! △ ATTENZIONE Alta temperatura! △ 注意 高温！</p>

No.	Contents/Warning label	No.	Contents/Warning label
7	<div>Interlock Caution</div> <div></div>	8	<div>Magnetism Warning</div> <div></div>
9	<div>Magnet</div> <div></div>		

1.2 Safety Caution

Read and follow all safety cautions thoroughly before using the product.

Be sure to observe the cautions described here, since it is regarding about the safety.

1.2.1 Caution Based on Ordinance

CAUTION



Caution regarding laser regulation

To prevent danger, do not remove the external covers or touch inside the equipment except the service engineer with official training.

Laser unit specification of the REGIUS MODEL 110

Item	Specification
Class	IIIb
Medium	Semiconductor laser
Wavelength	660 nm
Maximum output	130 mW (CW)

REGIUS MODEL 110 is laser class I product.

■ Notation According to Pharmaceutical Law

Following are text from "Caution regarding usage (safety and prevent danger) of the medical electric equipment", required to attach by Notification Number 495 of Pharmaceutical Affairs Bureau, Ministry of Health and Welfare (June 1, 1972). Read this caution closely and operate properly.

Caution regarding usage (safety and prevent danger) of the medical electric equipment

1. Equipment should only be operated by skilled operator.
2. Note following items when installing the equipment.
 - (1) Install in position where no water spills.
 - (2) Install in location where air pressure, temperature, ventilation, sun light, dust, salt, sulfur, etc., does not affect the equipment.
 - (3) Note the stability such as inclination, vibration, shock (including transport), etc.
 - (4) Do not install where the chemical is stored or where the gas is generated.
 - (5) Note the frequency and allowable current (or power consumption) of the power supply.
 - (6) Confirm the status (abandoned status, polarity, etc.) of the battery power supply.
 - (7) Connect to the ground correctly.
3. Note following items before using the equipment.
 - (1) Confirm that the equipment works properly by checking the contact of the switches, polarity dial setting, meters, etc.
 - (2) Confirm that the ground is connected safely.
 - (3) Confirm that all the cords are connected properly and safely.
 - (4) Be careful that simultaneous use of the equipment might lead to wrong diagnostic or cause danger.
 - (5) Confirm the battery power supply.
4. Note following items while operating the equipment.
 - (1) Be cautious that you do not go over the necessary time or amount needed for diagnostic or treatment.
 - (2) Always monitor that there is no problem with the equipment and patient.
 - (3) Perform appropriate measure, such as stopping the equipment safely to patient, when a problem is found with the equipment or patient.
 - (4) Be cautious that patient should not touch the equipment carelessly.

5. Note following items after operating the equipment.

- (1) Turn the power off by prescribed procedure after returning the operation switches and dials to the positions before usage.
- (2) Do not unplug the cables by pulling on cable part or apply unnecessary force.
- (3) Note following items for storing location.
 - Store in position where no water spills.
 - Store in location where air pressure, temperature, ventilation, sun light, dust, salt, sulfur, etc., does not affect the equipment.
 - Note the stability such as inclination, vibration, shock (including transport), etc.
 - Do not store where the chemical is stored or where the gas is generated.

(4) Organize the accessories, cables, electrodes, etc., after cleaning.

6. Clean the equipment so there is no interference on next use.

7. Do not tamper the equipment when it is malfunctioning, and let the professional perform the repair.

8. Do not modify the equipment.

9. Routine maintenance

(1) Always perform a routine maintenance on the equipment and parts.

(2) The equipment must be checked if it works normal and safely when operation is resumed after it has not been used for an extended period.

10. Operate properly in accordance with the User Manual.

1.2.2 General Caution

WARNING



Do not perform any operation that is not mentioned in this manual

There are hot spots and high voltage parts inside the equipment, and there is a possibility of burn or electrification if operated wrongly.



Always follow the contents of the warning label

Always follow the cautions mentioned in this manual and the contents of the warning label affixed to the equipment. Personal injury or destruction of the equipment may result if it is not followed.



This equipment is equipped with a laser generating device (Class IIIb)

Major damage could happen when this laser ray is projected on skin or eyes.

Use the dedicated protection glasses when performing operation confirmation with the power on.

This equipment can be considered as class I laser product only when the safety interlock is not released.



Person with cardiac pacemaker should not get close to this equipment

There is a possibility of electromagnetic interference to a cardiac pacemaker



Removal of the external covers

To prevent danger, do not remove the external covers or touch inside the equipment except the service engineer with official training.

1.2.3 Caution for Handling the Equipment

⚠ WARNING



Terminate the operation when abnormal noise or smell, or smoke arise from the equipment

Terminate the operation immediately when abnormal noise or smell, or smoke arise from the equipment. It may result to electrification, fire, or damage to the equipment by running the equipment with abnormality.



Do not trip on or step on the power supply cable

Electrification, excess heat, or fire may result using damaged power supply cable.



Do not pull the power supply cable to unplug the power supply

This may result to breakage of wire inside, and could cause excess heat or fire.



Do not place drink or foreign object on top of the equipment

Do not place drinks, such as juice, or foreign objects, such as clips or pins, on top of the equipment. It is possible that the internal circuit will short, and cause fire, when there is water or metal foreign object inside the equipment.

⚠ CAUTION



Do not block the air intake or outlet of the equipment

It is possible that equipment to break or decrease the image read quality when the air intake and outlet of the equipment is blocked.



Do not place object on top of equipment, or climb on the equipment

There is a risk of injury due to the fall, or damage to the equipment.



Do not use the equipment that will generate radio wave, such as mobile phone

There is a risk of harmful influence to the equipment when you use the equipment that will generate radio wave, such as mobile phone.

1.2.4 Caution for Handling the Cassette

⚠ WARNING

Do not disassemble the REGIUS plate.

Photostimulable phosphor that is toxic when entered the body is used on the plate. Follow the procedure described below when the photostimulable phosphor (milky white) is exposed due to breakage of the protection layer on the plate surface.



- Get a treatment by physician immediately when you swallowed it.
- Wash with clean water and then get a treatment by physician immediately when it got in your eyes.
- Wash with clean water immediately when it got on your skin.
- Even if it did not get in your body, treat the plate so the photostimulable phosphor will not contact anybody, and dispose it according to the regulation.

1.2.5 Caution During Service

WARNING

**Do not insert wire or metal pieces**

Do not insert foreign objects such as wire or metal pieces from the air holes or the gap of the body. There is a danger of electrification.

**Always turn OFF the power supply during service**

There is a risk of major incident when the PCB inside the equipment, connectors, or cables are pulled out with the power supply still ON.

Always perform these operation with the power supply switch in the OFF position.

**Do not detach the lithium battery without discretion**

A lithium battery is installed on the CIU PCB in the equipment. There is a risk of explosion when the lithium battery is placed near the fire or place in the water.

CAUTION

**Use the wrist band when handling the electronic parts inside the equipment**

Use the anti-static wrist band when handling the electronic parts inside the equipment. It is possible to damage the electronic part by touching it with static buildup.

**Unplug the power supply or turn the power switch to OFF while cleaning**

Always unplug the power supply or turn the power switch to OFF while cleaning the equipment.

There is a risk of pinching your finger on the sliding or rotating parts.

1.2.6 Treatment of Disposed Parts

CAUTION

**This equipment, accessories, and packaging material are considered as industrial waste.**

Always request a licensed industrial waste disposal firm in accordance to local regulations/rules to dispose them.

Chapter 2

Before the Repair

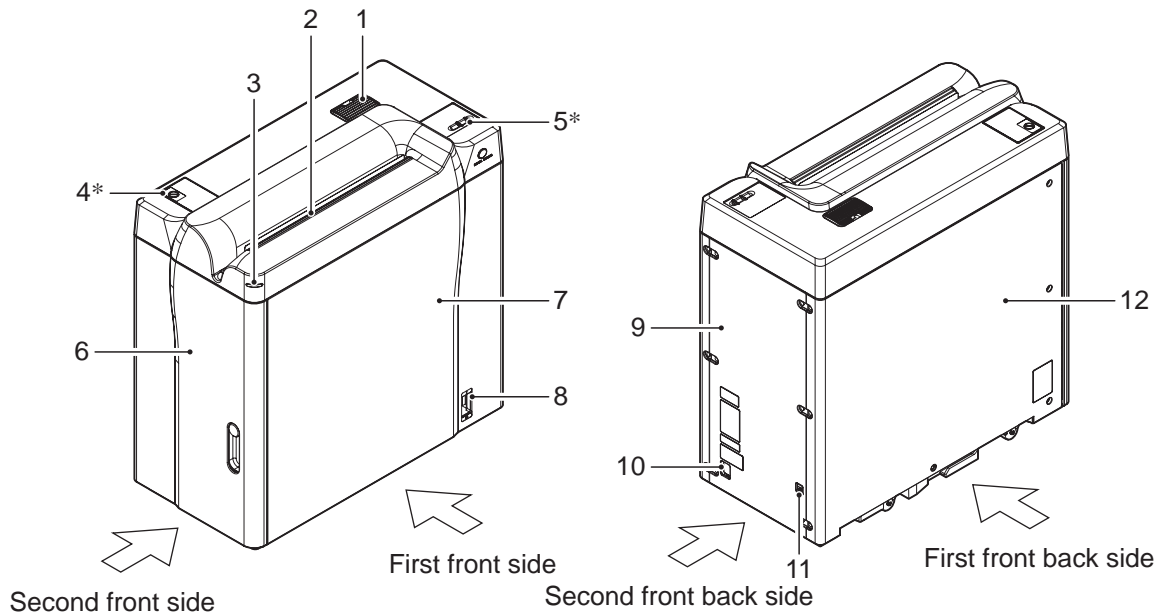
The basic knowledge about the equipment before performing the repair/maintenance are described.

2.1	Name of Parts	2-2
2.2	Structure	2-4
2.3	Principal Specifications	2-5
2.4	Block Diagram.....	2-9
2.5	Position of Major Components.....	2-11
2.6	Operation	2-20
2.7	Handling the Cassette.....	2-31
2.8	Tools, Measuring Devices, Jigs, Etc., Necessary for Service.....	2-32

2.1 Name of Parts

Following are names of parts that is necessary to know when performing repair of the REGIUS MODEL 110.

■ Exterior



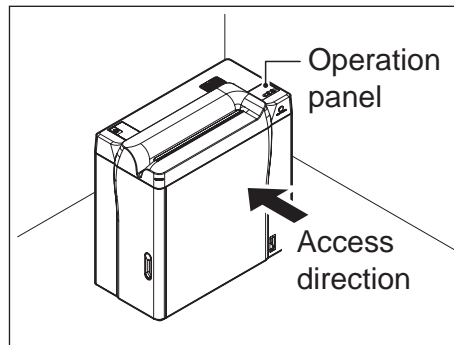
No.	Name	Function
1	Air intake	Intake the air to cool the interior.
2	Cassette insertion slot	Slot to insert/eject the cassette to the REGIUS MODEL 110.
3	Status lamp	Displays the status of the REGIUS MODEL 110 with LEDs. <ul style="list-style-type: none"> Off: Stopped, starting up, stopping Blue light on: Idling Orange light flashing: Transporting cassette Orange light flashing fast: Ejecting cassette Orange light on: Cassette ejected Blue/orange lights flashing alternately: Malfunction
4*	Dummy operation panel	A cover on the side where the operation panel is not connected, out of 2 operation panel attachment locations.
5*	Operation panel	Message display window showing the status and errors of the REGIUS MODEL 110 and switches to operate the equipment is located. See "■ Operation Panel (Page 2-3) " for description.
6	Second front door	A door user open to clear the cassette jam or replacing the erase lamp.
7	First front panel	An exterior panel.
8	Power supply circuit breaker	Turn ON/OFF power supply of the REGIUS MODEL 110.
9	Second front back panel	An exterior panel.
10	Power supply port	Connect the power supply cable.
11	Ethernet connection port	Connect the ethernet cable.
12	First front back panel	An exterior panel.

*: Switch the position of dummy operating panel and operation panel when the equipment is placed vertically.

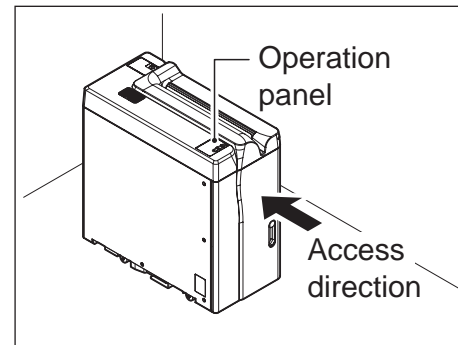
Vertical Positioning

The front side (user's access direction) of the equipment can be changed by switching the operation panel position.

Horizontal Positioning (Factory Default)



Vertical Positioning

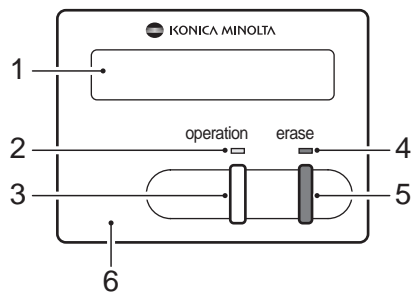


Horizontal positioning: First front side will be the front. (This is the factory default.)

Vertical positioning: Second front side will be the front.

Position of the operation panel needs to be changed to install in vertical positioning.

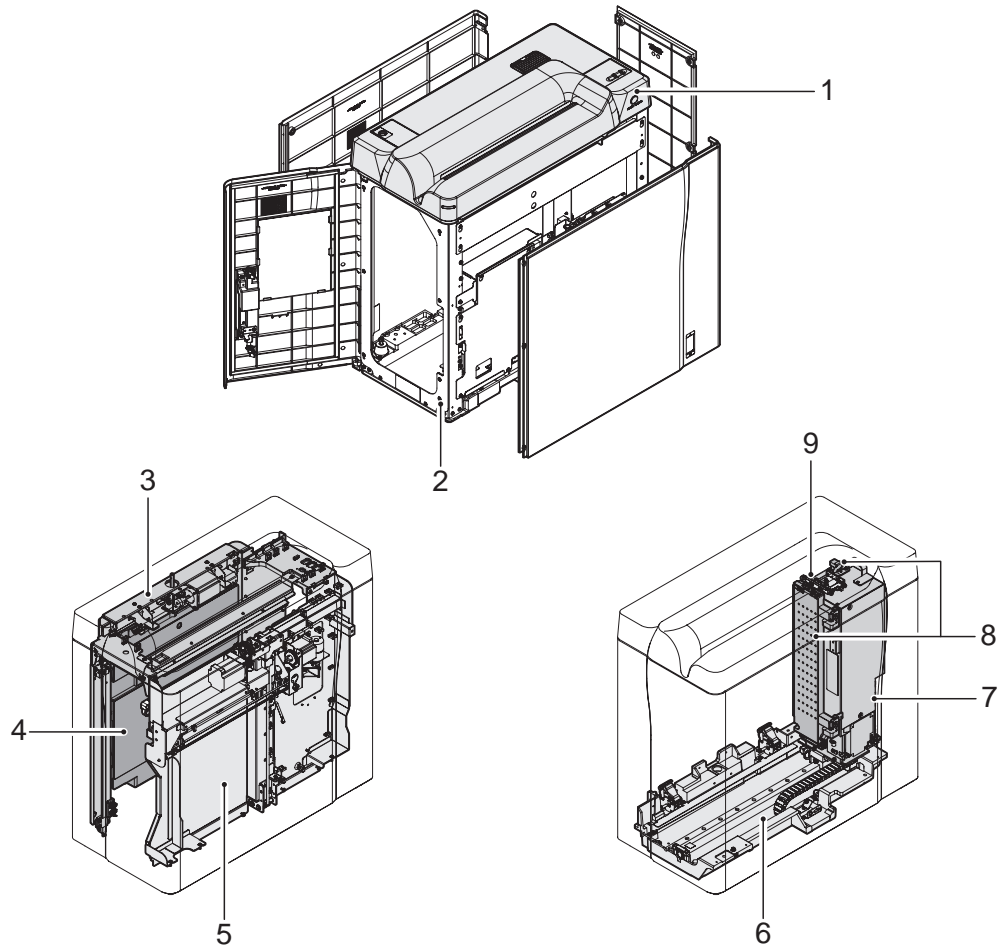
■ Operation Panel



No.	Name	Function
1	Message display window	Displays the status and errors of the REGIUS MODEL 110.
2	"operation" lamp	Turns on when "operation" switch is turned ON. <ul style="list-style-type: none"> Off: Stopped Green light on: Starting up, running, idling Green light on: Stopping Green flashing slowly: Sleeping
3	"operation" switch	Press to turn ON/OFF the REGIUS MODEL 110. Also, by pressing simultaneously with "erase" switch, it goes into optical unit maintenance (user maintenance) mode.
4	"erase" lamp	Turns on during erase mode.
5	"erase" switch	Press to erase the image information on the plate.
6	Speaker	Alarm will beep according to the operation status. <ul style="list-style-type: none"> Beep: Going into or coming out of idling state Beepbeep Beepbeep...: Ejecting cassette Bong Bong...: Erasing Beepbeepbeep: Warning occurred Pingpong: Error occurred

2.2 Structure

Following are the structure of the REGIUS MODEL 110.



No.	Name	Function
1	Insertion unit	Constructed of slot to insert/eject the cassette, operation panel, barcode reader, shutter open and close mechanism.
2	Exterior	Unit to separate from outer environment, such as light shield, vibration blocker, etc. Power supplies to supply power to control unit is located in the first front side.
3	Framework	Unit to construct the equipment's frame along with the exterior. Sensors and motors relating to the transporter is installed. Also, control unit is installed in the first front back side.
4	Transporter unit	Move only the back plate (including the plate) of the cassette, locked in the receiver unit, will be moved to reading position (first front back side).
5	Receiver unit	Take in the cassette into the equipment with the receiver mechanism and fix the cassette with the justifier mechanism. Also, cassette will be locked or unlocked with the lock/lock release mechanism.
6	Subscan unit	Subscan (horizontal movement) the optical unit/eraser unit. Reading will be done during the movement from the second front back side to the second front side, and erasing will be done during the returning.
7	Optical unit	Read the image information on the plate by laser scanning unit and light condensing unit.
8	Eraser unit	Image information left on the plate will be erased with hybrid 2 step erase method using halogen lamp and hot-cathode tube.
9	Detach detection unit	Detect the warp or detachment of the plate in the back plate during read/erase.

2.3 Principal Specifications

2.3.1 Equipment Specification

Dimensions	740 (W) x 365 (D) x 747 (H) mm	
Weight	Approximately 100 kg	
Floor height adjustment range	Up to 12 mm bump at the position of the foot adjuster	
Noise level	During operation: 55 dB or less During idle: 42 dB or less (Excluding warning buzzer, user operating sound, etc.)	
Power consumption	185 Wh or less (40 mR or less exposure, continuous processing of 14 x 17 inches)	
Maximum power consumption	800 VA or less (100 V, 8 A or less)	
Power supply	In Japan	AC 100 V \pm 10% (50/60 Hz)
	North America	AC 110/115/120/220/230/240 V \pm 10% (60 Hz)
	Europe	AC 200/220/230/240 V \pm 10% (50 Hz)
Environment condition (Temperature/Humidity)	During operation: 15 ~ 30°C/35 ~ 80% RH (no condensation) Not operating: -10 ~ 40°C/10 ~ 95% RH (no condensation)	
Periodic replacement parts	Erase lamp unit (erase count: About 30,000 shots)	
Accessories	Power supply cable, operation manual	
Available accessories	REGIUS cassette, REGIUS plate, JM, REGIUS console (CS-1/CS-2/CS-3)	

Applicable cassette

Cassette type	Description
Readable cassette type	RC-110, RC-110R, and cassette with equivalent open/close/separation mechanism with RC-110
Readable cassette size	14 x 17 inches, 14 x 14 inches, 11 x 14 inches, 10 x 12 inches, 8 x 10 inches, 24 x 30 cm, 18 x 24 cm, 15 x 30 cm
Exposure only cassette type	RC-110T (long length exposure), RC-110L (confirming therapy positioning)
Exposure only cassette size	RC-110T: 4 types (10 x 36 inches, 11 x 28 inches, 14 x 42 inches, 14 x 51 inches) RC-110L: 3 types (14 x 17 inches, 14 x 14 inches, 10 x 12 inches)



Important

Cassettes produced before April 2004 can not be used.

2.3.2 Read/Erase of the Image

■ Processing Performance

Reading resolution	<ul style="list-style-type: none"> Standard read mode: 175μm High resolution read mode: 87.5μm
Cassette feed load time	45 seconds or less (14 x 14 inches/standard read mode) <ul style="list-style-type: none"> Time from the cassette is inserted until the cassette is ejected.
Processing Performance	80 or more (14 x 14 inches/standard read mode) <ul style="list-style-type: none"> Number of cassettes process in 1 hour when the cassette is continuously inserted.
QR value	3 settings possible between 125 ~ 500 <ul style="list-style-type: none"> Low sensitivity (QR value: 125 ~ 249) Normal sensitivity (QR value: 250) High sensitivity (QR value: 251 ~ 500) QR value definition: Define as QR = 200 when the output signal value in 12 bit output is 1535 steps, with 2.58×10^{-7} C/kg (= 1 mR is exposed with 80 kV tube voltage)
Reading dynamic range	Normal D range (4.0 digits: PMT output current range = 100 nA ~ 1 mA)
Digital tone steps	12 bit (4096 steps)

Cutout image size

Cassette used	Cutout image size		
Cassette type	Display size (mm)	Normal mode (pixel)	High resolution mode (pixel)
14 x 17 inches	352.0 x 428.5	2010 x 2446	4020 x 4892
14 x 14 inches	352.0 x 352.0	2010 x 2010	4020 x 4020
11 x 14 inches	275.0 x 352.0	1572 x 2010	3144 x 4020
10 x 12 inches	250.5 x 301.5	1430 x 1722	2860 x 3444
8 x 10 inches	199.5 x 250.5	1140 x 1430	2280 x 2860
24 x 30 cm	236.5 x 296.5	1350 x 1692	2700 x 3384
18 x 24 cm	176.4 x 236.3	1008 x 1350	2016 x 2700
15 x 30 cm	296.5 x 146.5	1694 x 836	3388 x 1672

■ Optical Unit

Laser scan unit

Method	Laser scan by polygon mirror
Polygon face count	6 faces
Laser wavelength	660 nm
Laser intensity on the plate surface	35 mW or more
Imaging beam diameter	100 μ m or less (main and sub)
Lens	2 group 2 lens

Light condensing unit

Method	Light condensing by light guide and light condensing mirror
Elimination of exciting light	Elimination with exciting light cut filter

■ Eraser Unit

Method	Using halogen lamp and hot-cathode tube
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■ Subscan Unit

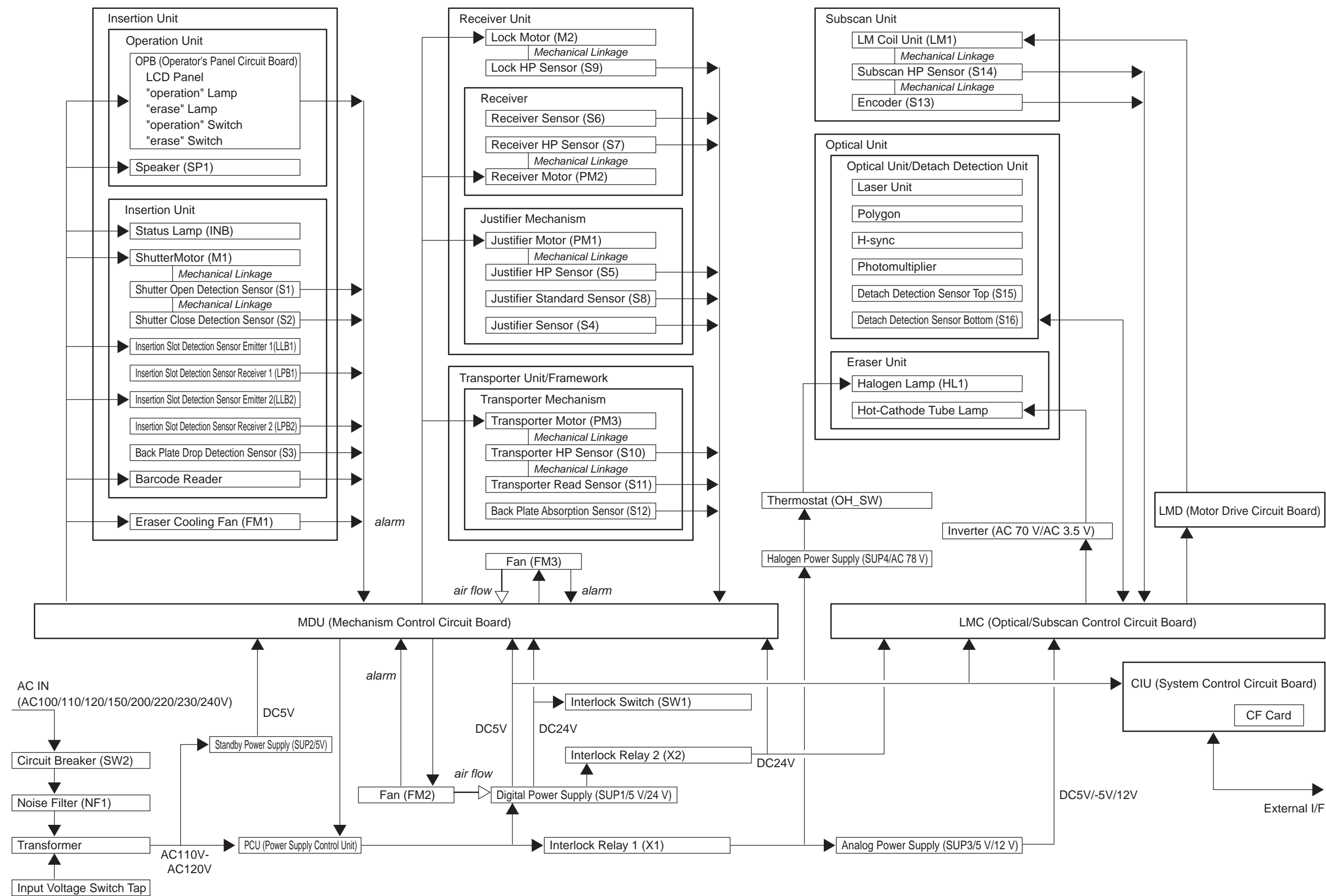
Method	Drive: Linear motor drive method
Reading speed	Normal read mode: 38.54 mm/s High resolution read mode: 19.27 mm/s
Erase speed	During read mode: Variable speed depending on signal value, automatically select from 5 speeds

2.3.3 Control Unit Performance

Major performance of the control unit is following.

Image data generation function	<ul style="list-style-type: none">• A function to generate image data by laser scan
Image data compensation/ calculation function	<ul style="list-style-type: none">• Moire elimination• Gain offset• Shading compensation and polygon correction• Erase speed calculation
Communication function	<ul style="list-style-type: none">• A function to receive various commands• A function to send the read image data to the specified destination• A function to notify the equipment status
Control functions	<ul style="list-style-type: none">• A function to perform sequence of controls, such as mechanical control, optical unit control, signal processing control, communication control, etc., triggered by cassette insertion• A control to execute various commands received via network
Calibration function (at maintenance/factory setup)	<ul style="list-style-type: none">• A function for autogain/offset• Unevenness calibration function• Sensitivity calibration function• A function for image position/size adjustment

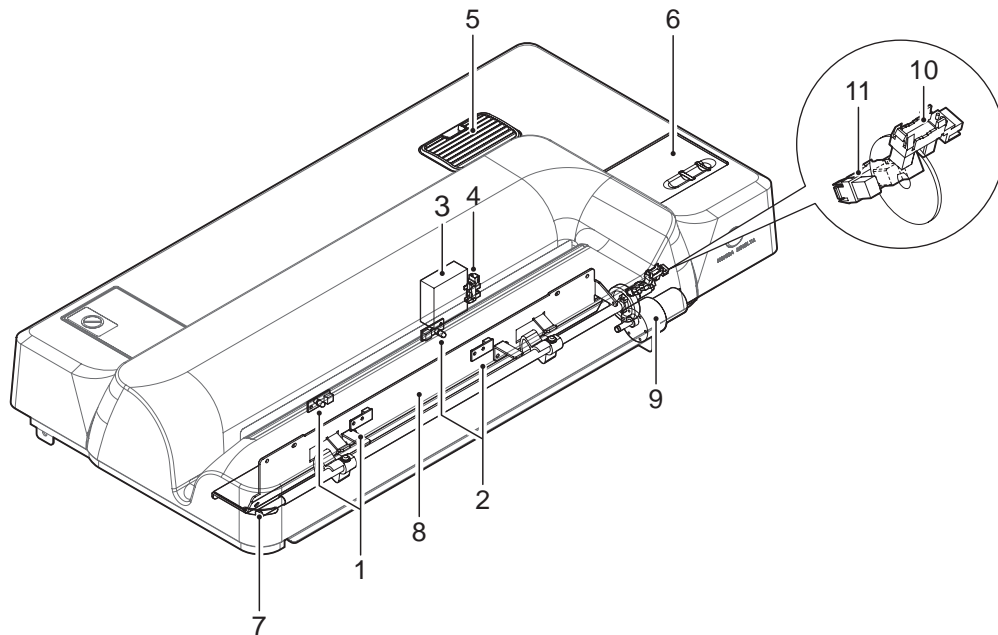
2.4 Block Diagram



2.5 Position of Major Components

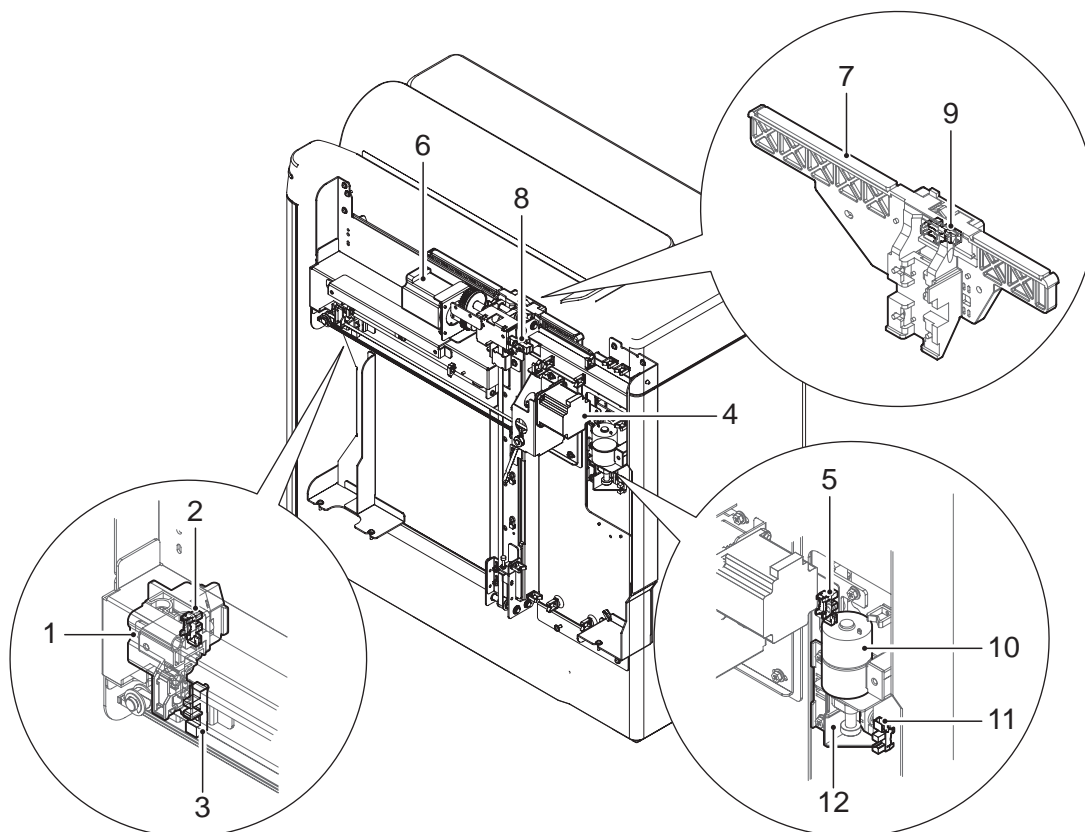
Position and function of the major components of each unit is described here.

2.5.1 Insertion Unit



No.	Name	Function	Reference on replacement method
1	Insert slot detection sensor 2	Detects the insertion of the cassette. It is turned ON when the cassette (except 15 x 30 cm) is inserted.	"5.3.7 Replacing the Insertion Slot Detection Sensors (LLB) (Page 5-28)"
2	Insert slot detection sensor 1	Detects the insertion of the cassette. It goes ON when the cassette (all sizes) is inserted.	"5.3.8 Replacing the Insertion Slot Detection Sensors (LPB) (Page 5-30)"
3	Barcode reader	Reads the barcode label on the cassette.	"5.3.5 Replacing the Barcode Reader (Page 5-25)"
4	Back plate drop detection sensor	Detects the presence of the back plate during insert/eject of the cassette. It is OFF when there is no back plate.	"5.3.6 Replacing the Back Plate Drop Detection Sensor (Page 5-27)"
5	Eraser cooling fan	Intakes air to cool the eraser unit.	"5.3.3 Replacing the Eraser Cooling Fan (Page 5-23)"
6	Operation panel	Constructed of switches, display window, and speaker.	"5.3.1 Replacing the Operation Unit (Operation Panel) (Page 5-19)"
7	Status lamp	Displays mostly the process status of the cassette.	"5.3.4 Replacing the Indicator (Page 5-24)"
8	Shutter	It is normally closed, preventing any foreign object to fall in, and opens only during the insert/eject of the cassette.	"5.3.12 Replacing the Shutter Unit (Page 5-38)"
9	ShutterMotor	Open and close the shutter.	"5.3.11 Replacing the Shutter Motor (Page 5-37)"
10	Shutter open detection sensor	It goes ON when the shutter is open.	"5.3.9 Replacing the Shutter Open Detection Sensor (Page 5-33)"
11	Shutter close detection sensor	It goes ON when the shutter is closed.	"5.3.10 Replacing the Shutter Close Detection Sensor (Page 5-35)"

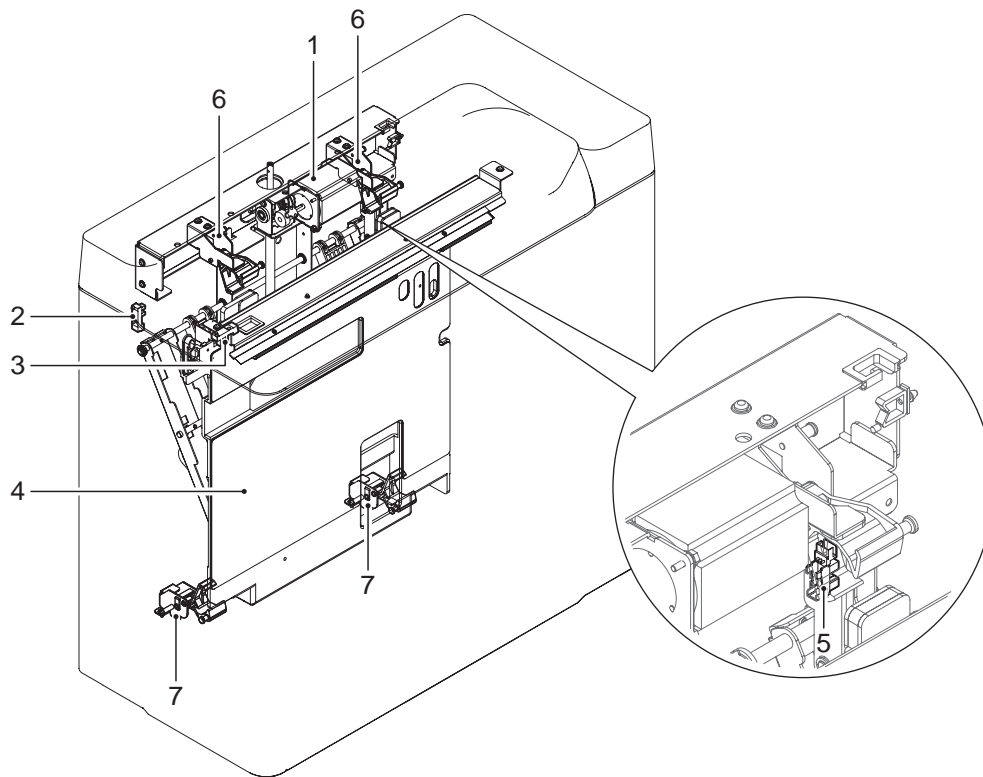
2.5.2 Receiver unit



No.	Name	Function	Reference on replacement method
1	Justifier guide	Fix the cassette by moving inward and push the cassette against the justifier standard block.	"5.4.11 Replacing the Justifier Guide Unit Assembly (Page 5-60)"
2	Justifier sensor	Detects the presence of cassette when it is fixing the cassette. It goes ON when there is a cassette.	"5.4.2 Replacing the Justifier Sensor (Page 5-43)"
3	Justifier HP sensor	It goes ON when the justifier guide is at the home position.	"5.4.1 Replacing the Justifier HP Sensor (Page 5-42)"
4	Justifier motor	Justifier guide will move horizontally.	"5.4.3 Replacing the Justifier Motor (Page 5-44)"
5	Justifier standard sensor	Detects the presence of cassette when it is fixing the cassette. It goes ON when there is a cassette.	"5.4.4 Replacing the Justifier Standard Sensor (Page 5-46)"
6	Receiver motor	Hoists the receiver.	"5.4.7 Replacing the Receiver Motor (Page 5-52)"
7	Receiver	A platform to place the cassette when it is inserted into the equipment.	"5.4.10 Replacing the Receiver (Receiver Unit Assembly) (Page 5-58)"
8	Receiver HP sensor	It goes ON when the receiver is at the home position.	"5.4.6 Replacing the Receiver HP Sensor (Page 5-50)"
9	Receiver sensor	It goes ON when there is a cassette on the receiver.	"5.4.5 Replacing the Receiver Sensor (Page 5-48)"
10	Lock Motor	Move the lock/lock release shaft holder, performing lock/lock release of the cassette.	"5.4.9 Replacing the Lock Motor (Page 5-55)"

No.	Name	Function	Reference on replacement method
11	Lock HP sensor	Use to control the operation of Lock Motor by the FPGA. Initial position is ON.	"5.4.8 Replacing the Lock HP Sensor (Page 5-54)"
12	Lock/lock release mechanism	Operate by Lock Motor, performing lock/lock release of the cassette.	—

2.5.3 Transporter Unit



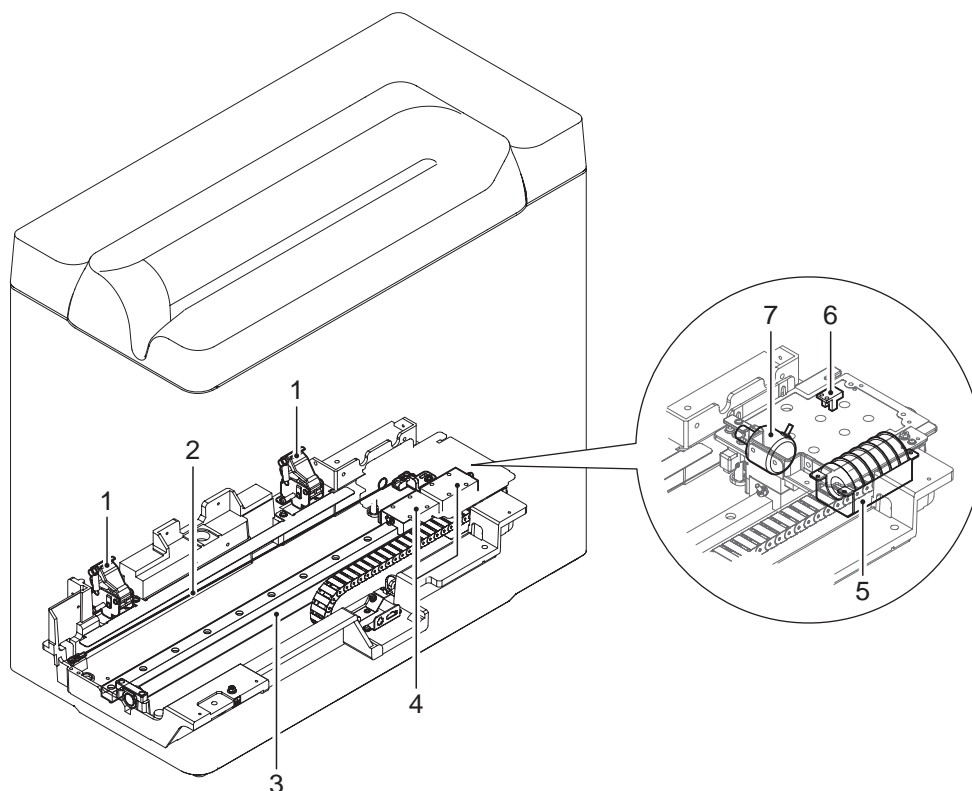
No.	Name	Function	Reference on replacement method
1	Transporter motor (*1)	Move the push plate unit.	"5.10.6 Replacing the Transporter Motor (Page 5-127)"
2	Transporter read sensor (*1)	It goes ON when the push plate is at the read position (*3).	"5.10.5 Replacing the Transporter Read Sensor (Page 5-126)"
3	Transporter HP sensor (*1)	It goes ON when the push plate unit is at the home position.	"5.10.4 Replacing the Transporter HP Sensor (Page 5-125)"
4	Push plate unit	Absorb the back plate of the cassette.	Cannot replace on-site.
5	Back plate absorption detection sensor (*1)	It goes ON when the push plate is at the read position (*3) and back plate is absorbed.	"5.10.7 Replacing the Back Plate Absorption Detection Sensor (Page 5-130)"
6	Tumbler (top) (*1)	Fix the push plate unit to read position (*3) with a spring.	"5.10.9 Replacing the Tumbler (Upper) (Page 5-133)"
7	Tumbler (bottom) (*2)	Fix the push plate unit to read position (*3) with a spring.	"5.5.4 Replacing the Tumbler (Lower) (Page 5-77)"

*1: Parts attached to the framework.

*2: Parts attached to the subscan unit.

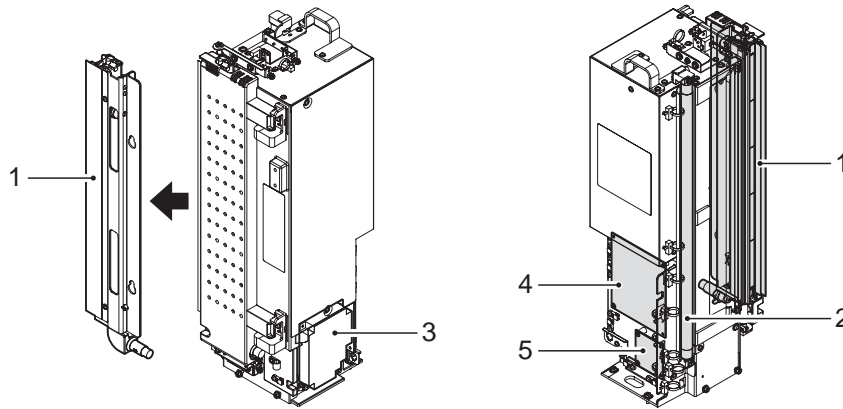
*3: Read position is the position to read/erase the plate, at the first front back side.

2.5.4 Subscan Unit



No.	Name	Function	Reference on replacement method
1	Tumbler (bottom)	Fix the push plate unit to read position with a spring.	"5.5.4 Replacing the Tumbler (Lower) (Page 5-77)"
2	Wire	Used on the position control encoder.	"5.5.3 Replacing the Encoder/ Wires (Page 5-72)"
3	Magnet shaft	A shaft for the subscan motor.	Cannot replace on-site.
4	LM block	A block running on top of the LM guide. Use these grease nipples to grease.	Cannot replace on-site.
5	Subscan motor (LM coil unit)	Move the holding plate with the optical unit.	Cannot replace on-site.
6	Subscan HP sensor	It goes ON when the holding plate is at the home position.	"5.5.1 Replacing the Subscan HP Sensor (Page 5-68)"
7	Encoder	Performs position control.	"5.5.3 Replacing the Encoder/ Wires (Page 5-72)"

2.5.5 Optical Unit/Eraser Unit



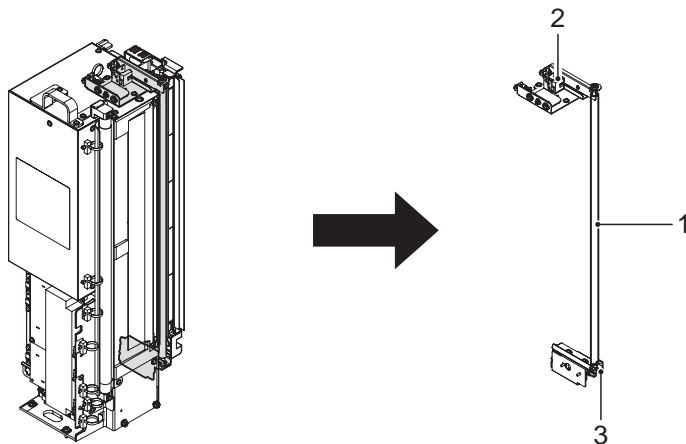
Eraser unit

No.	Name	Function	Reference on replacement method
1	Erase lamp unit	Halogen lamp is built-in, erasing the recording of the plate.	<ul style="list-style-type: none"> Unit: Instruction manual Halogen lamp only: "5.7.3 Replacing the Halogen Lamp (Page 5-88)"
2	Hot-cathode tube lamp	Erase the recording of the plate.	"5.7.2 Replacing the Hot-Cathode Tube Lamp (Page 5-87)"

Optical unit

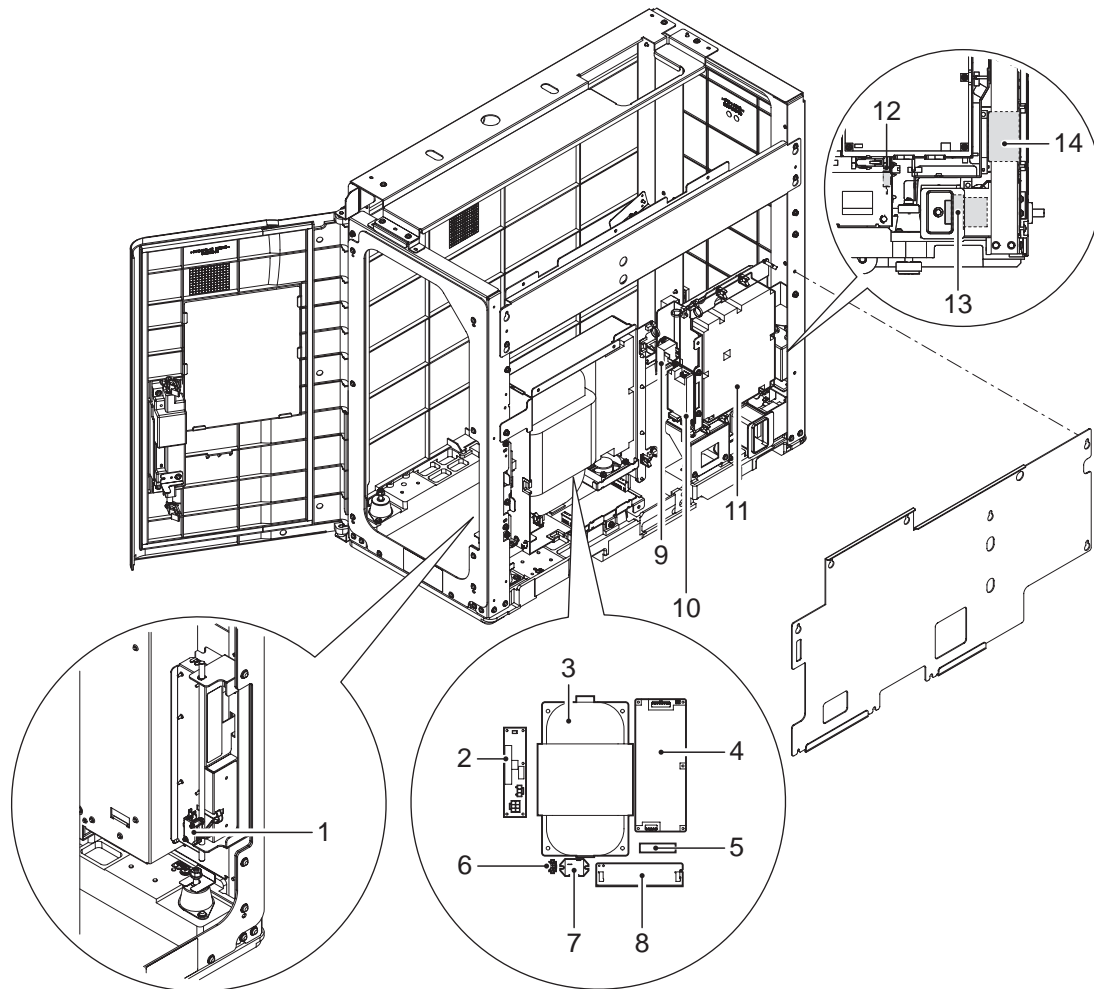
No.	Name	Function	Reference on replacement method
3	Inverter	An inverter for the hot-cathode tube lamp.	"5.6.3 Replacing the Inverter (Page 5-84)"
4	LMC	A circuit board to control the subscan motors and sensors.	"5.6.2 Replacing the LMC (Page 5-83)"
5	LMD	A drive circuit board for subscan motor (LM coil unit).	"5.6.1 Replacing the LMD (Page 5-82)"

2.5.6 Detach Detection Unit



No.	Name	Function	Reference on replacement method
1	Detach detection roller	When the back plate or the plate on the back plate is detached more than certain amount from the push plate unit, it will touch the detach detection roller during the read. This movement will be detected by the detach sensor (sensor goes ON), and determined as an error.	"5.8.3 Replacing the Detach Detection Roller (Page 5-93)"
2	Top detach detection sensor		"5.8.1 Replacing the Detach Detection Sensor (Upper) (Page 5-90)"
3	Bottom detach detection sensor		"5.8.2 Replacing the Detach Detection Sensor (Lower) (Page 5-91)"

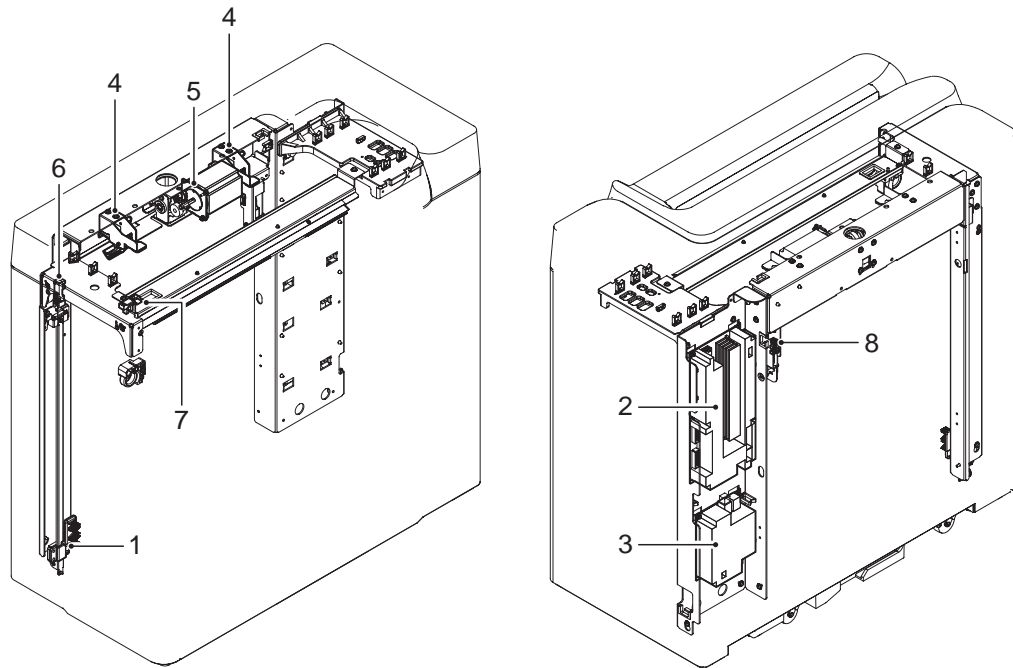
2.5.7 Exterior



No.	Name	Function	Reference on replacement method
1	Interlock switch	It turns ON when the second front door is open. All the power will be shut off, except for the electronic circuit board, when it is ON.	"5.9.2 Replacing the Interlock Switch (Page 5-97)"
2	PCU	A circuit board to control the ON/OFF when the operation switch is pressed.	"5.9.6 Replacing the PCU (Page 5-104)"
3	Transformer	—	"5.9.12 Replacing the Transformer (Page 5-113)"
4	Digital power supply	Supplies the power supply (+5 V, +24 V) for the digital components of the LMC, CIU, and MDU.	"5.9.11 Replacing the Digital Power Supply (Page 5-111)"
5	Digital power supply cooling fan	Cools the digital power supply.	"5.9.13 Replacing the Digital Power Supply Cooling Fan (Page 5-116)"
6	Tap switch connector	A connector to switch the input voltage. There are following 4 types, and switch to appropriate connector overseas. <ul style="list-style-type: none"> • Japan specification: AC 100 V • Europe specification: AC 220/230/240 V • General overseas: AC 200 V • UL specification: AC 110/150/120 V 	—

No.	Name	Function	Reference on replacement method
7	Interlock relay 1	A relay to cut power supply when the interlock is engaged.	"5.9.7 Replacing the Transformer Unit Relay (Interlock Relay 1) (Page 5-105)"
8	Analog power supply	Supply the power supply ($\pm 5V$, +24 V) to the LMC (photomultiplier).	"5.9.10 Replacing the Analog Power Supply (Page 5-110)"
9	Interlock relay 2	A relay to cut power supply when the interlock is engaged.	"5.9.8 Replacing the Standby Power Supply Unit Relay (Interlock Relay 2) (Page 5-106)"
10	Standby power supply	A power supply that is constantly ON.	"5.9.9 Replacing the Standby Power Supply (Page 5-108)"
11	Halogen power supply	Supply the power supply to the halogen lamp.	"5.9.5 Replacing the Halogen Power Supply (Page 5-103)"
12	Condenser	—	"5.9.4 Replacing the Condenser (Page 5-101)"
13	Circuit protector (Power supply circuit breaker)	Turn ON/OFF power supply of the REGIUS MODEL 110.	"5.9.3 Replacing the Noise Filter and the Circuit Protector Unit (Page 5-98)"
14	Noise filter	—	"5.9.3 Replacing the Noise Filter and the Circuit Protector Unit (Page 5-98)"

2.5.8 Framework



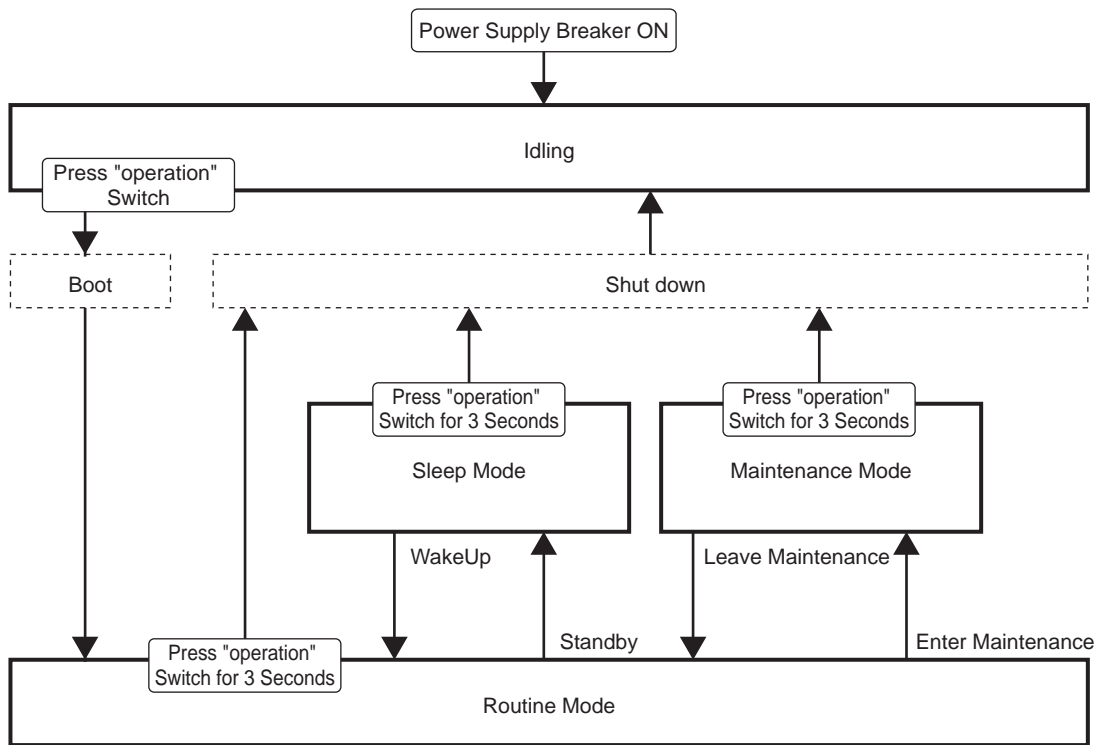
No.	Name	Function	Reference on replacement method
1	Cleaning brush	Clean the light condenser of the optical unit.	<ul style="list-style-type: none"> Brush only: "5.10.8 Replacing the Brush (Cleaning Unit) (Page 5-131)" Whole cleaner: "5.10.11 Replacing the Cleaning Unit (Page 5-135)"
2	MDU	A circuit board to control the motors excluding subscan motors, sensors, LED, LCD, operation switches, speaker, and cooling fans.	"5.10.2 Replacing the MDU (Page 5-120)"
3	CIU	Controls the system with the firmware.	"5.10.1 Replacing the CIU (Page 5-119)"
4	Tumbler (top)	A circuit board to fix the push plate unit to read position with a spring.	"5.10.9 Replacing the Tumbler (Upper) (Page 5-133)"
5	Transporter motor	Move the push plate unit.	"5.10.6 Replacing the Transporter Motor (Page 5-127)"
6	Transporter read sensor	It goes ON when the push plate is at the read position.	"5.10.5 Replacing the Transporter Read Sensor (Page 5-126)"
7	Transporter HP sensor	It goes ON when the push plate unit is at the home position.	"5.10.4 Replacing the Transporter HP Sensor (Page 5-125)"
8	Back plate absorption detection sensor	It goes ON when the push plate is at the read position and back plate is absorbed.	"5.10.7 Replacing the Back Plate Absorption Detection Sensor (Page 5-130)"

2.6 Operation

2.6.1 Operation Transition Diagram

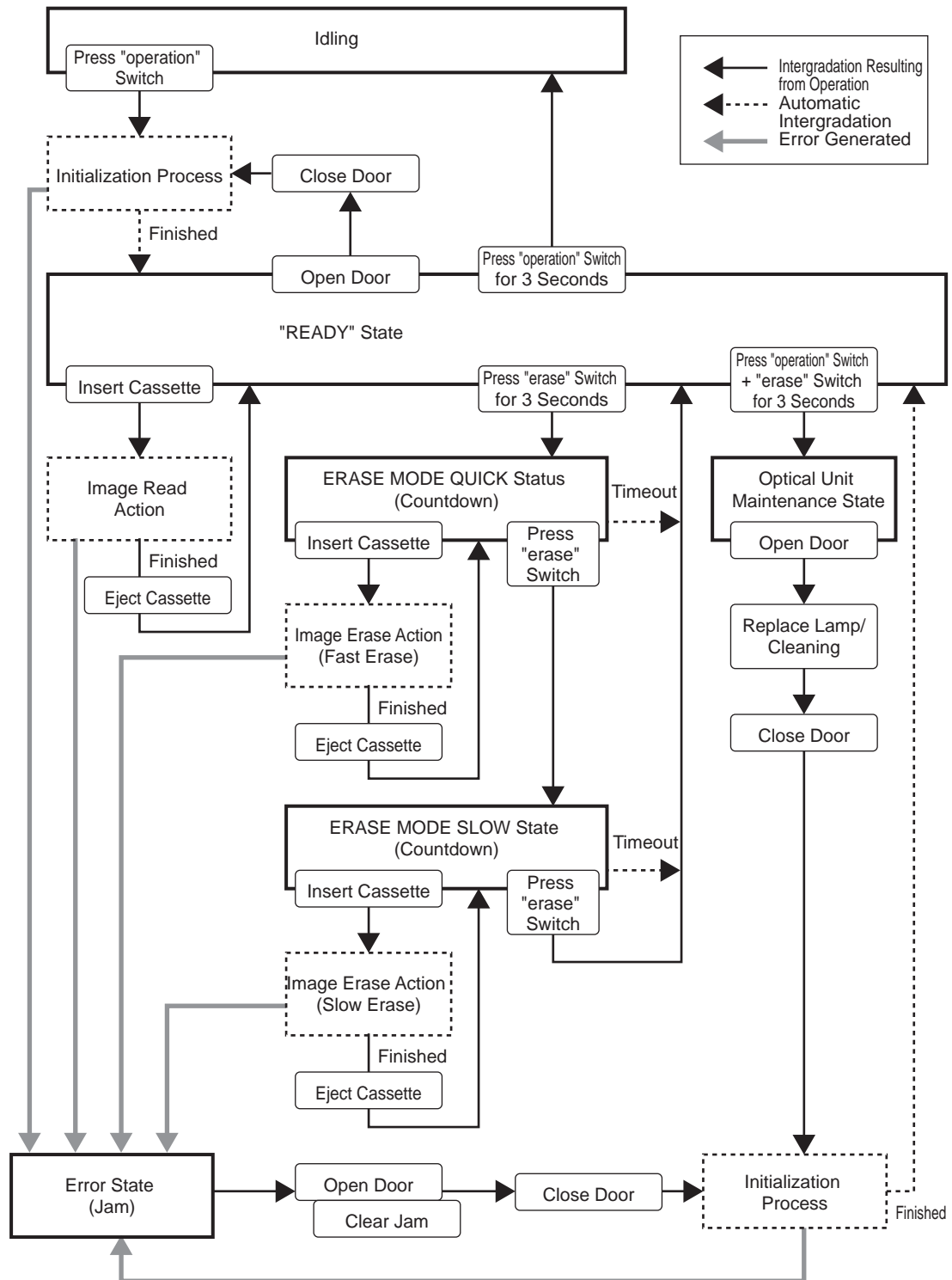
■ **Status Transition Diagram**

REGIUS MODEL 110 in in one of the following status.



Status name	Description
Stopped	Status where the OS is shut down. operation switch is monitored by hardware.
Routine mode	A main mode that does the read and erase of the cassette image. See "■ Routine Mode Operation Transition Diagram (Page 2-21)" for more description about the status transition.
Sleep mode	A sleep status engaged with turning OFF the REGIUS console.
Maintenance mode	A status performing operation confirmation with service tools.

■ Routine Mode Operation Transition Diagram

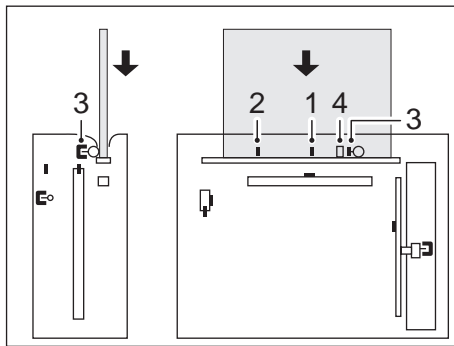


2.6.2 Normal Operation (Image Read Action)

Action from the insertion to the eject of the cassette is described here.

Use the service tool to confirm operation. See "[Chapter 4 Confirming Operation Using Service Tool \(Page 4-1\)](#)".

Numbers for each step (50~73) is corresponding to the steps of SeqID of the confirming operation using the service tool.



- 1: Insertion Slot Detection Sensor 1
- 2: Insertion Slot Detection Sensor 2
- 3: Back Plate Drop Detection Sensor
- 4: Barcode Reader

50 Sensor at the insert slot detects the cassette.

It is determined if it is a cassette or not by the status of the following sensors at the insertion slot when the cassette is inserted.

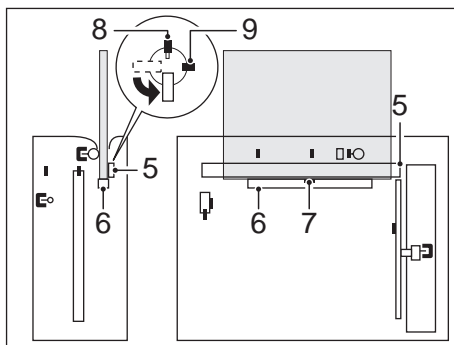
- Insert slot detection sensor 1
- Insert slot detection sensor 2
- Back plate drop detection sensor

When the cassette is inserted correctly, insert slot detection sensor 1 and back plate drop detection sensor will both go ON. In all other cases, it will generate an error as foreign object insertion or cassette insertion position error.

51 Barcode reader reads the barcode.

Following check will be performed by barcode reader reading the barcode.

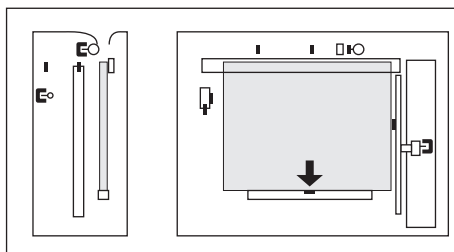
- If the barcode is correctly read
- If the plate size is smaller than calibration size
- If there is no discrepancy between the inserted cassette (status of the insert slot detection sensor 1 and insert slot detection sensor 2) and the cassette size from the barcode.



- 5: Shutter
- 6: Receiver
- 7: Receiver Sensor
- 8: Shutter Open Detection Sensor
- 9: Shutter Close Detection Sensor

52 Shutter will open and cassette will rest on the receiver.

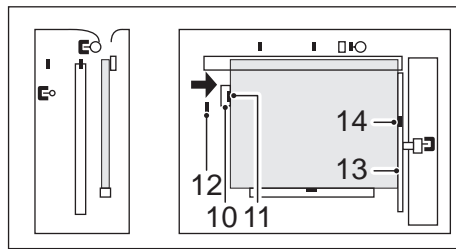
Shutter will open by rotating the ShutterMotor. Cassette will fall onto the receiver, and receiver sensor will detect the cassette.



53 Receiver will lower to the first falling position.

Receiver motor will rotate, according to the cassette size from the barcode, and receiver will lower to the first falling position.

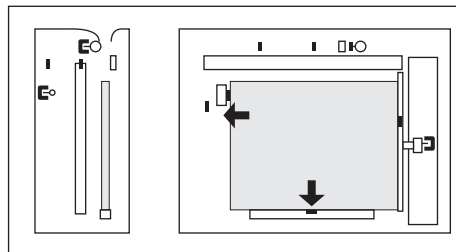
First falling position: The lowest position that the cassette will not fall out, without the support of the justifier mechanism.



- 10: Justifier Guide
 11: Justifier Sensor
 12: Justifier HP Sensor
 13: Justifier Standard
 14: Justifier Standard Sensor

54 Justifier guide will move toward the justifier standard, pressing the cassette to the justifier standard block.

Justifier motor will rotate, according to the cassette size from the barcode, moving the justifier guide to the justifier standard side.



55 Justifier guide will move to the slightly opened position.

Justifier motor will rotate, moving the justifier guide slightly (approximately 3 mm) to the home position side.

Slightly opened position:

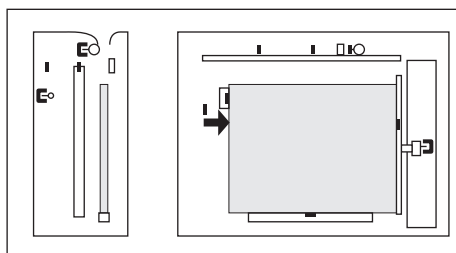
A position slightly moved from cassette fixing position toward the home position to unfix the cassette.

56 Receiver will lower to the second falling position.

Receiver will lower to the second falling position by rotating the receiver motor for appropriate pulses (depends on the cassette size) after the justifier guide completes its move.

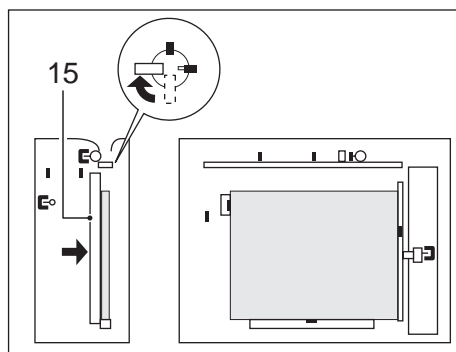
Second falling position:

Position of the lock/lock release mechanism and open/close lock of the cassette will match.



57 The justifier guide will move toward the justifier standard and the cassette is fixed between the justifier guide and the justifier standard block.

Justifier motor will rotate, moving the justifier guide slightly (approximately 3 mm) toward the justifier standard side.

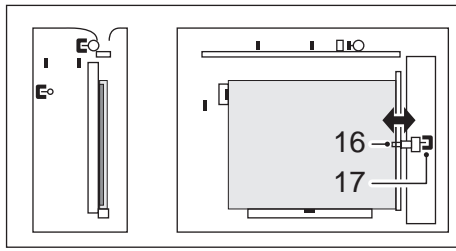


- 15: Push Plate Unit

58 Push plate unit will move to the press down position. The shutter is close at the same time.

The transporter motor will rotate and move the push plate unit to the press down position.

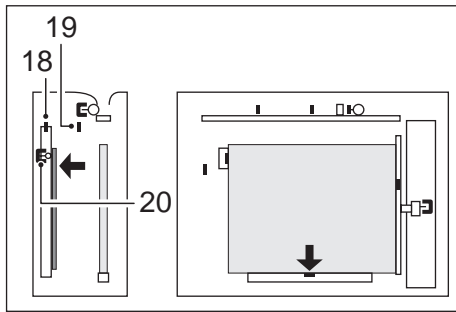
The shutter is closed by rotating the shutter motor.



16: Lock/Lock Release Mechanism
17: Lock HP Sensor

59 Lock/lock release mechanism will release the lock on the cassette.

Lock motor will rotate operating the lock/rock release mechanism, releasing the lock on the cassette.



18: Transporter Read Sensor
19: Transporter HP Sensor
20: Back Plate Absorption Detection Sensor

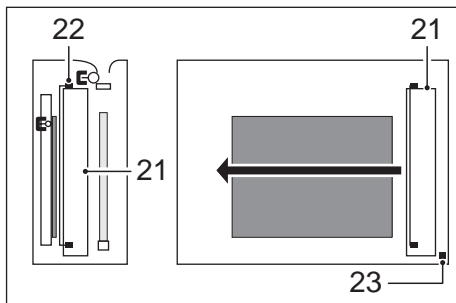
60 The push plate unit that absorbed the back plate will move to the read position.

Transporter motor will rotate to move the push plate unit to the read position.

The back plate absorption sensor will turn ON when the back plate is absorbed correctly with the push plate unit at the read position.

61 The receiver is lowered slightly.

The receiver will lower slightly (depends on the cassette size, 1 mm or less) by rotating the receiver motor at the end of movement of the push plate unit.



21: Optical Unit/Eraser Unit
22: Detach Detection Unit
23: Subscan HP Sensor

62 Optical unit will read the image on plate after moving the subscan unit the holding plate toward the second front side.

After waiting for the vibration to subside (1 second), the holding plate with the optical unit and the eraser unit will move to the second front side by the subscan motor.

Optical unit will turn on the laser and read the image from the plate.

If there is a warp or detach of the plate, this will contact the detach detection roller, then detected by detach detection sensor, and an error is generated.

Subscan unit will stop when the image read action is completed, and prepare for the erase action.

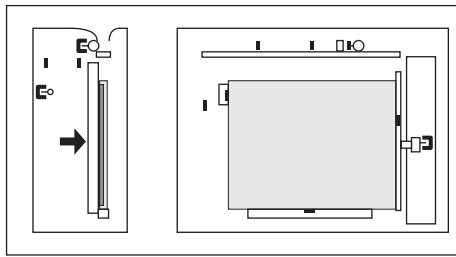
63 Eraser unit will erase the image on plate after moving the subscan unit the holding plate toward the second front back side.

The holding plate with the optical unit and the eraser unit will move to the second front back side by the subscan motor.

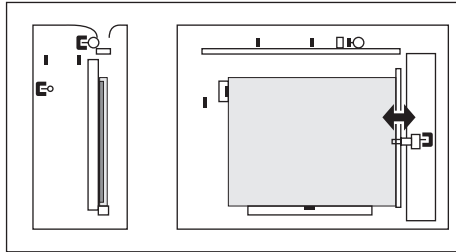
While the subscan unit is in action, eraser lamp (hybrid 2 step erase method using halogen lamp and hot-cathode tube) on the eraser unit is turned on, erasing the image on the plate.

When there is only 1 lamp

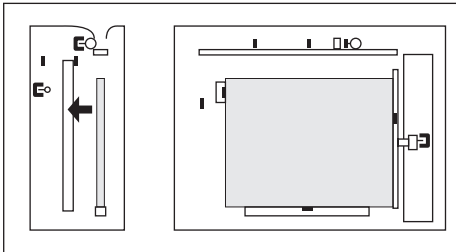
When the erase reference value (e value) is large, an image might not be erased with only 1 pass. In such case, subscan unit will move back and forth the amount calculated from the erase reference value.



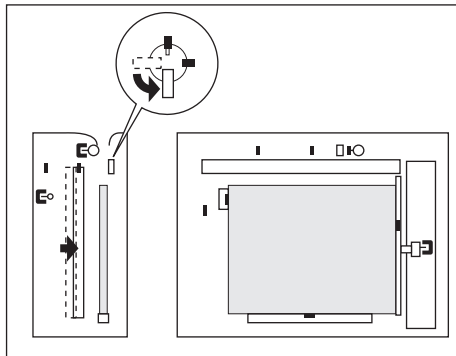
- 64** Push plate unit will move to the press down position and press the back plate to the front plate.
Transporter motor will rotate to move the push plate unit to the push down position.



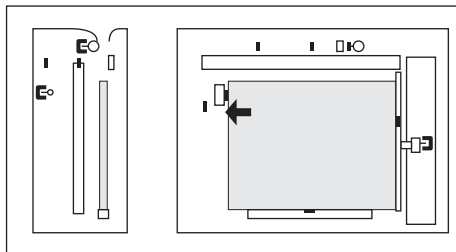
- 65** Lock/lock release mechanism will lock the cassette.
Lock motor will rotate operating the lock/rock release mechanism, locking the cassette.



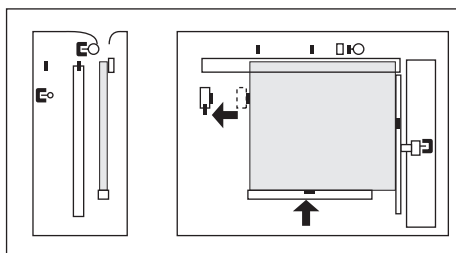
- 66** Push plate unit will move to pass the home position.
Transporter motor will rotate to move the push plate.



- 67** Push plate unit will move to the home position. Shutter will also open.
Transporter motor will rotate in reverse direction to move the push plate unit to the home position.
Shutter will also open by rotating the ShutterMotor.

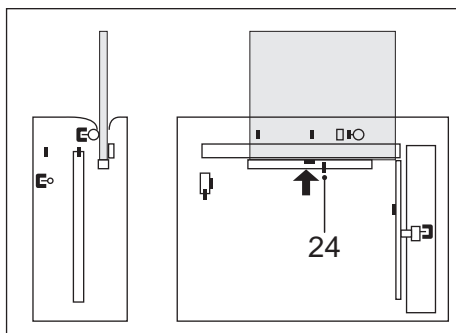


- 68** Justifier guide will move to the slightly opened position.
Justifier motor will rotate, moving the justifier guide slightly (approximately 3 mm) to the home position side.



- 69** Receiver will rise to the first falling position.
Receiver motor will rotate and receiver will rise to the first falling position.

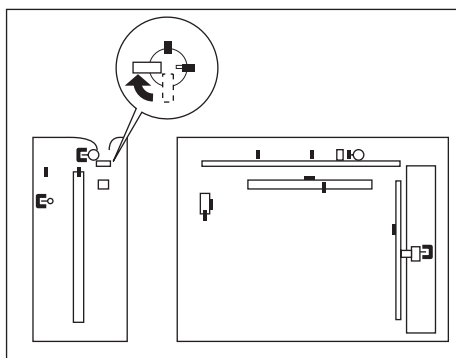
- 70** Justifier guide will move to the home position.
Transporter motor will rotate to move the justifier guide to the home position.



24: Receiver HP Sensor

71 Receiver will rise to the home position.

Receiver motor will rotate and receiver will rise to the home position.



72 Sensor at the insertion slot will detect ejection of the cassette.

Ejecting of cassette is completed when the following sensors turn OFF.

- Insert slot detection sensor 1
- Insert slot detection sensor 2
- Back plate drop detection sensor
- Receiver sensor

73 The shutter is closed.

Shutter is closed by rotating the ShutterMotor when the cassette eject is completed.

2.6.3 Initialization Action

Initialization action will be performed according to the timing of each status transition.

Description of initialization action per initialization operation timing

Initialization timing	Initialization action
After power on	<ul style="list-style-type: none"> "■ Initialization of the FPGA" "■ Initialization and Operation Check of the Mechanical Unit" "■ Set the Parameters of the FPGA"
Transition from the stopped to the routine mode	<ul style="list-style-type: none"> "■ Initialization and Operation Check of the Mechanical Unit" "■ Set the Parameters of the FPGA"
Transition from the sleep mode to the routine mode	<ul style="list-style-type: none"> "■ Initialization and Operation Check of the Mechanical Unit" "■ Set the Parameters of the FPGA"
From the sleep mode to the maintenance mode	<ul style="list-style-type: none"> "■ Initialization and Operation Check of the Mechanical Unit"
Transition from the maintenance mode to the routine mode	<ul style="list-style-type: none"> "■ Initialization of the Mechanical Unit"
Transition after detecting the close of the second front door to the routine mode	<ul style="list-style-type: none"> "■ Initialization of the Mechanical Unit"
Transition after detecting the close of the second front door to the maintenance mode	<ul style="list-style-type: none"> "■ Initialization of the Mechanical Unit"

■ Initialization of the FPGA

- Transmit the program in FPGA at the startup.

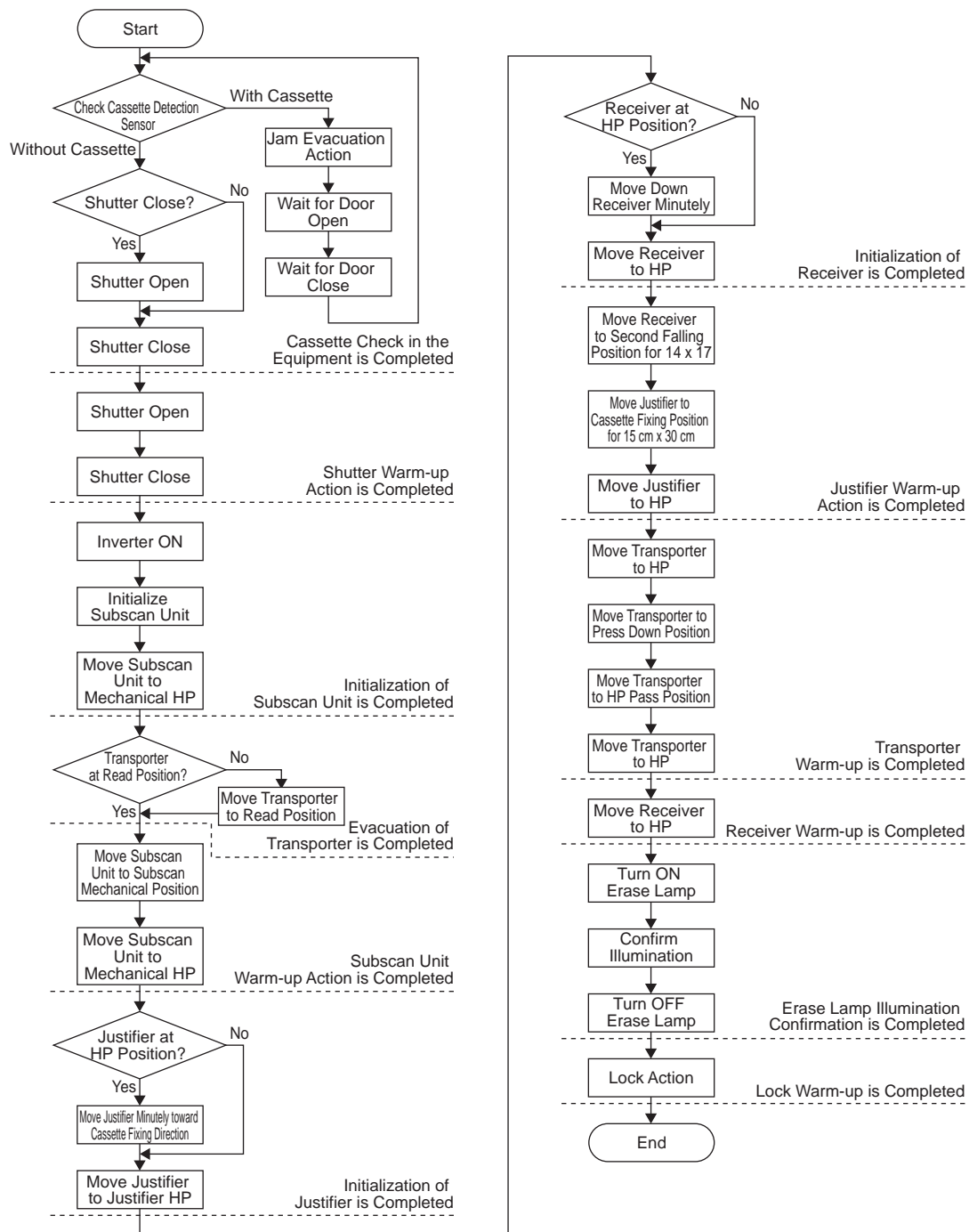
■ Set the Parameters of the FPGA

- Set the gain offset value, drive pattern of the motors, factory setting of the shading compensation, and factory setting of the QRV table to the FPGA.

■ Initialization and Operation Check of the Mechanical Unit

- Check if there is cassette inside the equipment and close the shutter.
- Move the unit to the initial position.
 - Shutter: Closed
 - Receiver: Receiver home position
 - Justifier guide: Justifier home position
 - Push plate unit: Transporter home position
 - Subscan unit: Subscan home position
- Perform warm-up action and operation check of all units.
(Warm-up action: Operate in a maximum operable range)

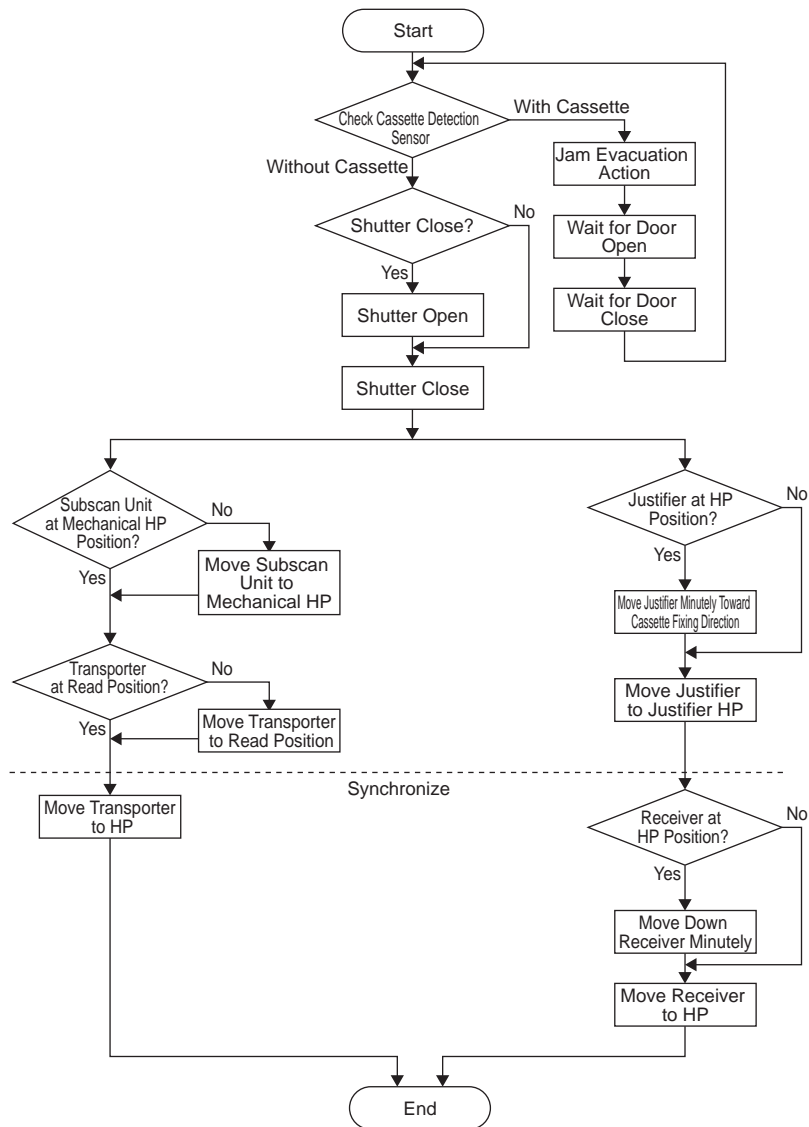
Initialization and operation check sequence of the mechanical unit



■ Initialization of the Mechanical Unit

- Check if there is cassette inside the equipment and close the shutter.
- Move the unit to the initial position.
 - Shutter: Closed
 - Receiver: Receiver home position
 - Justifier guide: Justifier home position
 - Push plate unit: Transporter home position
 - Subscan unit: Subscan home position

Initialization sequence of the mechanical unit



2.6.4 Erase Action

Erase mode is composed of 2 modes.

It will go into the erase mode (quick) by pressing the erase switch for more than 3 seconds when the equipment is in READY status. It will transit to the erase mode (slow) by pressing the erase switch in the erase mode (quick) status.

This erase action will perform the same action as normal image read/erase action, but only the read action will not be performed.

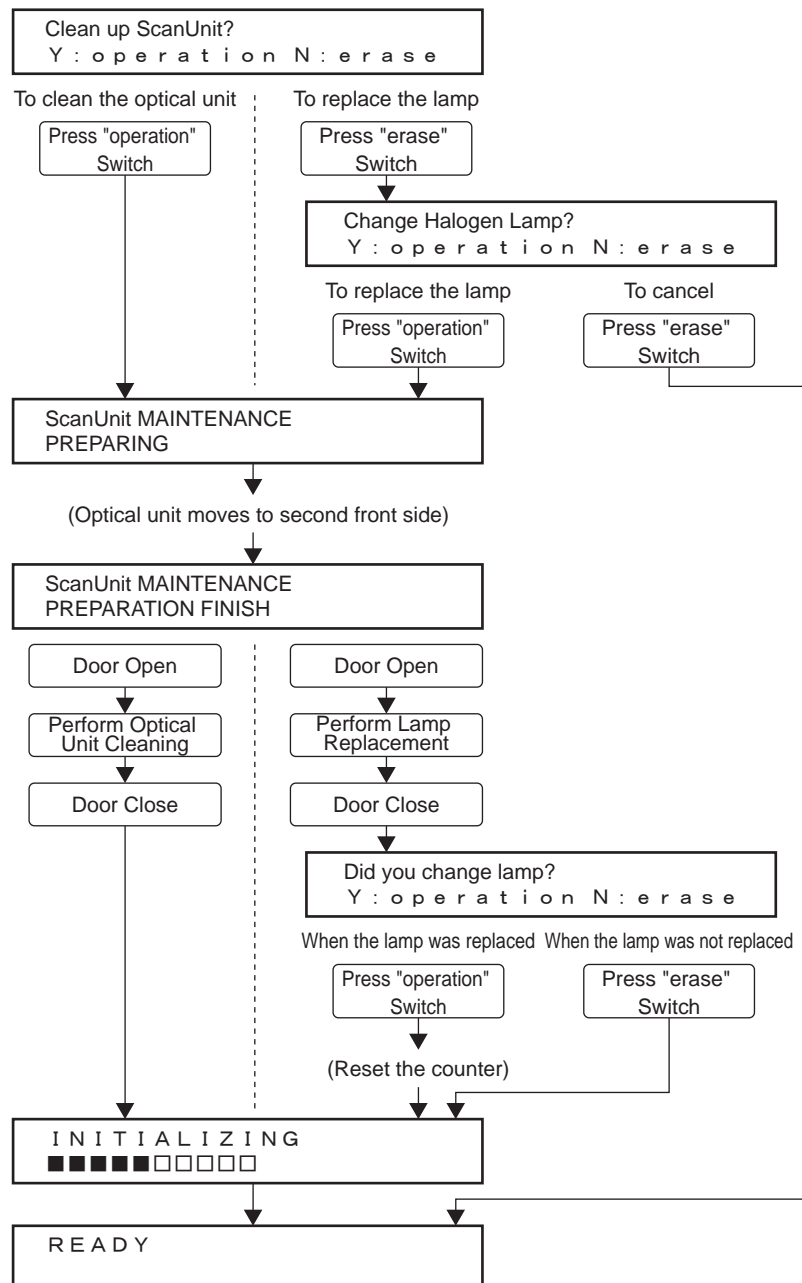
2.6.5 Optical Unit Maintenance Status

A mode user use to perform the following maintenance.

- Replacing erase lamp unit (halogen lamp)
- Cleaning reading unit

It will go into the optical unit maintenance mode by pressing the operation switch and the erase switch simultaneously for more than 3 seconds when the equipment is in READY status.

Optical unit maintenance flow



2.7 Handling the Cassette

Please be familiar with the following cautions when handling the REGIUS cassettes (RC-110 series).

Maintaining the image quality

- Be cautious no scratch or foreign object goes on the read surface of the plate.
- If you find any foreign object on the plate read surface, immediately clean it.
- Use a glove when handling a plate, just as handling the film.
- Do not expose the plate to the sun light.
- When you work on the plate under a fluorescent light in situation like cleaning, do it as fast as possible, and return it to the cassette as soon as it is completed.
- Do not scratch or smudge the front plate.

Transportation/storage

- Please follow following specification for temperature and humidity.
 - Temperature: Before opening the plate: 10 ~ 40°C
After opening the plate: 10 ~ 30°C
 - Humidity: 80% RH or less (no condensation)
- Do not expose to radiation such as X-ray, γ -ray, etc.
- Place it so the cassette will be horizontal when transporting or storing in the original box. The back plate may distort when the cassette is placed vertically for long period or in high temperature.
- Always tore the opened plate in the cassette.
- Do not store with back plate and front plate separated. Especially, the back plate might warp when it is stored diagonally by itself.
- Do not drop or bump the cassette.
- Store the operational cassettes vertically in the rack as conventional cassettes.

Confirmation before inserting

Confirm following before inserting the cassette to prevent the trouble of cassette transportation action in the REGIUS MODEL 110.

- Confirm that the lock mechanism is normal, and there is no distortion or breakage. Do not insert the cassette with abnormality into the REGIUS MODEL 110.
- Confirm that there is no foreign object, such as a paper, wedged on the memo clip on the back plate.
- Confirm that there is no foreign object, such as clips, between the front plate and the back plate.
- Confirm that there is no tape affixed on the back plate to ensure good absorption of the back plate to the absorption plate.
- Confirm that barcode is not dirty.
- Confirm that it is locked.

Disposal

- Request a disposal to an authorized industrial waste disposal service when disposing. Follow the local regulations/rules regarding the disposal methods.

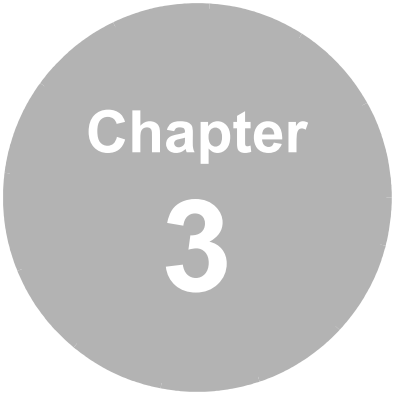
2.8 Tools, Measuring Devices, Jigs, Etc., Necessary for Service

Following tools, measuring devices, and jigs are necessary when performing service on the REGIUS MODEL 110.

Jigs/tools	Note
Phillips driver	Standard tools
Slotted tip driver	
Allen wrench	
Wrench	
Wire cutter	
Tray	
Anti-static wrist band (grounding strap)	Place the removed screws and parts.
Detach detection unit adjusting jig <ul style="list-style-type: none"> Adjustment block Sensor status detection jig 	Use to adjust the position of the detach detection roller/sensor. Power for the sensor status detection jig is coming from the USB connector. Prepare power outlet to USB adapter when getting the power from the power outlet.
Press down size adjusting jig	Used to adjust the press down size of the push plate unit.
0.2 mm spacer (film)	Used to adjust the position after installing the shutter unit assembly.
Interlock release key	
Laser protection glasses	Compatible to laser light of 660 nm wavelength
Acoustic wave tension meter	Manufacturer: Gates Unitta Asia Product name: Sonic Belt Tension Meter Model: U-505 or U-507
Oscilloscope	
Ethernet cable	Used to temporary connect the REGIUS console and the REGIUS MODEL 110 when replacing the CF card. Use category 5e or above cable. Cross cable can also be used. Interface specification: RJ-45 connector 100Base-TX/1000Base-T
Network hub	
Grease gun	Used to grease up the LM guide. Model name: MG70
Glove	Used to replace the halogen lamp.
Vacuum cleaner (portable)	Used to clean the brush.
Rag	<ul style="list-style-type: none"> Used to clean the magnet shaft. Used to clean the cassette absorption plate. Used to apply grease on the parts except the LM guide. Used to clean the exterior of the equipment upon completion of the service.
Plastic sheet	Cover the light condenser unit, so no dust will collect, when the optical unit is taken off.
Rag, cardboard, etc.	Cover the LM guide and magnet shaft when performing the replacement inside the equipment.
Maintenance PC	

Supplied Products

Jigs/tools	Note
Alcohol	Used to clean the cassette absorption plate.
Grease (for LM guide)	AFC grease by THK
Grease (all parts except LM guide)	Plusguard No 2 by Kyodo Yushi
Wiring band	
Snap ties	



Chapter 3



Troubleshooting

How to respond to a trouble on the equipment is described here.

3.1	Workflow	3-2
3.2	Description of the Error Codes and How to Respond.....	3-5
3.3	Response to the Problems Not Displaying Error	3-32
3.4	How to Respond on Image Defect.....	3-38

3.1 Workflow

Following describes the flow of response when there is a problem with the equipment.

Type of trouble	Flow of response
Trouble that displays an error message on the message display window	<ol style="list-style-type: none"> 1. Check if there is a cassette inside the equipment and restart the equipment. See "3.1.1 Restore Operation (Page 3-3)". 2. Confirm if the error occurs again. 3. See "3.2 Description of the Error Codes and How to Respond (Page 3-5)" and perform the response.
	
	When you can not respond Communicate the description of the condition (see "■ Information to Communicate") to the contact person.
Trouble that does not display an error message on the message display window	See "3.3 Response to the Problems Not Displaying Error (Page 3-32)" and perform the response. <ul style="list-style-type: none"> • Eject the cassette as first priority if the cassette is still in the equipment.
	
	When you can not respond Communicate the description of the condition (see "■ Information to Communicate") to the contact person.
Defect in the read image	See "3.4 How to Respond on Image Defect (Page 3-38)" and perform the response.

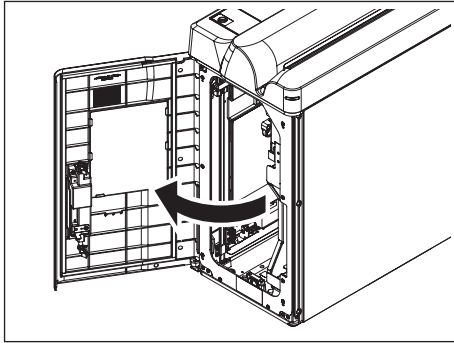
■ Information to Communicate

Communicate following information, as precise as possible, when communicating the status of trouble to the contact.

Logs	Collect the logs of the equipment from the REGIUS console for the equipment trouble.
Connection configuration of the site	JM internal/external
	n : m
	If any dedicated equipment such as 350 is connected
	IP address/subnet mask <ul style="list-style-type: none"> • REGIUS MODEL 110 • JM • REGIUS console
Restore information	Has it restored by opening and closing the second front door
	Did it need to turn OFF/ON the circuit breaker
Other, description	

3.1.1 Restore Operation

When the error occurs, confirm if the error recur after restarting the equipment. Hot to restart is described here.



- 1 Open the second front door.
- 2 Eject the cassette if it is possible to eject the cassette.

See the instruction manual on how to eject the cassette.

When the push plate unit is not at the read position due to operational error in the transporter, eject the cassette by [Step 6](#).

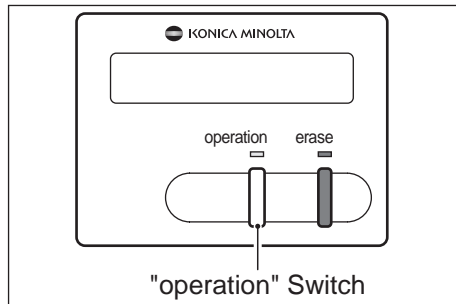
- 3 Close the second front door.

Initialization will be performed.

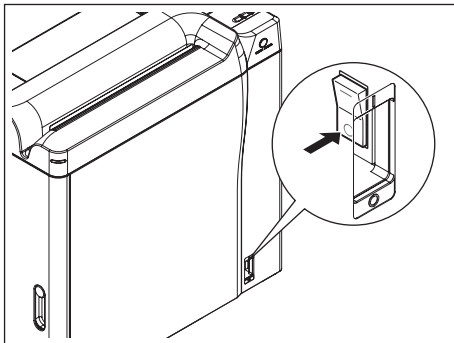
Initialization will be canceled if there is a fault in the sensors or if the cassette is not ejected, and an error will be displayed.

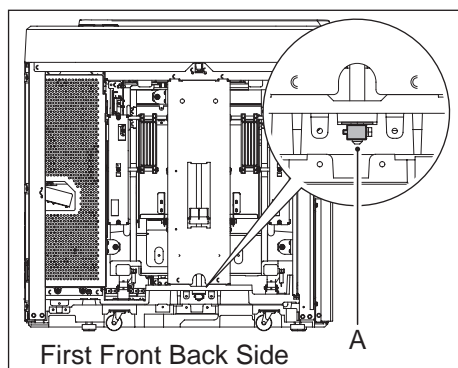
If the error was resolved, it will be in "READY" status.

- 4 Shutdown the equipment by pressing "operation" switch for more than 3 seconds.



- 5 Turn OFF the power supply circuit breaker.





- 6 Eject the cassette if the cassette is still in the equipment.

When the push plate is not at the read position

1. See "■ Removal Procedures (Page 5-6)" of the "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit", and remove the first front back panel.
2. Move the push plate to the read position by rotating A in the image (drive shaft holder).
3. Eject the cassette.
See the instruction manual on how to eject the cassette.
4. See "■ Installation Procedures (Page 5-8)" of the "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit", and attach the first front back panel.

- 7 Turn ON the power supply circuit breaker.

- 8 Press the "operation" switch.
Equipment will start up and initialization will be performed.

3.2 Description of the Error Codes and How to Respond

3.2.1 06000 ~ 06037: Justifier Motor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06000	06015	06030	Justifier HP sensor error (when moving to HP) Justifier HP sensor did not go ON when the justifier guide was moving to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier HP sensor • Sensor wire: JP41 ~ MCN3 (MDU) • Justifier motor • Motor wire: JJ50 ~ MCN5 (MDU) • MDU
06001	06016	06031	Justifier motor control error (when moving to HP) There was a trouble with the motor control when the justifier guide was moving to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier motor • Motor wire: JJ50 ~ MCN5 (MDU) • MDU
06002	06017	06032	Justifier HP sensor error (when moving to cassette fixing position) Justifier HP sensor did not go OFF when the justifier guide was moving to the cassette fixing position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier HP sensor • Sensor wire: JP41 ~ MCN3 (MDU) • Justifier motor • Motor wire: JJ50 ~ MCN5 (MDU) • MDU
06003	06018	06033	Justifier motor control error (when moving to cassette fixing position) There was a trouble with the motor control when the justifier guide was moving to the cassette fixing position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier motor • Motor wire: JJ50 ~ MCN5 (MDU) • MDU
06004	06019	06034	Justifier motor control error (when moving to minute opening position) There was a trouble with the motor control when the justifier guide was moving to the minute opening position.	
06005	06020	06035	Justifier motor control error (when moving to cassette fixing position 2) There was a trouble with the motor control when the justifier guide was moving to the minute opening position.	
06006	06021	06036	Justifier HP sensor error (when moving to HP 2) Justifier HP sensor did not go ON when the justifier guide was moving from the cassette fixing position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier HP sensor • Sensor wire: JP41 ~ MCN3 (MDU) • Justifier motor • Motor wire: JJ50 ~ MCN5 (MDU) • MDU
06007	06022	06037	Justifier motor control error (when moving to HP 2) There was a trouble with the motor control when the justifier guide was moving from the cassette fixing position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier motor • Motor wire: JJ50 ~ MCN5 (MDU) • MDU

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06008	06023	06038	Justifier HP sensor error (when moving to HP 3) Justifier HP sensor did not go ON when the justifier guide was moving from the minute opening position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Justifier HP sensor Sensor wire: JP41 ~ MCN3 (MDU) Justifier motor Motor wire: JJ50 ~ MCN5 (MDU) MDU
06009	06024	06039	Justifier motor control error (when moving to HP 3) There was a trouble with the motor control when the justifier guide was moving from the minute opening position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Justifier motor Motor wire: JJ50 ~ MCN5 (MDU) MDU
06010	06025	06040	Justifier HP sensor error (when moving to minute opening position) Justifier HP sensor did not go OFF when the justifier guide was moving from the home position to the minute opening position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Justifier HP sensor Sensor wire: JP41 ~ MCN3 (MDU) Justifier motor Motor wire: JJ50 ~ MCN5 (MDU) MDU
06011	06026	06041	Justifier motor control error (when moving to minute opening position 2) There was a trouble with the motor control when the justifier guide was moving from the home position to the minute opening position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Justifier motor Motor wire: JJ50 ~ MCN5 (MDU) MDU

References for response method

- See ["2.5.2 Receiver unit \(Page 2-12\)"](#) for the position of the justifier motor and the justifier HP sensor.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.4.1 Replacing the Justifier HP Sensor \(Page 5-40\)"](#) for the procedure to replace the justifier HP sensor.
- See ["5.4.3 Replacing the Justifier Motor \(Page 5-42\)"](#) for the procedure to replace the justifier motor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.2 06050 ~ 06090: Receiver Motor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06050	06065	06080	Receiver HP sensor error (when moving to HP) Receiver HP sensor did not go ON when the receiver was moving to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Receiver HP sensor • Sensor wire: JP43 ~ MCN3 (MDU) • Receiver motor • Motor wire: JP51 ~ MCN5 (MDU) • MDU
06051	06066	06081	Receiver motor control error (when moving to HP) There was a trouble with the motor control when the receiver was moving to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Receiver motor • Motor wire: JP51 ~ MCN5 (MDU) • MDU
06052	06067	06082	Receiver HP sensor error (when moving to first falling position) Receiver HP sensor did not go OFF when the receiver was moving from the home position to the first falling position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Receiver HP sensor • Sensor wire: JP43 ~ MCN3 (MDU) • Receiver motor • Motor wire: JP51 ~ MCN5 (MDU) • MDU
06053	06068	06083	Receiver motor control error (when moving to first falling position) There was a trouble with the motor control when the receiver was moving from the home position to the first falling position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Receiver motor • Motor wire: JP51 ~ MCN5 (MDU) • MDU
06054	06069	06084	Receiver motor control error (when moving to second falling position) There was a trouble with the motor control when the receiver was moving from the first falling position to the second falling position.	
06055	06070	06085	Receiver motor control error (when moving slightly down at the second falling position) There was a trouble with the motor control when the receiver was moving down slightly at the second falling position.	
06056	06071	06086	Receiver motor control error (when moving to first falling position 2) There was a trouble with the motor control when the receiver was moving from the second falling position to the first falling position.	
06057	06072	06087	Receiver HP sensor error (when moving to HP 2) Receiver HP sensor did not go ON when the receiver was moving from the first falling position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Receiver HP sensor • Sensor wire: JP43 ~ MCN3 (MDU) • Receiver motor • Motor wire: JP51 ~ MCN5 (MDU) • MDU

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06058	06073	06088	Receiver motor control error (when moving to HP 2) There was a trouble with the motor control when the receiver was moving from the first falling position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Receiver motor Motor wire: JP51 ~ MCN5 (MDU) MDU
06059	06074	06089	Receiver HP sensor error (when moving to HP 3) Receiver HP sensor did not go ON when the receiver was moving from the second falling position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Receiver HP sensor Sensor wire: JP43 ~ MCN3 (MDU) Receiver motor Motor wire: JP51 ~ MCN5 (MDU) MDU
06060	06075	06090	Receiver motor control error (when moving to HP 3) There was a trouble with the motor control when the receiver was moving from the second falling position to the home position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Receiver motor Motor wire: JP51 ~ MCN5 (MDU) MDU
06061	06076	06091	Receiver HP sensor error (when moving to second falling position) Receiver HP sensor did not go OFF when the receiver was moving from the home position to the second falling position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Receiver HP sensor Sensor wire: JP43 ~ MCN3 (MDU) Receiver motor Motor wire: JJ51 ~ MCN5 (MDU) MDU
06062	06077	06092	Receiver motor control error (when moving to second falling position 2) There was a trouble with the motor control when the receiver was moving from the home position to the second falling position.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Receiver motor Motor wire: JJ51 ~ MCN5 (MDU) MDU

References for response method

- See ["2.5.2 Receiver unit \(Page 2-12\)"](#) for the position of the receiver motor and the receiver HP sensor.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.4.6 Replacing the Receiver HP Sensor \(Page 5-48\)"](#) for the procedure to replace the receiver HP sensor.
- See ["5.4.7 Replacing the Receiver Motor \(Page 5-50\)"](#) for the procedure to replace the receiver motor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.3 06100 ~ 06143: Transporter Motor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06100	06115	06130	Transporter read sensor error (when moving to read position) Transporter read sensor did not go ON when the push plate unit was moving to the read position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Tumbler (if the spring is not broken) • Transporter read sensor • Sensor wire: JP47 ~ MCN4 (MDU) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06101	06116	06131	Transporter motor control error (when moving to read position) There was a trouble with the motor control when the push plate unit was moving to the read position.	<ol style="list-style-type: none"> 1. Confirm the ground. (It may cause noise) 2. Confirm that the antistatic brush right under the insertion slot has not fallen off. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Ground wire of transporter unit (if it is not broken) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06102	06117	06132	Transporter read sensor error (when moving to HP) Transporter read sensor did not go OFF when the push plate unit was moving to the home position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Transporter read sensor • Sensor wire: JP47 ~ MCN4 (MDU) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06103	06118	06133	Transporter HP sensor error (when moving to HP) Transporter HP sensor did not go ON when the push plate unit was moving from the read position to the home position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Transporter HP Sensor • Sensor wire: JP46 ~ MCN4 (MDU) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06104	06119	06134	Transporter motor control error (when moving to HP) There was a trouble with the motor control when the push plate unit was moving from the read position to the home position.	<ol style="list-style-type: none"> 1. Confirm the ground. (It may cause noise) 2. Confirm that the antistatic brush right under the insertion slot has not fallen off. 3. Confirm following, and replace faulty parts: <ul style="list-style-type: none"> • Ground wire of transporter unit (if it is not broken) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06105	06120	06135	Transporter HP sensor error (when moving to press down position) Transporter HP sensor did not go OFF when the push plate unit was moving from the home position to the press down position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Transporter HP sensor • Sensor wire: JP46 ~ MCN4 (MDU) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06106	06121	06136	Transporter motor control error (when moving to press down position) There was a trouble with the motor control when the push plate unit was moving from the home position to the press down position.	<ol style="list-style-type: none"> 1. Confirm the ground. (It may cause noise) 2. Confirm that the antistatic brush right under the insertion slot has not fallen off. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Ground wire of transporter unit (if it is not broken) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06107	06122	06137	Transporter read sensor error (when moving to read position 2) Transporter read sensor did not go ON when the push plate unit was moving from the press down position to the read position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Transporter read sensor • Sensor wire: JP47 ~ MCN4 (MDU) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06108	06123	06138	Transporter motor control error (when moving to read position 2) There was a trouble with the motor control when the push plate unit was moving from the press down position to the read position.	<ol style="list-style-type: none"> 1. Confirm the ground. (It may cause noise) 2. Confirm that the antistatic brush right under the insertion slot has not fallen off. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Ground wire of transporter unit (if it is not broken) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06109	06124	06139	Transporter read sensor error (when moving to press down position 2) Transporter read sensor did not go OFF when the push plate unit was moving from the read position to the press down position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Transporter read sensor • Sensor wire: JP47 ~ MCN4 (MDU) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06110	06125	06140	Transporter motor control error (when moving to press down position 2) There was a trouble with the motor control when the push plate unit was moving from the read position to the press down position.	<ol style="list-style-type: none"> 1. Confirm the ground. (It may cause noise) 2. Confirm that the antistatic brush right under the insertion slot has not fallen off. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Ground wire of transporter unit (if it is not broken) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU
06111	06126	06141	Transporter motor control error (when moving to HP pass position) There was a trouble with the motor control when the push plate unit was moving from the read position to the HP pass position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Transporter HP sensor • Sensor wire: JP46 - MCN4 (MDU) • Transporter motor • Motor wire: JP52 - MCN6 (MDU) • MDU
06112	06127	06142	Transporter HP sensor error (when moving to HP 2) Transporter HP sensor did not go ON when the push plate unit was moving from the HP pass position to the home position, when it was trying to move from the press down position to the home position.	<ol style="list-style-type: none"> 1. Confirm that there are no foreign objects between the push plate and the frame, and remove if there are any. 2. Confirm if there is enough grease on the drive shaft, nut, or transporter motor unit, and apply grease if it is not enough. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Transporter HP sensor • Sensor wire: JP46 - MCN4 (MDU) • Transporter motor • Motor wire: JP52 - MCN6 (MDU) • MDU

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06113	06128	06143	Transporter motor control error (when moving to HP 2) There was a trouble with the motor control when the push plate unit was moving from the HP pass position to the home position, when it was trying to move from the press down position to the home position.	<ol style="list-style-type: none"> 1. Confirm the ground. (It may cause noise) 2. Confirm that the antistatic brush right under the insertion slot has not fallen off. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Ground wire of transporter unit (if it is not broken) • Transporter motor • Motor wire: JP52 ~ MCN6 (MDU) • MDU

References for response method

- See ["2.5.3 Transporter Unit \(Page 2-13\)"](#) for the positions of push plate and tumbler.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the transporter motor, the transporter read sensor, the transporter HP sensor, and the MDU.
- See ["7.2.8 Greasing Transporter Lead Screw Unit and Transporter Motor Unit Assembly Gear Mechanism Unit \(Page 7-12\)"](#) for applying grease to the transporter motor unit.
- See ["5.10.5 Replacing the Transporter Read Sensor \(Page 5-122\)"](#) for the procedure to replace the transporter read sensor.
- See ["5.10.4 Replacing the Transporter HP Sensor \(Page 5-121\)"](#) for the procedure to replace the transporter HP sensor.
- See ["5.10.6 Replacing the Transporter Motor \(Page 5-123\)"](#) for the procedure to replace the transporter motor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.4 06150 ~ 06182: Subscan Motor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response
S	E	I		
06150	06165	06180	Encoder initialization error Initialization of the encoder has failed.	<ol style="list-style-type: none"> 1. Confirm that the fixing shaft of the simple fixing lock is not lowered. 2. Confirm there are no foreign objects on the magnet shaft of the subscan unit, and remove it if there are any. 3. Confirm that it is installed horizontally. 4. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Encoder • Encoder wire: CN4 (LMC) • LMC

Error code			Description of the error	Response
S	E	I		
06151	06166	06181	Subscan motor control error (when moving to mechanical HP) There was a trouble with the motor control when the subscan was moving from the home position to the mechanical home position.	<ol style="list-style-type: none"> 1. Confirm that the fixing shaft of the simple fixing lock is not lowered. 2. Confirm there are no foreign objects on the magnet shaft of the subscan unit, and remove it if there are any. 3. Confirm that it is installed horizontally. 4. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Subscan motor (cannot replace on-site) • Motor wire: CN2 (LMD) • LMD • LMC
06152	06167	06182	Transporter motor control error (when moving to read end position) There was a trouble with the motor control when the subscan was moving from the mechanical home position to the read end position.	
06153	06168	06183	Subscan motor control error (when moving to mechanical home position 2) There was a trouble with the motor control when the subscan was moving from the read end position to the mechanical home position.	

References for response method

- See ["2.5.4 Subscan Unit \(Page 2-14\)"](#) for the position of the encoder and the subscan motor.
- See ["2.5.5 Optical Unit/Eraser Unit \(Page 2-15\)"](#) for the position of the LMD and the LMC.
- See ["5.5.3 Replacing the Encoder/Wires \(Page 5-68\)"](#) for the procedure to replace the encoder.
- See ["5.6.1 Replacing the LMD \(Page 5-78\)"](#) for the procedure to replace the LMD.
- See ["5.6.2 Replacing the LMC \(Page 5-79\)"](#) for the procedure to replace the LMC.

3.2.5 06200 ~ 06231: Insertion ShutterMotor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06200	06215	06230	Insertion shutter open error There was a trouble with the motor control for the opening action of the insertion shutter.	1. Confirm there are no foreign objects in the shutter unit, and remove it if there are any. 2. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Shutter unit (if it is not deformed) • Shutter open detection sensor • Sensor wire: JP35 ~ MCN1 (MDU) • Shutter close detection sensor • Sensor wire: JP36 ~ MCN1 (MDU) • ShutterMotor • Motor wire: JP20 ~ MCN1 (MDU) • MDU
06201	06216	06231	Insertion shutter close error There was a trouble with the motor control for the closing action of the insertion shutter.	

References for response method

- See ["2.5.1 Insertion Unit \(Page 2-11\)"](#) for the position of the ShutterMotor, the shutter open detection sensor, and the shutter close detection sensor.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.3.12 Replacing the Shutter Unit \(Page 5-36\)"](#) for the method to replace the shutter unit.
- See ["5.3.9 Replacing the Shutter Open Detection Sensor \(Page 5-31\)"](#) for the procedure to replace the shutter open detection sensor.
- See ["5.3.10 Replacing the Shutter Close Detection Sensor \(Page 5-33\)"](#) for the procedure to replace the shutter close detection sensor.
- See ["5.3.11 Replacing the Shutter Motor \(Page 5-35\)"](#) for the procedure to replace the ShutterMotor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.6 06250 ~ 06282: Lock Release Motor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06250	06265	06280	Lock release motor error (when initializing) There was a trouble with the motor control for the initialization action of the lock unit.	<ol style="list-style-type: none"> 1. Check the sliding of the release rod (plunger pin), and replace the release pin unit assembly when it does not slide smoothly. 2. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Lock HP sensor • Sensor wire: JP45 ~ MCN3 (MDU) • Lock Motor • Motor wire: JP16 ~ MCN3 (MDU) • MDU
06251	06266	06281	Lock release motor error (when locking) There was a trouble with the motor control for the lock action of the lock unit.	<ol style="list-style-type: none"> 1. Confirm the status of how the cassette is set. (is the cassette set in correct orientation) 2. Check the sliding of the release rod (plunger pin), and replace the release pin unit assembly when it does not slide smoothly. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Lock HP sensor • Sensor wire: JP45 ~ MCN3 (MDU) • Lock Motor • Motor wire: JP16 ~ MCN3 (MDU) • MDU
06252	06267	06282	Lock release motor error (when releasing) There was a trouble with the motor control for the lock release action of the lock unit.	

References for response method

- See ["2.5.2 Receiver unit \(Page 2-12\)"](#) for the position of the Lock Motor and the lock HP sensor.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.4.8 Replacing the Lock HP Sensor \(Page 5-52\)"](#) for the procedure to replace the lock HP sensor.
- See ["5.4.9 Replacing the Lock Motor \(Page 5-53\)"](#) for the procedure to replace the Lock Motor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.7 06300 ~ 06333: Justifier Sensor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06300	06315	06330	Justifier sensor error (during fixing action) Both justifier sensor and justifier standard sensor did not go ON right after the cassette fixing action.	<ol style="list-style-type: none"> 1. Confirm that there are no scratches or foreign objects on the cassette, the receiver, and the justifier guide. Replace with new parts if there are any scratches, or remove any foreign objects. 2. Confirm if the adjustment of the justifier motor is appropriate, and adjust it if it is out of range. 3. Confirm that there is no rattling or loosening in the pulley or the gear unit of the justifier motor unit, and remount the unit if there is any rattling or loosening. <div> <p>The diagram shows a cross-section of the justifier motor unit. Label A points to the timing belt, label B points to the pulley screw, and label C points to the shaft. Arrows indicate the movement of the timing belt and the pulley.</p> </div> <ol style="list-style-type: none"> A: Confirm that there is rattling (backlash) on the timing belt by moving it left and right. B: Confirm that the fixing screw of the pulley is not loose. C: Confirm that the shaft does not move left and right. (should be less than 0.2 mm) 4. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier standard sensor • Sensor wire: JP44 ~ MCN3 (MDU) • Justifier sensor • Sensor wire: JP40 ~ JJ18/JP18 ~ MCN3 (MDU) • MDU
06301	06316	06331	Justifier sensor error (during fixing action) Justifier sensor or justifier standard sensor went OFF during the fixing of the cassette.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Justifier standard sensor • Sensor wire: JP44 ~ MCN3 (MDU) • Justifier sensor • Sensor wire: JP40 ~ JJ18/JP18 ~ MCN3 (MDU) • MDU

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06302			Cassette during the startup (justifier sensor) Justifier sensor or justifier standard sensor was ON during the initialization by PowerON.	1. Confirm for foreign object inside the equipment, and remove it if there is any. 2. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Justifier standard sensor Sensor wire: JP44 ~ MCN3 (MDU) Justifier sensor Sensor wire: JP40 ~ JJ18/JP18 ~ MCN3 (MDU) MDU
06303	06318	06333	Cassette during the initialization (justifier sensor) Justifier sensor or justifier standard sensor was ON during the initialization after closing the second front door.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Justifier standard sensor Sensor wire: JP44 ~ MCN3 (MDU) Justifier sensor Sensor wire: JP40 ~ JJ18/JP18 ~ MCN3 (MDU) MDU

References for response method

- See ["2.5.2 Receiver unit \(Page 2-12\)"](#) for the position of the receiver, the justifier guide, the justifier motor, the justifier standard sensor, and the justifier sensor.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["6.3 Adjustment of Justifier Motor \(Page 6-6\)"](#) for the confirmation and adjustment methods for the amount of justification.
- See ["5.4.13 Replacing the Justifier Belt \(Page 5-62\)"](#) for the method to mount the pulley and the gear unit for the justifier motor.
- See ["5.4.4 Replacing the Justifier Standard Sensor \(Page 5-44\)"](#) for the procedure to replace the justifier standard sensor.
- See ["5.4.2 Replacing the Justifier Sensor \(Page 5-41\)"](#) for the procedure to replace the justifier sensor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.8 06350 ~ 06385: Receiver Sensor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06350	06365	06380	Receiver sensor error (when receiving cassette) Receiver sensor did not go ON when receiving the cassette.	<ol style="list-style-type: none"> 1. Confirm that there are no scratches or foreign objects on the cassette, the receiver, and the justifier guide. Replace with new parts if there are any scratches, or remove any foreign objects. 2. Confirm that the sensor dog on the receiver sensor is not deformed, and replace it if there is any deformation. 3. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Receiver sensor • Sensor wire: JP42 ~ JJ17/JP17 ~ MCN3 (MDU) • MDU
06351	06366	06381	Receiver sensor error (when moving cassette) Receiver sensor went OFF when moving the cassette.	
06352	06367	06382	Receiver sensor error (when ejecting cassette) Receiver sensor went OFF when ejecting the cassette.	
06353	06368	06383	Receiver sensor error (when removing cassette) Receiver sensor did not go OFF after removing the cassette.(Insertion slot detection sensor is OFF)	
06354			Cassette during the startup (receiver) Receiver sensor was ON during the initialization by PowerON.	<ol style="list-style-type: none"> 1. Confirm for foreign object inside the equipment, and remove it if there is any. 2. Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Receiver sensor • Sensor wire: JP42 ~ JJ17/JP17 ~ MCN3 (MDU) • MDU
06355	06370	06385	Cassette during the initialization (receiver) Receiver sensor was ON during the initialization after closing the second front door.	

References for response method

- See ["2.5.2 Receiver unit \(Page 2-12\)"](#) for the position of the receiver, the justifier guide, and the receiver sensor.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.4.10 Replacing the Receiver \(Receiver Unit Assembly\) \(Page 5-55\)"](#) for the method to replace the receiver.
- See ["5.4.11 Replacing the Justifier Guide Unit Assembly \(Page 5-57\)"](#) for the method to replace the justifier guide.
- See ["5.4.5 Replacing the Receiver Sensor \(Page 5-46\)"](#) for the procedure to replace the receiver sensor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.9 06400 ~ 06432: Back Plate Detection Sensor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06400	06415	06430	Back plate detection sensor error (before moving to read position) Back plate absorption detection sensor was ON before moving the push plate to the read position after separating the cassette.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Back plate absorption detection sensor • Sensor wire: JP48 ~ MCN4 (MDU) • MDU
06401	06416	06431	Back plate detection sensor error (when stopped at read position) Back plate absorption detection sensor was OFF when the push plate is at the read position after separating the cassette.	
06402	06417	06432	Back plate detection sensor error (after moving to press down position) Back plate absorption detection sensor was ON after moving the push plate to the press down position after separating the cassette.	

References for response method

- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the back plate absorption detection sensor and the MDU.
- See ["5.10.7 Replacing the Back Plate Absorption Detection Sensor \(Page 5-126\)"](#) for the procedure to replace the back plate absorption detection sensor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.10 06450 ~ 06483: Detach Detection Sensor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06450	06465	06480	Plate detach detection (when reading or erasing) Detach detection sensor went ON during the read action or the erase action.	<ul style="list-style-type: none"> • Stop using the cassette with an error, and request a repair at the factory. • If same error occurs with multiple cassettes, adjust the position of the detach detection roller and the detach detection sensor.
06451	06466	06481	Detach detection sensor error (when not operating) Detach detection sensor went ON when the read action or the erase action is not performing.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Detach detection sensor • Sensor wire (top): JP54 ~ ACN6 (LMC) • Sensor wire (bottom): JP55 ~ ACN6 (LMC) • LMC
06452			Detach detection sensor error (during startup) Detach detection sensor was ON during the initialization by PowerON.	1. Confirm for foreign object inside the equipment, and remove it if there is any. 2. Confirm following and replace the faulty parts.
06453	06468	06483	Detach detection sensor error (during initialization) Detach detection sensor was ON during the initialization after closing the second front door.	<ul style="list-style-type: none"> • Detach detection sensor • Sensor wire (top): JP54 ~ ACN6 (LMC) • Sensor wire (bottom): JP55 ~ ACN6 (LMC) • LMC

References for response method

- See ["2.5.6 Detach Detection Unit \(Page 2-16\)"](#) for the position of the detach detection sensors.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.8.1 Replacing the Detach Detection Sensor \(Upper\) \(Page 5-86\)"](#) or ["5.8.2 Replacing the Detach Detection Sensor \(Lower\) \(Page 5-87\)"](#) for the procedure to replace the detach detection sensors.
- See ["5.8.3 Replacing the Detach Detection Roller \(Page 5-89\)"](#) for the procedure to replace the detach detection roller.
- See ["5.6.2 Replacing the LMC \(Page 5-79\)"](#) for the procedure to replace the LMC.

3.2.11 06500 ~ 06534: Insertion Slot Detection Sensor Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06500	06515	06530	Insertion slot detection sensor error (when initializing) One or more of the insertion slot detection sensor 1, the insertion slot detection sensor 2, or the back plate drop detection sensor was not OFF when initializing the cassette (before opening the shutter).	1. Confirm there are no foreign objects in the sensor hole of the insertion slot, and remove it if there are any. 2. Confirm following and replace the faulty parts. (sensor may be soiled) <ul style="list-style-type: none"> • Insert slot detection sensor 1 • Sensor wire (LLB2): JP32 ~ MCN1 (MDU) • Sensor wire (LPB2): JP34 ~ MCN1 (MDU) • Insert slot detection sensor 2 • Sensor wire (LLB1): JP31 ~ MCN1 (MDU) • Sensor wire (LPB1): JP33 ~ MCN1 (MDU) • Back plate drop detection sensor • Sensor wire: JP37 ~ MCN1 (MDU) • MDU
06501	06516	06531	Insertion slot detection sensor error (when loading cassette) One or more of the insertion slot detection sensor 1 or the insertion detection sensor 2 was not OFF when loading the cassette (from dropping to the second falling position to shutter close).	Confirm the following, and replace faulty parts: <ul style="list-style-type: none"> • Insertion slot detection sensor 1 • Sensor wire (LLB2): JP32 ~ MCN1 (MDU) • Sensor wire (LPB2): JP34 ~ MCN1 (MDU) • Insertion slot detection sensor 2 • Sensor wire (LLB1): JP31 ~ MCN1 (MDU) • Sensor wire (LPB1): JP33 ~ MCN1 (MDU) • Back plate drop detection sensor • Sensor wire: JP37 ~ MCN1 (MDU) • MDU
06502	06517	06532	Insertion slot detection sensor error (when ejecting cassette) One or more of the insertion slot detection sensor 1, the insertion detection sensor 2, or the back plate drop detection sensor was not OFF when ejecting the cassette (after opening shutter).	

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06503	06518	06533	Cassette back plate drop detection Back plate drop detection sensor was OFF (drop detected) after the insertion slot detection sensor went ON during the eject.	When the back plate is off 1. Check the cassette. <ul style="list-style-type: none"> Are there any clicks when lock unit is pushed? Is the manufacturing date of the cassette correct? (You can not use the ones before April 2004.) 2. If there was no problem with the cassette, check the operation of the equipment and determine the reason that it could not lock and respond accordingly. (Confirm the pressing amount of the push plate unit too) When the back plate is not off Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Roller on the insertion slot (if it is not deformed) Back plate drop detection sensor Sensor wire: JP37 ~ MCN1 (MDU) MDU
06504	06519	06534	Insertion slot detection sensor error (when ejecting cassette 2) Insertion slot detection sensor 1 and insertion slot detection sensor 2 were both OFF when ejecting the cassette.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> Insert slot detection sensor 1 Sensor wire (LLB2): JP32 ~ MCN1 (MDU) Sensor wire (LPB2): JP34 ~ MCN1 (MDU) Insert slot detection sensor 2 Sensor wire (LLB1): JP31 ~ MCN1 (MDU) Sensor wire (LPB1): JP33 ~ MCN1 (MDU) MDU

References for response method

- See ["2.5.1 Insertion Unit \(Page 2-11\)"](#) for the position of the insertion detection sensor 1, the insertion detection sensor 2, and the back plate drop detection sensor.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.3.7 Replacing the Insertion Slot Detection Sensors \(LLB\) \(Page 5-27\)"](#) and ["5.3.7 Replacing the Insertion Slot Detection Sensors \(LLB\) \(Page 5-27\)"](#) for the procedure to replace the insertion detection sensor 1, the insertion detection sensor 2, and the back plate drop detection sensor.
- See ["5.3.6 Replacing the Back Plate Drop Detection Sensor \(Page 5-26\)"](#) for the procedure to replace the back plate drop detection sensor.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.
- See ["6.6 Adjustment of Pressing Amount \(Page 6-15\)"](#) for the confirmation and adjustment method of the pressing amount of the push plate unit.

3.2.12 06550 : Optical Unit/Eraser Unit Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
06550	-	-	Polygon rotation error Rotation of the polygon was not stable when the push plate unit moved to the read position.	Replace the optical unit.

References for response method

- See ["5.2.5 Removing/Installing the Optical Unit \(Page 5-11\)"](#) for the procedure to replace the optical unit.

3.2.13 06600: Fan Error

Error code	Description of the error	Response (References to replacement methods are listed at the end of the table.)
06600	Digital power supply cooling fan blowout Fan blowout was detected when the digital power supply cooling fan tried to turn.	Confirm following and replace the faulty parts. <ul style="list-style-type: none"> • Digital power supply cooling fan • Fan wire: JJ49 ~ JP11/JJ11 ~ MCN9 (MDU) • MDU

References for response method

- See ["2.5.7 Exterior \(Page 2-17\)"](#) for the position of the digital power supply cooling fan.
- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.9.13 Replacing the Digital Power Supply Cooling Fan \(Page 5-112\)"](#) for the procedure to replace the digital power supply cooling fan.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.14 06650 ~ 06683: FPGA Errors

- Error codes S column: Errors at the read operation/calibration.
- Error codes E column: Errors during erase operation.
- Error codes I column: Errors during initialization.

Error code			Description of the error	Response (References to replacement methods are listed at the end of the table.)
S	E	I		
	06650		FPGA error (failure on event driver access) Failed on event driver access during the initialization after the PowerON.	
	06651		FPGA error (failure on access to MDU) Failed to access the MDU during the initialization after the PowerON.	
	06652		FPGA error (failure on access to LMC) Failed to access the LMC during the initialization after the PowerON.	
06653	06668	06683	FPGA error (failed on I/O control) Failed on IOCTL (I/O control) during access to the FPGA.	
06654	-	-	FPGA error (failed to open image driver) Failed to open the image driver when transferring the image.	

References for response method

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3.2.15 14000 ~ 15000: Signal Process Errors

Error code	Description of the error	Response (References to replacement methods are listed at the end of the table.)
14000	Signal process error — Gain Overflow Gain value has overflowed in the gain/offset compensation process during the PowerON/ Wakeup.	Confirm the operation of the LMC with standard current read if it recur.
14001	Signal process error — Gain Underflow Gain value has underflowed in the gain/offset compensation process during the PowerON/ Wakeup.	
14002	Signal process error — Offset Overflow Offset value has overflowed in the gain/offset compensation process during the PowerON/ Wakeup.	
14003	Signal process error — Offset Underflow Offset value has underflowed in the gain/offset compensation process during the PowerON/ Wakeup.	
14010	Signal process error — QRV Overflow PMT high voltage setup value has exceeded the operation guarantee voltage during the sensitivity calibration.	Confirm the following when it recur. <ol style="list-style-type: none"> 1. Confirm that there is no mistake in exposure X-ray condition and the service tool input dosage. (There is a possibility that the exposure dosage is too small) 2. Replace the cassette and confirm the operation. 3. Confirm the connectors around the PMT and the LMC.
14011	Signal process error — QRV Underflow PMT high voltage setup value is lower than the operation guarantee voltage during the sensitivity calibration.	Confirm the following when it recur. <ol style="list-style-type: none"> 1. Confirm that the high voltage ON/OFF switch is ON on the LMC. (It is ON if the image is displayed on the console upon reading any image) 2. Confirm that there is no mistake in exposure X-ray condition and the service tool input dosage. (There is a possibility that the exposure dosage is too large) 3. Replace the cassette and confirm the operation. 4. Confirm the connectors around the PMU and the LMC.

References for response method

- See ["2.5.5 Optical Unit/Eraser Unit \(Page 2-15\)"](#) for the position of the LMC.
- See ["3.2.20 Confirm the LMC Operation \(Page 3-31\)"](#) for the procedure to confirm the LMC.
- See ["5.10.3 Replacing the CF Card \(Page 5-118\)"](#) for the procedure to replace the CF card.

3.2.16 23000 ~ 23900: Program Errors

Error code	Description of the error	Response (References to replacement methods are listed at the end of the table.)
23000	Program error — Main control Network control program has detected a problem in the system call including the device I/O.	Confirm the following when it recur. 1. Replace only the CIU and confirm the operation. 2. Replace both CIU and CF card, restore the circuit data, and confirm the operation.
23200	Program error — Data file size In the operation of the maintenance mode, the size of the data that was sent from the console was different from the prescribed size.	Confirm the following when it recur. 1. If there is a backup from before the problem, restore the circuit board data, after confirming normal startup after replacing the CF card.
23900	Program error — Firmware update Problem in data included in the Update-Kit for updating the reader firm. (This error is displayed only on the console.)	Confirm that the Update-Kit is for the REGIUS MODEL 110 and it is not corrupted, then perform the update again after replacing the CF card.

References for response method

- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the MDU.
- See ["5.10.3 Replacing the CF Card \(Page 5-118\)"](#) for the procedure to replace the CF card.
- See ["5.10.2 Replacing the MDU \(Page 5-116\)"](#) for the procedure to replace the MDU.

3.2.17 24000 ~ 25200: Network Errors

Error code	Description of the error	Response (References to replacement methods are listed at the end of the table.)
24000	Network error — JM connection 1. The connection between the equipment and the JM was not established because the JM has not started. 2. The connection between the equipment and the JM was not established because there was problem with the network environment such as malfunction of the cable or the HUB. 3. The connection between the equipment and the JM was not established because there was a problem with the network setup of the console or the reader.	Confirm in following order: 1. Confirm the startup of the JM (internal/external console). 2. Confirm malfunction or power outage of the network hubs or disconnection of the Ethernet cables. 3. Confirm the network settings of the console, the reader, and the JM (see Install and Maintenance Manual for the console).

Error code	Description of the error	Response (References to replacement methods are listed at the end of the table.)
25000	Network error – Non-timeout Network control program has detected a problem in the system call related to the network I/F.	Confirm in following order: 1. Confirm if the console in communication is operating normally. 2. Confirm that there is no malfunction of the network hub between the equipment and the console, power outage, or disconnection of the Ethernet cable. 3. Confirm the network setup on the console, reader, and JM (see Install/Maintenance Manual for the console). 4. Replace only the CIU and confirm the operation. 5. Replace both CIU and CF card, restore the circuit data, and confirm the operation.
25100	Network error – Timeout (during normal communication) Data transmission to the console, mainly during operation of the maintenance mode, has timed out.	
25200	Network error – Timeout (during image transfer) Image transmission to the console, mainly during the image read operation in routine mode, has timed out.	

References for response method

- See ["2.5.8 Framework \(Page 2-19\)"](#) for the position of the CIU.
- See ["5.10.3 Replacing the CF Card \(Page 5-118\)"](#) for the procedure to replace the CF card.
- See ["5.10.1 Replacing the CIU \(Page 5-115\)"](#) for the procedure to replace the CIU.

3.2.18 26000 ~ 26900: Operation Errors

Error code	Description of the error	Response (References to replacement methods are listed at the end of the table.)
26000	Operation error – Invalid job There was an unsupported command in the job searched from JM. (This error is displayed on the console only)	Install the most current reader firm and console application with matching versions.
26010	Operation error – Invalid job parameter The job searched from JM included a command parameter that is not compatible. (This error is displayed on the console only)	
26100	Operation error – Out of mode job The job searched from the JM was not executable with any of the operation mode of the equipment. (This error is displayed on the console only)	If this error occurred on the startup after powering OFF the reader while it was sleeping, it should operate without any problem. In any other cases, confirm that the settings of the JM are correct (see Install/Maintenance Manual for the console).
26200	Operation error – Invalid console During the maintenance mode, there was an operation request from a console that is not performing the maintenance. (This error is displayed on the console only)	It will operate without any problems. When the reader is under maintenance, it will not accept the operation request from other consoles.

Error code	Description of the error	Response (References to replacement methods are listed at the end of the table.)
26300	Operation error — Reader Busy The operation request from the console was not executable because the cassette was inserted at the same time as the operation request from the console was received. (This error is displayed only on the console.)	Operation will continue without any problems. Perform the operation on the console again after the cassette is ejected.
26900	Operation error — PowerOFF during job execution PowerOFF was executed by pressing the "operation" switch right after the job search from the JM. (This error is displayed only on the console.)	Operation will continue without any problems. Perform the operation on the console again after starting up the reader that was powered OFF.

3.2.19 Confirm the H-sync Signal

(To be stated)

3.2.20 Confirm the LMC Operation

(To be stated)

3.3 Response to the Problems Not Displaying Error

The problems originated from electric regulation/communication are described below.

- Network Related
- Power ON/OFF Related
- Signal processing related (control/error)

3.3.1 Network Related

Phenomenon: "READY" is displayed, but the image is not transferred when it is registered and read is performed.

No.	Cause	Response
1	The equipment was not restarted after changing the settings for network and host name of REGIUS console.	Restart the equipment.

Phenomenon: Ethernet cable came off while operating.

Generation status	Response
Connection to the JM was disconnected in "READY" state.	<ul style="list-style-type: none"> • Nothing can be done on the equipment if no operation was performed. Restart of the REGIUS console is necessary if the registration action is not possible on the REGIUS console. • Restart of the equipment and the REGIUS console is necessary if the error is displayed on the equipment when some operation is performed.
Connection to the JM was disconnected immediately after pre-registering the cassette.	<p>When the registered cassette is inserted during disconnection.</p> <ul style="list-style-type: none"> • The cassette stops at the insertion slot, no read action, and error 04214 is displayed. Restart is necessary for all, restart of the equipment by power ON/OFF. Restart of both REGIUS console and JM is necessary. <p>When the JM is restarted without any operation after the disconnection, making it able to read again</p> <ul style="list-style-type: none"> • Possible to read the registered image. But, new cassette can not be registered to the REGIUS console, so restart is necessary.
Connection to the JM was disconnected before the cassette was inserted in the erase mode.	It will return to "READY" status after the erase mode is completed. Take same action as above disconnection during the "READY" as above if disconnection continues.
Network connection on the equipment was disconnected for 5 minutes after pre-registering the cassette.	Possible to read normally even after 5 minutes.
Network connection on the equipment was disconnected for 5 minutes after post-registering the cassette.	Possible to read normally even after 5 minutes.
Network connection on the equipment was disconnected for 5 minutes when it is in "READY" status.	Possible to read normally even after 5 minutes.
Network connection on the equipment was disconnected for 5 minutes during the shutdown.	Power supply can be turned OFF even if it was disconnected any time during the shutdown.
Network connection of the equipment was disconnected when only 1 symbol is displayed during the initialization after the power ON. (Same action for 1 to 10 symbols)	Error (24000) occurred in the equipment. Connect the network cable, and if it makes the network connection with the JM, it will resume to "READY" status and work without any problem.

■ Phenomenon Occurring by Setup Problem

Following phenomenon will occur when there is incorrect setup (like same IP address) in the REGIUS MODEL 110, REGIUS console, and JM.

Restart after setting up so the IP addresses and host names do not duplicate.

Setup condition	Phenomenon
There are 2 REGIUS MODEL 110 with same IP address and host name.	<ul style="list-style-type: none"> Both will startup normally from power ON to "READY" status. When the second REGIUS MODEL 11 starts the read action after first REGIUS MODEL 110 performed the read action, error (04214) will occur when the cassette is inserted, and error (04214) will occur after that on the first equipment too. When the cassette is inserted simultaneously on both equipment, error (13031) will occur.
There are 2 REGIUS MODEL 110 with same IP address.	Read action on the first equipment will be normal, but when the read action starts on the second equipment, action will stop after displaying "BUSY" on the message display window and have error (04202).
There are 2 REGIUS consoles with same host name.	Warning saying there are duplicate host name is displayed in the Windows, and REGIUS console will startup, but cannot read the image. REGIUS MODEL 110 will operate normally.
There are 2 JM with same IP address and host name.	It will operate with the JM that has started up first. Warning saying there are duplicate host name will be displayed in the Windows, but the read action is possible. It will take longer to insert the cassette after detecting the barcode only on the first read. Attempt to operate from the JM that started up later will cause a registration error.
There are 2 REGIUS consoles with same IP address.	REGIUS console that changed the IP address will not startup. Warning will be displayed in the Windows.
There are 2 JMs with same IP address.	It will operate with the JM that has started up first. It will take longer to insert the cassette after detecting the barcode only on the first read.
There are 2 REGIUS MODEL 110s with same host name.	There is no problem, and it will read normally.
There are 2 JMs with same host name.	It will operate with the JM that has started up first. Warning will be displayed in the Windows saying there are duplicate host name.
There are REGIUS MODEL 110 and REGIUS console with same IP address and host name.	<ul style="list-style-type: none"> If you change the IP address and host name of the REGIUS MODEL 110 to the one used in the REGIUS console, REGIUS MODEL 110 will startup, but it will not read. Error (04214) occurs. When you change the IP address and host name of the REGIUS console to the one used in the REGIUS MODEL 110, REGIUS console will startup, but there will be error (04214) on the REGIUS MODEL 110 when the cassette is inserted, and application error will occur on the REGIUS console too.
There are REGIUS MODEL 110 and JM with same IP address and host name.	<ul style="list-style-type: none"> When you change the IP address and host for the REGIUS MODEL 110 to the one used in the JM, error (24000) will occur. When you change the IP address and host name of the JM to the one used in the REGIUS MODEL 110, both REGIUS MODEL 110 and application will not startup.

Setup condition	Phenomenon
There are REGIUS console and JM with same IP address and host name.	<ul style="list-style-type: none"> When you set the IP address and host name of the REGIUS console to the one used in the JM, REGIUS console will not startup. When you set the IP address and host name of the JM to the one used in the REGIUS console, it will read normally.
There are REGIUS MODEL 110 and REGIUS console with same host name.	<ul style="list-style-type: none"> Even if you set the host name of the REGIUS console as same as the REGIUS MODEL 110, it will read as normal. Even if you set the host name of the REGIUS console as same as the REGIUS MODEL 110, it will read as normal.
There are REGIUS MODEL 110 and JM with same host name.	Either way, it will read normally.

3.3.2 Power ON/OFF Related

Phenomenon that might occur when the power is turned ON/OFF is described here.

Phenomenon	Response
Nothing operates when "operation" switch is pressed. ("operation" lamp does not turn on)	See "■ Analysis Procedure of Power Supply Problems (Cannot Turn ON the Power Supply) (Page 3-35)" .
When the "operation" switch is pressed for 3 seconds to shutdown during the "READY" state, message display window turns off but the blinking of the LED does not stop.	Turn OFF the power supply circuit breaker of the equipment.
"operation" switch was pressed before the JM started up.	Error (24000) will occur, but it will connect automatically as soon as the JM starts up, and read will be possible.
"operation" switch was pressed when there was an error, but it did not start the power OFF action.	Turn OFF the power supply circuit breaker of the equipment.
Pressed the "operation" switch during the read.	<ul style="list-style-type: none"> Image getting read will be sent to REGIUS console. Equipment will shutdown automatically after the transfer of the image. Startup the equipment when the "operation" switch was pressed by mistake.
Sleep action does not function properly.	Confirm the Relation setting in the JM.
Equipment does not startup after starting up the REGIUS console.	<p>Confirm if the "operation" lamp is on (sleep mode).</p> <ul style="list-style-type: none"> If the "operation" lamp is off, power supply is OFF (circuit breaker OFF) or stopped, so turn ON the power supply circuit breaker and startup by pressing the "operation" switch. If the "operation" lamp is on, shutdown once by pressing the "operation" switch and restart the equipment.

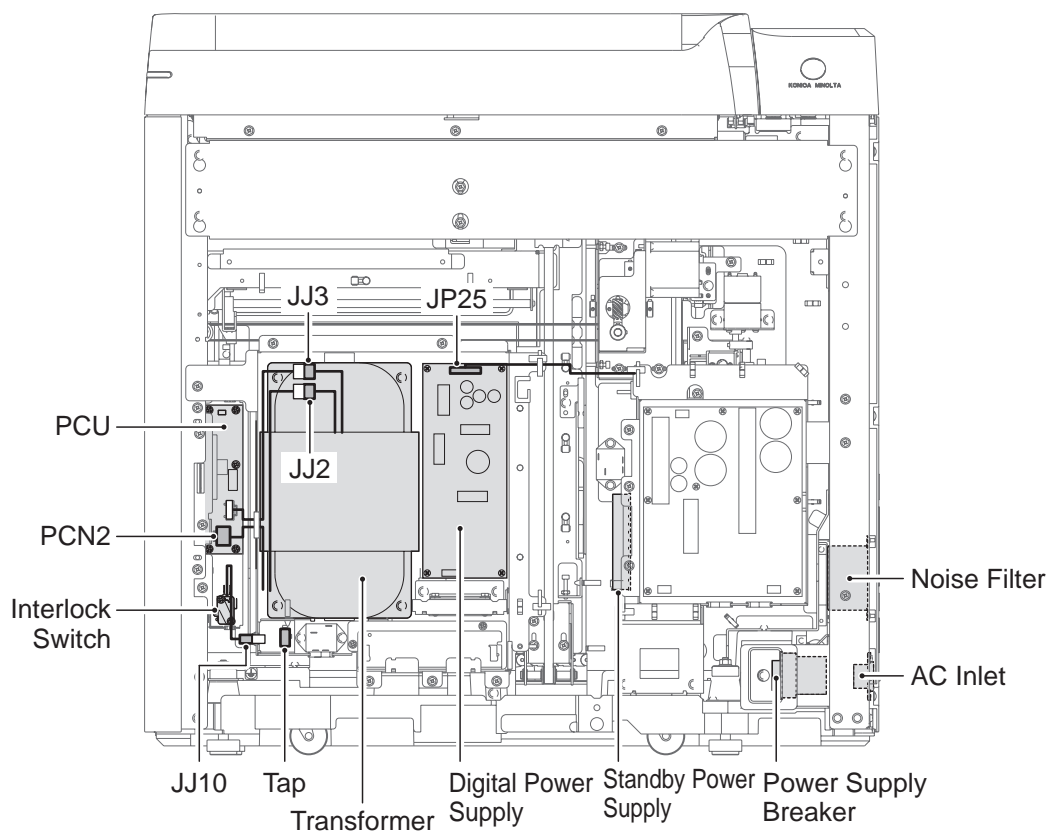
■ Analysis Procedure of Power Supply Problems (Cannot Turn ON the Power Supply)

When the power does not go ON by pressing the "operation" switch, confirm from top of the next table, and respond accordingly. (See next page for the position of each parts.)

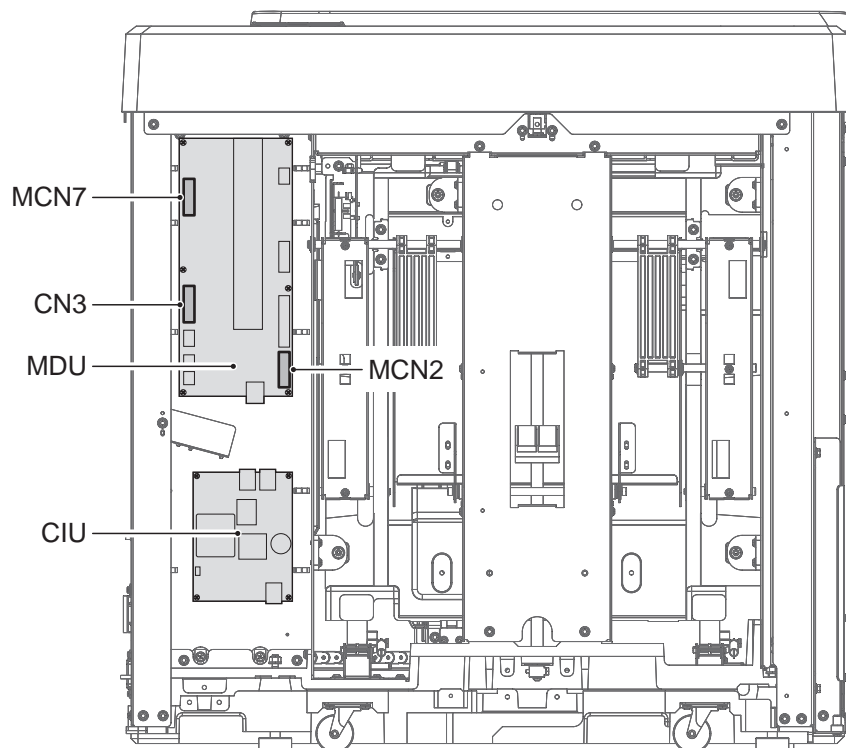
No.	Confirm	Possible fault location for no output*
1	Connect the power cable to the outlet, and confirm that there are specified voltage on the plug on other side.	Power cable
2	Confirm that second front door is closed.	Close the second front door.
3	Confirm that the position of the interlock switch (SW1) is adjusted.	Adjust the position.
4	If above is normal, confirm that the resistance between the contacts is open on the interlock switch (SW1) when the second front door is closed. Measuring point: JJ10-1 pin ~ 2 pin	Interlock switch (SW1)
5	Confirm that the resistance between the contacts is open on the "operation" switch while the "operation" switch is pressed. Measuring point: MCN2-1 pin ~ 10 pin	OPB
6	Confirm that AC 110 - 120 V is output on the secondary connector of the transformer (JJ2 and JJ3) after turning ON the power supply circuit breaker. Measuring point: JJ2-1 pin ~ 2 pin JJ3-1 pin ~ 2 pin	<ul style="list-style-type: none"> • AC inlet • Power supply circuit breaker (SW2) • Noise filter (NF1) • Transformer (PT1) • Wrong tap connected to the transformer
7	Confirm that standby power supply is supplied to the MDU power supply connector after turning ON the power supply circuit breaker. Measuring point: MCN7 - 1 pin = 5 V ~ 2 pin = 0 V	Standby Power supply (SUP2)
8	Confirm the power supply control output from the MDU while pressing the "operation" switch after turning ON the power supply circuit breaker. Measuring point: CN3 -1 pin \doteq 0 V	MDU if it is 5 V
9	Confirm the output from the PCU while pressing the "operation" switch after turning ON the power supply circuit breaker. Measuring point: PCN2 - 1 pin ~ 5 pin = AC 110 - 120 V	PCU
10	Confirm the that there is normal output from the SUP1 (JP25) while pressing the "operation" switch after turning ON the power supply circuit breaker. Measuring point: JP25- 3 pin = 24 V ~ 2 pin = 0 V 4 pin = 24 V ~ 2 pin = 0 V 7 pin = 5 V ~ 6 pin = 0 V 8 pin = 5 V ~ 6 pin = 0 V	Digital power supply (SUP1)
11	When all above are normal	<ul style="list-style-type: none"> • MDU • CIU

*: Only circuit board and power supply is described for faulty parts. Confirm the wiring too.

First Front Side



First Front Side Back



3.3.3 Signal Processing Related

Troubles caused by the signal processing is described here.

Phenomenon: Image transfer is very slow (cycle timeover even for single read)

No.	Cause	Response
1	There might be a 10BASE network hub or cable used in the network system.	Confirm the network hubs and cables.

Phenomenon: White (only compensation data) image is output

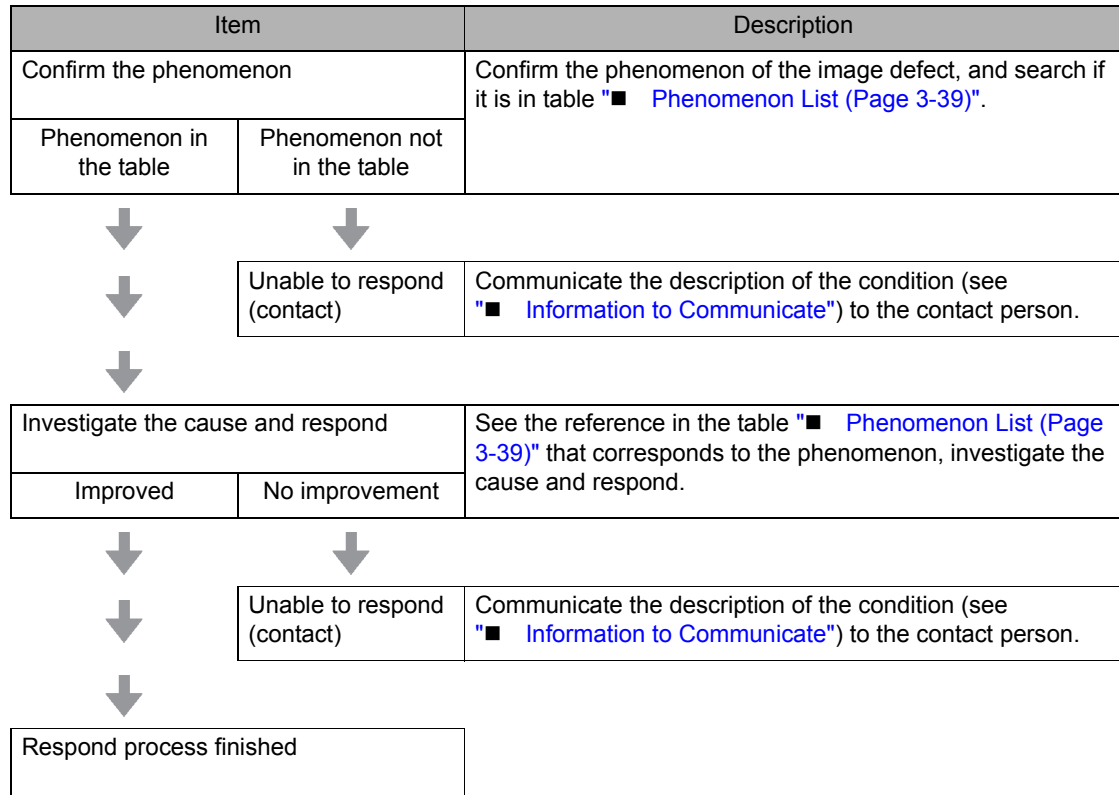
No.	Cause	Response
1	Settings of the SW on LMC is wrong.	<ol style="list-style-type: none"> 1. Confirm that HVSW (SW3) is ON on the LMC. 2. Confirm the high voltage supply cable on the LMC is connected firmly. 3. Confirm that DIP-SW (SW2, SW4) is set to Auto on the LMC.

3.4 How to Respond on Image Defect

How to respond on image defect is described here.

3.4.1 Flow of Response

Flow of response to image defect is described hereafter.



■ Information to Communicate

Communicate following information, as precise as possible, when communicating the status of image defect to the contact.

Log	Collect various logs from the REGIUS console. <ul style="list-style-type: none"> • Application log • System log • Reader log • JM log
System information	
Image data	Backup the defect image from the REGIUS console.
Other, description	

■ Phenomenon List

Find the corresponding phenomenon from the list and respond according to the reference.

No.	Phenomenon	Reference
1	Image is dark or black in general (still with structure of the object)	page 3-40
2	Image is bright or white in general (still with structure of the object)	page 3-40
3	Horizontal streak in part of the image	page 3-41
4	Horizontal streak all over the image	page 3-42
5	Vertical streak	page 3-43
6	Quasi-contour in the image	page 3-44
7	Jitter (jagged vertical line) in the image	page 3-44
8	Image size is different (vertically)	page 3-44
9	Image size is different (horizontally)	page 3-45
10	Top and bottom of the image is trimmed	page 3-45
11	Sides of the image is trimmed	page 3-45
12	Unevenness is not calibrated	page 3-45
13	Unevenness calibration data is too high (MAX-MIN is over 300 steps)	page 3-45
14	S value fluctuation	page 3-46
15	Not enough contrast (raw data)	page 3-46
16	Different density left to right	page 3-46
17	Dosage problem (compatibility problem with mAs value and S value, etc.)	page 3-46
18	Sandy image	page 3-47
19	White dot	page 3-47
20	Black dot	page 3-47
21	Monitor display problem (film is OK)	page 3-47
22	Duplex image	page 3-47
23	Sensitivity calibration do not fit within specification	page 3-47
24	All processed images are generally high in contrast	page 3-47
25	All processed images are generally low in contrast	page 3-48
26	Image out of focus	page 3-48

3.4.2 Image is Dark or Black in General (Still With Structure of the Object)

No.	Cause	Response
1	Output density in the G process parameter is set high in general.	See the Image Process Adjustment Manual and set the Density H/L in the G process parameter lower.
2	X-ray dosage is too much (in case of fix the process or unprocessed image).	Confirm the exposure condition if the X-ray dosage is not too much.
3	S value (gain) set in the REGIUS console is too large (in case of fix the process or unprocessed image).	Set the S value to the appropriate value.
4	Sensitivity calibration problem (in case of fix the process and unprocessed image).	Redo the sensitivity calibration.
5	The ROI recognized for process was not setup correctly for some reason.	Set the ROI to the correct position.

3.4.3 Image is Bright or White in General (Still With Structure of the Object)

No.	Cause	Response
1	Output density in the G process parameter is set low in general.	See the Image Process Adjustment Manual and set the Density H/L in the G process parameter higher.
2	X-ray dosage is extremely low or not generated at all.	<ul style="list-style-type: none"> • Confirm the exposure condition. Confirm that the exposure switch is not released during the X-ray exposure. • Confirm the X-ray dosage using the dosimeter.
3	S value (gain) set in the REGIUS console is too small (in case of fix the process or unprocessed image).	Set the S value to the appropriate value.
4	The ROI recognized for process was not setup correctly for some reason.	Set the ROI to the correct position.
5	Photomultiplier switch on the LMC is turned OFF.	Turn it ON.
6	Problem with the LMC.	Replace the LMC. See "5.6.2 Replacing the LMC (Page 5-79)" for the procedure to replace the LMC.
7	Failure of the photomultiplier.	Replace the photo multiplier filter assy. See "5.6.4 Replacing the Photomultiplier Tube Filter Assy (Page 5-81)" for the procedure to replace the photomultiplier filter or assy.

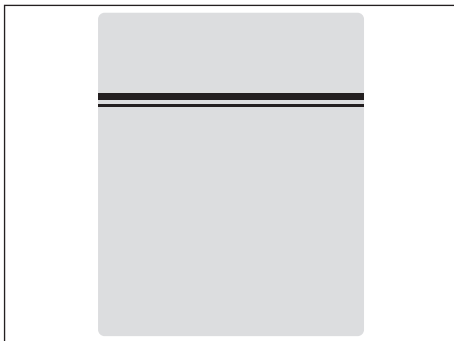
3.4.4 Horizontal Streak in Part of the Image



Important

Always perform the image size adjustment, the image position adjustment, the unevenness calibration, and the sensitivity calibration after replacing the optical unit.

Phenomenon: Streak appears in part of the image



No.	Cause
1	External force was applied during the read.

No.	Response
1	Perform read again making sure no shock is applied to the equipment.

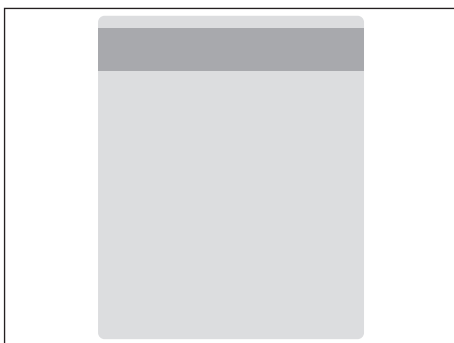
Phenomenon: Streak reaching sideways from a shielding material such as lead



No.	Cause
1	It could happen when there are shielding material is located at the white area.

No.	Response
1	<ul style="list-style-type: none"> Cause is so limited, ask the user to respond by methods such as moving the shielding material away from the object as much as possible or decrease the exposure field. Communicate the contact if it recur.

Phenomenon: Density jump occur at about 30 mm from the top of image.



No.	Cause
1	Plate is in contact with the detach detection roller due to warp or detach of the plate.

No.	Response
1	<ul style="list-style-type: none"> Return the plate with the warp or detach to the contact. Adjust the detach detection roller when it occurs in multiple plates.

Phenomenon: Cyclic slanted streaks

No.	Cause	Response
1	There is a possibility that light is entering from outside.	Confirm by reading solid image after reattaching the exteriors, or darkening the room.

Phenomenon: 1 to few lines of horizontal line looking digital

No.	Cause	Response
1	Connection failure	Confirm the connection of the LMC connectors (CN8, J1, CN301, CN302, CN303, and CN304).
2	H-sync signal detection problem.	Confirm the H-sync signal using the oscilloscope and replace the optical unit if there is a fault. <ul style="list-style-type: none"> See "3.2.19 Confirm the H-sync Signal (Page 3-30)" for the procedure to confirm the H-sync. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.
3	When there is any other digitalization (include density change)	Confirm after replacing LMC or CIU. <ul style="list-style-type: none"> Replace the LMC. See "5.6.2 Replacing the LMC (Page 5-79)" for the procedure to replace the LMC. Replace the CIU. See "5.10.1 Replacing the CIU (Page 5-115)" for the procedure to replace the CIU.

3.4.5 Horizontal Streak All Over the Image**Important**

Always perform the image size adjustment, the image position adjustment, the unevenness calibration, and the sensitivity calibration after replacing the optical unit.

Phenomenon: Horizontal streak in 7 line cycle

No.	Cause	Response
1	Polygon correction	Redo the unevenness calibration.
2	There is a possibility that vignetting is occurring to the laser ray in the optical unit	Replace the optical unit. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.

Phenomenon: Irregular horizontal streaks all over the left side of the image

No.	Cause	Response
1	Fluctuation of laser intensity	Replace the optical unit. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.

Phenomenon: White streaks starting in the midway going all the way to the right edge of the image

No.	Cause	Response
1	Fluctuation of laser intensity	Replace the optical unit. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.

Phenomenon: Horizontal streak in 6 ~ 7 mm cycle

No.	Cause	Response
1	Problem in subscan action due to the rust on the LM guide	Lubricate the LM guide. See "7.2.7 Greasing LM Guide (Page 7-11)" for the procedure to lubricate the LM guide.

Phenomenon: Horizontal streaks of 20 ~ 60 steps in 4 ~ 5 line cycle all over the image

No.	Cause	Response
1	Under effect of the radiofrequency treatment equipment.	Confirm if the horizontal streaks disappear by turning OFF the radiofrequency treatment equipment or point the antenna away from the equipment. Increase the distance between the equipment and the radiofrequency treatment equipment or point the antenna of the radiofrequency treatment equipment away from the equipment if the streaks disappear.

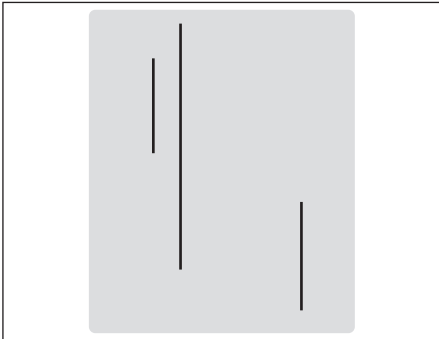
3.4.6 Vertical Streak

Always perform the image size adjustment, the image position adjustment, the unevenness calibration, and the sensitivity calibration after replacing the optical unit.

Phenomenon: Sharp white streak (width of 5 ~ 10 pixels)

No.	Cause	Response
1	There is vertical scratch on the plate.	Replace the plate.
2	Vignetting might be happening to the laser by the dust stuck on the tip of the condensing unit of the optical unit.	Clean the light condenser of the optical unit using a cleaning brush.

Phenomenon: Sharp black streak (width of 5 ~ 10 pixels)

No.	Cause	Response
1	Unevenness calibration was performed with a plate with scratch or dust on the tip of the condensing unit in the optical unit.	Redo the unevenness calibration with a plate without any scratch.
2	<p>If there is a partial black steak with low dosage image like shown below, and not in the high dosage image, exciting light leakage.</p> 	<p>Replace the optical unit. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.</p>

Phenomenon: Faint white streak (width of 20 ~ 100 pixels)

No.	Cause	Response
1	Could be a dust inside the optical unit.	Replace the optical unit.
2	Vignetting of the laser ray could be happening if there are several streaks all over the image.	See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.


Phenomenon: Faint black steak

No.	Cause	Response
1	When there is no streak by reading without any correction Correction could of been made with a dust on the CY2 mirror.	Redo the unevenness calibration.
2	White steak is at the same position by reading without any correction Could be a dust inside the optical unit.	Replace the optical unit. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.
3	There is a possibility of vignetting of the laser or a ghost.	

3.4.7 Quasi-Contour in the Image

Phenomenon	Cause/Response
Only occur on the film output.	Confirm the imager.
Quasi-contour is visible even when image data is confirmed on the service tool.	Bit fallout in the image data after LMC. <ul style="list-style-type: none"> Replace the LMC. See "5.6.2 Replacing the LMC (Page 5-79)" for the procedure to replace the LMC. Replace the CIU. See "5.10.1 Replacing the CIU (Page 5-115)" for the procedure to replace the CIU.

3.4.8 Jitter (Jagged Vertical Line) in the Image

 Important	Always perform the image size adjustment, the image position adjustment, the unevenness calibration, and the sensitivity calibration after replacing the optical unit.
--	--

No.	Cause	Response
1	Rotation failure of the polygon if it is in 6 line cycle.	Replace the optical unit. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.
2	Synchronization to the H-sync signal is not correct.	Confirm the input timing of the H-sync signal is not changed, and the pulse wave is not blunt. Replace the optical unit if you find any problem. <ul style="list-style-type: none"> See "3.2.19 Confirm the H-sync Signal (Page 3-30)" for the procedure to confirm the H-sync. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.

3.4.9 Image Size is Different (Vertically)

No.	Cause	Response
1	Pixel size of the printer (40 μ m) is not setup correctly.	Confirm the setup and correct.
2	Set the wrong printer type by mistake.	Confirm the setup and correct.

3.4.10 Image Size is Different (Horizontally)

No.	Cause	Response
1	Image size setup value was replaced.	Confirm and correct the image size setup value.

3.4.11 Top and Bottom of the Image is Trimmed

No.	Cause	Response
1	Aperture of the X-ray is not appropriate.	Confirm the exposure field.

3.4.12 Sides of the Image is Trimmed

No.	Cause	Response
1	Aperture of the X-ray is not appropriate.	Confirm the exposure field.
2	Horizontal start point is not appropriate.	Confirm and change the horizontal start point.

- Communicate the contact if it recur after the response.

3.4.13 Unevenness is Not calibrated

- Confirm if the image can be acquired without correction.
- Confirm if the high voltage switch on LMC is ON.

No.	Cause	Response
1	Image data used for unevenness calibration was faulty.	Redo the unevenness calibration with a plate without any scratch or smudge.
2	(Does not improve after performing the above action)	<ul style="list-style-type: none"> • Replace the CF card. See "5.10.3 Replacing the CF Card (Page 5-118)" for the procedure to replace the CF card. • Replace the CIU. See "5.10.1 Replacing the CIU (Page 5-115)" for the procedure to replace the CIU.

3.4.14 Unevenness Calibration Data is Too High (MAX-MIN is Over 300 Steps)



Always perform the image size adjustment, the image position adjustment, the unevenness calibration, and the sensitivity calibration after replacing the optical unit.

No.	Cause	Response
1	Exposure condition of the image used in the unevenness calibration is not appropriate.	Redo the exposure with appropriate exposure condition.
2	Plate or the light condensing unit in the optical unit is dirty.	Clean the plate and the light condensing unit in the optical unit.
3	Object was exposed on the image that was used for the unevenness calibration.	Redo the exposure without any object getting exposed.
4	Polygon correction data is too large (over 300 steps)	Replace the optical unit if it is still large after redoing the unevenness calibration. See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.

3.4.15 S Value Fluctuation

Phenomenon		Response
Fluctuation within same equipment	Fluctuate when the sampling pitch is different	87.5µm and 175 µm will not have identical S value due to the difference in the read pitch, resulting as difference in the luminance.
	Fluctuate with identical sampling pitch	Confirm if the exposure conditions (X-ray quality, distance, exposure area) and the process (condition key, etc.) are identical on both exposures. S value will fluctuate if there is any difference in them. S value also will fluctuate if the ROI for the process is different.
Fluctuate compared with other REGIUS MODEL 110		Redo the sensitivity calibration if the S value is different even after confirming the exposure conditions (X-ray tube, grid, X-ray quality (tube voltage), distance, exposure range) were identical.
Fluctuate compared with different model	Compare with 150	S value will be different if the x-ray tube, grid, or exposure condition are not equivalent.
	Compare with 170	(To be stated)
	Compare with 190	(To be stated)
	Compare with 330	S value will be different if the x-ray tube, grid, or exposure condition are not equivalent.
	Compare with 350 or 550	S value will be different if the x-ray tube, grid, or exposure condition (beware of focal distance) are not equivalent.

3.4.16 Not Enough Contrast (Raw Data)

No.	Cause	Response
1	—	Confirm the presence of the aperture.
2	—	Confirm the X-ray tube voltage referring to the recommended value in the medical notebook.
3	—	Confirm the process parameters (E, F, H).

3.4.17 Different Density Left to Right

- Expose solid image and compare with the solid image taken at the installation.
If there is a difference in the density left to right, cause 2.

No.	Cause	Response
1	Alignment of the grid is not appropriate.	Redo the exposure after adjusting the alignment.
2	The condensing unit in the optical unit is dirty.	Clean the condensing unit in the optical unit and redo the unevenness calibration.

3.4.18 Dosage Problem (Compatibility Problem with mAs Value and S Value, Etc.)

No.	Cause	Response
1	Sensitivity calibration is not appropriate.	Redo the sensitivity calibration.
2	X-ray tube failure (After measuring the mAs value and the mR, there was no linearity comparing the MR for 1 mA, 10 mAs, and 100 mAs against the log-log.)	Request the X-ray tube manufacturer to take response.

3.4.19 Sandy Image

No.	Cause	Response
1	Not enough dosage from X-ray tube.	Confirm the dosage of the X-ray tube. Perform the mR measurement and confirm if there is any X-ray.
2	Wrong exposure conditions	Confirm the exposure conditions referring to the recommended value in the medical notebook.

3.4.20 White Dot

No.	Cause	Response
1	There is a dust on the plate.	Clean the plate and confirm the solid image.
2	Plate fault (missing pixel)	Replace the plate.

3.4.21 Black Dot

No.	Cause	Response
1	Exposed on the plate that was not erased.	Erase the image on the plate and redo the exposure.

3.4.22 Monitor Display Problem (Film is OK)

No.	Cause	Response
1	Density does not match the light box.	Regenerate the display LUT.

3.4.23 Duplex Image

No.	Cause	Response
1	Exposed on the plate that was not erased.	Confirm that the erase lamp is on for certain when erasing.
2	Plate fault (plate might be damaged by X-ray exposure above allowable)	Confirm the plate right after the erase action without any compensation. Replace the plate if any image appears.

3.4.24 Sensitivity Calibration Do Not Fit Within Specification

No.	Cause	Response
1	Exposure condition and input value used for the sensitivity calibration was incorrect.	Confirm the exposure condition and input value for the image is correct.

3.4.25 All Processed Images are Generally High in Contrast

No.	Cause	Response
1	Output density in the process parameter is set high in contrast in general.	<ul style="list-style-type: none"> Reset the rotate/shift parameter output density H lower. Reset the rotate/shift parameter output density L higher. See the Image Process Adjustment Manual for details.

3.4.26 All Processed Images are Generally Low in Contrast

No.	Cause	Response
1	Output density in the process parameter is set low in contrast in general.	<ul style="list-style-type: none"> Reset the rotate/shift parameter output density H higher. Reset the rotate/shift parameter output density L lower. <p>See the Image Process Adjustment Manual for details.</p>

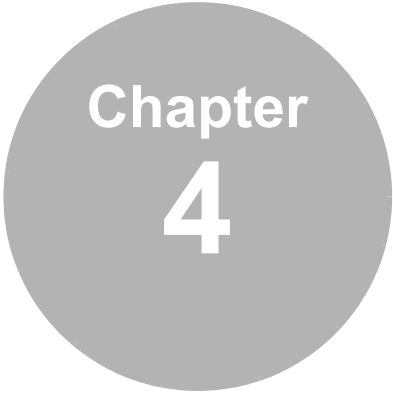
3.4.27 Image Out of Focus



Important

Always perform the image size adjustment, the image position adjustment, the unevenness calibration, and the sensitivity calibration after replacing the optical unit.

No.	Cause	Response
1	X-ray exposure time is too long. Organs will move when the time is longer.	<ul style="list-style-type: none"> Confirm the exposure time to the site. Also confirm that the display S value is less than 50 and abnormally small. Confirm there is no problem with the photo timer.
2	Fault in the beam diameter	<ul style="list-style-type: none"> Measure the chart method MTF. Replace the optical unit if the value of 2 cycles/mm is 22% or less. <p>See "5.2.5 Removing/Installing the Optical Unit (Page 5-11)" for the procedure to replace the optical unit.</p>



Chapter 4

Confirming Operation Using Service Tool

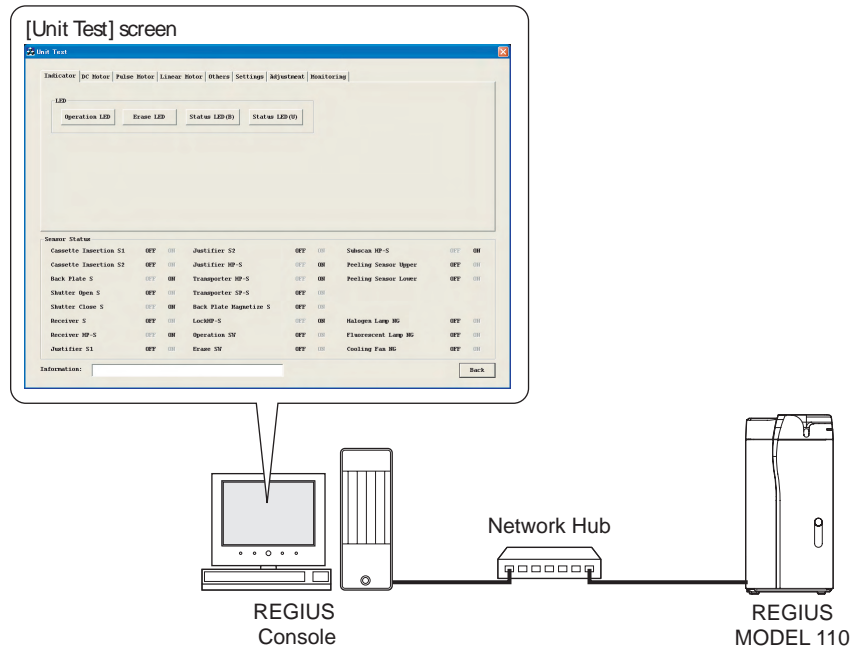
Methods to confirm the operation of REGIUS MODEL 110 is described here.

4.1	Before Confirming the Operation	4-2
4.2	Display [Unit Test] Screen.....	4-3
4.3	Confirming Operation for Each Unit.....	4-6
4.4	Confirming by Step Operation.....	4-8
4.5	Confirming the Status of the Sensors	4-17

4.1 Before Confirming the Operation

4.1.1 Outline of Confirming the Operation

To confirm the operation of each unit of the REGIUS MODEL 110 or confirm the status of the sensors, operate the [Unit Test] screen in the service tool (only for the REGIUS MODEL 110) on the REGIUS console.



The equipment will go into maintenance mode once the [Unit Test] screen is displayed, and only the commands from the REGIUS console displaying the [Unit Test] will be accepted (same status as performing the calibration).

Following operation can be performed on the [Unit Test] screen:

- Stand-alone operation of each unit
- Step operation (perform each step in order of read sequence, and display OK/NG of each operation)
- Display status of the sensors
- Setup of the reader parameter such as volume
- Setup of compensation value such as justifier (operation for the setup is possible too)

4.2 Display [Unit Test] Screen

How to display and outline of the function of the [Unit Test] screen, a service tool to perform the confirmation of operation of the REGIUS MODEL 110, is described here.

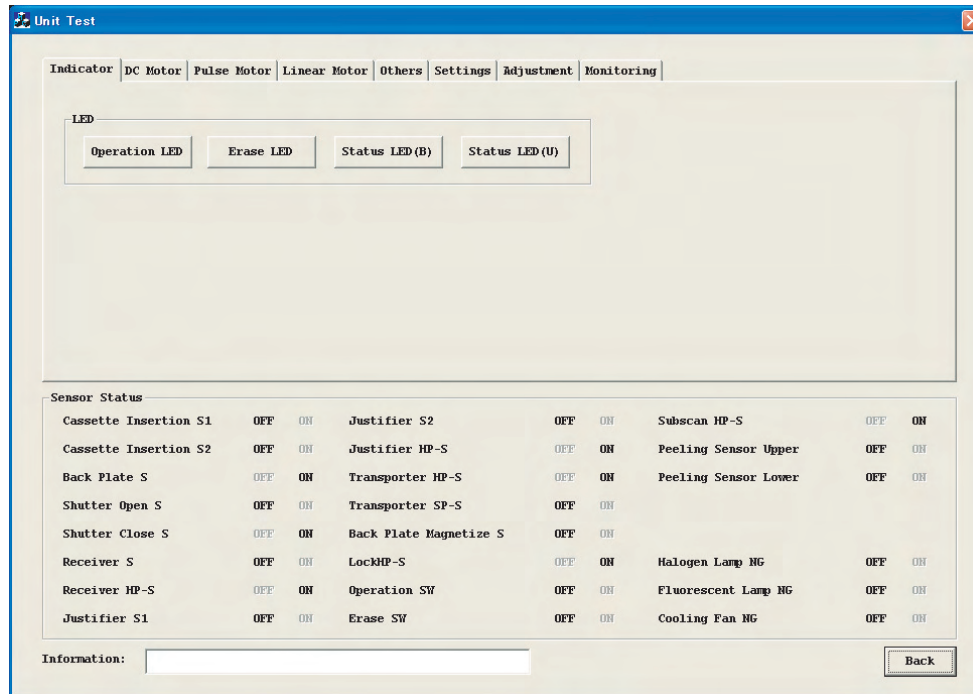
4.2.1 Display [Unit Test] Screen (In Case of CS-1/CS-2/CS-3)

- 1 Start up the service tool from the (REGIUS) service screen of the REGIUS console.
[Service Tool] screen (console) is displayed.
- 2 Click the [Reader] button.
[Service Tool] screen (reader) is displayed.
- 3 Click the [Unit Test] button in the [REGIUS 110].
[Unit Test] screen is displayed.

See the Installation/Service Manual for the REGIUS console on how to display the (REGIUS) service screen and [Service Tool] screen (console/reader).

- CS-1: See "Chapter 13 Service Tool Screen"
- CS-2: See "Chapter 12 Service Tool Screen"
- CS-3: See "Chapter 14 Service Tool Screen"

4.2.2 Function Outline of the [Unit Test] Screen



[Unit Test] is composed of 8 screens, and panels are switched using the tab.

Contents of each panels are as following:

Panel name	Description
Indicator	Stand-alone operation for following units can be confirmed. <ul style="list-style-type: none"> Lamps on the operation panel Status lamp
DC Motor	Stand-alone operation for following units can be confirmed. <ul style="list-style-type: none"> Shutter Motor Lock Motor
Pulse Motor	Stand-alone operation for following units can be confirmed. <ul style="list-style-type: none"> Receive Motor Justifier Motor Transporter Motor
Linear Motor	Stand-alone operation for following units can be confirmed. <ul style="list-style-type: none"> Subscan Motor
Others	Stand-alone operation for following units can be confirmed. <ul style="list-style-type: none"> Barcode reader Polygon Mirror Halogen Lamp Fluorescent Lamp
Settings	Following setups can be performed. <ul style="list-style-type: none"> Display language Speaker volume Also, stand-alone operation for following units can be confirmed. <ul style="list-style-type: none"> LCD Speaker

Panel name	Description
Adjustment	Following adjustment can be performed. <ul style="list-style-type: none">• Amount of Justification (Receiver Motor)• Pressing Amount (Transporter Motor)
Monitoring	<ul style="list-style-type: none">• Confirmation of the operation by step operation of the mechanical can be performed.• Monitor of the sensor can be performed.

Stand-alone operation confirmation of the unit and operation confirmation by step operation is described in this chapter.

- See ["4.3 Confirming Operation for Each Unit \(Page 4-6\)"](#) for the procedure to perform stand-alone confirmation the unit.
- See ["4.4 Confirming by Step Operation \(Page 4-8\)"](#) for the procedure to perform the operation confirmation by step operation.
- See ["8.1 Service Tool Screen \(Unit Test\) \(Page 8-2\)"](#) for the description of [Unit Test] screen.

4.3 Confirming Operation for Each Unit

Procedure to confirm the operation is explained here using stand-alone action of the receiver motor.

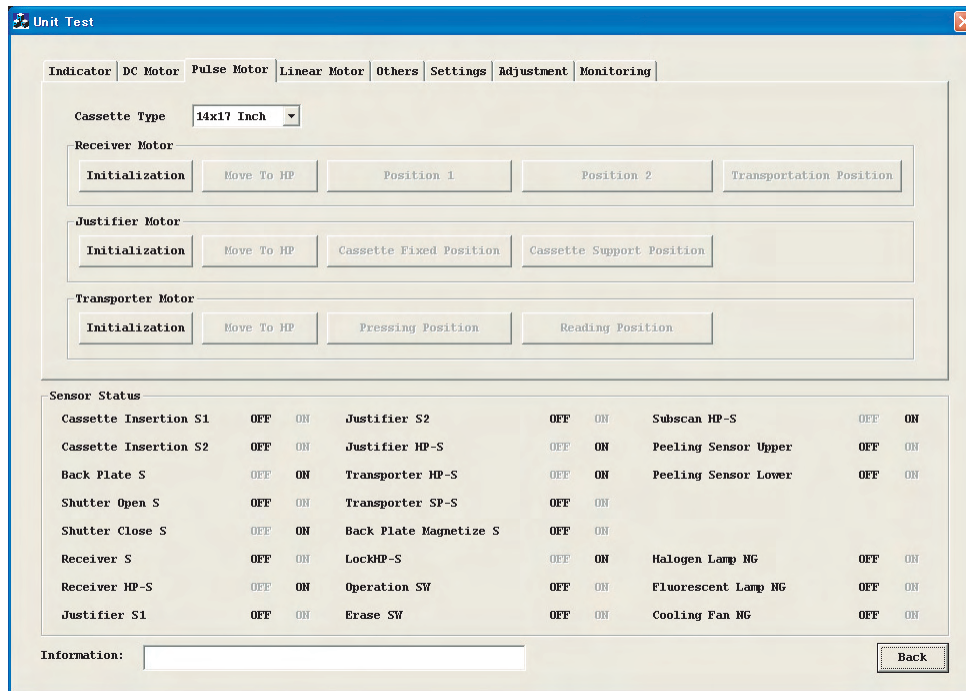


Caution

Do not use the cassette for confirming operation for each unit (except for "Adjustment" and "Monitoring" panels).

To perform confirmation using the cassette, perform the confirming by step operation. See ["4.4 Confirming by Step Operation \(Page 4-8\)"](#) for confirming by step operation.

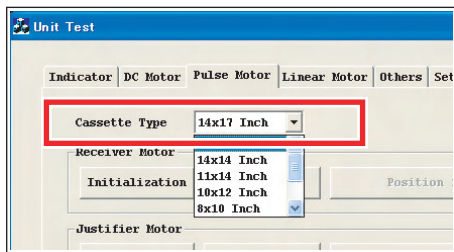
- 1 Click the [Pulse Motor] in the [Unit Test] screen.
[Pulse Motor] panel is displayed.



Note

Only the [Initialization] button is available for each motor in the [Pulse Motor] panel when it is first displayed.

Buttons to move to available positions will be enabled once the initialization is performed for each motor. Every time the motor is moved, available position will change, and only applicable buttons will be enabled. [Initialization] button will be enabled regardless of the position.

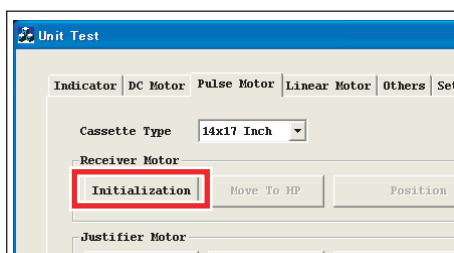


- 2 Select the cassette size to be emulated from the [Cassette Type].



Note

When the [Cassette Type] is changed, only [Initialization] button will be enabled like when the panel was switched.



- 3 Click the [Initialization] button for the receiver motor.

Initialization of the receiver mechanism is performed.

Initialization here is to move other mechanism so it will be possible to operate the receiver.

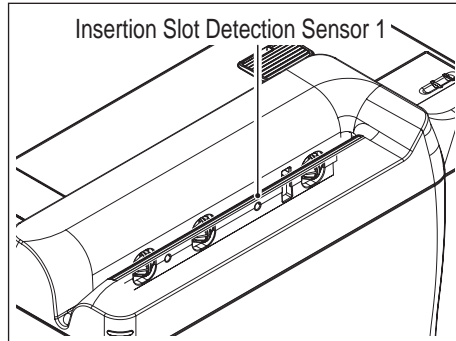
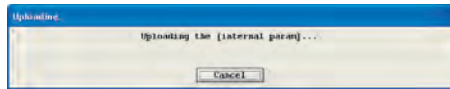
Once the initialization is completed, [Move to HP] button is enabled. Also, a message [Initialization ... OK] is displayed in the [Information] area saying that the initialization has finished without any problem.

Initialization of Justifier Motor

The following operation is necessary only when performing an initialization of the justifier motor.

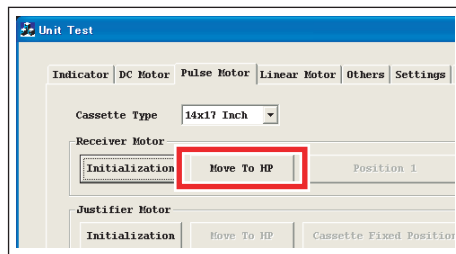
It will stop with the message, [Uploading...] displayed when the [Initialization] button for justifier motor is clicked.

Block the light of the insertion slot detection sensor 1 using your hands.



Note

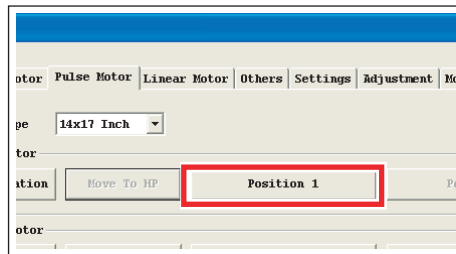
Justifier motor will perform the same operation as Adjustment of Justifier Motor in "Adjustment" panel, therefore stops and waits for the detection of the cassette. That is the reason for the need of this operation.



4 Click the [Move To HP] button.

Receiver will move to the home position.

Once the move is completed without any problem, a message [Move To HP ... OK] is displayed in the [Information] area and [Position 1] button is enabled.



5 Click the [Position 1] button.

Receiver will move to the home position.

Once the move is completed without any problem, a message [Position 1 ... OK] is displayed in the [Information] area, and [Move to HP] button and [Position 2] button are enabled.

Likely, the [Move To HP] button and [Transportation Position] button will be enabled after it moved to the second falling position by clicking the [Position 2] button.

Also, the [Move To HP] button and [Position 1] button will be enabled after it moved to the transportation position by clicking the [Transportation Position] button.

4.4 Confirming by Step Operation

Procedure to confirm the operation by step operation is described here.



Important

You can not terminate the process half-way between the steps. Perform all the way to the last step. To stop half-way between the steps, perform following steps to force quit the process.

1. Open the second front door.
(Remove the key if you are using the interlock release key.)
2. Remove the cassette if it is still in the equipment.
3. Close the second front door.
(Insert the key if you are using the interlock release key.)
4. Click the [Return] button on the "Unit Test" screen.

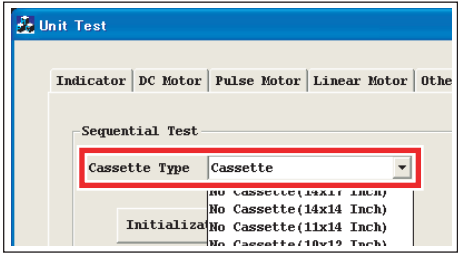
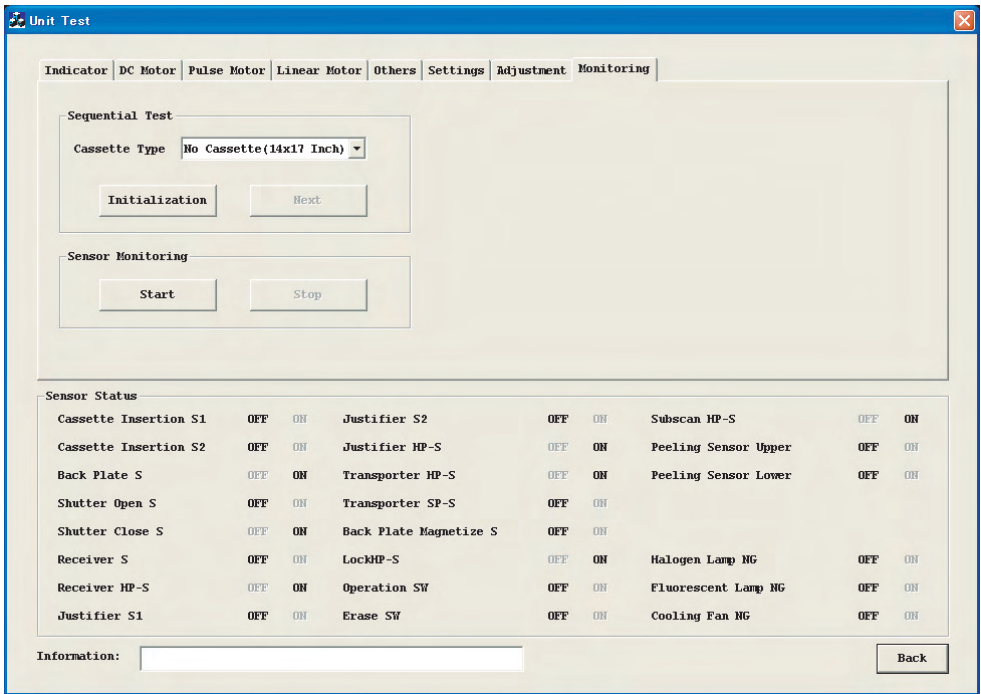


Note

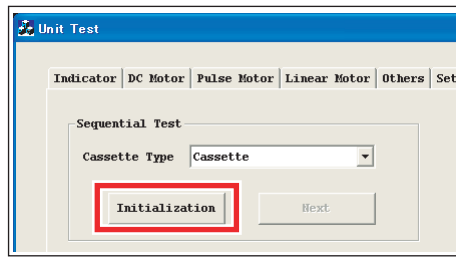
Step operation is different from normal read action in the following points.

- Vibration halt delay action will not be performed.
- Laser does not come on, and PMT high voltage value is 0 V.
- Subscan speed for reading direction is fixed to 175µm read.
- Reading and transmission of image will not be performed.
- Subscan speed for erasing direction is fixed to quick erase.
- Erase lamp will not come on.

- 1 Click the [Monitoring] tab in the [Unit Test] screen.
[Monitoring] panel is displayed.

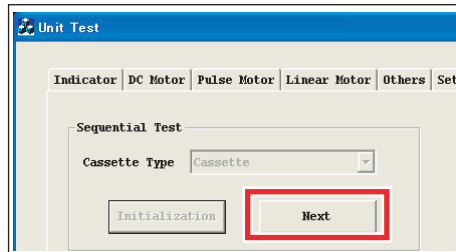


- 2 Select the cassette used to perform the step operation in the [Cassette Type].
Select [Cassette] when the actual cassette is to be used.
Select the cassette size to be emulated if the actual cassette is not used.



3 Click the [Initialization] button.

Initialization action will be performed, and [Next] button will be enabled once it is completed.



4 Click the [Next] button.

Step operation is performed.

When using the cassette

Click the [Next] button after setting the cassette in the insertion slot.

Operation check is performed for each step operation, and the step operation sequence ID and its result will be displayed in the [Information] area.

See "■ Step Operation Sequence" for the step operation and the sequence ID.

As an example, if the cassette detection operation was OK, it will display [Next [50] ... OK].

5 Click the [Next] button again to move to next step.

Ejecting a Cassette

If you are using a cassette, the cassette will be ejected from the insertion slot in sequence ID 71. To move to next step, click [Next] button after removing the cassette.

Once the last step (sequence ID 73) is completed, "Next [All]... OK" is displayed in the [Information] field, and [Initialization] button becomes available.

■ Step Operation Sequence

Step operation sequence will differ depending on the use/no use of the cassette. (Perform the operation with a ○)

Sequence type*		SeqID	Operation
A	B		
○		50	Detection of the cassette
○		51	Reading the barcode
○	○	52	Shutter open & wait for cassette to drop
○	○	53	Move the receiver to the first falling position
○	○	54	Fix the cassette with the justifier guide at the first falling position
○	○	55	Slightly release the cassette fixation by the justifier guide
○	○	56	Move the receiver to the second falling position
○	○	57	Fix the cassette with the justifier guide at the second falling position
○	○	58	Move the push plate unit to the press down position & shutter close
○	○	59	Release the lock

Sequence type*		SeqID	Operation
A	B		
<input type="radio"/>	<input type="radio"/>	60	Move the push plate unit to the read position
<input type="radio"/>	<input type="radio"/>	61	Slightly lower the receiver
<input type="radio"/>	<input type="radio"/>	62	Read
<input type="radio"/>	<input type="radio"/>	63	Erase
<input type="radio"/>	<input type="radio"/>	64	Move the push plate unit to the press down position
<input type="radio"/>	<input type="radio"/>	65	Lock
<input type="radio"/>	<input type="radio"/>	66	Move the push plate unit to the passing point of the home position
<input type="radio"/>	<input type="radio"/>	67	Move the push plate unit to the home position & shutter open
<input type="radio"/>	<input type="radio"/>	68	Slightly release the cassette fixation by the justifier guide
<input type="radio"/>	<input type="radio"/>	69	Move the receiver to the first falling position
<input type="radio"/>	<input type="radio"/>	70	Move the justifier guide to the home position
<input type="radio"/>	<input type="radio"/>	71	Move the receiver to the home position
<input type="radio"/>	<input checked="" type="radio"/>	72	Detect the eject of cassette
<input type="radio"/>	<input type="radio"/>	73	Shutter close

*: Sequence type

A: Using the cassette

B: Not using the cassette

■ Sensor Status for Each Step

Shows the status of the sensors after each step has completed its operation when the step action is performed with the cassette. (Areas boxed are the sensors that have changed its status from the previous step.)

After Initialization

Sensor Status								
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON			
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON			
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON

SeqID=50: Detect cassette

Sensor Status								
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON			
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON			
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON

"Cassette Insertion S2" stays OFF when the cassette is 15 x 30 cm.

SeqID=51: Read barcode

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=52: Open shutter & wait cassette drop

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=53: Move receiver to first falling position

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=54: Fix cassette with justifier guide at first falling position

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=55: Slightly release the fixing of cassette by the justifier guide

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

Depending on the cassette type, Justifier S1 = ON and Justifier S2 = OFF, but both are correct as a sensor status.

SeqID=56: Move the receiver to second falling position

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

SeqID=57: Fix cassette with justifier guide at second falling position

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

SeqID=58: Move the push plate unit to the press down position & close shutter

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

SeqID=59: Release lock

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=60: Move push plate to read position

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=61: Slightly lower the receiver

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=62: Read

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=63: Erase

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

SeqID=64: Move push plate unit to pressing position

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

SeqID=65: Lock

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

SeqID=66: Move push plate unit to the passing point of the home position

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

SeqID=67: Move push plate unit to home position & open shutter

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=68: Slightly release the fixing of the cassette with justifier guide

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

Depending on the cassette type, it might show Justifier S1 = ON and Justifier S2 = OFF, but both are correct as a sensor status.

SeqID=69: Move the receiver to the first falling position

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=70: Move the justifier guide to the home position

Sensor Status											
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON	Subscan HP-S	OFF	ON			
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON	Peeling Sensor Upper	OFF	ON			
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON	Peeling Sensor Lower	OFF	ON			
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON						
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON						
Receiver S	OFF	ON	LockHP-S	OFF	ON	Halogen Lamp NG	OFF	ON			
Receiver HP-S	OFF	ON	Operation SW	OFF	ON	Fluorescent Lamp NG	OFF	ON			
Justifier S1	OFF	ON	Erase SW	OFF	ON	Cooling Fan NG	OFF	ON			

SeqID=71: Move the receiver to home position

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

Cassette Insertion S2 stays OFF when the cassette is 15 x 30 cm.

SeqID=72: Detection of cassette ejection

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

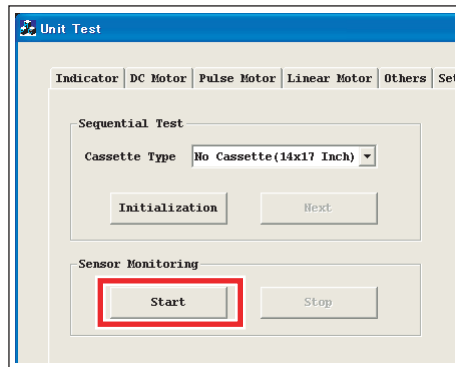
SeqID=73: Close shutter (finished)

Sensor Status					
Cassette Insertion S1	OFF	ON	Justifier S2	OFF	ON
Cassette Insertion S2	OFF	ON	Justifier HP-S	OFF	ON
Back Plate S	OFF	ON	Transporter HP-S	OFF	ON
Shutter Open S	OFF	ON	Transporter SP-S	OFF	ON
Shutter Close S	OFF	ON	Back Plate Magnetize S	OFF	ON
Receiver S	OFF	ON	LockHP-S	OFF	ON
Receiver HP-S	OFF	ON	Operation SW	OFF	ON
Justifier S1	OFF	ON	Erase SW	OFF	ON
			Subscan HP-S	OFF	ON
			Peeling Sensor Upper	OFF	ON
			Peeling Sensor Lower	OFF	ON
			Halogen Lamp NG	OFF	ON
			Fluorescent Lamp NG	OFF	ON
			Cooling Fan NG	OFF	ON

4.5 Confirming the Status of the Sensors

Confirmation procedure of the sensor status is described here.

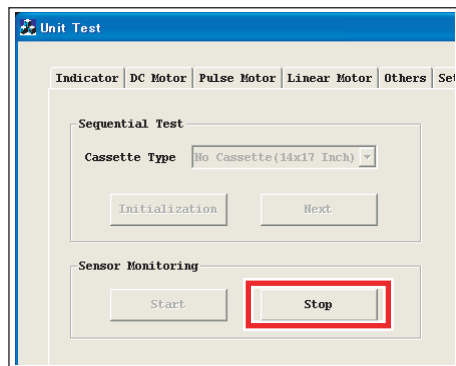
- 1 Click the [Monitoring] tab in the [Unit Test] screen.
[Monitoring] panel is displayed.



- 2 Click the [Start] button.
Monitoring of the sensor status of the REGIUS MODEL 110 will start.
Most current sensor status will be displayed in the "Sensor Status" every 3 seconds once the monitor is started.

- 3 Confirm the status of the sensors.

- 4 Click the [Stop] once the confirmation is completed.
Monitoring of the sensor status will finish.



Chapter 5

Disassembly and Assembly

This chapter describes the instructions on how to disassemble/assemble the equipment.

5.1	Before Disassembly	5-2
5.2	Basic Works	5-3
5.3	Replacing the Parts on the Insertion Unit	5-19
5.4	Replacing the Parts on the Receiver unit.....	5-40
5.5	Replacing the Parts on the Subscan Unit	5-65
5.6	Replacing the Parts on the Optical Unit	5-78
5.7	Replacing the Parts on the Eraser Unit.....	5-83
5.8	Replacing the Parts on the Detach Detection Unit.....	5-86
5.9	Replacing the Parts on the Exterior	5-90
5.10	Replacing the Parts on the Framework.....	5-115

5.1 Before Disassembly

5.1.1 Precautions during Disassembly/Assembly



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment. Failure to do so may lead to malfunction, causing your fingers to be wedged between the sliding or rotating parts inside the equipment.



Caution

Use the anti-static wristband when handling the electronic parts inside the equipment. It is possible to damage the electronic part by touching it with static buildup.



Caution

Do not touch inside the equipment with your bare hand. Otherwise, the equipment may be rusted by stain or sebum on your hand, leading to malfunction in the sliding or rotating parts.



Caution

When assembling the equipment, restore the wiring layouts to their original positions and make sure no wire is wedged between or stuck with the attaching parts. A wire wedged between or stuck with the attaching parts will cause malfunction in the equipment.



Caution

Never loosen the setscrew painted white. Loosing it may make the equipment unable to be restored in the service site.

5.2 Basic Works

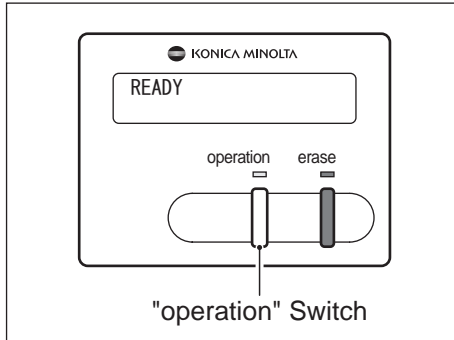
This section describes the works including the basic instructions on how to remove/install the exterior panels that are required in disassembling/assembling the equipment.

5.2.1 Power OFF/ON

This section describes the instructions on how to turn the power off/on on the equipment.

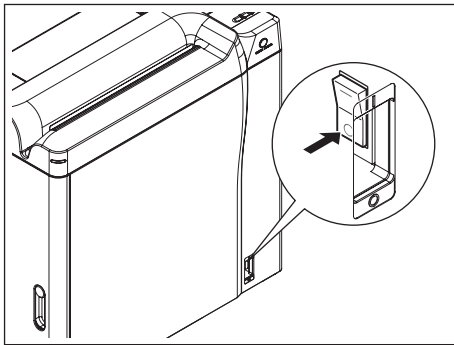
■ Power OFF

Turn the power supply circuit breaker OFF and unplug the power cable and the Ethernet cable.

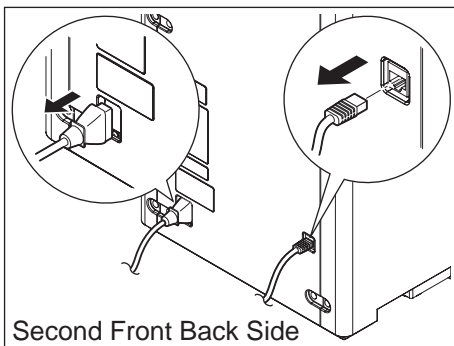


- 1 Press and hold the "operation" switch for 3 seconds or longer.

Shutdown action will take place and the "operation" lamp will go off when completed.



- 2 Turn off the power supply circuit breaker.



- 3 Unplug the power cable from the equipment and the power outlet.

- 4 Unplug the Ethernet cable.

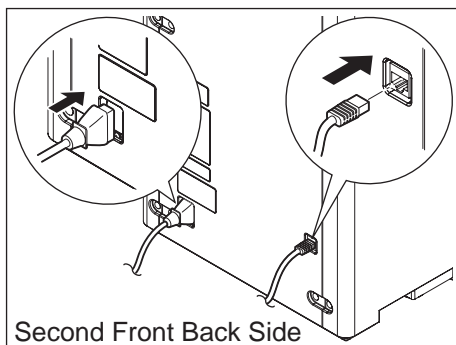


Place the unplugged power cable and Ethernet cable in a place where they will not be stepped on while servicing.

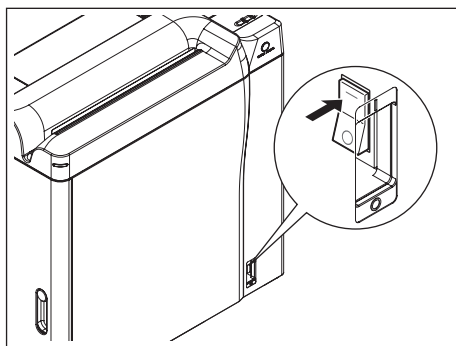
Now, you have finished with the procedures to turn the power off.

■ Power ON

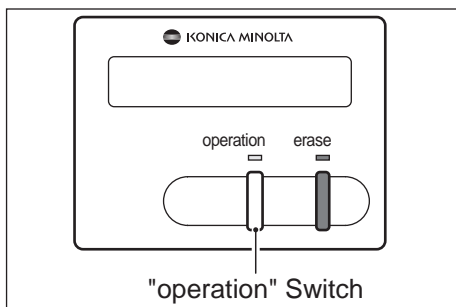
Connect the Ethernet cable and power cable and turn ON the power.



- 1 Connect the Ethernet cable to the equipment.
- 2 Connect the power cable to the equipment and power outlet.



- 3 Turn on the power supply circuit breaker.



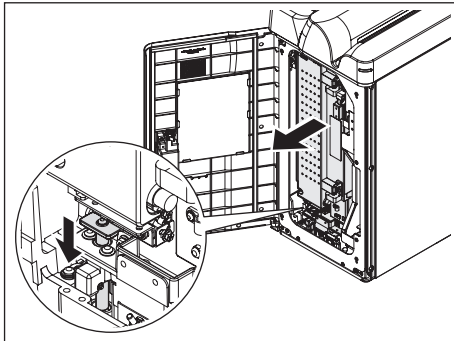
- 4 Press the "operation" switch.
Equipment will start up and initialization will be performed. When the initialization is completed, "READY" will be shown on the message display window.

Now, you have finished with the procedures to turn the power on.

5.2.2 Moving the Equipment

Move the equipment to a place available for servicing if it is hard to operate service at the installation site.

■ Moving to the Maintenance Space

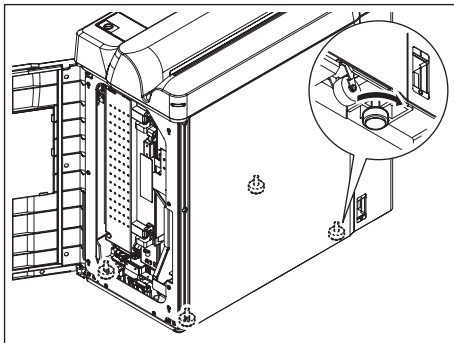


- 1 Move the optical unit to the second front side and fix it using the simple fixing lock.

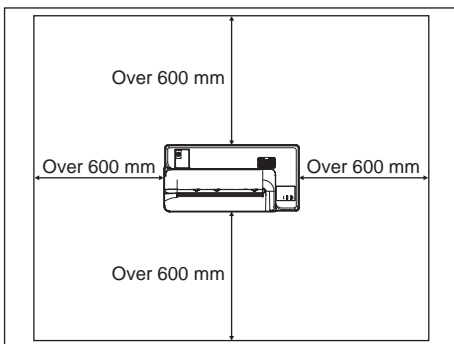


Note

- When the optical unit moves all the way toward the front, fixing shaft will automatically lower to lock.
- The second front door that is locked with the simple fixing lock cannot be fully closed. (for the purpose of preventing the unit from being left locked).



- 2 Loosen the adjusters (4 locations).



- 3 Move the equipment to a place capable of operation.

Secure a space of 600 mm or more in four directions.

- 4 Fix the equipment so that it will not move using the adjusters (4 locations) after moving it.

- 5 Release the simple fixing lock.

Lock will be released by pulling up the blue knob.




Important

Push the optical unit slightly towards the back when pulling up the knob. Fixing shaft might move down, and get locked again if the optical unit is at its hithermost position. Also, move the optical unit to confirm that the fixing shaft is not lowered after unlocking.

Now, you have finished with the procedures for moving the equipment to the maintenance space.

5.2.3 Removing/Installing the Exterior Panel and Insertion Unit

This section describes the instructions on how to remove and install the exterior panel and insertion unit.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Requirements

The works in this section can be performed using only the standard tools.

■ Removal Procedures

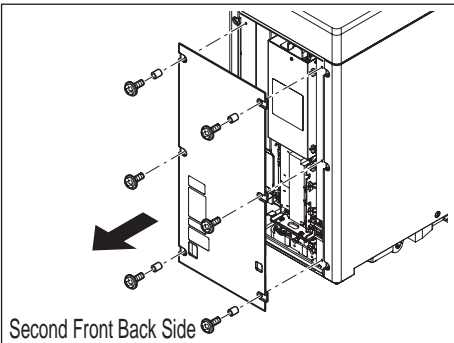
Work outline

Listed below are the personnel number and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

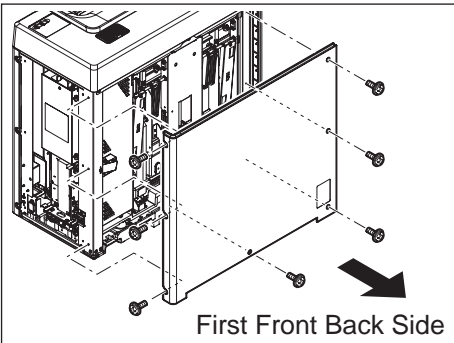
The exterior panels (first front, first front back and second front back panels) can be removed in any order.

Removing the Second Front Back Panel



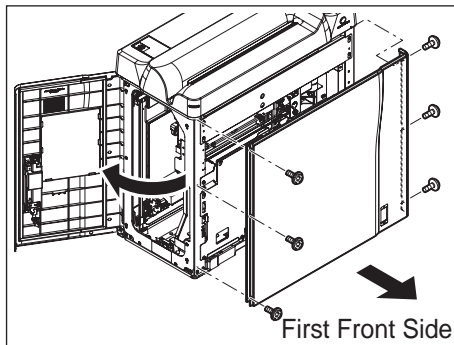
- 1 Remove the second front back panel.
- 6 screws (M4 x 8)
 - 1 spacer each (for 4 locations excluding the middle stage)

Removing the First Front Back Panel



- 2 Remove the first front back panel.
- 7 screws (M4 x 8)
- Remove the panel with both hands, holding on the bottom and pulling away from the equipment.

Removing the First Front Panel

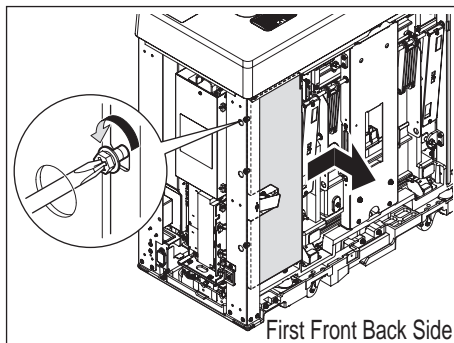


3 Remove the first front panel.

- 6 screws (M4 x 8)

Remove the panel with both hands, holding on the bottom and pulling away from the equipment.

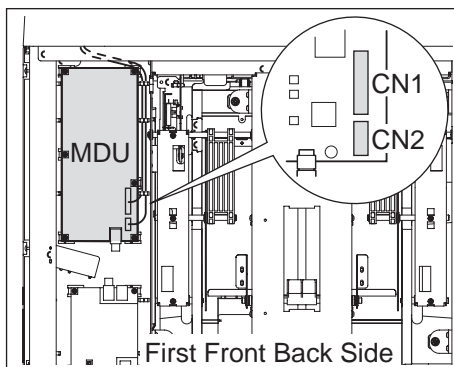
Removing the Insertion Unit



4 Remove the circuit board cover.

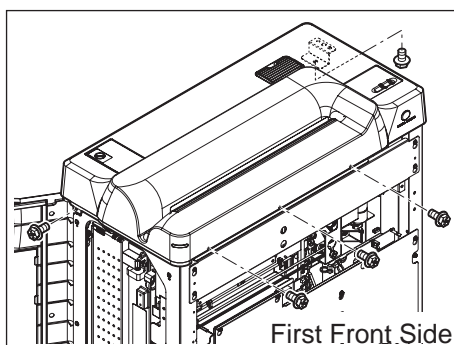
- 3 screws (M3 x 6)

Loosen all.



5 Remove the connectors from the MDU.

- CN1 (MCN1: cable)
- CN2 (MCN2: cable)



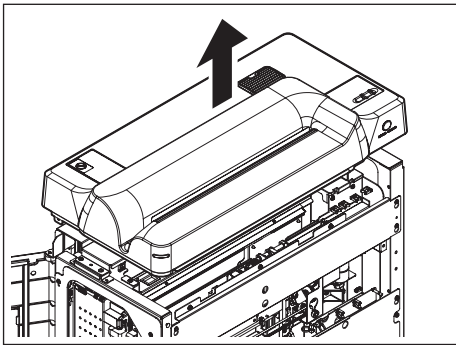
6 Remove the screws from the insertion unit.

- 5 hex/Phillips-head screws (M4 x 8)

If the push plate unit is not located at the read position, then the optical unit cannot be moved:


You cannot access one of the screws retaining the insertion unit, if the optical unit is located at the second front backside.

See "■ If the insertion unit has not been removed: (Page 5-17)" in "5.2.6 Moving the Push Plate Unit" to move the push plate unit to the read position, then move the optical unit to the second front side.



7 Remove the insertion unit.

Place the removed insertion unit upside down to prevent any damage inside, on a stable location.



Caution

Remove the unit carefully so the cables disconnected in [Step 5](#) do not get caught.

Now, you have finished with the procedure to remove the exterior panels and the insertion unit.

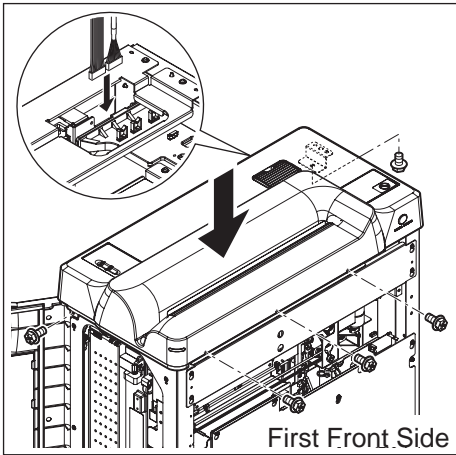
■ Installation Procedures

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.


Personnel Number	Work Hours
1	

Installing the Insertion Unit



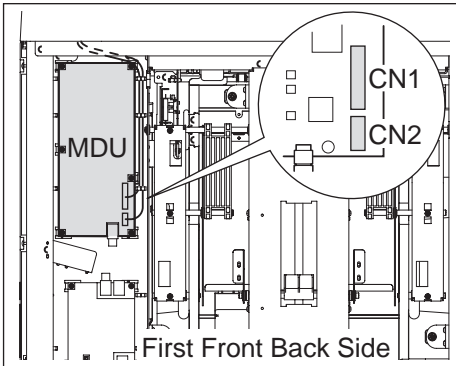
1 Install the insertion unit on the equipment.

- 5 hex/Phillips-head screws (M4 x 8)



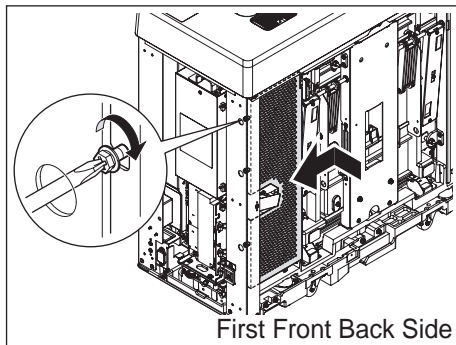
Caution

Take care of the cable routing and not to pinch the cable.



2 Connect the cables on the insertion unit to the MDU.

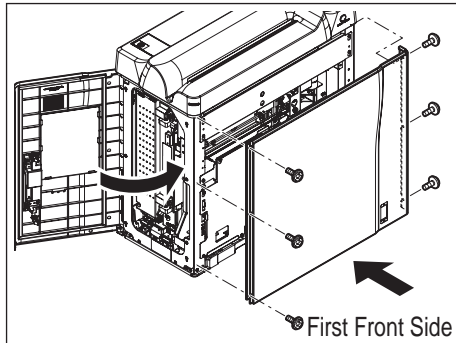
- MCN1 → CN1 (MDU)
- MCN2 → CN2 (MDU)



3 Install the circuit board cover.

- 3 screws (M3 x 6)

Installing the First Front Panel



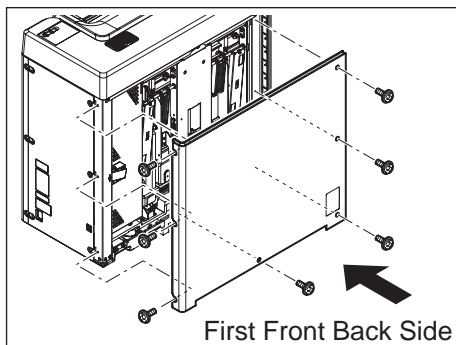
4 Install the first front panel.

- 6 screws (M4 x 8)

Hold the bottom part of the first front panel with both hands, and install it by inserting the top part of panel into the panel.

5 Close the second front door.

Installing the First Front Back Panel

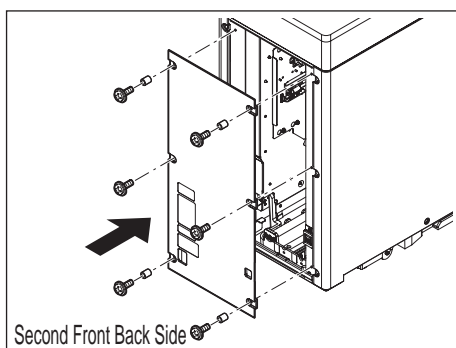


6 Install the first front panel.

- 7 screws (M4 x 8)

Hold the bottom part of the first front back panel with both hands, and install it by inserting the top part of panel into the panel.

Installing the First Front Back Panel




7 Install the first front back panel.

- 6 screws (M4 x 8)
- 1 spacer for each screw (for 4 locations excluding the middle one)

Now, you have finished with the procedures to install the exterior panels and the insertion unit.

5.2.4 Removing/Installing the Second Front Door

This section describes the instructions on how to remove and install the second front door.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Requirements

The works in this section can be performed using only the standard tools.

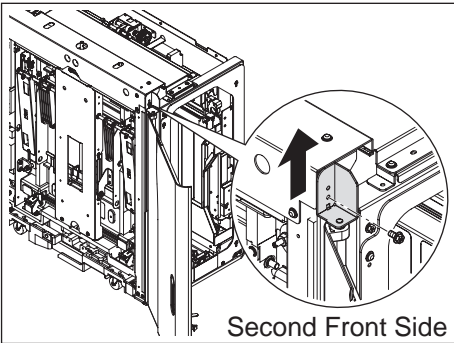
■ Removal Procedures

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 3)
1	

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.



2 Remove the fulcrum bracket assembly, while supporting the second front door.

- 1 hex/Phillips-head screw (M4 x 8)

3 Remove the second front door from the lower pin.

Now, you have finished with the procedures to remove the second front door.

■ Installation Procedures

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 1 to 2)
1	

1 Insert the second front door into the lower pin.

2 Install the fulcrum bracket assembly.

- 1 hex/Phillips-head screw (M4 x 8)

3 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.

Now, you have finished with the procedures to install the second front door.

5.2.5 Removing/Installing the Optical Unit

This section describes the instructions on how to remove and install the optical unit.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Requirements

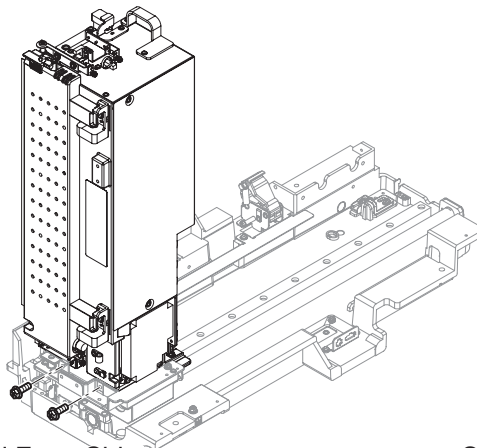
Shown below is the tool requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Vinyl sheet (used for covering the light condensing unit to screen out dust on it)

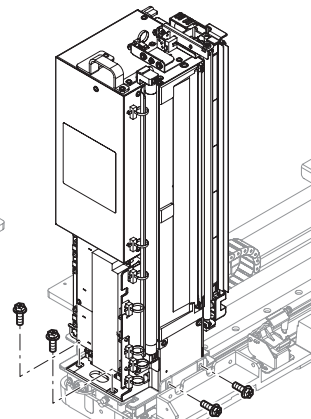
Positions of the Setscrews on the Optical Unit

The optical unit is secured to the holding plate unit assembly on the subscan unit with 6 screws.

Remove 2 setscrews on the second front side after moving the optical unit to the second front side. Remove a total of 4 setscrews on the first and second front sides after moving the optical unit to the second front back side.



Second Front Side



Second Front Back Side

■ Removal Procedures

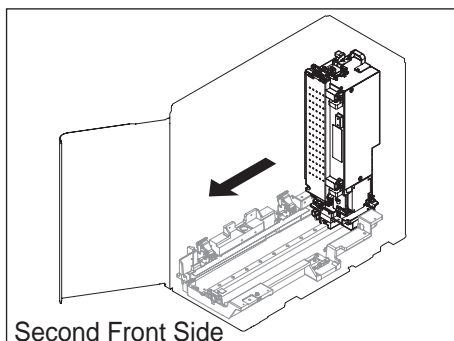
Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

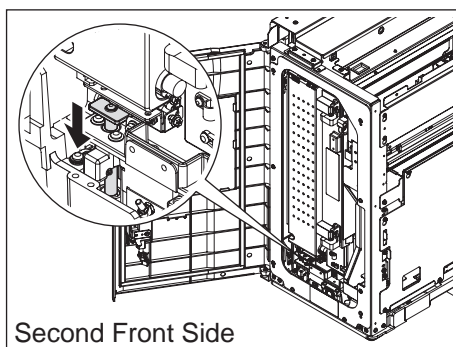
Personnel Number	Work Hours (steps 2 to 12)
1	

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.

- 2 Move the optical unit to the second front side.



Second Front Side

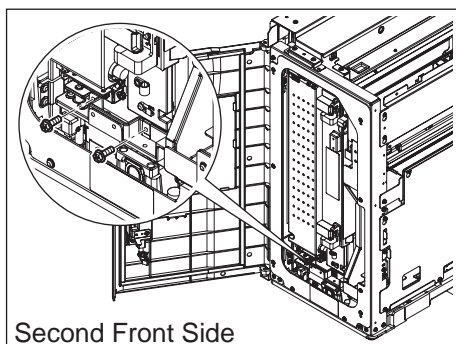


3 Fix the unit using a simple fixing lock.



Note

When the optical unit moves all the way toward the front, fixing shaft will automatically lower to lock.



4 Remove the setscrews on the second front side of the optical unit.

- 2 hex/Phillips-head screws (M4 x 12)

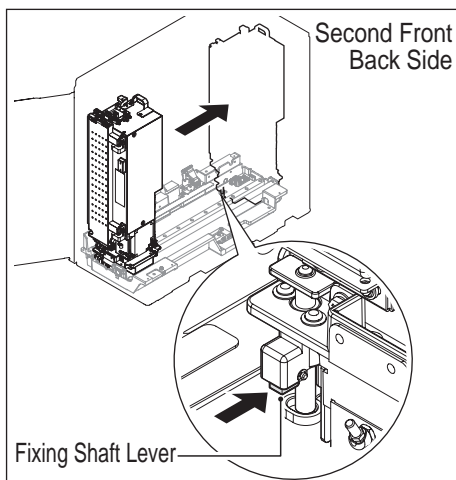
5 Release the simple fixing lock.

Lock will be released by pulling up the blue knob.



Important

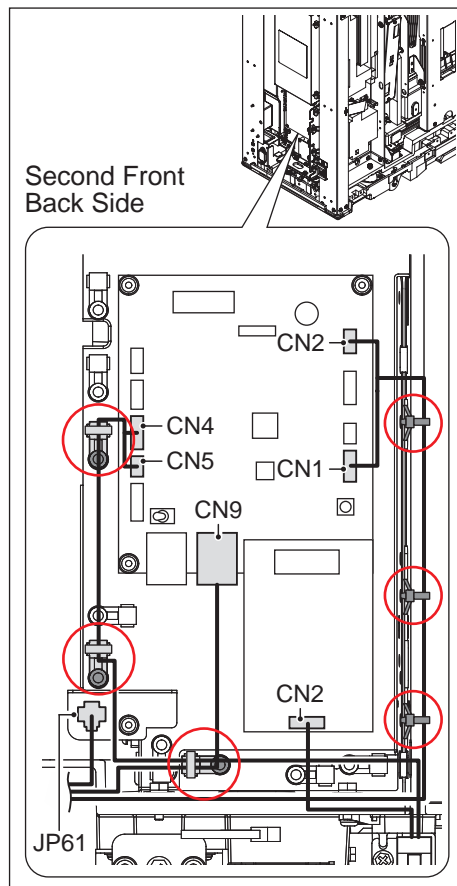
Push the optical unit slightly towards the back when pulling up the knob. Fixing shaft might move down, and get locked again if the optical unit is at its hithermost position.



6 Move the optical unit to the second front back side.

7 Fix the unit using a simple fixing lock.

Push the blue fixing shaft lever to lower the fixing shaft and have the unit locked.



8 Remove the cables connected to the optical unit.

- LMC
 - CN1 (ACN1: cable)
 - CN2 (ACN2: cable)
 - CN4 (ACN4: cable)
 - CN5 (ACN5: cable)
 - CN9 (ACN9: cable)
- LMD
 - CN2 (LMCN2: cable)
This connector may have been fixed very tightly.
- Eraser unit junction cable
 - JJ61 (JP61: cable)



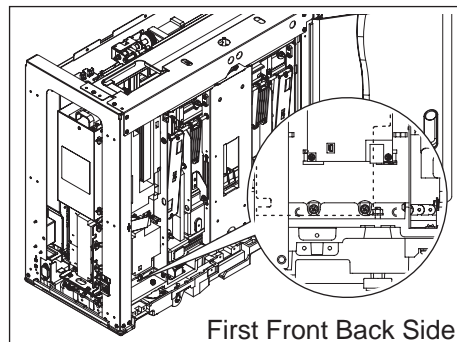
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

9 Remove the snap ties and other parts.

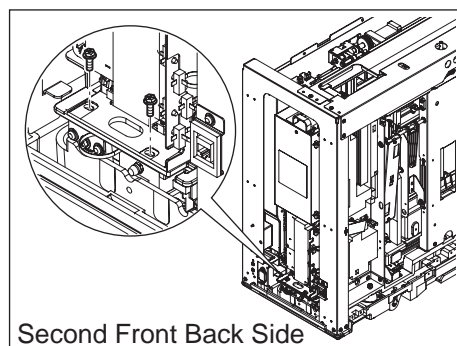
- Snap ties at 3 locations
- Tie fixtures at 3 locations

You do not have to cut off the ties coming with the tie fixtures.



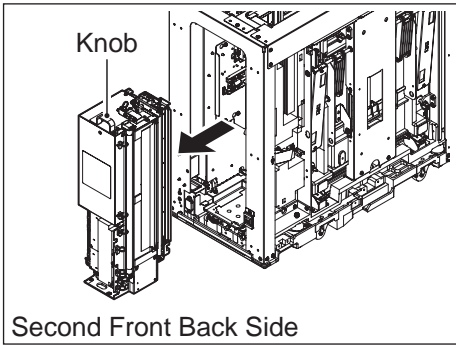
10 Remove the setscrews on the first front back side of the optical unit.

- 2 hex/Phillips-head screws (M4 x 12)

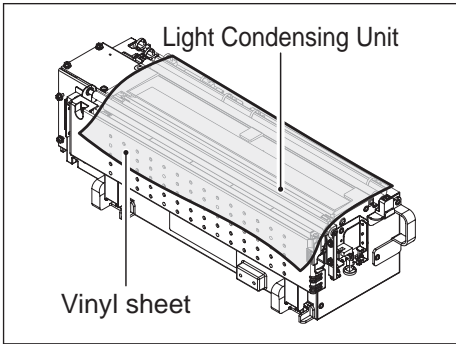


11 Remove the setscrews on the second front back side of the optical unit.

- 2 hex/Phillips-head screws (M4 x 12)



- 12 Remove the optical unit, holding the knob on top of the optical unit with the bottom surface. Place the removed optical unit in a level and stable place.



If you are going to lay it down, turn up the light condensing unit and cover it with a vinyl sheet in order to screen out dust on it.

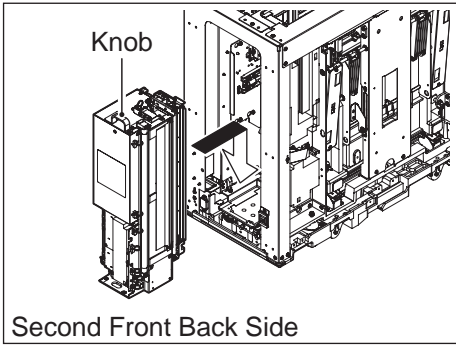
Now, you have finished with the procedures to remove the optical unit.

■ **Installation Procedures**

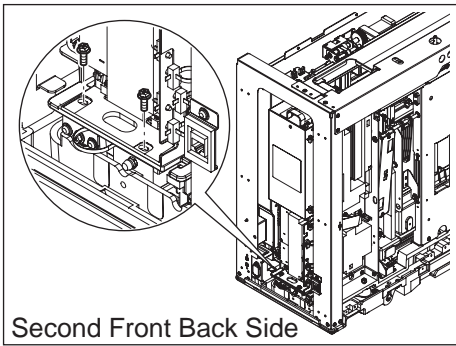
Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

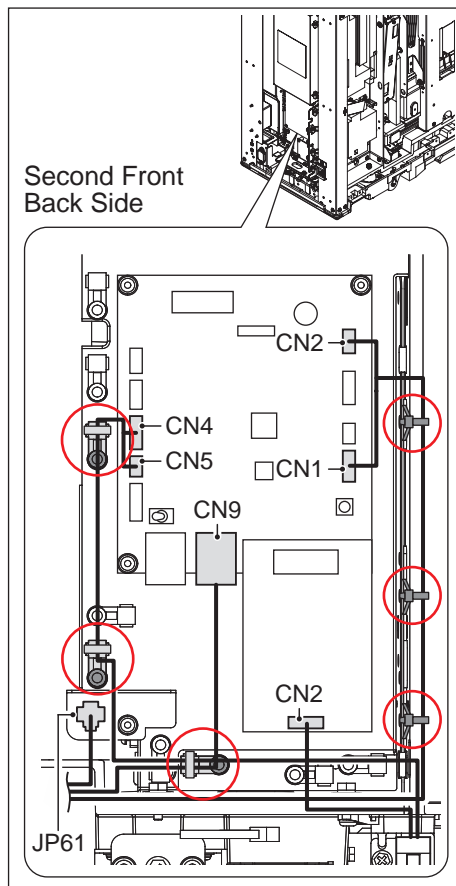
Personnel Number	Work Hours (steps 1 to 18)
1	



- 1 Move the holding plate on the subscan unit to the second front back side to fix it using a simple fixing lock.
- 2 Place the optical unit on the holding plate.



- 3 Temporarily fix the setscrews on the second front back side.
- 2 hex/Phillips-head screws (M4 x 12)

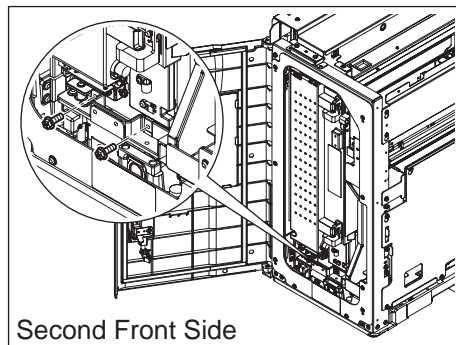


4 Connect the cables to the circuit board on the optical unit.

- LMC
 - CN1 (ACN1: cable)
 - CN2 (ACN2: cable)
 - CN4 (ACN4: cable)
 - CN5 (ACN5: cable)
 - CN9 (ACN9: cable)
- LMD
 - CN2 (LMCN2: cable)
- Eraser unit junction cable
 - JJ61 (JP61: cable)

5 Install the snap ties and other parts.

- Snap ties at 3 locations
- Tie fixtures at 3 locations



6 Release the simple fixing lock and move the optical unit to the second front side.



Push the optical unit slightly towards the back when pulling up the knob. Fixing shaft might move down, and get locked again if the optical unit is at its hithermost position.

7 In the second front side, fix the optical unit using a simple fixing lock.

8 Temporarily fix the setscrews on the second front side.

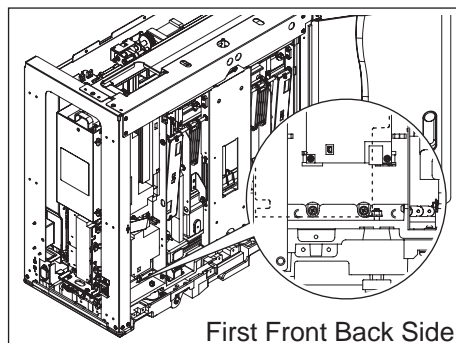
- 2 hex/Phillips-head screws (M4 x 12)

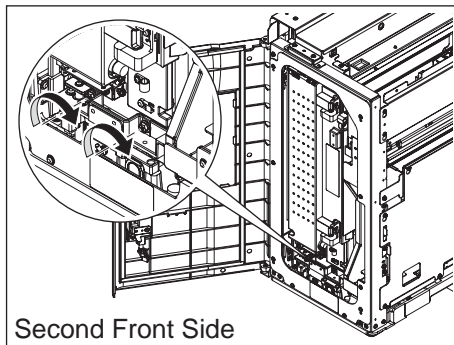
9 Release the simple fixing lock and move the optical unit to the second front back side.

10 In the second front back side, fix the optical unit using a simple fixing lock.

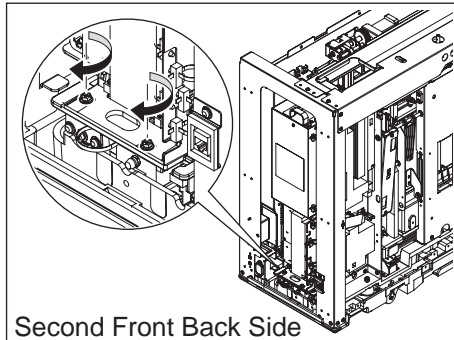
11 Install the setscrews on the first front back side.

- 2 hex/Phillips-head screws (M4 x 12)





- 12 Release the simple fixing lock and move the optical unit to the second front side.
- 13 In the second front side, fix the optical unit using a simple fixing lock.
- 14 Fully tighten the setscrews on the second front side.
 - 2 hex/Phillips-head screws (M4 x 12)



- 15 Release the simple fixing lock and move the optical unit to the second front back side.
- 16 In the second front back side, fix the optical unit using a simple fixing lock.
- 17 Fully tighten the setscrews on the second front back side.
 - 2 hex/Phillips-head screws (M4 x 12)
- 18 Release the simple fixing lock.

- 19 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the exterior panel and insertion unit.

Now, you have finished with the procedures to install the optical unit.

5.2.6 Moving the Push Plate Unit

This section describes the instructions on how to move the push plate unit with the power off.



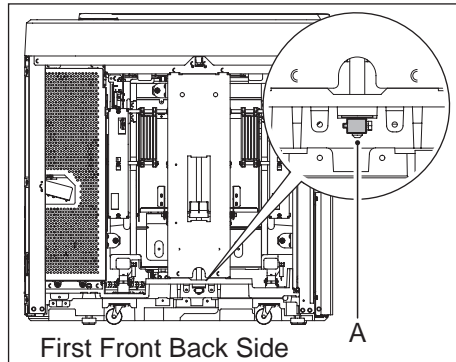
Caution

- First, move the optical unit to the second front back side, then move the push plate unit.
- When moving the push plate unit into the vicinity of the press down position, be careful so that it will not contact the receiver.

Requirements

The works in this section can be performed using only the standard tools.

■ If the insertion unit has not been removed:



1 See "■ Removal Procedures (Page 5-6)" of the "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit", and remove the first front back panel.

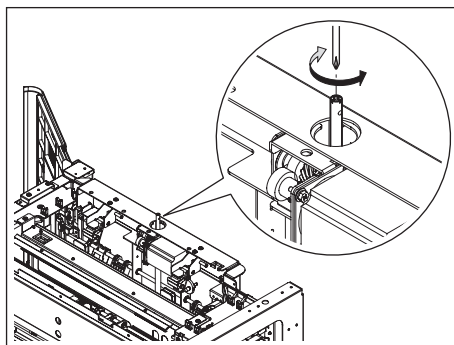
2 Move the optical unit to the second front back side.

3 Turn A (drive shaft presser) in the figure to move the push plate unit.

Relationship between the rotating direction of A in the figure (drive shaft holder) and the movement direction of the push plate is as shown below.

Rotating Direction Seen From Above	Movement Direction
Clockwise	First Front Side
Counter Clockwise	First Front Back Side

■ If the insertion unit has been removed:



1 Move the optical unit to the second front back side.

2 Turn the shaft to move the push plate unit.

Relationship between the rotating direction of the shaft and the movement direction of the push plate is as shown below.

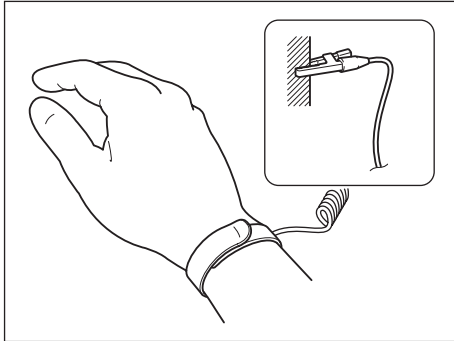
Rotating Direction	Movement Direction
Clockwise	First Front Side
Counter Clockwise	First Front Back Side

5.2.7 Binding the Grounding Strap



Caution

You must bind the grounding strap when accessing the circuit board in order to prevent the circuit board being damaged by static discharge.



- 1 Bind the grounding strap around your wrist, then have the other clip nip the metallic portion of the main unit that is surely grounded.

5.3 Replacing the Parts on the Insertion Unit

5.3.1 Replacing the Operation Unit (Operation Panel)

This section describes the instructions on how to replace the operation unit. Following are the procedures available for the unit with the horizontal positioning, though the same procedures can be used for the unit with the vertical positioning.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

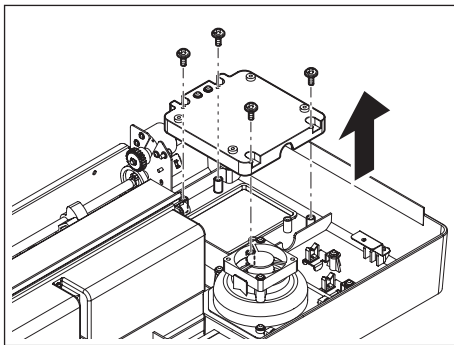
Personnel Number	Work Hours (steps 2 to 5)
1	

Requirements

The works in this section can be performed using only the standard tools.

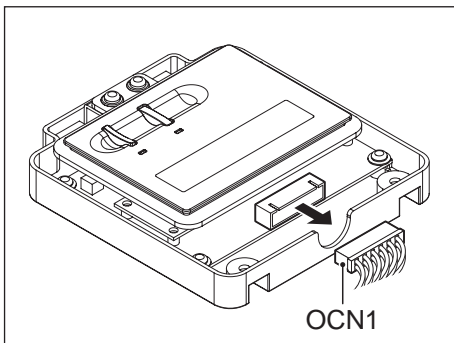
- 1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.



- 2 Remove the operation unit.

- 4 tapping screws (M4 x 10)



- 3 Unplug a cable from the operation unit.

- Connector (OCN1)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4 Connect the cable to the new operation unit.

- 5 See [Step 2](#) to install the operation unit.

- 4 tapping screws (M4 x 10)

- 6 See "■ [Installation Procedures \(Page 5-8\)](#)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the operation unit.

5.3.2 Changing the Mounting Location of the Operation Unit

This section describes the instructions on how to change the mounting location of the operation unit. Following are the procedures taking example for the case that the horizontal positioning will be changed to the vertical positioning, though the same procedures can be used for the unit with the vertical positioning.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

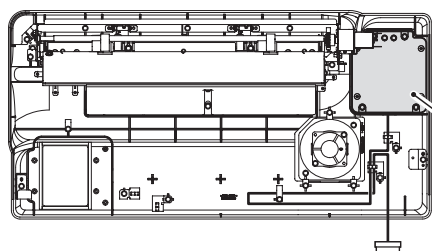
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

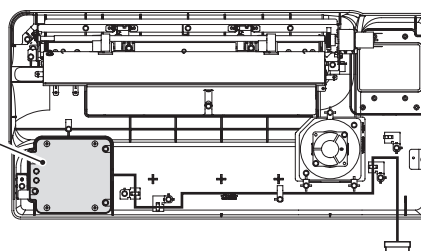
The works in this section can be performed using only the standard tools.

Attachment Position of the Operation Panel

Horizontal Positioning (Factory Default)



Vertical Positioning



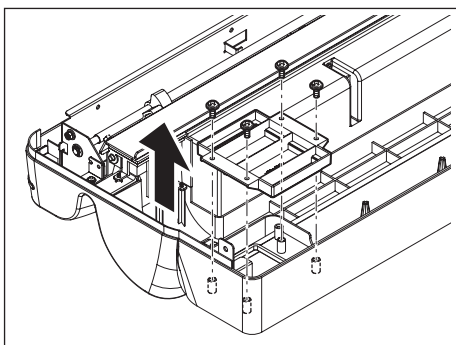
Operation Unit

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.

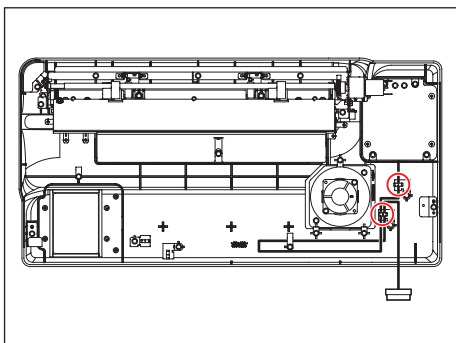
- 2 Remove the dummy operation panel.

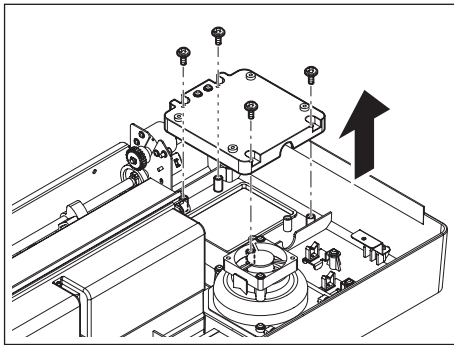
- 4 tapping screws (M4 x 10)



- 3 Unplug the cable to the operation unit at the clamps.

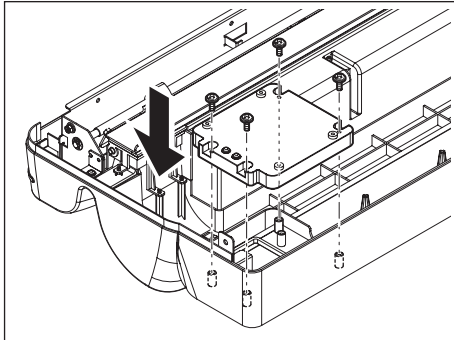
- Clamps for 2 locations





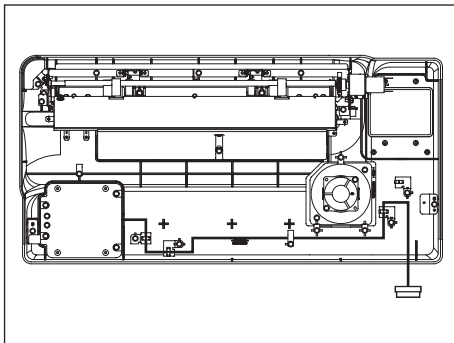
4 Remove the operation unit.

- 4 tapping screws (M4 x 10)



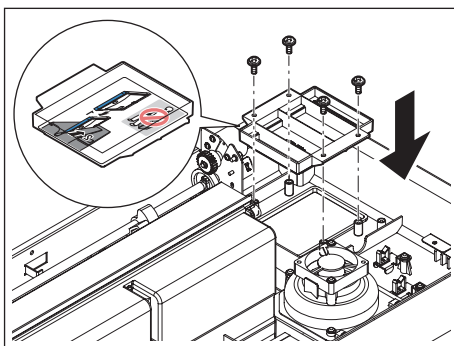
5 Place the operation unit at the position where the dummy operation unit was placed.

- 4 tapping screws (M4 x 10)



6 Follow the figure to wire the cables to the operation unit.

- Clamps for 4 locations



7 Install the dummy operation unit.

- 4 tapping screws (M4 x 10)



Important


Install the unit in a direction so that the bottom of the "Cassette loaded/Do not sit on" label is the operation side.

8 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to change the mounting location of the operation unit.

5.3.3 Replacing the Eraser Cooling Fan

This section describes the instructions on how to replace the eraser cooling fan.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

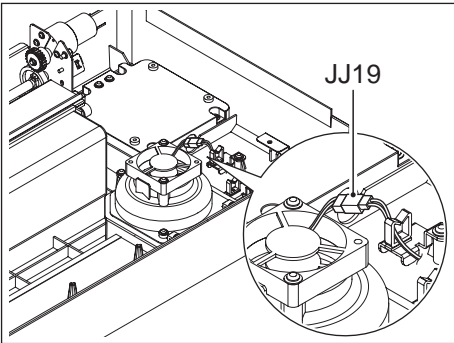
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 5)
1	


Requirements

The works in this section can be performed using only the standard tools.

- 1
- See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the insertion unit.
Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.

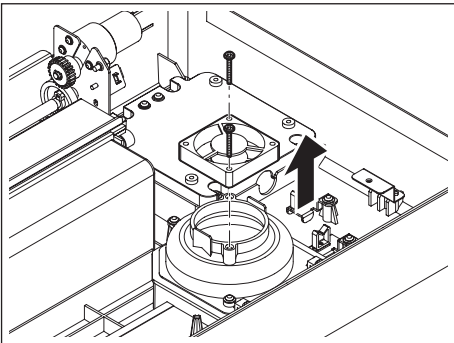


- 2
- Remove the connector (JJ19).



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



- 3
- Remove the eraser cooling fan.
 - 2 tapping screws (M4 x 25)
- 4
- Install the new eraser cooling fan.
 - 2 tapping screws (M4 x 25)

- 5
- Connect the connector (JJ19) that was removed in [Step 2](#).

- 6
- See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the eraser cooling fan.

5.3.4 Replacing the Indicator

This section describes the instructions on how to replace the indicator.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

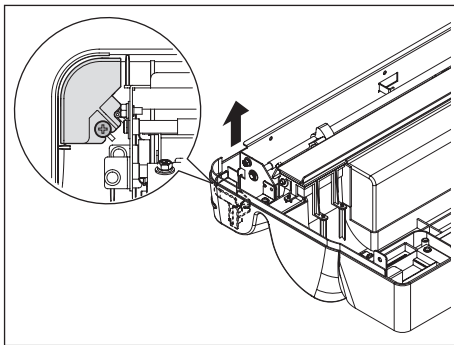
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

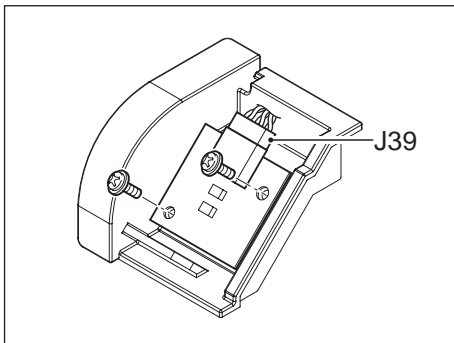
The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.



- 2 Remove the insertion indicator unit assembly.
 - 1 tapping screw (M4 x 10)



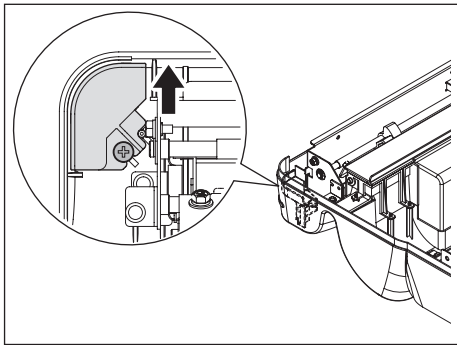
- 3 Unplug a cable from the indicator.
 - Connector (J39)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4 Remove the indicator.
 - 2 tapping screws (M3 x 8)
- 5 Install the new indicator.
 - 2 tapping screws (M3 x 8)
- 6 Connect the cable to the indicator.
 - Connector (J39)



- 7** Install the insertion indicator unit assembly.
- 1 tapping screw (M4 x 10)
- Move the insertion indicator in the direction of the arrow shown in the figure to fix it.

- 8** See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the indicator.

5.3.5 Replacing the Barcode Reader

This section describes the instructions on how to replace the barcode reader.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

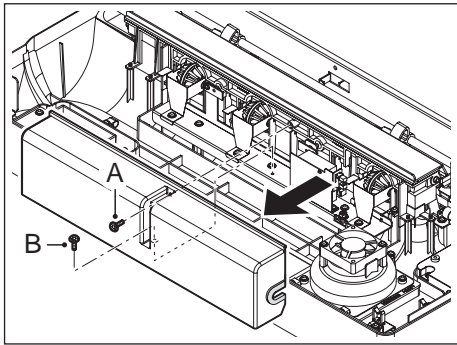
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

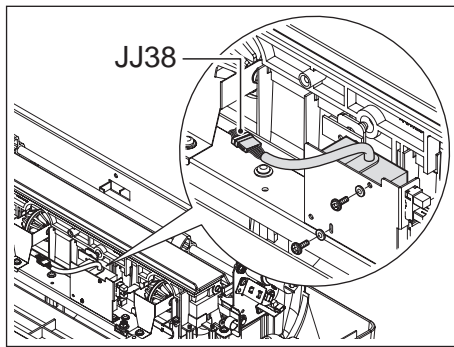
The works in this section can be performed using only the standard tools.

- 1** See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.



- 2** Remove the light shield cover.
- A: 1 tapping screw (M4 x 10)
 - B: 1 screw (M4 x 8)
- Remove the sponge protecting the cable at the right side of the light shield cover too.



3 Remove the connector (JJ38).

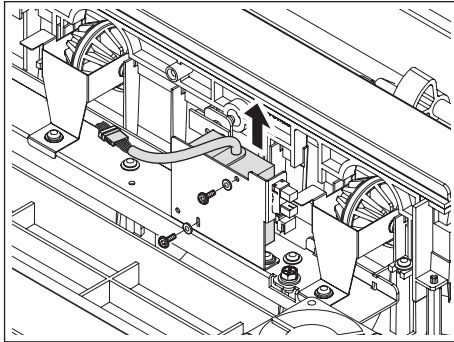


Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

4 Remove the barcode reader.

- 2 screws (M2 x 6)
- 1 washer for each screw



5 Install the new barcode reader.

- 2 screws (M2 x 6)
- 1 washer for each screw

Move the barcode reader in the direction of the arrow shown in the figure to fix it.

6 Connect the connector (JJ38) that was removed in [Step 3](#).

7 Install the light shield cover that was removed in [Step 2](#).

- 1 tapping screw (M4 x 10)
- 1 screw (M4 x 8)

Attach the sponge to the right side of the light shield cover, and wrap the cable with it.

8 See "[Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the barcode reader.

5.3.6 Replacing the Back Plate Drop Detection Sensor

This section describes the instructions on how to replace the back plate drop detection sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

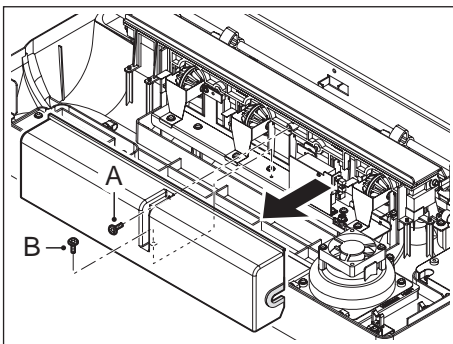
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

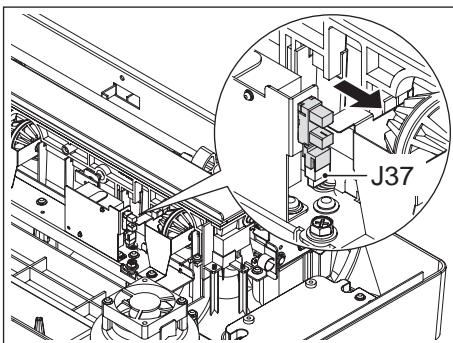
Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.



- 2 Remove the light shield cover.

- A: 1 tapping screw (M4 x 10)
- B: 1 screw (M4 x 8)

Remove the sponge protecting the cable at the right side of the light shield cover too.



- 3 Remove the back plate drop detection sensor.

- 4 Unplug the cable from the back plate drop detection sensor.

- Connector (J37)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 5 Connect the cable to the new back plate drop detection sensor.

- 6 Install the back plate drop detection sensor.

- 7 Install the light shield cover that was removed in [Step 2](#).

- 1 tapping screw (M4 x 10)
- 1 screw (M4 x 8)

Attach the sponge to the right side of the light shield cover, and wrap the cable with it.

- 8 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the back plate drop detection sensor.

5.3.7 Replacing the Insertion Slot Detection Sensors (LLB)

This section describes the instructions on how to replace the insertion slot detection sensors (LLB).



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

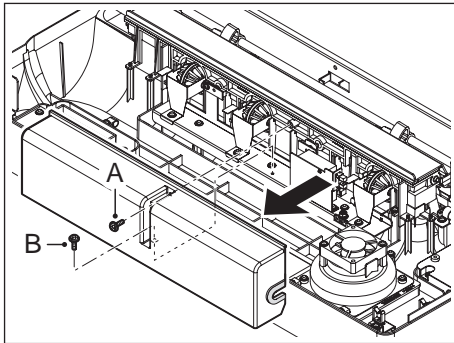
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

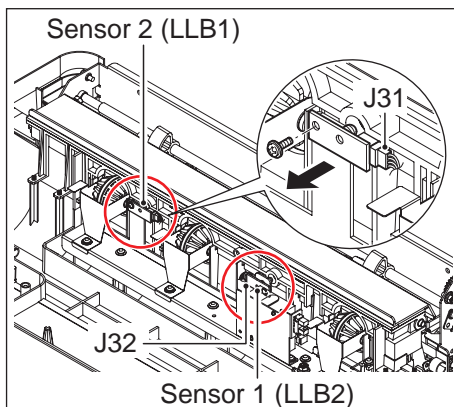
Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.



- 2 Remove the light shield cover.

- A: 1 tapping screw (M4 x 10)
- B: 1 screw (M4 x 8)

Remove the sponge protecting the cable at the right side of the light shield cover too.



- 3 Remove the insertion slot detection sensors (LLB).

- Insertion slot detection sensor 1: 1 screw (M3 x 6)
- Insertion slot detection sensor 2: 1 screw (M3 x 6)

- 4 Unplug the cables from the insertion slot detection sensors (LLB).

- Insertion slot detection sensor 1: connector (J32)
- Insertion slot detection sensor 2: connector (J31)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 5 Connect the cables to the new insertion slot detection sensors (LLB).

- 6 Install the insertion slot detection sensors (LLB).

- Insertion slot detection sensor 1: 1 screw (M3 x 6)
- Insertion slot detection sensor 2: 1 screw (M3 x 6)

7 Install the light shield cover that was removed in Step 2.

- 1 tapping screw (M4 x 10)
- 1 screw (M4 x 8)


Attach the sponge to the right side of the light shield cover, and wrap the cable with it.

8 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the insertion slot detection sensor (LLB).

5.3.8 Replacing the Insertion Slot Detection Sensors (LPB)

This section describes the instructions on how to replace the insertion slot detection sensors (LPB).



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 12)
1	

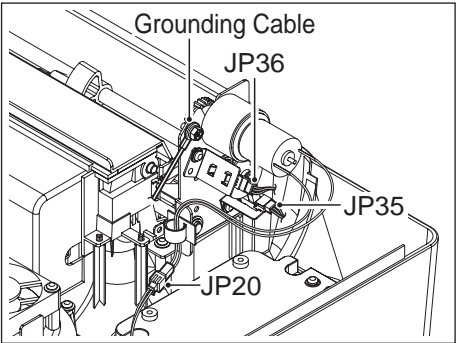
Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	0.2 mm spacer (film, etc.) A piece of film has about 0.2 mm in thickness.


1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.



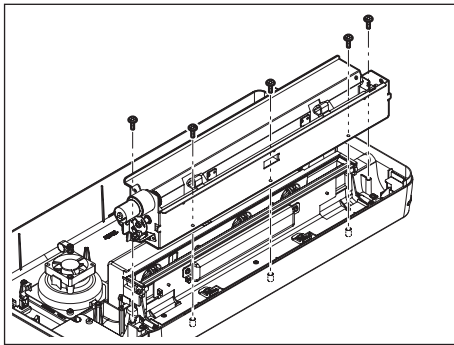
2 Unplug the cables connected to the shutter unit assembly.

- Connector (JP20): shutter motor
- Connector (JP36): shutter close detection sensor
- Connector (JP35): shutter open detection sensor
- Grounding cable: 1 hex/Phillips-head screw (M5 x 10)



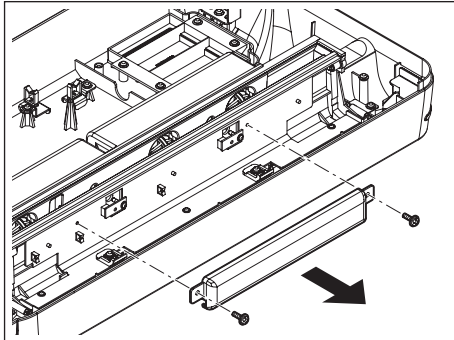
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



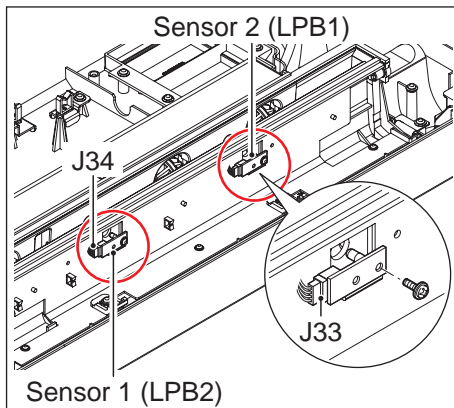
3 Remove the shutter unit assembly.

- 5 tapping screws (M4 x 10)



4 Remove the sensor cover.

- 2 screws (M4 x 8)



5 Remove the insertion slot detection sensors (LPB).

- Insertion slot detection sensor 1: 1 screw (M3 x 6)
- Insertion slot detection sensor 2: 1 screw (M3 x 6)

6 Unplug the cables from the insertion slot detection sensors (LPB).

- Insertion slot detection sensor 1: connector (J34)
- Insertion slot detection sensor 2: connector (J35)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

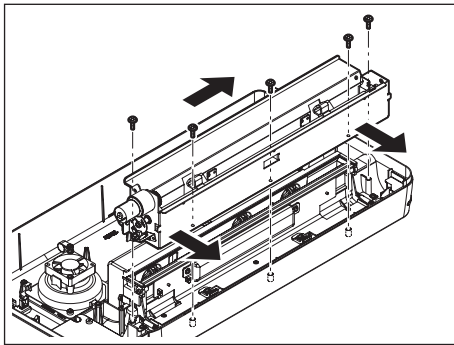
7 Connect the cables to the new insertion slot detection sensors (LPB).

8 Install the insertion slot detection sensors (LPB).

- Insertion slot detection sensor 1: 1 screw (M3 x 6)
- Insertion slot detection sensor 2: 1 screw (M3 x 6)

9 Install the sensor cover that was removed in [Step 4](#).

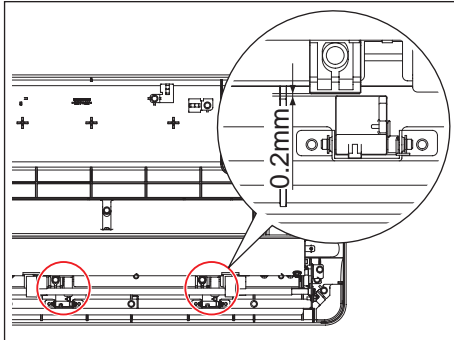
- 2 screws (M4 x 8)



10 Install the shutter unit assembly that was removed in [Step 3](#).

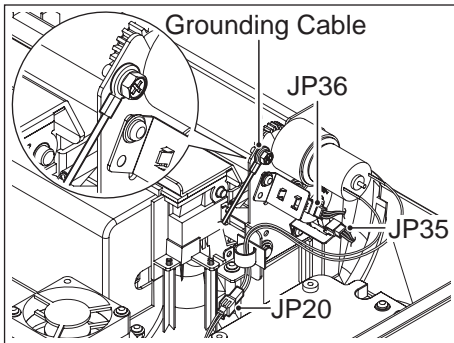
- 5 tapping screws (M4 x 10)

Press it in a direction of the arrow shown in the figure to fix it.



11 Use a 0.2 mm-spacer (film) to check the clearance between the lock cam and the stopper block.

If the clearance is any other value than 0.2 mm, adjust the position of the stopper block.



12 Connect the cables that were unplugged in [Step 2](#) to the shutter unit assembly.

- Connector (JP20): shutter motor
- Connector (JP35): shutter close detection sensor
- Connector (JP36): shutter open detection sensor
- Grounding cable: 1 hex/Phillips-head screw (M5 x 10)



Always attach the grounding cable in the direction shown in the figure.

13 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the insertion slot detection sensor (LPB).

5.3.9 Replacing the Shutter Open Detection Sensor

This section describes the instructions on how to replace the shutter open detection sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 10)
1	

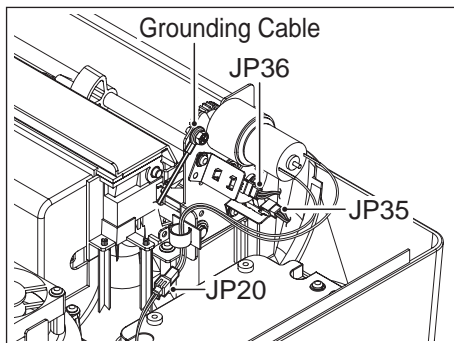
Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	0.2 mm spacer (film, etc.) A piece of film has about 0.2 mm in thickness.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.



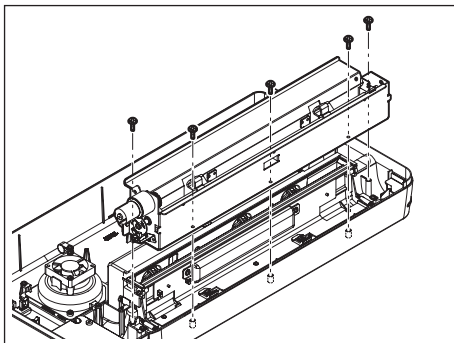
- 2 Unplug the cables connected to the shutter unit assembly.

- Connector (JP20): shutter motor
- Connector (JP36): shutter close detection sensor
- Connector (JP35): shutter open detection sensor
- Grounding cable: 1 hex/Phillips-head screw (M5 x 10)



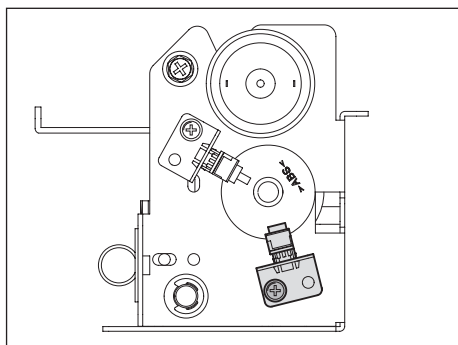
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



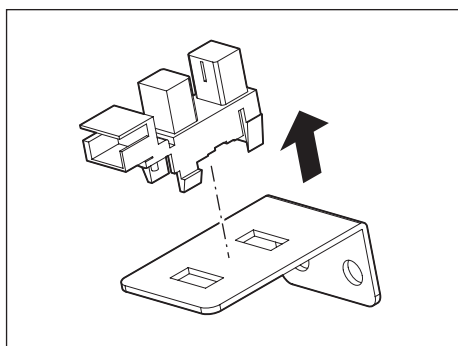
- 3 Remove the shutter unit assembly.

- 5 tapping screws (M4 x 10)



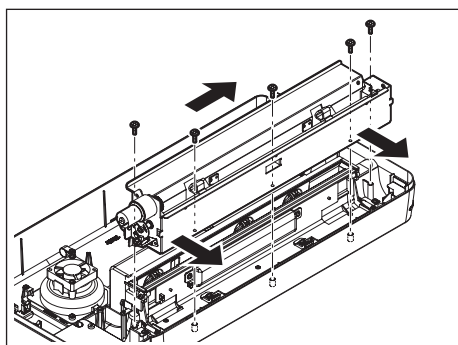
4 Remove the bracket from the shutter open detection sensor.

- 1 screw (M4 x 8)



5 Remove the shutter open detection sensor.

6 Install the new shutter open detection sensor on the bracket.



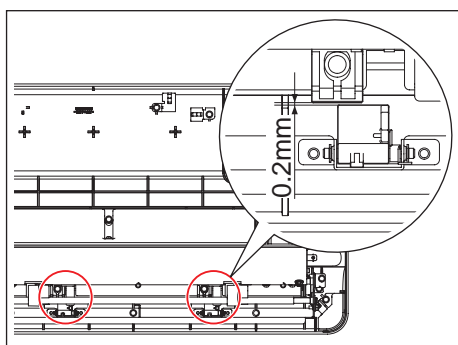
7 Install the bracket that was removed in [Step 4](#).

- 1 screw (M4 x 8)

8 Install the shutter unit assembly that was removed in [Step 3](#).

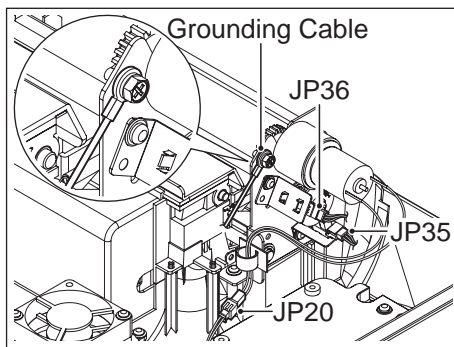
- 5 tapping screws (M4 x 10)

Press it in a direction of the arrow shown in the figure to fix it.



9 Use a 0.2 mm-spacer (film) to check the clearance between the lock cam and the stopper block.

If the clearance is any other value than 0.2 mm, adjust the position of the stopper block.



10 Connect the cables that were unplugged in [Step 2](#) to the shutter unit assembly.

- Connector (JP20): shutter motor
- Connector (JP35): shutter close detection sensor
- Connector (JP36): shutter open detection sensor
- Grounding cable: 1 hex/Phillips-head screw (M5 x 10)



Always attach the grounding cable in the direction shown in the figure.

11 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the shutter open detection sensor.

5.3.10 Replacing the Shutter Close Detection Sensor

This section describes the instructions on how to replace the shutter close detection sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

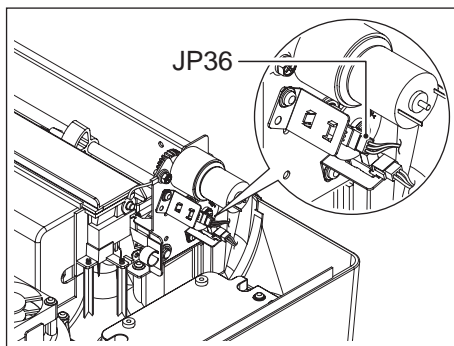
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

The works in this section can be performed using only the standard tools.

1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.

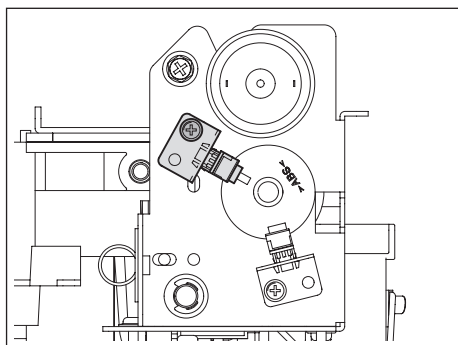


2 Unplug the cable from the shutter close detection sensor.

- Connector (JP36)

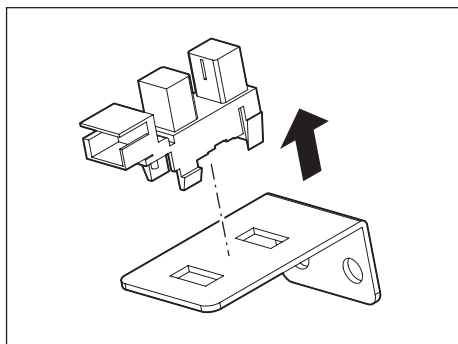


When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



3 Remove the bracket from the shutter close detection sensor.

- 1 screw (M4 x 8)



4 Remove the shutter close detection sensor.

5 Install the new shutter close detection sensor on the bracket.

6 Install the bracket that was removed in [Step 3](#).

- 1 screw (M4 x 8)

7 Connect the cables that were unplugged in [Step 2](#) to the shutter close detection sensor.

- Connector (JP36)

8 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the shutter close detection sensor.

5.3.11 Replacing the Shutter Motor

This section describes the instructions on how to replace the shutter motor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

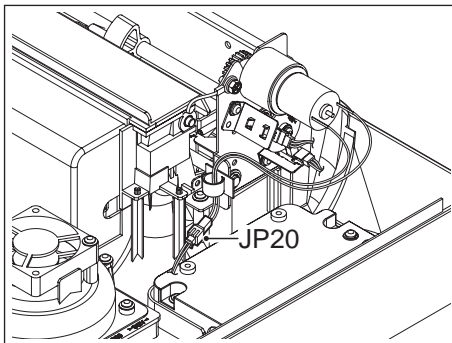
Personnel Number	Work Hours (steps 2 to 5)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.

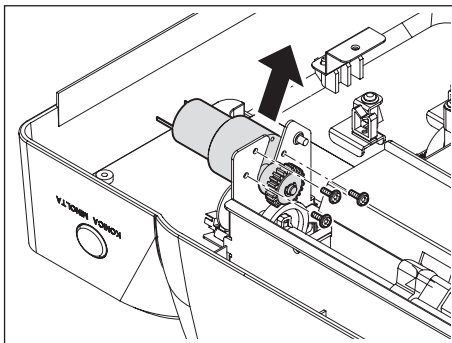


- 2 Remove the connector (JP20).



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



- 3 Remove the shutter motor.

- 3 screws (M3 x 6)

- 4 Install the new shutter motor.

- 3 screws (M3 x 6)


- 5 Connect the connector (JP20) that was removed in [Step 2](#).

- 6 See "■ [Installation Procedures \(Page 5-8\)](#)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the shutter motor.

5.3.12 Replacing the Shutter Unit

This section describes the instructions on how to replace the shutter unit.



Caution Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 7)
1	

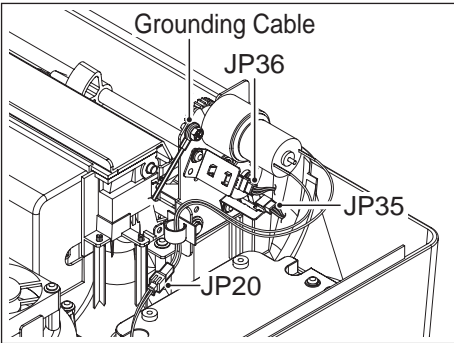
Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	0.2 mm spacer (film, etc.) A piece of film has about 0.2 mm in thickness.


1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the insertion unit.

Reverse the removed insertion unit and place it in a stable place in order to perform the replacing work.

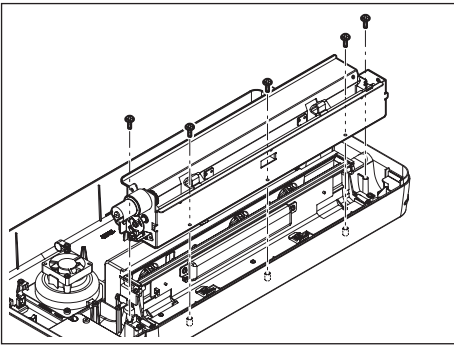


2 Unplug the cables connected to the shutter unit assembly.

- Connector (JP20): shutter motor
- Connector (JP36): shutter close detection sensor
- Connector (JP35): shutter open detection sensor
- Grounding cable: 1 hex/Phillips-head screw (M5 x 10)



Caution When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

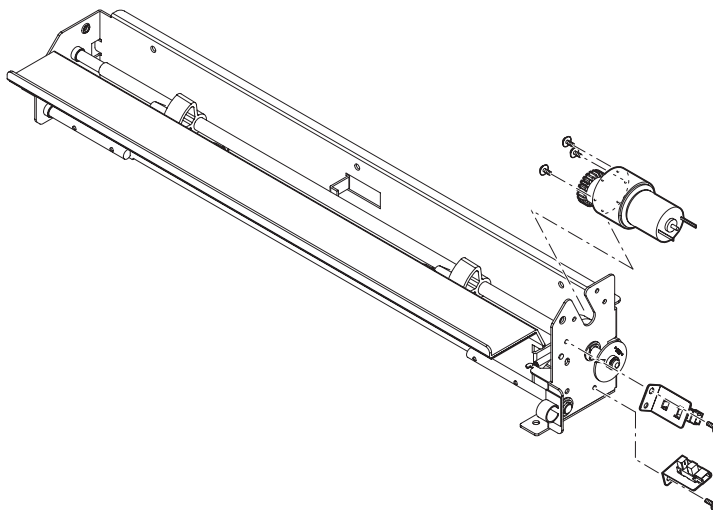


3 Remove the shutter unit assembly.

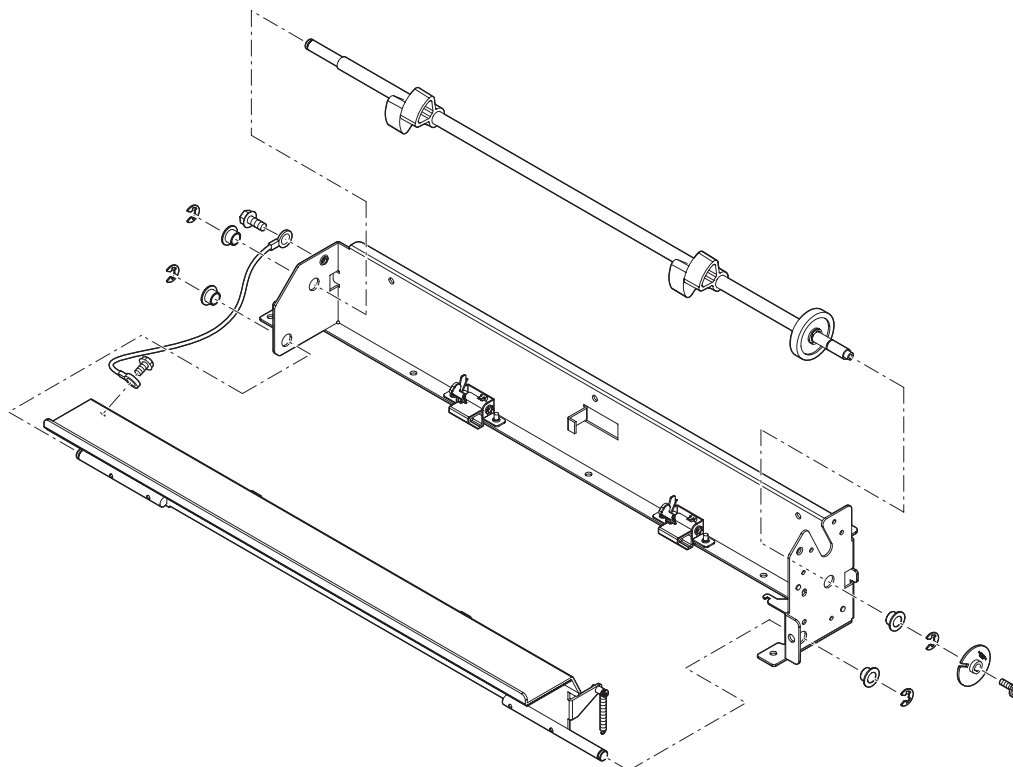
- 5 tapping screws (M4 x 10)

4 Replace the parts.

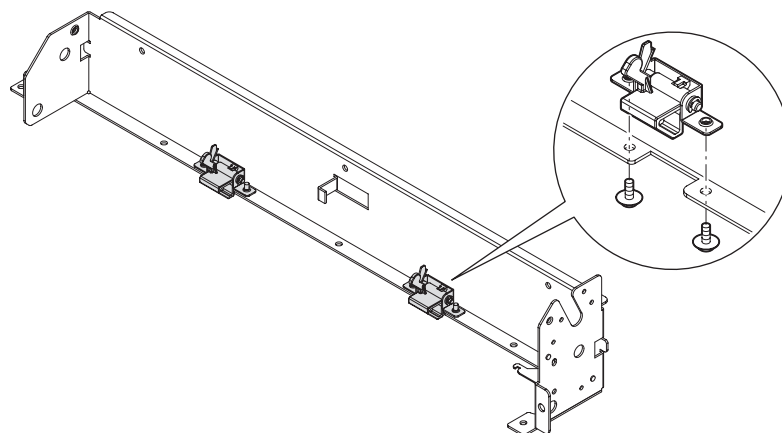
Removing the Shutter Motor and Shutter Sensor Unit Assembly



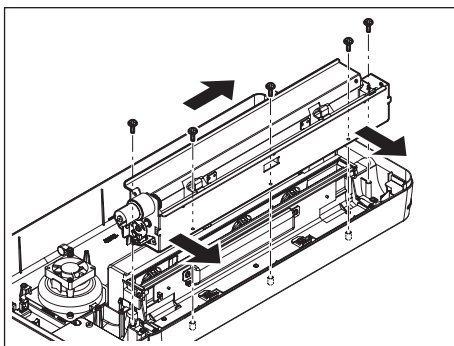
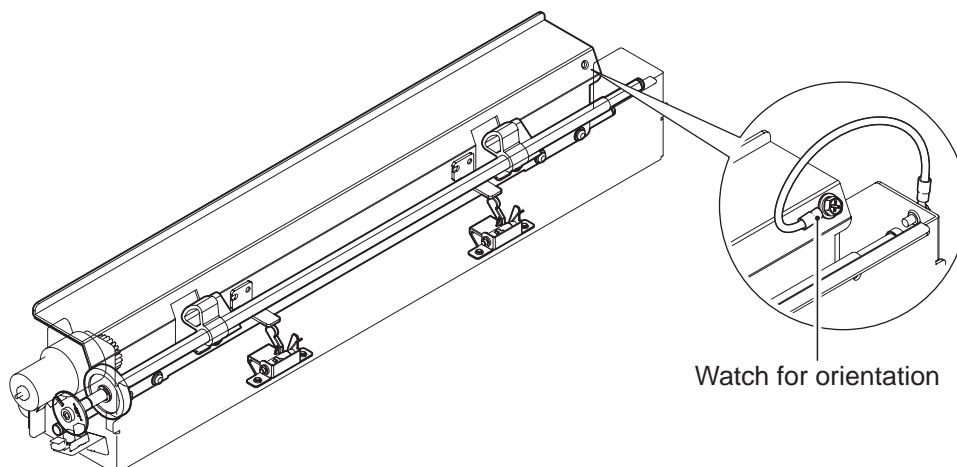
Removing the Shutter Motor and Shutter Plate unit Assembly and Cam Unit Assembly



Removing the Lock Unit Assembly



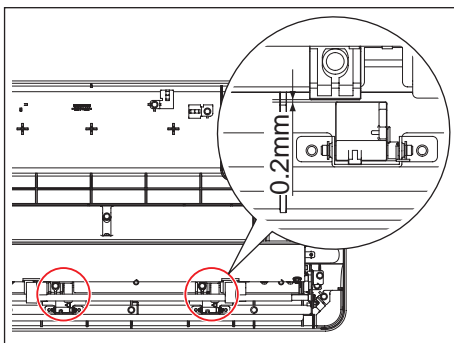
Assembly Figure



5 Install the shutter unit assembly that was removed in [Step 3](#).

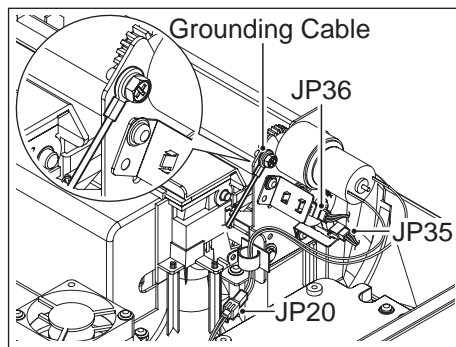
- 5 tapping screws (M4 x 10)

Press it in the direction of the arrow shown in the figure to fix it.



6 Use a 0.2 mm-spacer (film) to check the clearance between the lock cam and the stopper block.

If the clearance is any other value than 0.2 mm, adjust the position of the stopper block.



7 Connect the cables that were unplugged in [Step 2](#) to the shutter unit assembly.

- Connector (JP20): shutter motor
- Connector (JP36): shutter close detection sensor
- Connector (JP35): shutter open detection sensor
- Grounding cable: 1 hex/Phillips-head screw (M5 x 10)



Always attach the grounding cable in the direction shown in the figure.

8 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the shutter unit.

5.4 Replacing the Parts on the Receiver unit

5.4.1 Replacing the Justifier HP Sensor

This section describes the instructions on how to replace the justifier HP sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

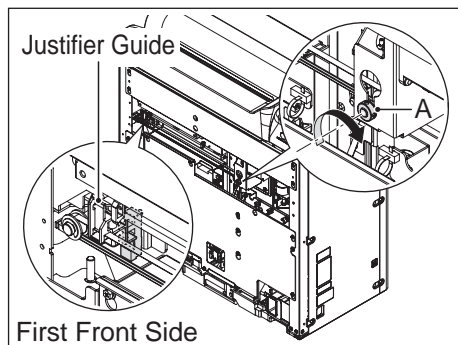
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 6)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.

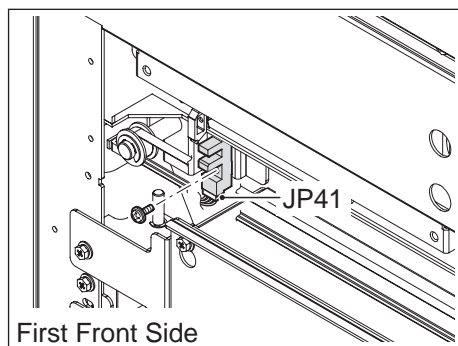


- 2 While the justifier guide is located upon the justifier HP sensor, turn A (thrust collar) to move the justifier guide.



Note

You can hold the justifier guide knob (green portion) to move the guide in the second front side.



- 3 Remove the justifier HP sensor.
 - 1 screw (M4 x 15)
- 4 Unplug the cable from the justifier HP sensor.
 - Connector (JP41)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 5 Connect the cable to the justifier HP sensor.
- 6 Install the justifier HP sensor.
 - 1 screw (M4 x 15)

- 7 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front panel.

Now, you have finished with the procedures to replace the justifier HP sensor.

5.4.2 Replacing the Justifier Sensor

This section describes the instructions on how to replace the justifier sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

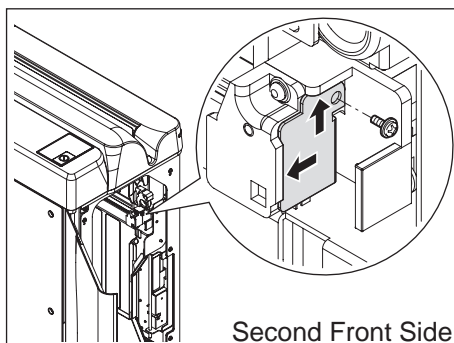
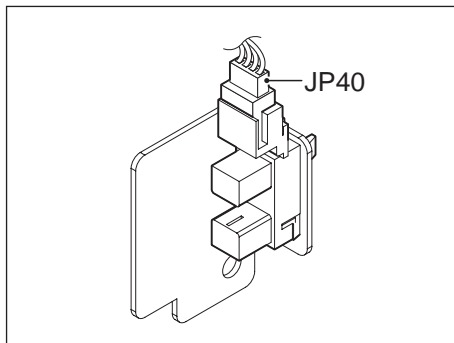
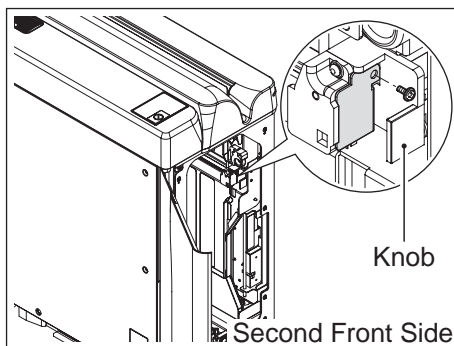
Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

Requirements

The works in this section can be performed using only the standard tools.



- 1 Open the second front door.
- 2 Remove the justifier detection mount board.

- 1 screw (M4 x 8)

If the justifier guide is not located in the home position (second front) side:

Hold the justifier guide knob (green portion) to move it toward you.

- 3 Unplug the cable from the justifier sensor.

- Connector (JP40)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4 Remove the justifier sensor.
- 5 Install the new justifier sensor on the positioning detection mount board.
- 6 Connect the cable to the justifier sensor.
- 7 Install the justifier detection mount board.


- 1 screw (M4 x 8)

Press it in a direction of the arrow shown in the figure to fix it.

Now, you have finished with the procedures to replace the justifier sensor.

5.4.3 Replacing the Justifier Motor

This section describes the instructions on how to replace the justifier motor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

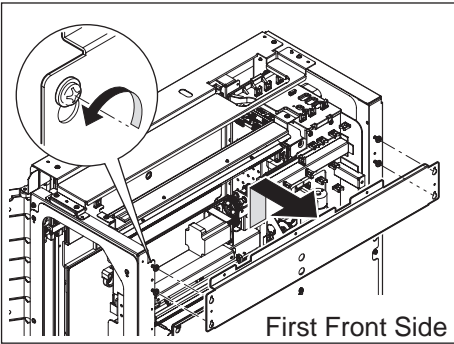
Personnel Number	Work Hours (steps 2 to 12)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

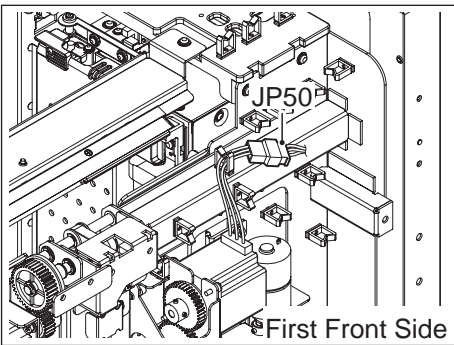
No.	Tool
1	Acoustic wave tension meter

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.




2 Remove the exterior frame (front).

- 4 screws (M4 x 8)
Loosen all screws.

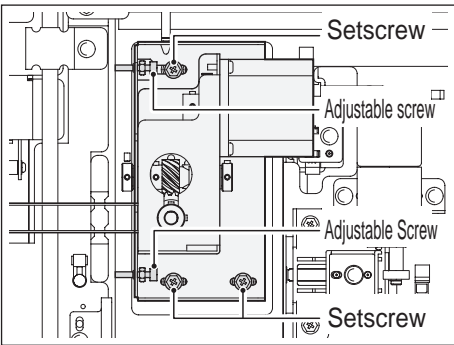


3 Remove the connector (JP50).



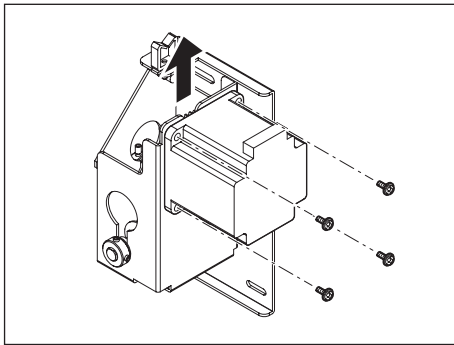
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



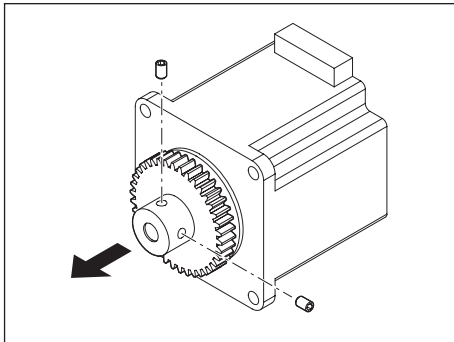
4 Remove the motor mount board.

1. Loosen the adjustable screws.
 - 2 hexagon socket head bolts (M4 x 20)
2. Remove the setscrews.
 - 3 hex/Phillips-head screws (M4 x 8)
3. Remove the motor mount board.



5 Remove the justifier motor.

- 4 screws (M4 x 12)



6 Remove the gear.

- 2 setscrews

7 Install the gear on the new justifier motor.

- 2 setscrews

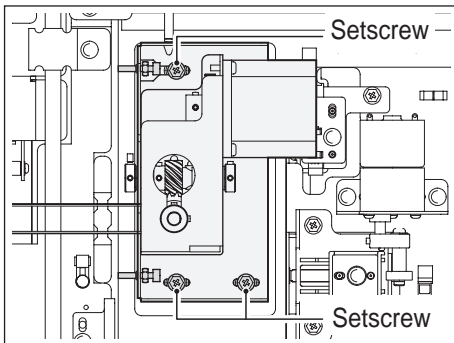
Fix the gear, fitting the edge surfaces of it and the motor shaft.

8 See [Step 5](#) to install the justifier motor on the motor mount board.

- 4 screws (M4 x 12)



Make sure the connector is in the right direction when installing the motor.



9 Temporarily secure the motor mount board to the main unit.

- 3 hex/Phillips-head screws (M4 x 8)

10 See "[6.1 Adjust Justifier Belt Tension \(Page 6-2\)](#)" to adjust the belt tension.

11 Connect the connector (JP50) that was removed in [Step 3](#).

12 Install the exterior frame (front) that was removed in [Step 2](#).


- 4 screws (M4 x 8)

13 See "[Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the justifier motor.

5.4.4 Replacing the Justifier Standard Sensor

This section describes the instructions on how to replace the justifier standard sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

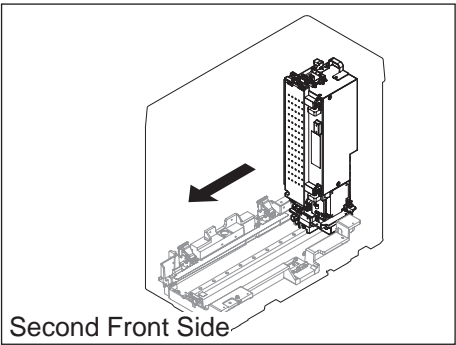
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 11)
1	

Requirements

The works in this section can be performed using only the standard tools.

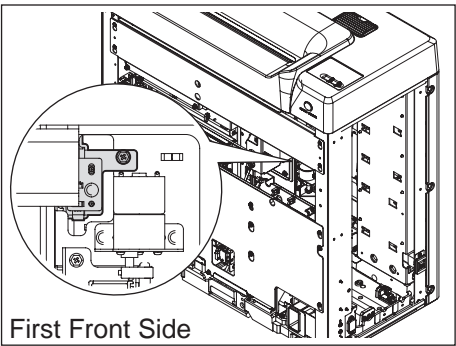
- 1
- See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the second front back panel and first front panel.



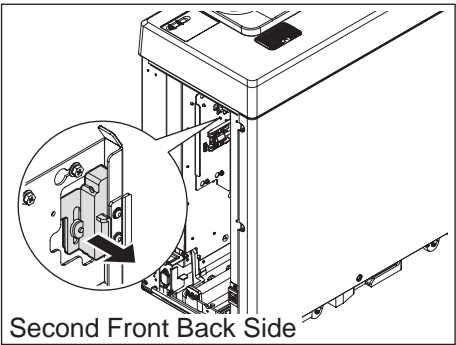
- 2
- Move the optical unit to the second front side.

If the push plate unit is not located at the read position, then the optical unit cannot be moved:

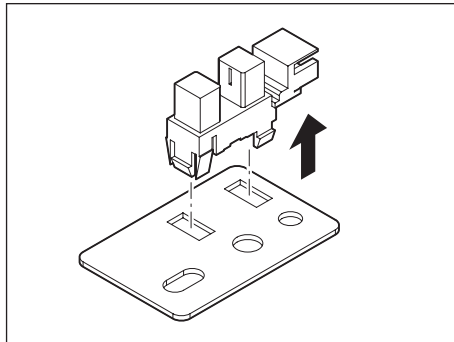
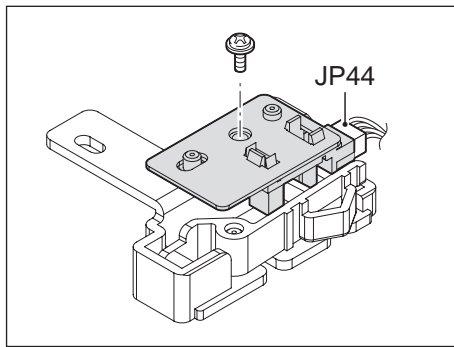
See "■ If the insertion unit has not been removed: (Page 5-17)" in "5.2.6 Moving the Push Plate Unit" to move the push plate unit to the read position, then move the optical unit to the second front side.



- 3
- Remove the setscrew from the cassette detection unit assembly.
 - 1 hex/Phillips-head screw (M4 x 8)



- 4
- Eject the cassette detection unit assembly from the second front back side.



5 Unplug the cable.

- Connector (JP44)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

6 Remove the justifier detection mount board 2.

- 1 screw (M4 x 10)

7 Remove the justifier standard sensor.

8 Install the new justifier standard sensor on the justifier detection mount board 2.

9 See [Step 6](#) to install the justifier detection mount board 2.

- 1 screw (M4 x 10)

10 Connect the cable that was unplugged in [Step 5](#) to the justifier standard sensor.

- Connector (JP44)

11 See [Step 3](#) and [Step 4](#) to install the cassette detection unit assembly.


- 1 hex/Phillips-head screw (M4 x 8)

12 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the removed exterior panel.

Now, you have finished with the procedures to replace the justifier standard sensor.

5.4.5 Replacing the Receiver Sensor

This section describes the instructions on how to replace the justifier receiver sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

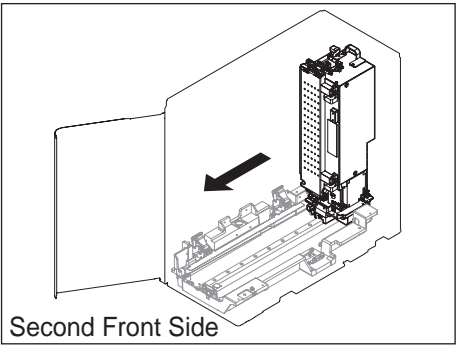
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 11)
1	

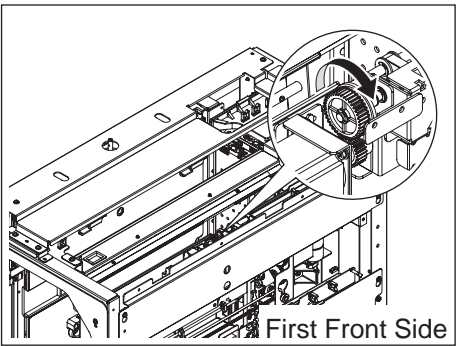
Requirements

The works in this section can be performed using only the standard tools.


- 1
- See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.



- 2
- Move the optical unit to the second front side.

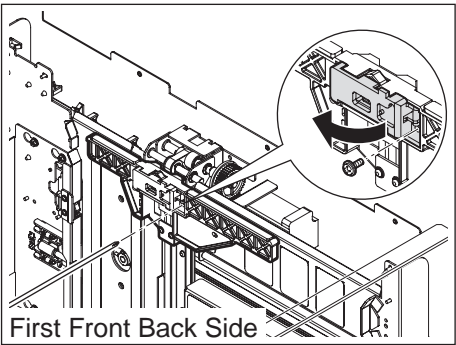


- 3
- Turn the gear shown in the figure to move the receiver toward the uppermost part.

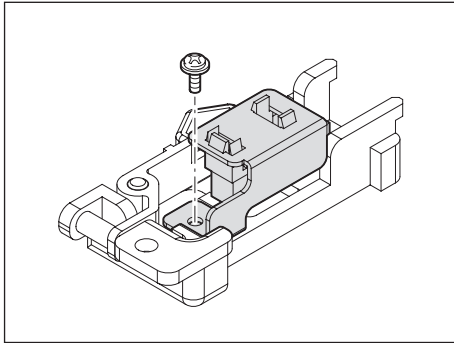


Important

When holding directly the receiver to move it up and down, be sure to hold it at the position approximate to the belt.

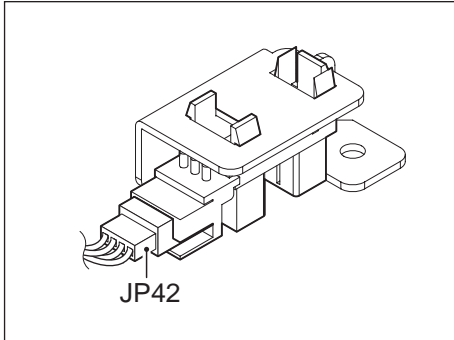


- 4
- Remove the receiver cover unit assembly.
 - 1 screw (M4 x 8)Access from the first front back side, using a long screw driver.



5 Remove the receiver detection mount board.

- 1 screw (M3 x 6)



6 Unplug the cable from the receiver sensor.

- Connector (JP42)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

7 Remove the receiver sensor.

8 Install the new receiver sensor on the receiver detection mount board.

9 Connect the cable to the receiver sensor.

- Connector (JP42)

Lower the receiver to the position easy to make the connection, as needed.

10 Install the receiver detection mount board that was removed in [Step 5](#).

- 1 screw (M4 x 8)

11 Install the receiver cover unit assembly that was removed in [Step 4](#).


- 1 screw (M4 x 8)

12 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the receiver sensor.

5.4.6 Replacing the Receiver HP Sensor

This section describes the instructions on how to replace the receiver HP sensor.

**Caution**

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

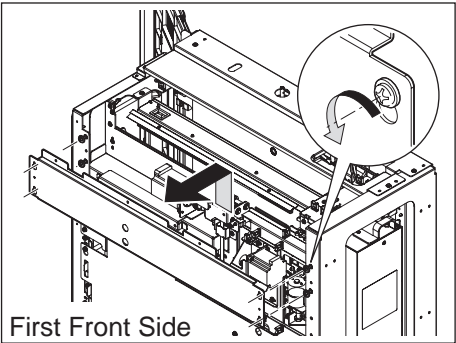
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 9)
1	

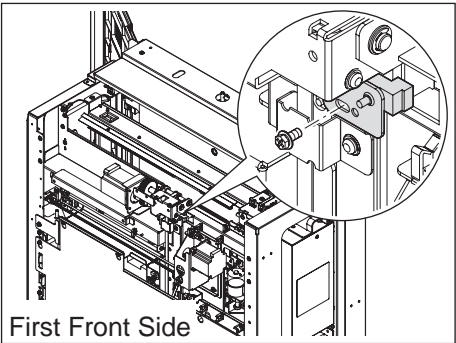
Requirements

The works in this section can be performed using only the standard tools.

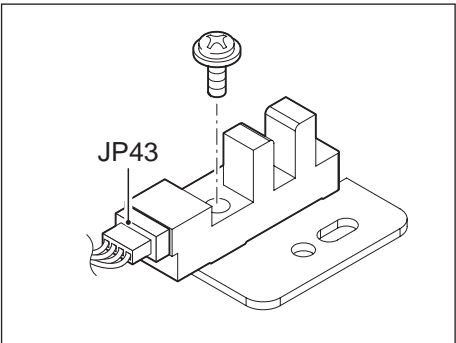
1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.




- 2 Remove the exterior frame (front).
- 4 screws (M4 x 8)
Loosen all screws.



- 3 Remove the receiver unit.
- 1 hex/Phillips-head screw (M4 x 8)



- 4 Unplug the cable from the receiver HP sensor.
- Connector (JP43)

**Caution**

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.


- 5 Remove the receiver HP sensor.
- 1 screw (M4 x 15)

- 6 Install the new receiver HP sensor on the receiver sensor mount board.
 - 1 screw (M4 x 15)
- 7 Connect the cable to the receiver HP sensor.
 - Connector (JP43)
- 8 Install the receiver sensor mount board that was removed in [Step 3](#).
 - 1 hex/Phillips-head screws (M4 x 8)
- 9 Install the exterior frame (front) that was removed in [Step 2](#).
 - 4 screws (M4 x 8)
- 10 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the receiver HP sensor.

5.4.7 Replacing the Receiver Motor

This section describes the instructions on how to replace the receiver motor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

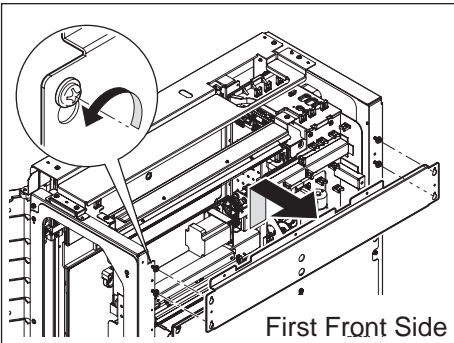
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 11)
1	

Requirements

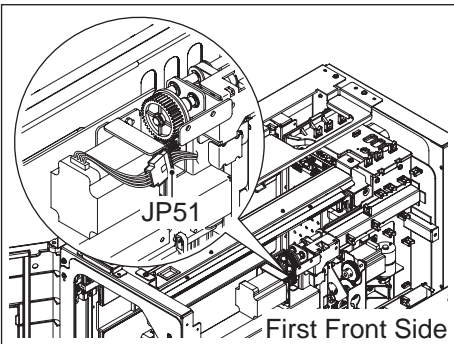
The works in this section can be performed using only the standard tools.

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.




2 Remove the exterior frame (front).

- 4 screws (M4 x 8)
Loosen all screws.

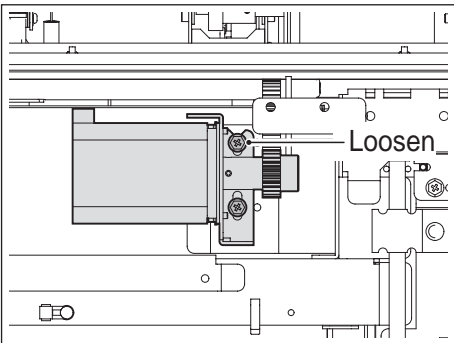


3 Remove the connector (JP51).



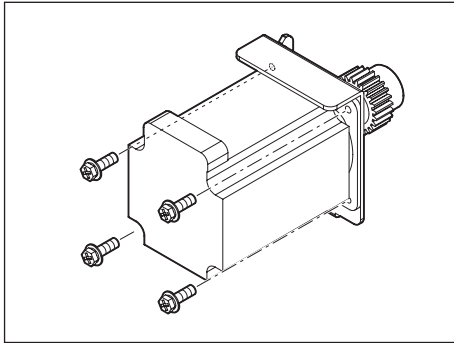
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



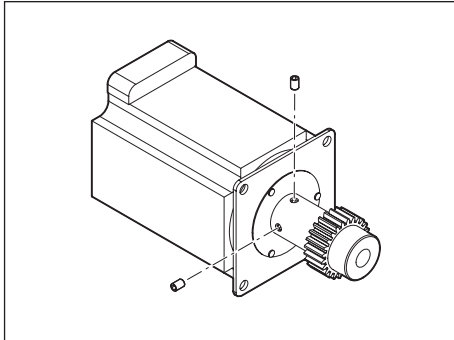
4 Remove the receiver motor mount board.

- 2 hex/Phillips-head screws (M4 x 8)
Loosen only the upper screw.



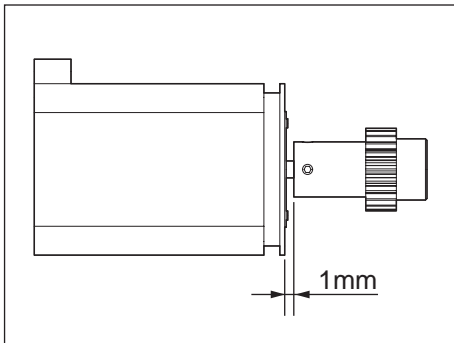
5 Remove the receiver motor.

- 4 hex/Phillips-head screws (M4 x 8)



6 Remove the gear.

- 2 setscrews (M4 x 5)



7 Install the gear on the new receiver motor.

- 2 setscrews (M4 x 5)

When installing, make sure the clearance between the motor main unit and the gear is 1 mm.

8 See [Step 5](#) to install the receiver motor on the receiver motor mount board.

- 4 hex/Phillips-head screws (M4 x 8)

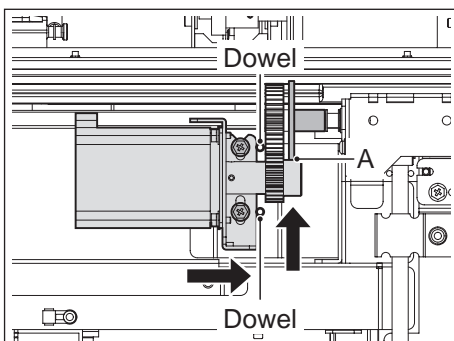


Make sure the connector is in the right direction when installing the motor.

9 Install the receiver motor mount board.

- 2 hex/Phillips-head screws (M4 x 8)

Press the board rightward until it reaches the dowel, then fix it by pressing upward so as not to form any clearance at A (between the edge of the motor and the pulley) shown in the figure.




- 10
- Connect the connector (JP51) that was removed in [Step 3](#).
- 11
- Install the exterior frame (front) that was removed in [Step 2](#).
 - 4 screws (M4 x 8)
- 12
- See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the receiver motor.

5.4.8 Replacing the Lock HP Sensor

This section describes the instructions on how to replace the lock HP sensor.


Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

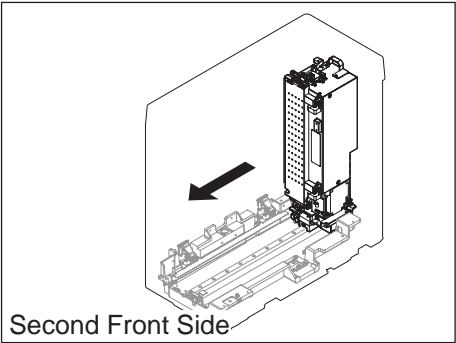
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 6)
1	

Requirements

The works in this section can be performed using only the standard tools.

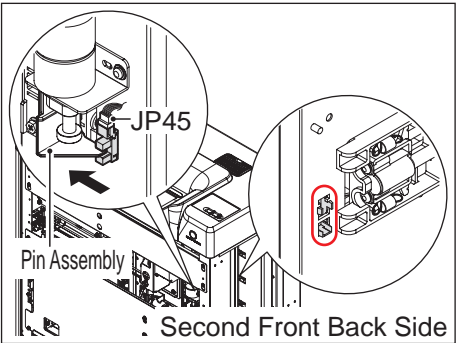
- 1
- See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the second front back panel and first front panel.



- 2
- Move the optical unit to the second front side.

If the push plate unit is not located at the read position, then the optical unit cannot be moved:

See "■ [If the insertion unit has not been removed: \(Page 5-17\)](#)" in "[5.2.6 Moving the Push Plate Unit](#)" to move the push plate unit to the read position, then move the optical unit to the second front side.




- 3
- Remove the lock HP sensor.

Leave the pin unit assembly moved leftward, then release the notch of the lock HP sensor to remove the sensor from the second front back side.

- 4
- Unplug the cable from the lock HP sensor.

- Connector (JP45)


Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 5 Connect the cable to the new lock HP sensor.
 - Connector (JP45)
- 6 Install the lock HP sensor.
- 7 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front panel and the second front back panel.

Now, you have finished with the procedures to replace the lock HP sensor.

5.4.9 Replacing the Lock Motor

This section describes the instructions on how to replace the Lock Motor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

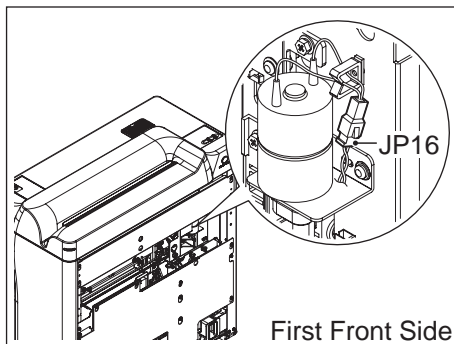
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 9)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the connector (JP16).

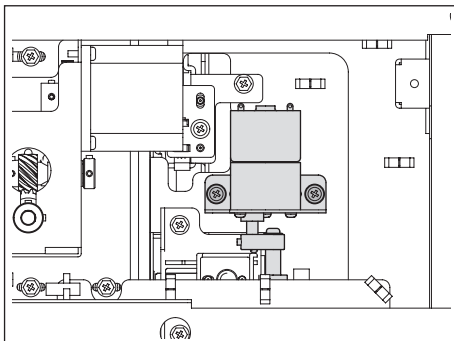


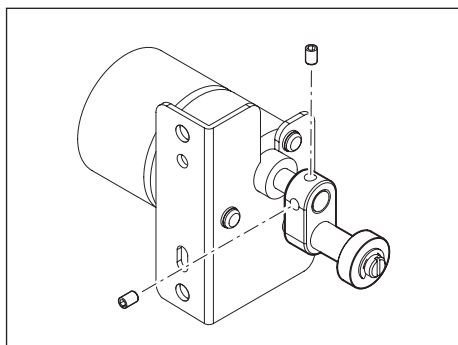
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 3 Remove the lock release motor unit assembly.

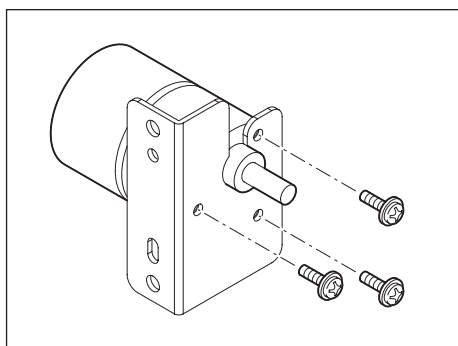
- 2 screws (M4 x 8)





4 Remove the cam unit assembly.

- 2 setscrews

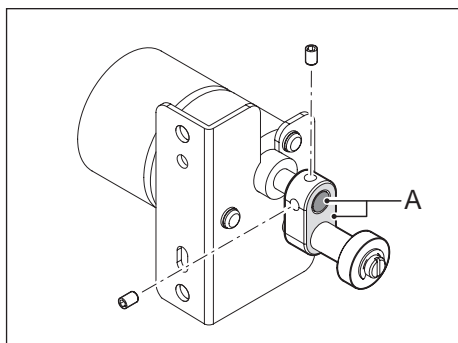


5 Remove the Lock Motor.

- 3 screws (M3 x 6)

6 Install the new Lock Motor on the motor mount board.

- 3 screws (M3 x 6)



7 Install the cam unit assembly.

- 2 setscrews

Fix the gear, aligning the Surface A in the figure.

8 Install the lock release motor that was removed in [Step 3](#).

- 2 screws (M4 x 8)

9 Connect the connector (JP16) that was removed in [Step 2](#).

10 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the Lock Motor.

5.4.10 Replacing the Receiver (Receiver Unit Assembly)

This section describes the instructions on how to replace the receiver (receiver unit assembly).



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

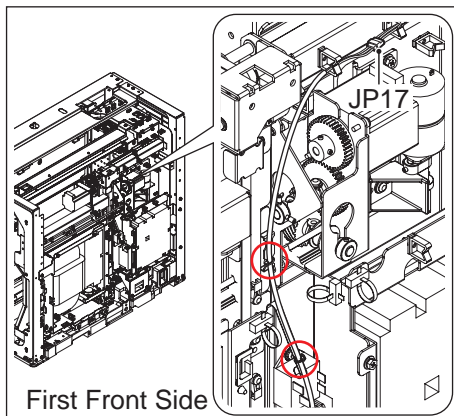
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Wiring band

- 1 See [Step 1](#) to [Step 6](#) in "[5.4.12 Replacing the Receiver Belt \(Page 5-59\)](#)" to remove the receiver belt.



- 2 Remove the connector (JP17) from the relay cable on the receiver sensor.



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 3 Cut off the wiring band (at 2 locations) to lead the cable inside the equipment.

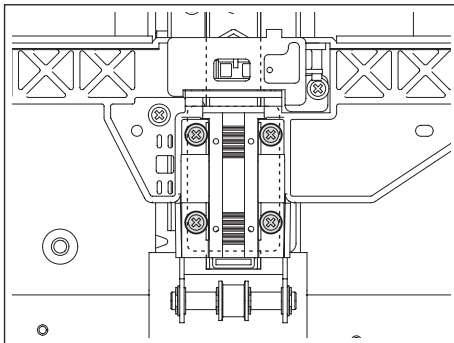
- 4 Remove the receiver.

- 4 screws (M4 x 6)

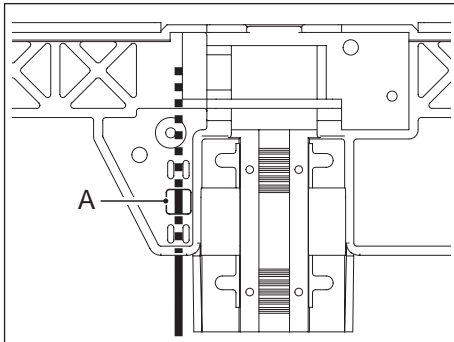
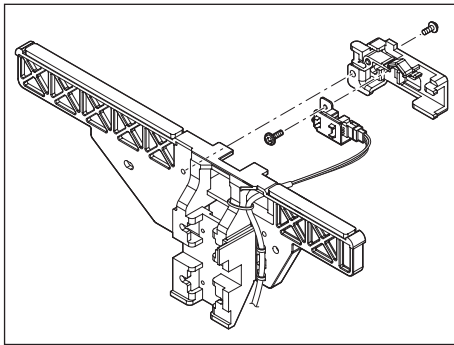


Caution

The receiver is secured to the guide. Work must be performed, supporting or setting down the guide so as to keep it up.



5 Replace the parts.

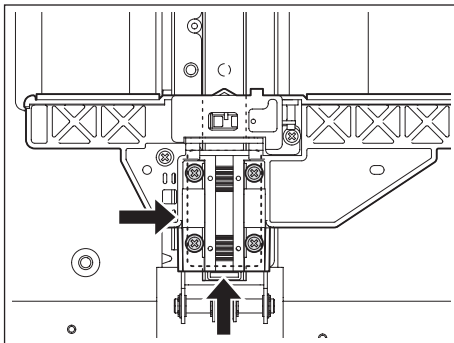


If the cable has been unplugged, align the white mark of the cable with the Hole A shown in the figure, then bind the cable with the wiring band to fix.

6 Install the receiver.

- 4 screws (M4 x 6)

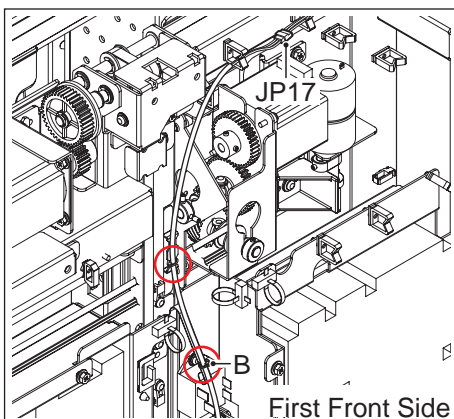
Press the receiver in the direction of the arrow shown in the figure to secure it to the guide on the slide pack.



7 Connect the connector (JP17), that was removed in [Step 2](#), to the original position to secure the cable to the guide with the wiring band.



Make sure that no twisted part is found in the cable, then align the white mark of it with the fixing position (B in the figure) to fix it.



8 See the descriptions following [Step 7](#) in "[5.4.12 Replacing the Receiver Belt \(Page 5-59\)](#)" to install the receiver belt.

Now, you have finished with the procedures to replace the receiver (receiver unit assembly).

5.4.11 Replacing the Justifier Guide Unit Assembly

This section describes the instructions on how to replace the justifier guide unit assembly.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

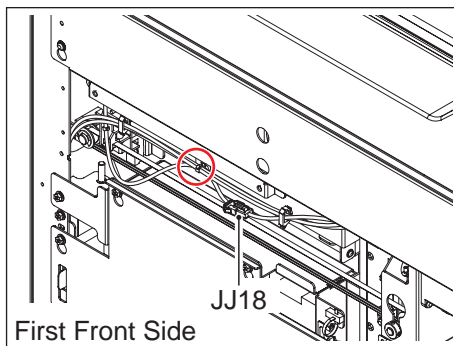
Personnel Number	Work Hours (steps 2 to 9)
1	

Requirements

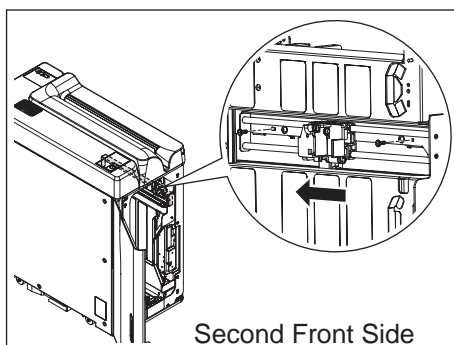
Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Wiring band

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the connector (JJ18) and cut off the wiring band.

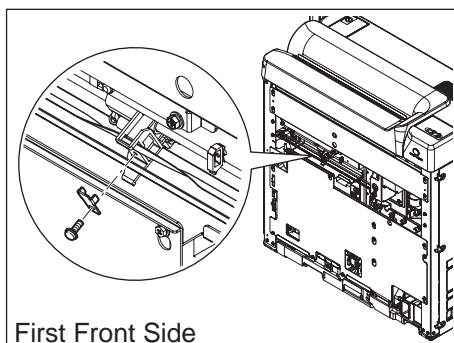


- 3 Move the justifier guide to the center of the shaft.

- 4 Remove the setscrews from the justifier base (justifier guide unit assembly).

- 2 screws (M4 x 8)

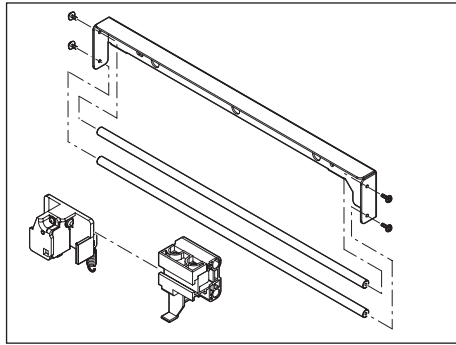
Do not remove the justifier guide unit assembly at this time because the justifier guide and the timing belt are left attached on the assembly.



- 5 Remove the belt presser plate from the justifier guide.

- 1 tapping screw (M4 x 10)

Incline the justifier guide unit assembly to remove the screw from the first front side.



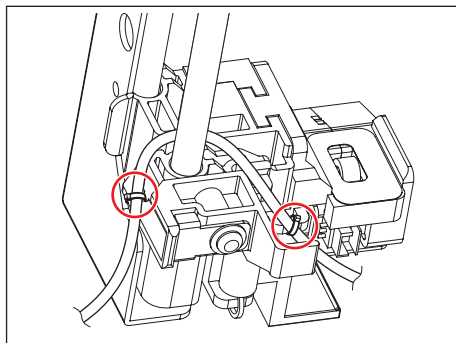
6 Eject the justifier guide unit assembly.

7 Replace the parts.

Checking the Justifier Guide Unit Assembly after Assembled

Incline the justifier guide unit assembly to make sure that the guide can be moved by its own weight.

If it cannot, the justifier shaft has not been assembled parallel to the guide. Adjust the justifier shaft by tightening or loosening the setscrew.

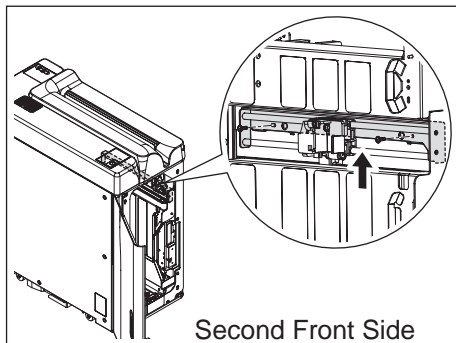


Fixing the Cable



Important

If the cable has been unplugged from the justifier guide, align the white mark with the fixing position, then fix the cable using the wiring band.



Second Front Side

8 See [Step 5](#) and [Step 4](#) to install the justifier guide unit assembly.

- Belt presser plate: 1 tapping screw (M4 x 10)
- Justifier base: 2 screws (M4 x 8)

Press the justifier guide unit assembly upward to fix it.

9 See [Step 2](#) to install the connector (JJ18) and the wiring band.



Important

Align the white mark on the cable with the fixing position, then fix the cable using the wiring band.

10 See ["6.1 Adjust Justifier Belt Tension \(Page 6-2\)"](#) to adjust the belt tension.

11 See ["■ Installation Procedures \(Page 5-8\)"](#) in ["5.2.3 Removing/Installing the Exterior Panel and Insertion Unit"](#) to install the first front panel.

Now, you have finished with the procedures to replace the justifier guide unit assembly.

5.4.12 Replacing the Receiver Belt

This section describes the instructions on how to replace the receiver belt.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

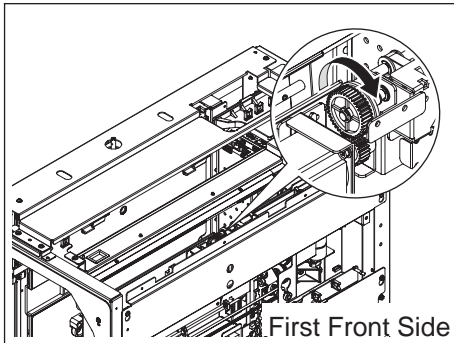
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 9)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.



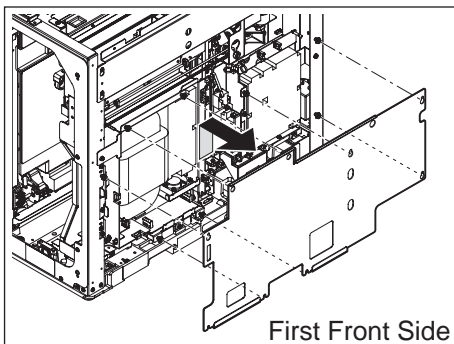
First Front Side

- 2 Turn the gear shown in the figure to move the receiver to the top.



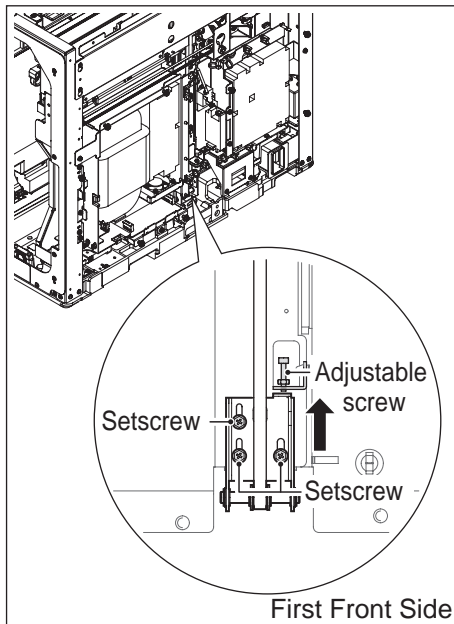
Important

When holding directly the receiver to move it up and down, be sure to hold it at the position approximate to the belt.



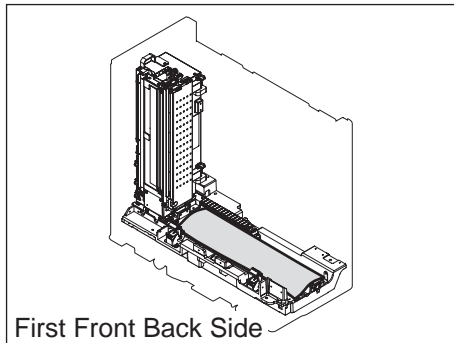
First Front Side

- 3 Remove the electric component mount panel.
 - 8 hex/Phillips-head screws (M4 x 8)
 - Loosen all screws.



4 Loosen the receiver belt tension.

1. Loosen the setscrews on the receiver idler pulley unit assembly.
 - 3 hex/Phillips-head screws (M4 x 8)
2. Loosen the adjustable screws.
 - 1 hexagon socket head bolts (M4 x 20)
 - 1 hexagon nut
3. Raise the receiver idler pulley unit assembly fully, then loosen the setscrews to fix the assembly.
 - 3 hex/Phillips-head screws (M4 x 8)

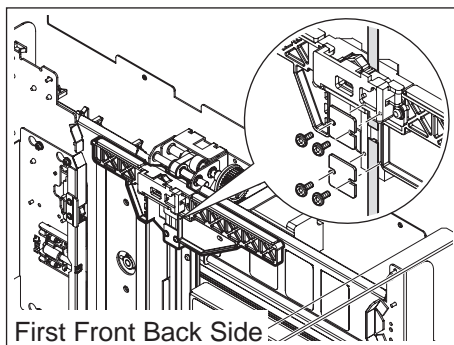


5 Cover the LM guide and the magnet shaft on the subscan unit using a rag or cardboard.



Caution

Falling down or banging the parts onto the LM guide or the magnet shaft may affect performance of the equipment. Cover the LM guide and the magnet shaft using a shock-absorbing object before removing/installing the parts inside the equipment.



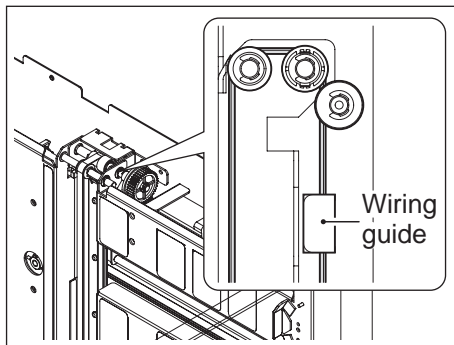
6 Remove the belt presser plates (2 pieces) first, then the timing belt.

- 2 screws for each plate (M3 x 10)
- Remove the lower belt presser plate first.



Caution

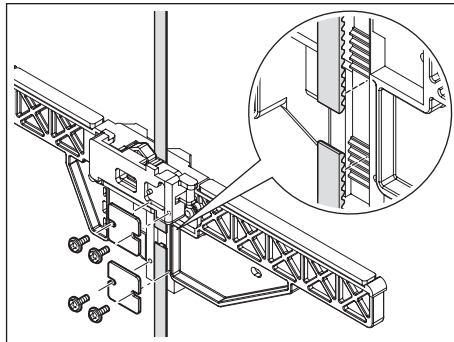
Remove the upper belt presser plate to automatically release the timing belt from the receiver and drop the receiver. Be sure to support the receiver when removing the upper belt presser plate.



7 Install the new timing belt.

- 2 belt presser plates
- 2 screws for each plate (M3 x 10)

Perform installation so that two belt cogs are exposed for each receiver cog.



8 See "6.2 Adjust Receiver Belt Tension (Page 6-4)" to adjust the belt tension.

9 Install the electric component mount panel that was removed in [Step 3](#).

- 8 hex/Phillips-head screws (M4 x 8)

10 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the receiver belt.

5.4.13 Replacing the Justifier Belt

This section describes the instructions on how to replace the justifier belt.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

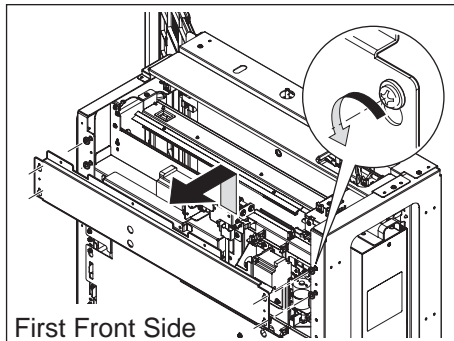
Personnel Number	Work Hours (steps 2 to 16)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

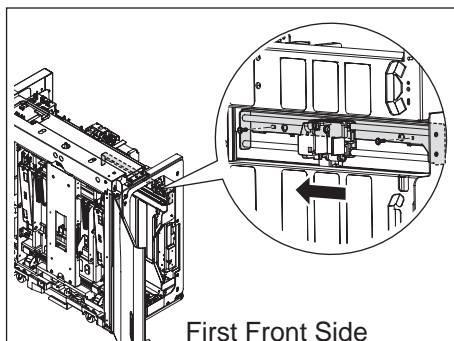
No.	Tool	No.	Tool
1	Acoustic wave tension meter	2	Grease (Plusguard No. 2 by Kyodo Yushi)
3	Waste cloth (used for greasing)		

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.



- 2 Remove the exterior frame (front).

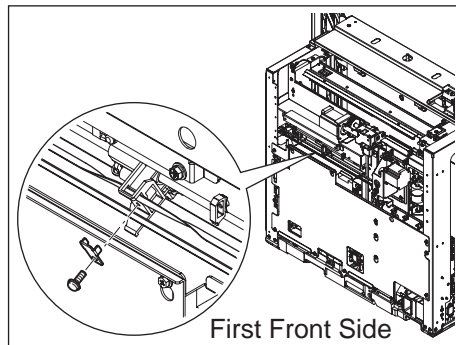
- 4 screws (M4 x 8)
Loosen all screws.



- 3 Move the justifier guide to the center of the shaft.

- 4 Remove the setscrews of the justifier base (justifier guide unit assembly).

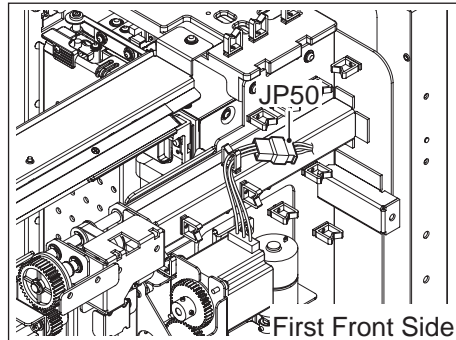
- 2 screws (M4 x 8)



5 Remove the belt presser plate first, then the timing belt.

- 1 tapping screw (M4 x 10)

Incline the justifier guide unit assembly to remove the screw from the first front side.

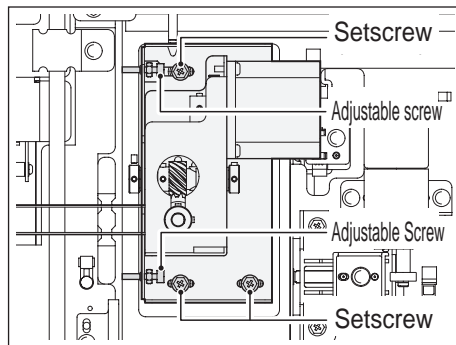


6 Remove the justifier motor connector (JP50).



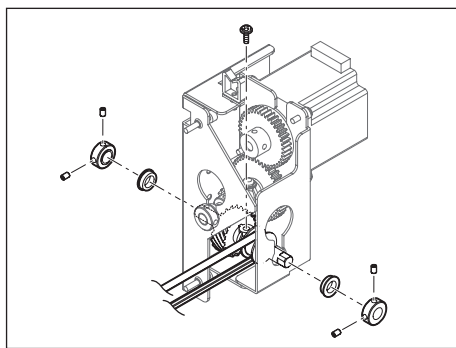
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



7 Remove the motor mount board.

1. Loosen the adjustable screws.
 - 2 hexagon socket head bolts (M4 x 20)
2. Remove the setscrews.
 - 3 hex/Phillips-head screws (M4 x 8)
3. Remove the motor mount board.



8 Remove the gear first, then the timing belt.

- Gear: 1 screw (M4 x 8)
- Thrust collars: 2 setscrews for each one

9 Lead the new timing belt and install the gear.

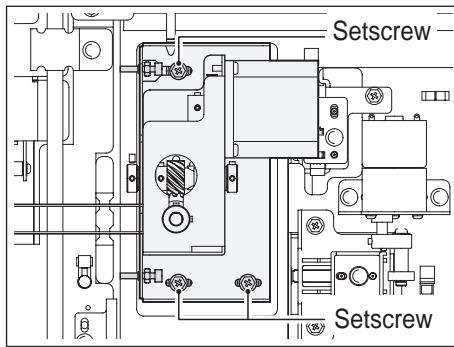
- Gear: 1 screw (M4 x 8)
- Thrust collars: 2 setscrews for each one

Fix the thrust collar placed far from you, mating the surfaces of it and the shaft end. Fix the thrust collar placed toward you, pressing it lightly to the shaft so as not to have the shaft misaligned after the collar is fixed.



Note

For the upper gear, install it, mating the surfaces of the thrust collar and the shaft end for the left side, while pressing lightly for the right side.



10 Temporarily secure the motor mount board to the main unit.

- 3 hex/Phillips-head screws (M4 x 8)

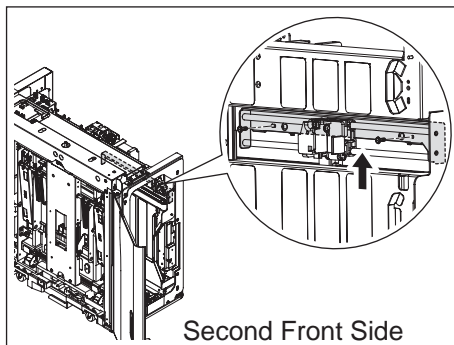
11 Connect the connector (JP50) that was removed in [Step 6](#).

12 See [Step 5](#) to install the timing belt on the justifier guide.

- Belt presser plate
- 1 tapping screw (M4 x 10)

13 Install the justifier base.

- 2 screws (M4 x 8)
- Press the base upward to fix it.



14 See ["6.1 Adjust Justifier Belt Tension \(Page 6-2\)"](#) to adjust the belt tension.

15 Apply grease to the justifier motor unit assembly gear mechanism unit.

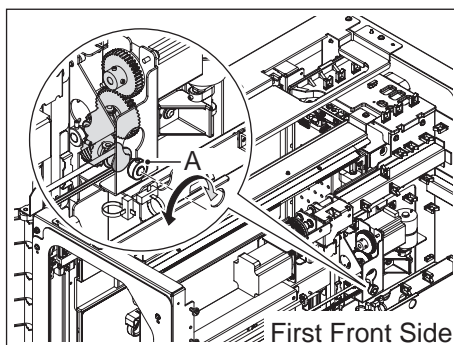
- Grease: Plusguard No. 2 by Kyodo Yushi



Always use the specified grease.

Important

Apply grease on entire area by turning A.



16 Install the exterior frame (front) that was removed in [Step 2](#).

- 4 screws (M4 x 8)

17 See ["■ Installation Procedures \(Page 5-8\)"](#) in ["5.2.3 Removing/Installing the Exterior Panel and Insertion Unit"](#) to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the justifier belt.

5.5 Replacing the Parts on the Subscan Unit

5.5.1 Replacing the Subscan HP Sensor

This section describes the instructions on how to replace the subscan HP sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

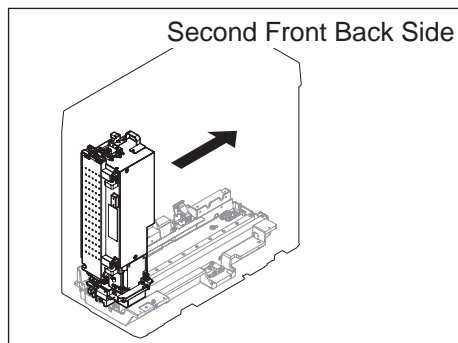
Personnel Number	Work Hours (steps 2 to 10)
1	

Requirements

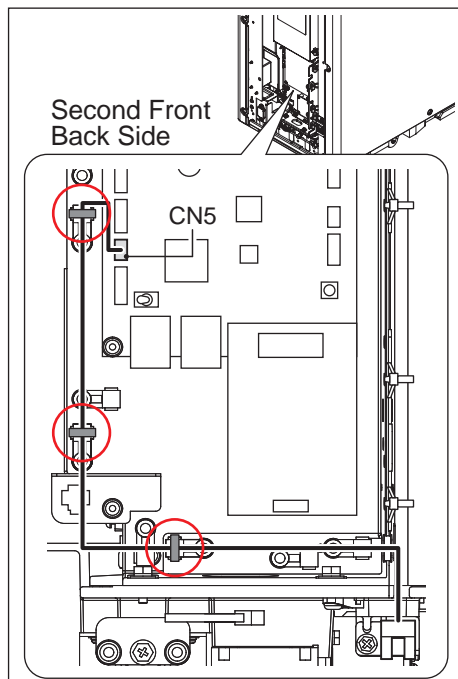
Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Wiring band

- 1 See "■ Removal Procedures (Page 5-6)" of the "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit", and remove the second front back panel.



- 2 Move the optical unit to the second front back side.



- 3 Unplug the subscan HP sensor cable from LMC.

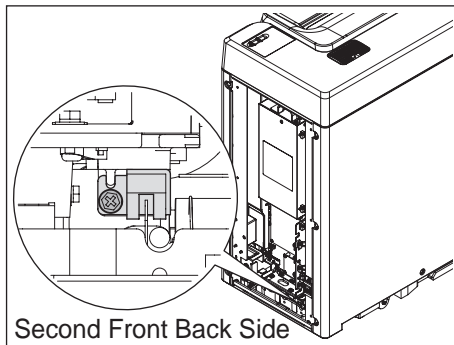
- CN5 (ACN5: subscan HP sensor cable)



Caution

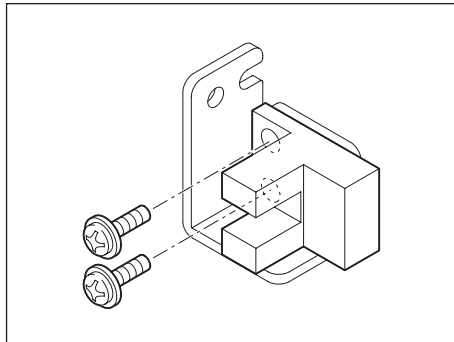
When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4 Cut off the wiring band binding other cables (at 3 locations).



5 Remove the photo sensor unit assembly.

- 1 screw (M3 x 10)

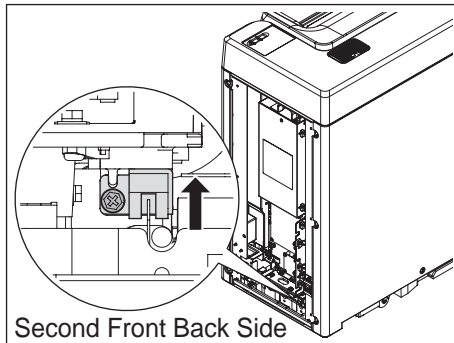


6 Remove the subscan HP sensor.

- 2 screws (M3 x 6)

7 Install the new subscan HP sensor on the sensor spacer.

- 2 screws (M3 x 6)



8 Install the photo sensor unit assembly.

- 1 screw (M3 x 10)

Press the photo sensor unit assembly upward to fix it so that the setscrew on the subscan HP sensor is led into the screw relief hole in the holding plate.

9 Connect the subscan HP sensor cable that was unplugged in [Step 3](#) to LMC.

- CN5 (ACN5: subscan HP sensor cable)

10 See [Step 4](#) to fix the cable using the wiring band.

11 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the second front back panel.

Now, you have finished with the procedures to replace the subscan HP sensor.

5.5.2 Replacing the Simple Fixing Unit

This section describes the instructions on how to replace the simple fixing unit.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 8)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

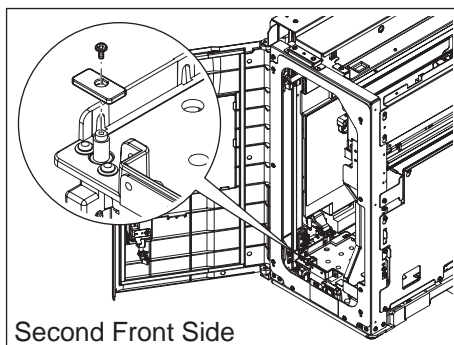
No.	Tool
1	Vinyl sheet (used for covering the light condensing unit to screen out dust on it)

- 1 See "■ Removal Procedures (Page 5-11)" in "5.2.5 Removing/Installing the Optical Unit" to remove the optical unit.

Place the removed optical unit in a level and stable place with the light condensing unit up.

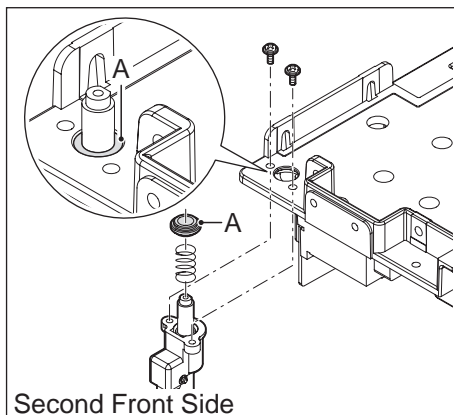
- 2 Fix the cable that was connected to the optical unit to the holding plate using tape.

- 3 Move the holding plate on the subscan unit to the second front side.



- 4 Remove the fixing shaft knob.

- 1 screw (M3 x 6)



- 5 Remove the simple fixing unit assembly.

- 2 tapping screws (M4 x 10)

Eject the anchor bearing (A in the figure) with it held pressed down using a precision screw driver or other tool.

- 6 Replace the parts.

- 7 See Step 5 to install the simple fixing unit.

- 2 tapping screws (M4 x 10)

8 Install the fixing shaft knob that was removed in [Step 4](#).

- 1 screw (M3 x 6)

Install it with the textured surface down.

9 See "■ [Installation Procedures \(Page 5-14\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to install the optical unit.

Now, you have finished with the procedures to replace the simple fixing unit.

5.5.3 Replacing the Encoder/Wires

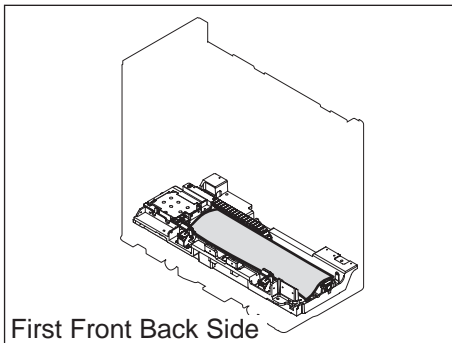
This section describes the instructions on how to replace the encoder.

The same procedures as below can be used to replace the wire, excluding the items on installing and removing the encoder.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.



First Front Back Side



Caution

Cover the LM guide and the magnet shaft of the subscan unit using a rag or cardboard

Performance of the equipment might be affected if the parts are hit or dropped on the LM guide or the magnet shaft. Cover the LM guide and magnet shaft with something that will absorb the shock when disassembling or assembling the parts inside the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 3 to 29)
1	

Requirements

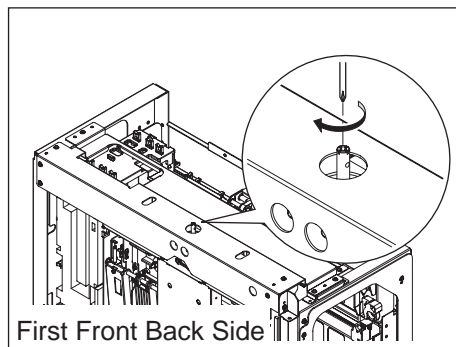
Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool	No.	Tool
1	Vinyl sheet (used for covering the light condensing unit to screen out dust on it)	2	Acoustic wave tension meter

1 See "■ [Removal Procedures \(Page 5-11\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to remove the optical unit.

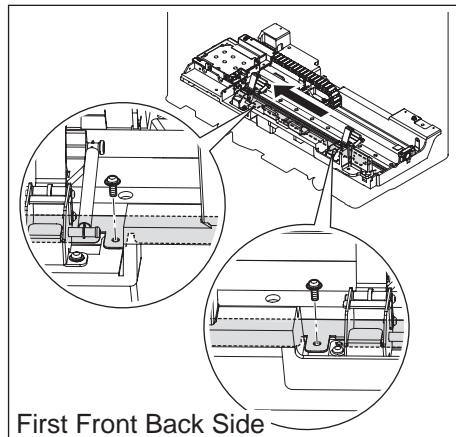
Place the removed optical unit in a level and stable place with the light condensing unit up.

2 See "■ [Removal Procedures \(Page 5-10\)](#)" in "[5.2.4 Removing/Installing the Second Front Door](#)" to remove the second front door.



- 3** Rotate the shaft clockwise, and move the push plate unit slightly to the first front side.

This work is intended to enable you to access the setscrews on the wire cover (that will be removed in [Step 6](#)).



- 4** Fix the cable that was connected to the optical unit to the holding plate using tape.

- 5** Move the holding plate to the second front back side.

- 6** Remove the wire cover.

- 2 screws (M4 x 8)

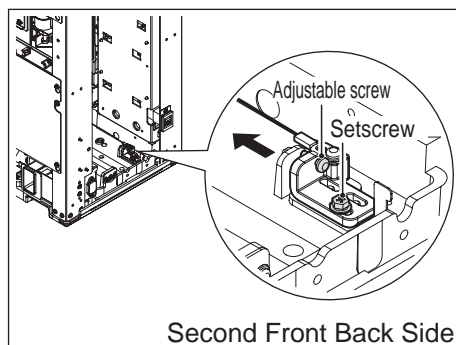


- Remove the screws, supporting the wire cover to keep it from falling down on the wire.
- Keep the wire cover away from the magnet shaft.

- 7** Move the push plate unit to the read position.

- 8** To replace the encoder, see ["5.5.2 Replacing the Simple Fixing Unit \(Page 5-67\)"](#) to remove the simple fixing unit.

To replace the wire only, the simple fixing unit does not need to be removed.

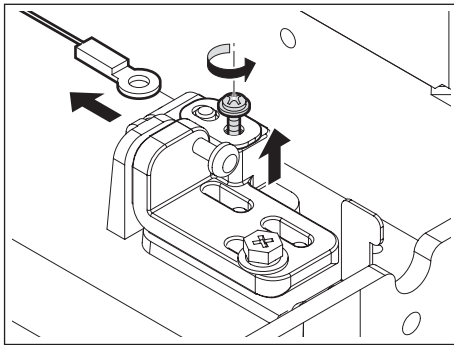


- 9** Loosen the setscrew on the wire holding assembly in the second front back side.

- 1 hex/Phillips-head screw (M4 x 12)

- 10** Loosen the adjustable screw to loosen the wire tension.

- 1 screw (M4 x 12)



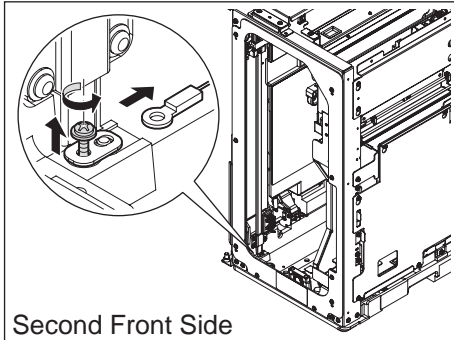
11 Loosen the setscrew on the wire presser plate in the second front back side to remove the wire.

- 1 screw (M4 x 8)
Loosen the screw.

Put down the removed wire without pulling at it or anything.



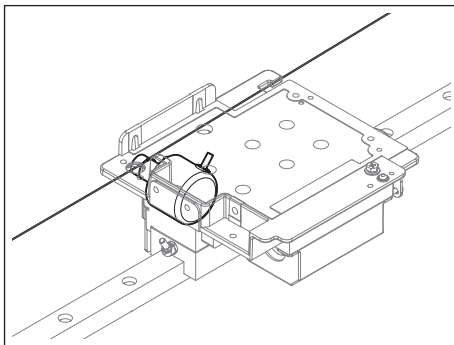
Handle the wire carefully so as not to damage or fold it.



Second Front Side

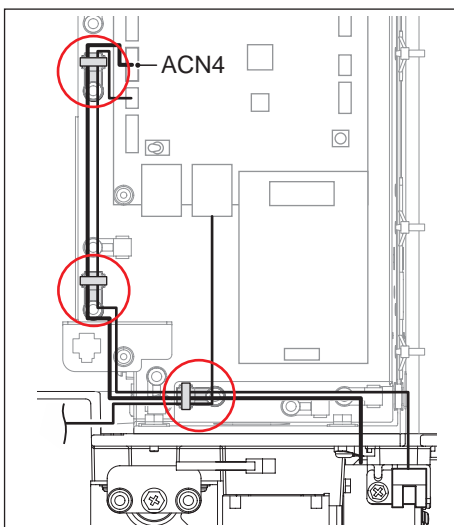
12 Loosen the setscrew on the wire presser plate in the second from side to remove the wire.

- 1 screw (M4 x 8)
Loosen the screw.



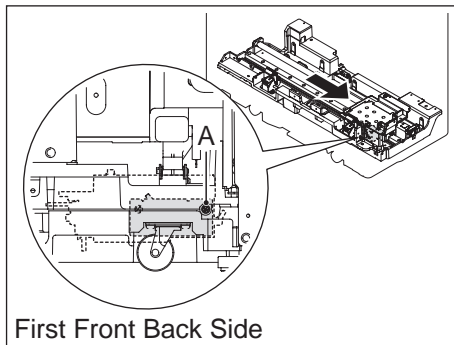
13 Disconnect the wire from the encoder.

- If the encoder is not replaced, skip to [Step 21](#).
- If the encoder is replaced, stick the removed wire to the cassette absorption plate, making sure the wire is not folded back.



14 Cut off the wiring band binding the encoder cable (connector: ACN4) and the other cables.

The wired optical unit is shown in the figure for reference, though the optical unit has been already removed.

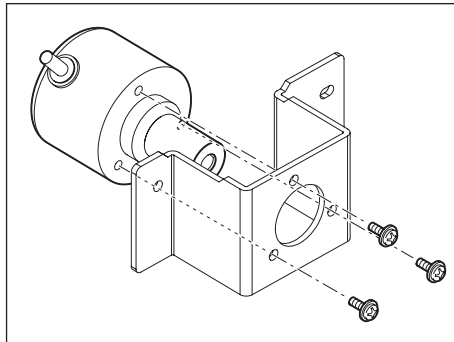


15 Move the holding plate to the second front side.

16 Remove the encoder unit assembly.

- 2 hex/Phillips-head screws (M3 x 12)

Move the holding plate on the subscan unit until the setscrews fixing the encoder bracket reaches the position A in the figure in order to remove the screws one by one.

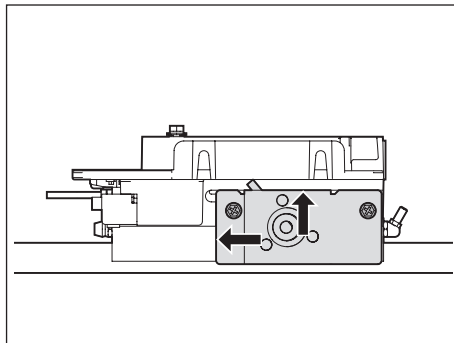


17 Remove the encoder.

- 3 screws (M3 x 12)

18 Install the new encoder.

- 3 screws (M3 x 12)



19 See [Step 16](#) to install the encoder unit assembly.

- 2 hex/Phillips-head screws (M3 x 12)

Fix the encoder unit assembly by pressing in the direction of the arrow in the figure.



Note

It will be easier to install if you temporarily attach the encoder unit assembly using screws, and then pressing it in the direction of the arrow in the figure.

20 See ["5.5.2 Replacing the Simple Fixing Unit \(Page 5-67\)"](#) to install the simple fixing unit assembly.

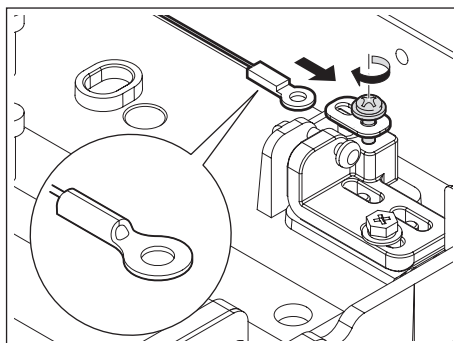
21 Pull the wire into the equipment carefully so as not to fold it.

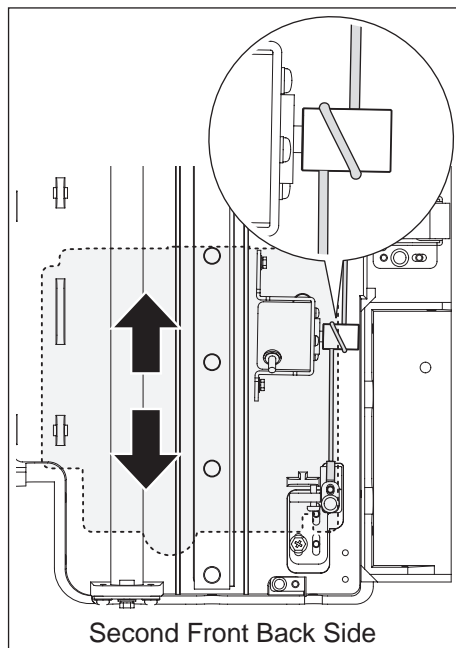
Stick one front edge the wire to the cassette absorption plate magnet from the second front side, then pull out the stuck the front edge from the second front back side.

22 Fix one front edge the wire using the wire presser plate in the second front back side.

- 1 screw (M4 x 8)

Install the wire with the level surface in the installation part down. Install other wire in this way for the second front side.





- 23** Give a single wrapping of the wire around the encoder.



Follow the descriptions in the figure to wrap.

Important

- 24** See [Step 12](#) to fix the other front edge of the wire using the wire presser plate in the second front side.

- 1 screw (M4 x 8)

- 25** See [Step 10](#) to slightly tighten the tension in the wire.



Note

If the tension in the wire is left loosen, the wire may be disconnected from the encoder while warming up the wrapping ([Step 26](#)).

- 26** Move the holding plate back and forth three times or more to warm up the wire wrapping.

- 27** See "[6.4 Adjust Wire Tension \(Page 6-10\)](#)" to adjust the wire tension.

- 28** Rotate the shaft clockwise and move the push plate unit slightly toward the first front side following the instruction in [Step 3](#).

- 29** Install the wire cover that was removed in [Step 6](#).

- 2 screws (M4 x 8)



Caution

- Do not drop the wire cover on the wire.
- Keep the wire cover away from the magnet shaft.

- 30** Move the push plate unit to the read position.

- 31** See "[■ Installation Procedures \(Page 5-10\)](#)" in "[5.2.4 Removing/Installing the Second Front Door](#)" to install the second front door.

- 32** See "[■ Installation Procedures \(Page 5-14\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to install the optical unit.

Now, you have finished with the procedures to replace the encoder or wires.

5.5.4 Replacing the Tumbler (Lower)

This section describes the instructions on how to replace the tumbler (lower).



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

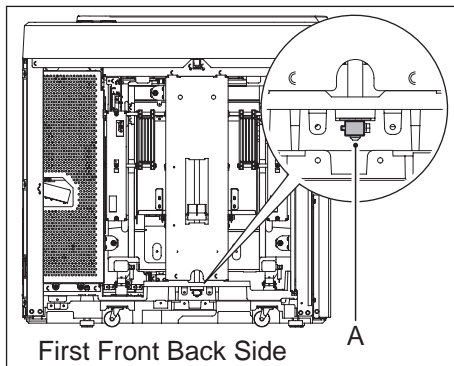
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 4)
1	

Requirements

The works in this section can be performed using only the standard tools.

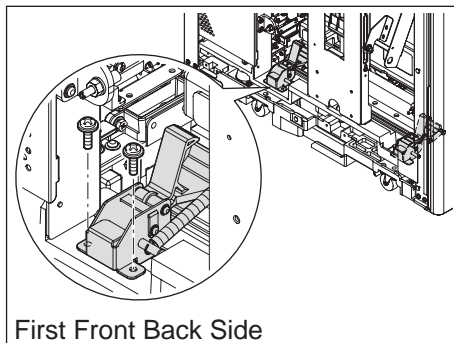
- 1 See "■ Removal Procedures (Page 5-6)" of the "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit", and remove the first front back panel.



- 2 Move the push plate unit into the vicinity of the transporter home position.

This work is intended for the case that the push plate is at the read position.

1. Move the optical unit to the second front back side.
2. Turn the A in the figure (drive shaft presser) to move it to the press down position side.



- 3 Remove the tumbler (lower).

- 2 screws for each plate (M4 x 8)

- 4 Install the new tumbler (lower).

- 2 screws for each plate (M4 x 8)



Important

Make sure that it is able to receive the push plate unit (as shown in the figure) after installing it.

- 5 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front back panel.

Now, you have finished with the procedures to replace the tumbler (lower).

5.5.5 Replacing the Cable Bear

This section describes the instructions on how to replace the cable bear.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 20)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

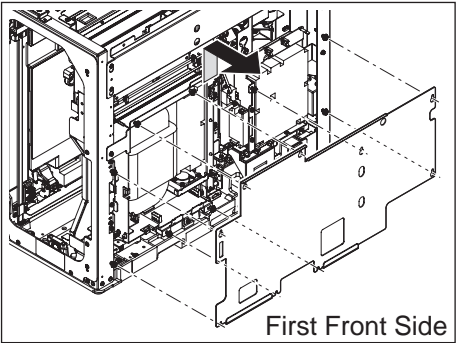
No.	Tool	No.	Tool
1	Wiring band	2	Snap ties

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.



Note

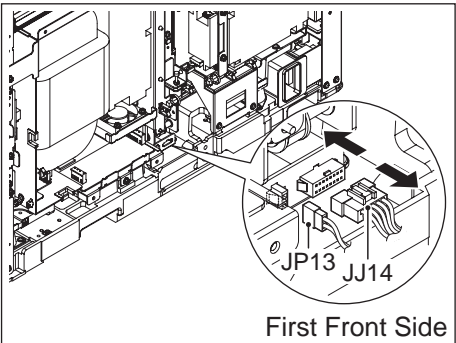
It is recommended the insertion unit be removed to let in light in order to work with the inner part of the equipment, though the insertion unit can be replaced without removing it.



First Front Side

- 2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



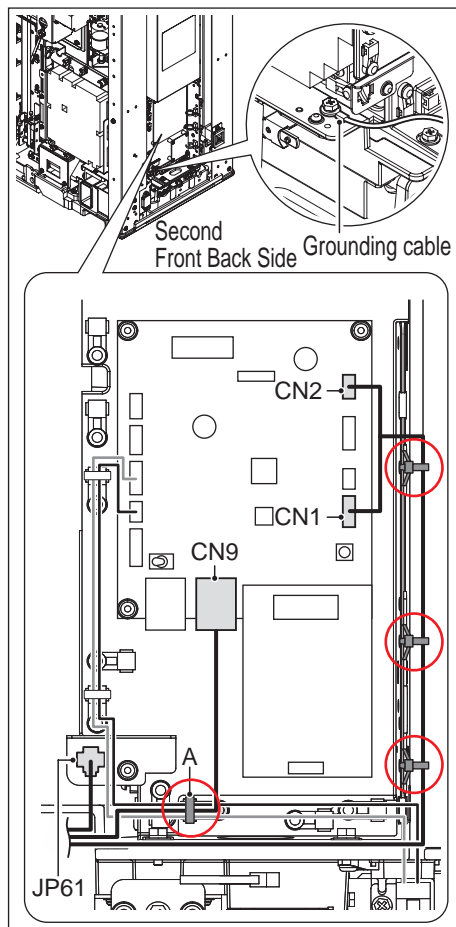
First Front Side

- 3 Remove the connectors (JP13, JJ14).



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



4 Remove the connector and the grounding cable from the optical unit.

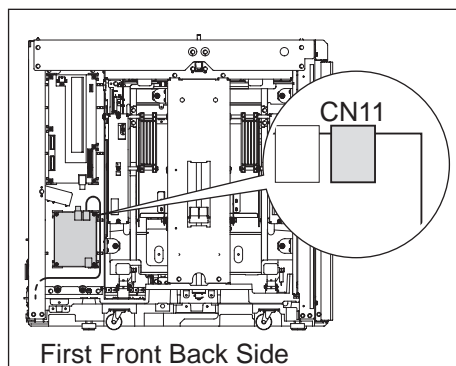
- LMC
 - CN1 (ACN1: cable)
 - CN2 (ACN2: cable)
 - CN9 (ACN9: cable)
- Eraser unit junction cable
 - JJ61 (JP61: cable)
- Grounding cable



When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

5 Remove the snap ties and other parts.

- Snap ties at 3 locations
- A: wiring band at a location (cut it off)



6 Remove the connector (CN11) from the CIU.

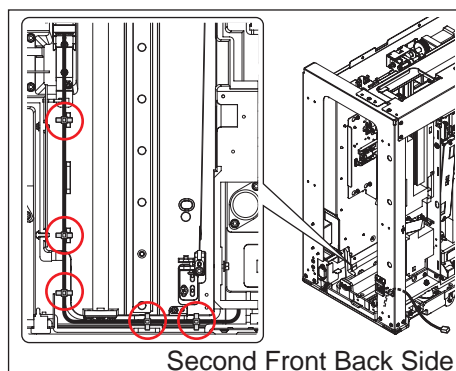
- CN11 (CCN11: cable)

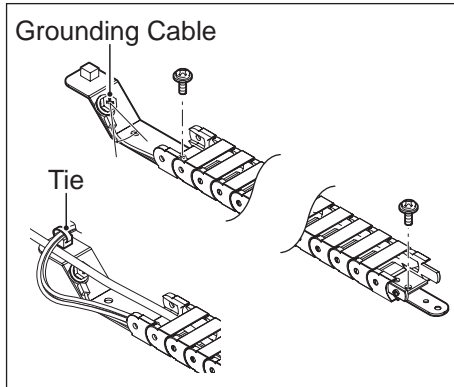
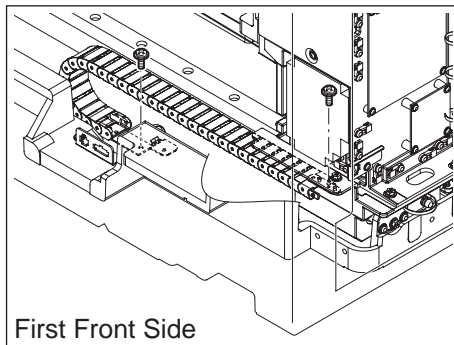


When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

7 Cut off the wiring band (5 locations) retaining the cable removed in [Step 6](#).

When installing, position the white mark on the cable to the position A in the figure. In addition, when fixing, make sure that the cable is located outside at the positions A, B, D and E.





8 Remove the cable bear unit assembly from the holding plate.

- 1 screw (M3 x 6)

9 Remove the cable bear unit assembly from the subscan base.

- 1 screw (M3 x 6)

10 Remove the tap plate and the tap plate B from the cable bear tie.

- Tap plate (subscan base mount side)
 - 1 screw (M3 x 6)
 - Snap tie (remove it)
 - Grounding cable: 1 hex/Phillips-head screw (M4 x 8)
- Tap plate B (holding plate mount side)
 - 1 screw (M3 x 6)

11 Install the tap plate and the tap plate B on the new cable bear tie.

- Tap plate (subscan base mount side)
 - 1 screw (M3 x 6)
 - Snap tie (remove it)
 - Grounding cable: 1 hex/Phillips-head screw (M4 x 8)
- Tap plate B (holding plate mount side)
 - 1 screw (M3 x 6)

When installing the grounding cable, incline it as shown in the figure.

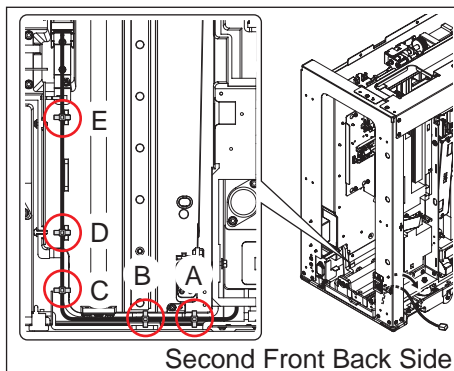
12 Fix the cables excluding a serial cable using the snap ties.

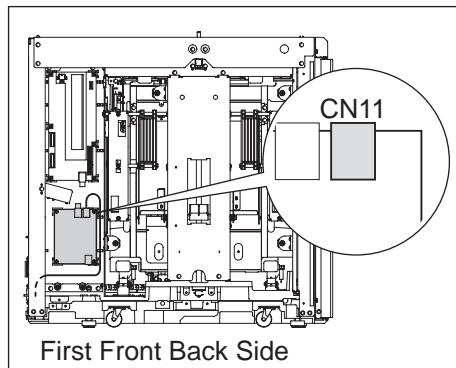
13 See [Step 9](#) to install the cable bear unit assembly on the subscan base.

- 1 screw (M3 x 6)

14 Wire the serial cable (connector: CCN11) and fix it using the wiring band.

Position the white mark on the cable to the position A in the figure. In addition, when fixing, make sure that the cable is located outside at the positions A, B, D and E.





15 Connect the serial cable connector to the CIU.

- CN11 (CCN11: cable)

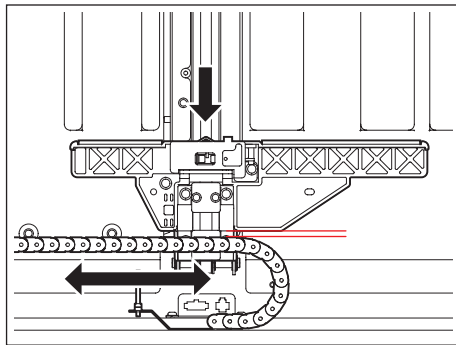
16 See [Step 3](#) to connect the cable bear side cables with the connectors (JP13, JJ14).

17 See [Step 8](#) to install the cable bear unit assembly on the holding plate.

- 1 screw (M3 x 6)

18 Make sure that the cable bear unit assembly has been mounted appropriately.

Move the holding plate with the receiver fully down to make sure that the cable bear does not contact the receiver and the receiver base.



19 See [Step 4](#) and [Step 5](#) to connect the cable to the optical unit and fix it using the snap ties and the wiring band.

- LMC
 - CN1 (ACN1: cable)
 - CN2 (ACN2: cable)
 - CN9 (ACN9: cable)
- Eraser unit junction cable
 - JJ61 (JP61: cable)
- Grounding cable

20 Install the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

21 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the cable bear.

5.6 Replacing the Parts on the Optical Unit

5.6.1 Replacing the LMD

This section describes the instructions on how to replace the LMD.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- See ["5.2.7 Binding the Grounding Strap \(Page 5-18\)"](#) to bind a grounding strap in order to protect the circuit board from damage due to static discharge.

Work outline

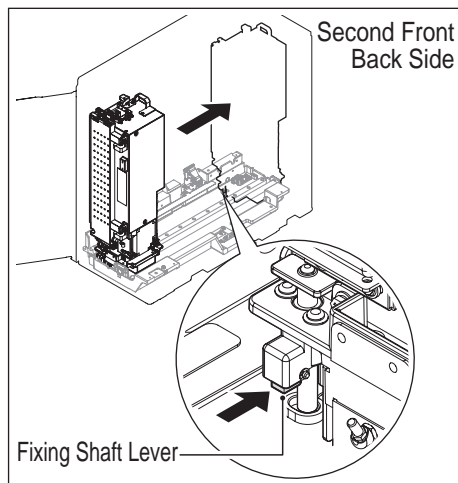
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 7)
1	

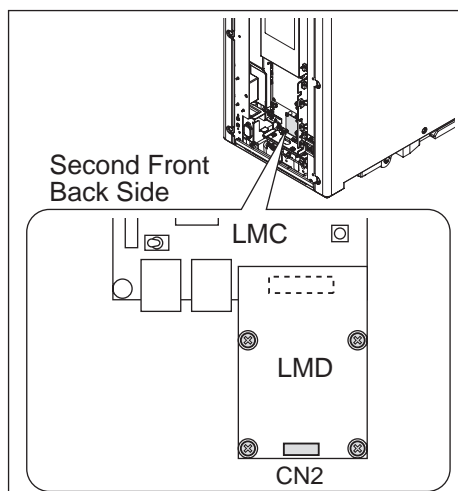
Requirements

The works in this section can be performed using only the standard tools.

- 1 See ["■ Removal Procedures \(Page 5-6\)"](#) of the ["5.2.3 Removing/Installing the Exterior Panel and Insertion Unit"](#), and remove the second front back panel.



- 2 Move the optical unit to the second front back side and fix it using the simple fixing lock. Push the blue fixing shaft lever to lower the fixing shaft and have the unit locked.



- 3 Unplug all the cables connected to the LMD. Each connector may have been fixed very tightly.



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4 Remove the LMD.
 - 4 screws (M3 x 6)

Be careful, when removing the LMD, so as not to damage the connector in the backside that connects it to the LMC.
- 5 Install the new LMD.
 - 4 screws (M3 x 6)

- 6 Connect the cables removed in [Step 3](#) to the LMD.
- CN2 (LMCN2: cable)
- 7 Release the simple fixing lock.
Lock will be released by pulling up the blue knob.
- 8 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the second front back panel.

Now, you have finished with the procedures to replace the LMD.

5.6.2 Replacing the LMC

This section describes the instructions on how to replace the LMC.



- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- See "[5.2.7 Binding the Grounding Strap \(Page 5-18\)](#)" to bind a grounding strap in order to protect the circuit board from damage due to static discharge.

Work outline

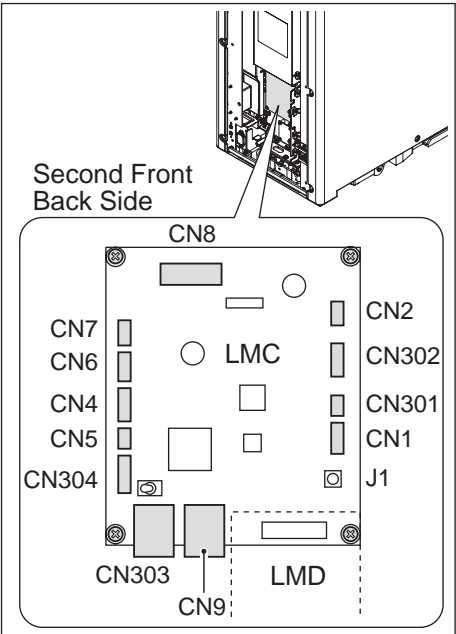
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 5)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "[5.6.1 Replacing the LMD \(Page 5-78\)](#)" to remove the LMD.



- 2 Unplug all the cables connected to the LMC.



When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 3 Remove the LMC.

- 4 screws (M3 x 6)

- 4 Install the new LMC.

- 4 screws (M3 x 6)

5 Connect the cables removed in [Step 2](#) to the LMC.

- CN1 (ACN1: cable)
- CN2 (ACN2: cable)
- CN301 (ACN301: cable)
- CN302 (ACN302: cable)
- CN303 (ACN303: cable)
- CN304 (ACN304: cable)
- CN4 (ACN4: cable)
- CN5 (ACN5: cable)
- CN6 (ACN6: cable)
- CN7 (ACN7: cable)
- CN8 (ACN8: cable)
- CN9 (ACN9: cable)
- J1 (AJ1: cable)

6 See ["5.6.1 Replacing the LMD \(Page 5-78\)"](#) to install the LMD.

Now, you have finished with the procedures to replace the LMC.

5.6.3 Replacing the Inverter

This section describes the instructions on how to replace the inverter.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

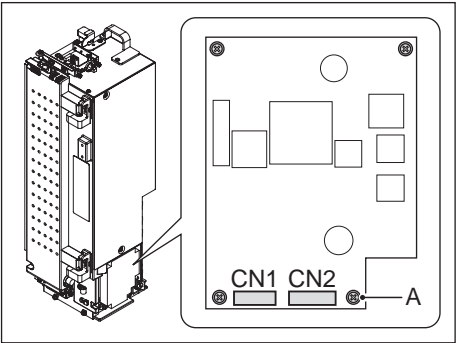
Personnel Number	Work Hours (steps 2 to 5)
1	

Requirements

The works in this section can be performed using only the standard tools.

1 See ["■ Removal Procedures \(Page 5-11\)"](#) in ["5.2.5 Removing/Installing the Optical Unit"](#) to remove the optical unit.

Place the removed optical unit in a level and stable place with it kept stood.



2 Unplug all cables from the inverter.



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

3 Remove the inverter.

- 1 screw (M3 x 12)
- 1 collar for each (3 locations excluding A in the figure)

4 Install the new inverter.

- 1 screw (M3 x 12)
- 1 collar for each (3 locations excluding A in the figure)

- 5 Connect the cables removed in [Step 2](#) to the inverter.
- CN1 (ICN1: cable)
 - CN2 (ICN2: cable)

- 6 See "■ [Installation Procedures \(Page 5-14\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to install the optical unit.

Now, you have finished with the procedures to replace the inverter.

5.6.4 Replacing the Photomultiplier Tube Filter Assy

This section describes the instructions on how to replace the photomultiplier tube filter assembly.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 5)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Vinyl sheet (used for covering the light condensing unit to screen out dust on it)

- 1 See "■ [Removal Procedures \(Page 5-11\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to remove the optical unit.

Place the removed optical unit in a level and stable place with the light condensing unit up.

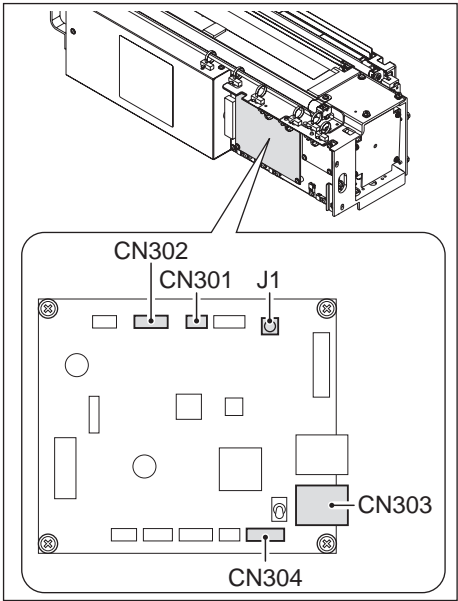
- 2 Unplug the photomultiplier tube filter assembly cables from the LMC.

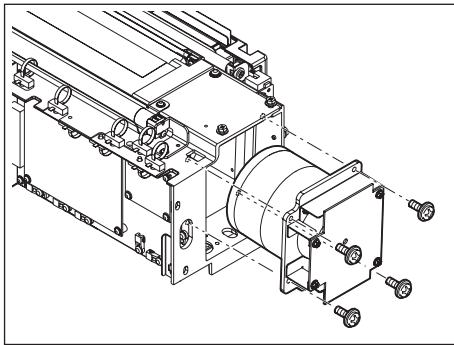
- CN301 (ACN301: cable)
- CN302 (ACN302: cable)
- CN303 (ACN303: cable)
- CN304 (ACN304: cable)
- J1 (AJ1: cable)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.





3 Remove the photomultiplier tube filter assembly.

- 4 screws (M4 x 8)

4 Install the new photomultiplier tube filter assembly.

- 4 screws (M4 x 8)

5 Connect the cables removed in [Step 2](#) to the LMC.

- CN301 (ACN301: cable)
- CN302 (ACN302: cable)
- CN303 (ACN303: cable)
- CN304 (ACN304: cable)
- J1 (AJ1: cable)

6 See "■ [Installation Procedures \(Page 5-14\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to install the optical unit.

Now, you have finished with the procedures to replace the photomultiplier tube filter assembly.

5.7 Replacing the Parts on the Eraser Unit

5.7.1 Replacing the Erase Lamp Unit (Halogen Lamp)

See the section "6.2.5 Replacing the Erase Lamp (Halogen Lamp)" in the Operation Manual.

5.7.2 Replacing the Hot-Cathode Tube Lamp

This section describes the instructions on how to replace the hot-cathode tube lamp.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

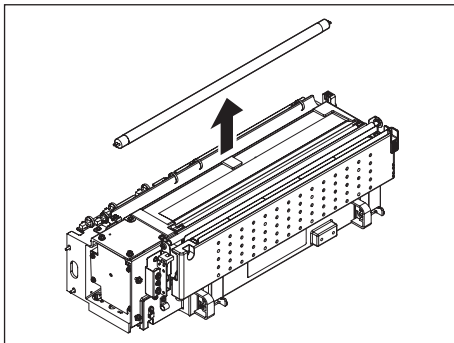
Personnel Number	Work Hours (steps 2 to 3)
1	

Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ [Removal Procedures \(Page 5-11\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to remove the optical unit.

Place the removed optical unit in a level and stable place with the light condensing unit up.



- 2 Remove the hot-cathode tube lamp.

- 3 Install the new hot-cathode tube lamp.
Install it so the transparent face will be on the surface.

- 4 See "■ [Installation Procedures \(Page 5-14\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to install the optical unit.

Now, you have finished with the procedures to replace the hot-cathode tube lamp.

5.7.3 Replacing the Halogen Lamp

This section described the instructions on how to replace the halogen lamp on the erase lamp unit.



Caution

- Do not touch the erase lamp directly immediately after it is turned on so as not to burn yourself.
- Wear glove when working with the lamp. The halogen lamp soiled with dirt or smear of your hand could be blown out in use.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

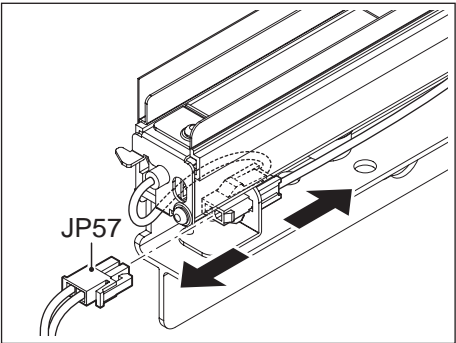
Personnel Number	Work Hours
1	

Requirements

Shown below is the tool requiring to be prepared in addition to the standard tools before performing the works in this section.

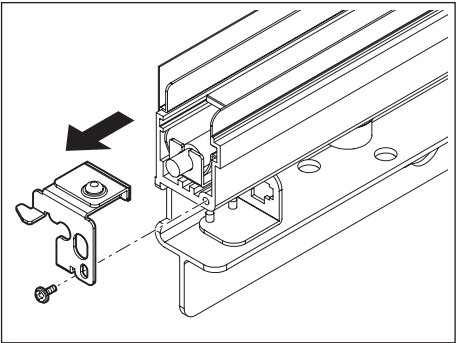
No.	Tool
1	Glove

- 1 See the section "6.2.5 Replacing the Erase Lamp (Halogen Lamp)" in the Operation Manual to remove the erase lamp unit.
- 2 Remove the halogen lamp cable connector (JP57).

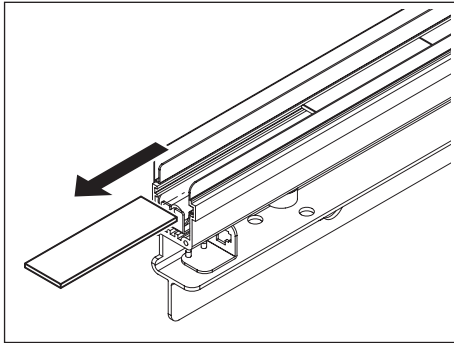


Caution

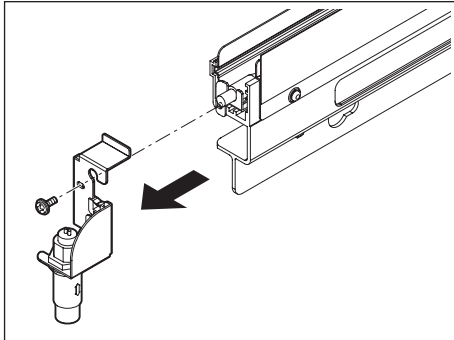
When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



- 3 Remove the fixing board.
 - 1 screw (M3 x 6)

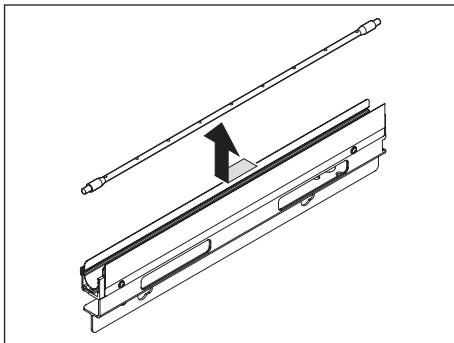


4 Slide the (five) filters to remove them.



5 Remove the reflector guide.

- 1 screw (M3 x 6)



6 Remove the halogen lamp.

7 Install the new halogen lamp.

8 Install the reflector guide that was removed in [Step 5](#).

- 1 screw (M3 x 6)

9 Install the (five) filters that were removed in [Step 4](#).

10 Install the fixing board that was removed in [Step 3](#).

- 1 screw (M3 x 6)

11 Connect the connector (JP57) that was removed in [Step 2](#).

12 See the section "6.2.5 Replacing the Erase Lamp (Halogen Lamp)" in the Operation Manual" to install the erase lamp unit.

Now, you have finished with the procedures to replace the halogen Lamp.

5.8 Replacing the Parts on the Detach Detection Unit

5.8.1 Replacing the Detach Detection Sensor (Upper)

This section describes the instructions on how to replace the detach detection sensor (upper).



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 5)
1	

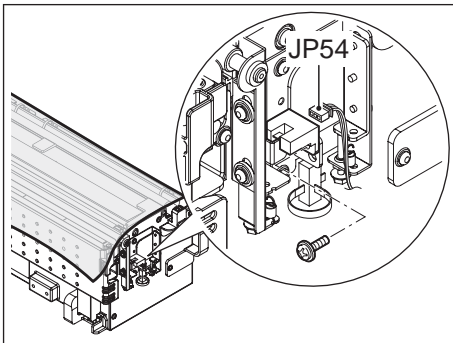
Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool	No.	Tool
1	Detach detection unit adjusting jig (Adjustment block, sensor status detection jig)	2	Vinyl sheet (used for covering the light condensing unit to screen out dust on it)

- 1 See "■ [Removal Procedures \(Page 5-11\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to remove the optical unit.

Place the removed optical unit in a level and stable place with the light condensing unit up.



- 2 Remove the detach detection sensor (upper).

- 1 screw (M3 x 6)



Caution

The screw cannot be accessed straight. Be careful so as not to break down its screw hole.

- 3 Unplug the cable from the detach detection sensor (upper).

- Connector (JP54)

- 4 Connect the cable to the new detach detection sensor (upper).

- 5 Install the detach detection sensor (upper).

- 1 screw (M3 x 6)

- 6 See "[6.5 Adjust Position of Detach Detection Roller/Sensor \(Page 6-12\)](#)" to adjust the sensor position.

- 7 See "■ [Installation Procedures \(Page 5-14\)](#)" in "[5.2.5 Removing/Installing the Optical Unit](#)" to install the optical unit.

Now, you have finished with the procedures to replace the detach detection sensor (upper).

5.8.2 Replacing the Detach Detection Sensor (Lower)

This section describes the instructions on how to replace the detach detection sensor (lower).



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 14)
1	

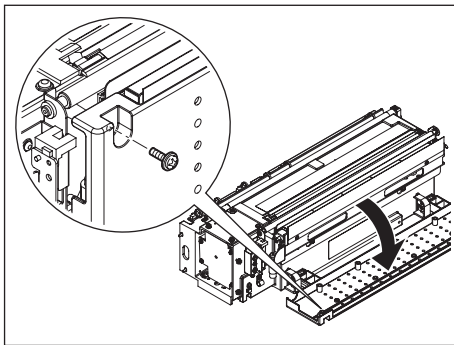
Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool	No.	Tool
1	Detach detection unit adjusting jig (Adjustment block, sensor status detection jig)	2	Vinyl sheet (used for covering the light condensing unit to screen out dust on it)

- 1 See "■ Removal Procedures (Page 5-11)" in "5.2.5 Removing/Installing the Optical Unit" to remove the optical unit.

Place the removed optical unit in a level and stable place with the light condensing unit up.



- 2 Open the number 2 eraser cover.

- 1 screw

- 3 See "5.8.3 Replacing the Detach Detection Roller" to remove the detach detection roller.

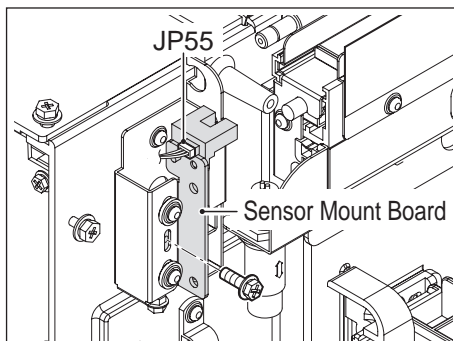
- 4 Cover the optical unit with a vinyl sheet to screen out dust on it.

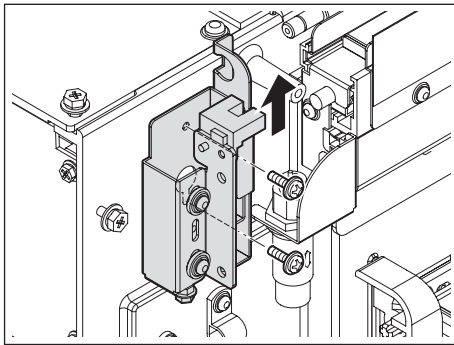
- 5 Unplug the cable from the detach detection sensor (lower).

- Connector (JP55)

- 6 Remove the setscrew from the sensor mount board.

- 1 hex/Phillips-head screw (M3 x 10)

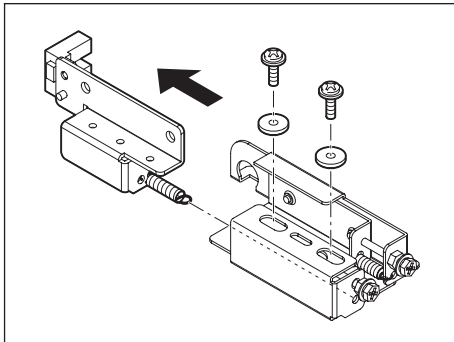




7 Remove the roller retention lower unit assembly.

- 2 screws (M3 x 6)

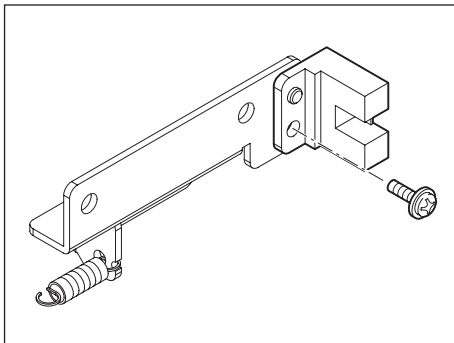
To access the screws, slide the sensor mount board upward.



8 Disconnect the spring connected to the sensor mount board, from one end of the spring.

9 Remove the sensor mount board.

- 2 screws (M3 x 6)
- 1 guide spacer for each



10 Remove the detach detection sensor (lower).

- 1 screw (M3 x 6)

11 Install the new detach detection sensor (lower).

12 See [Step 9](#) and [Step 8](#) to install the sensor mount board.

- 2 screws (M3 x 6)
- 1 guide spacer for each
- Spring

The setscrew removed in [Step 6](#) will be installed later when the sensor position will be adjusted ([Step 15](#)).

13 Install the roller retention unit lower assembly that was removed in [Step 7](#).

- 2 screws (M3 x 6)

14 Install the detach detection roller that was removed in [Step 3](#).

15 See ["6.5 Adjust Position of Detach Detection Roller/Sensor \(Page 6-12\)"](#) to adjust the roller and sensor positions.

16 See ["■ Installation Procedures \(Page 5-14\)"](#) in ["5.2.5 Removing/Installing the Optical Unit"](#) to install the optical unit.

Now, you have finished with the procedures to replace the detach detection sensor (lower).

5.8.3 Replacing the Detach Detection Roller

This section describes the instructions on how to replace the detach detection roller.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- Be careful when handling the optical unit not to send a shock wave to it, that is composed of precision parts.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 3)
1	

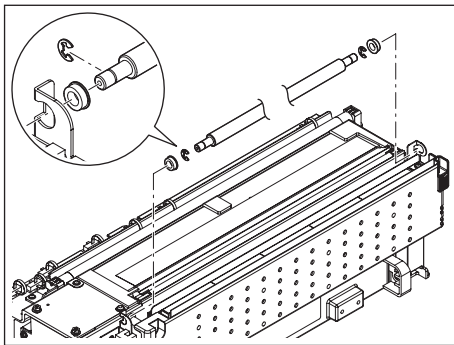
Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Detach detection unit adjusting jig (Adjustment block, sensor status detection jig)

- 1 See "■ Removal Procedures (Page 5-11)" in "5.2.5 Removing/Installing the Optical Unit" to remove the optical unit.

Place the removed optical unit in a level and stable place with the light condensing unit up.



- 2 Remove the E-rings to remove the detach detection roller.

- 2 E-rings
- 2 bearings

- 3 Install the new detach detection roller.

- 2 E-rings
- 2 bearings

- 4 See "6.5 Adjust Position of Detach Detection Roller/Sensor (Page 6-12)" to adjust the roller position.

- 5 See "■ Installation Procedures (Page 5-14)" in "5.2.5 Removing/Installing the Optical Unit" to install the optical unit.

Now, you have finished with the procedures to replace the detach detection roller.

5.9 Replacing the Parts on the Exterior

5.9.1 Replacing the Second Front Door Lock Mechanisms

This section describes the instructions on how to replace the second front door lock mechanisms (the lock mechanism unit assembly in the door side and the locking pin unit assembly in the main unit side).



Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

■ Door Side (Lock Mechanism Unit Assembly)

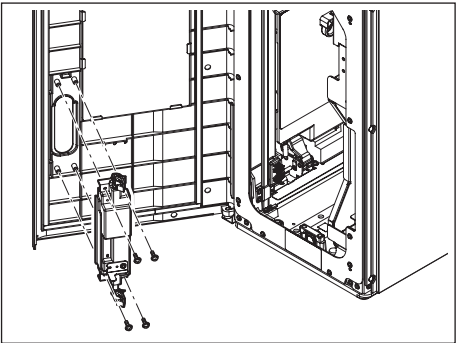
Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

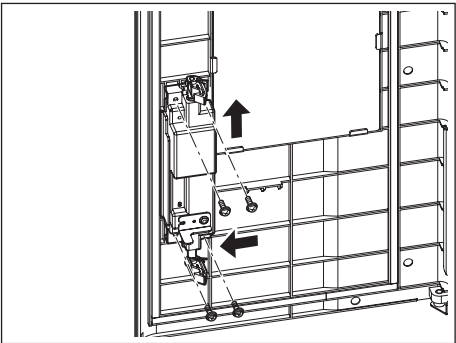
Personnel Number	Work Hours
1	

Requirements

The works in this section can be performed using only the standard tools.



- 1 Open the second front door.
- 2 Remove the lock mechanism unit assembly.
 - 4 tapping screws (M4 x 10)



- 3 Install the new lock mechanism unit assembly.
 - 4 tapping screws (M4 x 10)Press it in a direction of the arrow shown in the figure to fix it.

- 4 Close the second front door.

Now, you have finished with the procedures to replace the lock mechanism unit assembly.

■ Main Unit Side (Locking Pin Unit Assembly)

Work outline

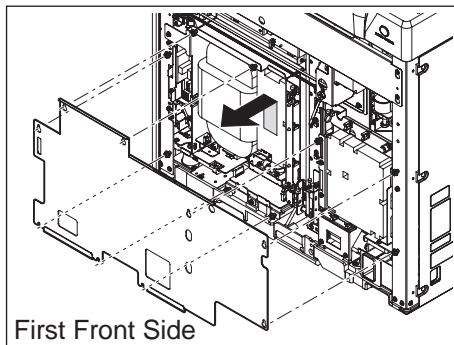
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 11)
1	

Requirements

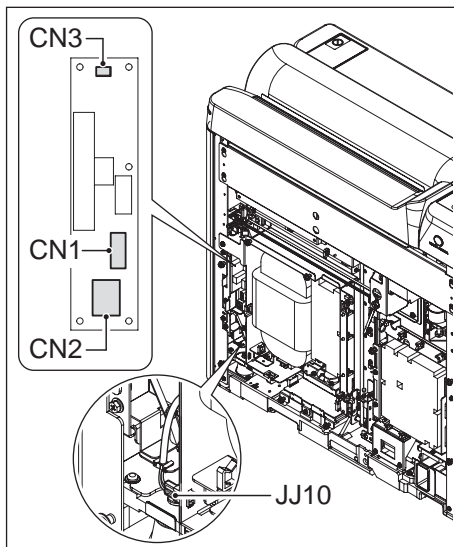
The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



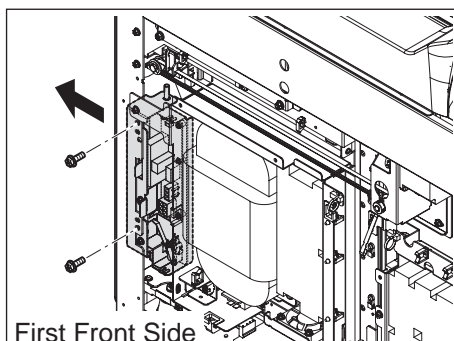
- 3 Remove all connectors from the PCU.

- CN1 (PCN1: cable)
- CN2 (PCN2: cable)
- CN3 (PCN3: cable)

- 4 Remove the interlock switch cable connector (JJ10).



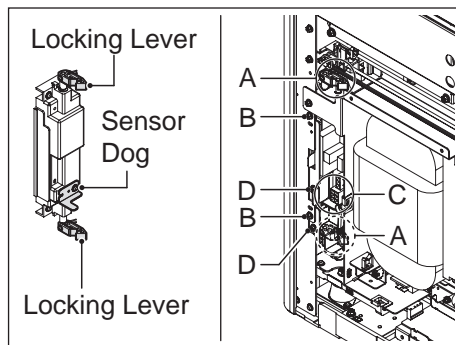
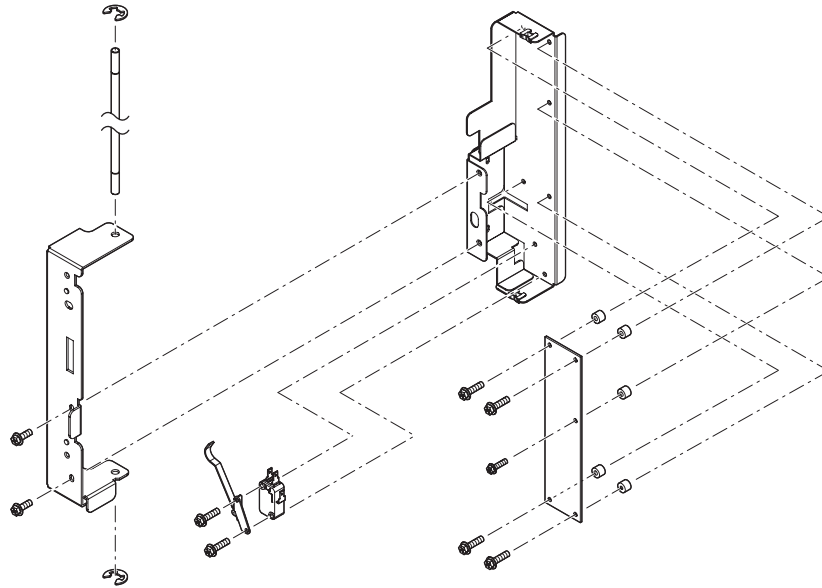
When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



- 5 Remove the locking pin unit assembly.

- 2 hex/Phillips-head screws (M4 x 8)

6 Replace the parts.



7 See [Step 5](#) to install the locking pin unit assembly.

- 2 hex/Phillips-head screws (M4 x 8)

8 Close the second front door to adjust the locking pin position.

- Make sure that the locking lever on the second front door is securely engaged to the locking shaft at the position A (two of upper and lower locations). If it is not, loosen the screws B to adjust the right and left sides, then fix the lever.
 - B: 2 hex/Phillips-head screws (M4 x 8)
- Make sure that the sensor dog on the second front door is set in the almost center of the slit in the switch mount bracket at the position C. If it is not, loosen the screws D to adjust the up and down sides, then fix the dog.
 - D: 2 hex/Phillips-head screws (M4 x 8)

9 Press the open/close button on the second front door to make sure that the door can be opened by spring force.

10 Connect the connectors removed in [Step 3](#) and [Step 4](#).

- PCU
 - CN1 (PCN1: cable)
 - CN2 (PCN2: cable)
 - CN3 (PCN3: cable)
- Interlock switch cable (JJ10)

11 Install the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

12 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the locking pin unit assembly.

5.9.2 Replacing the Interlock Switch

This section describes the instructions on how to replace the interlock switch.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

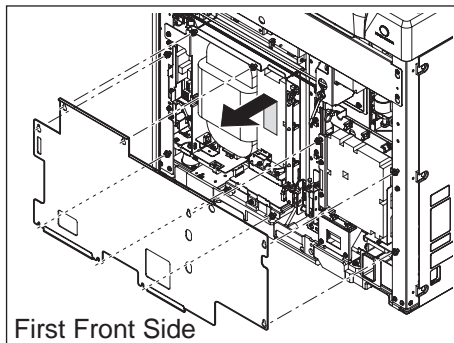
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 8)
1	

Requirements

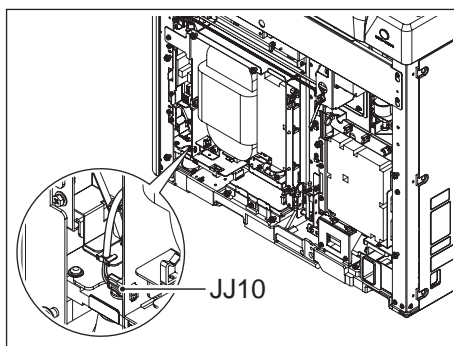
The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.

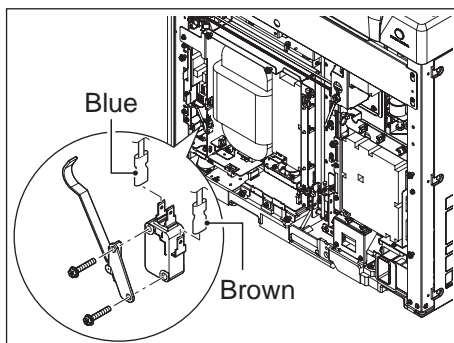


- 3 Remove the connector (JJ10).



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



- 4 Remove the interlock switch.

- 2 hex/Phillips-head screws (M3 x 15)

- 5 Disconnect the cable and connect it to the interlock switch.

- 6 Install the new interlock switch.


- 2 hex/Phillips-head screws (M3 x 15)

- 7 Connect the connector (JJ10) that was removed in [Step 3](#).
- 8 Install the electric component mount panel that was removed in [Step 2](#).
 - 8 hex/Phillips-head screws (M4 x 8)
- 9 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the interlock switch.

5.9.3 Replacing the Noise Filter and the Circuit Protector Unit

This section describes the instructions on how to replace the noise filter and the circuit protector unit

**Caution**

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

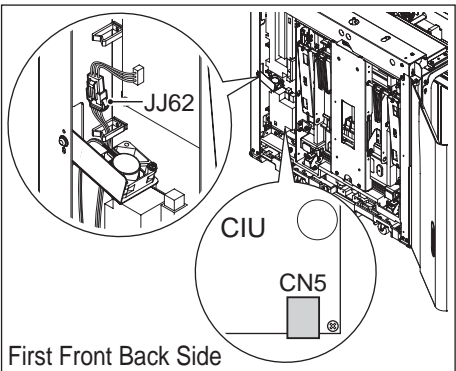
Personnel Number	Work Hours (steps 2 to 14)
1	


Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

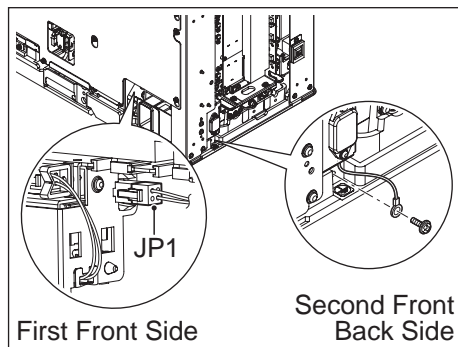
No.	Tool
1	Wiring band

- 1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the exterior panel and insertion unit.



- 2 Remove the cooling fan connector (JJ62) from the first front back side.
- **Caution**

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.
- 3 Remove the CIU connector (CN5).
 - CN5 (CCN5: cable)



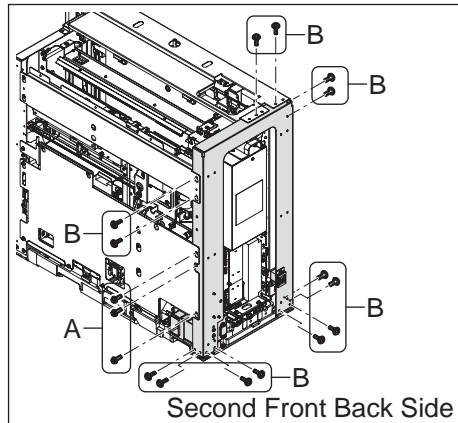
- 4 Remove the connector (JP1) from the first front side.



When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 5 Remove the grounding cable from the second front side.

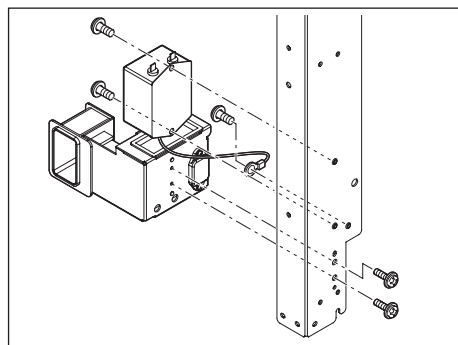
- 1 hex/Phillips-head screw (M5 x 10)



- 6 Remove the exterior frame (right).

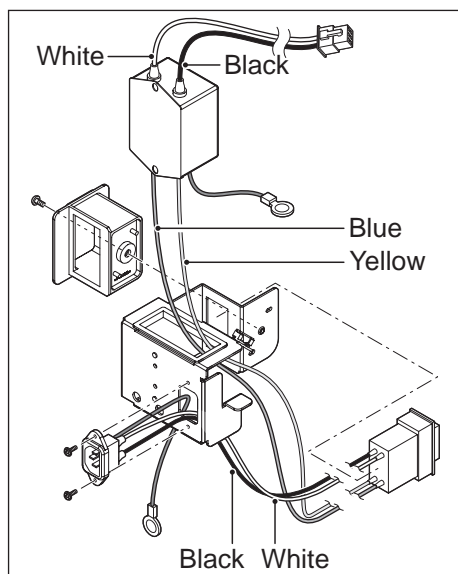
- A: 3 hex/Phillips-head screws (M4 x 8)
- B: 14 screws (M4 x 8)

Remove all screws.



- 7 Remove the noise filter and the circuit protector unit assembly.

- Noise filter
 - 2 screws (M4 x 8)
 - Grounding cable: 1 screw (M4 x 8)
- Circuit protector unit assembly
 - 2 screws (M4 x 8)

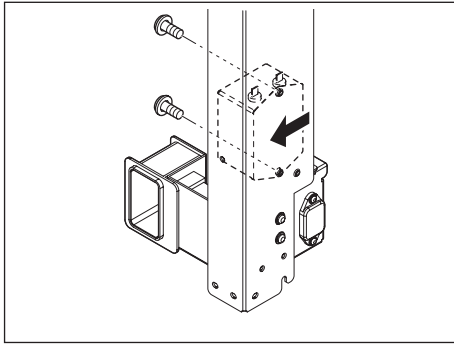


- 8 Replace the parts.

- Circuit breaker cover
 - 1 screw (M4 x 8)
- Inlet
 - 2 screws (M3 x 6)

Install the circuit protector (power supply circuit breaker) with the ON side up.

Install the inlet with the ground side facing to the left.



9 See [Step 7](#) to install the locking pin unit assembly.

- Noise filter
 - 2 screws (M4 x 8)
 - Grounding cable: 1 screw (M4 x 8)
- Circuit protector unit assembly
 - 2 screws (M4 x 8)

Move the noise filter in the direction of the arrow in the figure and fix it.



Caution

After installing, make sure that circuit protector has been switched to OFF.

10 See [Step 6](#) to install the exterior frame (right).

- A: 4 hex/Phillips-head screws (M4 x 8)
- B: 12 screws (M4 x 8)

11 See [Step 5](#) to connect the grounding cable of the inlet to the frame.

- 1 hex/Phillips-head screw (M5 x 10)

12 Connect the connector (JP1) that was removed in [Step 4](#).

13 Connect the CIU connector (CN5) that was removed in [Step 3](#).

- CN5 (CCN5: cable)

14 Connect the cooling fan connector (JJ62) that was removed in [Step 2](#).

15 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the noise filter and the circuit protector unit.

5.9.4 Replacing the Condenser

This section describes the instructions on how to replace the condenser.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

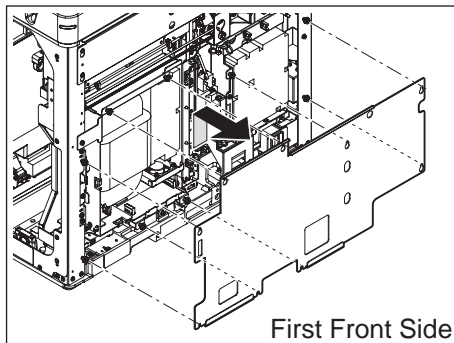
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 9)
1	

Requirements

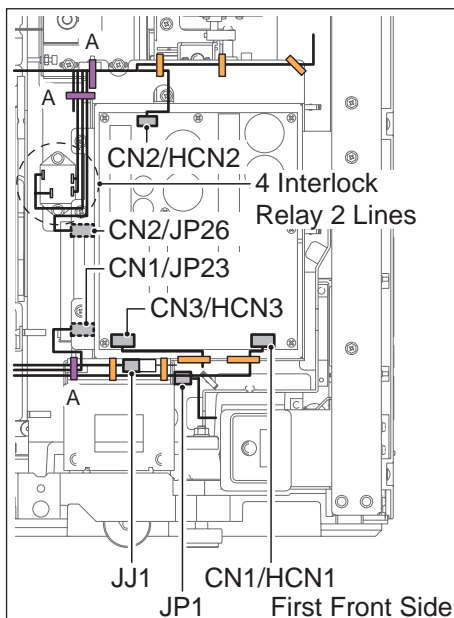
The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



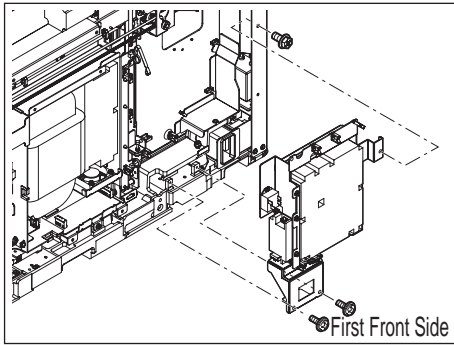
- 3 Remove the connectors in the figure to remove the cables secured to the halogen power supply unit assembly with the snap ties and the clamps.



Caution

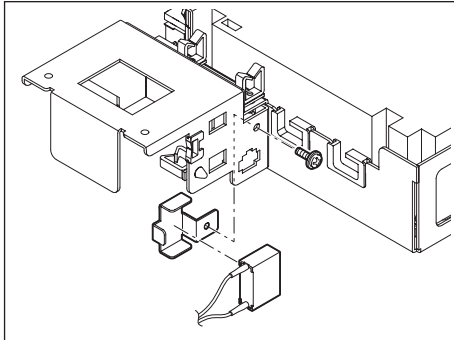
When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- Ties
 - A: Snap ties (remove them)
- Interlock relay 2
 - 4 pieces
- Standby power supply
 - CN1 (JP23: cable)
 - CN2 (JP26: cable)
- Halogen power supply
 - CN1 (HCN1: cable)
 - CN2 (HCN2: cable)
 - CN3 (HCN3: cable)
- Condenser
 - JJ1A (JP1: cable)
 - JP1A (JJ1: cable)



4 Remove the halogen power supply unit assembly.

- 1 hex/Phillips-head screw (M4 x 8)
- 2 screws (M4 x 8)

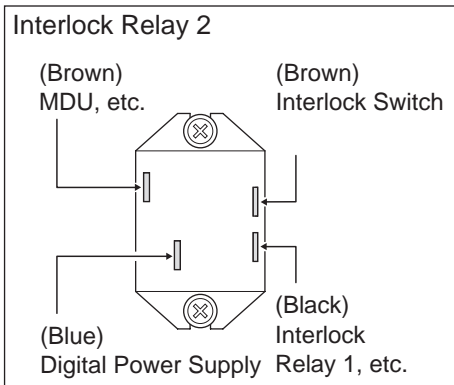


5 Remove the bracket, then the condenser.

- 1 screw (M3 x 6)

6 Install the new condenser.

- Bracket
- 1 screw (M3 x 6)



7 Install the halogen power supply unit assembly that was removed in [Step 4](#).

- 1 hex/Phillips-head screw (M4 x 8)
- 2 screws (M4 x 8)

8 Connect the connectors removed in [Step 3](#) and fix them using the snap ties and clamps.

- Ties
 - Snap ties at 3 locations
- Interlock relay 2
 - 4 pieces (see the figure)
- Standby power supply
 - CN1 (JP23: cable)
 - CN2 (JP26: cable)
- Halogen power supply
 - CN1 (HCN1: cable)
 - CN2 (HCN2: cable)
 - CN3 (HCN3: cable)
- Condenser
 - JJ1A (JP1: cable)
 - JP1A (JJ1: cable)

9 Install the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

10 See "■ Installation Procedures (Page 5-8)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the condenser.

5.9.5 Replacing the Halogen Power Supply

This section describes the instructions on how to replace the halogen power supply.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

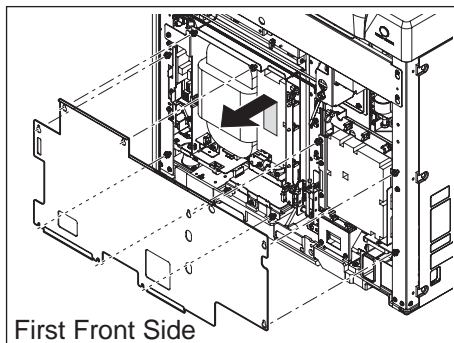
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

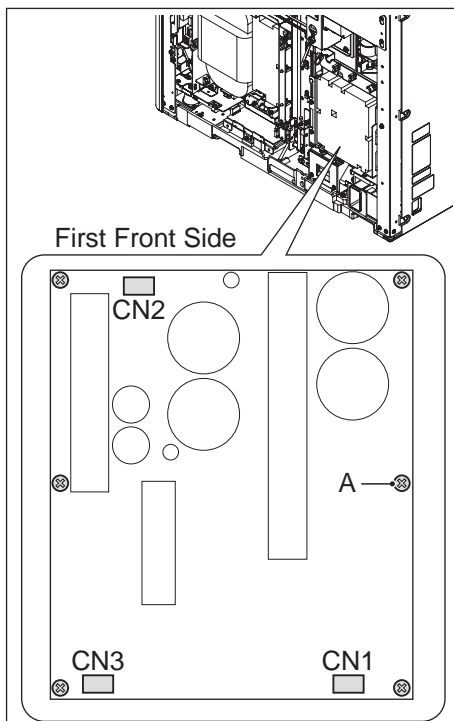
The works in this section can be performed using only the standard tools.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
- Loosen all screws.



- 3 Unplug all the cables connected to the halogen power supply.



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4 Remove the halogen power supply.

- 6 hex/Phillips-head screws (M3 x 15)
- 1 collar for each one (excluding the position A)

- 5 Install the new halogen power supply.

- 6 hex/Phillips-head screws (M3 x 15)
- 1 collar for each one (excluding the position A)

- 6 Connect the cables unplugged in [Step 3](#) to the halogen power supply.

- CN1 (HCN1: cable)
- CN2 (HCN2: cable)
- CN3 (HCN3: cable)

- 7 Install the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

8 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front panel.

Now, you have finished with the procedures to replace the halogen power supply.

5.9.6 Replacing the PCU

This section describes the instructions on how to replace the PCU.



Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

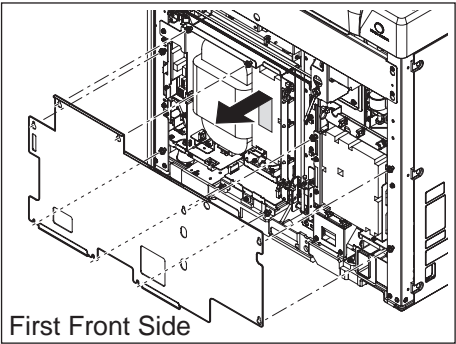
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

The works in this section can be performed using only the standard tools.

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



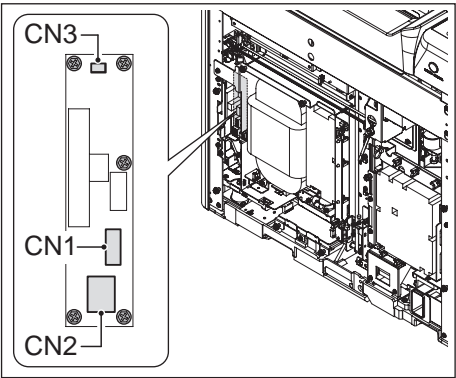
2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.

3 Unplug all the cables connected to the PCU.



When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



4 Remove the PCU.

- 5 hex/Phillips-head screws (M3 x 15)
- 1 collar for each one



Be careful not to drop and lose the collar.

5 Install the new PCU.

- 5 hex/Phillips-head screws (M3 x 15)
- 1 collar for each one

6 Connect the cables unplugged in [Step 3](#) to the PCU.

- CN1 (PCN1: cable)
- CN2 (PCN2: cable)
- CN3 (PCN3: cable)

7 Install the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

8 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the PCU.

5.9.7 Replacing the Transformer Unit Relay (Interlock Relay 1)

This section describes the instructions on how to replace the interlock relay 1.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

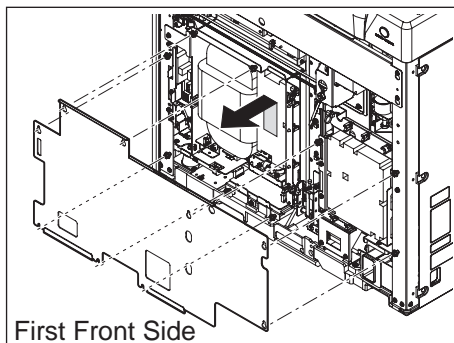
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 6)
1	

Requirements

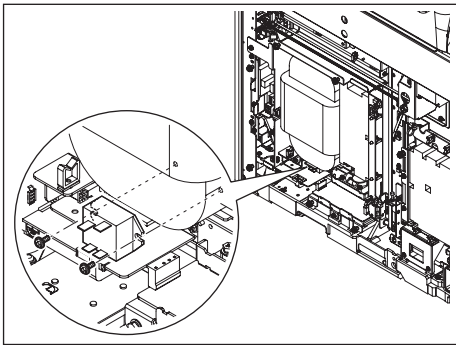
The works in this section can be performed using only the standard tools.

1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the first front panel.



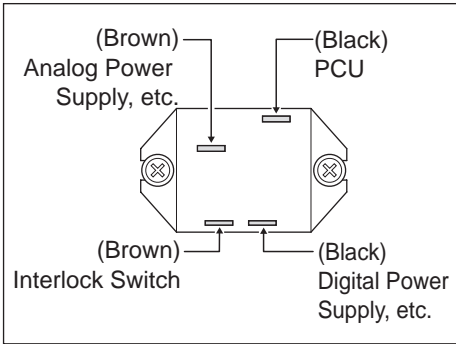
2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



3 Remove the interlock relay 1.

- 2 screws (M4 x 6)



4 Unplug the cable and connect it to the new interlock relay 1.

5 Install the new interlock relay 1.

- 2 screws (M4 x 6)

6 Install the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

7 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the interlock relay 1.

5.9.8 Replacing the Standby Power Supply Unit Relay (Interlock Relay 2)

This section describes the instructions on how to replace the interlock relay 2.



Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

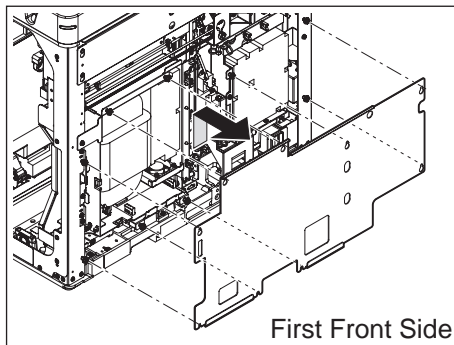
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 6)
1	

Requirements

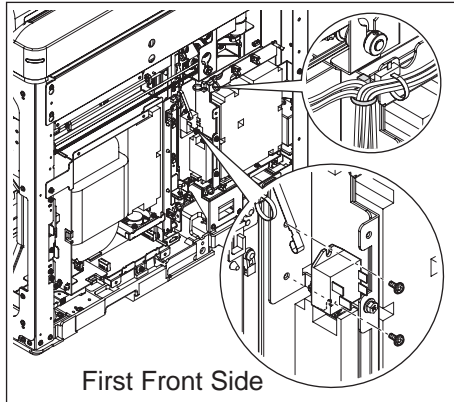
The works in this section can be performed using only the standard tools.

1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the first front panel.



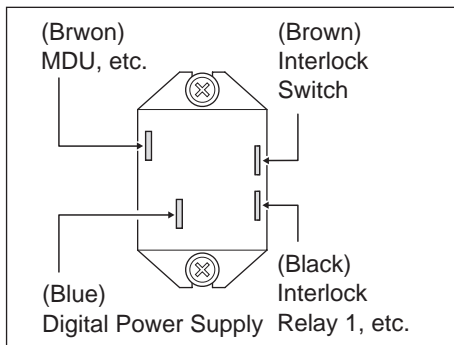
2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



3 Remove the interlock relay 2.

- 2 screws (M4 x 6)



4 Unplug the cable and connect it to the new interlock relay 1.

5 Install the new interlock relay 2.

- 2 screws (M4 x 6)

6 Install the electric component mount panel that was removed in [Step 2](#).


- 8 hex/Phillips-head screws (M4 x 8)

7 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front panel.

Now, you have finished with the procedures to replace the interlock relay 2.

5.9.9 Replacing the Standby Power Supply

This section describes the instructions on how to replace the standby power supply.

**Caution**

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

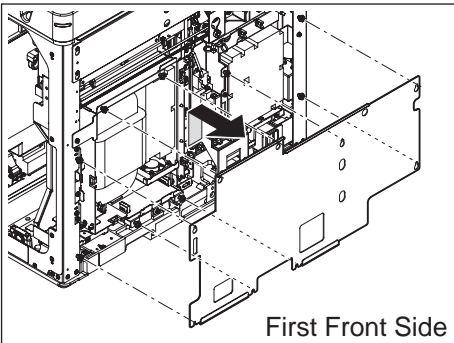
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 13)
1	

Requirements

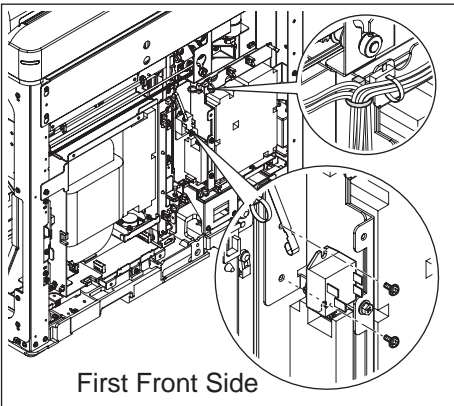
The works in this section can be performed using only the standard tools.

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



2 Remove the electric component mount panel.

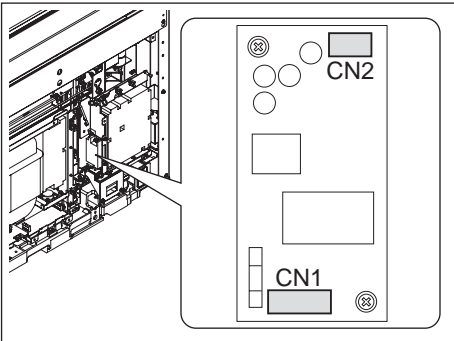
- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



3 Remove the snap tie (at 1 location) in the figure.
The tie does not to be cut off.

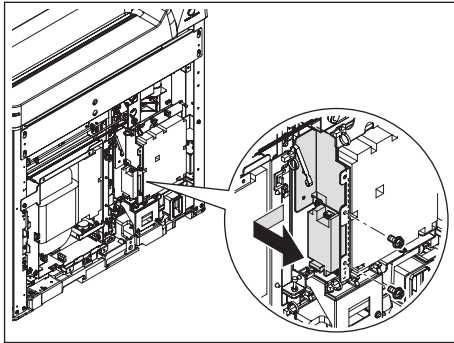
4 Remove the interlock relay 2.

- 2 screws (M4 x 6)



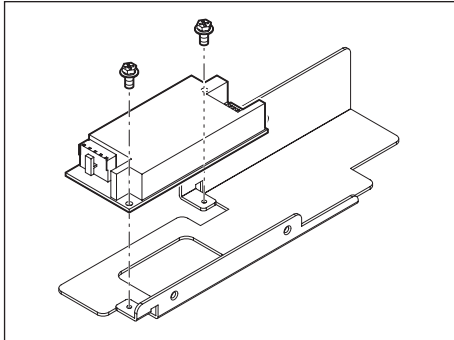
5 Unplug all the cables connected to the standby power supply.

- CN1 (JP23: cable)
- CN2 (JP26: cable)



6 Remove the circuit board mount bracket.

- 2 hex/Phillips-head screws (M4 x 8)



7 Remove the standby power supply.

- 2 hex/Phillips-head screws (M3 x 6)

8 Install the new standby power supply.

- 2 hex/Phillips-head screws (M3 x 6)

9 See [Step 6](#) to install the circuit board mount bracket.

- 2 hex/Phillips-head screws (M4 x 8)

10 Connect the cables removed in [Step 5](#) to the standby power supply.

- CN1 (JP23: cable)
- CN2 (JP26: cable)

11 Install the interlock relay 2 that was removed in [Step 4](#).

- 2 screws (M4 x 6)

12 Install the snap ties that was removed in [Step 3](#).

13 Install the electric component mount panel that was removed in [Step 2](#).


- 8 hex/Phillips-head screws (M4 x 8)

14 See "■ Installation Procedures (Page 5-8)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the standby power supply.

5.9.10 Replacing the Analog Power Supply

This section describes the instructions on how to replace the analog power supply.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

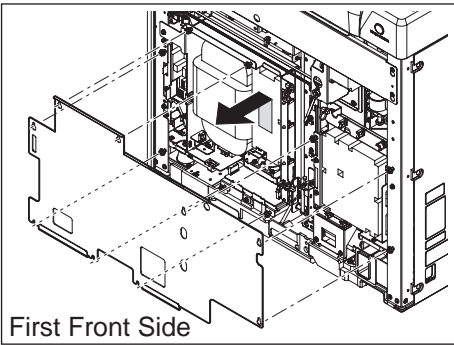
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 8)
1	

Requirements

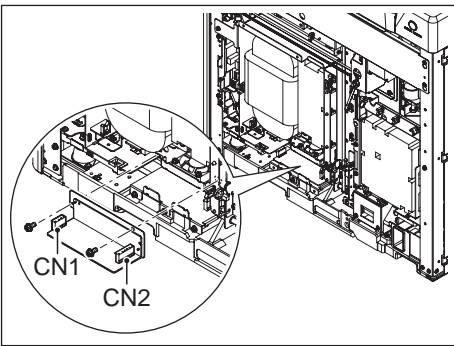
The works in this section can be performed using only the standard tools.

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.




2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



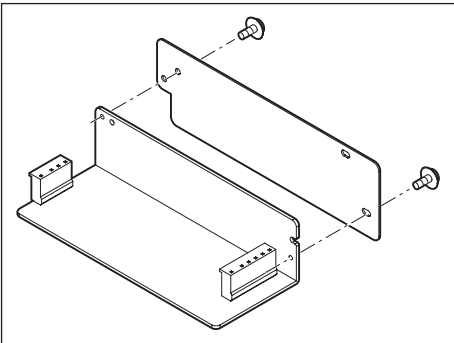
3 Eject the analog power supply together with the bracket.

- 2 hex/Phillips-head screws (M3 x 6)
While ejecting the analog power supply as above, unplug the cables from it.
- CN1 (JP24: cable)
- CN2 (JP27: cable)



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



4 Remove the analog power supply.

- 2 screws (M3 x 6)

5 Install the bracket on the new analog power supply.

- 2 screws (M3 x 6)

Fix the bracket by moving it upward to the analog power supply.

- 6 Connect the cables removed in [Step 3](#) to the analog power supply.
 - CN1 (JP24: cable)
 - CN2 (JP27: cable)
 - 7 See [Step 3](#) to install the bracket.
 - 2 hex/Phillips-head screws (M3 x 6)
 - 8 Install the electric component mount panel that was removed in [Step 2](#).
 - 8 hex/Phillips-head screws (M4 x 8)
- 9 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the analog power supply.

5.9.11 Replacing the Digital Power Supply

This section describes the instructions on how to replace the digital power supply.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

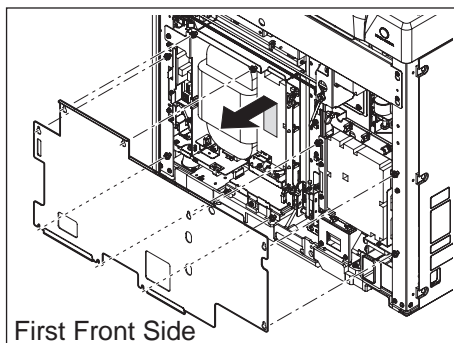
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 7)
1	

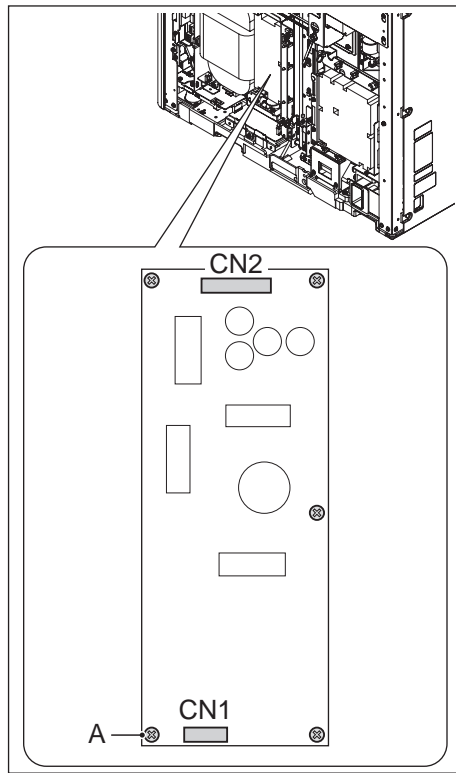
Requirements

The works in this section can be performed using only the standard tools.

- 1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the first front panel.



- 2 Remove the electric component mount panel.
 - 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



- 3** Unplug all the cables connected to the digital power supply.



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4** Remove the digital power supply.

- 5 hex/Phillips-head screws (M3 x 15)
- 1 circuit board spacer for each one (excluding the position A)

- 5** Install the new digital power supply.

- 5 hex/Phillips-head screws (M3 x 15)
- 1 circuit board spacer for each one (excluding the position A)

- 6** Connect the cables removed in [Step 3](#) to the digital power supply.

- CN1 (JP22: cable)
- CN2 (JP25: cable)

- 7** Install the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

- 8** See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the digital power supply.

5.9.12 Replacing the Transformer

This section describes the instructions on how to replace the transformer.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- A transformer weighs about ??kg. When removing or installing the transformer or transformer unit assembly, be sure to hold it securely so as not to drop it.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

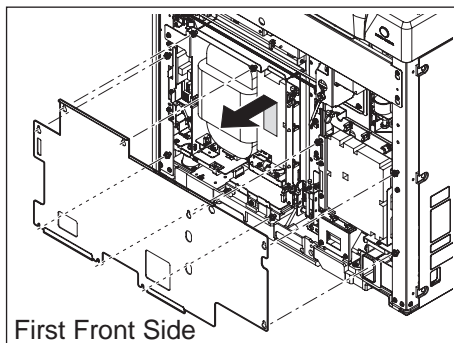
Personnel Number	Work Hours (steps 2 to 9)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Wiring band

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.

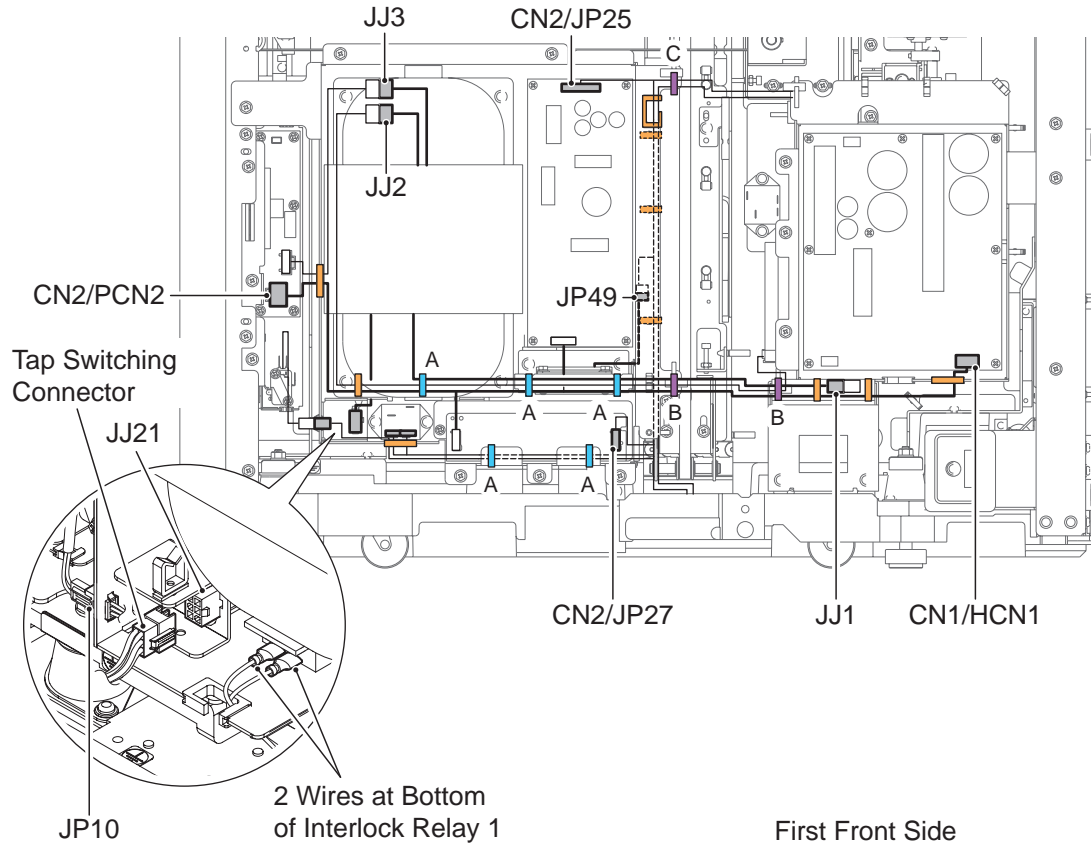
- 3 Remove the connectors in the below figure to remove the cables secured to the transformer unit assembly with the wiring band and clamps.



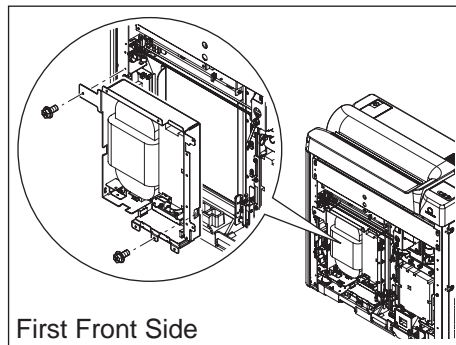
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

Removing the transformer unit assembly will remove the cables expressed with heavy lines in the figure, which are kept attached to the unit. Remove any other cable than the above, which is attached to the unit.

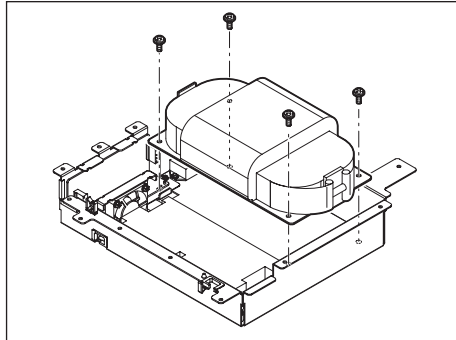


- Ties
 - A: wiring band (cut them off)
 - B: snap ties (cut them off)
 - C: snap ties (remove them)
- Transformer cables
 - JJ1 (JP1A: cable)
 - JP2 (CN2: cable)
 - JJ3 (JP3: cable)
 - JJ21 (tap switching connector)
JJ21 must be removed from the clasp.
- PCU
 - CN2 (PCN2: cable)
- Interlock switch
 - JJ10 (JP10: cable)
- Interlock relay 1
 - 2 pieces in the lower side (left: brown, right: black)
- Digital power supply
 - CN2 (JP25: cable)
- Digital power supply cooling fan cable
 - JP49 (JJ49: cable)
- Analog power supply
 - CN2 (JP27: cable)
- Halogen power supply
 - CN1 (HCN1: cable)



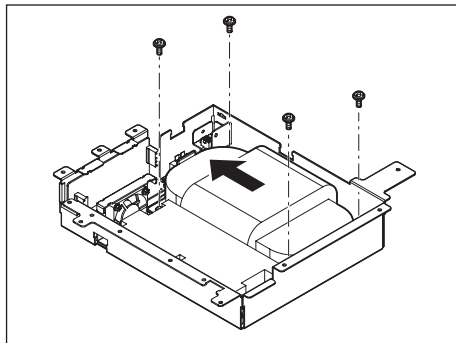
4 Remove the transformer unit assembly.

- 2 hex/Phillips-head screws (M4 x 8)



5 Remove the transformer.

- 4 screws (M4 x 6)



6 Install the new transformer.

- 4 screws (M4 x 6)

Press it in a direction of the arrow shown in the figure to fix it.

7 See [Step 4](#) to install the transformer unit assembly.

- 2 hex/Phillips-head screws (M4 x 8)

8 Connect the connectors removed in [Step 3](#) and fix them using the wiring band and clamps.

- Connectors at 10 locations
- 2 cables to the interlock relay 1

9 Install the electric component mount panel that was removed in [Step 2](#).


- 8 hex/Phillips-head screws (M4 x 8)

10 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the transformer.

5.9.13 Replacing the Digital Power Supply Cooling Fan

This section describes the instructions on how to replace the digital power supply cooling fan.

**Caution**

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

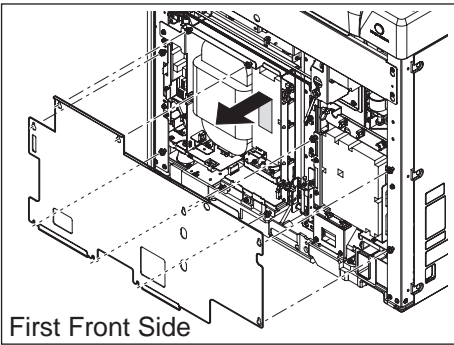
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 9)
1	

Requirements

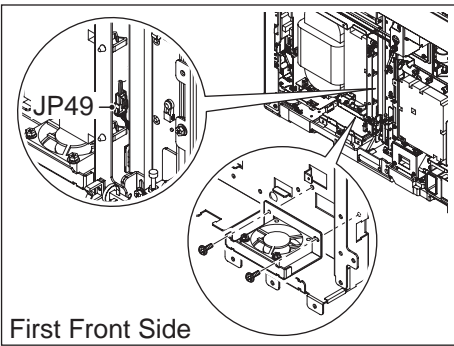
The works in this section can be performed using only the standard tools.

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.




2 Remove the electric component mount panel.

- 8 hex/Phillips-head screws (M4 x 8)
Loosen all screws.



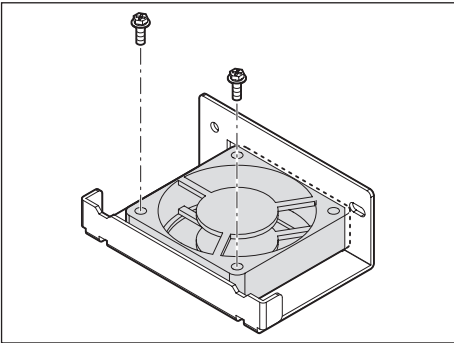
3 Remove the digital power supply cooling fan cable connector (JP49).

**Caution**

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

4 Remove the fan bracket.

- 2 screws (M4 x 8)



5 Remove the fan motor.

- 2 screws (M4 x 8)

6 Install the new fan motor.

- 2 screws (M4 x 8)

- 7 See [Step 4](#) to install the fan bracket.
 - 2 screws (M4 x 8)
- 8 Connect the connector (JP49) that was removed in [Step 3](#).
After connecting, fix the cable using the clamp and wiring band.
- 9 Install the electric component mount panel that was removed in [Step 2](#).
 - 8 hex/Phillips-head screws (M4 x 8)
- 10 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

Now, you have finished with the procedures to replace the power supply cooling fan.

5.9.14 Replacing the MDU Cooling Fan

This section describes the instructions on how to replace the MDU cooling fan.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

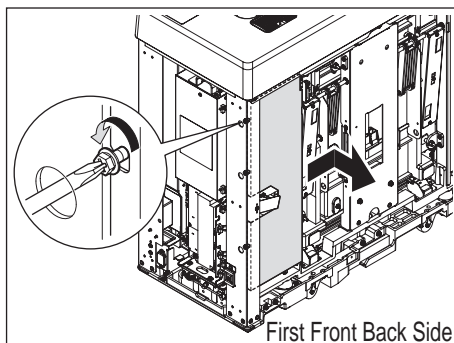
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 9)
1	

Requirements

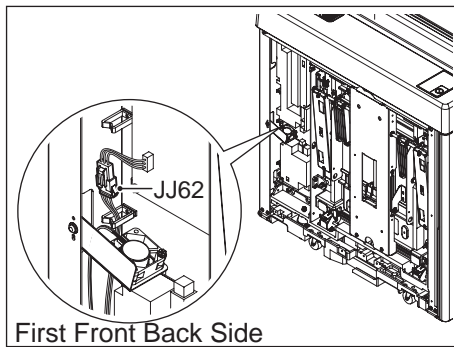
The works in this section can be performed using only the standard tools.

- 1 See "■ [Removal Procedures \(Page 5-6\)](#)" of the "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)", and remove the first front back panel.



First Front Back Side

- 2 Remove the circuit board cover.
 - 3 screws (M3 x 6)
 Loosen all.

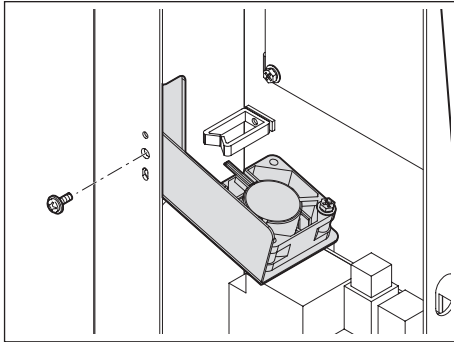


3 Remove the connector (JJ62).



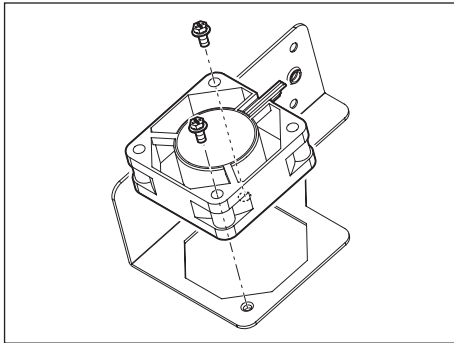
Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



4 Remove the fan unit assembly.

- 1 screw (M4 x 8)



5 Remove the cooling fan.

- 1 hex/Phillips-head screw (M3 x 20)

6 Install the new cooling fan.

- 1 hex/Phillips-head screw (M3 x 20)

7 See [Step 4](#) to install the fan unit assembly.

- 1 screw (M4 x 8)

8 Connect the connector (JJ62) that was removed in [Step 3](#).

9 Install the circuit board cover that was removed in [Step 2](#).

- 3 screws (M3 x 6)

10 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front back panel.

Now, you have finished with the procedures to replace the cooling fan.

5.10 Replacing the Parts on the Framework

5.10.1 Replacing the CIU

This section describes the instructions on how to replace the CIU.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- See ["5.2.7 Binding the Grounding Strap \(Page 5-18\)"](#) to bind a grounding strap in order to protect the circuit board from damage due to static discharge.

Work outline

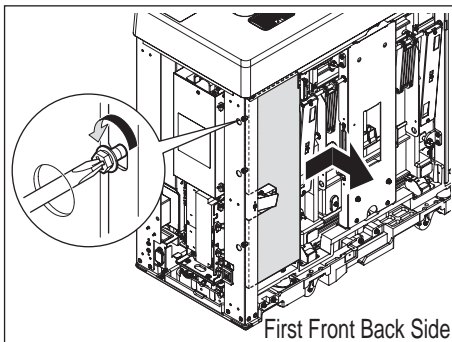
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 8)
1	

Requirements

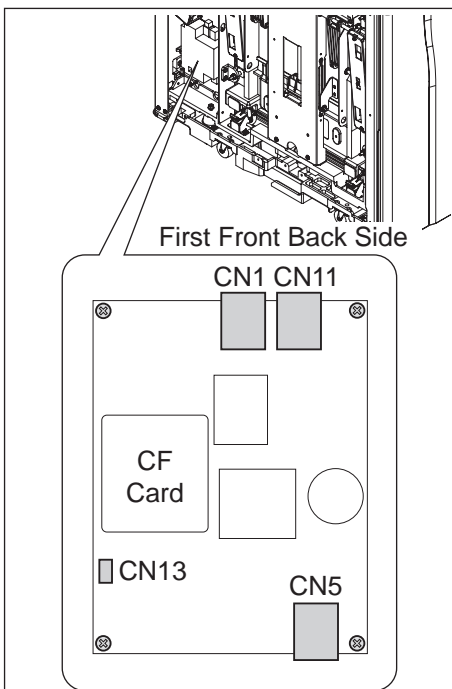
The works in this section can be performed using only the standard tools.

- 1 See ["■ Removal Procedures \(Page 5-6\)"](#) of the ["5.2.3 Removing/Installing the Exterior Panel and Insertion Unit"](#), and remove the first front back panel.



- 2 Remove the circuit board cover.

- 3 screws (M3 x 6)
- Loosen all.



- 3 Unplug all the cables connected to the CIU.



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 4 Remove the CIU.

- 4 hex/Phillips-head screws (M3 x 6)

- 5 Remove the CF card to install it on the new CIU.

- 6 Install the new CIU.

- 4 hex/Phillips-head screws (M3 x 6)

- 7 Connect the cables removed in [Step 3](#) to the CIU.

- CN1 (CCN1: cable)
- CN5 (CCN5: cable)
- CN11 (OCN11: cable)
- CN13 (CCN13: cable)


- 8
- Install the circuit board cover that was removed in [Step 2](#).
- 3 screws (M3 x 6)

- 9
- See "[■ Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front back panel.

Now, you have finished with the procedures to replace the CIU.

5.10.2 Replacing the MDU

This section describes the instructions on how to replace the MDU.



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- See "[5.2.7 Binding the Grounding Strap \(Page 5-18\)](#)" to bind a grounding strap in order to protect the circuit board from damage due to static discharge.

Work outline

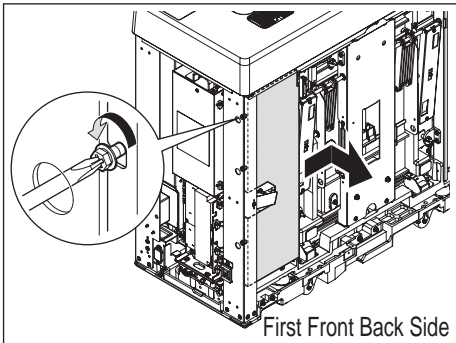
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

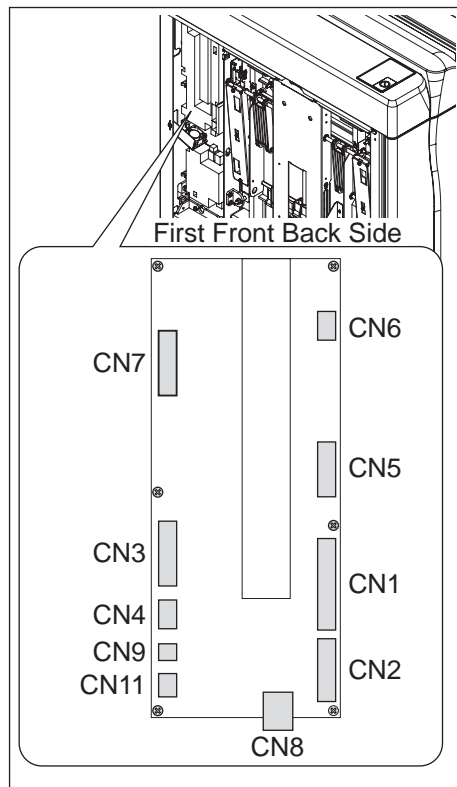
The works in this section can be performed using only the standard tools.

- 1
- See "[■ Removal Procedures \(Page 5-6\)](#)" of the "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)", and remove the first font back panel.



- 2
- Remove the circuit board cover.
- 3 screws (M3 x 6)

Loosen all.



3 Unplug all the cables connected to the MDU.



Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

4 Remove the MDU.

- 6 hex/Phillips-head screws (M3 x 6)

5 Install the new MDU.

- 6 hex/Phillips-head screws (M3 x 6)

6 Connect the cables removed in [Step 3](#) to the MDU.

- CN1 (MCN1: cable)
- CN2 (MCN2: cable)
- CN3 (MCN3: cable)
- CN4 (MCN4: cable)
- CN5 (MCN5: cable)
- CN6 (MCN6: cable)
- CN7 (MCN7: cable)
- CN8 (MCN8: cable)
- CN9 (MCN9: cable)
- CN11 (MCN11: cable)

7 Install the circuit board cover that was removed in [Step 2](#).

- 3 screws (M3 x 6)

8 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front back panel.

Now, you have finished with the procedures to replace the MDU.

5.10.3 Replacing the CF Card

This section describes the instructions on how to replace the CF card.

■ Before Replacing the CF Card

Own various configuration data on the individual REGIUS MODEL 110 equipment is stored in each CF card. Therefore, data within the card must be backed up before replaced, then it must be restored in the new card after replaced. The service tools can be used to perform these works as above on the REGIUS console that is connected to the REGIUS MODEL 110 through networking.



Replace the CF card when it is possibly malfunctioning. In most cases, a malfunction in the CF card will disable the REGIUS MODEL 110 to establish network connection, resulting in impossibility to perform data backup at this time. The CF card backup is one of the work items required when installing the equipment, however, backup must be performed whenever any setting is changed in the REGIUS MODEL 110 for the purpose of servicing or other purpose.

■ Work Procedures

This section describes the procedures for the works required in order to replace the CF card.

For operating the service tools, see the Installation/Service Manual for REGIUS console.



- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- See ["5.2.7 Binding the Grounding Strap \(Page 5-18\)"](#) to bind a grounding strap in order to protect the circuit board from damage due to static discharge.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool	No.	Tool
1*	Ethernet cable (Category 5e or higher)	2*	Network hub

*: Cross cable can also be used.

- 1 If the equipment can communicate with the REGIUS console, back up data in the CF card and store it in the console in the "Change Circuit Board" screen of a service tool.
- 2 Back up the own configuration data (system or JM information) on the REGIUS on the console on which backup of the CF card data has been performed.
Subsequently, use this REGIUS console to restore the CF card data or configure the equipment (REGIUS MODEL 110).
- 3 Reset the settings in the REGIUS console to default (1:1 connect, post-register)

Network address setting screen

- IP address: 192.168.20.90
- Subnet mask: 255.255.255.0

JOBINFO screen

- Select "JobManager internal, post-register"

CCU INFO screen

- Host name: R170-0001
- Host name (on JobManager): r170-0001
- IP address: 192.168.20.170

PostgreSQL access tool

- c_status: set to "CS#-0001" only
- r_status: set to "r170-0001" only
- relations: set to a single relation between "CS#-0001" and "r170-0001" only
- sys_config: set to "1"

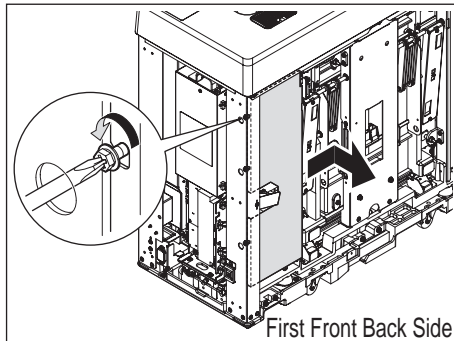
(CS#: "CS1" for CS-1 or CS-3; "CS2" for CS2)

Alternatively you can also initialize the JM settings using a service tool.

4 Exit the REGIUS console and the equipment and turn each power off.

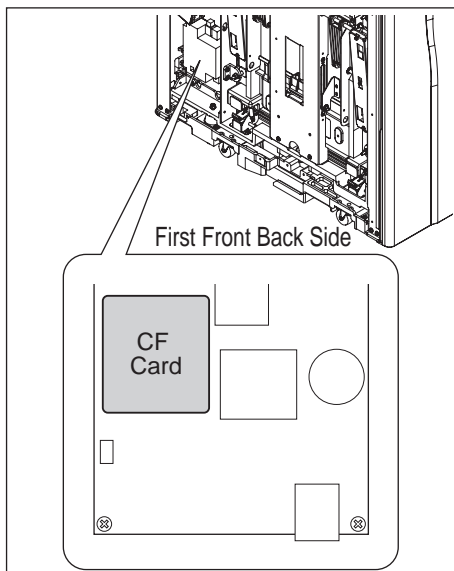
5 Replace the CF card.

1. See "■ [Removal Procedures \(Page 5-6\)](#)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front back panel.



2. Remove the circuit board cover.

- 3 screws (M3 x 6)
- Loosen all.



3. Replace the CF card.

4. Install the circuit board cover.

- 3 screws (M3 x 6)

5. See "■ [Installation Procedures \(Page 5-8\)](#)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front back panel.

- 6 Disconnect the equipment and the REGIUS console from the network over the site to establish the peer-to-peer based connection.
- 7 Turn both the REGIUS console and equipment powers on to get them started.
- 8 In the "Network Configuration" screen of the service tool, re-set the settings to the values when network configuration was set up on the equipment (during operations at the site).
- 9 Restore the settings in the REGIUS console that were backed up in [Step 2](#).
- 10 Connect the REGIUS console and the equipment to the network over the site.
- 11 Make sure that all data was reset to the settings that were made during operations, excluding each compensation and Config data.
- 12 In the "Change Circuit Board" screen of the service tool, restore the data backed up in [Step 1](#) (or during installation/servicing) in the CF card.

No Data to Restore

If data in the CF card cannot be backed up and there is no data backed up during installation/servicing, perform the rechecking/readjustment procedures as described below:

- Checking the number of read pixels and the read position
- Adjusting the image size and position
- Unevenness calibration
- Sensitivity calibration

For performing each work, see the Installation/Service Manual for REGIUS console.



Important

After configuration is completed, perform backup of the CF card data.

- 13 Restart the equipment.

Now, you have finished with the procedures to replace the CF card.

5.10.4 Replacing the Transporter HP Sensor

This section describes the instructions on how to replace the Transporter HP sensor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

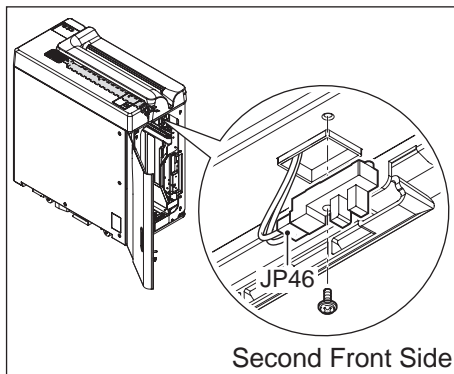
Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

Requirements

The works in this section can be performed using only the standard tools.



- 1 Open the second front door.
- 2 Check the position of the push plate unit.

When the push plate is in vicinity to the read home position:

See "■ If the insertion unit has not been removed: (Page 5-17)" in "5.2.6 Moving the Push Plate Unit" to move the push plate unit to the read position (first front back side).

- 3 Remove the transporter HP sensor.
 - 1 screw (M4 x 15)
- 4 Unplug the cable from the transporter HP sensor.
 - Connector (JP46)



Caution


When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

- 5 Connect the cable to the new transporter HP sensor.
- 6 Install the transporter HP sensor.
 - 1 screw (M4 x 15)
- 7 If the first front back panel was removed, see "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install it.

Now, you have finished with the procedures to replace the transporter HP sensor.

5.10.5 Replacing the Transporter Read Sensor

This section describes the instructions on how to replace the transporter read sensor.



Caution Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

Requirements

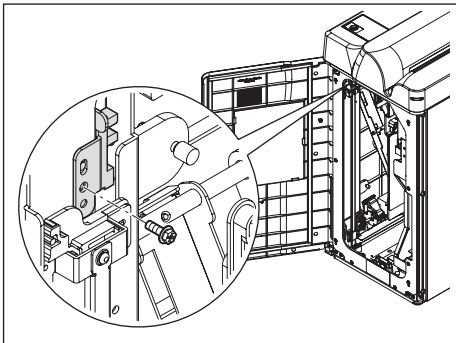
The works in this section can be performed using only the standard tools.

- 1
- Open the second front door.
- 2
- Check the position of the push plate unit.


When the push plate is at the read position:

See "■ If the insertion unit has not been removed: (Page 5-17)" in "5.2.6 Moving the Push Plate Unit" to move the push plate unit in the vicinity of the read home position.

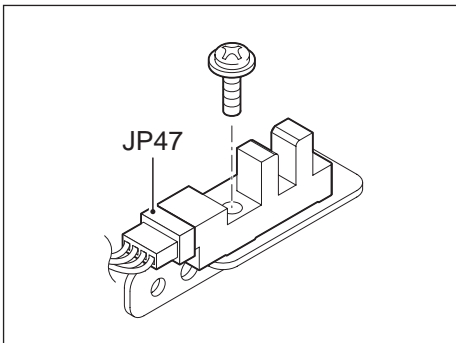
- 3
- Remove the read position detection unit assembly.
- 1 hex/Phillips-head screw (M4 x 8)



- 4
- Remove the connector (JP47).



Caution When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.



- 5
- Remove the transporter read sensor.
- 1 screw (M4 x 15)
- 6
- Install the new transporter read sensor on the sensor bracket.
- 1 screw (M4 x 15)
- 7
- Connect the connector (JP47).
- 8
- Install the read position detection unit assembly that was removed in [Step 3](#).
- 1 hex/Phillips-head screw (M4 x 8)

- 9 If the first front back panel was removed, see "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install it.

Now, you have finished with the procedures to replace the transporter read sensor.

5.10.6 Replacing the Transporter Motor

This section describes the instructions on how to replace the transporter motor.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

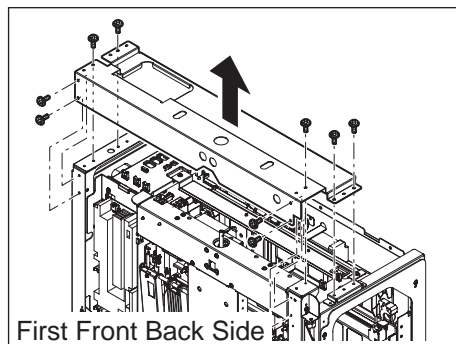
Personnel Number	Work Hours (steps 2 to 18)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

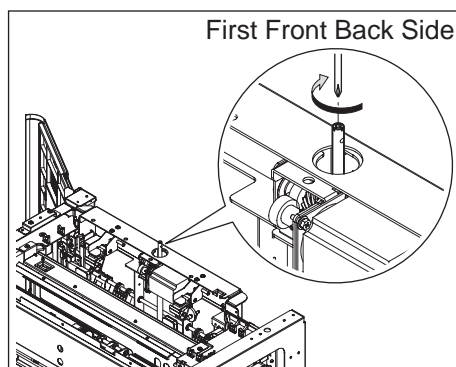
No.	Tool	No.	Tool
1	Grease (Plusguard No. 2 by Kyodo Yushi)	2	Waste cloth (used for greasing)
3	Wiring band		

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.



- 2 Remove the exterior frame (back).

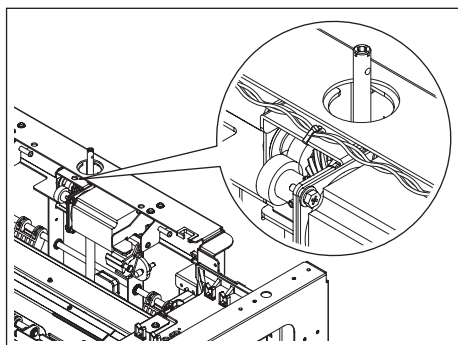
- 9 screws (M4 x 8)



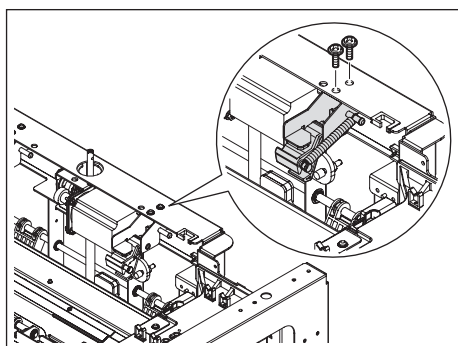
- 3 Rotate the shaft clockwise and move the push plate unit to the vicinity of the transporter home position.

This work is intended for the case that the push plate is at the read position.

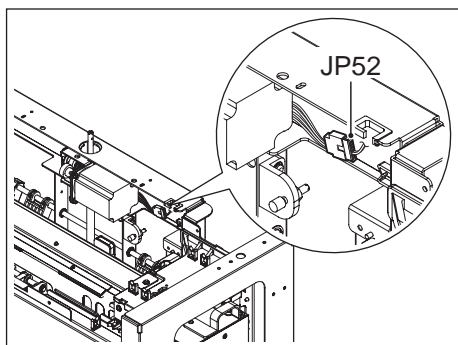
1. Move the optical unit to the second front back side.
2. Rotate the shaft clockwise and move to the vicinity of the transporter home position.



- 4 Cut off the wiring band retaining the cable on the transporter motor unit assembly.



- 5 Remove the right side tumbler (upper).
- 2 screws (M4 x 8)

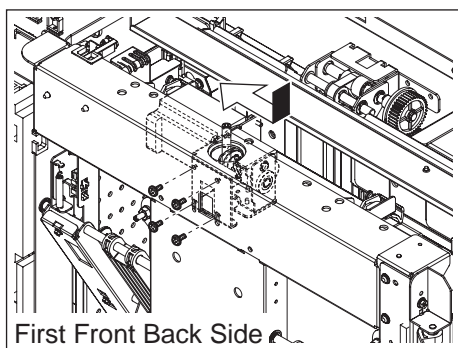


- 6 Remove the connector (JP52).

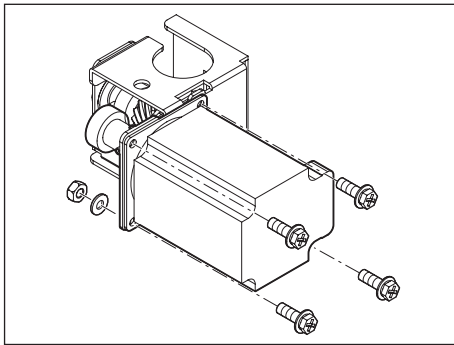


Caution

When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.

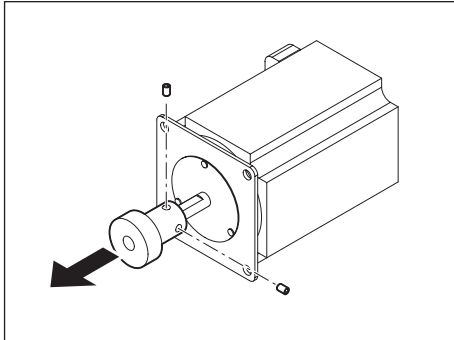


- 7 Remove the transporter unit assembly.
- 4 screws (M4 x 8)



8 Remove the transporter motor.

- 4 hex/Phillips-head screws (M4 x 12)
- 1 hexagon nut
- 1 washer



9 Remove the gear.

- 2 setscrews

10 Secure temporarily the gear to the new transporter motor.

- 2 setscrews

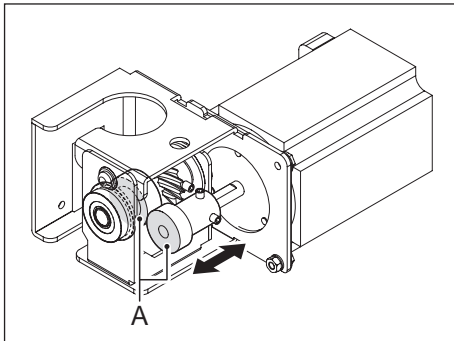
11 See [Step 8](#) to install the transporter motor on the bracket.

- 4 hex/Phillips-head screws (M4 x 12)



Make sure the connector is in the right direction when installing the motor.

Important



12 Adjust the position of the gear and fix it.

Fix the gear, positioning the Surface A shown in the figure.

13 See [Step 7](#) to install the transporter motor unit assembly.

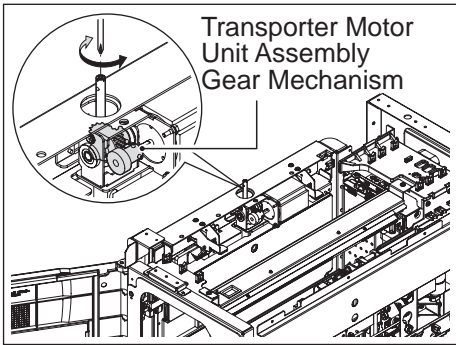
- 4 screws (M4 x 8)

14 Connect the connector (JP52) that was removed in [Step 6](#).

15 Install the right side tumbler (upper) that was removed in [Step 5](#).


- 2 screws (M4 x 8)

16 See [Step 4](#) to secure the cable to the transporter unit assembly with the wiring band.



17 Apply grease to the transporter motor unit assembly gear mechanism unit.

- Grease: Plusguard No. 2 by Kyodo Yushi



Always use the specified grease.

Important

Apply grease on entire area by turning the transporter lead screw using a screw driver.

18 Install the exterior frame (back) that was removed in [Step 2](#).


- 9 screws (M4 x 8)

19 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the transporter motor.

5.10.7 Replacing the Back Plate Absorption Detection Sensor

This section describes the instructions on how to replace the back plate absorption detection sensor.



Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

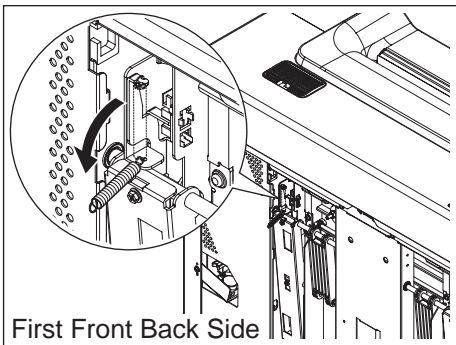
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 8)
1	

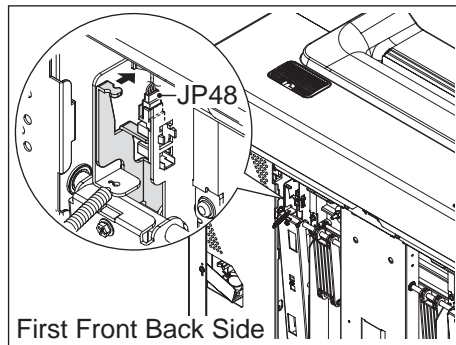
Requirements

The works in this section can be performed using only the standard tools.

1 See "■ [Removal Procedures \(Page 5-6\)](#)" of the "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)", and remove the first font back panel.



2 Remove the spring from the bracket assembly on the back plate detection unit.



- 3 Press the bracket assembly to lay it down.
 - 4 Remove the back plate absorption detection sensor.
 - 5 Unplug the cable from the back plate absorption detection sensor.
 - Connector (JP48)
- Caution** When removing the connector, hold a notch on the connector without pulling a cable. Giving a strong pull to the cable may cause it to be broken.
- 6 Connect the cable to the new back plate absorption detection sensor.
 - 7 Install the back plate absorption detection sensor.
 - 8 Install the spring that was removed in [Step 2](#) on the bracket assembly.

- 9 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front back panel.

Now, you have finished with the procedures to replace the back plate absorption detection sensor.

5.10.8 Replacing the Brush (Cleaning Unit)

This section describes the instructions on how to replace the brush (cleaning unit).



Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

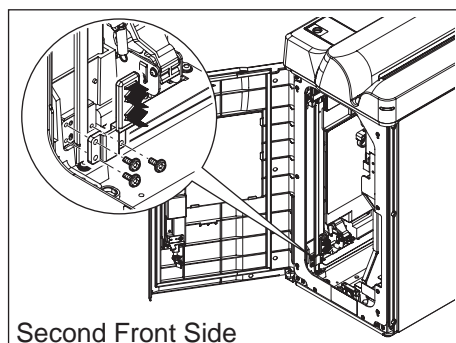
Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

Requirements

The works in this section can be performed using only the standard tools.




- 1 Open the second front door.
- 2 Remove the brush assembly.
 - 3 tapping screws (M4 x 10)
- 3 Install the new brush assembly.
 - 3 tapping screws (M4 x 10)

- 4 Close the second front door.

Now, you have finished with the procedures to replace the brush (cleaning unit).

5.10.9 Replacing the Tumbler (Upper)

This section describes the instructions on how to replace the tumbler (upper).

**Caution**

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

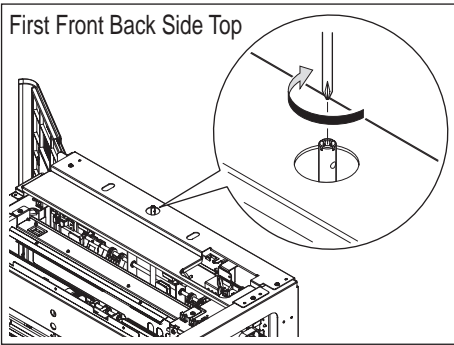
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 4)
1	

Requirements

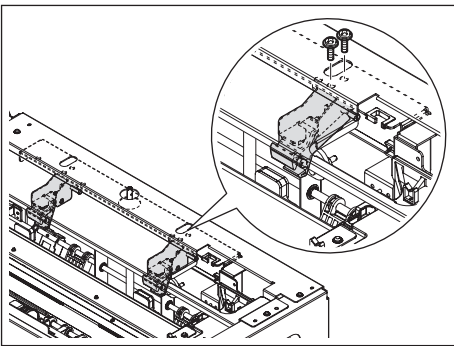
The works in this section can be performed using only the standard tools.

1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the exterior panel and insertion unit.




2 Rotate the shaft clockwise and move the push plate unit to the vicinity of the transporter home position.
This work is intended for the case that the push plate is at the read position.

- 1. Move the optical unit to the second front back side.
- 2. Rotate the shaft clockwise and move to the vicinity of the transporter home position.



3 Remove the tumbler (upper).
• 2 screws for each one (M4 x 8)

4 Install the new tumbler (upper).
• 2 screws for each one (M4 x 8)

**Important**


Make sure that it is able to receive the push plate unit (as shown in the figure) after installing it.

5 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the tumbler (upper).

5.10.10 Replacing the Back Plate Detection Unit

This section describes the instructions on how to replace the back plate detection unit.



Caution

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

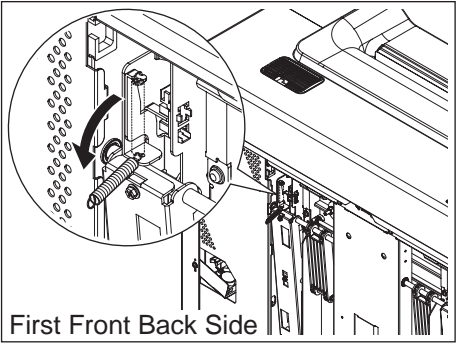
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 9)
1	

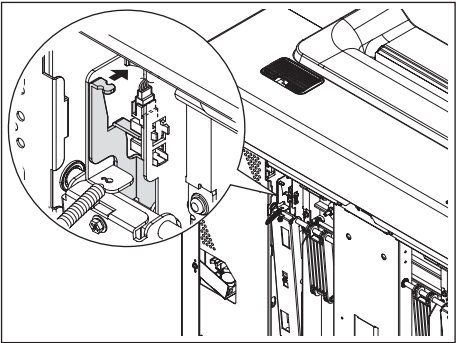
Requirements

The works in this section can be performed using only the standard tools.

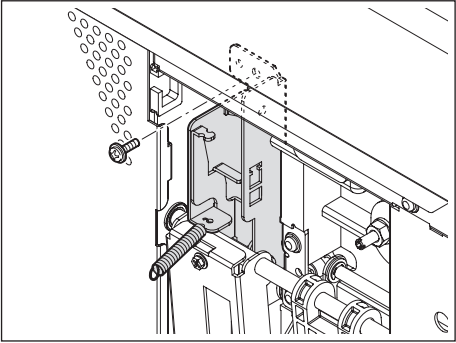
- 1
- See "■ Removal Procedures (Page 5-6)" of the "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit", and remove the first front back panel.



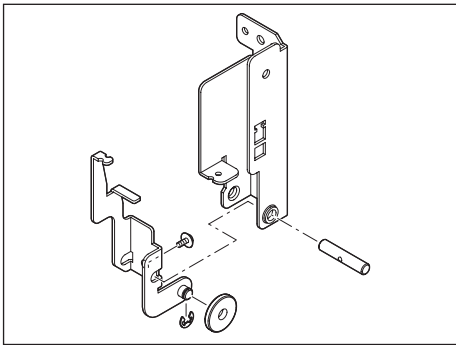
- 2
- Remove the spring from the bracket assembly on the back plate detection unit.



- 3
- Press the bracket assembly to lay it down.
- 4
- Remove the back plate absorption detection sensor.



- 5
- Remove the back plate detection unit assembly.
 - 1 screw (M4 x 8)



6 Replace the parts.
The spring will be installed later in [Step 9](#) after installed on the main unit.

7 See [Step 5](#) to install the back plate detection unit.
• 1 screw (M4 x 8)

8 Install the back plate absorption detection sensor that was removed in [Step 4](#).


9 See [Step 2](#) to install the spring on the back plate detection unit.

10 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front back panel.

Now, you have finished with the procedures to replace the back plate detection unit.

5.10.11 Replacing the Cleaning Unit

This section describes the instructions on how to replace the cleaning unit.

**Caution**

Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.

Work outline

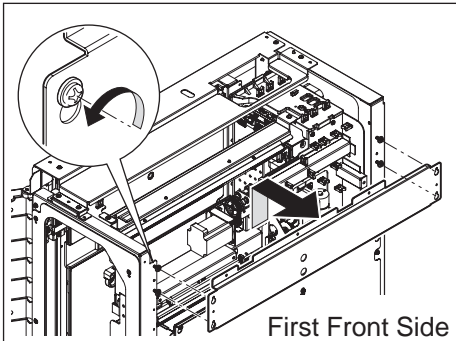
Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours (steps 2 to 8)
1	

Requirements

The works in this section can be performed using only the standard tools.

1 See "■ [Removal Procedures \(Page 5-6\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to remove the exterior panel and insertion unit.



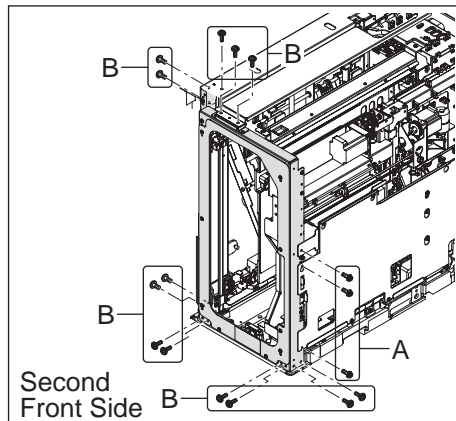
2 Remove the exterior frame (front).
• 4 screws (M4 x 8)
Loosen all screws.

3 See "■ Removal Procedures (Page 5-10)" in "5.2.4 Removing/Installing the Second Front Door" to remove the second front door.

4 Remove the exterior frame (left).

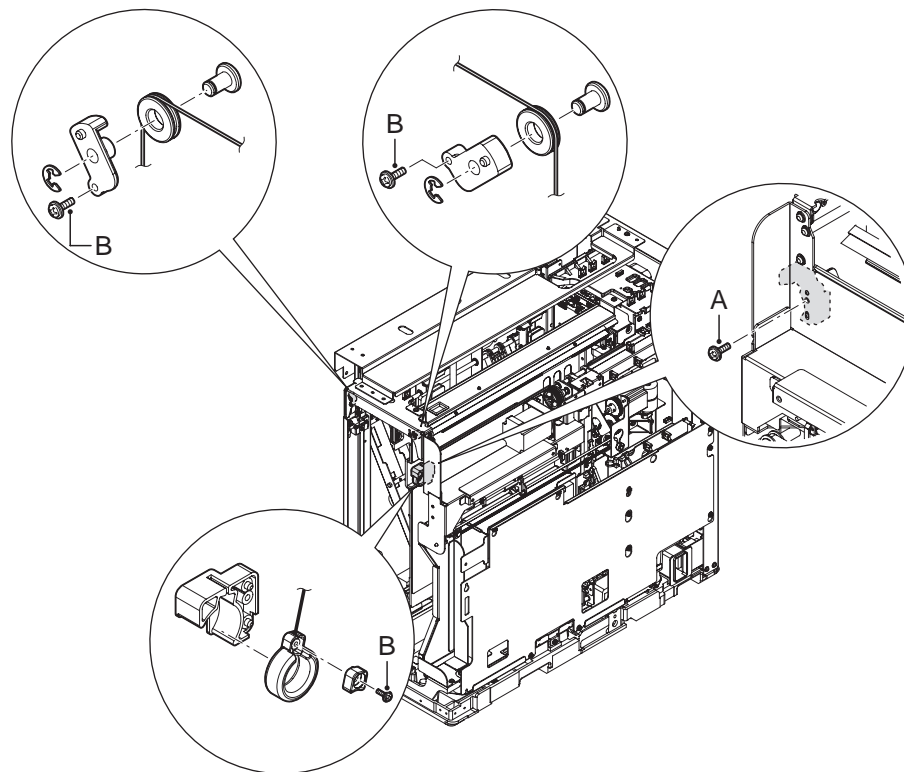
- A: 3 hex/Phillips-head screws (M4 x 8)
- B: 13 screws (M4 x 8)

Remove all screws.



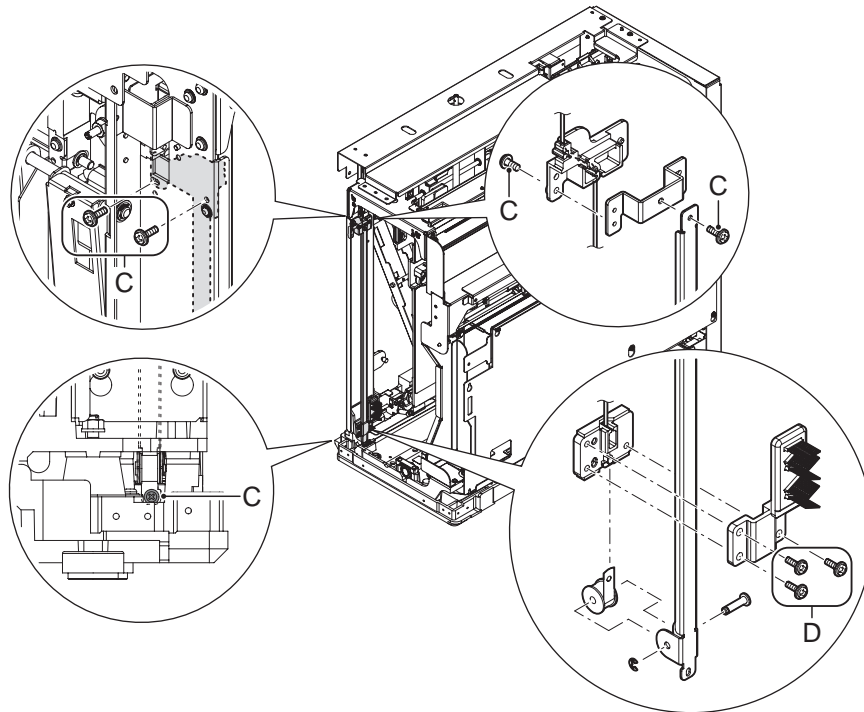
5 Replace the cleaning unit assembly.

Upper Part

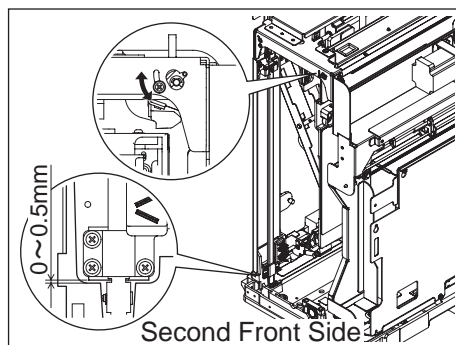


- A: tapping screw (M4 x 10)
- B: tapping screw (M3 x 8)

Left Side



- C: screw (M3 x 6)
- D: tapping screw (M4 x 10)



6 Adjust the wire tension.

Make sure that the clearance between the cushion rubber on the brush unit and the subscan base is a value from 0 to 0.5 mm as a result of a visual inspection.

Loosen the setscrew on the roller in the upper right side and move it upward and downward to adjust the tension.

After adjustment, move the knob to check the brush unit for normal operation.

7 See [Step 4](#) to install the exterior frame (left).

- A: 3 hex/Phillips-head screws (M4 x 8)
- B: 13 screws (M4 x 8)

8 See "■ [Installation Procedures \(Page 5-10\)](#)" in "[5.2.4 Removing/Installing the Second Front Door](#)" to install the second front panel.

9 Install the exterior frame (front) that was removed in [Step 2](#).

- 4 screws (M4 x 8)

10 See "■ [Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the insertion unit and exterior panel.

Now, you have finished with the procedures to replace the cleaning unit.

Chapter 6

Adjustment

How to adjust each units, which is necessary in repair/maintenance is described here.

6.1	Adjust Justifier Belt Tension	6-2
6.2	Adjust Receiver Belt Tension	6-4
6.3	Adjustment of Justifier Motor	6-6
6.4	Adjust Wire Tension	6-10
6.5	Adjust Position of Detach Detection Roller/Sensor	6-12
6.6	Adjustment of Pressing Amount.....	6-15

6.1 Adjust Justifier Belt Tension

Adjust the tension of the timing belt for the justifier mechanism in the receiver unit.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

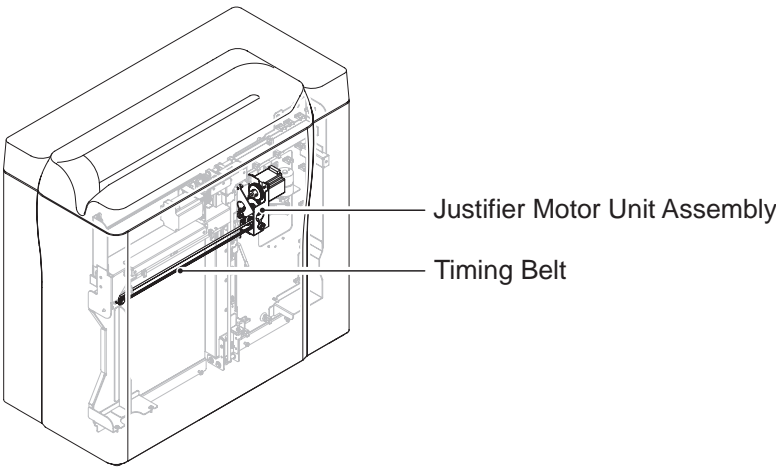
Personnel Number	Work Hours (steps 2 to 5)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Acoustic wave tension meter

Positioning and adjustment parts for timing belt

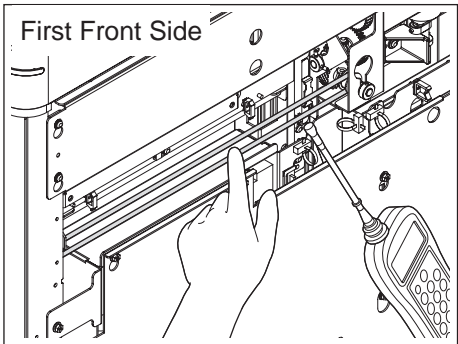


Adjustment method



Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you adjust the unit position of the equipment.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



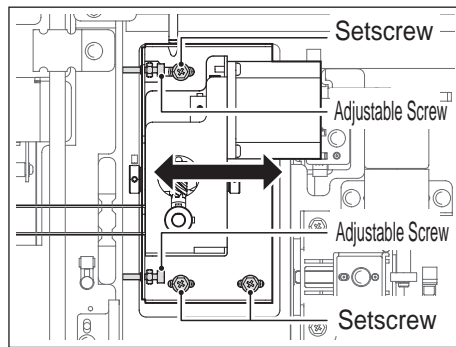
- 2 Measure the belt tension.

Strike around the center of the belt, and measure the vibration noise toward the end of the belt.

See "8.5 Operation of the Acoustic Wave Tension Meter (Page 8-13)" for how to use the acoustic wave tension meter.

Specified value is following. Perform the adjustment according to Step 3 - Step 5 if it is out of range.

Specified value	Tension: 15.8 ± 2 N
Confirmation method	Acoustic wave tension meter Input data <ul style="list-style-type: none">Weight (MASS): 1.3g/mWidth: 6.0mmSpan: 418mm



- 3 Loosen the fixing screws on the justifier motor unit assembly.
 - 3 hex/Phillips-head screws (M4 x 8)
- 4 Adjust by turning the adjustment screw so the tension is within the specified value.
 - 2 hexagon socket head bolts (M4 x 20)
 - 1 hexagon nut each
- 5 Fix the justifier motor unit assembly by tightening the fixing screws.
 - 3 hex/Phillips-head screws (M4 x 8)

- 6 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front panel.

6.2 Adjust Receiver Belt Tension

Adjust the tension of the timing belt for the receiver mechanism in the receiver unit.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

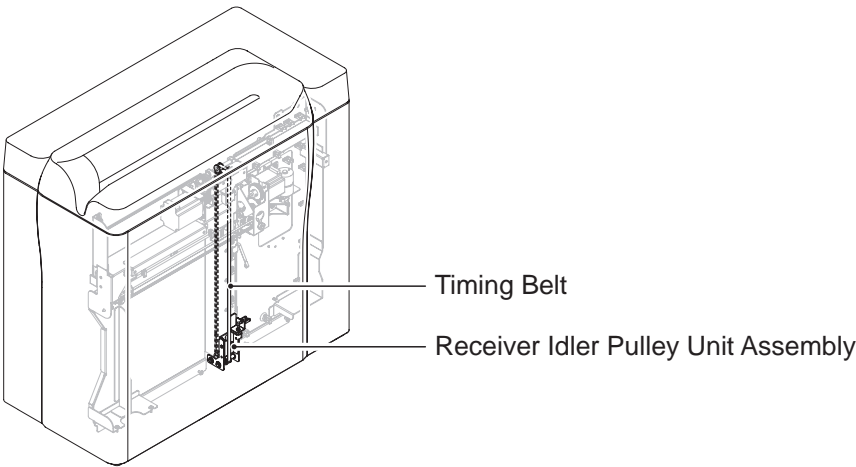
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Acoustic wave tension meter

Positioning and adjustment parts for timing belt

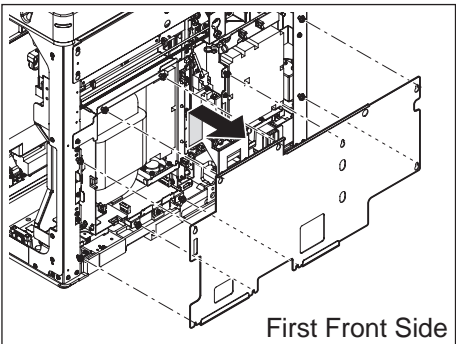


Adjustment method

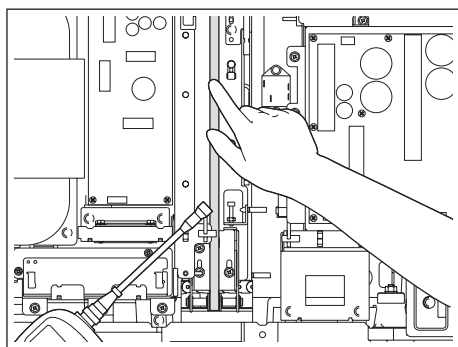


Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you adjust the unit position of the equipment.

- 1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.



- 2 Remove the electric component mount panel.
 - 8 hex/Phillips-head screws (M4 x 8)
 - Loosen all screws.



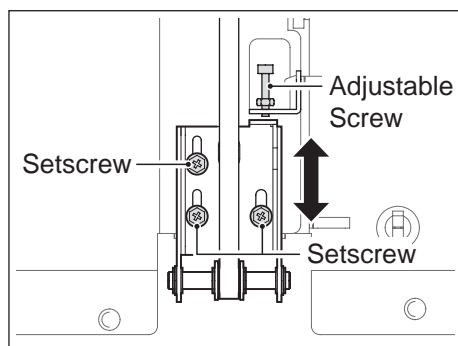
3 Measure the belt tension.

Strike around the center of the belt, and measure the vibration noise toward the end of the belt.

See "[8.5 Operation of the Acoustic Wave Tension Meter \(Page 8-13\)](#)" for how to use the acoustic wave tension meter.

Specified value is following. Perform the adjustment according to [Step 4](#) - [Step 6](#) if it is out of range.

Specified value	Tension: 44 ± 4 N
Confirmation method	Acoustic wave tension meter Input data <ul style="list-style-type: none"> • Weight (MASS): 2.5g/m • Width: 9.0mm • Span: 507mm



4 Loosen the fixing screws of the receiver idler pulley unit assembly.

- 3 hex/Phillips-head screws (M4 x 8)

5 Adjust by turning the adjustment screw so the tension is within the specified value.

- 1 hexagon socket head bolt (M4 x 20)
- 1 hexagon nut

6 Fix the receiver idler pulley unit assembly by tightening the fixing screws.

- 3 hex/Phillips-head screws (M4 x 8)

7 Attach the electric component mount panel that was removed in [Step 2](#).

- 8 hex/Phillips-head screws (M4 x 8)

8 See "[Installation Procedures \(Page 5-8\)](#)" in "[5.2.3 Removing/Installing the Exterior Panel and Insertion Unit](#)" to install the first front panel.

6.3 Adjustment of Justifier Motor

Adjust the justifier (distance justifier guide moves to fix the cassette) after replacing the justifier mechanism (justifier motor, justifier guide, justifier belt, etc.).

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.


Personnel Number	Work Hours (steps 2 to 11)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool	No.	Tool
1	Standard cassette (14 x 14 inches)	2	Interlock release key

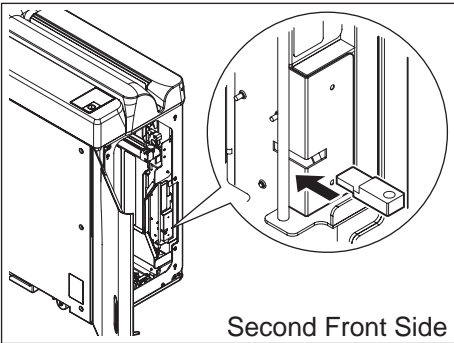
Adjustment method



Caution

- Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you disassemble/assemble the equipment.
- When operating inside the equipment with interlock released and power ON, be aware against the electrification and pinching.

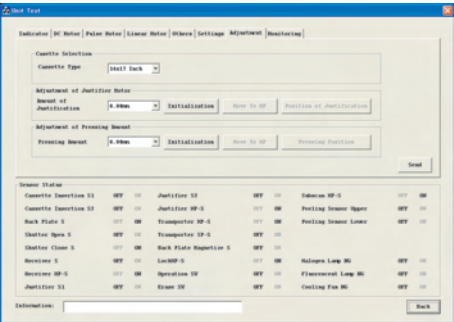
1 See "■ Removal Procedures (Page 5-6)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to remove the first front panel.




2 Insert the interlock release key into the interlock switch.

3 Turn the power ON.

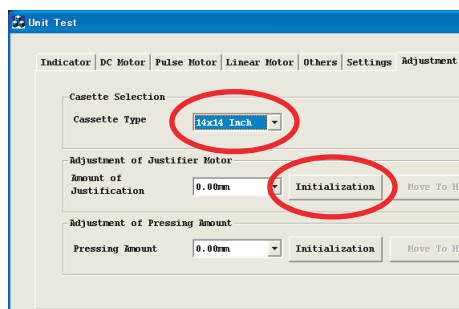
4 Start the service tool and display the [Adjustment] panel in [Unit Test] screen.





Note

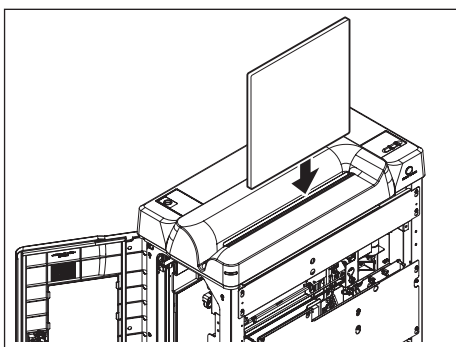
Current value right after the "Adjustment" panel was displayed is in the "Amount of Justification".



5 Select "14 x 14 inch" for the "Cassette Type".

6 Click the [Initialization] button for the [Adjustment of Justifier Motor].

Initialization process will be performed, and will wait for the cassette to be inserted. The message, "Uploading..." will continue to be displayed.

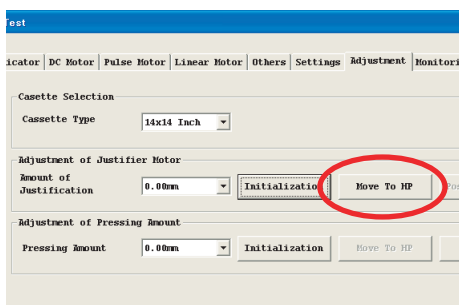


7 Set the standard cassette (14 x 14 inches) into the insertion slot.

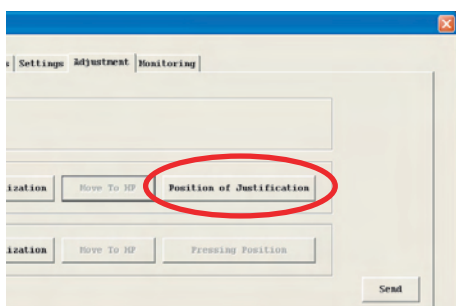
Shutter will open and the cassette will be loaded.



Caution Do not do anything that is not described until you take out the cassette in [Step 13](#). Equipment may be damaged by the drive unit and cassette contacting each other when wrong operation is performed.



8 Click the [Move To HP] button.

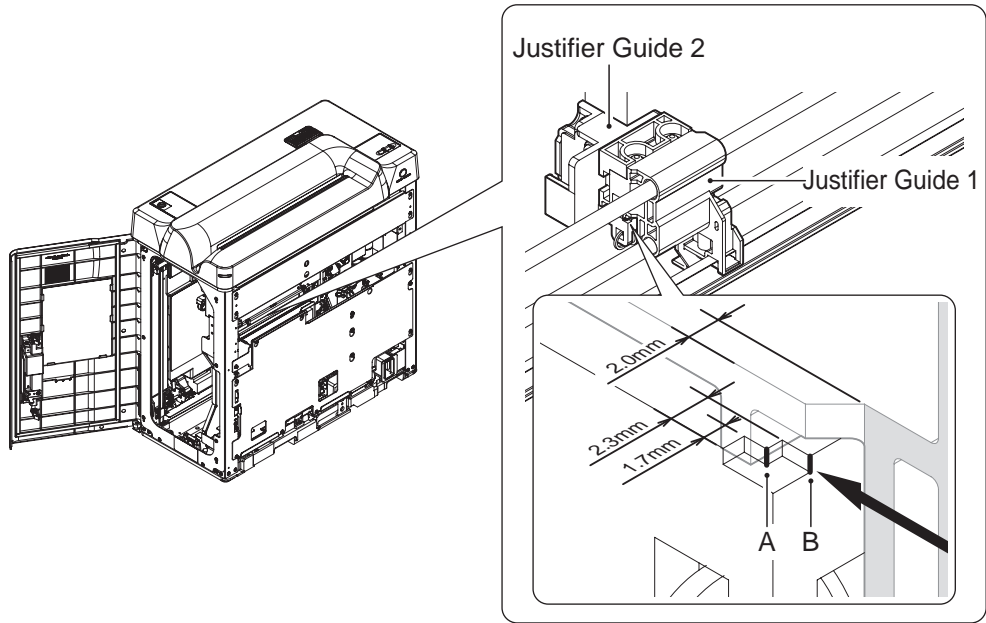


9 Click the [Position of Justification] button.

The standard cassette is fixed by the justifier guide.

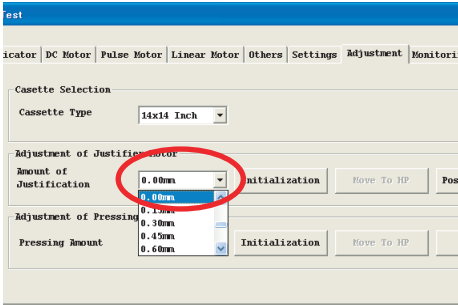
- 10** Confirm the step in the justifier guide 2 while the cassette is fixed with the justifier guide.
- If the left edge of the justifier guide 1 is between the position of the A and B of the justifier guide 2, it is within the specification, and there is not need for adjustment of the current justifier.
- Go to Step 13 if you do not need to change the Amount of Justification.

Measurement	Step between the justifier guide 2 and the justifier guide 1 when the standard cassette is fixed by justifier mechanism
Specified value	$2 \pm 0.3 \text{ mm}$

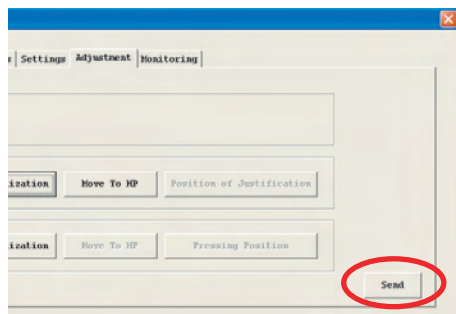


- 11** Change the justifier value if the step is not within specification, and reconfirm.

1. Click the [Move To HP] button.
2. Change the amount of justification.



3. Click the [Position of Justification] button.
4. Confirm the step of the justifier guide 2 again.
Repeat until the step come within the specified value.



- 12** Click the [Send] button once the step is within the specified value.

Selected amount of justification will be set.



Important

Adjustment amount of the last justifier operation performed will be set. Always perform the justifier operation with the value to set before clicking on the [Send] button.

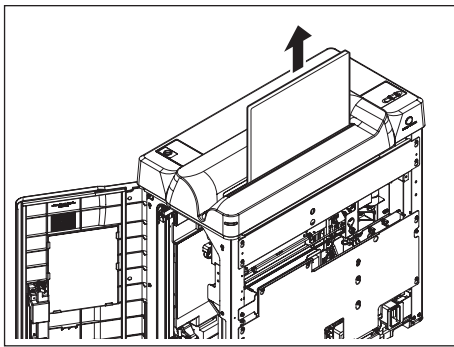
- 13** Eject the cassette.

1. Click the [Move to HP] button.

The cassette will be released from the fixing by the justifier guide.

2. Eject the cassette from the insertion slot.

The cassette cannot be ejected automatically, so push up the cassette with your hand from the second front side.



- 14** End the service tool.

- 15** Turn the power OFF.

- 16** Pull out the interlock release key.

- 17** See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the first front panel.

6.4 Adjust Wire Tension

Adjust the tension of the wire in the subscan unit.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

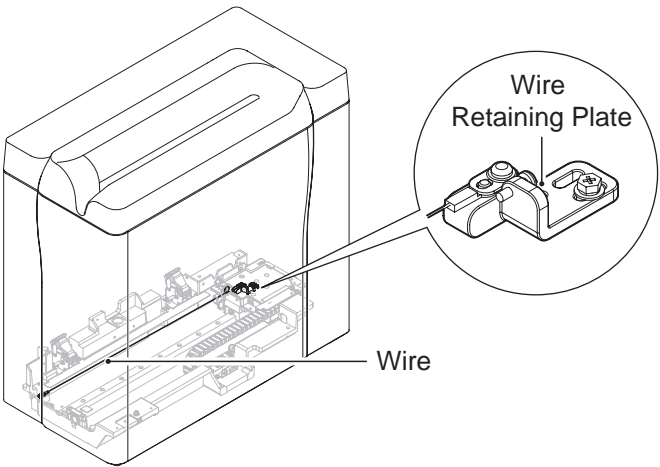
Personnel Number	Work Hours (steps 2 to 7)
1	

Requirements

Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool
1	Acoustic wave tension meter

Positioning and adjustment parts for wire

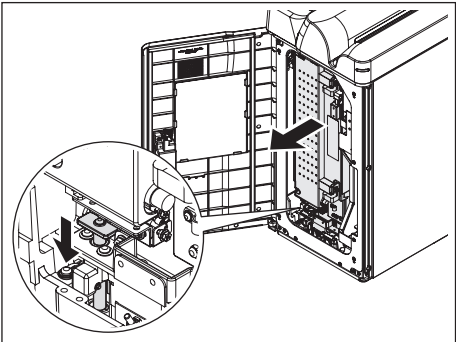


Adjustment method



Be sure to turn off the power supply circuit breaker and unplug the power cable from the equipment whenever you adjust the unit position of the equipment.

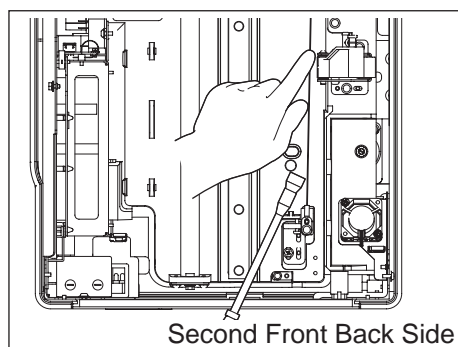
- 1 See "■ Removal Procedures (Page 5-6)" of the "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit", and remove the second front back panel.



- 2 Move the optical unit to the second front side and fix it using the simple fixing lock.



When the optical unit moves all the way toward the front, fixing shaft will automatically lower to lock.



3 Measure the wire tension.

Strike the wire around the center of the belt using ball of a finger, and measure the vibration noise toward the edge of the wire.



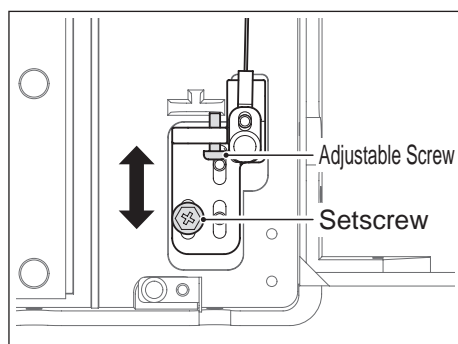
Do not strike the wire with your fingernail.

Caution

See "8.5 Operation of the Acoustic Wave Tension Meter (Page 8-13)" for how to use the acoustic wave tension meter.

Specified value is following. Perform the adjustment according to [Step 4](#) - [Step 6](#) if it is out of range.

Specified value	Tension: 30 ± 5 N
Confirmation method	Acoustic wave tension meter Input data <ul style="list-style-type: none"> • Weight (MASS): 1.4 g/m • Width: 1.0 mm • Span: 555 mm



4 Loosen the fixing screws of the wire holding assembly.

- 1 hex/Phillips-head screw (M4 x 12)

5 Adjust by turning the adjustment screw so the tension is within the specified value.

- 1 screw (M4 x 12)

6 Fix the wire holding assembly by tightening the fixing screw.

- 1 hex/Phillips-head screw (M4 x 12)

7 Release the simple fixing lock.

Lock will be released by pulling up the blue knob.



Important

Push the optical unit slightly towards the back when pulling up the knob. Fixing shaft might move down, and get locked again if the optical unit is at its hithermost position. Also, move the optical unit to confirm that the fixing shaft is not lowered after unlocking.

8 See "■ Installation Procedures (Page 5-8)" in "5.2.3 Removing/Installing the Exterior Panel and Insertion Unit" to install the second front back panel.

6.5 Adjust Position of Detach Detection Roller/Sensor

Adjust the positions of the detach detection roller and sensor when assembling the detach detection unit.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

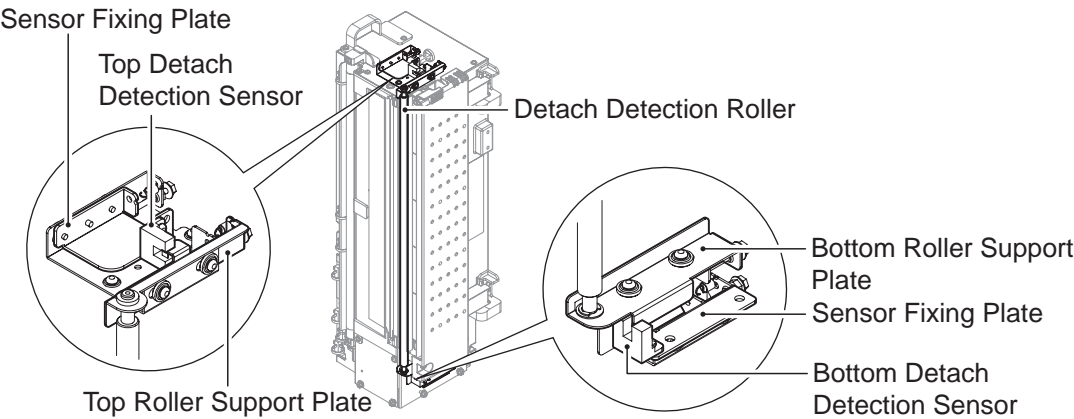
Personnel Number	Work Hours (steps 2 to 12)
1	

Requirements

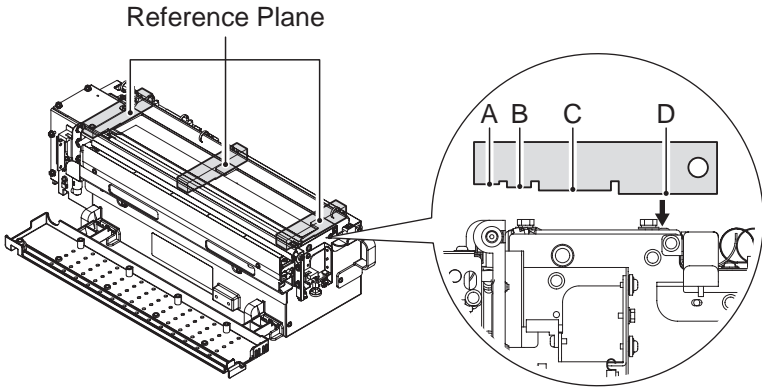
Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool	No.	Tool
1	Detach the detection unit adjusting jig (Adjustment block, sensor status detection jig)	2	Maintenance PC Or power outlet to USB adapter It will be used as power supply for the sensor status detection jig.

Position and adjustment parts for the detach detection roller/sensor



Adjustment block

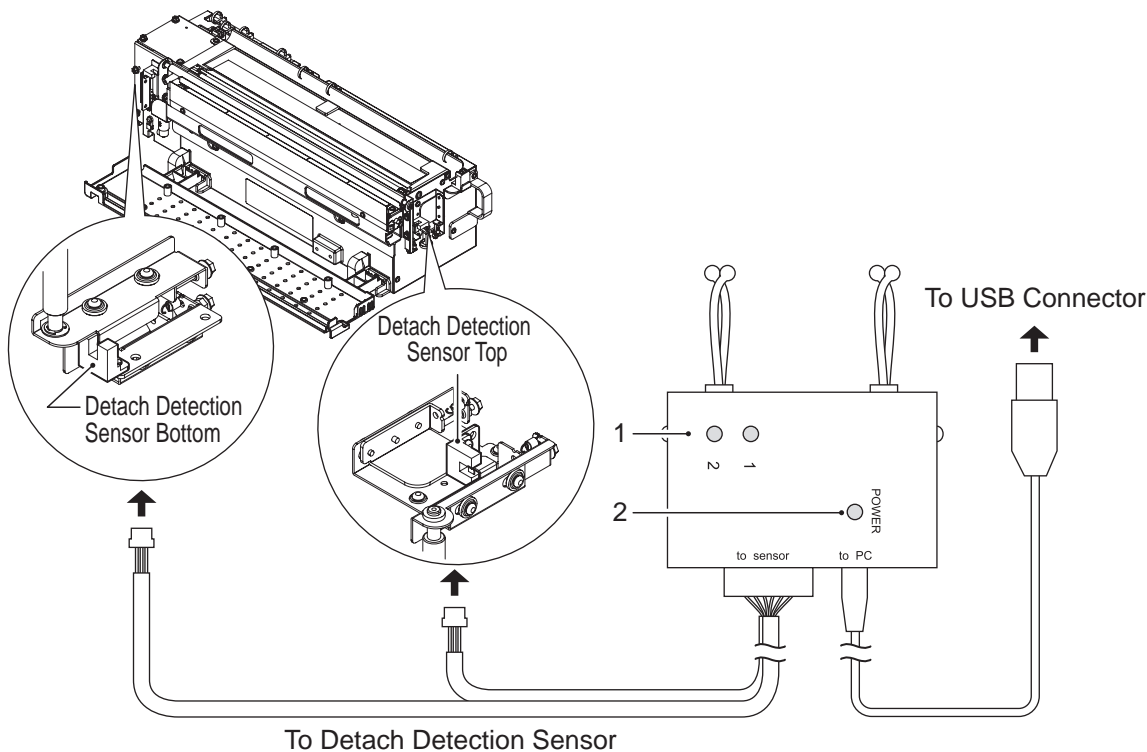


There are 4 steps in the adjustment block:

- A: Plane where roller should not touch
- B: Plane where roller touch (sensor is OFF)
- C: Plane where sensor goes ON
- D: Plane to place on the standard plane


Standard plane is the 3 locations at the side of the hot-cathode tube lamp attachment unit. Adjust at the top and bottom locations, and confirm at the center area with the roller rotating.

Sensor status detection jig



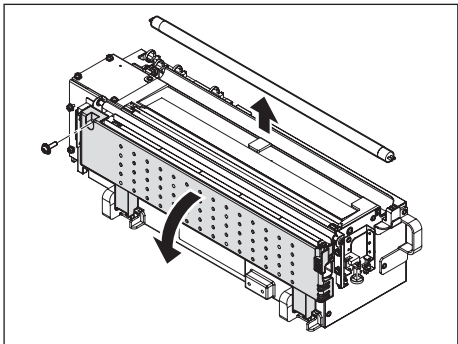
Sensor status detection jig will display the status of the sensor with the lamp by directly connecting it to the detach detection sensor.

No.	Function
1	Display the status of the connected detach detection sensor. <ul style="list-style-type: none">• Light on: ON (transparent)• Light off: OFF (opaque)
2	It will light up on power ON.

 **Note** It has a buzzer that will go on when ON is detected on both sensors. It will be in same condition and the buzzer will sound when the sensors are not connected, so if you do want it to buzz when connecting the cables, connect the sensor cables before connecting the USB cable.

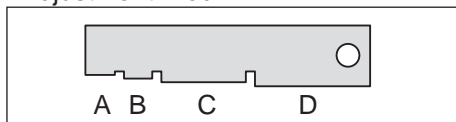
Adjustment method

1 See "■ Removal Procedures (Page 5-11)" in "5.2.5 Removing/Installing the Optical Unit" to remove the optical unit.

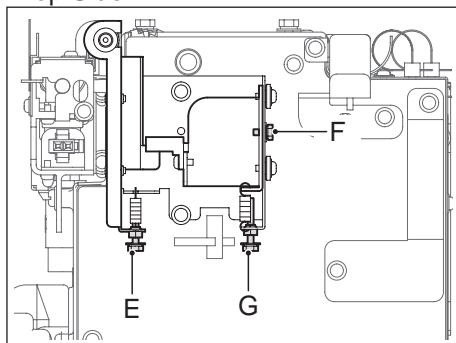


- 2 Remove the hot-cathode tube lamp.
- 3 Open the number 2 eraser cover.
- - 1 screw (M4 x 12)

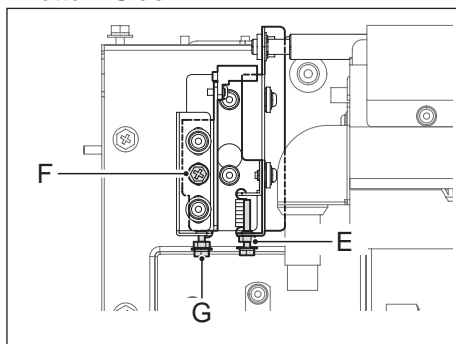
Adjustment Block



Top Side



Bottom Side



Adjust the roller position

Adjust the roller position by performing [Step 4 - Step 6](#) at the top and bottom of the roller.

- 4 Adjust the roller position by turning the adjustment screw (E in the figure) so it will touch B of the adjustment block.

- 1 each hex/Phillips-head screw (M3 x 20)
- 1 hexagon nut each

- 5 Confirm that it is not touching A of the adjustment block.

- 6 Fix it by tightening the hex nut of the adjustment screw (E in the figure).



Be careful that the adjustment screw do not turn when tightening the hex nut.

- 7 Turn the roller and confirm that the roller does not touch A of the adjustment block in the center part. Continue with the adjustment of the sensor position.

Adjust the sensor position

- 8 Loosen the fixing screw (F in the figure) for the sensor mount board.

- 1 each hex/Phillips-head screw (M3 x 10)

- 9 Remove the cables from the sensor, and connect the sensor status detection jig.

- 10 Connect the USB cable from the sensor status detection jig.

- 11 Adjust the position of the sensor mount board by turning the adjustment screw (G in the figure) so the sensor will come ON when C of the adjustment block is touching the roller.

- 1 each hex/Phillips-head screw (M3 x 10)
- 1 hexagon nut each

Also confirm that the sensor is OFF with B of the adjustment block.

- 12 Fix each sensor mount board by tightening the fixing screw (F in the figure) after adjusting the sensor position.



Be careful not to shift the adjusted position while fixing.

- 13 Close the number 2 eraser cover once the adjustments are finished.

- - 1 screw (M4 x 12)

- 14 Install the hot-cathode tube lamp that was removed in [Step 2](#).

Attach it so the transparent face will be on the surface.

- 15 See "■ Installation Procedures (Page 5-14)" in "5.2.5 Removing/Installing the Optical Unit" to install the optical unit.

6.6 Adjustment of Pressing Amount

Adjust the pressing amount (distance of the push plate unit moves to absorb the back plate of the cassette) when the transporter mechanism (transporter motor, etc.) is replaced.



If the purpose is just to confirm the press down, it can be done by using the step operation (sequence of operation from insertion to eject of the cassette) in the service tool. See ["4.4 Confirming by Step Operation \(Page 4-8\)"](#) for the procedure to operate the step operation.

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

Requirements

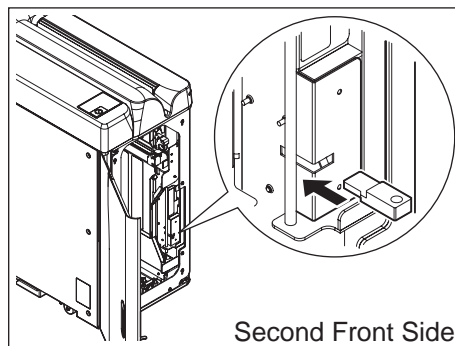
Shown below are the tools requiring to be prepared in addition to the standard tools before performing the works in this section.

No.	Tool	No.	Tool
1	Press down size adjusting jig	2	Standard cassette (14 x 17 inches)
3	Interlock release key		

Adjustment method



When operating inside the equipment with interlock released and power ON, be aware against the electrification and pinching.

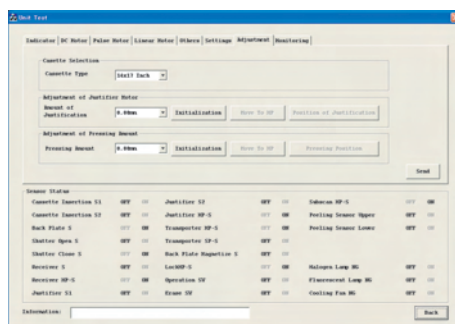


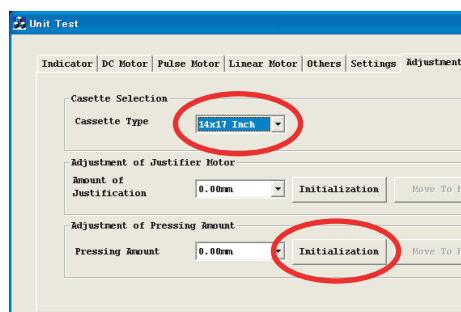
1 Insert the interlock release key into the interlock switch.

2 Start the service tool and display the [Adjustment] panel in [Unit Test] screen.



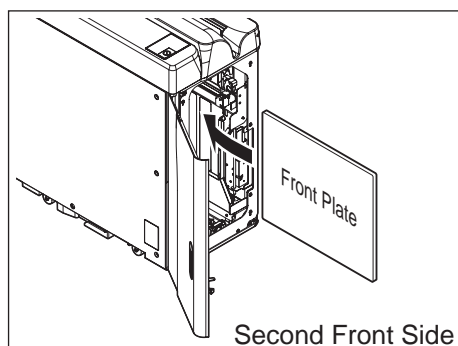
Current value right after the "Adjustment" panel was displayed is in the "Pressing Amount".





3 Select "14 x 17 inch" for the "Cassette Type".

4 Click the [Initialization] button for the [Adjustment of Pressing Amount].



5 Set the standard cassette facing toward the magnet (push plate) on the receiver.



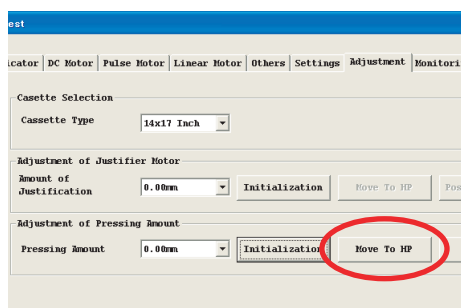
Important

Set the direction of the front plate and the back plate of the cassette in reverse so the cassette will not be absorbed onto the magnet absorption plate.



Caution

Do not do anything that is not described until you take out the cassette in [Step 11](#). Equipment may be damaged by the drive unit and cassette contacting each other when wrong operation is performed.

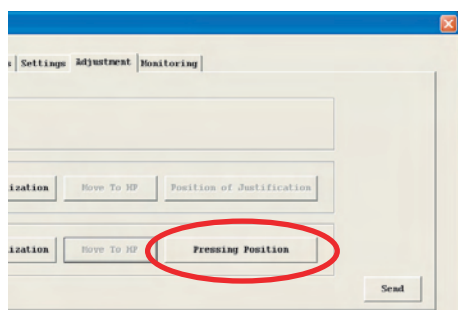


6 Click the [Move To HP] button.

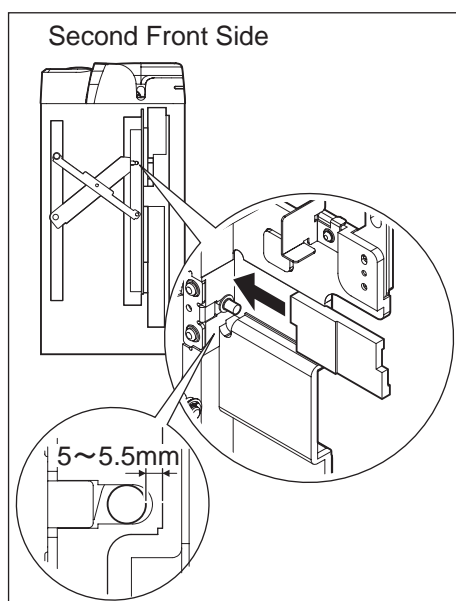


Note

Cassette may tilt toward the push plate unit by vibration. Cassette will be straightened by the press down operation, so there is no need to reset the cassette.

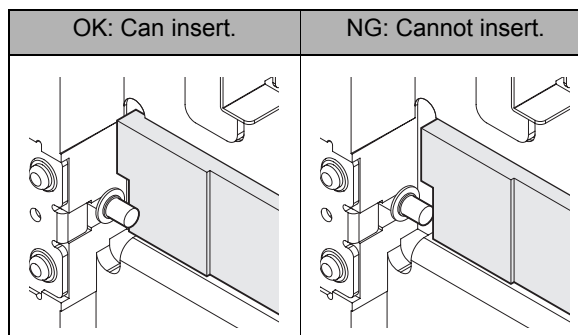


7 Click the [Pressing Position] button.



- 8 Confirm if it is possible to slide in the press down adjustment jig in-between the push plate and the shaft.

Slide in the jig along the indentation of the plate as shown in the figure.



Insertion direction		Status of press down
Thin	Thick	
OK	OK	Press down is weak
OK	NG	Appropriate
NG	NG	Press down is strong

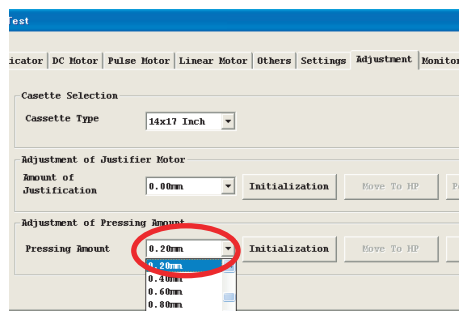
It is in following specified value if it is appropriate.

Measurement	Distance between the push plate and the shaft when the press down is performed on the 14 x 17 inch cassette
Specified value	5 - 5.5 mm

Go to Step 11 if you do not need to change the Pressing Amount.

- 9 Change the value for the press down if the distance between the push plate and the shaft is not within the specified value, and reconfirm.

1. Click the [Move To HP] button.
2. Change the pressing amount.



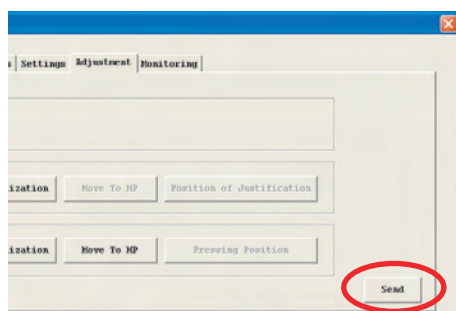
3. Click the [Pressing Position] button.
4. Confirm if the press down adjustment jig can be inserted again.

Repeat until the distance come within the specified value.



Note

There are around 0.15 mm error in the push down.



10 Click the [Send] button once the distance is within the specified value.

Selected pressing amount will be set.

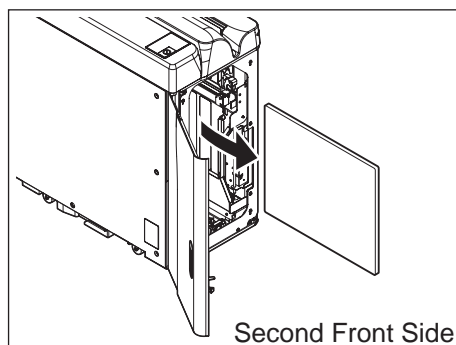


Important

Adjustment amount of the last pressing operation performed will be set. Always perform the pressing operation with the value to set before clicking on the [Send] button.

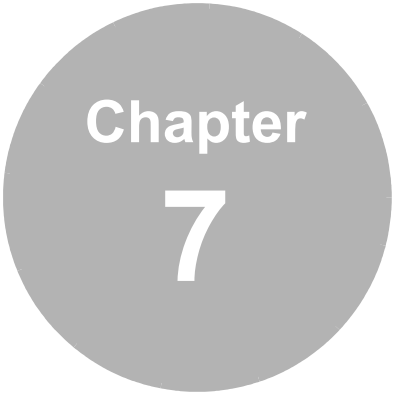
11 Eject the cassette.

1. Click the [Move to HP] button.
2. Eject the cassette.



12 End the service tool.

13 Pull out the interlock release key.



Chapter 7

Periodic Maintenance

Method for the periodic maintenance of the equipment is described here.

7.1	Maintenance Schedule	7-2
7.2	Maintenance Performed Annually	7-3

7.1 Maintenance Schedule

Perform the maintenance according to the following schedule.

■ Maintenance Performed by User

Description of Maintenance Work	Maintenance Period
Cleaning REGIUS cassette	1 week
Cleaning cassette insertion slot	
Cleaning exterior of the equipment	1 month
Cleaning air intake	3 month
Replacing erase lamp (halogen lamp)	Every 30,000 shots
Cleaning dust from optical unit	When vertical streak occur

See the Instruction Manual for detail.

■ Maintenance by the Maintenance Service Person

Description of Maintenance Work	Maintenance Period
Cleaning of the brushes (3 locations)	1 year
Cleaning cassette absorption magnet	
Greasing LM guide	
Greasing transporter lead screw unit	
Greasing transporter motor unit assembly gear mechanism	
Greasing of release shaft holder	
Greasing justifier motor unit assembly gear mechanism	
Check for fallen foreign objects	

See ["7.2 Maintenance Performed Annually \(Page 7-3\)"](#) for the maintenance procedure.

7.2 Maintenance Performed Annually

Work outline

Listed below are the number of people and the rough standard of work hours required for performing the works described in this section.

Personnel Number	Work Hours
1	

Requirements

Following are the supplies and tools required in addition to the standard tools before performing the works in this section.

No.	Supplies, tools	Note
1	Alcohol	For cleaning the cassette absorption plate
2	Grease (For LM guide)	AFC grease by THK
3	Grease (For all parts except LM guide)	Plusguard No. 2 by Kyodo Yushi
4	Grease gun	Model name: MG70
5	Glove	Use when handling the erase lamp unit.
6	Rag	For cleaning the magnet shaft
7	Rag	For cleaning the cassette absorption plate
8	Rag	For applying grease
9	Vacuum cleaner (portable)	For cleaning the brush

7.2.1 Workflow

Following are the flow of the maintenance performed annually.

Item	Description
Power OFF	Turn the power supply circuit breaker OFF and unplug the power cable and the Ethernet cable. See "7.2.2 Power OFF (Page 7-5)" for description.



Secure the maintenance space	Move the equipment to a place capable of performing the maintenance. See "7.2.3 Secure the Maintenance Space (Page 7-6)" for description.
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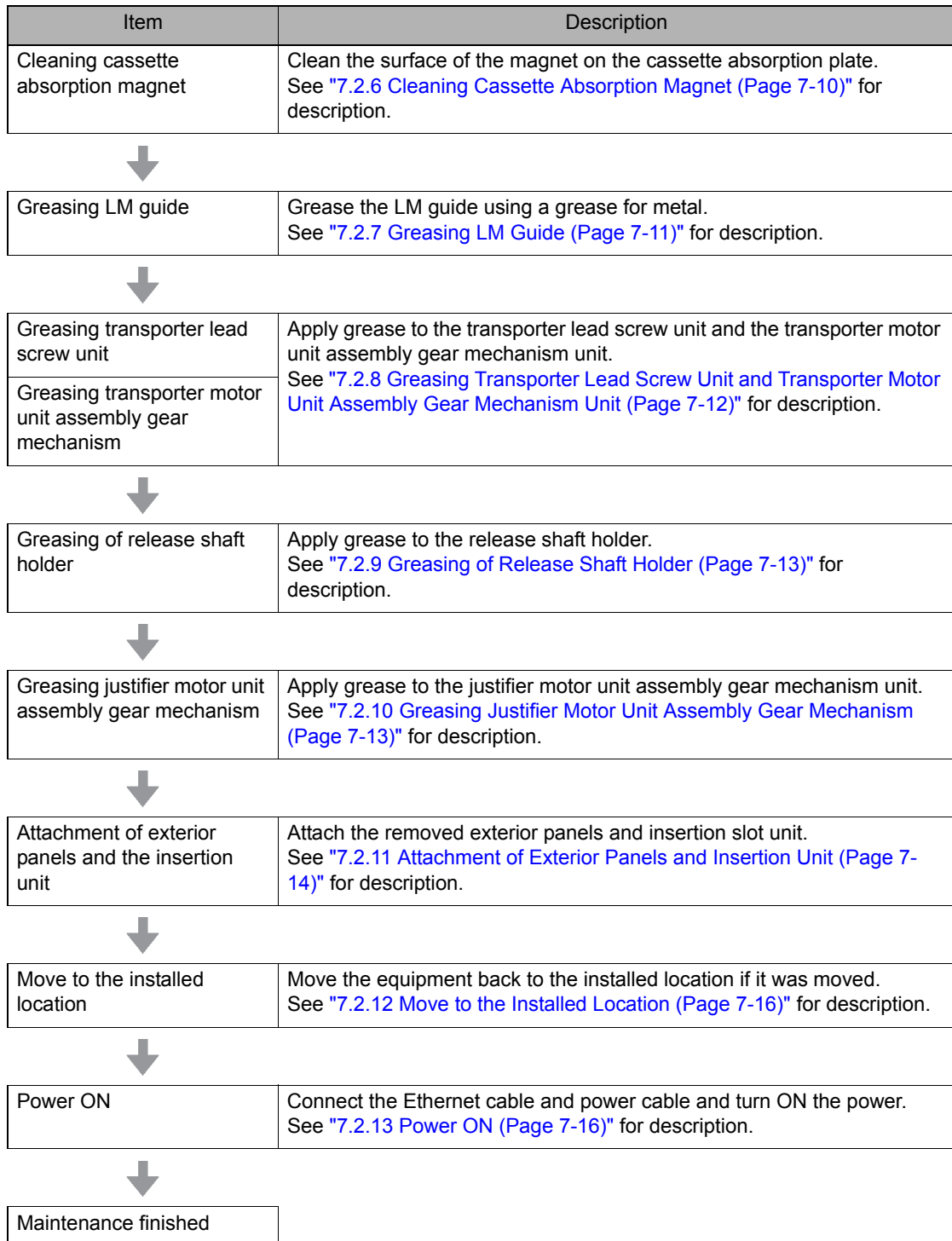


Attachment of exterior panels and the insertion unit	Remove the exterior panels and the insertion unit to access the maintenance area. See "7.2.4 Removal of Exterior Panels and Insertion Unit (Page 7-7)" for description.
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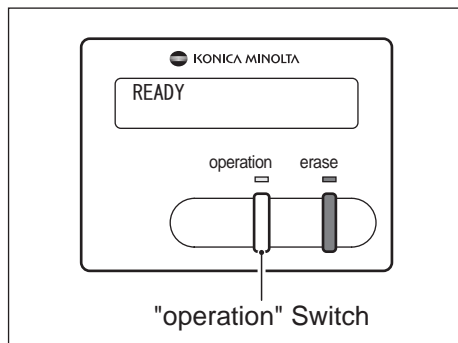
Cleaning brush	Clean the brush (cleaning unit, eraser unit, and toppling prevention block) and the magnet shaft. Also, confirm if any foreign object has fallen into the equipment. See "7.2.5 Cleaning Brush and Check for Fallen Foreign Objects (Page 7-9)" for description.
Check for fallen foreign objects	



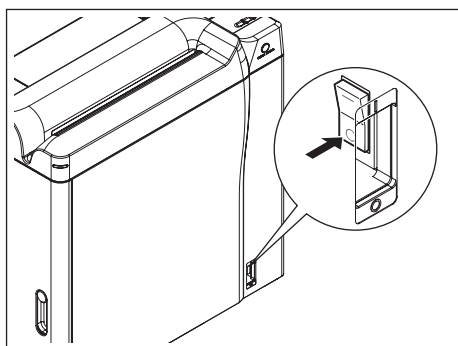


7.2.2 Power OFF

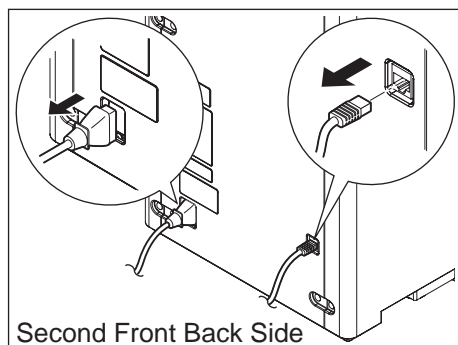
Turn the power supply circuit breaker OFF and unplug the power cable and the Ethernet cable.



- 1 Confirm that REGIUS MODEL 110 is not operating.
- 2 Press the "operation" switch for 3 seconds.
Shutdown action will take place and "operation" lamp will turn off when completed.



- 3 Turn OFF the power supply circuit breaker.



- 4 Unplug the power cable from the equipment and the power outlet.
- 5 Unplug the Ethernet cable.



Important

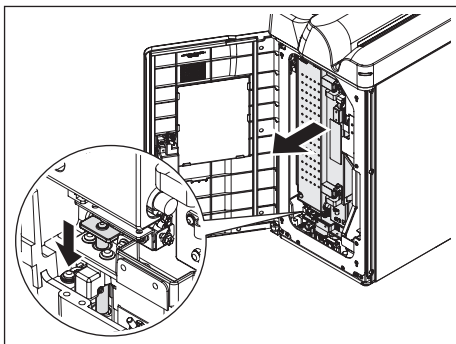
Place the unplugged power cable and Ethernet cable in a place where they will not be stepped on while servicing.

This completes the Power OFF procedure.

Go to ["7.2.3 Secure the Maintenance Space \(Page 7-6\)"](#) and secure the maintenance space.

7.2.3 Secure the Maintenance Space

If the maintenance procedure is difficult to perform at the installation site, move the equipment to a place capable of performing the maintenance.

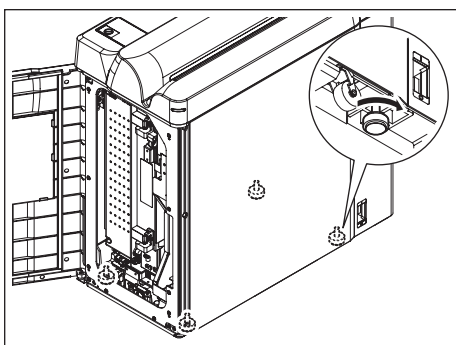


- 1 Move the optical unit to the second front side and fix it using the simple fixing lock.

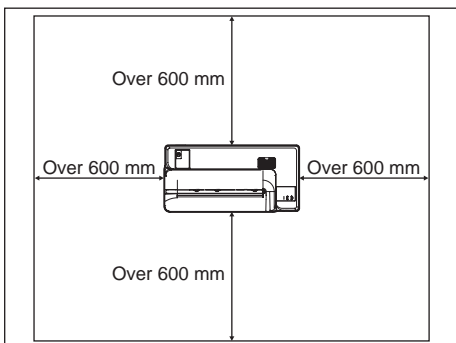


Note

- When the optical unit moves all the way toward the front, fixing shaft will automatically lower to lock.
- The second front door that is locked with the simple fixing lock cannot be fully closed. (for the purpose of preventing the unit from being left locked).



- 2 Loosen the adjuster (4 locations).



- 3 Move the equipment to a place capable of operation.

Secure a space of 600 mm around each side of the equipment.

- 4 Fix the equipment so it will not move using the adjuster (4 location) after moving it.

- 5 Release the simple fixing lock.

Lock will be released by pulling up the blue knob.



Important

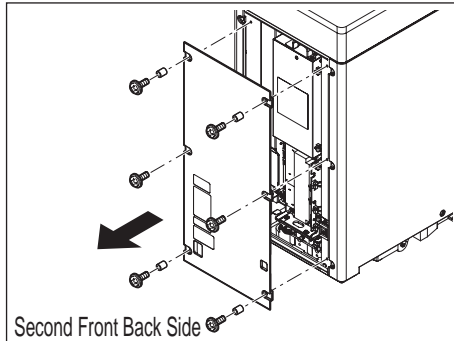
Push the optical unit slightly towards the back when pulling up the knob. Fixing shaft might move down, and get locked again if the optical unit is at its hithermost position. Also, move the optical unit to confirm that the fixing shaft is not lowered after unlocking.

This completes the securing of the maintenance space.

Go to ["7.2.4 Removal of Exterior Panels and Insertion Unit \(Page 7-7\)"](#) to remove the exterior panels and the insertion unit.

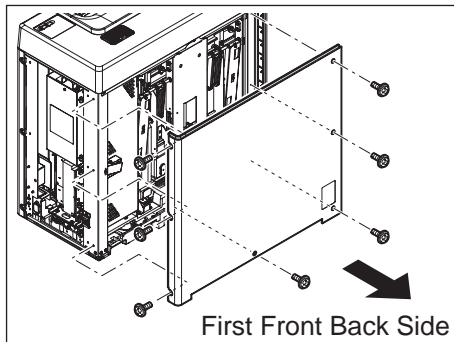
7.2.4 Removal of Exterior Panels and Insertion Unit

Remove the exterior panels and the insertion unit to access the maintenance area.



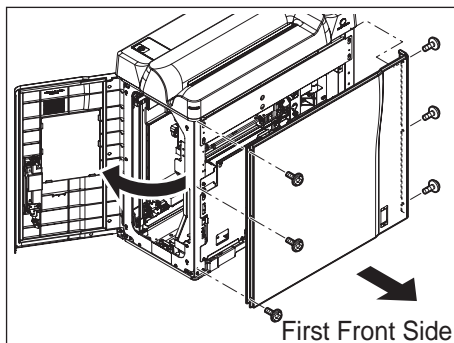
1 Remove the second front back panel.

- 6 screws (M4 x 8)
- 1 spacer each (for 4 locations excluding the middle)



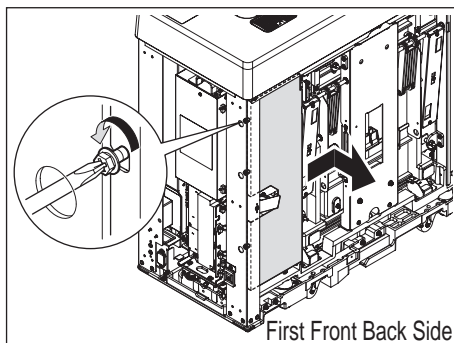
2 Remove the first front back panel.

- 7 screws (M4 x 8)
- Remove the panel with both hands, holding on the bottom and pulling away from the equipment.



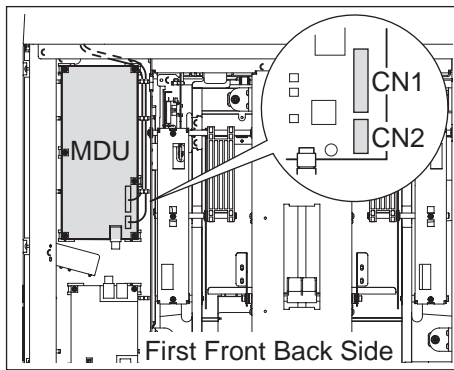
3 Remove the first front panel.

- 6 screws (M4 x 8)
- Remove the panel with both hands, holding on the bottom and pulling away from the equipment.



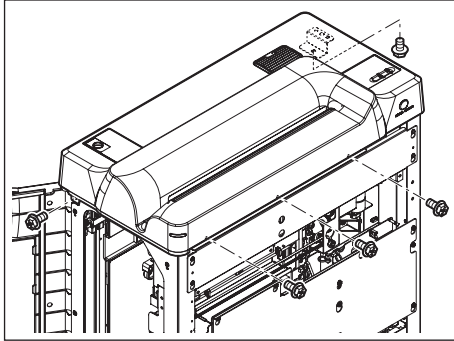
4 Remove the circuit board cover.

- 3 screws (M3 x 6)
- Loosen all.



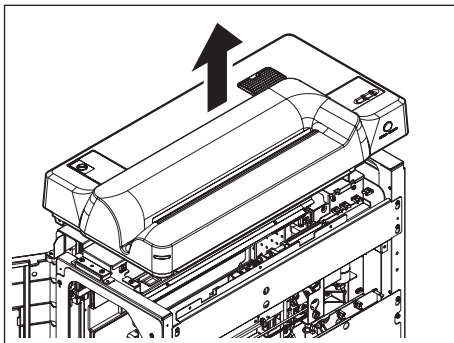
5 Remove the connectors from the MDU.

- CN1 (MCN1: cable)
- CN2 (MCN2: cable)



6 Remove the screws from the insertion unit.

- 5 hex/Phillips-head screws (M5 x 10)



7 Remove the insertion unit.

Place the removed insertion unit upside down to prevent any damage inside, on a stable location.



Caution

Remove the unit carefully so the cables disconnected in [Step 5](#) do not get caught.

This completes the procedure to remove the exterior panels and the insertion unit.

Go to ["7.2.5 Cleaning Brush and Check for Fallen Foreign Objects \(Page 7-9\)"](#) and clean the brush.

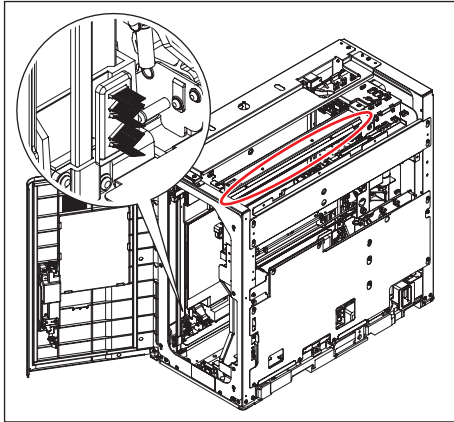
7.2.5 Cleaning Brush and Check for Fallen Foreign Objects

Clean the brush (cleaning unit, eraser unit, and toppling prevention block) and the magnet shaft.
Also, confirm if any foreign object has fallen into the equipment.

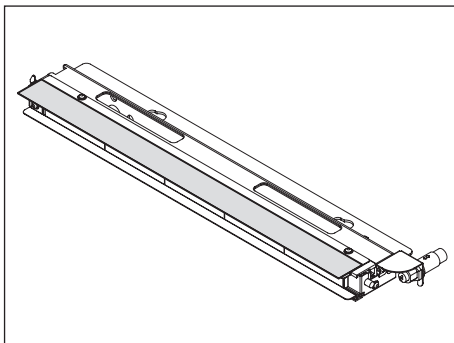


Caution

Be sure to turn OFF the power supply circuit breaker and unplug the power cable from the equipment whenever the maintenance is performed.



- 1 Open the second front door.
- 2 Remove dust on the brush in the cleaning unit using a vacuum cleaner.
- 3 Remove dust on the toppling prevention block using a vacuum cleaner.



- 4 Remove dust on the dust removal brush in the eraser unit using a vacuum cleaner.



Caution

Use the glove while working so there will be no oil from hand contaminating the filters on the eraser lamp unit.

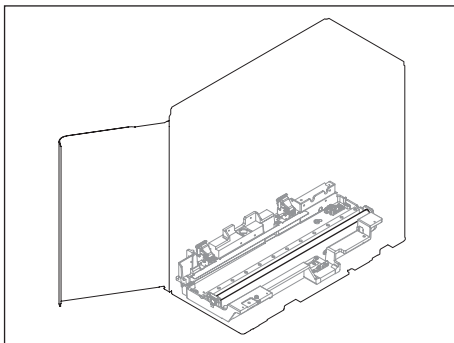
1. See the section "6.2.5 Replacing the Erase Lamp (Halogen Lamp)" in the Operation Manual" to remove the erase lamp unit.
2. Remove dust on the dust removal brush using a vacuum cleaner.
3. Attach the eraser lamp unit.

- 5 Confirm there is no foreign object in the equipment.

Remove it if there is any. If possible, give client an advice to be alert.

- 6 Clean the magnet shaft of the subscan unit.

Wipe off the grim from the magnet shaft using a rag dampened with a water and squeezed tightly.



This completes the cleaning of the brush and confirmation of the foreign objects.

Go to ["7.2.6 Cleaning Cassette Absorption Magnet \(Page 7-10\)"](#) and clean the surface of the magnet surface of the cassette absorption plate.

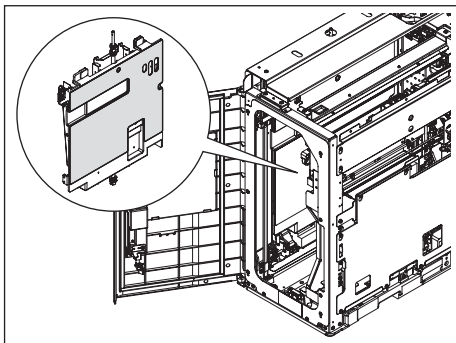
7.2.6 Cleaning Cassette Absorption Magnet

Clean the surface of the magnet on the cassette absorption plate. Confirm that the surface of the cassette absorption plate is free of scratches and flat at the same time.



Caution

Be sure to turn OFF the power supply circuit breaker and unplug the power cable from the equipment whenever the maintenance is performed.



- 1 Open the second front door.
- 2 Wipe the surface (magnet face) of the cassette absorption plate lightly with alcohol. Confirm that it is free of scratches and flat at the same time.



Caution

Be careful not to distort the cassette absorption plate with too much force.



Important

Replacement of the transporter unit (at the factory) will be necessary if there is a scratch on the surface of the cassette absorption plate or if it is not flat.

This completes the cleaning of the cassette absorption magnet.

Go to ["7.2.7 Greasing LM Guide \(Page 7-11\)"](#) and grease the LM guide.

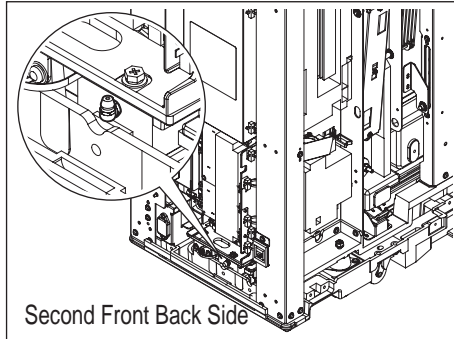
7.2.7 Greasing LM Guide

Grease the LM guide using a grease for metal.

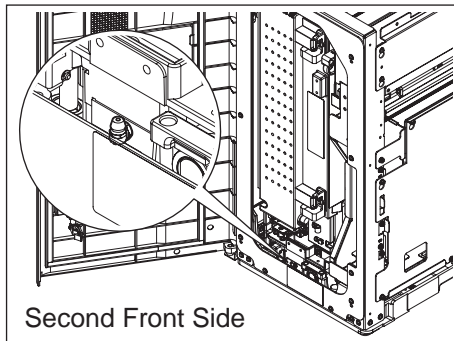


Caution

Be sure to turn OFF the power supply circuit breaker and unplug the power cable from the equipment whenever the maintenance is performed.



Second Front Back Side



Second Front Side

1 Grease the LM guide using a grease gun.

There are grease nipples at the front and back of the holding plate of the subscan unit. Grease by moving the subscan unit (optical unit).

- Grease: AFC grease by THK
- Grease gun model name: MG70
- Grease gun discharge rate: ca 60 cc/stroke

Pull the lever on grease gun twice per each location.



Important

Always use the specified grease.



Important

Wipe off the rust if you find any rust on the LM guide.

This completes the greasing procedure for the LM guide.

Go to ["7.2.8 Greasing Transporter Lead Screw Unit and Transporter Motor Unit Assembly Gear Mechanism Unit \(Page 7-12\)"](#) and apply grease to the transporter lead screw unit and the transporter motor unit assembly gear mechanism unit.

7.2.8 Greasing Transporter Lead Screw Unit and Transporter Motor Unit Assembly Gear Mechanism Unit

Apply grease to the transporter lead screw unit and the transporter motor unit assembly gear mechanism unit.



Caution

Be sure to turn OFF the power supply circuit breaker and unplug the power cable from the equipment whenever the maintenance is performed.

- 1 Move the optical unit to the second front back side.

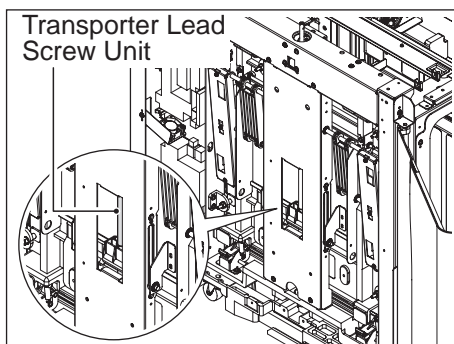
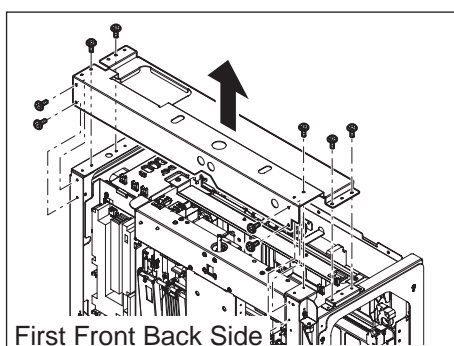


Note

It is necessary to move the optical unit to the second front back side when moving the push plate unit of the transporter unit (procedure to turn the transporter lead screw).

- 2 Remove the exterior frame (back).

- 9 screws (M4 x 8)



- 3 Apply grease to the transporter lead screw unit and the transporter motor unit assembly gear mechanism unit.

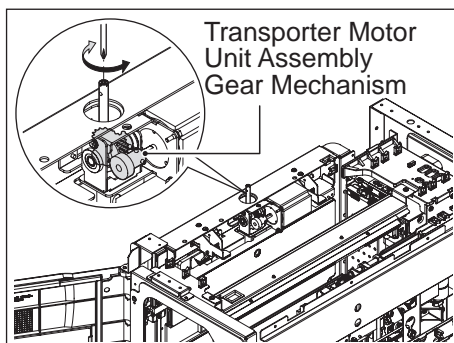
- Grease: Plusguard No. 2 by Kyodo Yushi



Important

Always use the specified grease.

Apply grease on entire area by turning the transporter lead screw by a screw driver.



- 4 Attach the exterior frame (back).

- 9 screws (M4 x 8)

This completes the greasing the transporter lead screw unit and the transporter motor unit assembly gear mechanism unit.

Go to "7.2.9 Greasing of Release Shaft Holder (Page 7-13)" and apply grease to the release shaft holder.

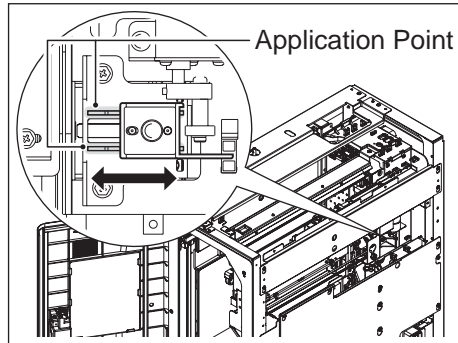
7.2.9 Greasing of Release Shaft Holder

Apply grease to the release shaft holder.



Caution

Be sure to turn OFF the power supply circuit breaker and unplug the power cable from the equipment whenever the maintenance is performed.



1 Apply grease to the release shaft holder.

- Grease: Plusguard No. 2 by Kyodo Yushi



Important

Always use the specified grease.

This completes the greasing procedure for the release shaft holder.

Go to "[7.2.10 Greasing Justifier Motor Unit Assembly Gear Mechanism \(Page 7-13\)](#)" and apply grease to the justifier motor unit assembly gear mechanism.

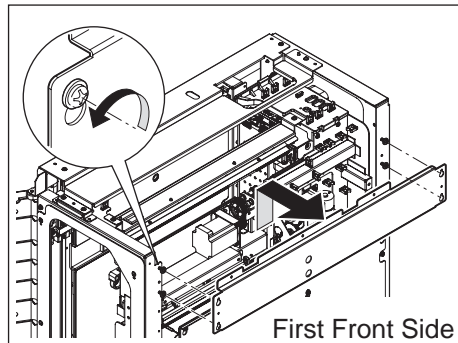
7.2.10 Greasing Justifier Motor Unit Assembly Gear Mechanism

Apply grease to the justifier motor unit assembly gear mechanism unit.



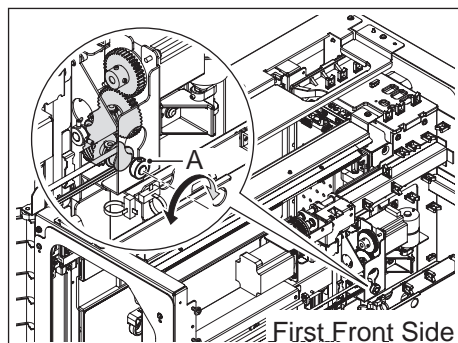
Caution

Be sure to turn OFF the power supply circuit breaker and unplug the power cable from the equipment whenever the maintenance is performed.



1 Remove the exterior frame (front).

- 4 screws (M4 x 8)
Loosen all screws.



2 Apply grease to the justifier motor unit assembly gear mechanism unit.

- Grease: Plusguard No. 2 by Kyodo Yushi



Important

Always use the specified grease.

Apply grease on entire area by turning A.

3 Attach the exterior frame (front) that was removed in [Step 1](#).

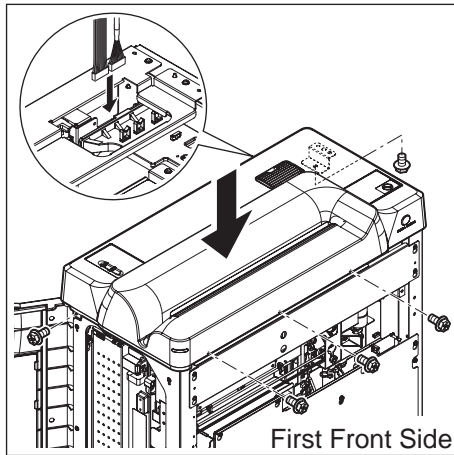
- 4 screws (M4 x 8)

This completes the greasing procedure for the justifier motor unit assembly gear mechanism unit.

Go to ["7.2.11 Attachment of Exterior Panels and Insertion Unit \(Page 7-14\)"](#) and attach the removed exterior panels and insertion slot unit.

7.2.11 Attachment of Exterior Panels and Insertion Unit

Attach the removed exterior panels and insertion slot unit after completion of the maintenance.

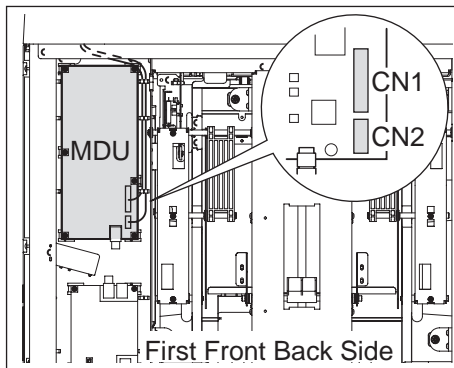


1 Attach the insertion unit to the equipment.

- 5 hex/Phillips-head screws (M4 x 8)

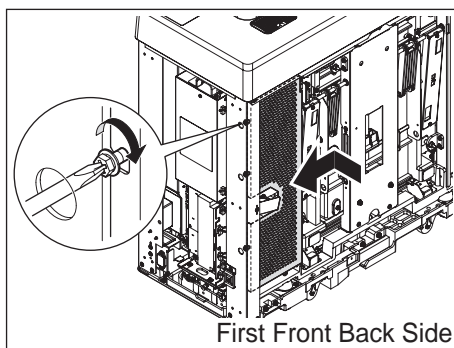


Take care of the cable routing and not to pinch the cable.



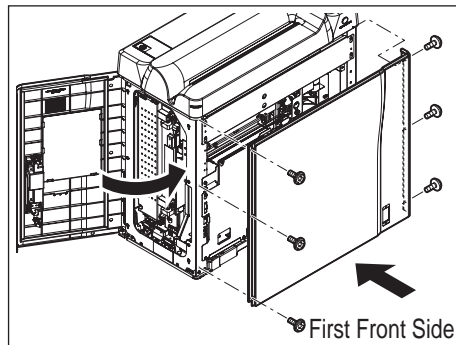
2 Connect the cables on the insertion unit to the MDU.

- MCN1 → CN1 (MDU)
- MCN2 → CN2 (MDU)



3 Attach the circuit board cover.

- 3 screws (M3 x 6)

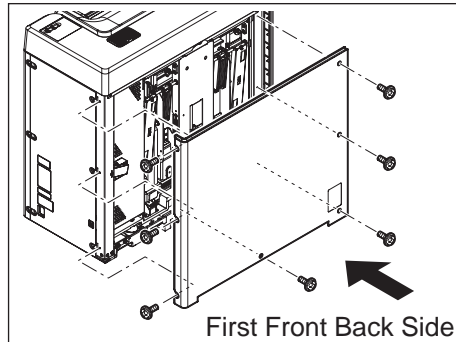


4 Attach the first front panel.

- 6 screws (M4 x 8)

Hold the bottom part of the first front panel with both hand, and attach it by sliding the top part of panel in to the top panel.

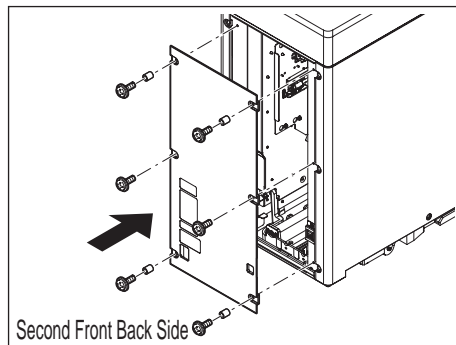
5 Close the second front door.



6 Attach the first front panel.

- 7 screws (M4 x 8)

Hold the bottom part of the first front back panel with both hand, and attach it by sliding the top part of panel in to the top panel.



7 Install the first front back panel.

- 6 screws (M4 x 8)
- 1 spacer each (for 4 locations excluding the middle)

This completes the attachment procedure of the exterior panels and the insertion unit.

Go to ["7.2.12 Move to the Installed Location \(Page 7-16\)"](#) and move the equipment back to the installed location.

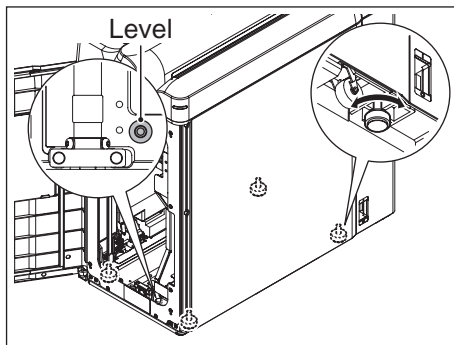
7.2.12 Move to the Installed Location

Move the equipment back to the installed location if it was moved.

- 1 Move the optical unit to the second front side and fix it using the simple fixing lock.
- 2 Move the equipment back to the installed location.
- 3 Release the lock on the optical unit.



Push the optical unit slightly towards the back when pulling up the knob. Fixing shaft might move down, and get locked again if the optical unit is at its hithermost position. Also, move the optical unit to confirm that the fixing shaft is not lowered after unlocking.



- 4 Fix the equipment using the adjuster (4 locations). Check the level inside the second front door and make sure the bubble is inside the circle.
- 5 Gently push the equipment to confirm that it is fixed firmly.

This completes the movement to the installed location.

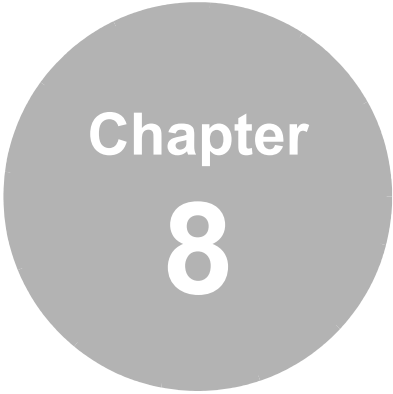
Go to ["7.2.13 Power ON \(Page 7-16\)"](#) and turn the power ON on the equipment.

7.2.13 Power ON

Connect the Ethernet cable and power cable to the equipment and turn ON the power.

- 1 Connect the Ethernet cable and the power supply cable.
- 2 Turn ON the power supply circuit breaker.
- 3 Press the "operation" switch.
Operation is possible once "READY" is displayed in the message display window.

This completes the maintenance operation performed annually.



Chapter 8

Appendix

Technical information that can be referenced during repair/maintenance is described here.

8.1	Service Tool Screen (Unit Test).....	8-2
8.2	Global Wiring Diagram.....	8-9
8.3	Circuit Board Silk Screen Diagram	8-11
8.4	Contents of Barcode	8-12
8.5	Operation of the Acoustic Wave Tension Meter...	8-13

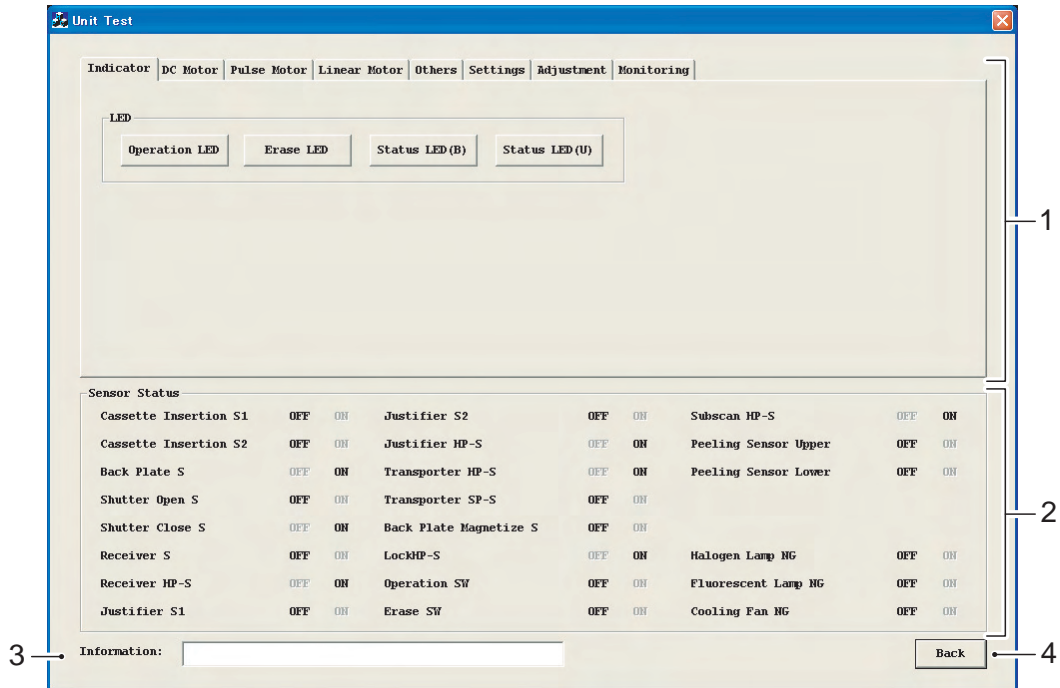
8.1 Service Tool Screen (Unit Test)

[Unit Test] screen of the service tool to perform the maintenance features of the REGIUS MODEL 110 is described here.

■ Display Procedure of the [Unit Test] Screen

See "4.2 Display [Unit Test] Screen (Page 4-3)" for the display procedure of [Unit Test] screen.

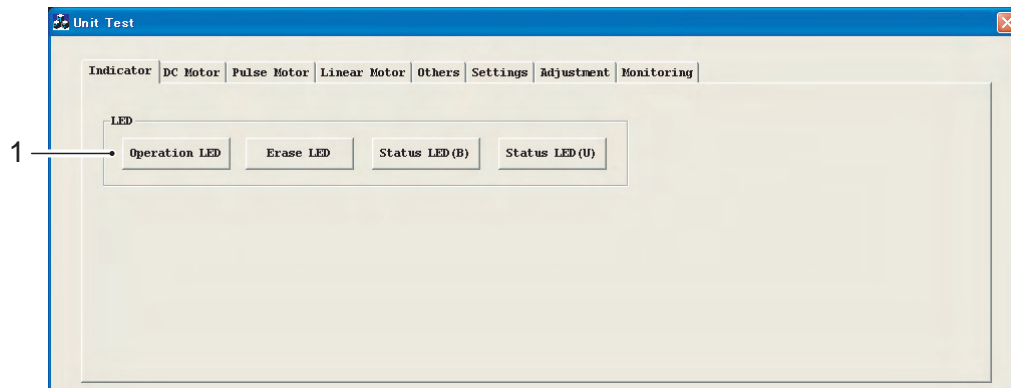
■ [Unit Test] Screen



No.	Item/button	Description
1	Command operation panel	<p>[Unit Test] screen is composed of 8 panels with group of command operation keys. Switch the panel using the tab. See following for the contents of each panel.</p> <ul style="list-style-type: none">Indicator: "8.1.1 [Indicator] Panel (Page 8-3)"DC Motor: "8.1.2 [DC Motor] Panel (Page 8-3)"Pulse Motor: "8.1.3 [Pulse Motor] Panel (Page 8-4)"Linear Motor: "8.1.4 [Linear Motor] Panel (Page 8-5)"Others: "8.1.5 [Others] Panel (Page 8-5)"Settings: "8.1.6 [Settings] Panel (Page 8-6)"Adjustment: "8.1.7 [Adjustment] Panel (Page 8-7)"Monitoring: "8.1.8 [Monitoring] Panel (Page 8-8)"
2	Sensor Status	<p>Displays the status of each sensor (OFF/ON), when the operation by a button is completed, for each operation panel. Right after the activation of the reader, the sensor status will be displayed in black if the status is at its default, and in red if it is not.</p>
3	Information	<p>Contents and the result of the executed action is displayed.</p>
4	[Back]	<p>Return to the [Service Tool] screen (reader).</p>

8.1.1 [Indicator] Panel

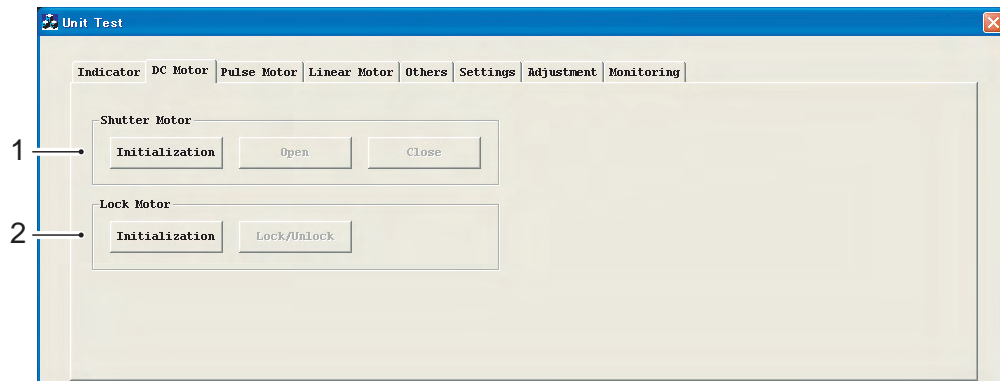
Confirmation of the operation of the operation panel and the status lamp can be performed in the [Indicator] panel.



No.	Item/button		Description
1	LED	[Operation LED]	The "operation" lamp (green) will be turned on for 3 seconds.
		[Erase LED]	The "erase" lamp (orange) will be turned on for 3 seconds.
		[Status LED (B)]	The status lamp (blue) will be turned on for 3 seconds.
		[Status LED (U)]	The status lamp (orange) will be turned on for 3 seconds.

8.1.2 [DC Motor] Panel

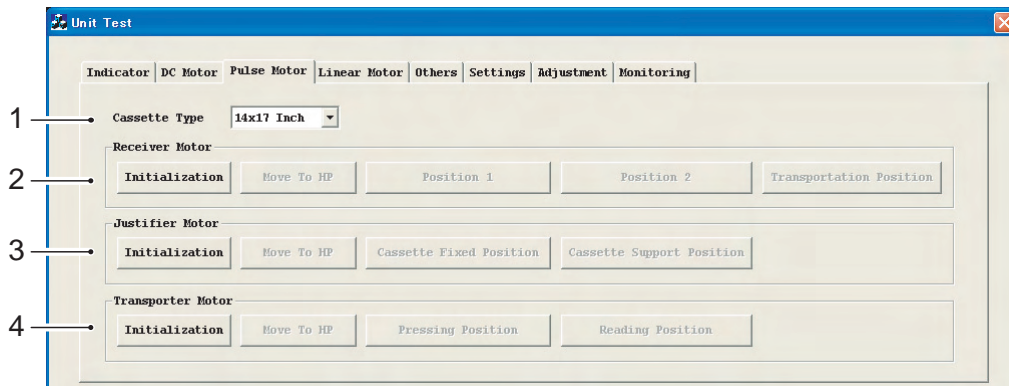
Confirmation of the operation of the shutter and lock/lock release mechanism can be performed in the [DC Motor] panel.



No.	Item/button		Description
1	Shutter Motor	[Open]	Open the shutter at the insertion slot.
		[Close]	Close the shutter at the insertion slot.
2	Lock Motor	[Initialization]	Cassette lock is pushed once.

8.1.3 [Pulse Motor] Panel

Confirmation of the operation of the receiver and the transporter can be performed in the [Pulse Motor] panel.



No.	Item/button		Description
1	Cassette Type		Specify the cassette size to be the standard when the receiver, the justifier guide, and the push plate is to be operated.
2	Receiver Motor	[Initialization]	Move other mechanism away before starting the operation of the receiver.
		[Move To HP]	Move the receiver to the home position.
		[Position 1]	Move the receiver to the position 1.
		[Position 2]	Move the receiver to the position 2.
		[Transportation Position]	Move the receiver to the transportation position (height when transporting the cassette).
3	Justifier Motor	[Initialization]	Move other mechanism away before starting the operation of the justifier guide. See the "Important: Initialization of the Justifier Motor" regarding the operation.
		[Move To HP]	Move the justifier guide to the home position.
		[Cassette Fixed Position]	Move the justifier guide to the cassette fixing position.
		[Cassette Support Position]	Slightly release the justifier guide from the cassette fixation position.
4	Transporter Motor	[Initialization]	Move other mechanism away before starting the operation of the transporter unit.
		[Move To HP]	Move the push plate unit to the home position.
		[Pressing Position]	Move the push plate unit to the pressing position (position to absorb the cassette back plate).
		[Reading Position]	Move the push plate to the reading position (position to read/erase the image).



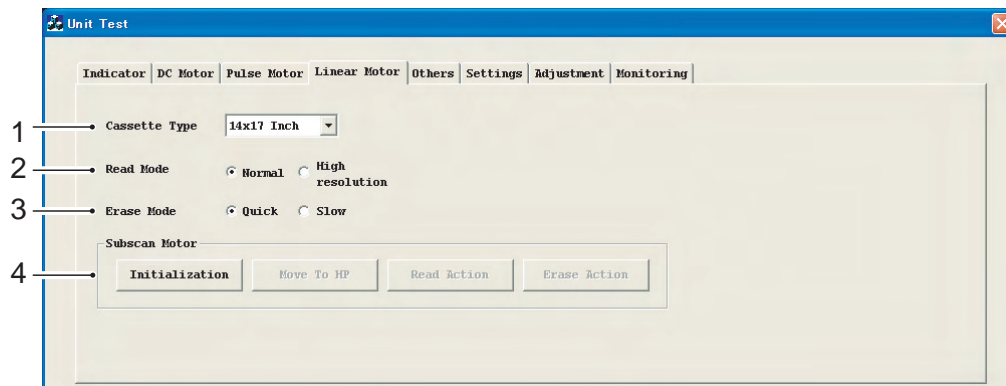
Important

Initialization of the Justifier Motor

It will stop with message, "Uploading..." when the [Initialization] button for justifier motor is clicked. Block the light of the insertion slot detection sensor 1 using your hands.

8.1.4 [Linear Motor] Panel

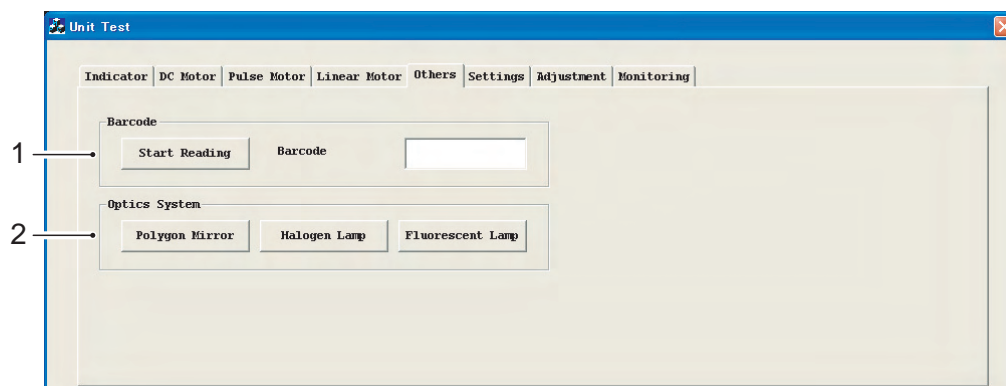
Confirmation of the operation of the subscan unit can be performed in the [Linear Motor] panel.



No.	Item/button		Description
1	Cassette Type		Specify the cassette size to be the standard when the subscan unit is to be operated.
2	Read Mode		Specify the mode of the subscan unit during the confirmation of the read action.
3	Erase Mode		Specify the operating speed during the confirmation of the erase action.
4	Subscan Motor	[Initialization]	Move other mechanism away before starting the operation of the subscan unit.
		[Move To HP]	Move the holding plate (optical unit) to the home position.
		[Read Action]	Move the holding plate to the second front side as in the read action.
		[Erase Action]	Move the holding plate to the home position with erase action.

8.1.5 [Others] Panel

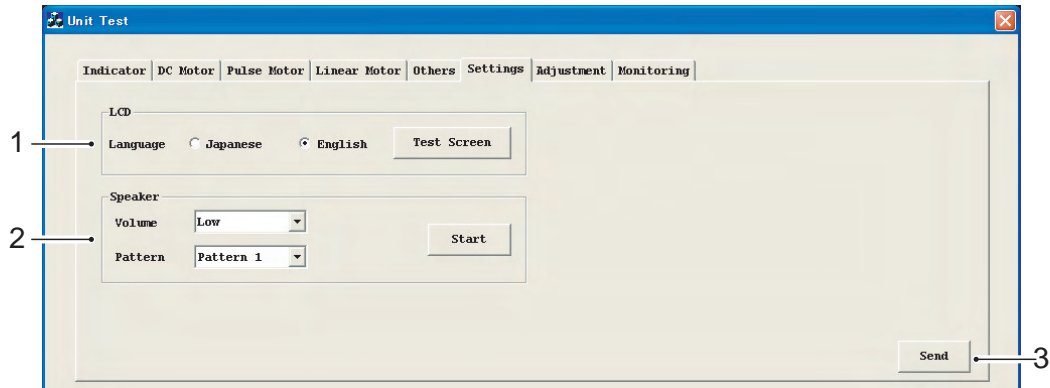
Confirmation of the barcode reader and the optical unit actions can be performed in the [Others] panel.




No.	Item/button		Description
1	Barcode	[Start Reading]	Instruct the barcode reader to start the read.
		Barcode	The barcode that was read is displayed.
2	Optics System	[Polygon Mirror]	Confirm that the polygon mirror rotates properly.
		[Halogen Lamp]	Confirm that the halogen lamp turns on properly.
		[Fluorescent Lamp]	Confirm that the fluorescent lamp (hot-cathode tube lamp) turns on properly.

8.1.6 [Settings] Panel

Settings for the reader parameter such as display language and speaker volume, and confirmation of the LCD and speaker operation can be performed in the [Settings] panel.



No.	Item/button		Description
1	LCD	Language	Select the language to display on the LCD.
		[Test Screen]	Display the test screen on the LCD.The back light will be turned ON too.
2	Speaker	Volume	Select the volume of the error and warning sound on the speaker. <ul style="list-style-type: none">• [Low]• [Normal]• [High]
		Pattern	Select the type of sound played on the speaker. <ul style="list-style-type: none">• Pattern 1: Sound 1 (pingpong) is played.• Pattern 2: Sound 2 (beepbeep beepbeep) is played.• Pattern 3: Sound 3 (beep) is played.• Pattern 4: Sound 4 (beepbeepbeep) is played.• Pattern 5: Sound 5 is played.
		[Start]	Play the sound selected in [Volume] and [Pattern].
3	[Send]		Contents of the following items during the confirmation will be set as the reader parameter when the button is clicked. <ul style="list-style-type: none">• [LCD] - [Language]• [Speaker] - [Volume]

 Current values right after the "Others" panel was displayed are in the "Language" and "Volume".

■ Setup Procedure for Reader Parameter

1 Change the values for the items that needs to be changed.

Following items are reader parameter.

- [LCD] - [Language]
- [Speaker] - [Volume]

2 Confirm the operation of the changed items.

- Click the [Test Screen] button if you have changed the display language of the LCD.
- Click the [Start] button if you have changed the volume of the speaker.



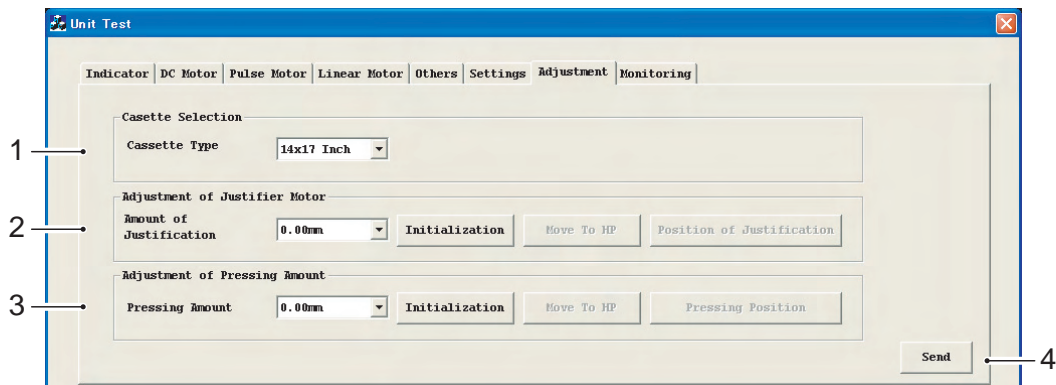
The value of the last confirmation performed will be set as a parameter. Always perform the confirmation when changing the setting.

3 Click the [Send] button.

Value will be registered.

8.1.7 [Adjustment] Panel

Adjustment of the justifier mechanism and the transporter mechanism can be performed in the [Adjustment] panel.



No.	Item/button		Description
1	Cassette Selection	Cassette Type	Specify the cassette size to be the standard when the justifier guide and the push plate is to be operated.
2	Adjustment of Justifier Motor	Amount of Justification	Setup the compensation value for the cassette fixing position (distance the justifier guide moves to fix the cassette).
		[Initialization]	Move other mechanism away before starting the operation of the justifier mechanism.
		[Move To HP]	Move the justifier guide to the home position.
		[Position of Justification]	Move the justifier guide to the cassette fixing position.
3	Adjustment of Pressing Amount	[Pressing Amount]	Setup the compensation value for the press down position (distance the push plate unit moves to absorb the back plate of the cassette).
		[Initialization]	Move other mechanism away before starting the operation of the transporter unit.
		[Move To HP]	Move the push plate unit to the home position.
		[Pressing Position]	Move the push plate unit to the press down position (position to absorb the cassette back plate).

No.	Item/button	Description
4	Send	When you click this button, the value for the "Amount of Justification" or "Pressing Amount" when the justification or pressing was performed last will be set as the reader parameter.

**Note**

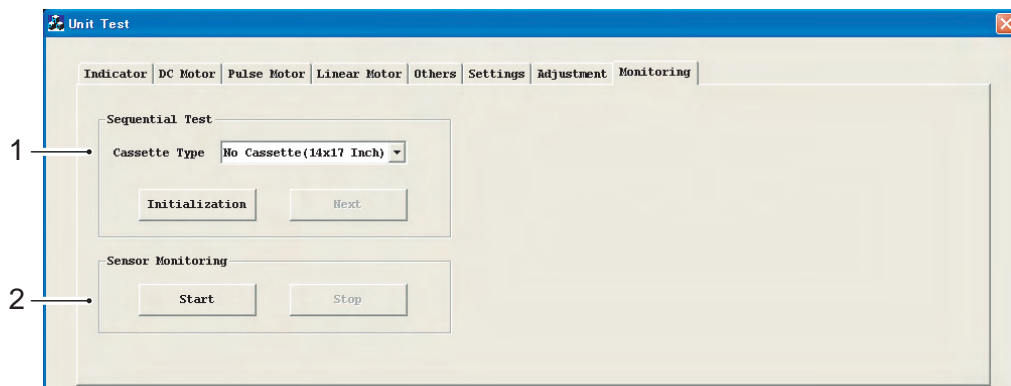
Current values right after the "Adjustments" panel was displayed are in the "Amount of Justification" and "Pressing Amount".

■ Adjustment Procedure

- See ["6.3 Adjustment of Justifier Motor \(Page 6-6\)"](#) for the Amount of Justification procedure for the justification.
- See ["6.6 Adjustment of Pressing Amount \(Page 6-15\)"](#) for the Pressing Amount procedure for the pressing.

8.1.8 [Monitoring] Panel

Confirmation of the operation can be performed by step operation in accordance to the read action in the [Monitoring] panel.

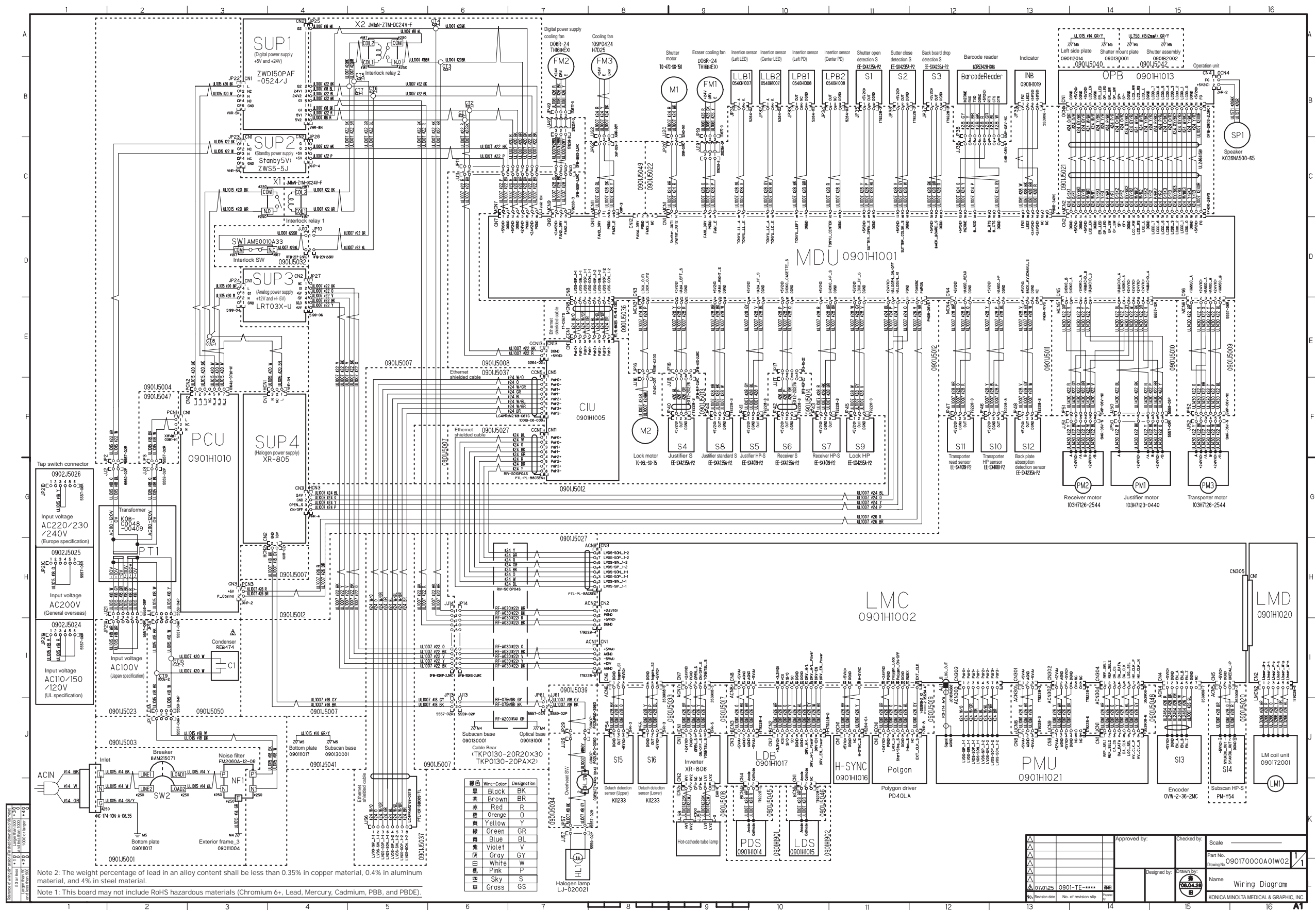


No.	Item/button		Description
1	Sequential Test	Cassette Type	Select the cassette used to perform the step operation. Select [Cassette] when the actual cassette is to be used. Select the cassette size to be emulated if actual cassette is not used.
		[Initialization]	Perform the initialization operation.
		[Next]	Perform the operation step by step according to the read sequence every time it is clicked.
2	Sensor Monitoring	[Start]	Start the monitoring of the sensor status.
		[Stop]	Stop the monitoring of the sensor status.

■ Operation Procedure

- See ["4.4 Confirming by Step Operation \(Page 4-8\)"](#) for the operation procedure of the [Mechanical Sequence].
- See ["4.5 Confirming the Status of the Sensors \(Page 4-17\)"](#) for the operation procedure of the [Sensors].

8.2 Global Wiring Diagram



8.3 Circuit Board Silk Screen Diagram

8.3.1 MDU (Mechanism Control Circuit Board)

(To be stated)

8.3.2 CIU (System Control Circuit Board)

(To be stated)

8.3.3 LMC (Optical/Subscan Control Circuit Board)

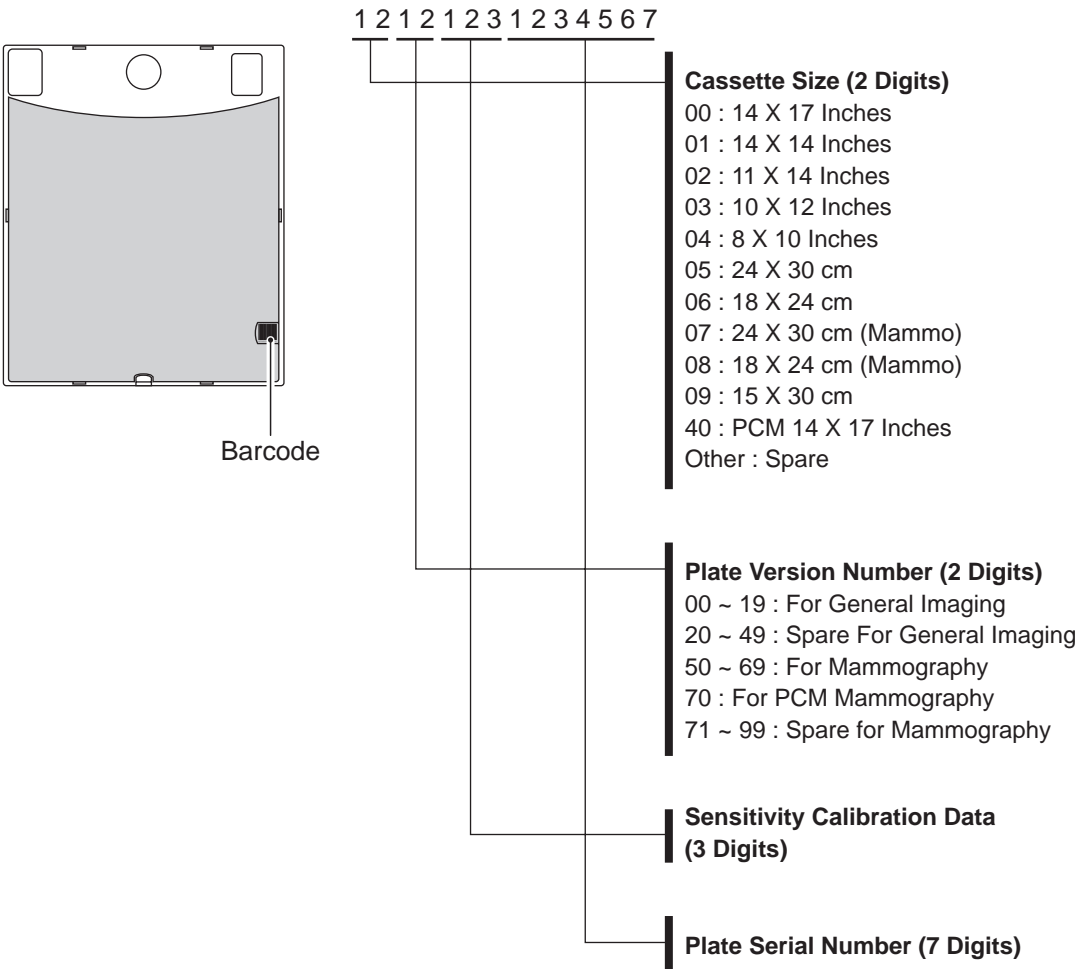
(To be stated)


8.3.4 LMD (Motor Drive Circuit Board)


(To be stated)

8.4 Contents of Barcode

The number (14 digits) on the barcode label on the cassette is describing the following.



 **Important** Cassette sizes that can be used on the equipment are 00 - 06 and 09.

 **Note** The sensitivity calibration data (3 digits) are not used.

8.5 Operation of the Acoustic Wave Tension Meter

Use the acoustic wave tension meter to adjust the belt tension and the wire tension.

Manufacturer: Gates Unitta Asia
Product name: Sonic Belt Tension Meter
Model: U-505 or U-507

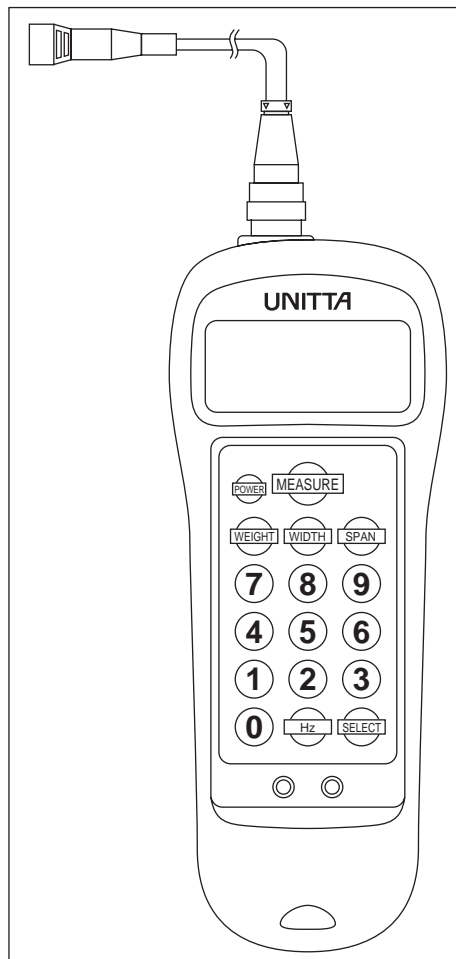
This section describes how to operate U-505 for measurement.

([WEIGHT] button will be [MASS] button in case of U-507.)



Caution

Before using the acoustic wave tension meter, always read and understand the Operation Manual for the acoustic wave tension meter.



- 1 Attach the microphone to the body of the tension meter.
- 2 Turn ON by pressing the [POWER] button.
- 3 Select the [Input No.].
Select in one of following method.
 - Press the [SELECT] button multiple times. (Number will change in sequence.)
 - Press the number on the numeric keypad.
- 4 Input the M (unit mass value).
Input the value from numeric keypad after pressing the [WEIGHT] button.
Press the buttons in following order to input "1.3".
[WEIGHT] → [0] → [0] → [1] → [3]
- 5 Input the W (belt width value).
Input the value from numeric keypad after pressing the [WIDTH] button.
- 6 Input the S (span length value).
Input the value from numeric keypad after pressing the [SPAN] button.
- 7 Place the microphone close to the center of the span of the object to measure, but not touching.
- 8 Press [MEASURE] button.
- 9 Vibrate the object by tapping it with the finger.
The result is displayed when the vibration sound is detected and the measurement is performed.



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