

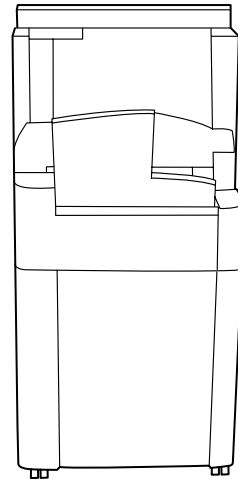


KONICA MINOLTA

## DIRECT DIGITIZER

# REGIUS MODEL 190 (DD-941) SERVICE MANUAL

CODE NO. : 0676



2nd EDITION DEC 2004

**KONICA MINOLTA MEDICAL & GRAPHIC, INC.**

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# Forward

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Direct Digitizer REGIUS MODEL 190 (hereafter referred to as REGIUS MODEL 190) is a device for reading an X-ray image cassette that uses photostimulable fluorescent material as an X-ray detector.

This Service Manual provides the procedures of installing the REGIUS 190 for a field service engineer.

Be sure to carefully read and understand this manual before installing the REGIUS 190.

## TRADEMARK

- Microsoft and Windows are trademarks of Microsoft Corporation USA in the U.S. and other countries.
  - Windows 2000 is an abbreviation of Microsoft ® Windows ® 2000 Professional operating system.
  - The company and product names described in this manual are trademarks of their respective companies.
- Please note that the marks, such as ©, ®, and ™ are omitted in this manual.

## Features of REGIUS MODEL 190

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- (1) With the application of photostimulable fluorescent material, the X-ray images can be digitized directly.
- (2) Wider dynamic range than film, allowing a large amount of diagnostic data acquisition.
- (3) Wide latitude with respect to the emitted X-ray, minimizing fluctuations in exposures.
- (4) Approx. 40 seconds of the cassette feed/load time for reading 14" x 14" cassette at 175 $\mu$ m saves a patient from waiting.
- (5) Displaying images on the LCD of Console just after exposure allows the doctor to check images on the spot.
- (6) Sampling pitch can be selected from 43.75 $\mu$ m, 87.5 $\mu$ m and 175 $\mu$ m depending on diagnostic purposes.
- (7) Cassette size can be selected from 14" x 17", 14" x 14", 11" x 14", 10" x 12", 8" x 10", 15cm x 30cm, 24cm x 30cm(mammography except the USA) depending on the patient or the body part to be examined. Mix-use of these cassettes also possible.
- (8) New scanning method using a semiconductor laser allows space-saving design. (Installation space: 58cm x 58cm)
- (9) Capability to transfer the digital image data to a host computer allows the system to be used as a PACS educated X-ray image acquisition device.
- (10) Up to 16 units of REGIUS 190 can be connected to the REGIUS Console.

## ALERT SYMBOL MARK





### Safety Alert Symbol

This is the industry “Safety Alert Symbol”. This symbol draws your attention to items and operations associated with the use of this equipment that could result in danger to yourself and others. Please read all messages next to alert symbol marks, and follow the directions very carefully. Before assembling or using this equipment, it is important that you read the instructions and safety.

## OTHER SYMBOL MARKS

The meaning of following symbol marks described in this equipment and this manual is as the following table.

No	Symbol	Meaning of Symbol
1		Danger, Warning or Note. Read the description that bears this symbol.
2		Alternating current
3		Protective earth (ground)
4		OFF (power: disconnection from the mains)
5		ON (power: connection to the mains)
6		Stand by ON/OFF (The main power source will still be ON even when this is turned OFF.)
7		Dangerous voltage.
8		Type B-applied part.
9		High temperature cautions. The part indicated with this symbol becomes very hot.

10		Caution for electricity static. Internal parts of the device may get damaged due to electricity static.
11		Touching the parts indicated with this mark is prohibited. It may cause electrocution or hand may become entangled in the device.

## WARNING NOTICES (SIGNAL WORDS)

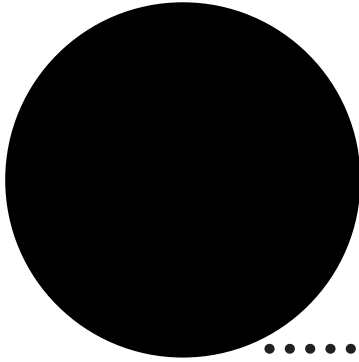
- (1) Signal words provide an indication of the degree of danger concealed within the product.
- (2) This manual uses three different signal words depending on the probability and severity of injury or damage as explained below.

<b>DANGER</b>	: Indicates an acute hazard that will result in death or serious injury if not avoided.
<b>WARNING</b>	: Indicates a danger that may result in death or serious injury if not avoided.
<b>CAUTION</b>	: Indicates a danger that may result in medium-level wound or minor injury if not avoided. It is also used to indicate anticipation of a danger of physical damage only.

		Probability of damage	
		High	Low
<b>Bodily injury and (damage to equipment)</b>	<b>Death or serious injury (serious damage)</b>	DANGER	WARNING
	<b>Medium-level wound or minor injury (minor damage)</b>	WARNING or CAUTION	CAUTION
<b>Physical damage only</b>		CAUTION	

- (3) In this manual, in addition to the above warning notices, reference notes providing supplementary explanations are indicated as follows.

**<IMPORTANT>**Indicates a supplementary note.



# CAUTION

The basic cautions to be observed when installing or operating the REGIUS MODEL 190 are described in this chapter. Be sure to read the descriptions in this chapter and drive the users home to them.

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## Cautions relating to Laws

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Following cautions must be observed when handling the REGIUS MODEL 190 and become thoroughly familiar with the correct method of usage.

### Cautions relating to Laser Regulations



#### WARNING

The reader device uses a laser light and high voltage.  
Never remove the external panel.  
If you remove the external panel, you may be exposed to laser light or receive an electric shock.  
Specifications of laser unit on the REGIUS MODEL 190 are:  
Class: IIIb\*  
Medium: Semiconductor laser  
Wavelength: 660 nm  
Maximum output: 80 mW (CW)



Be certain to comply with any and all laws and government regulations including electric codes and utility regulations, regarding the installation and operation of this equipment.

Precautions to be observed when using medical electrical equipment (to ensure safety and prevent danger)

1. Ensure that only a trained or approved operator uses the equipment.
2. When installing the equipment, observe the following precautions.
  - (1) Install the equipment in a location where it is not exposed to water.
  - (2) Install the equipment in a location where there is no likelihood of being adversely affected by atmospheric pressure, temperature, humidity, drafts, light, dust, or air containing salt, or sulfur, etc.
  - (3) Install the equipment in a stable location. Do not install it on an inclined surface and avoid vibrational shock (including during transportation).
  - (4) Do not install the equipment in a location where chemical reagents are stored or where chemical fumes may be present.
  - (5) Check the frequency, voltage and allowable current (or power consumption) of the power source.
  - (6) Confirm the conditions of the batteries (how exposed they are, or their polarity).
  - (7) Ground the equipment well.
3. Before using the equipment, observe the following precautions.
  - (1) Check the contact state of the switches, the polarity dial setting, and the various meters, and confirm that the equipment operates normally.
  - (2) Make sure that the equipment is well grounded.
  - (3) Make sure that all the cables are connected correctly and safely.
  - (4) Using two X-ray devices at the same time may result in an incorrect diagnosis or hazards to people.  
So, extreme care should be taken.
  - (5) Check the batteries.

**<IMPORTANT>** Should this manual become not readable due to any reason, replace it with a new one which is available at charged basis.

- 
4. When using the equipment, observe the following precautions.
    - (1) Be careful not to exceed the time period and the amount of X-rays required for diagnosis or treatment.
    - (2) Always monitor the entire equipment and a patient for safety.
    - (3) If an abnormality occurs on the equipment or a patient, take appropriate measures (i.e. turn off the equipment ensuring the safety for patient, etc.), to ensure patient protection.
    - (4) Do not allow a patient to touch the equipment.
  5. After using the equipment, observe the following precautions.
    - (1) Return the switches and dials to their original positions in the specified procedure, and turn the equipment OFF.
    - (2) When disconnecting the cables, do not pull the cables or apply an excessive force to them.
    - (3) Observe the following precautions concerning the storage location.
      - Store the equipment in a location where it is not exposed to water.
      - Store the equipment in a location where there is no likelihood of being adversely affected by atmospheric pressure, temperature, humidity, drafts, light, dust, or air containing salt, or sulfur, etc.
      - Store the equipment in a stable location. Do not store it on an inclined surface and avoid vibrational shock (including during transportation).
      - Do not store the equipment in a location where chemical reagents are stored or where chemical fumes may be present.
    - (4) Keep all accessories, cables, terminals, etc. neatly after cleaning them.
    - (5) Be sure to keep the equipment clean for next use.
  6. In the event that the equipment operates incorrectly or breaks down, do not try to repair it yourself. Have a trained engineer to repair it.
  7. Never attempt to modify the equipment.
  8. Maintenance and Inspection
    - (1) Inspect the equipment and its components regularly.
    - (2) If the equipment has not been used for an extended period of time, clean the equipment and make sure it operates safely before using it.
  9. Operate the equipment correctly according to the Operation Manual.

## Disposing of the system

Disposal must be carried out in accordance with local ordinances and regulations.
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The replaceable REGIUS plates used in REGIUS cassettes are coated with fluorescent material that has toxic potential. Disposal and replacement of these plates must be carried out by properly trained service personnel.
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**<IMPORTANT>Should this manual become not readable due to any reason, replace it with a new one which is available at charged basis.**

# Warning Labels

Warning and Caution labels stuck on the REGIUS 190 are as follows.

## CAUTION



To prevent accident during servicing, never peel or soil the labels on the REGIUS MODEL 190.

## CAUTION



If the label gets soiled or falls off, and the caution is no Longer legible, replace it with a new one.

### • Warning Labels

#### • Warning for LCD fall

<b>注意</b> モニターが落下してケガをしたり、 モニターが破損する恐れがありますので、 装置をゆすったり移動させたりしないで下さい。
<b>CAUTION</b> NEVER shake or move the device. Doing so may cause the monitor to drop or result in monitor damage.
<b>PRECAUCIÓN</b> No agite ni mueva NUNCA el dispositivo. Si lo hace podrá propiciar la caída del monitor u ocasionar daños al monitor.
<b>ATTENTION</b> NE secouez et ne déplacez JAMAIS l'appareil. Cela pourrait faire tomber le moniteur ou l'endommager.
<b>ACHTUNG</b> NIEMALS des Gerät schütteln oder bewegen. Dadurch kann der Monitor herunterfallen oder beschädigt werden.
<b>CUIDADO</b> NUNCA balance nem movimento o dispositivo. Do contrário, poderá provocar a queda ou a avaria do monitor.
<b>ATTENZIONE</b> Non scuotere né spostare MAI il dispositivo. Così facendo il monitor potrebbe cadere o danneggiarsi.
<b>注意</b> 監視器掉落下来会导致人员受伤、 或导致监视器损坏，因此， 请勿摇晃或移动装置。

<b>注意 CAUTION PRECAUCIÓN ATTENZIONE ACHTUNG ATTENTION PRECAUÇÃO 注意</b>
ケガをしたり故障の原因となることありますので、 カセット取出口に物を入れないで下さい。 また、カセットが突然に取出されるまで、取出口には手を 触れないで下さい。
NEVER insert any obstacles in the cassette eject area. Doing so may result in physical injuries or mechanical malfunctions. NEVER touch the eject area until the cassette is fully ejected.
No inserte NUNCA ningún objeto en el área de expulsión del casete. Si lo hace podrá resultar en heridas corporales o malfuncionamiento mecánico.
No toque NUNCA el área de expulsión hasta que el casete haya sido expulsado completamente.
No inserire MAI corpi estranei nell'area di espulsione della cassetta. In caso contrario si potrebbero verificare lesioni fisiche o malfunctionamenti meccanici.
Ne insere MAI l'area di espulsione sino a quando la cassetta è totalmente fuoriuscita.
NIEMALS Hindernisse in den Kassettenausgabebereich bringen. Dabei besteht die Gefahr von Verletzungen oder mechanischen Fehlfunktionen. NIEMALS den Ausgabebereich berühren, bevor die Kasette vollständig ausgegeben ist.
NE JAMAIS insérer d'obstacles dans la section d'éjection de la cassette. Cela pourrait provoquer des blessures physiques ou un mauvais fonctionnement mécanique. NE JAMAIS toucher la section d'éjection tant que la cassette n'est pas complètement éjectée.
JAMAIS insere algum obstáculo na área de ejeção de cassetes. Caso contrário, poderá resultar em lesões físicas ou algum mau funcionamento mecânico. JAMAIS toque na área de ejeção até que a cassette esteja completamente ejeçada.
有时会导致人员受伤或机械故障，请勿将物品放入磁带出口。 另外，在磁带完全弹出之前，切勿用手接触出口。

#### • Warning for Cassette Magnetizing Plate

<b>注意 CAUTION ACHTUNG PRECAUCIÓN</b>
ケガをしたり装置が壊れるおそれがありますので、吸着板を外すときは 修理マニュアルに従い、作業して下さい。
ALWAYS observe the instructions in the Service Manual when removing the magnet absorption plate. Failure to do so may result in injuries or mechanical malfunction.
IMMER die Anweisungen in der Wartungsanleitung beim Entfernen der Magnetabsorptionsplatte beachten. Bei unsachgemäßer Handhabung besteht die Gefahr von Verletzungen oder mechanischen Fehlfunktionen.
Observe siempre las instrucciones ofrecidas en el Manual de Servicio cuando quite la placa de absorción magnética. El no hacerlo podrá resultar en heridas o en un mal funcionamiento mecánico.

#### • Warning for High Temperature

<b>注意 CAUTIONPRECAUCIÓN ACHTUNG ATTENZIONE PRECAUÇÃO 注意</b>
火傷に注意してください。 60℃以上になる場合があります。 The temperature of the elevator section may reach 60°C. Do not touch hot surface. La temperatura de la sección del elevador podrá alcanzar 60°C. No toque la superficie caliente. Die Temperatur der Hebesektion kann 60°C erreichen. Nicht die heiße Oberfläche berühren. La température de la section d'élévateur peut atteindre 60°C. Ne touchez pas la surface chaude. La temperatura della sezione dell'elevatore può raggiungere 60°C. Non toccate quindi la superficie calda. A temperatura da secção de elevação pode atingir 60°C. Não toque na superfície quente. 小心被升降部烫伤。 升降部有时会达到60℃的高温。
<b>高温注意 HIGH TEMPERATURE PRECAUCIÓN SOBRE CALOR HOHE TEMPERATUR ATTENTION TRES CHAUD PRECAUZIONE PER IL CALORE AVISO DE AQUECIMENTO 高温注意</b>

#### • Warning for Steel Belt

<b>危険</b> ケガをする恐れがありますので このベルトに触らないで下さい。
<b>DANGER</b> NEVER touch this steel belt. Doing so may result in injuries.
<b>PELIGRO</b> No toque NUNCA esta correa metálica. Si lo hace podrá sufrir heridas.
<b>Gefahr</b> NIEMALS diesen Stahlriemen berühren. Dabei besteht die Gefahr von Verletzungen.

#### • Warning for High Temperature

<b>注意 CAUTIONPRECAUCIÓN ACHTUNG ATTENZIONE PRECAUÇÃO 注意</b>
火傷に注意してください。 消火ユニットは170℃以上になる場合があります。 充分時間をおきユニットが冷めた後に、作業を行って下さい。 The temperature of the erase unit reach may reach 170°C. Do not touch hot surface. Espera un mínimo de 20 minutos, después realice el servicio. La temperatura der Löscheinheit kann 170°C erreichen. Nicht die heiße Oberfläche berühren. Mindestens 20 Minuten warten, und dann die Wartung ausführen.
<b>高温注意 HIGH TEMPERATURE PRECAUCIÓN SOBRE CALOR HOHE TEMPERATUR ATTENTION TRES CHAUD PRECAUZIONE PER IL CALORE AVISO DE AQUECIMENTO 高温注意</b>
La température de l'unité d'effacement peut atteindre 170°C. Ne touchez pas la surface chaude. Attendez au moins 20 minutes avant de procéder aux réparations. La temperatura dell'unità di cancellazione può raggiungere 170°C. Non toccate quindi la superficie calda. Attendete almeno 20 minuti prima di procedere con la manutenzione. A temperatura da unidade de apagamento pode atingir 170°C. Não toque na superfície quente. Aguarde no mínimo 20 minutos, e então realize a manutenção. 小心被消去装置烫伤。 消去装置有时会达到170℃的高温。 最起码等20分钟，要等到装置冷却以后再再进行维修作业。

• Warning for Foreign Object



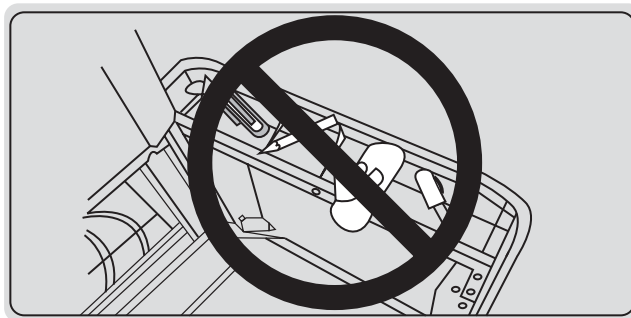
• Warning for Laser (External)



• Warning for Laser



• Do not place anything on the inner shelf.



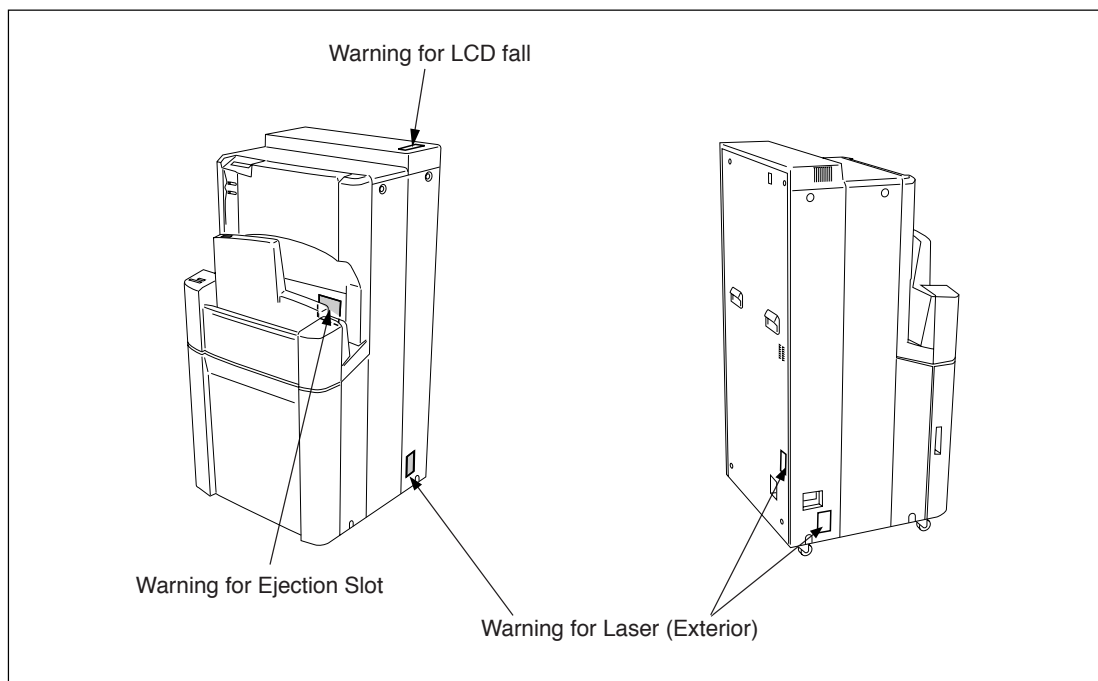
• Warning for Electrostatic



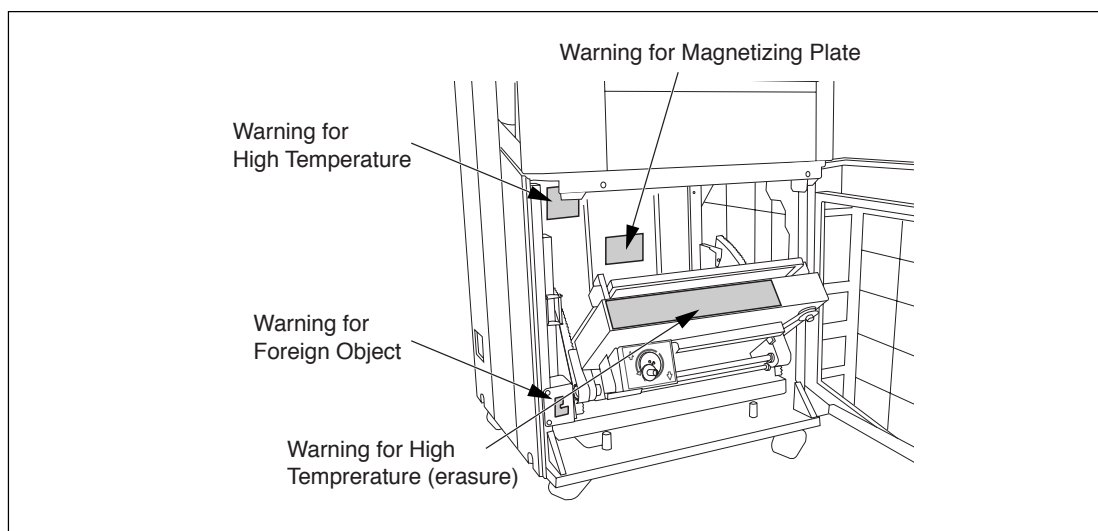
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- Location of Warning Labels

### Exterior

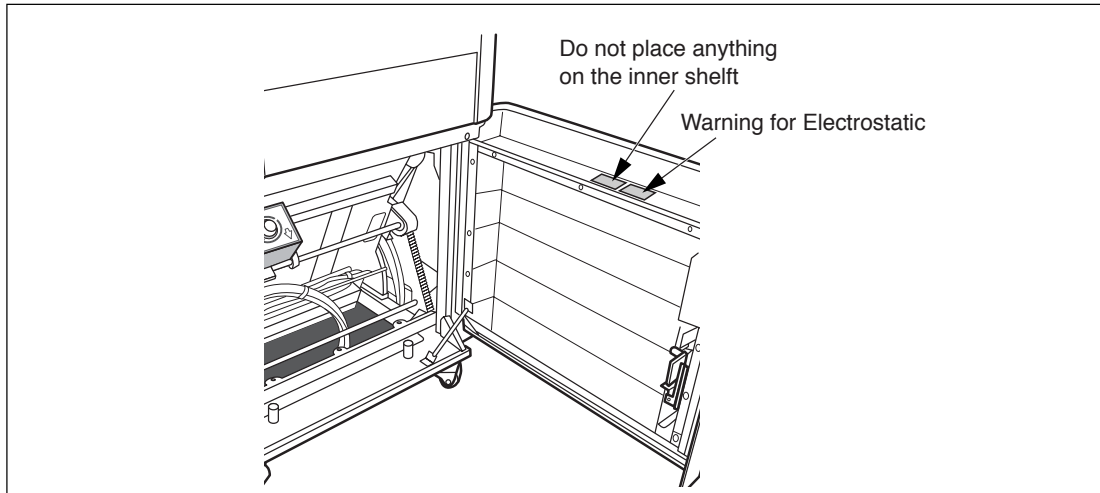


### Transport Unit/Cassette Magnetizing Plate

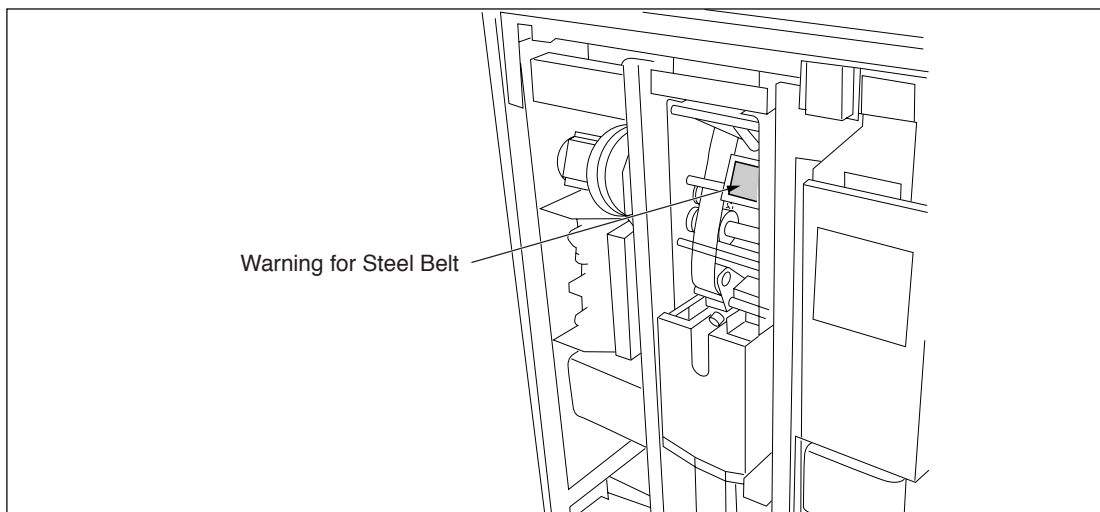


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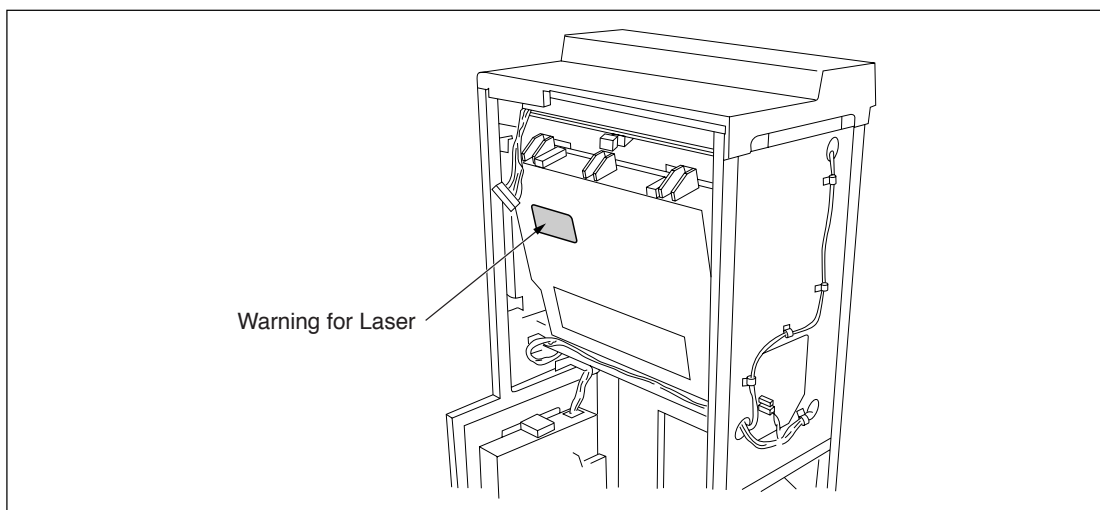
### Front Door (inner shelf)



### Steel Belt



### Optical Unit



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# Cautions for Handling the REGIUS MODEL 190

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The following information should be read before proceeding with maintenance work. Those who are involved in servicing should become thoroughly familiar with these cautions relating to normal handling of the REGIUS MODEL 190.

## CAUTION

Failure to observe the cautions set out below will cause personal injury and/or damage to the equipment itself.



### Cautions prior to Usage of the Equipment

- Cautions detailed in the user's manual accompanying the product must be carefully read and thoroughly understood.
- The power cable should be checked for damage.
- Check to ensure that the earth terminals are properly connected.
- Check that all cables are properly and firmly connected.
- Check to ensure that the LCD panel is not cracked or fractured.
- Check to ensure that the REGIUS MODEL 190 is operating normally and safely.
- The REGIUS MODEL 190 is furnished with air intake and outlet vents to prevent any rise in the internal temperature of the unit: ensure that these vents are not blocked.

### Cautions Regarding Storage of the Product when Temporarily out of Use

- Power supply breakers should be switched off following prescribed procedures.
- When disconnecting, be sure to hold cables properly.
- All accessories and cables should be cleaned and set in order at the place of storage.
- In order to prevent problems the next time the product is used, the place of storage should be cleaned.

### Cautions Regarding Usage after an Extended Period of None-Use

- Check the power cables for damage.
- Check that earth terminals are properly connected.
- Check that all cables are properly and firmly connected.
- Check to ensure that the LCD panel is not cracked or fractured.
- Check to ensure that the REGIUS MODEL 190 is operating normally and safely.
- Use of the unit with other equipment may result in erroneous diagnosis or pose danger: under such circumstances, the unit must be operated with utmost caution.
- The REGIUS MODEL 190 is furnished with air intake and outlet vents to prevent any rise in the internal temperature of the unit: ensure that these vents are not blocked.

### Other Cautions

#### Caution



**If the REGIUS MODEL 190 produces any unusual noise, odor or smoke, power should be switched off immediately. Power should not be restored until the cause has been detected and the problem resolved.**

- The Ethernet terminal should not be used for any other purpose, for example connection to telephone lines, than Ethernet connection.

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# Cautions for Handling Cassettes and Plates

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The user should become thoroughly familiar with the following cautions before handling REGIUS cassettes (RC-110 Series) and REGIUS Plates (RP-3 Series)

- In this manual, REGIUS cassettes are referred to as "cassettes" and REGIUS plates as "plates".

## Cautions Regarding Photo-stimulated Fluorescent Coating

### WARNING



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**The surface of the plate incorporates a photo-stimulated fluorescent coating which is potentially harmful if ingested. In the event of leakage of the fluorescent coating (milky white) due to substantial damage to the protective layer on the plate, the following measures should be taken.**

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- If the coating is swallowed, a doctor should be consulted immediately.
- If the eyes are exposed to the coating, the eyes should be rinsed with clean water and a doctor consulted immediately.
- If the coating comes into contact with the skin, the affected area should be immediately rinsed with clean water.
- Even if the coating has not been ingested, care must be taken to ensure that no part of the body is contaminated and the plate disposed of following prescribed procedures.

When disposing the REGIUS Plate, accept the regulations of each local government.

## Cautions to Ensure Maintenance of Image Quality

- Constant care must be taken to ensure that the reading surface of the plate is not damaged or soiled.
- Any contaminant (dust, etc.) that has attached to the reading surface of the plate should be removed by cleaning immediately.
- As for films, gloves must be worn when handling plates.
- Ensure that plates are not exposed to sunlight.
- Any procedures involving exposure of the plate to fluorescent light, such as cleaning, should be finished as quickly as possible and the plate immediately replaced in the cassette upon completion of the procedure.
- Care must be taken to ensure that the front plate does not become damaged or soiled.

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### Cautions Regarding Transportation and Storage

- Temperature and humidity levels must be maintained within the following specified ranges.

	Before unsealing the plate	After unsealing the plate
Temperature	10°C ~40°C	10°C ~30°C
Humidity	Humidity 80%RH or lower (without condensation)	

- Do not expose the plate to X or  $\gamma$  rays.
- If the cassette is transported or stored in its packing, ensure that the cassette is kept in horizontal position. Storage of cassettes in vertical position for extended periods or in a high-temperature environment may result in warping of the back plate.
- Once the plate is unpacked, store it in the cassette.
- Do not store the front and back plates separately. In particular, storage of the back plate separately in angled position may result in warping.
- Be careful not to drop or bump cassettes.
- As for previous cassettes, cassettes in use should be stored vertically in a rack.

### Cautions Before Inserting the Cassette

In order to avoid problems with cassette conveying operation inside the REGIUS MODEL 190, the following cautions should be observed:

- Ensure that the locking mechanism is functioning properly and check for bending or other damage. Do not insert damaged cassettes into the REGIUS MODEL 190.
- Make sure that there is no paper clipped into the memo clip on the back plate.
- Make sure that there are no foreign objects such as clips between the front and back plates.
- In order to ensure that the back plate properly adheres to the
- absorption plate, check that there is nothing (e.g. tape) adhered to the back plate.
- Ensure that the bar code has not become soiled.

### Cautions Regarding Disposal

Disposal must be carried out by following the local regulations in each country.

- If the protective layer on the plate is damaged and the photo-stimulated fluorescent coating leaking, be careful to handle the plate so that none of the photo-stimulated fluorescent coating comes into contact with the body.
- Lead foil is incorporated into all plates (RP-3S) except plates for mammograms (RP-3M). Disposal of such plates must be carried out in accordance with the appropriate waste disposal regulations.

#### WARNING



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**When disposing the REGIUS Plate, accept the regulations of each local government.**

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# Cautions during Servicing

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The following cautions must be observed during servicing.

## Cautions Relating to Personal Safety

### DANGER



The REGIUS MODEL 190 incorporates a laser generator (class IIIb). Direct exposure of the body or the eyes to the laser will result in serious injury. Special purpose protective goggles must be worn while carrying out repairs or servicing.

- Only REGIUS MODEL 190 units with the multiple interlocks disengaged may be treated as class-I laser products.

### WARNING



The REGIUS MODEL 190 incorporates high-voltage parts which pose the risk of electrocution if touched.

### WARNING



To minimize risk, only properly trained service personnel are allowed to remove covers or handle internal components, etc.

### WARNING



When in the proximity of moving parts such as motors, care must be exercised to ensure that parts of the body or clothing do become tangled in the mechanism.

### WARNING



Before removing or replacing internal circuit boards, or disconnecting connectors or cables, the REGIUS MODEL 190 power supply must be switched off. Carrying out such procedures with the power on will result in serious injury and must always be avoided.

- Work procedures should be carried out properly and safely with due regard the descriptions of the warning labels.

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## Cautions Relating to Power Supply Voltage

### WARNING



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**The voltage supply to the REGIUS MODEL 190 is AC110V or higher. To avoid electrocution, the following cautions must be observed:**

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- Check that the REGIUS MODEL 190 earth is properly connected.
- Ensure that all cables are properly connected and check for damage.
- Before carrying out work which may involve touching power supply lines, the power supply must be switched off.
- In cases where the power supply must be left on to carry out, for example voltage measurement, every precaution must be taken to avoid contact with power supply lines.

## Cautions Relating to Lithium Batteries

The SCB2 (System Control Board) in the REGIUS MODEL 190 incorporates a lithium battery.

- Unless given specific instructions, the lithium battery should not be removed.
- In cases where the lithium battery must be removed, care must be exercised to avoid exposure to fire or water. Such exposure may cause the battery to explode.

## Cautions Relating to Damage to the Equipment

### CAUTION



The electronic circuits in the REGIUS MODEL 190 may be damaged by static electricity. The main body and any electrical parts removed should be handled with due care during installation and/or repairs.

### CAUTION



An earthing strap should always be worn when handling circuit boards.

### CAUTION



Never loosen the screws painted in white. Loosening these screws may disable the restoration of the normal status in the field.

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## Cautions Relating to Disposal

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For the purposes of disposal, this product must be handled in accordance with the appropriate waste disposal regulations. Disposal of the product must be carried out in accordance with local ordinances and regulations.

Part that should be disposed of observing the local regulations	Location
Photo-stimulated fluorescent coating	Plate
Lead foil	Plate (except for mammo and long object)
Lithium battery	SCB2 (System Control Board)
Fluorescent tube	LCD panel

Main unit and packing material for optional equipments should also be disposed of observing the local regulations.

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## Life Expectancy of Parts

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In order to ensure safe operation of the REGIUS MODEL 190, the part listed below should be replaced or serviced before its life expires.

Part	Life Expectancy
Eraser lamp	approx. 10000 shots

Regarding the Above Life Expectancy

- The above figure is valid on condition that the part is used in accordance with prescribed cautions relating to usage and is properly maintained and inspected.
- The above figure should be used as a guide to estimate the timing of replacement.

Period of Warranty

In accordance with the warranty, parts will be supplied at cost after expiry of the period of warranty (one year).

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Chap.1

## ***Overview***

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## 1.1 Principal Specifications

### 1.1.1 Reading the Image

- Image Data

Service cassettes

Cassette Type	Dimensions (mm)	
	W x H	Thickness ≥
14" x 17"	384 x 460	14
14" x 14"	384 x 384	14
11" x 14"	308 x 384	14
10" x 12"	282 x 333	14
8" x 10"	231 x 282	14
24 x 30cm (mammography) <sup>Note</sup>	328 x 255	14
18 x 24cm (mammography) <sup>Note</sup>	268 x 195	14
15 x 30cm	328 x 178	14

Note : Except the USA

Read image sizes

In situations where the read image data sent from the REGIUS 190 is larger than this read area, it will be necessary for the number of pixels shown here to be extracted by the receiving device.

Cassette	Read Size (mm)	Pixels		
		at 175μm	at 87.5μm	at 43.75μm <sup>Note2</sup>
14" x 17"	352.0 x 428.5	2010 x 2446	4020 x 4892	-
14" x 14"	352.0 x 352.0	2010 x 2010	4020 x 4020	-
11" x 14"	275.0 x 352.0	1570 x 2010	3140 x 4020	-
10" x 12"	250.5 x 301.5	1430 x 1722	2860 x 3444	-
8" x 10"	199.5 x 250.5	1140 x 1430	2280 x 2860	-
24 x 30cm (mammography) <sup>Note1</sup>	296.5 x 238.0	-	3388 x 2720	6776 x 5440
18x 24cm (mammography) <sup>Note1</sup>	237.0 x 177.0	-	2709 x 2023	5416 x 4040
15 x 30cm	296.5 x 146.5	1694 x 836	3388 x 1672	-

Note1 : Except the USA

Note2 : Needs optional license for 43.75μm read capability

<b>Exposure cycle time</b> The time between insertion and removal of the cassette.	Approximately 40 seconds maximum (for an image size of 14" x 14" and at 175 $\mu$ m)
<b>Processing Capacity</b>	90 or more images per hour (for an image size of 14" x 14" and at 175 $\mu$ m)
<b>Sampling Pitch</b>	3 types, i.e., Super High Precision Mode (43.75 $\mu$ m), High Precision mode (87.5 $\mu$ m) and Normal mode (175 $\mu$ m)
<b>Max. Reading Size (mm)</b>	352.0 x 428.5 (14" x 17" cassette)
<b>Max. Number of Pixels</b>	7080 x 9480
<b>QR Value</b>	3 types, i.e., Low Sensitivity (QR value = 125), Standard Sensitivity (QR value = 250), and High Sensitivity (QR value = 500)  • A QR value of 200 is defined for 1,535 steps at an exposure of $2.58 \times 10^{-7}$ C/kg (=1mR) and 12-bit output for the output signal value.
<b>Dynamic Range (read)</b>	Normal D range (4.0 digits: PMT output current range = 100 nA to 1 mA)
<b>Digital Density Steps</b>	12 bit (4,096 steps)

- **Main Scan Unit**

<b>Method</b>	Laser drive using polygon mirror technology
<b>Incident Angle of Laser</b>	Approximately 5° from the plate's normal
<b>One-Line Read Frequency</b>	2 types; 7.54ms/line (133kHz), 5.20ms/line (192kHz)
<b>f-θ Lens</b>	3 groups of 3 (f = 253.6 mm) Tilt compensation using cylindrical mirrors
<b>Effective Scan Ratio</b>	82.8% ±49.7°)
<b>No. of Polygon Faces</b>	7 (inscribed circle diameter: 82ø)
<b>Rotation Speed of Polygon</b>	2 types; 1,137rpm, 1,648rpm
<b>Laser Wavelength</b>	660nm
<b>On-Plate Laser Intensity</b>	35mW or higher
<b>Imaging beam diameter100</b>	100 $\mu$ m or less (for both main and sub scanning)

- **Beam-Reception Unit**

<b>Method</b>	Condensing mirror + Beam guide + Condenser tube + Short photomultiplier
<b>Beam Guide</b>	Uses full reflection from acrylic plates
<b>Condenser Tube</b>	Ammonite condenser with multiple coatings on the inner surface
<b>Excitation-beam elimination</b>	Realized using a excitation-beam cut filter

- **Erasing Unit**

<b>Method</b>	Erasure by halogen lamps
<b>Lamp Spec.</b>	2 x 300W halogen lamps
<b>Filter Spec.</b>	Cuts light in the photo-multiplier's sensitivity range

### 1.1.2 Control Unit

The Control Section features the following functionality.

<b>Image data generation</b>	After condensing in the Beam-reception unit, the image data which has been photoelectrically converted is then converted into image data using AD conversion processing.
<b>Image data correction / calculation</b>	<p>The read image data is principally subjected to the following correction and calculation.</p> <ul style="list-style-type: none"><li>• Calculation for moire elimination (digital filtering)</li><li>• Calculation for gain and offset correction</li><li>• Calculation for correction of irregularity in the main scanning direction (shading correction and polygon correction)</li><li>• Calculation of the erasing speed</li></ul>
<b>Communication</b>	<p>The following functionality is realized through communication via a network.</p> <ul style="list-style-type: none"><li>• Receipt of various commands</li><li>• Forwarding of read image data to a specified device</li><li>• Notification of device status</li></ul>
<b>Controlling Function</b>	<ul style="list-style-type: none"><li>• Using cassette insertion as a trigger, a range of different controls are implemented for mechanisms, optical system, signal processing, and communication, etc.</li><li>• Controls are provided to allow operation in response to commands received via a network.</li></ul>

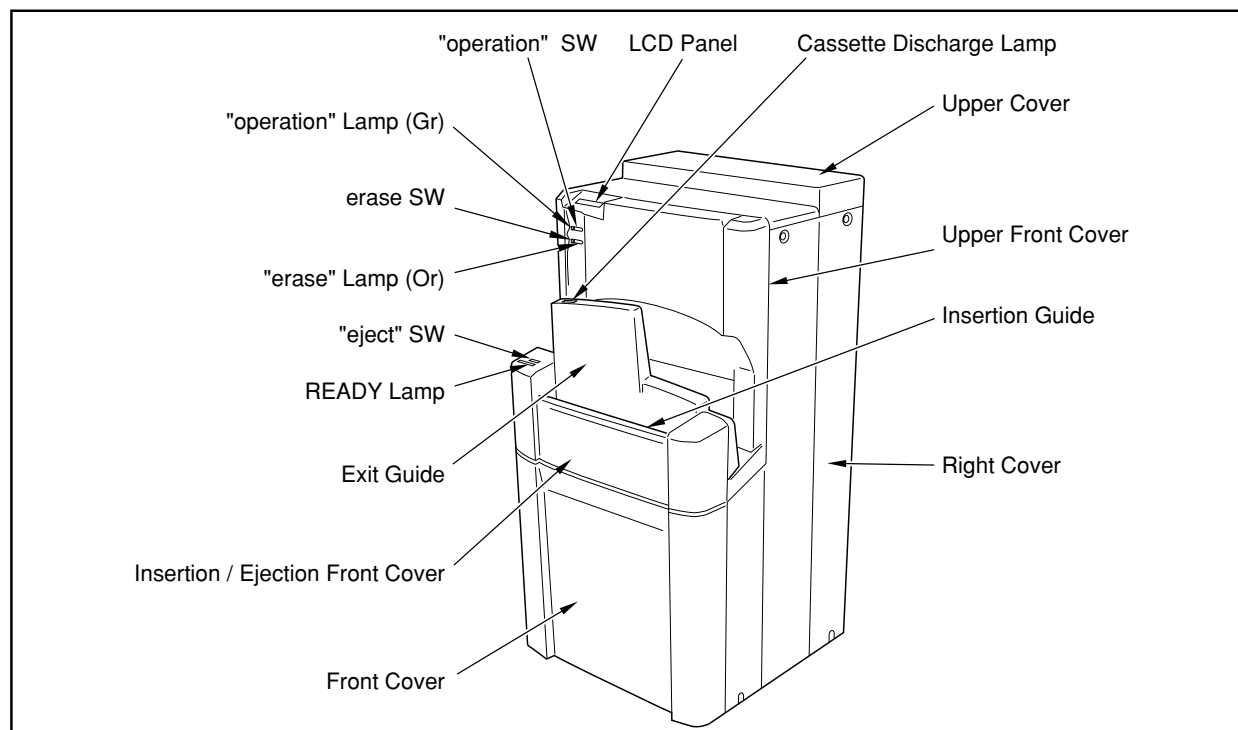
### 1.1.3 Specifications

<b>Dimensions</b>	580(W) x 580 (D) x 1230 (H) mm
<b>Weight</b>	Approx. 170kg (excluding the cassette)
<b>Power Consumption</b>	1200W or less (Rating1100W)
<b>Power Supply</b> • Domestic • North America • EC	AC100V $\pm 10\%$ (50/60Hz) AC115 / 120 / 220 / 230 / 240V $\pm 10\%$ (60Hz) AC200 / 220 / 230 / 240V $\pm 10\%$ (50Hz)
<b>Environment</b> • Temperature/Humidity	At operation: 15 ~ 30°C, 35 ~ 80%RH (no condensation) At storage: -10 ~ 40°C, 10 ~ 95%RH (no condensation)
<b>Noise</b>	60dB or less
<b>Regular Spare Parts</b>	Erasing lamp unit (Reading/Erasing Life: 10,000 shots)
<b>Accessories</b>	Power cable, operation manual
<b>Optional Accessories</b>	REGIUS Cassette (RC-110 series), REGIUS Plate (RP-xS series for normal examination, RP-xM series for mammography), JM (Job Manager), REGIUS Console CS-2/CS-3 Note : Use for mammography available except the USA.

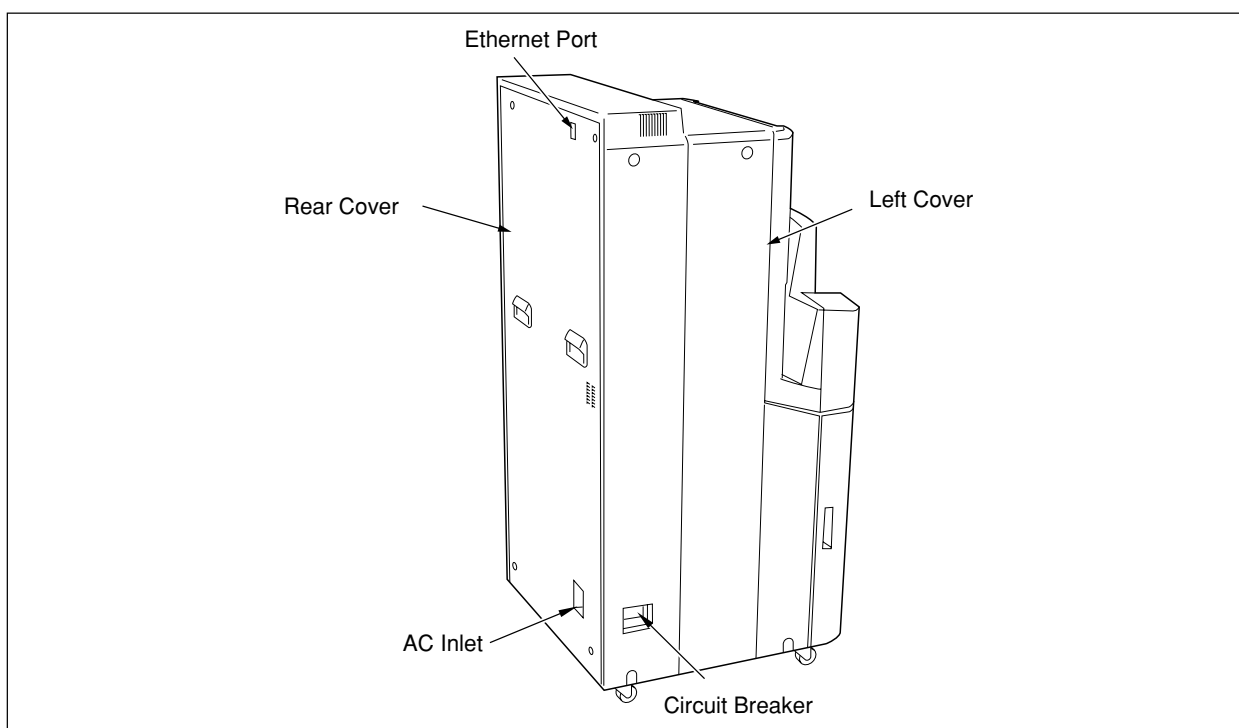
## 1.2 Name of Parts

### 1.2.1 External View of REGIUS 190

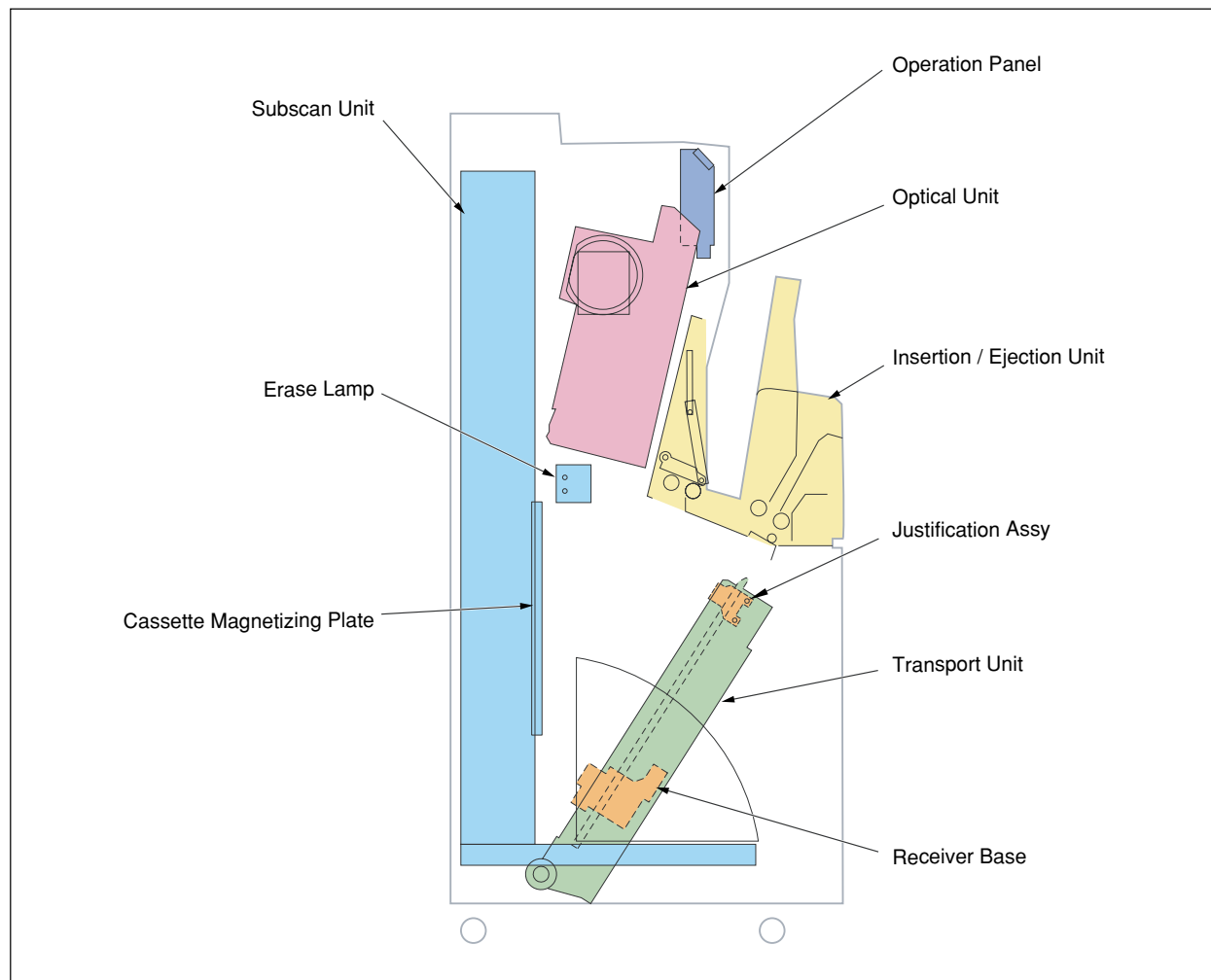
- Front / Right



- **Rear / Left**

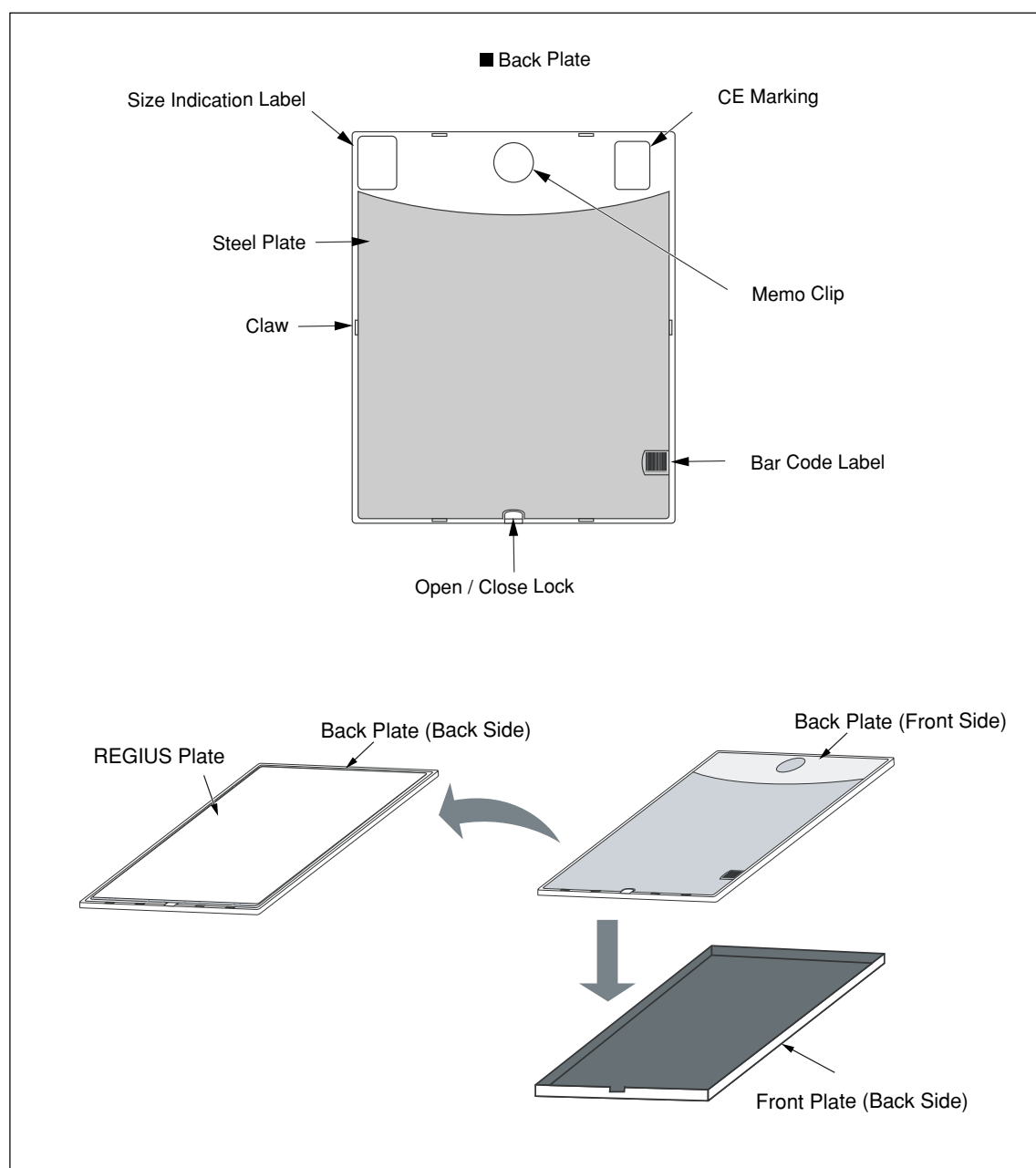


## 1.2.2 Main Parts inside REGIUS 190

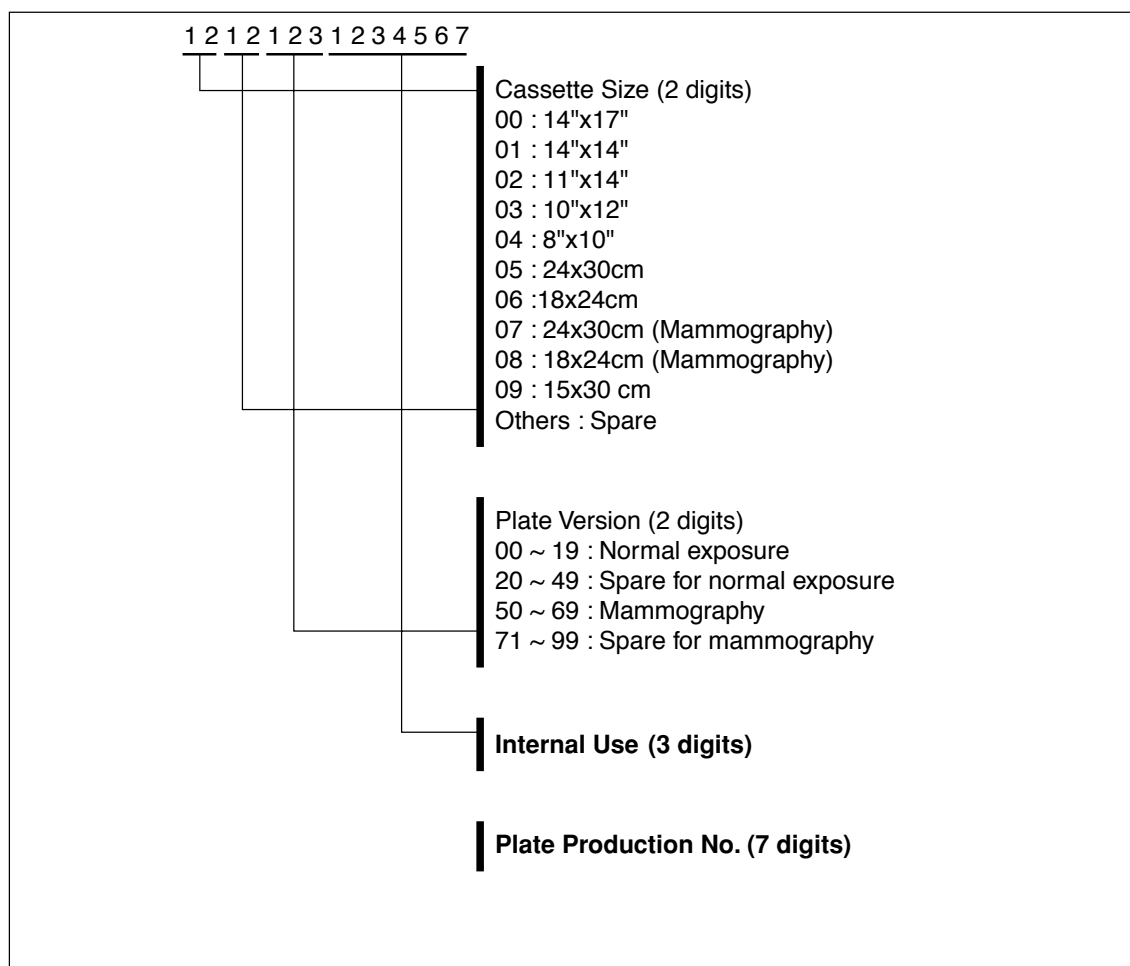


Part	Function
<b>Subscan Unit</b>	Actuates the cassette magnetizing plate up and down. (subscanning operation)
<b>Erase Lamp</b>	Erases the remaining image on the plate.
<b>Cassette Magnetizing Plate</b>	Retains the back plate magnetically.
<b>Operation Panel</b>	Comprised of LCD panel which displays the device's status and switches for starting the device and for erasing the image.
<b>Optical Unit</b>	Scans the plate with laser beam, and collects and converts the light through condenser tube into the electrical signal.
<b>Insertion / Ejection Slot</b>	<ul style="list-style-type: none"> <li>• Draws a cassette into the device, which the operator inserts.</li> <li>• Ejects the cassette after reading onto the cassette stacker.</li> </ul>
<b>Justification Assy</b>	Sandwiches the front plate of the cassette at both side, and retain it on the transportation unit.
<b>Transport Unit</b>	Driven on the sector gear to and from the cassette insertion / ejection unit and cassette magnetizing plate, transports the plate.
<b>Receiver</b>	Moves up and down to fit to the cassette size, and operates lock / unlock of the cassette.

### 1.2.3 Name of Cassette Parts

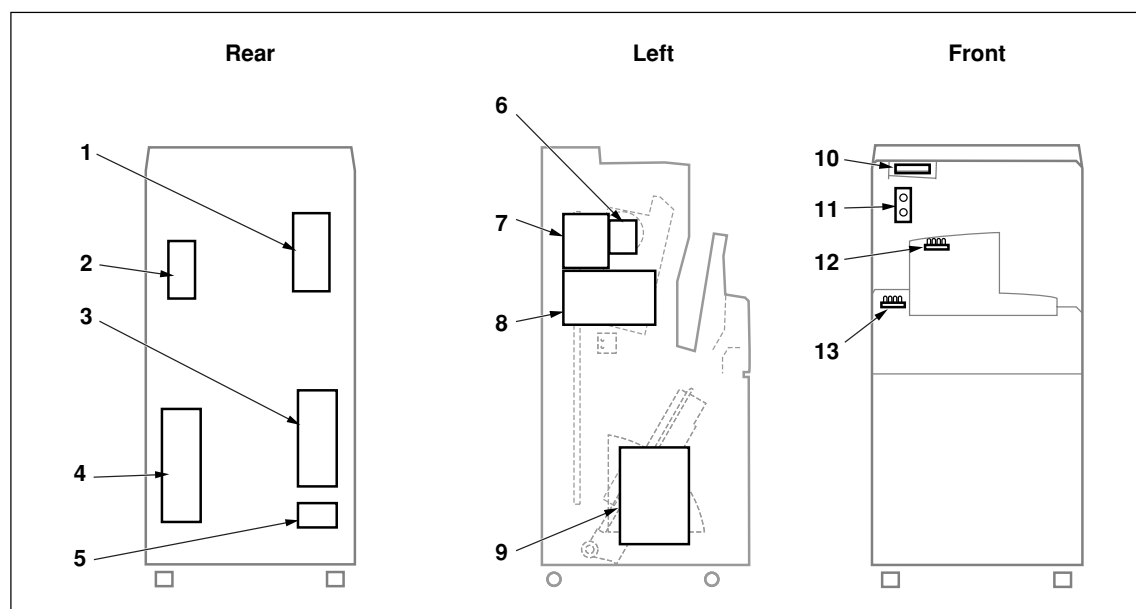


The figures (14 digits) listed on the bar code label stuck on the back side of plate as well as packed together with the plate when delivered has following information.



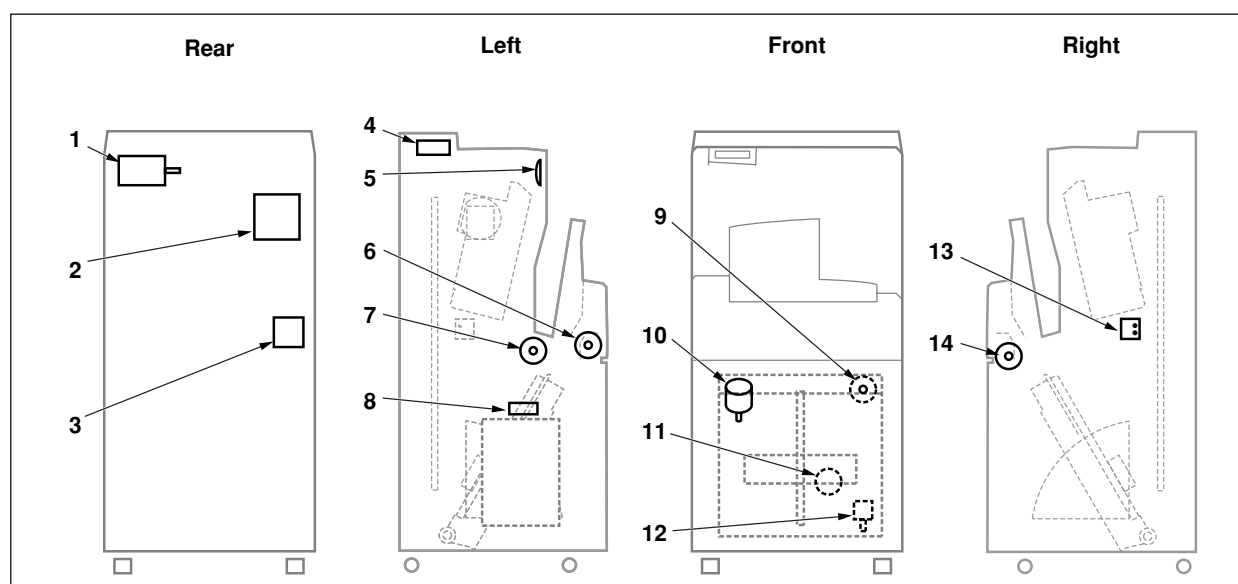
## 1.3 Layout of Controlling Components

### 1.3.1 Layout of Power Supplies and Main Boards



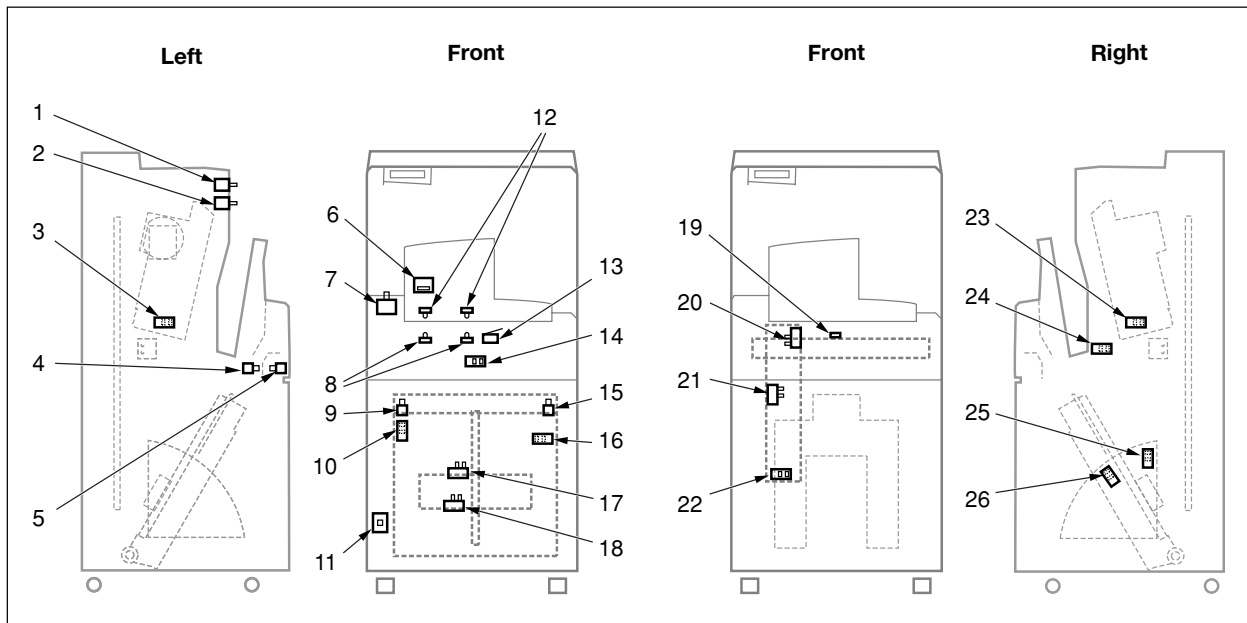
No.	Part Name	No.	Part Name
1	SUP1 (DC5V/24V power supply)	8	ADB2 (A/D board)
2	PSB ( $\pm 15V$ power supply)	9	MCB2 (Mechanical control board)
3	Power Transformer (PT1)	10	LCD Panel
4	SUP3 (Halogen power supply)	11	GYB (Green Yellow LED board)
5	TAP (Power Voltage Switching Board)	12	ELB (Cassette ejection lamp)
6	Photomultiplier (Breeder circuit)	13	BLB (READY lamp)
7	SCB2 (System control board)		

### 1.3.2 Locations of Motors and Fans



No.	Part Name	No.	Part Name
1	Subscanning Motor (PM4)	8	MCB2 Cooling Fan (FM4)
2	DC Power Supply Cooling Fan (FM2)	9	Justification Motor (PM2)
3	Halogen Cooling Fan (FM3)	10	Transportation Motor (PM3)
4	Main Unit Exhaustion Fan (FM1)	11	Lock Release Motor (M4)
5	Speaker (SP1)	12	Elevator Motor (PM1)
6	Insertion Motor (M1)	13	Erase Lamp x 2 tubes (HL1, HL2)
7	Ejection Motor (M3)	14	Shutter Motor (M2)

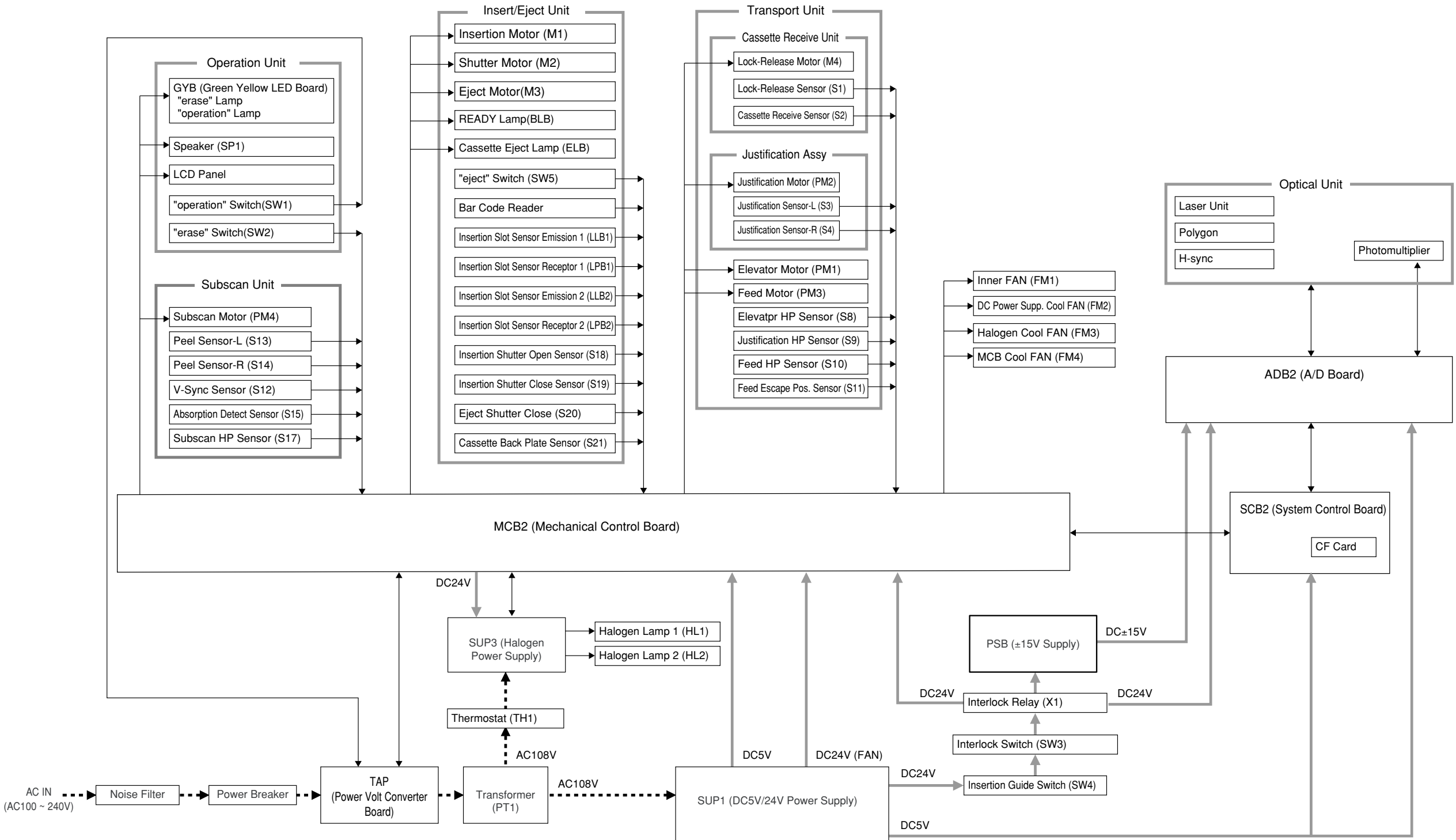
### 1.3.3 Locations of Sensors and Switches



No.	Part Name	No.	Part Name
1	"operation" SW (SW1)	14	Cassette Back Plate Sensor (S21)
2	"erase" SW (SW2)	15	Justification Sensor-R (S4)
3	Peel Sensor-L (S13)	16	Elevator Sensor-HP (S8)
4	Insertion Shutter Close Sensor (S18)	17	Cassette Receive Sensor (S2)
5	Insertion Shutter Open Sensor (S19)	18	Lock-Release Sensor (S1)
6	Bar Code Reader	19	Thermostat (TM1)
7	"eject" SW (SW5)	20	Sync Sensor (S12)
8	Insertion Slot Sensor Emission (LLB1, LLB2)	21	Absorption (Magnetizing) Detect Sensor (S15)
9	Justification Sensor-L (S3)	22	Subscan HP Sensor (S17)
10	Justification HP Sensor (S9)	23	Peel Sensor-Right (S14)
11	Interlock SW (SW3)	24	Ejection Shutter Close Sensor (S20)
12	Insertion Slot Sensor Receptor (LPB1, LPB2)	25	Feed Escape Position Sensor (S11)
13	Insertion Guide SW (SW4)	26	Feed HP Sensor (S10)



1.4 Block Diagram

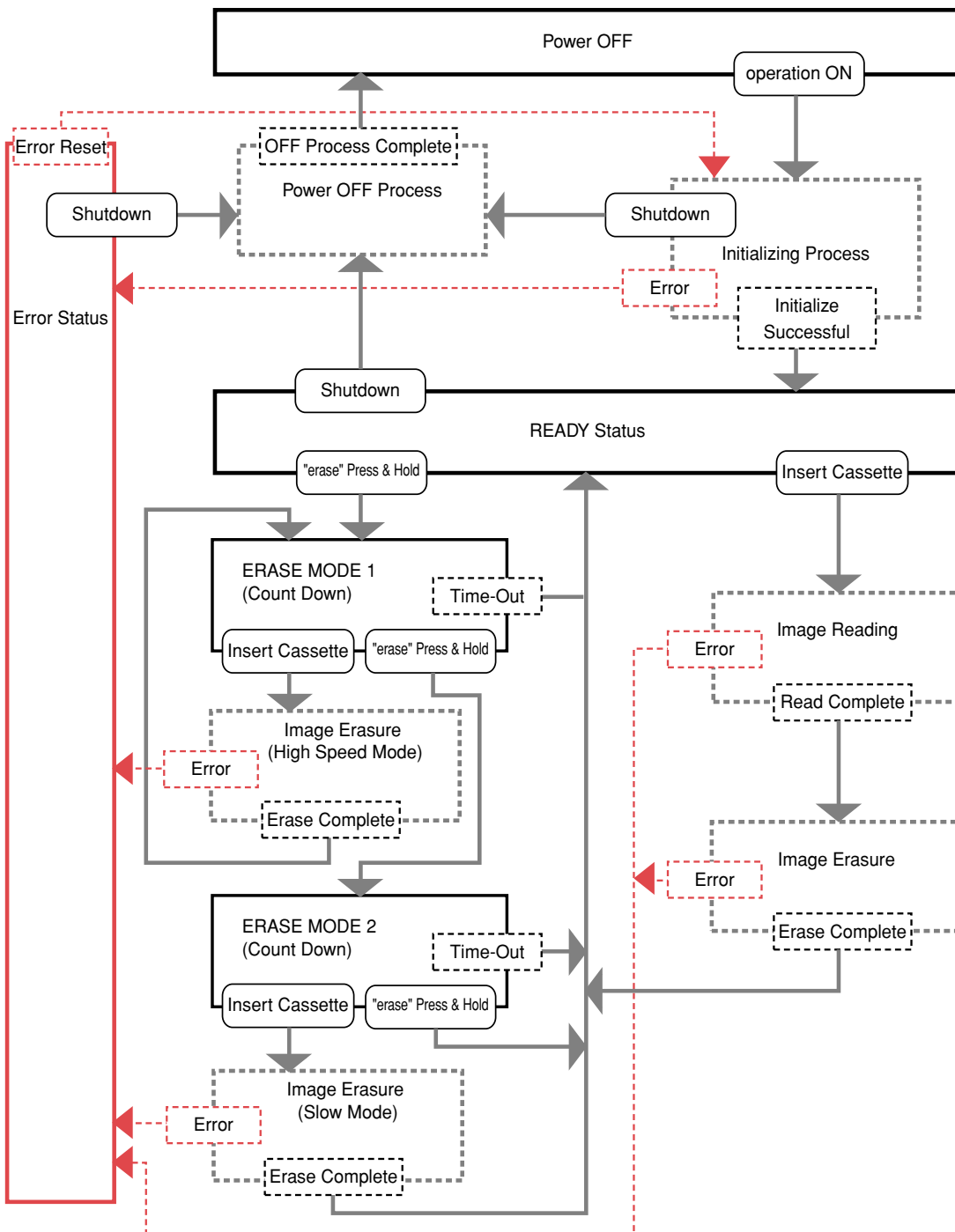


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## 1.5 Description of Operation

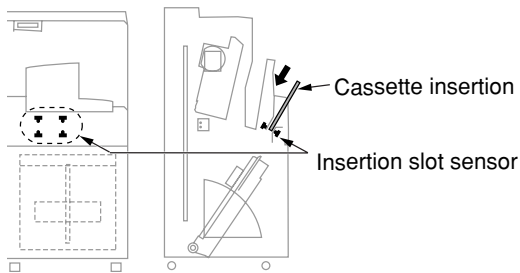
### 1.5.1 Operation Flow

After the REGIUS Model 190 has started up, the status of the device should be one of the following. (Dotted line shows the status that will automatically transit without user's operation)



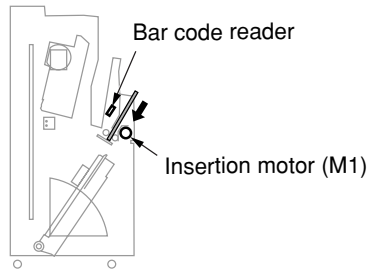
## 1.5.2 Normal Operation

1



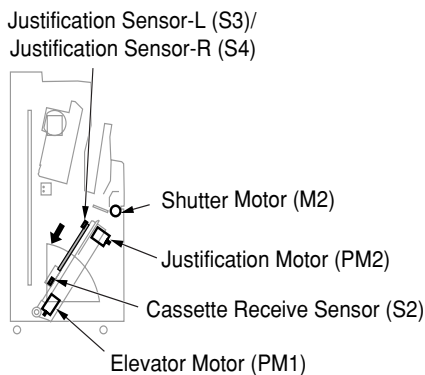
- When a cassette is inserted, the light beams from the insertion slot sensors' emission side is interrupted, and the insertion slot sensors' receptor side turns on.
- Two individual insertion slot sensors with emitters and receptors are arranged in parallel, and when a small cassette is inserted along right side, only one of these sensors will turn on and an error will be generated.

2



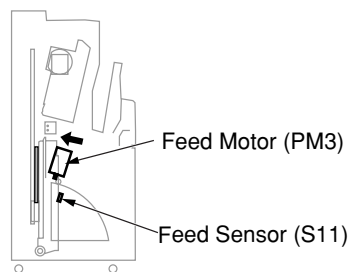
- When the insertion slot sensors turn on, the insertion motor will operate for one second.
- The cassette is pulled in by rollers, and reading by the bar code reader commences.
- An error will be generated if the bar code on the back plate cannot be read.

3



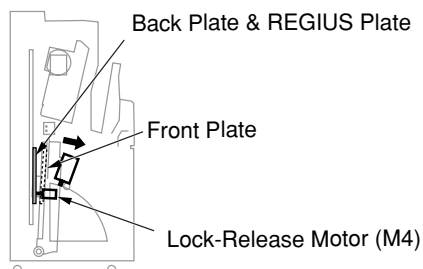
- The shutter motor starts to operate and the shutter at the bottom of the insertion slot opens up.
- The elevation stand moves up to a receiving position suitable for the size of the cassette.
- The elevation stand moves down to the feed position and the cassette is drawn further into the device.
- Several seconds after the insertion slot sensors turn off, the shutter closes.
- When the cassette has been fully drawn into the transport section, the width justification motor drives the width justification mechanism so that the cassette is held on the left and right.
- A cassette which was inserted aligned to the left will be aligned to the center at this time.

4



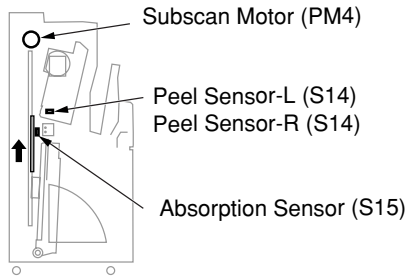
- The feed motor starts to operate and the transport section moves to the absorb position.
- The feed sensor turns on.
- Transport section then moves to the absorb position.
- Back plate is stuck to the Cassette Magnetizing Plate.

5



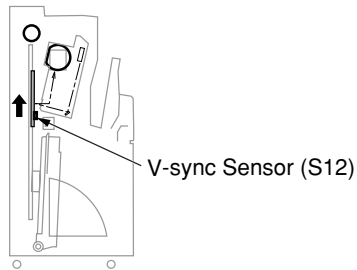
- The transport section's lock release motor starts to operate and the push-up pin pushes against the cassette's open/close lock, raising it up.
- The feed motor operates and the transport section is returned to the retracted position.
- The back plate and the REGIUS Plate become attached to the absorption plate, with only the front plate remaining in the transport section.

6



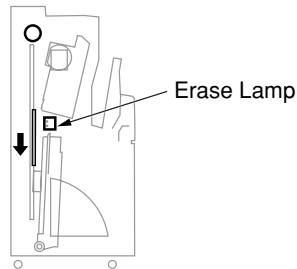
- If the back panel attaches normally, the absorption sensor turns on.
- The subscan motor starts to operate and the absorption plate moves upward.
- If one of the peel sensors turns on, it will indicate that the plate condition is not normal; in such a case, the upward motion is halted and the mechanism returns to the subscan home position.

7



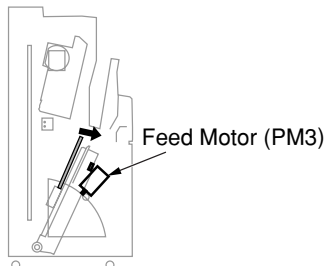
- Several seconds after the V-SYNC sensor turns on, the laser also turns on and image reading operations start.

8



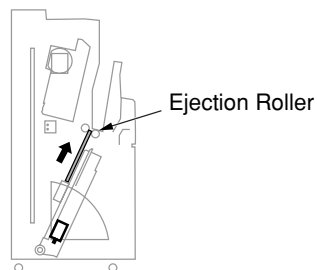
- When the image reading has been completed, the absorption plate moves down and simultaneously the erasing lamps turn on.

9



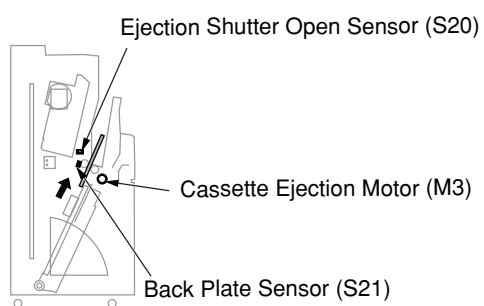
- The cassette is fed to the ejection shutter in the reverse order to that described above.

10



- The Cassette receive Unit moves up to the standby position.
- The actual stop position will depend on the size of the cassette.
- The tip of the cassette comes into contact with the ejection roller.

11



- The cassette ejection motor starts to operate and the cassette is ejected.
- If as a result of back plate detachment or the like, the cassette passes the ejection shutter without a front plate, the back plate sensor does not turn on and an error is generated.
- If a subsequent cassette is inserted, drawing in of this cassette will start when the ejection shutter close sensor turns on.

### 1.5.3 Initializing Sequence

Initializing sequence will be completed by turning ON the power breaker and pressing "operation" button of the REGIUS Model 190.

<b>1</b>	Insertion Slot Shutter	Initialization of the insertion slot shutter is implemented.
<b>2</b>	Justification Assy	Justification assy moves to HP.
<b>3</b>	Transport Unit	Transport unit moves to HP.
<b>4</b>	Elevator Stand	Elevator stand moves to HP, and initialization is implemented. After completing initialization, the elevator stand moves to receive position.
<b>5</b>	Subscanning Unit	Initialization of the subscanning unit is implemented.
<b>6</b>	Transport Unit	Initialization of the transport unit is implemented.
<b>7</b>	Elevator Stand	Elevator stand moves to HP.
<b>8</b>	Lock-Release Motor	Lock-release motor is locked.

Use the dummy SCB2 software to check mechanical operations. Refer to "3.3 Verification of Initializing Sequence".

### 1.5.4 Erase Operation

Erase operation (both ERASE MODE 1 and ERASE MODE 2) follows the same sequence as the normal operation. Erasing will be completed in step 7 of "1.5.2 Normal Operation".

## 1.6 Required Tools

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The following testers and tools will be required for maintenance of the REGIUS 190.

- Phillips head screwdriver
- Torque driver
- Peel detection roller tester
- Front-door interlock release key
- Maintenance PC
- Unit checker RS-232C cable
- Dummy SCB2 Software (Maintenance tool software)
- Laser goggle
- Earth strap
- 150mm steel scale
- Push-pull gauge
- Cotton work glove
- Vacuum cleaner (handy type recommended)
- Oscilloscope
- Digital multi meter
- Ethernet hub or cross-cable (necessary for CF card replacement)



Chap.2

***Disassembly and  
Reassembly***

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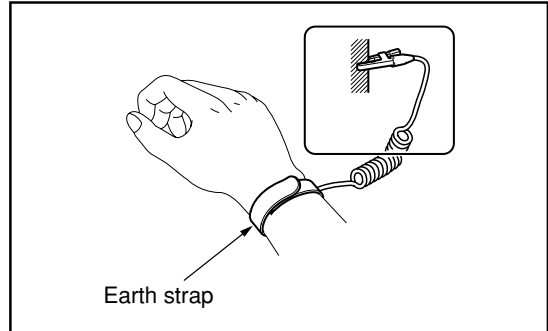
## 2.1 Preparation for Disassembly

### 2.1.1 Precautions for Disassembly and Reassembly

**Caution** Be sure to observe the following precautions whenever performing disassembly or reassembly on this device. Note that failure to do so may lead to personal injury or damage to equipment.



- In order to protect against electric shocks, always confirm that the supply of power has been turned off before starting disassembly or reassembly. Please also turn off the REGIUS 190's circuit breaker or the facility's breaker.
- If printed circuit boards are to be handled, be sure to secure an earth strap to your wrist and to attach the clip end to a grounded section of the device.
- An earth strap must be worn to protect circuits from damage.
- During reassembly, be sure to return wire bundles to their original condition and to confirm that they have not become trapped between, or caught on components.
- Sensors are still electrified even after the interlock has been disengaged. Be careful not to short-circuit the sensors.



Except for the work to replace the decelerating steel belt unit ("2.5.3 Steel Belt Decelerating Unit, p.68"), no work is necessary to touch the steel belt.

**Danger** Never touch the steel belt directly by hand. The hand or fingers may be cut due to the sharp edge of the steel belt.



**Caution** If the fat of hand remains on the steel belt, rust may develop, and it may cause malfunction of the subscan operation.



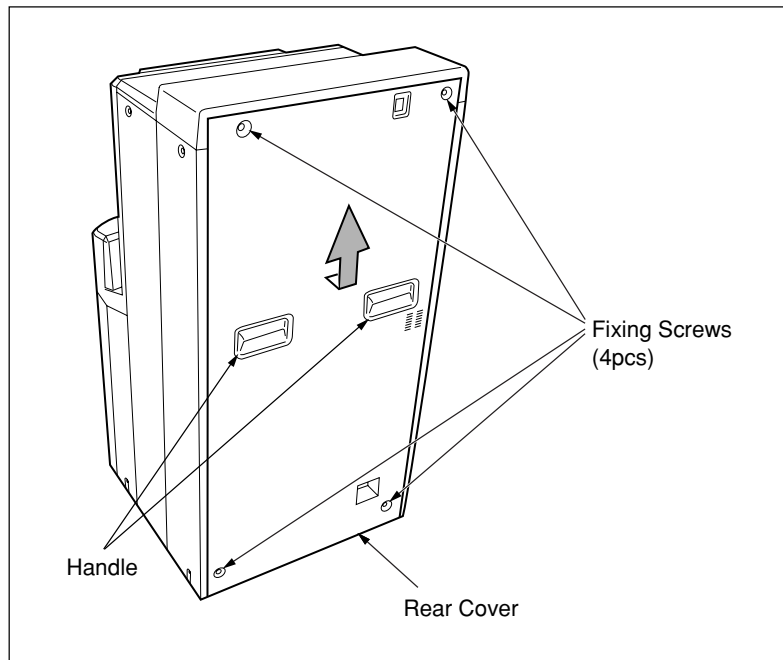
#### • Note for the anti-slip rubber on the justification assy

Do not touch the antislip rubber on the justification assy. Soiling the rubber with finger fat may develop adhesion, and adversely affects the separating process of cassette (especially mammo cassette). Should the fat sits on the rubber, clean it with alcohol. However, note that the rubber has to be left untouched for minimum of 2 days in the case an alcohol is applied. When the new antislip rubber is available, replace it with a new one.

## 2.2 Removing the External Covers

### 2.2.1 Removal of the Rear Cover

1. Unscrew and remove the four fixing screws (4pcs).
2. Grip the handle and lift up the rear cover to remove it.



## 2.2.2 Removal of the Left & Right Covers

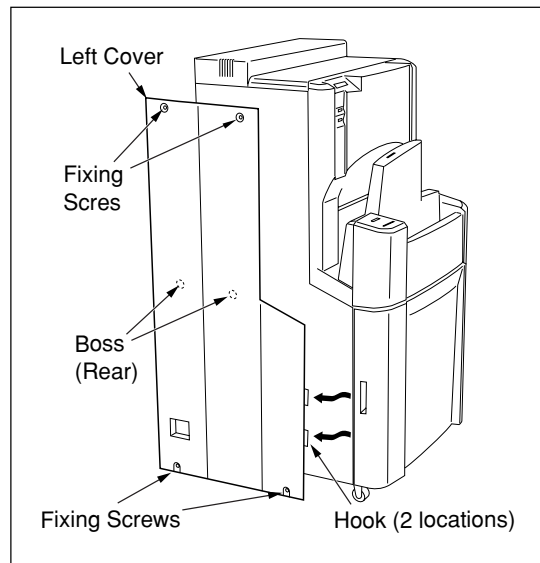
The methods for removal of the left and right covers are symmetrically opposite.

**Danger** When the left and/or right covers are removed, there is a danger that reading by the optical system and other similar operations could lead to the laser beam being directed outside the REGIUS 190. In order to prevent accidental loss of eyesight as a result, be sure to confirm the optical system's current operating condition when these covers are to be removed.



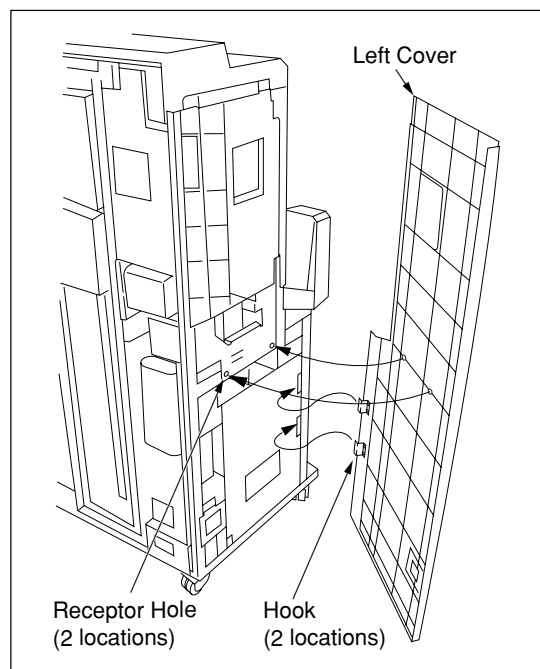
**Important** Sems screws (M4 x 12mm) are used to retain the right and left covers. Be cautious not to loose them, nor to use them for other purpose.

1. Unscrew and remove the four fixing screws.
2. Slide the cover towards the rear and remove. (Left and right)
  - It will not be possible to remove the left or right cover unless the two hooks on the front side are detached from the main body.



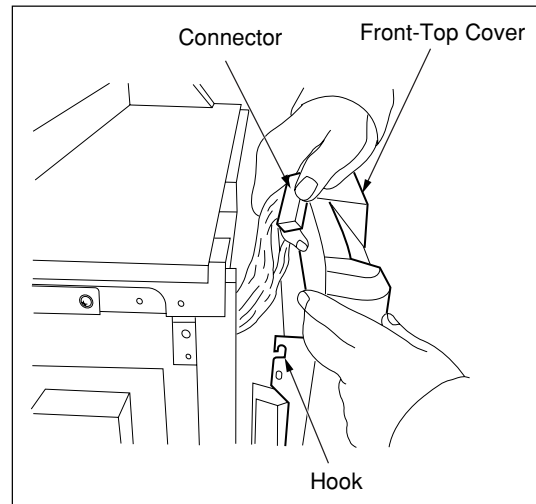
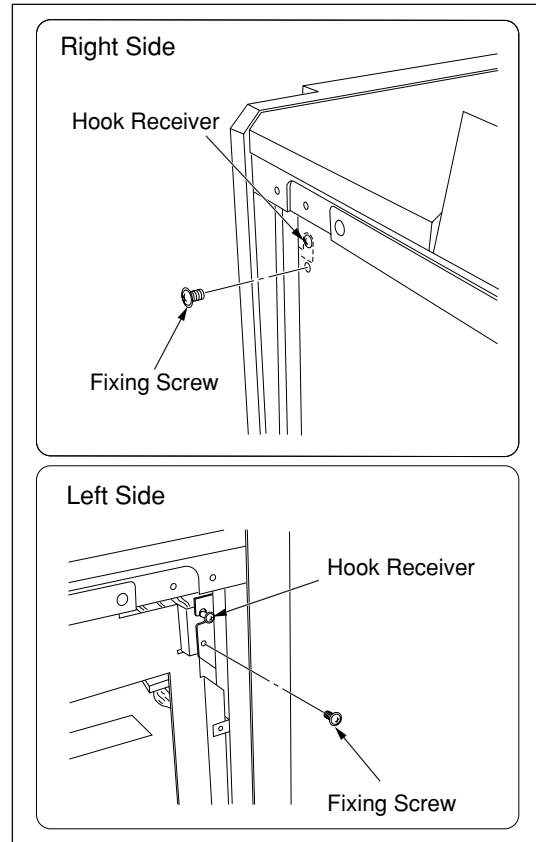
### • Reassembly

1. Insert the protrusions on the rear side of the left or right cover into the holes in the main unit.
2. Insert the two hooks on the front side of the cover into the square holes in the main unit.
3. Secure the left or right cover in place using the four fixing screws.



### 2.2.3 Removal of the Front-Top Cover

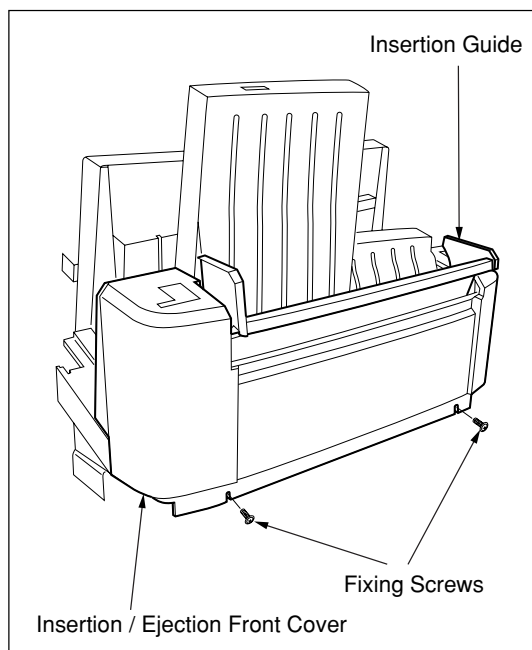
1. Remove the left cover and the right cover.(p.29 )
2. Unscrew and remove the two fixing screws (one on each side) which are securing the front-top cover in place.
  - On the left side, remove the lower screw of the two on the line. The upper screw is to receive the hook on the front-top cover.
3. Lift the front-top cover 2 ~ 3mm. Then tilt the front-top cover towards the front until a gap of approximately 100 mm opens up between that cover and the front cover.
4. Uncouple the connector from the display section.
  - JJ27
5. Remove the front-top cover.
6. Carry out reassembly in the reverse order to that described above.
  - To reassemble, first hook the hook on the front-top cover on the hook receiver (screw), then tighten the fixing screws.
  - There are 4 hooks to be coupled. First start with the lower hooks.



### 2.2.4 Removal of Insertion / Ejection Front Cover

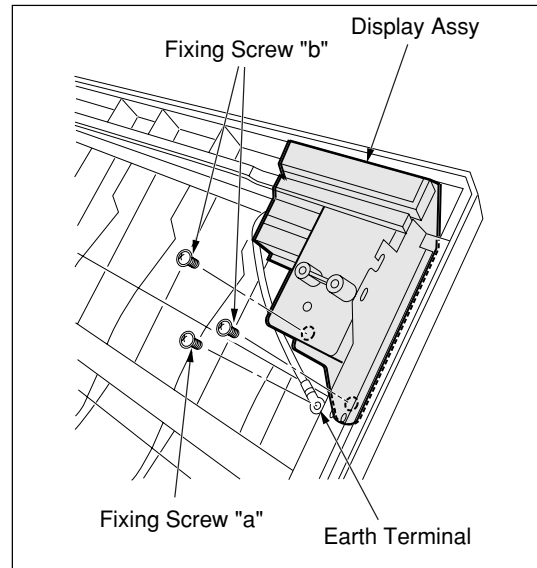
**Important** Sems screws (M4 x 12mm) are used to retain the insertion / ejection front cover. Be cautious not to loose them, nor to use them for other purpose.

1. Open the front cover.
2. Remove two fixing screws.
3. Lift up the insertion guide.
4. Remove the insertion / ejection front cover.

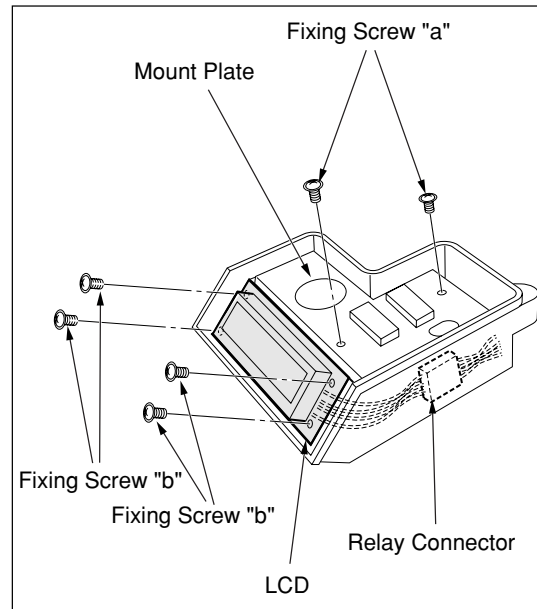


### 2.2.5 Removal of LCD

1. Remove the front-top cover. (Refer to "Removal of the Front-Top Cover, p.30" )
2. Remove a fixing screw "a". Then remove a toothed washer and earth terminal from the front-top cover.
3. Remove two fixing screws "b", and remove the display assy.



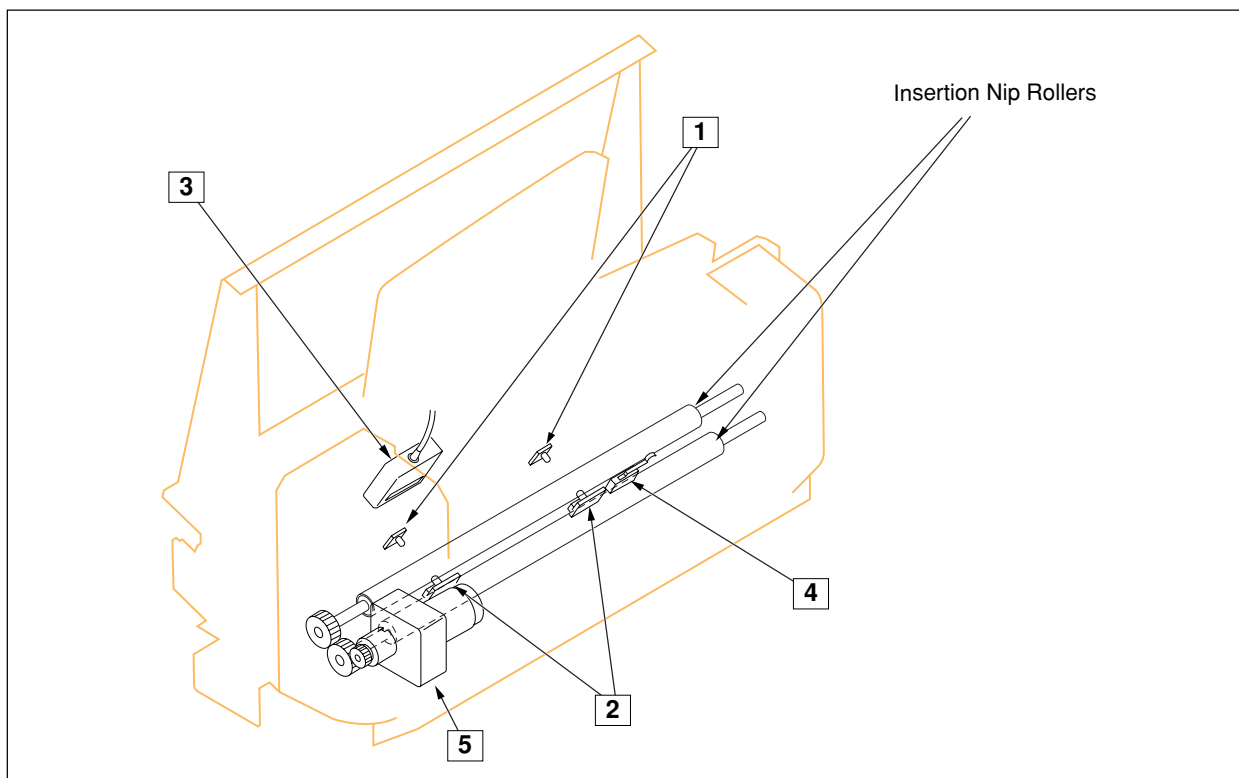
4. Remove two fixing screws "a", and remove the mount plate.
5. Unplug a relay connector.
  - JJ15
6. Remove 4 fixing screws "b", and remove LCD from the display cover.
7. Carry out reassembly in the reverse order to that described above.



## 2.3 Insertion / Ejection Unit

### 2.3.1 Controlling Parts of Insertion / Ejection Unit

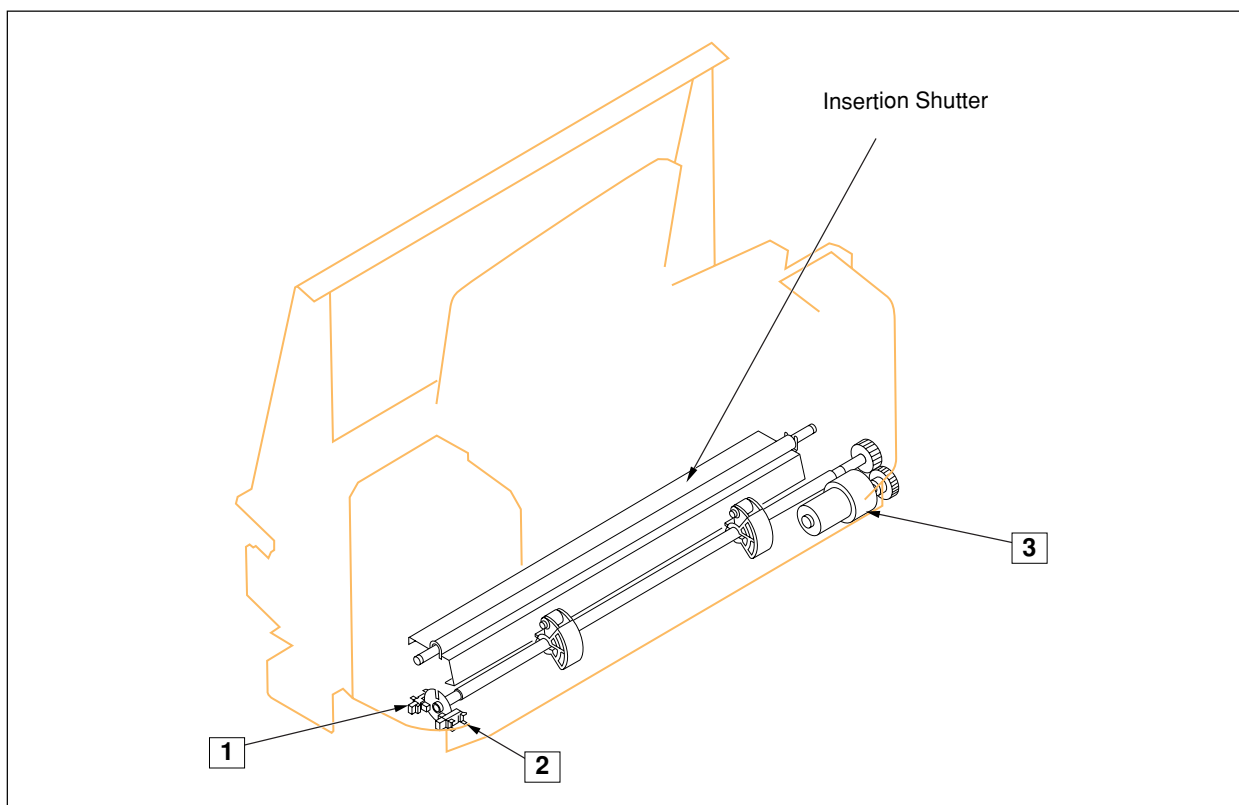
- Controlling parts in the area of insertion nip rollers



Part Name	Function	Access to the Part
<b>1 Insertion Slot sensor Receiver Side (LPB1, LPB2)</b>	Detects the inserted cassette.	1) Remove the ejection guide assy. •Refer to "2.3.3 Removal of Ejection Guide Assy, p.39" 2) Remove the cassette stacker. •Refer to "2.3.4 Replacement of Bar Code Reader, p.40". 3) Remove the stay. •Refer to "2.3.4 Replacement of Bar Code Reader, p.40". 4) Remove the fixing screws (one for each sensor). 5) Unplug the connector (one for each sensor) •Left: JP57, Center: JP55
<b>2 Insertion Slot Sensor Emission Side (LLB1, LLB2)</b>	Emits light against 1.	1) Remove the insertion / ejection unit front cover. •Refer to "2.2.4 Removal of Insertion / Ejection Front Cover, p.31". 2) Remove the fixing screws (one for each sensor). 3) Unplug the connector (one for each sensor) •Left: JP58, Center: JP56
<b>3 Bar Code Reader</b>	Reads the bar code label	Refer to "2.3.4 Replacement of Bar Code Reader, p.40".

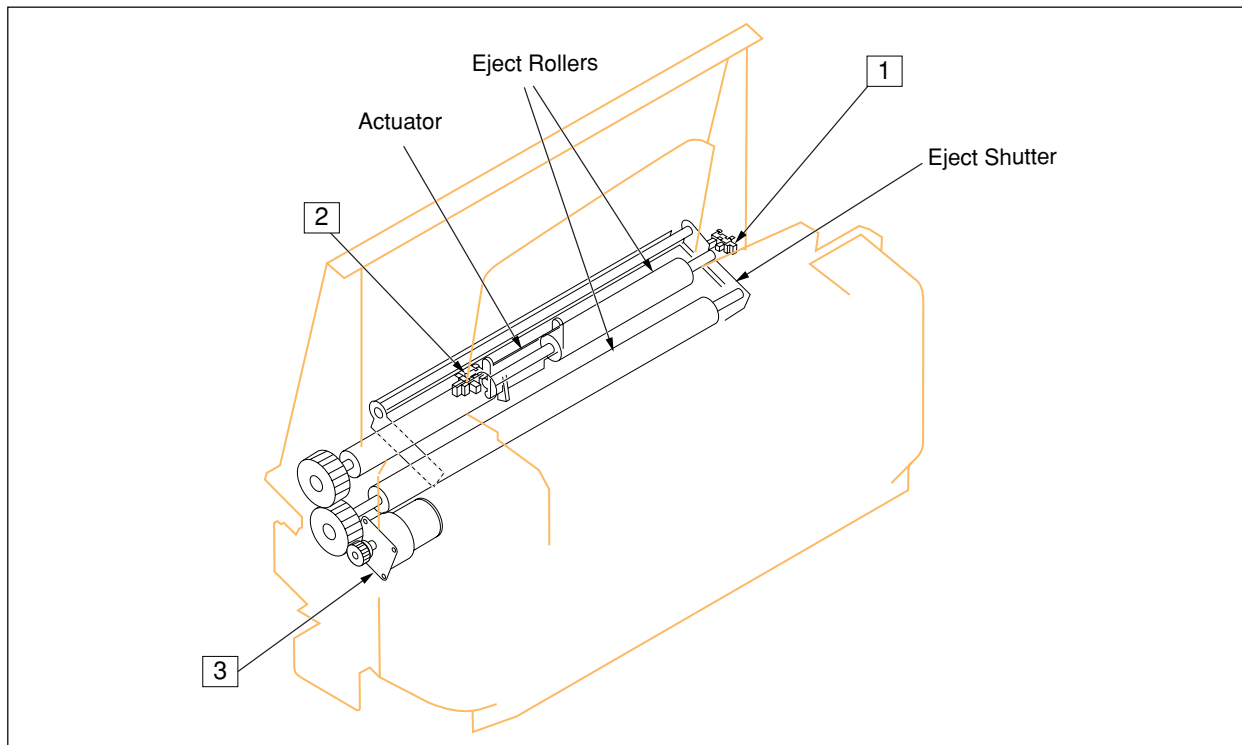
Part Name	Function	Access to the Part
<b>4 Insertion Guide SW (SW4)</b>	Detects the insertion guide position	<ol style="list-style-type: none"> <li>1) Remove the insertion / ejection unit front cover. •Refer to <a href="#">"2.2.4 Removal of Insertion / Ejection Front Cover, p.31"</a>.</li> <li>2) Remove the insertion guide. •Refer to <a href="#">"2.3.5 Replacement of Insertion Nip Rollers, p.41"</a>.</li> <li>3) Remove tow fixing screws from the sensor.</li> <li>4) Pull out the fasten terminal. •COM terminal; Black, NC terminal: Brown</li> </ol> <p>Adjustment when reinstalled. Refer to <a href="#">"3.9 Adjusting the Position of Insertion Guide Switch (SW4), p.125"</a>.</p>
<b>5 Insertion Motor (M1)</b>	Drives the insertion roller	Refer to <a href="#">"2.3.6 Replacement of Insertion Motor, p.43"</a> .

- Controlling parts comprising the insertion shutter



Part Name	Function	Access to the Part
<b>1 Insertion Shutter Close Sensor (S18)</b>	Detects the insertion shutter close position	1) Remove the insertion / ejection unit front cover. •Refer to " <a href="#">2.2.4 Removal of Insertion / Ejection Front Cover</a> , p.31". 2) Remove the sensor bracket. 3) Remove the sensor from the sensor bracket. 4) Unplug a connector. •JP53
<b>2 Insertion Shutter Open Sensor (S19)</b>	Detects the insertion shutter open position	1) Remove the insertion / ejection unit front cover. •Refer to " <a href="#">2.2.4 Removal of Insertion / Ejection Front Cover</a> , p.31". 2) Remove the sensor bracket. 3) Remove the sensor from the sensor bracket. 4) Unplug a connector. •JP52
<b>3 Shutter Motor (M2)</b>	Opens / closes the insertion shutter	Refer to " <a href="#">2.3.7 Replacement of Shutter Motor (M2)</a> , p.44".

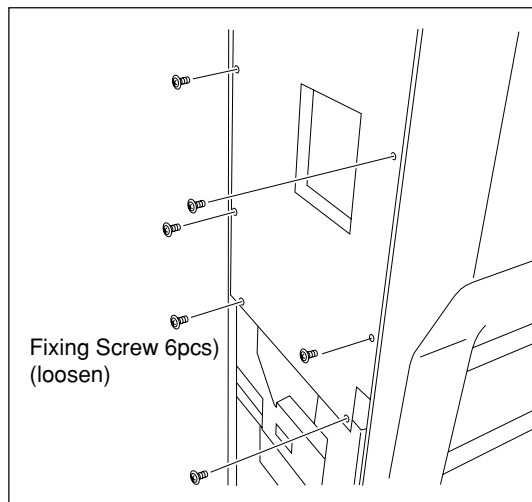
- Controlling parts comprising the ejection assy



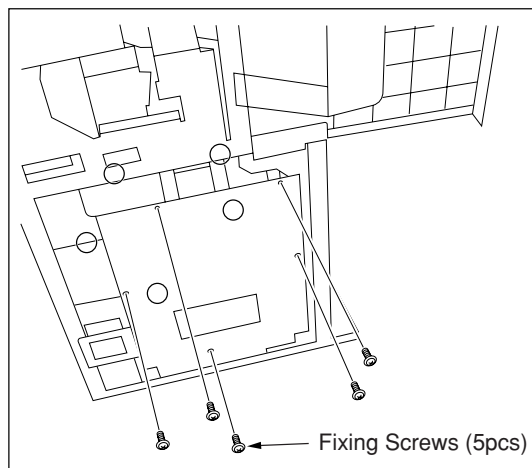
Part Name	Function	Access to the Part
<b>1 Eject Shutter Close sensor (S20)</b>	Detects the eject shutter close position.	1) Remove the insertion / ejection unit. •Refer to "2.3.2 Removal of the Insertion/Ejection Unit, p.37". 2) Remove the guide plate for eject sensor wiring. •Refer to "2.3.8 Replacement of Ejection Motor (M3), p.45" 3) Remove the eject sensor bracket. •Refer to "2.3.8 Replacement of Ejection Motor (M3), p.45". 4) Remove the sensor from the eject sensor bracket. 5) Unplug a connector. •JP54
<b>2 Back Plate Detect Sensor (S21)</b>	Detects presence of the back plate through actuator.	1) Remove the insertion / ejection unit. •Refer to "2.3.2 Removal of the Insertion/Ejection Unit, p.37". 2) Remove the actuator bracket. 3) Remove the sensor from the actuator bracket. 4) Unplug a connector. •JP51
<b>3 Eject Motor (M3)</b>	Drives the eject rollers.	Refer to "2.3.8 Replacement of Ejection Motor (M3), p.45"

### 2.3.2 Removal of the Insertion/Ejection Unit

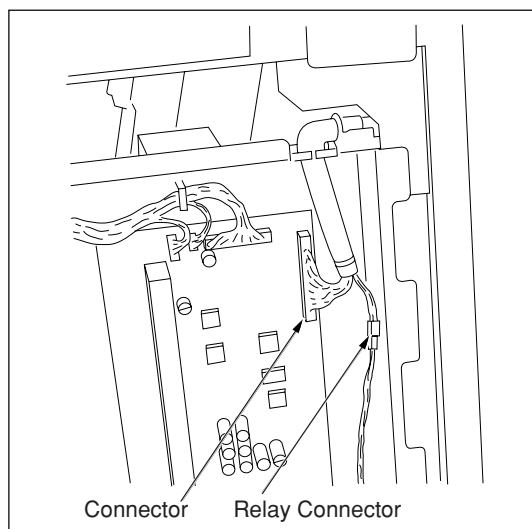
1. Open the front door.
2. Remove the left and right cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
3. Remove the front-top cover. ("2.2.3 Removal of the Front-Top Cover, p.30")
4. Loosen 6 fixing screws. Then detach board cover.



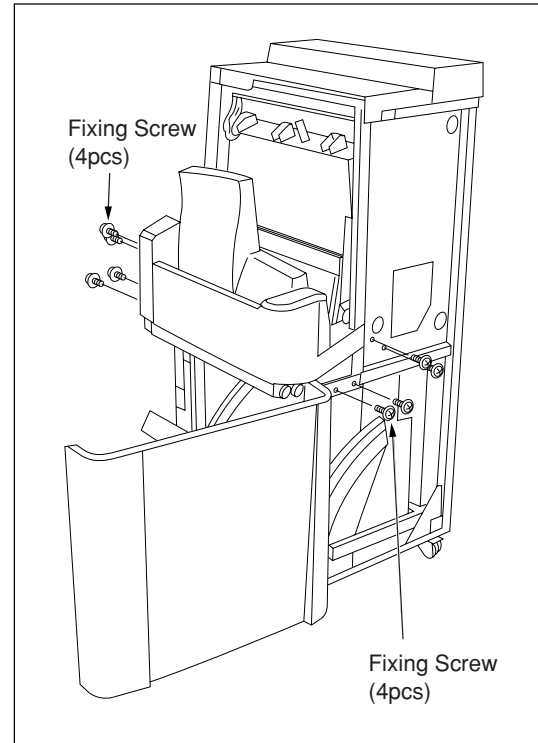
5. Loosen the 5 fixing screws and then remove the lid of the mechanical control box.



6. Unplug a relay connector.
  - JJ26
7. Unplug a connector from the MCB2 (Mechanical Control Board).
  - CN10

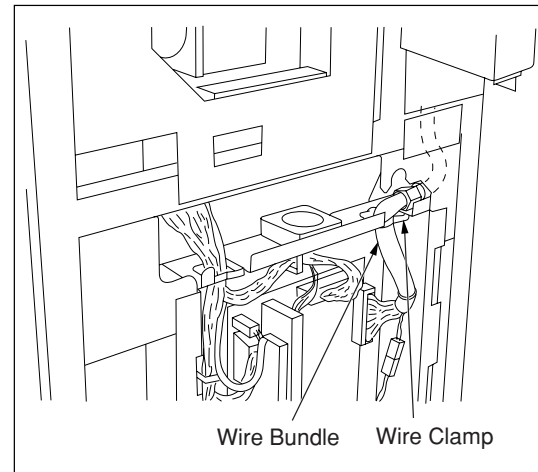


- 8.** Unscrew and remove the eight fixing screws\* which are securing the insertion/ejection unit in place. (\*: Four on each side)



- 9.** Remove the wire bundle from the clamp and pull the bundle towards the front of the device.

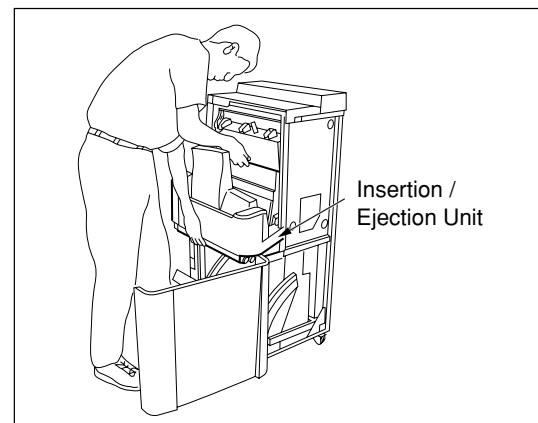
- Depending the position of the Transport Unit at the time, it may require to tilt the Transport Unit using a handle so that the hand can reach the part.



- 10.** Hold the insertion / ejection unit as shown in the right, and remove from the main unit.

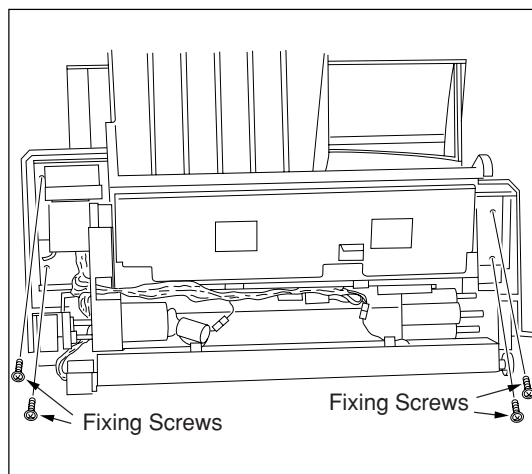
- 11.** Carry out reassembly in the reverse order to that described above.

- For reassembly, it will make it easier if you insert the unit while aligning it to the left on the front of the main unit.

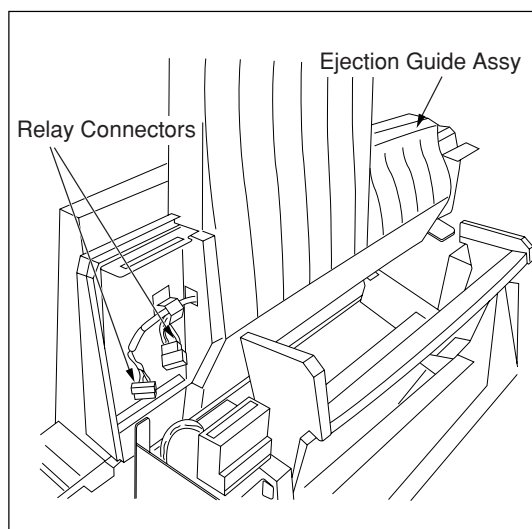


### 2.3.3 Removal of Ejection Guide Assy

1. Remove the insertion / ejection unit front cover. ("2.2.4 Removal of Insertion / Ejection Front Cover, p.31")
2. Remove 4 fixing screws (2 on each side).

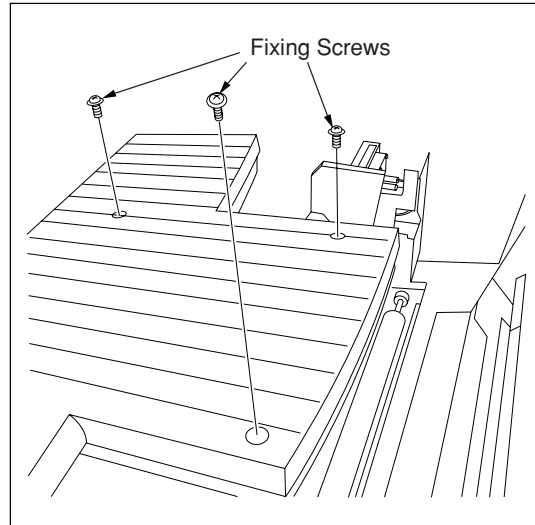


3. Unplug two relay connectors.
  - JJ46, JJ59
4. First, slide the ejection guide assy toward rear of the main unit, lift it up, and remove from the main unit.
5. Carry out reassembly in the reverse order to that described above.

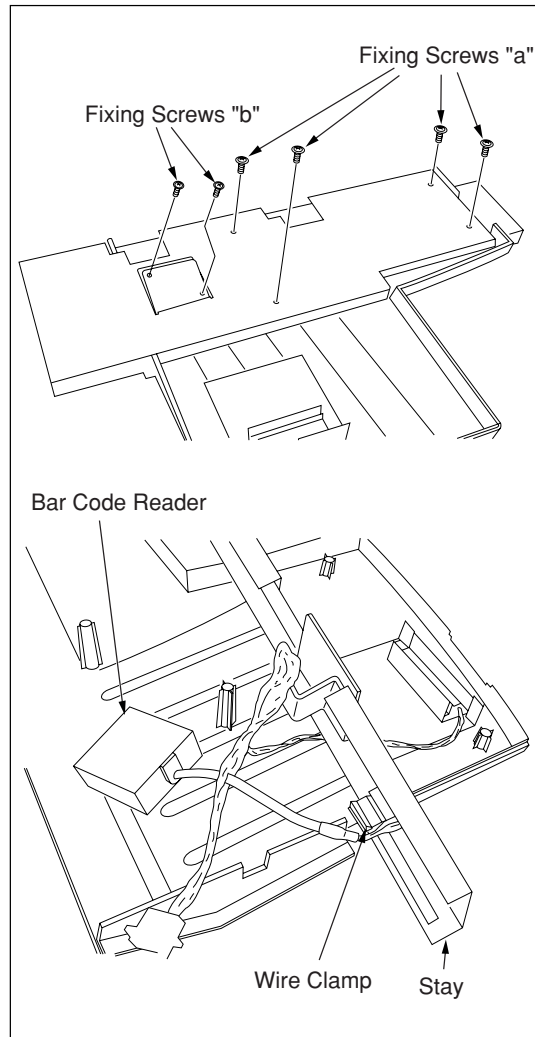


### 2.3.4 Replacement of Bar Code Reader

1. Remove the ejection guide assy. ("2.3.3 Removal of Ejection Guide Assy, p.39")
2. Remove three fixing screws, and remove the cassette stacker.



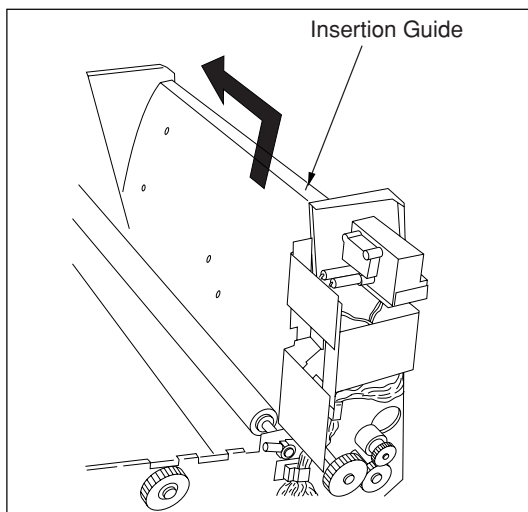
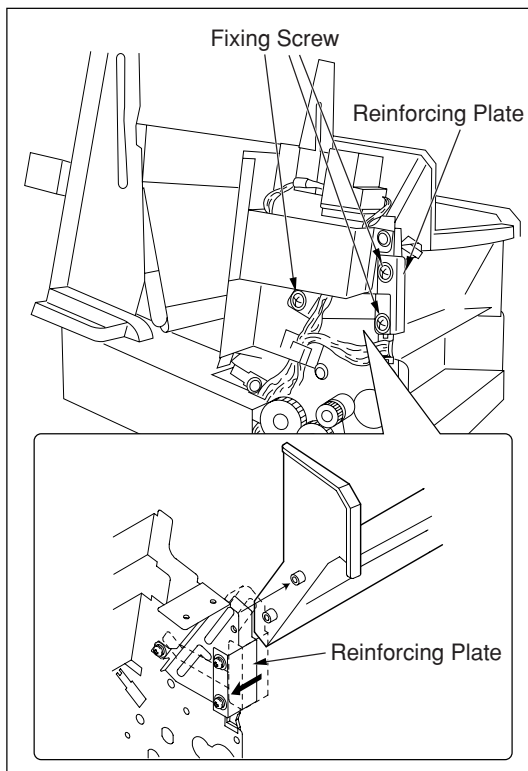
3. Remove 4 fixing screws "a", and remove the stay.
4. Remove two fixing screws "b", and remove the bar code reader from the stay.
5. Remove the wire bundle from the wire clamp.
6. Carry out reassembly in the reverse order to that described above.



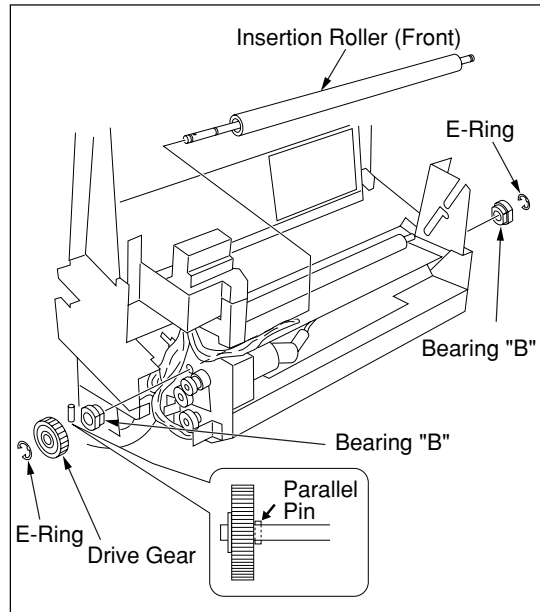
### 2.3.5 Replacement of Insertion Nip Rollers

Follow the procedures below to replace the cassette insertion nip rollers (2pcs).

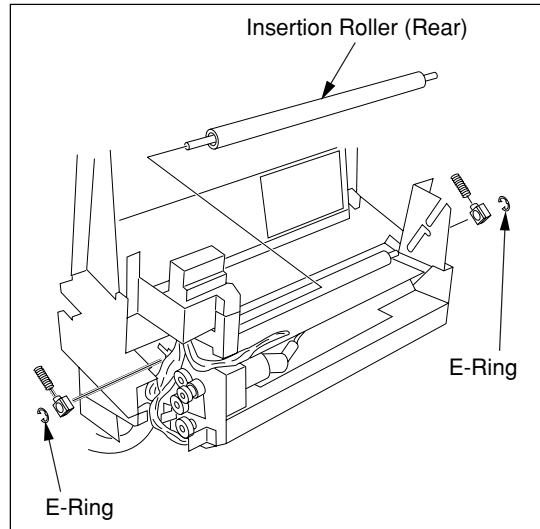
1. Open the front cover.
2. Remove the right and left covers. ("2.2.2 Removal of the Left & Right Covers, p.29")
3. Remove the front-top cover. ("2.2.3 Removal of the Front-Top Cover, p.30")
4. Remove the insertion / ejection unit. ("2.3.2 Removal of the Insertion/Ejection Unit, p.37")
5. Remove the insertion /ejection unit front cover. ("2.2.4 Removal of Insertion / Ejection Front Cover, p.31")
6. Loosen three fixing screws until the screw end becomes invisible (insertion guide becomes free).
7. Slide the reinforcing plate for the side plate outward of the insertion / ejection unit, and remove.



8. Remove an E-ring, and remove drive gear x 1, parallel pin x 1, shaft bearing "B" x 1 from the left of the roller shaft.
9. Remove an E-ring, and remove shaft bearing "B" x 1 from the right of the roller shaft.
10. Remove the insertion roller (front).

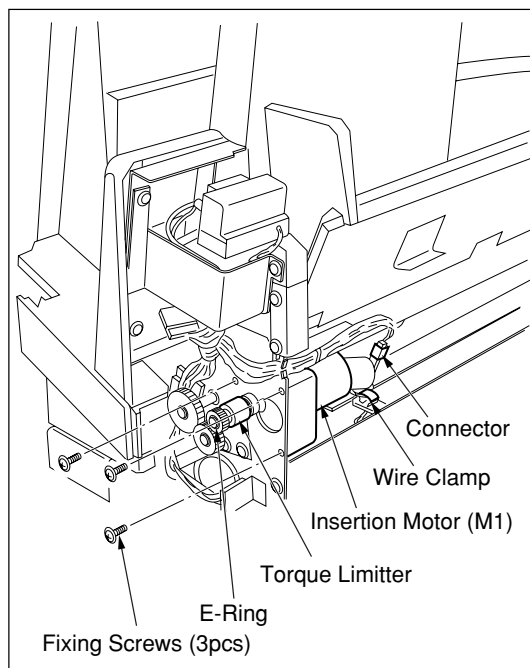


11. Remove E-rings (one on each side) from the both shaft ends, and remove the insertion roller (rear).
12. Carry out reassembly in the reverse order to that described above.



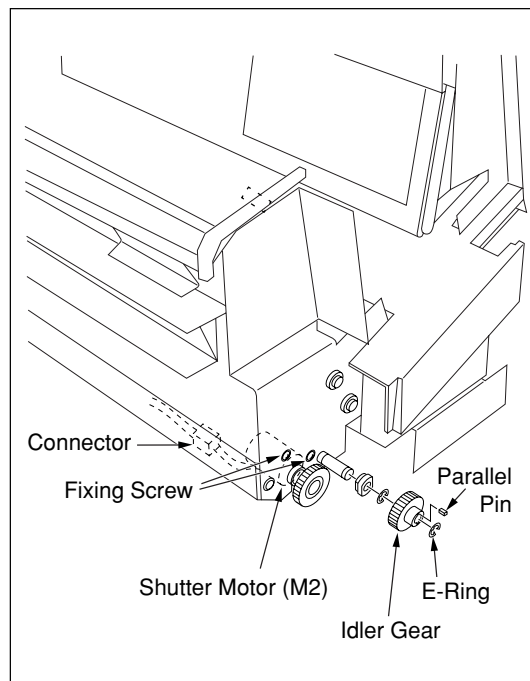
### 2.3.6 Replacement of Insertion Motor

1. Remove the insertion / ejection unit front cover. ("2.2.4 Removal of Insertion / Ejection Front Cover, p.31")
2. Remove three fixing screws, and remove the insertion motor (M1).
3. Detach the wire bundle from the wire clamp, and unplug a connector.
  - JJ47
4. Remove an E-ring, and remove the torque limiter.
5. Carry out reassembly in the reverse order to that described above.



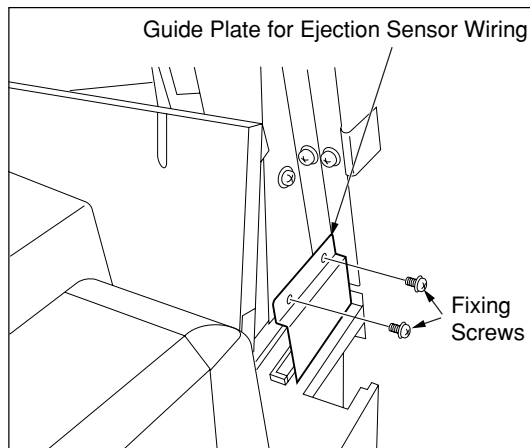
### 2.3.7 Replacement of Shutter Motor (M2)

1. Remove the insertion / ejection unit. ("2.3.2 Removal of the Insertion/Ejection Unit", p.37)
2. Remove the insertion / ejection unit front cover. ("2.2.4 Removal of Insertion / Ejection Front Cover, p.31")
3. Remove an E-ring, and then an idler gear.
  - At the same time, a parallel pin will also become free. Be cautious not to lose this pin.
4. Remove the wire bundle from the wire clamp. Then unplug a connector.
  - JJ48
5. Remove two fixing screws, and remove the shutter motor (M2).
6. Carry out reassembly in the reverse order to that described above.

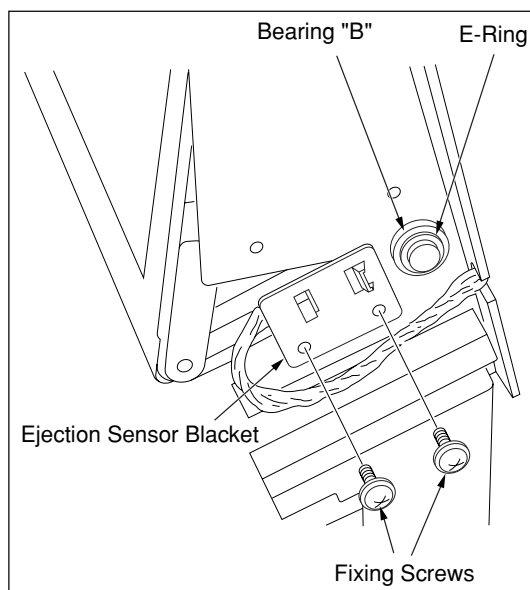


### 2.3.8 Replacement of Ejection Motor (M3)

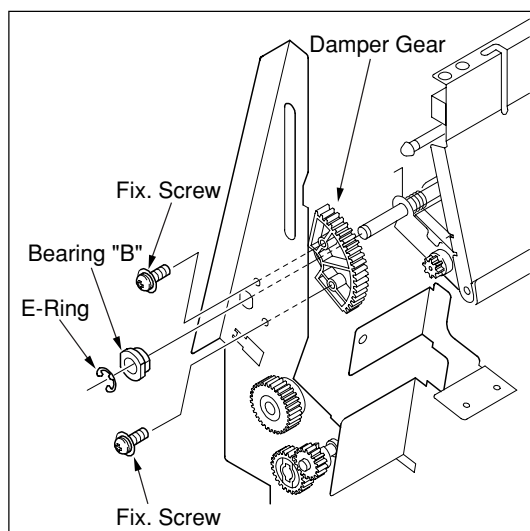
1. Remove the insertion / ejection unit. ("2.3.2 Removal of the Insertion/Ejection Unit, p.37")
2. Remove the insertion / ejection unit front cover. ("2.2.4 Removal of Insertion / Ejection Front Cover, p.31")
3. Remove two fixing screws, and remove the guide plate for the ejection sensor wiring.
  - The fixing screws used here are M3 x 6 (2pcs).



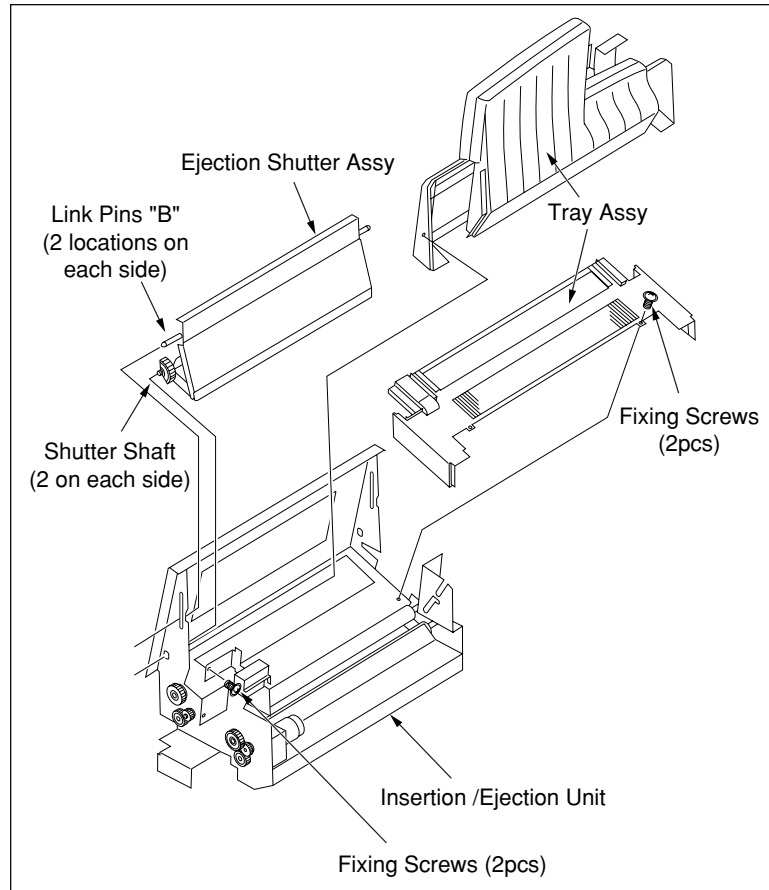
4. Remove two fixing screws, and remove the ejection sensor bracket.
5. Remove an E-ring and two bearing "B" (one on each side).



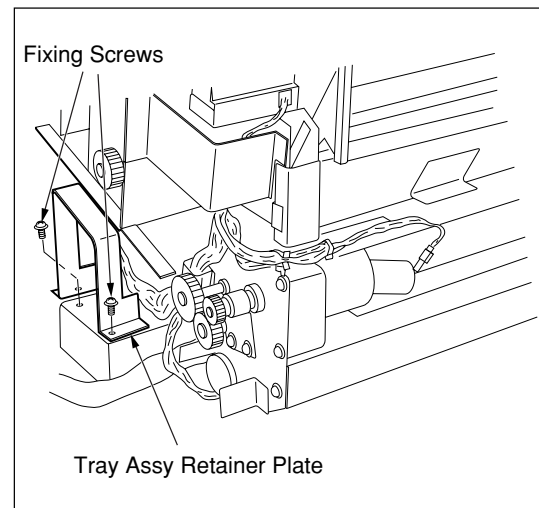
6. Remove two fixing screws that attach the damper gear to the frame.
7. Remove an E-ring and bearing "B".



8. Slide the link pins "B" (both sides) inward, pull out the from the slide hole on the right and left frame.
9. Remove the shutter shaft from the right and left frame, and remove the ejection shutter assy from the insertion / ejection unit.
10. Remove 4 fixing screws, and remove the tray assy.



11. Remove two fixing screws, and remove the tray assy retainer plate (left).

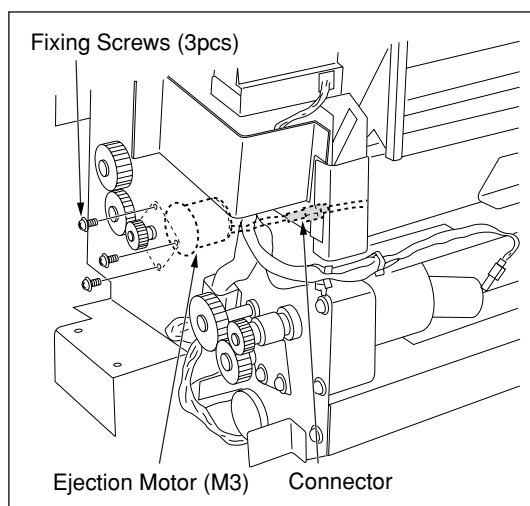


**12.** Unplug a connector, and remove the wire bundle from the wire clamp.

- JJ49

**13.** Remove three fixing screws, then pull out the gear for the ejection motor(M3) from the screw hole, and remove the ejection motor(M3).

**14.** Carry out reassembly in the reverse order to that described above.



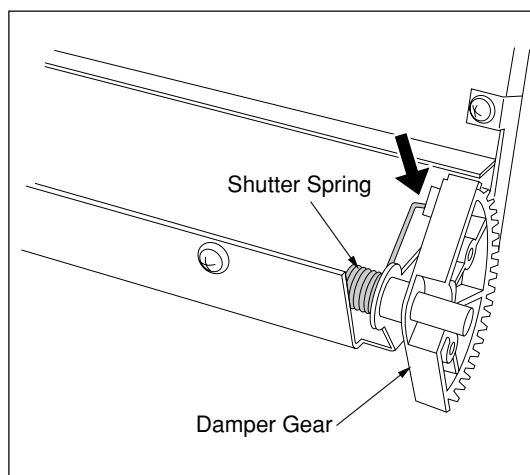
### • Remarks for Installation

#### Assembling the ejection shutter (step9.)

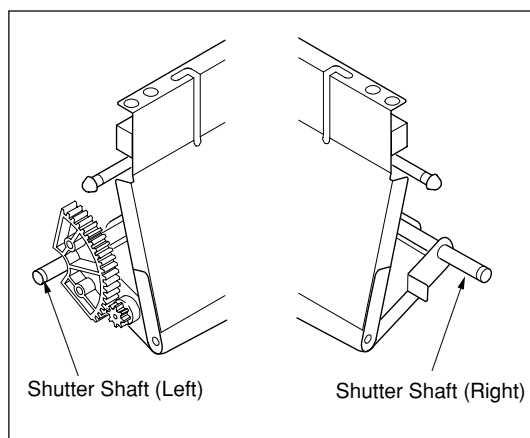
Confirm that the arm for shutter spring is properly set in the damper gear assy.

Lubricate the grease inside the shutter spring.

Recommended grease : Epinox AP-2



First, insert the shutter shaft (right) in the bearing (right), then insert the shutter shaft (left) in the bearing (left).



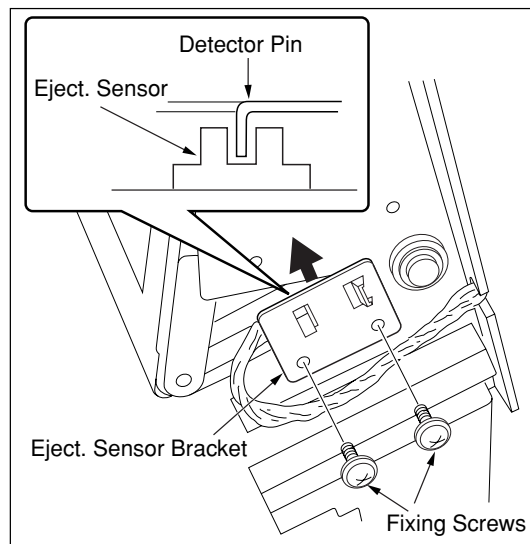
#### Ejection sensor bracket (step4.)

Fix the screws while the eject sensor bracket is held up.

Confirm that the sensor pin stays close to the center of the ejection sensor when the ejection shutter closes.

#### Ejection sensor wiring guide plate(step3.)

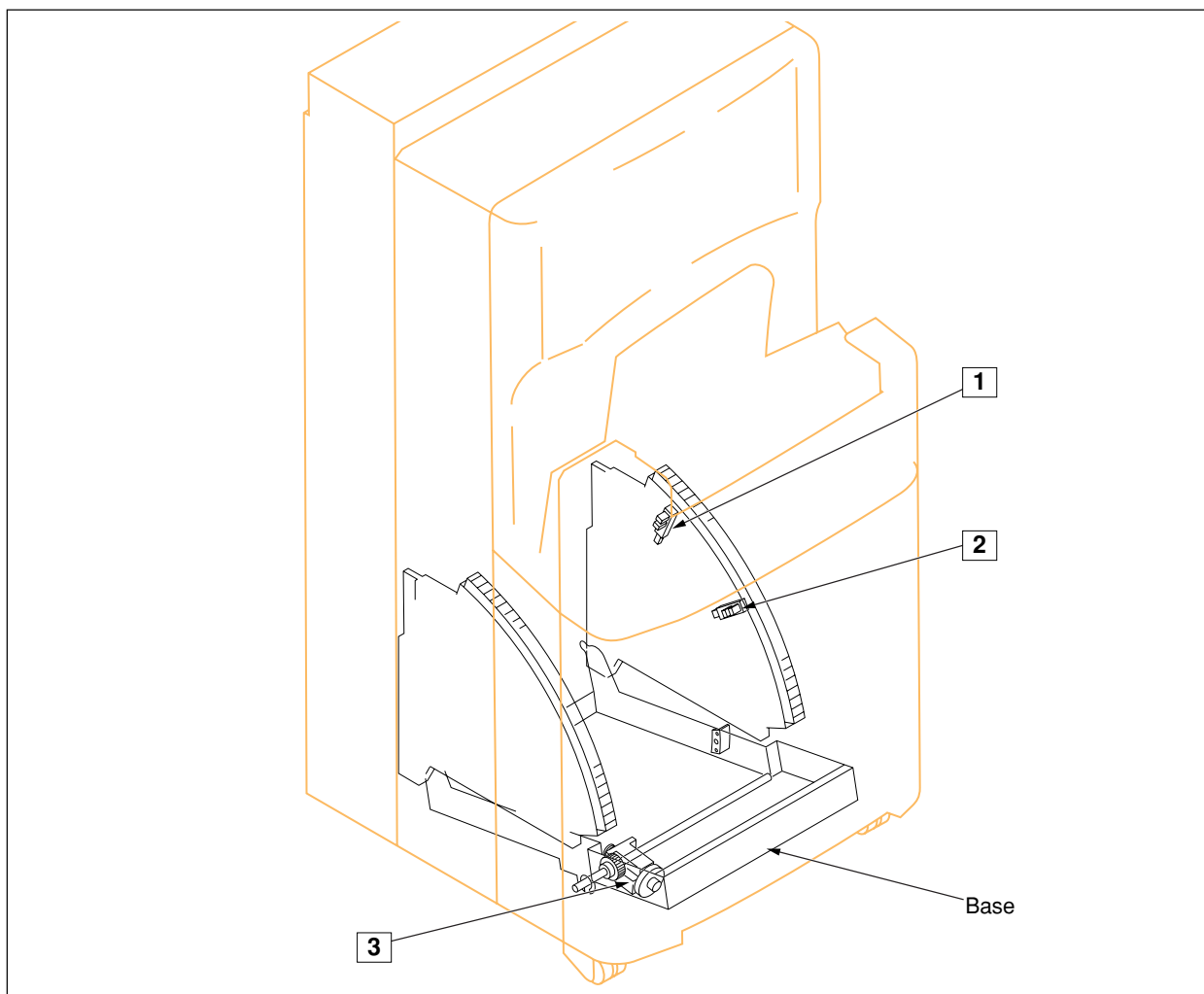
Confirm that the sensor wires are not sandwiched by the plate, then tighten the screws.



## 2.4 Transport Unit

### 2.4.1 Controlling Parts comprising the Transport Unit

- Controlling parts for transport mechanism



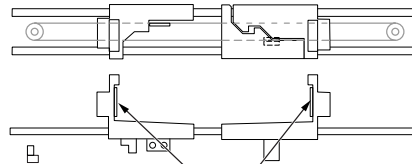
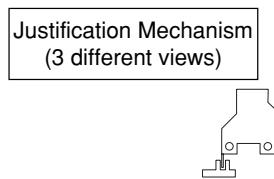
Part Name	Function	Access to the Part
1 Feed Escape Sensor (S11)	Detects the evacuation position of the base	1) Remove the right cover. •Refer to "2.2.2 Removal of the Left & Right Covers, p.29" 2) Remove two fixing screws, and remove the transport sensor bracket. 3) Remove a fixing screw, and remove the sensor from the bracket. 4) Unplug a connector. • JP34 <b>Adjustment after reinstallation</b> Always implement "3.7 Adjusting the Pressing Amount, p.122"

Part Name	Function	Access to the Part
<b>2 Feed HP Sensor (S10)</b>	Detects the HP of the base.	1) Remove the right cover. •(Refer to "Removal of the Left & Right Covers, p.29") 2) Remove two fixing screws, and remove the transport sensor bracket. 3) Remove a fixing screw, and remove the sensor from the bracket. 4) Unplug a connector. • JP33
<b>3 (PM3)</b>	Drives the base.	Refer to "2.4.6 Replacement of Transport Motor (PM3), p.60"

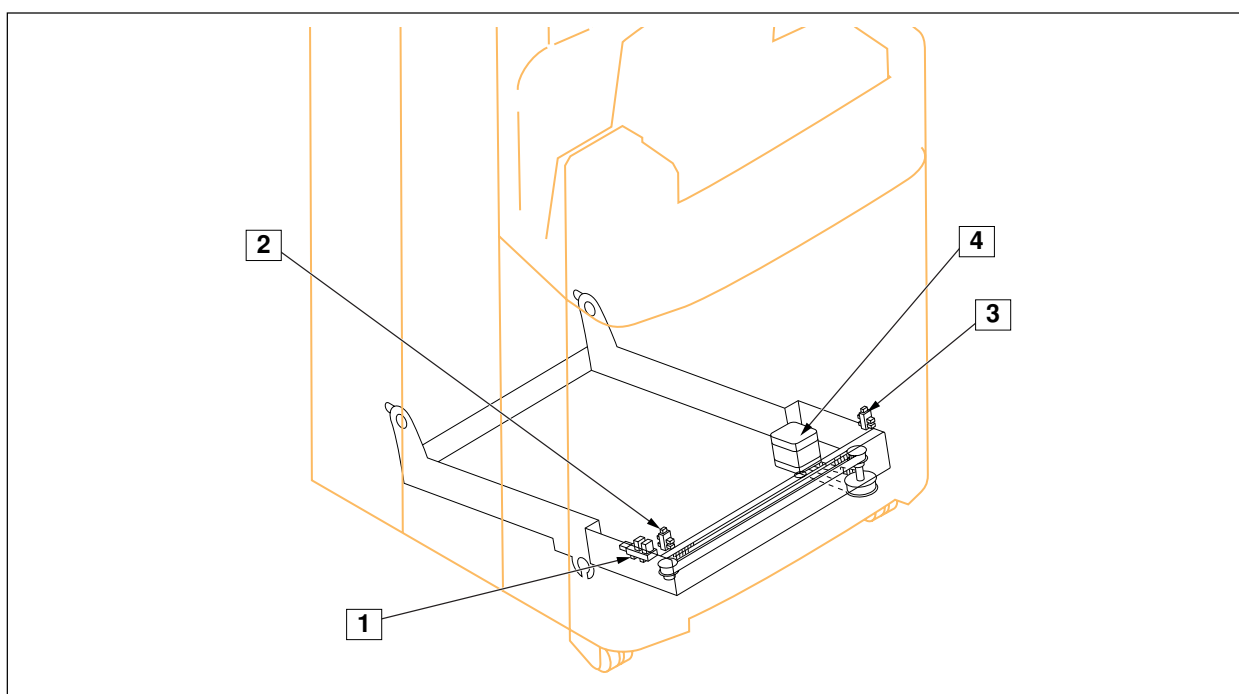
• **Controlling parts for justification mechanism**

**Important** Do not remove the bracket on which the justification HP sensor is mounted.

**Important** Do not touch the antislip rubber which is attached on the part where the cassette frame comes in contact.

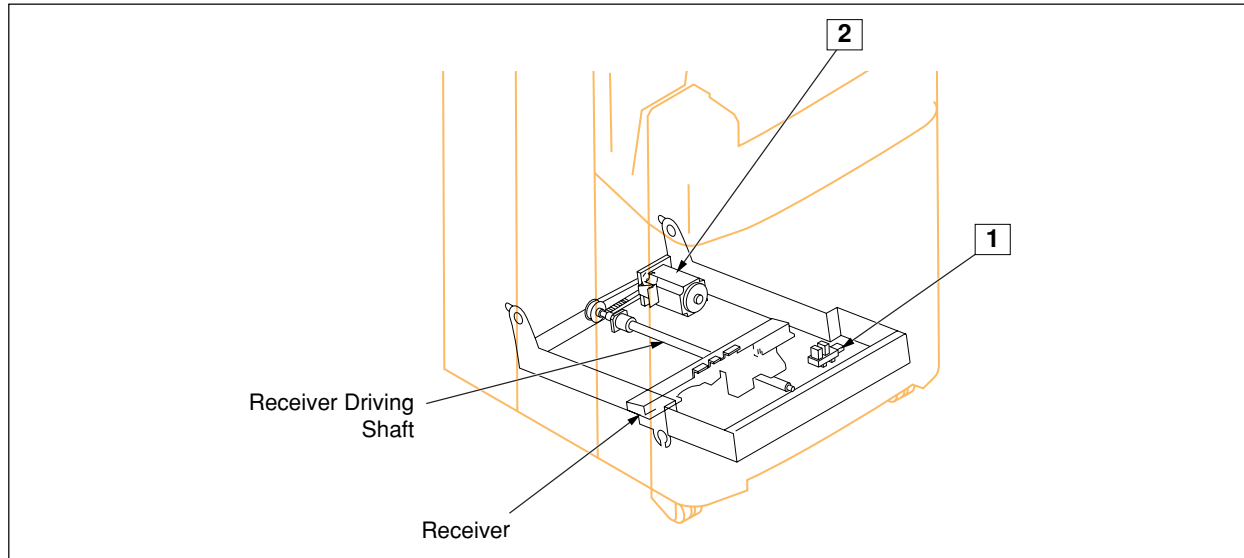


Antislip Rubber Caution : Do not touch



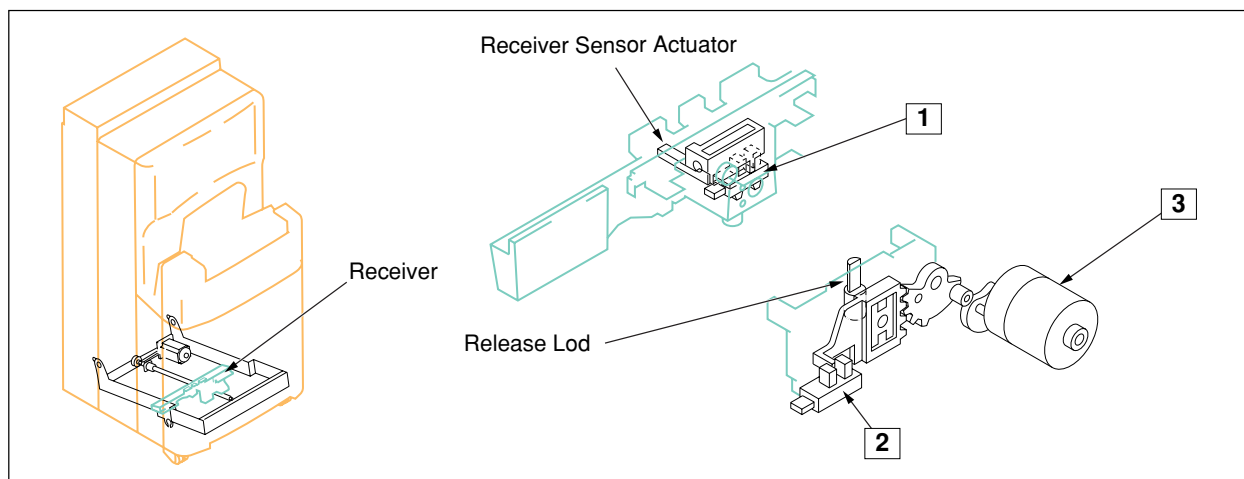
Part Name	Function	Access to the Part
<b>1 Justification HP sensor (S9)</b>	Detects the HP of the justification mechanism.	1) Open the front cover, and tilt the Transport Unit using handle. 2) Remove a fixing screw, and remove the sensor. 3) Unplug a connector. • JP32
<b>2 Justification Sensor-L (S3)</b>	Detects the left end when justifying.	1) Open the front cover, and tilt the Transport Unit using handle. 2) Bring the justification mechanism to the center by hand. 3) Remove a fixing screw, and remove the justification sensor mount plate. 4) Remove the sensor from the justification sensor mount plate. 5) Unplug a connector. • JP22
<b>3 Justification Sensor-R (S4)</b>	Detects the right end when justifying.	1) Open the front cover, and tilt the Transport Unit using handle. 2) Bring the justification mechanism to the center by hand. 3) Remove a fixing screw, and remove the justification sensor mount plate. 4) Remove the sensor from the justification sensor mount plate. 5) Unplug a connector. • JP23
<b>4 Justification Motor (PM2)</b>	Drives the mechanism via timing belt.	Refer to "2.4.3 Replacement of the Justification Motor (PM2), p.55".

- Controlling parts for elevator mechanism



Part Name	Function	Access to the Part
<b>1 Elevator HP Sensor (S8)</b>	Detects the HP of receiver.	1) Open the front cover, and tilt the Transport Unit using handle. 2) Remove a fixing screw, and remove the sensor. 3) Unplug a connector. • JP31
<b>2 Elevator Motor (PM1)</b>	Drives the receiver via belt, and elevate the receiver.	Refer to " <a href="#">2.4.5 Replacement of Elevator Motor (PM1), p.59</a> "

- Controlling parts for the receiver



Part Name	Function	Access to the Part
<b>1 Cassette Receive Sensor (S2)</b>	Detects the cassette presence via receiver sensor plunger.	Refer to " <a href="#">2.4.8 Replacement of Receiver Sensor, p.63</a> "

Part Name	Function	Access to the Part
<b>2 Lock-Release Sensor (S1)</b>	Detects the HP of release shaft.	1) Remove the receiver assy. •Refer to "2.4.2 Removal of the Cassette Receive Unit, p.54" 2) Unplug a connector. • JP20 3) Remove the sensor from the release sensor bracket.
<b>3 Lock-Release Motor (M4)</b>	Actuate the release shaft up and down (1 cycle)	Refer to "2.4.7 Unlock Motor (M4), p.61"

### 2.4.2 Removal of the Cassette Receive Unit

1. Open the front door.
2. Use the handle to tilt the Transport Unit.
3. Remove the two fixing screws.

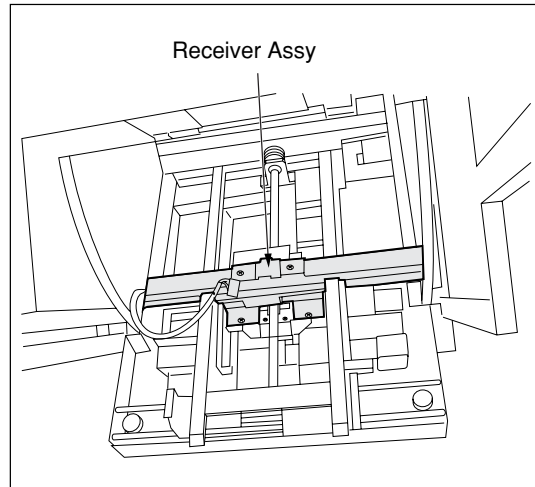
**Caution** Of the four fixing screws arranged in series, remove only the outer two screws. The two inner screws (painted in white) must not be removed, and if this precaution is not observed, it may become impossible for cassettes to be correctly passed from the Transport Unit to the subscanning section.



4. Remove the wire bundle from the wire clamp.
5. Unplug a connector.
  - JP18
6. Remove the receiver assy.
7. Carry out reassembly in the reverse order to that described above.

- **Remarks for reinstallation**

Fit the wire bundle into the wire clamp so the tie band for preventing the pull-out comes out of the clamp.

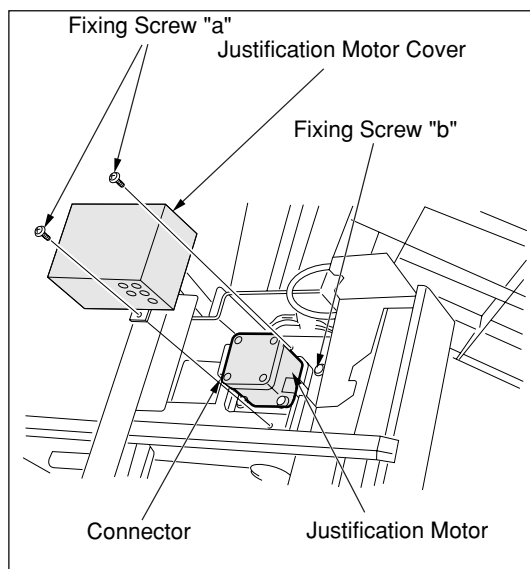


### 2.4.3 Replacement of the Justification Motor (PM2)

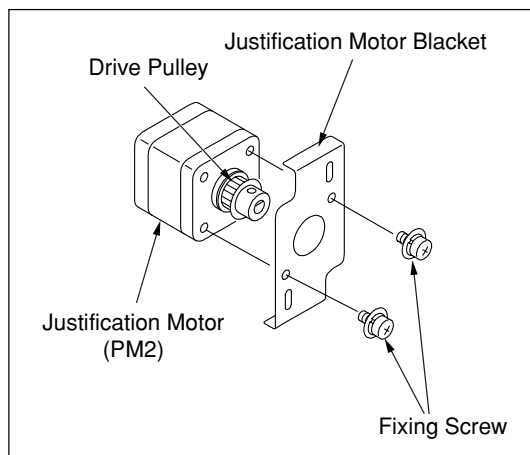
**Caution** To protect from burning, do not touch the justification motor immediately after it stops.



1. Open the front door.
2. Remove the right cover. (Refer to "Removal of the Left & Right Covers, p.29")
3. Remove the insertion / ejection unit. (Refer to "Removal of the Insertion/Ejection Unit, p.37")
4. Use the handle to tilt the Transport Unit.
5. Remove two fixing screws "a", and detach the cover for justification motor.
6. Uncouple the connector from the justification motor.
  - JP29
7. Remove two fixing screws, and remove the justification motor.

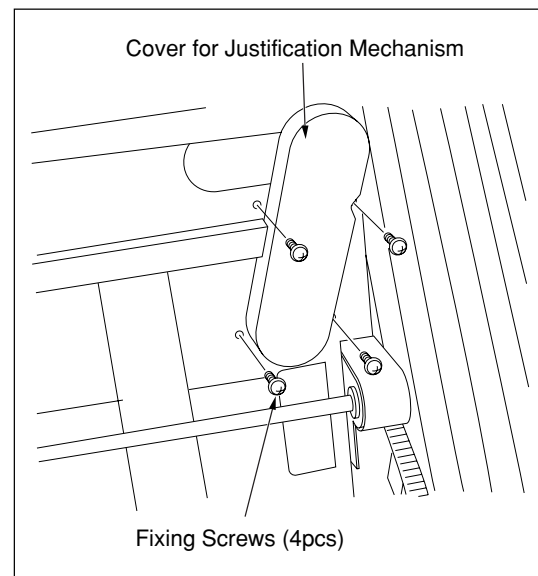


8. Remove two fixing screws, and dismount the justification motor from the motor bracket.
9. Carry out reassembly in the reverse order to that described above.
  - Using a torque driver, tighten the drive pulley at the force of  $0.6\text{N}\cdot\text{cm}$  ( $6\text{kgf}\cdot\text{cm}$ ).

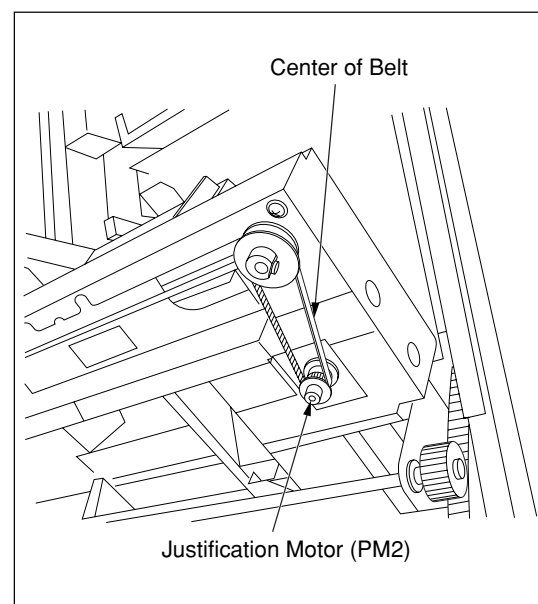


- **Tension adjustment**

1. Remove 4 fixing screws, and remove the pulley cover for justification mechanism.



2. The width justification motor is to be secured in such a way that a 2-mm deflection in the center of the belt will be caused by a load of between 1 ~ 2.5 N (102 ~ 255 gf)



### 2.4.4 Replacement of Transport Rack Gear

The shape of transport rack gears on the right and left are same.

**Important** When replacing the transport rack gear, never remove the both (right and left) gears at the same time. Doing so means there is nothing left to support the transportation unit, in consequence, it becomes impossible to install the transport rack gear.

1. Remove the right cover. ("2.2.2 Removal of the Left & Right Covers, p.29")

2. Open the front cover.

3. Using the handle, tilt the transportation unit until it comes to stop-end.

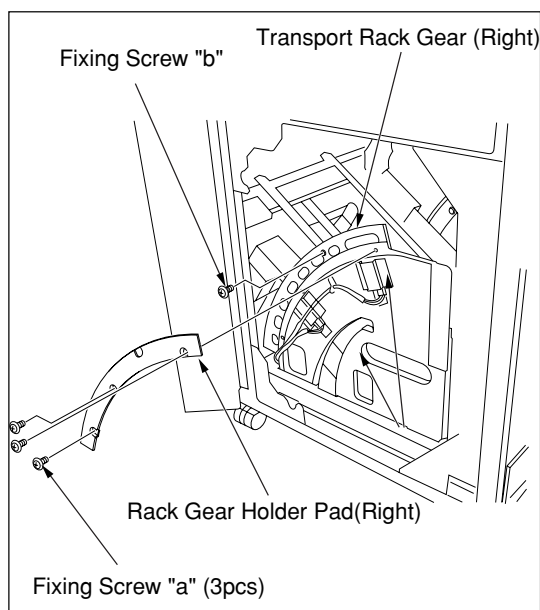
- When the Transport Unit is at upright position, the transportation rack gear is being pressed down by the weight of the Transport Unit, rendering it difficult to remove the unit

4. Remove three fixing screws "a", and remove the rack gear holder pad (right).

5. Remove a fixing screw "b", and remove the transport rack gear (right).

6. Install a new transport rack gear on the right sector plate with two fixing screws.

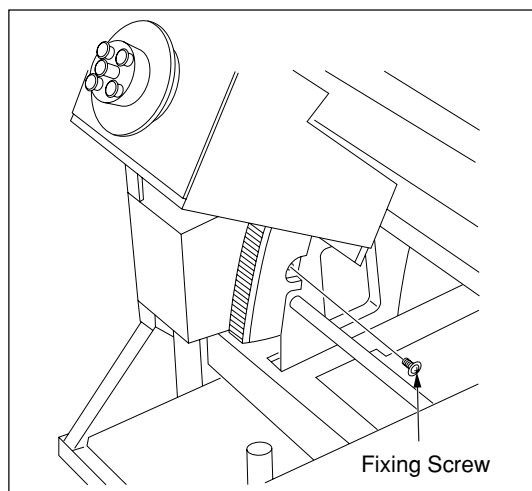
7. Install the rack gear holder pad on the right sector plate with three fixing screws.



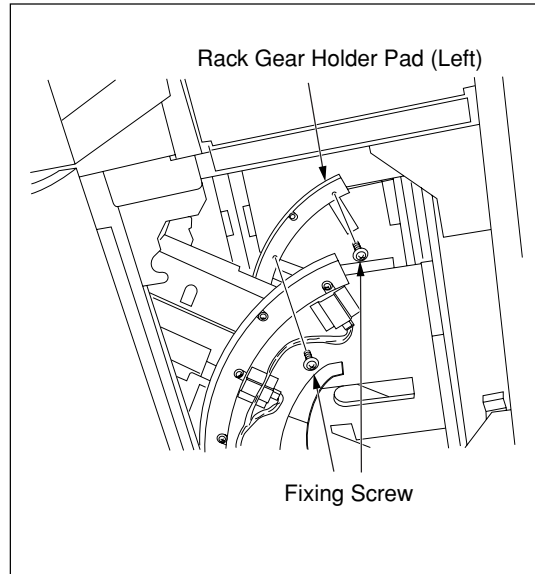
8. Using the handle, raise the Transport Unit until the fixing screw on the lowest level of the rack gear holder pad (left) is located.

9. Remove the fixing screw on the lowest level of the rack gear holder pad (left).

10. Tilt the Transport Unit until it comes to stop-end using the handle.



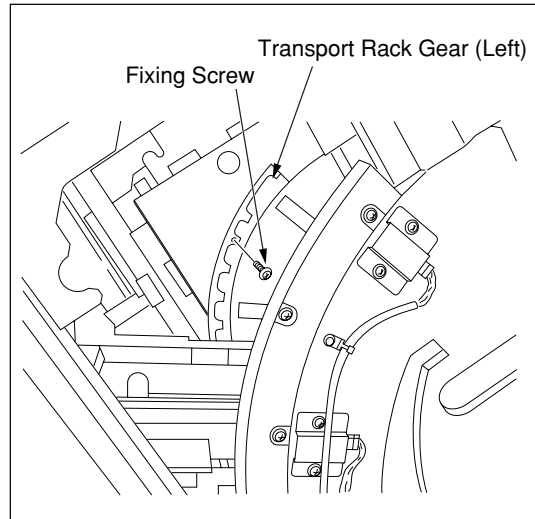
- 11.** Remove the remaining fixing screws (2pcs), and detach the rack gear holder pad (left).



- 12.** Remove a fixing screw, and remove the transport rack gear on the left.

- 13.** Install a new transport rack gear on the right sector plate with two fixing screws.

- 14.** Install the rack gear holder pad on the right sector plate with three fixing screws.



- **Lubrication after installation**

Lubricate the pinion gear on the transport rack gear with a small quantity of grease.

Recommended Grease: Kyodo Yushi Co., Ltd. Plus Guard No.2 or equivalent.

- **Adjustment after installation**

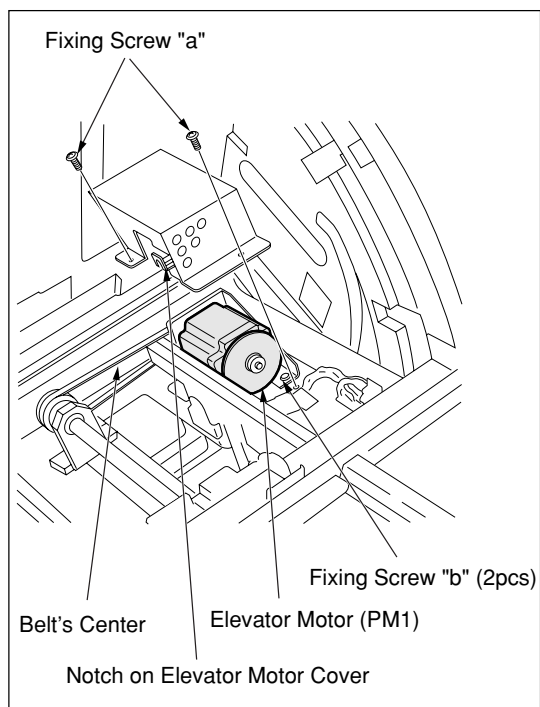
Carry out "[3.7 Adjusting the Pressing Amount, p.122](#)"

### 2.4.5 Replacement of Elevator Motor (PM1)

**Caution** To protect from burning, do not touch the justification motor immediately after it stops. Open the front door.



1. Open the front cover.
2. Use the handle to tilt the Transport Unit.
3. Unscrew and remove the two fixing screws "a" which are securing the elevator motor's cover in place.
4. Unplug the connector and remove the wire bundle from the notch in the elevator motor's cover.
5. Remove the elevator motor's cover.
6. Remove the two fixing screws "b" which are securing the elevator motor.
7. Unplug the connector from the elevator motor.
  - JP28
8. Remove the elevator motor (PM1).
9. Carry out reassembly in the reverse order to that described above.



#### • Tension adjustment

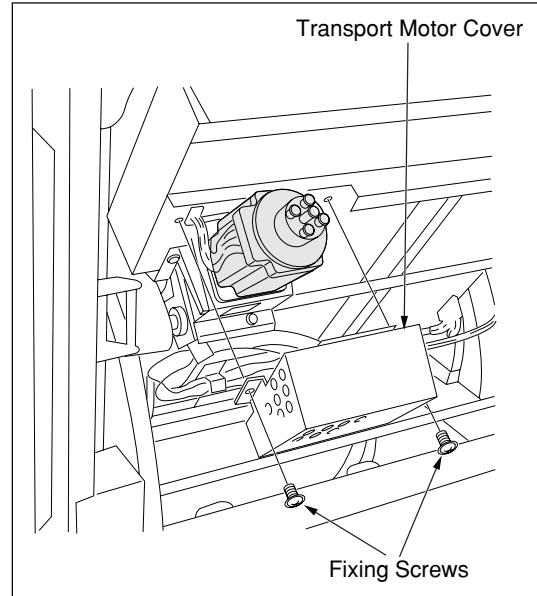
The elevator motor is to be secured in such a way that a 2-mm deflection in the center of the belt will be caused by a load of between 0.5 ~ 1.5 N (51 ~ 153 gf). The target value will be approached if the elevator motor is moved towards the right side.

### 2.4.6 Replacement of Transport Motor (PM3)

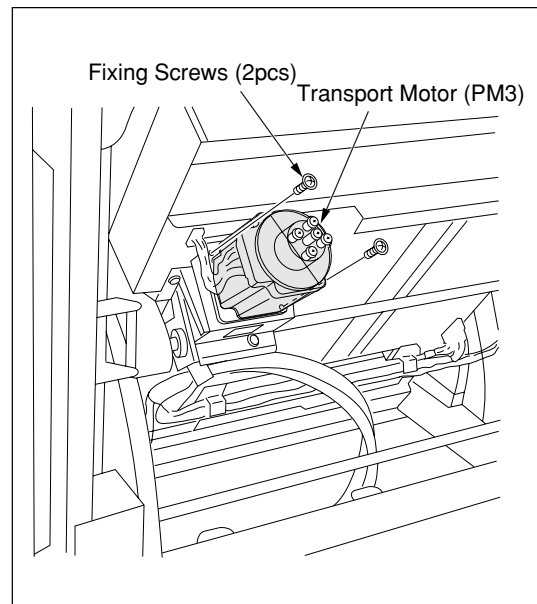
**Caution** To protect from burning, do not touch the justification motor immediately after it stops. Open the front door.



1. Open the front door.
2. Remove the two fixing screws, and detach the transport motor cover.

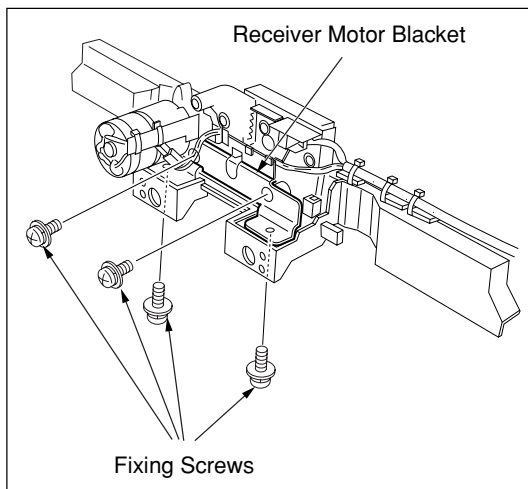


3. Unplug the connector from the transport motor.
  - JJ2830
4. Remove the two fixing screws, and remove the transport motor.
  - The coupling (green) may also become detached when the cassette feed motor is removed. Care should be taken to avoid misplacing this component.
5. Carry out reassembly in the reverse order to that described above.

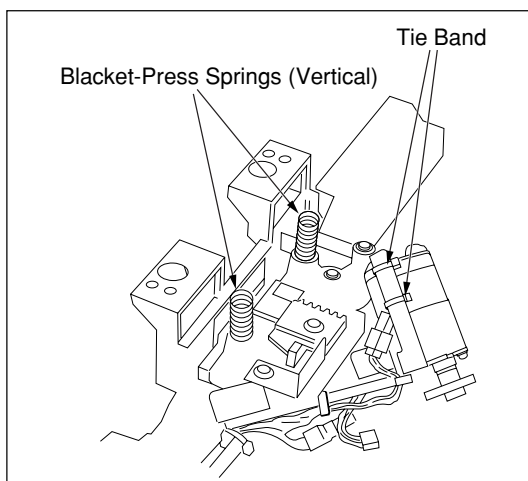


### 2.4.7 Unlock Motor (M4)

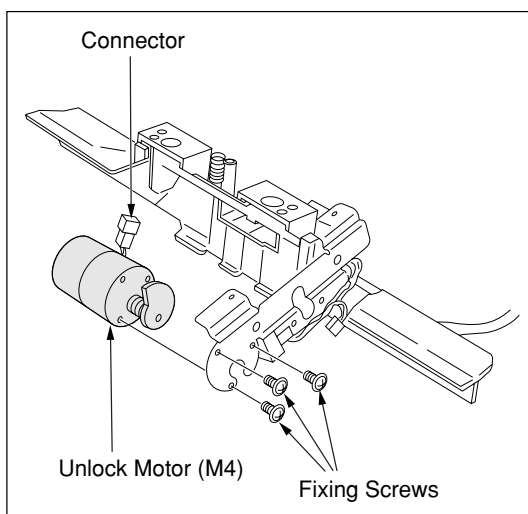
1. Remove the receiver assy. ("2.4.2 Removal of the Cassette Receive Unit, p.54")
2. Remove the 4 fixing screws, and remove the receiver motor bracket.



3. Cut the wire bundle of the receiver motor bracket.

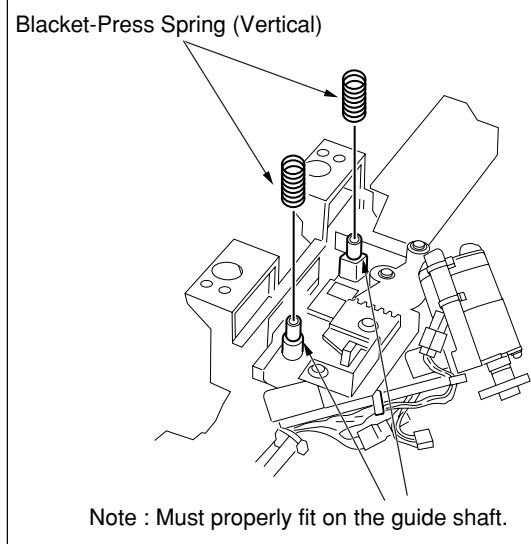


4. Unplug the connector.
  - JJ19
5. Remove the three fixing screws, and remove the unlock motor (M4) from the receiver motor bracket.
6. Carry out reassembly in the reverse order to that described above.

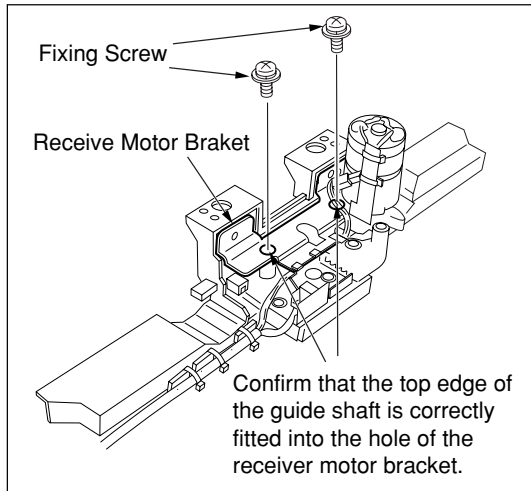


- **Remarks for Installation**

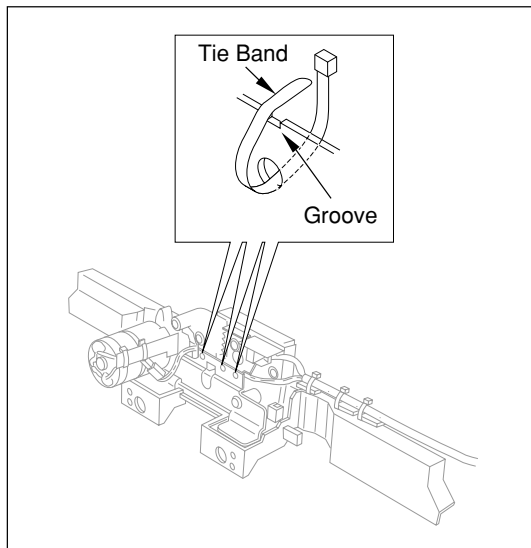
Confirm that the bracket-press springs (vertical) are securely fitted on the guide shafts for upper and lower brackets. If the fitting is not correctly installed, the bracket-press spring may interfere each other when the Transport Unit comes to the magnetizing point, and cause a trouble in operation.



Before fixing the screw for the receiver motor bracket, confirm that the top edge of the guide shaft is correctly fitted into the hole of the receiver motor bracket.

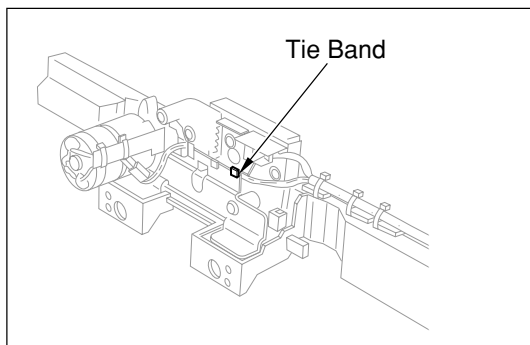


When attaching the tie band to the wires on the receiver sensor bracket, fit it into the groove with its end shown in the right.

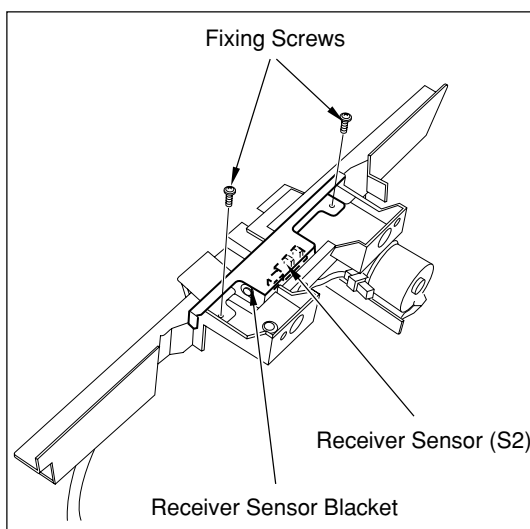


## 2.4.8 Replacement of Receiver Sensor

1. Remove the receiver assy. ("2.4.2 Removal of the Cassette Receive Unit, p.54")
2. Cut the tie band of the receiver motor bracket.

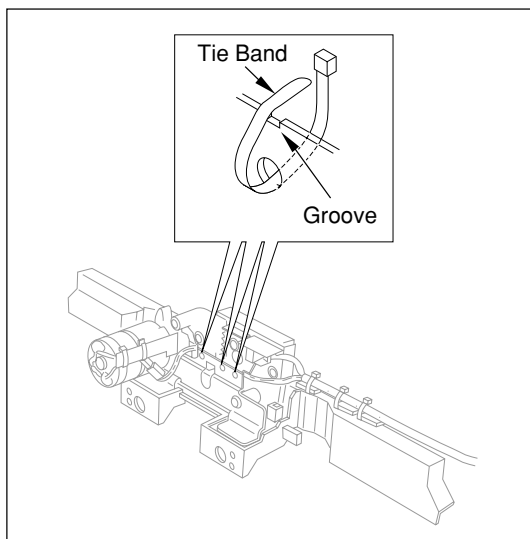


3. Remove the two fixing screws, and remove the receiver sensor bracket.
4. Unplug the connector from the receiver.
  - JP21
5. Remove the receiver sensor (S2) from the receiver sensor bracket.
6. Carry out reassembly in the reverse order to that described above.



### • Remarks for installation

When attaching the tie band to the wires on the receiver sensor bracket, fit it into the groove with its end shown in the right.



## 2.5 Subscan Unit

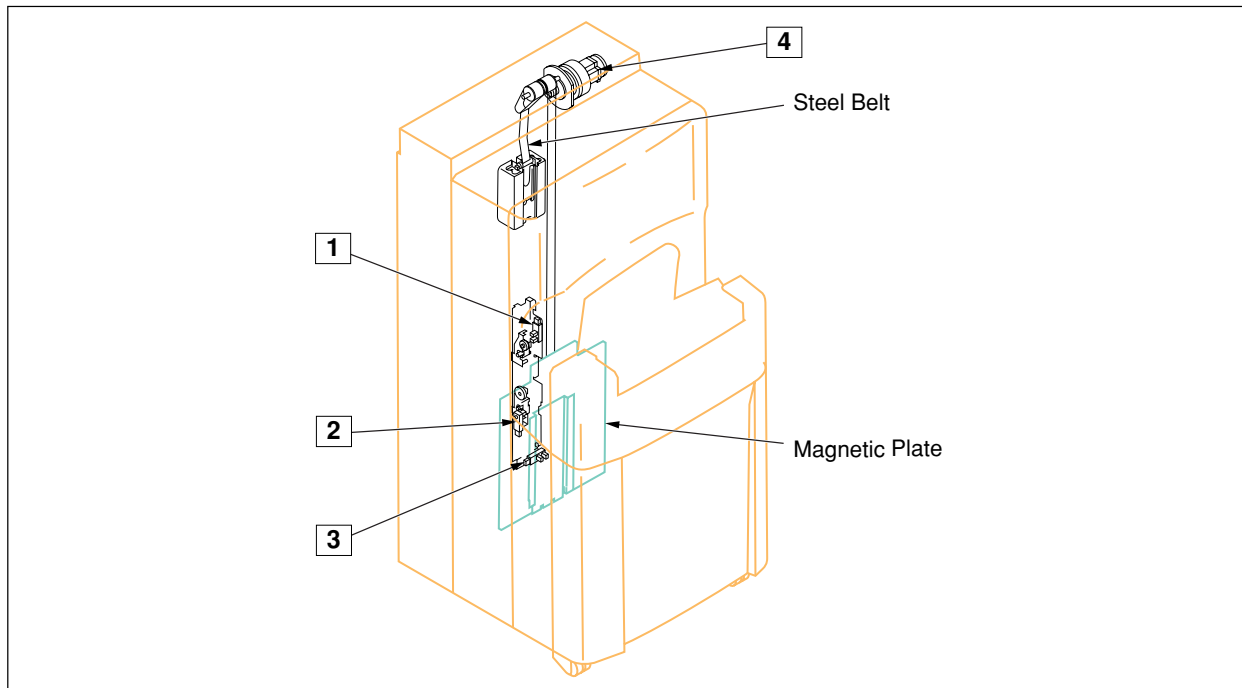
**Danger** Never touch the steel belt directly by hand. The hand or fingers may be cut due to the sharp edge of the steel belt.



**Caution** If the fat of hand remains on the steel belt, rust may develop, and it may cause malfunction of the subscan operation.



### 2.5.1 Controlling Parts of subscan Unit



Part Name	Function	Access to the Part
<b>1 V-sync Sensor (S12)</b>	Detects the read-start position of sub scanning direction.	1) Remove the sensor assy. •Refer to " <a href="#">2.5.5 Removal of the Sensor Assembly, p.71</a> " 2) Unplug the connector. •JP40 3) Remove a fixing screw, and remove the sensor.
<b>2 Magnetization Detect Sensor (S15)</b>	Detects the adhesion of the back plate.	1) Remove the sensor assy. •Refer to " <a href="#">2.5.5 Removal of the Sensor Assembly, p.71</a> " 2) Unplug the connector. •JP43 3) Remove a fixing screw, and remove the sensor.

Part Name	Function	Access to the Part
<b>3 Subscan HP Sensor (S17)</b>	Detects the HP of cassette magnetizing plate.	1) Remove the sensor assy. •Refer to "2.5.5 Removal of the Sensor Assembly, p.71" 2) Unplug the connector. •JP45 3) Remove a fixing screw, and remove the sensor.
<b>4 Subscan Motor (PM4)</b>	Moves the cassette magnetizing plate in subscan direction.	Refer to "2.5.6 Replacement of Subscanning Motor (PM4), p.73"

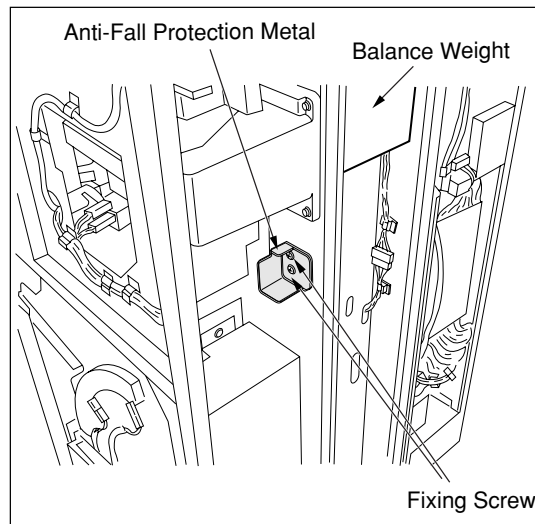
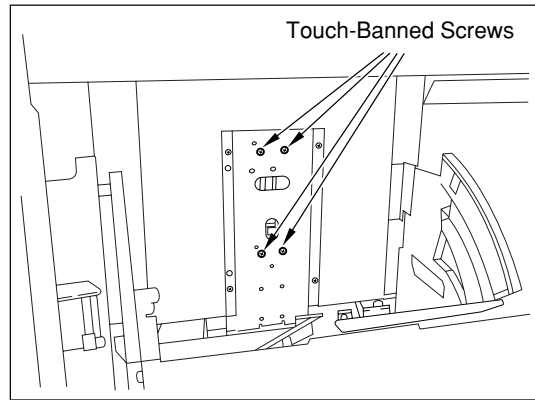
## 2.5.2 Replacement of Cassette Magnetizing Plate

**Caution** To maintain the precision of the mechanism, never touch the 4 white-painted screws.



**Important** Take cautions not to scratch the surface of the cassette magnetizing plate. Especially, scratches of convex shape will decrease the magnetizing power.

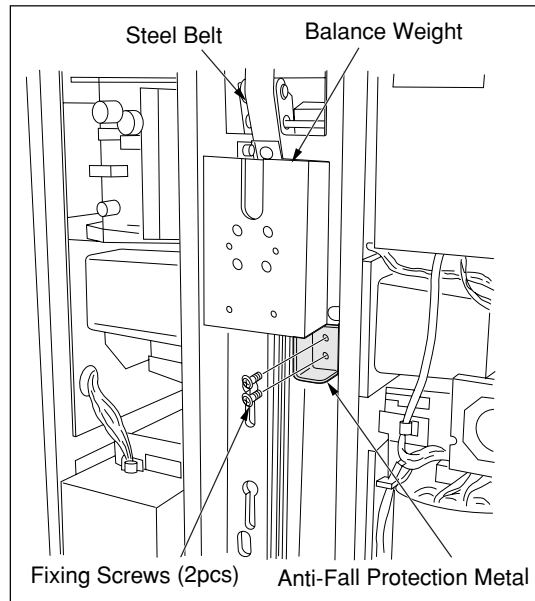
1. Remove the rear cover. ("2.2.1 Removal of the Rear Cover, p.28")
2. Manually raise the balance weight up to the top level.
3. Remove the two fixing screws, and remove the anti-fall protection metal (yellow).



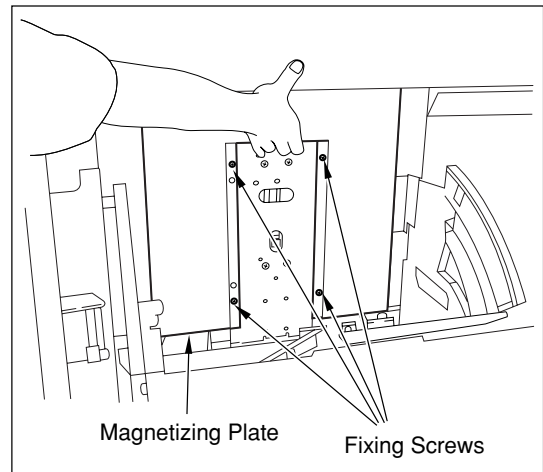
4. While holding the bottom of balance weight, secure the anti-fall protection metal with the two fixing screws removed in the proceeding step.

**Important** Press and raise the anti-fall protection metal, then secure with two fixing screws.

5. Move to the front, and open the front cover.
6. Using the handle, tilt the Transport Unit until it comes to the stop -end.



7. Remove the 4 fixing screws.
8. Holding the cassette magnetizing plate as shown in the right figure, and pull it out.
9. Carry out reassembly in the reverse order to that described above.



- **Remarks for installation**

- After confirming two positioning pins which are located between the fixing screws are properly sit in the hole, tighten the fixing screws.
- Attach the anti-fall protection metal to its original position from which it was detached in step 3.
- Confirm that there is no foreign metals such as clip on the magnetized surface of the cassette magnetizing plate.

- **Adjustment after installation**

Carry out "[3.6 Adjusting the Peel-Detection Rollers, p.117](#)".

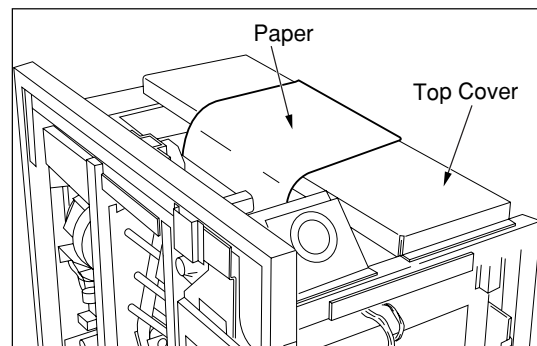
Carry out "[3.7 Adjusting the Pressing Amount, p.122](#)".

### 2.5.3 Steel Belt Decelerating Unit

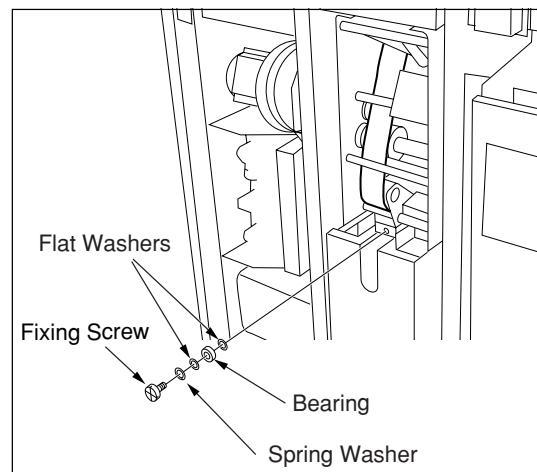
**Important** Following procedures should be carried out by minimum 2 person in order to avoid accident and finger fat to transfer onto the steel belt. Make clear the job for each one in advance, and carry out the procedure with full attention.

**Important** Always wear cotton gloves to avoid accident.

1. Remove the rear cover. ("2.2.1 Removal of the Rear Cover, p.28")
2. Remove the right and left covers. ("2.2.2 Removal of the Left & Right Covers, p.29")
3. Remove 4 fixing screws, and detach the top cover.
4. Remove the cassette magnetizing plate. ("2.5.2 Replacement of Cassette Magnetizing Plate, p.66")
5. Place a paper on the top cover.
  - This will help to avoid causing scratches on the steel belt when it is temporarily placed on the top cover in step 8.

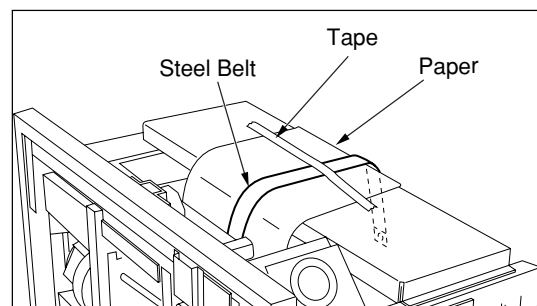


6. Remove one each of fixing screw, spring washer, bearing and two flat washers that secure the steel belt to the balance weight.
7. Put gloves if not worn.



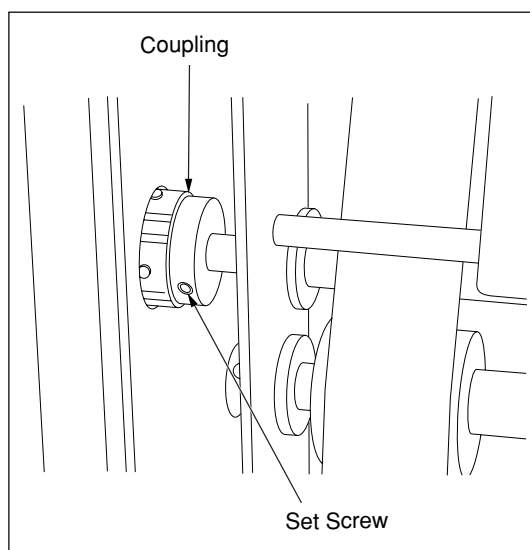
8. Draw the steel belt to the front, and place it on the paper prepared in step 5.

**Important** Handle the steel belt with care not to soil the belt with fat or oil neither to cause scratches. Special attention has to be paid to the grease on the LM guide of subscan unit, and try not to touch it.



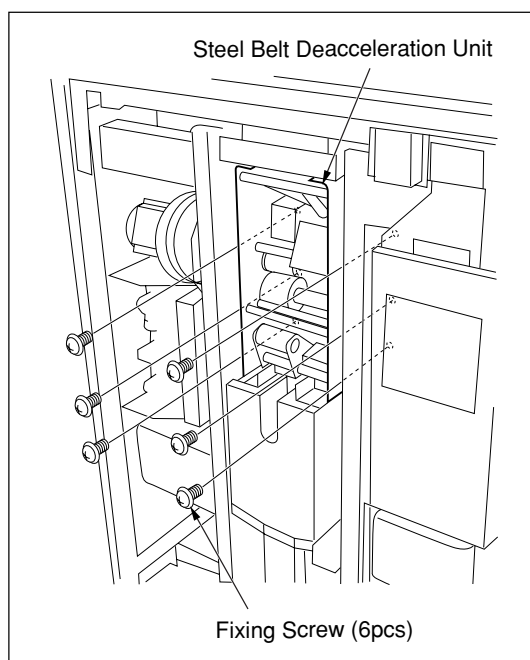
9. Secure the steel belt and the paper onto the top cover so that they will not fall off.

10. Loosen a set screw on the coupling.



11. Remove 6 fixing screws, and remove the steel belt decelerating unit.

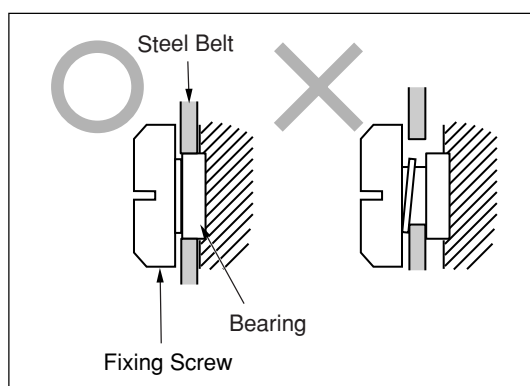
12. Carry out reassembly in the reverse order to that described above.



**Important** When securing the steel belt to the balance weight, check that the steel belt is not pinched between the bearing and washer.

#### • Adjustment after installation

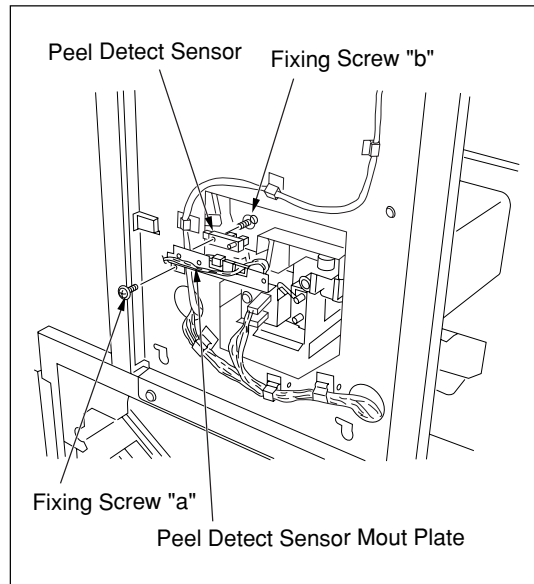
Carry out an solid image exposure, and check that there is no horizontal stripes or artifacts caused by malfunction of the subscan unit.



### 2.5.4 Replacement of Peel Detect Sensor 1/2 (S13 /S14)

Two peel detect sensor on the right and left are symmetric. The one on the left is a peel detect sensor-L (S13), and the one on the right is a peel detect sensor-R (S14).

1. Remove the left or right cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
2. Remove a fixing screw "a", detach the peel detect sensor-L mount plate or peel detect sensor-R mount plate.
3. Remove a fixing screw "b" which is securing the peel detect sensor, and detach the peel detect sensor.
4. Remove the wire bundle from the wire clamp.
5. Unplug the connector from the peel detect sensor.
  - JP41 (S13) or JP42 (S14)
6. Carry out reassembly in the reverse order to that described above.

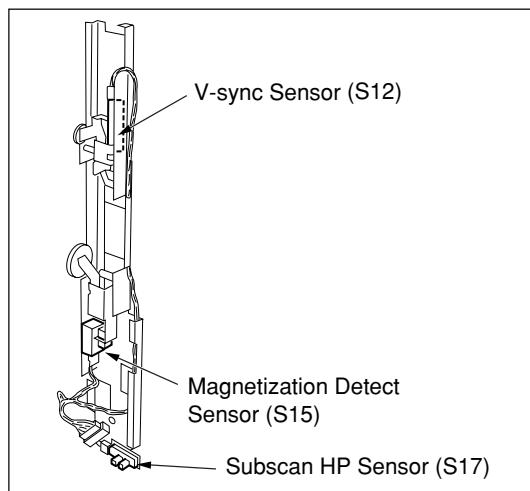


- **Adjustment after installation**

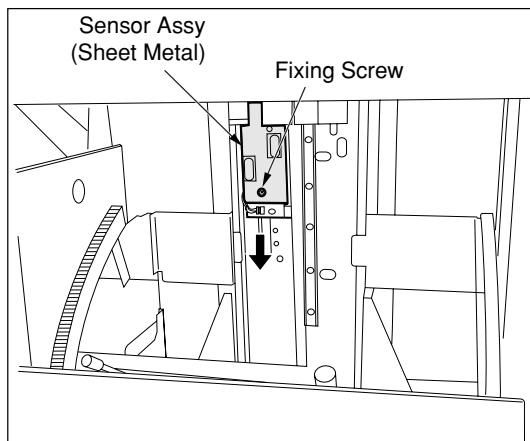
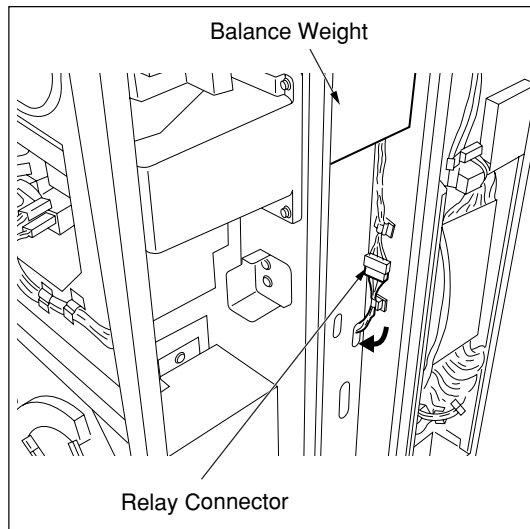
Always carry out "3.6 Adjusting the Peel-Detection Rollers, p.117".

### 2.5.5 Removal of the Sensor Assembly

The sensor assembly contains three different types of sensor, and from the top down, these are the V-SYNC sensor (S12), the absorption detection sensor (S15), and the subscanning HP sensor (S17).

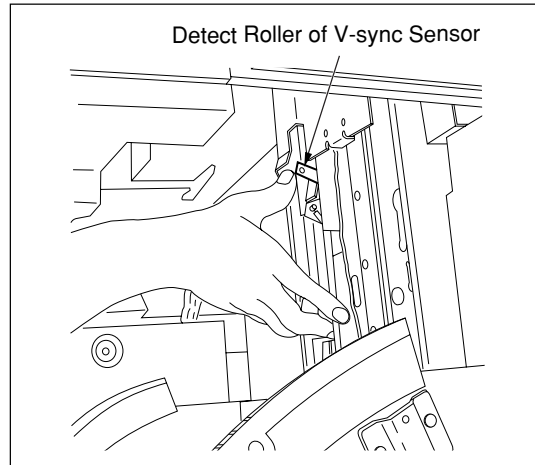


1. Remove the rear cover. ("2.2.1 Removal of the Rear Cover, p.28")
2. Manually raise the balance weight to the top.
3. Uncouple the relay connector and push it out to the front through the hole in the main unit.
  - JP65
4. Lower the balance weight to the bottom by hand.
5. Move to the front, and open the front door.
6. Use the handle to tilt the Transport Unit.
7. Remove a fixing screw which secures the lower part of the sensor assy.
8. Lower the sensor assembly while holding the sheet metal section.

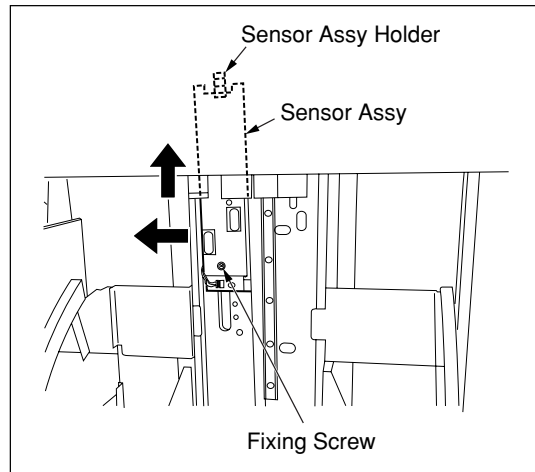


## • Remarks for installation

- When reinstalling the sensor assy into the unit, while pressing the detect roller of the V-sync sensor by finger as shown in the right figure, slide the assy up. If the slide roller is in upright position, it interferes with the activator receptor plate, and cannot be slid in.

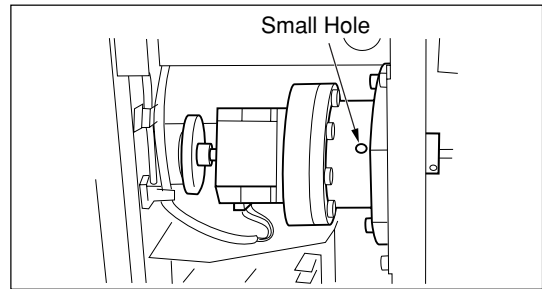


- When sliding the sensor assy up, align the assy to the left end as close as possible.
- After confirming that the top edge of the sensor assy fits into the sensor holder (leaf spring) of the main unit, tighten the fixing screw.



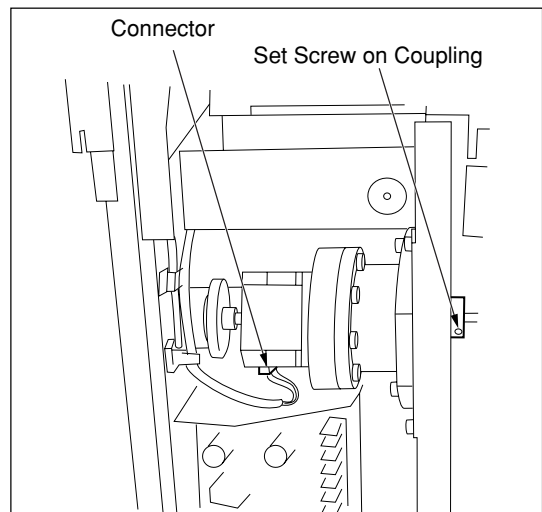
### 2.5.6 Replacement of Subscanning Motor (PM4)

**Important** If the subscanning motor is oriented with its small hole facing downward, there is a possibility that lubrication oil will leak from its interior. When work is being carried out on this motor, either ensure that the hole remains facing up, or close it over with tape or the equivalent.



- **Removal**

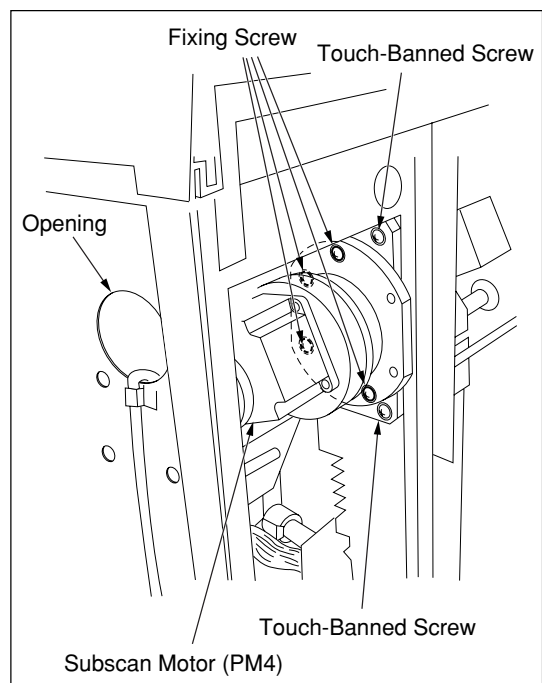
1. Remove the rear cover. ("2.2.1 Removal of the Rear Cover, p.28")
2. Remove the right cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
3. Unplug the connector from the subscanning motor.
  - JP35
4. Loosen the set screw on the coupling.
  - Loosening the set screw releases the link between the subscan motor shaft and the shaft on the steel belt.



5. Remove four fixing screws, and remove the subscanning motor (PM4).

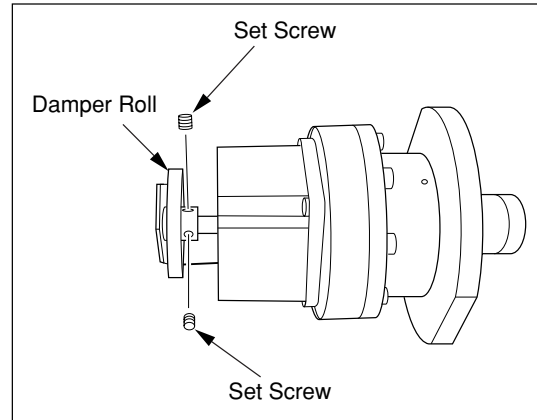
**Important** Remove the four fixing screws which directly secure the subscanning motor, not the four screws which are securing the motor base nearby must not be loosened.

- There is an opening on the right side of the main unit so that a long screw driver can be used through this hole.



**6. Loosen two set screws and remove the damper roll.**

- The removed damper roll shall be used on the new sub-scanning motor; accordingly, it should not be disposed of.



• **Installation**

**1. Install the damper roll on the subscanning motor using two set screws.**

- New subscanning motors are supplied without damper roll.

**2. Remove the sealing sticker from the subscanning motor.**

**Important Once the sealing sticker has been removed, ensure that the hole which it was covering remains oriented upward.**

**3. Attach the subscanning motor to the main body using four fixing screws.**

**4. Use a hexagonal screwdriver or the equivalent to ensure that the set screws are correctly tightened to the rated torque.**

- The set screws are tightened with a torque of approximately 90 N•cm (9 kgf •cm) at the factory.

**5. Plug a connector into the subscanning motor.**

- JP35

**6. Install the rear cover and the right cover in their original position.**

• **Confirmation after installation**

Carry out solid image exposure, and check that there shows not horizontal streaks caused by malfunction of the subscan unit.

## 2.6 Optical Unit

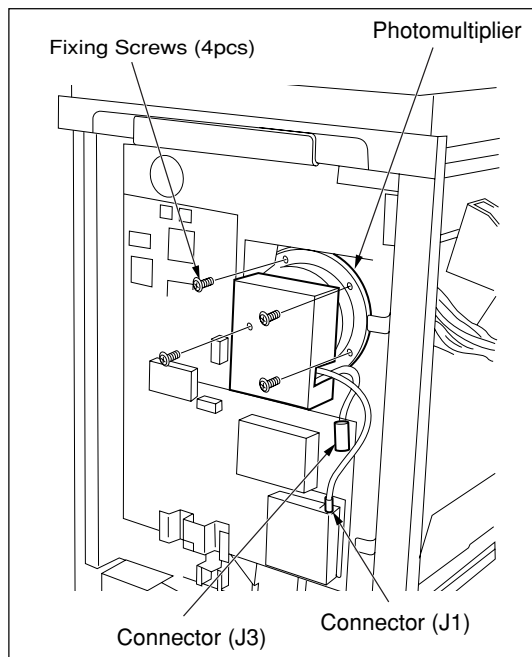
### 2.6.1 Replacement of Photomultiplier (PMT)

**Important** When handling the PMT, be cautious not to touch the light collector (glass surface) with fingers or any object. Once scratch is generated, it may result in deteriorated image quality.

1. Remove the left cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
2. Remove 4 fixing screws, and loosen 2 fixing screws to remove the board cover.
3. Unplug two connectors from the analog/digital board (ADB2).
  - J1, J3
4. Remove four fixing screws, and remove the photomultiplier from the optical unit.

**Important** When placing the photomultiplier on the table, always place it with its light collector side (glass surface) facing up.

5. Carry out reassembly in the reverse order to that described above.



- **Adjustment after replacement**

Always carry out the calibration list below following the "Installation / Service Manual" or REGIUS Console.

- Uniformity Calibration
- Sensitivity Calibration

## 2.6.2 Replacement of Optical Unit

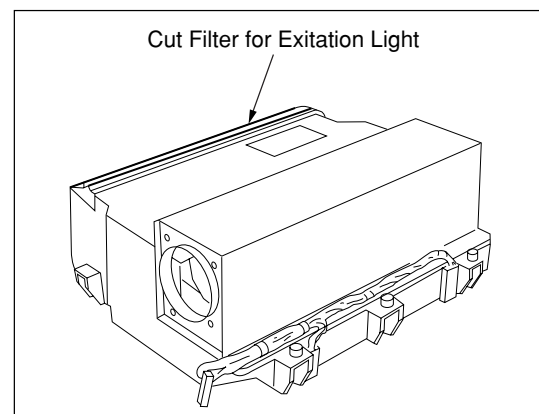
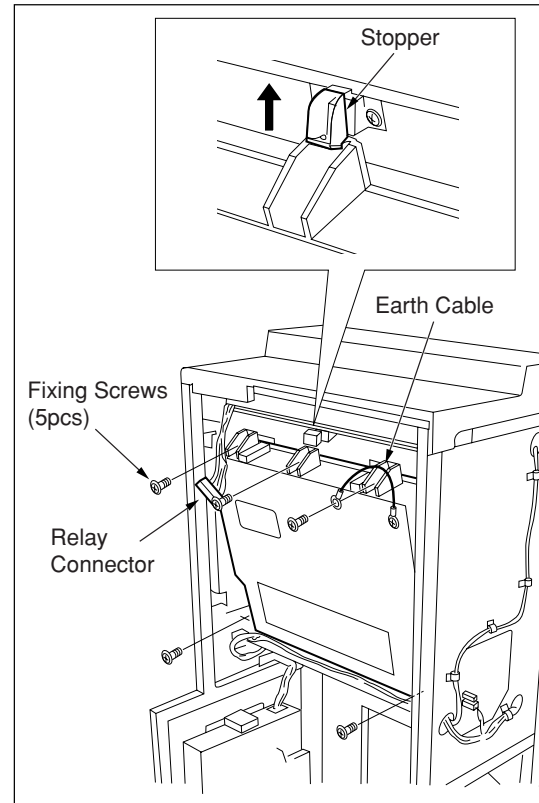
**Caution** The optical unit is made up of precision components: Be sure to avoid banging or knocking these components during installation or removal.



**Caution** Laser diode may be damaged due to the electrostatic generated by human body. Always wear a wrist strap to avoid the electrostatic.



1. Open the front cover.
2. Remove the right and left covers. ("2.2.2 Removal of the Left & Right Covers, p.29")
3. Remove the front-top cover. ("2.2.3 Removal of the Front-Top Cover, p.30")
4. Remove the insertion / ejection unit. ("2.3.2 Removal of the Insertion/Ejection Unit, p.37")
5. Remove the photomultiplier. ("2.6.1 Replacement of Photomultiplier (PMT), p.75")
6. Unplug a relay connector.
  - JJ37
7. Remove 5 fixing screws.
  - The fixing screw on the upper right also fixes the earth cable of the optical unit to the frame.
8. Hold the optical unit to prevent it from toppling over and lift up the stopper.
9. Raise the optical unit by several millimeters and remove it from the main unit.
  - Raising the optical unit allows the protrusions on its lower side to move clear of the main unit.
10. Place the cut filter (blue) for excitation light with its face up, and put a cover (plastic sheet, etc.) so that dust will not stick to the filter surface.
11. Carry out reassembly in the reverse order to that described above.
  - Make sure that the earth cable of the optical unit is fixed to the frame with the fixing screw.



- **Check and adjustment after installation**

Always carry out the calibration below following the "Installation

/ Service Manual" for REGIUS Console.

- Confirmation of Shading Correction
- Sensitivity Calibration
- PLL Adjustment
- Adjustment of Main Scan Start Position

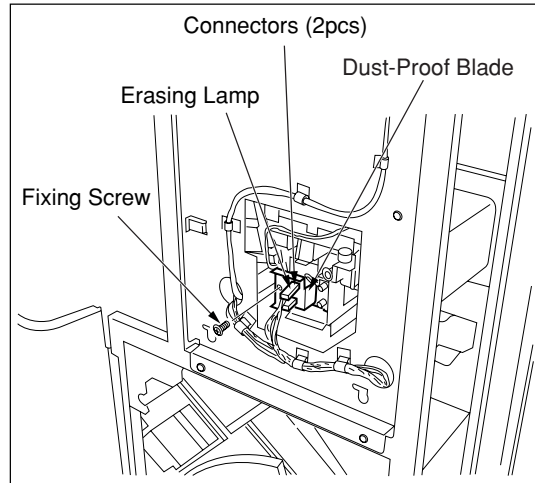
### 2.6.3 Replacement of Erasing Lamps

The erase lamp unit except the lamps is a reusable part. When replacing the lamps, always replace two lamps at a time.

**Caution** To protect from burning, do not touch the erase lamp immediately after it is extinguished.

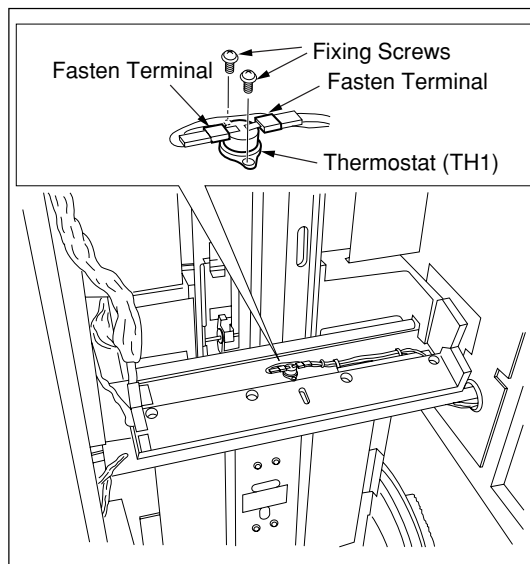


1. Remove the right cover. (See page [p.29](#) )
2. Unplug two connectors.
  - JJ12, JJ13
3.
  - If the dust-proof blade is not drawn out, the erase lamp unit cannot be pulled out because it gets stuck with the folding of the blade.
4. Remove a fixing screw, and remove the erasing lamp.
5. Carry out reassembly in the reverse order to that described above.



## 2.6.4 Replacement of Thermostat (TH1)

1. Open the front cover.
2. Remove the right and left covers. ("2.2.2 Removal of the Left & Right Covers, p.29")
3. Remove the front-top cover. ("2.2.3 Removal of the Front-Top Cover, p.30")
4. Remove the insertion / ejection unit. ("2.3.2 Removal of the Insertion/Ejection Unit, p.37")
5. Remove the photomultiplier. ("2.6.1 Replacement of Photomultiplier (PMT), p.75")
6. Remove the optical unit. ("2.6.2 Replacement of Optical Unit, p.76")
7. Unplug 2 fasten terminal from the thermostat.
8. Remove two fixing screws, and remove the thermostat (TH1).
9. Carry out reassembly in the reverse order to that described above.



### 2.6.5 Checking H-sync Signal

Follow the procedures below to check the H-sync signal. This procedure shall be carried out with the power ON.

Adjustment of the H-sync should not be carried out in the field. When abnormality occurs with the H-sync signal, replace the optical unit as a whole. ("2.6.2 Replacement of Optical Unit", p.76)

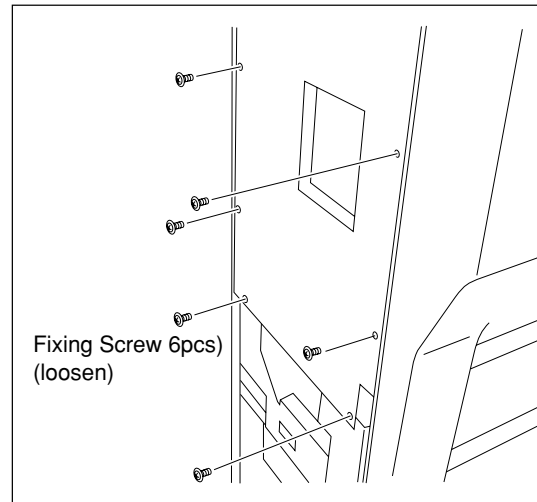
#### **Danger**



**In this procedure, the laser beam may be emitted out of the REGIUS 190. Always wear a laser protection glasses to prevent an eye injury.**

1. Remove the left cover. ("2.2.2 Removal of the Left & Right Covers, p.29")

2. Loosen 6 fixing screws, and detach the board cover.



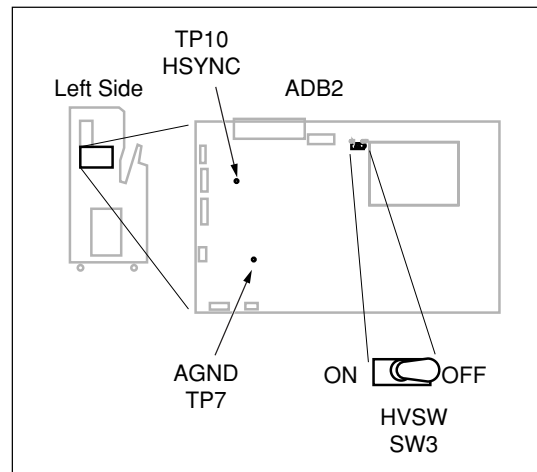
3. Turn OFF (set to the right) the HVSW(SW3) (high voltage SW) of the ADB2 (A/D board).

4. Connect the oscilloscope to TP10 (HSYNC) located at the upper left and to TP7 (AGND) located at lower left of the ADB2.

5. Set the range of the oscilloscope to 2V/div for Y-axis and 2msec/div for X-axis.

6. Wear a laser protection glasses.

7. Read the 14" x 17" cassette at high resolution mode.

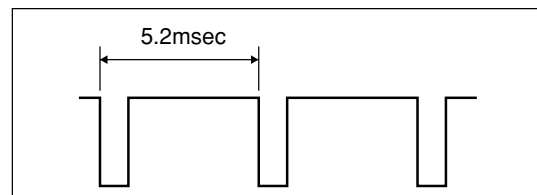


8. Check that the H-sync pulse which appears during the image reading is within the specification.

- Spec.: Interval = approx. 5.2msec

9. When the measured result complies with the specification, reassemble the parts in the reverse order to the above procedure.

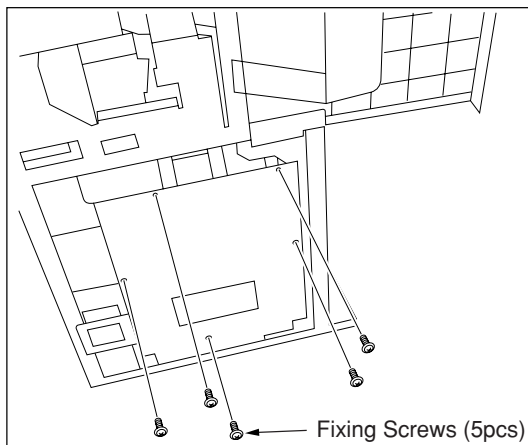
- Do not fail to set the high voltage SW to its original setting, i.e. ON (set to the left).



## 2.7 Electrical Unit

### 2.7.1 Replacement of MCB2 (Mechanical Control Board)

1. Detach the left cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
2. Loosen 5 fixing screws, and remove the MCB2 box cover.



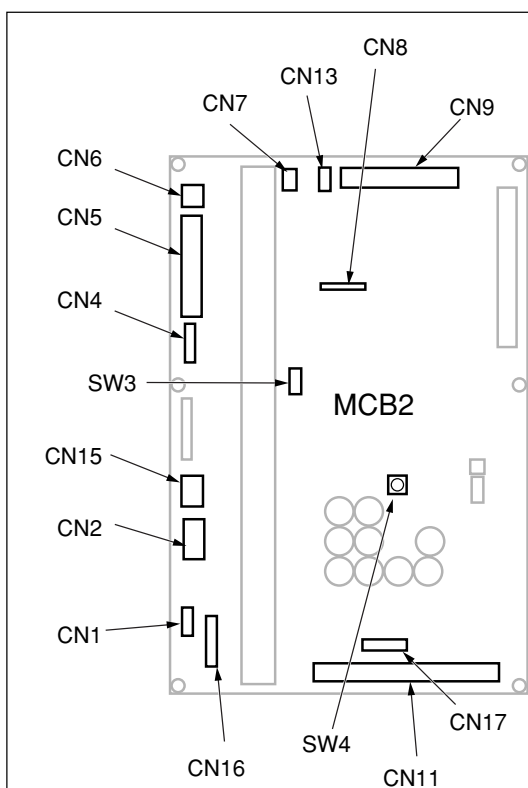
3. Put note of the setting of rotary SW (SW4) and DIP SW (SW3).

- This setting has been adjusted in "3.7 Adjusting the Pressing Amount, p.122", and varies from one machine to the other.

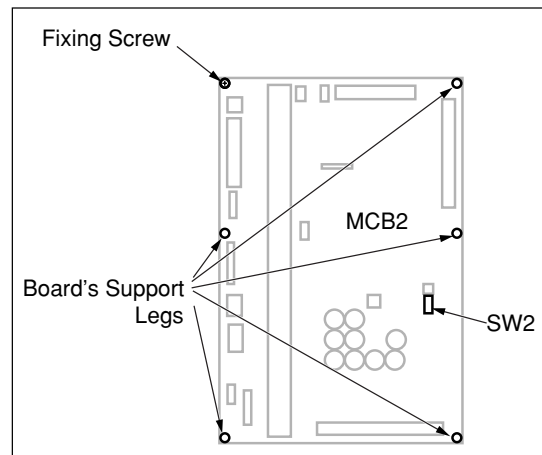
4. Wear an earth strap.

5. Unplug 13 connectors from the MCB2.

- CN1 CN2, CN4, CN5, CN6, CN7, CN8, CN9, CN11, CN13, CN15, CN16, CN17



6. Remove a fixing screw, and pull out the MCB2 from board's support legs (5pcs).
7. Carry out reassembly in the reverse order to that described above.



- **Remarks for Installation**

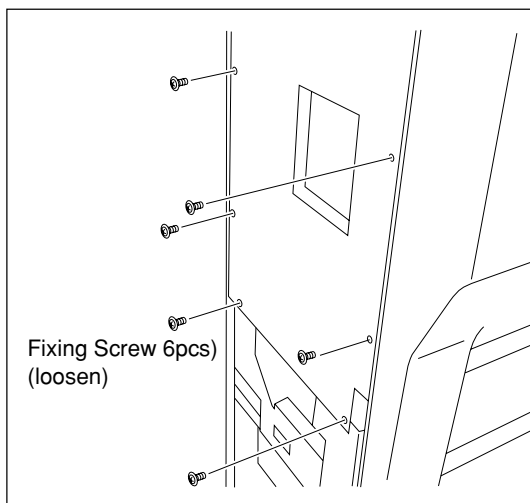
- Set the rotary SW (SW4) and DIP SW (SW3) on the new board according to the note taken in step 3.
- Check that the DIP SW(SW2)'s all dips are set to OFF (set to the left) before turning on the power.
- Update the firmware using the REGIUS Console.

## 2.7.2 Replacement of CF Card

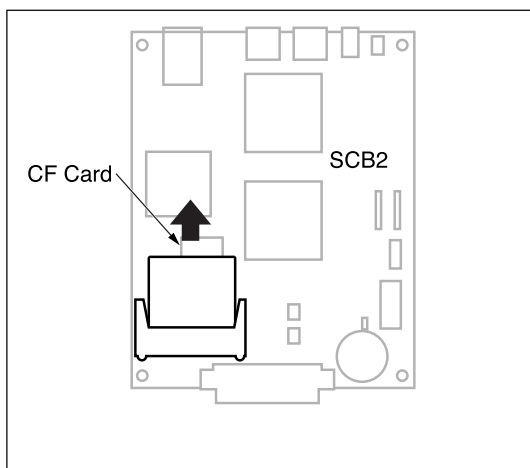
When the CF card is replaced, it is necessary, after completing the replacement to restore the original data of the CF card that have been backed up in the REGIUS Console in advance. All related settings necessary when the CF card is replaced, refer to ("5.3Replacement Procedures of CF Card", p.187).

CF card is installed in the card slot on the SCB2.

1. Detach the left cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
2. Loosen 6 fixing screws, and remove the cover for the PCB.
3. Wear an earth strap.



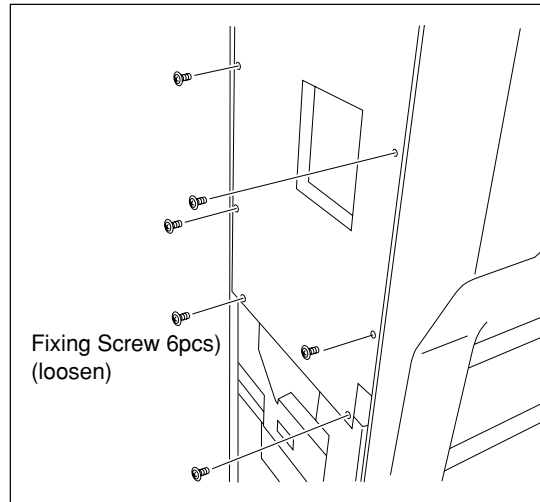
4. Slide the CF card along the arrow, and pull it out from the card slot.
5. Insert a new CF card into the card slot.



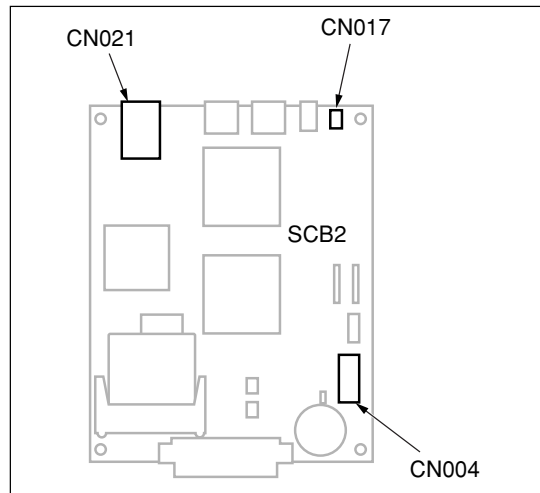
### 2.7.3 Replacement of SCB2 (System Control Board)

When replacing the CF card at the same time, restore the backed up data from the REGIUS Console onto the CF card by following the "Installation/ Service Manual" for REGIUS Console.

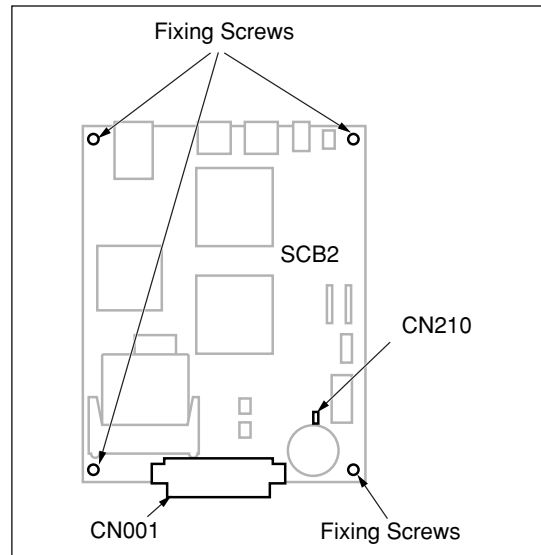
1. Detach the left cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
2. Loosen 6 fixing screws, and detach the board cover.
3. Wear an earth strap.



4. Unplug three connectors from the SCB2.
  - CN004 CN017, CN021



5. Remove 4 fixing screws, and unplug board connector (CN3). Then remove the SCB2.
6. Carry out reassembly in the reverse order to that described above.
  - Check that the jumper pin (CN015) is short-circuited. (other jumper pins should be open)



- **When the CF card is changed at the same time.**

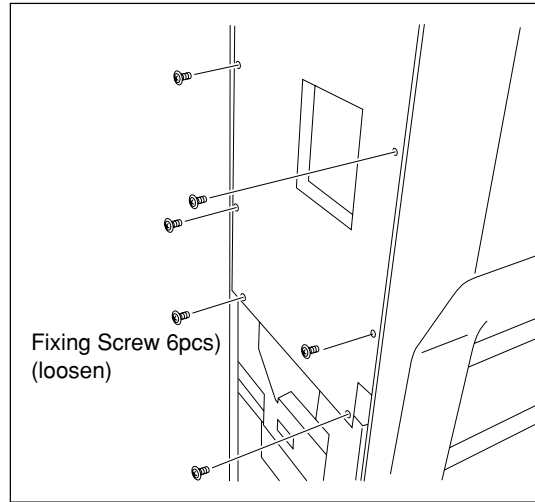
The new CF card contains the default network setting. Therefore, it may not be possible to communicate with the REGIUS Console which was changed in setting at the time of installation. (because of different host name, IP address, subnet setting). In this case, set the network first referring to ("[A.3 Replacement Procedures of CF Card, p.187](#)"), then make connections.

After completing the network connection, make sure that the data of CF card that has been backed up in the REGIUS Console is restored onto the new CF card.

**Important** Do not use the CF card by copying the previous data. Always use the CF card delivered from the factory, which has the software installed. SCB2 operates on Linux OS, and its file system employs a file system which is durable against the breaker-OFF.

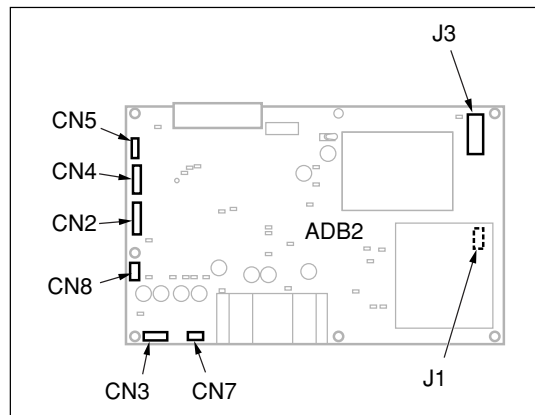
### 2.7.4 Replacement of ADB2 (A/D board)

1. Remove the left cover. ("2.2.2 Removal of the Left & Right Covers, p.29")
2. Loosen 6 fixing screws. Then detach the board cover.
3. Wear an earth strap.
4. Pull out the SCB2.



5. Unplug 8 connectors from ADB2.

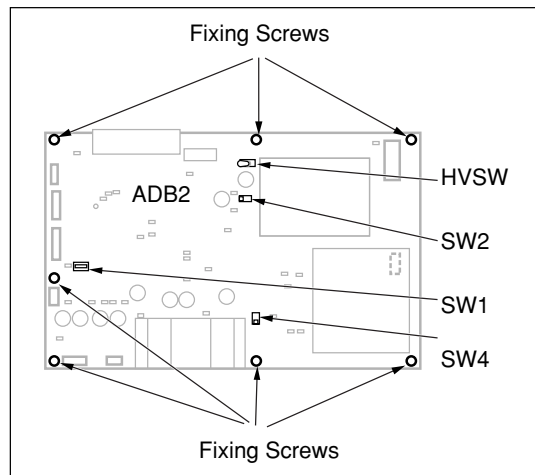
- CN2 CN3, CN4, CN5, CN7, CN8, J1, J3



6. Remove 5 fixing screws, and pull out ADB2.

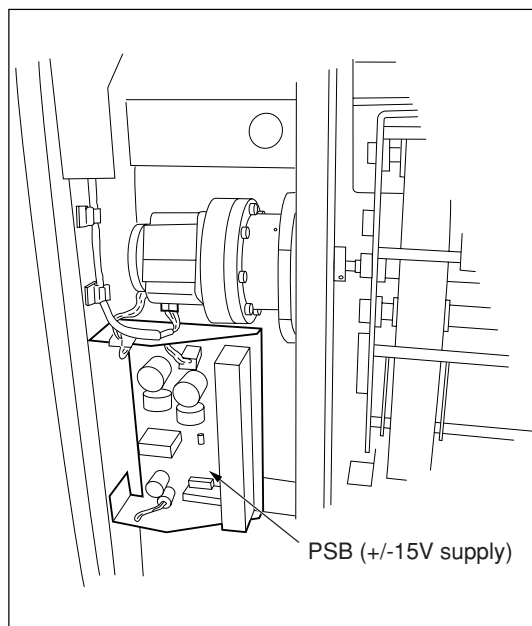
7. Carry out reassembly in the reverse order to that described above.

- Remarks for installation
  - Check that the HVSW is set to ON (left).
  - Check that all dips of SW1 are set to ON.
  - Check that the SW2 and SW4 (auto / manual switching) are set to "Auto".



### 2.7.5 Replacement of PSB ( $\pm 15V$ supply)

1. Remove the rear cover. ("2.2.1 Removal of the Rear Cover, p.28")
2. Unplug two connectors from PSB ( $\pm 15V$  supply).
  - JP6, JP7
3. Remove a fixing screw, and pull out the PSB from board's support legs (3pcs).
4. Carry out reassembly in the reverse order to that described above.



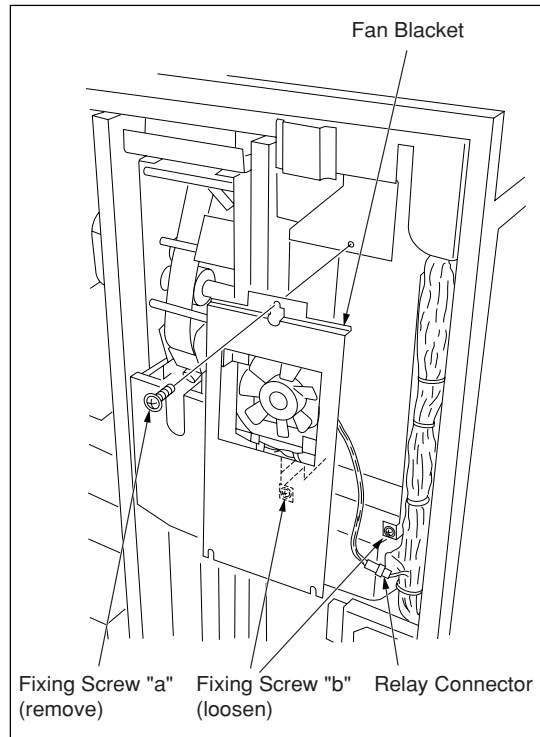
- **Remarks for installation**

When it is replaced with a new PSB, check the voltage at the following point is +15V and -15V using a digital multi meter.

- +15V: PCB JP7 / PIN1 (+15V) - PIN2 (GND)
- -15V: PCB JP7 / PIN3 (-15V) - PIN2 (GND)

### 2.7.6 Replacement of SUP1 (DC5V / 24V supply)

1. Detach the rear cover. ("2.2.1 Removal of the Rear Cover, p.28")
2. Remove a fixing screw "a", and loosen two fixing screws "b".
3. Then remove the fan bracket.
  - Pay attention to the connector for DC supply cooling fan, located on the back of the fan bracket, and do not apply an excessive force.
4. Unplug a relay connector of the DC supply cooling fan.
  - JJ60
5. Unplug two connectors from SUP1 (DC5V / 24V supply).
  - JP2, JP3

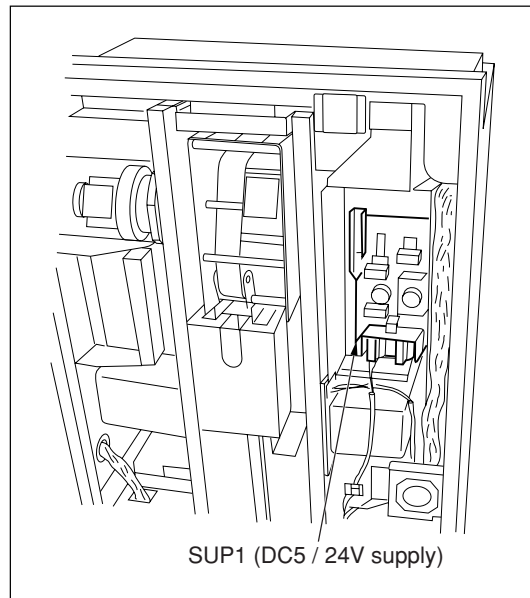


6. Remove 4 fixing screws, and pull out SUP1.
7. Carry out reassembly in the reverse order to that described above.

#### • Remarks for installation

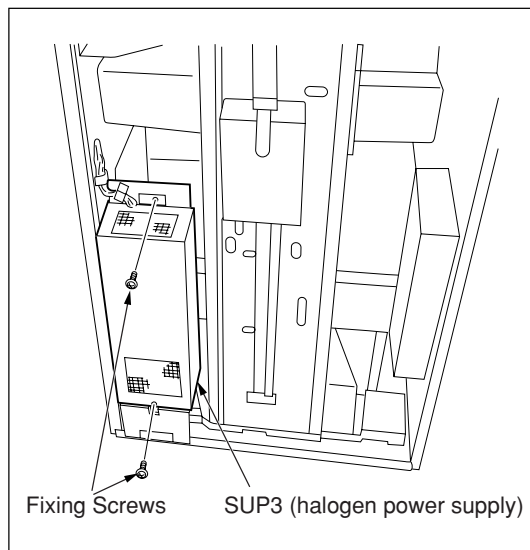
When it is replaced with a new SUP1, check the voltage at the following point is DC 5V and DC 24V using a digital multi meter.

- DC 5V: Between SUP1 JP3 / PIN 10 (5V) - PIN 7 (GND)
- DC 24V: Between SUP1 JP3 / PIN 5 (24V) - PIN 2 (GND)



### 2.7.7 Replacement of SUP3(Halogen Power Supply)

1. Remove the rear cover. (See p.28 )
2. Remove two fixing screws, and remove the cover for the SUP3 (halogen power supply).
3. Unplug three connectors from the SUP 3 (halogen power supply).
  - JP8, JP9, JP11
4. Remove 4 fixing screws, and remove the SUP 3 (halogen power supply).
5. Carry out reassembly in the reverse order to that described above.



- **Remarks for installation**

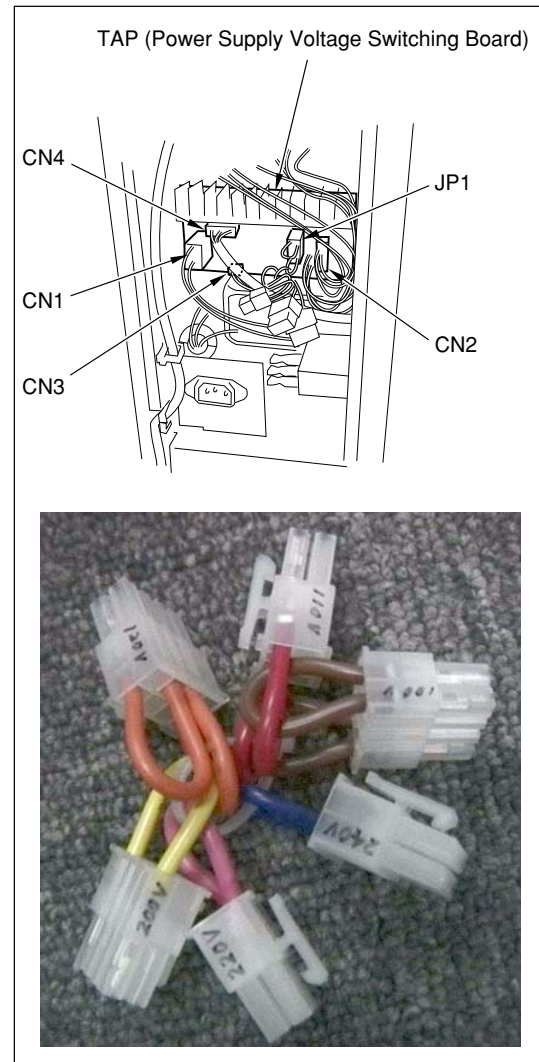
When it is replaced with a new SUP3, check the voltage at the following point is DC 24V using a digital multi meter.

- DC 24V: Between SUP3 JP11 / PIN 1 (24V) - PIN 5 (GND)

### 2.7.8 Replacement of TAP (Power Supply Voltage Switching Board)

1. Remove the rear cover. (See [p.28](#) )
  2. Unplug 5 connectors from the TAP.
    - CN1, CN2, CN3, CN4, JP1
  3. Remove 4 fixing screws, and pull out the TAP.
  4. Carry out reassembly in the reverse order to that described above.
- **Remarks for installation**
- When connecting JP1 to the new board, select the wire color suitable to the power supply (AC) of the facility.

Wire Color	Br	Red	Or	Y	Pink	Blue
Power Voltage	100V	110V	120V	200V	220V	240V





Chap.3

***Maintenance &  
Adjustment***

---



## 3.1 Maintenance Items

### 3.1.1 Maintenance & Service Schedule

Carry out maintenance and service following the timetable shown below.

Maintenance by user: Refer to the operation manual for details.

Frequency Maintenance Task	Weekly	Monthly	Every 6 mo.
Cleaning of the cassette stacker	√		
Cleaning of the REGIUS Plate	√		
Cleaning of the outer covers		√	
Cleaning of the exhaust slot			√

Other maintenance by qualified person only

Frequency Maintenance Task	Every 6 mo.	Every 12 mo.	Refer to;
Cleaning of the cassette magnetizing (absorption) plate	√		<a href="#">p.98</a>
Cleaning of the exit rollers	√		
Lubrication to the LM guide		√	<a href="#">p.94</a>
Greasing the warm wheel of transport unit		√	<a href="#">p.95</a>
Lubrication to the release shaft holder		√	<a href="#">p.96</a>
Cleaning of the power supply cooling fan		√	<a href="#">p.97</a>
Replacement of the erasing lamps	app. every 10,000 shots		<a href="#">p.78</a>

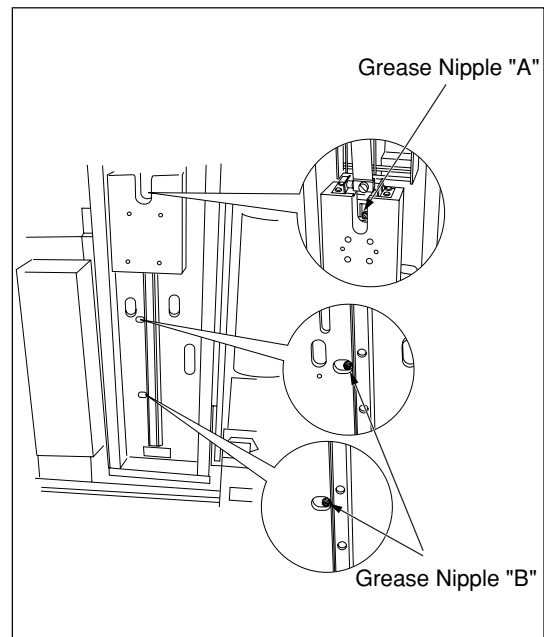
### 3.1.2 Lubrication of the LM Guide

Using a grease gun, lubricate the metal grease to the specified points once a year, following the procedures below.

- Recommended Grease: AFC grease by THK.
- Grease Gun: MG70
- Grease Gun Discharge Rate; app. 0.6ml / stroke

**Important** Never apply a grease to the steel belt.  
Doing so may cause a malfunction in sub-scanning.

1. Remove the rear cover. ("2.2.1 Removal of the Rear Cover, p.28")
2. Lubricate via grease nipple "A" on the balance weight.
  - Trigger the grease gun twice.
3. Move the balance weight up and down until the two grease nipples [B] can be seen through the lubrication hole, and then lubricate via these two points.
4. Lubricate via grease nipple "B" (2 locations).
  - Trigger the grease gun twice for each nipple.



- **Checks after lubrication**

Expose the solid density image, and check there is no horizontal streaks on the image.

**Important** If rust is found when lubricating, never fail to wipe it off.

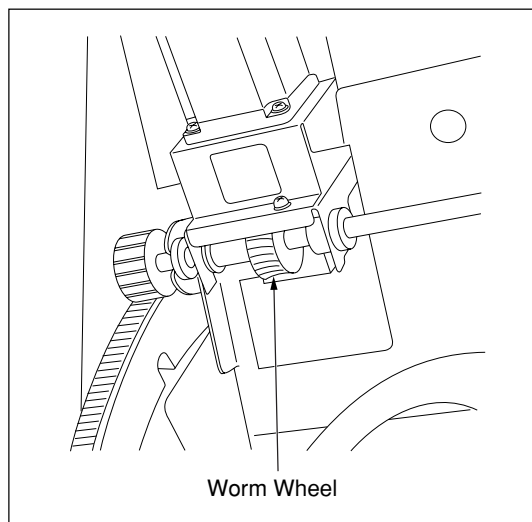
### 3.1.3 Lubrication to the Transport Motor Gears

Using a grease gun, lubricate the metal grease to the worm wheel once a year.

- Before shipment, a grease, is applied to the worm wheel.

1. Open the front cover.
2. Apply the grease directly to the worm wheel.

**Important** Never apply a grease to the antislip rubber on the surface of the justification mechanism, which press and hold the cassette. Should it is accidentally applied to the worm wheel, wipe it with an alcohol. In this case, it is necessary to leave the device for minimum 2 days without operation.

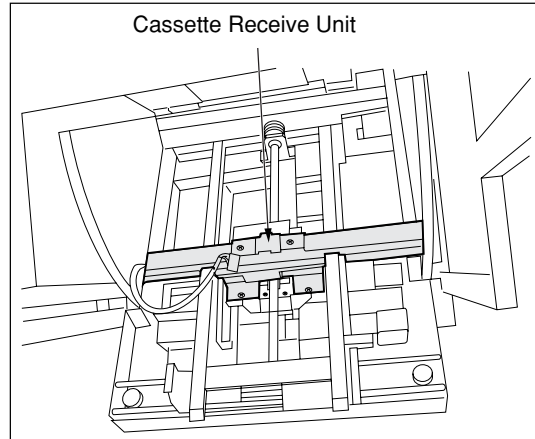


### 3.1.4 Lubrication to the release shaft holder

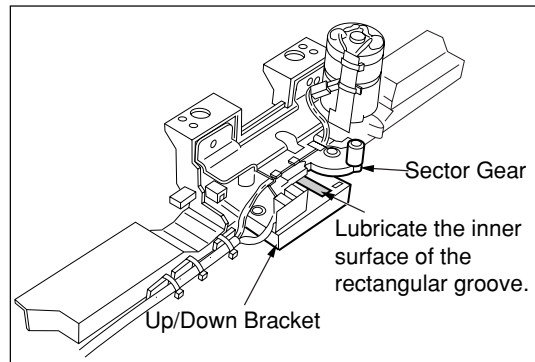
Lubricate the actuator part of the release shaft holder once a year.

- Recommended grease: PlusGuard No.2 of Kyodo Yushi Co., Ltd. or equivalent.

1. Open the front door.
2. Using the handle for transport unit, lean the transport unit.
3. Remove the cassette receive unit.(refer to [p.54](#) )



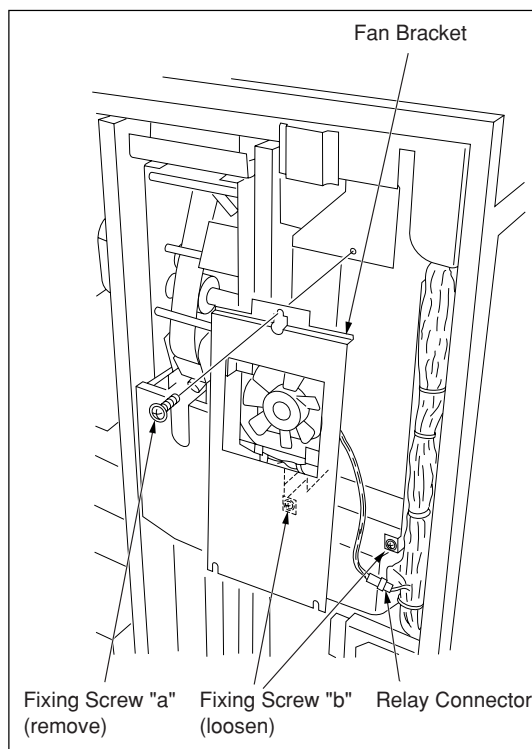
4. Apply a small amount of grease to the inner side of the angle groove of the up/down bracket within which the release shaft holder actuates.
5. Move the sector gear several times to actuate the release shaft holder so that the grease spread over the surface.
6. Reverse the procedure of removal, and install the cassette receiver unit on the transport unit.



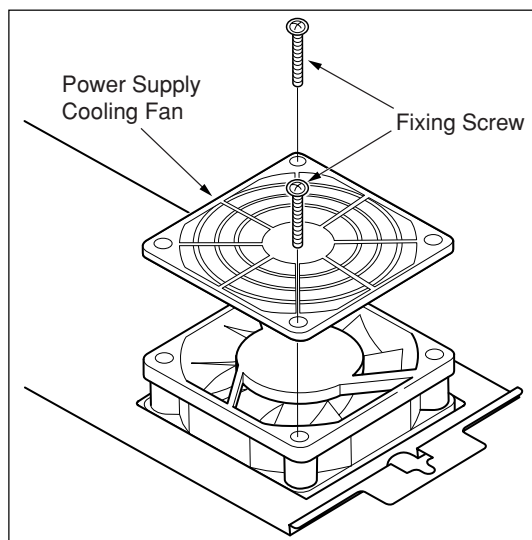
### 3.1.5 Cleaning of Power Supply Fan Filter

Clean the filter once a year following the procedure below.

1. Remove the rear cover. (refer to p.28)
2. Remove one fixing screw "a", and loosen 2 fixing screws "b" to remove the fan bracket.
  - Be careful not to apply excessive force to the DC power supply cooling fan connector that is located on the back of the fan bracket.
3. Unplug one relay connector of the DC power supply cooling fan.
  - JJ60



4. Remove 2 fixing screws retaining the power supply cooling fan, and remove the power supply cooling fan filter.
5. Vacuum the dust accumulated on the back side (fan side) of the filter using a vacuum cleaner.
6. Install the power supply cooling fan filter at its original position, and install the fan bracket in the reverse order of removal.



### 3.1.6 Cleaning of Cassette Magnetizing Plate

Gently clean the surface of the cassette magnetizing plate (magnetizing surface) with an alcohol every 6 months. At the same time, check that there is no scratches on the surface of the plate.

**Important** To avoid warping of the cassette magnetizing plate, do not apply excessive force to the surface.

## 3.2 Set Up of dummy SBC2 program

To check each operation of mechanical control, use the dummy SBC2 program. Start the dummy SBC2 program following the procedures below.

**Important** Do not change the setting of DIP SW other than SW2- 1 on the MCB2. (for the rest of DIP SWs, refer to ("A.2 DIP Switch Setting, p.184")

**Important** To terminate the dummy SBC2 program, confirm that the all dips of DIP SW (SW2) are set to OFF (left).

### 3.2.1 Installing the dummy SBC2 program

- **Preparation of maintenance PC**

Prepare a PC which satisfies the following specifications.

- OS: Windows2000 or later
- Interface: EIA-232C (D-Sub9P)

- **Installation**

1. Before start installation, check that all of following files are available.
  - DmyScbEng.msi
  - InstMsiA.exe
  - InstMsiW.exe
  - setup.exe
  - setup.ini
2. Start "setup.exe", and follow the messages shown on the window.
  - When the installation completes successfully, a short-cut to the dummy SBC2 program will be automatically created.

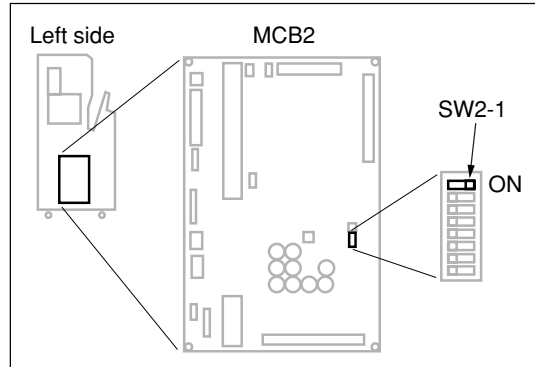


Refer to "A.1 SCB2 Dummy Program Screens, p.169" for the details of dummy SBC2 program screens.

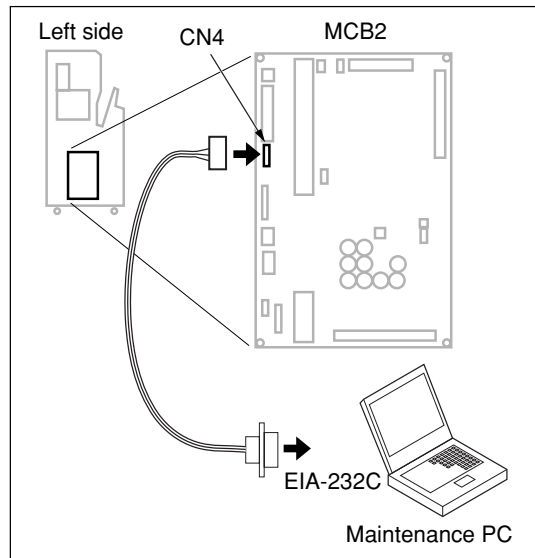
### 3.2.2 Connection

Connect the maintenance PC to the REGIUS 190.

1. Move the REGIUS 190's power breaker to the OFF position.
2. Remove the left side cover. "2.2.2 Removal of the Left & Right Covers, p.29")
3. Loosen 5 fixing screws, and remove the cover of the mechanical control box.
4. Move the SW2-1 dip switch on the top of the MCB2 to the ON (right) position.



5. Unplug the connector from CN4 on the MCB2.
  - CN4
6. Connect the Unit Checker RS-232C cable between CN4 and the EIA-232C port of the maintenance PC

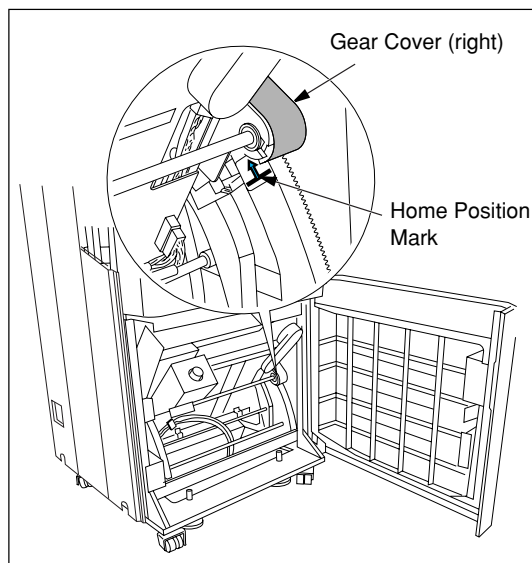


### 3.2.3 Start Up of REGIUS 190

1. Open the front cover of REGIUS 190, and check that there is not cassette left inside.
2. Check that the gear cover (right) is located behind the home position mark.
  - If the gear cove is located before the home position mark, move the transport unit using the handle.
3. Insert the interlock release key into the interlock switch.

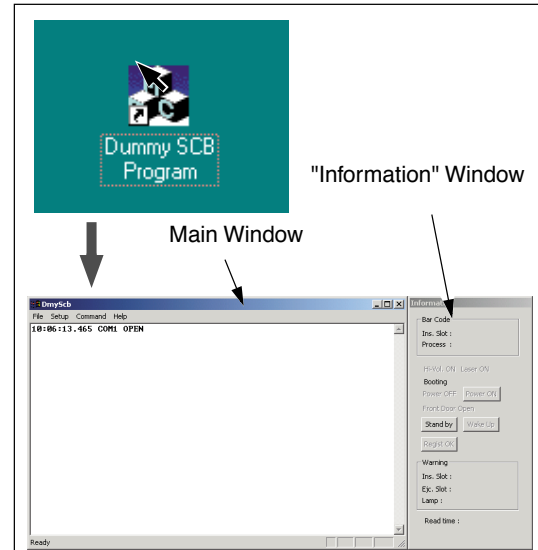
**Important** Make sure that the handle (for tilting the transport unit) is returned to the handle pocket before inserting the interlock-release key.

4. Move the power breaker to the ON position.
5. Press the REGIUS 190's Operation button.

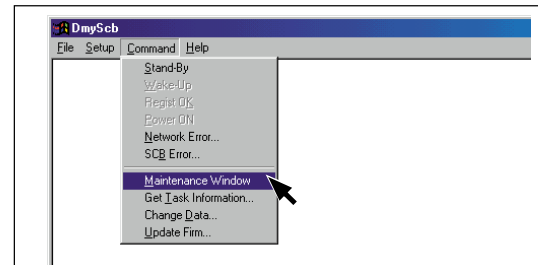


### 3.2.4 Starting the dummy SBC2 program

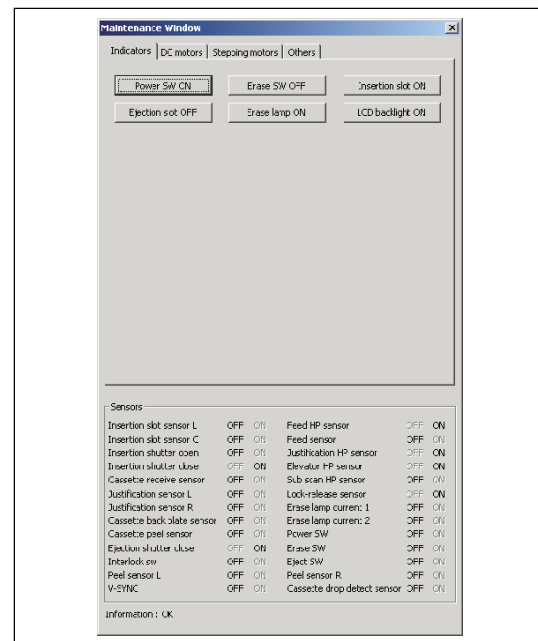
1. Start the maintenance PC.
2. Double-click the short-cut for "dummy SBC2 program" on the desk top.
  - dummy SBC2 program starts up, and "Main" window and "Information" window will be shown.
  - "COM1 OPEN" will be shown on the "Main" window.
  - "Starting..." will be shown on the "Information" window.



3. Select "Command (C)", then "Maintenance Window (M)"



- "Maintenance" window will be shown.



Implementing the above procedures completes the preparation of dummy SBC2 program.

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- **If the start up was unsuccessful;**

Phenomena	Action
"READY" will not appear on the LCD even after successfully completing initialization of the REGIUS 190.	1) Check that the DIP SW setting on the MCB2. 2) Check that the cables are properly connected. 3) Restart the "dummy SBC2 program", and check that the "Starting..." is on the "Information" window is shown in black. 4) Restart the REGIUS 190.
Though "READY" is shown on the LCD panel of the REGIUS 190, "Starting ..." on the "Information" window does not change to screened text.	1) Check that the DIP SW setting on the MCB2. 2) Restart the REGIUS 190.
"COM1 OPEN" is not shown on the "Main" window, and a message "COM Port not available" is shown on the pop up. <ul style="list-style-type: none"> <li>• Either the COM1 port of the maintenance PC is disabled or occupied by other application.</li> </ul>	1) Select "Setup" --> "Communication Port" in the main window menu. <div data-bbox="933 697 1192 900" data-label="Image"> </div> 2) Select an available port in the combo box for COM ports.

---

### 3.2.5 Cautions in Operation of Dummy SCB2 Software

Different from the normal operation, the dummy SBC2 program can start each motor regardless of its status. Therefore, it may cause damage on the component parts if it is forcefully run for abnormal operation.

Special attention has to be paid when operating stepping motors as shown below.

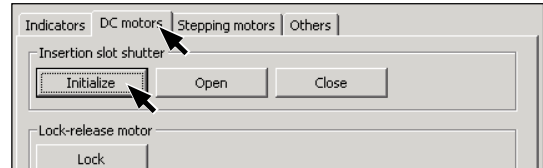
Stepping Motors		Cautions
<b>Sub scanning Motor</b>		Transport unit must not be located at magnetizing position.
		Move to the HP before starting subscanning operation.
		Implement the erasing operation (read mode) after the subscanning operation is completed.
		Move to the HP before starting the erasing operation (erase mode).
		Move to the HP before inserting the cassette.
<b>Transport Unit Motor</b>		Move the receiver to the transport standby position before starting the initialization.
		Receiver must be located at the transport standby position when it is moved to the magnetizing position.
		Move to the HP before inserting the cassette.
<b>Elevator Unit Motor (Cassette Receive Unit)</b>		Transport unit must not be located at the magnetizing position.
		Move the justification assy to the HP before starting the initialization.
		Move to the HP before moving to the receiving position.
		Move to the HP or receiving position before moving to the transport standby position.
		Move to the HP before inserting the cassette.
<b>Justif</b>	<b>Motor</b>	Transport unit must not be located at the magnetizing position, nor the receiver at the HP.
		Move to the HP before inserting the cassette.

### 3.3 Verification of Initializing Sequence

To initiate initialization in the same order as actual sequence using the dummy SBC2 program, follow the procedures below.

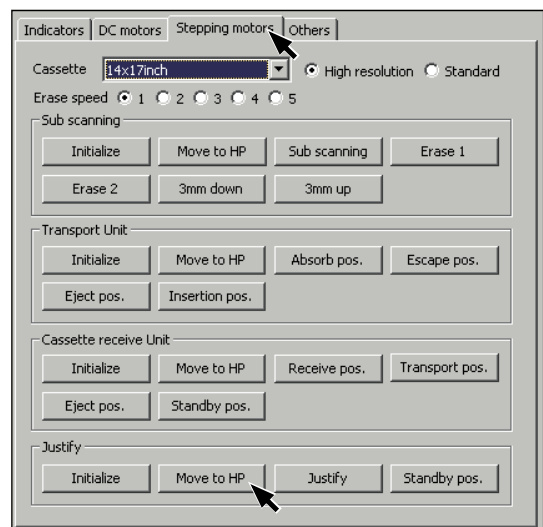
1. Start up the dummy SBC2 program, and bring the maintenance window to the screen. ("3.2 Set Up of dummy SBC2 program, p.99")
2. Check the initializing sequence of the insertion slot shutter.

- 1) Click [DC motors] tab.
- 2) Click [Initialize] of "Insertion slot Shutter".
- 3) Check that "Insertion Slot Initialize ...OK" is shown on "Information :".



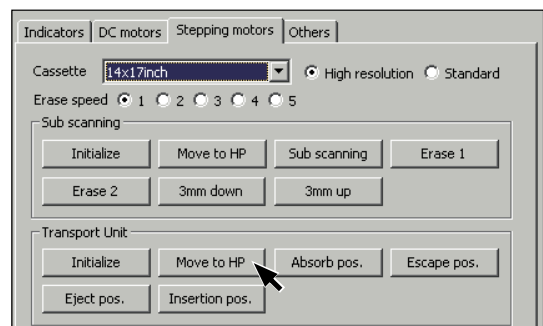
3. Move the justification assy to the HP.

- 1) Click [Stepping motors] tab.
- 2) Click [Move to HP] of "Justification".
- 3) Check that "Move to Justification HP...OK" is shown on "Information :".



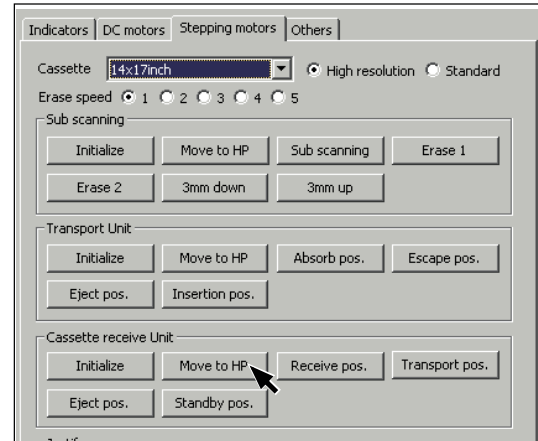
4. Move the transport unit to the HP.

- 1) Click [Move to HP] of "Transport Unit"
- 2) Check that "Move to Transport Unit to HP...OK" is shown on "Information :".



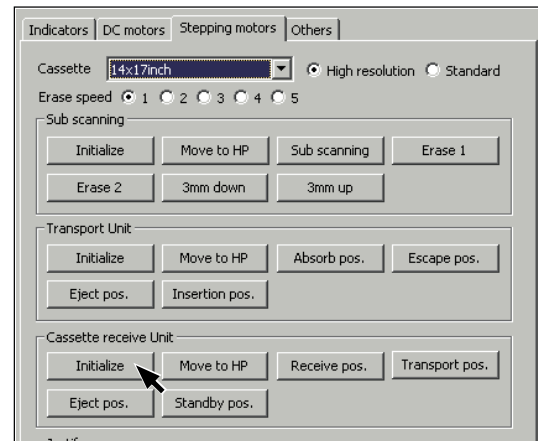
### 5. Move the Elevator Unit (Cassette Receive Unit) to the HP.

- 1) Click "Move to HP" of "Cassette receive Unit".
- 2) Check that "Move to Cassette receive Unit...OK" is shown on "Information : ".



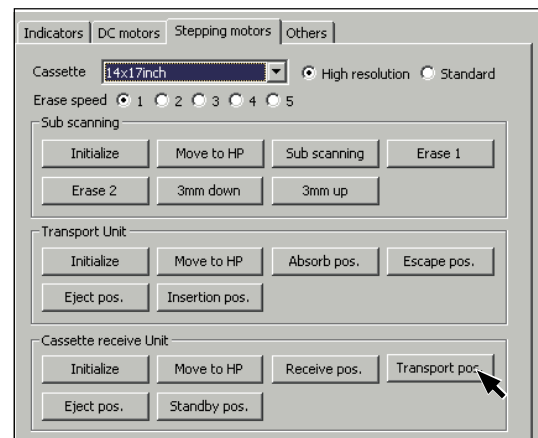
### 6. Check the initialization sequence of Cassette receive Unit.

- 1) Click "Initialize" of "Cassette receive Unit".
- 2) Check that "Cassette receive Unit Initialize...OK" is shown on "Information : ".



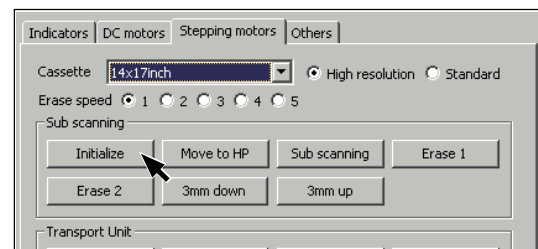
### 7. Move the Cassette receive Unit to the transport standby position.

- 1) Click "Transport pos." of "Cassette receive Unit".
- 2) Check that "Cassette receive Unit at Transport-Standby...OK" is shown on "Information : ".



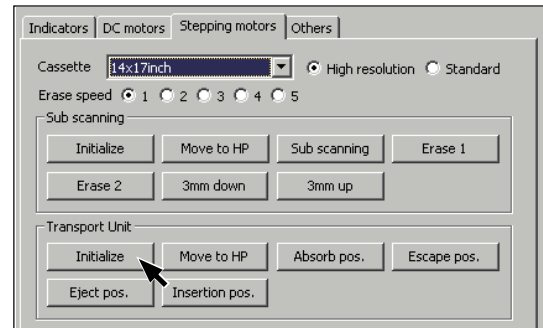
### 8. Check the initialization sequence of sub scanning unit.

- 1) Click "Initialize" of "Sub scanning".
- 2) Check that "Sub scanning Unit Initialize...OK" is shown on "Information : ".

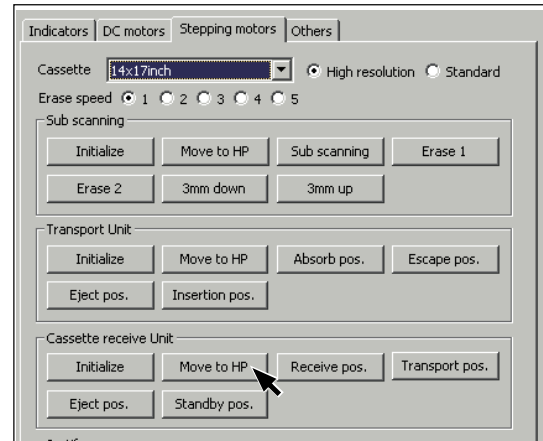


**9.** Check the initialization sequence of Transport Unit.

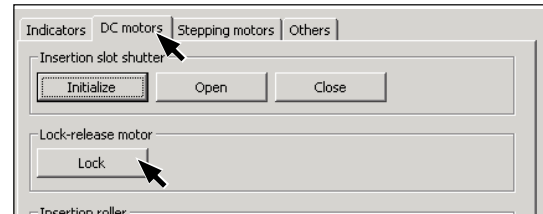
- 1) Click "Initialize" of "Transport Unit".
- 2) Check that "Transport Unit Initialize...OK" is shown on "Information : "

**10.** Move the Cassette receive Unit to the HP.

- 1) Click "Move to HP" of "Cassette receive Unit".
- 2) Check that "Cassette receive Unit to HP...OK" is shown on "Information : ".

**11.** Check the lock operation.

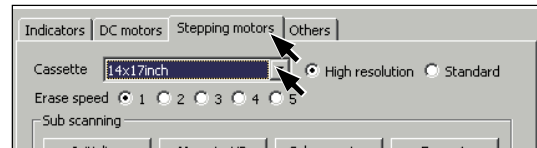
- 1) Click [DC motors] tab.
- 2) Click [Lock] of "Lock-release motor".
- 3) Check that "Lock...OK" is shown on "Information : ".



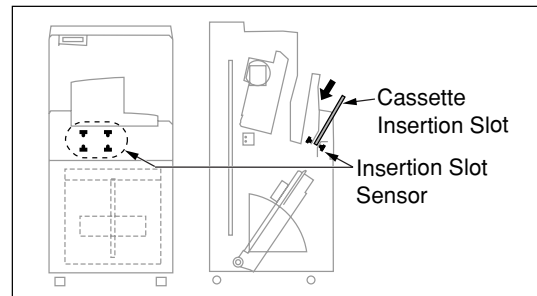
## 3.4 Verification of Reading Operation

To check the operation from cassette insertion through ejection using the dummy SBC2 program, follow the procedures below.

1. Start up the dummy SBC2 program, and bring the maintenance window to the screen. ("3.2 Set Up of dummy SBC2 program, p.99")
2. Check that the initialization is successful following ("3.3 Verification of Initializing Sequence, p.105").
  - This step can be neglected if the initialization has been completed after the REGIUS 190 had successfully started up.
3. Select the cassette type on the window depending on the cassette size which will be tested.
  - The position of the Cassette receive Unit will be automatically adjusted according to the selection of the cassette type.
  - 1) Click [Stepping motors] tab.
  - 2) Click the combo box of "Cassette", and show the cassette size to be tested.

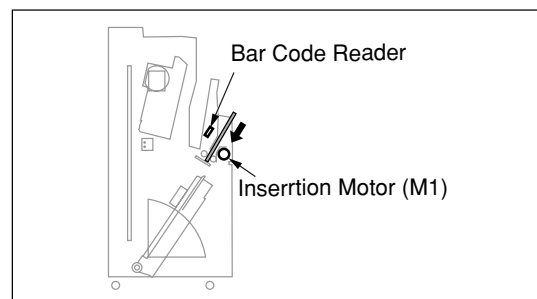


4. Check the lock of the cassette, and insert the cassette into the insertion slot.
  - 1) Check that all claws on the back plate are coupled with the receiver hole of the front plate.
  - 2) With the bar code facing up, insert the cassette into the insertion slot by aligning cassette to the left edge of the device.
  - 3) Check that the "Insertion slot sensor L" and "Insertion slot sensor C" turn ON.

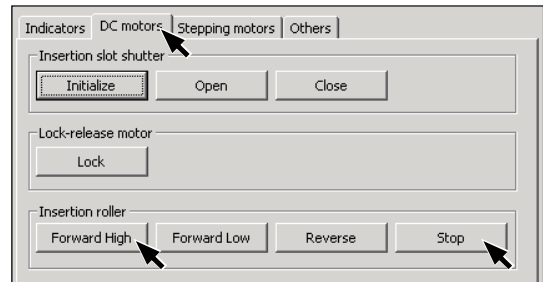


Sensors					
Insertion slot sensor L	OFF	ON	Feed HP sensor	OFF	ON
Insertion slot sensor C	OFF	ON	Feed sensor	OFF	ON
Insertion shutter open	OFF	ON	Justification HP sensor	OFF	ON
Insertion shutter close	OFF	ON	Fluorescent Lamp	OFF	ON

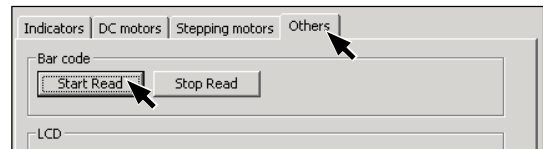
5. Reads the bar code labeled on the back plate.



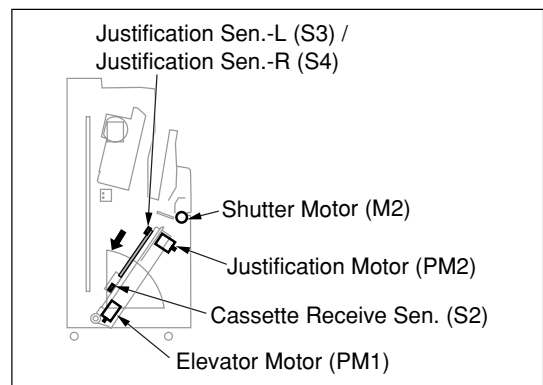
- 1) Click [DC motors] tab.
- 2) Click [Forward High] of "Insertion Roller".
- 3) Wait for 1 second or longer, click [Stop] of "Insertion Roller".



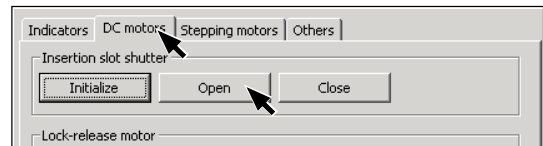
- 4) Click "Others" tab.
- 5) Click [Start Read] of "Bar code".
- 6) Check that "Reading Bar Code ..." is shown on "Information: " window, and the value read in is shown.



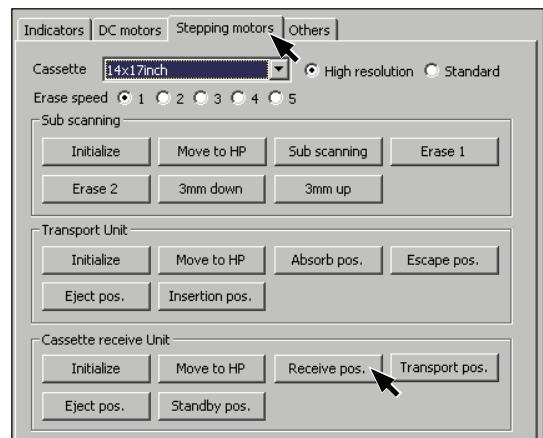
6. The cassette is then drawn into the device, and sandwiched by justification mechanism from right and left.



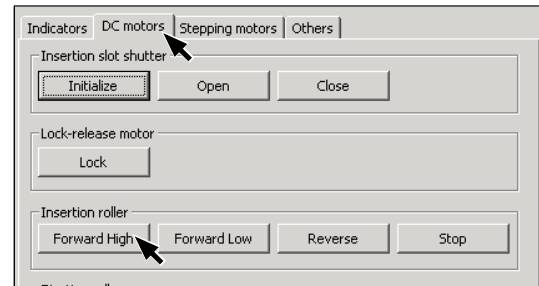
- 1) Click [DC motors] tab.
- 2) Click [Open] of "Insertion slot shutter".



- 3) Click "Stepping motors" tab.
- 4) Click [Receive pos.] of "Cassette receive Unit".
- 5) Check that "Cassette receive Unit at Receive Position ...OK" is shown on "Information : " window.



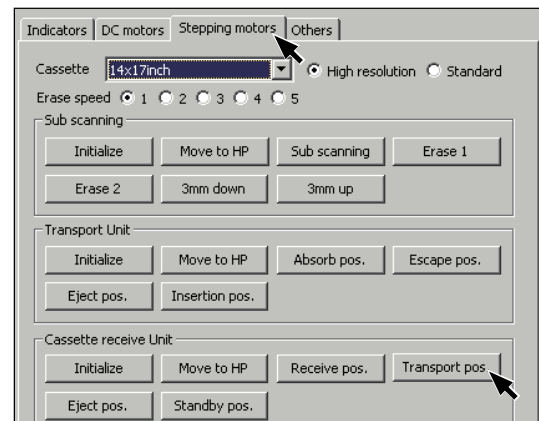
- 6) Click [DC motors] tab.
- 7) Click [Forward High] of "Insertion roller".



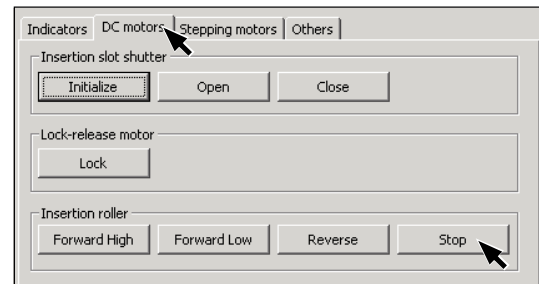
- 8) Check that "Cassette on Cassette receive Unit Detect" of "Sensor" is switched to ON.

Cassette receive sensor	OFF	ON	Sub scan HP sensor	OFF	ON
Justification sensor L	OFF	ON	Lock-release sensor	OFF	ON
Justification sensor R	OFF	ON	Erase lamp current: 1	OFF	ON

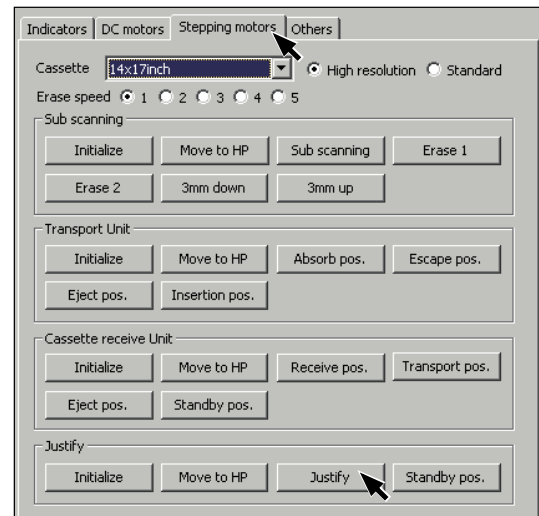
- 9) Click [Stepping motors] tab.
- 10) Click [Transport pos.] of "Cassette receive Unit".
- 11) Check that "Cassette receive Unit at Transport Position ...OK" is shown on "Information : " window.



- 12) Click [DC motors] tab.
- 13) Click [Stop] of "Insertion roller".



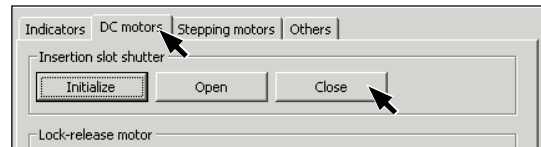
- 14) Click [Stepping motors] tab.
- 15) Click [Justify] of "Justify".



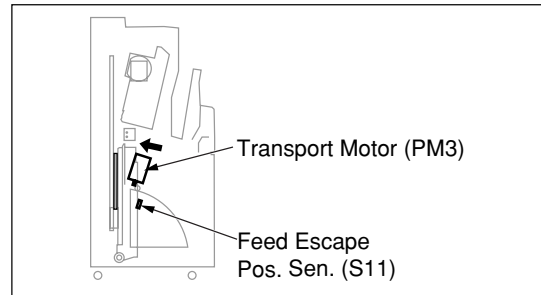
- 16) Check that "Justification sensor L" and "Justification sensor R" of "Sensor" turn "ON".

Cassette receive sensor	OFF	ON	Sub scan HP sensor	OFF	ON
Justification sensor L	OFF	ON	Lock-release sensor	OFF	ON
Justification sensor R	OFF	ON	Erase lamp current: 1	OFF	ON
Cassette back plate sensor	OFF	ON	Erase lamp current: 2	OFF	ON

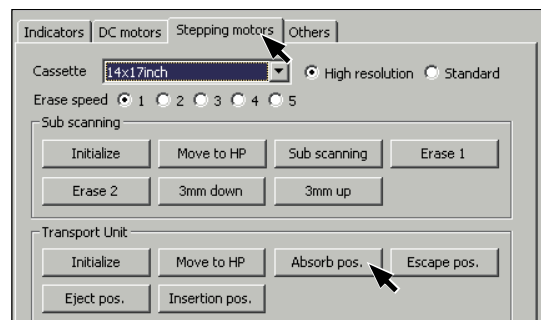
- 17) Click [DC motors] tab.
- 18) Click [Close] of "Insertion slot Shutter".



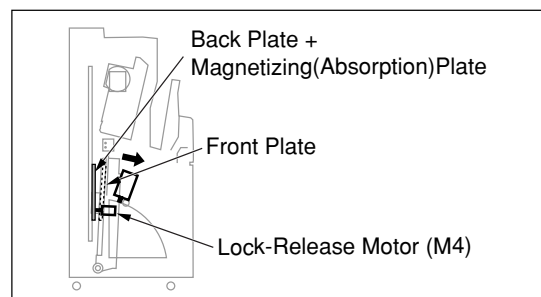
7. Transports the cassette to the magnetizing (absorb) position.



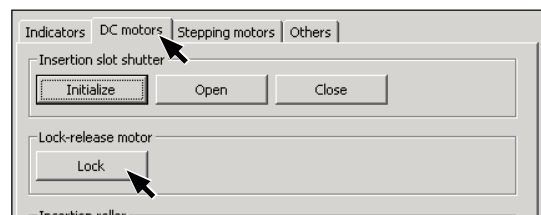
- 1) Click [Stepping motors] tab.
- 2) Click [Absorb pos.] of "Transport Unit".
- 3) Check that "Transport Unit Magnetizing Position ...OK" is shown on "Information : " window.



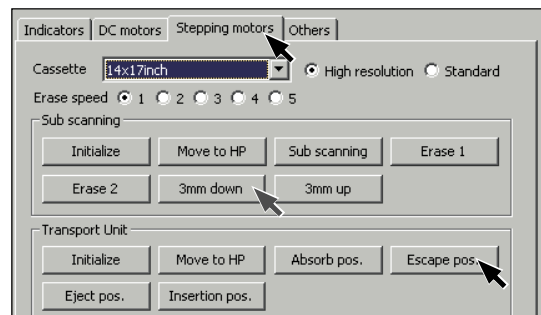
8. Releases the cassette open / close lock, and separates the front plate from the back plate.

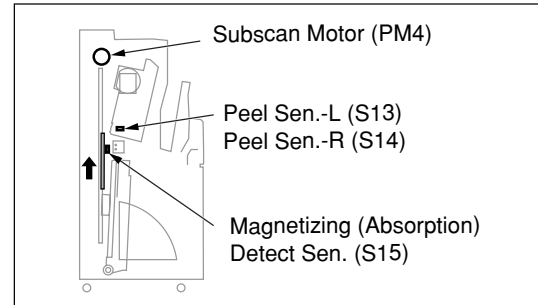


- 1) Click [DC motors] tab.
- 2) Click [Lock] of "Lock-release motor".
- 3) Check that "Lock ...OK" is shown on "Information : " window.



- 4) Click [Stepping motors] tab.
- 5) Only when the cassette is mammo type, click [3mm down] of "Sub scanning".
- 6) Click [Escape pos.] of "Transport Unit".
- 7) Check that "Transport Unit Escape pos. ...OK" is shown on "Information : " window.



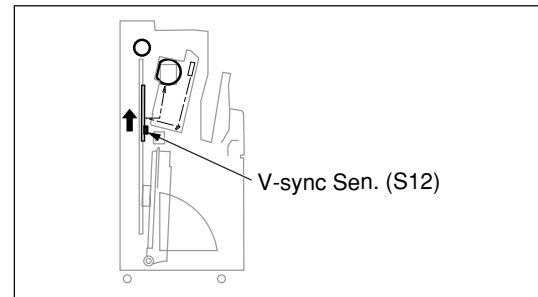
**9.** Subscanning operation starts.

- 1) Check that the "Cassette back plate sensor" of "Sensor" is "ON".
- 2) Click [Sub scanning] of "Sub scanning".

Justification sensor R	OFF	ON	Erase lamp current: 1	OFF	ON
Cassette back plate sensor	OFF	ON	Erase lamp current: 2	OFF	ON
Cassette peel sensor	OFF	ON	Power SW	OFF	ON
First head detection	OFF	ON	Erase SW	OFF	ON



- Cassette magnetizing plate elevates.
- Image reading by the optical unit will not be implemented.

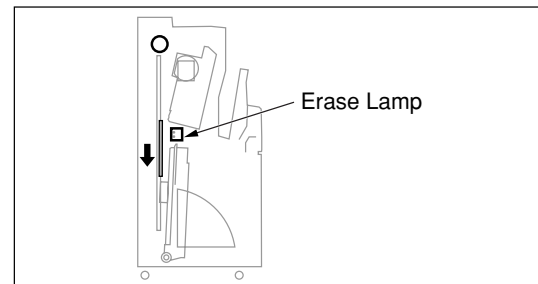


- 3) Check that [V-SYNC] of "Sensor" switches from "OFF" to "ON".
- 4) Check that "Subscan : Subscanning ...OK" is shown on "Information : " window.

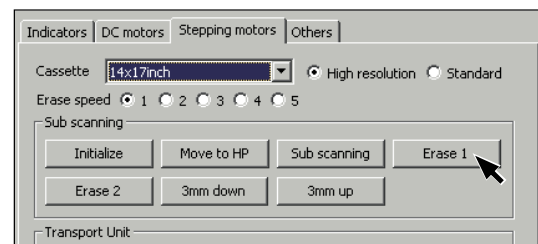
Peel sensor L	OFF	ON	Peel sensor R	OFF	ON
V-SYNC	OFF	ON	Cassette drop detect sensor	OFF	ON

**10.** Erasing operation starts.

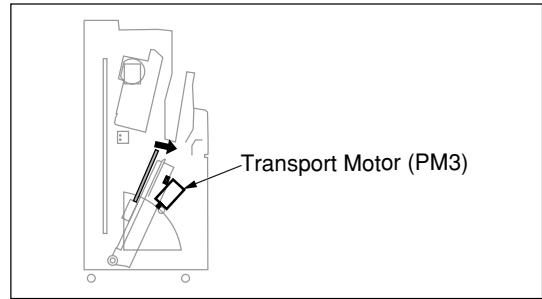
- Erasing lamp will not be turned on.



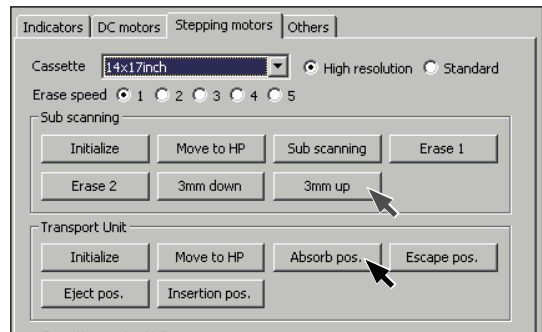
- 1) Click [Erase 1] of "Sub scanning".
- 2) Check that "Subscan: Erase 1 ...OK" is shown on "Information : " window.



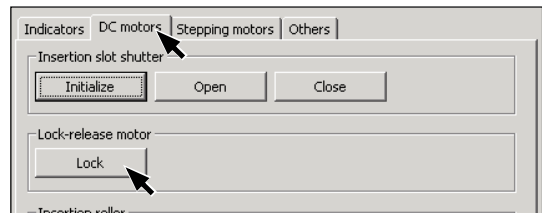
- 11.** After coupling the back plate with the front plate, transports the cassette to the ejection position.



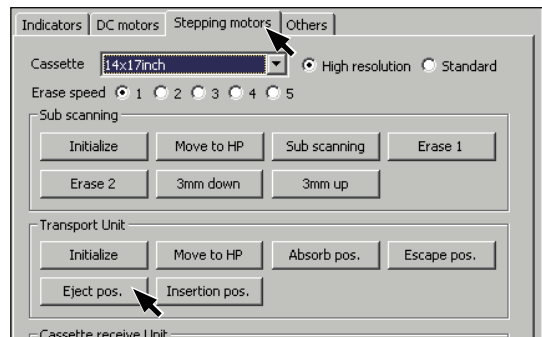
- 1) Click [Absorb pos.] of "Transport Unit".
- 2) Only when the cassette is mammo type, click [3mm up] of "Sub scanning".
- 3) Check that "Transport Unit Magnetizing Position ...OK" is shown on "Information : " window.



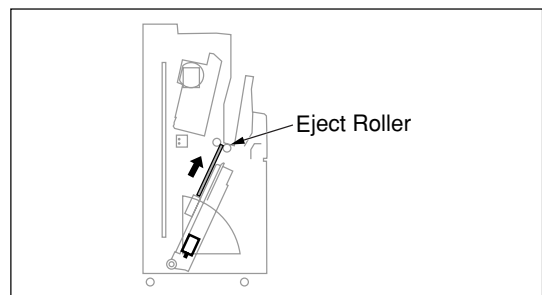
- 4) Click [DC motors] tab.
- 5) Click [Lock] of "Lock-release motor".
- 6) Check that "Lock...OK" is shown on "Information : " window.



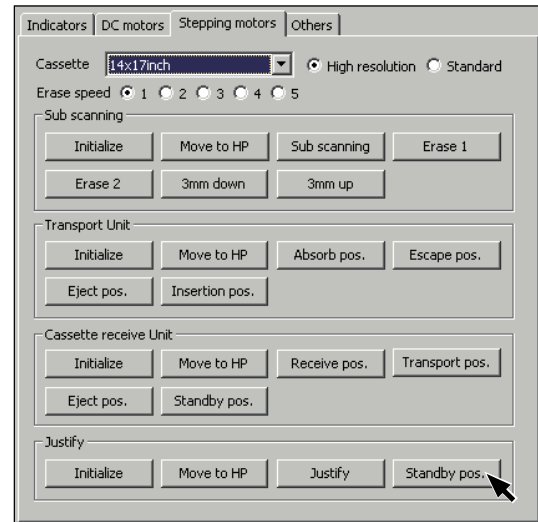
- 7) Click [Stepping motors] tab.
- 8) Click [Eject pos.] of "Transport Unit".
- 9) Check that "Transport Unit Ejection Position ...OK" is shown on "Information : " window.



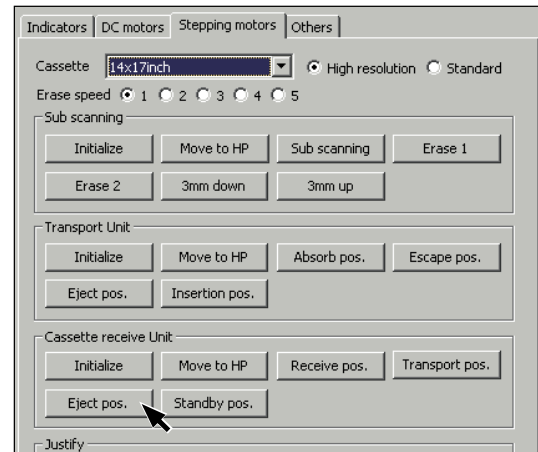
- 12.** Cassette ejection operation starts.



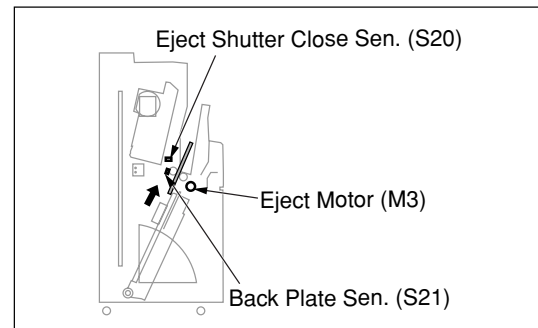
- 1) Click [Standby pos.] of "Justify".
- 2) Check that "Justification Standby Position ...OK" is shown on "Information : " window.



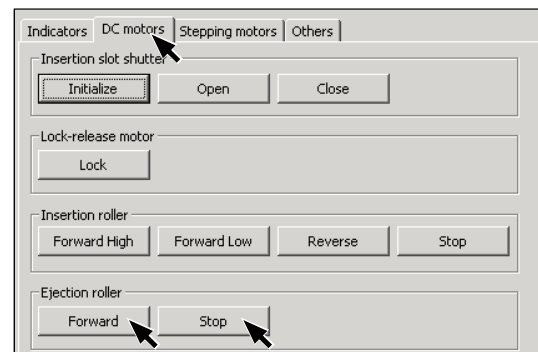
- 3) Click [Eject pos.] of "Cassette receive Unit".
- 4) Check that "Cassette receive Unit Standby Position ...OK" is shown on "Information : " window.
- 5) Check that the leading edge of the cassette is located at the ejection slot.



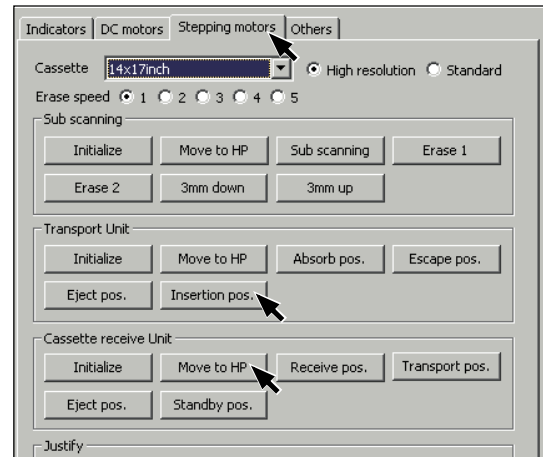
- 13.** Ejects the cassette, and returns the transport unit to the insertion position.



- 1) Click [DC motors] tab.
- 2) Click [Forward] of "Ejection roller".
- 3) Ejects the cassette, and closes the ejection slot shutter.
- 4) Click [Stop] of "Ejection roller".



- 5) Click "Stepping motors" tab.
- 6) Click [Insertion pos.] of "Transport Unit".
- 7) Check that "Transport Unit Insertion Position ...OK" is shown on "Information : " window.
- 8) Click [Move to HP] of "Cassette receive Unit".
- 9) Check that "Cassette receive Unit to HP ...OK" is shown on "Information : " window.



Implementing the above procedures completes the series of operation starting from insertion through ejection. At this stage, next cassette can be inserted. (READY Status)

## 3.5 Checking the Stand-Alone Operation

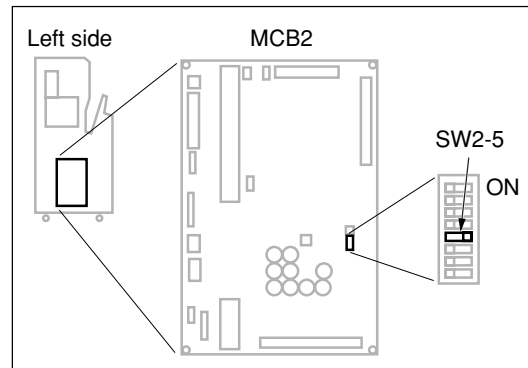
Normally, when the REGIUS 190 which is not networked to the REGIUS Console is started up, a network error 24000 occurs, and it will not start even the cassette is inserted.

When it is necessary to operate the REGIUS 190 as stand-alone, follow the procedures described below.

**Important** Do not change the setting of DIP SW other than SW2- 5 on the MCB2. (for the rest of DIP SW, refer to "5.2 DIP Switch Setting", p.184)

**Important** To terminate the dummy SBC2 program, confirm that the all dips of DIP SW (SW2) are set to OFF (left).

1. Remove the left cover. ("2.2.2 Removal of the Left & Right Covers", p.29)
2. Loosen 5 fixing screws, and detach the cover for mechanical control box.
3. Turn the DIP SW (SW2-5) on the MCB2 (Mechanical Control Board) to ON (right).
4. Press "operation" button of the REGIUS 190.
  - Insert the cassette into the insertion slot. The cassette will be drawn into the device, and series of operations including ejection of cassette will be initiated.

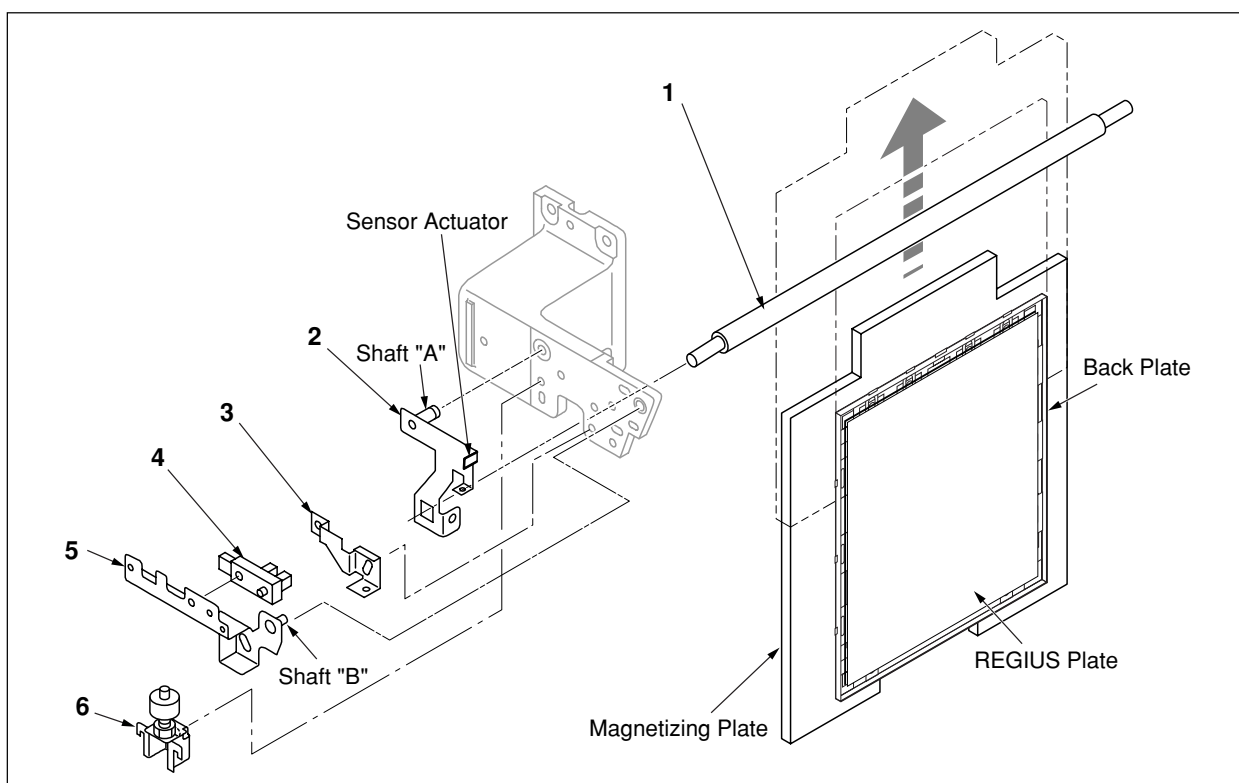


## 3.6 Adjusting the Peel-Detection Rollers

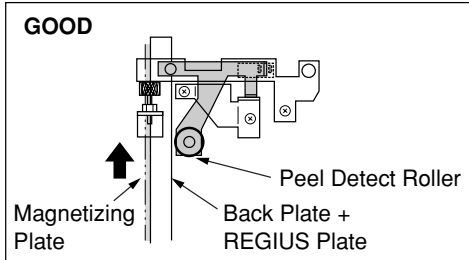
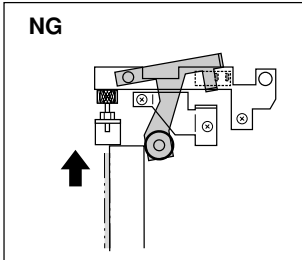
### 3.6.1 Peel detection mechanism

The REGIUS 190 has been designed such that, when subscanning operation is being carried out, there is a gap of approximately 1 mm between the optical beam condensing section and the plate surface. However, in situations such as where abnormal adherence of double-sided adhesive tape leads to peeling of the plate from the back plate, any attempted subscanning operation could result in interference of the plate with the optical unit. In order to avoid such interference, a peel detection roller is provided in the position where the elevating plate is just enters the operational area of optical unit.

- **Main Components of Peel Detection Mechanism**



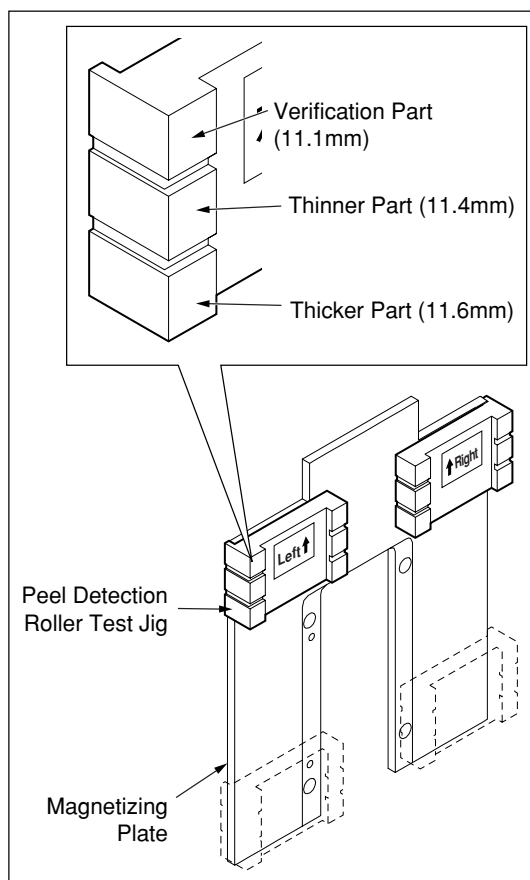
The peel detection mechanism is laterally symmetric. In this paragraph, explanation is made for the left mechanism.

No	Part	Name Function
1	Peel Detect Roller	<p>When a back plate (Plate) of a thickness greater than specification is ascending, it touches the peel detect roller and press it toward the front of the device. When a plate of standard thickness ascends, it will not touch the peel detect roller. Because the roller rotates even in contact with the plate, it will not block the plate to ascend further.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p><b>GOOD</b></p>  <p>Peel Detect Roller Back Plate + REGIUS Plate Magnetizing Plate</p> </div> <div style="text-align: center;"> <p><b>NG</b></p>  </div> </div>
2	Peel Detect Arm-L	Sustains the peel detect roller (1) from the left. As the peel detect roller (1) is pressed, rotates around the axis "A" accordingly. Sensor plunger will start ascending as it starts rotation.
3	Peel Detect Cam-L	Move the position of this sheet plate to adjust the reference position of the peel detect roller (1).
4	Peel Detect Sensor-L	<ul style="list-style-type: none"> <li>When the sensor plunger of the peel detect arm-L (2) ascends and separates, it switches to "ON", and detects the peeling or warping of the plate.</li> <li>As this sensor switches from "OFF" to "ON", the subscanning operation will immediately stop, and the cassette magnetization plate will descends to the subscan HP.</li> </ul>
5	Peel Detect Sensor Plate-L	Metal plate to which the peel detect sensor-L (4) is mounted. the position of peel detect sensor-L (4) can be adjusted up and down around the shaft "B" in the center.
6	Peel Detect Adjuster Plate	Metal plate to make a fine adjustment of the peel detect sensor plates-L(5) in vertical direction. Peel detect screw to push the peel detect sensor plate-L (5) up and hexagonal nut to secure the screw is attached to this metal plate.

### • Important adjustment issues

Install the peel detect roller jig on the cassette magnetizing plate, and adjust the standard position of the peel detect roller and the position where the peel detect sensor switches to "ON".

- When the verification part (plate thickness : 11.1mm) passes through, it should not contact the peel detect roller.
- When the thinner part (plate thickness : 11.4mm) passes through, though it is allowed to contact the peel detect roller, but the peel detect sensor should remain OFF.
- When the thicker part (plate thickness : 11.6mm) passes through, the peel detection sensor should switch to "ON".



### • Timing for adjustment

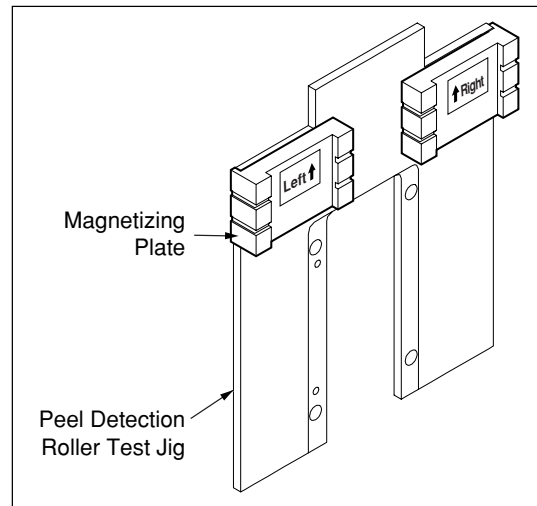
Adjustment is to be carried out whenever the peel detection sensor or the absorption plate is replaced.

### 3.6.2 Adjustment of the Standard Position

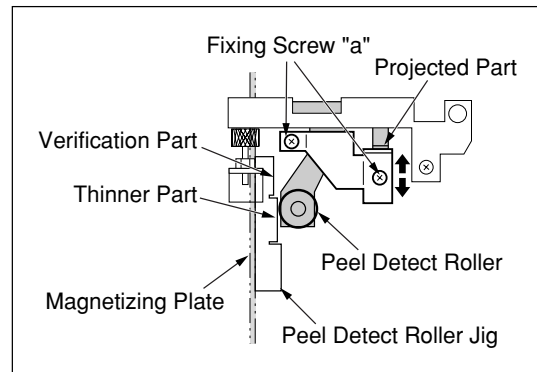
The peel detection roller is to be fixed at the standard position where it comes into contact with the peel detect roller jig.

1. Move the power-supply breaker to the OFF position.
2. Remove the rear cover. ("2.2.1 Removal of the Rear Cover", p.28)
3. Remove the left and right side covers. ("2.2.2 Removal of the Left & Right Covers", p.29)
4. Open the front door.
5. Manually raise the balance weight to bring the cassette magnetizing plate to the bottom.
6. Attach the peel detect roller jig to the both corners of top edge of the magnetizing plate.

**Important** Attach the jig with its arrow pointing upward.



7. Loosen two fixing screws "a".
  - It is possible to start at either the left or right side.
8. Slowly lower the balance weight until the peel detection roller comes into contact with thinner part of the peel detect roller jig.
9. Confirm the following and then tighten the fixing screws "a".
  - When the peel detect roller jig ascends, the peel detection roller should not contact with verification part of the peel detect roller jig.
  - The peel detection roller should contact with thinner part of the peel detect roller jig.
  - The peel detection cam should contact with the projected part of peel detect arm.
10. In the same way as above, adjust the peel detection mechanism on the opposite side.
11. Proceed to "3.6.3 Adjustment of the Sensor Detect Position, p.121"

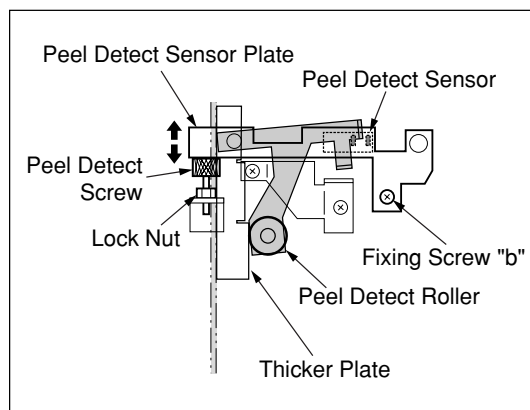


### 3.6.3 Adjustment of the Sensor Detect Position

Adjust the position of the peel detect roller where the peel detect sensor switches from "OFF" to "ON".

1. Starts the dummy SBC2 program, and open the maintenance window. ("3.2 Set Up of dummy SBC2 program, p.99")
2. Slowly lower the balance weight until the thicker part of the peel detect roller jig contacts the peel detect roller.
3. Loosen the fixing screw "b".
  - It is possible to start at either the left or right side.
4. Loosen the lock nut and turn the peel detect screw to the left and right.
  - The peel detect sensor plate will move up and down.
  - The peel detect sensor will also move up and down in accordance with the motion of the peel detect sensor plate.
  - When the peel detection sensor detaches from the sensor plunger, the [Back Plate Warp] display on the Maintenance Tool window will change from "OFF" to "ON".
5. Tighten the lock nut at the point where the [Back Plate Warp] display changes from "OFF" to "ON".

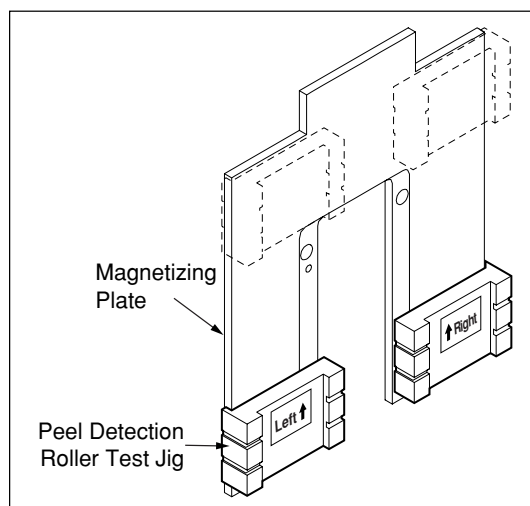
**Important** Note that it is not when it changes from ON to OFF.



Justification sensor R	OFF	ON	Erase lamp current: 1	OFF	ON
Cassette back plate sensor	OFF	ON	Erase lamp current: 2	OFF	ON
Cassette peel sensor	OFF	ON	Power SW	OFF	ON
Ejection shutter close	OFF	ON	Erase SW	OFF	ON
Interlock sw	OFF	ON	Eject SW	OFF	ON

6. Tighten the fixing screw "b".
7. In the same way as above, adjust the peel detect mechanism on the opposite side.
8. Switch the position of the peel detect roller jig from top edge to the bottom edge of the cassette magnetizing plate, and carry out ("3.6.2 Adjustment of the Standard Position, p.120") and ("3.6.3 Adjustment of the Sensor Detect Position, p.121").

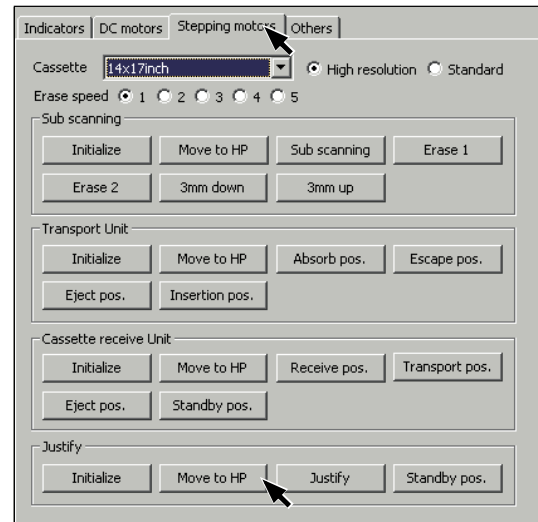
- Check the upper edge and lower edge of the cassette magnetizing plate, and preferentially adjust the one edge that is more convex than the other. For example, when the detector turns on at the upper edge but not at the lower edge, it is not necessary to adjust at the lower edge.



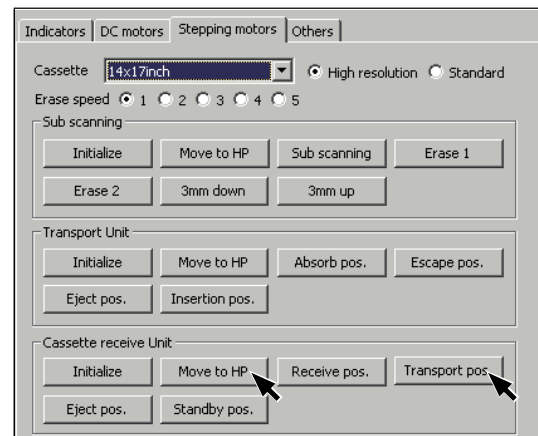
## 3.7 Adjusting the Pressing Amount

When any of the cassette magnetizing plate, transport evacuation sensor (S11), transport rack gear, etc. which affects the magnetizing position, follow the procedures below to adjust the pressing amount which the transport unit applies to the cassette magnetizing plate.

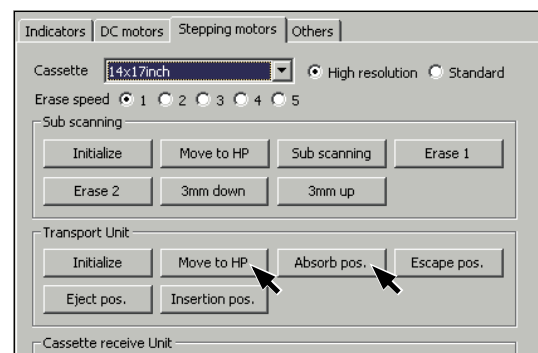
1. Remove the rear cover.
2. Remove the right and left cover.
3. Start the dummy SBC2 program, and open the maintenance window. ("3.2 Set Up of dummy SBC2 program, p.99")
4. Click [Stepping motors] tab.
5. Click [Move to HP] of "Justification".
  - "Justification to HP .... OK" on the "Information" window.



6. Click [Move to HP] of "Cassette receive Unit".
  - "Cassette receive Unit to HP .... OK" on the "Information" window.
7. Click [Transport Position] of "Cassette receive Unit".
  - "Cassette receive Unit Transport Position .... OK" on the "Information" window.

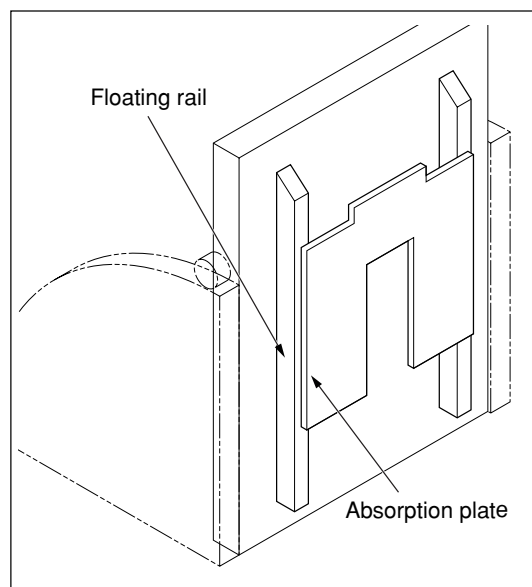


8. Click [Move to HP] of Transport Unit".
  - "Move to Transport Unit to HP .... OK" on the "Information" window.
9. Click [Absorb pos.] of "Transport Unit".
  - "Transport Magnetizing Position .... OK" on the "Information" window.



- 10.** With the steel scale, measure the gap between the floating rail on the right side of the device and the absorption plate.

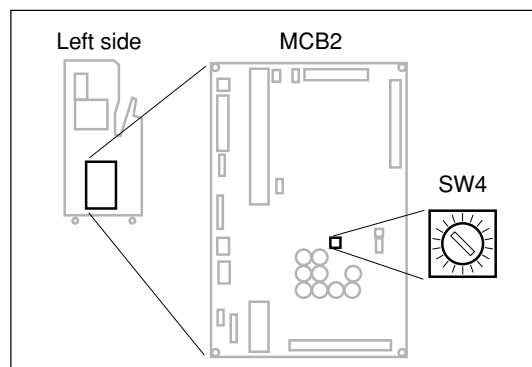
Criterion :  $12 \pm 0.5\text{mm}$



- If the measured values does not satisfy the rating

Adjust the correction amount (mm) by turning the rotary switch (SW4) on the MCB2.

No.	Degree of correction (Pressing amount)	No.	Degree of correction (Pressing amount)
0	+4.0	8	0
1	+4.5	9	+0.5
2	+5.0	A	+1.0
3	+5.5	B	+1.5
4	-2.0	C	+2.0
5	-1.5	D	+2.5
6	-1.0	E	+3.0
7	-0.5	F	+3.5

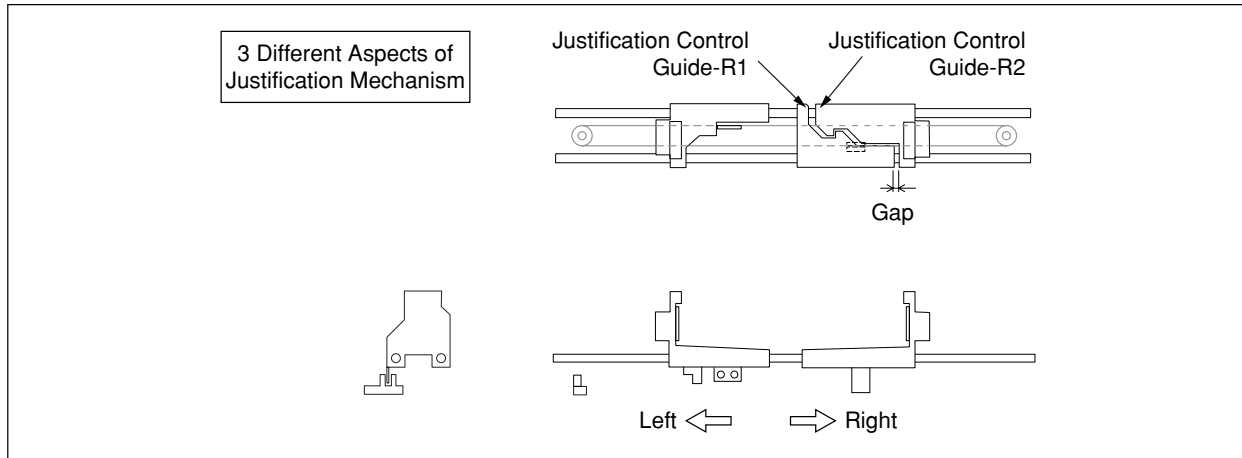


**Important** When the MCB2 is changed ("2.7.1 Replacement of MCB2 (Mechanical Control Board)", p.81), set the correction value for the new MCB2 as that of the old one.

## 3.8 Checking and Adjusting the Justification Allowance

Set the 14" x 17" cassette on the justification mechanism, and measure the gap between the justification control guide-R1 and justification control guide-R2.

Criterion: 1 ~ 3mm



- If the drive pulley is loose, tighten the drive pulley at the force of 0.6N•cm (6kgf•cm) using a torque driver.

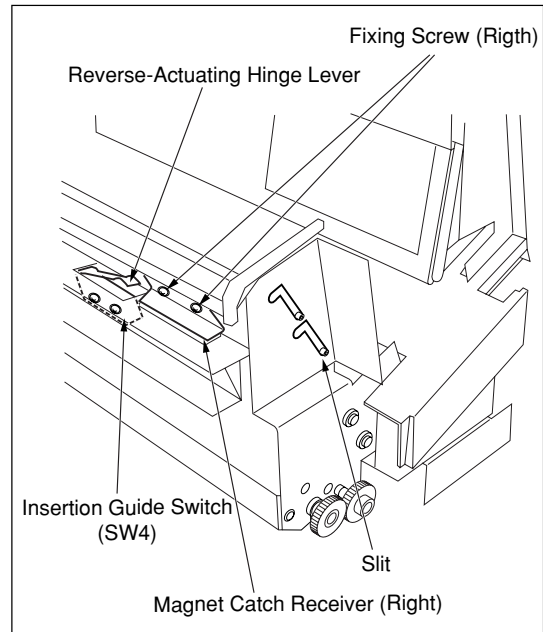
### 3.9 Adjusting the Position of Insertion Guide Switch (SW4)

If the assembled positions of the insertion guide SW and the receiver plate of the magnet catch are incorrect, initializing will not be initiated even the insertion guide is put back to the original position.

When the insertion guide or the insertion guide switch (SW4) is replaced, follow the procedures below to check and adjust the assembled position.

1. Loosen two fixing screws at right and left on the magnet catch receiver plate.
2. Lower the insertion guide (bossed part) beneath the slit.
3. Tighten two fixing screws (right and left) to secure the magnet catch receiver plate.
4. Pull up the insertion guide.
5. Loosen 2 fixing screws which are securing the insertion guide switch (SW4).

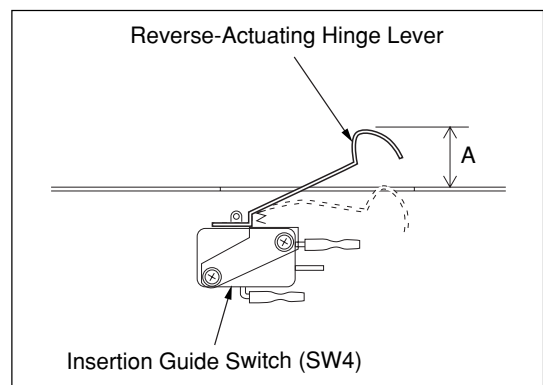
**Important** Loosen the screws as slightly as possible. Loosening too far will allow the nut on the nut plate on the back to fall off.



6. Fluctuate the reverse-actuating hinge lever, and measure the distance "A" when the insertion guide switch (SW4) is tuned on.

Criterion : When  $A = 13.5\text{mm}$ , SW4 should be turned on.

7. Adjust the fixing screws (2pcs) to bring the position of insertion guide switch (SW4) so that it falls complies with the criterion.







Chap.4

# ***Troubleshooting***

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## 4.1 Troubleshooting for Electrical Control & Communication

Troubles due to electrical control and communication are classified and explained as below.

- Network problem ..... [p.129](#)
- Power On/Off problems ..... [p.132](#)
- Signal processing problems (i.e., control, errors) ..... [p.134](#)

### 4.1.1 Network Problems

**Case 1 : Occurrence of a 24000 error. MAC and IP addresses are displayed on the LCD.**

Cause	Remedy
1) The network cable is not connected to Readers.	Connect the ethernet cable between the Ethernet port located on the back of REGIUS 190 and the network hub.
2) The network cable is not connected to either the JM or the JMs integrated REGIUS Console.	Connect the Ethernet cable between the external JM or the JM's integrated REGIUS Console and the network hub.
3) The JM is not operating (or for the JM's integrated REGIUS Console, the REGIUS Console is not operating)	Startup the JM or the JM's integrated REGIUS Console.
4) Network between the REGIUS Console and REGIUS 190 is faulty.	Send a ping from the REGIUS Console to the REGIUS 190. <ul style="list-style-type: none"> <li>• If connection was not possible (i.e., no response),               <ul style="list-style-type: none"> <li>–&gt; Check the connection of network hub and Ethernet cable between the REGIUS Console and REGIUS 190.</li> </ul> </li> <li>• If connection was possible (i.e., a response was returned),               <ul style="list-style-type: none"> <li>–&gt; Proceed to 5).</li> </ul> </li> </ul>
5) Network between the REGIUS Console and JM is faulty.	Send a ping from the REGIUS Console to the JM. <ul style="list-style-type: none"> <li>• If connection was not possible (i.e., no response),               <ul style="list-style-type: none"> <li>–&gt; Check the connection of network hub and Ethernet cable between the REGIUS Console and JM.</li> </ul> </li> <li>• If connection was possible (i.e., a response was returned),               <ul style="list-style-type: none"> <li>–&gt; Proceed to 6).</li> </ul> </li> </ul>
6) Network setting between the REGIUS Console, JM and REGIUS 190 is wrong.	Confirm the network setting for the REGIUS Console and the JM. <ul style="list-style-type: none"> <li>• IP addresses for all devices (i.e., REGIUS Console, JM, Reader)</li> <li>• Hosts for all devices</li> <li>• Values relevant to JM settings for the Reader's DBHOST etc.</li> <li>• JM settings</li> <li>• Whether the REGIUS 190, REGIUS Console, and JM have the same subnet mask (i.e., 255.255.255.0)</li> </ul>

**Case 2: The Reader has reached the Ready startup condition, but no images are forwarded after registration and reading.**

Cause	Remedy
The device has not been restarted after changing the REGIUS Console's network and/or host settings.	Restart the REGIUS 190.

**Case 3: Operation condition where incorrect settings have been made for the Reader, REGIUS Console, or JM etc. Countermeasures involve the re-definition of IP and host name settings to ensure no duplication.**

**After this, be sure to restart the system.**

Cause	Remedy
1) Two Readers exist with the same IP and host name.	<ul style="list-style-type: none"> <li>Between POWER ON and READY, both of the Readers will startup.</li> <li>After one has performed reading, a "04214" error will occur on the other when an attempt is made to insert a cassette, and following this, the same error will occur for the first Reader.</li> <li>If an attempt is made to simultaneously insert cassettes into both of these Readers, a "13031" error will occur on one of these.</li> </ul>
2) Two Readers exist with the same IP.	Although normal reading operations will be possible for one of the Readers, after this operation has been started for the other, operation will halt as soon as the LCD indicates "busy ?" and a "04202" error will occur.
3) Two REGIUS Consoles exist with the same host name.	If host names are duplicated on Windows 2000, a warning will be displayed, and although the REGIUS Console will startup, the reading of images will not be possible. Note however that the Reader will operate normally.
4) Two JM exist with the same IP and host name.	<ul style="list-style-type: none"> <li>The first JM to startup will operate.</li> <li>When host names are duplicated on Windows 2000, a warning will be displayed and reading will not be possible. During the first read, a certain amount of time will be required between bar code detection and cassette insertion.</li> <li>If operation is attempted with only the JM started last, a registration error will occur.</li> </ul>
5) Two REGIUS Consoles exist with the same IP.	The REGIUS Console with the modified IP will not start and a warning will be displayed on Windows 2000.
6) Two JMs exist with the same IP.	The first JM to startup will operate. During the first read, a certain amount of time will be required between bar code detection and cassette insertion.
7) Two Readers exist with the same host name.	No specific problems will result and normal reading will be possible.
8) Two JMs exist with the same host name.	The first JM to startup will operate. When host names are duplicated on Windows 2000, a warning will be displayed.
9) A Reader and REGIUS Console share the same IP and host name.	<ul style="list-style-type: none"> <li>If the REGIUS 190's IP and host name are set the same as that for the REGIUS Console, the Reader will startup, but reading will not be possible. A "04214" error will occur.</li> <li>If the REGIUS Console's IP and host name are set the same as that for the Reader, the REGIUS Console will startup but a "04214" error will occur upon insertion of a cassette into the Reader and an application error will also occur for the REGIUS Console.</li> </ul>
10) A Reader and JM share the same IP and host name.	<ul style="list-style-type: none"> <li>If the Reader's IP and host name are set the same as that for the JM, a 24000 network error will occur.</li> <li>If the JM's IP and host name are set the same as that for the Reader, neither the Reader nor the application will be able to startup.</li> </ul>
11) A REGIUS Console and JM share the same IP and host name.	<ul style="list-style-type: none"> <li>If the REGIUS Console's IP and host name are set the same as that for the JM, the REGIUS Console will not startup.</li> <li>Even if the JM's IP and host name are set the same as that for the REGIUS Console, normal reading will be possible.</li> </ul>

Cause	Remedy
12) A Reader and REGIUS Console share the same host name.	<ul style="list-style-type: none"> <li>• Even if the REGIUS Console's host name is set for the Reader, normal reading will be possible.</li> <li>• Even if the Reader's host name is set for the REGIUS Console, normal reading will be possible.</li> </ul>
13) A Reader and JM share the same host name.	Regardless of the setting location, normal reading will be possible.

#### Case 4: Operation status where the network cable has been disconnected during operation.

Cause	Remedy
1) Connection with the JM was interrupted when in the Ready condition.	<ul style="list-style-type: none"> <li>• If no operation was being performed, no Reader problems will result. If the REGIUS Console is not capable of registration operation, a restart must be carried out.</li> <li>• If an error is displayed on the Reader during operation, it will be necessary to restart the Reader and the REGIUS Console.</li> </ul>
2) Connection with the JM was lost immediately after the last cassette registration.	<p>If a recorded cassette was read during disconnection</p> <ul style="list-style-type: none"> <li>• The Reader will not perform reading, operation will stop at the insertion slot, and a "04214" error will occur. Although a restart will be necessary for all devices, this can be done for the Reader by simply turning the power Off and then On. A standard restart will be required for REGIUS Console and JM.</li> </ul> <p>If after disconnection, a non-operating JM is restarted to return to the reading condition</p> <ul style="list-style-type: none"> <li>• The reading of registered images will be possible; however, it will not be possible to register a new cassette for the REGIUS Console, and therefore, a restart must subsequently be carried out.</li> </ul>
3) Connection with the JM was lost in Erase mode while no cassette was inserted	The system will return to Ready mode after the end of Erase mode. If disconnection continues following this, operation will be the same as for the above-mentioned disconnection in the Ready condition.
4) If the network is disconnected for five minutes after cassette registration	Normal reading will be possible even after five minutes.
5) If the network is disconnected for five minutes after manual registration of cassette.	Normal reading will be possible even after five minutes.
6) If the network is disconnected for five minutes in the Ready status.	Normal reading will be possible even after five minutes.
7) If the network is disconnected for five minutes during shutdown.	It will be possible to turn the power off regardless of when the disconnection takes place during a POWER OFF operation.
8) During initialization after POWERON, the network is disconnected for five minutes from when there is one "■". (Operation is the same for up to ten "■".)	A 24000 error occurs for the Reader, and if the network cable is subsequently connected to re-establish connection with the JM, the Ready condition will be achieved and normal operation will be possible.

### 4.1.2 Power Supply On/Off Problems

Possible errors that may arise when the power is turned ON/OFF.

Cause	Remedy
1) Even though the Operation button is pressed, no operation takes place whatsoever (and the LED does not turn on)	Refer to "• Analysis Procedure of Power Failure (unable to turn on the device) p.133".
2) When in Ready condition, pressing and holding "operation" button to terminate the processing only put out the LCD panel but the LED keep flashing.	Turn off the breaker of REGIUS 190.
3) Operation button has been pressed before the JM is started up.	24000 error will occur; however, the JM will be automatically connected as soon as it has been started up and the condition for normal reading will be achieved.
4) Power-supply off operation is not started even though Operation button is pushed during occurrence of an error.	Turn off the breaker of REGIUS 190.
5) Operation button has been pressed during reading by the REGIUS.	<ul style="list-style-type: none"> <li>The image in reading process will be transferred to the REGIUS Console.</li> <li>The REGIUS 190 will be automatically shut down after completing the image transfer. Restart the REGIUS 190.</li> </ul>
6) Sleep operation does not proceed correctly.	Review the Relation setting for the JM.
7) Even though the REGIUS Console starts up, the REGIUS 190 does not.	<p>Check the status of the operation lamp.</p> <ul style="list-style-type: none"> <li>If the operation lamp is not on, it indicates that the REGIUS 190's power is off, and the operation button should be pressed to startup this device.</li> <li>If the operation lamp is on, shutdown the device using the operation button first, and then start it up again.</li> </ul>
8) During image reading, the door is opened and closed, or a breaker is turned off.	<p>During image reading, if the plate adopts standby condition in the Reader as a result of power off or the like, restoration in that condition will result only in an error and the back plate will not be lowered. Follow the procedures below to remove the back plate.</p> <ol style="list-style-type: none"> <li>1) Open the door, remove only the cassette's front plate only.</li> <li>2) Restart.</li> <li>3) After an error will be displayed, open the front door, and remove from the cassette absorption plate, the back plate that has been lowered.</li> </ol>

### • Analysis Procedure of Power Failure (unable to turn on the device)

If the device cannot be started up even the operation button is pressed down, search the cause and take necessary action according to the following procedures.

1. Plug the power cable into the power outlet, and check AC100 is output at the other end of the power cable.
  - If AC100 is not detected, the power cable is broken.
2. Turn on the power breaker, and check that AC100V is output between the 1-3pin(black-white) of the TAP PCB connector (CN1). (refer to fig A in the right)
  - If AC100V is not detected, any of AC inlet (JP1), power breaker (CB1) or noise filter (NF1) is faulty.
3. Check that AC100V is output at the 1-4pin of the TAP PCB connector (CN2) while the operation button is pressed down. (refer to fig A in the right)
  - If AC100V is not output, the TAP PCB is faulty.

**Important AC100V will not be output while the operation button is not pressed down.**

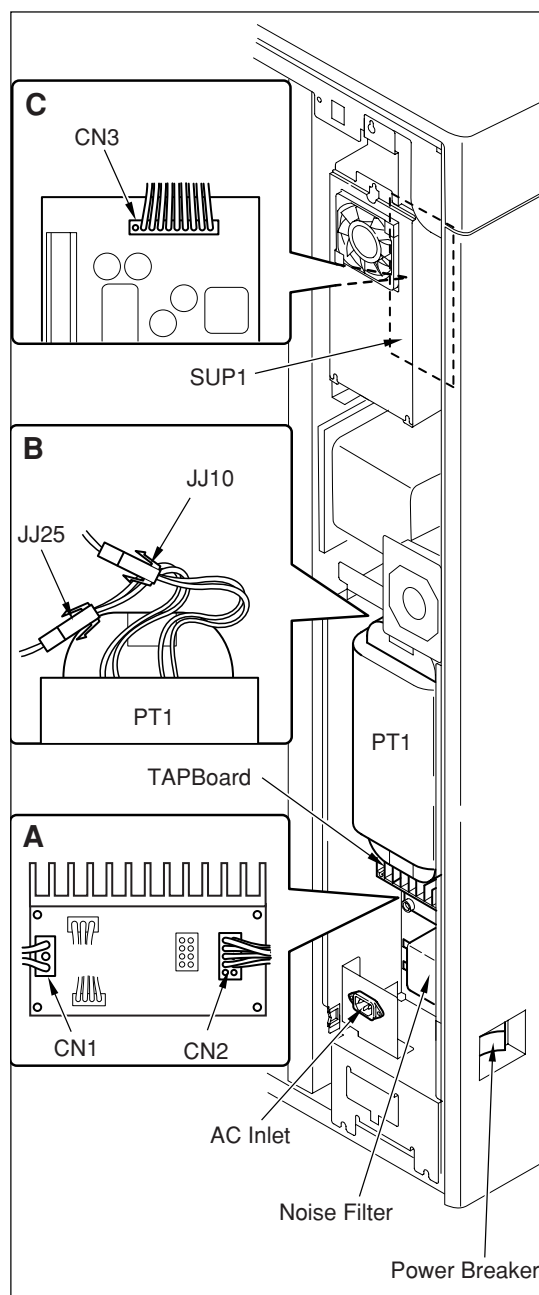
4. Check that AC107V is output at the connector (JJ10, JJ25) of the transformer (PT1) while the operation button is pressed down. (refer to fig B in the right)
  - If not output, the transformer (PT1) is faulty.

**Important AC107V will not be output while the operation button is not pressed down.**

5. Check that DC24V is output between 2, 3-4, 5, 6pin (black-yellow) of the SUP1(5V/24V DC power supply) connector (CN3) while the operation button is pressed down. (refer to fig C in the right)
  - If not output, the SUP1(5V/24V DC power supply) is faulty.

**Important DC24V will not be output while the operation button is not pressed down.**

6. If all of 1 through 5 are proved to be normal, MCB2 (Mechanical Control Board) may be faulty.



### 4.1.3 Signal Processing Problems

Troubles due to signal processing are listed below.

Cause	Remedy
1) Occurrence of a 04905 SCB2 communication error from the mechanical control	<ol style="list-style-type: none"> <li>1) Confirm whether power is being supplied to the SCB2 (and also carry out a voltage check). <ul style="list-style-type: none"> <li>• If the power-supply cable is connected and 5 V is being supplied, carry out a check of the power-supply cable and unit, and replace if necessary.</li> </ul> </li> <li>2) Check the connectors between the SCB2 and the MCB2.</li> <li>3) Confirm whether the CF card is properly inserted.</li> <li>4) Confirm whether operation is possible when the CF card is replaced. <ul style="list-style-type: none"> <li>• If this is possible, replace the original CF card and return it to the plant.</li> </ul> </li> <li>5) Confirm whether operation is possible when the SCB2 is replaced. <ul style="list-style-type: none"> <li>• If this is possible, replace the original SCB2 and return it to the plant.</li> </ul> </li> <li>6) Check the simultaneous communication condition of the SCB2, MCB2, and connection cable <ul style="list-style-type: none"> <li>• If simultaneous communication is not being carried out, replace the cable.</li> </ul> </li> </ol>
2) Image forwarding is extremely slow (i.e., cycle time is exceeded even for a single reading)	Confirm that a 10BASE hub or cables are not being used on the network system.
3) Blank white images are generated (i.e., correction data only)	<ol style="list-style-type: none"> <li>1) Confirm that HVSW (SW3) for the ADB2 is on.</li> <li>2) Confirm whether the high-voltage cable is connected to the ADB2.</li> <li>3) Confirm that DIP-SW (i.e., the Auto/Manual setting switch for high voltage) for the ADB2 is set to Auto.</li> </ol>

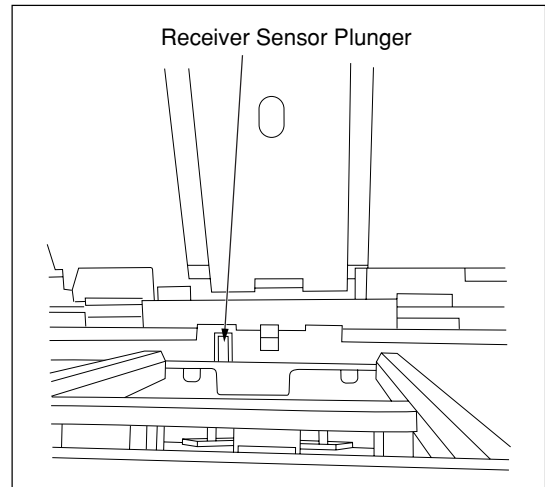
- For details regarding action in response to other signal-processing errors (10000 to 19999 ; i.e., first digit is "1"), refer to ["4.4.7 SCB2 Error Codes, p.163"](#)

## 4.2 Troubleshooting for Mechanical Troubles

### 4.2.1 Caution for Receiver Sensor Plunger

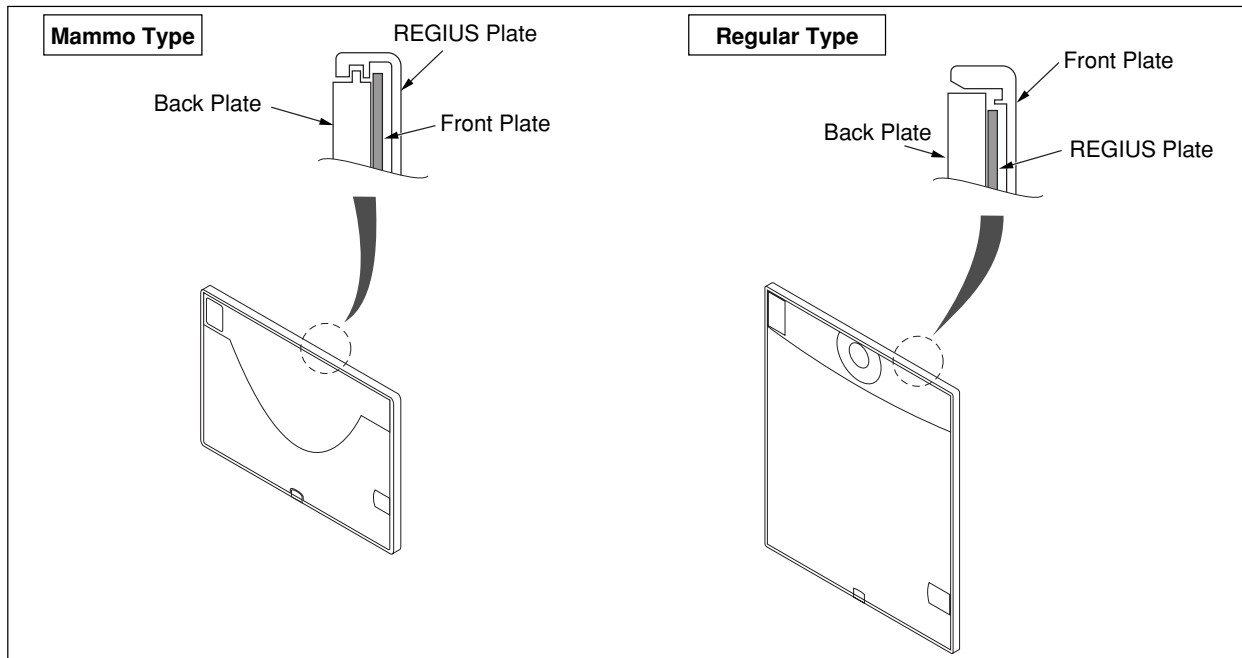


**Caution** When attempting to remove the back plate from the cassette magnetizing plate, always couple the back plate with the front plate first, then remove the cassette from the magnetizing plate. Removing the back plate alone after removing the front plate may cause the edge of the back plate to hit the sensor plunger of the receiver, and may damage the sensor plunger.



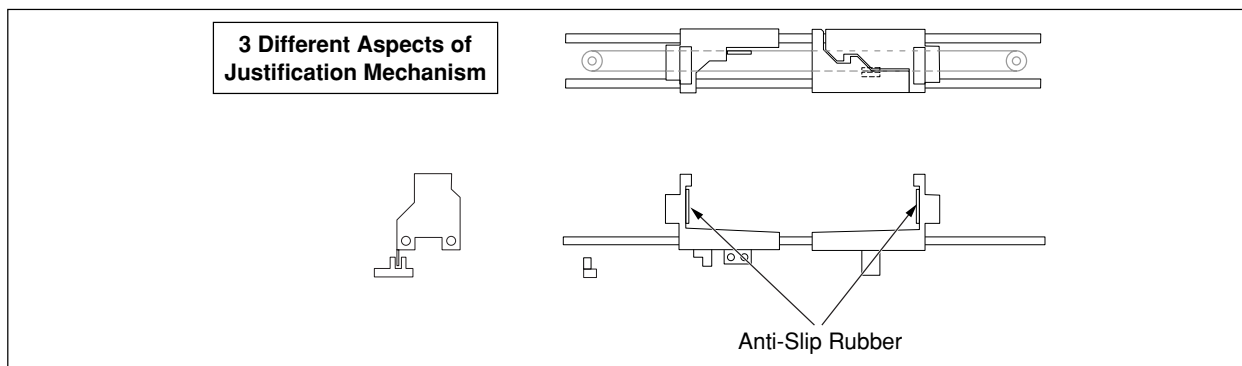
## 4.2.2 Troubles when Separating / Coupling the Mammo Cassette

Mammo cassette has a structure different from the regular cassette as shown below, the REGIUS Plate protruding into the frame area of the front plate, so that the exposure area shall be extended to the chest side.



Therefore, when the back plate is separated or coupled from / with the front plate at the magnetizing position, the back plate (cassette magnetizing plate) is first lowered by 3mm, then the front plate is separated and sent to the evacuation position.

In this operation, if the anti-slip rubber which sandwiches and holds the front plate from both sides is fell off or disabled in some way, the front plate will also move in conjunction with the back plate when it moves by 3mm, causing a trouble in separation / coupling operation.



Should error in separation / coupling repeats exclusively with the mammo cassette, refer to "[3.8 Checking and Adjusting the Justification Allowance, p.124](#)", and check that the justification mechanism holds the front plate without failure during the operation.

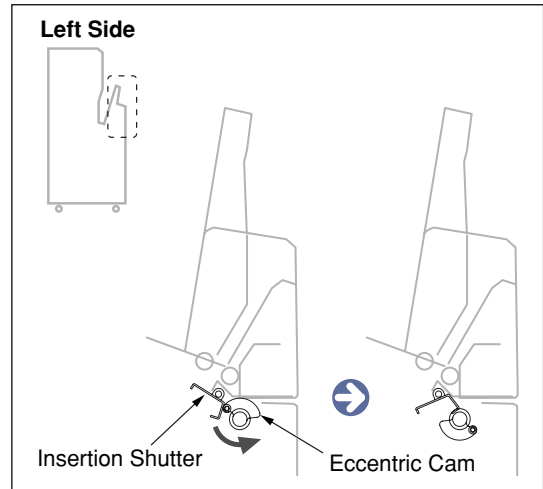
### 4.2.3 Actions when a Foreign Material falls in to the Insertion Slot

Normally if anything falls in the insertion slot, pull up the insertion guide, and remove the material. If the dropped material fell further in depth, and unable to pick up simply by pulling up the insertion guide, follow the procedures below to remove the dropped material.

1. Shut down the REGIUS 190.
2. Open the front cover.
3. Manually rotate the eccentric cam in orientation shown in the right figure to open the insertion shutter.

**Important** Never rotate in opposite orientation.

4. Remove the dropped material.



## 4.3 Troubleshooting for Image Quality

In this paragraph, remedies for image quality troubles as listed below are described.

Horizontal stripes, vertical stripes, S-value variation, poor contrast, irregular L/R brightness, dose abnormalities, image disparity, white blotches, black blotches, monitor display errors (OK for film), image duplication.

### 4.3.1 Flow of Troubleshooting

- For each of the following cases, carry out investigation of causes in sequence from Step 1, and take an appropriate action. If the problem is not resolved by any action, please report the corresponding details to the manufacturer (i.e., quality assurance).
- Similarly, for cases which are not included in the following description, please report the corresponding details to the manufacturer (i.e., quality assurance).
- After replacement of the optical unit, carry out PLL adjustment, side start-point adjustment, uniformity calibration, and sensitivity calibration.

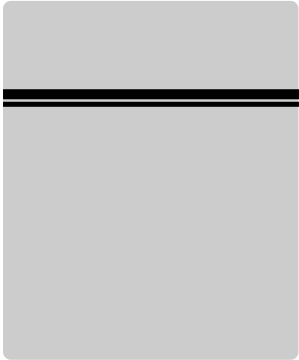
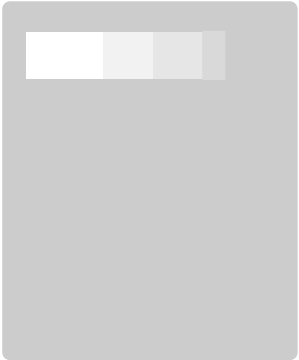
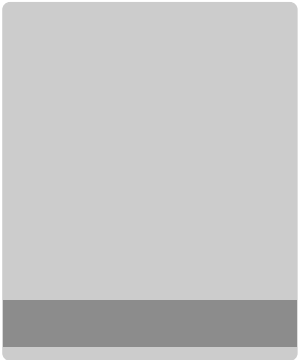
### 4.3.2 Case 1: Entire image is too dark (with subject structure)

Cause	Remedy
1 The output density of the G-processing parameters is too high overall.	Set the H/L brightness setting of the G-processing parameters to a lower value. (For more details, refer to the Image Processing Adjustment Manual)
2 The X-ray dose is too high (for FIX processing and non-processed images)	Review the exposure conditions to determine whether the X-ray dose is appropriate.
3 S value (i.e., gain) setting of the REGIUS Console is too high (for FIX processing and non-processed images)	Correct the S value setting to a suitable level.
4 Failure in sensitivity correction (for FIX processing and non-processed images)	Review the sensitivity correction.
5 For some reason, the ROI identified for processing is not correctly set.	Correct the ROI setting to the appropriate position.

### 4.3.3 Case 2: Entire image is too bright, whitish (with subject structure)

Cause	Remedy
<b>1</b> The output density of the G-processing parameters is too low overall.	Set the H/L brightness setting from the G-processing parameters to a higher value. (For more details, refer to the Image Processing Adjustment Manual)
<b>2</b> The X-ray dose is extremely low or non-existent.	<ul style="list-style-type: none"> <li>• Check the exposure conditions, and confirm that the Exposure switch is not released during X-ray exposure.</li> <li>• Confirm the X-ray dosage using a quantimeter.</li> </ul>
<b>3</b> S-value (i.e., gain) setting of the REGIUS Console is too low (for FIX processing and non-processed images)	Correct the S value setting to a suitable level.
<b>4</b> Failure in sensitivity correction	Review the sensitivity correction.
<b>5</b> For some reason, the ROI identified for processing is not correctly set.	Correct the ROI setting to the appropriate position.
<b>6</b> There is a problem with the REGIUS 190's photo-multiplier or high-voltage system.	<div data-bbox="269 886 829 945">1) ADB2's photomultiplier high-voltage switch is set to OFF.</div> <div data-bbox="269 966 829 1022">2) Replace the ADB2 if it is faulty. --&gt; Replace the ADB2.</div> <div data-bbox="269 1043 565 1068">3) Photomultiplier is damaged.</div> <div data-bbox="857 886 1122 911">1) Set the switch to ON.</div> <div data-bbox="857 966 1440 1022">2) Replace the ADB2. Refer to "<a href="#">2.7.4 Replacement of ADB2 (A/D board)</a>, p.86".</div> <div data-bbox="857 1043 1440 1100">3) Replace the photomultiplier. "<a href="#">2.6.1 Replacement of Photomultiplier (PMT)</a>, p.75"</div>

### 4.3.4 Case 3: Horizontal Streaks in Image

Phenomena	Cause/Remedy
<b>1</b> Horizontal streak occurring at one location within the image. *	<ul style="list-style-type: none"> <li>• There is a possibility that an external signal is being applied during reading.</li> <li>• Ensure that the device is protected from external influences during reading, and perform exposure again.</li> </ul>
	
<b>2</b> Horizontal lines extend from shielding materials such as lead.	<ul style="list-style-type: none"> <li>• This can happen when the lead or shielding material is in a blank section.</li> <li>• This phenomenon happens only under very specific conditions, and it can be resolved by moving the shielding material as far as possible from the subject or by restricting the exposure field.</li> <li>• If this continues to occur repeatedly, please contact the plant or Development.</li> </ul>
	
<b>3</b> Sudden change in brightness approximately 30 mm from the bottom of the image.	<ul style="list-style-type: none"> <li>• Return the plate with warping or peeling to the REGIUS Console.</li> <li>• If the problem repeats with different plates, adjust the peel detector roller. (<a href="#">p.117</a>)</li> <li>• Plate warping or peeling can lead to contact between the plate and the detection roller.</li> </ul>
	
<b>4</b> Regular, diagonal stripes This can occur as a result of light leaking from the exterior.	<ul style="list-style-type: none"> <li>• Light may be leaking in the device.</li> <li>• Reassemble the exterior covering or darken the room, and then take a solid image to confirm quality</li> </ul>

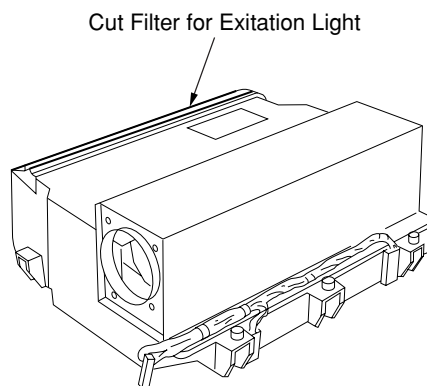
Phenomena	Cause/Remedy
5 Digital-type horizontal line or lines	<ul style="list-style-type: none"> <li>Poor connection: Check the connection of the optical unit's relay connector (JP37) and the photomultiplier cable connectors (J1, J3).</li> <li>H-SYNC loss: Check H-SYNC using a signal and replace the optical unit. <a href="#">"2.6.5 Checking H-sync Signal, p.80"</a></li> <li>In the case of any other digital-type problems (including brightness variations), replace either the ADB2 or SCB2 and confirm the effectiveness of this action. Refer to <a href="#">"2.7.4 Replacement of ADB2 (A/D board), p.86"</a>, <a href="#">"2.7.3 Replacement of SCB2 (System Control Board), p.84"</a>.</li> </ul>

#### 4.3.5 Case 4: Horizontal lines throughout the entire image

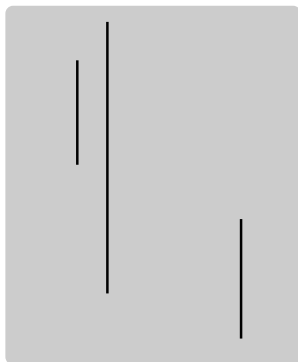
Phenomena	Cause/Remedy
1 Horizontal lines with a 7-line interval.	<ul style="list-style-type: none"> <li>This occurs due to polygon irregularity and should be resolved through irregularity correction.</li> <li>If this does not resolve the problem, it is possible that the optical unit's internal laser beam is being disturbed, and the optical unit should be replaced. <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a></li> </ul>
2 Irregular horizontal lines over the entire left side.	The laser's radiation intensity is varying and the optical unit should be replaced. <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a>
3 White lines extend from the center to the right side.	The laser's radiation intensity is varying and the optical unit should be replaced. <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a>
4 Horizontal streaks with 6 ~ 7mm interval.	<ul style="list-style-type: none"> <li>Malfunction of the subscanning due to rust on the LM guide.</li> <li>Lubricate the LM guide. <a href="#">"3.1.2 Lubrication of the LM Guide, p.94"</a></li> </ul>
5 Horizontal streaks (20~60 streaks) with 4 ~ 5mm interval throughout the image.	<ul style="list-style-type: none"> <li>Noise originated by the high frequency therapy equipment. Turn off the equipment or direct the antenna of the equipment not against the REGIUS 190, and check whether the streaks disappear.</li> <li>If the streaks disappear, widen the distance between the equipment and the REGIUS 190 or direct the antenna of the equipment not against the REGIUS 190.</li> </ul>

### 4.3.6 Case 5: Vertical Lines

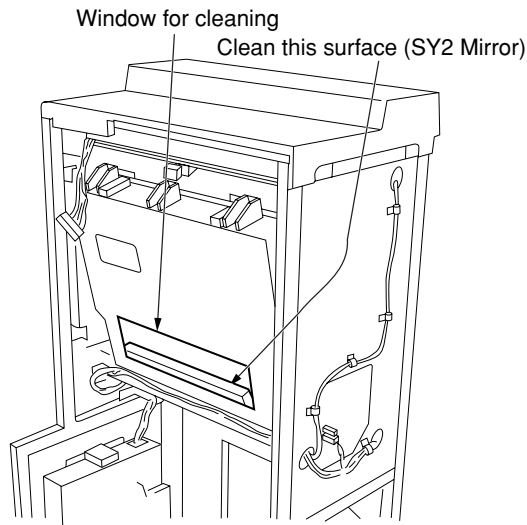
Phenomena	Cause/Remedy
<b>1</b> Sharp white lines (5 to 10 pixels in width)	
1) If there are horizontal scratches on the plate;  2) If dust has collected on the edge of the optical unit's beam-condensing section and the laser is disturbed;	1) Replace the plate.  2) Blow clean the edge of the optical unit's beam-condensing section. At this time, visually check whether dust is present between the excitation light's cut filter and the condensing mirror, and then perform blower cleaning and confirm that the dust has been removed. Note that the location of dust adherence can be estimated from the position of the vertical lines in the image. (The service tool's left side corresponds to the right side of the condensing mirror.



<b>2</b> Sharp black lines (5 to 10 pixels in width)	
1) Lines disappear when exposure is performed without correction.  2) This defect is caused if irregularity correction is carried out when either the plate is scratched or when dust is present on the edge of the optical unit's beam condensing section.	1) Redo irregularity correction using a plate which is free of scratches. If vertical, localized black stripes occur in low dosage images as in the diagram on the right and they do not re-appear in high-dosage images;  2) Excitation light is leaking and the optical unit should be replaced. <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a>



Phenomena	Cause/Remedy
<b>3</b> Faint white lines (20 to 100 pixels in width)	<ol style="list-style-type: none"> <li>1) There is a possibility that dust is present in side the optical unit.</li> <li>1) Open the small window below the lid of the optical unit (in the assembled condition, if so required), and clean the corresponding location on the CY2 mirror with a blower. (Left positions on the detection tool correspond to left positions on the CY2 mirror. See the diagram on the right.) <ul style="list-style-type: none"> <li>• If the dust is not removed by cleaning, replace the optical unit. <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a></li> </ul> </li> <li>2) If multiple lines are visible over the entire image.</li> <li>2) There is a possibility that the laser is disturbed and the optical unit should be replaced. <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a></li> </ol>
<b>4</b> Faint black lines	<ol style="list-style-type: none"> <li>1) Lines disappear when exposure is performed without correction.</li> <li>1) Irregularity correction was carried out while the CY2 mirror was contaminated; accordingly, this correction should be repeated.</li> <li>2) The black lines are replaced by white lines when exposure is performed without correction.</li> <li>2) This situation should be resolved as described in 5-3 above.</li> <li>3) If this does not resolve the problem;</li> <li>3) There is a possibility that either the laser is disturbed or ghosting is taking place; accordingly, the optical unit should be replaced. <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a></li> </ol>



**4.3.7 Case 6: False contours can be seen in the image**

Phenomena	Cause/Remedy
1 Phenomena only on the output film.	Check the imager.
2 Check the raw data using the Service Tool, and if these contours are confirmed.	<ul style="list-style-type: none"> <li>• Bit loss from image data in the process after the ADB2.</li> <li>• Replace the ADB2 and SCB2. "<a href="#">2.7.4 Replacement of ADB2 (A/D board), p.86</a>", "<a href="#">2.7.3 Replacement of SCB2 (System Control Board), p.84</a>".</li> </ul>

**4.3.8 Case 7: Jittering can be seen (i.e., zigzags in vertical lines)**

Phenomena	Cause/Remedy
1 If this occurs with a 7-line interval.	<ul style="list-style-type: none"> <li>• Incorrect rotation of the polygon.</li> <li>• Replace the optical unit (and polygon).</li> </ul> <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a>
2 H-SYNC signals are not being correctly obtained.	<p>Confirm that the read-in timing for H-SYNC signals has not changed and that the pulse waveform has not degraded. If an abnormality is identified, replace the optical unit.</p> <a href="#">"2.6.2 Replacement of Optical Unit, p.76"</a>

**4.3.9 Case 8: Image dimensions are incorrect (vertical direction)**

Phenomena	Cause/Remedy
1 There is a problem with the Imager's image size setting (i.e., 40 $\mu$ m).	Check the setting, and correct if necessary.
2 Printer type (imager) has been incorrectly set.	Check the settings and rectify where necessary.

**4.3.10 Case 9: Image dimensions are incorrect (horizontal direction)**

Phenomena	Cause/Remedy
1 PLL setting values have been replaced.	Check the PLL setting values and modify if necessary.

**4.3.11 Case 10: The top and bottom of the image are disconnected.**

Phenomena	Cause/Remedy
1 The X-ray exposure field aperture is not suitable.	Check the exposure field.

- If problems from cases 10 and 11 above repeats after resolution, inform to the manufacturer.

**4.3.12 Case 11: The left and right of the image are disconnected.**

Phenomena	Cause/Remedy
1 The X-ray exposure restriction is not suitable.	Check the exposure field.
2 The sideways-direction start point is not correct.	Check the sideways-direction start point and modify if necessary.

- If problems from cases 10 and 11 above repeats after resolution, inform to the manufacturer.

**4.3.13 Case 12: Irregularity correction has not been carried out.**

- Confirm whether images are being obtained without correction.
- Confirm that the ADB2's high-voltage switch is turned ON.

Phenomena	Cause/Remedy
1 The image data for creation of irregularity correction is bad.	Recreate the irregularity correction using a plate with no surface damage or contamination.
2 If the problem persists after performing the above.	<ul style="list-style-type: none"> <li>• Replace the CF card.</li> <li>• Replace the SCB2. "<a href="#">2.7.3 Replacement of SCB2 (System Control Board)</a>, p.84"</li> </ul>

**4.3.14 Case 13: The irregularity correction data is excessive (i.e., 300 steps or more from MAX to MIN)**

Phenomena	Cause/Remedy
1 Exposure conditions for the irregularity correction are not suitable.	Repeat with appropriate exposure condition.
2 Plates or the optical unit's beam collector section is soiled.	Clean the soil.
3 Foreign objects are exposed in the correction image.	Repeat the exposure avoiding any object to be included in the imaging field.
4 Polygon correction is made excessively. (300 steps or more)	When this remains large even after irregularity correction is repeated, replace the optical unit. " <a href="#">2.6.2 Replacement of Optical Unit</a> , p.76"

**4.3.15 Case 14: S-value variation**

Phenomena	Cause/Remedy
<b>1</b> Fluctuates on the same unit.	
1) Occurs with different sampling pitches.	1) 87.5 $\mu\text{m}$ and 175 $\mu\text{m}$ correspond to sampling pitch differences, and since frequency also changes, S-values will never be exactly equal.
2) Occurs with identical sampling pitches.	2) Confirm whether exposure conditions (i.e., X-ray quality, distance, exposure field) and processes (i.e., condition keys, etc.) are all identical for exposure. Any differences in these factors will cause S-values to vary. Furthermore, this will also result from deviation in process ROI.
<b>2</b> Varies when compared to the S-Value of other REGIUS190.	If S-values are different even after confirming that exposure conditions (i.e., tube, grid, X-ray quality (tube voltage), distance, exposure field) are identical, carry out sensitivity calibration once again.
<b>3</b> Varies when compared to the S-Value of other reader types	
1) Comparison with 150	1) S-values will change if there are differences in tubes, grids, or exposure conditions.
2) Comparison with 330	2) S-values will change if there are differences in tubes, grids, or exposure conditions.
3) Comparison with 350	3) S-values will change if there are differences in tubes, grids, or exposure conditions (especially focal length).

**4.3.16 Case 15: Poor contrast (raw data)**

Remedy
<b>1</b> Check the presence of aperture.
<b>2</b> Check the X-ray tube voltage by referring to the Recommended table.
<b>3</b> Check the processing parameters (i.e., E, F, H)

**4.3.17 Case 16: Density differs from the left to the right.**

Phenomena	Cause/Remedy
<b>1</b> Alignment error of grids	Correct the alignment and make a test exposure.
<b>2</b> Solid density images between the one exposed at the time of installation and the one exposed for check have a difference in density from left to right.	Clean the optical unit's beam collector, and repeat the uniformity calibration.

**4.3.18 Case 17: Dose irregularities (i.e., bad correspondence of mAs and S values, etc.)**

Phenomena	Cause/Remedy
1 Incorrect sensitivity calibration.	Repeat the sensitivity calibration.
2 The log-log curve created by measuring the values for "mAs" and "mR" is not linear. (check the linearity for each of 1mAs, 10mAs, 100mAs against mR)	Request the X-ray tube manufacturer for remedies.

**4.3.19 Case 18: Image disparity**

Remedy
1 Check the bulb dose (i.e., measure the mR value and confirm whether the dose is correct)
2 Confirm the exposure settings. (Refer to the recommended value in the medical ledger)

**4.3.20 Case 19: White blotches**

Remedy
1 Clean any dust from the plate and then check the solid image.
2 If the blotches remain, there is a possibility of plate defects and the plate should be replaced.

**4.3.21 Case 20: Black blotches**

Remedy
1 Erase the plate and re-expose.

**4.3.22 Case 21: Monitor display problems (OK with film)**

Remedy
1 Brightness between the viewer and the monitor does not match. Regenerate the display's LUT.

**4.3.23 Case 22: Image duplication**

<b>Remedy</b>	
<b>1</b>	Check the erase lamp is operating during the erasure process.
<b>2</b>	<ul style="list-style-type: none"> <li>• Erase and then carry out reading without using any correction.</li> <li>• If the problem repeats, replace the plate (as large doses have caused the plate to break). This operation is to be carried out with correction.</li> </ul>

**4.3.24 Case 23: Sensitivity correction is not within the specified range**

<b>Remedy</b>	
<b>1</b>	Check whether the correction image's exposure conditions and input values are correct.

**4.3.25 Case 24: All post-processing images have high contrast.**

<b>Phenomena</b>	<b>Cause/Remedy</b>
<b>1</b> A high overall contrast is set for the processing parameter of output density.	<ul style="list-style-type: none"> <li>• Set the output density "H" of G-Value/Shift parameters to a lower value.</li> <li>• Set the output density "L" of G-Value/Shift parameters to higher value. For more details, refer to the Image Processing Adjustment Manual.</li> </ul>

**4.3.26 Case 25: All post-processing images have low contrast.**

<b>Phenomena</b>	<b>Cause/Remedy</b>
<b>1</b> A low overall contrast is set for the processing parameter of output density.	<ul style="list-style-type: none"> <li>• Set the output density "H" of G-Value/Shift parameters to a higher value.</li> <li>• Set the output density "L" of G-Value/Shift parameters to a lower value. For more details, refer to the Image Processing Adjustment Manual.</li> </ul>

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**4.3.27 Case 26: Image fading**

Phenomena	Cause/Remedy
<b>1</b> The x-ray exposure time is too long. (Organs move over extended periods)	<ul style="list-style-type: none"><li>• Check the equipment's exposure time and the display S-value. (An S-value of less than 50 is exceptionally low.)</li><li>• Confirm whether the photo timer is operating correctly.</li></ul>
<b>2</b> Beam diameter abnormality	<ul style="list-style-type: none"><li>• Carry out MTF chart measurement.</li><li>• If the value for 2 cycles/mm is 22% or less, replace the optical unit. Refer to "<a href="#">2.6.2 Replacement of Optical Unit, p.76</a>".</li></ul>

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## 4.4 Error Code

### 4.4.1 General Procedures Required when Error Occurs

Below is the general procedure required when an error occurs.

- **Collect the log.**

When an error is displayed on the LCD of REGIUS 190, collect the error log using REGIUS Console.

- **Reset**

1. Open / close the front cover.
2. Remove the cassette if it is capable.
3. Press "operation" button, and shut down the REGIUS 190.
4. Turn OFF the circuit breaker located on the side of the main unit.
5. Restart the REGIUS 190.

- **Information to be attached when sending the error log**

When sending the error log to the manufacturer, attach the related information listed below as detailed as possible.

<b>Network Condition at the institute</b>	<b>JM: External or internal?</b>
	n: m
	Any dedicated reader is connected?
	IP address /subnet mask <ul style="list-style-type: none"> <li>• REGIUS 190</li> <li>• JM</li> <li>• REGIUS Console</li> </ul>
<b>Reset</b>	Reset implemented by opening / closing the door.
	Needed to turn the breaker OFF / ON.
<b>Others, details</b>	

## 4.4.2 Mechanical Control Error Codes

04001 ~ 04069 indicates an error occurred on the sensors.

Error code	Error name	Error description	Action
<b>04001</b>	Feed HP sensor NG	A time-out occurred for ON or OFF detection by the Feed HP sensor while the transport unit is moving to its receiving position.	Check MCB2:CN11-, pins 32 through 34 (HP sensor) and MCB2:CN15 (Transportation Motor)
<b>04011</b>	Feed Escape Position sensors NG (at initialization)	A time-out occurred for ON detection by the Feed Escape Position sensor while the transport unit is moving to escape position.	Check MCB2:CN11-, pins 35 through 37 (Feed Escape Position sensors) and MCB2:CN15 (Transportation Motor)
<b>04012</b>	Feed Escape Position sensors NG (while moving to absorption position)	<ol style="list-style-type: none"> <li>1) The Feed Escape Position sensor was already ON at the start of motion by the transport unit from the receive position to the absorption position.</li> <li>2) A limit-over occurred for ON detection by the Feed Escape Position sensor during motion by the transport unit from the receive position to the absorption position.</li> </ol>	Check MCB2:CN11-, pins 35 through 37 (Feed Escape Position sensors) and MCB2:CN15 (Transportation Motor)
<b>04013</b>	Feed Escape Position sensors NG (while moving to escape position)	A limit-over occurred for OFF detection by the Feed Escape Position sensor during motion by the transport unit from the absorption position to the escape position.	Check MCB2:CN11-, pins 35 through 37 (Feed Escape Position sensors) and MCB2:CN15 (Transportation Motor)
<b>04014</b>	Feed Escape Position sensors NG (while moving to eject position 1)	A limit-over occurred for OFF detection by the Feed Escape Position sensor during motion by the transport unit from the absorption position to the escape position.	Check MCB2:CN11-, pins 35 through 37 (Feed Escape Position sensors) and MCB2:CN15 (Transportation Motor)
<b>04015</b>	Feed Escape Position sensors NG (while moving to eject position 2)	During motion by the transport unit from the absorption position to the eject position, ON --> OFF detection by the Feed Escape Position sensor occurred within 70 mm from the absorption position.	Check MCB2:CN11-, pins 35 through 37 (Feed Escape Position sensors) and MCB2:CN15 (Transportation Motor)
<b>04021</b>	Justification R/L sensor NG (at reading)	<ol style="list-style-type: none"> <li>1) The Justification Sensor was OFF after the completion of justification operation during cassette intake.</li> <li>2) The justification sensor was OFF after closing of the insertion slot shutter during cassette take-in.</li> </ol>	<ul style="list-style-type: none"> <li>• Check MCB2:CN11-, pins 9 through 11 (Justification Sensor- L); MCB2:CN11-, pins 12 through 14 (Justification Sensor-R); and MCB2:CN17 (Justification Motor)</li> <li>• Check the loose of the drive pulley Refer to "2.4.3 Replacement of the Justification Motor (PM2), p.55" and "3.8 Checking and Adjusting the Justification Allowance, p.124"</li> </ul>

Error code	Error name	Error description	Action
		3) Cassette with a barcode that is not registered or represents wrong size is inserted.	In the care of 3), remove the cassette, and reset the printer to READY by performing open/close of front cover. Return the cassette to the plant.
04022	Justification R/L sensor NG (at absorption)	<ol style="list-style-type: none"> <li>1) The Justification Sensor was OFF after the completion of motion by the transport unit to the absorption position during cassette absorption.</li> <li>2) The Justification Sensor was OFF after lock release during cassette absorption.</li> <li>3) The Justification Sensor was OFF after the completion of motion by the transport unit to the absorption position during cassette ejection.</li> </ol>	<ul style="list-style-type: none"> <li>• Check MCB2:CN11-, pins 9 through 11 (Justification Sensor- L); MCB2:CN11-, pins 12 through 14 (Justification Sensor-R); and MCB2:CN17 (Justification Motor)</li> <li>• Check the loose of the drive pulley. Refer to <a href="#">"2.4.3 Replacement of the Justification Motor (PM2), p.55"</a> and <a href="#">"3.8 Checking and Adjusting the Justification Allowance, p.124"</a></li> </ul>
04023	Justification R/L sensor NG (during escape)	<ol style="list-style-type: none"> <li>1) The Justification Sensor was OFF after the completion of motion by the transport unit to the Escape Position following cassette separation.</li> <li>2) The Justification Sensor was OFF after the completion of erasure.</li> </ol>	<ul style="list-style-type: none"> <li>• Check MCB2:CN11-, pins 9 through 11 (Justification Sensor- L); MCB2:CN11-, pins 12 through 14 (Justification Sensor- R); and MCB2:CN17 (Justification Motor)</li> <li>• Check the loose of the drive pulley. Refer to <a href="#">"2.4.3 Replacement of the Justification Motor (PM2), p.55"</a> and <a href="#">"3.8 Checking and Adjusting the Justification Allowance, p.124"</a></li> </ul>
04024	Justification R/L sensor NG (at ejection)	The Justification Sensor was OFF after the completion of motion by the transport unit to the eject position during cassette ejection.	<ul style="list-style-type: none"> <li>• Check MCB2:CN11-, pins 9 through 11 (Justification Sensor- L); MCB2:CN11-, pins 12 through 14 (Justification Sensor- R); and MCB2:CN17 (Justification Motor)</li> <li>• Check the loose of the drive pulley. Refer to <a href="#">"2.4.3 Replacement of the Justification Motor (PM2), p.55"</a> and <a href="#">"3.8 Checking and Adjusting the Justification Allowance, p.124"</a></li> </ul>
04025	Justification HP sensor NG	<ol style="list-style-type: none"> <li>1) A time-out occurred for ON detection by the HP sensor during HP motion processing for initialization by the justification.</li> <li>2) A limit-over occurred for ON detection by the HP sensor during HP motion processing by the justification during cassette ejection.</li> </ol>	Check MCB2:CN11-, pins 29 through 31 (Justification HP Sensor) and MCB2:CN17 (Justification Motor)
04026	Justification sensor-R NG (at initializing)	The right side of the Justification Sensor was ON after completion of HP motion processing for initialization by the justification.	<ul style="list-style-type: none"> <li>• Check MCB2:CN11-, pins 12 through 14 (Justification Sensor- R)</li> <li>• Check no foreign object is present in the justification guide-R</li> </ul>

Error code	Error name	Error description	Action
04027	Justification sensor-L NG (at initializing)	The right side of the Justification Sensor was ON after completion of HP motion processing for initialization by the justification.	<ul style="list-style-type: none"> <li>Check MCB2:CN11-, pins 9 through 11 (Justification Sensor- L)</li> <li>Check no foreign object is present in the justification guide-L</li> </ul>
04031	Cassette Receive Sensor NG (at reading)	<ol style="list-style-type: none"> <li>The elevation-bed cassette sensor was OFF after the completion of width-justification motion during cassette take-in.</li> <li>The elevation-bed cassette sensor was OFF after closing of the insertion slot shutter during cassette take-in.</li> </ol>	<ul style="list-style-type: none"> <li>Check MCB2:CN11-, pins 6 through 8 (Cassette Receive Sensor)</li> <li>If the error occurred with small size cassette, reset the device to READY by performing open/close of front cover</li> </ul>
04032	Cassette Receive Sensor NG (at adsorption)	<ol style="list-style-type: none"> <li>The elevation-bed cassette sensor was OFF after completion of motion to the absorption position by the transport unit during cassette absorption.</li> <li>The elevation-bed cassette sensor was OFF after lock release during cassette absorption.</li> <li>The elevation-bed cassette sensor was OFF after the completion of motion by the transport unit to the absorption position during cassette ejection.</li> </ol>	Check MCB2:CN11-, pins 6 through 8 (Cassette Receive Sensor)
04033	Cassette Receive Sensor NG (during escape)	<ol style="list-style-type: none"> <li>The elevation-bed cassette sensor was OFF after the completion of motion by the transport unit to the Escape Position following cassette separation.</li> <li>The elevation-bed cassette sensor was OFF after the completion of erasure.</li> </ol>	Check MCB2:CN11-, pins 6 through 8 (Cassette Receive Sensor)
04034	Cassette Receive Sensor NG (at ejection before elevation)	The elevation-bed cassette sensor was OFF after the completion of motion by the transport unit to the eject position during cassette ejection.	Check MCB2:CN11-, pins 6 through 8 (Cassette Receive Sensor)
04035	Lock-Release sensor NG	A time-out occurred for ON or OFF detection by the lock HP sensor during lock or unlock operation.	<ul style="list-style-type: none"> <li>Check MCB2:CN11-, pins 3 through 5 (lock HP sensor) and MCB2:CN11-, pins 1 and 2 (Lock Release Motor)</li> <li>Check the plunger pin is actuating. if it is not smoothly actioning, replace the cassette receive unit. (p.54)</li> </ul>
04036	Elevator HP sensor NG	A time-out or limit-over occurred for ON detection by the HP sensor during HP motion processing by the elevation bed.	Check MCB2:CN11-, pins 26 through 28 (Elevator HP sensor) and MCB2:CN16 (Elevator Motor)

Error code	Error name	Error description	Action
04037	Cassette Receive Sensor NG (at ejection after elevation)	The elevation-bed cassette sensor was ON following the completion of motion by the elevation bed to the eject position during cassette ejection.	Check MCB2:CN11-, pins 6 through 8 (Cassette Receive Sensor) and MCB2:CN16 (Elevator Motor)
04041	Insertion shutter open sensor NG	A time-out occurred for ON detection by the open sensor during opening operation by the insertion slot shutter.	Check MCB2:CN10-, pins 11 through 13 (Insertion Shutter Open Sensor) and MCB2:CN10, pins 3 and 4 (Shutter Motor)
04042	Insertion shutter close sensor NG	A time-out occurred for ON detection by the close sensor during closing operation by the insertion slot shutter.	Check MCB2:CN10-, pins 14 through 16 (Insertion Shutter Close Sensor) and MCB2:CN10, pins 3 and 4 (Shutter Motor)
04061	Subscanning HP sensor NG	A time-out occurred for ON detection by the HP sensor during HP motion processing by the subscanning section.	Check MCB2:CN5-, pins 16 through 18 (Scanning HP Sensor) and MCB2:CN6 (Subscan Motor)
04062	Absorption Detect sensor NG (after lock released)	The back-plate Absorption Detect sensor was OFF after the completion of lock release.	Check MCB2:CN5-, pins 10 through 12 (Absorption Detect sensor)
04064	V-SYNC Sensor NG	1) The V-SYNC sensor was already ON before reading operations started for subscanning.  2) A limit-over occurred for ON detection by the V-SYNC sensor during read-operation processing for subscanning.	Check MCB2:CN5-, pins 1 through 3 (V-SYNC) and MCB2:CN6 (Subscan Motor)
04065	Absorption Detect sensor NG (at retraction)	The back-plate Absorption Detect sensor was OFF after the completion of motion to the Escape Position by the transport unit following cassette separation.	Check MCB2:CN5-, pins 10 through 12 (Absorption Detect sensor)
04066	Absorption Detect sensor NG (at erase completion)	The back-plate Absorption Detect sensor was OFF after the completion of erasure in reading mode.	Check MCB2:CN5-, pins 10 through 12 (Absorption Detect sensor)
04067	Absorption Detect sensor NG (at erase completion)	The back-plate absorption detect sensor was OFF after the completion of erasure in reading mode.	Check MCB2:CN5-, pins 10 through 12 (Absorption Detect sensor)
04068	Absorption Detect sensor NG (at absorption point)	The back-plate Absorption Detect sensor was OFF after the completion of motion to the absorption position by the transport unit following cassette peel-away.	Check MCB2:CN5-, pins 10 through 12 (Absorption Detect sensor) and MCB2:CN15 (Transportation Motor)
04069	Absorption Detect sensor NG (before erasure starts)	The back-plate Absorption Detect sensor was OFF before the start of erasure in erase mode.	Check MCB2:CN5-, pins 10 through 12 (Absorption Detect sensor)

### 4.4.3 Mechanical Control Error Code (04101 ~ 04106)

04101 ~ 04106 indicates an error occurred on the motors.

Error code	Error name	Error description	Action
<b>04101</b>	Subscan motor NG	A deviation occurred between the elevation pulse number and the descent pulse number (i.e., HP motion) during initialization operations for subscanning.	Check MCB2:CN5-, pins 16 through 18 (Subscan HP Sensor) and MCB2:CN6 (Subscan Motor)
<b>04102</b>	Transportation Motor NG	A deviation occurred between the pulse number for [insertion position -->Escape Position motion] and the pulse number for [Escape Position --> insertion position motion] during initialization operations for the Transport Unit.	Check MCB2:CN11-, pins 32 through 34 (Feed HP sensor); MCB2:CN11-, pins 35 through 37 (Feed escape position sensor); and MCB2:CN15 (Transportation Motor)
<b>04103</b>	Elevator motor NG	A deviation occurred between the descent pulse number and the elevation pulse number (i.e., HP motion) during initialization operations for the elevation bed.	Check MCB2:CN11-, pins 26 through 28 (Elevator HP Sensor) and MCB2:CN16 (Elevator Motor)
<b>04104</b>	Justification motor NG	A deviation occurred between the closing-direction pulse number and the opening-direction pulse number (i.e., HP motion) during initialization operations for justification.	Check MCB2:CN11-, pins 29 through 31 (Justification HP Sensor) and MCB2:CN17 (Justification Motor)
<b>04105</b>	Insertion shutter open/close time-out	A time out occurred due to lack of response from the sensor upon opening or closing of the installation port shutters.	Check MCB2:CN10-, pins 11 through 13 (Insertion Shutter Open Sensor); MCB2:CN10-, pins 14 through 16 (shutter closed sensor); and MCB2:CN10-, pins 3 through 4 (Shutter Motor)
<b>04106</b>	Lock time-out	A time out occurred due to lack of response from the sensor upon locking.	<ul style="list-style-type: none"> <li>• Check MCB2:CN11-, pins 3 through 5 (Lock Release Sensor) and MCB2:CN11-, pins 1 and 2 (Lock Release Motor)</li> <li>• Check the plunger pin is actuating. if it is not smoothly action ig, replace the cassette receive unit. (p.54)</li> </ul>

#### 4.4.4 Mechanical Control Error Code (04150 ~ 04165)

04150 ~ 04165 indicates an error occurred on the firmware.

Error code	Error name	Error description	Action
<b>04150</b>	Lock initializing process	Initialization of the lock motor cannot be carried out as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04151</b>	Insertion shutter initializing process	Initialization of the insertion slot shutter motor cannot be carried out as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04152</b>	Cassette receive Unit initializing process	Initialization of the elevation-bed motor cannot be carried out as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04153</b>	Justification initializing process	Initialization of the justification motor cannot be carried out as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04154</b>	Transport Unit initializing process	Initialization of the Transportation Motor cannot be carried out as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04155</b>	Subscan initializing process	Initialization of the auxiliary scanning motor cannot be carried out as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04156</b>	Feed in operation 1 start NG	Draw-in operation 1 could not be carried out by the insertion slot motor as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04157</b>	Feed in operation 2 start NG	Draw-in operation 2 could not be carried out by the insertion slot motor as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04158</b>	Insertion slot ejection start NG	An eject operation could not be carried out by the insertion slot motor as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04159</b>	Ejection start NG	An eject operation could not be carried out by the removal-port motor as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04160</b>	Insertion slot shutter open NG	An opening operation could not be carried out by the insertion slot motor as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
<b>04161</b>	Insertion slot shutter close NG	A closing operation could not be carried out by the insertion slot shutter motor as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.

Error code	Error name	Error description	Action
04162	Lock start NG	Push-up operation could not be carried out by the lock motor as a result of a problem in the firmware.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
04163	Back plate detect time NG	The eject shutters closed before the delay time for cassette descent detection had elapsed from the start of elevation-section rise during ejection. The delay time for cassette descent detection is too short.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
04164	Notice for erase lamp ON not reached	The timing for switch-On of the erasure lamp during erase operation by the subscanning section was not reported in either Read mode or Erase mode.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
04165	Notice for erase lamp OFF not reached	The timing for switch-Off of the erasure lamp during erase operation by the subscanning section was not reported in either Read mode or Erase mode.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.

#### 4.4.5 Mechanical Control Error Code (04200 ~ 04219)

04200 ~ 04219 indicates an error relating the SCB2 communication.

Error code	Error name	Error description	Action
<b>04200</b>	GetStatus receipt time-out - Initialize	Initialize Communication for the purpose of reporting the start of initialization to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04201</b>	GetStatus receipt time-out - Ready	Ready Communication for the purpose of reporting either the completion of initialization or cassette ejection to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04202</b>	GetStatus receipt time-out - Barcode detect	Barcode detection Communication for the purpose of reporting bar code detection to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04203</b>	GetStatus receipt time-out - high voltage ON	High-voltage on Communication for the purpose of reporting a request for high-voltage to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04204</b>	GetStatus receipt time-out - laser ON	Laser on Communication for the purpose of reporting a request for Laser On to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04205</b>	GetStatus receipt time-out - bar code delete	Bar Code erasure Communication for the purpose of reporting a request for cassette draw-out to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04206</b>	GetStatus receipt time-out - Processing	Processing Communication for the purpose of reporting processing of a cassette to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.

Error code	Error name	Error description	Action
<b>04208</b>	GetStatus receipt time-out - front door open	Front door open Communication for the purpose of reporting that the front door is open to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04209</b>	GetStatus receipt time-out - front door close	Front door closed Communication for the purpose of reporting that the front door is closed to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04210</b>	GetStatus receipt time-out - error	Error Communication for the purpose of reporting occurrence of an error to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04211</b>	GetStatus receipt time-out - Standby	Standby Communication for the purpose of reporting transition to StandBy condition to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04212</b>	GetStatus receipt time-out - transporting in erase mode	Erase-mode feeding Communication for the purpose of reporting feeding of a cassette in Erasure mode to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04213</b>	GetStatus receipt time-out - power OFF after Ready	Power Off after Ready Communication for the purpose of reporting ejection of a cassette to the SCB2 was not possible.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
<b>04214</b>	RegistrationOK receipt time-out	Reception of either RegistrationOK or NoRegistration was not possible within 10 seconds after bar code detection.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.

Error code	Error name	Error description	Action
04216	GoBackward receipt time-out	A GoBackward command (i.e., permission for erasure start after reading) could not be received from the SCB2 within 5 seconds after the completion of subscanning.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.
04217	Laser ON w/o sending high voltage ON (case 1)	Even though a request for high voltage On was not reported to the SCB2, an attempt was made to provide notification of Laser On to the SCB2 (with no stand-by cassette in the insertion slot).	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
04218	Laser ON w/o sending high voltage ON (case 2)	Even though a request for high voltage On was not reported to the SCB2, an attempt was made to provide notification of Laser On to the SCB2 (with a stand-by cassette in the insertion slot).	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart.
04219	Illegal command received	A command which was unrecognizable to the MCB2 was received from the SCB2.	Open the front door, remove any cassette that may be present inside the equipment, and then carry out a restart. If this problem should reoccur, confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected and that cables are not damaged or broken.

#### 4.4.6 Mechanical Control Error Code (04900 ~ 04908)

Type Error name Error description 04900~ 04908 indicates an error which can not be classified.

Error code	Error name	Error description	Action
<b>04900</b>	Cassette exists when initializing (Cassette receive Unit)	The Cassette receive sensor was On at the start of initialization operations.	Open the front door, remove any cassettes, and then close the door and restore. If restoration was not possible (i.e., Ready is not achieved after completion of initialization operations), press the Operation switch and perform a restart after the power has turned off.
<b>04901</b>	Cassette exists when initializing (justification)	The justification sensor-L or -R was On at the start of initialization operations.	Open the front door, remove any cassettes, and then close the door and restore. If restoration was not possible (i.e., Ready is not achieved after completion of initialization operations), press the Operation switch and perform a restart after the power has turned off.
<b>04902</b>	Cassette exists when initializing (ejection shutter open)	The eject shutter close sensor was Off at the start of initialization operations.	Open the front door, remove any cassettes, and then close the door and restore. If restoration was not possible (i.e., Ready is not achieved after completion of initialization operations), press the Operation switch and perform a restart after the power has turned off.
<b>04903</b>	Cassette exists when initializing (absorbed on back plate)	The back plate's Absorption Detect sensor was On at the start of initialization operations.	Open the front door, remove any cassettes, and then close the door and restore. If restoration was not possible (i.e., Ready is not achieved after completion of initialization operations), press the Operation switch and perform a restart after the power has turned off.
<b>04904</b>	Erase lamp down (2 lamps)	Both of the erasure lamps have blown out.	Carry out lamp replacement immediately.
<b>04905</b>	SCB2 communication error	No ACK was received in response to an ENQ code in accordance with the SCB2 communication protocol.	<p>If the error repeats after restart by performing open/close of the front cover, check the follows.</p> <ol style="list-style-type: none"> <li>1) Reoccurrence even after opening and closing of the door and a restart.</li> <li>2) Check the connection of the power-supply connector and the SCB2.</li> <li>3) Check the voltage level in the SCB2.</li> <li>4) Confirm that the SCB2(CN5)-MCB2(CN4) connectors are connected.</li> <li>5) Confirm that the CF card has been inserted.</li> <li>6) Replace the CF card and check the subsequent operation.</li> <li>7) Replace the SCB2 and confirm the subsequent operation.</li> </ol>

Error code	Error name	Error description	Action
04906	Cassette warp detected	The Peel sensor turned on during execution of either read operations or erasure operations.	<ol style="list-style-type: none"> <li>1) Open the front cover and remove any cassettes, and then close the door and restore.</li> <li>2) Halt usage of the problematic cassette and return it to the plant for repair.</li> <li>3) If the error occurs with different cassettes, adjust the peel detection roller. (p.117)</li> </ol>
04907	Cassette peel off NG	The Absorption Detect sensor turned on after peeling of the cassette from the absorption plate following joining of the front and back plates.	<ol style="list-style-type: none"> <li>1) Remove any cassettes, and then close the door and restore.</li> <li>2) If the problem reoccurs for the same cassette, halt usage of this cassette and return it to the plant for repair.</li> </ol>
04908	Cassette fall off detected	It was detected that joining of the front and back plates was not confirmed at cassette ejection.	<ol style="list-style-type: none"> <li>1) Remove any cassettes, and then close the door and restore.</li> <li>2) Check the operation of the device and examine the cassettes.</li> </ol>

### 4.4.7 SCB2 Error Codes

Code	Medium Classification	Detailed Classification		Countermeasures, etc.
10000	Memory error			SCB2 replacement or CF card replacement
11000	Hardware error			SCB2 replacement
12000	Internal communication error	Mechanical control communication	High voltage ON Timeout	<p>Confirm that there was no continuous insertion.</p> <ul style="list-style-type: none"> <li>Open and close the door and then restore. If restoration is not possible, restart.</li> </ul>
12001	Internal error	Mechanical control communication	Laser ON Timeout	<p>Open and close the door and then restore. If restoration is not possible, restart. Following restart, confirm the following.</p> <p>LD peripherals (LD power supply and optical unit)</p> <p>Check the wiring on the board.</p>
12002	Internal error	Mechanical control communication	Mech Ready Timeout	Open and close the door and then restore. If restoration is not possible, restart.
12003	Internal error	Mechanical control communication	Standby Timeout	Open and close the door and then restore. If restoration is not possible, restart.
12010	Internal error	Mechanical control communication	Resent counts Overflow	Open and close the door and then restore. If restoration is not possible, restart.
12011	Internal error	Mechanical control communication	CRC Error counts Over-flow	Open and close the door and then restore. If restoration is not possible, restart.
12200	Internal error	Network communication	Net Initialize Timeout	Open and close the door and then restore. If restoration is not possible, restart. If the problem then reoccurs, confirm whether the JM is operating. Also confirm that the device is connected to the net.
12201	Internal error	Network communication	Net Ready Timeout	Open and close the door and then restore. If restoration is not possible, restart.
12202	Internal error	Network communication	Put Shading Timeout	Open and close the door and then restore. If restoration is not possible, restart.
12203	Internal error	Network communication	Status Check Timeout	Open and close the door and then restore. If restoration is not possible, restart.
12204	Internal error	Network communication	Barcode Seek Timeout	Open and close the door and then restore. If restoration is not possible, restart.

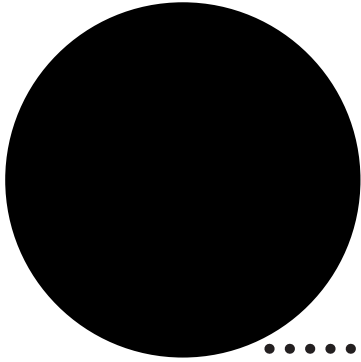
Code	Medium Classification	Detailed Classification		Countermeasures, etc.
12205	Internal error	Network communication	Net Command Timeout	Open and close the door and then restore. If restoration is not possible, restart.
12206	Internal error	Network communication	Transfer End Timeout	Open and close the door and then restore. If restoration is not possible, restart.
12210	Internal error	Network communication	Resent counts Overflow	Open and close the door and then restore. If restoration is not possible, restart.
12211	Internal error	Network communication	CRC Error counts Overflow	Open and close the door and then restore. If restoration is not possible, restart.
13000	Main control error		H sync timeout	No H-SYNC signal is received. Confirm H-sync signal. Confirm whether the laser is ON. "2.6.5 Checking H-sync Signal, p.80"
13001	Main control error		Polygon Timeout	Confirm whether the laser is on. If so, a polygon is abnormal.
13030	Main control error		DMA Timeout	Open and close the door and then restore. If restoration is not possible, restart.
13031	Main control error		SCOM Timeout	Open and close the door and then restore. If restoration is not possible, restart.
14000	Signal process error		Gain Overflow	The gain value has been incorrectly set. Carry out fixed-current reading and confirm the operation of the ADB2. If the fixed current is correct, carry out a restart. If a problem is identified, replace the ADB2.
14001	Signal process error		Gain Underflow	The gain value has been incorrectly set. Carry out fixed-current reading and confirm the operation of the ADB2. If the fixed current is correct, carry out a restart. If a problem is identified, replace the ADB2.
14002	Signal process error		Offset Overflow	The offset value has been incorrectly set. Carry out fixed-current reading and confirm the operation of the ADB2. If the fixed current is correct, carry out a restart. If a problem is identified, replace the ADB2.
14003	Signal process error		Offset Underflow	The offset value has been incorrectly set. Carry out fixed-current reading and confirm the operation of the ADB2. If the fixed current is correct, carry out a restart. If a problem is identified, replace the ADB2.

Code	Medium Classification	Detailed Classification	Countermeasures, etc.
14010	Signal process error	QRV Overflow	<p>The sensitivity has been mistakenly corrected. Check the following.</p> <ol style="list-style-type: none"> <li>1) Confirm that the ADB2's high voltage On/Off switch is On (check by reading the solid density).</li> <li>2) Confirm the absence of problems in the exposure X-ray.</li> <li>3) Replace the plate and confirm operation.</li> <li>4) Check the connectors in the vicinity of the PMT and ADB2.</li> </ol>
14011	Signal process error	QRV Underflow	<p>The sensitivity has been mistakenly corrected. Check the following.</p> <ol style="list-style-type: none"> <li>1) Confirm that the ADB2's high voltage On/Off switch is On (check by reading the solid density).</li> <li>2) Confirm the absence of problems in the exposure X-ray.</li> <li>3) Replace the plate and confirm operation.</li> <li>4) Check the connectors in the vicinity of the PMT and ADB2.</li> </ol>

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#### 4.4.8 Network Errors

Code	Error name	Countermeasures, etc.
20000	Memory error	Open and close the door, and then confirm operation. If re-occurrence seems likely, replace the SCB2 and CF card.
21000	Hardware error	Open and close the door, and then confirm operation. If re-occurrence seems likely, replace the SCB2 and CF card.
26000	Invalid Job Error	A problem such as absence of a search job has occurred and execution is not possible.
26100	Mode-out Job Error	The search job is invalid for Standby, Read, and Maintenance modes, and job execution is not possible.
26200	Invalid Console	Check the Console is correctly operating. One or more of the search job's registration or return address consoles is invalid, and job execution is not possible
26300	Erase Job Error	Check the same job can be executed after erasure. During erasure by the mechanism section, job execution is not possible.



# ***Appendix***

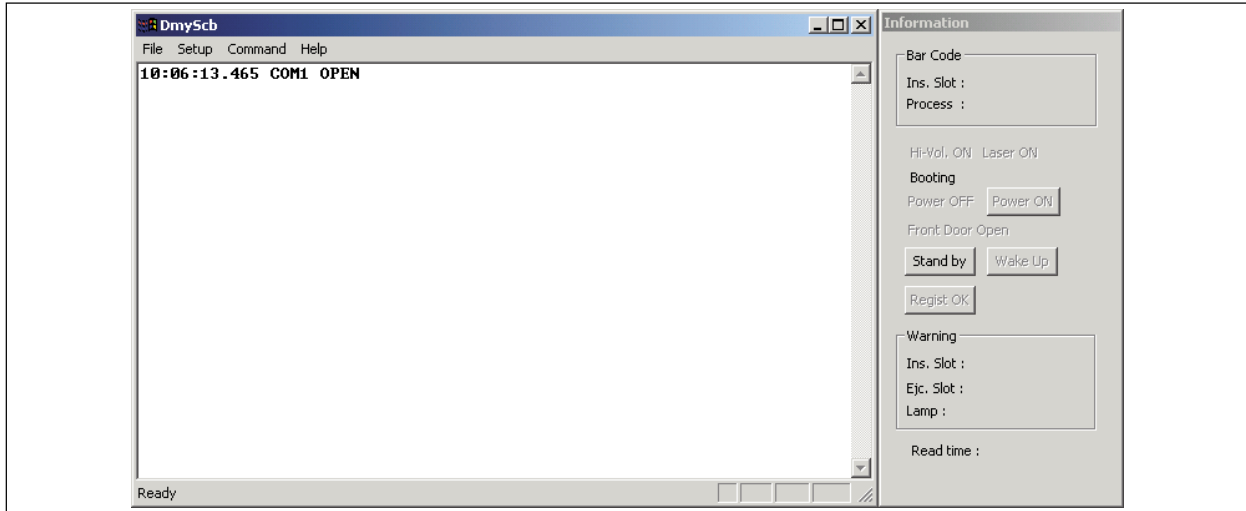




## A.1 SCB2 Dummy Program Screens

### A.1.1 Main Window

The main window will appear right after the start up of the dummy SCB2 program.

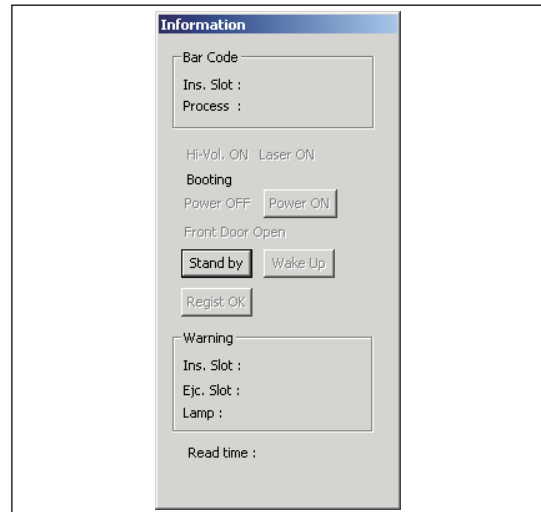


Menu	Menu Item	Description
File	Send Log (S)...	N/A at present.
	End Log (E)	N/A at present.
	Exit Dummy SCB2 (X)	Exit the "Dummy SCB2 Program".
Set Up	Communication Set Up (C)...	Displays the "Communication Set Up" dialogue, and enables to change the communication speed and COM port. (p.171)
	SCB2 Set Up (S)...	Displays "SCB2 Set Up" dialogue, and enables to change various parameters for communication with MCB2. (p.173)
	Font (F)...	Changes the fonts which are displayed on the main window.

Menu	Menu Item	Description
<b>Command</b>	Stand-By ( <u>S</u> )	Sends "Switch to Standby" to the REGIUS 190 of READY status, and changes its mode to standby.
	Wake-Up ( <u>W</u> )	Sends "Release from Standby" to the REGIUS 190 of Standby status, and changes its mode to READY.
	Regist OK ( <u>K</u> )	Sends "Registration OK" to the REGIUS 190 on which a message "Not Registered" is displayed in "Manual Registration" mode, and reset the error message.
	Power ON ( <u>P</u> )	Transit "Dummy SCB2 Program" which has been put off due to the power OFF initiated by pressing the "operation" button of REGIUS 190 to running status again.
	Network Error ( <u>N</u> )...	Sends a network error to the MCB2, and transits the REGIUS 190 to the network error status.
	SCB2 Error ( <u>B</u> )...	Sends a SCB2 error to the MCB2, and transits the REGIUS 190 to the SCB2 error status. (p.175)
	View Maintenance Window ( <u>M</u> )	Displays the maintenance window. (p.176)
	Task Info....( <u>T</u> )	Acquiring the task information, and save it in the firmware of MCB2.(p.182)
	Data Change...(D)	Acquires and changes various data from/on firmware of MCB2.(p.181)
	Update Firm...(U)	Installs the firmware of MCB2.(p.183)
<b>Help</b>	DmySCB2 Version ( <u>A</u> )...	Displays the current version information of the SCB2 software.

### A.1.2 "Information" window

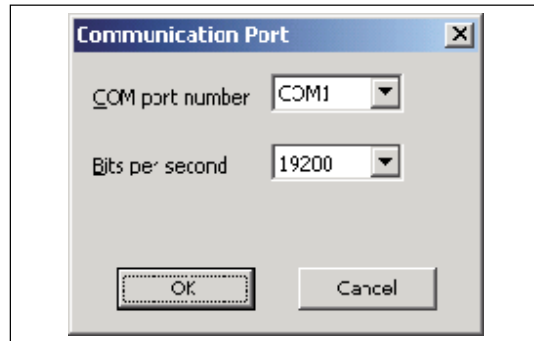
The "Information" window will appear in the right next to the main window right after the start up of the dummy SCB2 program.



Item		Description
Bar Code	Ins. Slot	Displays the bar code of the cassette which is inserted into the REGIUS 190 insertion slot.
	Process	Displays the bar code of the cassette which is being read on the REGIUS 190.
Hi Vol. ON		It is displayed in black when the high voltage ON status is sent from the MCB2, and changes to halftone when "GoBackward" is sent.
Laser ON		It is displayed in black when the laser ON status is sent from the MCB2, and changes to halftone when "GoBackward" is sent.
Booting		It is displayed in black when the software is waiting the initialization to complete, and changes to halftone when Ready status is received from the MCB2.
Power OFF		It is displayed in black when the power OFF status is received from the MCB2.
[Power ON] Button		When the REGIUS 190 is powered ON from the status where the REGIUS 190 has been OFF with the "Power OFF" button being displayed in black, click this button.
Front Door Open		It is displayed in black when "Front cover open status" is sent from the MCB2, and changes to halftone when "Front cover close status" is sent from the MCB2.
[Stand by]		Sends "Switches to standby" command to the MCB2.
[Wake Up]		Sends "Releases standby" command to the MCB2.
[Regist OK]		Sends "Register OK" command to the MCB2.
Warning	Ins. Slot	Displays the error occurred at the insertion slot.
	Ejc. Slot	Displays the error occurred at the insertion slot.
	Lamp	Displays the error relating to the lamp.
Read time		Displays the total number of reading implemented since the dummy SCB2 program is started up.

### A.1.3 "Communication Port" Dialogue

This dialogue will appear when "Communication" is selected in "SetUp" menu of the main window. ("A.1.1 Main Window, p.169")

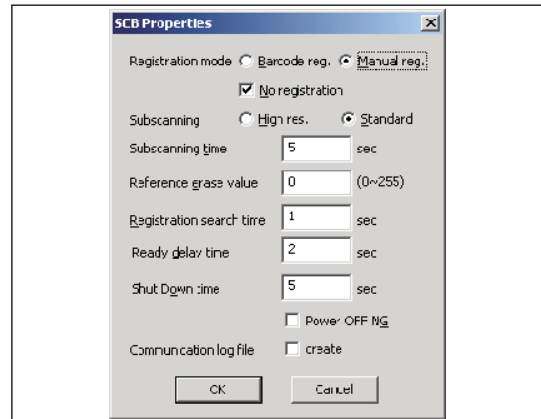


Item	Description
COM Port number	Specifies the serial port to be used.
Bits per second	Specifies the line speed at which the communication is made with the MCB2. However, because the line speed set on the MCB2 is 19200bps (fixed), no alternative than specifying this speed.

### A.1.4 "SCB2 Properties" Dialogue

This dialogue will appear when "SCB2 Set Up" is selected in "Set Up" menu of the main window. ("A.1.1 Main Window, p.169")

Do not change the setting unless otherwise instructed.

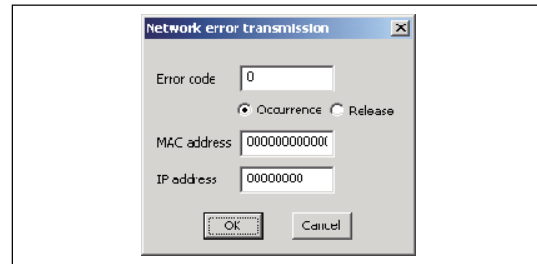


Item	Description
Registration mode	Specifies "Barcode Reg." or "Manual reg.". This setting will be sent as a parameter of "Ready OK" command after initialization is completed.
No registration	Checking this item will send "Registration NG" against "Barcode Detect" sent from the MCB2.
Subscanning	Specifies "High res" or "Standard". This setting will be sent as a parameter of "GoForward".
Subscanning time	Specifies the waiting time between the receipt of "Laser ON" status from the MCB2 and sending "GoBackward" .
Reference erase value	Specifies the reference value for erasure. This setting will be sent as a parameter of "GoBackward", and the MCB2 will set the erase time according to this value.
Registration search time	Specifies the waiting time between the receipt of "Barcode Detect" status from the MCB2 and sending "Registration OK" or "Registration NG".
Ready delay time	Specifies the waiting time between the receipt of "Ready" status from the MCB2 and sending "Ready OK".
Shut Down time	Specifies the waiting time between the receipt of "Power OFF" status from the MCB2 and sending "Power OFF OK".
Power OFF NG	Specifies the waiting time between the receipt of "Power OFF" status from the MCB2 and sending "Power OFF NG".
Communication log file	Checking this item allows to save all communication result with the MCB2 in file.

### A.1.5 "SCB2 Properties" Dialogue

This dialogue will appear when "Network Error" is selected in "Command" menu of the main window. ("A.1.1 Main Window, p.169")

Do not change the setting unless otherwise instructed.

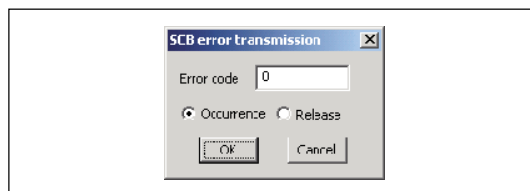


Item	Description
Error code	Specifies the error code which shall be sent to the MCB2.
Occurrence / Release	Specifies whether it is error occurrence or reset.
MAC address	Specifies the MAC address which shall be sent to the MCB2.
IP address	Specifies the IP address which shall be sent to the MCB2.

### A.1.6 "SCB2 Error Transmission" Dialogue

This dialogue will appear when "SCB2 Error" is selected in "Command" menu of the main window. (["A.1.1 Main Window, p.169"](#))

Do not change the setting unless otherwise instructed.

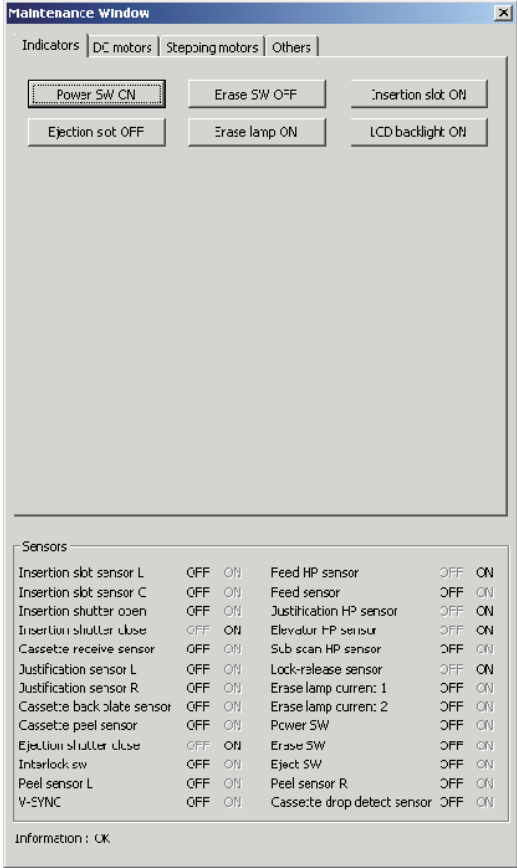


Item	Description
Error code	Specifies the error code which shall be sent to the MCB2.
Occurrence / Release	Specifies whether it is error occurrence or reset.

### A.1.7 Maintenance Window

This dialogue will appear when "View Maintenance Window" is selected in "Command" menu of the main window. (["A.1.1 Main Window, p.169"](#))

- **Common Screen**



The screenshot shows the 'Maintenance Window' dialog box. It has a title bar with a close button. Below the title bar are four tabs: 'Indicators', 'DC motors', 'Stepping motors', and 'Others'. The 'Indicators' tab is selected. Inside this tab, there are six buttons arranged in two rows: 'Power SW ON', 'Erase SW OFF', 'Insertion slot ON' in the top row, and 'Ejection slot OFF', 'Erase lamp ON', 'LCD backlight ON' in the bottom row. Below these buttons is a large empty rectangular area. At the bottom of the dialog is a 'Sensors' section containing a table of sensor statuses. Below the table is an 'Information : OK' label.

**Command Group Switching Tab**  
Switches the command operation key group which will be displayed on the lower part (Command Operation Item View Column)

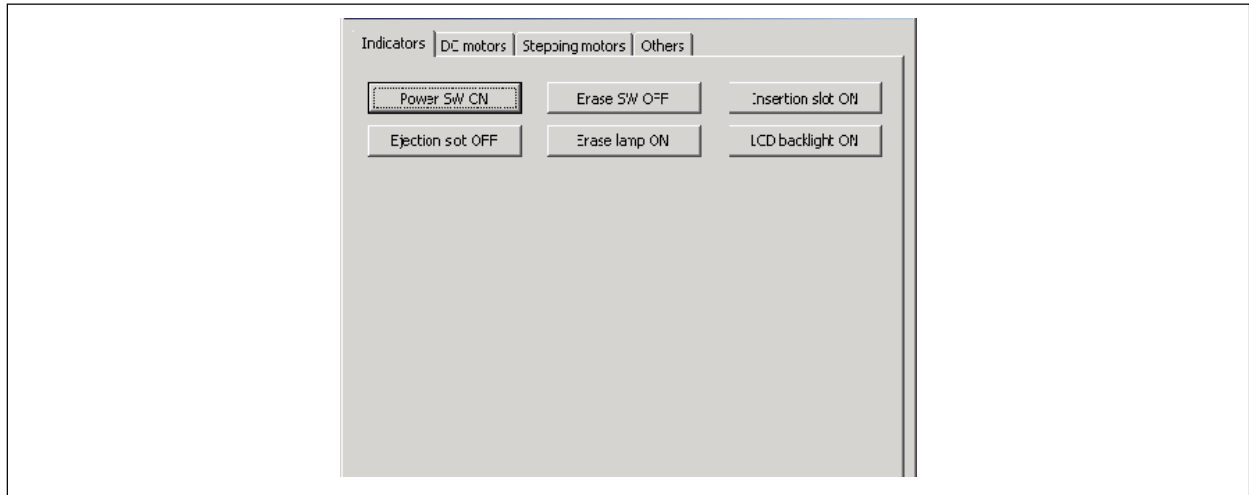
**Command Operation Keys**  
Displays the command keys for the command group which is displayed by selecting the command group switching tab.

**Sensors Status**  
Status of each sensors are displayed here on real time basis.

**Command Execution Information**  
Displays the command in action and its result.

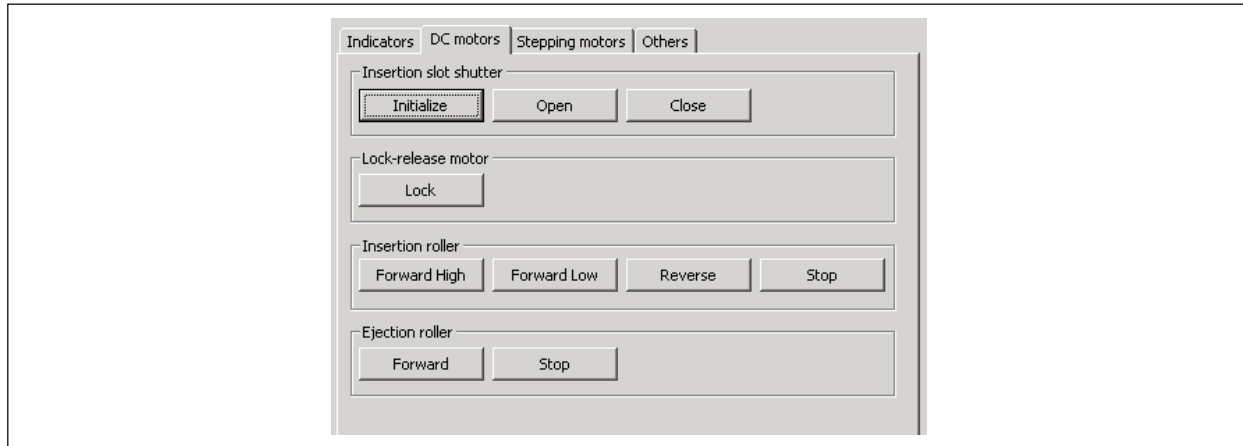
Sensors			
Insertion slot sensor L	OFF	ON	
Insertion slot sensor C	OFF	ON	
Insertion shutter open	OFF	ON	
Insertion shutter close	OFF	ON	
Cassette receive sensor	OFF	ON	
Justification sensor L	OFF	ON	
Justification sensor R	OFF	ON	
Cassette back plate sensor	OFF	ON	
Cassette pabel sensor	OFF	ON	
Ejection shutter close	OFF	ON	
Interlock sw	OFF	ON	
Peel sensor L	OFF	ON	
V-SYNC	OFF	ON	
Feed HP sensor	OFF	ON	
Feed sensor	OFF	ON	
Justification HP sensor	OFF	ON	
Elevator HP sensor	OFF	ON	
Sub scan HP sensor	OFF	ON	
Lock-release sensor	OFF	ON	
Erase lamp current: 1	OFF	ON	
Erase lamp current: 2	OFF	ON	
Power SW	OFF	ON	
Erase SW	OFF	ON	
Eject SW	OFF	ON	
Peel sensor R	OFF	ON	
Cassette drop detect sensor	OFF	ON	

- **[Indicators] Tab**



Key	Description
[Power SW ON]	Switches ON / OFF of "operation" lamp (green).
[Erase SW OFF]	Switches ON / OFF of "erase" lamp (orange).
[Insertion slot ON]	Switches ON / OFF of "READY" lamp (blue).
[Ejection slot OFF]	Switches ON / OFF of "Cassette Ejection" lamp (orange).
[Erase lamp ON]	Switches ON / OFF of "erase" lamp (green).
[LCD Backlight ON]	Switches ON / OFF of the backlight of LCD panel.

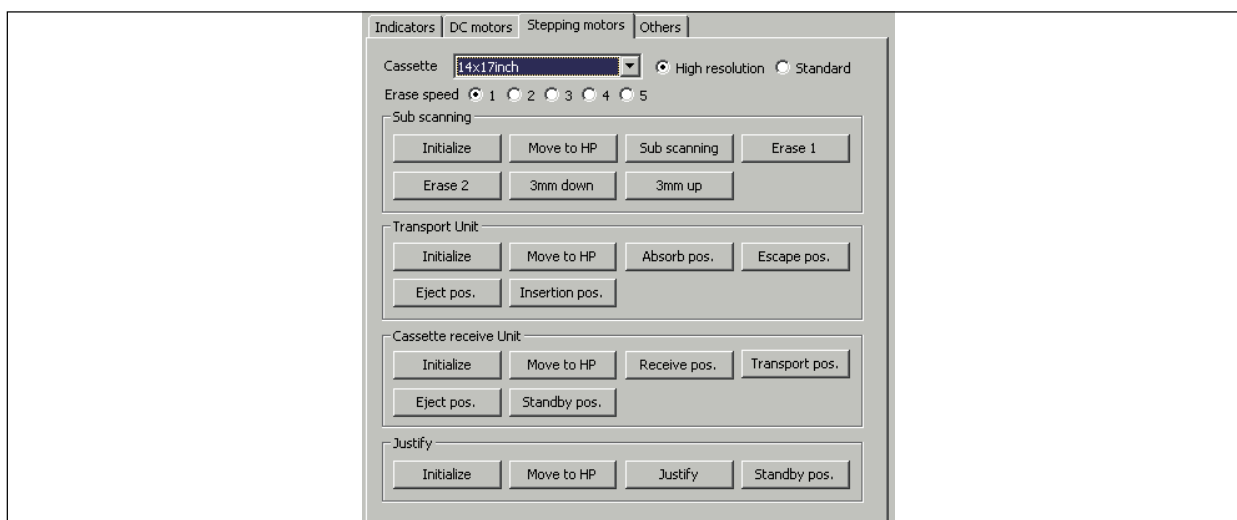
- **[DC Motors] Tab**



Key	Description	
Insertion slot shutter	[Initialize]	Initiates initializing of the insertion shutter. (open, close, and check the operation is normal)
	[Open]	Opens the insertion shutter.
	[Close]	Closes the insertion shutter.
Lock-release motor	[Lock]	Plunge the cassette lock one time.
Insertion roller	[Forward High]	Initiates normal rotation (to draw the cassette) of the insertion roller at high speed.
	[Forward Low]	Initiates normal rotation (to draw the cassette) of the insertion roller at low speed.
	[Reverse]	Initiates reverse rotation (to eject the cassette) of the insertion roller.
	[Stop]	Stops the rotation of the insertion roller.
Ejection roller	[Forward]	Initiates normal rotation (to eject the cassette) of the ejection roller.
	[Stop]	Stops the rotation of the ejection roller.

- **[Stepping Motors] Tab**

**Important** Full care should be taken when starting the stepping motor so that any component parts should not interfere with each other.



Item / Key		Description
Cassette		Specifies the cassette type that will be used as a standard for operations of subscan, Cassette receive Unit, justification.
High resolution / Standard		Specifies the mode for subscanning.
Erase speed		Specifies the operation speed for erase (read mode).
Sub scanning	[Initialize]	Initiates initialization of the subscan unit.
	[Move to HP]	Moves the subscan unit to HP.
	[Sub scanning]	Initiates the subscan operation (image reading operation) of the subscan unit.
	[Erase1]	Initiates the erase operation (erase after image reading) of the subscan unit.
	[Erase2]	Initiates the erase operation (erase in erase mode) of the subscan unit.
	[3mm down]	Descends the subscan unit by 3mm.
	[3mm up]	Ascends the subscan unit by 3mm.
Trans- port Unit	[Initialize]	Initiates initialization of the Transport Unit.
	[Move to HP]	Moves the Transport Unit to HP.
	[Absorb pos.]	Moves the Transport Unit to magnetizing position where the cassette is magnetized onto the cassette magnetizing plate.
	[Escape pos.]	Moves the Transport Unit to magnetizing position where the cassette is separated in to front and back plates.
	[Eject pos.]	Moves the Transport Unit to ejection position.
	[Insertion pos.]	Moves the Transport Unit to insertion position.

Item / Key		Description
Cassette receive Unit	[Initialize]	Initiates initialization of the Cassette receive Unit.
	[Move to HP]	Moves the Cassette receive Unit to HP.
	[Receive pos.]	Moves the Cassette receive Unit to the receiving position where the cassette is brought down when inserted.
	[Transport pos.]	Moves the Cassette receive Unit to the transport position where the cassette is aligned to the level for transportation.
	[Standby pos.]	Moves the Cassette receive Unit to HP.
Justify	[Initialize]	Initiates initialization of the justification assy.
	[Move to HP]	Moves the justification assy to HP.
	[Justify]	Initiates the justification operation (sandwiching the cassette) of the justification assy.
	[Standby pos.]	Moves the justification assy to HP.

- **[Others] Tab**

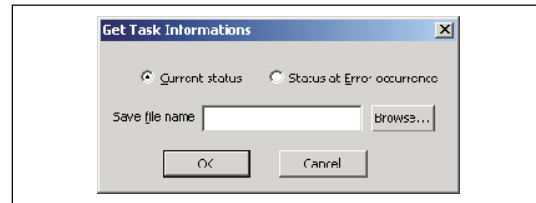


Key	Description	
Bar code	[Start Read]	Sends a command to the bar code reader to start reading. After reading, the bar code information will be displayed on the "Command Execution Information Column".
	[Stop Read]	Sends a command to the bar code reader to stop reading.
LCD	[Test screen]	Displays the test window on the LCD. At the same time, the backlight is turned ON.
Speaker	[Sound 1]	Output "Sound 1(pin pone)" from the speaker. This sound is used to notify an error.
	[Sound 2]	Output "Sound 1(pipi! pipi! .... continued)" from the speaker. This sound is used to notify a cassette is being ejected.
	[Sound 3]	Output "Sound 1(pi!)" from the speaker. This sound is used to notify it is ready to accept a new cassette.
	[Sound 4]	Output "Sound 1(pipipi!)" from the speaker. This sound is used to notify that it failed to read the bar code or the cassette is not aligned to the left edge, and to prompt the user to check the operation.
	[Stop]	Stops the sound being output from the speaker.

### A.1.8 "Get Task Information" Dialogue

This dialogue will appear when "Get Task Info." is selected in "Command" menu of the main window. ("A.1.1 Main Window, p.169")

Do not change the setting unless otherwise instructed.



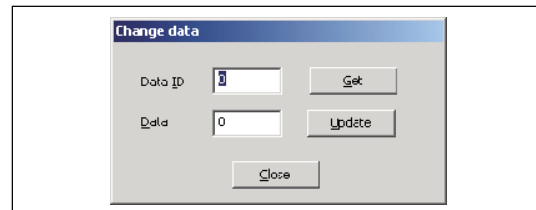
Item	Description
<u>C</u> urrent Statu Status at <u>E</u> rror occurrence	Specifies whether to get the current task information or the task information which is safeguarded when an error occurred.
Save <u>f</u> ile name	Specifies a file in which the obtained task shall be saved.

### A.1.9 "Change data" Dialogue

This dialogue will appear when "Data Change" is selected in "Command" menu of the main window. ("A.1.1 Main Window, p.169")

Do not change the setting unless otherwise instructed.

**Important**     **REGIUS 190 may not operate properly when the data change is implemented.**



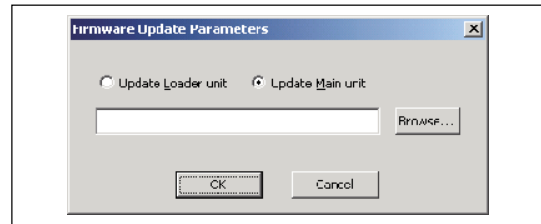
Item	Description
Data <u>I</u> D	Specifies the data ID of the data to be changed or acquired.
<u>D</u> ata	Clicking [ <u>G</u> et] will displays the data ID of the specified data. Clicking [ <u>U</u> pdate] will update the data ID to the specified ID.

### A.1.10 "Firmware Update Parameters" Dialogue

This dialogue will appear when "Update firm ..." is selected in "Command" menu of the main window. ("A.1.1 Main Window, p.169")

Do not change the setting unless otherwise instructed.

**Important**     **If the update of the firmware is implemented only on the MCB2, and not on the SCB2 may cause malfunction of the REGIUS 190 depending on the combination of versions.**



Item	Description
Update <u>L</u> oader unit	Select this to update the loader of the firmware on the flash memory of MCB2.
Update <u>M</u> ain unit	Select this to update the main of the firmware on the flash memory of MCB2.
[Browse ...]	Displays the dialogue on which a selection of firmware file (*.bin) can be made.

## A.2 DIP Switch Setting

### A.2.1 DIP Switches on the MCB2 (Mechanical Control Board)

- **Operation Mode Setting**

SW2-1	SW2-2	Setting Mode	Description
OFF	OFF	Normal operation mode	Normal operation mode that allows the REGIUS 190 to perform the normal reading sequence.
ON	OFF	Stand-alone test mode	Connecting the REGIUS 190 and the PC with serial cable, enables to implement each individual operation command.
OFF	ON	Continuous operation mode	Enables to repeat the reading operation of the REGIUS 190 without cassette.
ON	ON	Durability test mode	A mode to perform durability test of the cassette. Difference from the normal mode is; subscanning is made only for stroke of 5cm(up & down).

- **SIO CH0 Setting**

SW2-3	SW2-4	Setting Mode	Description
OFF	OFF	Bar code reader	Enables the bar code reader on the REGIUS 190.
ON	OFF	No input/output	Disables the I/O operation of the specified port. Reading operation is performed by default cassette size.
OFF	ON	Debug I/O-1	Output the debug information from this port. Do not read the bar code, and operation is performed by default cassette size.
ON	ON	Debug I/O-2	Output the debug information from CN12 port. Do not read the bar code, and operation is performed by default cassette size.

- **SIO CH1 Setting**

SW2-5	SW2-6	Setting Mode	Description
OFF	OFF	SCB2 communication	Enables the communication with SCB2.
ON	OFF	No input/output	Disables the I/O operation of the specified port.
OFF	ON	Debug I/O	Output the debug information from this port. For it does not communicate with SCB2, registration mode is fixed to bar code registration, erase speed is fixed to the maximum.
ON	ON		

- **Cassette-Fall Detection**

SW2-7	Setting Mode	Description
OFF	Enabled	Enables the detection of cassette fall.
ON	Disabled	Disables the detection of cassette fall.

- **Durability Test Mode (expanded mode)**

SW2-8	Setting Mode	Description
OFF	Expanded	Eject the cassette at every cycle.

SW2-8	Setting Mode	Description
ON	Nonexpanded	Continuous operation without ejecting the cassette.

- **LCD Message Language**

SW3-3	Setting Mode	Description
OFF	Japanese	Uses Japanese for the LCD message on the REGIUS 190.
ON	English	Uses English for the LCD message on the REGIUS 190.

- SW3-1, SW3-2, SW3-4, SW3-5, SW3-6, SW3-7, SW3-8 are spares.

- **Fine Adjustment of Magnetizing Position at Transport Unit.**

SW4	Offset Value
0	+4.0mm
1	+4.5mm
2	+5.0mm
3	+5.5mm
4	-2.0mm
5	-1.5mm
6	-1.0mm
7	-0.5mm
8	0.0mm
9	+0.5mm
A	+1.0mm
B	+1.5mm
C	+2.0mm
D	+2.5mm
E	+3.0mm
F	+3.5mm

## A.2.2 DIP Switches on the ADB2 (Analogue/Digital Board)

### • Input Mode Selection

SW1-1	Setting Mode	Description
OFF	Manual	Various settings are made by manual. (use SW1-2 ~ 6)
ON	Remote	Various settings can be controlled by SCB2.

### • Log AMP Input Selection

SW1-2	Setting Mode	Description
OFF	Ref. Curr.	Uses reference current for the input to Log AMP.
ON	PMT	Uses PMT current for the input to Log AMP.

### • Setting of Reference Current

SW1-3	SW1-4	Setting Mode	Description
OFF	OFF	-50uA	Set the reference current at -50uA.
ON	OFF	-500nA	Set the reference current at -500nA.
OFF	ON	-50nA	Set the reference current at -50nA.
ON	ON	0A	Set the reference current at 0A.

### • Setting of Polygon CLK

SW1-5	SW1-6	Setting Mode	Description
OFF	OFF	Setting-1	Set the Polygon CLK to 659.3472Hz. (setting except for mam-mography)
ON	OFF	Setting-2	Set the Polygon CLK to 329.6236Hz. (setting except for mam-mography)
OFF	ON	Setting-3	Set the Polygon CLK to 454.7224Hz. (setting for mammography)
ON	ON	Setting-4	Set the Polygon CLK to 227.3612Hz. (setting for mammography)

### • High Voltage Setting Mode Selection

SW2	Setting Mode	Description
A	Auto.	High voltage setting is controlled by the data sent from SCB2.
M	Manual	High voltage setting is controlled by VR2.

### • High Voltage ON/OFF Selection

SW3	Setting Mode	Description
OFF	OFF	High voltage OFF.
ON	ON	High voltage ON.

### • Offset Adjustment Mode Selection

SW4	Setting Mode	Description
A	Auto.	Setting of offset adjustment is controlled by the data sent from SCB2.
M	Manual	Setting of offset adjustment is controlled by VR1.

## A.3 Replacement Procedures of CF Card

CF card mounted on the SCB2 (System Control Board) contains the following data.

- Unevenness correction and shading correction data.
- Sensitivity correction data.
- Config data (PLL adjust value, start position/home position, etc.)
- Various setting data for networks.

Because the set of these data is unique to each REGIUS 190, it is necessary to back up the data before replacement of the CF card, and to restore the data on the new CF card after the replacement.

Back up and restoration of these data can be implemented from the REGIUS Console that is connected to the REGIUS 190 via network using the service tool.

Described below is the outline of replacement procedure of CF card. For the detailed operation of REGIUS Console (service tool), refer to "Installation/Service Manual".

**<Caution> Replacement of the CF card shall be carried out when the error is attributed to the CF card. In most of cases, network communication of the REGIUS 190 becomes disabled when an error occurs on the CF. Therefore in addition to the back up of the CF data at the time of installation, which is a must, it is strongly recommended to back up the data whenever the setting on the REGIUS 190 is changed at the time of maintenance work.**

### • Replacement Procedures of CF Card

1. If the network communication between the REGIUS 190 and REGIUS Console is valid, back up the data in the CF card onto the REGIUS Console.
  - Start the service tool, and click "REGIUS190 --> REGIUS Console" of the "REGIUS 190 PCB" screen.
2. Using one REGIUS Console (the one on which the data of the CF card has been backed up), back up the set up data of this REGIUS Console onto the super disk. (hereinafter, implement the settings for REGIUS 190 and restore onto the CF card using this REGIUS Console)
3. Restore the factory setting (default) onto the REGIUS Console.
  - On the "Network Setup" screen, restore the default settings. (IP address : 192.168.20.90, Sub-net mask : 255.255.255.0)
  - On the "JOB INFO" screen, put a check mark on [Job Manager(built-in)] of "Basic Setting", and "Manual Register (afterward)" of "Barcode Setting".
  - On the "CCU INFO" screen, restore the default settings for [Host Name] of "TCP/IP", [Host Name (on Job Manager)] and [IP Address]. ([Host Name] : R170-0001, [Host Name (on Job Manager)] : r170-0001, and [IP Address] : 192.168.20.190)
  - On the "PostgreSQL" screen, restore the original settings (c\_status : CS1-0001 only, r\_status : r170-0001 only, relations : CS1-0001 and r170-0001, one relation only, sys\_config : to "1", or on the "Service Tool" screen, click "Adjust" --> [Job Manager] --> [Initialize] to initialize the settings.
4. Disconnect the REGIUS Console and REGIUS 190 from the facility's network, and connect them in 1 to 1 configuration.
5. Turn off the REGIUS 190 by pressing the operation button, and turn off the power breaker.
6. Replace the CF card. (["2.7.2 Replacement of CF Card, p.83"](#))
7. Turn on the power breakers and start the REGIUS Console and REGIUS 190.

8. After the REGIUS Console and REGIUS 190 have successfully started up, start the service tool on the REGIUS Console.
9. On the "Network Setup" screen, restore the original settings (settings for the hospital) for the network of the REGIUS 190 as it was installed.
10. Restore the original settings (settings for the hospital) for the REGIUS Console as it was installed.
11. Connect the REGIUS 190 and the REGIUS Console to the facility's network.
12. Check that the all setting data except various correction data and config data of the REGIUS 190 has restored the original status as it was installed.
13. Start the service tool on the REGIUS Console, and restore the data onto the CF card of the REGIUS 190 using the "Board Change" screen.
  - Restore the data that was backed up in the step 1 or at the time of installation, servicing.
  - If there is no CF data available for restoration, check/readjust the REGIUS 190 according to the ["Procedures when no CF data is available"](#) in the following.
14. Restart the REGIUS 190.

- **Procedures when no CF data is available**

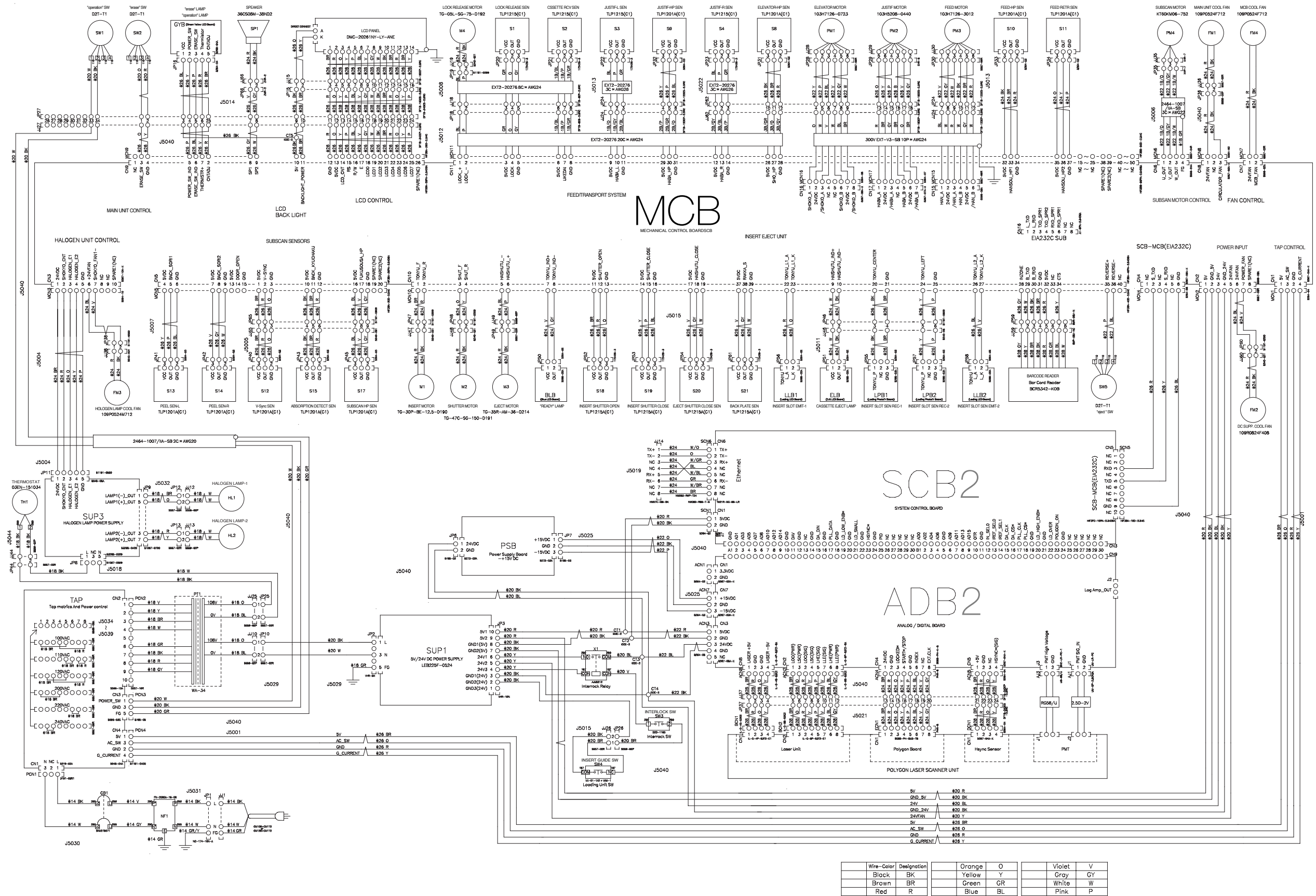
When back up of the CF card is not successful, and there is no back up data available from the installation, it is required to check/readjust as following after the replacement of CF card.

For the actual procedures of each work, refer to the "Installation/Service" manual.

- Checking the reading pixels, read start position.
- Adjusting the PLL setting, read start position.
- Unevenness correction.
- Sensitivity correction.

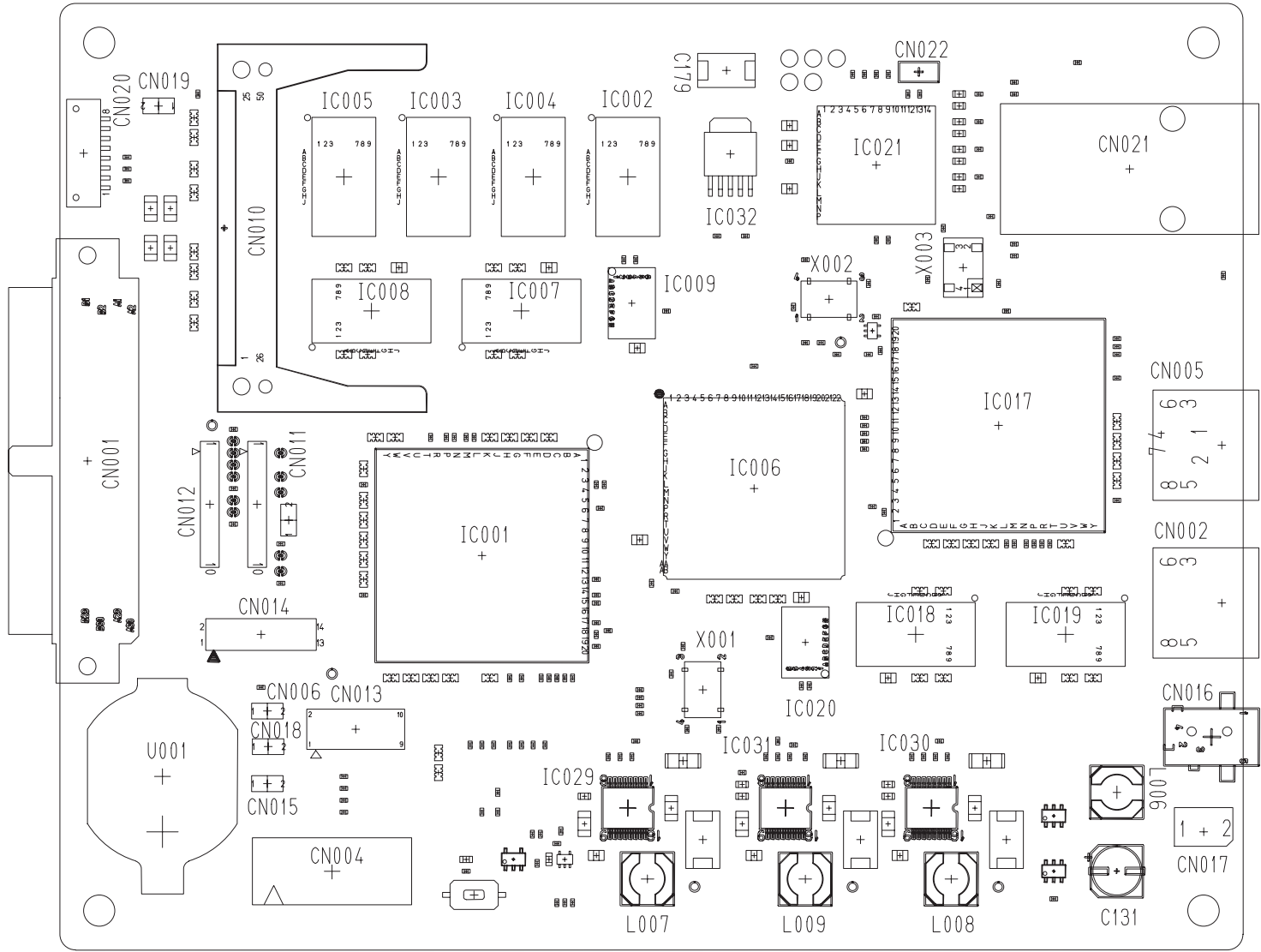
**Important**     **The above procedures require tremendous steps to complete. Thus it is strongly recommended to back up the CF card data at the time of installation.**

A.4 Main Circuit Diagram

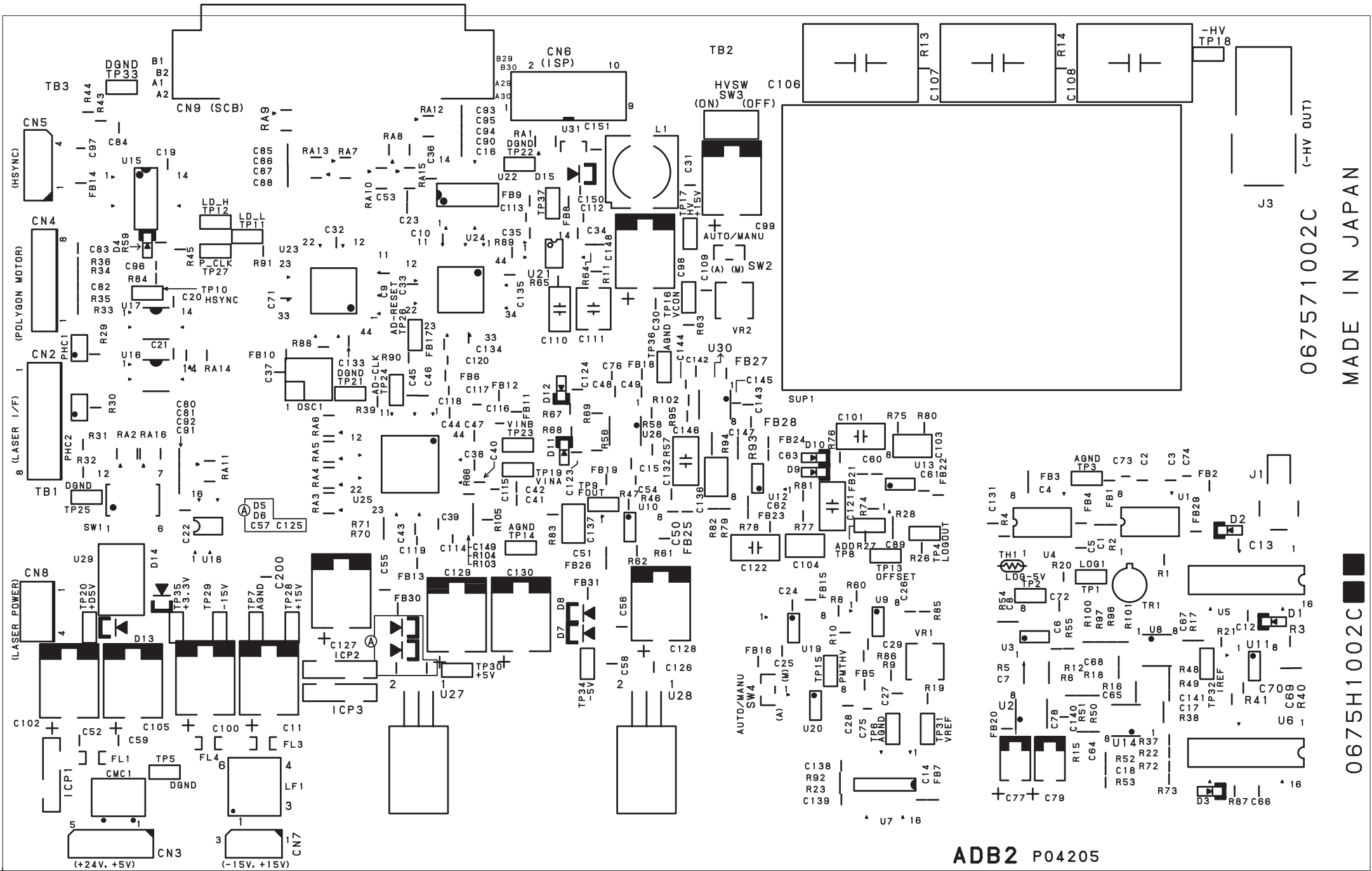


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A.5.2 SCB2 (System Control Board)



A.5.3 ADB2 (A/D Board)





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