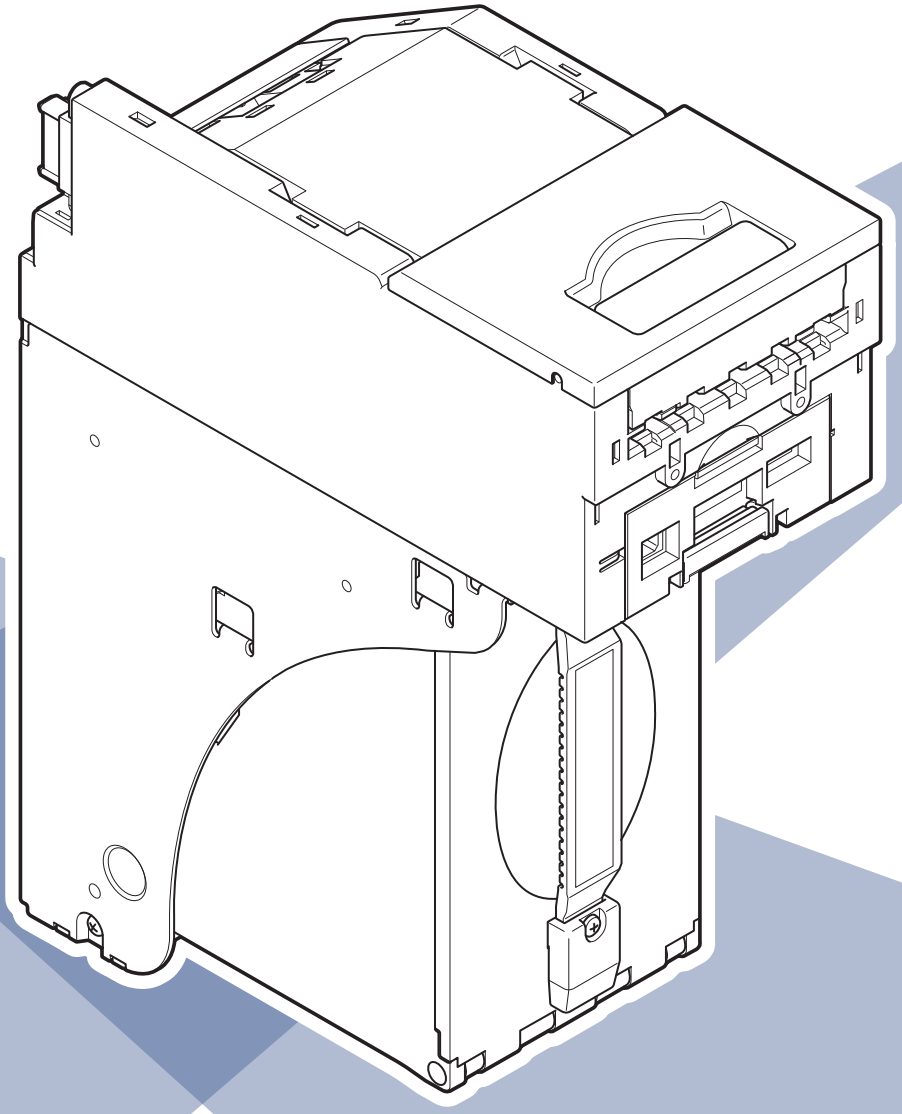
Universal Bill Validator

AZ-KT101-500/1000

Service Manual



ARUZE CORP.

Preface

Thank you for supporting the Aruze Universal Bill Validator. Please read this manual carefully as it explains, step by step, to support the unit correctly and safely.

Documentation Conventions

The list below describes the documentation conventions used in this manual.

Symbol	Description
⚠	This icon notifies situations in which bodily injury or equipment damage can occur.
Note	This indicates important information or procedures that must be understood and followed for correct and risk-free maintenance work.
1), 2)	This indicates steps in the procedure. Be sure to perform these steps in the order.

Note

(1) It is forbidden to copy the contents of this manual, in whole or in part, without the express permission of Aruze Corporation, except for the support use.
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Table of Contents

Chapter 1 Model Numbers and Specifications

Chapter 2 Installation, Operation and Maintenance

Chapter 3 Disassembly and Reassembly

Chapter 4 Trouble Shooting and Performance Test

Chapter 5 Software Download

Chapter 6 Exploded Views and Parts List

Chapter 1

Model Numbers and Specifications

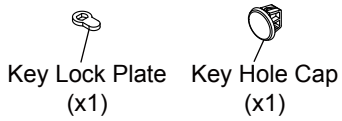
1-1. Model Numbers

Four models are available as listed below. They are different in the RF-tag function and the capacity of the Cash Box.

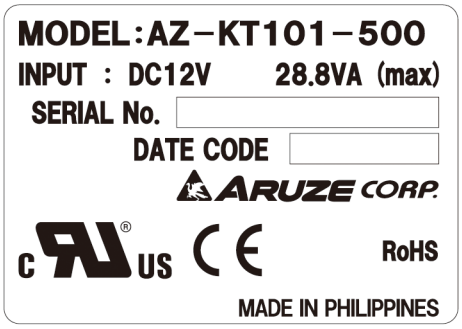
Model No.	Capacity of Cash Box	RF-tag Function
AZ-KT101-500	500 Bills	No
		Yes (Factory Option)
AZ-KT101-1000	1000 Bills	No
		Yes (Factory Option)

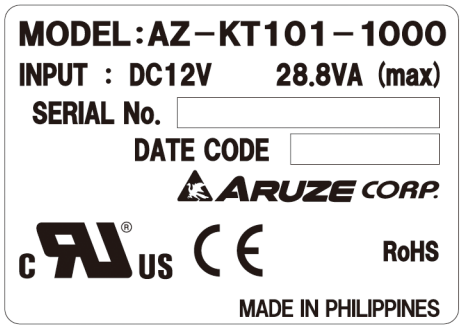
Supplied Accessories

The following parts are supplied with the unit as accessories.
Their usage is described in "2-2-2. Lock Installation".



Name Plate





Currency Check Label

Non-checked currencies are available.

USD	CNY	EUR	HKD	MOP	JPY
PHP	KRW				

1-2. Main Features

High Validation Ability

– High acceptance rate for genuine bills: 99.5% or more (Higher than ATM)
– Equipped with a newly-developed Contact Image Sensor (CIS)

High Operability

– Wide bill-entrance: Widened to the utmost limit
– Prevention of mistaken bill-insertion and making a bill withdrawal:
Equipped with a new shutter mechanism

High Expandability

– Easy upgrade of dictionaries
– Easy upgrade of countermeasures against counterfeit bills
– Multi validation of plural-country bills

1-3. Specifications

1-3-1. General Specifications

Power requirements	
Supply voltage:	DC 12 V
Power consumption	
Standby:	7.0 VA
In operation:	28.8 VA (Maximum)
Dimensions:	W114 ´ D225 ´ H295 mm (For details, refer to "1-3-4. Dimensions".)
Mass:	Approx. 4 kg
Acceptable Bill size	
Width:	62 to 85 mm
Length:	120 to 163 mm
Interface	
Serial:	RS232C, Photocoupler
Operation environment	
Temperature:	+5 to +50 °C
Humidity:	+30 to +85% RH (Non condensing)
Storage environment	
Temperature:	-20 to +60 °C
Humidity:	+30 to +85% RH (Non condensing)
Location:	Indoors only
Light Disturbance:	Avoid direct sunlight.
Reliability	
MCBF:	200,000 Vending (Jamming rate: 1/10,000)
Life:	1,000,000 Vending

FCC WARNING
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE
This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will no occur in a particular installation. If this equipment does cause farmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the follwing measures:
-Reorient or relocate the receiving antenna
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

1-3-2. Validator Specifications

Contact Image Sensor (CIS)
- Resolution: 200 dpi (630 Pixels/Line)
- Effective reading width: 80 mm
- Reflection light source: Two wavelengths
- Transparent light source: Two wavelengths

Genuine-bill acceptance rate: 99.5%

Processing speed
- Transport speed: 254 mm/s
- Processing time: 4.5 s (at validating five-country bills)

Bar-code reading: Four directions

Dictionary: Eight-country bills multiple processing (Maximum)

Inserter
- Bill entrance: W86 ´ H5 mm
- Skew correction: Available
- Prevention of mistaken bill-insertion: Available
- Prevention of making a bill withdrawal: Available

Escrow: 1 bill
- Prevention of back-feed: Available

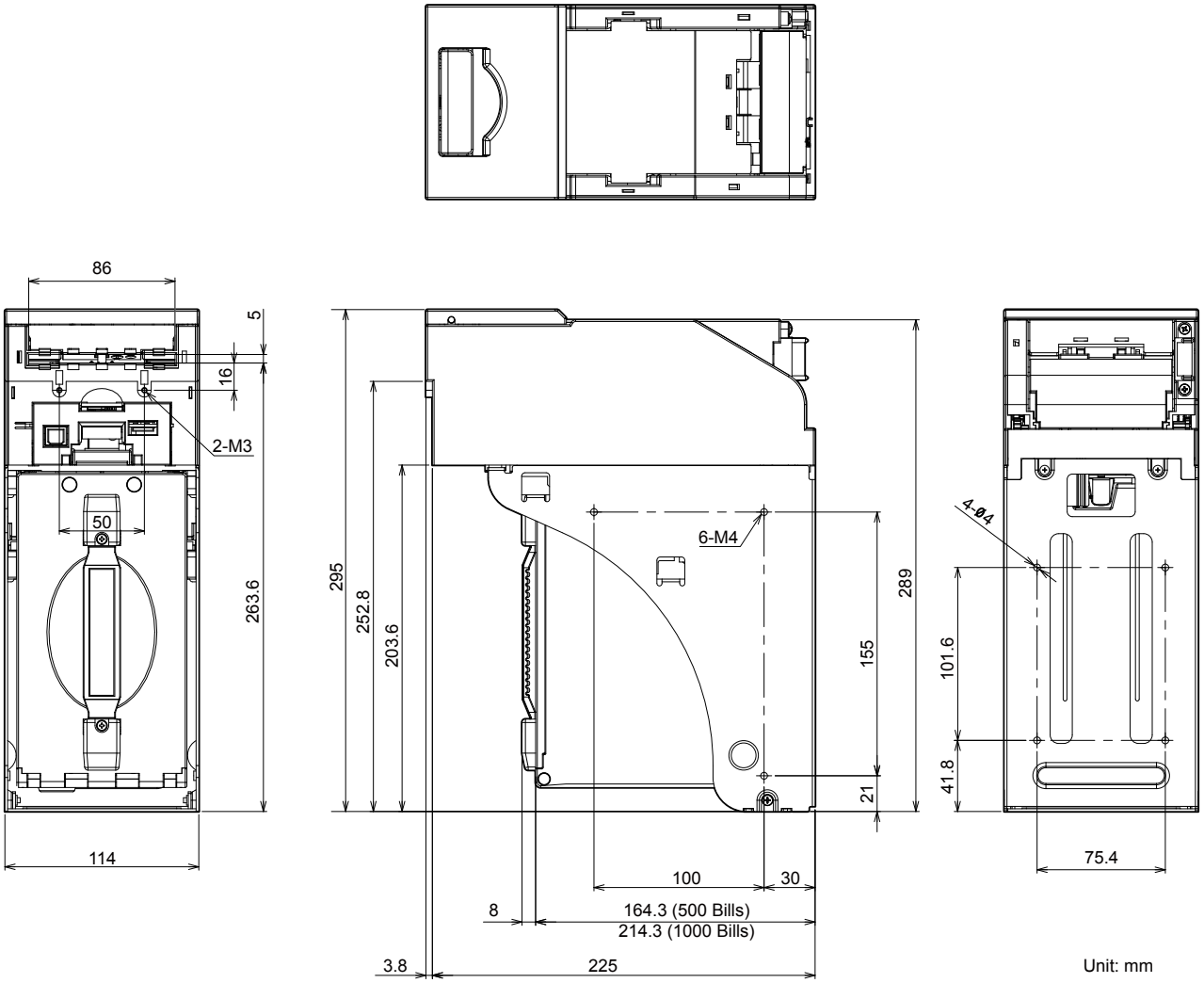
1-3-3. Cash Box Specifications

Capacity: 500 bills (for AZ-KT101-500)
1,000 bills (for AZ-KT101-1000)

Cash-box-full detection: Available

RF-tag function (Data storege of vending record and validation result): Available (factory option)

1-3-4. Dimensions



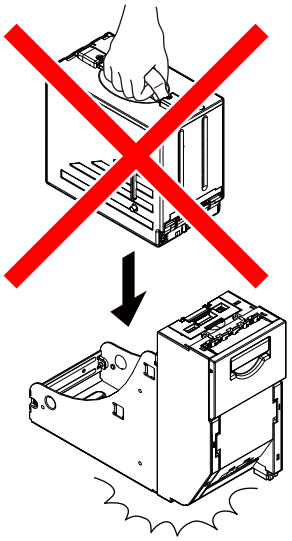
Unit: mm

Chapter 2

Installation, Operation and Maintenance

2-1. Precautions

(1) Do not insert a torn, folded, or wet bill, as these may cause bill jam inside the unit.
(2) Do not expose the unit to water.
The unit contains precision electronic devices that can be damaged if water or any liquid is sprayed or spilled into the unit.
(3) Do not install the unit in a dusty environment. Dust may affect the sensor performance.
(4) ⚠ Do not carry the unit with the Handle of the Cash Box otherwise the Transport Assy and Stand Assy may fall down and damage.

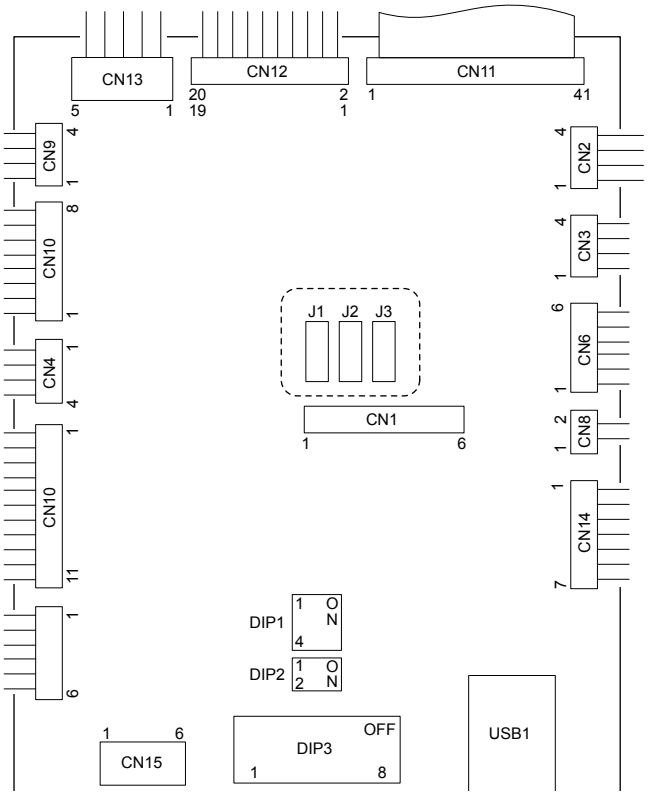


2-2. Installation

2-2-1. Unit Installation

1) If a cable is connected to the Interface Connector, disconnect it to remove the DC 12 V power.
2) Set the jumpers on the MAIN PCB Assy according as the interface with the host machine: photo-coupler isolation or RS-232C.
   Remove the Lower Chassis to make access to the jumpers. Refer to “3-5-2. Lower Chassis”.

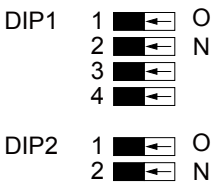
MAIN PCB Assy



Interface	Jumpers J1 J2 J3
Photo-coupler Isolation (Default Setting)	
RS-232C	

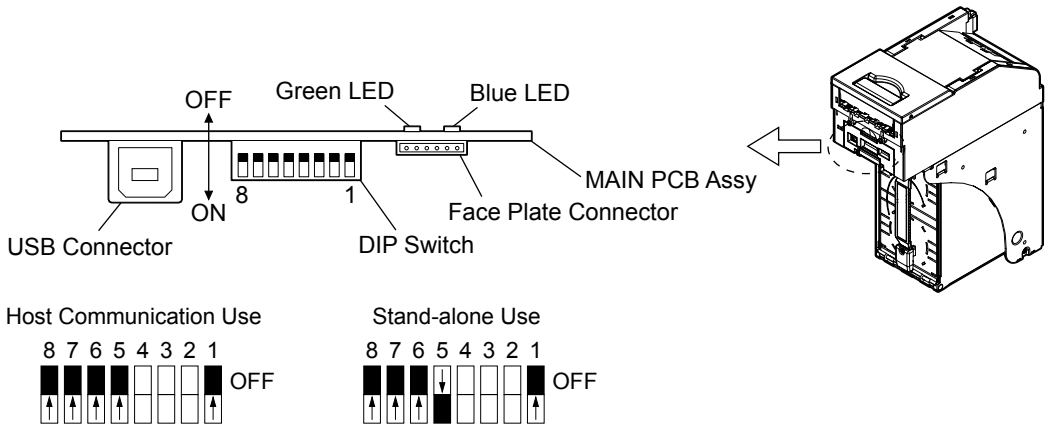
: Shorted

3) Ensure that all bits of the DIP1 and DIP2 switches on the MAIN PCB Assy are set OFF.

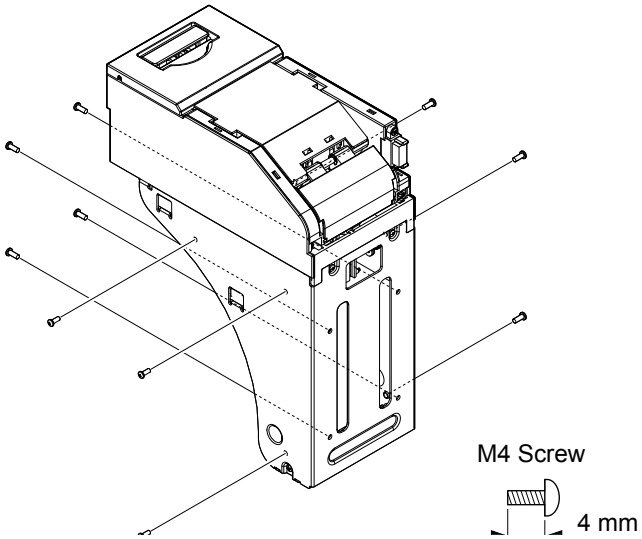


4) Ensure that the DIP3 switch on the MAIN PCB Assy is set as shown below.

Note *In this manual, "DIP switch" means the DIP3 switch.*



5) Mount the unit to the predetermined position with ten screws.

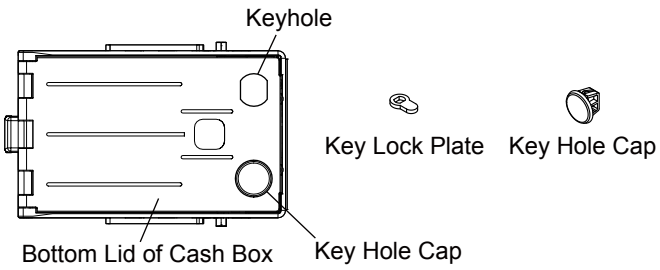


2-2-2. Lock Installation

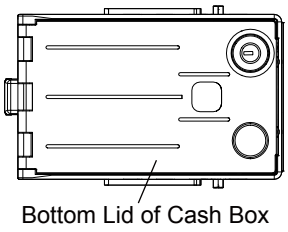
One or two security locks can be installed to the Cash Box.

Note *There are many lock designs. The customer is responsible for selecting a lock with performance that is fit for the intended purpose.*

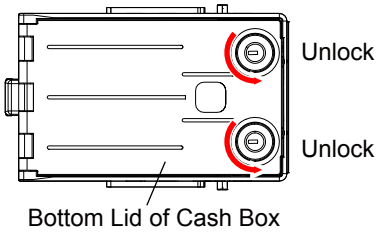
The Key Lock Plate and Key Hole Cap are supplied as accessories each one for the keyhole on the bottom lid of the Cash Box. Another keyhole is covered with a Key Hole Cap at the factory.



When using only one lock, keep another keyhole covered as shown below.



When two locks are installed, they must be rotated to lock or to unlock in the same direction as shown below.



2-2-3. System Connection

Interface Connector

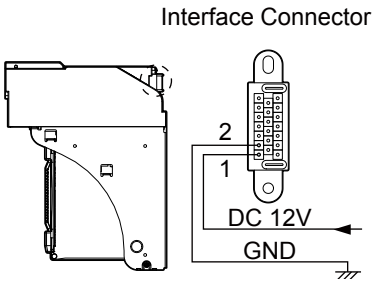
Connector on the unit
Housing: DRA-20PC-F0 (JAE)
Contact: D02-22-26P-10000 (JAE)

Mating Connector:
Housing: DRA-20SC-F0R (JAE)
Contact: D02-22-26S-10000 (JAE)

Stand-alone Use

Supply DC 12 V to the Interface Connector with an appropriate cable. Refer to Chapter 1 for power consumption.

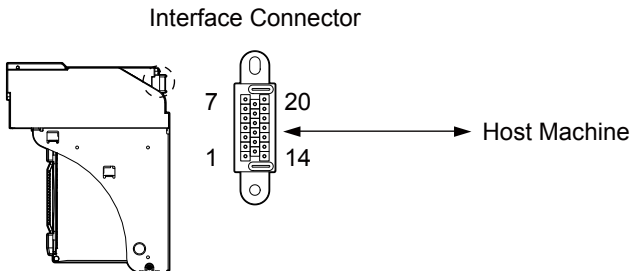
⚠Keep the cable length less than 3m.



Host Communication Use

Connect the host machine to the Interface Connector with an appropriate cable.

Pin	Signal Name	I/O	Description
1	+12V POWER	I	DC +12 V power
2	GND POWER	-	DC 0 V power
3	M.RES	I	System reset signal
4	PC/RS232C OUT	O	Signal output line to Controller
5	+12V (I/F)	I	Interface power (DC +12 V)
6	PC/RS232C IN	I	Signal input line from Controller
7	GND (I/F)	-	Interface power (photo-coupler DC 0 V)
8	TTL1 IN	I	Reserved (TTL1)
9	TTL1 OUT	O	Reserved (TTL1)
10	TTL2 IN	I	Reserved (TTL2)
11	TTL2 OUT	O	Reserved (TTL2)
12	TTL3 IN	I	Reserved (TTL3)
13	GND	-	Interface power (RS232C DC 0 V)
14	NC	-	No use (pulled up to +5 V with 2.2 kΩ resistor)
15	TTL RXD	I	Reserved (TTL4)
16	TTL5 IN	I	Reserved (TTL5)
17	TTL3 OUT	O	Reserved (TTL3)
18	TTL4 OUT	O	Reserved (TTL4)
19	TTL5 OUT	O	Reserved (TTL5)
20	TTL6 OUT	O	Reserved (TTL6)



2-2-4. Initial Check

1) When the unit is used in stand-alone, apply the DC 12 V power to the Interface Connector. When the unit is in host communication use, send the RESET command from the host machine.
   Ensure that the unit operates in the sequence described below.
   (1) Both green and blue LEDs light for a moment and go out.
   (2) Initialization is performed.
   (3) The green LED lights.
   Refer to "(1) Power-ON and Initialization" in "4-2-2. Normal Operation".

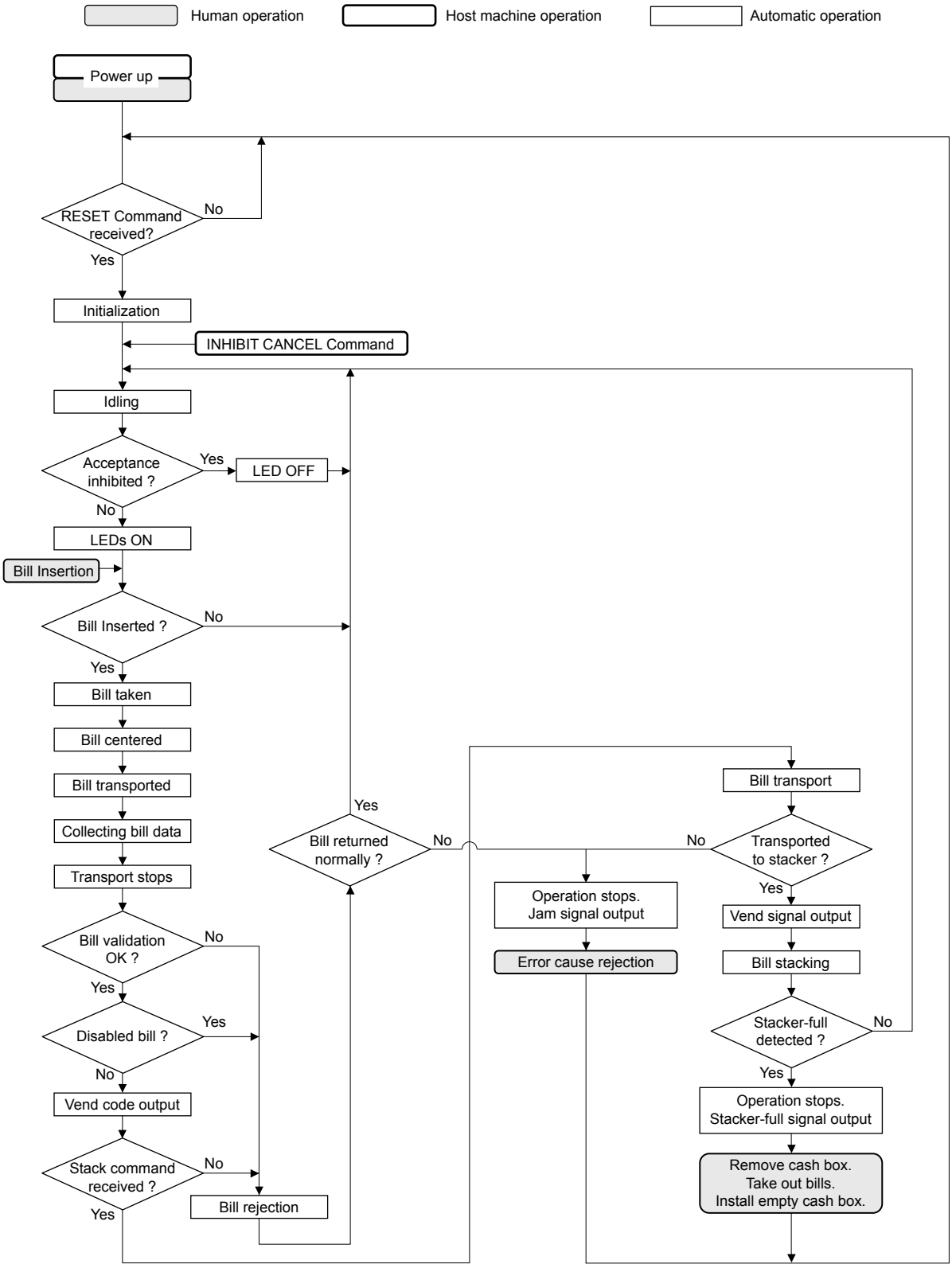
   Note *If the unit does not operate as above, check the followings.*
   DC 12 V power connection
   Error status (Refer to "4-2-3. Errors".)

2) Insert bills of each denomination to be validated and ensure that bills are accepted and validated.

2-3. Operation

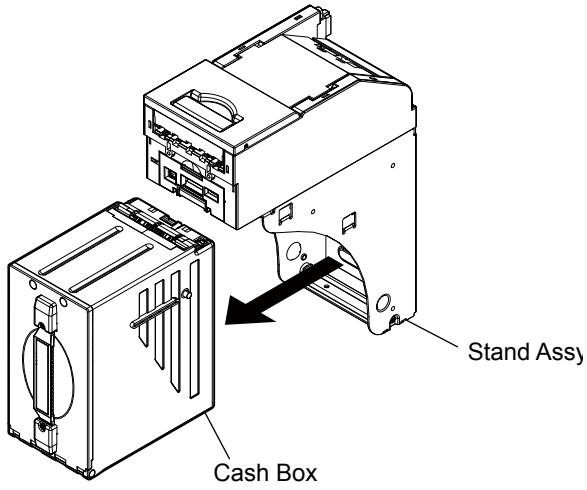
2-3-1. Operation Flow

This unit operates in the sequence shown below.

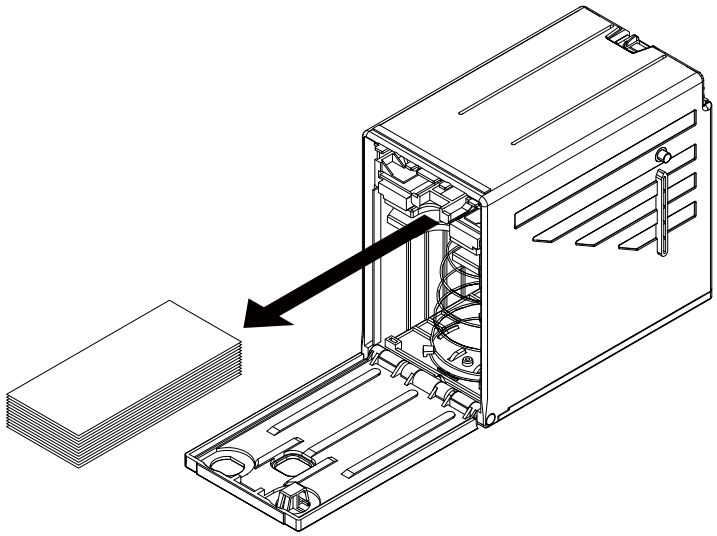


2-3-2. Retrieving Bills

1) Pull the Handle to take out the Cash Box.

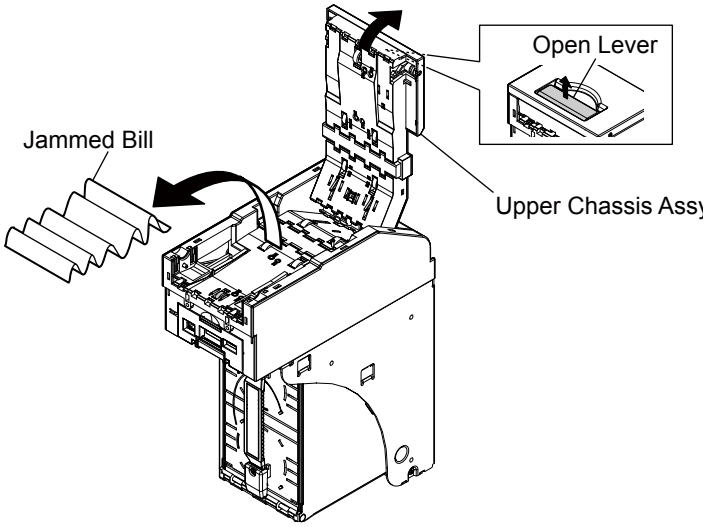


2) When a lock is installed, unlock it.
3) Open the Cash Box bottom lid and retrieve the bills.

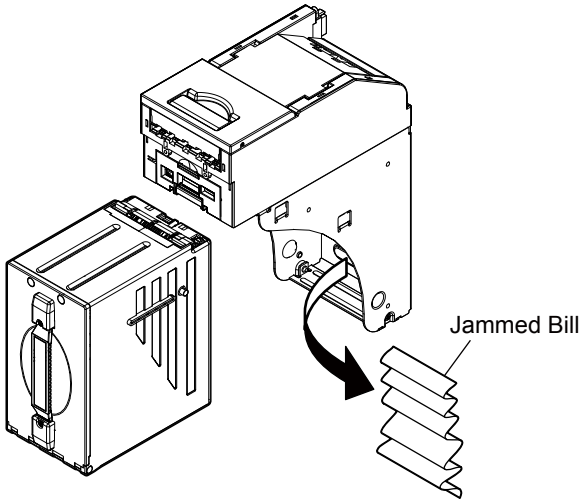


2-3-3. Clearing Bill Jam

1) When a bill is jammed near the bill entrance, pull the Open Lever on top of the unit to open the Upper Chassis Assy, and then remove the jammed bill.



2) When a bill is jammed near the Cash Box entrance, pull the Handle to take out the Cash Box from the Stand Assy, and then remove the jammed bill.



2-4. Maintenance

2-4-1. Preventive Maintenance

Transport Assy

It is important to keep feeding path and optical devices clean.
Use a soft lint-free cloth or cotton swab to wipe out dirt and stain on the surface of rollers and optical sensors. The optical lenses are transparent, and made of polymer material. Handle them with care.

⚠ *Do not use alcohol or paint thinner for cleaning.*

Use compressed air to blow out the paper fibers and other debris that builds up over time.
Check the belts and all moving parts for wear and proper positioning.

Cash Box

Periodically perform maintenance on the Cash Box to ensure proper operation.
Use compressed air to blow out the paper fibers and other debris that builds up over time.
Check the belts and all moving parts for wear and proper positioning.

2-4-2. Trouble Shooting

Refer to Chapter 4.

2-4-3. Adjustment

Four adjustments are required according to replaced parts as listed below.

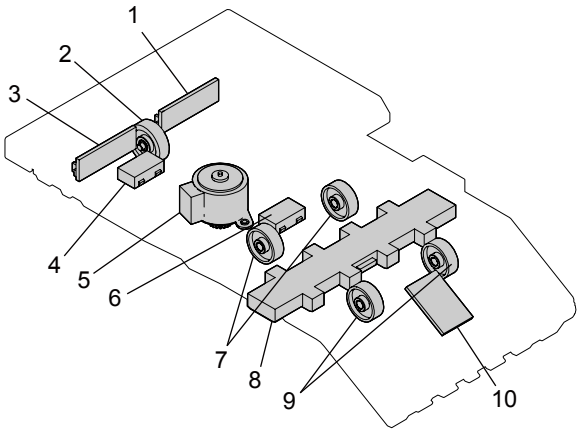
Adjustment	Replaced Part	Adjustment Procedure
Blank paper Correction	CIS CIS Light Source MAIN PCB Assy	Refer to “3-4-4. Others on Upper Chassis Assy”.
Bar-code Sensor Gain	BAR PCB Assy	Refer to “3-4-4. Others on Upper Chassis Assy”
Timing Belt Tension	Timing Belts (On the Lower Chassis Assy) Arm Assembly and its screw (Reinstalled or loosened)	Refer to “3-5-7. Timing Belts”.
Timing Belt Tension	Timing Belts (In the Cash Box)	Refer to “3-6-4. Timing Belts”.

2-4-4. Location of Main Parts

This section shows the location mainly of electrical and optical parts, such as motors, printed wiring boards and sensors.

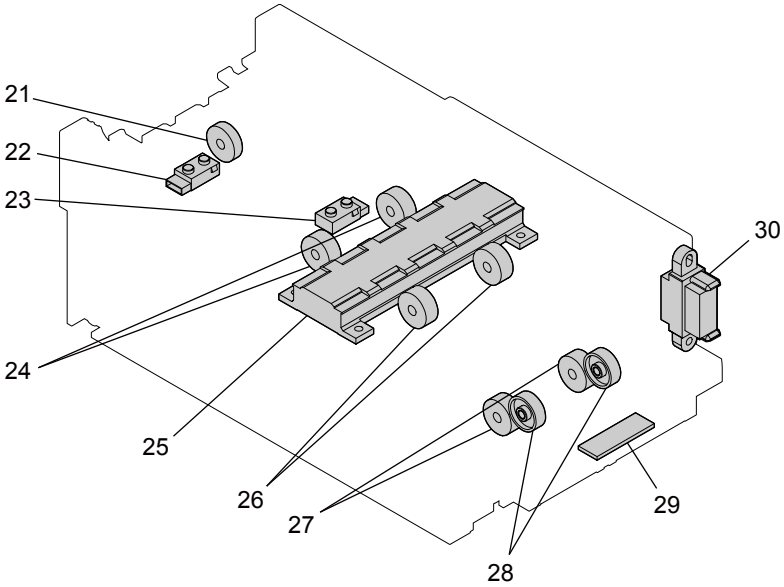
Upper Chassis Assy

1 Clamp Roller Interrupter PCB
(Photointerrupter)
2 Roller CL
(For Front Roller)
3 Upper Chassis Interrupter PCB
(Photointerrupter)
4 Inlet Prism Lens
(For Inlet Prism Sensor)
5 Clamp Motor
(PM Motor-PM20S)
6 Mid Prism Lens
(For Mid Prism Sensor)
7 Mid Up Rollers 1
(For Mid Rollers 1)
8 CIS Light Source
9 Mid Up Rollers 2
(For Mid Rollers 2)
10 BAR PCB Assy
(Photoreflector)



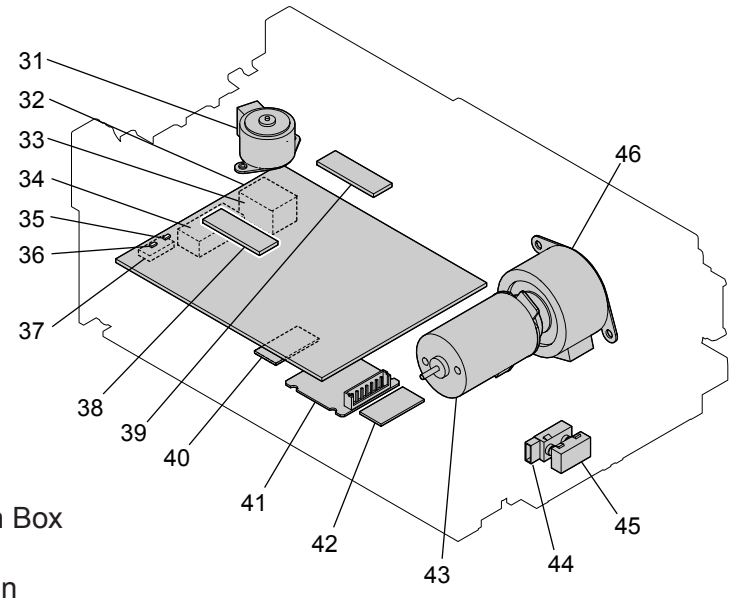
Lower Chassis Assy

21 Front Roller
22 Inlet Prism Sensor
(Photoreflector)
23 Mid Prism Sensor
(Photoreflector)
24 Mid Rollers 1
25 CIS
26 Mid Rollers 2
27 Rear Rollers
28 Rear Pressure Rollers
(For Rear Rollers)
29 Stacker HP Sensor Board
30 Interface Connector



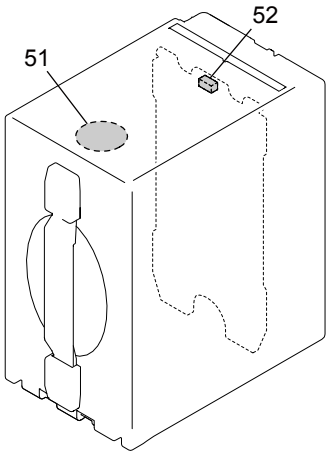
(Lower Chassis Assy)

31 Skew Correction Motor
(PM Motor-PM20S)
32 MAIN PCB Assy
33 USB Connector
34 DIP Switch
35 Green LED
36 Blue LED
37 Face Plate Connector
38 Shutter HP Interrupter PCB
(Photointerrupter)
39 Shutter EP Interrupter PCB
(Photointerrupter)
40 Stacker-full RSW PCB Assy
(Reed Relay)
For the model with 1000-bill Cash Box
41 Reader-writer Module
For the model with RF-tag function
42 Stacker-full RSW PCB Assy
(Reed Relay)
For the model with 500-bill Cash Box
43 Stack Motor
(DC Motor-CN26)
44 Outlet Prism Sensor
(Photoreflector)
45 Outlet Prism Lens
(For Outlet Prism Sensor)
46 Feeding Motor
(PM Motor-PM35L)



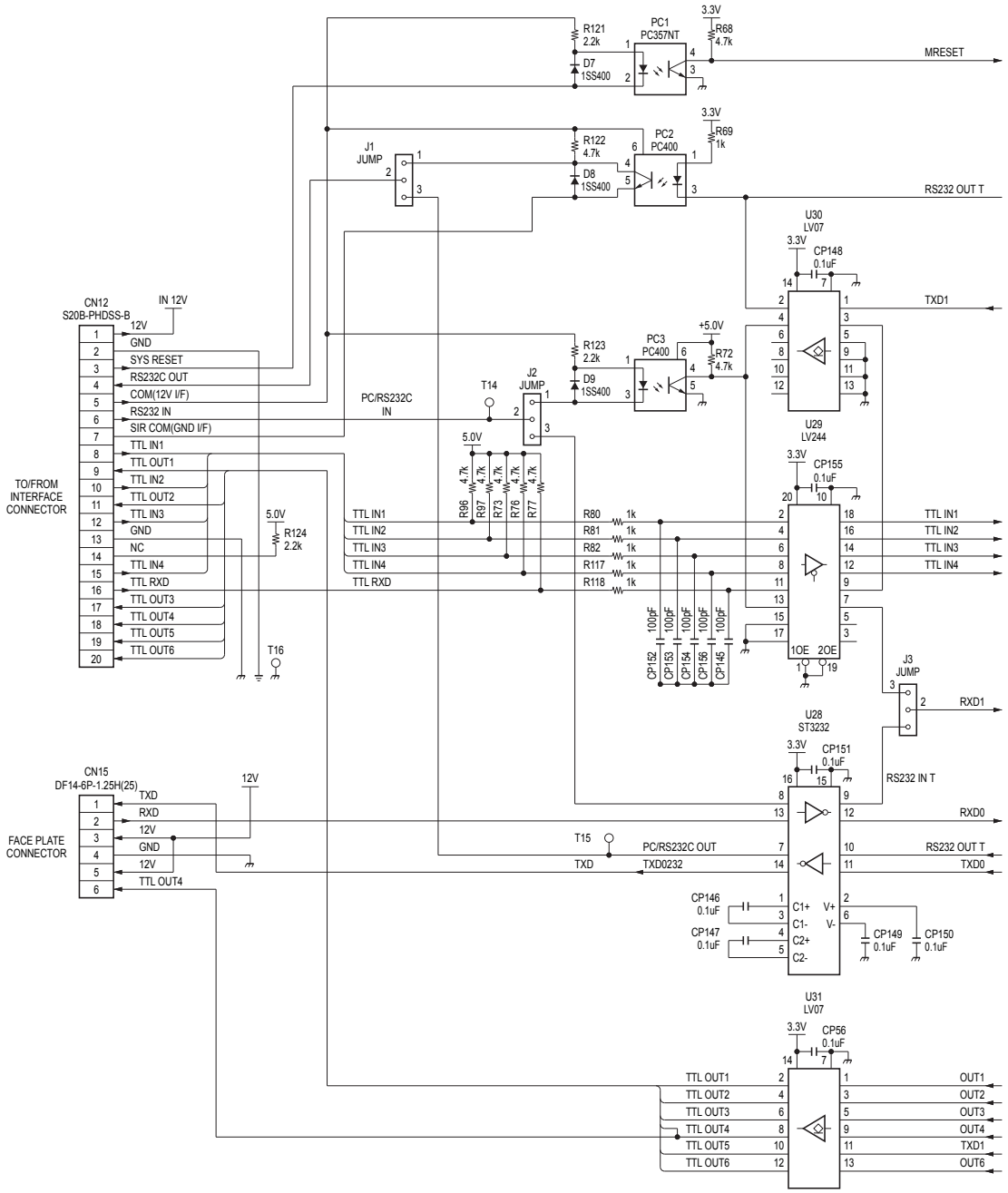
Cash Box Assy

51 RF Tag
For the model with RF-tag function
52 Magnet
(For Stacker-full Sensor)

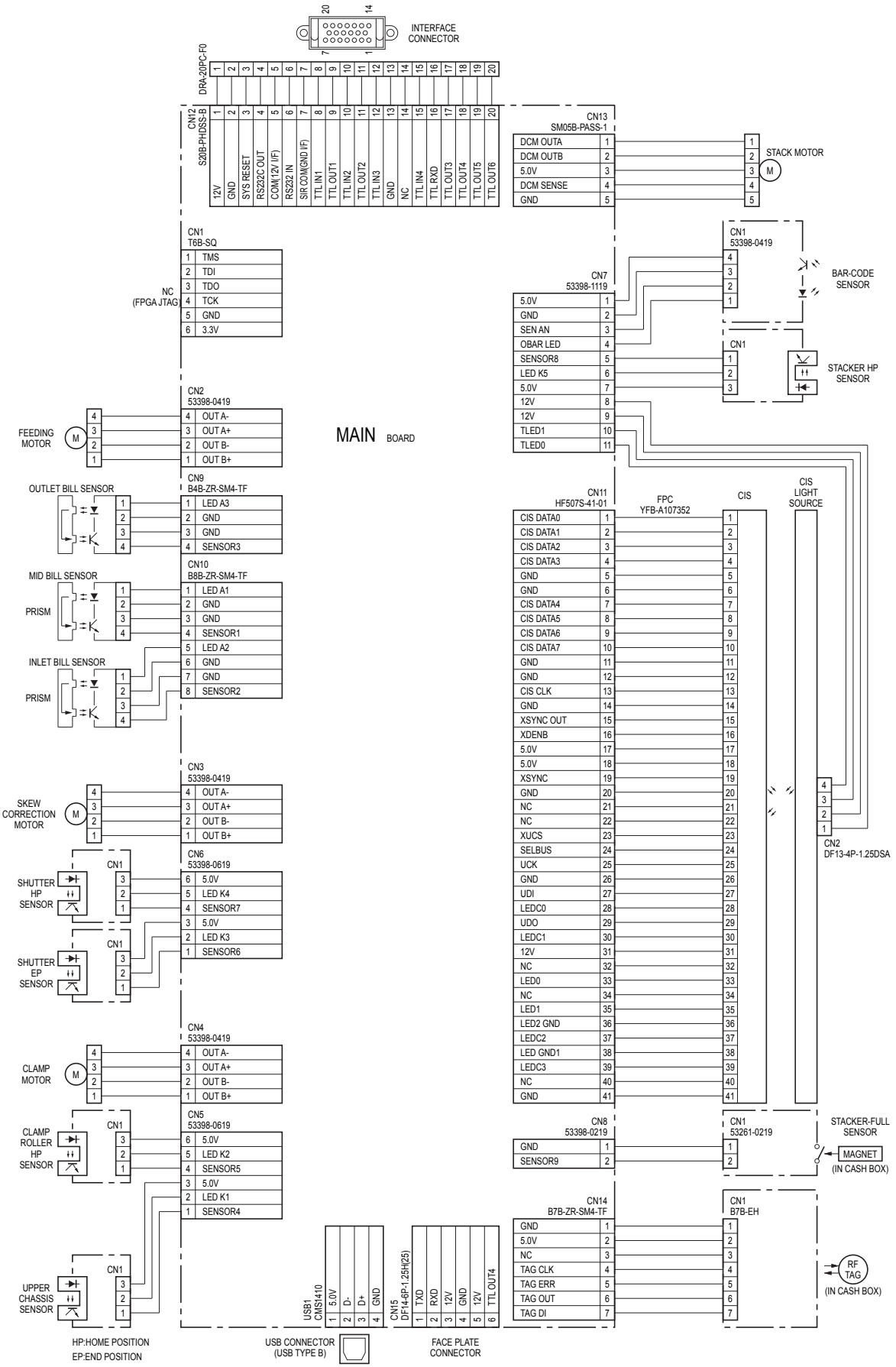


2-4-5. Schematic Diagram

External Interface (MAIN PCB Assy)



Frame Wiring



Chapter 3

Disassembly and Reassembly

3-1. Introduction of Disassembly/Reassembly

Disassembly/Reassembly Procedure

– Disassembly/removal procedure only may be described. Reassemble/reinstall the parts in the reverse order of disassembly/removal in this case.
– Disassembly/removal procedure may not be described for some parts. Refer to the exploded view in Chapter 6 for them in this case.

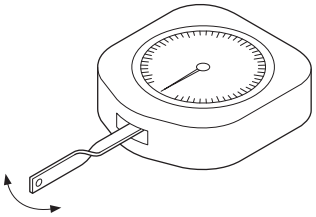
Blank Paper

– Supplied from Aruze Corporation on request. Keep it clean.
– Used for the following.

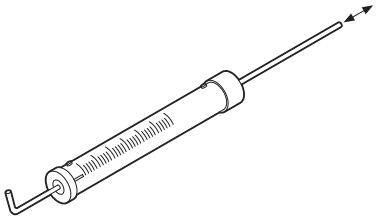
Blank paper correction:	Refer to “3-4-4. Others on Upper Chassis Assy”.
Bar-code sensor gain adjustment:	Refer to “3-4-4. Others on Upper Chassis Assy”.

Tension Gauge

– Prepare two types of tension gauge as specified below.
– Use them for belt tension adjustment when having replaced the Timing Belt with a new one.
– 50 g full scale (to measure 10 to 33 g for the Timing Belts on the Lower Chassis Assy)

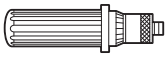
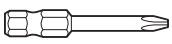


– 30 g full scale x2 (to measure 30 g for the Timing Belts in the Cash Box)



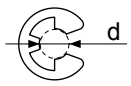
Torque Screwdriver

– Prepare the torque screwdriver and its bit specified below.
When reinstalling the removed parts, tighten screws with the torque specified in each step.

Torque screwdriver	Bit
	
0.3 N•m (3 kgf•cm)	+2 mm
0.6 N•m (6 kgf•cm)	+3 mm

E Ring

– E Rings of three sorts in size are used in this unit.
The removed E Ring should not be used again. It is recommended to prepare new E Rings before disassembling.



d = 2 mm
d = 3 mm
d = 4 mm

Grease and Oil

– Some parts require grease or oil to be applied when replaced with a new one.
Use the grease and oil specified below.

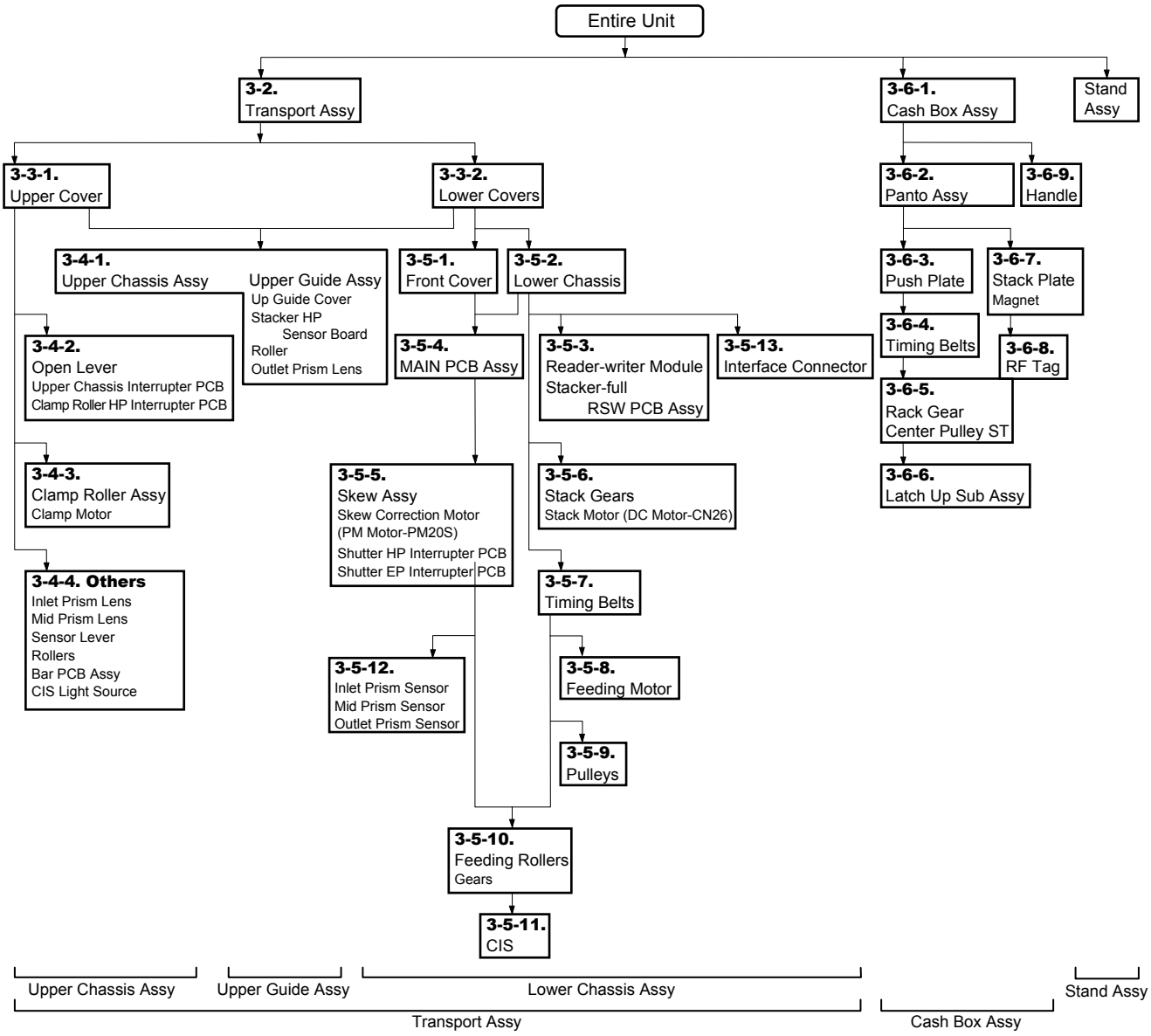
Grease: EM-D110
Oil: PD-930

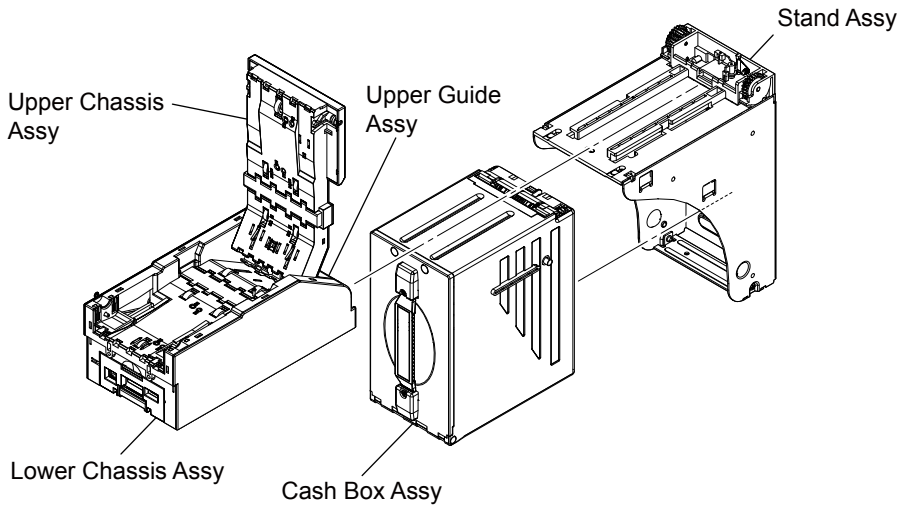
Cleaning

– Wipe out dirt and stain on the surface of rollers and optical devices listed below with a soft lint-free cloth after finishing reassembly.

Feeding Rollers: x5 on the Lower Chassis Assy
Pressure Rollers: x5 on the Upper Chassis Assy and x2 on the Upper Guide Assy
Prisms Lens: x2 on the Upper Chassis Assy, x1 on the Upper Guide
Prism Sensors: x3 on the Lower Chassis Assy
CIS (Image Sensor): x1 on the Lower Chassis Assy
CIS Light source: x1 on the Upper Chassis Assy

Disassembly Flowchart

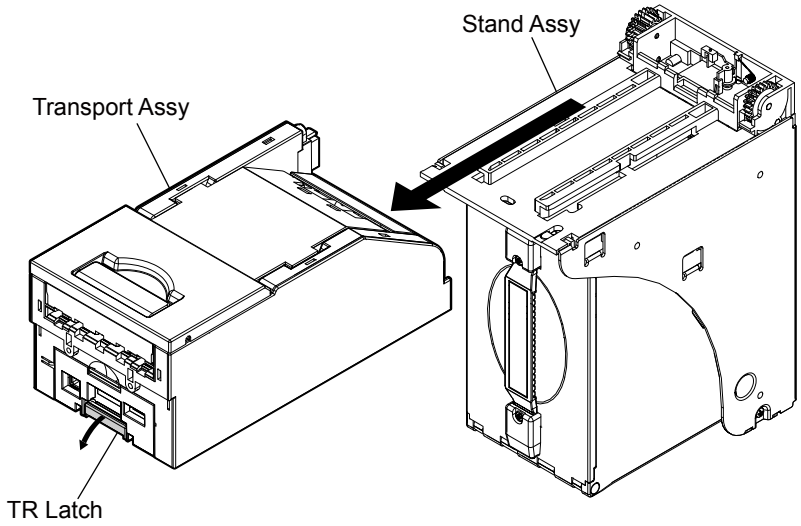




3-2. Transport Assy

Removal

1) Press down the TR Latch to release the lock and pull out the Transport Assy to remove it from the Stand Assy.



Installation

2) Put the Transport Assy on the Stand Assy, and then push it until it locks to the Stand Assy mechanically.

3-3. Covers

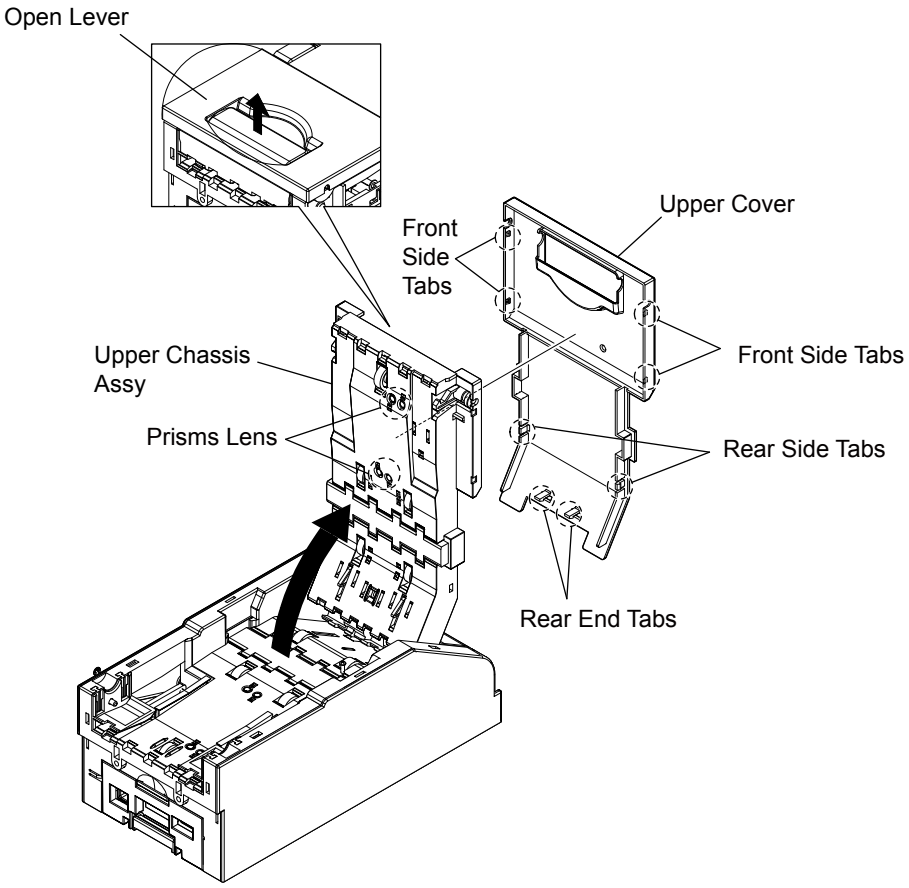
3-3-1. Upper Cover

Preparation

1) Remove the Transport Assy. Refer to “3-2. Transport Assy”.

Removal

2) Pull the Open Lever to open the Upper Chassis Assy.
3) The Upper Cover is locked to the Upper Chassis Assy with eight tabs.
Release the rear end tabs while inserting a flathead screwdriver into the square holes for the rear end tabs, and then pull the rear end of the Upper Cover a little.
Release the rear side tabs while inserting a flathead screwdriver into the square holes for the rear side tabs, and then gently pull the rear end of the Upper Cover to release the front side tabs and to remove the Upper Cover.



Note *After the Upper cover is removed, it is recommended to keep the cover removed until maintenance work is finished.*

Installation

4) Push in the front part and then rear part of the Upper Cover to the Upper Chassis Assy.

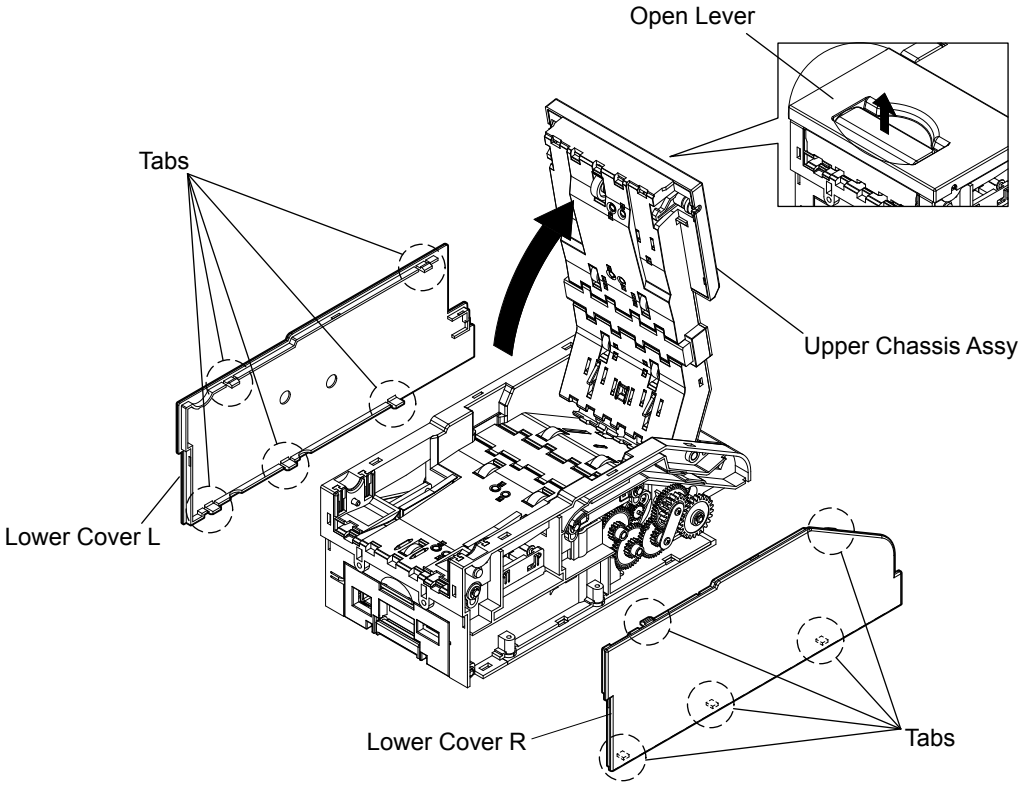
3-3-2. Lower Covers

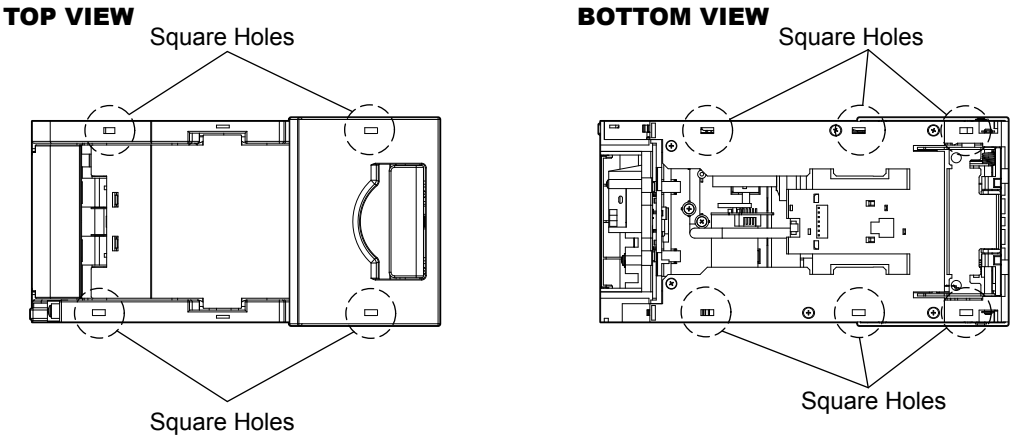
Preparation

1) Remove the Transport Assy. Refer to “3-2. Transport Assy”.

Removal

2) Pull the Open Lever to open the Upper Chassis Assy assembly.
3) The Lower Covers left and right are locked to the Lower Chassis Assy with five tabs respectively.Insert a flathead screwdriver into the square holes, at which the tabs are hooked, to release the tabs and to remove the Lower Covers from the Lower Chassis Assy.





Note *After the Lower Covers are removed, it is recommended to keep the covers removed until maintenance work is finished.*

Installation

4) Push in the Lower Covers to the Lower Chassis Assy.

3-4. Upper Chassis Assy and Upper Guide Assy

3-4-1. Upper Chassis Assy and Upper Guide Assy

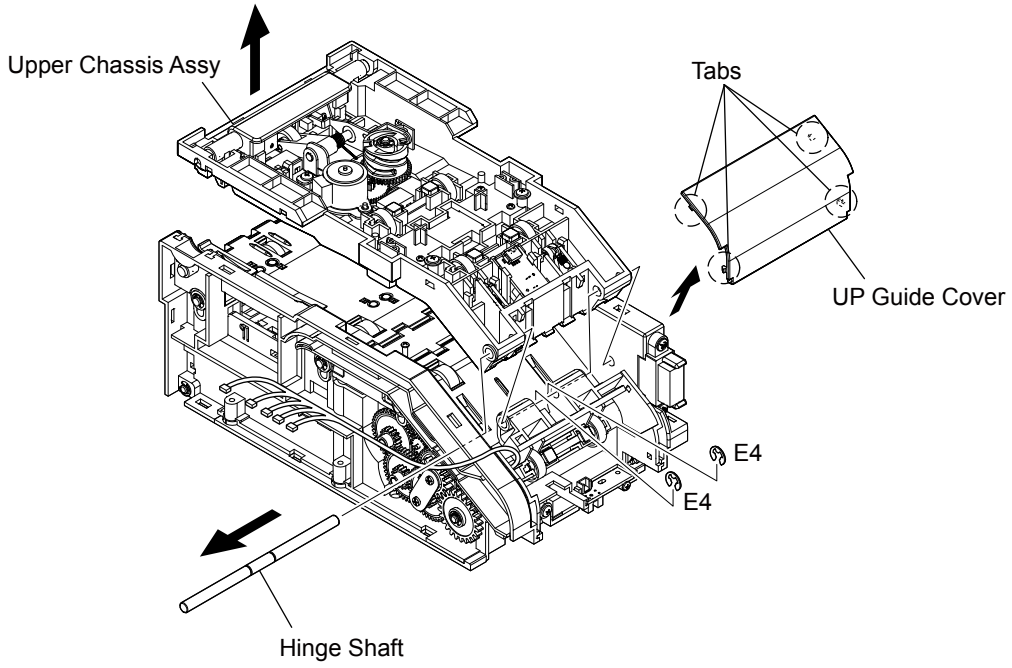
Preparation

1) Remove the following parts.
   - Transport Assy: Refer to “3-2. Transport Assy”.
   - Upper Cover: Refer to “3-3-1. Upper Cover”.
   - Lower Covers: Refer to “3-3-2. Lower Covers”.

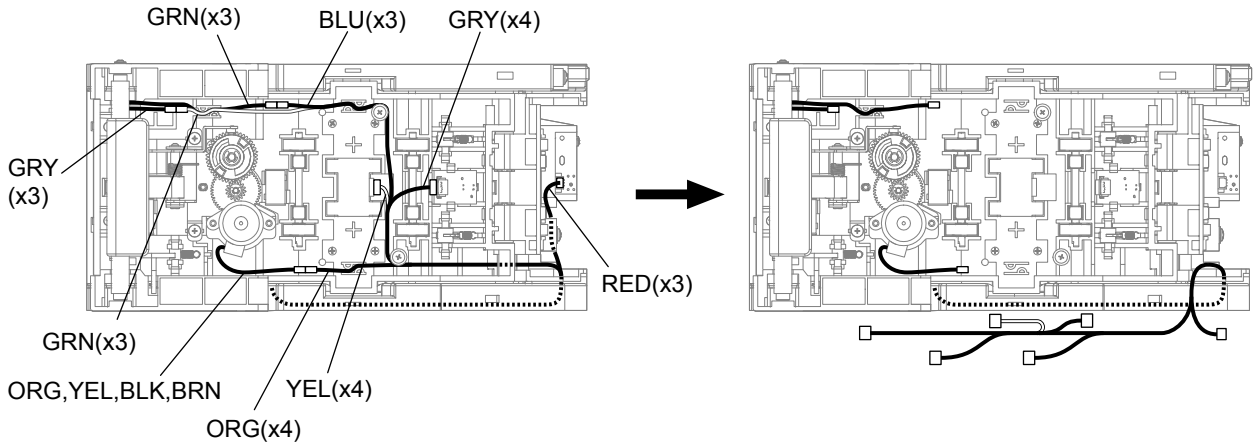
Removal

2) Remove two E Rings, and then draw out the Hinge Shaft.
3) The Upper Guide Assy is locked to the Lower Chassis Assy with two bosses.
   Pull out the Upper Guide Assy a little while pushing both sides of the Lower Chassis Assy towards outside.
4) The UP Guide Cover is locked to the Upper Guide Assy with four tags.
   Pull the lower part of the UP Guide Cover to remove it.

Note *After the UP Guide Cover is removed, it is recommended to keep the cover removed until maintenance work is finished.*

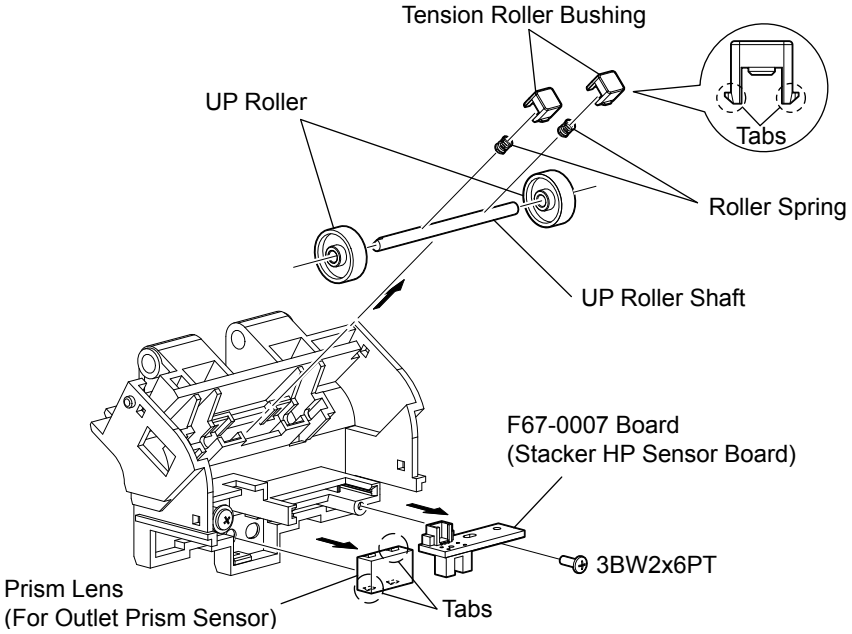


5) Disconnect harnesses from the Upper Chassis Assy and Upper Guide Assy, and then pull out them as shown below.



6) Take out the Upper Chassis Assy.

7) Take out the Upper Guide Assy.
8) Unscrew the screw to pull out the F67-0007 board (Stacker HP sensor board).
Tightening torque for installation: 0.16 N·m (1.7 kgf·cm)
9) Pry out two Tension Roller Bushings together with two Roller Springs, and then take out the UP Roller Shaft and two UP Rollers.
10) Insert a flathead screwdriver into the square hole on the backside to release the tab of the Prism Lens for the Outlet Prism Sensor.



3-4-2. Open Lever

Preparation

1) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Upper Cover: Refer to “3-3-1. Upper Cover”.

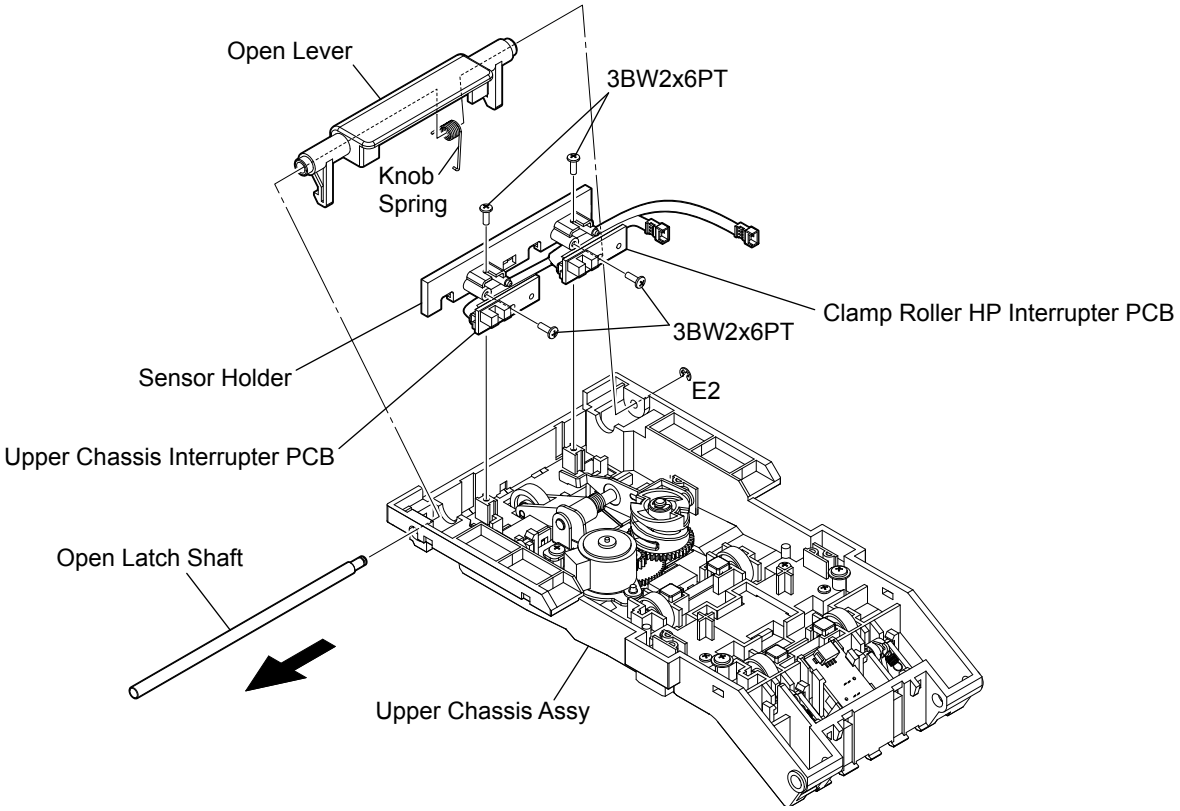
Removal of Open Lever

2) Remove the E Ring from the Open Latch Shaft.
3) Draw the Open Latch Shaft out of the Upper Chassis Assy. The Open Lever and the Knob Spring are removed from the Upper Chassis Assy.

Removal of Two Sensor Boards

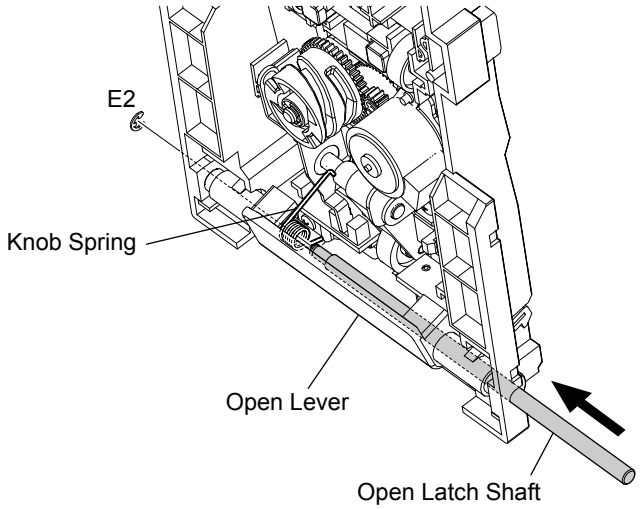
(Upper Chassis Interrupter PCB and Clamp Roller HP Interrupter PCB)

4) Unscrew the screw to remove the Sensor Holder.
   Pull up the Sensor Holder while pushing it towards the back of the Upper Chassis Assy.
5) Unscrew the screw to remove the two F67-0007 boards.

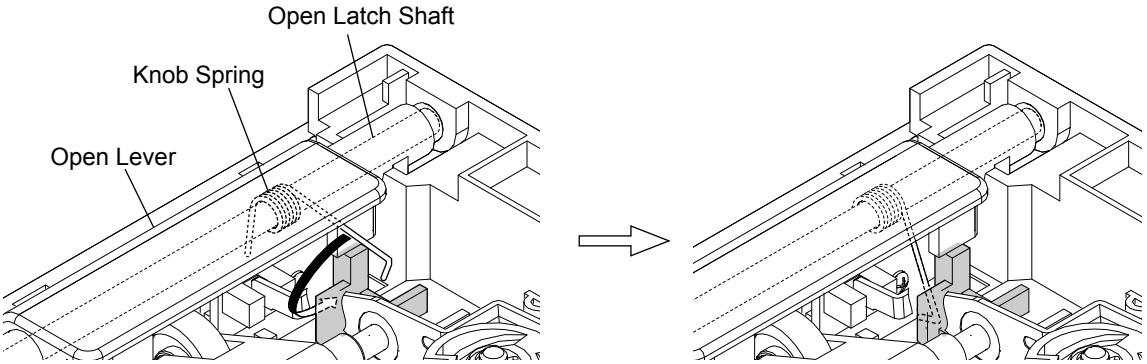


Installation

6) Attach the two Sensor Boards (Interrupter PCBs) with the screw respectively.
   Tightening torque: 0.12 N·m (1.3 kgf·cm)
7) Push in the Sensor Holder to its original position, and then arrange the harnesses.
8) Turn the Transport Assy front face down.
9) Place the Open Lever on its original position and the Knob Spring in the corner of the Open Lever, and then insert the Open Latch Shaft while pressing down the Knob Spring as shown below.



10) Hook the end of the Knob Spring as shown below.



11) Attach the E Ring to the Open Latch Shaft.

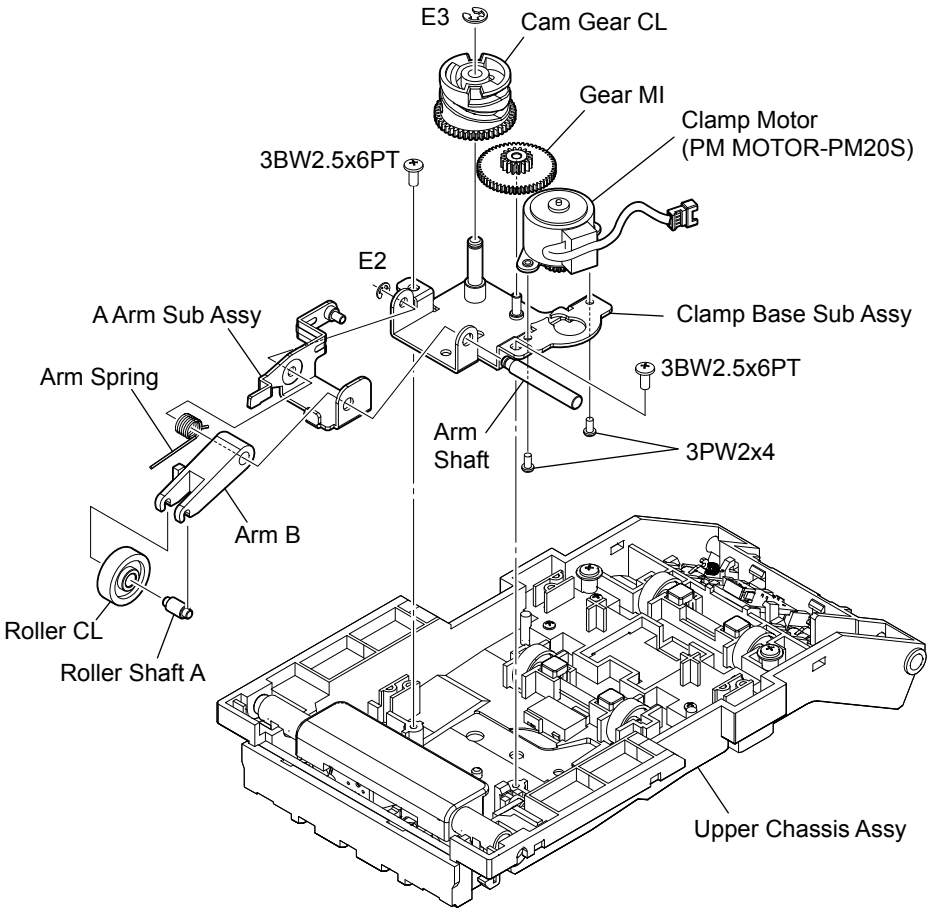
3-4-3. Clamp Roller Assy

Preparation

1) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Upper Cover: Refer to “3-3-1. Upper Cover”.

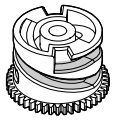
Removal and Disassembly

2) Unscrew two screws to remove the Clamp Roller Assy.
   Tightening torque for installation: 0.24 N·m (2.5 kgf·cm)
3) Disassemble the Clamp Roller Assy as shown below.

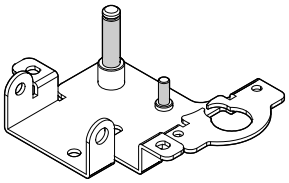


Assembly and Installation

4) Apply grease to the shaded portion shown below when replacing the parts with a new one.



Groove of Cam Gear CL



Shaft of Gears

5) Assemble the parts and install the assembly in the reverse order of removal and disassembly.

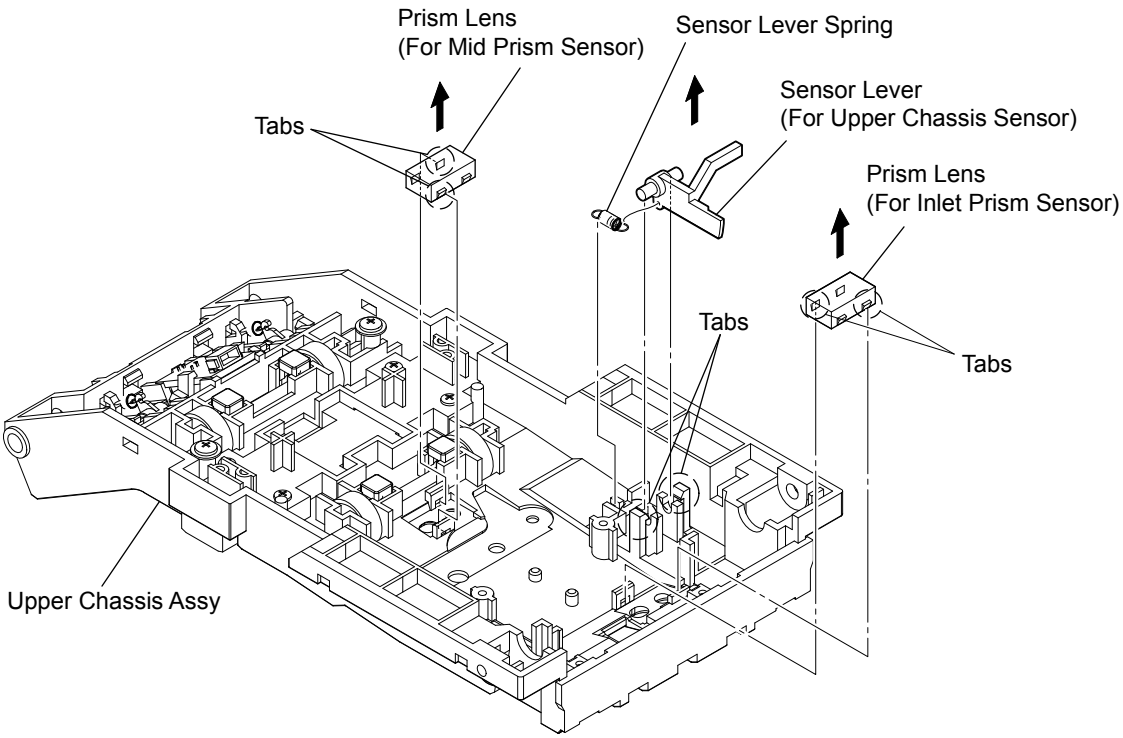
3-4-4. Others on Upper Chassis Assy

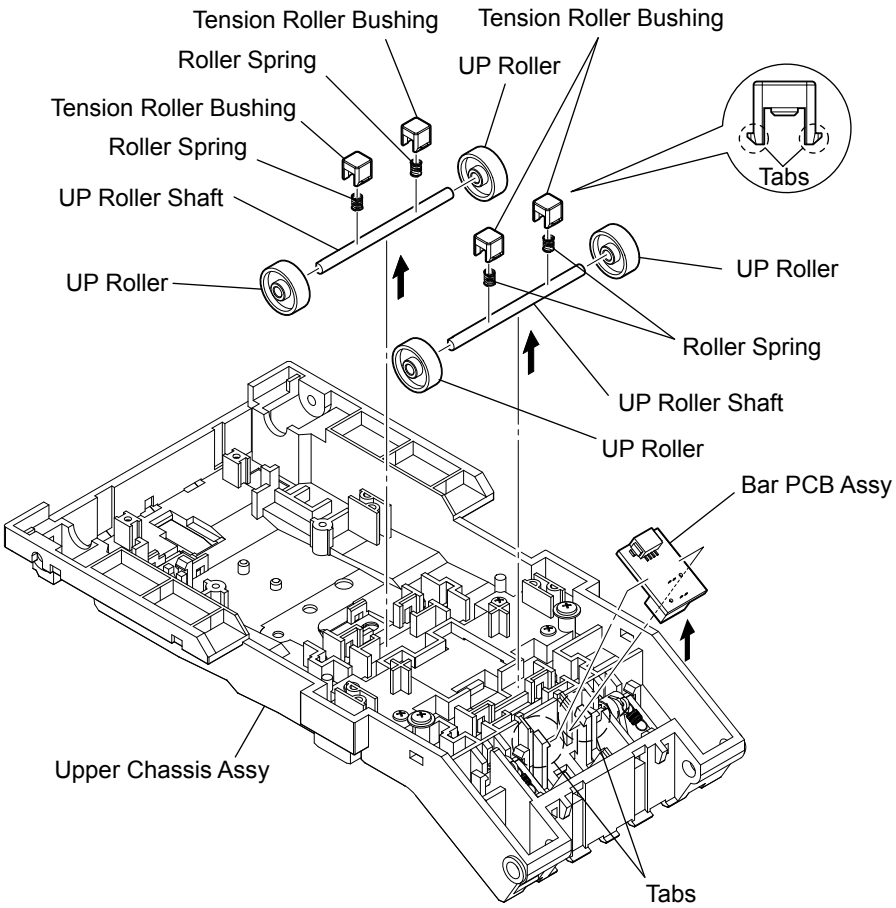
Preparation

1) When replacing the CIS light source and/or Bar PCB Assy (or the Bar-code sensor itself) with a new one, prepare the Blank paper.
   The Blank paper is used for the adjustment.
2) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Upper Cover: Refer to “3-3-1. Upper Cover”.

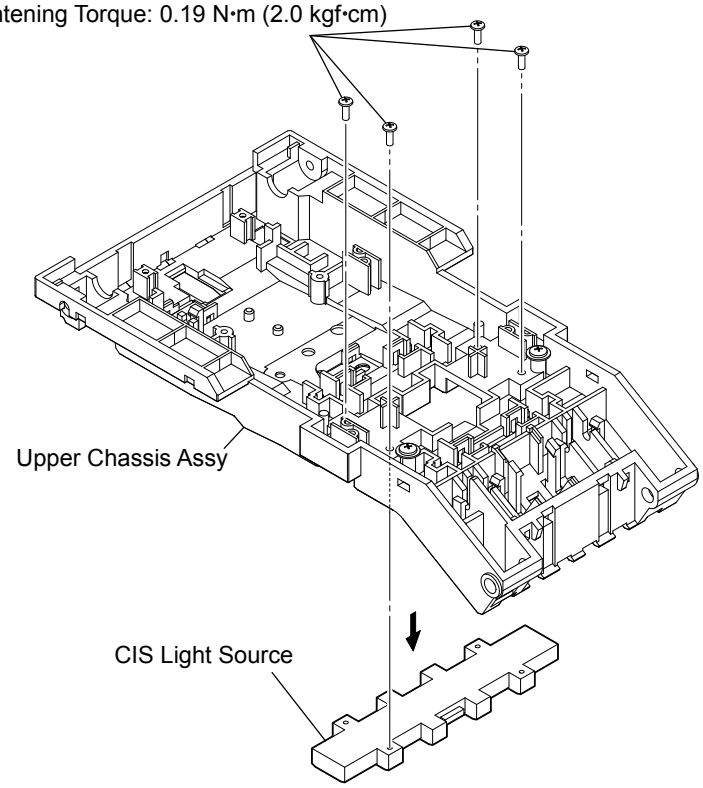
Removal

3) Remove the parts on the Upper Chassis Assy as shown below.





3BW2x6PT
Tightening Torque: 0.19 N•m (2.0 kgf•cm)



For Installation of the Bar PCB Assy

Before installing the Bar PCB Assy, wipe out dirt and stain on the surface of the Bar-code sensor with a soft lint-free cloth.

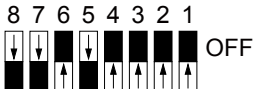
Adjustment: Blank Paper Correction (CIS Sensitivity)
Bar-code Sensor Gain

When having replaced the CIS light source and/or Bar PCB Assy (or Bar-code sensor itself) with a new one, be sure to perform adjustment as follows after reassembling the removed parts.

– Blank Paper Correction
After having replaced the CIS light source, perform the steps (1), (3) and (4) in the order. Skip the step (2). The Blank paper correction is automatically adjusted.

– Bar-code Sensor Gain Adjustment
After having replaced the Bar PCB Assy (or Bar-code sensor itself), perform the steps (1), (2), (3) and (4) in the order.

(1) Set the DIP switch on the Front Cover as shown below, and then turn on the power.



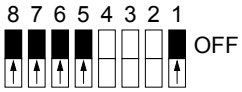
When the green LED lights, insert the Blank paper. The Blank paper stops at the skew correction position in an instant, and then is fed to the escrow position and stops there.

(2) When both green and blue LEDs light, adjustment is OK.
When the green LED on the Front Cover flashes, turn VOL1 on the Bar PCB Assy clockwise so that both LEDs light.
When the blue LED flashes, turn it counterclockwise so that both LEDs light.

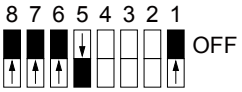
(3) Set the bit 5 of the DIP switch OFF to return the Blank paper.

(4) Set the DIP switch as shown below (any of OFF/ON for the blank bits), and then turn on the power to set the unit to the normal validation mode.

Host Communication Use



Stand-alone Use



3-5. Lower Chassis Assy

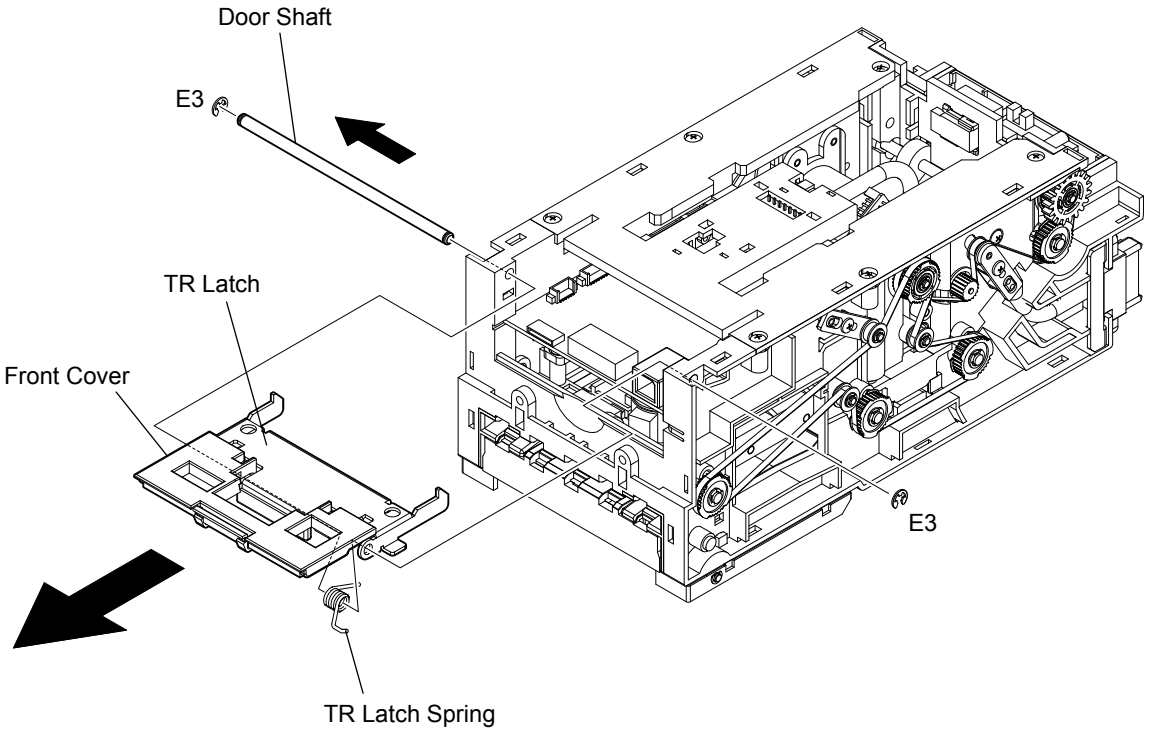
3-5-1. Front Cover

Preparation

1) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Lower Covers: Refer to “3-3-2. Lower Covers”.

Removal

2) Turn the Transport Assy upside down.
3) Remove the E Ring from the Door Shaft.
4) Draw the Door Shaft out of the Transport Assy.
   The Front Cover, TR Latch, and TR Latch Spring are removed from the Lower Chassis Assy as shown below.

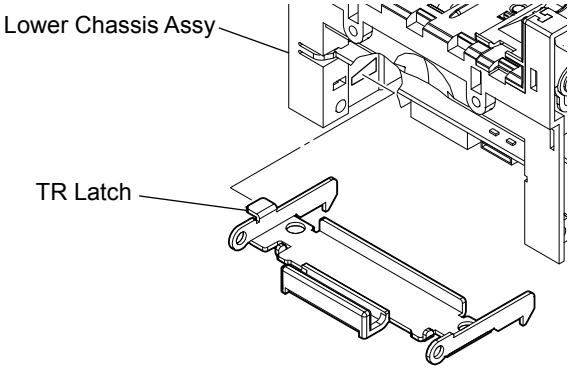


Note *After the Front Cover is removed, it is recommended to keep the cover removed until maintenance work is finished.*

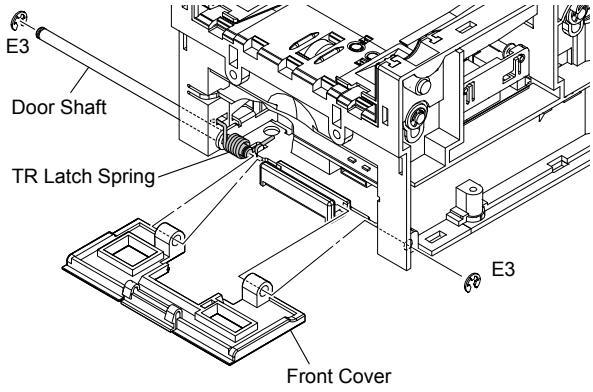
⚠ *Take care to keep the Transport Assy pressing fully to the Stand Assy as the Transport Assy does not lock to the Stand Assy without the Front Cover when installing the Transport Assy on the Stand Assy and operating the unit.*

Installation

5) Turn the unit bottom side down.
6) Insert the protrusion of the TR latch into the trapezoidal hole of the Lower Chassis Assy.



7) Hook the bended end of the TR Latch Spring to the square hole of the Lower Chassis Assy and the other end to the protrusion of the TR Latch, and then push in the Door Shaft through the Lower Chassis Assy, TR Latch, and the TR Latch Spring while pressing down the spring.
8) Place the Front Cover as shown below, and then pass the Door Shaft through the Front Cover and TR Latch.



9) Turn the unit upside down. Push the Door Shaft while adjusting the position of the TR Latch for the shaft to go through the chassis.
10) Attach the E Rings to the both ends of the Door Shaft.

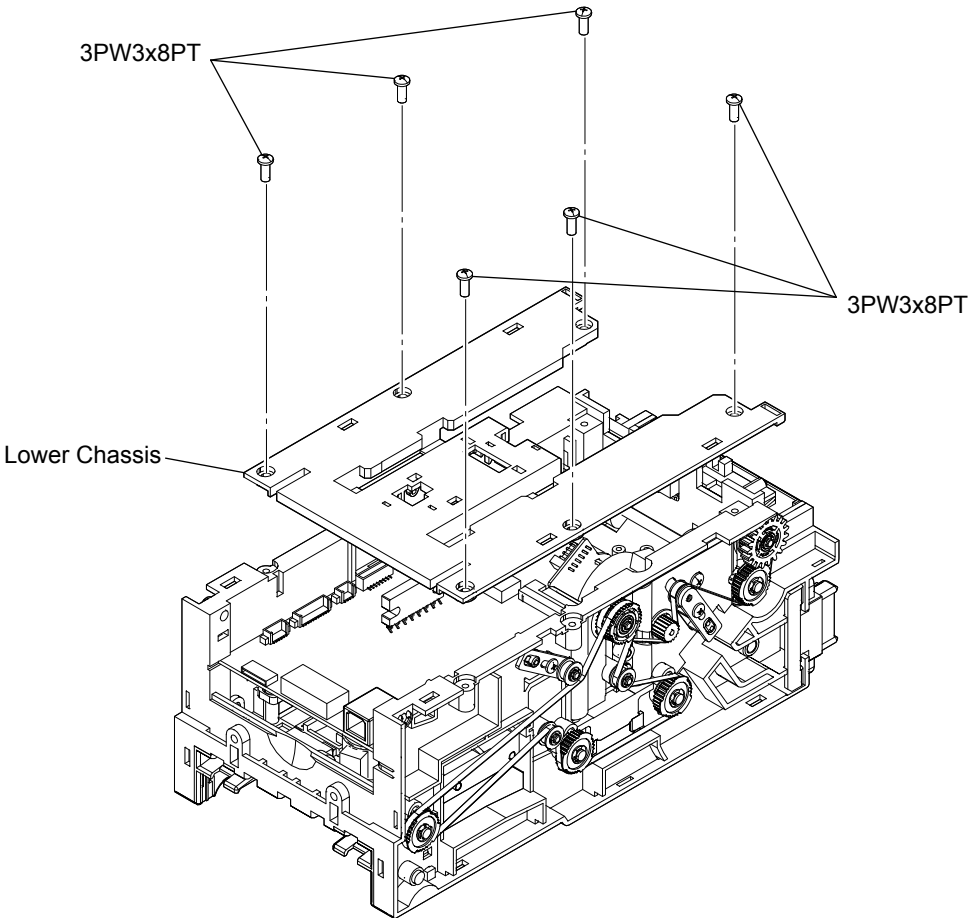
3-5-2. Lower Chassis

Preparation

1) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Lower Covers: Refer to “3-3-2. Lower Covers”.

Removal

2) Turn the Transport Assy upside down.
3) Unscrew six screws to remove the Lower Chassis.
   Tightening torque for installation: 0.29 N·m (3.0 kgf·cm)
4) Disconnect two harnesses from the MAIN PCB Assy.



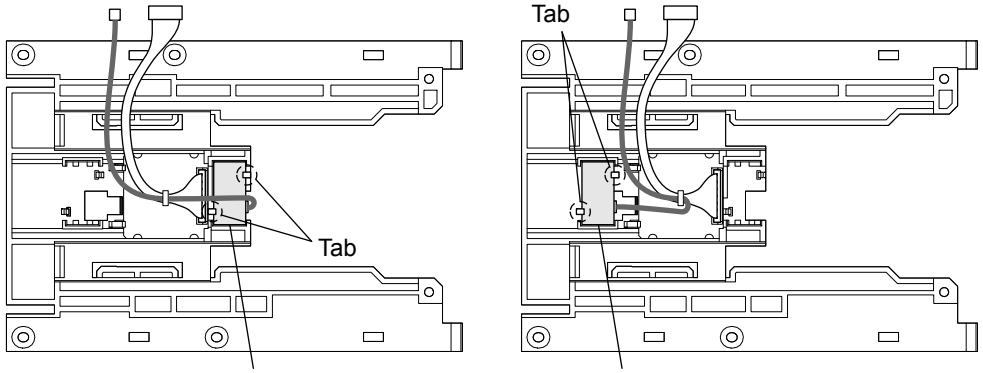
For Installation

Connect two harnesses to connectors CN8 (2 pins) and CN14 (7 pins) on the MAIN PCB Assy when installing the Lower Chassis. Refer to “3-5-4. MAIN PCB Assy”.

3-5-3. Reader-writer Module and RSW PCB Assys

Note *The RF-tag-less model is not equipped with the Reader-writer Module board and its harness.*
Note *The RSW PCB Assy has two home positions according to the capacity of the Cash Box as shown below.*

Inside of the Lower Chassis Sub Assy



RSW PCB Assy for 500-bill Cash Box

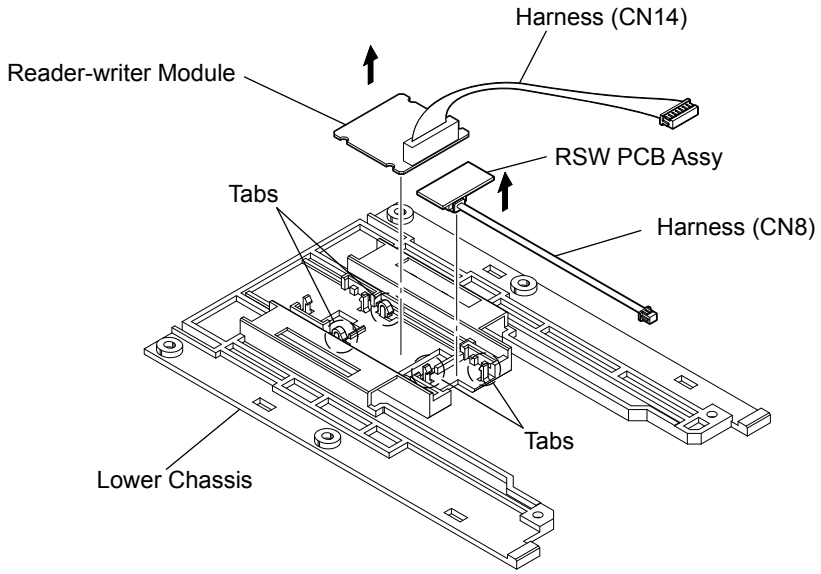
RSW PCB Assy for 1000-bill Cash Box

Preparation

1) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Lower Covers: Refer to “3-3-2. Lower Covers”.

Removal

2) Remove the Lower Chassis referring to “3-5-2. Lower Chassis”, and then reverse it.
3) Release the two tabs, which lock the RSW PCB Assy, and then remove it.
   Release the two tabs, which lock the Reader-writer Module, and then remove it.



Installation

4) Push in the Reader-writer Module board to its original position.
5) Push in the RSW PCB Assy to its original position according to the capacity of the Cash Box.
6) Connect the harnesses to connectors CN8 (2 pins) and CN14 (7 pins) on the MAIN PCB Assy.
   Refer to “3-5-4. MAIN PCB Assy”.

3-5-4. MAIN PCB Assy

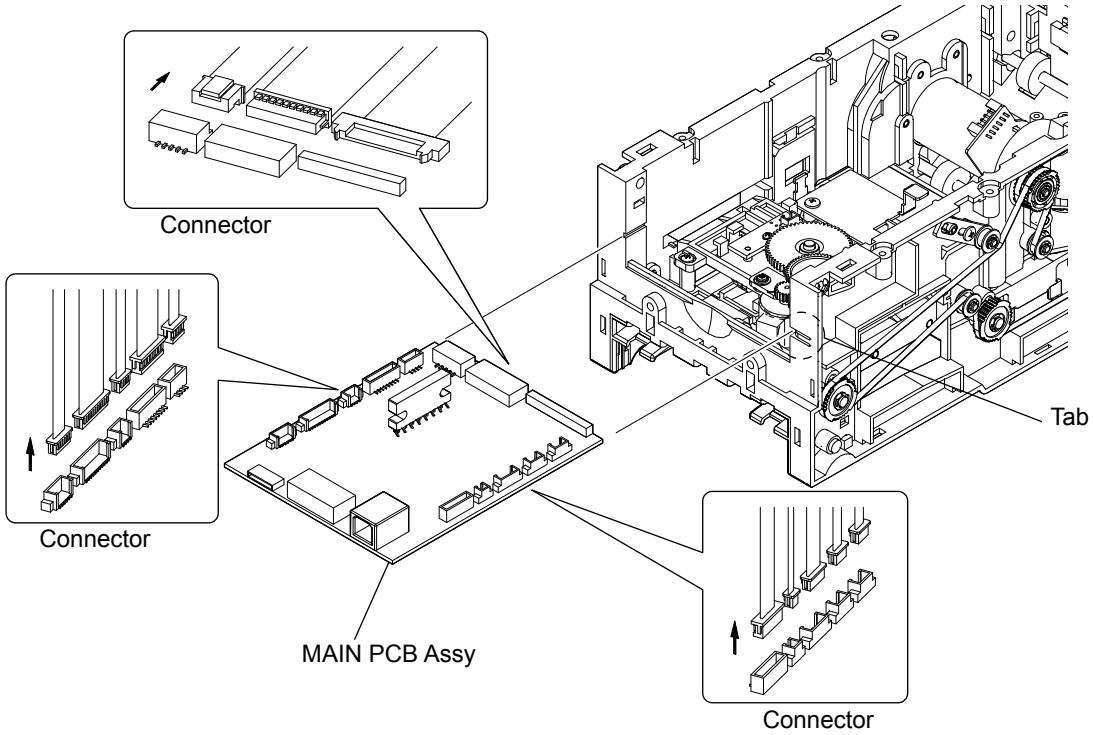
Preparation

1) When replacing the MAIN PCB Assy with a new one, prepare the Blank paper. The Blank paper is used for the adjustment.
2) Remove the following parts.

Transport Assy:	Refer to “3-2. Transport Assy”.
Lower Covers:	Refer to “3-3-2. Lower Covers”.
Front Cover:	Refer to “3-5-1. Front Cover”.
Lower Chassis:	Refer to “3-5-2. Lower Chassis”.

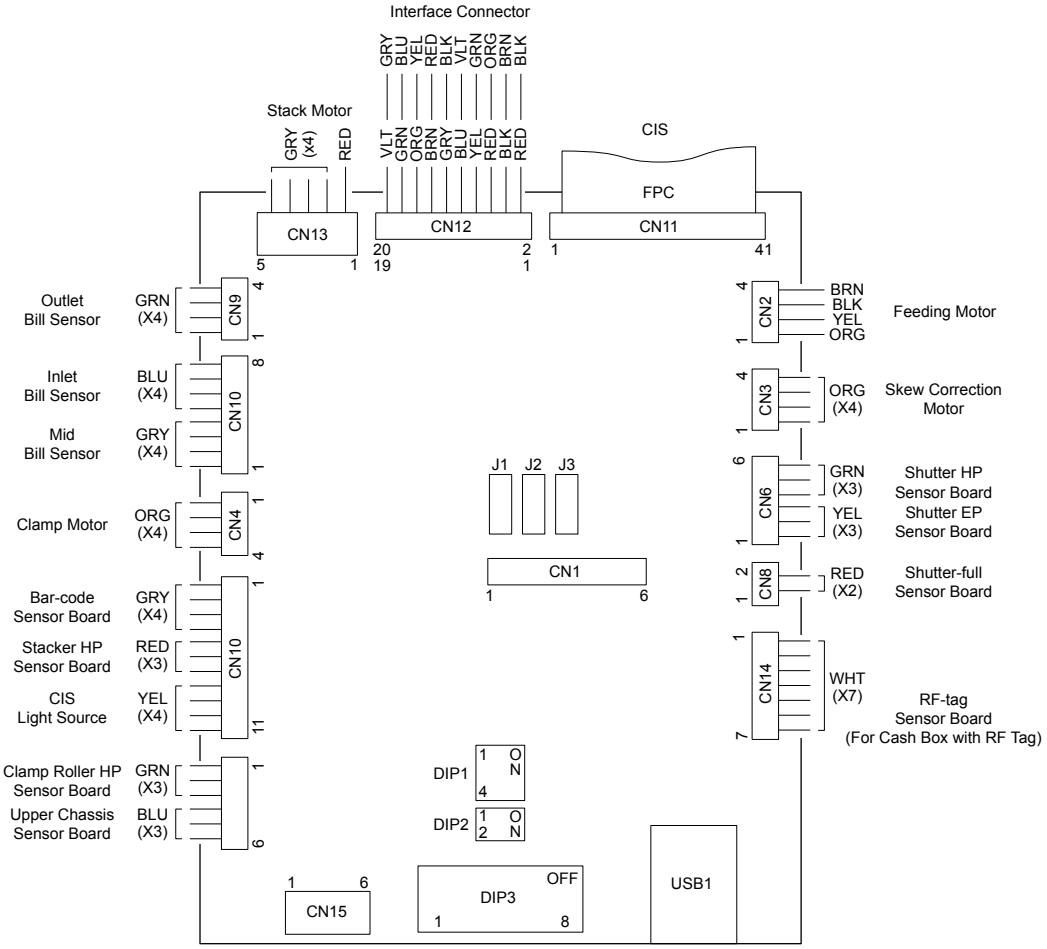
Removal

3) Disconnect all harnesses from the MAIN PCB Assy.
4) Press the front tab towards outside while pushing back the MAIN PCB Assy to release the front tab.
5) Pull out the MAIN PCB Assy.



For Installation

Connect the harnesses to the MAIN PCB Assy as shown below when installing the MAIN PCB Assy.



Adjustment: Blank Paper Correction (CIS Sensitivity)

When having replaced the MAIN PCB Assy with a new one, be sure to perform the Blank paper correction after reassembling the removed parts. Refer to “3-4-4. Others on Upper Chassis Assy”.

3-5-5. Skew Assy

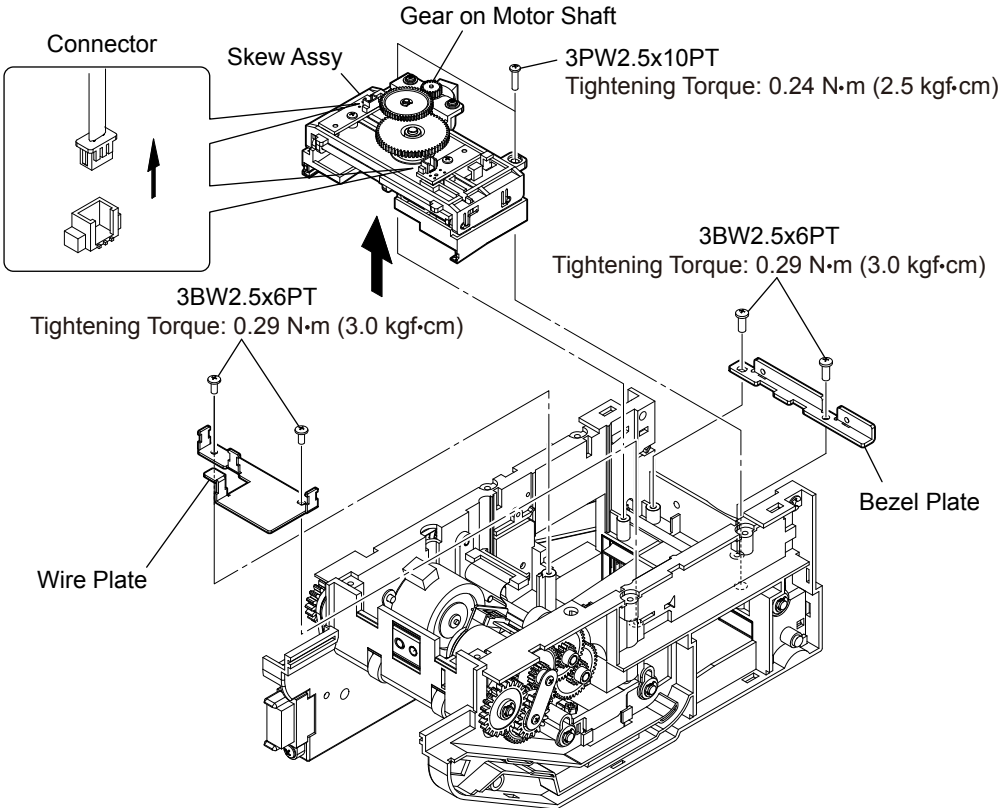
Preparation

1) When replacing the Guide Shaft with a new one, apply oil to the new Guide Shaft, let it stand for approximately 10 minutes, and then wipe out the oil with clean paper or cloth
2) Remove the following parts.

Transport Assy:	Refer to “3-2. Transport Assy”.
Lower Covers:	Refer to “3-3-2. Lower Covers”.
Front Cover:	Refer to “3-5-1. Front Cover”.
Lower Chassis:	Refer to “3-5-2. Lower Chassis”.
MAIN PCB Assy:	Refer to “3-5-4. MAIN PCB Assy”.

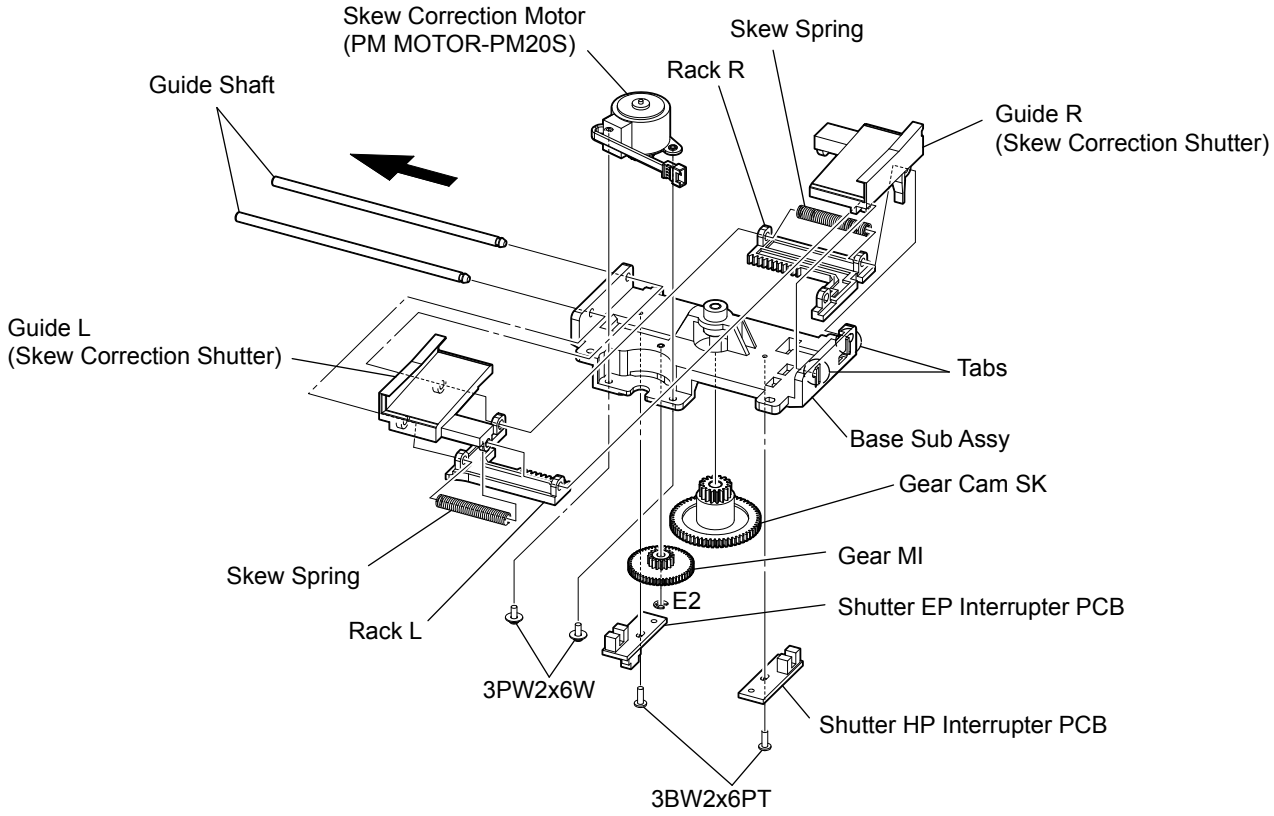
Removal

3) Disconnect harnesses from the Skew Assy and around.
4) Unscrew two screws to remove the Bezel Plate.
5) Unscrew two screws to remove the Wire Plate.
6) Unscrew two screws from the Skew Assy.
7) Turn the Gear on the motor shaft counterclockwise fully, and then clockwise 1.5 to 2.5 turns.
8) Take out the Skew Assy.



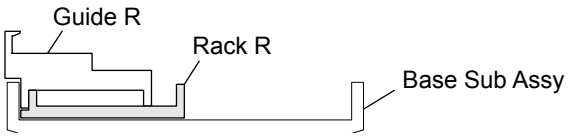
Disassembly

9) Disassemble the Skew Assy as shown below.

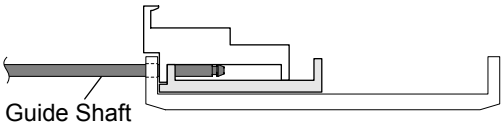


Assembly

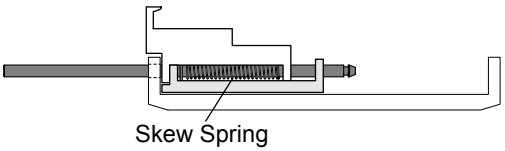
10) Put the Rack R and Guide R on the Base Sub Assy as shown below.



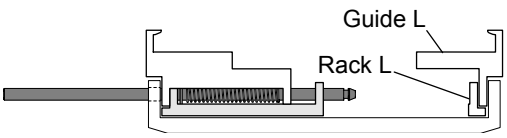
11) Insert the Guide Shaft as shown below.



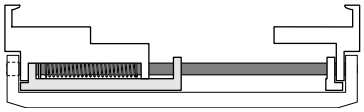
12) Push in the Guide Shaft little by little while putting the Skew Spring to the Guide Shaft, and then pass the Guide Shaft to the mid position as shown below.



13) Put the Rack L and Guide L on the Base Sub Assy.



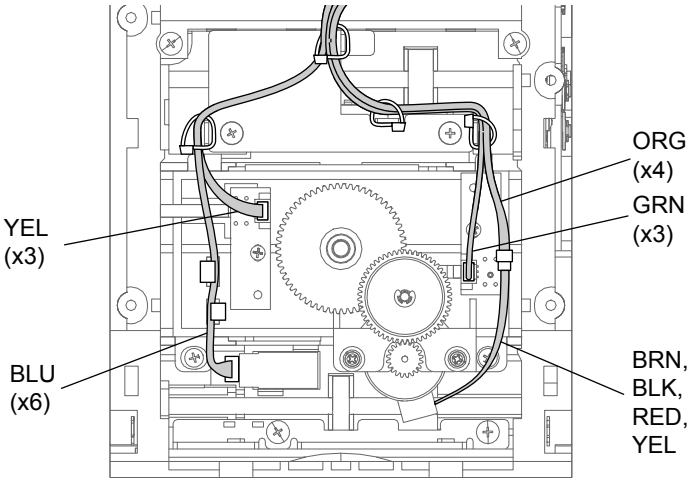
14) Push the Guide Shaft through the Rack L and Guide L fully.



15) Attach the Guide Shaft and Skew Spring to the opposite side while pressing the Racks R and L towards outside fully. Perform it in the similar manner as above.
16) Attach the E Ring to each Guide Shaft.
17) Apply grease to the shafts for the Cam Gear SK and Gear MI.
18) Attach the Cam Gear SK, Gear MI, and Skew Motor(PM MOTOR-PM20S), and then attach the E Ring to the shaft for the Gear MI.
19) Attach two Sensor Boards.
Tightening torque: 0.14 N·m (1.5 kgf·cm)

Installation

20) Install the Skew Assy in the reverse order of removal.
21) Connect and arrange the harnesses as shown below.



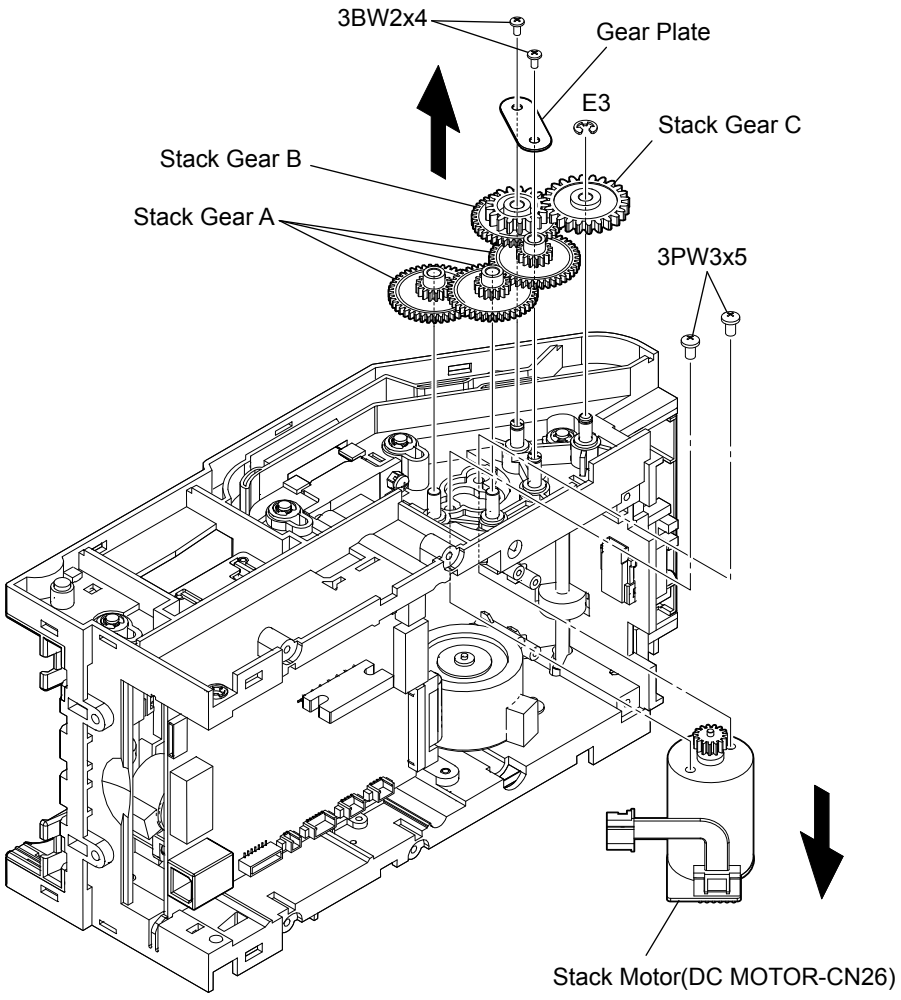
3-5-6. Stack Gears

Preparation

1) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Lower Covers: Refer to “3-3-2. Lower Covers”.
   Lower Chassis: Refer to “3-5-2. Lower Chassis”.

Removal

2) Turn the Transport Assy side face down.
3) Unscrew two screws to remove the Gear Plate.
   Tightening torque for installation: 0.19 N·m (2.0 kgf·cm)
4) Remove the E Ring, and then pull up Stack Gear C.
5) Pull up the Stack Gear B and the three Stack Gear As.
6) Disconnect the harness of the Stack Motor (DC MOTOR-CN26) from connector CN3 on the MAIN PCB Assy.
7) Unscrew two screws to remove the Stack Motor.



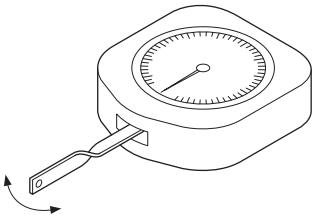
For Installation

Apply grease to the following portions when replacing the gear with a new one.
   Shaft for each Gear
   Inside of the center hole of each Gear

3-5-7. Timing Belts

Preparation

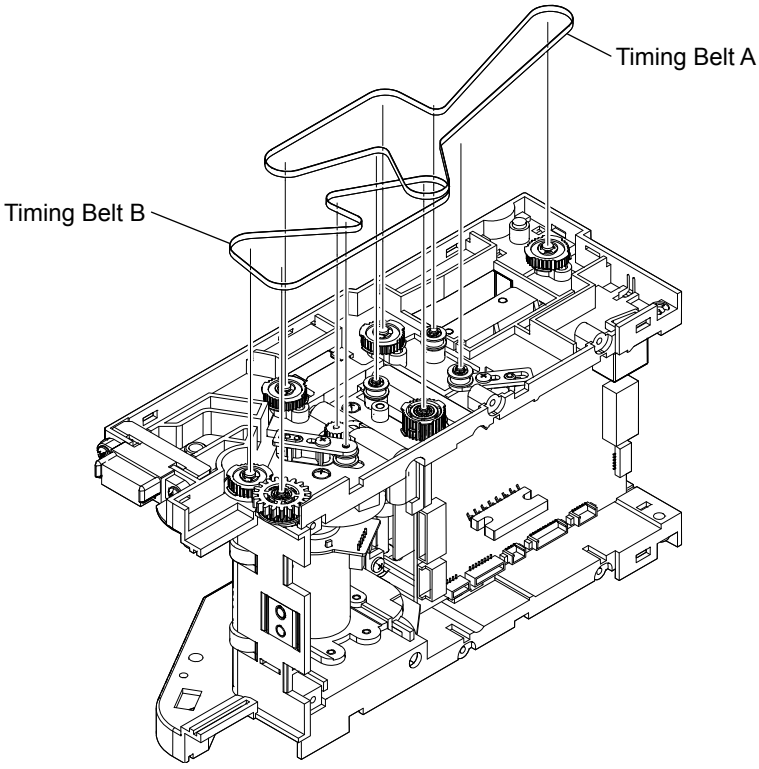
1) When replacing the Timing Belt, prepare the tension gauge specified below in advance.
   50 g full scale



2) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Lower Covers: Refer to “3-3-2. Lower Covers”.
   Lower Chassis: Refer to “3-5-2. Lower Chassis”.

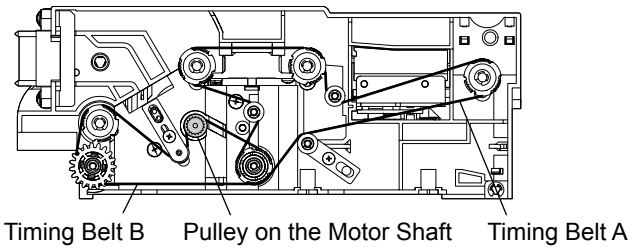
Removal

3) Turn the Transport Assy side face down.
4) Remove the Timing Belt A, and then B.



Installation

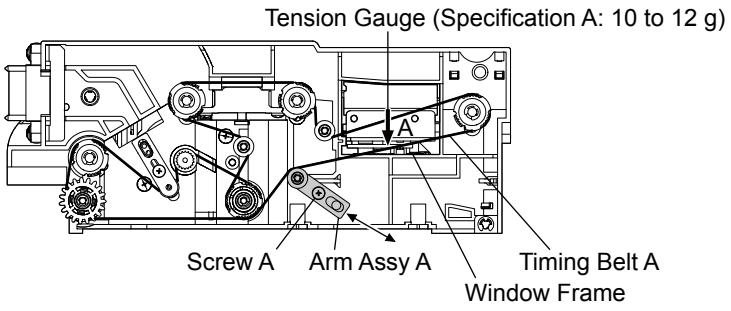
5) Put Timing Belt B, and then A as shown below.
6) Turn the Pulley on the motor shaft with your finger to drive the belts in amount of 1/3 loop of the Timing Belt A so that the belts are accustomed to their path.



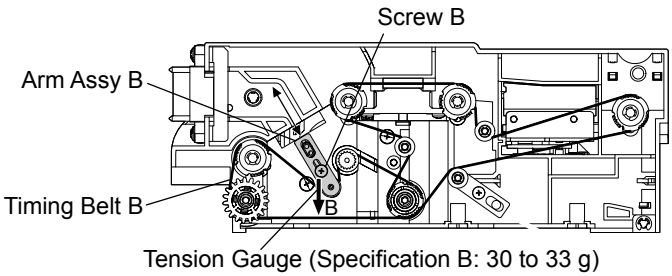
Adjustment

Note *When any one of the following has been done, perform the adjustment.*
The Timing Belt A or B was replaced with a new one.
The Screw A or B was loosened.
The Arm Assy A or B was removed and then reinstalled.

7) Press the arrow A portion of the Timing Belt A with the probe of the tension gauge so that the outside surface of the belt is in line with the chassis's window frame as shown below. Check that the tension gauge reading satisfies the specification A.
If it does not satisfy the specification, loosen the screw A and adjust the position of the Arm Assy A, and then tighten the screw A.
Tightening torque: 0.24 N·m (2.5 kgf·cm)



8) Press the arrow B portion of the Timing Belt B with the probe of the tension gauge so that the outside surface of the belt is very close to the wall of the chassis but not in contact as shown below. Check that the tension gauge reading satisfies the specification B.
If it does not satisfy the specification, loosen the screw B and adjust the position of the Arm Assy B so that the tension gauge reading satisfies the specification B, and then tighten screw B.
Tightening torque: 0.24 N·m (2.5 kgf·cm)



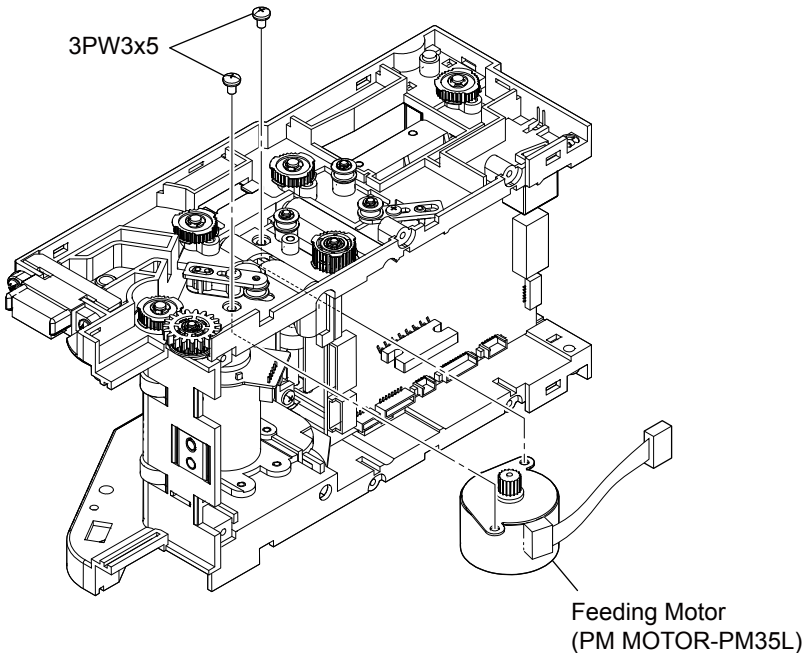
3-5-8. Feeding Motor

Preparation

1) Remove the following parts.
   - Transport Assy: Refer to “3-2. Transport Assy”.
   - Lower Covers: Refer to “3-3-2. Lower Covers”.
   - Lower Chassis: Refer to “3-5-2. Lower Chassis”.
   - Timing Belts: Refer to “3-5-7. Timing Belts”.

Removal

2) Disconnect the harness of the Feeding Motor(PM MOTOR-PM35L) from the MAIN PCB Assy.
3) Unscrew two screws to remove the Feeding Motor.



Installation

4) Attach the Feeding Motor with two screws.
5) Connect the harness of the Feeding Motor to CN2 on the MAIN PCB Assy. Refer to “3-5-4. MAIN PCB Assy”.

3-5-9. Pulleys

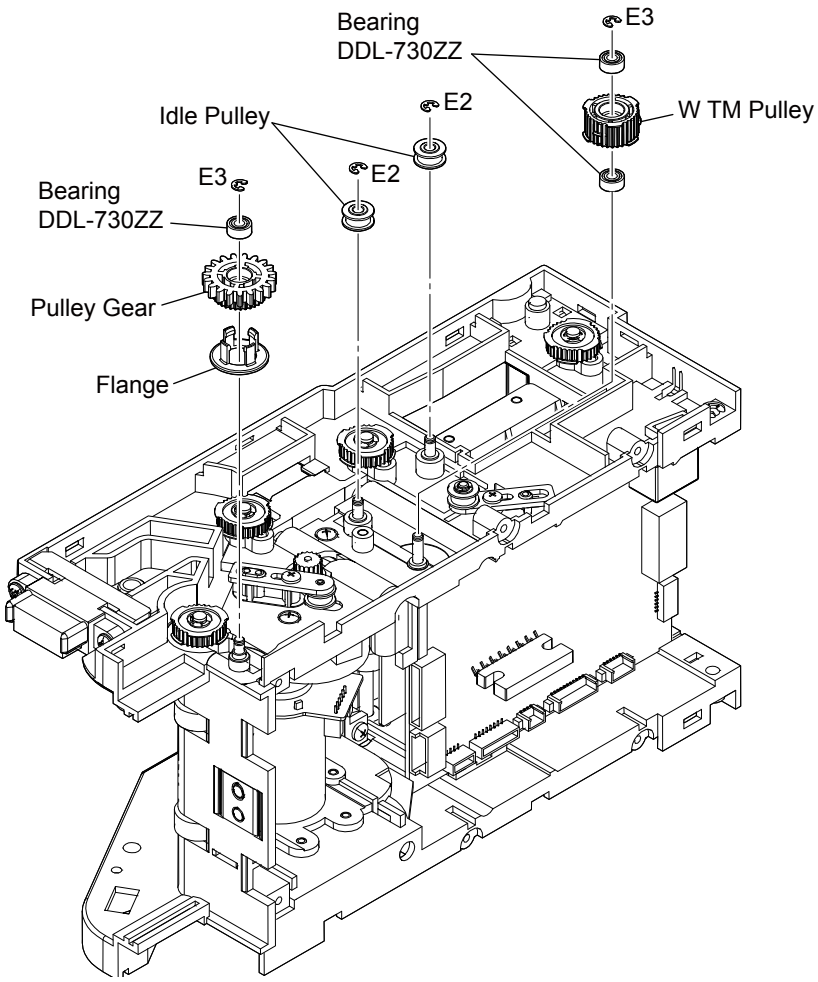
Preparation

1) Remove the following parts.

Transport Assy:	Refer to “3-2. Transport Assy”.
Lower Covers:	Refer to “3-3-2. Lower Covers”.
Lower Chassis:	Refer to “3-5-2. Lower Chassis”.
Timing Belts:	Refer to “3-5-7. Timing Belts”.

Removal

2) Remove E Rings to remove pulleys respectively.



3-5-10. Feeding Rollers

Preparation

1) Remove the following parts.
   - Transport Assy: Refer to “3-2. Transport Assy”.
   - Lower Covers: Refer to “3-3-2. Lower Covers”.
   - Front Cover: Refer to “3-5-1. Front Cover”.
   - Lower Chassis: Refer to “3-5-2. Lower Chassis”.
   - Timing Belts: Refer to “3-5-7. Timing Belts”.

   Remove the following parts for each roller.

   For Inlet roller and Roller (Mid Roller 1)
   - MAIN PCB Assy: Refer to “3-5-4. MAIN PCB Assy.”
   - Skew Assy: Refer to “3-5-5. Skew Assy.

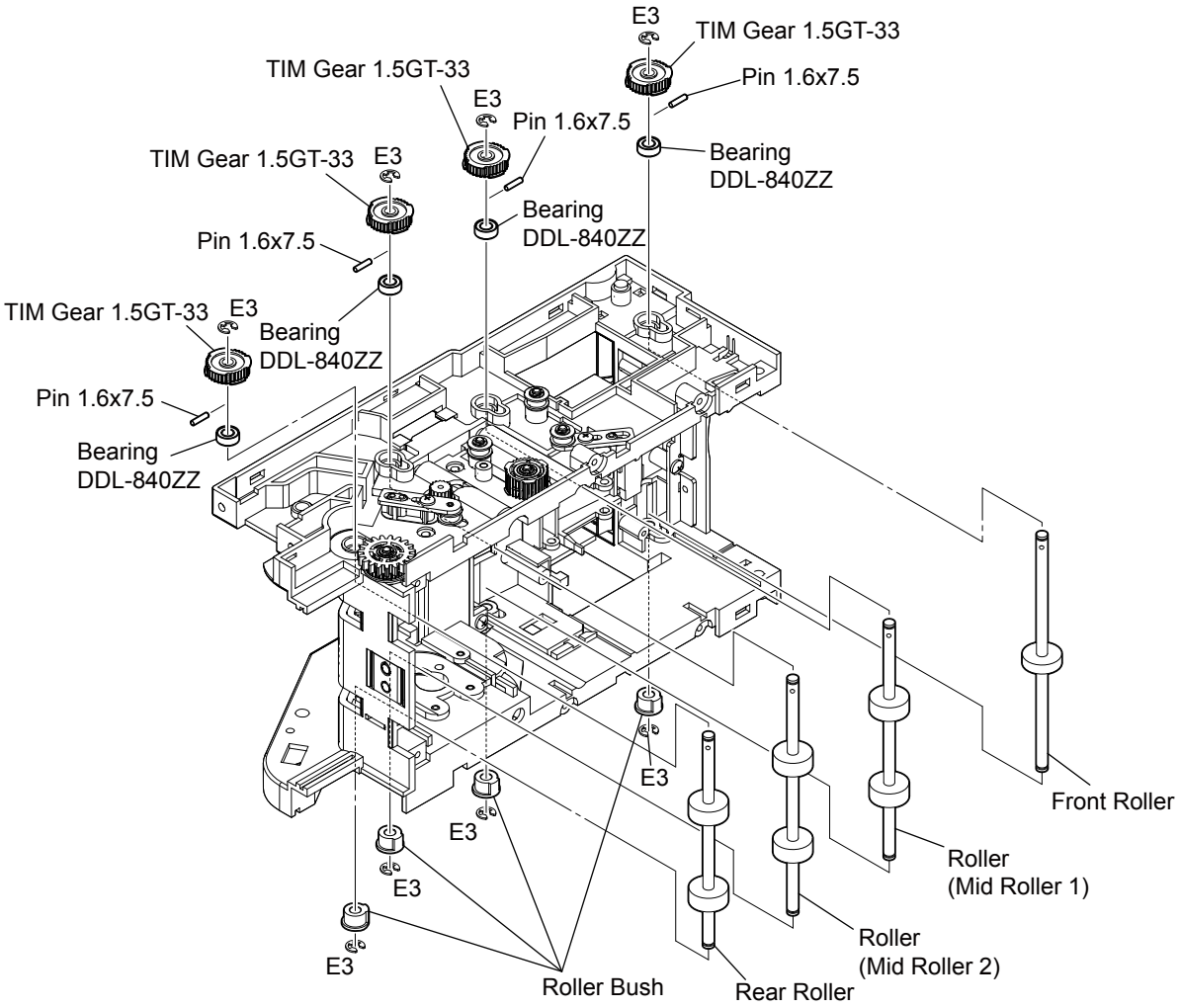
   For Roller (Mid Roller 2)
   - Stack Motor: Refer to “3-5-6. Stack Gears.”
   - Feeding Motor: Refer to “3-5-8. Feeding Motor.”

   For Outlet roller
   - Stack Gears: Refer to “3-5-6. Stack Gears.”

Removal

2) Remove the E Ring on the left end of the roller shaft, and then remove the Gear from the roller shaft.
3) Remove the Pin 1.6x7.5 from the roller shaft, and then remove the Bearing DDL-840ZZ (and poly-slider washers if attached).
4) Remove the E Ring on the other end of the roller shaft, and then remove the Roller Bush.

5) Take out the Front Roller, Roller (Mid Roller 1, 2), or Rear Roller.



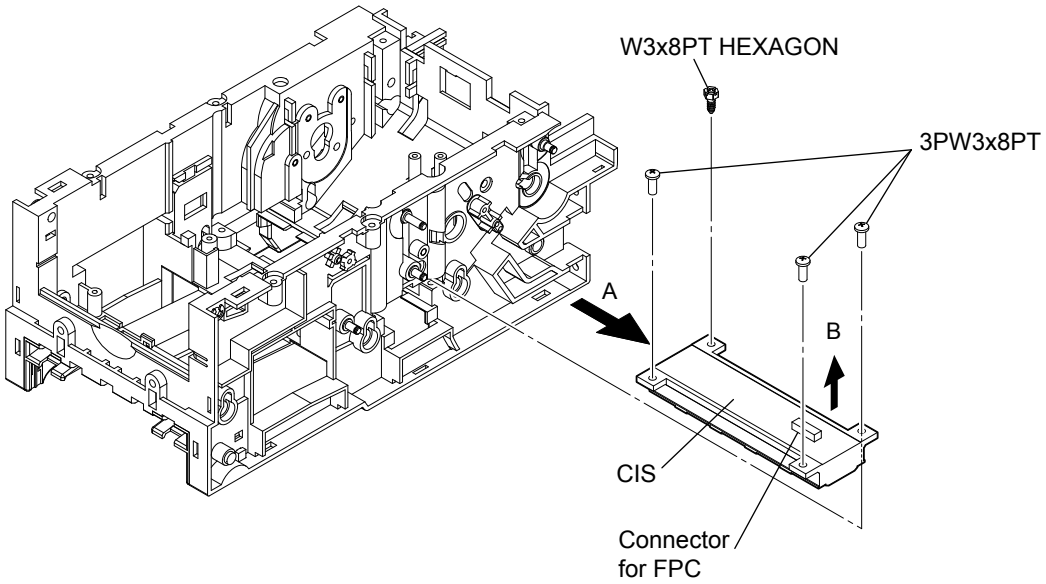
3-5-11. CIS

Preparation

1) When replacing the CIS with a new one, prepare the Blank paper.
   The Blank paper is used for the Blank paper correction (CIS sensitivity adjustment).
2) Remove the following parts.
   - Transport Assy: Refer to “3-2. Transport Assy”.
   - Lower Covers: Refer to “3-3-2. Lower Covers”.
   - Front Cover: Refer to “3-5-1. Front Cover”.
   - Lower Chassis: Refer to “3-5-2. Lower Chassis”.
   - MAIN PCB Assy: Refer to “3-5-4. MAIN PCB Assy”.
   - Skew Assy: Refer to “3-5-5. Skew Assy”.
   - Stack Gears and Stack Motor: Refer to “3-5-6. Stack Gear”.
   - Timing Belts: Refer to “3-5-7. Timing Belts”.
   - Feeding Motor: Refer to “3-5-8. Feeding Motor”.
   - Rollers (Mid Rollers 1 and 2): Refer to “3-5-10. Feeding Rollers”.

Removal

3) Disconnect the Flexible Card Wire (FPC) for the MAIN PCB Assy from the Contact Image Sensor (CIS).
4) Unscrew four screws.
   Tightening torque for installation: 0.29 N·m (3.0 kgf·cm)
5) Pull out the CIS in the arrow A direction while pulling it in the arrow direction B.



6) Install the removed parts in the reverse order of removal.
7) Connect harnesses to the MAIN PCB Assy. Refer to “3-5-4. MAIN PCB Assy”.

Adjustment: Blank Paper Correction (CIS Sensitivity)
When having replaced the CIS with a new one, be sure to perform the Blank paper correction after reassembling the removed parts. Refer to “3-4-4. Others on Upper Chassis Assy”.

3-5-12. Prism Sensors

Inlet and Mid Prism Sensors

Preparation

1) Remove the following parts.

Transport Assy:	Refer to “3-2. Transport Assy”.
Lower Covers:	Refer to “3-3-2. Lower Covers”.
Front Cover:	Refer to “3-5-1. Front Cover”.
Lower Chassis:	Refer to “3-5-2. Lower Chassis”.
MAIN PCB Assy:	Refer to “3-5-4. MAIN PCB Assy”.
Skew Assy:	Refer to “3-5-5. Skew Assy”.

Removal

2) Release the tab of each Prism Sensor, and then remove each Prism Sensor as shown below.

Outlet Bill Sensor

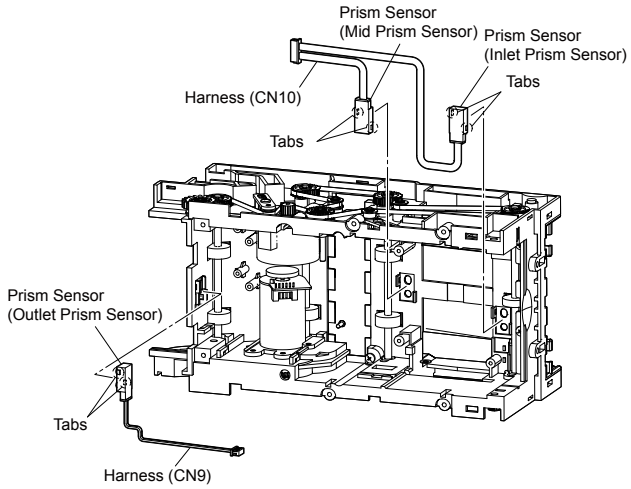
Preparation

1) Remove the following parts.

Transport Assy:	Refer to “3-2. Transport Assy”.
Lower Covers:	Refer to “3-3-2. Lower Covers”.
Lower Chassis:	Refer to “3-5-2. Lower Chassis”.

Removal

2) Release the tab of the Prism Sensor, and then remove the sensor as shown below.



Installation

3) Push in the Prism Sensors to their original position.
4) Reinstall the Skew Assy, and then the MAIN PCB Assy.
5) Connect harnesses to the MAIN PCB Assy. Refer to “3-5-4. MAIN PCB Assy”.

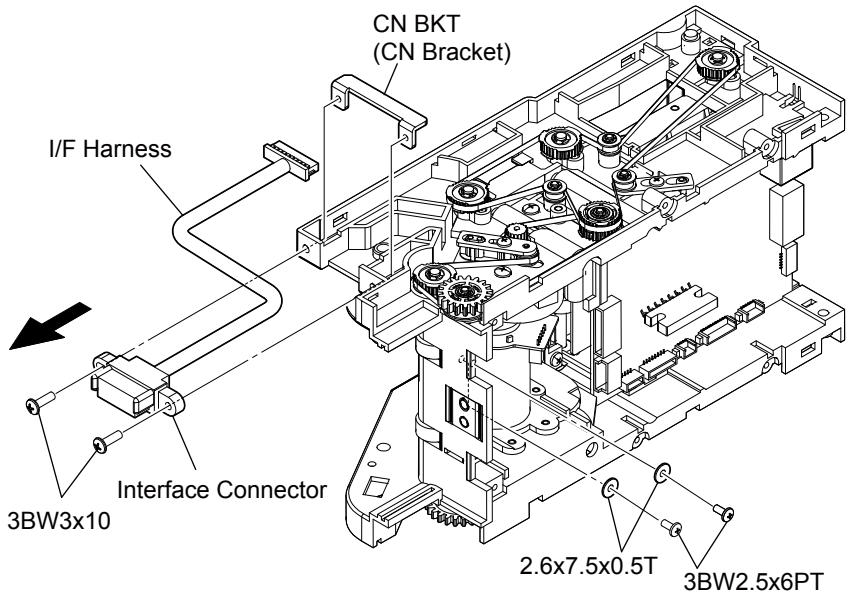
3-5-13. Interface Connector

Preparation

1) Remove the following parts.
   Transport Assy: Refer to “3-2. Transport Assy”.
   Lower Covers: Refer to “3-3-2. Lower Covers”.
   Lower Chassis: Refer to “3-5-2. Lower Chassis”.

Removal

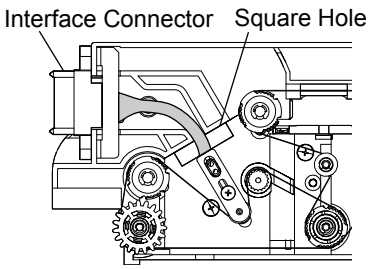
2) Disconnect the harness of the Interface Connector from the MAIN PCB Assy.
3) Remove two screws and washers used for the harness retainer.
4) Unscrew two screws to remove the Interface Connector and the CN BKT (CN Bracket).
5) Take out the Interface Connector with its harness.



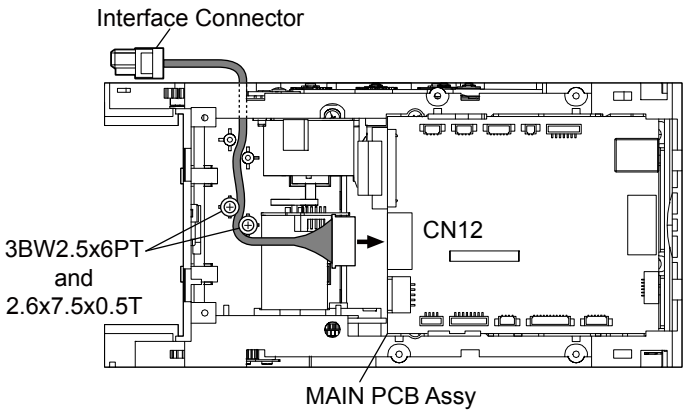
Installation

6) Pass the harness and connect it to connector CN12 on the MAIN PCB Assy as shown below.
7) Attach two screws and washers used for the harness retainer.
   Tightening torque: 0.24 N·m (2.5 kgf·cm)

Side View



Bottom View



8) Attach the Interface Connector and the CN BKT (CN Bracket) with two screws.